SIEMENS

SIMATIC

RFID systems
SIMATIC RF-MANAGER 2008

Operating Manual

06/2010
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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION

with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.

CAUTION

without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.

NOTICE

indicates that an unintended result or situation can occur if the corresponding information is not taken into account.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation for the specific task, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

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Note the following:

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We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Foreword

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1.1 About this manual

Purpose of the manual

This documentation provides a complete overview of configuration and operation of RFID systems using SIMATIC RF-MANAGER 2008. The manual supports you with creating new projects and explains the engineering procedures and implementation of new projects.

The manual is aimed at users and project engineers who are employed in the areas of configuring, commissioning and servicing of RFID systems using SIMATIC RF-MANAGER 2008.

Contents

This documentation will familiarize you with the components of the SIMATIC RF-MANAGER 2008 software:

- SIMATIC RF-MANAGER Engineering System (ES): Engineering software for creating and processing RFID projects
- SIMATIC RF-MANAGER Runtime (RT): Runtime software for executing RFID projects

Basic knowledge required

General experience in the field of automation technology and RFID technology is essential for understanding this manual. Knowledge of the EPCglobal Application Level Events (ALE) Specification is also required.

It is assumed that the reader is competent in the use of personal computers with the Windows XP Professional operating system.

Conventions

In this manual, the product SIMATIC RF-MANAGER 2008 is also referred to as RF-MANAGER.

Scope of validity

The manual is applicable to SIMATIC RF-MANAGER 2008 and describes the delivery status of June 2010.

History

Edition	Remarks
02/2007	First edition
04/2008	Edited for RF-MANAGER 2008
06/2010	Revision for RF670R

1.2 Further information

You can obtain further information about the SIMATIC RFID system, for example, from the following documentation:

- Configuring and Operating Manual SIMATIC RF-MANAGER Basic

This manual contains all the information you need for installing and using the SIMATIC RF-MANAGER Basic software for parameterizing the RF670R reader.

- SIMATIC RF670R Function Manual

This manual is intended for advanced users and describes the XML-based programming interface of the SIMATIC RF670R reader as well as the system alarms.

- SIMATIC RF-MANAGER Information System
- SIMATIC RF-MANAGER Getting Started
- SIMATIC RF-MANAGER Function Manual
- SIMATIC RF-MANAGER Basic Information System
- Configuring and Operating Manual SIMATIC RF-MANAGER Basic
- SIMATIC RF670R Function Manual
- SIMATIC RF600 System Manual
- SIMATIC RF660R Configuration Software Programming and Operating Manual
- SIMATIC RF660R XML Interface Function Manual
- SIMATIC RF610M Operating Instructions
- SIMATIC RF610M Function Manual
- SIMATIC RF300 System Manual
- SIMATIC RF310M Operating Instructions
- SIMATIC RF310M Function Manual

The documentation can be downloaded from the Siemens Service & Support pages (http://support.automation.siemens.com/WW/llisapi.dll?aktprim=0&lang=en&referer=%2fWW%2f&func=cslib.csinfo&siteid=csius&subtype=133300&extranet=standard&startNode=4000024&nodeid0=21355358&objaction=csopen).

Additional information regarding RFID and the EPCglobal Application Level Events (ALE) Specification can be downloaded fromEPCglobal site (http://www.epcglobalinc.org/home) at www.epcglobalinc.org.

Note

Detailed information is available in the Information System

This manual provides a comprehensive overview of RF-MANAGER. You will find detailed information about the individual topics in the Information System.

Introduction 2

2.1 Field of application

Application areas

The RF-MANAGER is used for configuring, commissioning and operating RFID systems. It allows you to collect RFID data, to process it and to filter it. This data can be exchanged with an S7 PLC by means of variables or transferred to a higher-level management system.

The RF-MANAGER supports you with quick and easy creation of RFID solutions as well as the administration of RFID systems and their hardware components. The application also offers extensive help with the preprocessing of RFID data.

The RF-MANAGER supports the readers of the SIMATIC RF600 systems and RF300 systems.

2.2 RF-MANAGER components

The RF-MANAGER comprises the following components:

- RF-MANAGER Engineering System (ES)
- RF-MANAGER Runtime (RT)

RF-MANAGER Engineering System (ES)

The RF-MANAGER Engineering System is the software for handling all your essential configuring tasks. You can use ES to create RFID projects on your PC and to parameterize their components.

RF-MANAGER Runtime (RT)

RF-MANAGER Runtime is the software that is used to operate RFID systems. In Runtime, you can execute the RFID projects during process operation that you created and parameterized in the Engineering System. The RT software can run either on the same PC as the ES, or on another Windows XP-PC of your choice. The SIMATIC Microbox PC 427B is also an option for runtime. The runtime system can exchange data with an S7 PLC by means of variables.
In accordance with the product version or licensing of RF-MANAGER that you have selected, you can use the runtime system to address up to 50 RFID readers. Later license extensions for the Runtime software can also be obtained.

2.3 Product versions

RF-MANAGER is available in the following versions:

Full versions:

Product version	Description	Order number
SIMATIC RF-MANAGER 2008 ES +RT for 1 reader	Product CD with license for the ES and the RT (1 reader)	6GT2080-3CA00-8AA5
SIMATIC RF-MANAGER 2008 ES +RT for 5 reader	Product CD with license for the ES and the RT (5 readers)	6GT2080-3CC00-8AA5
SIMATIC RF-MANAGER 2008 ES +RT for 20 reader	Product CD with license for the ES and the RT (20 readers)	6GT2080-3CE00-8AA5
SIMATIC RF-MANAGER 2008 ES +RT for 50 reader	Product CD with license for the ES and the RT (50 readers)	6GT2080-3CG00-8AA5

Upgrade:

Product version	Description	Order number
SIMATIC RF-MANAGER 2007 → 2008 ES +RT for 1 reader	Product CD with upgrade license for the ES and the RT (1 reader)	6GT2080-3CA00-8AE5
SIMATIC RF-MANAGER 2007 → 2008 ES +RT for 5 reader	Product CD with upgrade license for the ES and the RT (5 reader)	6GT2080-3CC00-8AE5
SIMATIC RF-MANAGER 2007 → 2008 ES +RT for 20 reader	Product CD with upgrade license for the ES and the RT (20 reader)	6GT2080-3CE00-8AE5
SIMATIC RF-MANAGER 2007 → 2008 ES +RT for 50 reader	Product CD with upgrade license for the ES and the RT (50 reader)	6GT2080-3CG00-8AE5

Note

Language version

All the above-mentioned product CDs contain the following language versions: German/English

Note

Licensing

To use the RF-MANAGER, you will need one license for each component (ES or RT) and PC.

2.4 System requirements

System requirements

	RF-MANAGER Engineering System	RF-MANAGER Runtime
Supported devices	Standard PC	Standard PC / SIMATIC Microbox PC 420 / SIMATIC Microbox PC 427B
Operating system	Windows XP Professional SP3 or higher	Windows XP Professional SP3 or higher (standard PC) Windows XP Embedded SP3 or higher (SIMATIC Microbox PC 420/ SIMATIC Microbox PC 427B)
CPU	Pentium IV or later with 1.6 GHz processor	Pentium III or later with 933 MHz processor (standard PC) Pentium III with at least 933 MHz processor (SIMATIC Microbox PC 420/ SIMATIC Microbox PC 427B)
Graphic	Resolution of at least 1024x768 / 1280x1024 recommended at least 256 colors	Resolution of at least 640x480 at least 256 colors
RAM	At least 1.0 GB / 2.0 GB recommended	At least 512 MB / 1024 MB recommended
Free memory space / hard disk	At least 1.5 GB	At least 256 MB excluding archives (standard PC) CompactFlash card with at least 512 MB (SIMATIC Microbox PC 420/ SIMATIC Microbox PC 427B)
	In addition to the space needed by RF-MANAGER, Windows also requires space on the hard disk, e.g. for the swap file. For additional information, refer to your Windows documentation.	
Additional hardware	CD-ROM drive (for installing the software) USB port for installing the licenses	
Reader for document display	Adobe Acrobat Reader 5.02	
Internet browser	Microsoft Internet Explorer V6.0 SP1 / SP2	
Multiple screens	The operating system function used to visualize the screen content on several monitors (Control Panel > Display > Settings) is not released with RF-MANAGER.	

2.5 Installation

Installation

The software RF-MANAGER Engineering System is located on the CD "SIMATIC RF-MANAGER 2007". A license (license key) is required to run the software.

NOTICE

If you start the RF-MANAGER without a valid license, the system alerts you that you are working in non-licensed mode. You have the option, once only, of activating a trial license. The trial license expires after 14 days.

If the trial license expires, one of the following applies:

- A main license has never been installed on the computer
  – the RF-MANAGER can no longer be started.
- A main license was installed on the computer at one time
  – the RF-MANAGER can be started, but the system outputs a message at regular intervals to notify the user of unlicensed mode.

1. If the autorun function is enabled for your CD-ROM drive, setup is run automatically when the CD is inserted. Otherwise, start the program "setup.exe" from the CD.
2. Select the user interface language of the Setup program under "Language."
3. Display the product information and accept the licensing conditions in the subsequent window.
4. Select the drives for the installation data. If you select the option "Transfer license key automatically", you must also specify the source and destination of the license key. If you do not select this option, messages will appear frequently during operation that must be confirmed.
5. Select the components to be installed.
6. Follow the instructions on the screen.

Note

If, when installing the software, you do not have a license, you can install this later using the Automation License Manager.

2.6 Installation Service Pack

Requirement

SIMATIC RF-MANAGER 2008 must be installed.

Procedure

1. Start the file "SIMATIC_RF-MANAGER_2008_SP3.exe" by double-clicking the file name.
2. Follow the on-screen instructions.

Result

RF-MANAGER 2008 Service Pack is now installed on your computer.

In the installation folder, usually "C:\Program Files\ Siemens\SIMATIC RF-MANAGER\RF-MANAGER 2008 Support", five additional folders have been created by launching the Service Pack:

- ALEDatabridgeClient

  ALEDataBridgeClient is already fully installed following installation of the Service Pack, and it can be started via "SIMATIC > RF-MANAGER 2008 Runtime > AleDataBridgeClient". This demo application is based on the ALE+ Client API Library and uses the ALE interface to make files available in .csv (text), .sql (database), and .xml (structured text) formats.
  The documentation for the ALEDataBridgeClient can be found in the folder, along with the source files.

- ALE+Client Demo

  The ALE+Client Demo is already fully installed following installation of the Service Pack, and it can be started via "SIMATIC > RF-MANAGER 2008 Runtime > ALE+Client Demo". This demo application is based on the ALE+ Client API Library and uses the ALE interface to provide an overview of the functional scope of the interface. All supported commands can be run, and reports for files and messages can be displayed.
  Along with the source files, the folder contains comprehensive documentation on the use of the ALE+ interface and the ALE+Client Demo.

- RF610M
  The "RF610M" folder contains components to be installed on the respective devices if RF610M units are used with RF-MANAGER, as well as the installation documentation.

- RF310M

  The "RF310M" folder contains components to be installed on the respective devices if RF310M units are used with RF-MANAGER, as well as the installation documentation.

  Prerequisites: RF310M from the 2nd generation (G2) of the PSION basic device with the MLFB 6GT2803-0AB00

- Project samples

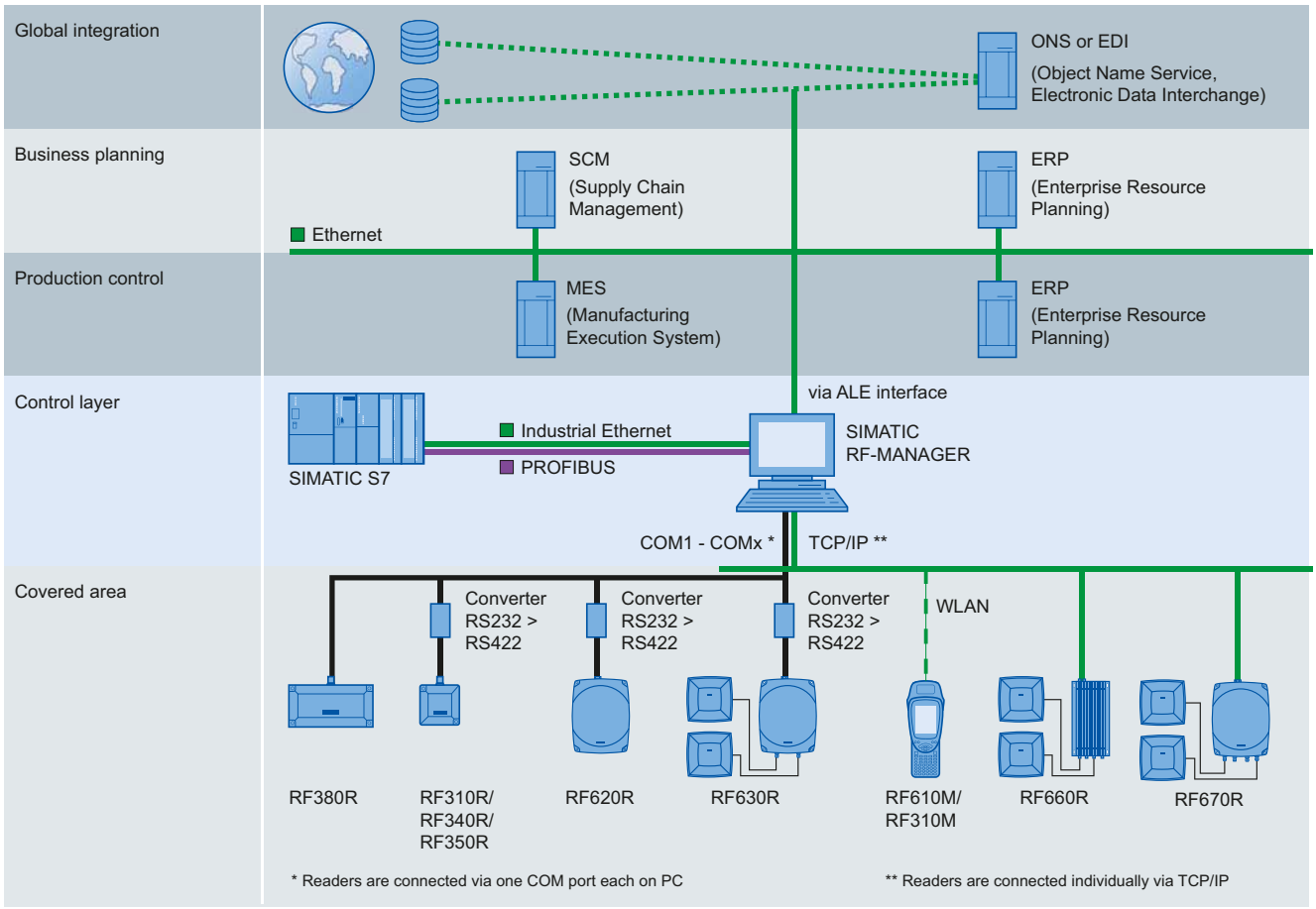
  The "Project samples" folder contains numerous example configurations for the new devices. The mode of operation of the readers and their integration into the RF-MANAGER can be followed in the projects.

2.7 RFID systems

2.7.1 General layout

Overview

The general automation and IT structure of a company is shown in the following figure. This comprises several different levels that are described in detail below.



- **Acquisition level**
  This level contains the RFID readers that read the appropriate tag data and transfer them to the next highest level.
- **Control level**
  At the control level , the RFID data are collected, preprocessed and presented to the production control and business administration control levels for further processing.
- **Production control**
  The Manufacturing Execution System (MES) closes the gap between the data that arise in the automation environment (control level) and the logistical and commercial processes of the company (business administration control). MES solutions are used, for example, for defining and performing production processes.

- **Business administration control**
  This level covers planning and control of the equipment used. For this purpose, Enterprise Resource Planning (ERP) systems and Supply Chain Management (SCM) systems are used with modules for cost accounting, financial bookkeeping and personnel management.
- **Global integration**
  Product information can be exchanged here at an inter-company level. This can be performed over the Internet with the help of special services.

Tasks of RF-MANAGER

At both the planning level (ERP) and production level (MES), systems are used that generate a large volume of information that is relevant to production or that has commercial relevance. To increase productivity and efficiency, the individual levels must communicate with each other to use all the information that is available optimally. The RF-MANAGER makes an important contribution to this and is located at the PLC/PC level. It manages the connected RFID readers, collects the supplied data and reduces them to the accuracy and quantity required by the MES/ERP level. The most important areas are device management, data management and business integration. RF-MANAGER also acts as the interface between RFID data and the MES/ERP level.

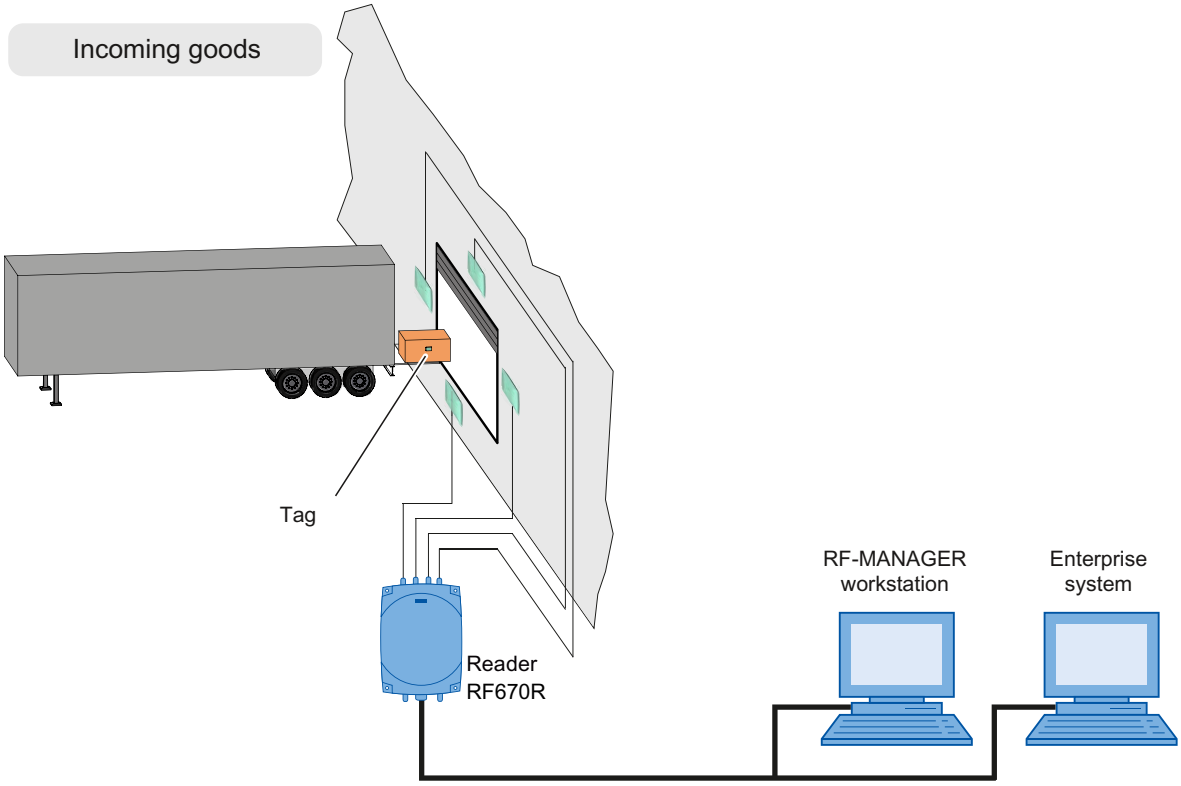
- Device management
  Device management involves management of the connected RFID readers. This comprises configuration of the readers during the engineering phase as well as monitoring the readers during normal operation. With the help of a project wizard and special editors, projects can be created in the shortest possible time that are ready to run. Up to 50 readers can be operated in parallel. Fine tuning of the readers is possible using the user interface of the runtime system - which, for example, also supplies statistical information on the read quality of individual antennas - and a high-performance indication system. The time spent on commissioning and servicing can be significantly shortened especially in the case of large-scale applications.
- Data management
  Data management is the processing of RFID data at a hardware-based level. This contains the reading and writing of RFID data and its filtering on the one hand and conditioning of the data contents for the MES/ERP level and the PLC on the other hand. Read and write functions can be triggered either directly by RF-MANAGER or by the higher-level MES/ERP systems or PLCs. The RFID data are filtered at different levels. Starting from basic reduction of the read quantity of data, through bit pattern masking of the RFID data as far as filtering according to EPCglobal schemes. This ensures that only the information that is actually required is passed on. Digital inputs/outputs of the readers can also be activated or evaluated. Furthermore, RFID data can be evaluated by means of simple scripting or in the PLC.
- Business integration
  All aspects concerning connection of the RF-MANAGER to the MES/ERP level are combined under the heading of business integration. The emphasis here is on presenting the RFID data in reports. The contents of reports and connection to the MES/ERP level can be configured in RF-MANAGER. At runtime, these reports can be requested from the higher level. Actions for the connected readers can also be triggered directly from the MES/ERP system. This includes, for example, the reading, writing and locking of tags. RF-MANAGER provides the messages of the MES/ERP level. Data is exchanged between the MES/ERP level and RF-MANAGER or the PLC by means of the reading and writing of variables.
  For maximum flexibility, RF-MANAGER provides ALE+ (Application Level Events), a software interface designed by EPCglobal. For a detailed description of this interface, refer to the *ALE+ Function Manual*.

2.7.2 Overview of the RF-MANAGER architecture

Before you configure your RFID system with RF-MANAGER, you should be familiar with the individual components of the system. These components are described below, on the basis of typical scenarios, and their interdependencies are presented.

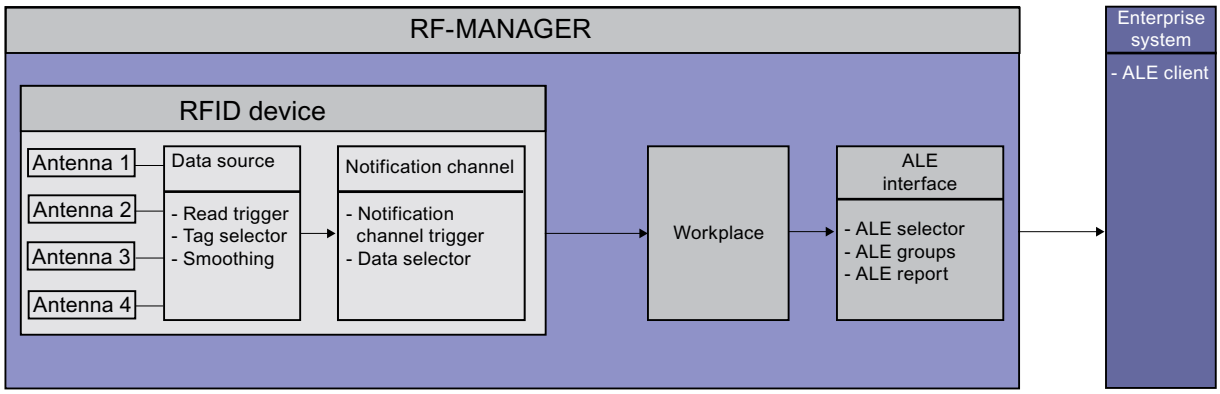
1) Monitoring incoming goods

The scenario comprises an RFID system with a reader. Its four antennas monitor the incoming goods portal of a production hall through which pallets are delivered - each pallet is marked with a tag. The tags contain user data that provide information about the sender and receiver of the goods. These data are read out and routed on.



The reader is connected to an RF-MANAGER workstation that is connected to an enterprise system through an ALE interface. The enterprise system receives the data from the tags in the form of reports. For this example, you must configure the components described below in RF-MANAGER.

Diagram in RF-MANAGER



RFID device

The RFID device is a function block in RF-MANAGER and represents a reader. The following components are active in this function block:

Antennas

The four antennas read the data of the tags that are applied to the pallets for incoming goods and transfer the data to the data source.

Data source

Data sources are the basic components for reading RFID data. They encapsulate the antennas assigned to them and the data that is received by them through to the subsequent function units. In this example, one data source is sufficient for the four antennas assigned to it, because only the incoming goods portal is monitored.
It is a general rule that one RFID device can also contain several data sources. Various different data sources can be defined so that mutually independent tasks can be performed with the same reader.

One data source contains the following blocks:

- Read trigger
  Read triggers are activation mechanisms. They cause the data source to read the data from the tags that are located in the field of the four incoming goods antennas. A continuous trigger can, for example, be configured that will cause the antennas to read constantly.
- Tag selector
  Tag selectors are mechanisms used to route data on and to filter data. They determine which tag data areas should be read or routed on. They also define which tags should be supplied or filtered out on the basis of the contents of these data areas. In this case, a tag selector orientates itself on the tag ID or the freely parameterizable user data of the tag. In this scenario, the tag selector is use to read the recipient of the goods from the user data field and to route this information on together with the pallet ID. The enterprise system checks, on the basis of the transferred data, whether the correct pallets have been delivered. If this is the case, the enterprise system triggers a green signal light in the production hall by activating an output of the reader. The stock inventory is also updated. If this is a fixed filter criterion, the evaluation and control of the output can occur directly in the RF670R.
- Filtering
  Filtering is a technique that is used to optimize the read quality. The RF-MANAGER marks the read event with a status description for the tag (e.g.: detected for the first time by the inbound logistics antennas, reliably detected, lost) and adds these states to the read results. Time intervals are defined using this technique - for example, how long a tag detected for the first time has to be "seen" for it to be regarded as reliably detected. This allows tags to be excluded that have been unintentionally detected briefly in the boundary areas of the reader.

Notification channel

One or more data sources are assigned to one notification channel as data suppliers. A notification channel is used in this example to which the data source for the antennas of the incoming goods portal has been assigned. The notification channel routes on the data from this data source.

A notification channel contains the following blocks:

- Notification channel trigger
  Notification channel triggers are activation mechanisms. They cause the notification channel to transfer the data from the data source assigned to it. A continuous trigger can, for example, be configured that will cause data to be transferred constantly.
- Data selector
  Data selectors are mechanisms that process tag information and filter it. In this scenario, for example, filtering can be performed using smoothing criteria that are defined in the data source. Information is only transferred from tags that are in the reliably detected state. It can be assumed that these have been detected without errors.
  In general, the data selectors can supply additional information (reader fields). This includes, for example, the time of the read.

Workplace

Workplaces are used as an abstraction of the hardware. The relevant data sources and notification channels are grouped here into workplaces using the RF-MANAGER. Practically, workplaces are combinations of readers.
In this example, the workplaces refers to the notification channel that is fed from the four incoming goods channels. This means that: This workplace represents the incoming goods area. It then receives the prefiltered or transferred tag data in accordance with the notification channel trigger.

ALE interface

The data of a workplace can be requested in the form of reports by the enterprise system over the ALE interface (Application Level Events). The is performed using the following read procedure:

- Asynchronous read procedure
  An asynchronous read procedure is when an ALE client of the enterprise system logs onto the report of the ALE interface and receives the data automatically. This continues until the client logs off again.
- Synchronous read procedure
  A synchronous read procedure is when an ALE client of the enterprise system logs onto the report of the ALE interface and receives the required data automatically.

The data of an ALE report, however, are dependent on the activity of the following blocks:

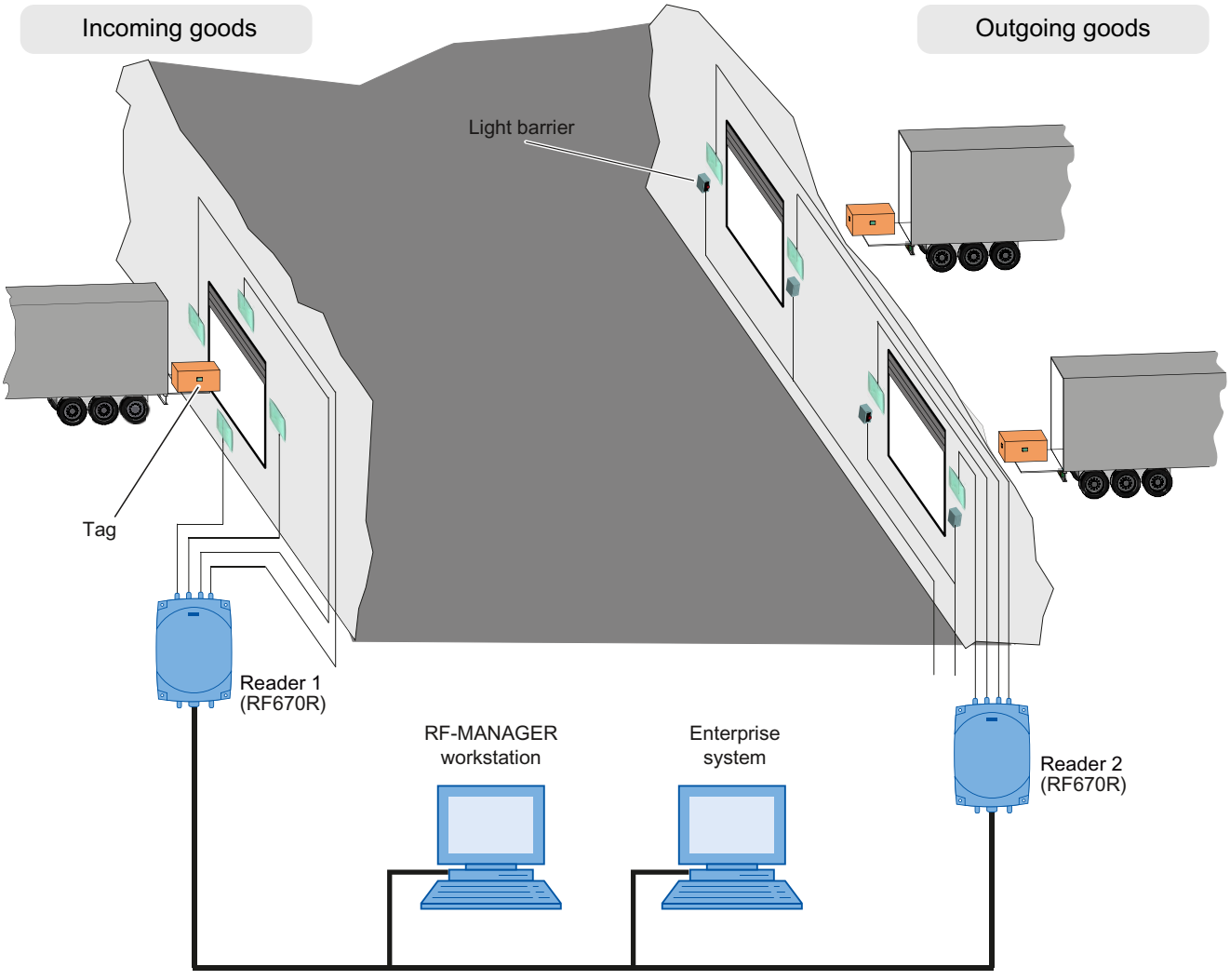
- ALE selector
  ALE selectors are filter mechanisms that further reduce the accumulated data in accordance with the configuration settings. ALE selectors can only filter out EPC tags - to perform, for example, filtering according to article classes.
  Filtering of the freely parameterizable user data is not possible with ALE selectors - this must be performed via the data source or the notification channel.
- ALE groups
  ALE groups determine how the data records that have passed through the filter should be grouped for the report to the ALE client. In this scenario, for example, the data records can be grouped according to serial numbers.

When data are provided over the ALE interface, it is generally the case that ALE clients only have a logical view of the workplaces, precise knowledge of the hardware of the RFID system is no longer necessary.

2) Monitoring inbound logistics and outbound logistics

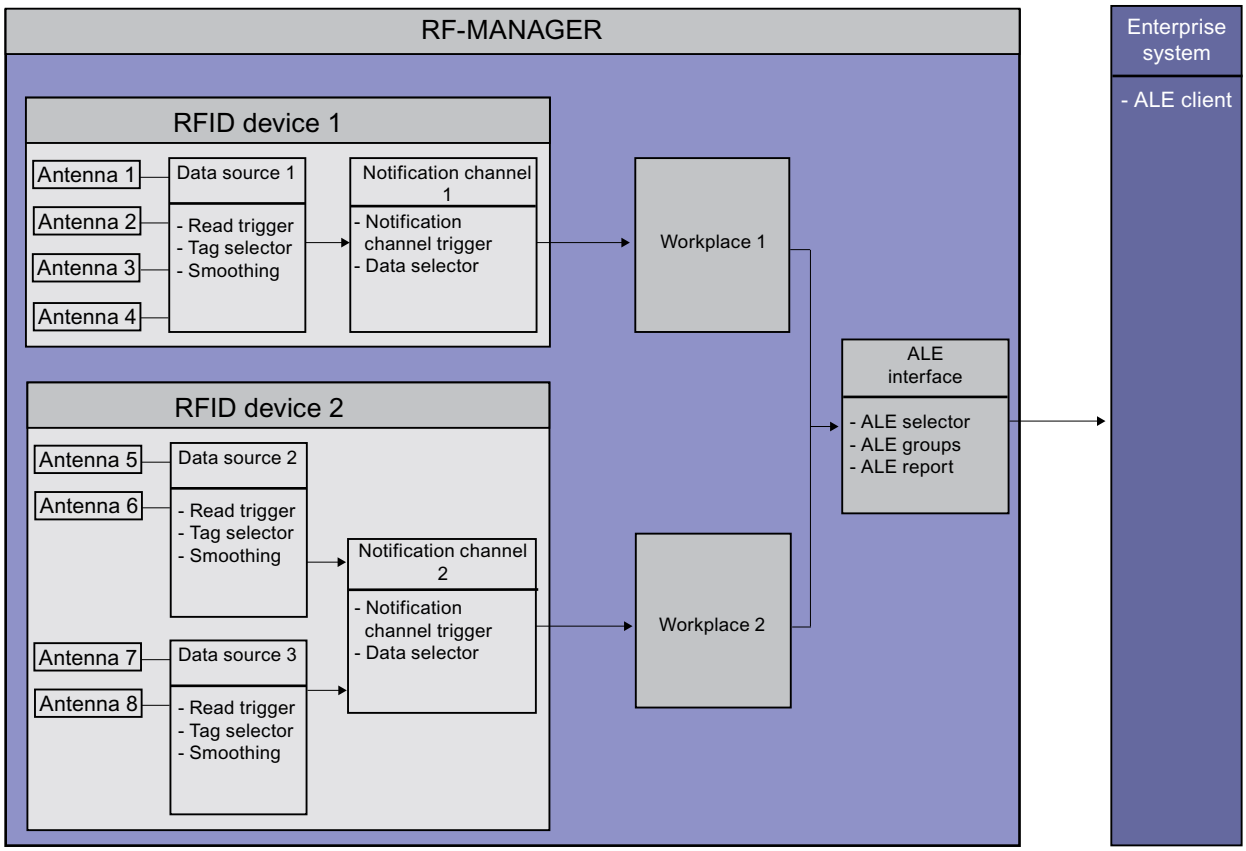
The scenario comprises an RFID system with two readers. Reader 1 with its four antennas monitors the incoming goods portal of a production hall through which pallets are delivered - each pallet is marked with a tag. The tags contain user data that provide information about the sender and receiver of the goods. These data are read out and routed on - in the same manner as in the first scenario. The goods supplied on pallets undergo further processing in the production hall and subsequently exit the hall through the outgoing goods portal.

Reader 2 is controlled through light barriers and monitors the two outgoing goods portals that are assigned to different recipients with two antennas in each case. Pallets are dispatched through the outgoing goods portals - each pallet is marked with a tag. These tags also contain user data that provide information about the sender and receiver of the goods. The data read by the readers are checked to ensure that the pallets are waiting at the correct outgoing goods portal. Depending on the read results of the reader, the outgoing portal opens, or it remains closed.



The two readers are connected to an RF-MANAGER workstation that is connected to an enterprise system through an ALE interface. The enterprise system receives the data from the filtered and sorted tags in the form of reports. For this example, you must configure the components described below in RF-MANAGER.

Diagram in RF-MANAGER



RFID device

In this scenario, there are two RFID devices. RFID device 1 is designed as for the RFID device of the first scenario - it represents Reader 1 that monitors the incoming goods portal. RFID device 2 represents Reader 2 that monitors both outgoing goods portals.

Antennas

RFID device 1 contains four antennas for the pallets that pass through the incoming goods portal. RFID device 2 contains two antennas each for the pallets that pass through the two outgoing goods portals.

Data source

For RFID device 1, one data source is sufficient, because only the incoming goods portal is monitored.
In RFID device 2, two data sources are created each with two assigned antennas - one for each outgoing goods portal. The two data sources enable two mutually independent tasks (separate read procedures for each outbound logistics gate) to be implemented.
The data sources contain the following blocks:

- Read trigger
  In this scenario, a continuous trigger is configured in data source 1. A trigger is configured in data sources 2 and 3 that activates the antenna for reading when the respective light barrier is interrupted.
- Tag selector
  In this scenario, the following actions can be performed, for example:
  The tag selector in data source 1 is used to read the recipient of the goods and to pass this information on. In the same manner as scenario 1, it orientates itself on the user data.
  The tag selectors in data sources 2 and 3 also orientate themselves on the user data and the included goods recipient, but they use this information for filtering. This means that: When a suitable tag is delivered, the enterprise system automatically opens the outgoing goods gate by activating one output of the reader. If the gate is operated by a PLC, the appropriate variable must be set by the enterprise system. If this is a fixed filter criterion, the evaluation and control of the output can occur directly in the RF670R.

Notification channel

In this scenario, there are two notification channels: Notification channel 1 refers to data source 1 and is a component of RFID device 1.
Notification channel 2 as a component of RFID device 2 and passes on the data from data source 2 or 3.

The notification channels contain the following blocks:

- Notification channel trigger
  In this scenario, the following triggering mechanisms can be configured, for example: The trigger in notification channel 1 operates continuously. The trigger in notification channel 2 also operates continuously so that the enterprise system can open the outgoing goods door as soon as possible on delivery of a suitable tag.
- Data selector
  In this scenario, the following filtering procedures can be performed, for example:
  The data selector in notification channel 1 operates in the same manner as in the first scenario.
  The data selector in notification channel 2 supplies additional data from the reader fields along with the data of the read procedure. This is particularly useful when the loading times for pallets has to be monitored.

Workplace

There are two workplaces in this example:
As in the first scenario, workplace 1 represents inbound logistics through the gate.
Data source 2 and data source 3 are combined with notification channel 2 to form workplace 2. This means that: Workplace 2 represents inbound logistics through both gates.

ALE interface

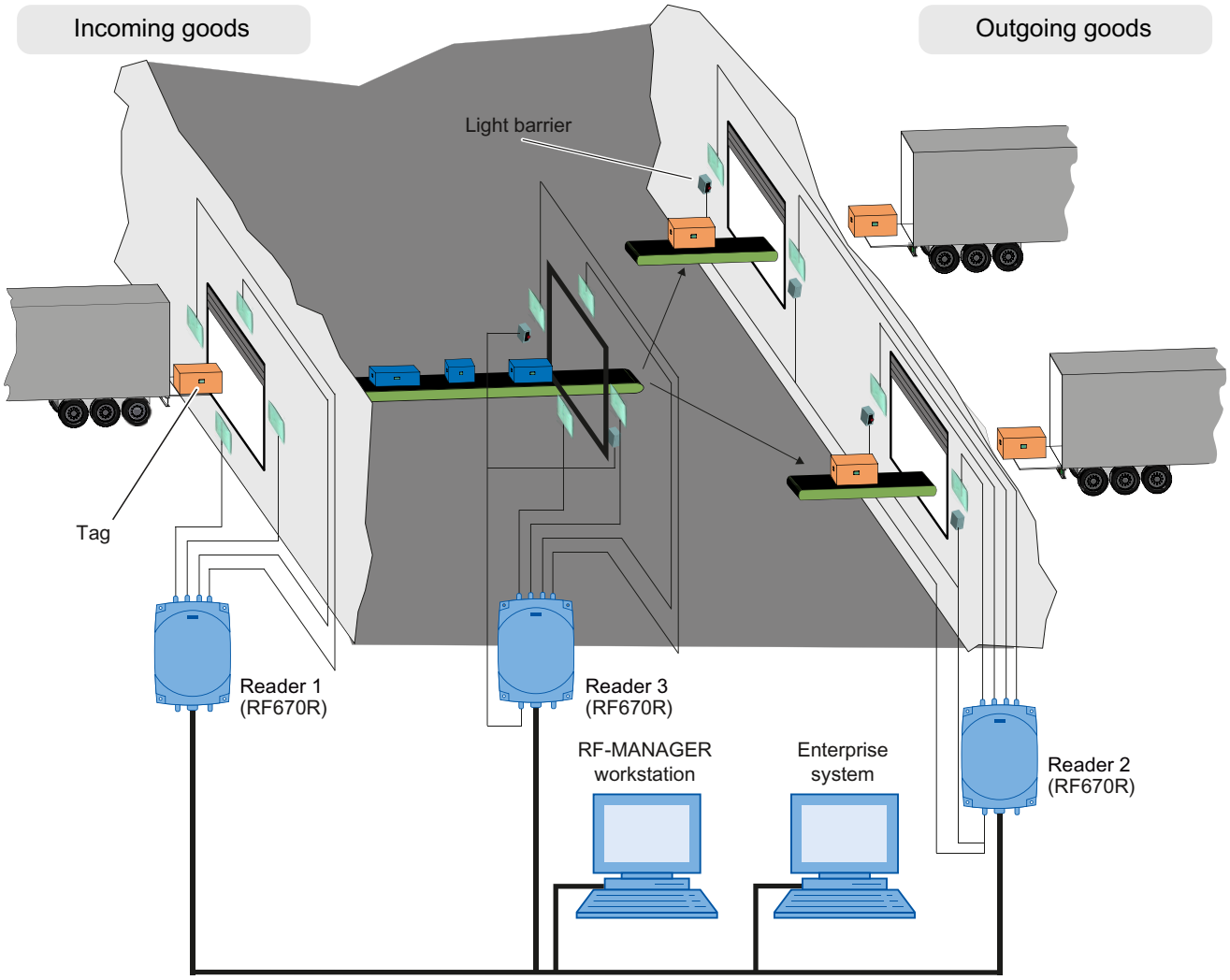
There is an ALE interface in this example that scans the data from workplace 1 (inbound logistics) as well as the data from workplace 2 (outbound logistics).
The blocks of the ALE interface operate in the same manner as in the first scenario.

3) Monitoring incoming goods, distribution of goods and outgoing goods

The scenario comprises an RFID system with three readers. Reader 1 with its four antennas monitors the incoming goods portal of a production hall through which pallets are delivered - each pallet is marked with a tag. The tags contain user data that provide information about the sender and receiver of the goods. These data are read out and routed on - in the same manner as in the first scenario. The goods supplied on pallets undergo further processing in the production hall and subsequently exit the hall through the outgoing goods portal.

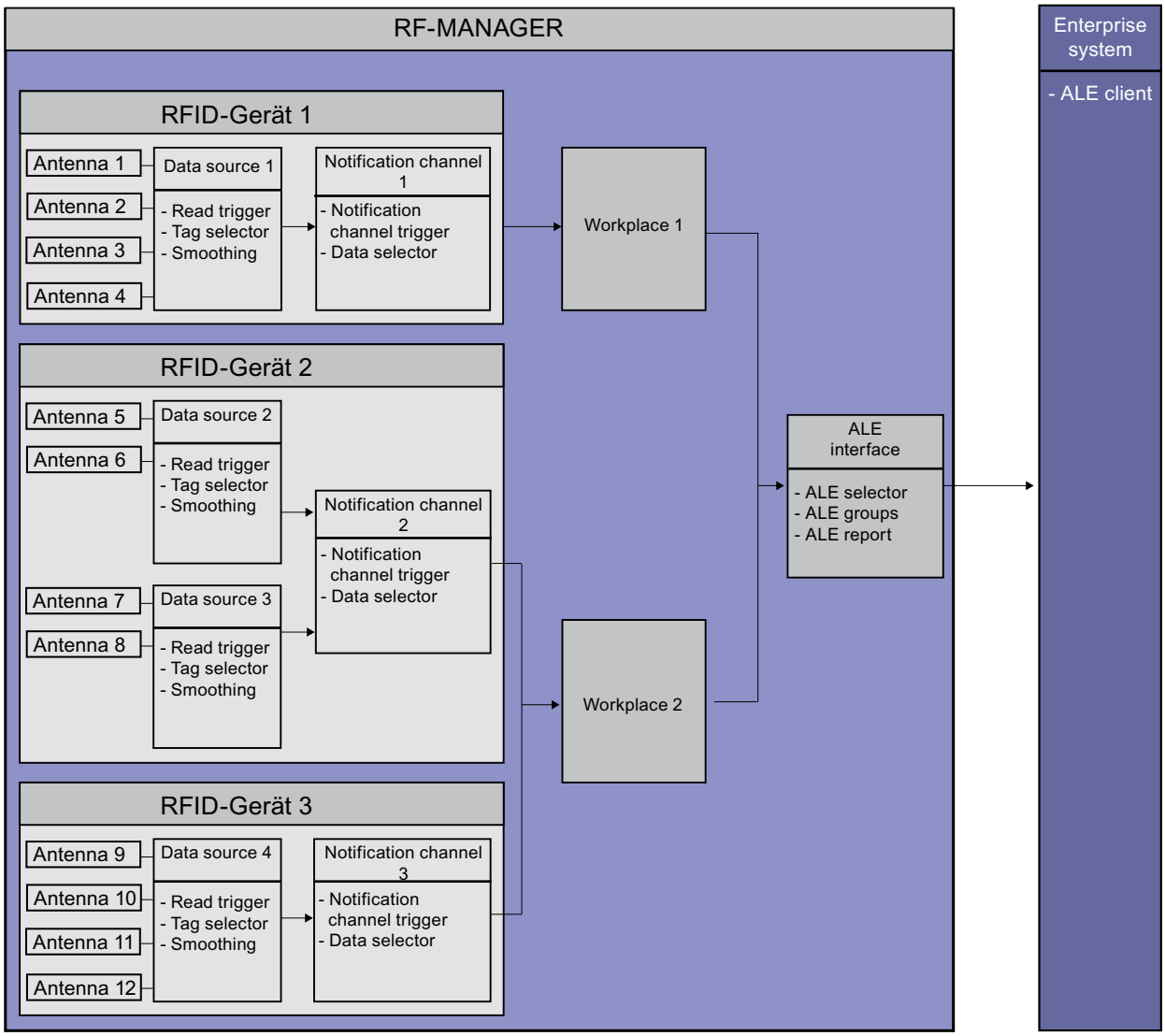
Reader 3 is controlled by a light barrier and monitors a conveyor belt using four antennas; the conveyor transports the goods towards two output gates that are assigned to two different recipients and each item is equipped with a tag. These tags also contain user data that provide information about the sender and receiver of the goods. There is a separating filter downstream of the conveyor that determines the output gate to which the goods should be directed. The separating filter is set in accordance with the results from the reader and the goods are distributed.

Downstream of the separating filter, the goods are loaded onto pallets - each pallet is marked with a tag. These tags also contain user data that provide information about the sender and receiver of the goods. The data read by Reader 2 are checked to ensure that the correct pallets are waiting at the outbound logistics gate specific to the recipient. Light barriers are installed to control the reader. Depending on the read results of the reader, the outgoing portal opens, or it remains closed.



The three readers are connected to an RF-MANAGER workstation that is connected to an enterprise system through an ALE interface. The enterprise system receives the data from the filtered and sorted tags in the form of reports. For this example, you must configure the components described below in RF-MANAGER. A PLC also receives the data from Reader 3 via the RF-MANAGER.

Diagram in RF-MANAGER



RFID device

In this scenario, there are three RFID devices. RFID device 1 represents Reader 1 that monitors the incoming goods portal. RFID device 2 represents Reader 2 that monitors both outgoing goods portals. RFID device 3 represents Reader 3 that monitors the goods distribution conveyor.

Antennas

RFID device 1 contains four antennas for the pallets that pass through the incoming goods portal. RFID device 2 contains two antennas each for the pallets that pass through the two outgoing goods portals.
RFID device 3 contains four antennas for the items that pass over the goods distribution conveyor.

Data source
For RFID device 1, one data source is sufficient, because only the incoming goods portal is monitored.
In RFID device 2, two data sources are created each with two assigned antennas - one for each outgoing goods portal.
A data source for the goods distribution conveyor is created in RFID device 3.
The data sources contain the following blocks:

- Read trigger
  In this scenario, a continuous trigger is required for data source 1 that activates the antennas for continuous reading.
  In each of data sources 2, 3, and 4, one trigger is configured that activates the antenna for a read when the respective light barrier is interrupted.
- Tag selector
  In this scenario, the following actions can be performed, for example:
  The tag selector in data source 1 is used to read the recipient of the goods and to pass this information on. In the same manner as scenario 1, it orientates itself on the user data.
  The tag selector in data sources 4 also orientates itself on the user data and passes on the included goods recipient. This means that: The enterprise system or the PLC program must check on the basis of the information the output gate for which the goods are destined. The separating filter is set by the enterprise system or PLC in accordance with the result of the check and the goods are directed to the correct output gate.
  The tag selectors in data source 2 and data source 3 use the goods recipients included in the user data for filtering. It is determined whether the goods that have been directed to the correct output gate were also loaded onto the correct pallets. It this is the case, and therefore a suitable tag is delivered, the enterprise system or the PLC automatically opens the outgoing goods gate.

Notification channel

In this scenario, there are three notification channels: Notification channel 1 is assigned to data source 1 and is a component of RFID device 1.
Notification channel 2 is a component of RFID device 2 and is assigned to data sources 2 or 3.
Notification channel 3 is assigned to data source 4 and is a component of RFID device 3.
The notification channels comprise the following blocks:

- Notification channel trigger
  In this scenario, the following triggering mechanisms can be configured, for example: The trigger in notification channel 1 operates continuously. The triggers in notification channels 2 and 3 also act continuously to allow the enterprise system to make the decision for the separating filter as soon as possible or to open the goods gate as quickly as possible.
- Data selector
  In this scenario, the following filtering procedures can be performed, for example:
  The data selector in notification channel 1 operates in the same manner as in the first scenario.
  The data selector in notification channel 2 also supplies additional data from the reader fields along with the data of the read procedure. This is particularly important when the loading times for the pallets are to be monitored.
  The data selectors in notification channel 3 also supplies additional data from the reader fields, for example, the name of the reader.

Workplaces

There are two workplaces in this scenario:
Data source 1 and notification channel 1 are combined to form workplace 1. This means that: Workplace 1 represents inbound logistics through the gate.
Notification channel 2 with data sources 2 and 3 and notification channel 3 with data source 4 are grouped to form workplace 2. This means that: Workplace 2 represents goods distribution over the conveyor belt and outbound logistics through both gates.

ALE interface

This example contains an ALE interface that scans the data from workplace 1 (inbound logistics) and workplace 2 (goods distribution and outbound logistics).

The blocks of the ALE interface operate in the same manner as in the first scenario.

4) Writing tag IDs at the outgoing goods portal using system functions

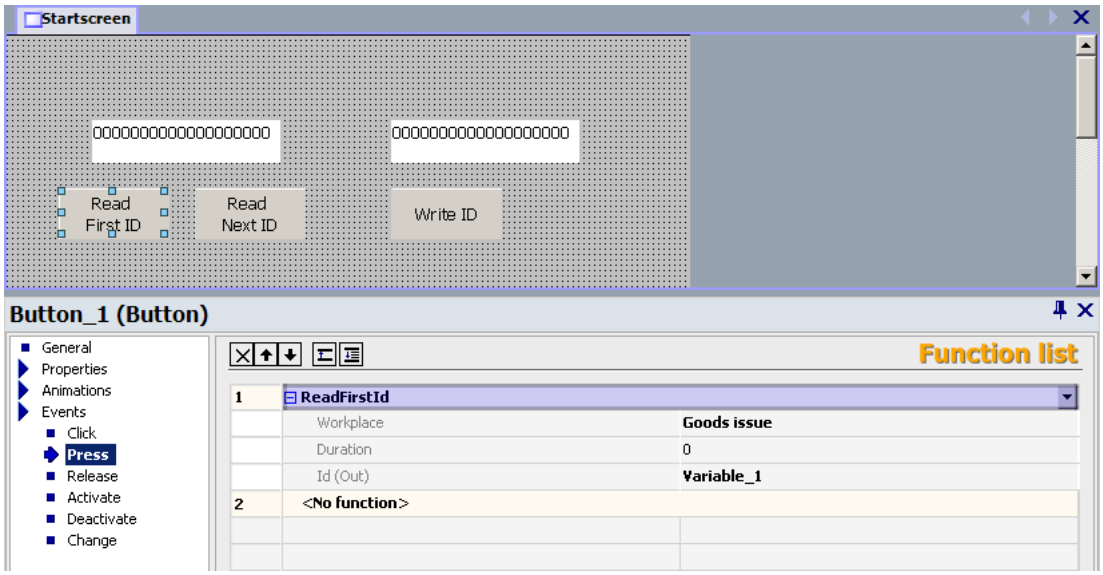
The scenario is based on scenario 3 and comprises an RFID system with three readers. It is expanded by the following functions: Certain tags on pallets destined for the outgoing goods portal should be written with new IDs before dispatch. This is performed by reader 2 that uses two antennas to monitor each outgoing goods portal.

Implementation with RF-MANAGER

A display containing two input/output fields is created in the Engineering System. One of these will display the current tag ID and the other will display the new tag ID. The components shown below are also required.

Button 1

A button must be created. This button is then linked to the "ReadFirstTagId" system function. When the button is clicked during runtime, the function will be executed.



System function "ReadFirstTagId"

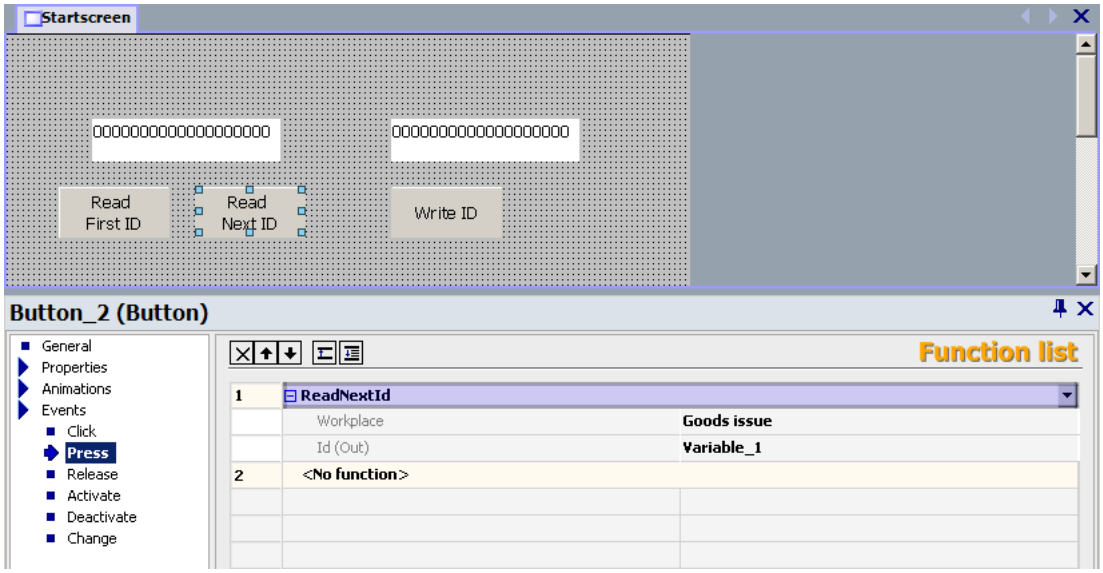
This function uses Reader 2 to read all the current tags detected in the workplace for outgoing goods (Workplace 2) and returns the first tag ID. All tags identified for Workplace 2 are also written to a cache.

Variable 1

A string variable must be defined. This variable is linked to the function "ReadFirstTagId" and stores the returned tag ID. The result is visualized in the first input/output field.

Button 2

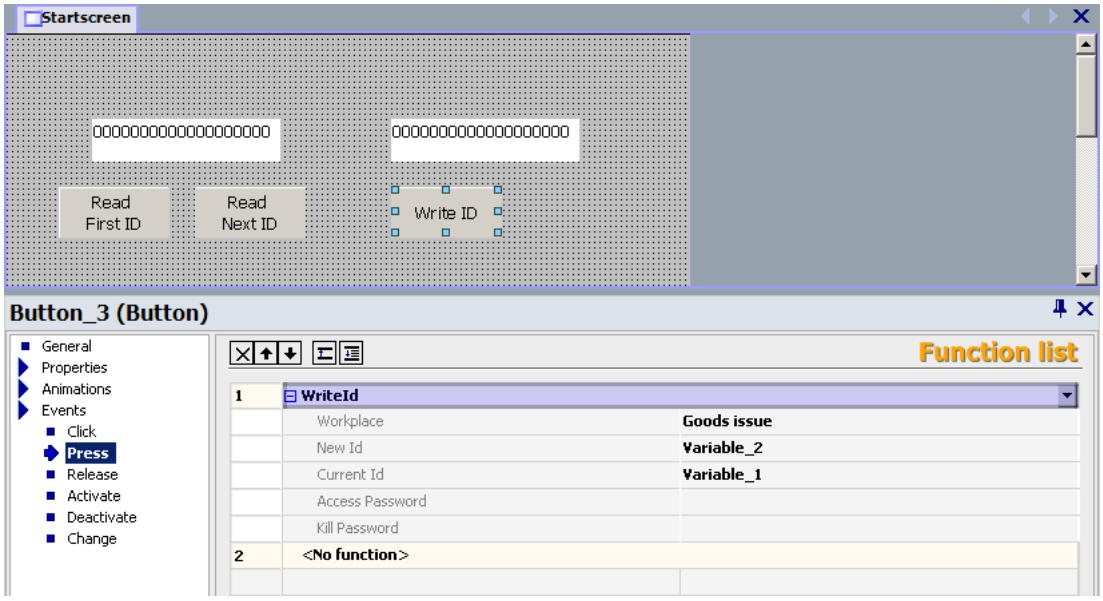
A button must be created. This button is then linked to the "ReadNextTagId" system function. When the button is clicked during runtime, the function will be executed. The "ReadNextTagId" system function can be executed at runtime as many times as necessary until the required tag ID to be overwritten appears.



System function "ReadNextTagId"
This function reads the next tag ID from the cache of the workplace for outgoing goods.

Variable 1
Variable 1 is linked to the system function "ReadNextTagId". This means that: When "ReadNextTagId" is executed, the previous value of the variable that was generated by the function "ReadFirstTagId" will be overwritten with the current value of the next tag ID. The result is visualized in the first input/output field.

Button 3
A button must be created. This button is then linked to the "WriteTagId" system function. When the button is clicked during runtime, the function will be executed. This means that: The read tag ID (Variable 1) is replaced by the new tag ID (Variable 2). A synchronous write procedure is used.



System function "WriteTagId"
This function uses Reader 2 to write a new tag ID in the workplace for outgoing goods.

Variable 1
Variable 1 is linked to the system function "WriteTagId" and contains the tag ID to be overwritten. Its value is generated by the function "ReadNextTagId".

Variable 2
A string variable must be defined. This variable is linked to the system function "WriteTagId" and contains the new tag ID. This is entered manually in the second input/output field.

Note

Further possible implementations

The scenario described above can also be implemented automatically with scripts. Another possible implementation involves control from an enterprise system over the ALE interface.

2.7.3 Overview of the RFID functions

An overview of the main RFID functions is given below. These can be implemented either by using the RF-MANAGER system functions or the ALE interface functions.

Overview of the RFID functionality
Reading tags
Writing tags
Locking tags
Erasing tag
Translating EPC
Set output
Read input/output
Switching RFID device online/offline
Switching workplace online/offline
Initiating trigger
Starting/stopping data link
Read/write variables
Registering/deregistering an ALE connection for alarm transfer

Note

ALE interface functions

The ALE interface functions that can be used in combination with the RF-MANAGER are based on an extension of the ALE standard defined by EPCglobal.

Read tag

RF-MANAGER system function	Description	ALE interface function	Description
-	-	Subscribe (…)	Registration with an ALE connection for automatic (asynchronous) data transfer. The client application automatically receives tag data from the RF-MANAGER over the ALE connection. The data are supplied in the form of a report. User data are also included in this report.
-	-	Unsubscribe (…)	Deregistering an ALE connection. No more reports will be automatically transferred to the client application.
-	-	Poll (…)	The client application receives tag data once (synchronously) from the RF-MANAGER over the ALE connection. The data are supplied in the form of a report. The report contains data from all the workplaces assigned to the ALE connection.
ReadFirstTagId (…)	Reads tags from a specific workplace. Transfers the first read value to an internal string variable.	ReadIDs (…)	The client application receives tag data once (synchronously) from the RF-MANAGER over the ALE connection. The data are supplied in the form of a string array. The report contains the data of one workplace.
ReadNextTagId (…)	Transfers the next read value to another internal string variable.		
ReadTagField (…)	reads the user data from a tag with the transferred tag ID. The data area is defined in accordance with the configuration of the tag selectors / tag fields. The first data source of the workplace that sees the addressed tag reads the data.	Read (…)	Reads several items of user data from a tag with the transferred tag ID. The data areas are defined in accordance with the configuration of the tag selectors / tag fields. The first data source of the workplace that sees the addressed tag reads the data.

RF-MANAGER system function	Description	ALE interface function	Description
-	-	Trigger (…)	Start/stop reports.
ReadTagMemory (…)	Reads the user data from a tag with the transferred tag ID. The data areas are defined by specifying the direct address. The first data source of the workplace that sees the addressed tag reads the data.	ReadTagMemory (…)	Reads several items of user data from a tag with the transferred tag ID. The data areas are defined by specifying the direct address The first data source of the workplace that sees the addressed tag reads the data.

Writing tags

RF-MANAGER system function	Description	ALE interface function	Description
WriteTagId (…)	Writes tags for a specific workplace. The value to be written and the current value are stored in a string variable.	WriteID (…)	A single tag is written with a new EPC ID. The tag to be written is identified on the basis of its current ID. The command refers to the reader of a workplace.
WriteTagField (…)	Writes any user data to tags. The data areas are defined in accordance with the configuration of tag selectors / tag fields. If a tag ID is not transferred, all the tags in the field will be written. The command refers to the reader of a workplace.	Write (…)	Writes user data to tags. The data areas are defined in accordance with the configuration of tag selectors / tag fields. The command refers to the reader of a workplace. When IDs are specified, only certain tags will be written - when no ID is specified, all the tags in the field will be written.
WriteTagMemory (…)	Writes any user data to tags. The data areas are defined by specifying the direct address. If a tag ID is not transferred, all the tags in the field will be written. The command refers to the reader of a workplace.	WriteTagMemory (…)	Writes user data to tags. The data areas are defined by specifying the direct address. The command refers to the reader of a workplace. When IDs are specified, only certain tags will be written - when no ID is specified, all the tags in the field will be written.

Locking tags

RF-MANAGER system function	Description	ALE interface function	Description
LockEpcGen2Tag (…)	Locks EPC Class1 Gen2 tags over a specific workplace. The ID for the tag to be locked is saved in a string variable.	LockTag (…)	Locks tags for a specific workplace. When IDs are specified, only certain tags will be locked - when no ID is specified, all the tags in the field will be locked.
LockIsoTag (…)	Locks ISO 1800-6B tags for a specific workplace. The ID for the tag to be locked is saved in a string variable.	LockTag (…)	Locks tags for a specific workplace. When IDs are specified, only certain tags will be locked - when no ID is specified, all the tags in the field will be locked.

Erasing tag

RF-MANAGER system function	Description	ALE interface function	Description
KillTag (…)	Erases tag data for a specific workplace. The ID for the tag to be erased is saved in a string variable.	KillTag (…)	Erases tag data for a specific workplace. When IDs are specified, only the data of certain tags will be erased - when no ID is specified, the data of all the tags in the field will be erased.

Translating EPC

RF-MANAGER system function	Description	ALE interface function	Description
TranslateEpc (…)	Translates an EPC from one format to another.	TranslateEPC (…)	Translates an EPC from one format to another.

Set output [1]

RF-MANAGER system function	Description	ALE interface function	Description
SetReaderIO (...)	Sets the specified output of an RFID device to the specified value.	SetIOPort (…)	Sets the output of an RFID device.

[1] Reader outputs can also be set with system functions that use variables. The output of the reader must be set in the variable as the address for this purpose.

Note

For **secure** assignment of a value to the specified variable, use the system function "SetValueBuffered". The variable will then retain the value even after a connection has been interrupted.

Read input/output [2]

RF-MANAGER system function	Description	ALE interface function	Description
GetReaderIO (...)	Reads the value from the specified input/output of an RFID device.	GetIOPort (…)	Supplies the status of the input/output of an RFID device.
SetIOPort (…)	Direct in the RF670R reader	-	Sets the specified output in the reader to the specified value.
SetIOPortOnAlarm (…)	Direct in the RF670R reader	-	Sets the specified output of a reader to the specified value when a specified alarm is generated.
SetIOPortOnCondition (…)	Direct in the RF670R reader	-	Sets the specified output in the reader to the specified value when the specified condition is fulfilled.

[2] Reader inputs/outputs can also be read with system functions that use variables. The input/output of the reader must be set in the variable as the address for this purpose.

Switching RFID device online/offline

RF-MANAGER system function	Description	ALE interface function	Description
SetRfidDeviceStatus (...)	Switch RFID device online or offline for partial start-up.	-	-

Switching workplace online/offline

RF-MANAGER system function	Description	ALE interface function	Description
SetRfidWorkplace Status (…)	Switch workplace online or offline for partial start-up.	-	-

Initiating trigger

RF-MANAGER system function	Description	ALE interface function	Description
ActivateTrigger (...)	Activates a trigger that has been configured for the specified RFID device.	ActivateTrigger (…)	Activates a trigger that has been configured for the specified RFID device.

Starting/stopping data link

RF-MANAGER system function	Description	ALE interface function	Description
SetRfidDataLink Status (…)	Starts/stops an RFID data link.	-	-

Read/write variables

RF-MANAGER system function	Description	ALE interface function	Description
Use the system functions from the groups: • Calculation • Bit processing	-	ReadVariable (…)	Reads the value of an RF-MANAGER Runtime variable. The name of the variable is transferred as an argument. The value of the variable is transferred as a character string.
		WriteVariable (…)	Writes a value in an RF-MANAGER Runtime variable. The name and the new value of the variable are transferred as a character string.

Registering/deregistering an ALE connection for alarm transfer

RF-MANAGER system function	Description	ALE interface function	Description
These functions are mirrored in alarm logging.	-	AlarmSubscribe (…)	Registers the client application with the alarm logging of RF-MANAGER Runtime. After registering, alarms are transferred to the "notificationURI". When registering, one of the configured languages can be selected. The alarm texts will then be supplied in this language.
		AlarmUnsubscribe (…)	Deregisters the "notificationURI" from the alarm logging of RF-MANAGER Runtime. Following deregistration, no more alarms are supplied to the transferred address.

NXP functions

RF-MANAGER system function	Description	ALE interface function	Description
SetReadProtect	-	SetReadProtect (…)	Protects a specific tag from being read. If the read protection is set, the protected tag does not return a tag ID in the event of an inventory.
ResetReadProtect	-	ResetReadProtect (...)	Resets the write protection of a tag. If the read protection of a previously read-protected tag is reset again, the tag can be addressed again via its tag ID when there is an inventory.

Note

For a complete list of the RF-MANAGER system functions, see the Help system.

RF-MANAGER Engineering System 3

3.1 Overview

3.1.1 Basic Principles

RF-MANAGER is the software for future oriented RFID concepts using easy and efficient engineering.

To start RF-MANAGER, either click the desktop icon on the programming device or select it from the Windows Start menu.

In RF-MANAGER, you can only ever have one project open. Start RF-MANAGER more than once to work on several projects simultaneously.

3.1.2 Program desktop

3.1.2.1 Desktop elements

Introduction

The working environment of RF-MANAGER comprises several elements. Some of the elements are linked to specific editors which means they are not visible unless the corresponding editor is active.

Note

Setting small fonts

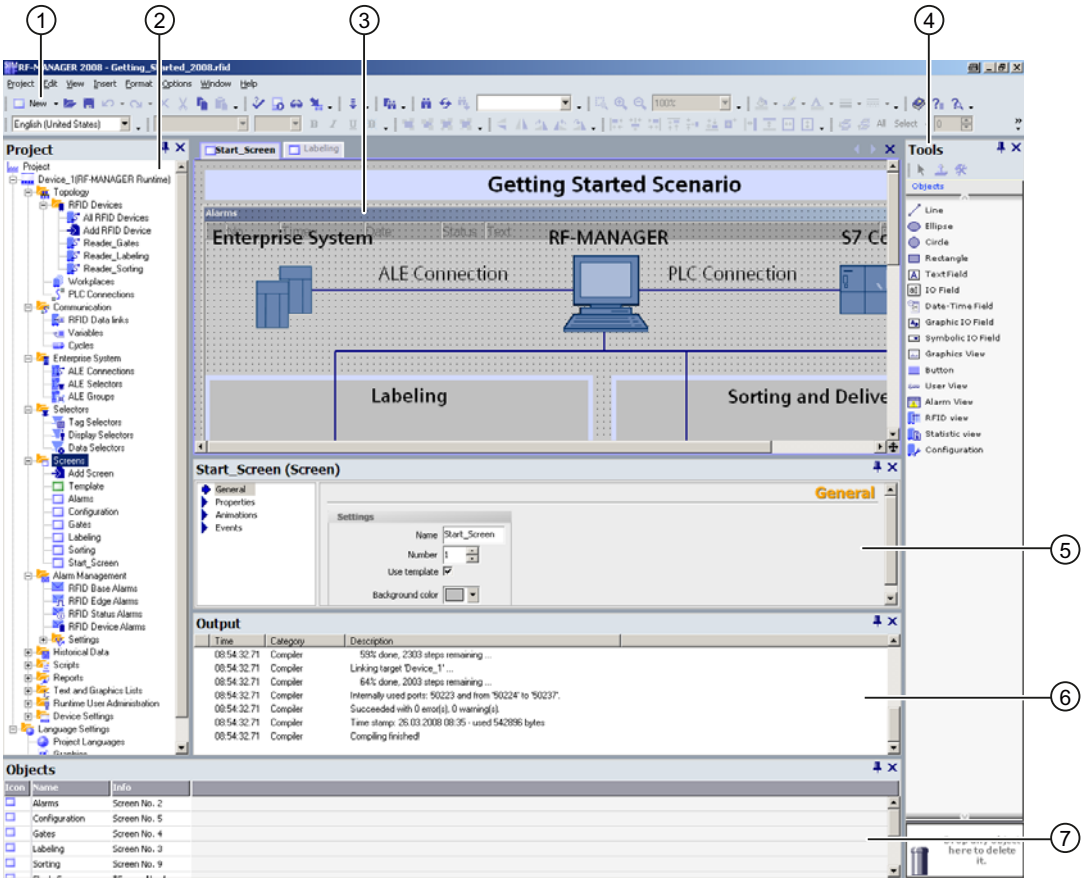
Set the configuration computer operating system to "Small Fonts" while working with RF-MANAGER. Otherwise the runtime system will not display correctly.

Elements of RF-MANAGER

You can access all the functions provided by RF-MANAGER by means of its menus and toolbars. When the mouse pointer is moved over a function, a ToolTip appears.

The RF-MANAGER comprises the following elements:

Elements of RF-MANAGER



1	Menus and toolbars	The menus and toolbars provide access to all functions you need to configure your runtime system. When the corresponding editor is activated, menu commands and toolbars specific to that editor appear. When the mouse pointer is moved over a command, the corresponding ToolTip appears.
2	Project view	All component parts and editors available in a project appear in a tree structure in the Project View. Folders are provided as sub-elements of each editor in which you can save objects in a structured way. With some editors, especially with the editor RFID Device, you have direct access to the configured objects. In the project window you have access to the device settings of the runtime system and the language settings.
3	Workplace	Project objects are edited in the workplace. All RF-MANAGER elements are arranged on the borders of the workplace. With the exception of the workplace, you can organize, configure and, for example, move or hide any of the elements to suit your individual requirements.
4	Toolbox	The Toolbox contains a selection of objects that you can add to your screens, e. g. image objects or operator control elements.
5	Property view	The property dialog box is used to edit object properties, e. g. the color of screen objects. The property view is only available in specific editors.
6	Output window	The output window displays system alarms generated, for example, in a project test run.
7	Object view	The "Objects View" shows all elements of the area selected from the "Project View".

Note

With the exception of the workplace, you can show or hide all windows in the "View" menu.

See also

Editor Properties (Page 68)

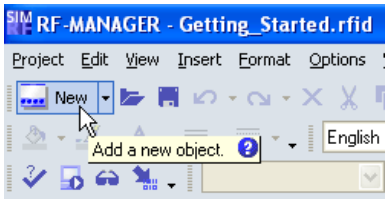
Displaying Help (Page 73)

3.1.2.2 Menus and toolbars

Introduction

The menus and toolbars provide access to all functions you need to configure your Runtime system. When the corresponding editor is activated, menu commands and toolbars specific to that editor appear.

When the mouse pointer is moved over a command, the corresponding ToolTip appears.



Positioning the Toolbars

Menus and toolbars are, as a standard, positioned at the top edge of the screen when creating a new project. The position of menus and toolbars is determined by the user who is logged on in Windows. If the toolbars are moved using the mouse, they revert back to their last ‘Exit’ position when RF-MANAGER is restarted.

Menus

The following menus are available in RF-MANAGER:

Menu	Short description
"Project"	Contains commands for project management.
"Edit"	Contains commands for clipboard and search functions.
"View"	Contains commands for opening / closing elements, and for zoom / layer settings. To reopen a closed element, select the "View" menu.
"Insert"	Contains commands for pasting new objects
"Format"	Contains commands for organizing and formatting screen objects.
"Options"	Contains commands for changing the user interface language and configuring the basic settings in RF-MANAGER, for example.
"Script"	Contains commands for the synchronization and syntax check of scripts.
"Window"	Contains commands for managing multiple windows in the workplace, e.g. for changing to other windows.
"Help"	Contains commands for calling help functions.

The availability of the menus and the scope of their commands depend on the respective editor which is used.

Toolbars

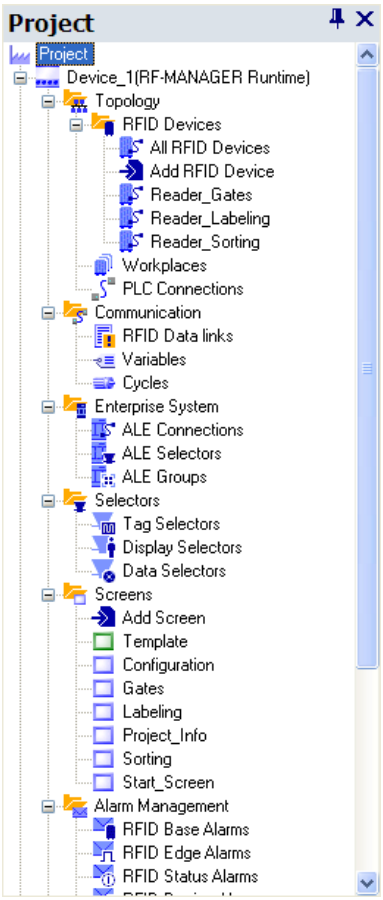
The toolbars provide quick access to important, frequently used functions. The following toolbar configuration options are available:

- Adding and removing buttons
- Changing the position

3.1.2.3 Project view

Introduction

The project view is the central control point for project editing. All component parts and editors available in a project appear in a tree structure in the Project View. Each editor is assigned a symbol which you can use to identify the corresponding objects. In the project window you have access to the device settings of the runtime system and the language settings.



Description

The Project View displays the project structure hierarchically:

- project
- Runtime systems
- Folder
- Objects

The project view is used to create and open objects for editing. You can organize your project objects in folders to create a structure. Handling the Project View is similar to handling Windows Explorer. Shortcut menus, which consist of the most important commands, are available for all objects.

Objects from graphic editors are displayed in the Project View and Objects View. Objects from "tabular editors" are shown only in the Objects View.

See also

Editor Properties (Page 68)

Object view (Page 56)

Working with the mouse (Page 63)

3.1.2.4 Workplace

Introduction

The workplace is used to edit project data either in table format (e.g. a data selector) or in graphic format (e.g. a diagram).

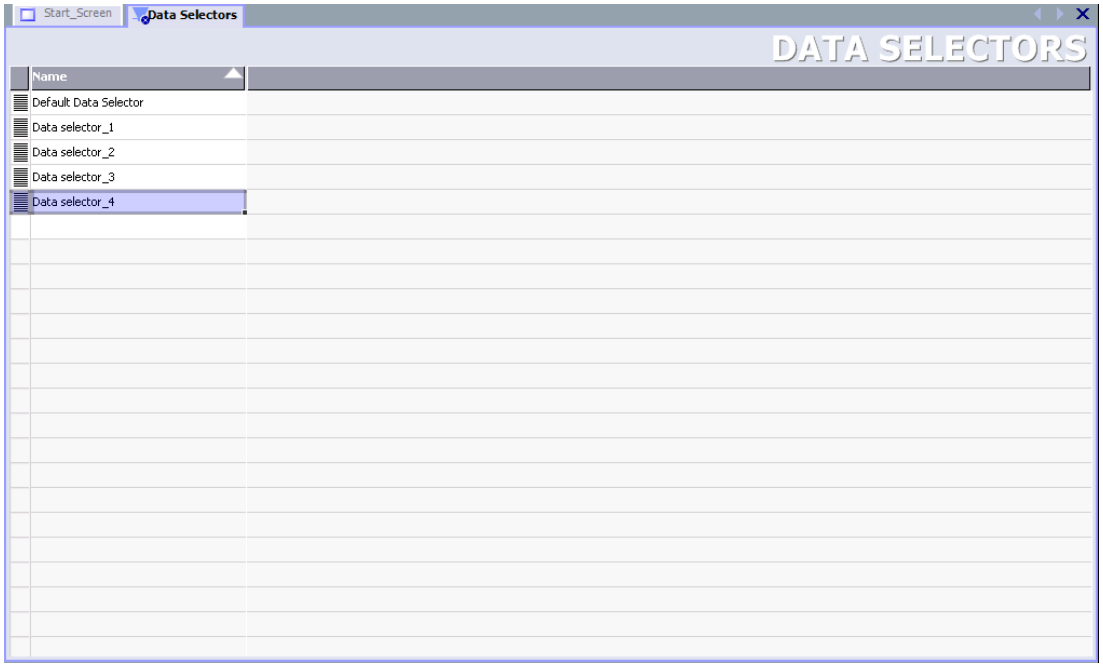


Figure 3-1 Workplace: Project data in tabular form

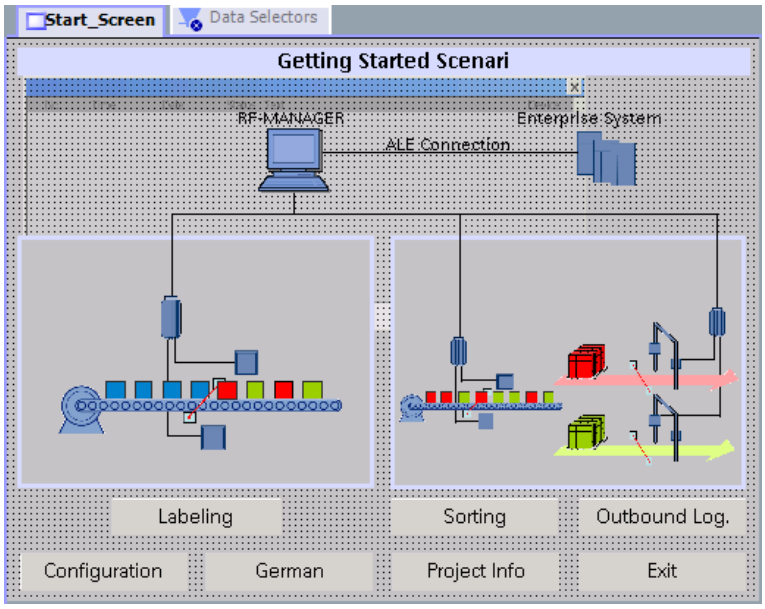


Figure 3-2 Workplace: Project data in graphical form

Description

Each editor is opened in a separate tab on the workplace. In the case of graphic editors, each object is displayed on a separate tab. Only one tab is active when several editors are open simultaneously. To move to another editor, click the corresponding tab. You can open up to 20 editors in parallel.

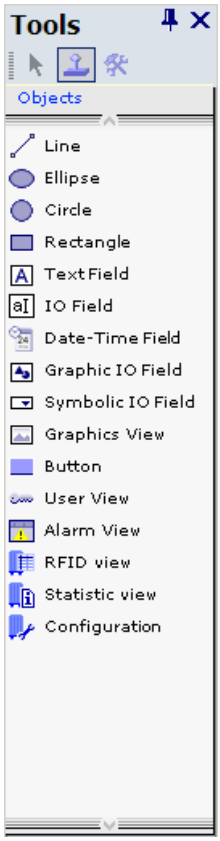
See also

Switching between editors (Page 72)

3.1.2.5 Toolbox

Introduction

The Toolbox contains a selection of objects that you can add to your screens, e. g. image objects or operator control elements.



Description

The "Toolbox" contains various types of objects which are frequently required for use in screens.
The Toolbox View can be faded in and out using the "Toolbox" command in the "View" menu. The Toolbox view can be moved to any position on the screen. The "Toolbox" contains various object groups, depending on the currently active editor.

Note

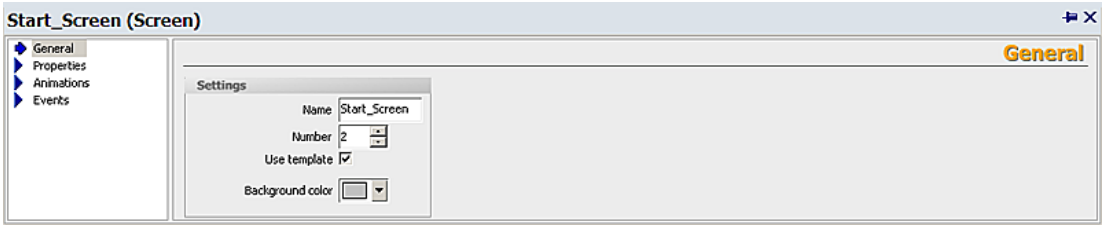
Further information

Further information about using the toolbox can be found in the description of the individual editors.

3.1.2.6 Properties view

Introduction

The properties dialog box is used to edit the properties of an object selected from the workplace. The content of the properties dialog box is based on the selected object.



Description

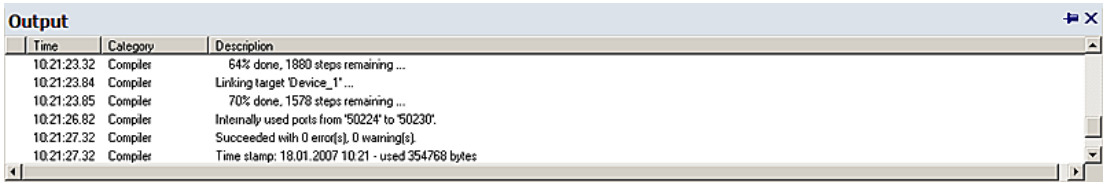
The properties dialog box shows the properties of the selected object organized in categories. The changed values take effect directly after exiting from the input field.

If you enter an invalid value, this is highlighted in color and you can correct this input error. QuickInfo provides you with information on the valid value range, for example

3.1.2.7 Output View

Introduction

The output window displays system alarms generated, for example, in a project test run.



Description

The output window normally displays system alarms in the order they occur. The categories define the corresponding RF-MANAGER module which has generated a system alarm. System messages of the "Generator" category are generated, for example, during the consistency check.

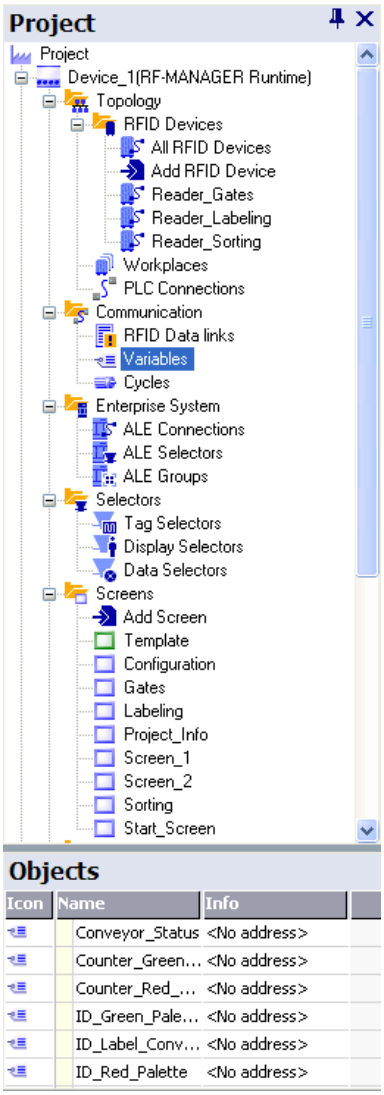
To sort system alarms, click the header of the corresponding column. The pop-up menu can be used to jump to an error location or a variable, and copy or delete system alarms.

The output window shows all system alarms of the last action. A new action overwrites all previous system alarms. You can still retrieve old system alarms from a separate log file.

3.1.2.8 Object view

Introduction

If folders or editors are selected in the Project View, their content is displayed in the Objects View.



Description

Double-click an object in the Objects View to open the corresponding editor. Drag-and-drop functions are available for all objects displayed in the object window.

The following drag-and-drop actions, for example, are supported:

- Moving a variable to a screen in the workplace: Creates an I/O field which is linked to the variable.
- Moving a variable to an existing I/O field: Creates a logical link between the variable and the I/O field.
- Moving a screen to a screen in the workplace: Generates a button with screen change function which is linked to the screen.

Long object names are abbreviated in the "Objects View". After moving the mouse pointer to the object, the full name appears as a ToolTip.

When a large number of objects are available, quickly locate the object you require by entering just the first letter of the object.

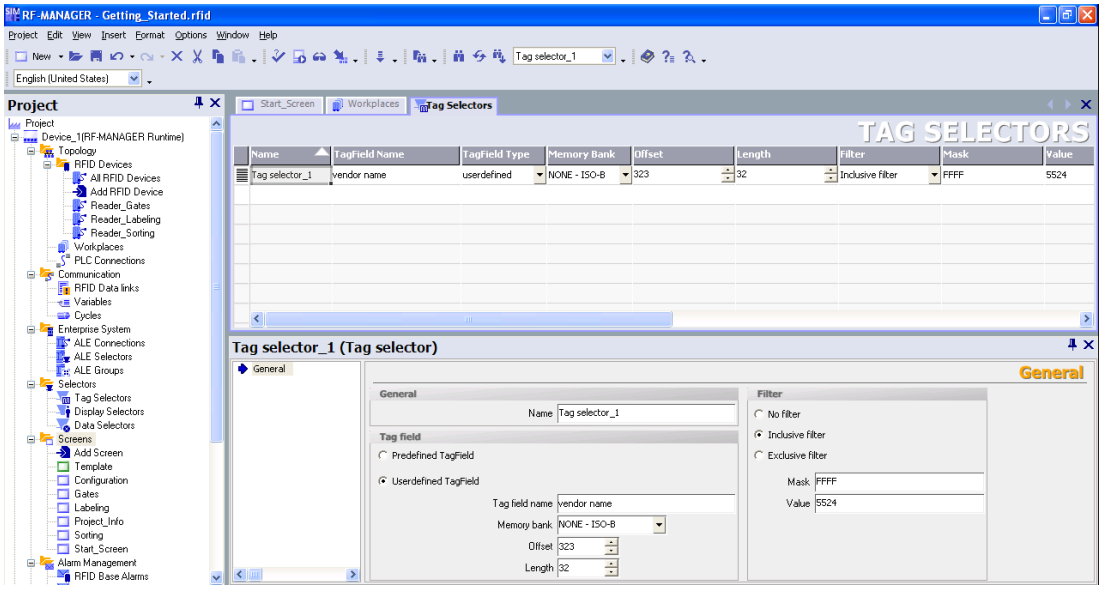
See also

Working with the mouse (Page 63)

3.1.2.9 Placing editor-specific operating elements

Introduction

Editor-specific operating elements are only visible in the active workplace of the corresponding editor.



Editor-specific operating elements include:

- Toolbars
- Toolbox
- Menu commands

Placement

The default position of editor-specific toolbars is on the right-hand side or below the existing toolbars.

Default position of editor-specific toolbox views is the screen margin on the right-hand side.

Editor-specific commands are added to the corresponding menus.

The positions of editor-specific operating elements are restored the next time you start RF-MANAGER if you have rearranged these in a previous session to suit your individual requirements.

3.1.2.10 Working with windows and toolbars

Introduction

RF-MANAGER allows you to customize the layout of frames and toolbars. You can hide certain frames which are not used frequently in order to enlarge the workplace.

The "View" menu can be used to restore the default layout of frames and toolbars.

Operating Elements Available

The table below shows you the operating elements of the frames and toolbars and what they are used for.

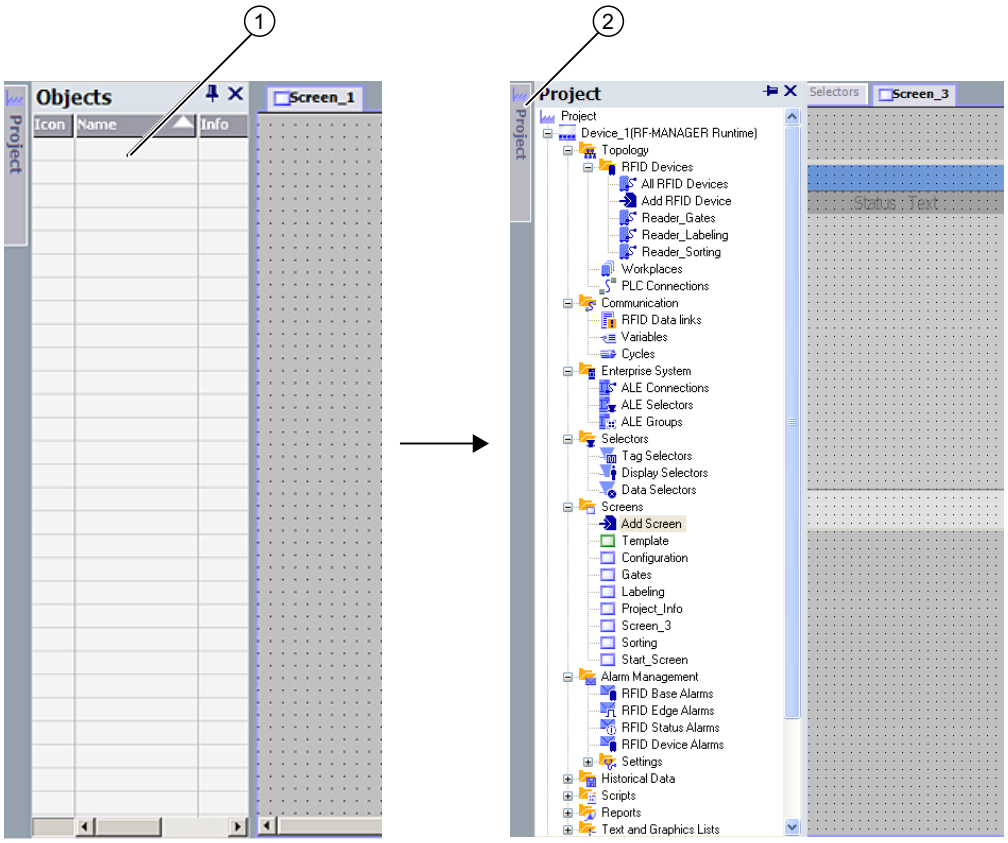
Control	Purpose	Where used
	Closes a frame or toolbar	Frames and toolbars (movable)
	Moves and docks frames and toolbars using drag-and-drop	Frames and toolbars (movable)
	Moves a toolbar by means of drag-and-drop	Toolbar (docked)
	Adds or deletes toolbar icons	Toolbar (docked)
	Activates the auto-hide mode for a window	Frame (docked)
	Disables auto-hide mode for a frame	Frame (docked)

Docking frames or toolbars

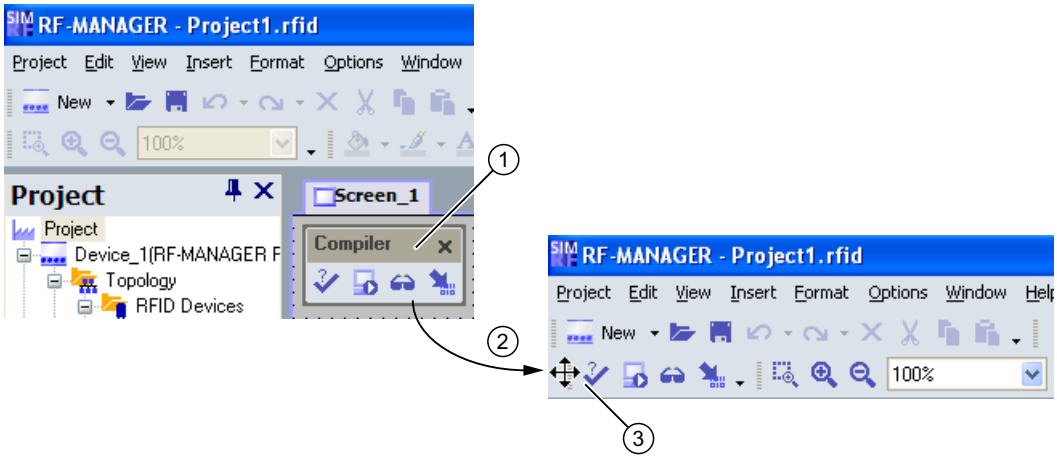
"Docking" refers to the integration of a window into the RF-MANAGER workbench. You can automatically hide docked frames in order to increase your workspace.

A freely moveable window can be docked on a window at the following positions:

- Upper edge
- Right edge
- Bottom edge
- Left edge



You can dock a toolbar onto any existing toolbar.

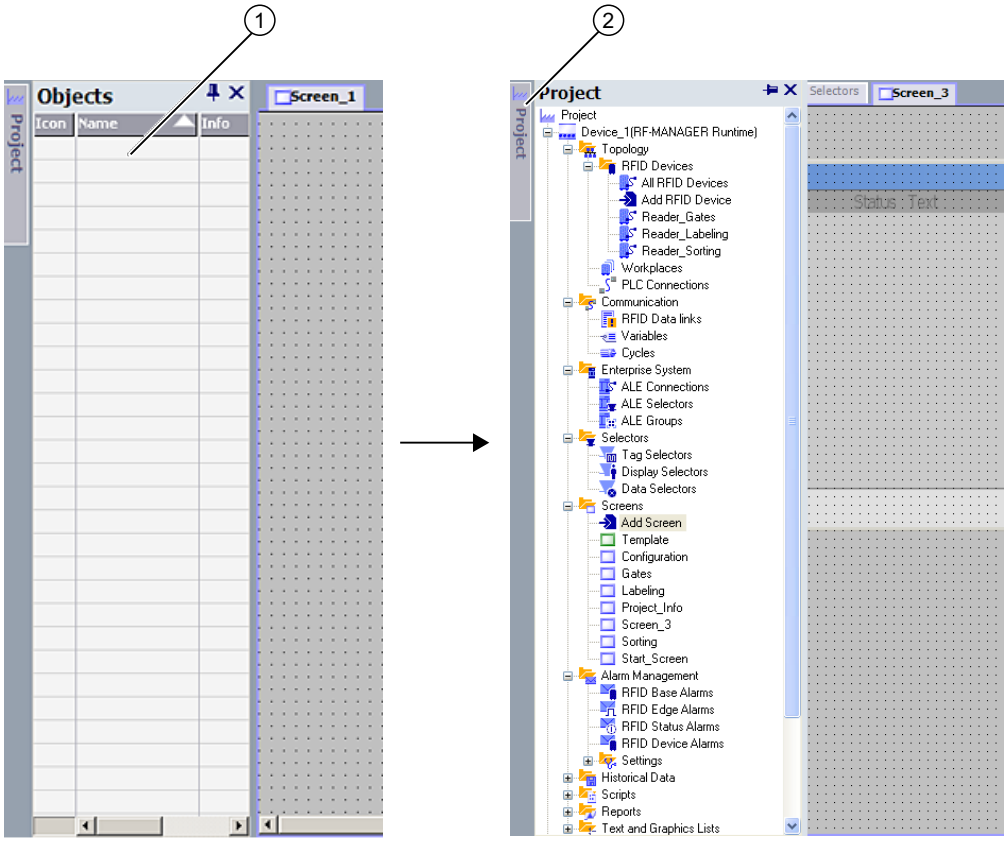


Combined frames

You can combine a frame with another frame. Each frame is represented in the combined frame by a separate tab. To change to a different frame, click the corresponding tab.

Hiding windows automatically

You can automatically hide the windows you do not require frequently. This will increase your workspace. To restore the window to the screen, click its title bar.



3.1.2.11 Working with the mouse

Introduction

In RF-MANAGER, you will work mainly with the mouse. Important operating functions in this context are the drag-and-drop function and the call of commands from the shortcut menu.

Drag and drop

Drag-and-drop makes configuration much easier. For example, when you drag-and-drop a variable from the Object View to a screen, the system automatically generates an I/O field which is logically linked to the tag. To configure a screen change, drag-and-drop the required screen onto the screen shown in the workplace. This generates a button configured to contain a corresponding screen change function.

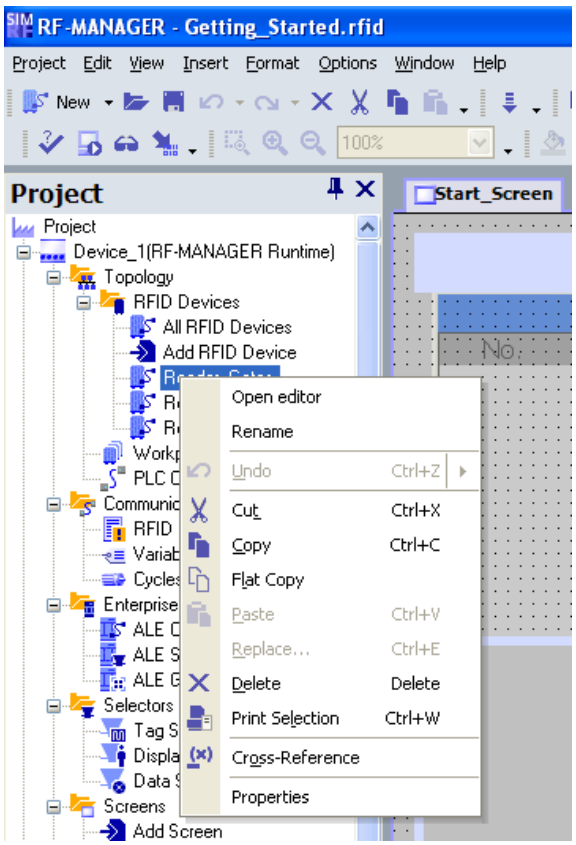
The drag-and-drop function is available for all objects in the project view and "Object view." The mouse pointer shows you whether drag-and-drop is supported at the destination or not:

Drag and drop is possible

Drag and drop is not possible

Context Menu

In RF-MANAGER, you can right-click any object to open a shortcut menu. The shortcut menu contains the commands you can execute in the relevant situation.



Overview: Mouse functions

Function	Effect
Left-click	Activates any object or executes an action such as a menu command or drag-and-drop.
Right-click	Opens a shortcut menu.
Double-click (left mouse button)	Starts an editor in the Project View or Objects View or opens a folder.
<Left mouse button+drag-and-drop>	Generates a copy of the object in the project view.
<CTRL+left mouse button>	Selects a number of individual objects from the "Objects View" one after the other.
<SHIFT+left mouse button>	Selects all objects within the rectangle lasso you have drawn with the mouse in the "Objects View."

See also

Properties view (Page 54)

Object view (Page 56)

3.1.2.12 Keyboard control

Introduction

RF-MANAGER provides a number of hotkeys which you can use to execute frequently required menu commands. The menu shows whether a hotkey is available for the relevant command or not.

WinCC also integrates all the standard hotkeys provided by Windows.

Important hotkeys

The table shows you the most important hotkeys for use in RF-MANAGER.

Hotkeys	Effect
<Ctrl+Tab>/<Ctrl+Shift+Tab>	Activates the next/previous tab in the workplace.
<Ctrl+F4>	Closes the active view in the workplace.
<Ctrl+C>	Copies a selected object to the clipboard.
<Ctrl+X>	Cuts an object and copies it to the clipboard.
<Ctrl+V>	Inserts the object stored in the clipboard.
<Ctrl+F>	Opens the "Find and Replace" dialog.
<Ctrl+A>	Selects all objects in the active area.
<ESC>	Cancels an action.

3.2 Working with the engineering system

3.2.1 Configuration Support

Introduction

RF-MANAGER provides support for the configuration tasks in the form of solution-oriented concepts. This concerns, for example, processing of bulk data.

Engineering support

Efficient configuration saves time and costs. RF-MANAGER supports you as follows:

- Central modification of referenced objects

  Modifications made at a central station are applied to the entire project. If you create a tag selector for example, and assign it to the data sources of different RFID devices, the change in paramaterization of the tag selector takes effect in all the affected data sources.

- Use

  The reuse of configuration objects simplifies configuration and reduces overall costs.

- Bulk data processing

  Create an action, for example, with several tags having the same values or chronologically ascending addresses.

User customization of the programming user interface

The RF-MANAGER user interface can be user customized by moving or hiding windows and toolbars.

3.2.2 Working with projects

Introduction

In RF-MANAGER, you configure user interfaces for managing the devices of RFID systems and their components and for data processing.

Special editors are available for the different configuration tasks. All configuration information is saved in a project.

Creating or Loading a Project

After starting RF-MANAGER, a wizard guides the user through all the steps which are necessary to create a new project. The user is prompted, for example, to enter a name for the project and select a runtime system.

If RF-MANAGER is already open, select the "New" command to create a new project. In some circumstances, a wizard will appear to guide you through the process.

To load an existing project, select the "Open" command from the "Project" menu.

3.2.3 Processing more than one project

Principle

In RF-MANAGER, you can only ever have one project open for processing. If projects should be copied globally, for example, restart RF-MANAGER and then open the required project.

Several runtime systems can be set up parallel in each project.

Each opened RF-MANAGER is shown in the Windows task bar:

3.2.4 Editor Properties

Introduction

RF-MANAGER provides a special editor for each configuring task. RF-MANAGER differentiates between two different types of editors: graphical editors and tabular editors. You can open up to 20 editors in parallel.

Graphical Editors

Graphical editors, such as the "RFID Devices" editor, display the elements belonging to both the Project View and Object View. You open each object in the workplace with graphical editors.

Tabular editors

Tabular editors, such as the "ALE links" editor, only display the associated objects in the Object View. When a tabular editor is opened to edit the objects, all associated objects are displayed in a table in the workplace.

Editor properties

The following properties apply to all editors and their objects:

- Changing contents

  Changes take effect directly after exiting an input field and affect projects globally. All the objects affected by a modification are automatically updated.

  If a variable parameter is changed at the place of use in the "Screens" editor, for example, the change has a direct effect in the "Variables" editor.

- Accepting changes to the project data

  The modified project data are transferred to the project database as soon as the project is saved.

- Undo or redo working steps

  Every editor has an internal list in which user actions are saved. In this way, all actions can be reverted (undone) or restored. The relevant commands are in the "Edit" menu. The list is deleted when the editor is closed or the project is saved. Switching to another editor does not affect the actions stored in the list.

See also

Placing editor-specific operating elements (Page 58)

3.2.5 Open Editor

Introduction

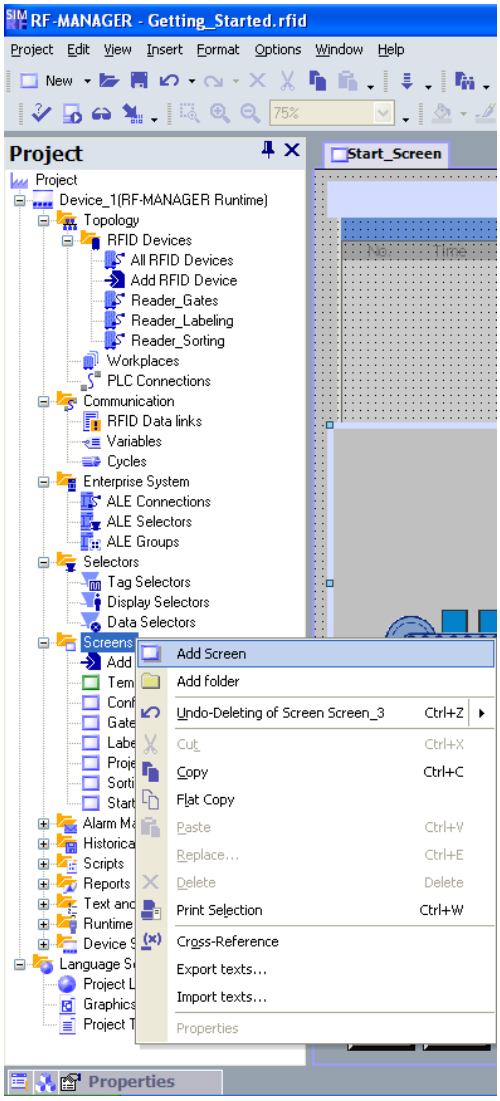
The way in which an editor is started depends on whether it is a graphical editor (e.g. "Screen" editor) or tabular editor (e.g. "Variable" editor). You can open up to 20 editors in parallel.

Opening a Graphical Editor

A graphical editor is started by either creating a new object or opening an existing object.

To create a new object, proceed as follows:

1. Click the right mouse button on the graphical editor in the Project View in which a new object is to be added.
2. Select "Add screen" in the shortcut menu, for example:

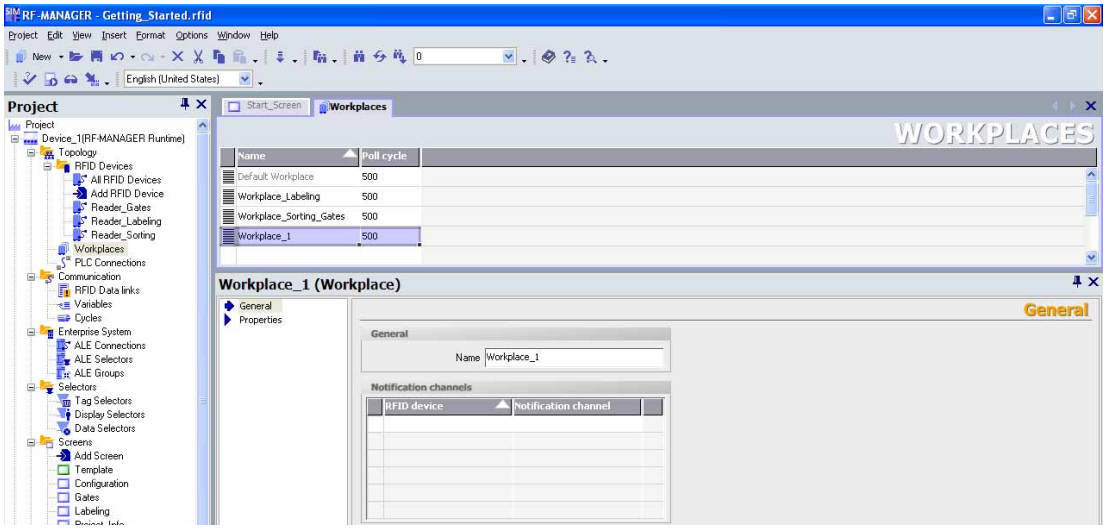


   The object, e.g. a screen, is created in the Project View and displayed in the workplace.
3. To open an existing object, double-click on the object in the Project View or Object View.

   The object, e.g. a screen, is displayed in the workplace.

Opening a tabular editor

A tabular editor is opened by double-clicking on the tabular editor in the Project View. The editor appears in the workplace.



A tabular editor can also be activated using the associated shortcut menu. To open an existing element in the tabular editor, select the tabular editor in the Project View. Then double-click on the required object in the table.

Alternative procedure

To open an editor via the menu, select the "New object in project" command from the "Insert" menu.

3.2.6 Switching between editors

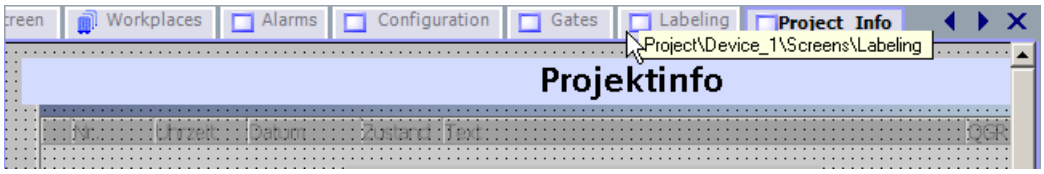
Introduction

Although several editors or their objects can be opened simultaneously in RF-MANAGER, only the workplace of one editor can be active in the workplace.

If several editors are open, they are represented by separate tab controls in the workplace.

Tabs

To select a different editor, click the relevant tab in the workplace. In tabular editors, a tab shows the name of the editor for easy identification. In the case of graphical editors, the name of the current element is indicated, e.g. "Screen1".

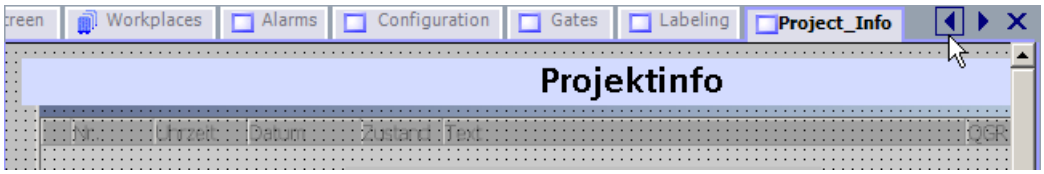


The tooltip indicates which runtime system is being configured in the editor.

Navigation arrows

If the workplace runs out of space to show all tabs, the navigation arrows become active in the workplace.

To access tabs which are no longer visible in the workplace, click the corresponding navigation arrow.



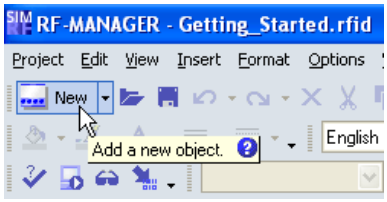
Closing the editor

To close an editor, click the ☒ symbol in the workplace.

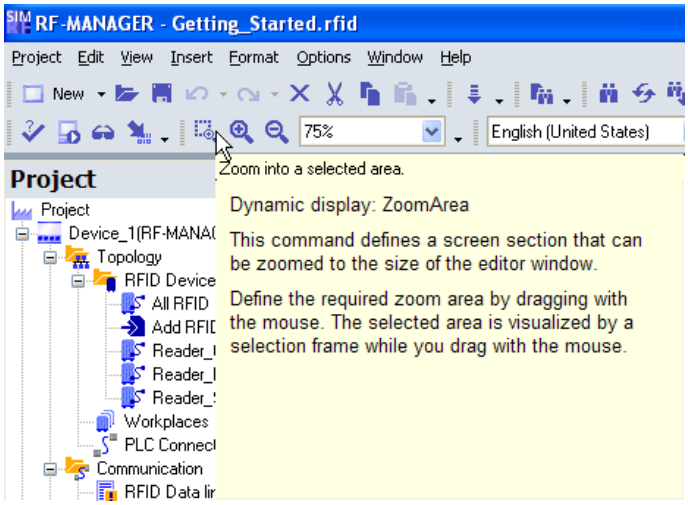
3.2.7 Displaying Help

Shortcut help

A tooltip will appear after moving the mouse pointer over any object, icon, or dialog element.



A question mark next to the tooltip indicates that a shortcut help is available for this user interface element. To call up an additional explanation to the short description, click on the question mark, press <F1> if the tooltip is activated, or move the mouse cursor to the tooltip.



The explanation includes references which refer users to a detailed description in the Online Help.

Online help

In the "Help" command menu you can access the online help. When you use the "Help > Contents" menu command, the RF-MANAGER Information System opens with an opened table of contents. Use the table of contents to navigate to the desired topic.

Alternatively select the "Help > Index" menu command. The RF-MANAGER Information System opens with an opened index. Use the index to search for the desired topic.

In order to use the full text search across the entire RF-MANAGER Information System select the "Help > Search" menu command. The RF-MANAGER Information System opens with an opened search register. Enter the desired search term.

The RF-MANAGER Information System can also be opened via the Start menu in Windows. Select the menu command "Start > SIMATIC > RF-MANAGER > RF-MANAGER Help System" in the task bar.

The Online Help system is opened in a separate window.

3.2.8 Customized setup of the working environment

Introduction

RF-MANAGER allows you to customize the position and reaction of windows and toolbars. This allows you to configure the work environment to meet your special requirements.

Working Environment User-Dependency

The appearance of RF-MANAGER is linked to the user logged on in Microsoft Windows. On saving the project, the positions and behavior of windows and toolbars are automatically saved with it.

When the project is opened again, the project status loaded is identical to that when saved. In this way, the working environment is opened as it was when last closed. This is also the case when a project edited by a different project planner is opened.

Resetting the work environment

The positions of views and toolbars can be reset to their original state. To do this, select "Reset layout" in the "View" menu.

3.3 Working with projects

You can configure a maximum of eight runtime systems in an RF-MANAGER project

A project in RF-MANAGER contains all your configuration data for one or more runtime systems. Configuration data includes:

- Desktop elements for visualizing RFID data or PLC data
- RFID alarms for indicating the operating status of readers
- System alarms for indicating the operating status of the runtime system

All data related to a project is stored in the database integrated in RF-MANAGER.

Opening multiple sessions of an RF-MANAGER project

An RF-MANAGER project should not be opened in multiple sessions. This applies in particular to the opening of projects on network drives.

3.3.1 Components of a project

An RF-MANAGER project consists of all the data that is provided by the data and device management of your system. A business interface to the MES/ERP level is also possible.

The configuration data is compiled in RF-MANAGER according to topic categories. Each category is processed in an individual editor.

If you want to archive the project, it is sufficient to back up the [project name].rfid, [project name]_log.ldf and [project name].rfidsim files. Before you continue with delta compilation, you must also back up the [project name].data and [project name]_RT_log.data files. All other files can be created as required.

3.3.2 Types of projects

Principle

Different types of projects can be created using the RF-MANAGER. The project type depends on your plant planning, the size of the plant or machine and the required representation of the plant or machine.

The following project types can be configured in RF-MANAGER:

- Single-user project

  Project which is used for a single runtime system.

- Multi-user project

  Project in which several runtime systems are configured.

Single-user project

In most cases, only one HMI device is configured. During the configuration phase, a project always displays precisely the function range which is supported by the currently selected runtime system.

Multi-user project

If several runtime systems are used to operate a system, RF-MANAGER can be used to create a project in which several runtime systems are configured. This type of project is used, for example, when the machine or system controlled is operated from several different points. Common objects can then be used in the project. This method means that a project need not be created for each separate runtime system, but rather all runtime systems are managed in the same project.

An RF-MANAGER project consists of all the configuration data which supports operation and monitoring of your system. Each configured runtime system only displays the functions which the specific unit supports. Functions which are not supported are hidden but remain a component part of the project data.

3.3.3 Multilingual configuration

Multilingual configuration

You can configure your projects in multiple languages using RF-MANAGER. RF-MANAGER supports the multilingual configuration of practically all objects with texts displayed in the runtime system.

RF-MANAGER can be used for configuration in all languages installed in the operating system.

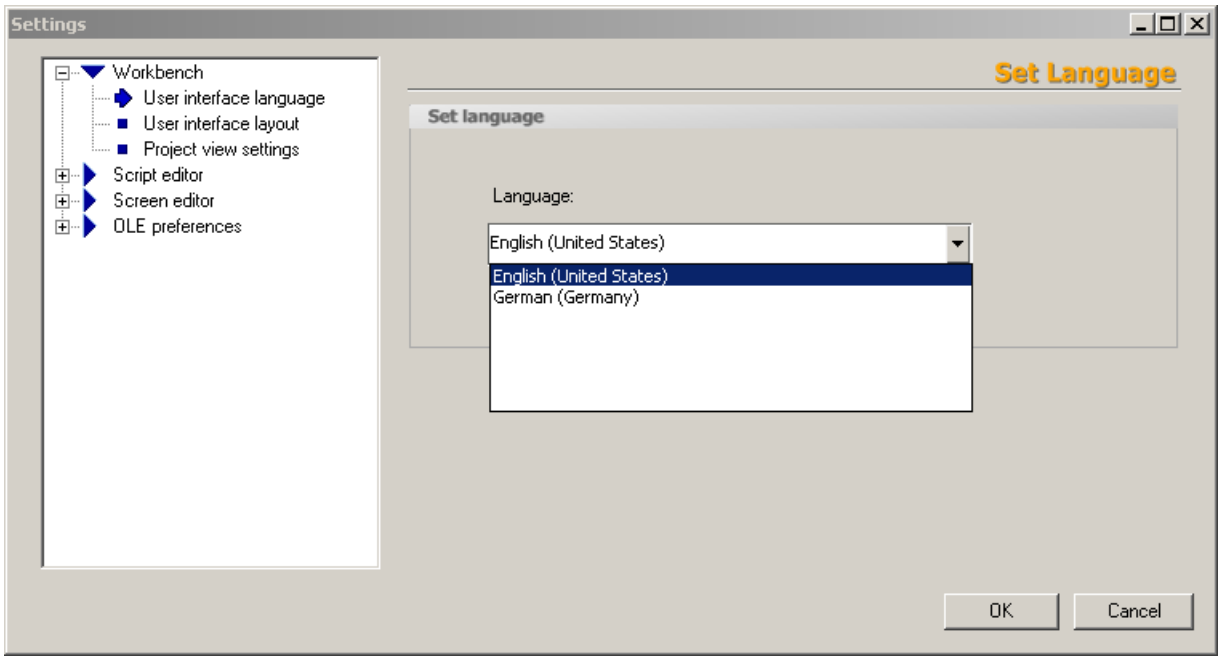
In addition to direct text input in the editors, RF-MANAGER provides easy-to-use export and import features for translating projects. This is of particular advantage when configuring large projects with a large share of text.

Use the following editors to translate texts in RF-MANAGER:

Toolbar	Short description
Project languages	Managing languages for the project texts
Languages and fonts	Defining the languages and fonts used in the runtime system
Project texts	Managing language-dependent project texts
Graphic browser	Managing local graphics

Multilingual RF-MANAGER user interface

The language of the user interface in RF-MANAGER can be selected, for example, to suit regional requirements of several engineers of different nationality working with the RF-MANAGER. Languages are selected under:
"Options > Settings > Workbench > User interface language".



Switching the Online Help language

If the Online Help system crashes when the language is switched, check the version of the "hhctrl.ocx" file in the "system32" subdirectory of the installation directory of the operating system. If the file version is older than V5.2.3735.0, download a newer version from http://msdn.microsoft.com/library/default.asp?url=/library/enus/htmlhelp/html /hwMicrosoftHTMLHelpDownloads.asp
.

3.3.4 Editing projects

Objects and editors

The following objects can be created and edited in RF-MANAGER.

- **RFID objects**

  You create and process RFID objects in the associated editors. These include, for example, RFID devices, workplaces, ALE connections, RFID data links and the filter mechanisms that operate within the RF-MANAGER.

- **Screens**

  Screens are created and edited in the "Screens" editor.

- **Graphics list**

  In a graphic list, the values of a variable are assigned to various graphics. The graphics lists are created in the editor "Graphics lists".

- **Text List**

  In a text list, the values of a variable are assigned to various texts. The text lists are created in the "Text List" editor and displayed with the "Symbolic I/O Field" object.

- **Language-dependent texts and graphics**

  Using RF-MANAGER, projects can be created in different languages:

  – The "Project languages" editor is used to manage the languages in which the projects should run.

  – The "Project texts" editor is used to manage and translate language-dependent texts centrally.

  – The "Graphic browser" editor is used to manage language-dependent graphics.

- **Variables**

  Variables are created and edited in the "Variables" editor.

- **Cycles**

  It is possible to configure events in RF-MANAGER which reoccur at regular intervals. The time intervals are defined in the "Cycles" editor.

- **Alarms**

  You create and edit alarms in the "Alarm management" editor.

- **Logs**

  The "Alarm log" editor is used to log alarms in order to record operating statuses and faults which occur in a system.

- **PLC connections**

  In the "PLC connections" editor, you can configure PLCs.

- **Reports**

  The "Reports" editor is used to create reports with which the user prints alarms and process values, for example, in runtime.

- **Runtime user administration**
  In the "Runtime user administration" editor, you can create users and user groups and assign user privileges for operation of the runtime system.
- **Scheduler**
  In the "Scheduler" editor, you can manage job-related tasks. It is possible to execute a job once or several times.
- **Device settings**
  In the "Device settings" editor, you can create device settings such as the welcome screen or language setting.
- **Scripts**
  RF-MANAGER allows you to expand your project with scripts that you have written. These scripts are managed in the "Scripts" editor.

Tabular editors and image editors

Graphical editors, such as the "Screens" editor, display the elements belonging to both the Project View and Object View. You open each object in the workplace with graphical editors.

Tabular editors, such as the "Variables" editor, only display the associated objects in the Object View. When a tabular editor is opened to edit the objects, all associated objects are displayed in a table in the workplace.

See also

Creating a project (Page 88)

3.3.4.1 Displaying projects

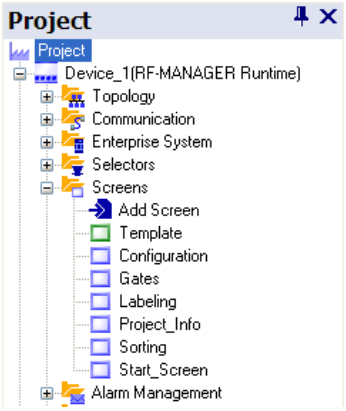
Principle

All component parts and editors available in a project appear in a tree structure in the Project View.

Displaying a project in the Project View

All editors available are displayed under the project node in the Project View. The objects in a project can be edited using the various editors.

Folders are provided as sub-elements of each editor in which you can save objects in a structured way. In addition, direct access to the configured objects is available for RFID devices and screens.



Select the project objects which are to be edited in the Project View. To do this, double-click on the relevant object. The corresponding editor will open.

Displaying objects in the Objects View

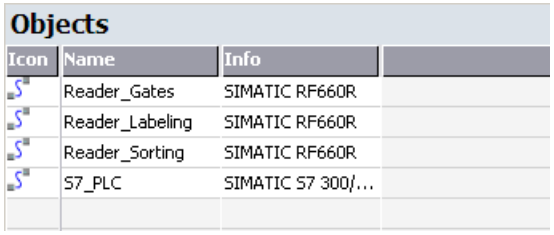
The Objects View displays the content and associated information of the respective folders and editors selected in the Project View. The Objects View is displayed below the Project View by default.

The Objects View is comprised of three columns:

- "Object type"
- "Name"

  Name of the object
- "Info"

  Brief information, e.g. a comment entered by the project engineer



Objects are displayed in the Objects View by the following icons:

Icon	Short description	Icon	Short description
	RFID devices		Alarm logs
	Workplaces		Scripts
	Variables		Text lists
	Cycles		Graphics lists
	ALE connections		Groups
	ALE selectors		Users
	ALE groups		Runtime security settings
	Tag selectors		Device settings
	Display selectors		Languages and fonts
	Data selectors		Scheduler
	Screens		Network settings
	RFID base alarm		Reporting
	RFID edge alarm		Project languages
	RFID status alarm		Graphic browser
	Alarm settings		Project texts
	Alarm classes		Reports
	System alarms		RFID data link
	RFID device alarms		PLC connections

Working with the Objects View

Double-click an object in the Objects View to open the corresponding editor.

In addition, drag-and-drop actions can be performed on all objects displayed in the Objects View. The following drag-and-drop actions, for example, are supported:

- Moving a variable to a process screen in the workplace: Creates an I/O field which is linked to the variables.
- Moving a process screen to another process screen in the workplace: Creates a "Change screen" button to the relevant process screen.

See also

Working in the Project View (Page 83)

Working in the Objects View (Page 85)

Creating a project (Page 88)

3.3.4.2 Working in the Project View

Principle

The representation of the project in the Project View can be used to edit projects.

The following actions can be executed in the Project View:

- Double-click
- Select a command in the shortcut menu
- Drag and drop actions

Double-click

A folder is opened by double-clicking on the folder in the Project View.

You can open an editor by double-clicking the editor, for example, "Workplaces" or "ALE connections".

Shortcut menus

After positioning the pointer on an object or folder and clicking the right mouse button, the respective shortcut menu appears. The following actions are available in the shortcut menu:

Action	Description
"Open editor"	Opens the editor
"Add folder"	Creates a new subfolder. The creation of subfolders enables the user to sort the objects according to topics.
"Add object"	Inserts a new object.
"Delete"	Deletes the object or folder selected.
"Rename"	Enables the object or folder selected to be renamed.
"Undo"	Reverts the last process.
"Cut"	Copies the object or folder in the clipboard and deletes it.
"Copy"	Copies the object or folder in the clipboard.
"Flat copy"	"Flat copy" will copy those objects with a parent-child relationship completely. See .
"Paste"	Inserts the object stored in the clipboard.
"Replace"	Replaces an object with the one in the clipboard.
"Print selection"	Prints the object or folder selected.
"Cross-references"	Shows all places of use for the selected object or folder.
"Properties"	Shows the properties of the object or folder selected.
"Export/import texts"	Texts can be imported or exported in accordance with the object type.

Drag and drop actions

Drag-and-drop can be used for the following actions:

- Inserting objects in an editor

  Drag an image from the Project View and drop it in another screen. The screen is then assigned a button which, when clicked, switches the screen content back to the first screen.

- Moving or copying objects in subfolders

  If the Project View simultaneously contains objects and subfolders, an object can be moved to a subfolder by means of drag-and-drop or copied.

See also

Displaying projects (Page 80)

Working in the Objects View (Page 85)

Creating a project (Page 88)

3.3.4.3 Working in the Objects View

Principle

The Object View provides an overview of the objects.

The following actions can be executed in the Object View:

- Double-click
- Select a command in the shortcut menu
- Drag and drop

Double-click

A folder is opened by double-clicking on the folder in the Object View.

After double-clicking on an object (e.g. a screen) in the Object View, the editor opens.

Shortcut menus

The following actions are available in the shortcut menu:

Action	Description
"Open editor"	Opens the editor
"Add folder"	Creates a new subfolder. The creation of subfolders enables the user to sort the objects according to topics.
"Delete"	Deletes the object or folder selected.
"Rename"	Enables the object or folder selected to be renamed.
"Undo"	Reverts the last process.
"Cut"	Copies the object or folder in the clipboard and deletes it.
"Copy"	Copies the object or folder in the clipboard.
"Flat copy"	"Flat copy" will copy those objects with a parent-child relationship completely. See "Flat copy".
"Paste"	Inserts the object stored in the clipboard.
"Replace"	Replaces an object with the one in the clipboard.
"Print selection"	Prints the object or folder selected.
"Cross-references"	Shows all places of use for the selected the object or folder.
"Properties"	Shows the properties of the object or folder selected.
"Export/import texts"	Texts can be imported or exported in accordance with the object type.

Inserting objects in an editor with drag and drop

Using drag-and-drop, an object can be dragged from the Object View into any editor when the editor permits editing of the object. An example of its application is the linking of variables to a screen. If a variable is dragged from the Object View into a screen, an I/O field is automatically created.

See also

Displaying projects (Page 80)

Working in the Project View (Page 83)

Creating a project (Page 88)

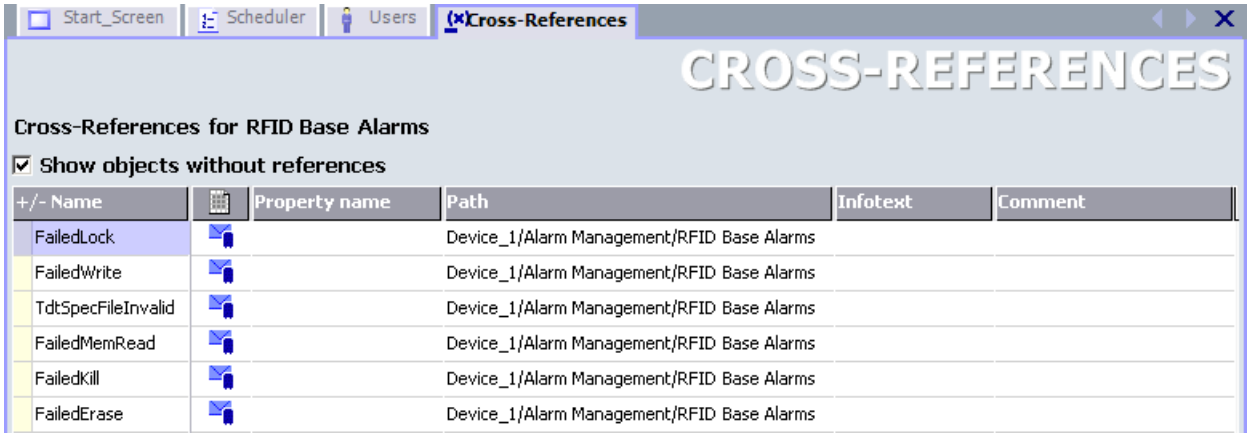
3.3.5 Working with the cross-reference

Principle

The "Cross reference" editor enables all usage points for specific objects, e.g. variables or screens, to be located and to skip to those points directly.

To display the cross reference list, highlight the relevant object and click "Cross reference" with the right mouse button.

Cross-reference user interface



Open the object by double-clicking the icon .

Possible operations in the cross-reference via the shortcut menu

Use the "Go to usage" command to skip directly to the location of usage in the project. Alternatively, double-click the point of usage icon.

It is possible to change the view in the "Cross reference" editor. The following commands are available to change the view:

- Collapse all

  The "Collapse all" command is used to hide the list of places of use for all objects.

- Expand all

  The "Expand all" command is used to recall the list of places of use.

The "Print" command is used to print the cross-reference list.

3.3.6 Internal project find and replace feature

Principle

With the RF-MANAGER, you can find and replace character strings and objects:

- You can find and replace character strings in the workplace: Use the "Find in workplace..." dialog and "Replace in workplace..." dialog in this case.
- You can search for objects in the complete project or in parts of the project. Use the "Find in project" dialog in this case.

3.3.7 Basic principles of documentation

Principle

Use the project documentation to recall an overview of the configuration data.

The project documentation can be provided as follows:

- Displayed on screen
- Output as file, e.g. HTML
- Output via a printer

If only certain parts of the project data need to be used in the project documentation, select the corresponding objects.

For further information, see the chapter "Project documentation".

3.3.8 Creating a project

There are two basic methods for creating a project:

- Using the Project Wizard
- Using the option "Create empty project".

When should I use the project wizard?

You should use the project wizard if you are a first-time user. The Project Wizard supports rapid familiarization and presents standard scenarios that can be used to create a basic project. This basic project will have to be reparameterized later.

To start the Project Wizard, either select the option "Create new project with project wizard" in the engineering system or select the menu option "Project > New project with project wizard".

You will find further details in the "Getting Started" document for RF-MANAGER which describes the use of an RFID sample project that is included in the scope of supply.

When should I use the option "Create empty project"?

The option "Create empty project" is used to create a new project in RF-MANAGER without project components. You only have to select the HMI device that you are using for the runtime system in the "HMI device type" view.

If you want to create an empty project, select the option "Create empty project" in the engineering system or select the menu item "Project > New".

3.3.8.1 Prerequisites for operating a project with a reader

If you want to operate a project with a reader, the following requirements must be fulfilled:

- At least one reader is connected to the PC.
- The reader must have communications capability.

Connecting and parameterizing readers

Depending on the reader model, there are different connection and commissioning methods for the reader:

- Stationary readers (Page 90):
  - RF670R
  - RF660R
  - RF620R/RF630R, RF310R, RF340R, RF350R, RF380R
- Mobile readers (Page 108):
  - RF310M
  - RF610M

Connecting and parameterizing stationary readers

Use of DHCP (Dynamic Host Configuration Protocol)

Introduction

A DHCP server ensures that IP addresses are automatically assigned to DHCP-capable network clients in a network segment. The DHCP server uses the MAC address of the network client for this purpose. The IP addresses are assigned due to permanent assignment of a MAC address to an IP address. The readers of the RF600 family with Ethernet connection are DHCP-capable.
Mechanisms that extend beyond this, such as dynamic assignment of IP addresses or Domain Name Service (DNS), are not supported.

Requirements for activating DHCP

A DHCP server must be present in the network segment.

An up-to-date list of permanent assignments between MAC addresses and IP addresses must be stored in the DHCP server. This list must be maintained by your responsible IT staff member.

You will find the MAC addresses of readers:

- on the enclosure next to the RJ45 socket

NOTICE
Ensure that the DHCP server is running and the reader is entered in the list. Otherwise RF-MANAGER Basic will be unable to establish a connection to the reader following activation.

RF670R

Connecting stationary readers to the parameterization computer

You have the following options for connecting a reader of the RF600 series to your parameterization computer via Ethernet:

- Ethernet connection (10/100 Mbit/s) via RJ45 cable, either over an Ethernet network (connection via hubs or switches) or as a point-to-point link using a crosslink cable directly between a PC and a reader.

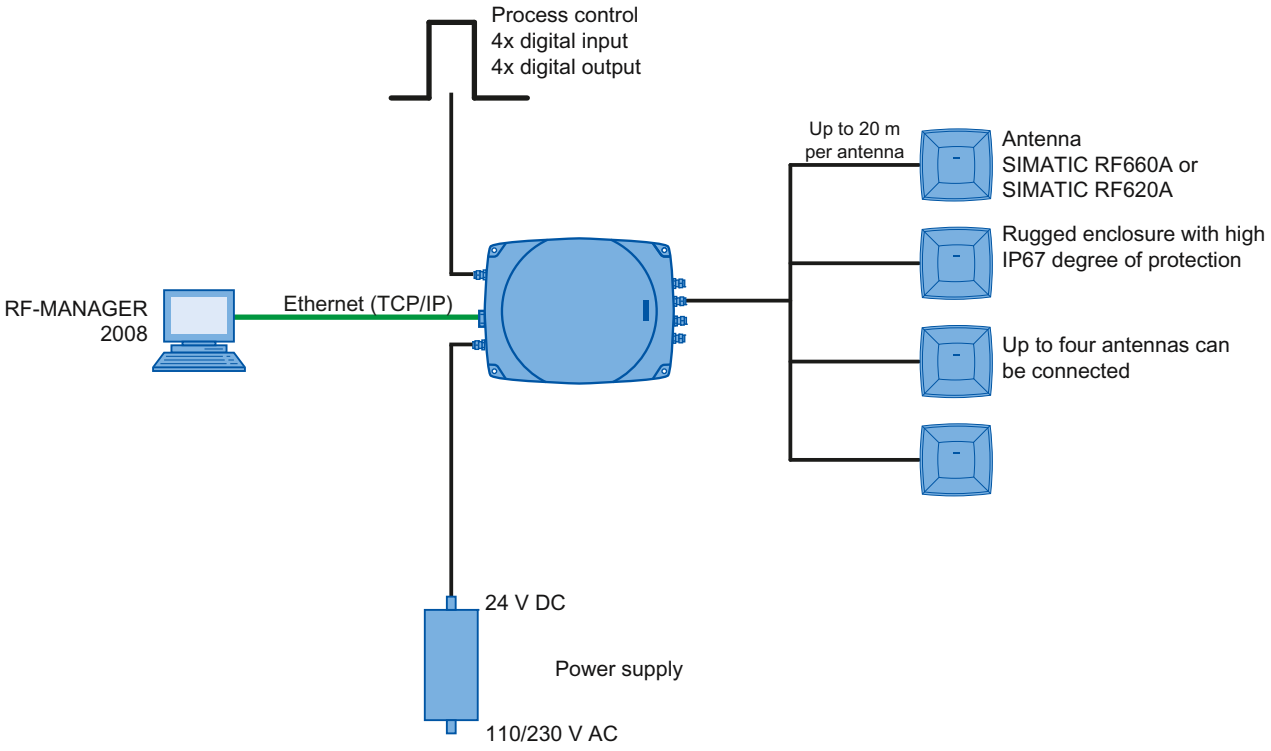
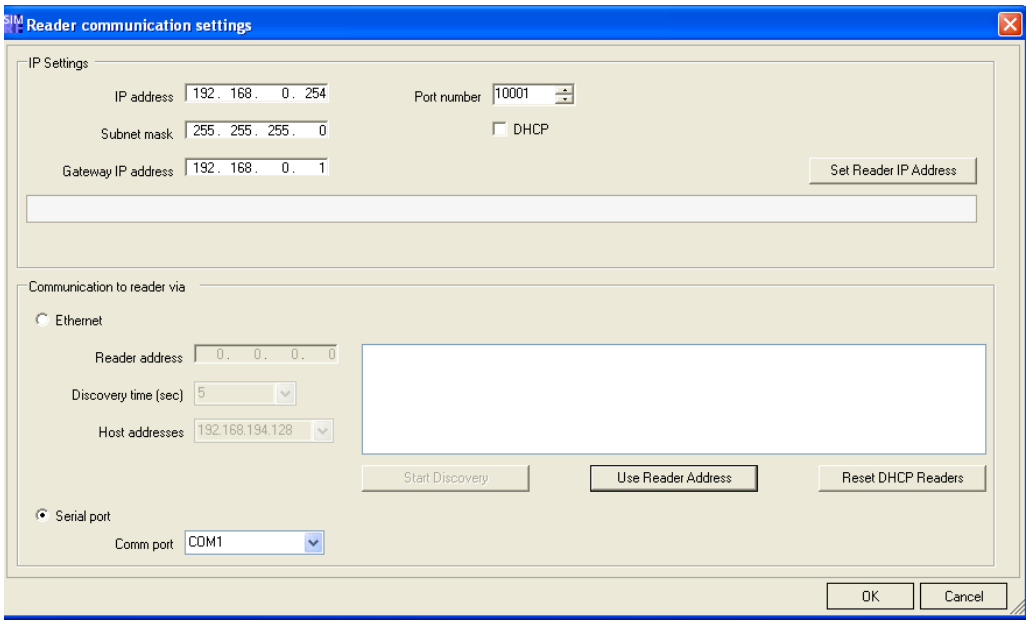


Figure 3-3 Overview of configuration of the RF670R reader

Connecting the stationary reader to the parameterization computer over Ethernet

Procedure	
1	Disconnect the reader from the power supply.
2	Connect the Ethernet interface of the reader to the hub/switch to which your parameterization computer is also connected over an RJ45 cable. It is strongly advised that you use the accessory cables approved by Siemens for each reader. When using RJ45 cables from other manufacturers, there is a risk that the cable will be difficult to remove from the socket of the reader. For PnP connections, a crosslink cable **must** be used if the network card in the PC does not support autocrossover.
3	Connect the reader to the power supply.

Providing the reader with communications capability



1. Select "Project > Reader configuration > Reader communication settings".
2. If the reader has not been pre-parameterized, use the "Start Discovery" button to activate the automatic reader search function in the application.

   All readers connected via Ethernet will be shown in the list.

   Note that the network card you have used to connect the reader is selected under the network address.
3. Select the desired reader.

4. Click the button "Use Reader Address" to adopt the IP address in the "IP Settings".
5. In the "IP Settings" menu, you can now set new Ethernet parameters for the reader. These include:
   - The IP address,
   - The subnet mask
   - The IP address of the gateway

   Click the "Set Reader IP Address" button to transfer the new settings to the reader. Alternatively, DHCP can also be set.

NOTICE
Deactivate firewall If you want to parameterize a reader of the RF600 family over Ethernet, deactivate your firewall before communication starts between the parameterization computer and the reader. Otherwise, it may not be possible to connect.

NOTICE
Avoid simultaneous Ethernet access to readers The applications RF-Manager Basic and RF-Manager 2008 cannot simultaneously access the same reader of the RF600 family via Ethernet. Only start applications that are currently required. Make sure that all RF-Manager Basic 2010 components are deactivated.

Providing the reader with communications capability using the RF-MANAGER Basic

As an alternative to using the RF-MANAGER Engineering System, you can use the "RF-MANAGER Basic 2010" software, which is included in the scope of supply of the reader, to provide the reader with communications capability:

1. In the "Reader" menu, select the command "Set Reader IP Address".
2. If the reader has not been pre-parameterized, use the Start Discovery button to activate the automatic reader search function in the application.

   All readers connected via Ethernet will be shown in the list.

   Note that the network card you have used to connect the reader is selected under the network address.
3. Select the desired reader.
4. Click the button "Use Reader Address" to adopt the IP address in the "IP Settings".
5. In the "IP Settings" menu, you can now set new Ethernet parameters for the reader. These include:
   - The IP address,
   - The subnet mask
   - The IP address of the gateway

   Click the "Set Reader IP Address" button to transfer the new settings to the reader. Alternatively, DHCP can also be set.

NOTICE
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NOTICE
Avoid simultaneous Ethernet access to readers The applications RF-Manager Basic and RF-Manager 2008 cannot simultaneously access the same reader of the RF600 family via Ethernet. Only start applications that are currently required. Make sure that all RF-Manager 2008 Runtime components are deactivated.

Note

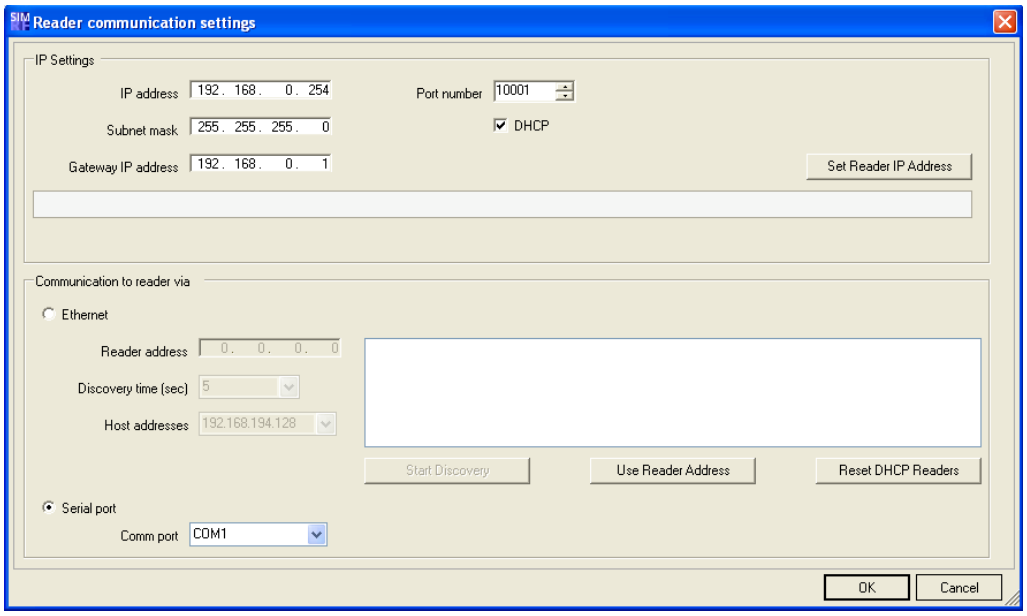
For more information on DHCP

See Chapter Enabling DHCP (Page 95)

Enabling DHCP

The RF670R reader can be switched over to DHCP mode using the "Communication settings" menu item in RF-MANAGER.

Procedure



1. Connect the reader that should be switched over to DHCP mode to the parameterization computer via the Ethernet interface.
2. Select "Project > Reader configuration > Reader communication settings" and click the option "DHCP" to activate it.

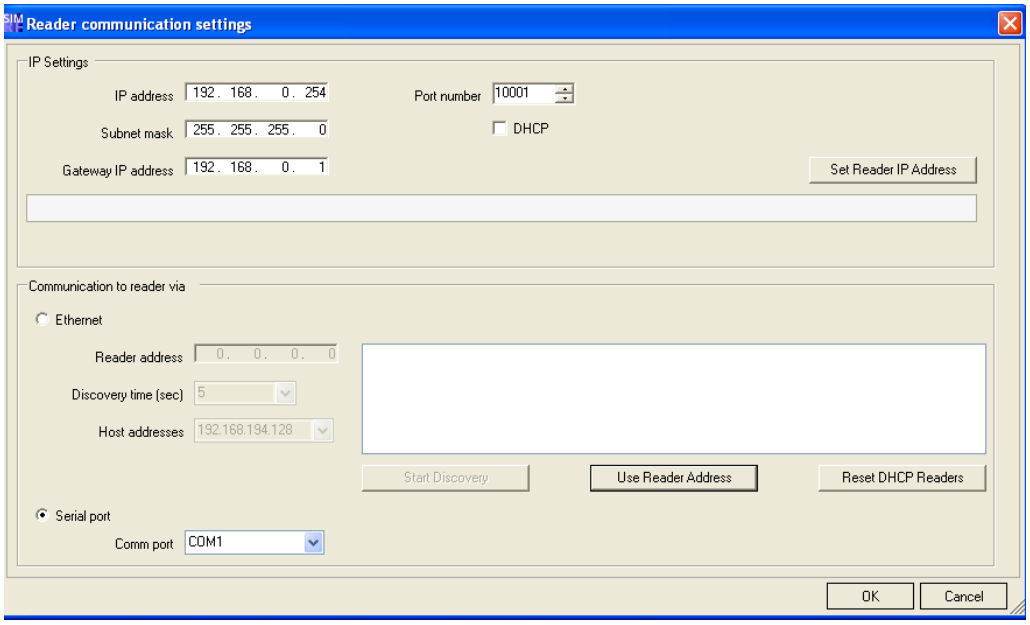
   The DHCP mode is activated for the selected reader.
3. Click the "Set Reader IP Address" button.

   The new settings are transferred to the reader.
4. Disconnect the Ethernet connection between the reader and the parameterization computer again.

Disabling DHCP

The DHCP mode can be disabled for the RF670R reader via the Communication settings menu item in RF-MANAGER.

Procedure



1. Connect the reader for which DHCP mode should be disabled to the parameterization computer via the Ethernet interface.
2. Select "Project > Reader configuration > Reader communication settings" and click the option "DHCP" to deactivate it.

   The DHCP mode is deactivated for the selected reader.
3. Click the "Set Reader IP Address" button.

   The new settings are transferred to the reader.
4. Disconnect the Ethernet connection between the reader and the parameterization computer again.

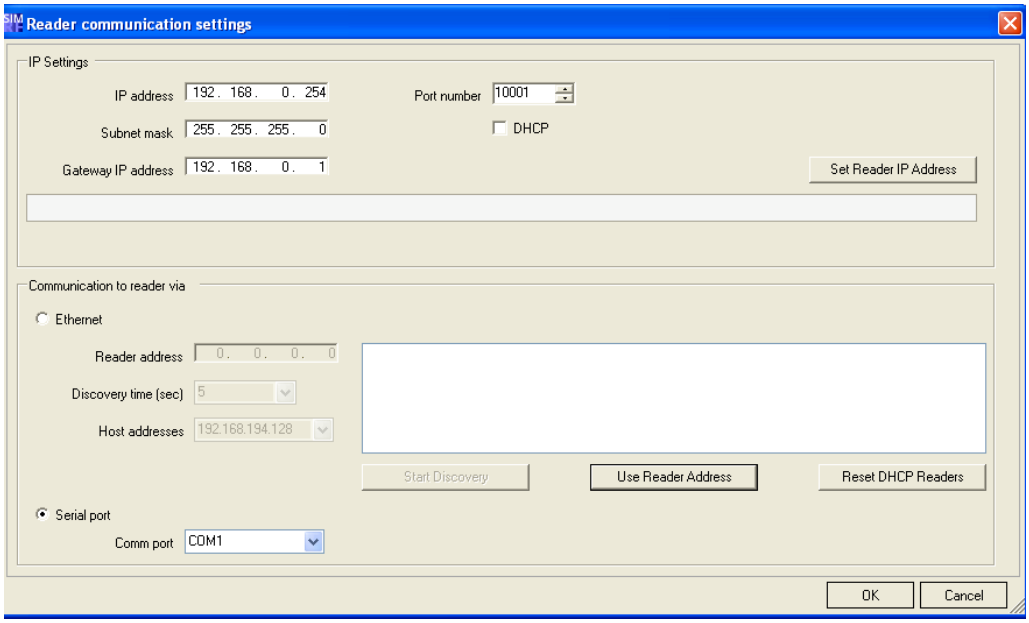
Restoring default settings on a DHCP reader

Note

Please note that this functionality is currently only available for the SIMATIC RF670R reader.

If DHCP is activated on a reader but no DHCP server is available, no connection can be made to that reader because it does not have an IP address.

Procedure



To assign the reader a new unambiguous IP address, proceed as follows:

1. Disconnect the affected reader from the network and connect it point-to-point with the configuration computer.
2. Select "Project > Reader configuration > Communication settings".
3. Click the "Reset DHCP Readers" button.

   The reader is reset to the default IP address and DHCP is deactivated.

4. Assign a new unique IP address to the reader.
5. Disconnect the reader from the parameterization computer and reconnect it to the network.

NOTICE
Several readers with identical IP address It is recommended that the affected reader is disconnected from the network and connected point-to-point with the configuration computer. If the reader remains in the network, all DHCP readers in the network are restored to their default settings and thus have identical IP addresses, because the "Reset DHCP Readers" button works on all DHCP readers in the network simultaneously. You must then disconnect all DHCP readers from the network, connect each point-to-point with the configuration computer, and successively assign each DHCP reader an unambiguous new IP address.

Result

The reader has an unambiguous IP address and can be addressed via the network, e.g. to make settings.

RF660R

Connecting stationary readers to the parameterization computer

You have two alternatives for connecting a reader of the RF660 series to your parameterization computer:

- Serial connection through RS232 cable.
- Ethernet connection (10/100 Mbit/s) via RJ45 cable, either over an Ethernet network (connection via hubs or switches) or as a point-to-point link using a crosslink cable directly between a PC and a reader.

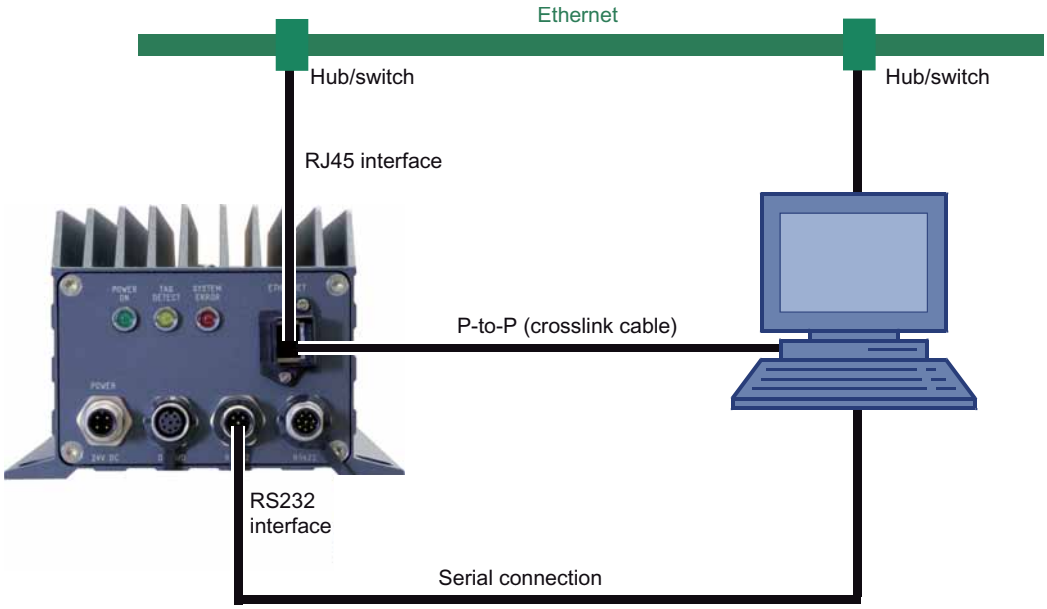


Figure 3-4 Connection options from reader to parameterization computer

Note

Setting-up an Ethernet connection

If you want to connect and parameterize a stationary reader of the RF660 family over Ethernet, initial contact must be made over a serial connection, i.e.: a serial connection over an RS232 cable must be available.

Connecting the stationary reader to the parameterization computer over a serial interface

Procedure	
1	Disconnect the reader from the power supply.
2	Connect the serial interface of the reader to a spare COM port of your parameterization computer using the RS232 cable (Order No. 6GT 2891-0GH50 or 6GT 2891-0GN10).
3	Connect the reader to the power supply.

Connecting the stationary reader to the parameterization computer over Ethernet

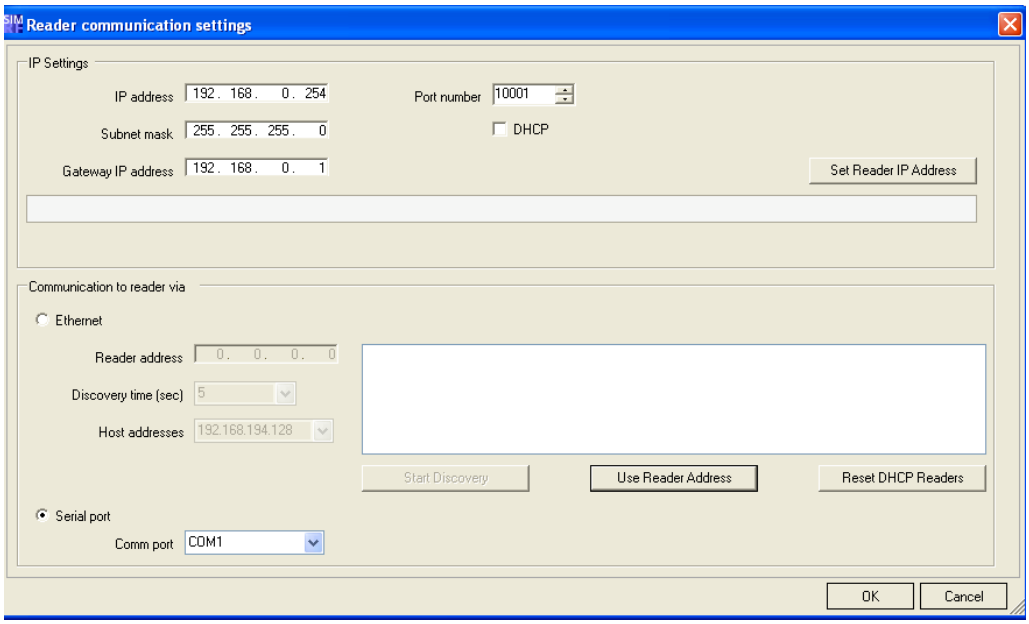
Procedure	
1	Disconnect the reader from the power supply.
2	Connect the Ethernet interface of the reader to the hub/switch to which your parameterization computer is also connected over an RJ45 cable. It is urgently recommended that the connecting cable (Order No. 6GT 2891-0HN10 or 6GT 2891-0HN20) is used when connecting via a hub/switch. When using RJ45 cables from other manufacturers, there is a risk that the cable will be difficult to remove from the socket of the reader. For point-to-point links, a crosslink cable **must** be used.
3	Connect the reader to the power supply.

Providing the stationary reader with communications capability

There are two possibilities for providing the reader with communications capability:

- Using the RF-MANAGER Engineering System
- Using the configuration software included in the scope of supply of the reader.

Providing the reader with communications capability using the RF-MANAGER Engineering System



1. Select "Project > Reader configuration > Reader communication settings".
2. In the "Reader communication settings" menu, you can
   - specify the reader's IP address and port number under "**Ethernet**" if the reader has already been pre-parameterized.

     If the reader has not been pre-parameterized, use the "Start Discovery" button to activate the automatic reader search function in the application.
   - Specify the required COM interface for initial contact between the parameterization computer and RF660R reader under "**Serial port**".
3. In the "IP Settings" menu, you can set new Ethernet parameters for the reader. These include:
   - The IP address,
   - The IP address of the gateway
   - The subnet mask
   - and the port number

   Click the "Set Reader IP Address" button to transfer the new settings to the reader. Alternatively, DHCP can also be set.

NOTICE
Deactivate firewall If you want to parameterize a reader of the RF600 family over Ethernet, deactivate your firewall before communication starts between the parameterization computer and the reader. Otherwise, it may not be possible to connect.

NOTICE
Avoid simultaneous Ethernet access to RF660R readers The SIMATIC RF660R Configuration Software and the RF-MANAGER cannot simultaneously access the same reader of the RF660 family via Ethernet. If you require simultaneous access, connect the reader and the SIMATIC RF660R Configuration Software over the serial interface.

Establishing the communication capability of the RF660R reader using the SIMATIC RF660R Configuration Software

As an alternative to using the RF-MANAGER Engineering System, you can use the SIMATIC RF660R Configuration Software that is included in the scope of supply of the reader to provide the reader with communications capability:

- The radio profile applicable to your country has been set up.
  ("Welcome" screen)
- A permanent IP address has been assigned to the reader or DHCP has been activated.

  Note when using DHCP that a specific pre-installed infrastructure is required.
  ("Ethernet and notify channel settings" menu)
- Alarm channel configuration is set to "**None**".
  ("Ethernet and notify channel settings" menu)
- Read trigger mode is set to "On application request".

  Specification of a value / change in the default value for the "Minimum trigger duration" is not necessary.
  ("Trigger settings" menu)
- The reader is in "Stand-alone" mode.
  ("Reader mode settings" menu)

Note

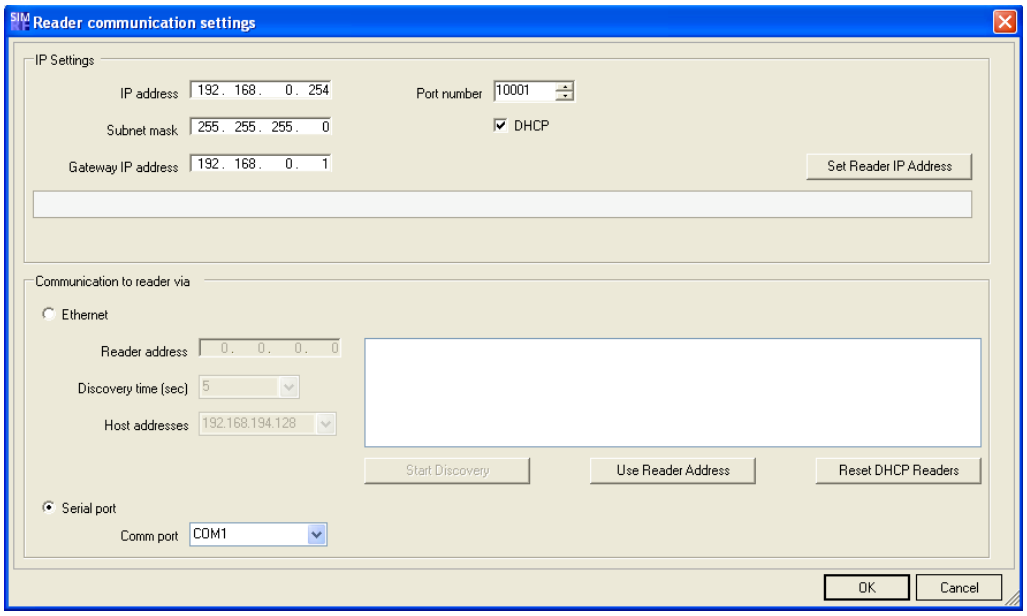
For more information on DHCP

See Chapter Enabling DHCP (Page 103)

Enabling DHCP

The RF660R reader can be switched over to DHCP mode using the "Communication settings" menu item in RF-MANAGER.

Procedure



1. Connect the reader that should be switched over to DHCP mode to the parameterization computer.
2. Select "Project > Reader configuration > Reader communication settings" and click the option "DHCP" to activate it.

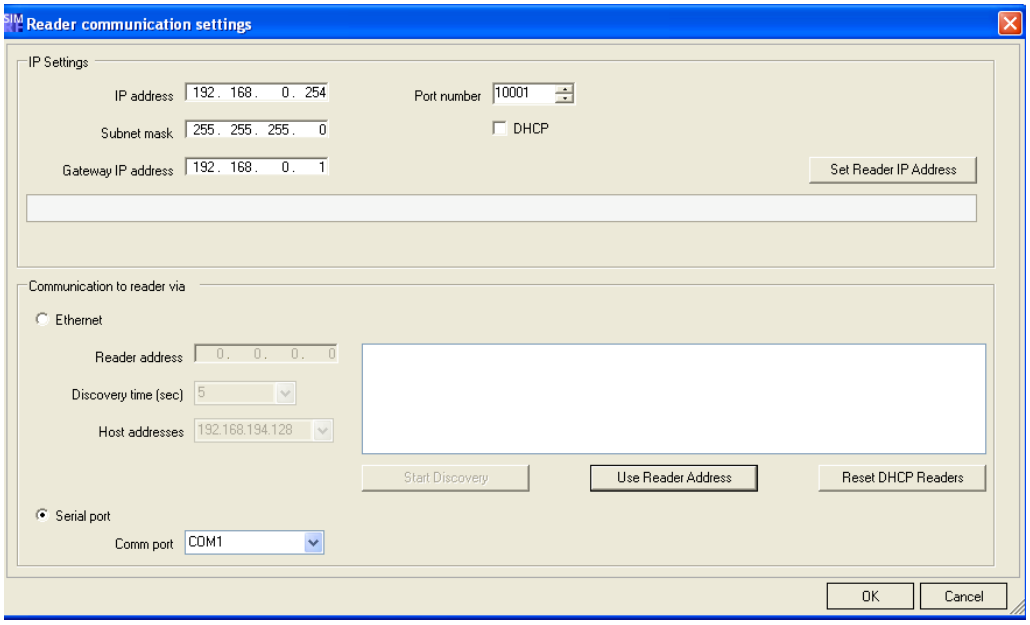
   The DHCP mode is activated for the selected reader.
3. Click the "Set Reader IP Address" button.

   The new settings are transferred to the reader.
4. Disconnect the connection between the reader and the parameterization computer again.

Disabling DHCP

The DHCP mode can be disabled for the RF660R reader via the Communication settings menu item in RF-MANAGER.

Procedure



1. Connect the reader for which the DHCP mode is to be deactivated to the parameterization computer.
2. Select "Project > Reader configuration > Reader communication settings" and click the option "DHCP" to deactivate it.

   The DHCP mode is deactivated for the selected reader.
3. Click the "Set Reader IP Address" button.

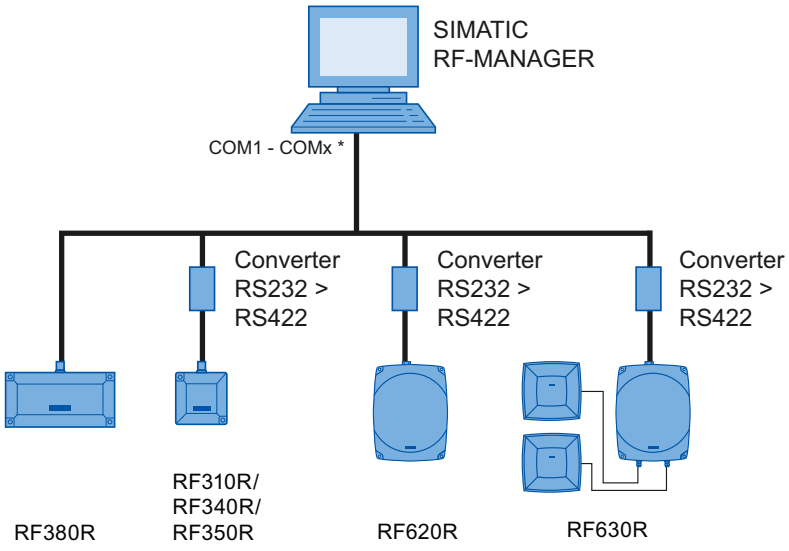
   The new settings are transferred to the reader.
4. Disconnect the connection between the reader and the parameterization computer again.

RF620R/RF630R, RF310R, RF340R, RF350R, RF380R

Connecting the stationary reader to the parameterization computer over a serial interface

You have two alternatives for connecting a reader to your parameterization computer:

Reader	Connection option
RF620R/RF630R RF310R, RF340R, RF350R,	• Serial connection via RS232/RS422 interface converter
RF380R	• Serial connection through RS232 cable



* Readers are connected via one COM port each on PC

Figure 3-5 Reader to parameterization computer connection options

Connecting the stationary reader to the parameterization computer via RS232/RS422 interface converters

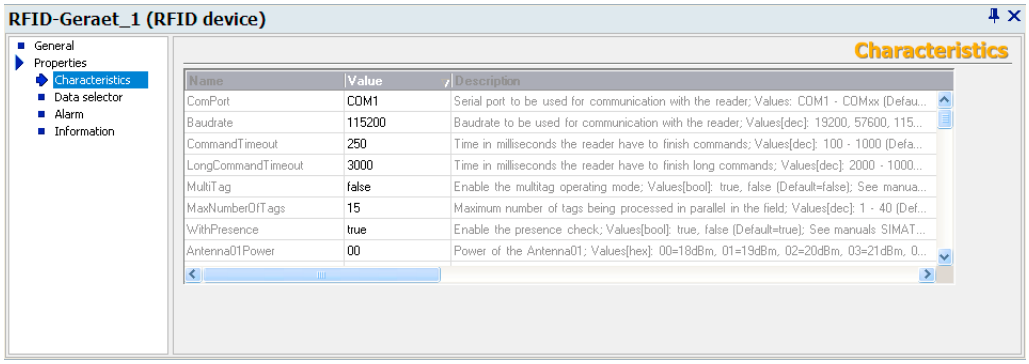
Procedure	
1	Disconnect the reader from the power supply.
2	Connect the serial COM interface of the reader to an RS232/RS422 interface converter. Then connect the interface converter to your PC via an RS232 cable. A list of which interface converters have been tested by Siemens along with their pin assignment can be found in the RF600 System Manual, chapter "Integration into networks".
3	Connect the reader to the power supply.

Connecting the stationary reader to the parameterization computer over a serial interface

Procedure	
1	Disconnect the reader from the power supply.
2	Connect the serial interface of the reader to a spare COM port of your parameterization computer using the RS232 cable (Order No. 6GT 2891-0GH50 or 6GT 2891-0GN10).
3	Connect the reader to the power supply.

Providing the reader with communications capability

Providing the reader with communications capability

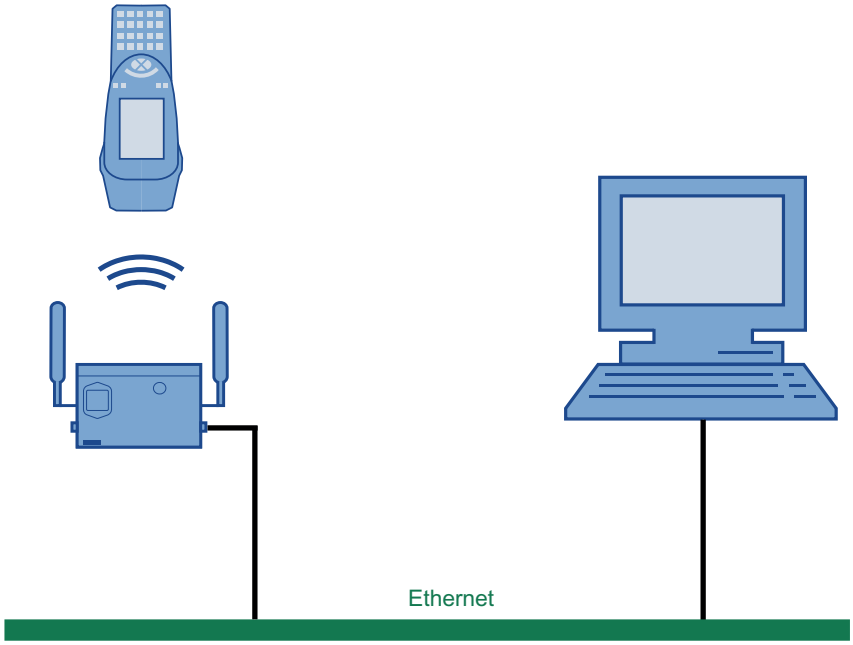


1. Enter the ComPort and baud rate in the dialog box "RFID-Gerät>Eigenschaften>Eigenschaften".

Connecting and parameterizing mobile readers (RF310M/RF610M)

Preconditions for parameterization of the WLAN connection

- The mobile reader must be ready for operation (the battery is charged).
- The mobile reader must contain a WLAN card.
- A WLAN connection must exist between the reader and the network of the PC, e.g. via an access point.
- Information regarding the WLAN settings must be available.
- The operating mode of the mobile reader must be set to "Supervisor".



Overview of procedure

1. Make settings in the Engineering System.
2. Parameterize the WLAN card in the mobile reader.
3. Assign the IP address if a DHCP server is not used.
4. Start the application on the mobile reader.

Settings in the Engineering System

1. **Enter IP address of the reader**

   Enter the assigned IP address in the device settings of the mobile reader ("RFID devices > RFID device_X").

2. **Enter the network address of the PC**

   Enter the network address of the PC in the network settings ("Device settings > RFID / network settings").

Note

An automatic reader search is not possible in the Engineering System

The automatic reader search via "Project > Reader configuration > Communication settings" does not function in the case of mobile readers.

Parameterize the WLAN card in the mobile reader

Two examples are given below for the procedure that you can follow for configuring the WLAN card of a mobile reader. The examples pertain to the SIMATIC RF610M mobile reader, but are also applicable to the SIMATIC RF310M mobile reader.

Consult your network administrator to ensure that the WLAN connection is set up correctly. You will find detailed information on configuring the WLAN in the operating instructions for the PSION WORKABOUT PRO.

Please note that "WPA 2" encryption is only possible in Example 2.

Example 1

With this procedure, the active radio network is automatically displayed and "WPA 2" encryption is not possible.

1. Set the operating mode to "Supervisor" in SIMATIC RF610M.
2. In SIMATIC RF610M, select "Start > Programs > Summit > SCU"
3. Under "Active Config", select "**Third party**".
4. To activate these changes, set the device to "Power down" mode by pressing the <FN> key followed by the <ENTER> key. Then restart the device by pressing the <ENTER> key.
5. Select the required active radio network in the dialog that subsequently appears.
6. Click the "Connect" button and enter the respective encryption code under "Authentication" and "Network key".
7. Click on the "OK" button.

Example 2

1. In the mobile reader, select "Start > Programs > Summit > SCU"
2. Click on the "Config" tab.
3. Select the "New" button to create a new profile setting
4. Enter a name for the profile setting.
5. At least make the following settings:
   - **SSID** (name of the radio network), e.g. "RF610M"
   - **Auth** Type (security level): e.g. "Shared"
6. Select the encryption required under "Encryption": e.g. "WPA 2".
7. Then click the button "WEP/PSK Keys". Enter the encryption code and confirm with "OK".
8. Click the "Commit" button to confirm the settings.
9. In the "Main" tab, under "Active config", select the profile that should be active.

Note

Other encryption possibilities

You can also use other encryption methods, depending on the access point. "WEP" encryption is no longer regarded as secure; you should not use this.

Enter the IP address in the mobile reader

If a DHCP server is not present in the network, you must enter the IP address in the mobile reader:

1. Double-click the WLAN icon in the taskbar for this purpose.
2. Click the "Configure" button and select "Specify an IP address". Enter the IP address.

You can also enter the IP address in the following manner: "Start > Settings > Control Panel > Network and Dial-up Connections" and select the appropriate connection.

Notes on working with RF-MANAGER and a mobile reader

Display in the task bar

After establishing the connection between the mobile reader and RF-MANAGER, note the symbol in the task bar.

It provides the following information about the radio connection:

Green:	A radio connection exists
Red:	A radio connection does not exist

Working with RF-MANAGER and the mobile reader

To start working with the mobile reader, activate the "RF-MANAGER" application by double-clicking the desktop icon for the mobile reader.

Note

Display the MAC and IP address

Double-click the icon in the taskbar. The MAC address and IP address are displayed in the "Wireless Statistics" and "IP Information" tab sheets.

Use of DHCP (Dynamic Host Configuration Protocol)

Introduction

A DHCP server ensures that IP addresses are automatically assigned to DHCP-capable network clients in a network segment. The DHCP server uses the MAC address of the network client for this purpose. The IP addresses are assigned due to permanent assignment of a MAC address to an IP address. The readers of the RF600 family with Ethernet connection are DHCP-capable.
Mechanisms that extend beyond this, such as dynamic assignment of IP addresses or Domain Name Service (DNS), are not supported in RF-MANAGER.

RF-MANAGER always uses fixed IP addresses internally. If a reader is replaced and receives the IP address of a reader that is already known, the new reader will be reparameterized when the connection is established. The new reader will then function without any further modification to the project configuration.

Requirements for activating DHCP

A DHCP server must be present in the network segment.

An up-to-date list of permanent assignments between MAC addresses and IP addresses must be stored in the DHCP server. This list must be maintained by your responsible IT staff member.

You will find the MAC addresses of readers:

- In the case of mobile readers, in the "Wireless statistics" tab

  Double-click the WLAN icon in the taskbar and access the "Wireless statistics" tab.

NOTICE
Ensure that the DHCP server is running and the readers are entered in the list. Otherwise RF-MANAGER will be unable to establish a connection to a reader following activation.

- DHCP can be used with the mobile reader if a WLAN card is inserted and the card is parameterized (seeParameterize the WLAN card in the mobile reader (Page 109)).

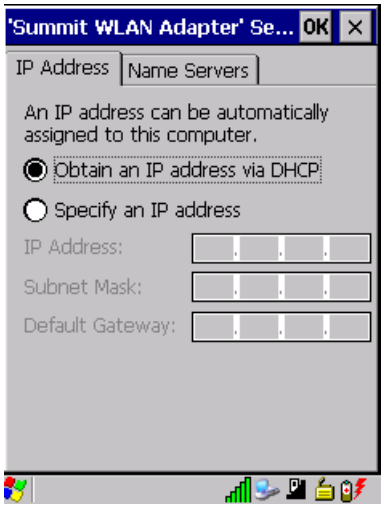
Enabling DHCP

The mobile reader is switched to DHCP mode using the integral device menu. Proceed as follows:

1. Double-click the WLAN icon in the taskbar.

   Select "IP Information > Configure" to access the tab sheet for enabling DHCP mode.

2. Activate the button "Obtain an IP address via DHCP" here.



Alternatively, you can call up the tab sheet for enabling DHCP mode via "Start > Settings > Control Panel > Network and Dial-up Connections > Selection of the appropriate connection > IP Information > Configure".

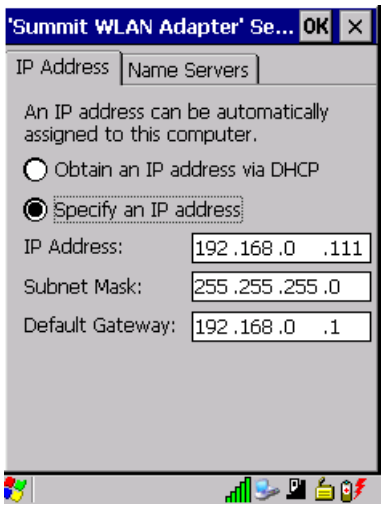
Disabling DHCP

If you want to disable DHCP mode for a mobile reader, proceed as follows:

1. Double-click the icon in the taskbar.

   Select "IP Information > Configure" to access the tab sheet for disabling DHCP mode.

2. Deactivate the button "Obtain an IP address via DHCP" here.



Benefits of replacing a reader with DHCP

DHCP mode allows a reader to be replaced without the need for modifying the configuration in the project. The IT staff member only has to change the NAC address in the DHCP server.

Mobile reader: SIMATIC RF310M and SIMATIC RF610M

Enable DHCP mode on the mobile reader as described above under *Mobile reader: SIMATIC RF310M, SIMATIC RF610M > Enabling DHCP*.

If the new reader is detected by RF-MANAGER and its configuration is not in accordance with the settings in the project, the reader will be automatically reparameterized.

3.3.8.2 Creating a new project using the Project Wizard

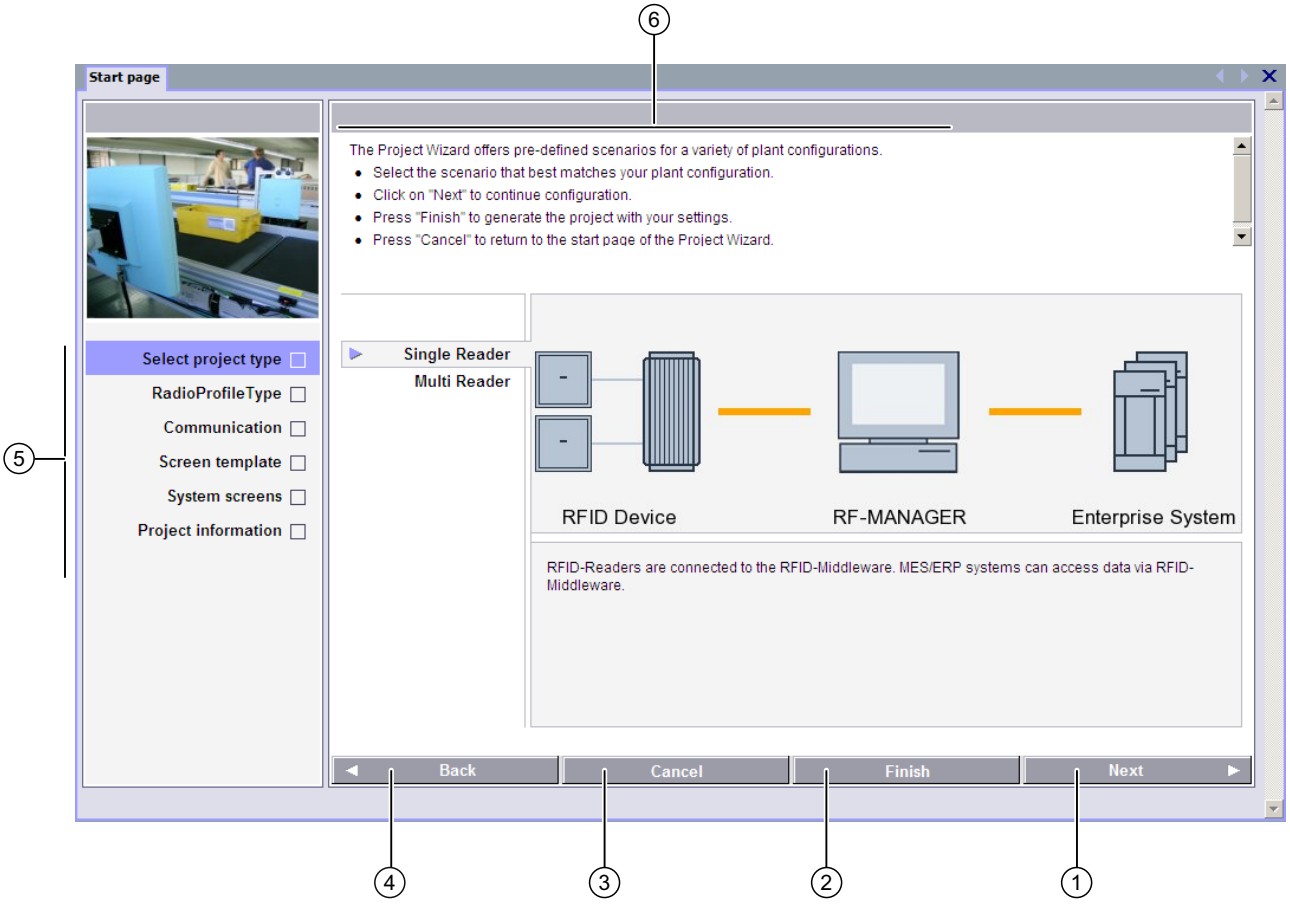
Getting Started

1. Start the RF-MANAGER Engineering System (ES) by double-clicking the desktop icon (or via "Start" or by clicking the "RF-MANAGER" icon in the taskbar).
2. In the welcome screen, select the option "Create new project with the project wizard". The window described in the following chapter opens.

Operation and display options

When creating a project using the Project Wizard, you have the following operation and display options:

Operation and display options of the Project Wizard



1	Next ▶	Jump to next menu page. Any parameter settings made in the current menu will be saved.
2	Finish	The parameter settings made on all menu pages until now are saved and the project will be created. Further processing of the project is then possible.

Operation and display options of the Project Wizard		
3	Cancel	Jump to welcome menu. All parameter settings made until now on all menu pages are rejected.
4	Back	Jump to previous menu. Any parameter settings made in the current menu will be saved.
5	-	Navigation field. The current menu is highlighted in color.
6	-	Information field. Explains the contents of the current menu.

Select project type

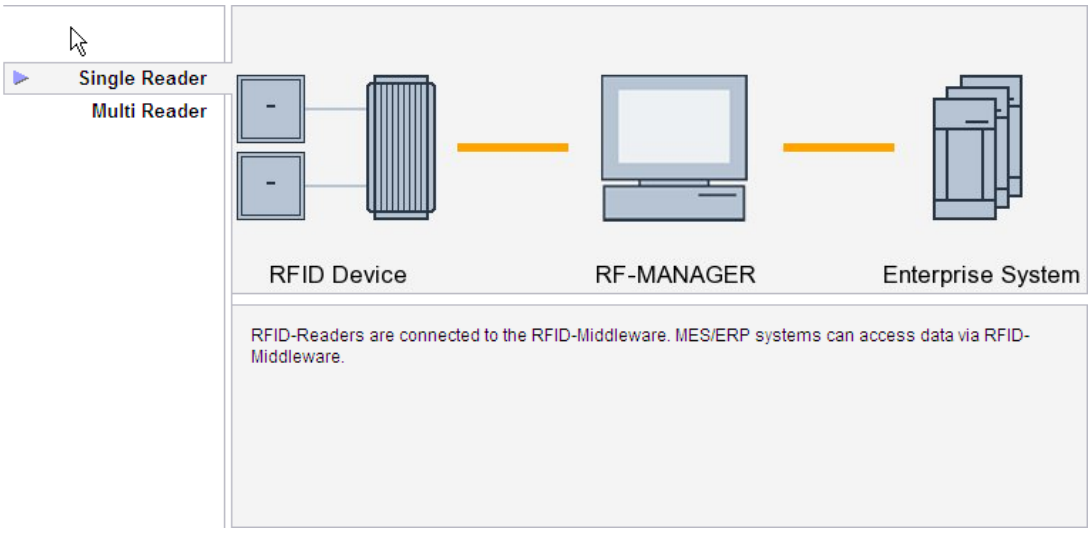
Introduction

Under "Project type", you can select a predefined scenario for the structure and the associated configuration of your RFID system.

Click "Select project type" on the welcome screen to parameterize your settings. You have the following options when selecting the project type:

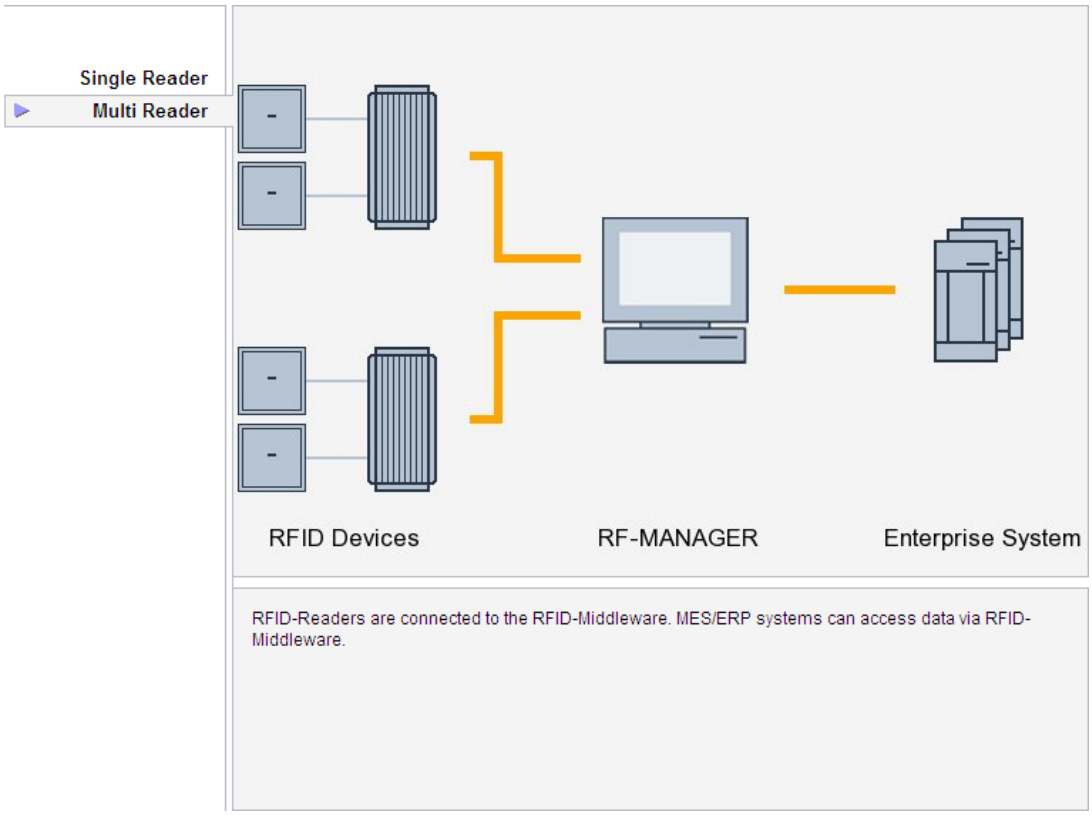
- Single RFID device
- Several RFID devices

Single RFID device



With the "Single RFID device" option, one RFID reader is connected to the RF-MANAGER. You can create system screens with RFID elements and an alarm system. Enterprise systems can access the reader data through the RF-MANAGER.

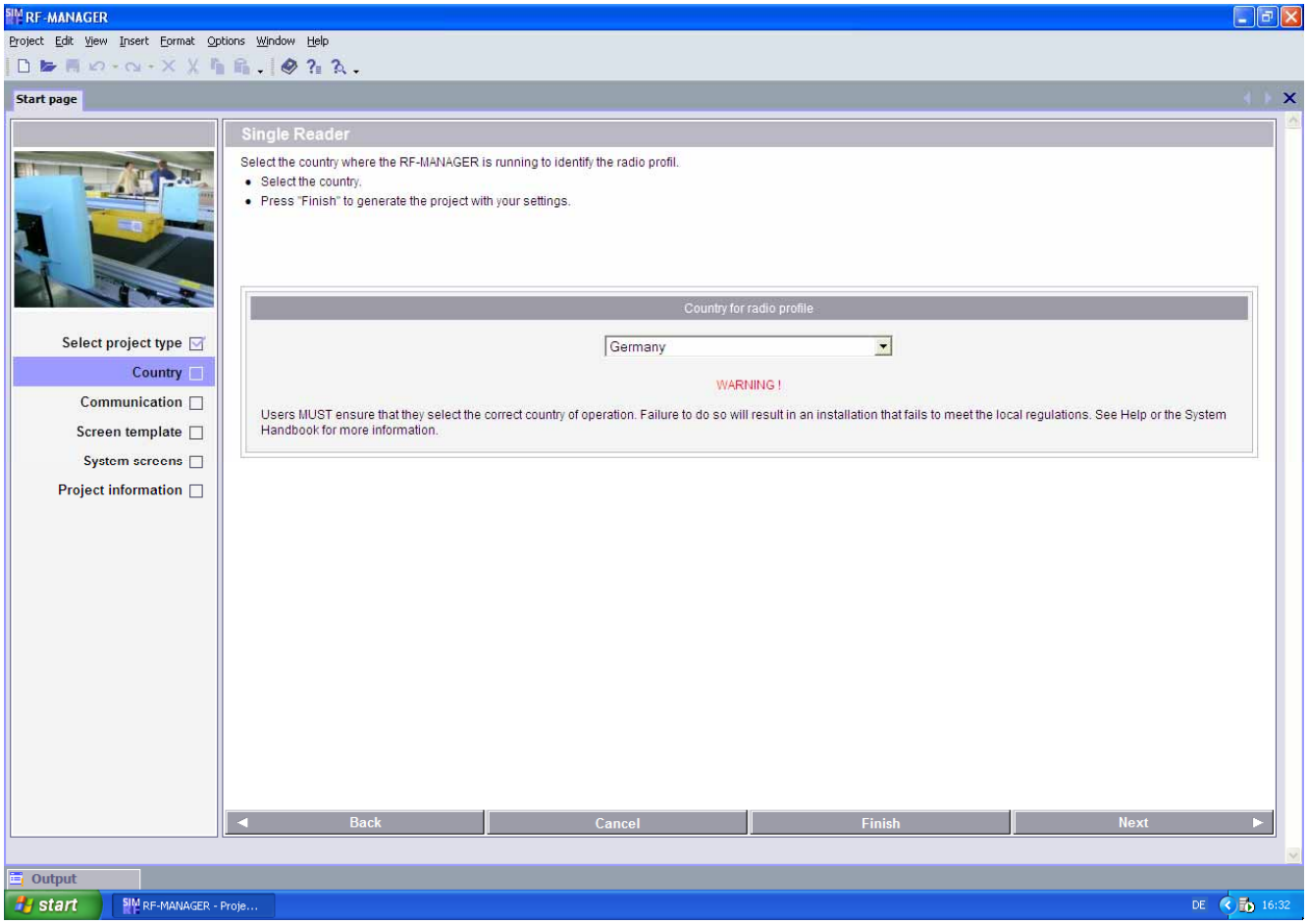
Several RFID devices



With the "Several RFID devices" option, several RFID readers are connected to the RF-MANAGER. You can create system screens with RFID elements and an alarm system. Enterprise systems can access the reader data through the RF-MANAGER.

Country selection for wireless profile

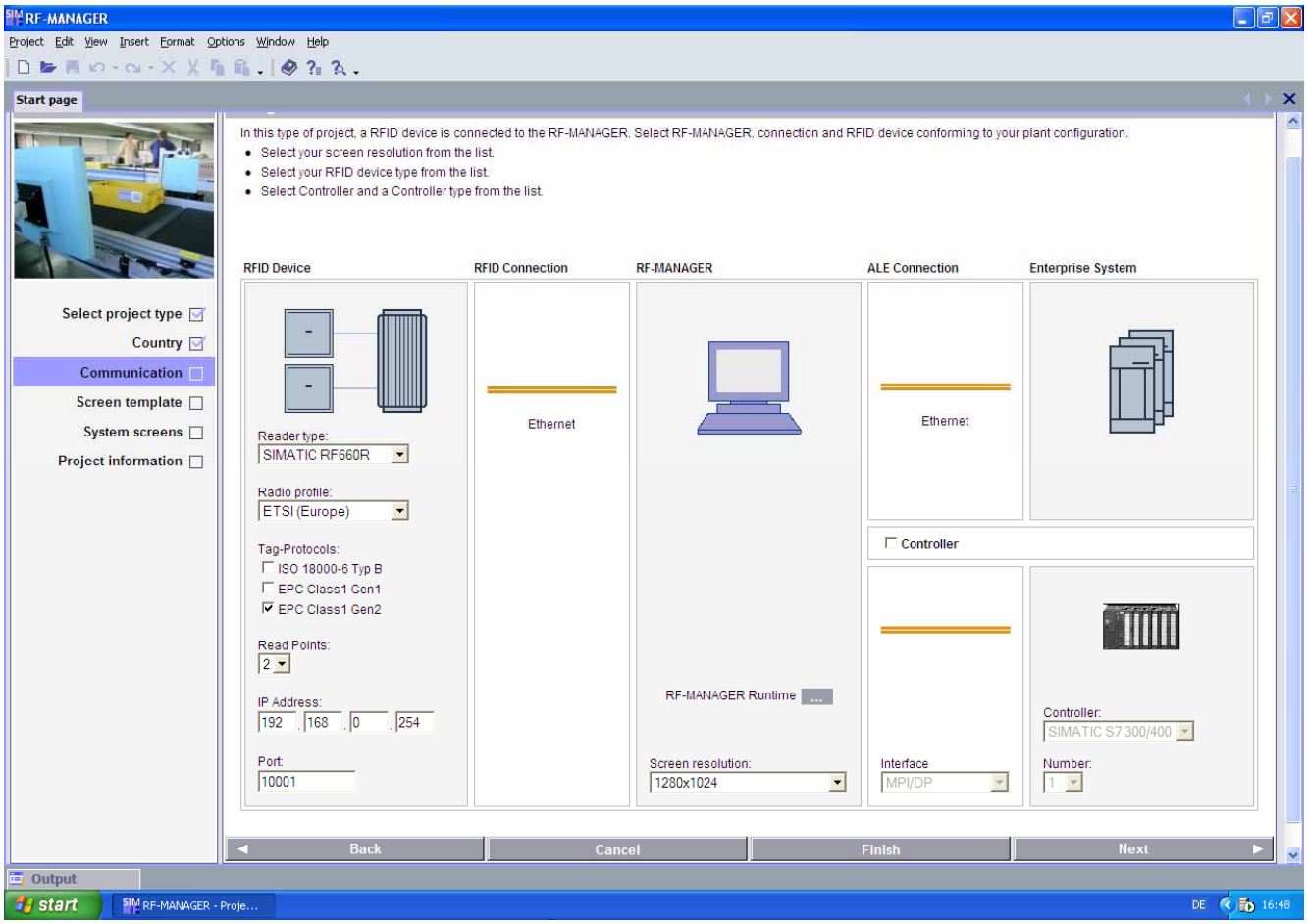
Under "Country for wireless profile", select the country in which the project must operate.



Specifying the RFID devices and enterprise system

Introduction

In the "Communication" menu, you can parameterize the communication paths for your RFID system and set parameters for the individual readers and PLCs.



The communication is parameterized in the following stages:

- RFID device
- RFID connection
- RF-MANAGER
- ALE connection
- Enterprise system
- PLC

RFID device

The following settings are made here:

- Device type
- Wireless profile (for further information, see Section .
- Tag protocol
- Number of antennas ("Read points")
- The IP start address of the reader
- Port for the reader

Note

Reader IP addresses

In the Project Wizard, you only have to specify the IP address of the first reader. The IP address is automatically incremented for subsequent readers.

RFID connection

The route of the connection between the reader and the runtime system is specified here. The "Ethernet" connection is permanently set and cannot be changed.

RF-MANAGER runtime

You can make the following settings here:

- Changing the screen resolution
- Specifying the type of runtime system:
  - RF-MANAGER runtime (standard PC)
  - Microbox 420
  - Microbox 427B

ALE connection

The route of the connection between the runtime system and the enterprise system is specified here. The "Ethernet" connection is permanently set and cannot be changed.

Enterprise system

No parameters can be set here.

Controller

If you check "Controller", you can make the following settings:

- Setting the interface: "MPI/DP" or "ETHERNET"
- Selecting the controller:
  - SIMATIC S7 200 or
  - SIMATIC S7 300/400
- Number of PLCs: You can specify the number of PLCs here that will be created by the Project Wizard.

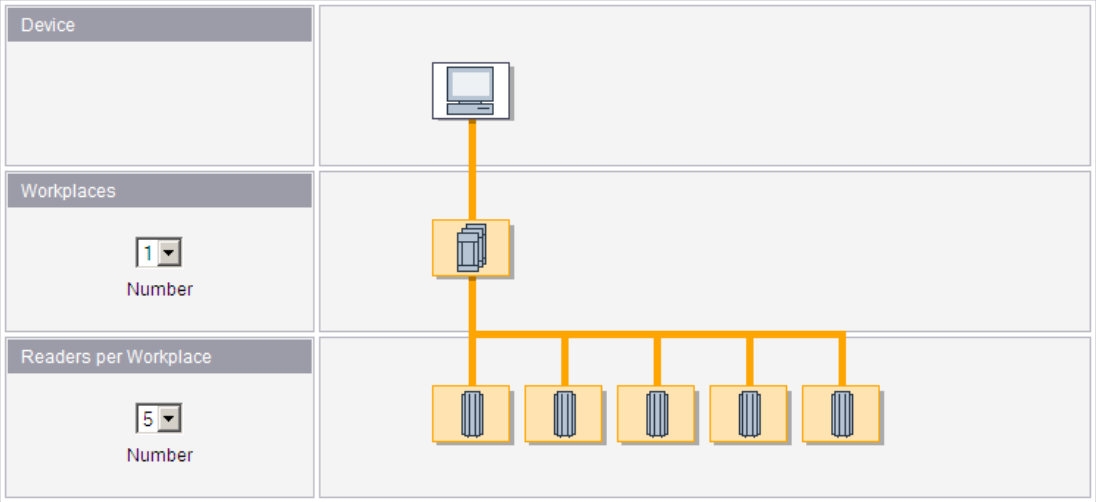
Setting basic topology parameters

Note

The "Topology" menu can only be selected when you selected the "Several RFID devices" option in the start menu.

You can specify the following in the "Topology" menu:

- Total number of workplaces.
- Number of readers that are each connected to a workplace.

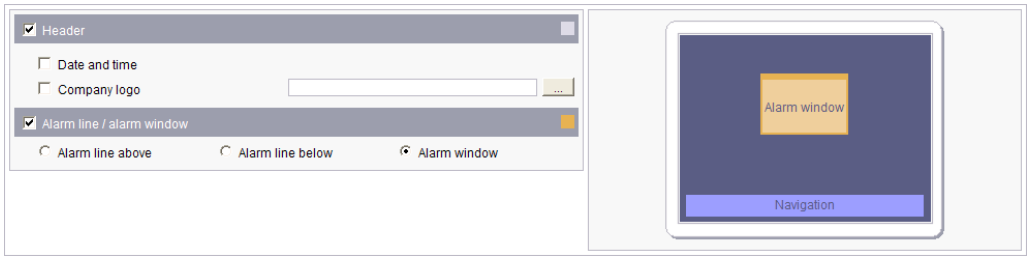


The workplaces are logical combinations of readers whose RFID data are collected and evaluated, for example, the group of readers for the incoming goods area.
These data can be transferred to an enterprise system over an ALE connection.

Selecting a screen template

Introduction

In the "Screen template" menu, you can set the basic parameters for screen presentation. The template to be created here is used for all screens of the RF-MANAGER project.



The screen template is parameterized in the following stages:

- Page header
- Alarm line / Alarm window

Page header

You specify here whether the screens should have a page header and the information that it should contain (e.g. date or company logo).

The graphic for the company logo is selected using the ... button.

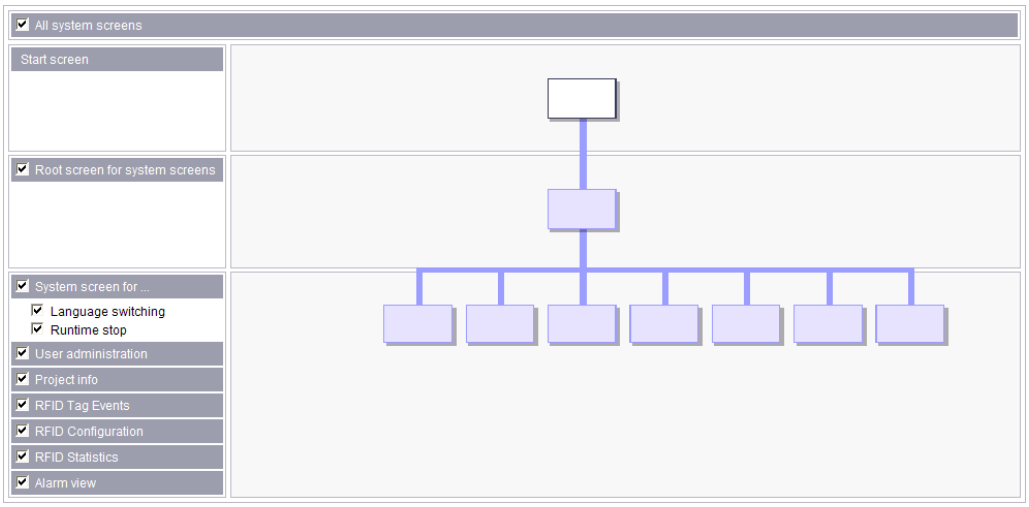
Alarm line / Alarm window

You specify here whether the screens should have an alarm line or alarm window and where it should be positioned.

Selecting system screens

Introduction

In the "System screens" menu, you specify which system screens should be generated for your project.



The system screens are parameterized in the following stages:

- Root screen for system screens
- System screen for
  - Language switching
  - Runtime stop
- System screen for user administration
- System screen for project information
- System screen for RFID tag events
- System screen for RFID configuration view
- System screen for RFID statistics view
- System screen for alarm window

Root screen

Here you specify whether a root screen should be created as a central screen for all system screens or whether all system screens should be directly referenced in the welcome screen.

System screen for language switching and runtime stop

You specify here whether a system screen should be created that you can use to switch between the configured languages.

You also specify whether a system screen should be created via which you can stop the runtime system, start or stop RFID processing or switch to transfer mode for transferring a project.

System screen for user administration

You specify here whether a system screen should be created that will display user administration. Tabular information about the different authorized users of a project is displayed in this screen and can be edited.

System screen for project information

You specify here whether a system screen should be created that will display the project information that you have entered. See Chapter .

System screen for RFID tag events

You specify here whether a system screen should be created that will display the RFID data communication. The tag events, associated readers and the over-arching workplaces are displayed in this screen for example.

.

System screen for RFID configuration view

You specify here whether a system screen should be created that will display the RF-MANAGER configuration. You can make changes to the project configuration and reparameterize individual components at runtime using this screen.

System screen for RFID statistics view

You specify here whether a system screen should be created that will display the statistical values for your project, such as the number of read statuses of all scanned tags.

System screen for RFID alarm window

You specify here whether a system screen should be created that will display the RFID alarms. The alarm event is displayed in accordance with the assigned alarm classes.

Note

Select all system screens

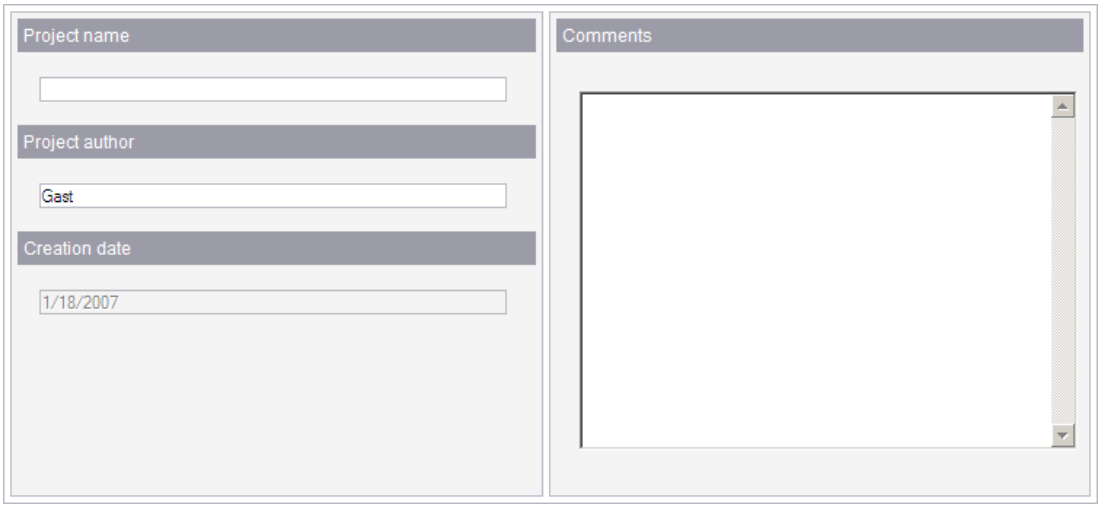
When you activate the option "All system screens", the Wizard will automatically create all the available system screens.

Enter project information

Introduction

In the "Project information" menu, you can enter information that precisely defines your project to make identification in RF-MANAGER easier. The project information can be displayed as a system screen.

See



The project information is parameterized in the following stages:

- Project name
- Project author
- Creation date
- Comments

Project name

You can enter the name of the project here.

Project author

You can enter the name of the project author here.

Creation date

You can enter the creation date of the project here.

Comments

You can enter a project comment of any length here.

Creating and modifying a project

After entering the project information, if you click on the "Finish" button, the project will be created. The project can be modified later as required. In the case of some settings, such as the parameterization of IP addresses, modification is mandatory.

3.3.9 Requirements for transfer

A transfer operation refers to the transfer of a compiled project file to the runtime system where the project is to run.

Requirement

After you have completed a configuration process, check the consistency of the project by using the menu "Project > Compiler > Check Consistency". After completing the consistency check, the system generates two compiled project files. This project files have the same name assigned to it as the project, however with the extensions "*.rfidx" and "*.xml". These compiled project files must be transferred to the runtime system.

Note

Engineering System and Runtime System on the same PC

If the Engineering System and Runtime System are on the same PC, a transfer is not necessary. The project files can be stored locally in any directory.

The runtime systems must be connected to the configuration computer to transfer the project files. Mobile data storage units can also be used to transfer the files.

Compile the project again if the *.pwx is not found and you receive an error message while transferring the data.

Basic procedure

1. Enter the transfer settings for the individual runtime systems in your RF-MANAGER project.
2. Enter the transfer mode on the runtime system to which the project is to be transferred in "RF-MANAGER 2008 Runtime Loader". The alternative options are as follows:
   - Using the "RF-MANAGER 2008 Runtime Loader"
   - By executing the system function "SetDeviceMode" with the option "Transfer"
3. Transfer the compiled project files from the configuration computer to the runtime systems. The project files are transferred to all runtime systems for which the respective check box is selected in the transfer settings.

Transfer mode

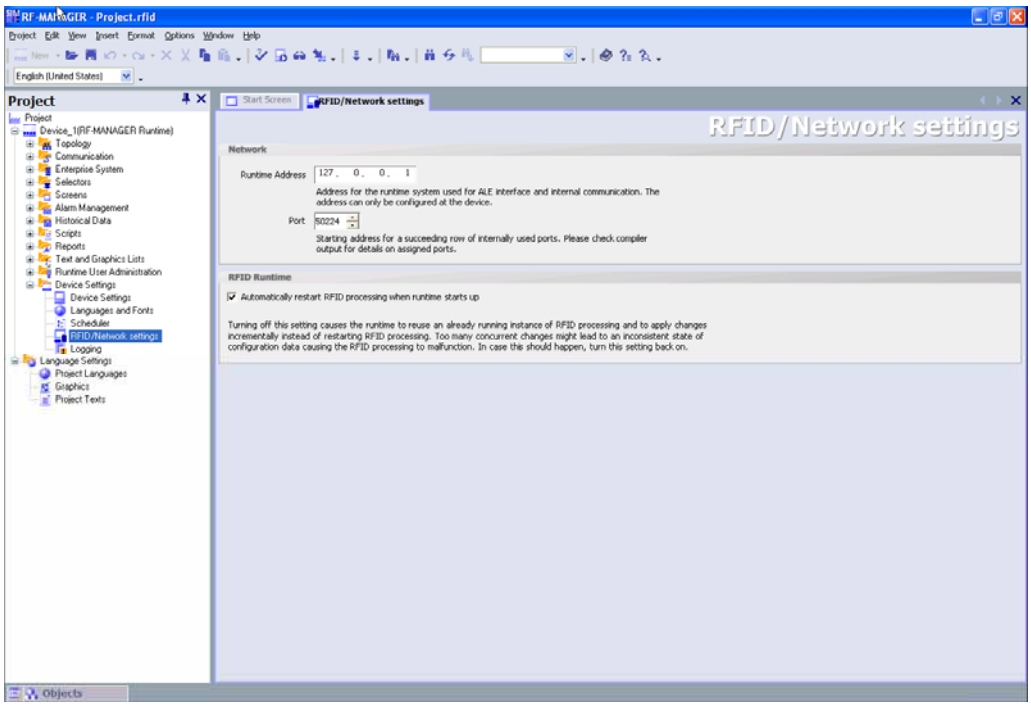
The runtime system must be in "transfer mode" for the transfer operation. If a project is not yet available on the PC, you must enable the transfer mode in the "RF-MANAGER 2008 Runtime Loader" manually before the first transfer operation.

This is however not necessary if you selected the "File" option in the "Transfer settings" and/or your engineering system and your runtime system are located on the same PC.

Automatic restart of RFID processing

When you make extensive changes to your configuration in the engineering system, stop RFID processing before you copy the changes. Use the system function "StopRfidProcessing" for this purpose or select "Stop RFID processing" in the Start Center. This shortens the subsequent starting phase considerably. It is generally recommended that RFID processing should be restarted after several project modifications.

Before any productive data has been supplied from the plant, the following possibility for transferring modified configuration data is available as an alternative: Check the box "Automatic restarting of RFID processing when runtime starts" under "Device settings > RFID/network settings".



When this box is disabled, only those changes implemented since the last start will be transferred for any RFID processing in progress. This can result in inconsistencies in the configuration which can cause malfunctions in RFID processing.

Data comparison with the runtime system

You can use the menu item "Data comparison with the runtime system" to save changes in the Engineering System that you made to your project at runtime in the "Configuration" screen object. In this procedure, the changes are saved in an "xml.sync" file and copied into the project in the Engineering System.

Otherwise the changes in the runtime system will be overwritten by the transfer.

See also

Configuration (Page 500)

Data comparison with the runtime system (Page 461)

3.3.10 Debugging projects

3.3.10.1 Introduction

Testing the runtime system

You can check that the connected readers are functioning correctly using the SIMATIC RF660R Configuration Software.

Requirements

3.3.10.2 Debugging projects

Introduction

During configuration, the data entered is automatically tested for its plausibility. Example: When you create a new user, the system indicates that the current password of the user is invalid and you have to assign a new password for the user.

The plausibility test ensures, for example, that value ranges are maintained and incorrect input is indicated during the configuration phase.

There is no check for incorrect parameters in the input, for example, when a variable is not assigned in an I/O field. The assignment is checked with the "Check consistency" function and displayed as an error. Using the simulator, you can also check that the RFID system is functioning correctly with regard to tag processing and the configured screens /screen objects.

Perform consistency check

To locate configuration faults, start the integrity test by clicking the "Check consistency" icon or via "Project > Check consistency". All faulty points in the project are listed in the Output View. Then skip to the cause of fault. Work through the fault list from top to bottom.

If you perform the consistency check frequently, inconsistencies may occur in the project built. To remedy this problem, rebuild the project using the command "Project > Generator > Rebuild all."

See also

Troubleshooting (Page 129)

3.3.10.3 Troubleshooting

Introduction

After completing the consistency test in the project, the results of the test appear in the Output View. There are three different result categories

- Notes

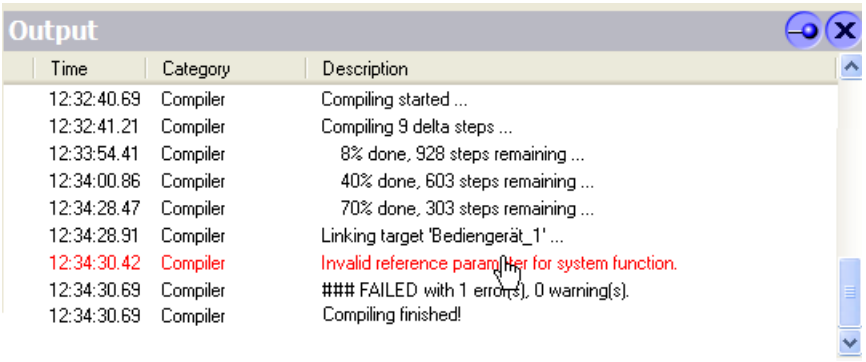
  It is possible that logical links in the project are not correct or not available. Check the logical links of the project in conjunction with the alarms. The generating operation is fully executed.

- Warnings

  The project contains faults which may lead to an incomplete view on the runtime system. The generating operation is fully executed.

- Error

  Faults must be eliminated so that the data can be fully loaded onto the runtime system. The fault number helps to identify the type of fault.



It is possible to call in help on the individual alarms by moving the mouse pointer to the relevant alarm line and pressing <F1>.

Procedure

1. Click the "Check consistency" icon to run the consistency test on the project.

   The configuration data are now verified. Notifications, warnings and faults are shown in the Output View.

2. Double-click an entry in the Output View to access the location in the project which caused the fault.

3. Clear the fault.

Note

Clear the faults in succession because follow-up faults could already have been cleared after clearing a fault.

Debugging projects

See also

Debugging projects (Page 128)

3.3.10.4 Using the simulator

The RF-MANAGER is supplied with a simulator which you can use to test the essential components of the RFID project.

The simulator is a separate application.

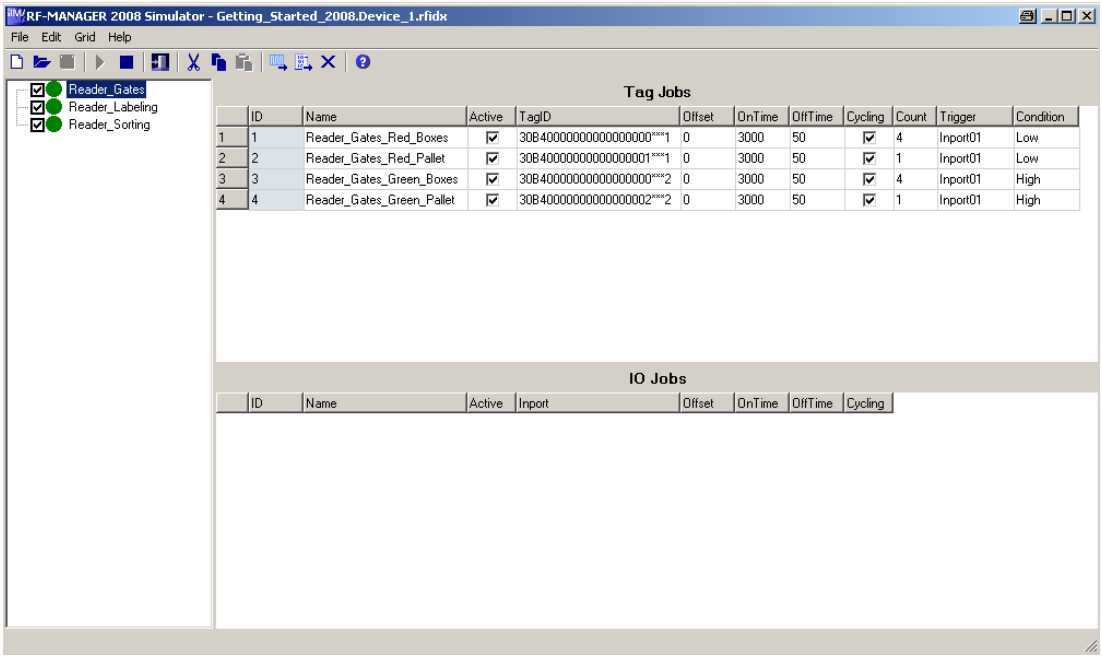
You can use the simulator to simulate operation of the readers used in your projects using pre-defined tag events in the runtime system. The tag events are created in a simulation table. Tag IDs can be defined simply and conveniently in this table. It is also possible to trigger several tag IDs simultaneously.

You can also simulate reader inputs on the runtime system. The I/O events are also created in a simulation table. You can easily define the reader inputs and their conditions in this table.

Simulated reader inputs can also be used to trigger tag events.

Simulation of tags

During simulation, you can use a simulation table to create any number of tag jobs with predefined tag events for the readers configured in the Engineering System. These jobs are independent of each other and can execute once, cyclically or triggered by reader inputs.



The created jobs can be set to active or inactive. You can also copy the jobs and delete individual jobs.

Simulation of reader inputs

Using the simulation table I/O jobs, you can simulate reader inputs with predefined time events on the runtime system.

For detailed information please see the simulator help system.

Handling instructions

The following steps show the basic procedures for simulating a project.

1. Start by creating a project as it is going to be run later with an interconnected controller.
2. Save and compile the project.
3. Launch the simulator directly from the running configuration software. Select "Compiler" > start Runtime with simulator" from the "Project" menu.
   When you simulate the project for the first time, the simulator is started with new, empty simulation tables; only the previously configured readers are shown. You can then create the required jobs for each reader and parameterize them using "Edit > Insert".
   If you have already created a simulation table for your project, it will then be opened automatically. The simulation table "*.rfidsim" contains all the settings that you made for the simulation. These settings can be changed.
4. You can save all settings made in this table for project simulation to a file. To do so, select "File > Save" in the Simulator, then type in a file name ("*.rfidsim".) You can now always retrieve these settings in order to simulate your project again.
5. When you click the Start button, simulation will be started in the runtime system.

3.3.10.5 Basic functional test of the RF670R using the SIMATIC RF-MANAGER Basic

Requirements

If problems occur when using the RF670R reader, you can check the general functionality as follows:

- The antenna configuration must be as shown in the figure below.
- The reader is connected to the SIMATIC RF-MANAGER Basic.
- RF-Manager 2008 and RF-Manager 2008 Runtime must not have been started.

Procedure

To check whether the reader can read a tag, proceed as follows:

1. Open the RF-MANAGER Basic.
2. Select the IP address of the reader to be checked (see).
3. Hold a tag on an electromagnetically neutral base in the middle in front of the antennas.

NOTICE
As a base use wood or plastic, for example, but definitely do not use any metallic or field-influencing materials.

4. In the menu "View", select the "Diagnosis View" command or click the icon.

   The "Diagnosis View" dialog box is opened.
5. Click "Start".

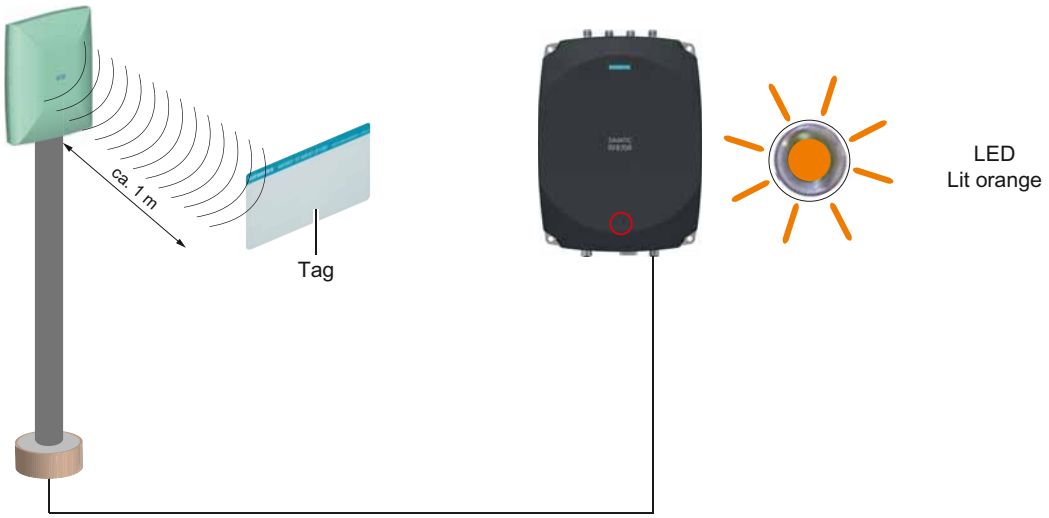


Figure 3-6 Configuration to test the RF670R

Result

If the tag in the field can be read by the reader, it will appear in the list in the "Diagnosis View" dialog. In addition, the orange LED of the RF670R indicates that a tag recognized by the reader is presently located in the field.

3.3.10.6 Basic functional test of the RF660R using the SIMATIC RF660R Configuration Software

Requirements

If problems occur when using the RF660R reader, you can check the general functionality as follows:

- The antenna configuration must be as shown in the figure below.
- Alternative configuration:

  The antennas are installed above one another. Mounting height of the first antenna 1 m above the ground, the second antenna 2 m above the ground (bottom edge of antenna in each case)
- Reader must be in the "Autonomous" operating mode.
- The reader must be connected to the *RF660R Configuration Software*.

Procedure

Hold a tag on an electromagnetically neutral base in the middle in front of the antennas.

NOTICE
As a base use wood or plastic, for example, but definitely do not use any metallic or field-influencing materials.

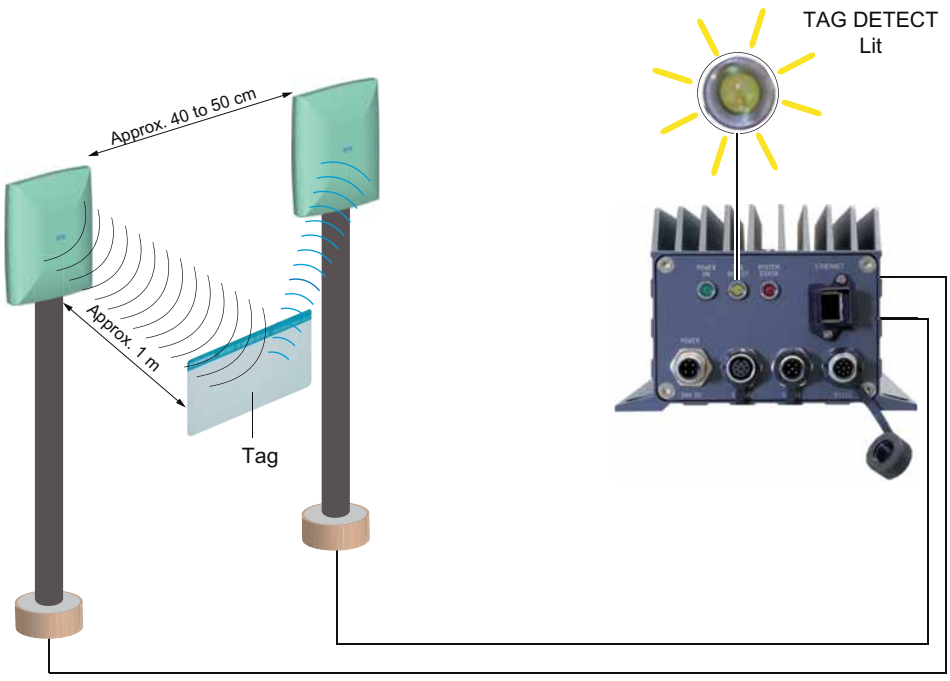


Figure 3-7 Configuration to test the RF660R

Result

The "Tag Detect" LED of the RF660R starts to light up yellow.

Event monitor

To view the tag ID, ID type, protocol and time stamp of the transmitted tag, click the "Event monitor" button in the *RF660R Configuration Software*.

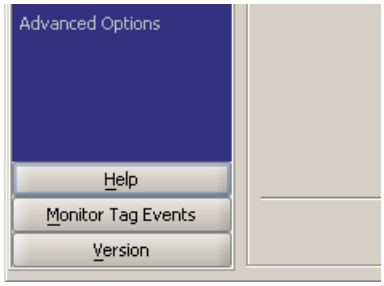


Figure 3-8 Event monitor button

The following window is displayed:

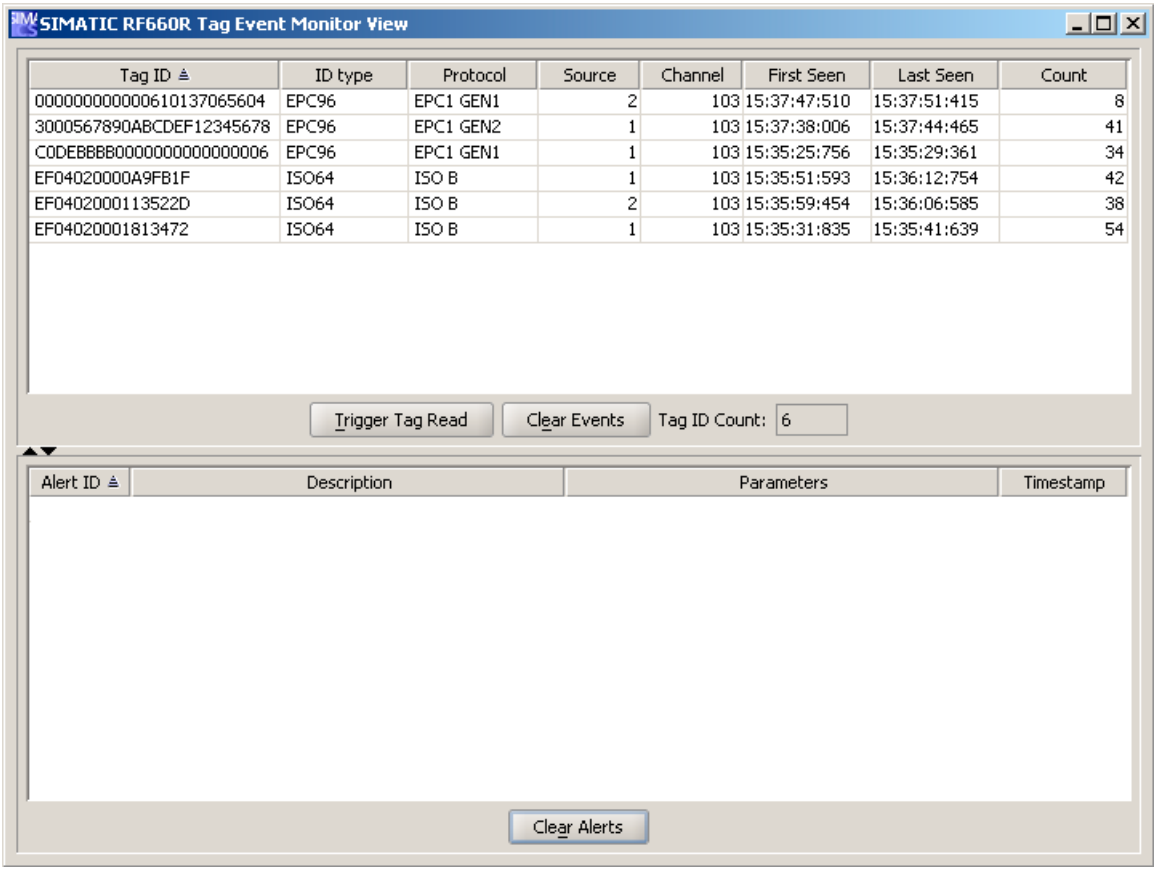


Figure 3-9 Tag event monitor

3.4 Parameterize topology

Under the item "Topology" of the project tree, you can set the basic parameters for your RFID system. You create connections between the readers and the runtime system, parameterize the readers, create workplaces and determine which areas of the tag memory can be read or written. You can also configure PLC connections.

Overview of the RF-MANAGER architecture (Page 21)

The parameters are set in the following stages:

- Topology:
  - RFID device
  - Workplaces
  - PLC connections

Note

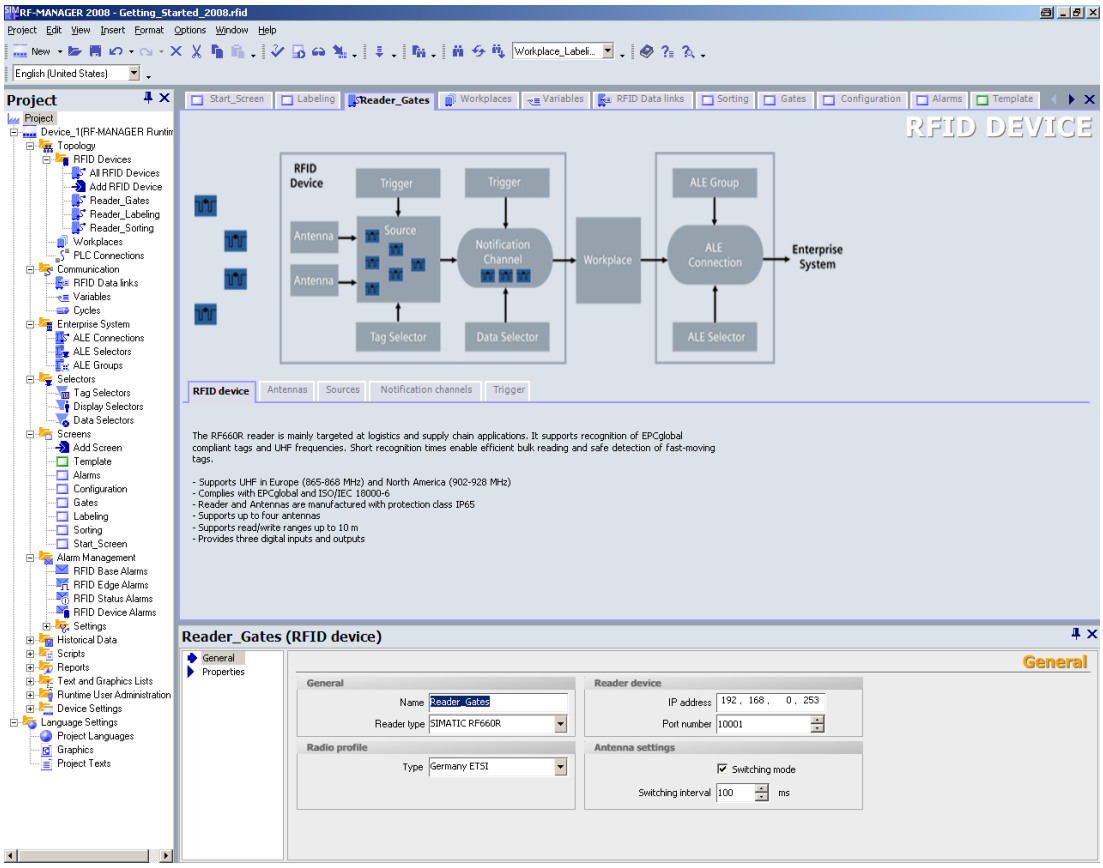
PLC connections

Information on creating PLC connections can be found in the chapter *Fundamentals > Working with PLC connections.*

3.4.1 Parameterizing RFID devices

3.4.1.1 Introduction

In the "RFID devices" submenu, you can create new readers and parameterize readers that have already been created in your RFID system. The transmission paths between the runtime system and readers are specified here. You can also set general parameters for the antennas that are connected to the readers.



And you can create data sources for the purpose of reading tags and notification channels for transferring the scanned tags. It is also necessary to specify triggers: Triggers that activate the data sources for reading and triggers that activate the notification channels to transfer the data of the data sources that are assigned to you.

The RFID devices are parameterized in the following stages:

- RFID device
- Antennas
- Data sources
- Notification channels
- Trigger

- Barcode units (RF610M only)
- Inputs/outputs (only RF670R)

Procedure

If you want to create a new RFID device, use the right mouse button in the Project View to click on the folder "Topology > RFID devices". Select the option "Add RFID device". The editor opens for the new device. This device can also be selected in the tree structure of the Project View under "RFID device_(number)".

If you want to edit an RFID device that has already been created, click "RFID device_(number)" with the right mouse button. Select the option "Open editor". Alternatively, you can double-click "RFID device_(number)" with the left mouse button.

The menus appear in the workplace in the form of register cards. You can edit these menus in the properties dialog box.

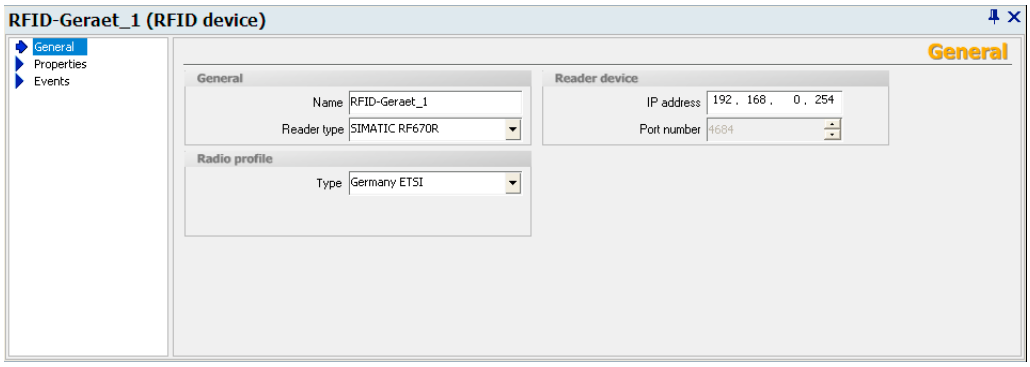
3.4.2 Stationary readers connected via Ethernet

3.4.2.1 RF670R

RFID device

The "RFID device" menu provides the following parameter setting options:

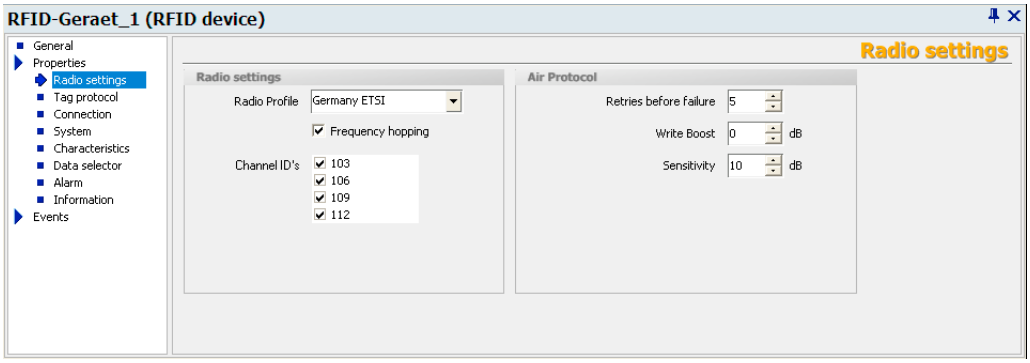
General



Here you can enter the IP address for the reader set in the RF670R, and the radio profile used for the reader.

Properties

- **Radio settings**



You can set the radio profile used for the reader under "Radio settings"

If your RFID system is using "Frequency hopping", you can specify the "Channel switching interval" for the reader transmission channels here in milliseconds.

Frequency hopping is used to prevent mutual inference from the readers. If frequency hopping is not activated, you must permanently assign the transmission channel by means of an ID. If the FCC radio profile is used, however, frequency hopping cannot be deactivated.

You can set the following parameters under "Air Protocol":

"**Retries before failure**:

Here you can set the maximum number of repetitions of a faulty air protocol command. The command is terminated and an error reported only when the command has failed in all attempts. With this setting you can reduce the likelihood of errors when accessing tags. However, this lower error probability leads to an increased time required for command execution. The maximum execution time may increase depending on the actual number of repetitions performed. For time-critical applications, it may therefore be advantageous to turn off the repeat and if needed, to respond in the application and then selectively make the repetition.

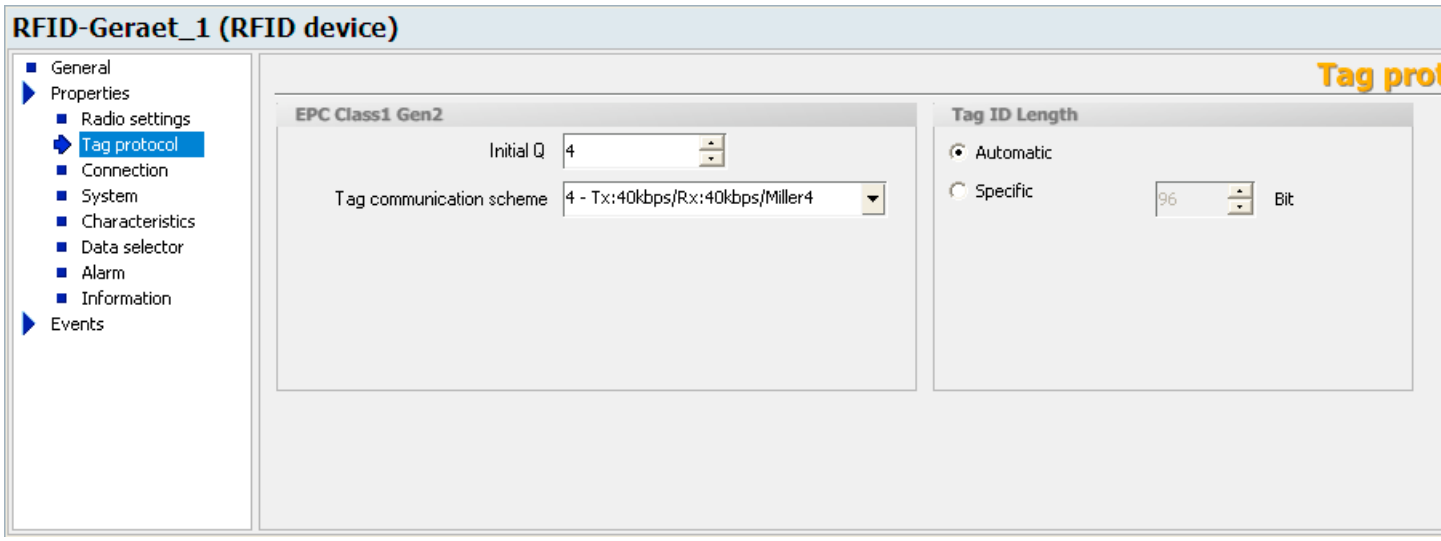
"**Write Boost**"

Here you set how many decibels the antenna performance is increased for writing of data or the ID to the tag. To write data or an ID, a tag that can be read needs about 3 dB more energy at a constant distance. This increased capacity reduces interference potential and increases performance. An increase can only be up to the maximum allowed power.

"**Sensitivity**"

Here you set the attenuation of the tag responses in the input branch of the reader. An increase in attenuation causes weak received tag signals to no longer be recognized by the reader. A decrease means that even weak received tag signals are detected. On the other hand, decreased attenuation brings with it the disadvantage that interference can negatively affect detection. The attenuation simultaneously affects all antennas.

- **Tag protocol**



This is where you select the communication protocol to be used between the reader and tag.

With EPC Class1 Gen2, you can use "**Initial Q**" to specify the maximum number of tags that can be expected to be located in the measuring field at the same time so that collisions can be prevented.
The following formula applies: $2^{\text{Initial Q value}}$ = number of expected tags.
It is important to note here that the length of a read cycle increases with the value of the Initial Q value. Normally this value is automatically set by the reader. If, however, you want to optimize performance, the rule of thumb is that the value must be set as low as possible and as high as necessary.

Under "**Tag communication scheme**", you can set the data transfer rates between reader and tag for EPC Gen2 (see Tag modulation schemes (Page 149)).

Under "**Tag ID Length**", you can select the setting "Automatic" or "Specific". "Automatic" means that tags of different lengths are detected. Select the setting "Specific" only when you are sure that there will only be tags with the same length or only specific ID lengths are desired. Tags with different ID lengths are ignored.

Dense Interrogator mode (Page 149)

See also:

Help system *Understanding and optimizing the scanning of RFID tags*

- **Connection**

If "**RSSI events**" is activated, then for each tag a message containing the information "Tag ID", "RSSI value" and "active antenna" is generated for all read processes and tag commands that result in the acquisition of the tag ID at the air interface. This information can be useful during commissioning.

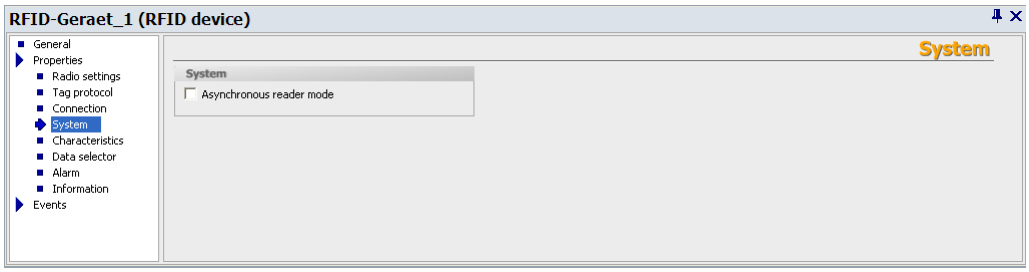
NOTICE
Very many messages Very many messages are generated for large tag populations, which can reduce overall performance and lead to overload. Disable "RSSI events" after commissioning if you work with large tag populations.

With the "**Delta threshold**" parameter you can set the difference in the RSSI value per tag from which a new RSSI message is created. If, for example, the value is set to "10" and a message has been generated at an RSSI value of 50 for the tag with ID x, a new message is created when a value of >60 or <40 is reached. No messages are generated at RSSI values in between to avoid a flood of messages on small changes.

If "**Command response events**" is activated, messages containing information such as command, ID, result of the command, RSSI value, active antenna, etc. are created for all tag command (e.g. WriteID, Kill, Lock, etc.) and for each tag. If the command was executed on several tags, separate messages are generated for each individual tag. At the end of a command execution, an additional message is created with a summary of the results (tags OK, number of tags NOK).

During commissioning, you can enable this option in order to detect problems with command execution. After the commissioning you should disable the option again, otherwise a lot of data will be generated, causing the overall performance of the system to be reduced or leading to an overload.

- **System**



Under "**Asynchronous reader mode**", you can change the operating mode of the RFID module. In asynchronous reader mode, the RFID module continuously reads tags that are present in the field. Even if always the same tag is in the field, the same tag is constantly read and the data source made available. If the option is not enabled, the RFID module will only read in response to an explicit request from the data source or in accordance with the configured trigger conditions.

You use "Asynchronous reader mode" when you want tags to be detected as quickly as possible. In this mode, the software does not provide a trigger because the reader reads autonomously. You will need this function for high-speed processes in which temporary reading pauses are not acceptable.

Note

Preconditions/settings

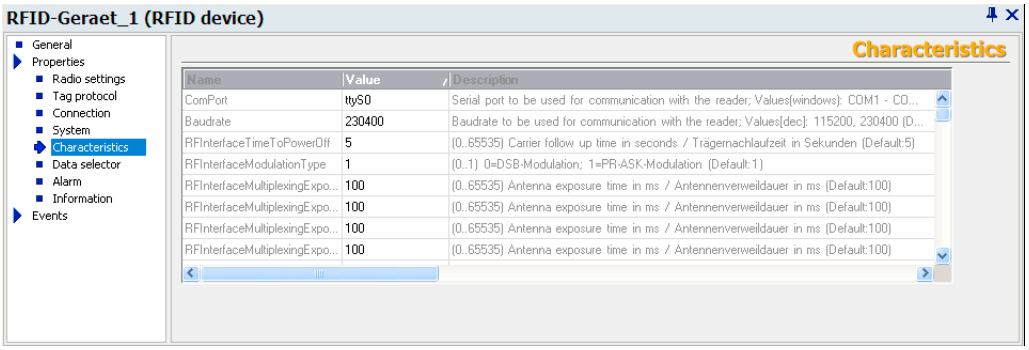
- Read settings: Set the threshold for "Observed" to 0.
- Set all the participating components, e.g. data sources and notification channels, to continuous triggering.

Note

Only one data source

Please note that you can only parameterize one data source for your reader in asynchronous reader mode. Scenarios with multiple data sources are not permitted!

- **Properties**



The dialog "Properties" contains expert parameters for special applications. These expert parameters permit the subsequent optimization for difficult applications.

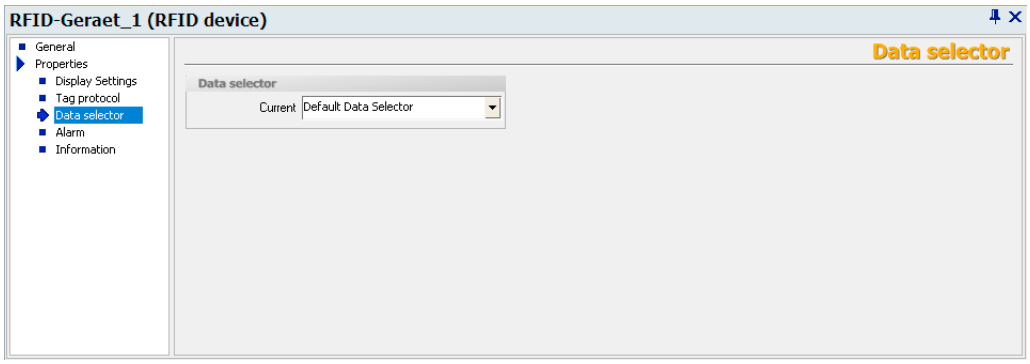
The following expert parameters can be parameterized via the "Properties" dialog:

Parameter	Description	Default setting
RFInterfaceModulationType	The RF670R readers provide two basic modulation types: • Double Sideband (DSB) • Phase Reversal Amplitude Shift Keying (PR-ASK) modulation.	PR-ASK modulation is the default setting and should not be changed.
TagCommUsePilotton	To ensure that the RFID module can better synchronize with the transponder response, the tag is told to transmit a pilot signal (x ms long) via the air interface. If no fault is expected in the field, the pilot signal can be switched off (minimal time savings). But the user is advised to always leave the pilot signal switched on.	ON = 255
TagCommIntelligentWrite	In comparison with the reading process, the writing process is a very slow process. The concept of intelligent writing includes reading of the special cells to be written in the tag, comparing of words (2 bytes), and word-by-word writing of only those words that deviate in content between target data and actual data. Users who would like to write the contents of the memory in any case, due to the medium-length data management period, will shut down this mechanism.	ON = 255
TagCommVerifyWrite	When writing data to transponders, the transponder can acknowledge correct writing in the event of a defective memory cell, but during the next reading, it is discovered that memory cells were not correctly written compared to the acknowledgement. In order to be able to prevent such data corruption, the corresponding memory cells are read word-by-word by the reader after writing data on tags and then compared to the writing data by default. Users who do not want to use this mode can disable the mechanism via the expert parameter defined here.	ON = 255
TagCommForcePowerOffAfterEPCWrite	In order to be able to optimize the inventory chronologically, you must ensure that a tag briefly exits the status after overwriting the EPC ID in order to be assigned a new status in a different inventory as soon as possible. This timed response can be achieved by switching off the power for X ms after the EPC ID is written.	The setting range for the wait time is 0 ms to 255 ms. The default is a pause of 5 ms.

Parameter	Description	Default setting
RFInterfaceTimeToPowerOff	This time specifies how long the carrier remains switched on after a tag operation, taking the restrictions of the selected communication standard into consideration. The advantage of selecting a sufficiently long carrier running-on time is that after data accesses, the reader leaves the carrier of a channel switched on, thus saving time when the data accesses are used again.	5 s
RFInterfaceMultiplexingExposureTime1 ... 4	These settings only become effective when the reader is operating in asynchronous mode (see RFID device > Properties > System). In this mode, the RFID module continuously executes read cycles (inventories) and switches the antennas according to the set times. Time 1 ...4 corresponds to Antenna 1 ... 4	100
GlimpsedTimeoutCount ObservedTresholdCount ObservedTimeOutCount	Three counters are reserved in the tag list for each tag. They can be changed by the user. These settings only become effective when the reader is operating in asynchronous mode (see RFID device > Properties > System). In this mode, the RFID module continuously executes read cycles (inventories). When a tag is reported depends on the number of identifications and the resulting states. The tag status "Observed" is reported. Possible states: • Glimpsed • Observed • Lost The basic model of smoothing is described in the chapter "Understanding and optimizing the scanning of RFID tags".	GlimpsedTimeOutCount = 1 ObservedTresholdCount = 0 ObservedTimeoutCount = 5

Parameter	Description	Default setting
TagCommTransmitSelectIfNoFilterIsOn	Before each read cycle, the reader sends a select command at the air interface to switch tags into a defined idle state. This procedure is only required if tags changed their states due to previous filter functions. If it is ensured that no filters affect tags via the air interface, the read performance can be increased by omitting the select command.	ON = 255
TagCommUseBlockWrite	The EPC Gen 2 air protocol supports the command "BlockWrite" for simultaneously writing several words to the tag. If only tags that support this command are used, you can activate this write mode exclusively. Word-by-word writing is then deactivated.	OFF = 0

- **Data selector**



You can select the current data selector or define new data selectors here. Please note that the data selector chosen here will only be effective in the following cases:

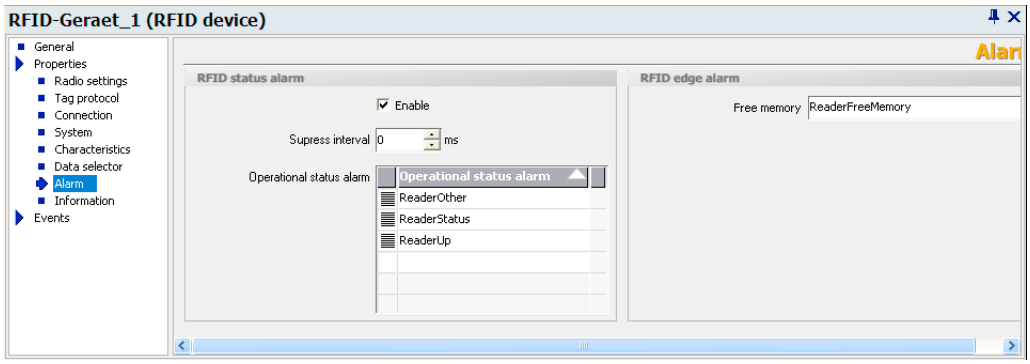
– During synchronous read procedures

– Or for notification channels for which a data selector has not been explicitly selected.

In general, data selectors are components of notification channels and are used with the asynchronous read procedure.

For further information on using data selectors, see .

- Alarm

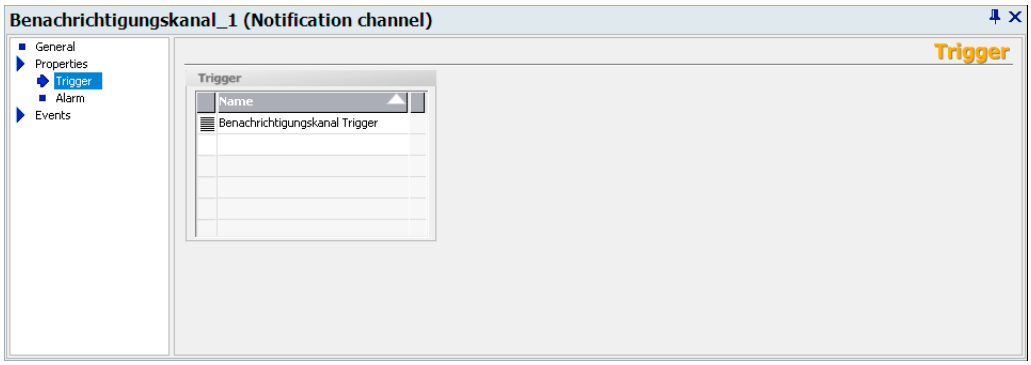


You can select alarms for reader status and available memory here or define them. Under "Operational status alarm", you can assign more than one RFID status alarm to the selected RFID device. You will then receive detailed information regarding the status of the RFID device.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section *Working with alarms*.

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

- **Information**



You can store descriptions regarding the reader, reader location, responsible contact person(s) and reader role here. This information is displayed in the "Configuration" and "Statistics" views.

- **Events**

"On Alarm"

If the reader triggers an alarm, this event is triggered. You can configure function lists for the event in order to execute system functions.

You can find further information on the use of lists of functions in the chapter "System functions and runtime scripting".

Tag modulation schemes

You set the data transfer rate between reader and tag using tag modulation schemes. This parameterization is only possible with the tag protocol EPC Class1 GEN2.

EPC Class1 GEN2 tag communication schemes

Index	Reader - Tag Tari*	Reader - Tag data rate	Link frequency	Tag - reader data rate	Coding	ETSI-compatible	FCC-compatible
0	25 µs	40 kbps	80 kHz	80 kbps	FM 0	Yes	Yes
2	25 µs	40 kbps	160 kHz	160 kbps	FM 0	Yes	Yes
4	25 µs	40 kbps	160 kHz	40 kbps	Miller 4	Yes	Yes
5	12.5 µs	80 kbps	160 kHz	160 kbps	FM 0	Yes	Yes
7	12.5 µs	80 kbps	160 kHz	40 kbps	Miller 4	Yes	Yes
9	12.5 µs	80 kbps	320 kHz	160 kbps	Miller 2	Yes	Yes
10	12.5 µs	80 kbps	320 kHz	80 kbps	Miller 4	Yes	Yes
11	12.5 µs	80 kbps	320 kHz	40 kbps	Miller 8	Yes	Yes
12	6.25 µs	160 kbps	320 kHz	320 kbps	FM 0	No	Yes
13	6.25 µs	160 kbps	320 kHz	160 kbps	Miller 2	No	Yes
14	6.25 µs	160 kbps	320 kHz	80 kbps	Miller 4	No	Yes
15	6.25 µs	160 kbps	320 kHz	40 kbps	Miller 8	No	Yes

Dense Interrogator mode

The dense interrogator mode for Gen 2 tags (schemata with Miller coding) enables several RF670R readers to be operated without interference in close proximity to each other.

Operating principle

When using Gen 2 tags, a so-called Miller subcarrier permits readers located close to one another to use the same frequency. This is achieved by inserting a frequency offset for the signal carrier in the tag (by using a square-wave hybrid signal).

As a result of the large difference in level between the transmitter channels and the tag response channels, this technology provides great advantages for frequency reuse. However, a prerequisite is that a certain minimum distance, and thus minimum decoupling, is observed between the antennas of adjacent readers.

Antenna alignment and distances

The minimum distance required between antennas using the same frequency depends on the transmitter power set and the antenna alignment.

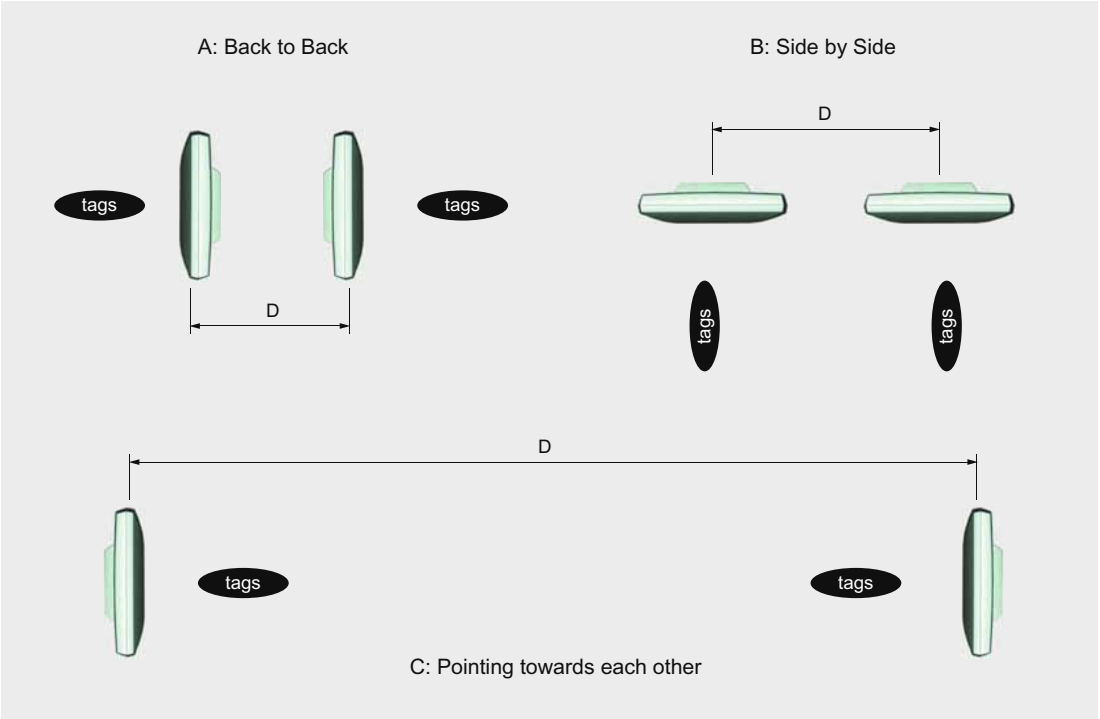


Figure 3-10 Antenna distances

Antenna configuration	Antenna alignment	Minimum distance required = D
A	With backs to each other	0.5 m
B	Arranged laterally	1 m
C	Antennas point toward each other	6 m

Optimizing tag reading accuracy

A further improvement in the tag reading accuracy in an environment with a high density of readers can be achieved by orienting the antennas toward the respective tag field, i.e. by rotating them horizontally and vertically.

In addition, the transmitter power of the readers can be reduced down to the minimum at which the tags are still just detected accurately.

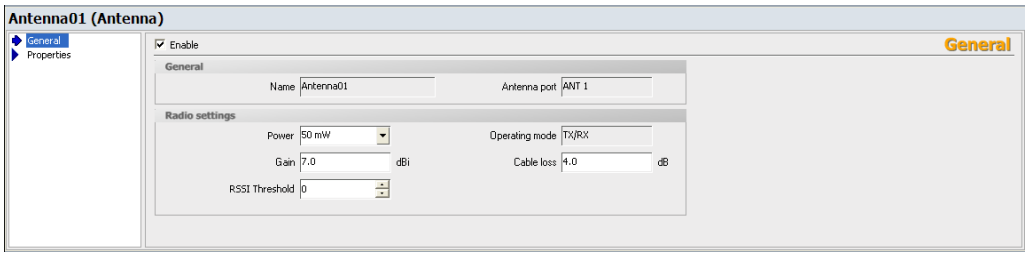
This greatly reduces the probability of interference.

Antennas

Antennas

The "Antennas" menu provides the following parameter setting options:

General



In this window, you can specify the radio properties of an antenna. The "Name" of the antenna and the antenna port assigned to it are automatically assigned.

The maximum "Power" is limited by the radio profile and communication scheme used. The settings for the "antenna gain" and "cable loss" parameters are dependent on the hardware used.

Under "Enable", you can activate the antenna.

The operating mode of the antenna with RF670R is preset to TX/RX, as the reader operates the antenna monostatically, i.e. transmitting and receiving take place simultaneously.

For additional information on the transmit power of the antennas, refer to Transmit power of the antennas (Page 153).

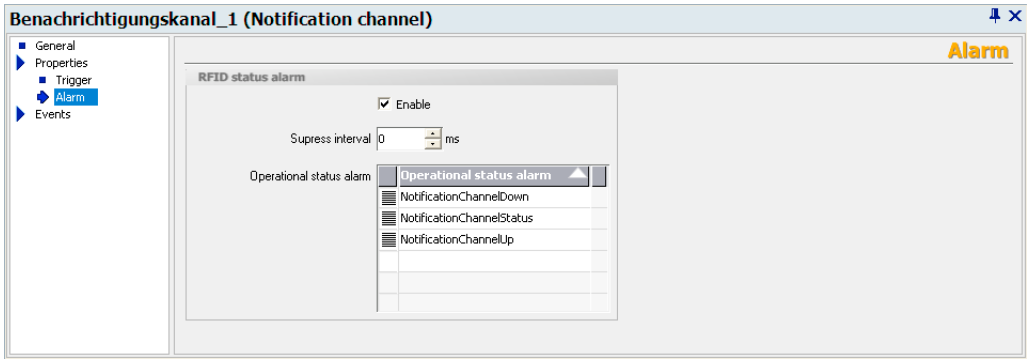
RSSI threshold value

RSSI (received signal strength indication) data provide information about the strength of the reception field with which a tag is read. To reduce the effect of overshooting when making data accesses to transponders, setting a threshold allows received transponder signals that do not reach the Received Signal Strength Indicator (RSSI) threshold to be discarded by the reader. An analysis of RSSI data may also help, for example, to initiate a write operation only if there is a sufficiently strong tag in the field. This can increase the writing success rate.

The value is a unitless amount without direct conversion to the level and a value range of 0-255 (default 0).

Properties

- **Alarm**

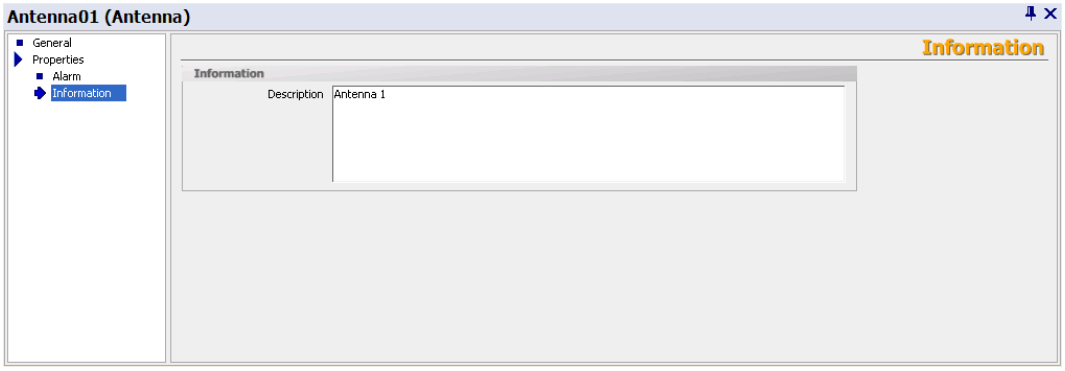


You can assign the "RFID status alarms" and "RFID base alarms" to the antenna here. You can either select them from the drop-down list or create new ones.
Under "Operational status alarms", you can assign several RFID status alarms to the selected antenna. You will then receive detailed information regarding the status of the antenna.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section "Working with alarms".

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

- **Information**



You can store a description of the antenna here.

Transmit power of the antennas

The maximum transmit power of the antennas is restricted by the radio profile used. Parameterization of antenna gain and cable loss depends on the hardware used.

ETSI radio profile

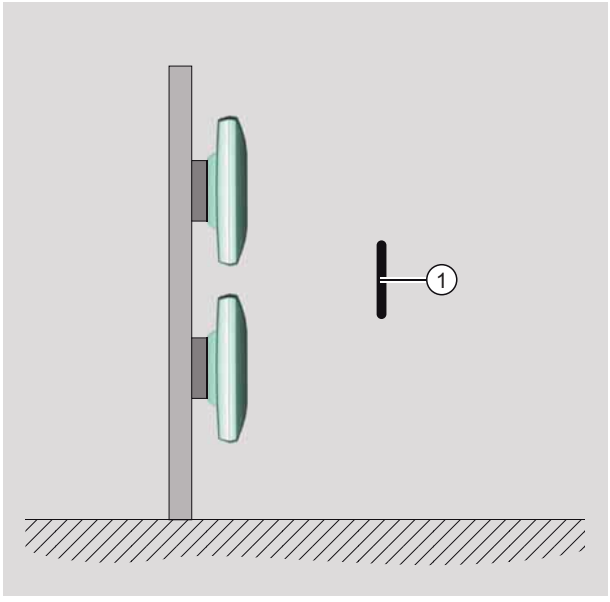
With the ETSI radio profile, the minimum transmit power is 50 mW ERP, and the maximum is 2000 mW ERP. The set power corresponds to the desired effective radiate power (ERP), and is calculated for the reader based on the entered parameters "Antenna gain" and "Cable loss". The RF660A-EU antenna has a gain of 7 dBi, and a 10 m long LMR-195 cable has a loss of 4 dB or an LMR-300 cable has a loss of 2 dB.

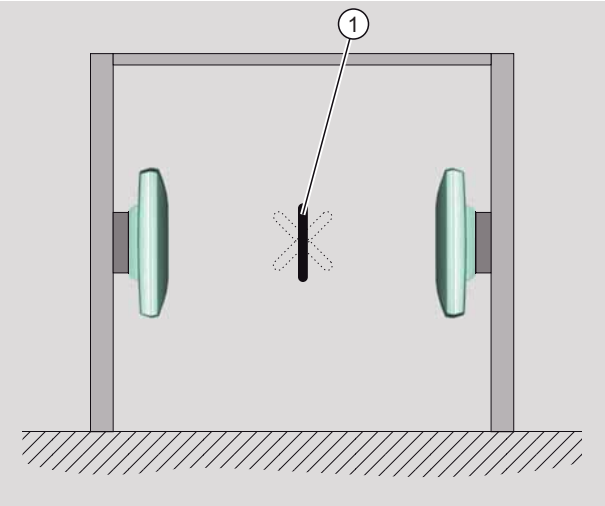
FCC radio profile

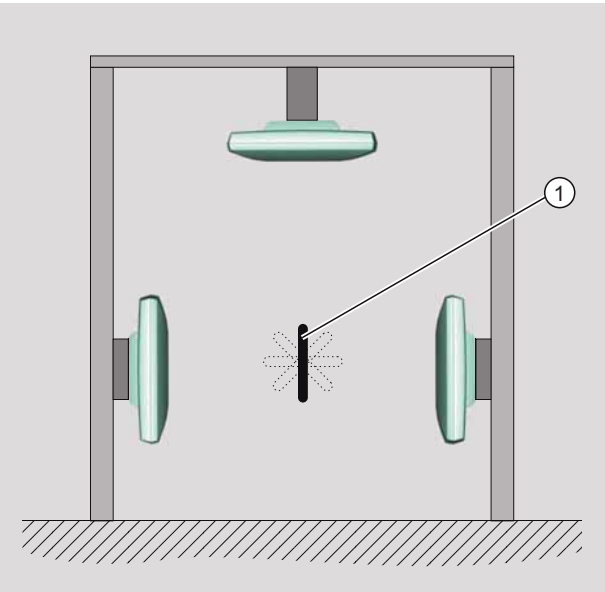
With the FCC radio profile, the minimum transmit power is 100 mW, and the maximum transmit power is 1000 mW. The set power corresponds to the desired signal level on the end of the antenna cable and is calculated for the reader based on the entered parameters "Antenna gain" and "Cable loss". The RF660A-US antenna has a gain of 6 dBi, and a 10 m long LMR-195 cable has a loss of 4 dB or an LMR-300 cable has a loss of 2 dB.

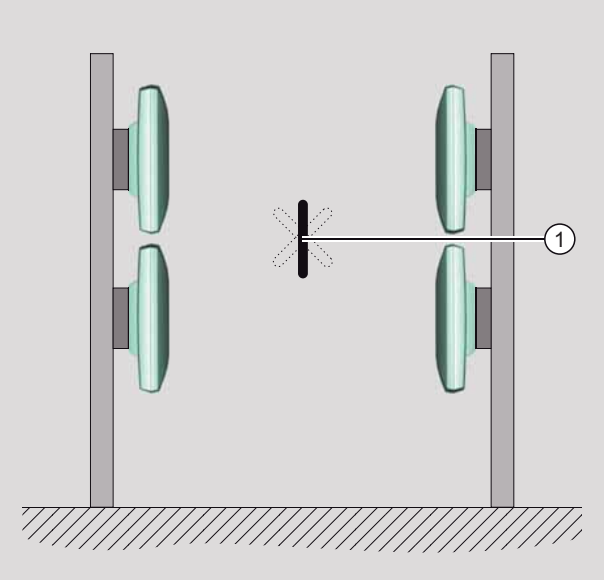
Antenna configurations

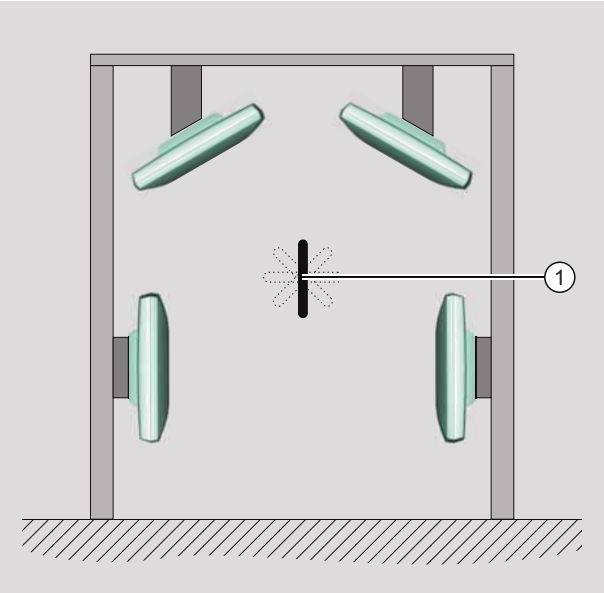
Some basic antenna configurations and possible fields of application are shown below.

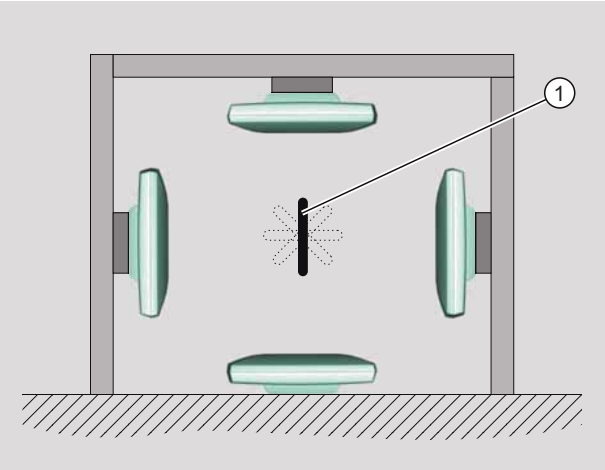
Antenna configuration 1	Description/application areas
	This arrangement of antennas is appropriate when the tags to be read are only located on one side of the items to be identified, e.g. when pallets are to be identified on which the tags to be read must be on a prespecified side. ① Tag

Antenna configuration 2	Description/application areas
	Preferred application: For the identification of goods at loading portals. The tag is located in the field of radiation of two antennas; for reliable tag reading, the height of the tag above floor level must therefore be known with reasonable accuracy. ① Tag

Antenna configuration 3	Description/application areas
	Preferred application: For the identification of goods at loading portals. Similar to configuration 2, but with additional reading reliability when the tag is at an angle to the vertical. ① Tag

Antenna configuration 4	Description/application areas
	Preferred application: For the identification of goods at loading portals. The tag is located in the field of radiation of all four antennas, so the tag position can vary more than in configuration 2 for reliable tag identification. ① Tag

Antenna configuration 5	Description/application areas
	Preferred application: For the identification of goods at loading portals. Similar to configuration 4, but the reliability of tag identification is improved as a result of the four antennas at separate locations, so the tag position is not critical. ① Tag

Antenna configuration 6	Description/application areas
	This tunnel configuration is suitable for conveyor belt applications. The goods with the tags to be read are moving forwards on a conveyor belt but the alignment of the tags relative to the antennas is not clearly defined. One of the antenna is located on the floor and radiates vertically upwards in the direction of the conveyor belt. A relatively high reading reliability is achieved due to the use of four antennas. ① Tag

Specified spacing of antennas

Specified minimum spacing of antennas

The following diagram shows the specified minimum and maximum spacings for mounting antennas.

A minimum spacing of 50 cm is necessary between the antenna and liquids or metals. The distance between the antenna and the floor should also be at least 50 cm.

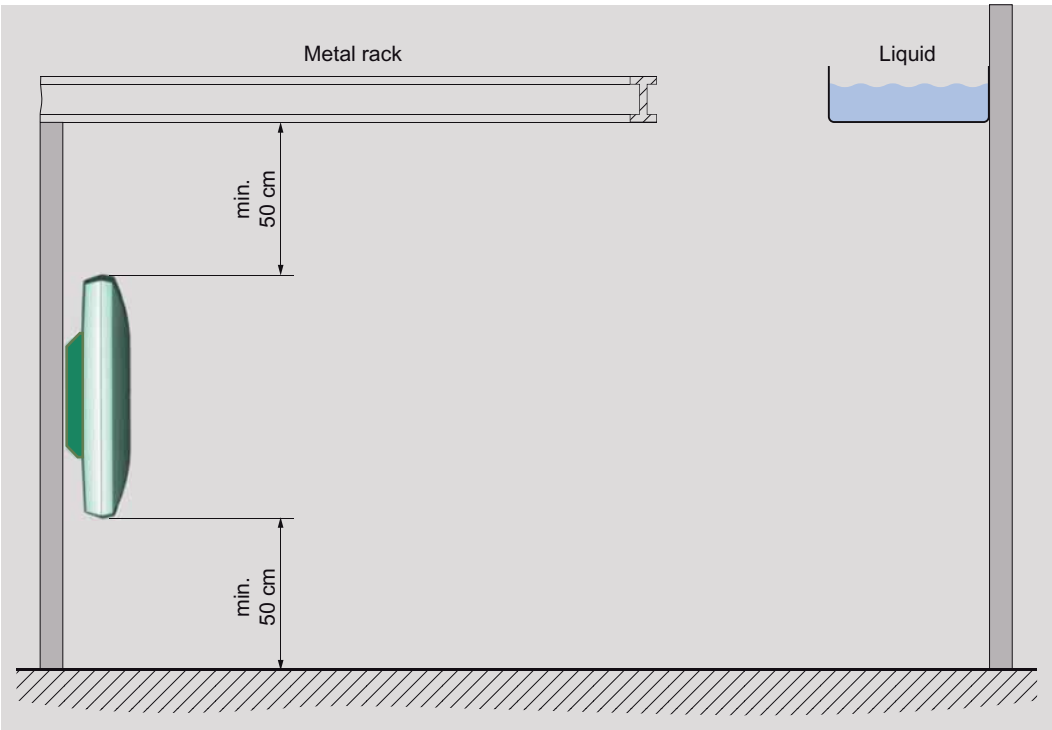


Figure 3-11 Minimum distance to the environment

The distance between two antennas mounted alongside each other or one above the other should be at least 20 cm, but a distance of more than 50 cm is better.

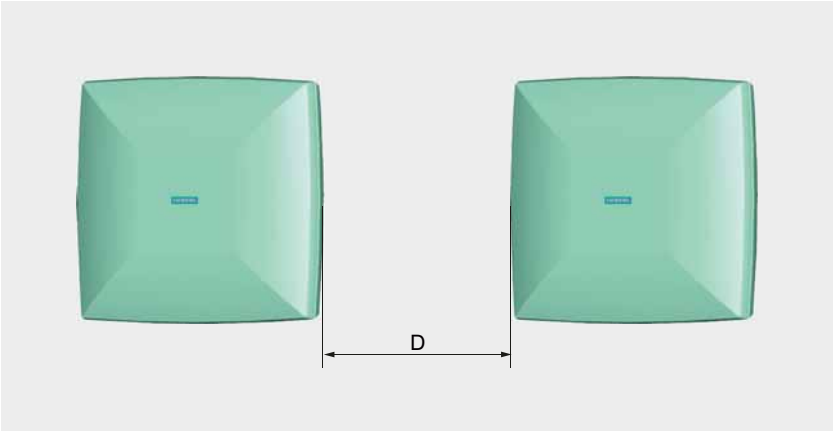


Figure 3-12 Antennas mounted adjacently horizontally or vertically

For a portal configuration, the distance between two antennas that are connected to the same reader is up to 3.5 m (in Europe) or 4 m (in the USA).

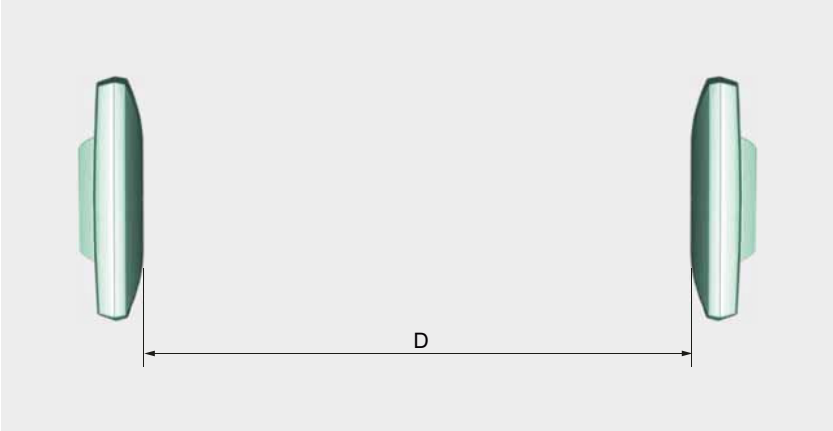
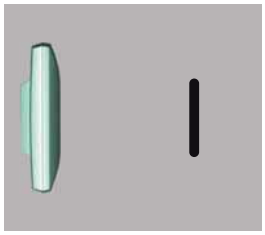


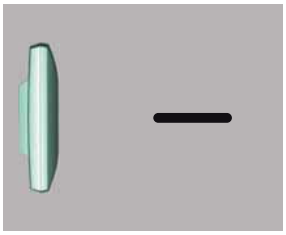
Figure 3-13 Portal configuration, maximum distance

The specified distances are recommended minimum or maximum values for configuration.

Tag orientation in space

The alignment of the tag antenna to the antenna of the reader affects the reading range. For maximum performance and to achieve the maximum reading range, the tag antenna should therefore be aligned in parallel with the reader antenna:

Parallel tag alignment	Large reading range
	Maximum probability of identification of tags.

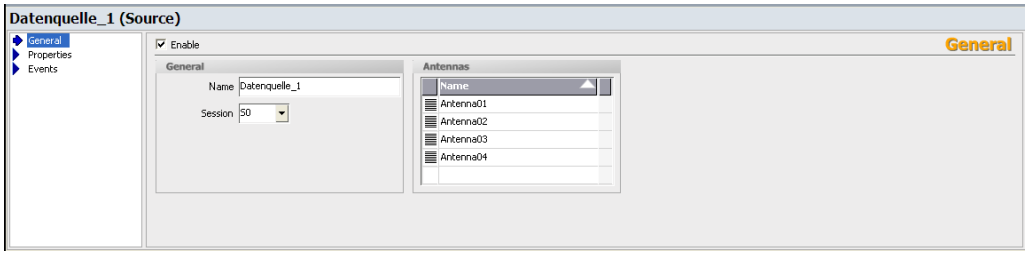
Vertical tag alignment	Minimal reading range
	Minimum probability of identification of tags.

Data sources

Data sources read the data from logically associated antennas. The data sources pass on the data that are read from the antennas assigned to them.

The "Data sources" menu provides the following parameter setting options:

General



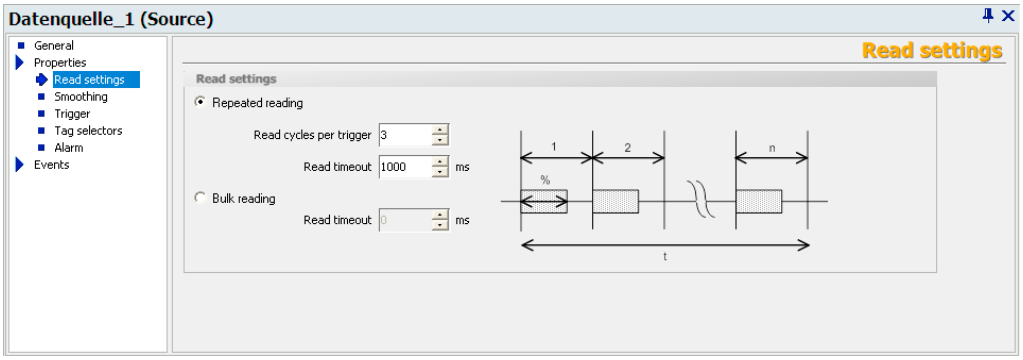
You can assign a name to the data source using the parameter "Name". Under "Antennas", you can assign the antennas that are available to the data source.

If you selected EPC Class1 Gen2 as the communication protocol between the reader and the tags, you must specify the session parameters for the data source. One tag can communicate with up to 4 data sources simultaneously, so to distinguish between these data sources, a unique number S0 to S3 is assigned to each via the session parameters.

Under "Enable", you can activate the data source.

Properties

- **Read settings**



Under "Read settings" you can choose between "Repeated reading" and "Bulk reading".

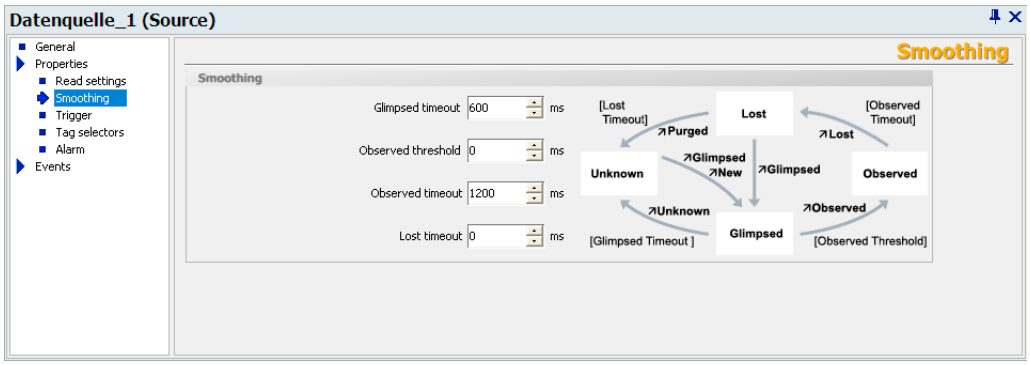
If the option "Repeated reading" is activated, you can define the number of "Read cycles per trigger". The "Read timeout" specifies in milliseconds how long the defined number of read cycles per trigger may take. When this time limit is exceeded, the read cycles are stopped even if the number of cycles that you specified has not been reached.

If the option "Bulk reading" is active, the reader continuously reads all tags in the fields in one read cycle. The "Read timeout" determines how long this continuous reading will last. Other data sources must wait during this defined read duration and are only processed when it ends.

For more detailed information and general background information, please refer to:

Help system *Getting started > Understanding and optimizing the scanning of RFID tags*

- **Smoothing**



Smoothing is a technique that is used to optimize the read quality. The reader adds a status indication for the tags to the read results.

In this window, you specify the parameters for the status indication for the tags. Here you can specify times that have an effect on the status transitions.

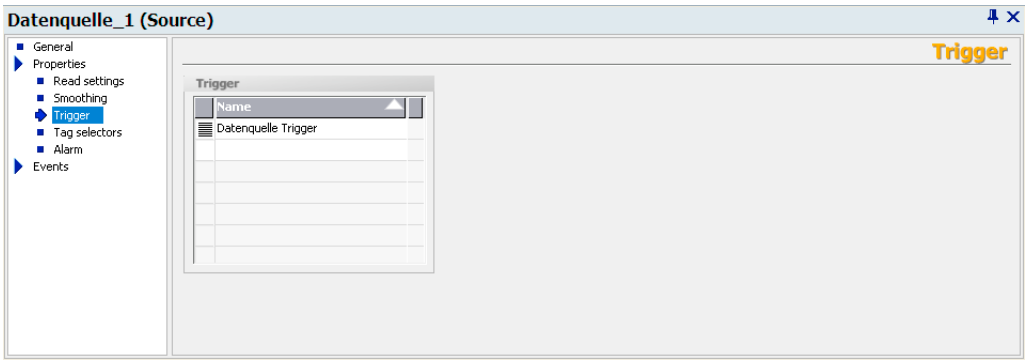
The different statuses are described below:

Status	Meaning	Description
Unknown	Unknown	The tag has this status before communication is established with the reader.
		Data selector event "Purged": Status "Unknown" is achieved due to "Lost timeout".
Glimpsed	Briefly detected	This status is assigned to the tag when it is read for the first time. Two times are activated: "Glimpsed timeout": If communication is established briefly and unintentionally, when the time "Glimpsed timeout" has elapsed, the status changes back to "Unknown". The tag is removed from the tag list. This is used to remove tags that have been briefly detected in the boundary areas of the reader. The rule of thumb is that "Glimpsed timeout" should be at least twice as long as a complete read cycle. "Observed threshold": If a stable connection exists beyond the time "Observed threshold", the status "Observed" is assigned to the tag. The rule of thumb is that "Observed threshold" should be at least twice as long as one complete read cycle.
		Data selector event "New": The status "Glimpsed" was achieved from status "Unknown" for the first time.
Observed	Reliably detected	An interruption in the communication that is shorter than the set time "Observed timeout" has no effect on the current status. This time interval can be used to suppress temporary interference. The rule of thumb is that "Observed timeout" must be twice as long as one complete read cycle. When the times of the read triggers are set longer than the "Observed timeouts", there is a danger that tags that remain stationary in the field will be lost.
Lost	Lost	When a tag exits the field of the reader, the status "Lost" will be assigned to it after the time "Observed timeout" has elapsed. If communication is established again, the status "Glimpsed" will be assigned again immediately. The "Unknown" status is activated if communication is not established before the time "Lost timeout" elapses. The rule of thumb is that "Lost timeout" must be at least twice as long as one complete read cycle.

For more detailed information and general background information, please refer to:

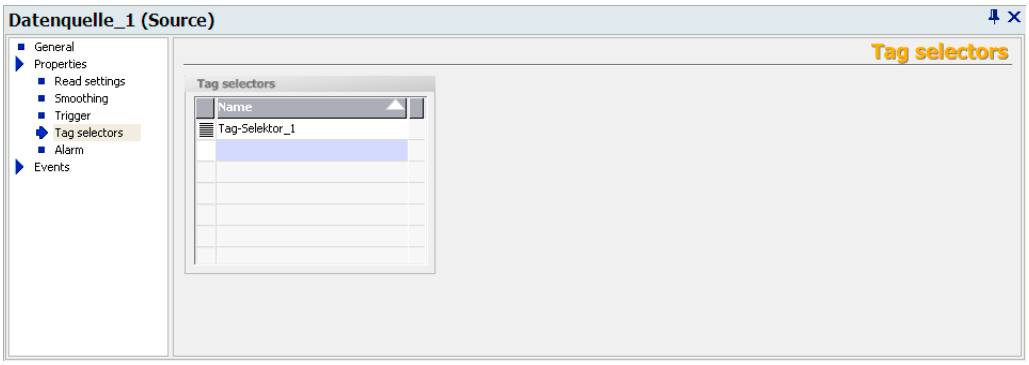
Help system *Understanding and optimizing the scanning of RFID tags*

- **Triggers**



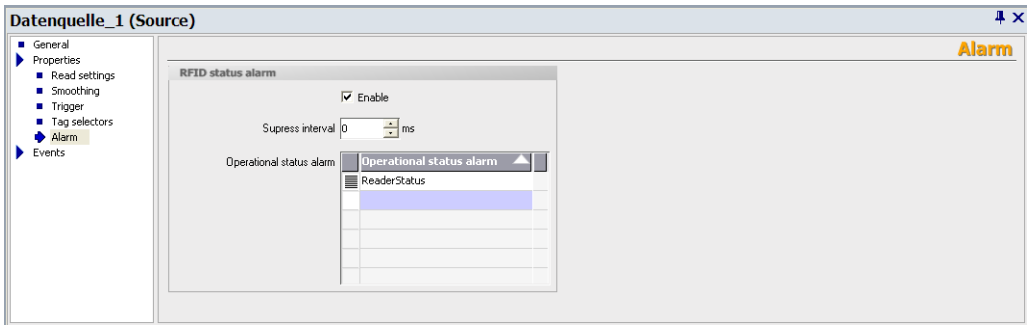
You specify the read triggers here. They cause the data source to read the data from the tags that are located in the antenna field. You can select the triggers from the drop-down list or define them yourself.

- **Tag selectors**



You assign tag selectors to the data source here. You can select the selectors from the drop-down list or define them yourself. The data to be read and filtered is specified here. If a selector is not entered here, the tag IDs will be supplied from all tags.
If several tag selectors with filter function are selected here, they will be combined with a logical **and**. If this is not desirable, you must create additional data sources.

- **Alarm**

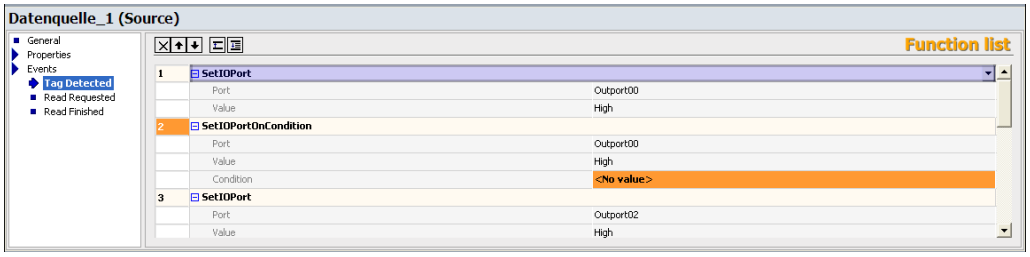


Under "Operational status alarm", you can assign more than one RFID status alarm to the data source. You can select these from the drop-down list or create them. You will then receive detailed information regarding the status of the data source.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section "Working with alarms".

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

Events



The following events to trigger system functions are available:

- **Tag Detected**

  As soon as a tag is detected by the data source, triggering is initiated. The system functions "SetIOPort" or "SetIOPortOnCondition" can be configured at the trigger.

  By defining a tag selector for the system function "SetIOPortOnCondition", it can be specified for which tag data the output is to be set.

  If several tags are recognized, triggering occurs for each tag.

- **Read Requested**

  The triggering occurs at the start of each read request to the RFID module. Only the system function "SetIOPort" can be triggered at the trigger.

- **Read Finished**

  The triggering occurs at the end of a read request to the RFID module. Only the system function "SetIOPort" can be triggered at the trigger.

I/O Ports

The digital I/O ports of the RF670R reader can be activated or deactivated individually. Via the digital inputs, for example, read operations can be triggered by means of light barriers. Pertinent visual or acoustic feedback can be output via the digital outputs.

The "I/O Ports" menu provides the following parameter setting options:

General

You can select an output from the table in the workplace. Its parameters can then be set via the Property view:

In the input field "**Inactivity Level**", you can define the state of the output (High or Low) after switching on the reader.

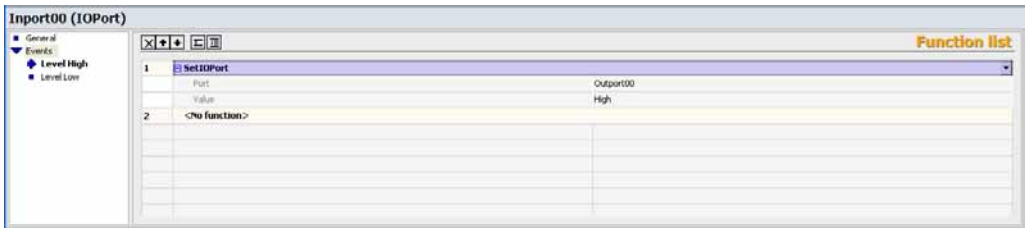
A time in ms can be entered in the "**Automatic Reset Time**" input field. After the reset time, a set output returns to the status defined via "Inactivity Level". If there is a further change in state during the Automatic Reset Time , the Automatic Reset Time starts from the beginning.

The "**Toggle Interval**" indicates a time interval in ms. As long as a set output is activated, it automatically switches the status of the reader output at the beginning and end of this time interval.

The parameters "Automatic Reset Time" and "Toggle Interval" can be combined with each other, so that the output automatically changes its state and after the given Automatic Reset Time returns to the level set under "Inactivity Level".

If you additionally activate the option "**Send notifications**", the reader will automatically generate an alarm after every status change.

Events



- **Level High**

  As soon as an input or output is switched on, the function list configured here is triggered. Only the function "SetIOPort" can be used in the list of functions.

- **Level Low**

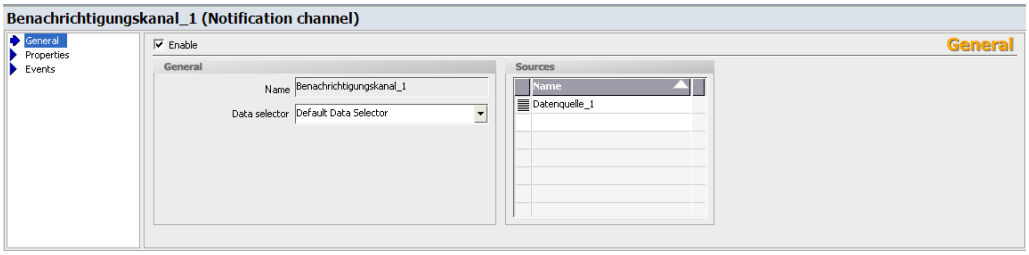
  As soon as an input or output is switched on, the function list configured here is triggered. Only the function "SetIOPort" can be used in the list of functions.

Notification channels

The notification channels pass on the RFID data of the data sources assigned to it in accordance with the configured triggering mechanism and the data selector.

The "Notification channels" menu provides the following parameter setting options:

General



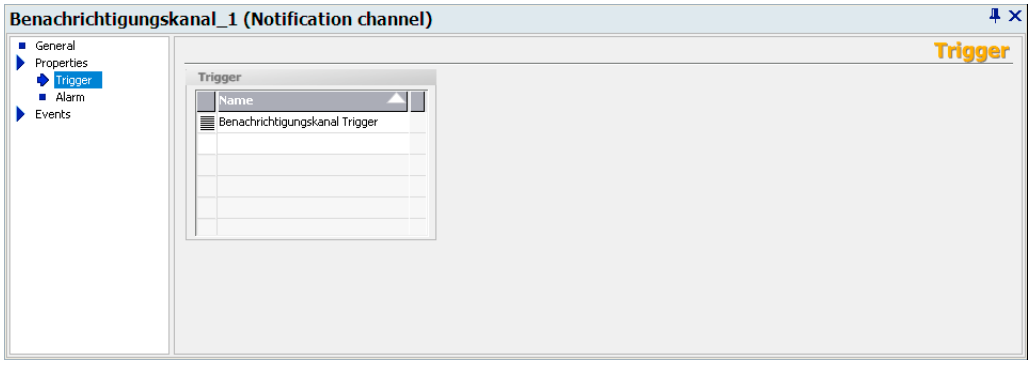
You can assign a name to the notification channel and assign a "Data selector" and one or more "Data sources" to it. You can define the data selector and the data source(s) yourself or select them from a drop-down list.

If a data selector is not defined for the notification channel, the data selector will automatically be used that was defined as current in the "Data selectors" submenu on the RFID device.

Under "Enable", you can activate the notification channel.

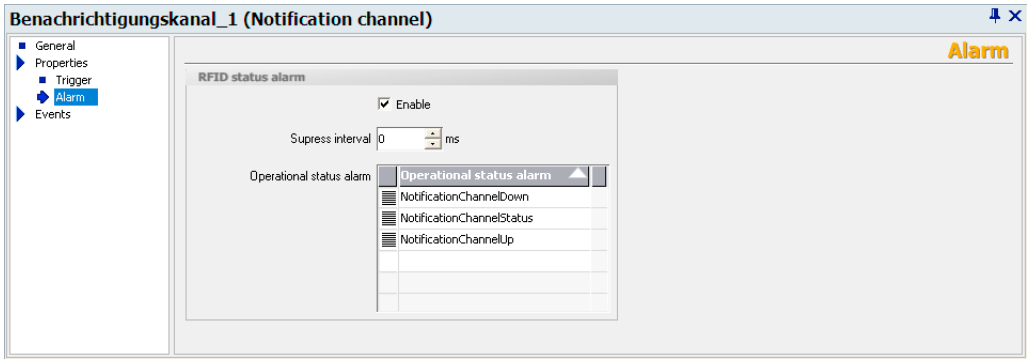
Properties

- **Trigger**



You can specify here whether the events received from the data sources should be transmitted **continuously** or whether they should be passed on dependent on the notification channel trigger. You can select these triggers from the drop-down list or create them. When you define the triggers, you can also specify when they will be activated.

- **Alarm**

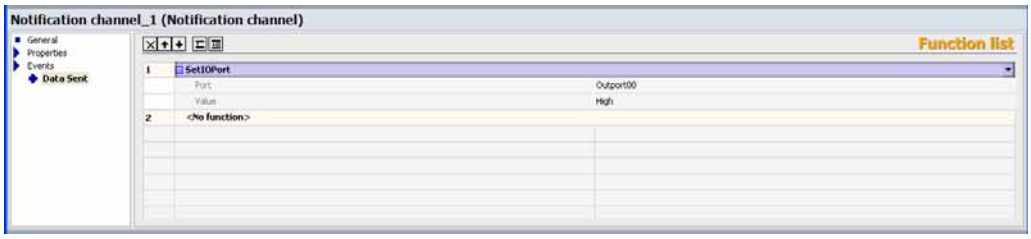


Under "Operational status alarm", you can assign more than one RFID status alarm to the notification channel. You can select these from the drop-down list or create them. You will then receive detailed information regarding the status of the notification channel.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section "Working with alarms".

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

Events



- Data Sent

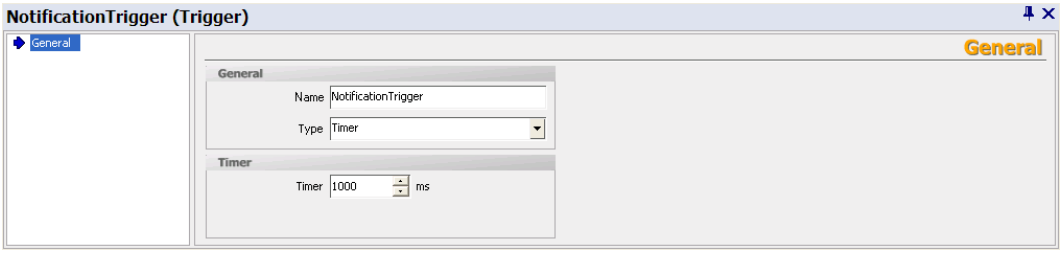
  As soon as data supplied from the data sources are forwarded to the workplace, the trigger is activated. Only the system function "SetIOPort" can be set as a trigger.

Triggers

Triggers represent activation mechanisms that can be used to control asynchronous read and filter procedures. Tag data are read at specific times or the stored tag data can be transferred dependent on triggers. Triggers can be used with data sources (read triggers) and notification channels (notification channel triggers).

The "Trigger" menu provides the following parameter setting options:

General



You can specify the trigger "Type" here and set the following parameters:

Trigger	Description	Parameter settings
Continuous	The activity is activated as soon as possible and operates continuously. The maximum permissible frequency reservation time must be taken into account. For notification channel triggers, this means that notifications are transmitted immediately to the workplace when a new event occurs.	-
I/O edge	The activity is triggered by an external binary signal that specifies a transition: 0 → 1 or 1 → 0 (rising or falling).	The transition for the trigger ("rising" or "falling") must be specified. A digital I/O of the reader must be assigned to the trigger.
I/O signal level	The activity will be activated by an external binary signal as long as the level is Low or High.	The trigger must be set to "Low" or "High". The trigger must be assigned to a digital I/O of the reader.
Application request	The activity is triggered on request from the application (e.g. over the ALE interface, or using the system function "ActivateTrigger").	-
Timer	The activity is triggered in accordance with specified time intervals.	The time ("Timer") between the triggers must be specified in milliseconds.

Events

- **Trigger fired**

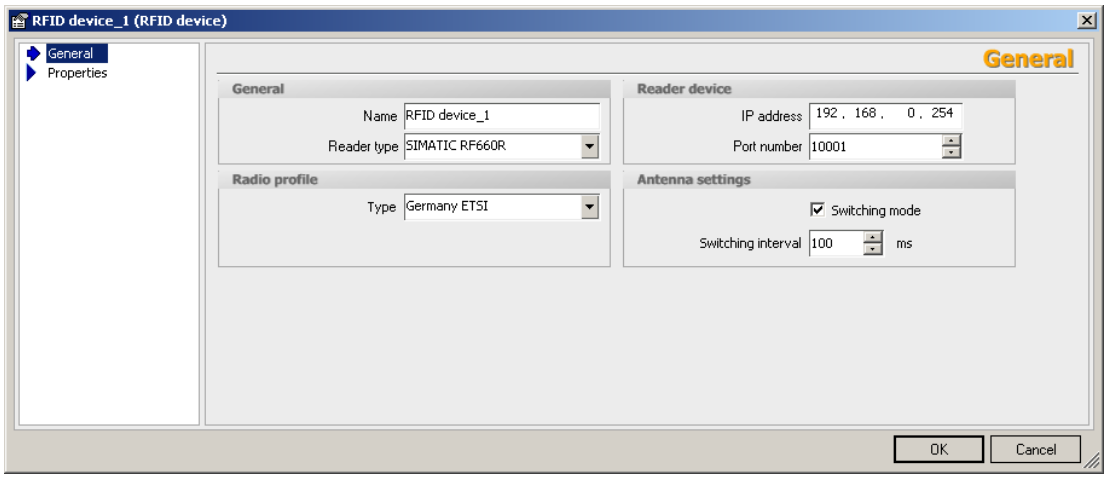
  As soon as a trigger is fired according to its conditions, the function list configured here is triggered. Only the function "SetIOPort" can be used in the list of functions.

3.4.2.2 RF660R

RFID device

The "RFID device" menu provides the following parameter setting options:

General



You can assign a "Name" to the reader and enter the parameter settings made on the *RF660R*. This contains the "IP address" and the "Port number" of the reader as well as the "radio profile" used for the RFID reader.

Note that the "Listen Before Talk" (LBT) procedure with the new ETSI standard EN 302 208 V1.2.1 is no longer supported for RF660R readers V1.3 or higher and the new XML protocol version GR_XML_3.0. The "ETSI SRD" radio profile also no longer applies.

With the new XML messaging version GR_XML_3.0, RF660R readers V1.3 can also be parameterized with the "CHINA" radio profile. The UHF band ranges from 920.125 MHz to 924.875 MHz in 250 kHz channel increments. There are 16 channels up to max. 2 W (ERP) and 20 channels up to max. 0.1 W (ERP).

Further detailed information on radio profiles can be found in the RF600 System Manual, chapter Regulations for frequency bands".

Select the radio profile via the dropdown menu "Type".

The "Antenna switching" option uses "Switching mode" to switch antennas over between transmitting (TX) and receiving (RX) in accordance with the rotation principle. You enter the "Switching interval" in milliseconds.

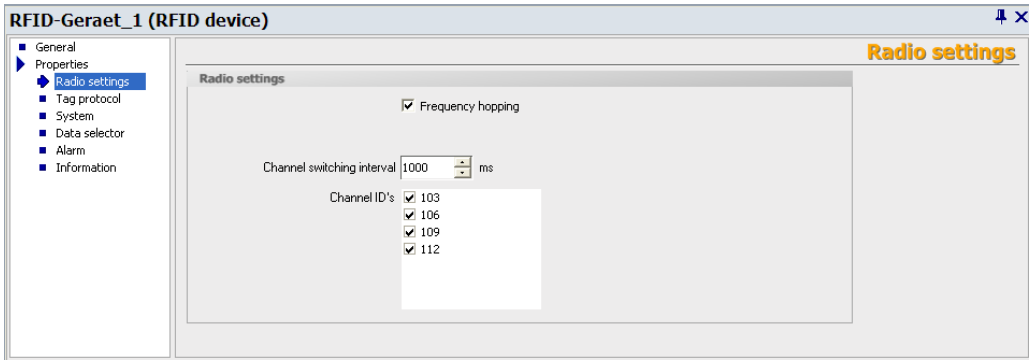
In practice, the "Switching interval" causes the system to transmit on one antenna at one time and to receive on the other antennas. As long as one antenna is receiving further tags, the system continues to transmit on the same transmission antennas until all responding tags have been detected. Afterwards, or if a tag does not respond, the system will activate another antenna as the transmission antenna. After all the antennas have transmitted at least once or if the settling time is too long, the reader will set frequency hopping mode (USA) or channel selection mode (Europe).

In general, it is recommended that the antenna switching option is activated and all connected antennas are set to combined transmit and receive mode (TX/RX) to increase the read probability of tags.

Antenna switching (Page 184)

Properties

- **Radio settings**



If your RFID system is using "Frequency hopping", you can specify the "Channel switching interval" for the reader transmission channels here in milliseconds.

Frequency hopping is used to prevent mutual inference from the readers. If frequency hopping is not activated, you must permanently assign the transmission channel by means of an ID. If the FCC radio profile is used, however, frequency hopping cannot be deactivated.

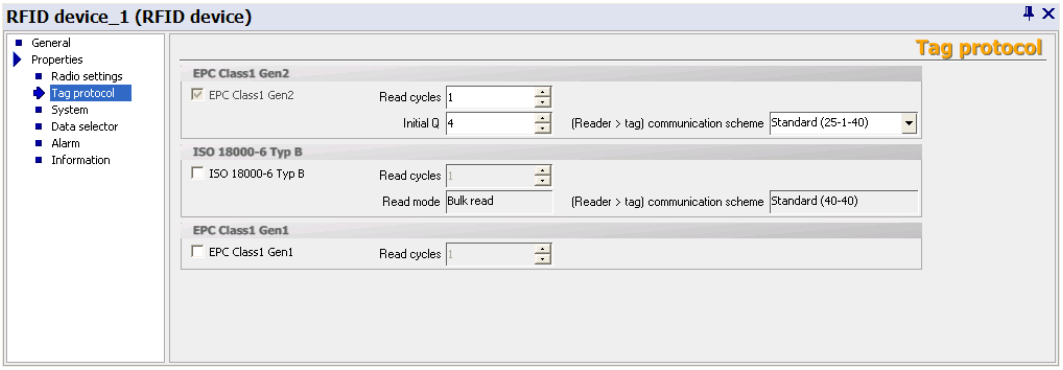
Reader with firmware version up to V1.2 and XML messaging version GR_XML_V2.0:

When the ETSI radio profile is used, frequency hopping automatically causes the Listen Before Talk procedure to be used. The reader checks before transmitting whether a channel is reserved to prevent tag collisions. The reader only transmits when a channel is free. The reader can transmit on this channel for up to 4 seconds and must then either insert a pause of at least 100 milliseconds or hop immediately to an unreserved channel where it can transmit for another 4 seconds.

When frequency hopping is activated, you also have the option of "Send only on even channels". This option ensures that more than one RF660R reader can be operated simultaneously close to each other without interference and the tag read reliability can be increased. This will function correctly provided that the minimum spacings of antennas are complied with. This option is only specified for EPC Class1 Gen2 and does not function with other tag types.

NOTICE
Select "Dense Interrogator" modulation mode If you selected the option "Send only on even channels", in the "Tag protocol" menu, you must select the EPC Class1 Gen2 modulation mode "Dense Interrogator".

- **Tag protocol**



This is where you select the communication protocol to be used between the reader and tag. Depending on the tags used, you can decide between ISO 18000-6 Type B, EPC Class1 Gen1 or EPC Class1 Gen2. More than one communication protocol can be used.

You can also specify the "Number of read cycles". When more than one communication protocol is used, the cycle time can be increased to extend the time that the reader searches for specific tag types taking other tag types into account.
Example: If two tag types are used, ISO and EPC Gen2, the number of read cycles for each of them can be set to 1; so that 50 % of the time, the reader will search for ISO tags and 50 % of the time it will search for EPC Gen2 tags. If the ISO read cycles were set to 3 and the EPC Gen2 read cycles to 1, this would mean that the reader would search for ISO tags for three times as long as for EPC Gen2 tags.

You must also specify the "Read mode". For ISO 18000-6 Type B, you can choose either SINGLE_TAG or BULK_READ.
In SINGLE_TAG mode, the reader is optimized so that it finds a single tag in the field as quickly as possible. When several tags are located in a field, in some cases, after the first tag has been detected by the reader, the others are ignored.
In BULK_READ mode, the reader is set so that it finds all the tags located in the field with the greatest possible probability. This is the default setting.
With EPC Class1 Gen2, you can use "Initial Q" to specify the maximum number of tags that can be expected to be located in the field at the same time, so that collisions can be prevented.
The following formula applies: $2^{\text{Initial Q value}}$ = Number of expected tags
It is important to note here that the length of a read cycle increases with the value of the Initial Q value. Normally this value is automatically set by the readers. If, however, you want to optimize performance, the rule of thumb is that the value must be set as low as possible and as high as necessary.

In "Modulation mode", for ISO and EPC Gen2, set the data transfer rates between the reader and tag.

NOTICE
Option conditional on "Dense Interrogator" for "Send only on even channels" If you have selected the EPC Class1 Gen2 modulation mode "Dense Interrogator", in the "Radio settings" menu, you must select the option "Send only on even channels".

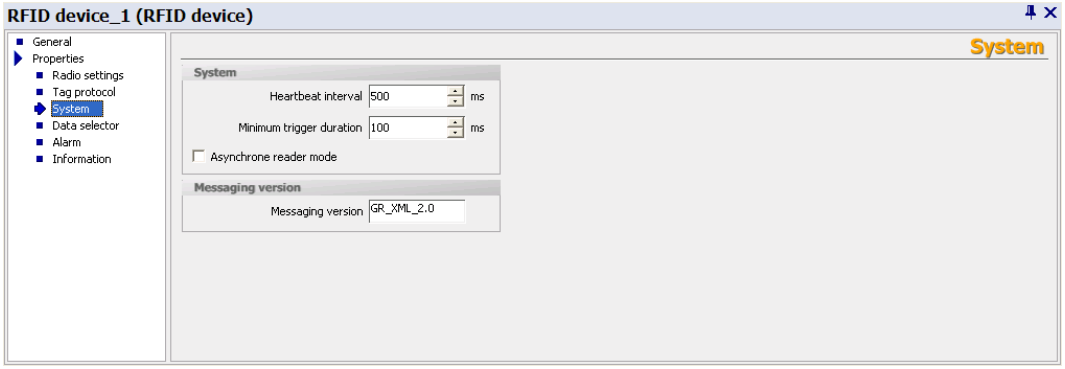
Dense interrogator mode (Page 179)

Tag modulation schemes (Page 179)

See also:

Help system *Understanding and optimizing the scanning of RFID tags*

- **System**



You specify the "Heartbeat interval" in milliseconds here. This describes the time interval between the transmission of the live pings that are exchanged between the RF-MANAGER and the reader. The live pings are used to monitor communication within the RFID system. Short intervals place a higher load on the RFID system but result in faster fault detection.

Under "Minimum trigger duration", you can specify the minimum duration of a complete read cycle. The default value is set to 100 milliseconds and must not be changed for standard scenarios.

Under "Asynchronous reader mode", you can change the operating mode of the reader. In asynchronous reader mode, the reader continuously reads tags that are resent in the field. Even if the same tag is always present in the field, the tag is read again and again and transferred to RF-MANAGER via the interface. Asynchronous reader mode corresponds to the "Trigger mode > Continuous" setting in the "SIMATIC RF660R Configuration Software". When the option is not enabled, the RF660R reader will only read in response to an explicit request or in accordance with the configured trigger conditions.

You use "Asynchronous reader mode" when you want tags to be detected as quickly as possible. In this mode, the software does not provide a trigger because the reader reads autonomously. You will need this function for high-speed processes in which temporary reading pauses are not acceptable.

Note

Preconditions/settings

- Read settings: Set the threshold for "Observed" to 0.
- Set all the participating components, such as notification channels, to continuous triggering.

Note

Only one data source

Please note that you can only parameterize one data source for your reader in asynchronous reader mode. Scenarios with multiple data sources are not permitted!

NOTICE

Network problems and performance problems

In asynchronous reader mode, an extremely large number of tag events are transferred to RF-MANAGER over the network. When a number of readers are operated in asynchronous mode, a narrow network bandwidth can cause problems.

Similarly, when a large number of tag events are processed in RF-MANAGER, problems can occur with the computing performance of your PC.

NOTICE

No asynchronous reader mode in ETSI-SRD mode

In ETSI-SRD mode, the reader should not operate in asynchronous reader mode, because active reading is always performed.

NOTICE

Time delays on reparameterization

In asynchronous reader mode, when a number of tags are located in the field, time delays can occur in the "Configuration" screen object during reparameterization.

Under "Protocol version", the communication protocol is displayed that is used for communication with the reader. The protocol is dependent on the firmware of the reader and can only be changed during a firmware upgrade.

When you create new projects for the RF660R reader in RF-MANAGER 2008, the new XML messaging version GR_XML_3.0 is automatically set. This ensures compatibility with the firmware version V1.3 of the reader. The profile "Dense interrogator" is activated as modulation scheme.

If you open projects created with older RF-MANAGER versions, the readers in these projects initially keep their old XML messaging version. An automatic conversion to GR_XML_3.0 does not take place.

In these projects, however, you can manually convert the XML messaging version of individual RF660R readers from GR_XML_2.0 to GR_XML_3.0. The result is that all channels except for the 4 channels permitted in the 4-channel plan are deactivated for this reader in this project. Therefore, only RF660R readers with firmware version V1.3 are permitted.

Below you will find an overview of the compatibility of XML messaging versions and RF660R reader firmware versions.

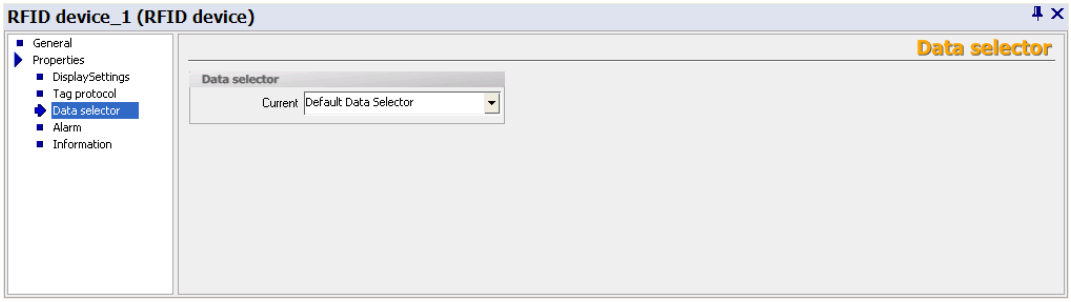
	XML messaging versions	
Reader firmware version	**GR_XML_2.0**	**GR_XML_3.0**
V1.1	X	-
V1.2	Restricted functionality [1)]	-
V1.3	X [2)]	X

[1)] In this case the reader firmware's properties are compatible with firmware V1.1 (e.g. no CHINA radio profile permissible)

[2)] No command parameters may be used that are no longer permitted in firmware V1.3.

NOTICE
Avoidance of faults If you use RF-MANAGER projects with the old XML messaging version GR_XML_2.0, it is your responsibility to configure your project in agreement with the new ETSI standard EN 302 208 V1.2.1. If you do not do that, this may result in problems in the plant and you might infringe radio regulations. Further information on this and on the possible mixed operation of readers according to ETSI EN 302 208 V1.1.1 und V1.2.1 can be found in the RF600 System Manual.

- **Data selector**



You can select the current data selector or define a new data selector here. Please note that the data selector chosen here will only be effective in the following cases:

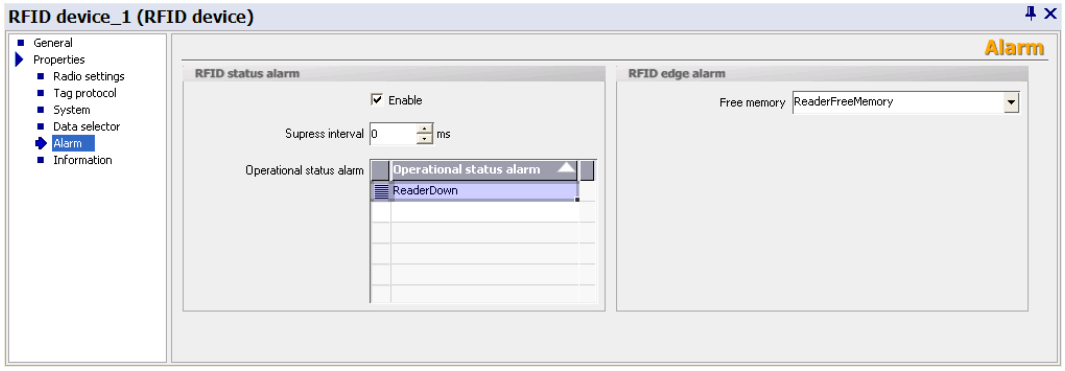
– During synchronous read procedures

– Or for notification channels for which a data selector has not been explicitly selected.

In general, data selectors are components of notification channels and are used with the asynchronous read procedure.

For further information on using data selectors, refer to the section.

- **Alarm**



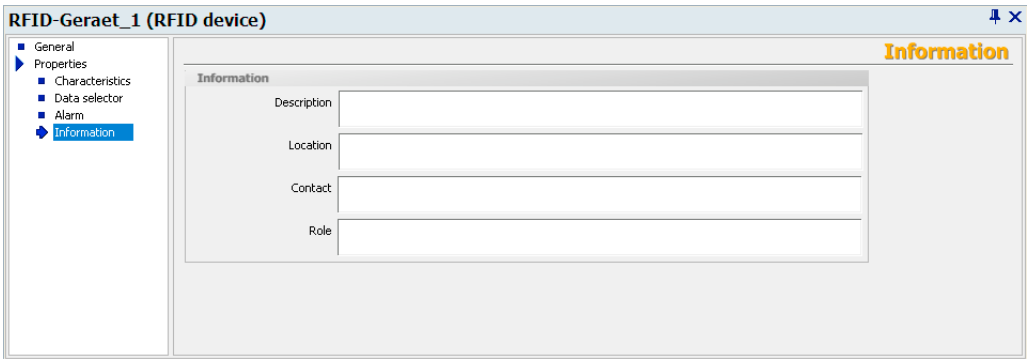
You can select alarms for reader status and available memory here or define them. Under "Operational status alarm", you can assign more than one RFID status alarm to the selected RFID device. You will then receive detailed information regarding the status of the RFID device.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section *Working with alarms*.

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

RFID alarms (Page 302)

- **Information**



You can store descriptions regarding the reader, reader location, responsible contact person(s) and reader role here. This information is displayed in the "Configuration" and "Statistics" views.

Configuration (Page 500)

Statistics view (Page 498)

See also

Overview of the RF-MANAGER architecture (Page 21)

Parameterizing data selectors (Page 275)

Parameterizing tag selectors (Page 271)

Tag modulation schemes

You set the data transfer rate between reader and tag using tag modulation schemes. This parameterization is only possible in the case of tag logs ISO 18000-6 Type B and EPC Class1 GEN2.

ISO 18000-6 type B tag modulation schemes

Tag communication scheme	Reader-tag data rate	Tag-reader data rate	ETSI-compatible	FCC-compatible	China-compatible	ETSI_SRD-compatible
Standard (40-40)	40 kbps	40 kbps	Yes	Yes	Yes	Yes
Low (10-40)	10 kbps	40 kbps	Yes	Yes	Yes	No
High (40-160)	40 kbps	160 kbps	Yes	Yes	Yes	Yes

EPC Class1 GEN2 tag communication schemes

Tag communication scheme	Reader - Tag Tari*	Reader-tag data rate	Link frequency	Tag-reader data rate	ETSI-compatible	FCC-compatible	China-compatible	ETSI_SRD-compatible
Standard (25-1.0-40)	25 µs	26.7 kbps	40 kHz	40 kbps	Yes	Yes	Yes	Yes
Higher rate (12.5-1.0-160)	12.5 µs	53.3 kbps	160 kHz	160 kbps	No	Yes	No	No
Higher rate (12.5-1.0-80)	12.5 µs	53.3 kbps	80 kHz	80 kbps	No	Yes	No	No
Higher rate (25-0.5-160)	25 µs	32 kbps	160 kHz	160 kbps	Yes	Yes	Yes	No
Higher rate (25-1.0-160)	25 µs	26.7 kbps	160 kHz	160 kbps	Yes	Yes	Yes	No
Higher rate (12.5-0.5-160)	12.5 µs	64 kbps	160 kHz	160 kbps	No	Yes	No	No
Higher rate (6.25-1.0-160)	6.25 µs	106.7 kbps	160 kHz	160 kbps	No	Yes	No	No
Higher rate (6.25-0.5-160)	6.25 µs	128 kbps	160 kHz	160 kbps	No	Yes	No	No
Dense (25-1.0-200)	25 µs	26.7 kbps	160 kHz	40 kbps	Yes	Yes	Yes	No
* Tari = Duration for representation of a bit with content 0.								

Dense interrogator mode

The dense interrogator mode for Gen 2 tags enables several readers to be operated without interference in close proximity to each other.

Dense Interrogator Environment mode (DIE mode)

In this mode, tag readability is increased through the application of interference-reducing measures.

DIE mode is only defined for Gen 2 and does not function with other tag types.

Operating principle

When using Gen 2 tags, a so-called Miller subcarrier permits readers located close to one another to use the same frequency. This is achieved by inserting a frequency offset for the signal carrier in the tag (by using a square-wave hybrid signal).

In accordance with EPC Global, only the even channels are used for transmitting in this mode (communications path Reader → Tag); the tag response is on the odd channels as a result of the frequency offset. As a result of the large difference in level between the transmitter channels and the tag response channels, this technology provides great advantages for frequency reuse. However, a prerequisite is that a certain minimum distance, and thus minimum decoupling, is observed between the antennas of adjacent readers.

Antenna alignment and distances

The minimum distance required between antennas using the same frequency depends on the transmitter power set and the antenna alignment.

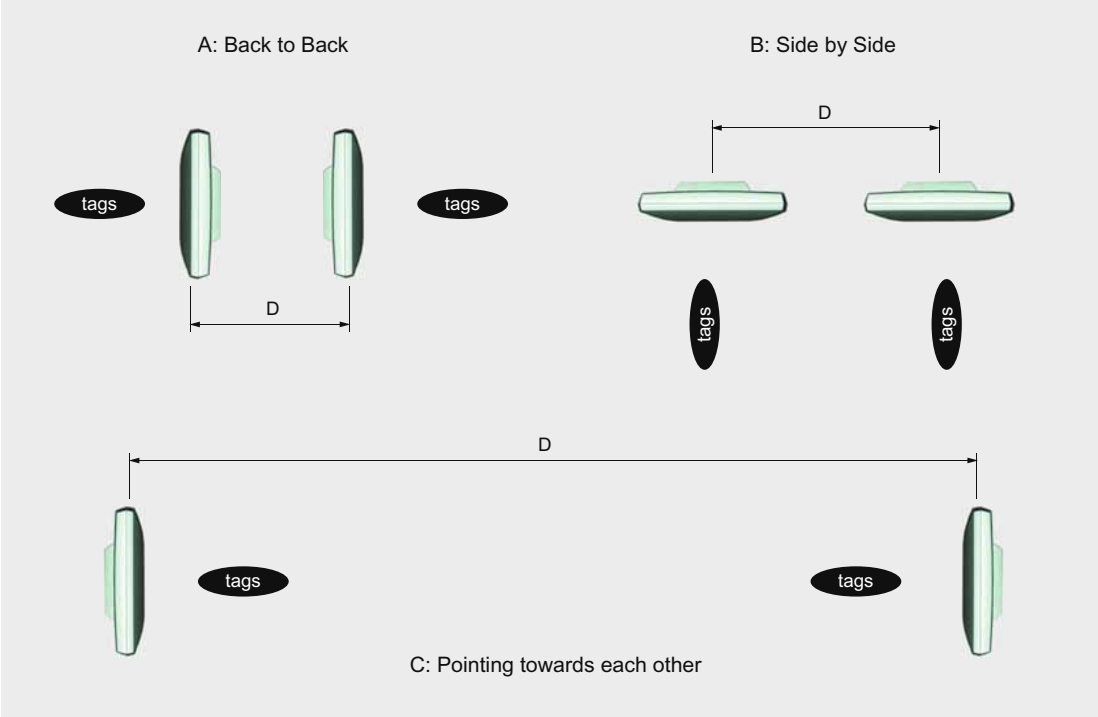


Figure 3-14 Antenna distances

Antenna configuration	Antenna alignment	Minimum distance required = D
A	With backs to each other	1 m
B	Arranged laterally	2 m
C	Antennas point toward each other	5 m

Optimizing tag reading accuracy

A further improvement in the tag reading accuracy in an environment with a high density of readers can be achieved by orienting the antennas toward the respective tag field, i.e. by rotating them horizontally and vertically.

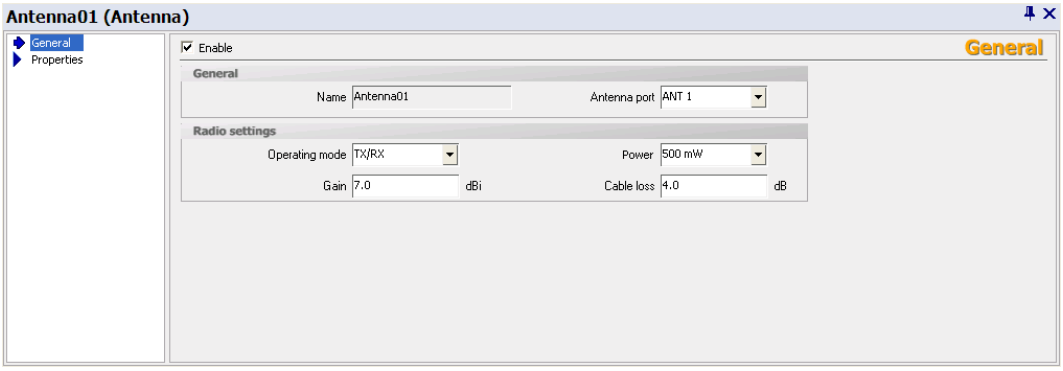
In addition, the transmitter power of the readers can be reduced down to the minimum at which the tags are still just detected accurately.

This greatly reduces the probability of interference.

Antennas

The "Antennas" menu provides the following parameter setting options:

General



In this window, you can specify the radio properties of an antenna. You must specify the "Antenna port" of the reader. If an RF660R is used, Ports 1 to 4 are available. The "Name" of the antenna is automatically assigned.

The maximum "Power" is limited by the radio profile used. The settings for the antenna gain and cable loss parameters are dependent on the hardware used.

The "Operating mode" of each antenna must also be determined in this window: "Transmit only (TX)" / "Receive only (RX)" or "Transmit and receive (TX/RX)". TX/RX is only available if the antenna switching option was activated in the "RFID devices > General" menu. "Transmit only (TX)" is only available when antenna switching is deactivated.

The rules described below are applicable regardless of the number of antennas used:

Rules for antenna switching	
Antenna switching On	At least two antennas must be set to TX/RX and the remaining antennas must be set to RX. No antennas must be set to TX.
Antenna switching Off	Only one antenna can be set to TX; at least one of the other antennas must be set to RX. No antenna can be set to TX/RX.

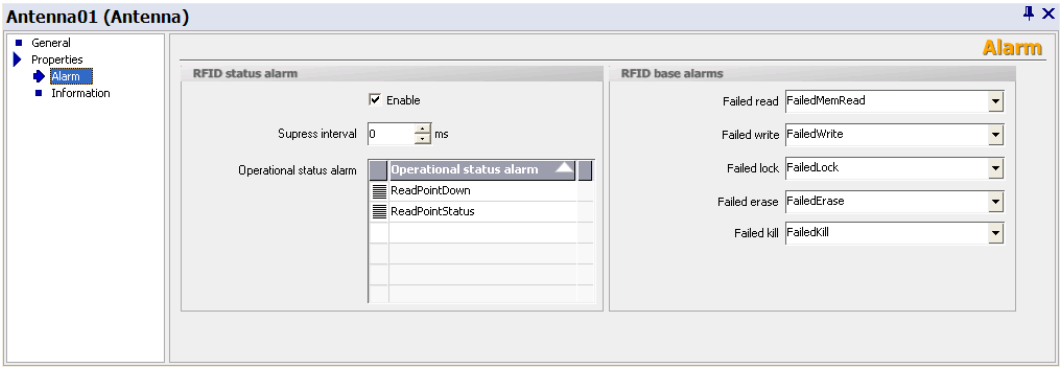
Under "Enable", you can activate the antenna. Alternatively, you can enable the antenna later using the "Configuration" screen object at runtime.
The advantage of the enable option is that the project can be completely configured even when the required hardware is not yet available.

Antenna switching (Page 184)

Transmit power of the antennas (Page 184)

Properties

- **Alarms**

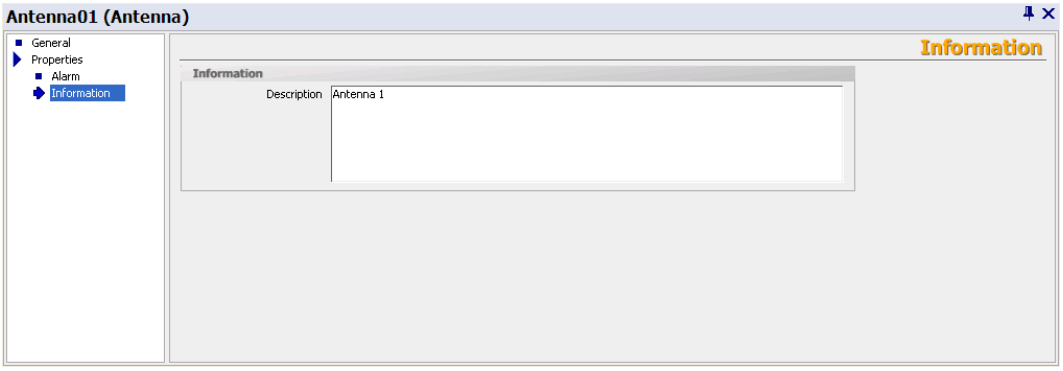


You can assign the "RFID status alarms" and "RFID base alarms" to the antenna here. You can either select them from the drop-down list or create new ones.
Under "Operational status alarms", you can assign several RFID status alarms to the selected antenna. You will then receive detailed information regarding the status of the antenna.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section "Working with alarms".

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

- **Information**



You can store a description of the antenna here. This information is displayed in the "Configuration" and "Statistics View" screen objects.

Configuration (Page 500)

Statistics view (Page 498)

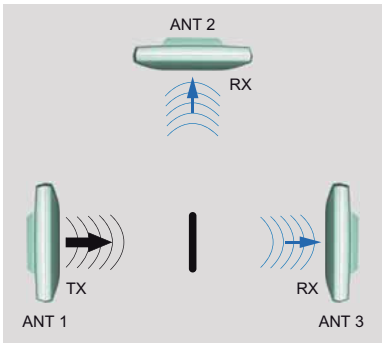
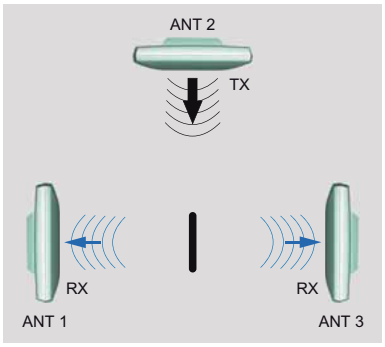
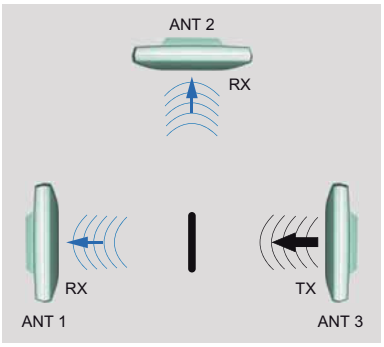
See also

RFID alarms (Page 302)

Antenna switching

To achieve a high probability of reading tags, the "Antenna switching" function has been implemented in the RF660R reader.

During a defined time period, the reader transmits on one antenna and receives on the other. As long as the antenna is receiving signals from further tags, the reader continues to transmit on the same transmitter antenna until all responding tags have been identified. Subsequently, or if no tags respond, the reader activates another antenna as the transmitter antenna. After all the antenna have transmitted at least once and no tag has responded, or when the settling time is excessively long, the reader activates frequency hopping (in the USA) or channel selection (in Europe).

Cycle 1	Cycle 2	Cycle 3
		
Antenna 1 transmits Antennas 2 and 3 receive	Antenna 2 transmits Antennas 1 and 3 receive	Antenna 3 transmits Antennas 1 and 2 receive

Transmit power of the antennas

The maximum transmit power of the antennas is restricted by the radio profile used. Parameterization of antenna gain and cable loss depends on the hardware used.

ETSI radio profile

With the ETSI radio profile, the minimum transmit power is 100 mW ERP, and the maximum is 2000 mW ERP. The set power corresponds to the desired effective radiate power (ERP), and is calculated for the reader based on the entered parameters "Antenna gain" and "Cable loss". The RF660A-EU antenna has a gain of 7 dBi, and a 10 m long LMR-195 cable has a loss of 4 dB. For further antennas and cables, refer to the *RF600 System Manual*

ETSI_SRD radio profile (up to reader firmware V1.2)

With the ETSI_SRD radio profile, the minimum transmit power is 100 mW ERP, and the maximum is 500 mW ERP. The set power corresponds to the desired ERP and is calculated for the reader based on the entered parameters "Antenna gain" and "Cable loss". The RF660A-EU antenna has a gain of 7 dBi, and a 10 m long LMR-195 cable has a loss of 4 dB. For further antennas and cables, refer to the *RF600 System Manual*

FCC radio profile

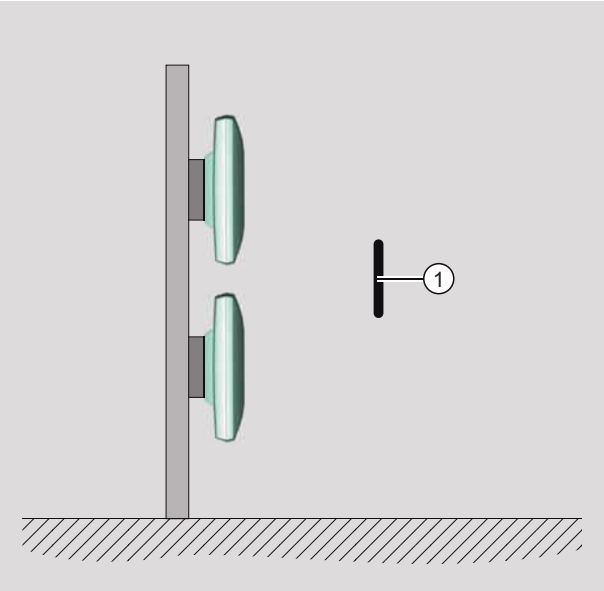
With the FCC radio profile, the minimum transmit power is 100 mW, and the maximum transmit power is 1000 mW. The set power corresponds to the desired signal level on the end of the antenna cable and is calculated for the reader based on the entered parameters "Antenna gain" and "Cable loss". The RF660A-US antenna has a gain of 6 dBi, and a 10-m long LMR-195 cable has a loss of 4 dB. For further antennas and cables, refer to the *RF600 System Manual*

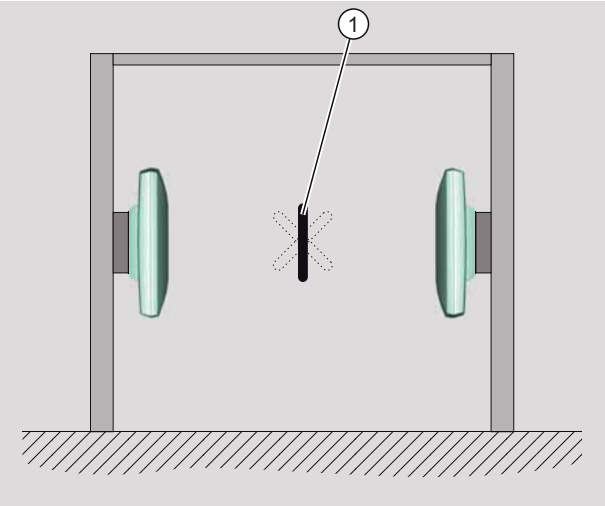
China radio profile

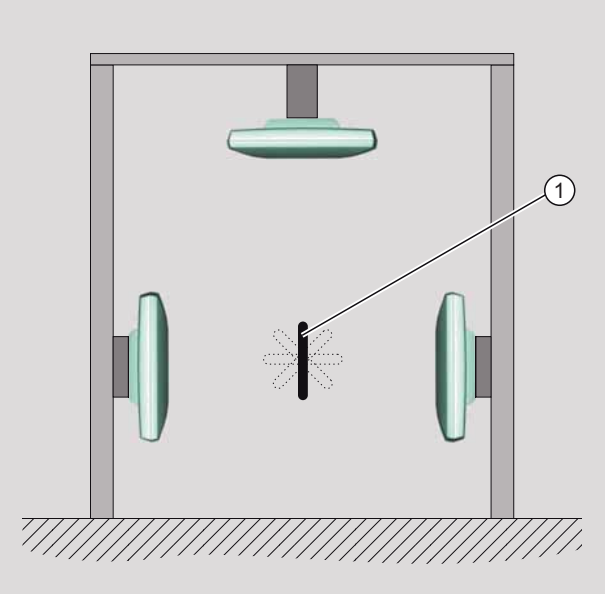
With the China radio profile, the minimum transmit power is 100 mW ERP, and the maximum transmit power is 2000 mW ERP. The set power corresponds to the desired effective radiate power (ERP), and is calculated for the reader based on the entered parameters "Antenna gain" and "Cable loss". The RF660A-US antenna has a gain of 6 dBi, and a 10 m long LMR-195 cable has a loss of 4 dB. For further antennas and cables, refer to the *RF600 System Manual*

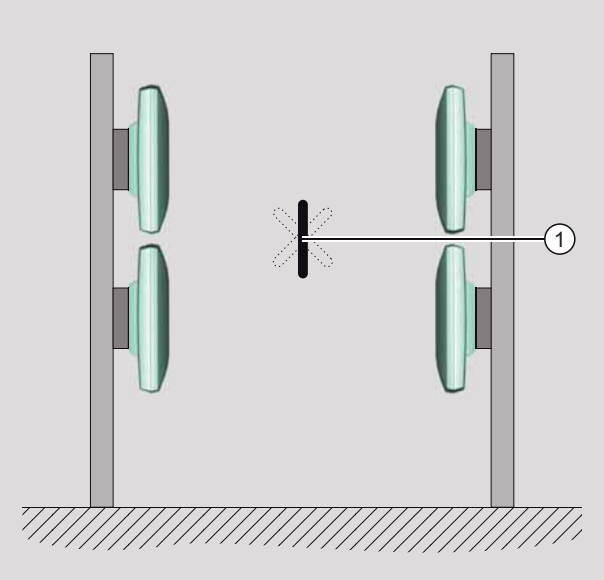
Antenna configurations

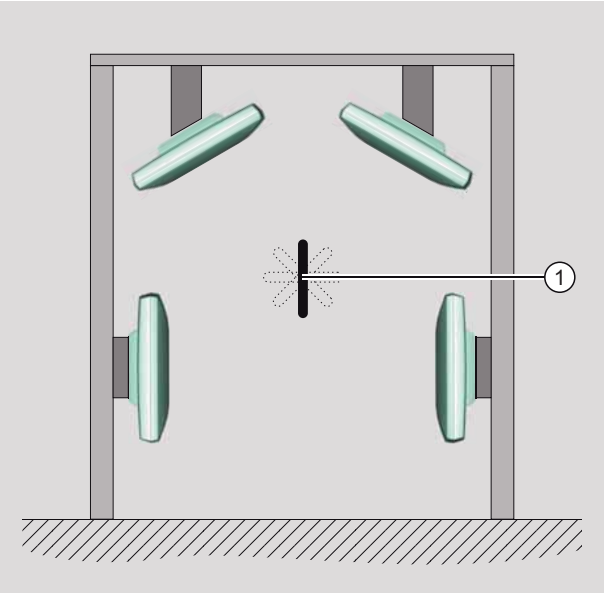
Some basic antenna configurations and possible fields of application are shown below.

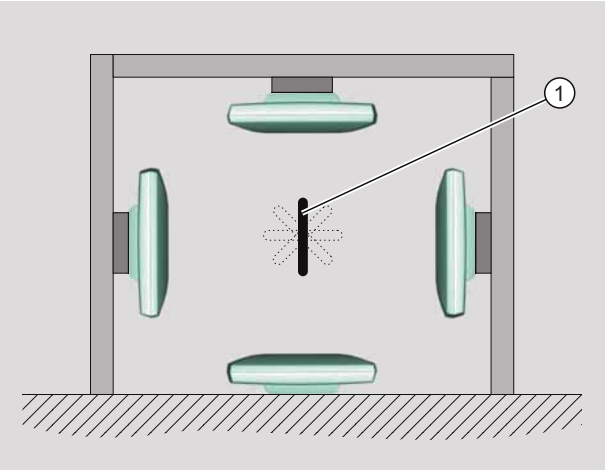
Antenna configuration 1	Description/application areas
	This arrangement of antennas is appropriate when the tags to be read are only located on one side of the items to be identified, e.g. when pallets are to be identified on which the tags to be read must be on a prespecified side. ① Tag

Antenna configuration 2	Description/application areas
	Preferred application: For the identification of goods at loading portals. The tag is located in the field of radiation of two antennas; for reliable tag reading, the height of the tag above floor level must therefore be known with reasonable accuracy. ① Tag

Antenna configuration 3	Description/application areas
	Preferred application: For the identification of goods at loading portals. Similar to configuration 2, but with additional reading reliability when the tag is at an angle to the vertical. ① Tag

Antenna configuration 4	Description/application areas
	Preferred application: For the identification of goods at loading portals. The tag is located in the field of radiation of all four antennas, so the tag position can vary more than in configuration 2 for reliable tag identification. ① Tag

Antenna configuration 5	Description/application areas
	Preferred application: For the identification of goods at loading portals. Similar to configuration 4, but the reliability of tag identification is improved as a result of the four antennas at separate locations, so the tag position is not critical. ① Tag

Antenna configuration 6	Description/application areas
	This tunnel configuration is suitable for conveyor belt applications. The goods with the tags to be read are moving forwards on a conveyor belt but the alignment of the tags relative to the antennas is not clearly defined. One of the antenna is located on the floor and radiates vertically upwards in the direction of the conveyor belt. A relatively high reading reliability is achieved due to the use of four antennas. ① Tag

Specified spacing of antennas

Specified minimum spacing of antennas

The following diagram shows the specified minimum and maximum spacings for mounting antennas.

A minimum spacing of 50 cm is necessary between the antenna and liquids or metals. The distance between the antenna and the floor should also be at least 50 cm.

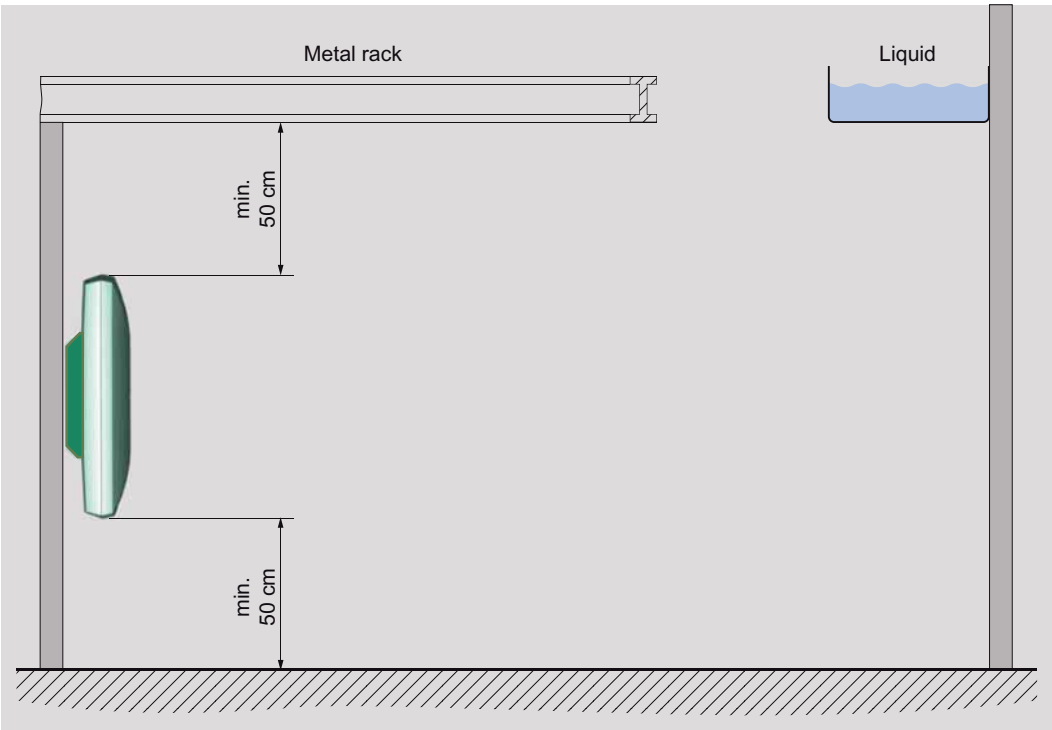


Figure 3-15 Minimum distance to the environment

The distance between two antennas mounted alongside each other or one above the other should be at least 20 cm, but a distance of more than 50 cm is better.

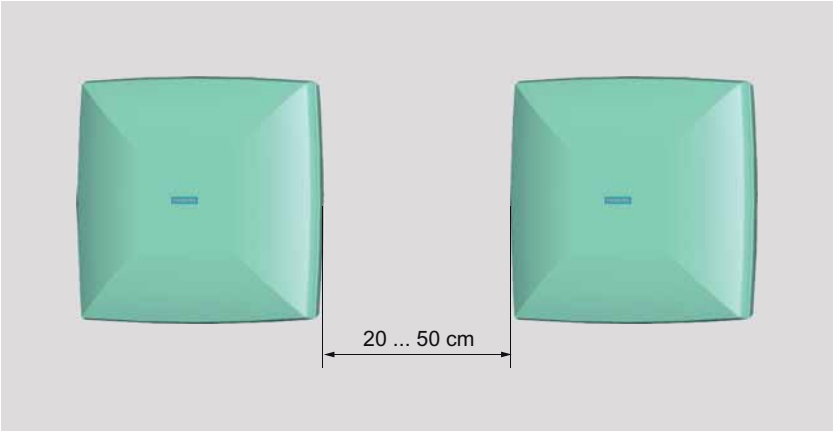


Figure 3-16 Antennas mounted adjacently horizontally or vertically

For a portal configuration, the distance between two antennas that are connected to the same reader is up to 3.5 m (in Europe) or 4 m (in the USA).

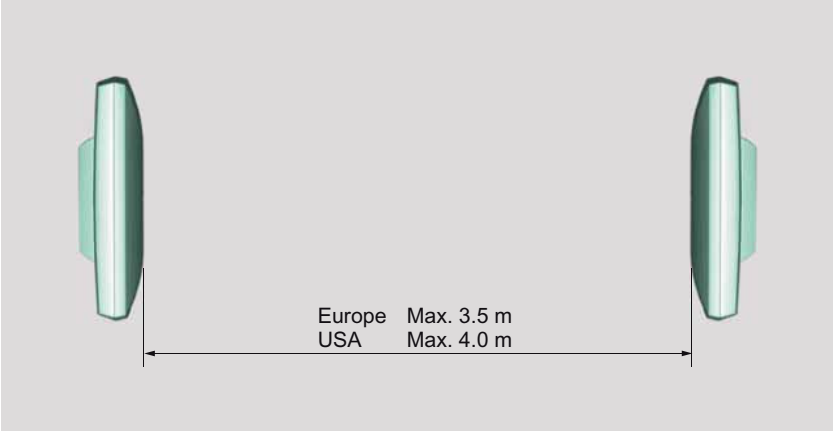
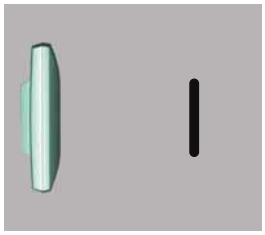


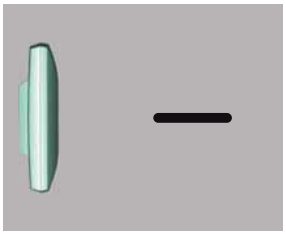
Figure 3-17 Portal configuration, maximum distance

The specified distances are recommended minimum or maximum values for configuration.

Tag orientation in space

The alignment of the tag antenna to the antenna of the reader affects the reading range. For maximum performance and to achieve the maximum reading range, the tag antenna should therefore be aligned in parallel with the reader antenna:

Parallel tag alignment	Large reading range
	Maximum probability of identification of tags.

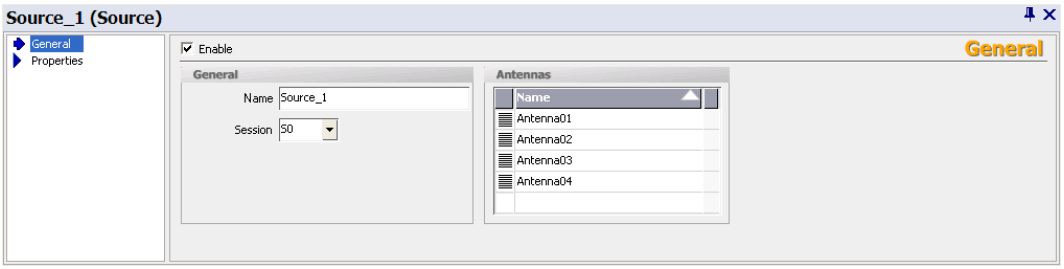
Vertical tag alignment	Minimal reading range
	Minimum probability of identification of tags.

Data sources

Data sources read the data from logically associated antennas. The data sources pass on the data that are read from the antennas assigned to them.

The "Data sources" menu provides the following parameter setting options:

General



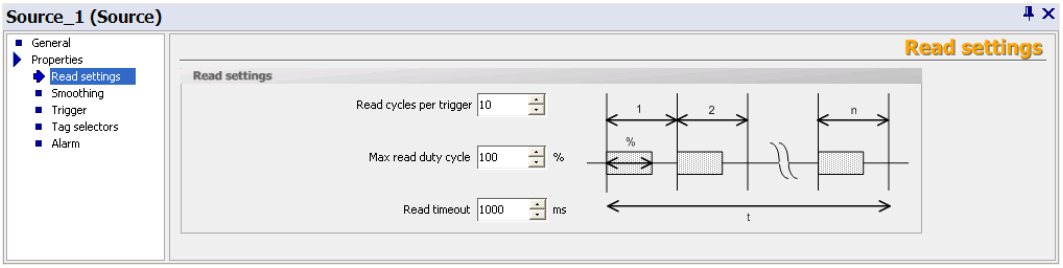
You can assign a name to the data source using the parameter "Name". Under "Antennas", you can assign the antennas that are available to the data source.

If you selected EPC Class1 Gen2 as the communication protocol between the reader and the tags, you must specify the session parameters for the data source. One tag can communicate with up to 4 data sources simultaneously, so to distinguish between these data sources, a unique number S0 to S3 and SL is assigned to each via the session parameters.

Under "Enable", you can activate the data source. Alternatively, you can enable the data source using the "Configuration" screen object at runtime.

Properties

- **Read settings**



You specify the number of "Read cycles per trigger" here.

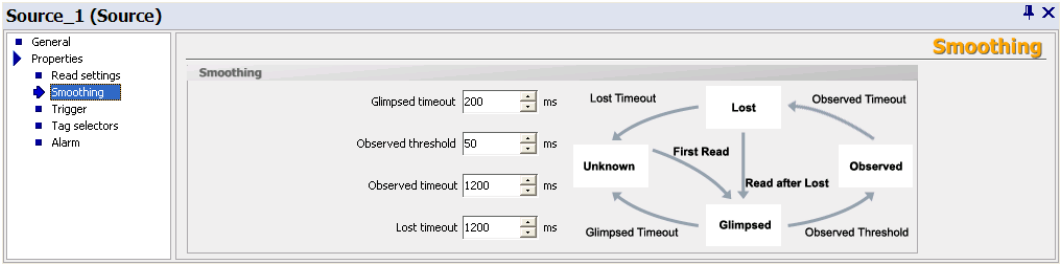
Under "Maximum read duty cycle", you specify a percentage that provides information on the length of time for which the antenna of a reader is permitted to be switched on; this feature serves to reduce the radio interference.

The "Read timeout" specifies in milliseconds how long the specified number of read cycle per trigger is permitted to take. When this time limit is exceeded, the read cycles are stopped even if the number of cycles that you specified has not been reached.

For more detailed information and general background information, please refer to:

Help system *Getting started > Understanding and optimizing the scanning of RFID tags*

- **Smoothing**



Smoothing is a technique that is used to optimize the read quality. The RF-MANAGER adds a status indication for the tags to the read results.

In this window, you specify the parameters for the status indication for the tags. Here you can specify times that have an effect on the status transitions.

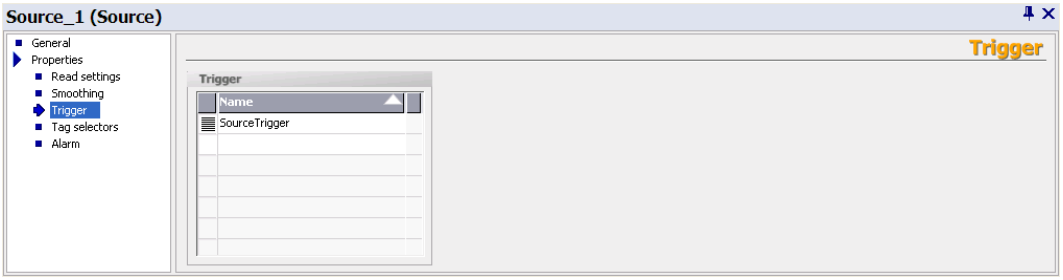
The different statuses are described below:

Status	Meaning	Description
Unknown	Unknown	The tag has this status before communication is established with the reader.
		Data selector event "Purged": Status "Unknown" is achieved due to "Lost timeout".
Glimpsed	Briefly detected	This status is assigned to the tag when it is read for the first time. Two times are activated: "Glimpsed timeout": If communication is established briefly and unintentionally, when the time "Glimpsed timeout" has elapsed, the status changes back to "Unknown". The tag is removed from the tag list. This is used to remove tags that have been briefly detected in the boundary areas of the reader. The rule of thumb is that "Glimpsed timeout" should be at least twice as long as a complete read cycle. "Observed threshold": If a stable connection exists beyond the time "Observed threshold", the status "Observed" is assigned to the tag. The rule of thumb is that "Observed threshold" should be at least twice as long as one complete read cycle.
		Data selector event "New": The status "Glimpsed" was achieved from status "Unknown" for the first time.
Observed	Reliably detected	An interruption in the communication that is shorter than the set time "Observed timeout" has no effect on the current status. This time interval can be used to suppress temporary interference. The rule of thumb is that "Observed timeout" must be twice as long as one complete read cycle. When the times of the read triggers are set longer than the "Observed timeouts", there is a danger that tags that remain stationary in the field will be lost.
Lost	Lost	When a tag exits the field of the reader, the status "Lost" will be assigned to it after the time "Observed timeout" has elapsed. If communication is established again, the status "Glimpsed" will be assigned again immediately. The "Unknown" status is activated if communication is not established before the time "Lost timeout" elapses. The rule of thumb is that "Lost timeout" must be at least twice as long as one complete read cycle.

For more detailed information and general background information, please refer to:

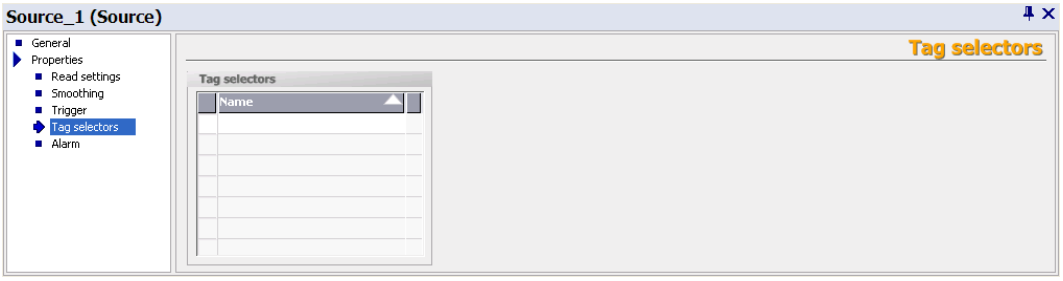
Help system *Understanding and optimizing the scanning of RFID tags*

- **Triggers**



You specify the read triggers here. They cause the data source to read the data from the tags that are located in the antenna field. You can select the triggers from the drop-down list or define them yourself.

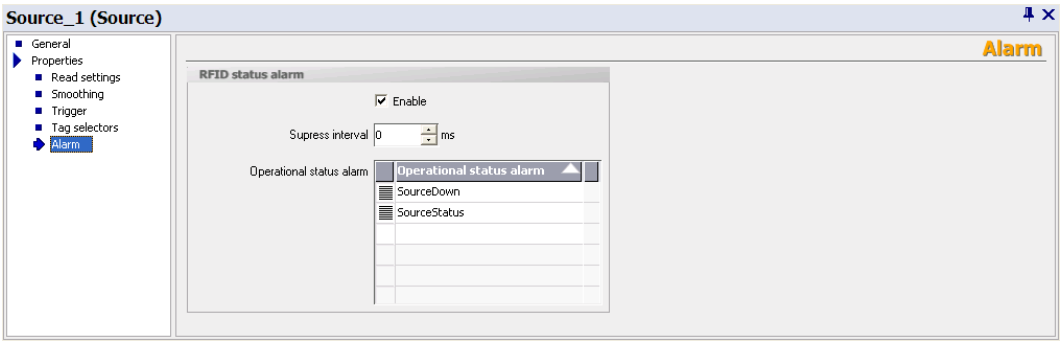
- **Tag selectors**



You assign tag selectors to the data source here. You can select the selectors from the drop-down list or define them yourself. The data to be read and filtered is specified here. If a selector is not entered here, the tag IDs will be supplied from all tags.
For further information on the mode of operation of tag selectors, see

Parameterizing tag selectors (Page 271)

- **Alarm**



Under "Operational status alarm", you can assign more than one RFID status alarm to the data source. You can select these from the drop-down list or create them. You will then receive detailed information regarding the status of the data source.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section "Working with alarms".

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

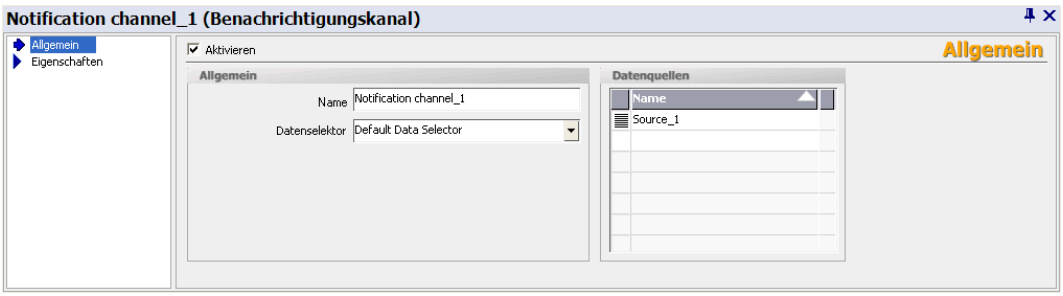
RFID alarms (Page 302)

Notification channels

The notification channels pass on the RFID data of the data sources assigned to it in accordance with the configured triggering mechanism and the data selector to its workplaces.

The "Notification channels" menu provides the following parameter setting options:

General



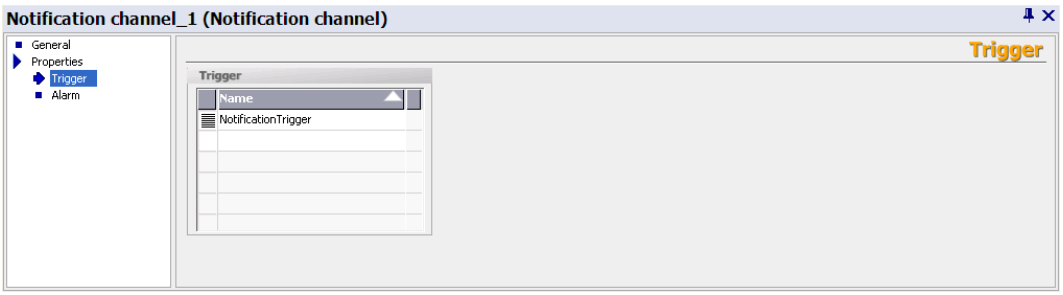
You can assign a name to the notification channel and assign a "Data selector" and one or more "Data sources" to it. You can define the data selector and the data source(s) yourself or select them from a drop-down list.

If a data selector is not defined for the notification channel, the data selector will automatically be used that was defined as current in the "Data selectors" submenu on the RFID device.

Under "Enable", you can activate the notification channel. Alternatively, you can activate the notification channel in the "Configuration" view at runtime.

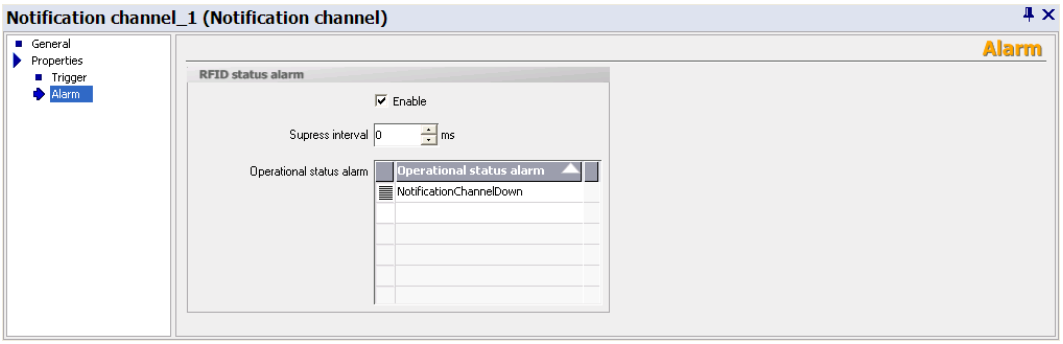
Properties

- **Triggers**



You can specify here whether the events received from the data sources should be transmitted **continuously** or whether they should be passed on dependent on the notification channel trigger. You can select these triggers from the drop-down list or create them. When you define the triggers, you can also specify when they will be activated.

- **Alarm**



Under "Operational status alarm", you can assign more than one RFID status alarm to the notification channel. You can select these from the drop-down list or create them. You will then receive detailed information regarding the status of the notification channel.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section "Working with alarms".

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

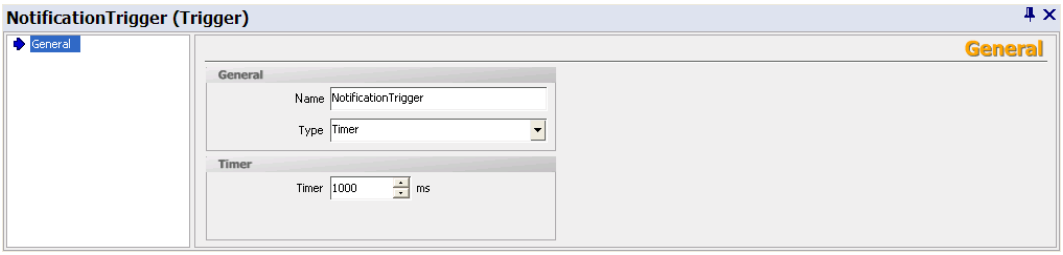
Triggers

Triggers represent activation mechanisms that can be used to control asynchronous read and filter procedures. Tag data are read at specific times or the stored tag data can be transferred dependent on triggers. Triggers can be used with data sources (read triggers) and notification channels (notification channel triggers).

Triggers can also be activated using the system function "ActivateTrigger" independently of these settings; in addition to the triggering conditions configured for the trigger. When this function is used, for example, for changing the value of a variable, a trigger can be activated by a change in value in the PLC. Depending on the configuration, this trigger causes the data sources to be read.

The "Trigger" menu provides the following parameter setting options:

General



You can specify the trigger "Type" here and set the following parameters:

Trigger	Description	Parameter settings
Continuous	The activity is activated as soon as possible and operates continuously. The maximum permissible frequency reservation time must be taken into account. For notification channel triggers, this means that notifications are transmitted immediately to the workplace when a new event occurs.	-
I/O edge	The activity is triggered by an external binary signal that specifies a transition: 0 → 1 or 1 → 0 (rising or falling).	The transition for the trigger ("rising" or "falling") must be specified. A digital I/O of the reader must be assigned to the trigger.
I/O signal level	The activity will be activated by an external binary signal as long as the level is "Low" or "High".	The trigger must be set to "Low" or "High". The trigger must be assigned to a digital I/O of the reader.
Application request	The activity is triggered on request from the application (e.g. over the ALE interface, or using the system function "ActivateTrigger").	-
Timer	The activity is triggered in accordance with specified time intervals.	The time ("Timer") between the triggers must be specified in milliseconds.

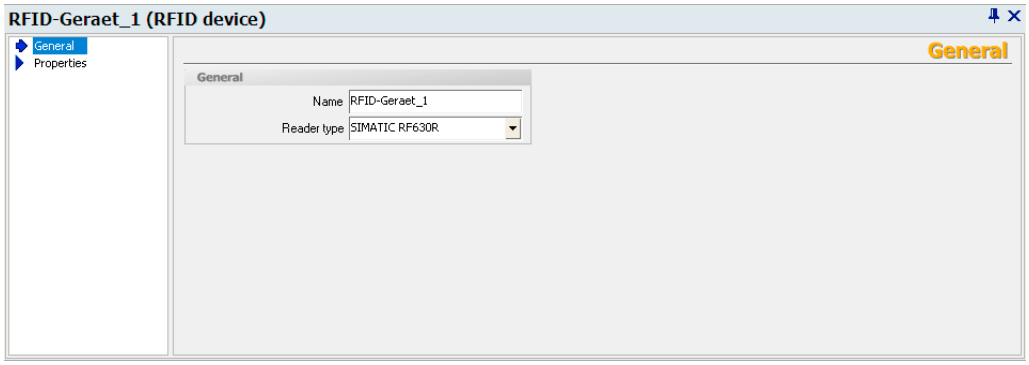
3.4.3 RF620R/RF630R/RF300 systems

3.4.3.1 RFID device

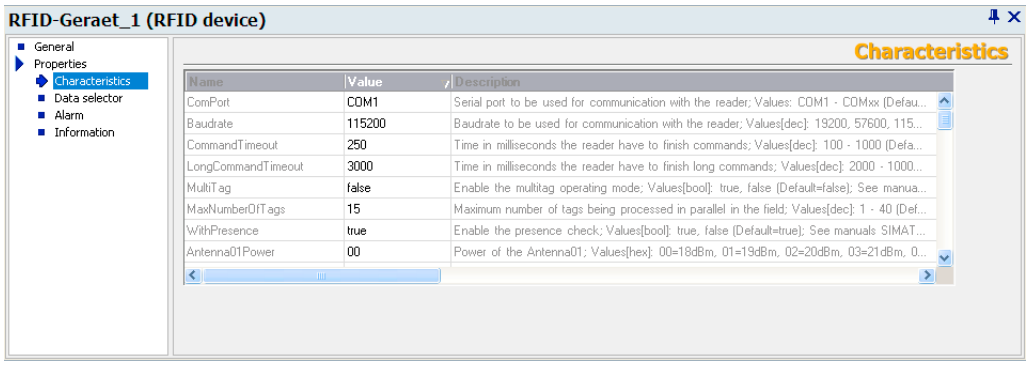
The "RFID device" menu provides the following parameter setting options:

General

Here you can select the Reader type and assign a name to the reader.



Properties



Under "Properties" you can enter the parameters of the readers.

The parameters are entered in plain text form. The parameters in the Engineering System are not language-dependent. The parameters and their possible values are shown below. Please note that not all parameters are available to all readers.

More detailed information on the significance of the parameters can be found in the RF620R/RF630R Parameterization Manual, the RF300 Product Information, and the manuals for the individual function blocks.

- **Parameters for RF300 readers**

Parameter	Value range	Default	Description
ComPort	COM1 ... COM xx	COM1	Serial interface to be used for communication with the reader.
Baudrate	Decimal value: 19200, 57600, 115200	115200	Baud rate to be used for communication with the reader.
CommandTimeout [1]	Decimal value: 20 ... 1000	100	Time in milliseconds in which the reader must process commands.
LongCommandTimeout	Decimal value: 2000 ... 10000	3000	Time in milliseconds in which the reader must process long commands.
RF300Enabled	Boolean value: true or false	true	Activates the RF300 protocol on the air interface (transponder), see MOBY manuals, parameter "field_ON_time"
Iso15693Enabled	Boolean value: true or false	false	Activates the ISO15693 protocol on the air interface (transponder), see MOBY manuals, parameter "field_ON_time
IsoTagType	Hexadecimal value: 01 ... 07	01	Type of ISO tag used • 01 hex = Manufacturer-independent tag • 03 hex = ISO my-d(Infineon SRF 55V10P) • 04 hex = ISO(Fujitsu MB89R118) • 05 hex = ISO I-Code SLI(NXP SL2 ICS20) • 06 hex = ISO Tag-it HFI(Texas Instruments) • 07 hex = ISO (ST LRI2K), see MOBY manuals, parameter "field_ON_time"
WithPresence [2]	Boolean value: true or false	false	Activates presence control, see MOBY manuals, parameter "MDS_control"
RFID AntennaPower	Hexadecimal value: 02 ... 08	05	Antenna performance • 02 hex = 0.5 W • 03 hex = 0.75 W • 04 hex = 1.0 W • 05 hex = 1.25 W • 06 hex = 1.5 W • 07 hex = 1.75 W • 08 hex = 2.0 W See MOBY manuals, parameter "distance_limiting"
ResetOfLed	Boolean value: true or false	true	Activates restart of the ERR-LED, see MOBY manuals, parameter "option_1"
HeartBeatInterval	1000 ... 20000	2000	Time in milliseconds in which the heartbeat is sent to the reader.

Parameter	Value range	Default	Description
scanning_time	Hexadecimal value	00	Expert settings for air interface, see MOBY manuals, parameter "scanning_time"
field_ON_control	Hexadecimal value	00	Expert settings for air interface, see MOBY manuals, parameter "field_ON_control"

1) If errors in communications or in writing data to the transponder occur sporadically, it may be necessary to increase the value for CommandTimeout. This is necessary if several protocols are simultaneously activated or if larger data amounts are written to ISO transponders (typical value: 300).

2) If presence is activated (WithPresence = true), only one protocol may be activated (either RF300enabled or Iso15693Enabled)

- **Parameters for RF620R/RF630R readers**

Parameter	Value range	Default	Description
ComPort	COM1 ... COM xx	COM1	Serial interface to be used for communication with the reader.
Baudrate	Decimal value: 19200, 57600, 115200	115200	Baud rate to be used for communication with the reader.
CommandTimeout	Decimal value: 100 ... 1000	250	Time in milliseconds in which the reader must process commands.
LongCommandTimeout	Decimal value: 2000 ... 10000	3000	Time in milliseconds in which the reader must process long commands.
MultiTag	Boolean value: true or false	false	Activates MultiTag mode, see MOBY manuals, parameter "MOBY_mode"
MaxNumberofTags	Decimal value: 1 ... 40	15	Maximum number of tags in the field that can be processed in parallel. See MOBY manuals, parameter "Multitag"
WithPresence	Boolean value: true or false	true	Activates presence control, see MOBY manuals, parameter "MDS_control"
Antenna01Power	Hexadecimal value: 00 ... 0F	00	Performance of Antenna 01 0 ≙ 18 dBm (65 mW) 1 ≙ 19 dBm (80 mW) ... 9 ≙ 27 dBm A(...F) ≙ 27 dBm (500 mW)
Antenna02Power	Hexadecimal value: 00 ... 0F	00	Performance of Antenna 02 0 ≙ 18 dBm (65 mW) 1 ≙ 19 dBm (80 mW) ... 9 ≙ 27 dBm A(...F) ≙ 27 dBm (500 mW)

Parameter	Value range	Default	Description
RadioProfile	Hexadecimal value: 01 ... 05	01	Radio profile according to EPC Global 00 hex = no standard selected • 01 hex = autodetect: Default profile depending on reader type (ETSI, FCC) For ETSI readers: ETSI new: EU, EFTA, and Turkey ETSI EN 302 208 V1.2.1 (4-channel plan) • 02 hex = ETSI new: EU, EFTA, and Turkey correspond to the standard ETSI EN 302 208 V1.2.1 (4-channel plan) • 03 hex = ETSI old: EU, EFTA, and Turkey correspond to the standard ETSI EN 302 208 V1.1.2 • 04 hex = FCC (e.g. USA, Canada) • 05 hex = China
Channels	Hexadecimal value: 00 ... 0F	00 (all channels on)	Defines the active channel • Bit 0=865.7 MHz • Bit 1=866.3 MHz • Bit 2=866.9 MHz • Bit 3=867.5 MHz See MOBY manuals, parameter "field_ON_time"
ResetofLeds	Boolean value: true or false	true	Activates restart of the ERR-LED, see MOBY manuals, parameter "option_1"
HeartBeatInterval	1000 ... 20000	2000	Time in milliseconds in which the heartbeat is sent to the reader.
field_ON_control	Hexadecimal value	02	Expert settings for air interface, see MOBY manuals, parameter "field_ON_control"

Note

For the RF620R/RF630R readers and all RF300 readers, the antenna performance must be set in the properties table. The value under the antenna tab is not relevant.

In general, in the overview of all readers many properties are shown that are only relevant for the RF670R/RF660R and RF610M readers. Properties that cannot be set for the RF620R/RF630R and all RF300 readers are ignored.

See also

RFID device (Page 170)

Operating modes with serial readers

The following operating modes are supported:

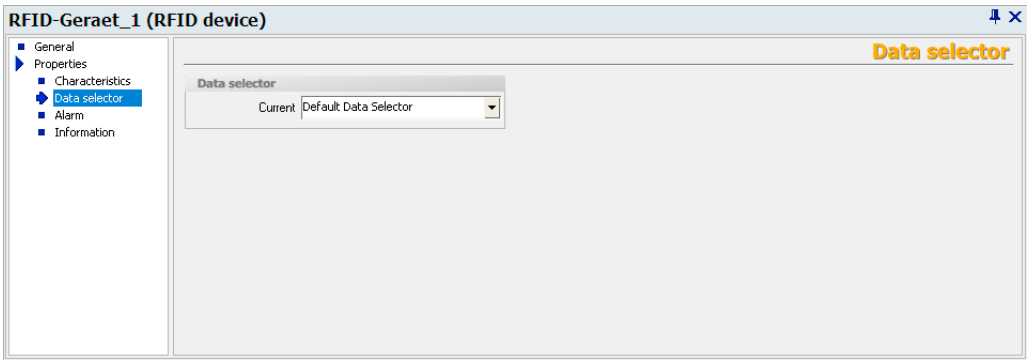
- Single tag without presence
  Continuous cyclic reading from the RF-MANAGER takes place.
- Single tag with presence
  Cyclic reading from the RF-MANAGER only takes place after a reader presence message has been received.
- MultiTag without presence (only RF620R/RF630R)
  Continuous cyclic reading from the RF-MANAGER takes place.
- MultiTag with presence (only RF620R/RF630R)
  Cyclic reading from the RF-MANAGER only takes place after a reader presence message has been received.

In all operating modes, the RF300 readers provide 8 bytes for the tag ID. The RF620R/RF630R readers provide 12 bytes for the tag ID to the RF-MANAGER.

Note

The activation of the operating mode with presence (WithPresence = true) causes commands to be sent only to the reader if at least one tag is in the field.

- **Data selector**



You can select the current data selector or define a new data selector here. Please note that the data selector chosen here will only be effective in the following cases:

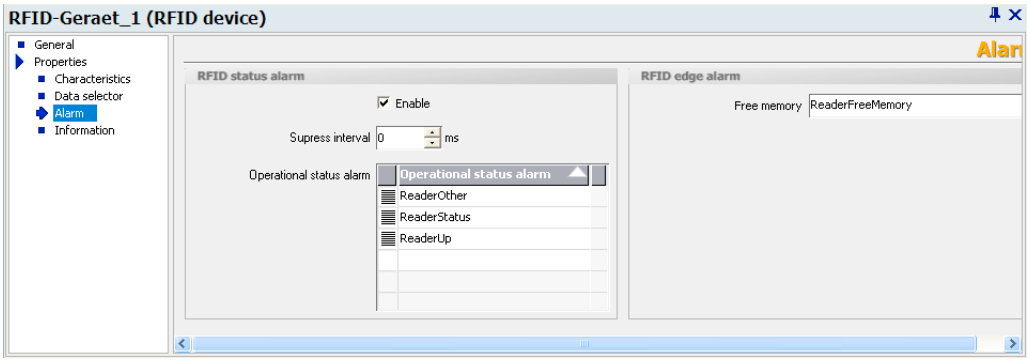
– During synchronous read procedures

– Or for notification channels for which a data selector has not been explicitly selected.

In general, data selectors are components of notification channels and are used with the asynchronous read procedure.

For further information on using data selectors, refer to the section.

- **Alarm**

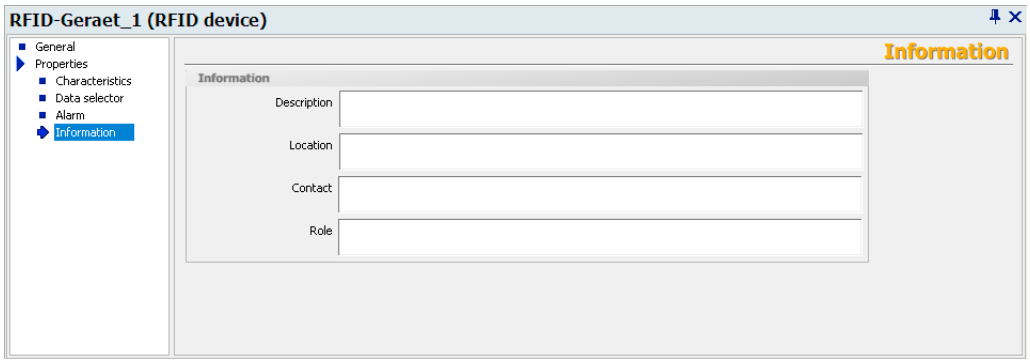


You can select alarms for reader status and available memory here or define them. Under "Operational status alarm", you can assign more than one RFID status alarm to the selected RFID device. You will then receive detailed information regarding the status of the RFID device.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section *Working with alarms*.

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

- **Information**

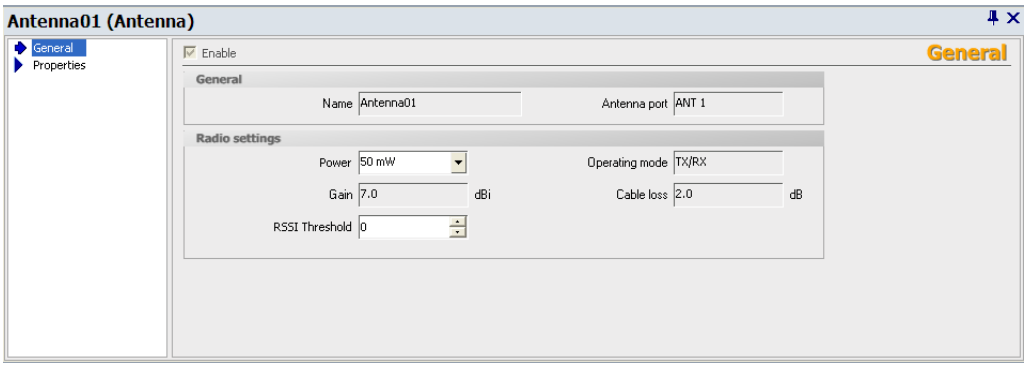


You can store descriptions regarding the reader, reader location, responsible contact person(s) and reader role here. This information is displayed in the "Configuration" and "Statistics" views.

3.4.3.2 Antennas

The "Antennas" menu provides the following parameter setting options:

General

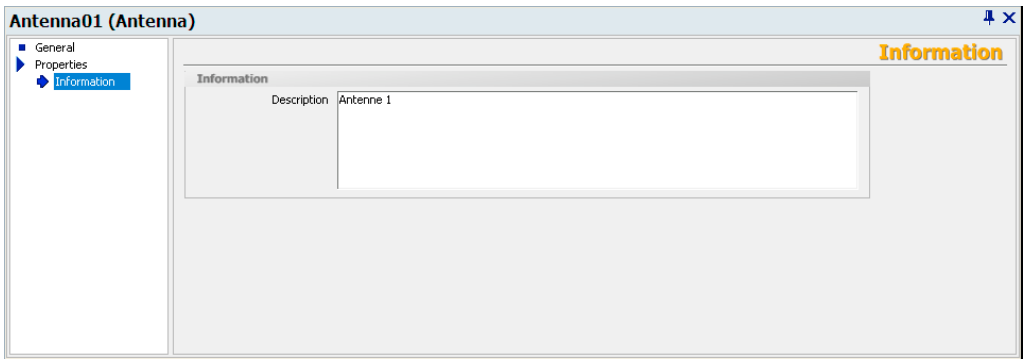


There are no setting options in the "General" dialog. The "Name" of the antenna is automatically assigned.

This performance of the antenna can be set under RFID device > Properties > Characteristics.

Properties

- **Information**



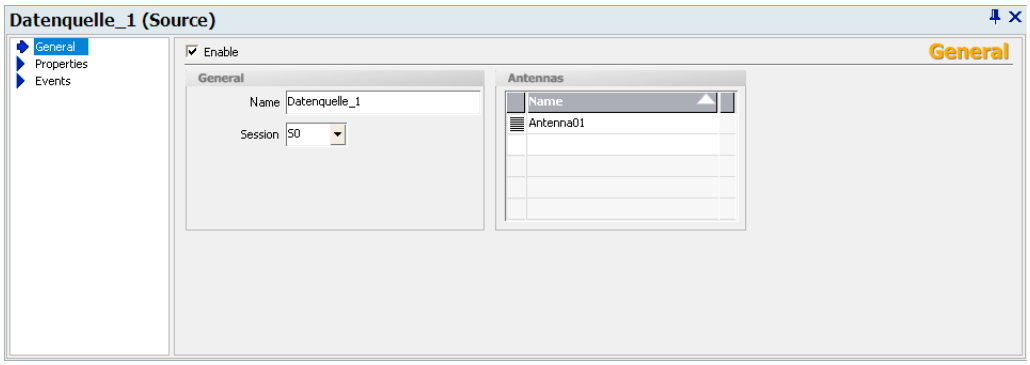
You can store a description of the antenna here. This information is displayed in the "Configuration" and "Statistics View" screen objects.

3.4.3.3 Data sources

Data sources read the data from logically associated antennas. The data sources pass on the data that are read from the antennas assigned to them.

The "Data sources" menu provides the following parameter setting options:

General

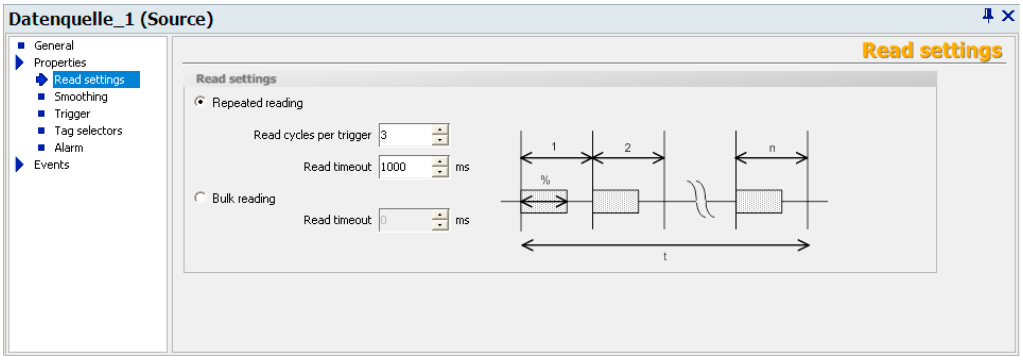


You can assign a name to the data source using the parameter "Name". Under "Antennas", you can assign the antennas that are available to the data source.

Under "Enable", you can activate the data source. Alternatively, you can enable the data source using the "Configuration" screen object at runtime.

Properties

- Read settings



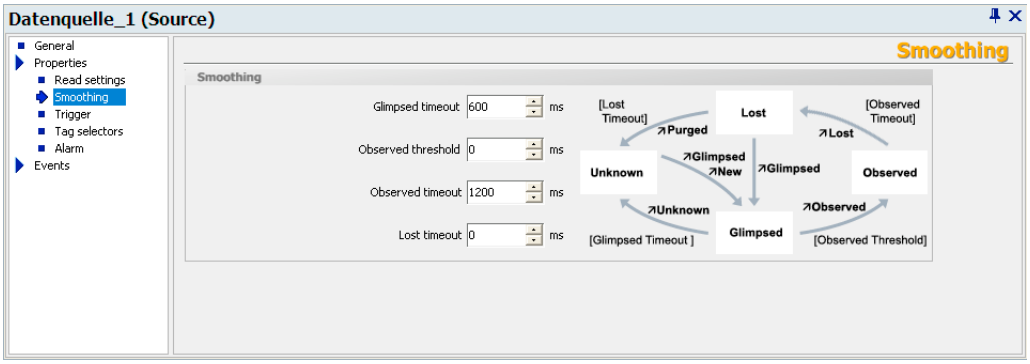
You specify the number of "Read cycles per trigger" here.

The "Read timeout" specifies in milliseconds how long the specified number of read cycle per trigger is permitted to take. When this time limit is exceeded, the read cycles are stopped even if the number of cycles that you specified has not been reached.

For more detailed information and general background information, please refer to:

Help system *Getting started > Understanding and optimizing the scanning of RFID tags*

- **Smoothing**



Smoothing is a technique that is used to optimize the read quality. The RF-MANAGER adds a status indication for the tags to the read results.

In this window, you specify the parameters for the status indication for the tags. Here you can specify times that have an effect on the status transitions.

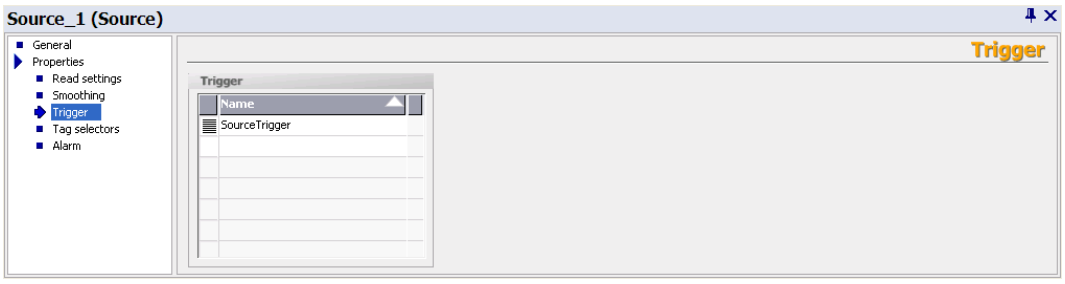
The different statuses are described below:

Status	Meaning	Description
Unknown	Unknown	The tag has this status before communication is established with the reader.
		Data selector event "Purged": Status "Unknown" is achieved due to "Lost timeout".
Glimpsed	Briefly detected	This status is assigned to the tag when it is read for the first time. Two times are activated: "Glimpsed timeout": If communication is established briefly and unintentionally, when the time "Glimpsed timeout" has elapsed, the status changes back to "Unknown". The tag is removed from the tag list. This is used to remove tags that have been briefly detected in the boundary areas of the reader. The rule of thumb is that "Glimpsed timeout" should be at least twice as long as a complete read cycle. "Observed threshold": If a stable connection exists beyond the time "Observed threshold", the status "Observed" is assigned to the tag. The rule of thumb is that "Observed threshold" should be at least twice as long as one complete read cycle.
		Data selector event "New": The status "Glimpsed" was achieved from status "Unknown" for the first time.
Observed	Reliably detected	An interruption in the communication that is shorter than the set time "Observed timeout" has no effect on the current status. This time interval can be used to suppress temporary interference. The rule of thumb is that "Observed timeout" must be twice as long as one complete read cycle. When the times of the read triggers are set longer than the "Observed timeouts", there is a danger that tags that remain stationary in the field will be lost.
Lost	Lost	When a tag exits the field of the reader, the status "Lost" will be assigned to it after the time "Observed timeout" has elapsed. If communication is established again, the status "Glimpsed" will be assigned again immediately. The "Unknown" status is activated if communication is not established before the time "Lost timeout" elapses. The rule of thumb is that "Lost timeout" must be at least twice as long as one complete read cycle.

For more detailed information and general background information, please refer to:

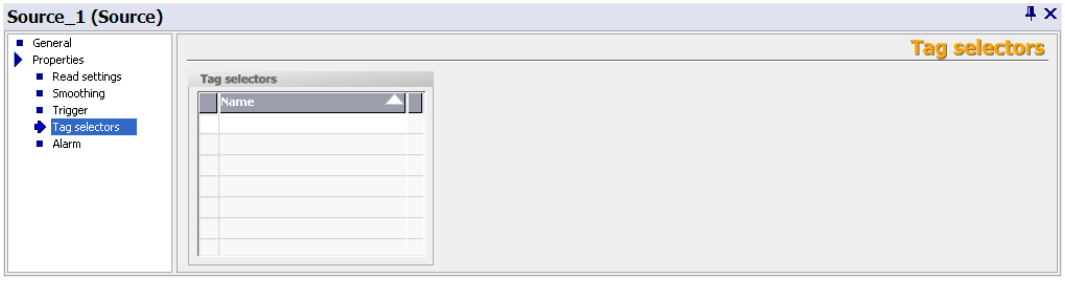
Help system *Understanding and optimizing the scanning of RFID tags*

- **Triggers**



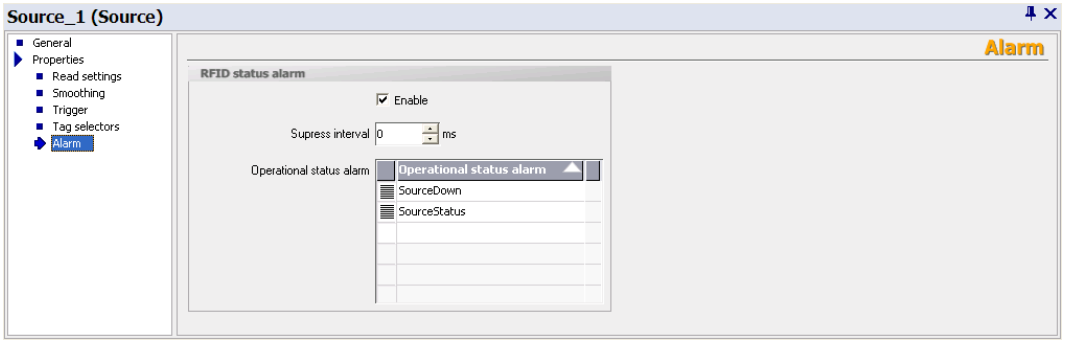
You specify the read triggers here. They cause the data source to read the data from the tags that are located in the antenna field. You can select the triggers from the drop-down list or define them yourself.

- **Tag selectors**



You assign tag selectors to the data source here. You can select the selectors from the drop-down list or define them yourself. The data to be read and filtered is specified here. If a selector is not entered here, the tag IDs will be supplied from all tags.
For further information on the mode of operation of tag selectors, see

- **Alarm**



Under "Operational status alarm", you can assign more than one RFID status alarm to the data source. You can select these from the drop-down list or create them. You will then receive detailed information regarding the status of the data source.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section "Working with alarms".

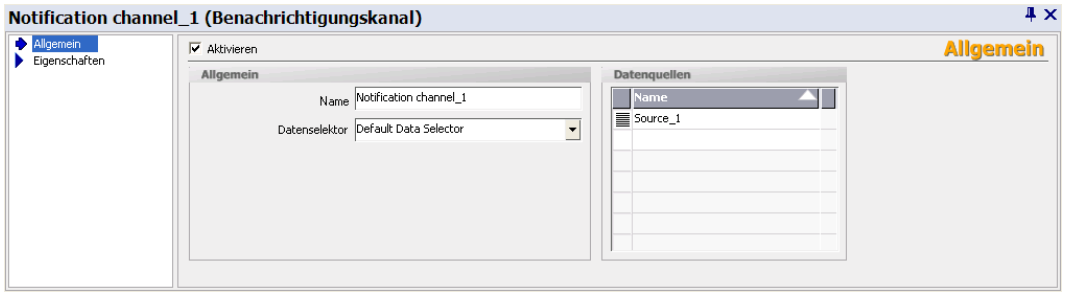
Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

3.4.3.4 Notification channels

The notification channels pass on the RFID data of the data sources assigned to it in accordance with the configured triggering mechanism and the data selector to its workplaces.

The "Notification channels" menu provides the following parameter setting options:

General



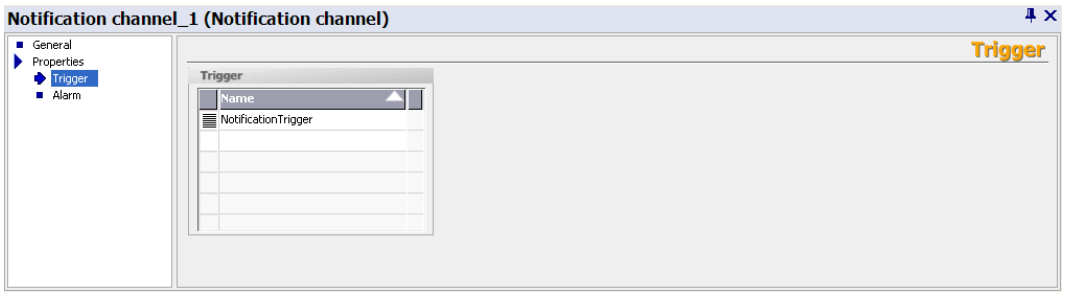
You can assign a name to the notification channel and assign a "Data selector" and one or more "Data sources" to it. You can define the data selector and the data source(s) yourself or select them from a drop-down list.

If a data selector is not defined for the notification channel, the data selector will automatically be used that was defined as current in the "Data selectors" submenu on the RFID device.

Under "Enable", you can activate the notification channel. Alternatively, you can activate the notification channel in the "Configuration" view at runtime.

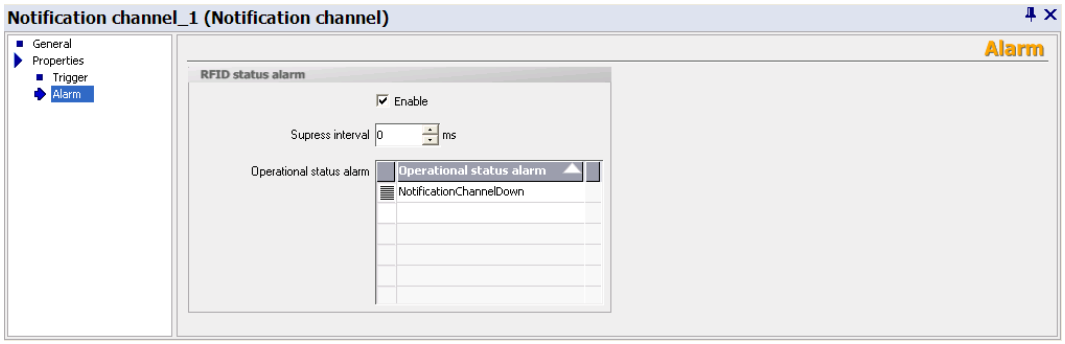
Properties

- **Trigger**



You can specify here whether the events received from the data sources should be transmitted **continuously** or whether they should be passed on dependent on the notification channel trigger. You can select these triggers from the drop-down list or create them. When you define the triggers, you can also specify when they will be activated.

- **Alarm**



Under "Operational status alarm", you can assign more than one RFID status alarm to the notification channel. You can select these from the drop-down list or create them. You will then receive detailed information regarding the status of the notification channel.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read the section "Working with alarms".

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

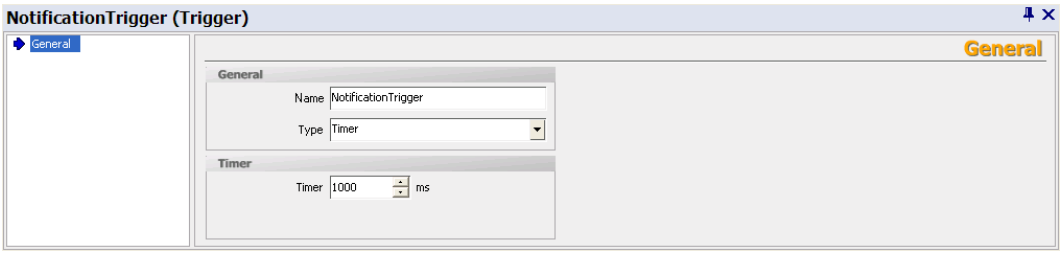
3.4.3.5 Triggers

Triggers represent activation mechanisms that can be used to control asynchronous read and filter procedures. Tag data are read at specific times or the stored tag data can be transferred dependent on triggers. Triggers can be used with data sources (read triggers) and notification channels (notification channel triggers).

Triggers can also be activated using the system function "ActivateTrigger" independently of these settings; in addition to the triggering conditions configured for the trigger. When this function is used, for example, for changing the value of a variable, a trigger can be activated by a change in value in the PLC. Depending on the configuration, this trigger causes the data sources to be read.

The "Trigger" menu provides the following parameter setting options:

General



You can specify the trigger "Type" here and set the following parameters:

Trigger	Description	Parameter settings
Continuous	The activity is activated as soon as possible and operates continuously. The maximum permissible frequency reservation time must be taken into account. For notification channel triggers, this means that notifications are transmitted immediately to the workplace when a new event occurs.	-
Application request	The activity is triggered on request from the application (e.g. over the ALE interface, or using the system function "ActivateTrigger").	-
Timer	The activity is triggered in accordance with specified time intervals.	The time ("Timer") between the triggers must be specified in milliseconds.

3.4.3.6 Presence as virtual input

In addition the presence is made available in the form of a virtual input (as InPort00). To be able to evaluate the presence in the application, this input can be addressed as a variable. Likewise, the input can be used to set a trigger. If a trigger of type "IO edge" or "I/O level" is linked to this input, the activation is dependent on presence.

Examples: With the "IO edge" type, as soon as a tag enters the field, a single read process is initiated. With the "IO level" type, reading takes place as long as a tag is in the field.

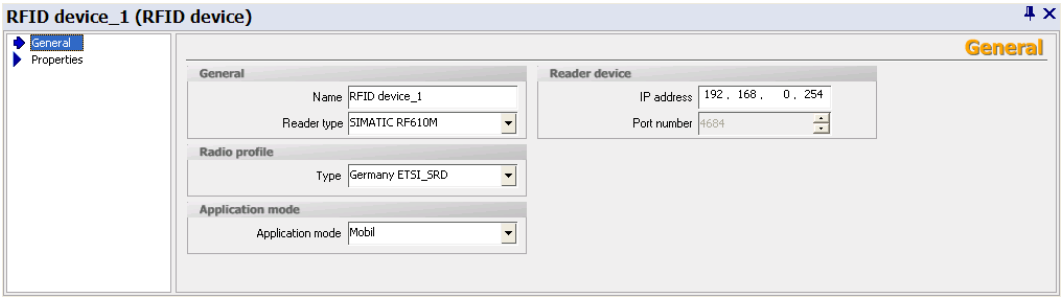
3.4.4 Mobile reader

3.4.4.1 RF610M

RFID device

The "RFID device" menu provides the following parameter setting options:

General



You can assign a "Name" to the reader here and enter the "IP address" setting made on the RF610M.

Note

Restriction of the selection of the "radio profile"

For SIMATIC RF610M, the only radio profiles that are available are "ETSI-SRD" and "FCC".

Application mode

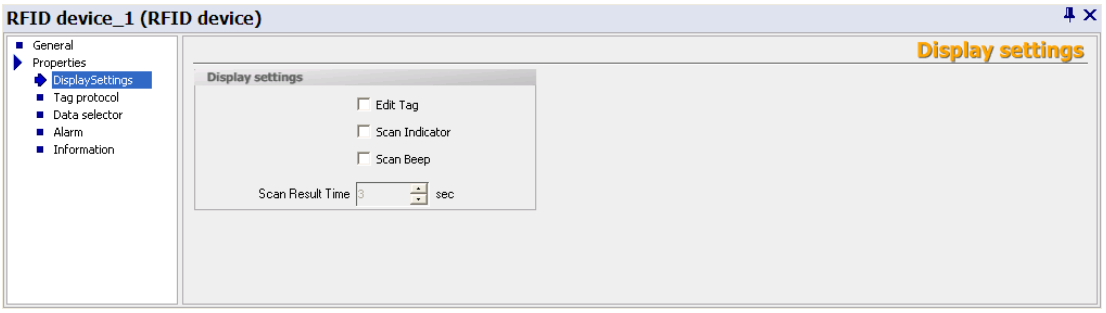
You can set the application mode to set up the SIMATIC RF610M device for "Remote" or "Mobile" operating mode:

Application mode "Remote"	Application mode "Mobile"
• RF610M behaves like a stationary reader • The acquired data is only displayed and transferred to RF-MANAGER • The acquired data cannot be modified	• The acquired data is acknowledged before being transferred to RF-MANAGER. Data that has been incorrectly scanned can be deleted. • All the tag data from the RFID chip can also be displayed or edited depending on the configuration in the engineering system.

Properties

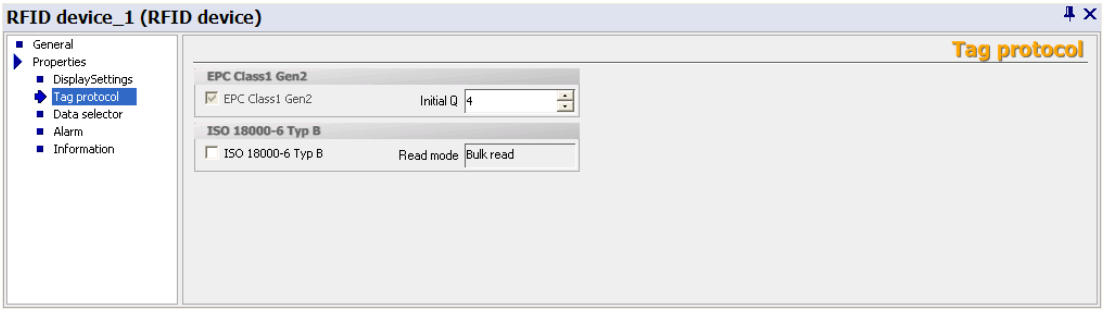
- **Display settings**

  You can select the following under display settings:



  – Edit tag: Display or edit tag data (only available in "Mobile" application mode)
  – Scan indication: Visual indication that a read procedure is active (waves propagate in a circular manner)
  – Scan beep: Acoustic signal indicates that a tag or barcode has been detected
  – Scan result time: Display interval for the tag data. When this time elapses, the display will automatically disappear. (Only available in "Remote" application mode.)

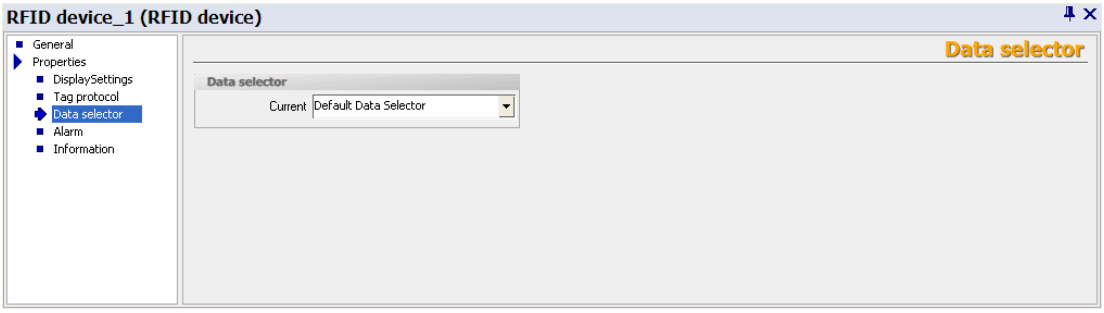
- **Tag protocol**



  This is where you select the communication protocol to be used between the reader and tag. Depending on the tags used, you can decide between ISO 18000-6 Type B or EPC Class1 Gen2.

  You must also specify the "Read mode". For ISO 18000-6 Type B, you can choose either SINGLE_TAG or BULK_READ.
  In SINGLE_TAG mode, the reader is optimized so that it finds a single tag in the field as quickly as possible. When several tags are located in a field, in some cases, after the first tag has been detected by the reader, the others are ignored.
  In BULK_READ mode, the reader is set so that it finds all the tags located in the field with the greatest possible probability. This is the default setting.
  With EPC Class1 Gen2, you can use "Initial Q" to specify the maximum number of tags that can be expected to be located in the field at the same time, so that collisions can be prevented.
  The following formula applies: $2^{\text{Initial Q value}}$ = Number of expected tags
  It is important to note here that the length of a read cycle increases with the value of the Initial Q value. Normally this value is automatically set by the readers. If, however, you want to optimize performance, the rule of thumb is that the value must be set as low as possible and as high as necessary.

- **Data selector**



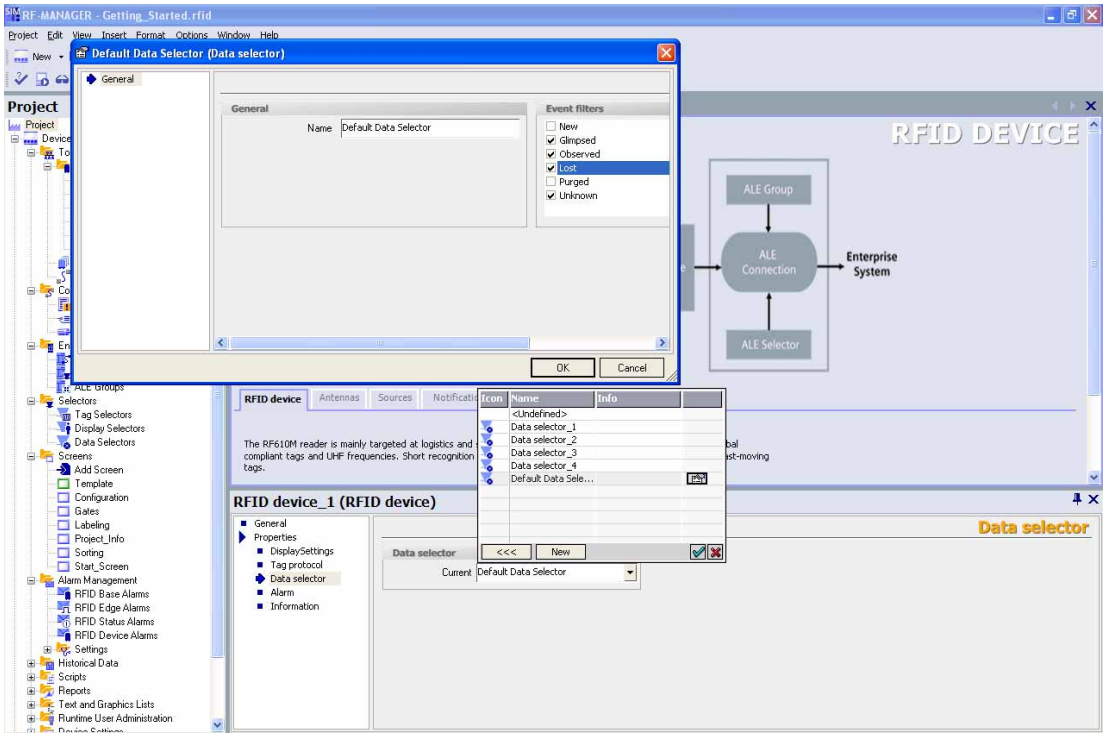
You can select the data selector or define new data selectors here. Please note that the data selector chosen here will only be effective in the following cases:

– During synchronous read procedures

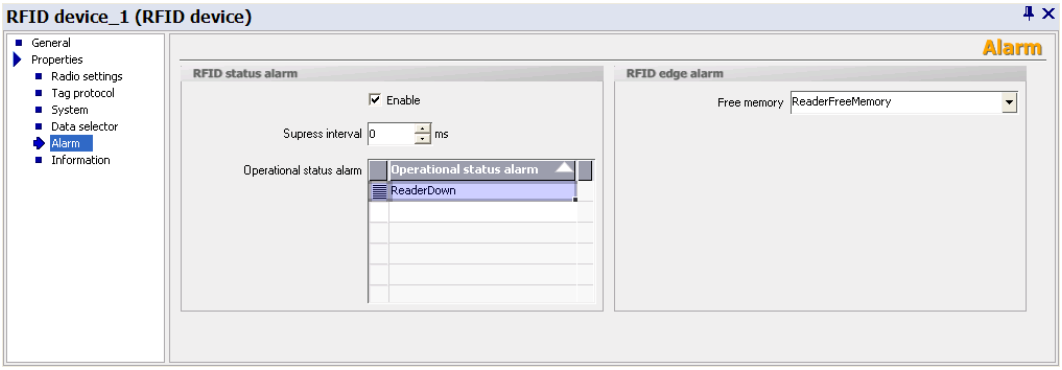
– Or for notification channels for which a data selector has not been explicitly selected.

In general, data selectors are components of notification channels and are used with the asynchronous read procedure.

In the data selector, the boxes for the "Observed" and "Lost" events must be checked:



- **Alarm**

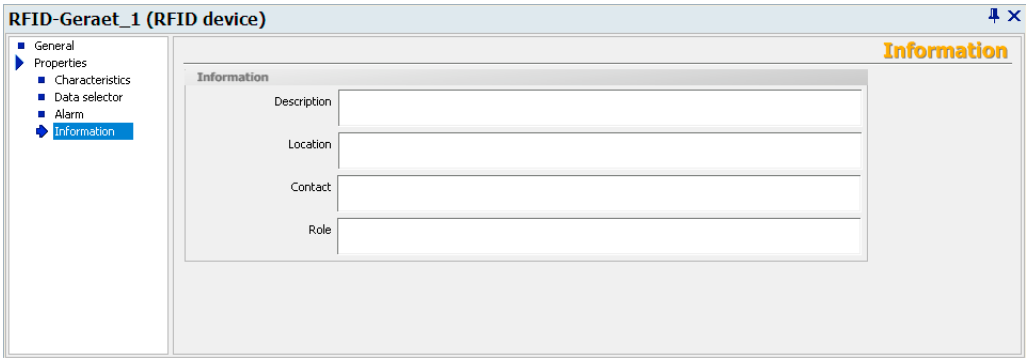


You can select alarms for reader status and available memory here or define them. Under "Operational status alarm", you can assign more than one RFID status alarm to the selected RFID device. You will then receive detailed information regarding the status of the RFID device.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section *Working with alarms*.

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

- **Information**



You can store descriptions regarding the reader, reader location, responsible contact person(s) and reader role here. This information is displayed in the "Configuration" and "Statistics" views.

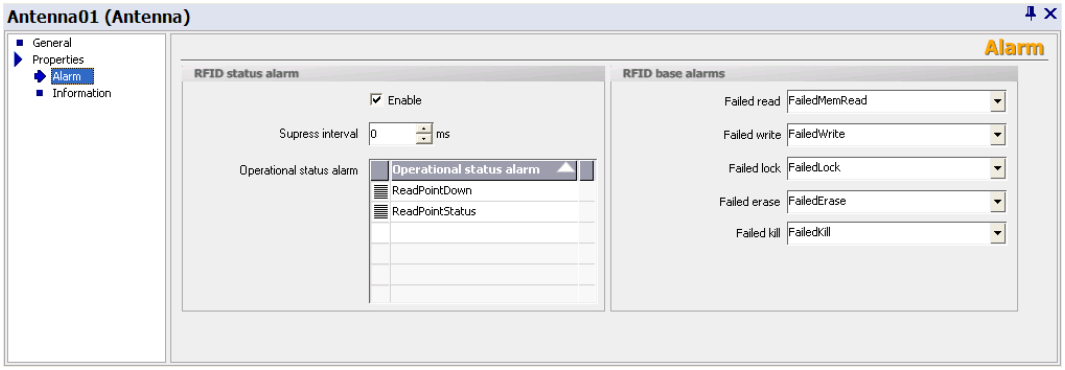
Antennas

General

Two antennas are already defined for SIMATIC RF610M: One for RFID and one for barcodes. You can only set parameters for "Alarms" and "Information".

Properties

- **Alarms**

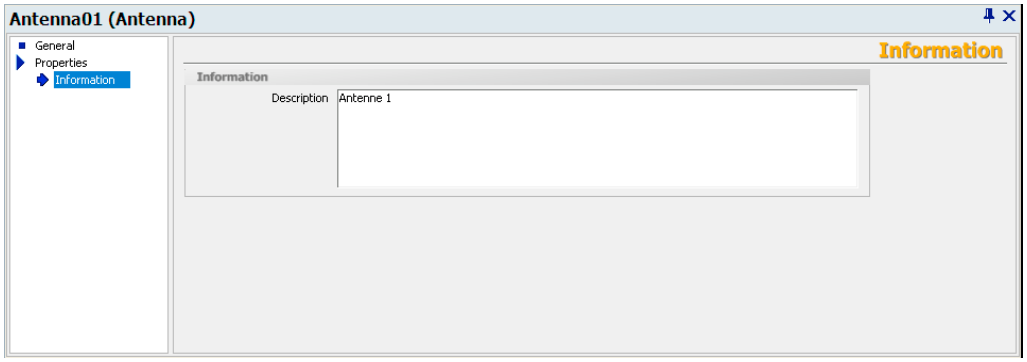


You can assign the "RFID status alarms" and "RFID base alarms" to the RFID antenna here. You can select these from the drop-down list or create them. For barcodes, only "RFID status alarms" are available.
Under "Operational status alarm", you can assign more than one RFID status alarm to the selected RFID device. You will then receive detailed information regarding the status of the antenna.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section *Working with alarms*.

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

- **Information**

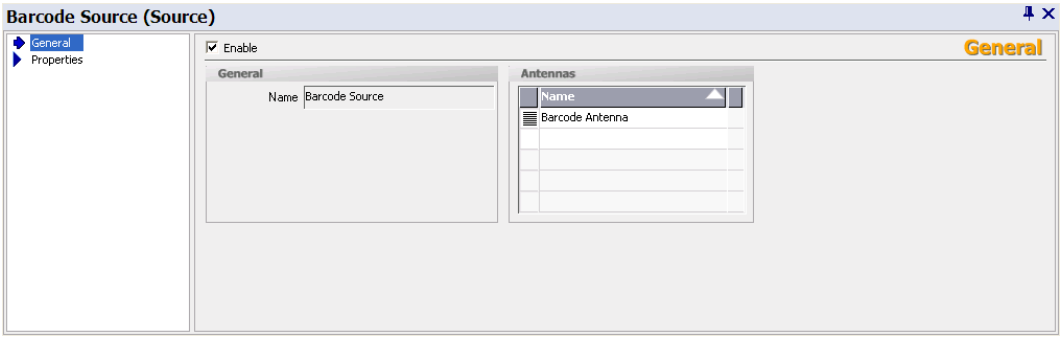


You can store a description of the antenna here. This information is displayed in the "Configuration" and "Statistics View" screen objects.

Data sources

In SIMATIC RF610M, one data source with the associated antenna is permanently assigned for barcode scanning and one for RFID data scanning.

General

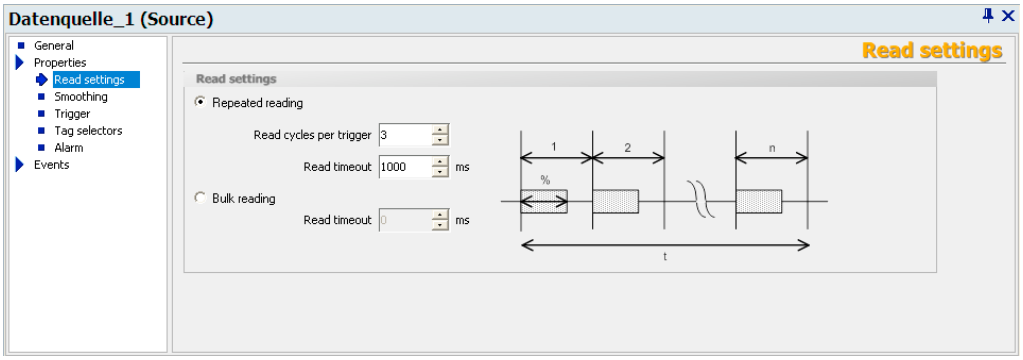


Under "Enable", you can activate the data source. Alternatively, you can enable the data source using the "Configuration" screen object at runtime.

You can disable unused data sources here, e.g. when the SIMATIC RF610M device does not have a barcode scanner.

Properties

- **Read settings**(only for RFID data source)



You specify the number of "Read cycles per trigger" here.

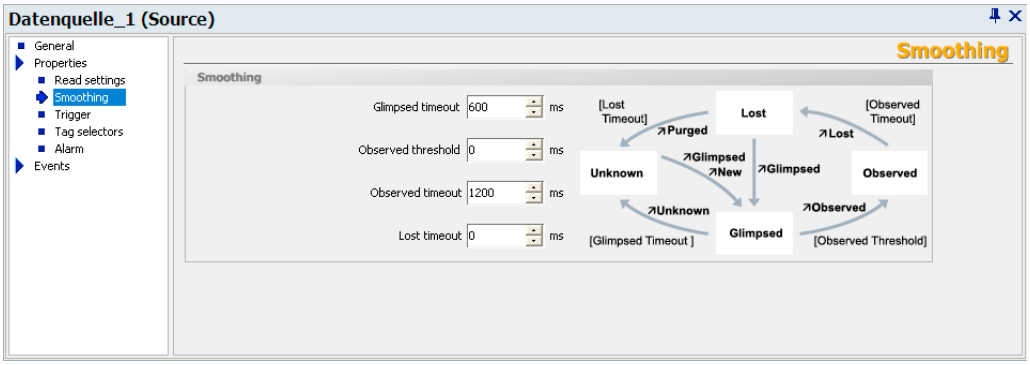
Under "Maximum read duty cycle", you specify a percentage that provides information on the length of time for which the antenna of a reader is permitted to be switched on; this feature serves to reduce the radio interference.

The "Read timeout" specifies in milliseconds how long the specified number of read cycle per trigger is permitted to take. When this time limit is exceeded, the read cycles are stopped even if the number of cycles that you specified has not been reached.

For more detailed information and general background information, please refer to:

Help system *Getting started > Understanding and optimizing the scanning of RFID tags*

- **Smoothing**



Smoothing is a technique that is used to optimize the read quality. The RF-MANAGER adds a status indication for the tags to the read results.

In this window, you specify the parameters for the status indication for the tags. Here you can specify times that have an effect on the status transitions.

The different statuses are described below:

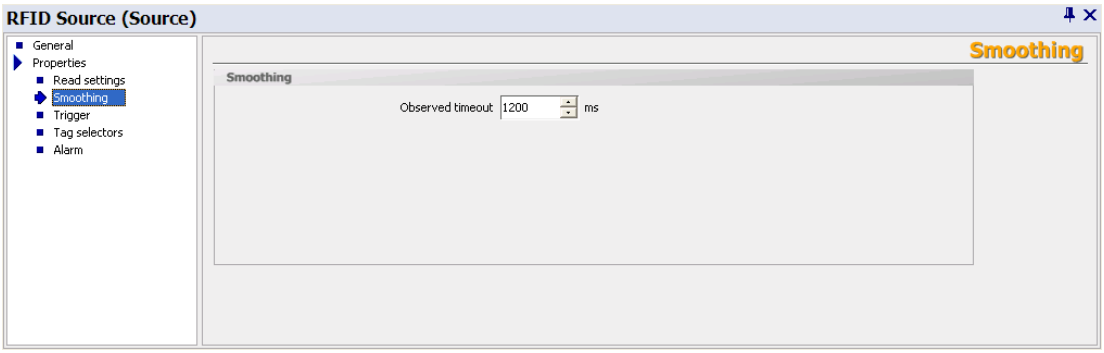
Status	Meaning	Description
Unknown	Unknown	The tag has this status before communication is established with the reader.
		Data selector event "Purged": Status "Unknown" is achieved due to "Lost timeout".

Status	Meaning	Description
Glimpsed	Briefly detected	This status is assigned to the tag when it is read for the first time. Two times are activated: "Glimpsed timeout": If communication is established briefly and unintentionally, when the time "Glimpsed timeout" has elapsed, the status changes back to "Unknown". The tag is removed from the tag list. This is used to remove tags that have been briefly detected in the boundary areas of the reader. The rule of thumb is that "Glimpsed timeout" should be at least twice as long as a complete read cycle. "Observed threshold": If a stable connection exists beyond the time "Observed threshold", the status "Observed" is assigned to the tag. The rule of thumb is that "Observed threshold" should be at least twice as long as one complete read cycle.
		Data selector event "New": The status "Glimpsed" was achieved from status "Unknown" for the first time.
Observed	Reliably detected	An interruption in the communication that is shorter than the set time "Observed timeout" has no effect on the current status. This time interval can be used to suppress temporary interference. The rule of thumb is that "Observed timeout" must be twice as long as one complete read cycle. When the times of the read triggers are set longer than the "Observed timeouts", there is a danger that tags that remain stationary in the field will be lost.
Lost	Lost	When a tag exits the field of the reader, the status "Lost" will be assigned to it after the time "Observed timeout" has elapsed. If communication is established again, the status "Glimpsed" will be assigned again immediately. The "Unknown" status is activated if communication is not established before the time "Lost timeout" elapses. The rule of thumb is that "Lost timeout" must be at least twice as long as one complete read cycle.

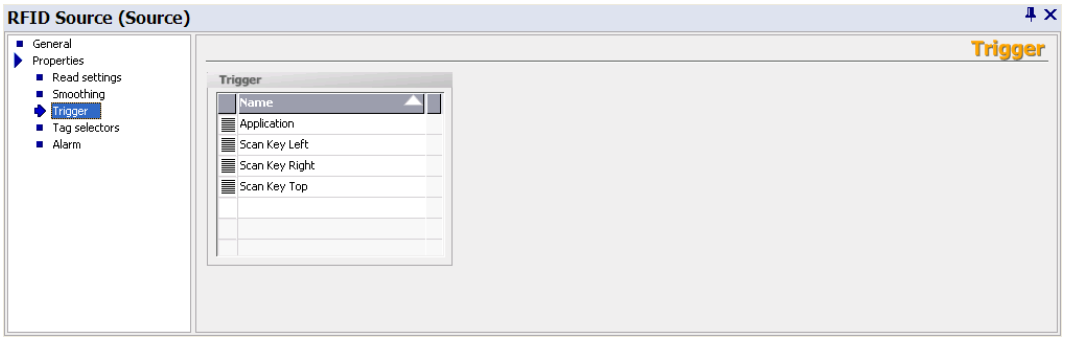
For more detailed information and general background information, please refer to:

Help system *Understanding and optimizing the scanning of RFID tags*

Only a simple status model is required for "Mobile" application mode and with barcode scanning in general.



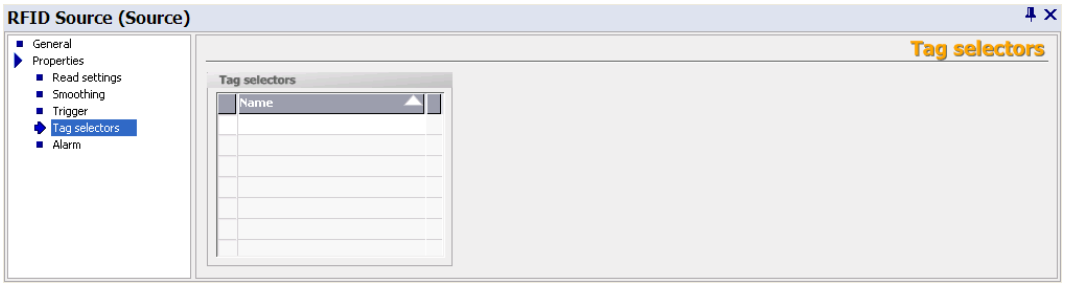
- **Trigger**



You specify the read triggers here. They cause the data source to read the data from the tags that are located in the antenna field. You can select the triggers from the drop-down list or define them yourself.

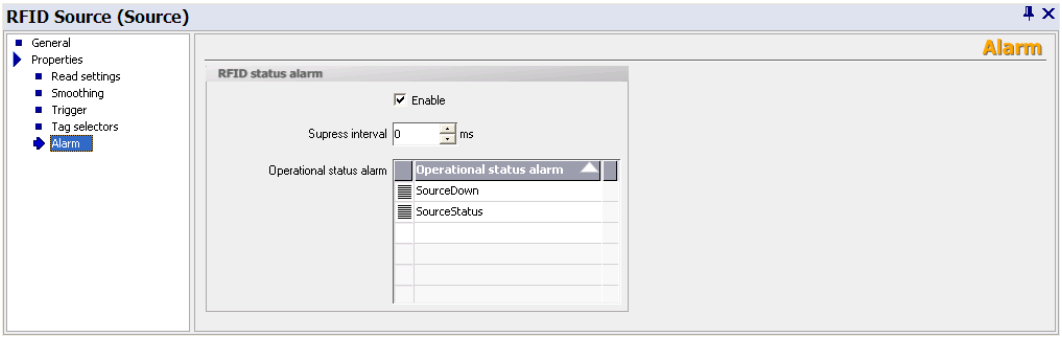
Triggers have been predefined for the keys on the SIMATIC RF610M. This makes it easy for you to specify which key should be used to read data.

- **Tag selectors**



You assign tag selectors to the data source here. You can select the selectors from the drop-down list or define them yourself. The data to be read and filtered is specified here. If a selector is not specified, the tag IDs of all tags are supplied or all barcode data is transferred.
If more than one tag selector is selected, they will be logically **anded**.

- **Alarm**



Under "Operational status alarm", you can assign several RFID status alarms to the data source. You can select these from the drop-down list or create them. You will then receive detailed information regarding the status of the data source.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section "Working with alarms".

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

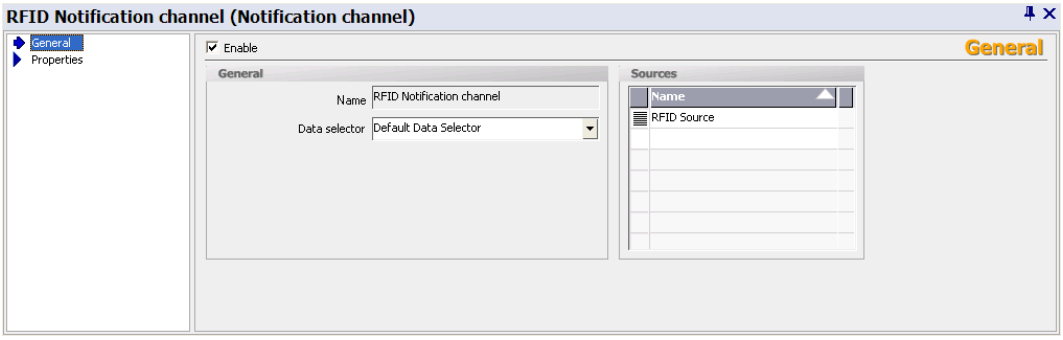
Notification channels

The notification channels pass on the data of the data sources assigned to it in accordance with the configured triggering mechanism and the data selector to its workplaces.

One notification channel is permanently specified for RFID data and one for barcode data.

The "Notification channels" menu provides the following parameter setting options:

General



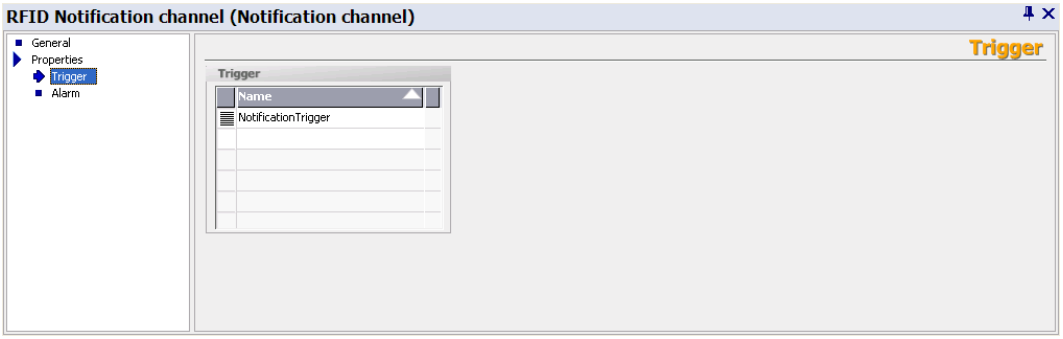
You can assign a name to the notification channel and assign a "Data selector" to it. You can define the data selector yourself or select them from a drop-down list.

If a data selector is not defined for the notification channel, the data selector will automatically be used that was defined as current in the "Data selectors" submenu on the RFID device.

Under "Enable", you can activate the notification channel. Alternatively, you can activate the notification channel in the "Configuration" view at runtime.

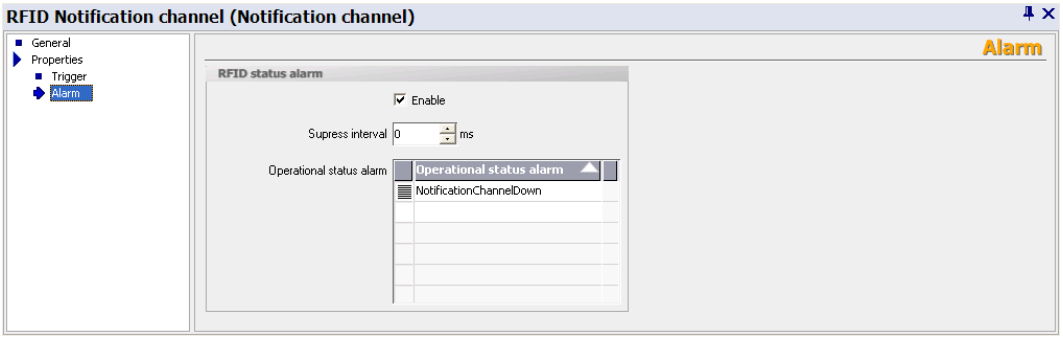
Properties

- **Trigger**



You can specify here whether the events received from the data sources should be transmitted **continuously** or whether they should be passed on dependent on the notification channel trigger. You can select these triggers from the drop-down list or create them. When you define the triggers, you can also specify when they will be activated.

- **Alarm**



Under "Operational status alarm", you can assign more than one RFID status alarm to the notification channel. You can select these from the drop-down list or create them. You will then receive detailed information regarding the status of the notification channel.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read the section "Working with alarms".

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

Triggers

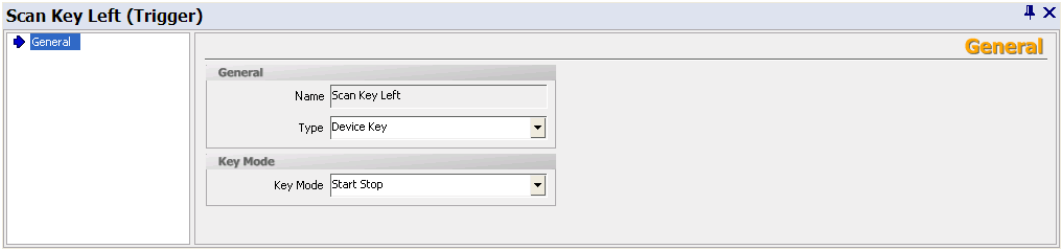
Triggers represent activation mechanisms that can be used to control asynchronous read and filter procedures. Tag data are read at specific times or the stored tag data can be transferred dependent on triggers. Triggers can be used with data sources (read triggers) and notification channels (notification channel triggers).

Triggers can also be activated using the system function "ActivateTrigger" independently of these settings; in addition to the triggering conditions configured for the trigger. When this function is used, for example, for changing the value of a variable, a trigger can be activated by a change in value in the PLC. Depending on the configuration, this trigger causes the data sources to be read.

This is, however, only appropriate for SIMATIC RF610M when it has been established that a connection to RF610M is active.

The "Trigger" menu provides the following parameter setting options:

General



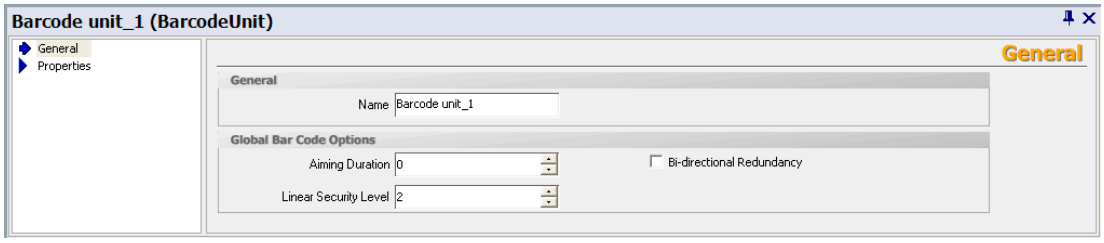
You can specify the trigger "Type" here and set the following parameters:

Trigger	Description	Parameter settings
Continuous	The activity is activated as soon as possible and operates continuously. The maximum permissible frequency reservation time must be taken into account. For notification channel triggers, this means that notifications are transmitted immediately to the workplace when a new event occurs.	-
Application request (Only appropriate when it has been established that a connection to the RF610M is active.)	The activity is triggered on request from the application (e.g. over the ALE interface, or using the system function "ActivateTrigger").	-
Timer	The activity is triggered in accordance with specified time intervals.	The time ("Timer") between the triggers must be specified in milliseconds.
Device key	The activity is performed with an operator input on the SIMATIC RF610M.	The time condition for the trigger can be specified as a parameter. • Selection of the start/stop response • Response to a held down key: Scanning is performed as long as the key is held down • ReadFirst ID: Scanning is performed until the tag/barcode is detected.

Barcode unit

When you have installed a barcode scanner in SIMATIC RF610M, the following settings in RF-MANAGER are also relevant:

General



- **Name**:

  You can enter a name for the barcode unit here.

- **Aiming duration**: (0...2)

  Time for aiming. The laser generates a dot as an aid to aiming. When the time has elapsed, the actual scan is performed.

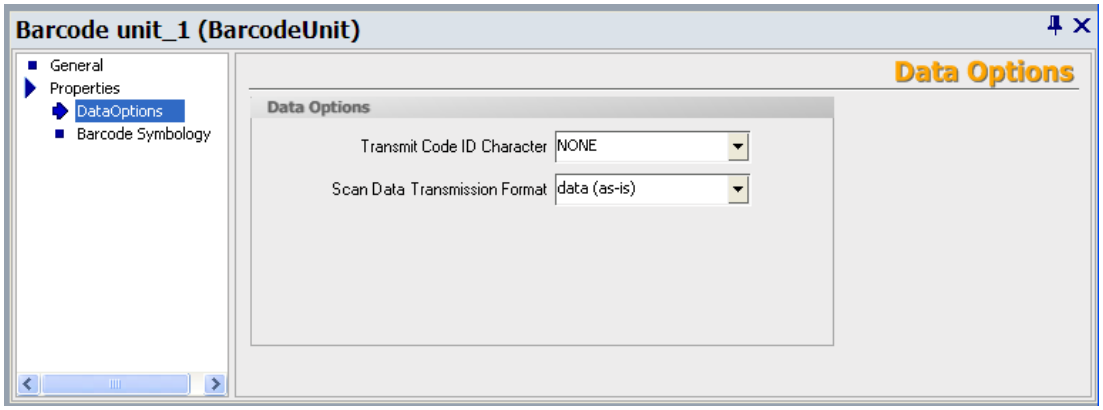
- **Linear security level**: (1...4)
  The linear security level is set to enhance the read quality for barcodes. It is only effective for linear codes (e.g. Code 39).

  The higher the setting (maximum 4), the more often a barcode is read before it is transferred as a valid scan.

- **Bi-directional redundancy**: The barcode must be successfully scanned in both directions (forwards and backwards) before it can be decoded.

Properties

- **Display settings**



  – **Transmit code ID character**

    You specify the ID character here that is displayed with the selected barcode: NONE, AIM or SYMBOL

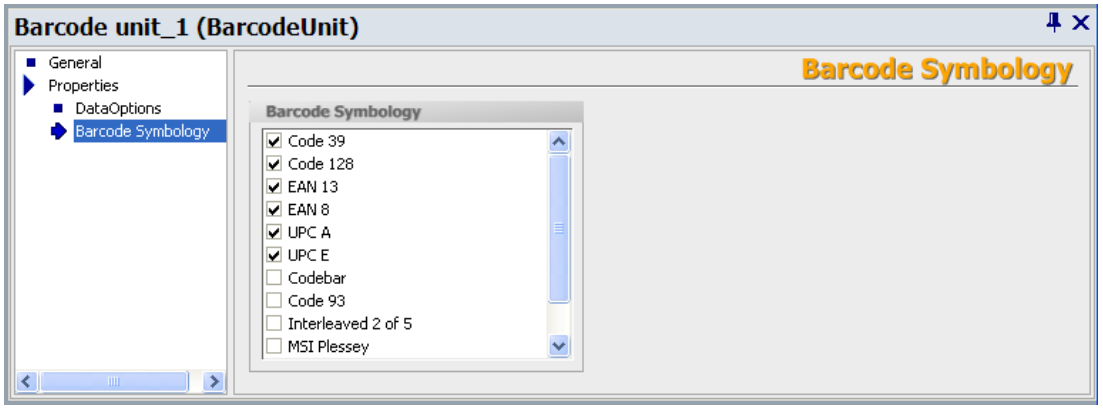
    If NONE is selected, an ID character is not inserted.

  – **Scan data transmission format**

    You specify the display format for the barcode data here. Select the possible formatting in a drop-down list.
    If you select a format with a prefix or suffix, you can specify their values in the appropriate fields.

    The relationship between barcode type, ID character and barcode data formatting is explained below.

- **Barcode type**



In a selection list, you can tick the barcode types that should be recognized by the scanner.

Note

The greater the number of barcode types selected, the longer the scanning procedure will be.

Relationship between barcode type, ID character and barcode data formatting

The individual barcode types are assigned to the following ID characters:

Barcode type	AIM ID characters	SYMBOL ID characters
Code 39	]A0	D
Code 128	]C0	D
EAN 13	]E0	A
EAN 8	]E	A
UPC A	]E000	A0
UPC E	]E000	A0
Codebar	]F0	C
Code 93		
Interleaved 2 of 5		
MSI Plessey		
Discrete 2 of 5		
IATA 2 of 5		

In accordance with the barcode data formatting selected, the selected ID characters are always inserted in front of the barcode data.
Output examples:

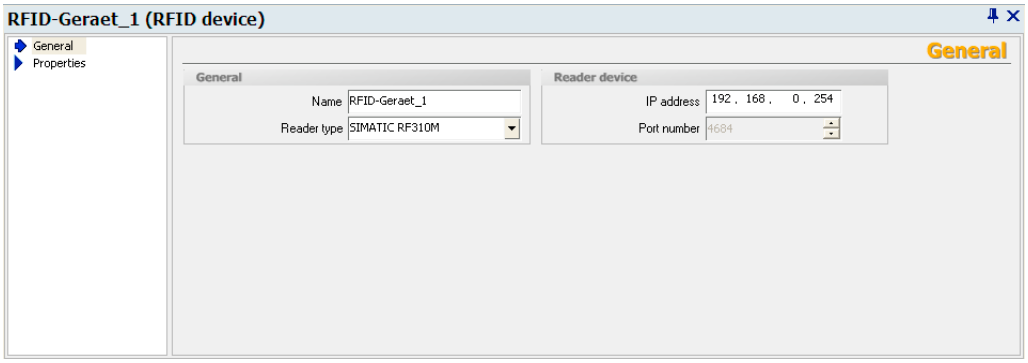
Scan data transmission format	ID character	Barcode type	Output
data (as-is)	NONE	Code 39	data
data (as-is)	AIM	Code 39	]A0 data
data <S1>	SYMBOL	EAN 8	A data <S1>
<P> data	AIM	Codebar	<P>]F0 data
<P> data <S1><S2>	SYMBOL	UPC E	<P> A0 data <S1><S2>

3.4.4.2 RF310M

RFID device

The "RFID device" menu provides the following parameter setting options:

General



You can assign a "Name" to the reader here and enter the "IP address" setting made on the RF310M.

Further parameters

Parameter	Value range	Default	Description
CommandTimeout [1]	Decimal value: 20 ... 1000	100	Time in milliseconds in which the reader must process commands.
LongCommandTimeout	Decimal value: 2000 ... 10000	3000	Time in milliseconds in which the reader must process long commands.
RF300Enabled	Boolean value: true or false	true	Activates the RF300 protocol on the air interface (transponder), see MOBY manuals, parameter "field_ON_time"
Iso15693Enabled	Boolean value: true or false	false	Activates the ISO15693 protocol on the air interface (transponder), see MOBY manuals, parameter "field_ON_time

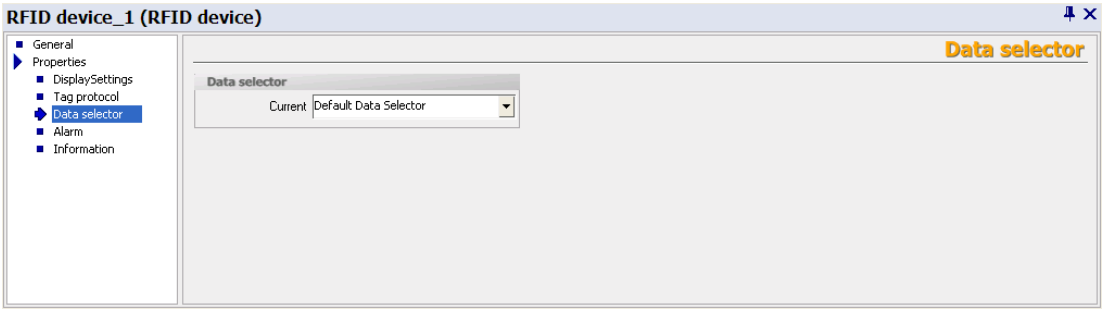
Parameter	Value range	Default	Description
IsoTagType	Hexadecimal value: 01 ... 07	01	Type of ISO tag used • 01 hex = Manufacturer-independent tag • 03 hex = ISO my-d(Infineon SRF 55V10P) • 04 hex = ISO(Fujitsu MB89R118) • 05 hex = ISO I-Code SLI(NXP SL2 ICS20) • 06 hex = ISO Tag-it HFI(Texas Instruments) • 07 hex = ISO (ST LRI2K), see MOBY manuals, parameter "field_ON_time"
ResetOfLed	Boolean value: true or false	true	Activates restart of the ERR-LED, see MOBY manuals, parameter "option_1"
scanning_time	Hexadecimal value	00	Expert settings for air interface, see MOBY manuals, parameter "scanning_time"
field_ON_control	Hexadecimal value	00	Expert settings for air interface, see MOBY manuals, parameter "field_ON_control"
MobileOperatingModeEnabled	Boolean value true or false	true	**Application mode "Mobile":** • The acquired data is acknowledged before being transferred to RF-MANAGER. Data that has been incorrectly scanned can be deleted. • All the tag data from the RFID chip can also be displayed or edited depending on the configuration in the engineering system **Application mode "Remote"** • RF310M behaves like a stationary reader • The acquired data is only displayed and transferred to RF-MANAGER • The acquired data cannot be modified
EditTagEnabled	Boolean value true or false	false	Edit tag: Display or edit tag data (only available in "Mobile" application mode)
BeepEnabled	Boolean value true or false	true	Acoustic signal indicates that a tag or barcode has been detected

Parameter	Value range	Default	Description
ScanResultTime	Decimal value 0 ... 20	3	Display interval for the tag data. When this time elapses, the display will automatically disappear. (Only available in "Remote" application mode.)
PowerOnTimeout	Decimal value 5000 ... 60000	20000	Time in milliseconds after which the reader will automatically switch off if there is no activity in the field.

1) If errors in communications or in writing data to the transponder occur sporadically, it may be necessary to increase the value for CommandTimeout. This is necessary if several protocols are simultaneously activated or if larger data amounts are written to ISO transponders (typical value: 300).

2) If presence is activated (WithPresence = true), only one protocol may be activated (either RF300enabled or Iso15693Enabled)

- **Data selector**



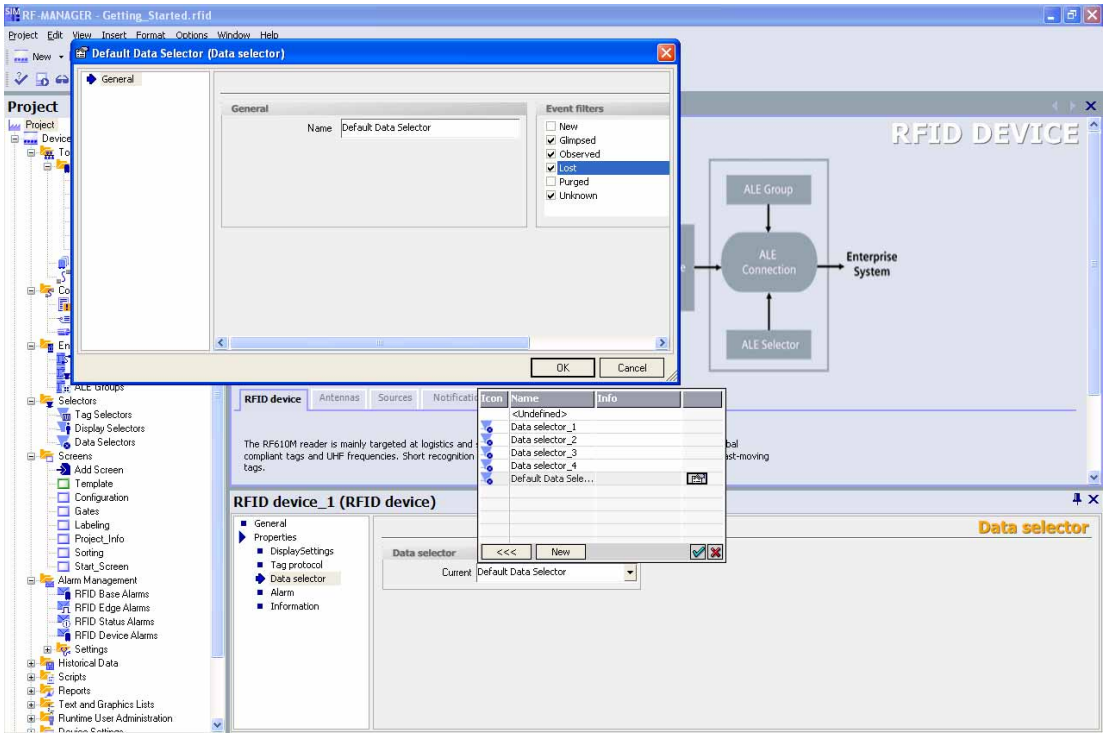
You can select the data selector or define new data selectors here. Please note that the data selector chosen here will only be effective in the following cases:

– During synchronous read procedures

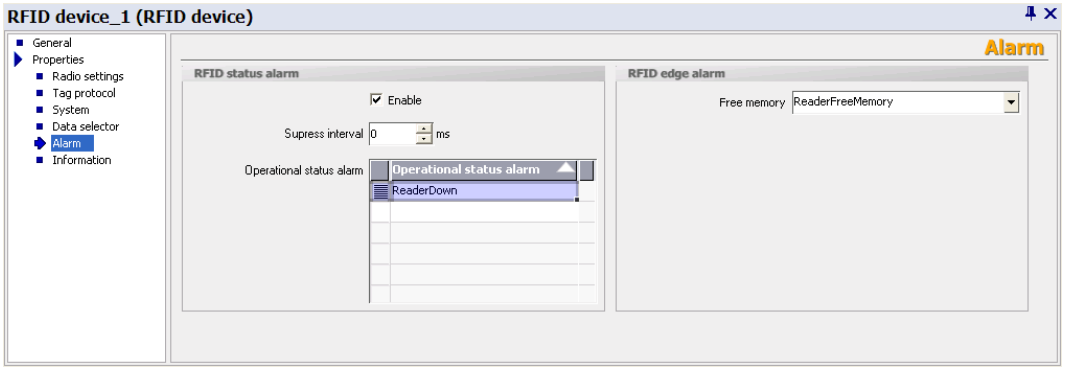
– Or for notification channels for which a data selector has not been explicitly selected.

In general, data selectors are components of notification channels and are used with the asynchronous read procedure.

In the data selector, the boxes for the "Observed" and "Lost" events must be checked:



- **Alarm**

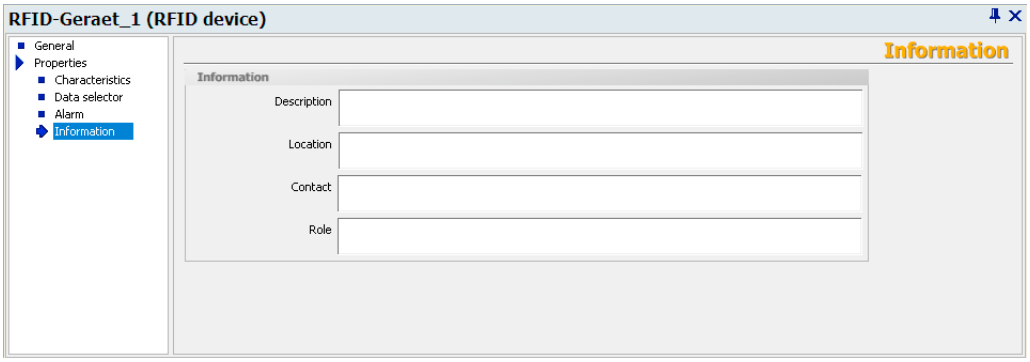


You can select alarms for reader status and available memory here or define them. Under "Operational status alarm", you can assign more than one RFID status alarm to the selected RFID device. You will then receive detailed information regarding the status of the RFID device.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section *Working with alarms*.

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

- **Information**



You can store descriptions regarding the reader, reader location, responsible contact person(s) and reader role here. This information is displayed in the "Configuration" and "Statistics" views.

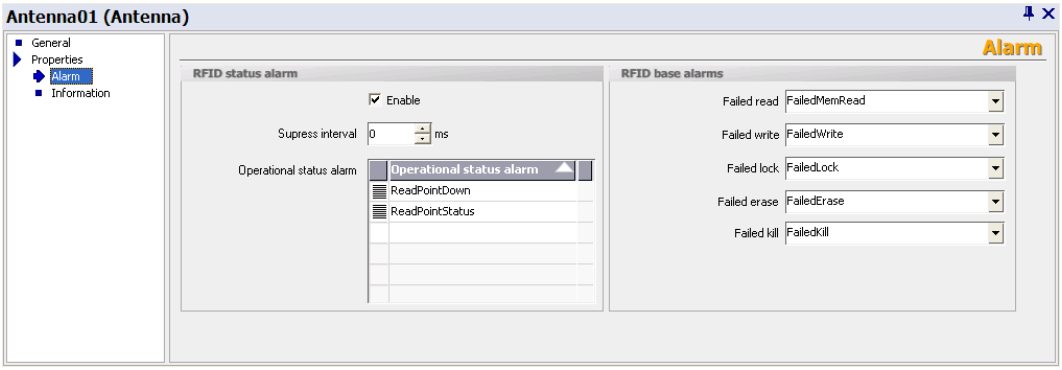
Antennas

General

For SIMATIC RF310M, only one antenna is predefined for RFID. You can only set parameters for "Alarms" and "Information".

Properties

- **Alarms**

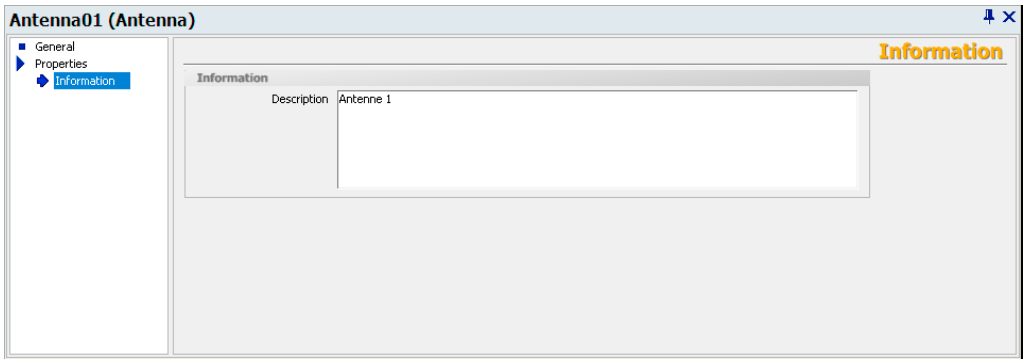


You can assign the "RFID status alarms" and "RFID base alarms" to the RFID antenna here. You can select these from the drop-down list or create them. For barcodes, only "RFID status alarms" are available.
Under "Operational status alarm", you can assign more than one RFID status alarm to the selected RFID device. You will then receive detailed information regarding the status of the antenna.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section *Working with alarms*.

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

- **Information**

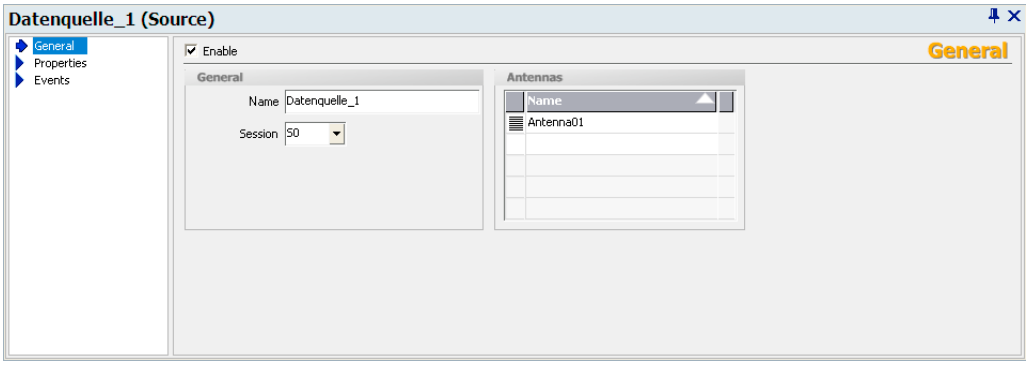


You can store a description of the antenna here. This information is displayed in the "Configuration" and "Statistics View" screen objects.

Data sources

In SIMATIC RF310M, only one data source with the associated antenna is permanently assigned for RFID data scanning.

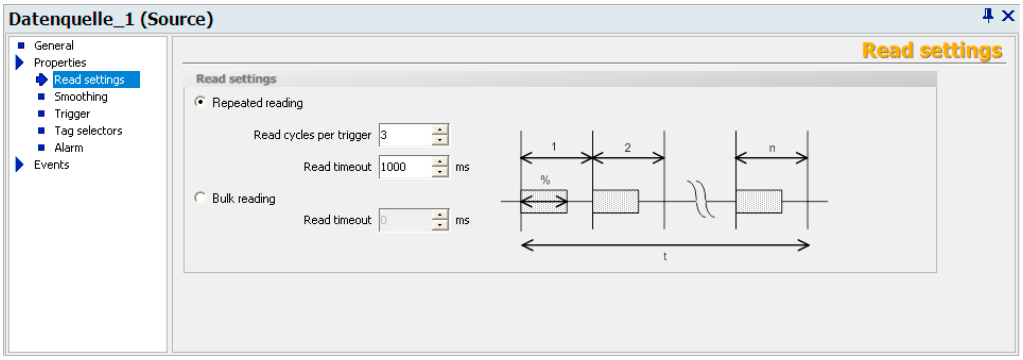
General



Under "Enable", you can activate the data source. Alternatively, you can enable the data source using the "Configuration" screen object at runtime.

Properties

- **Read settings**(only for RFID data source)



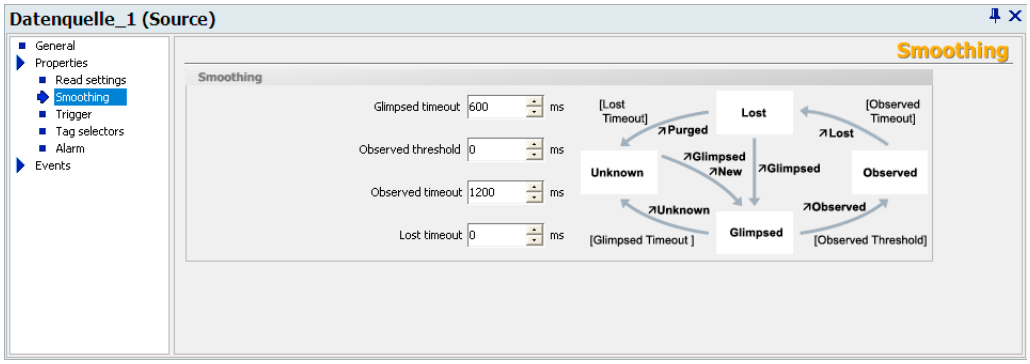
You specify the number of "Read cycles per trigger" here.

Under "Maximum read duty cycle", you specify a percentage that provides information on the length of time for which the antenna of a reader is permitted to be switched on; this feature serves to reduce the radio interference.

For more detailed information and general background information, please refer to:

Help system *Getting started > Understanding and optimizing the scanning of RFID tags*

- **Smoothing**



Smoothing is a technique that is used to optimize the read quality. The RF-MANAGER adds a status indication for the tags to the read results.

In this window, you specify the parameters for the status indication for the tags. Here you can specify times that have an effect on the status transitions.

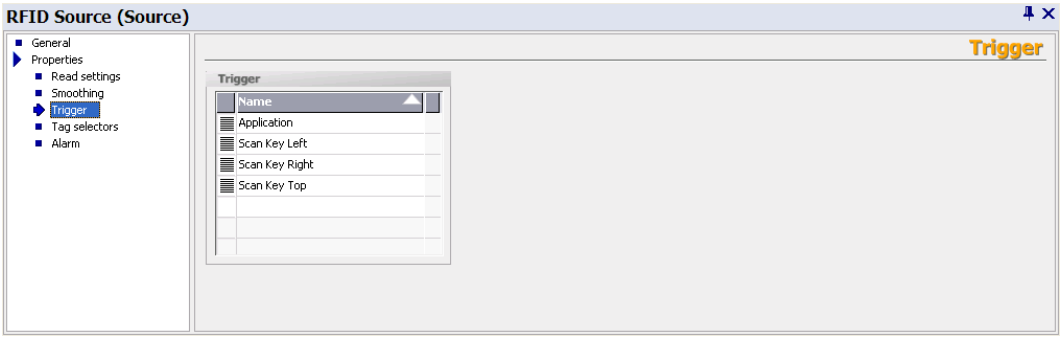
The different statuses are described below:

Status	Meaning	Description
Unknown	Unknown	The tag has this status before communication is established with the reader.
		Data selector event "Purged": Status "Unknown" is achieved due to "Lost timeout".
Glimpsed	Briefly detected	This status is assigned to the tag when it is read for the first time. Two times are activated: "Glimpsed timeout": If communication is established briefly and unintentionally, when the time "Glimpsed timeout" has elapsed, the status changes back to "Unknown". The tag is removed from the tag list. This is used to remove tags that have been briefly detected in the boundary areas of the reader. The rule of thumb is that "Glimpsed timeout" should be at least twice as long as a complete read cycle. "Observed threshold": If a stable connection exists beyond the time "Observed threshold", the status "Observed" is assigned to the tag. The rule of thumb is that "Observed threshold" should be at least twice as long as one complete read cycle.
		Data selector event "New": The status "Glimpsed" was achieved from status "Unknown" for the first time.
Observed	Reliably detected	An interruption in the communication that is shorter than the set time "Observed timeout" has no effect on the current status. This time interval can be used to suppress temporary interference. The rule of thumb is that "Observed timeout" must be twice as long as one complete read cycle. When the times of the read triggers are set longer than the "Observed timeouts", there is a danger that tags that remain stationary in the field will be lost.
Lost	Lost	When a tag exits the field of the reader, the status "Lost" will be assigned to it after the time "Observed timeout" has elapsed. If communication is established again, the status "Glimpsed" will be assigned again immediately. The "Unknown" status is activated if communication is not established before the time "Lost timeout" elapses. The rule of thumb is that "Lost timeout" must be at least twice as long as one complete read cycle.

For more detailed information and general background information, please refer to:

Help system *Understanding and optimizing the scanning of RFID tags*

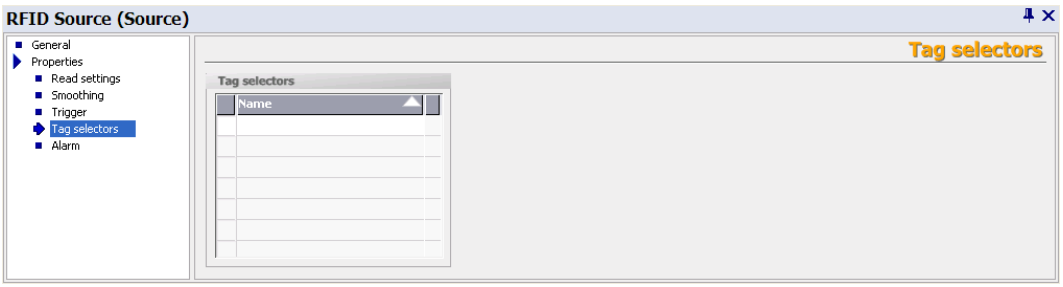
- **Trigger**



You specify the read triggers here. They cause the data source to read the data from the tags that are located in the antenna field. You can select the triggers from the drop-down list or define them yourself.

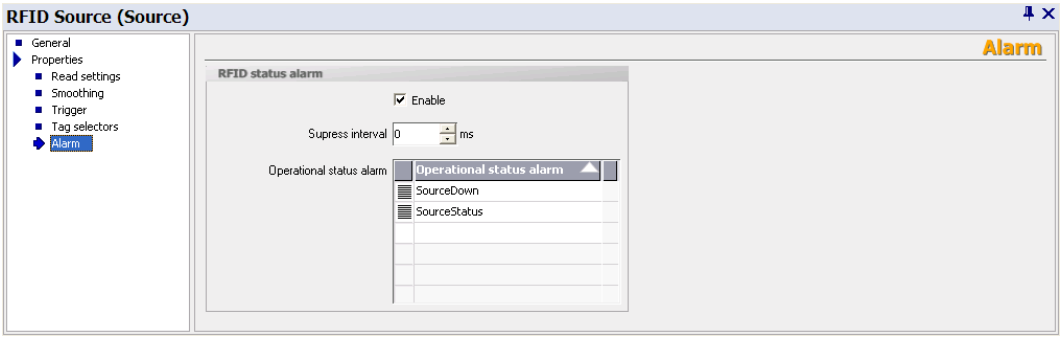
Triggers have been predefined for the keys on the SIMATIC RF310M. This makes it easy for you to specify which key should be used to read data.

- **Tag selectors**



You assign tag selectors to the data source here. You can select the selectors from the drop-down list or define them yourself. The data to be read and filtered is specified here. If a selector is not specified, the tag IDs of all tags are supplied.
If more than one tag selector is selected, they will be logically **anded**.

- **Alarm**



Under "Operational status alarm", you can assign several RFID status alarms to the data source. You can select these from the drop-down list or create them. You will then receive detailed information regarding the status of the data source.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read section "Working with alarms".

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

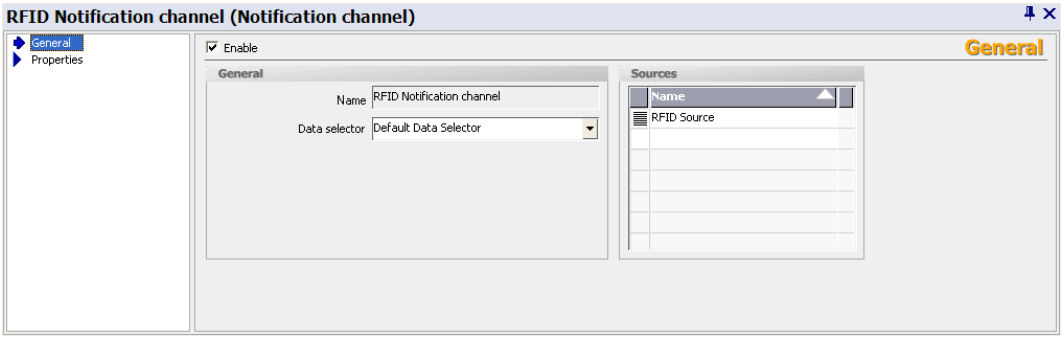
Notification channels

The notification channels pass on the data of the data sources assigned to it in accordance with the configured triggering mechanism and the data selector to its workplaces.

One notification channel is permanently specified for RFID data.

The "Notification channels" menu provides the following parameter setting options:

General



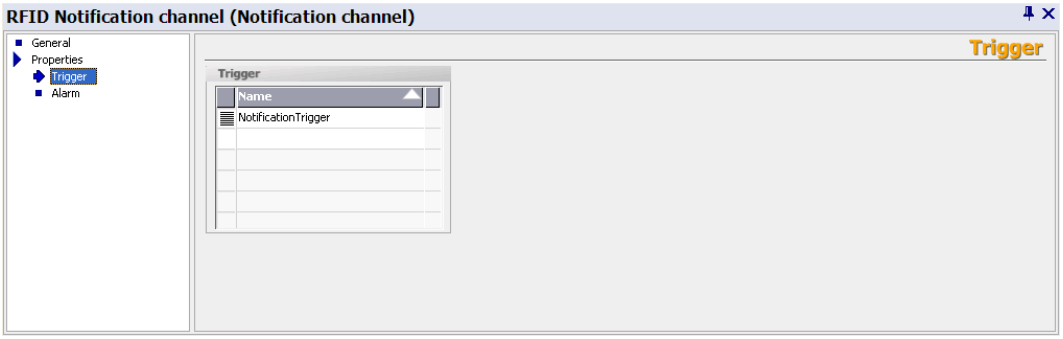
You can assign a name to the notification channel and assign a "Data selector" to it. You can define the data selector yourself or select them from a drop-down list.

If a data selector is not defined for the notification channel, the data selector will automatically be used that was defined as current in the "Data selectors" submenu on the RFID device.

Under "Enable", you can activate the notification channel. Alternatively, you can activate the notification channel in the "Configuration" view at runtime.

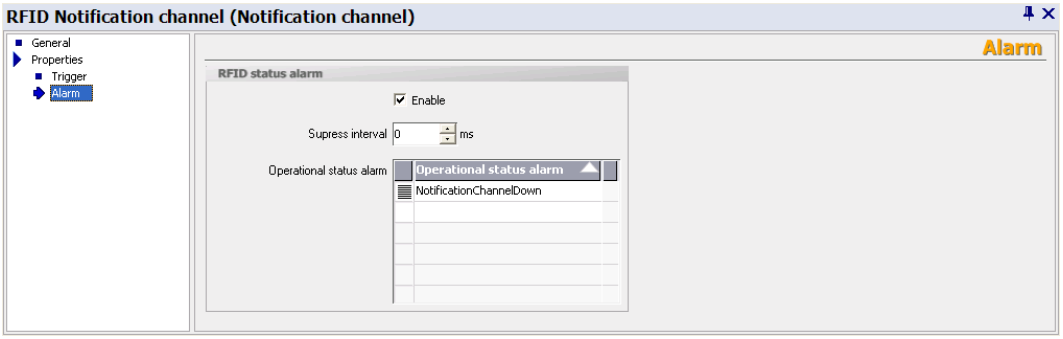
Properties

- **Trigger**



You can specify here whether the events received from the data sources should be transmitted **continuously** or whether they should be passed on dependent on the notification channel trigger. You can select these triggers from the drop-down list or create them. When you define the triggers, you can also specify when they will be activated.

- **Alarm**



Under "Operational status alarm", you can assign more than one RFID status alarm to the notification channel. You can select these from the drop-down list or create them. You will then receive detailed information regarding the status of the notification channel.

If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read the section "Working with alarms".

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

Triggers

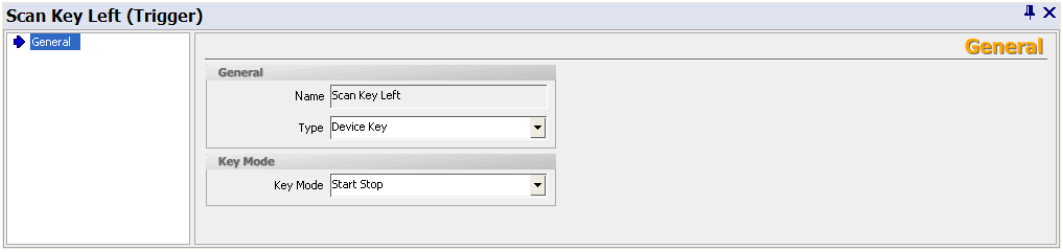
Triggers represent activation mechanisms that can be used to control asynchronous read and filter procedures. Tag data are read at specific times or the stored tag data can be transferred dependent on triggers. Triggers can be used with data sources (read triggers) and notification channels (notification channel triggers).

Triggers can also be activated using the system function "ActivateTrigger" independently of these settings; in addition to the triggering conditions configured for the trigger. When this function is used, for example, for changing the value of a variable, a trigger can be activated by a change in value in the PLC. Depending on the configuration, this trigger causes the data sources to be read.

This is, however, only appropriate for SIMATIC RF310M when it has been established that a connection to RF310M is active.

The "Trigger" menu provides the following parameter setting options:

General

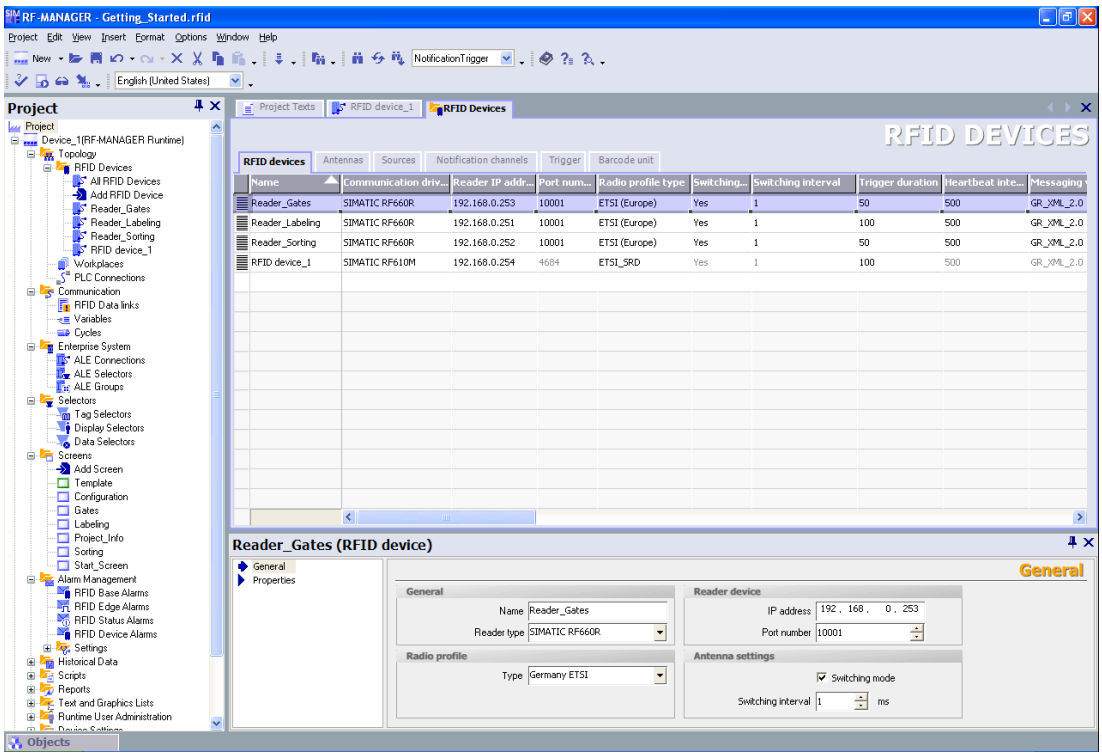


You can specify the trigger "Type" here and set the following parameters:

Trigger	Description	Parameter settings
Continuous	The activity is activated as soon as possible and operates continuously. The maximum permissible frequency reservation time must be taken into account. For notification channel triggers, this means that notifications are transmitted immediately to the workplace when a new event occurs.	-
Application request (Only appropriate when it has been established that a connection to the RF310M is active.)	The activity is triggered on request from the application (e.g. over the ALE interface, or using the system function "ActivateTrigger").	-
Timer	The activity is triggered in accordance with specified time intervals.	The time ("Timer") between the triggers must be specified in milliseconds.
Device key	The activity is performed with an operator input on the SIMATIC RF310M.	The time condition for the trigger can be specified as a parameter. • Selection of the start/stop response • Response to a held down key: Scanning is performed as long as the key is held down • ReadFirst ID: Scanning is performed until the tag/barcode is detected.

3.4.5 Editor "All RFID devices"

The editor "All RFID devices" in the project tree offers you the following functions with regard to the properties of your RFID devices:



Display parameters

In the overview table, you can check the properties of all configured RFID devices at once. The tabs "RFID devices", "Antennas", "Sources", "I/O Ports", "Notification channels", "Trigger", "Barcode unit" are provided for this purpose.

In the table header of the individual tab sheet, you can also hide or show additional properties of the components. Right-click on the header line and activate or deactivate the tick for the properties.

Editing the overview table

Using the table editor, you can change values in the table quickly and easily. Click the cell whose value you want to change, delete the old value and enter the changed parameter.

You can also transfer any value to other lines of the same column easily:

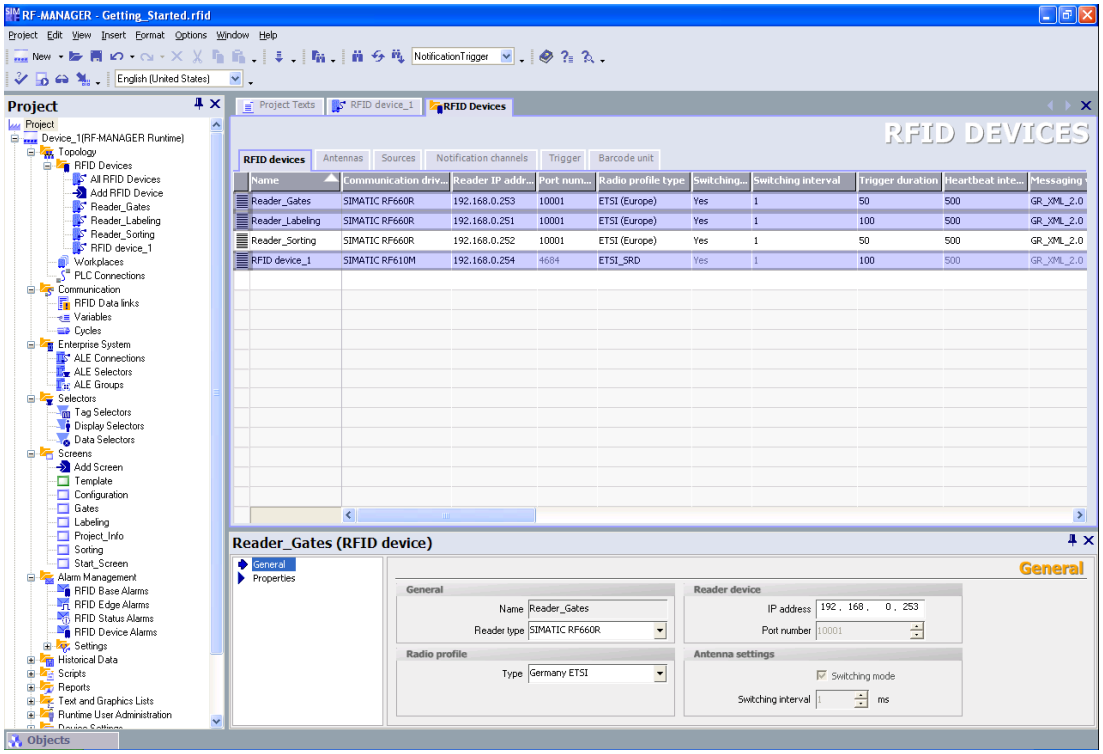
1. Move the mouse pointer to the bottom right-hand corner of a cell for this purpose.
2. Click the right mouse button and hold the button down.
3. Drag the mouse downwards over the cells of your column that should receive the same value as the original cell.
4. Now release the mouse button.

   You have now transferred the original value to other cells.

Multiple selection in the overview table

In the overview table, you can make changes to several RFID devices, antennas, data sources, I/O ports, notification channels, triggers or barcode units simultaneously.

In the relevant tab sheets, you can highlight several RFID devices or components and change their settings in the property view: The same settings will then be assigned to the highlighted RFID devices.



Multiple selection

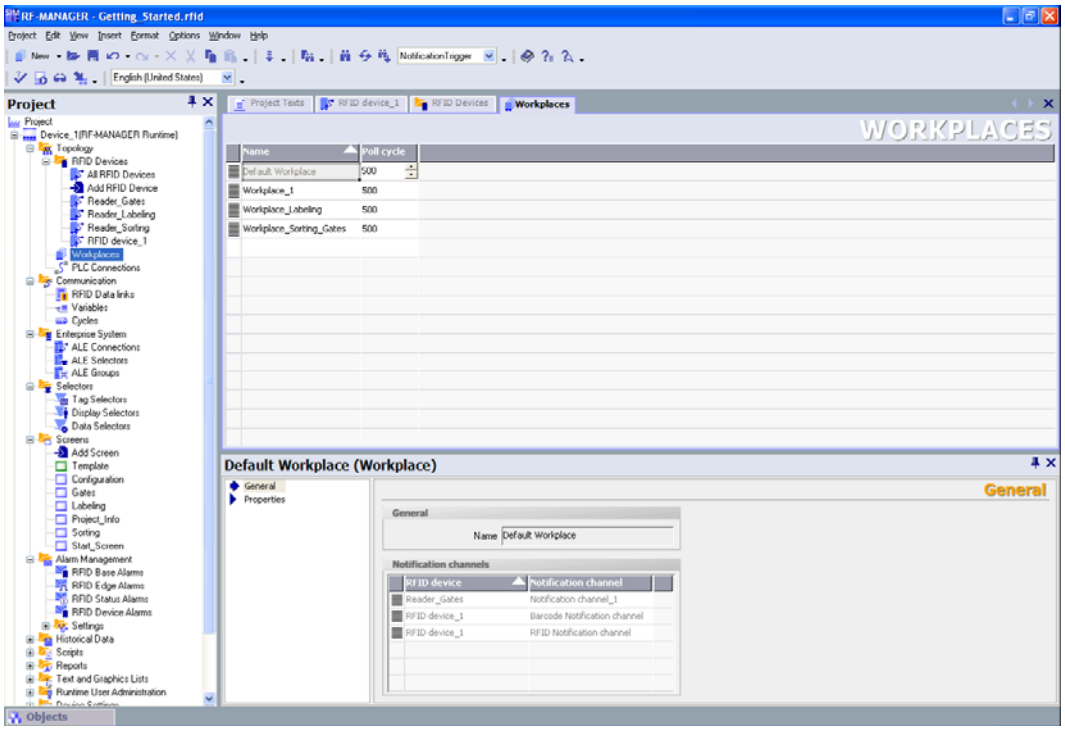
1. Select the tab sheet in which you want to make changes to the RFID device or components.
2. Use the mouse to click the left-hand column for the respective RFID device or component to highlight the line. To add further lines, hold down the <Ctrl> button and click the lines that you want to add using the left mouse button.

   As an alternative, you can also highlight blocks of lines. After you have highlighted a line, hold the <Shift> key down and mark the required lines using the left mouse button.
3. In the property view, you can now change the required parameters for all highlighted lines simultaneously.

   The selection is retained on switching to a different properties area.

3.4.6 Parameterizing workplaces

You can create RF-MANAGER workplaces In the "Workplaces" submenu. These represent containers for logically related data sources and notification channels and they are represented in the abstract for the higher-level systems.. One workplace is assigned to one or more ALE connections for communication with the enterprise system.



Procedure

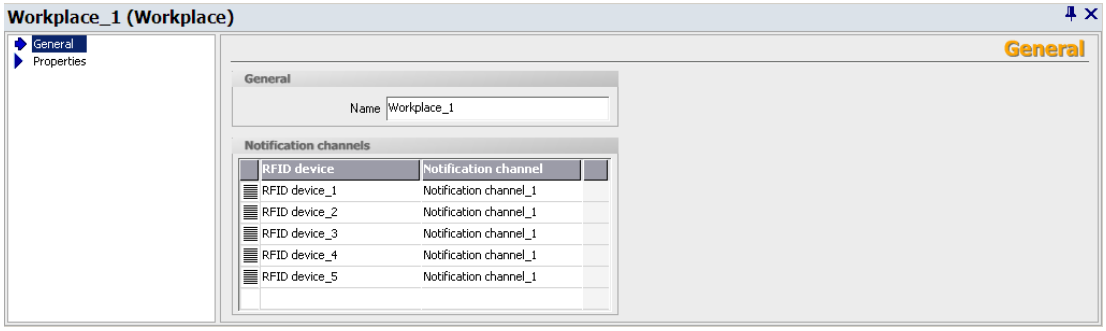
Right-click on "Topology > Workplaces" in the project view. Select the option "Add workplace". The editor for workplaces opens.
Alternatively, you can double-click "Topology > Workplaces" with the left mouse button. In the table, you can then create a new workplace in the next empty line.
The workplace can be edited in the property view.

Workplaces

The "Workplaces" menu provides the following parameter setting options:

General

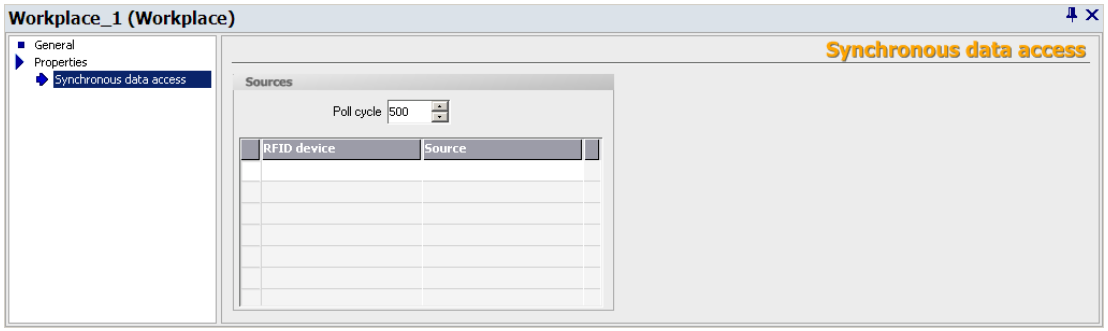
- **Asynchronous data access**



You can parameterize asynchronous data access here. This is the most common read procedure. The asynchronously transferred data of the notification channels are transferred from the workplace to its ALE connection(s). You then have to specify the appropriate RFID devices with the associated notification channels. Select the RFID devices and notification channels whose read data you want to make available to the workplace and the associated ALE connection. You can select these from the drop-down list or create them.

Properties

- **Synchronous data access**



You can parameterize synchronous data access here. You specify the RFID devices and the data sources that they provide whose data is requested by the workplace when required. You can select the RFID devices and the associated data sources from the drop-down list or create them.

You can also specify the "Poll cycle" in milliseconds here. This is in fact a trigger that determines how often the associated data sources are scanned. After one poll cycle has ended, another cycle is not triggered until all the assigned data sources have been scanned. Otherwise, the next poll cycle is skipped. The rule of thumb for parameterizing the poll cycle is that it should be longer than the sum of the read cycles for all data sources.

Note

Preconditions for writing via system functions and ALE functions

Parameterization of synchronous data access is the precondition for writing via system functions and ALE functions, such as WriteTagId".

Note

Standard workplace

RF-MANAGER automatically creates a standard workplace to which all data sources and notification channels are assigned that are not explicitly assigned to other workplaces. The standard workplace is always assigned to the standard ALE connection and cannot be deleted.
You can however assign all data sources and notification channels of the standard workplace to a configured workplace. Then, their connection to the standard workplace is removed.

Note

Assignment of data sources and notification channels to workplaces

One data source or notification channel can be assigned to any number of workplaces.

3.5 Parameterize communication

3.5.1 Introduction

Under the item "Communication" of the project tree, you can set the basic parameters for communication relationships in your RFID system. You can create RFID data links via which RFID data can be provided for evaluations. You can define variables for transferring data and cycles for recurring project procedures.

The parameters are set in the following stages:

- Communication
  - RFID data links
  - Variables
  - Cycles

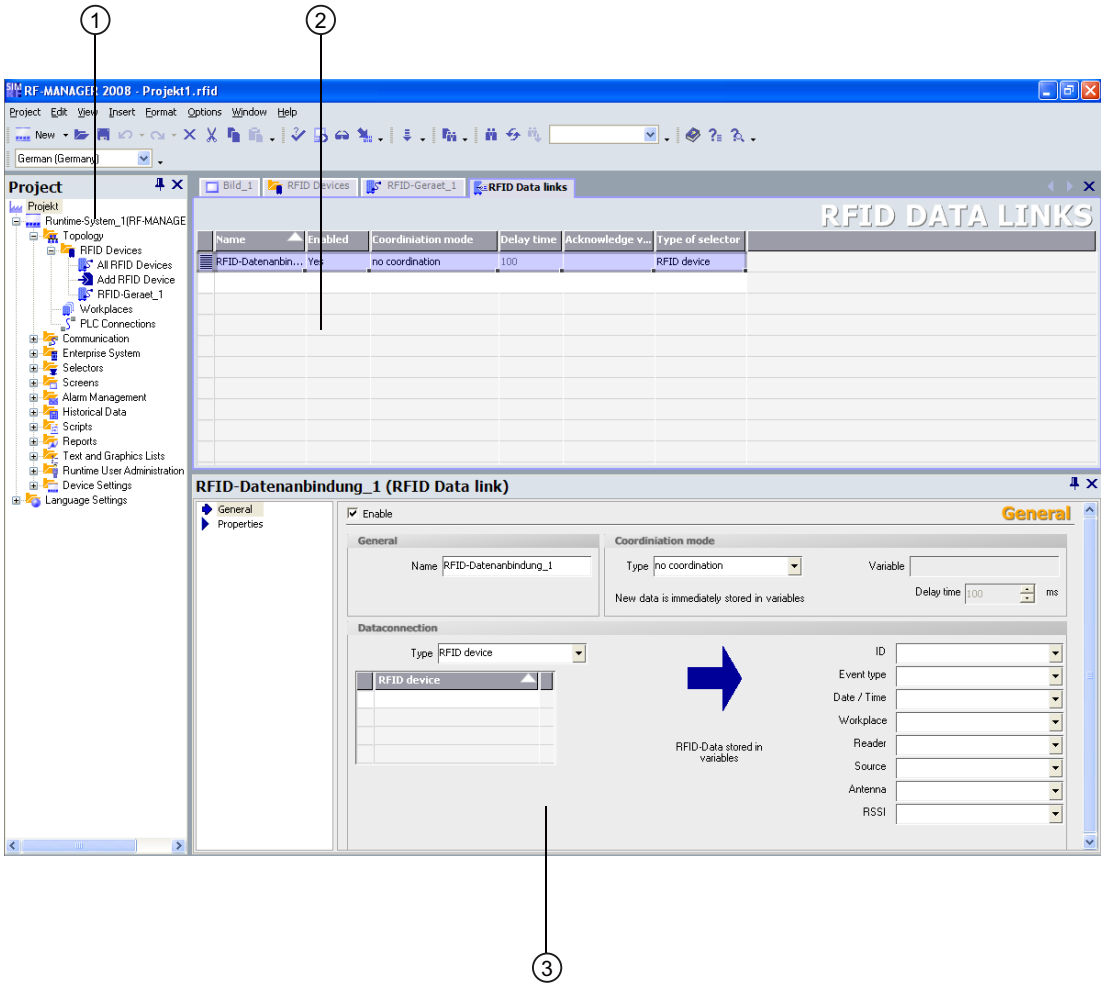
Note

Variables / cycles

For information about handling variables and cycles, refer to the chapter *Working with variables* or *Working with variables > Working with cycles*.

3.5.2 Parameterizing an RFID data link

You set up the supply of RFID data in the submenu "RFID data links". The read RFID data is supplied in variables. This ensures that the data can be reliably evaluated in a PLC or with VB scripting in RF-MANAGER. The PLC can then trigger appropriate actions, for example, in production in accordance with the evaluation results. Through the use of variables, the data can be displayed in output fields in parallel.



① Project view
② Workplace
③ Property view

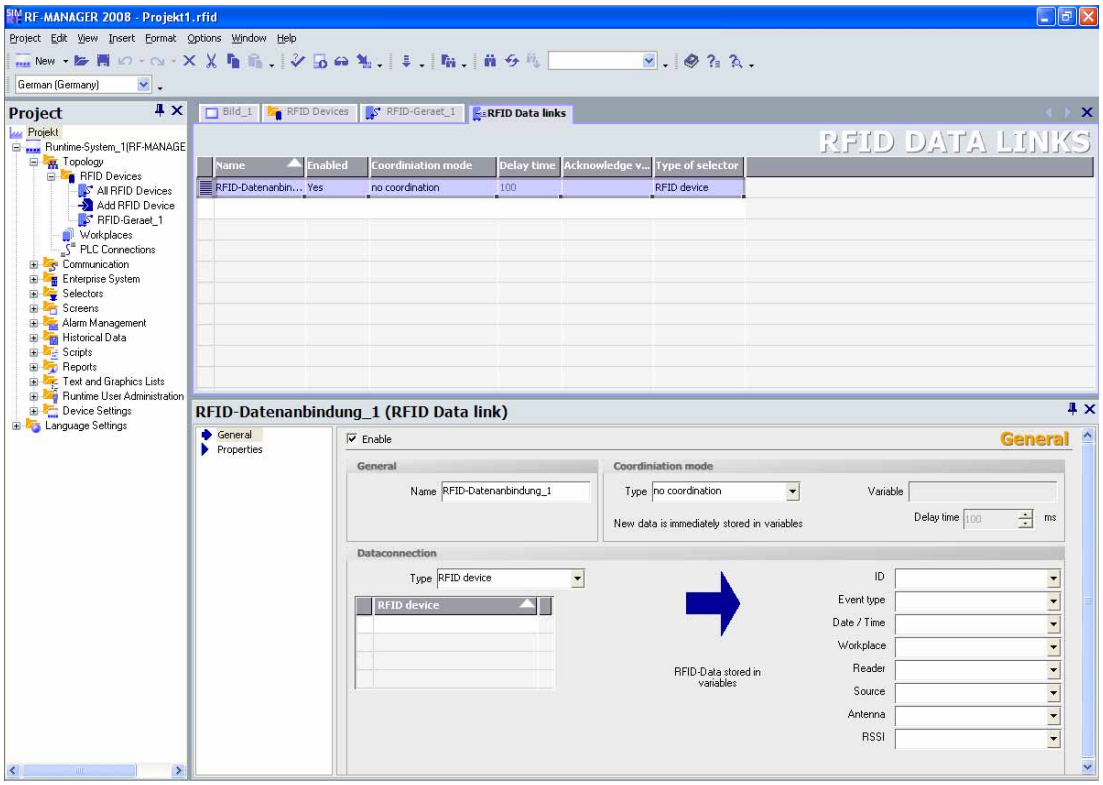
Procedure

Right-click on "Communication > RFID data links" in the project view. Select the option "Add RFID data link". A new RFID data link appears in the workplace that you can edit in the property view.
Alternatively, you can use the left mouse button to double-click on "Communication / RFID data links" to open the workplace for ALE connections. By double-clicking the next empty table line with the left mouse button, you can create a new RFID data link that you can edit in the property view.

RFID data links

The "RFID data links" menu provides the following parameter setting options:

General



You can specify the name of the RFID data link here and determine the type of data link. You can specify where the RFID data originate from: From a workplace, an RFID device or a data source. Multiple selections are possible for every type.

Under "Variable", you specify which RFID data is supplied in which variable:

Field	Variable	
ID	The current tag ID as a string variable	
Event type	The event type for the above tag ID	
	Variable of type STRING	"New" "Glimpsed" "Observed" "Lost" "Purged" "Unknown" "Read"
	Variable of type VALUE	1 = "New" 2 = "Glimpsed" 3 = "Observed" 4 = "Lost" 5 = "Purged" 6 = "Unknown" 7 = "Read"
Date/time	The acquisition time of the tag as a string variable or alternatively the acquisition time of the tag as a date/time variable e.g. 10/22/2007 12:45:11:312 AM [1] or alternatively in UTC e.g. 2007-10-22T12:45:11.312+00:00	
Workplace	The name of the workplace via which the tag was read as a string variable	
Reader	The name of the reader that read the tag as a string variable	
Data source	The name of the data source where the tag was read as a string variable	
Antenna	As string (Antenna 01 ... Antenna 04) or value (1 ...4)	
RSSI value	As value 0 ... 255 (is only provided by RF670R)	
[1] The display is dependent on the selected runtime language and the settings in the control panel.		

Internal and external variables can be used as variables.
If you do not select any variable in a field, this is permitted and data is not supplied in this case.

Note

For performance reasons, you must only activate the fields that are actually required for evaluation.

Data is usually supplied from a large number of tags over the RFID data link. The supply of data and processing of the supplied data must therefore be coordinated. Two coordination techniques are available:

- Coordination via an acknowledgement variable

  To ensure reliable synchronization between the supply and evaluation of data, you should use coordination by means of an acknowledgement variable.

  After selecting this method, you must assign an acknowledgement variable. The acknowledgement variable must be of the "BOOL" type. After it has been enabled, synchronization takes place between the supply of data and confirmation of evaluation via the acknowledgement variable.

- Coordination via a delay time

  You should use coordination via a delay time when

  – Faster processing of the RFID data is necessary. The RFID data link does not have to wait for the acknowledgement variables to be reset before new data can be written to the output variables. The polling time for updating the acknowledgement variables is omitted.

  – The cycle time is known. This is required by the PLC so that written RFID data can be completely processed. It is only then possible to set an appropriate value for the delay time. This ensures that the previous data is not overwritten by new data and no inconsistencies in the data can arise.

  After selecting this method, you can adjust the preset time value to your requirements. You can also assign a variable here. Following activation, the supply of data and its evaluation are coordinated via the set delay time and the optionally assigned variable.

For additional information, see Section .
Under certain conditions for a system and procedure, a coordination procedure can be omitted.

You can use the "Enable" checkbox to specify whether the RFID data link should be started automatically at runtime. This check box is not selected in the default state. Starting/stopping is possible in the runtime system by executing the system function "SetRfidDataLinkStatus".

Note

A number of simultaneously active RFID data links will have an adverse effect on runtime system performance. Only enable those RFID data links in the runtime system that are actually required.

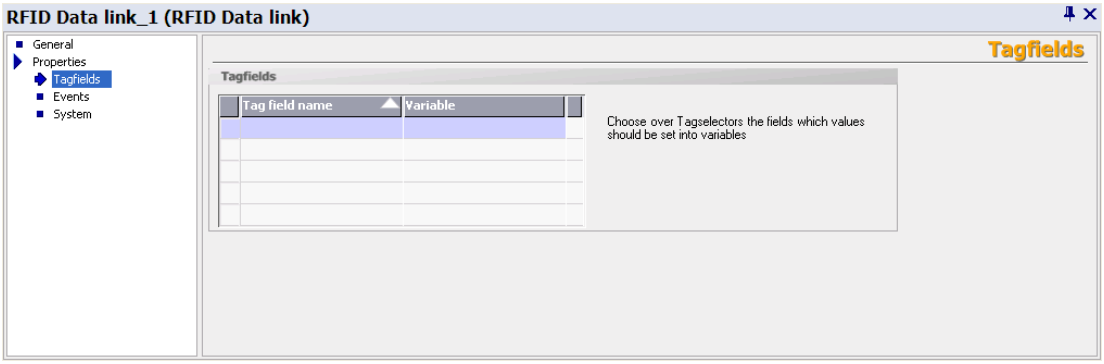
Note

Data consistency and coordination

During parameterization, ensure that the same variables or destination memory in the PLC are not used by more than one RFID data link. Otherwise data consistency and error-free coordination cannot be assured.

Properties

- **Tag fields**

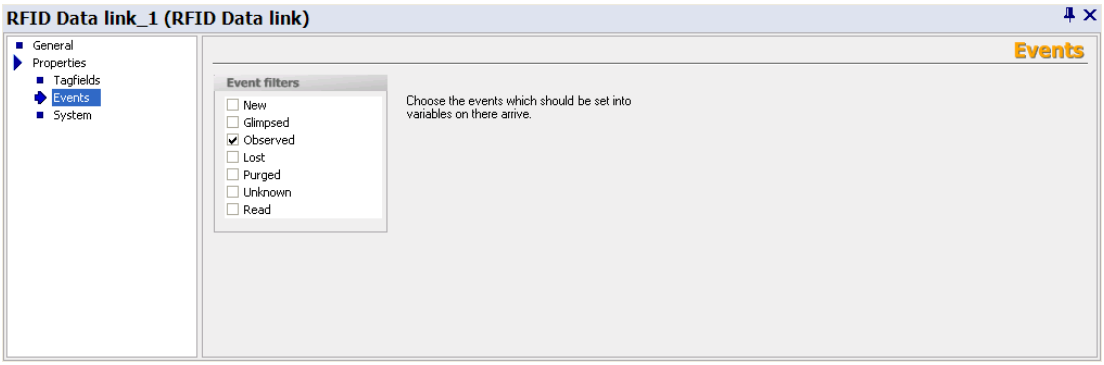


You can specify further data here that should be supplied in variables. Through tag selectors, select the tag fields whose values you require. String variables are permitted to be used as variables.

The tag selectors must be assigned to at least one data source used here.

The data can be supplied in internal or external variables. All the selection possibilities and notes described under *General* above also apply here. The coordination procedure described above is also used.

- **Event filter**



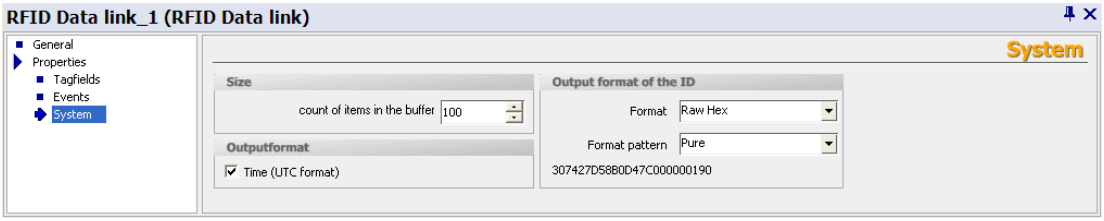
You can define the event filter here which in the case of a match the read RFID data events will be supplied in the variables. It is possible, for example, to only supply RFID data events with the "Observed" status. All other statuses are discarded. This can be used to reduce the data volume for evaluation to achieve higher performance.

Note

At runtime, only those events can be written to the variables that have been actually generated. The settings for the associated data selectors are decisive here.

Example: For all "Observed" events in Workplace_1, RFID data should be supplied. Workplace_1 has one notification channel with a data selector. The event "Observed" must therefore also be selected for this data selector.

- **System**



– You specify the maximum number of entries here for the internal buffer that must be buffered for serial processing. This is set to 100 entries by default; the maximum number is 10,000.

– You can specify the output format for date/time.

– You can specify the output format for the tag ID.

  The available options are as follows:

Format	Formatting	Example of output format
Raw hex	with complete prefix (full)	urn:epc:raw:96.x307427D58B0D47C000000190
	with abbreviated prefix (prefixed)	96.x307427D58B0D47C000000190
	without prefix (pure)	307427D58B0D47C000000190
Raw decimal	with complete prefix (full)	urn:epc:raw:96.149957039779689235352817504 16
	with abbreviated prefix (prefixed)	96.14995703977968923535281750416
	without prefix (pure)	14995703977968923535281750416
EPC format	with complete prefix (full)	urn:epc:id:sgtin:0652642.800031.400
	with abbreviated prefix (prefixed)	sgtin:0652642.800031.400
	without prefix (pure)	0652642.800031.400
Tag format	with complete prefix (full)	urn:epc:tag:sgtin-96:3.0652642.800031.400
	with abbreviated prefix (prefixed)	sgtin-96:3.0652642.800031.400
	without prefix (pure)	3.0652642.800031.400

3.5.3 Functionality of RFID data links at runtime

Introduction

In the runtime system, the RFID data link registers with the selected workplaces, readers or data sources and receives the RFID data read there from this point onwards.

Function method

With acknowledgement variable

Note

No exchange of data over the RFID data link

After starting the runtime system, set the selected acknowledgement variable to "0", e.g. with the start value for the variable. There will otherwise be no exchange of data over the RFID data link.

The RFID data link checks whether the supplied data matches one of the parameterized event types. If so, the data will be stored in the internal buffer first.

Before the values are written to the output variables, the RFID data link checks whether the value of the acknowledgement variable is set to FALSE (i.e. "0"). If this is the case, the oldest values from the internal buffer will be written to the configured output variables. The acknowledgement variable is then set to TRUE (i.e. "1"). This signals that all the values have been written and evaluation can start:

- The PLC reads the data from the variables and evaluates them in the user program.
- If the data is to be evaluated using a VB script, it is recommended that the script is started when the acknowledgement variables are set. You can use the event trigger "Value change" of the acknowledgement variables for this purpose.

After the data has been read, the PLC or script sets the acknowledgement variable to FALSE ("0").

In the diagram below, this procedure is depicted graphically based on the example of the PLC.

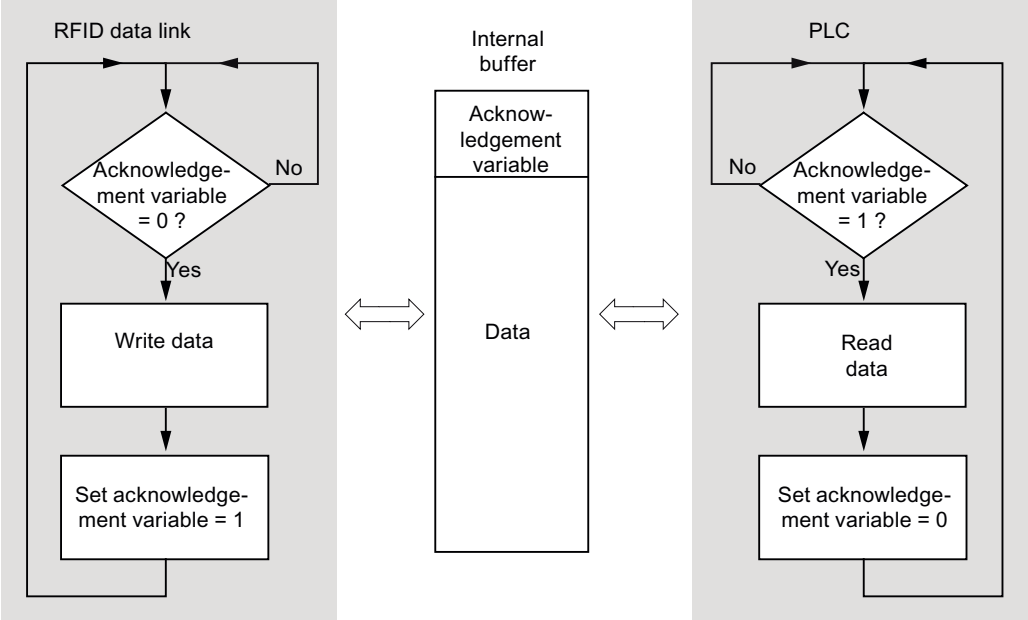


Figure 3-18 Sequence diagram for RFID data link with acknowledgement variable

The RFID data link then checks cyclically whether the acknowledgement variable has been reset. Further values that are available in the buffer will not be written to the output variables until it has been reset.

If new RFID data is supplied in the meantime, this will be buffered until the buffer is full. If the buffer overflows, an appropriate system alarm will be output.

Note

You can prevent a buffer overflow by increasing the maximum number of buffer entries.

With delay time

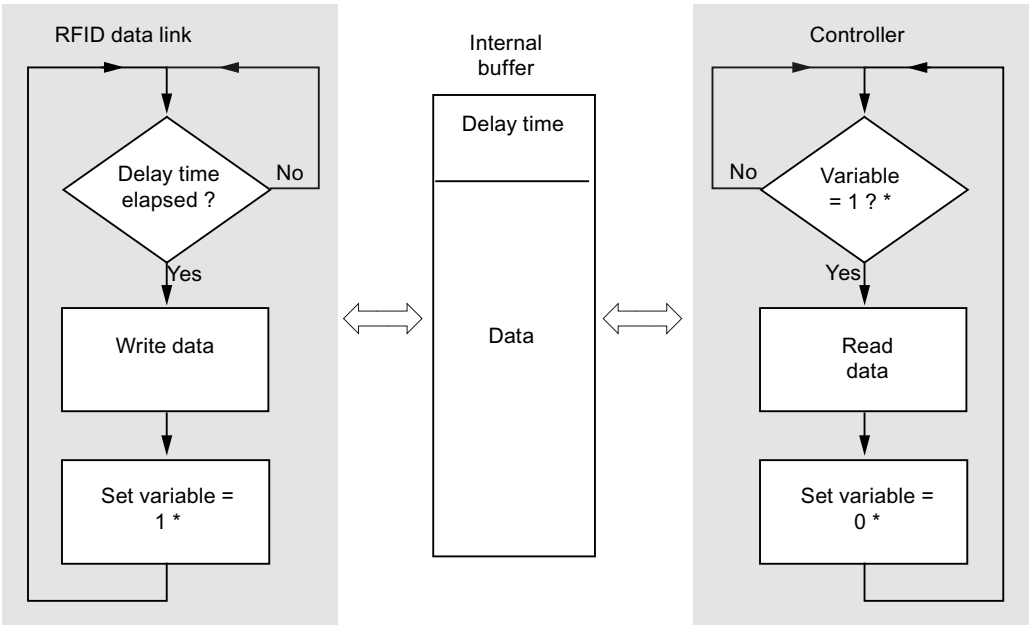
The RFID data link checks whether the supplied data matches one of the parameterized event types. If so, the data will be stored in the internal buffer first.

Before the values are written to the output variables, the RFID data link checks whether the delay time has elapsed since the last write. If this is the case, the oldest values from the internal buffer will be written to the configured output variables. If a variable has been assigned, the RFID data link will then set the variable to TRUE ("1").

The PLC reads the data from the output variables and evaluates them in the user program. if a variable has also been assigned, the PLC can check whether this is set to TRUE ("1"). This ensures that the data has been completely written.

After the data has been read, the PLC sets the variable to FALSE ("0").

In the diagram below, this procedure is depicted graphically.



* Optional, only when variable was configured

Figure 3-19 Sequence diagram for RFID data link with delay time

The RFID data link then checks cyclically whether the delay time has elapsed. Further values that are available in the buffer will not be written to the output variables until it has been reset.

If new RFID data is supplied in the meantime, this will be buffered until the buffer is full. If the buffer overflows, an appropriate system alarm will be output.

Note

You can prevent a buffer overflow by increasing the maximum number of buffer entries.

Without coordination procedure

If you have not configured a coordination procedure, newly arriving RFID data is directly transferred to the output variables.
This is only appropriate when the system procedures ensure that the next RFID data will only arrive after the evaluation has definitely been completed.

3.6 Parameterizing an enterprise system

In the "Enterprise System" branch of the project tree, you can specify the ALE connections between the RF-MANAGER and the enterprise system. You can also determine which selectors sort the occurring RFID data communication and how the data records allowed to pass through should be grouped for the report to the ALE client.

Overview of the RF-MANAGER architecture (Page 21)

Note

Basic information

Basic information about the EPCglobal Application Level Events (ALE) Specification can be downloaded from the EPCglobal site atwww.epcglobalinc.org

The enterprise system is parameterized in the following stages:

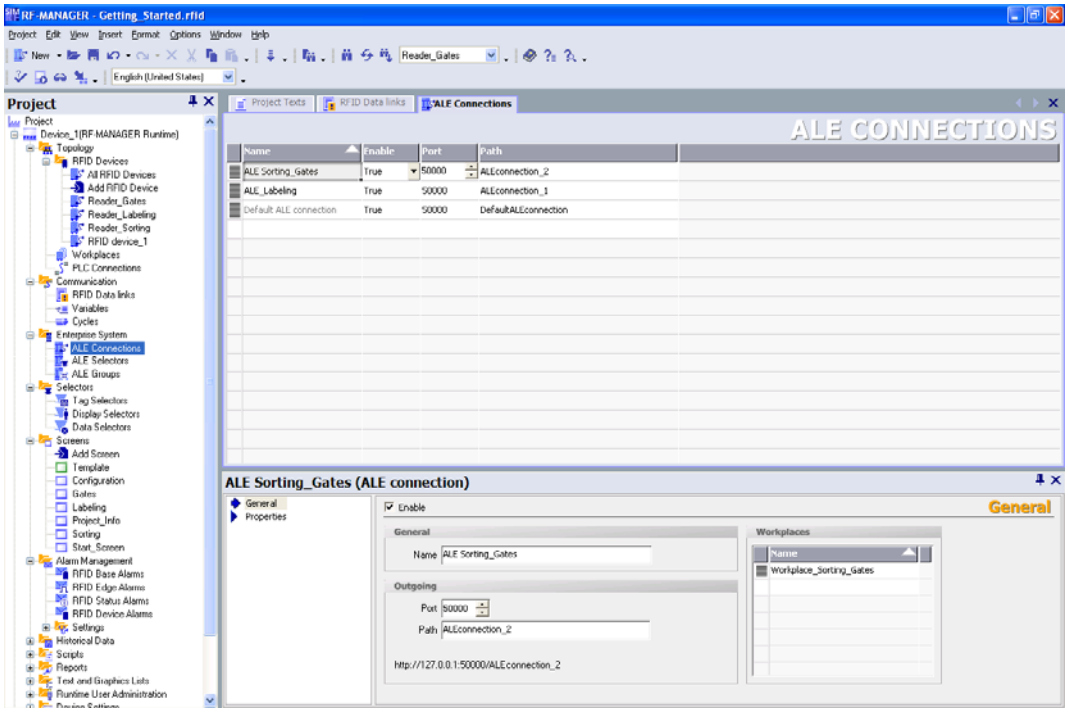
- ALE connections
- ALE selectors
- ALE groups

See also

EPCglobal site (http://www.epcglobalinc.org/home)

3.6.1 Parameterize ALE connections

In the "ALE connections" submenu, you can create and parameterize the Application Level Events connections. This allows you to transfer RFID data from RF-MANAGER to a higher-level enterprise system and to receive alarms in the enterprise system.



The ALE connection provides a standardized format for transferring collected and filtered RFID data. This is performed independently of the origins and method of processing of the RFID data.

The core of ALE connections is the report into which the RFID data is incorporated. Clients can scan the report data either synchronously (direct approach) or asynchronously (logon/logoff). For this reason, you also have to specify for example the read procedure and the report cycles in this menu.

RFID alarm events can also be sent to the enterprise system over the ALE connection.

Abstraction of the hardware, as implemented by the ALE connection, means that the ALE clients do not require detailed knowledge of the RFID system.

You will find detailed information on the functionality and scope of the ALE interface or the ALE client in the *ALE+Function Manual* in the section "ALE+Client Example Application".

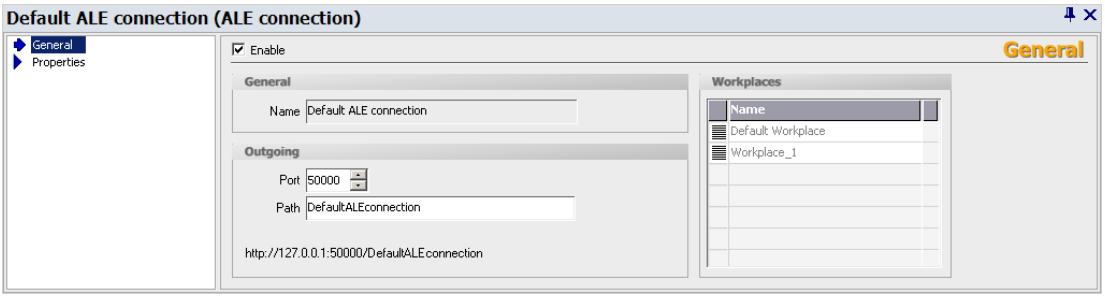
Procedure

Click in the project view with the right mouse button on "Enterprise system > ALE connections". Select the item "Add ALE connection". A new ALE connection appears in the workplace that you can edit in the property view.
Alternatively, you can use the left mouse button to double-click on "Enterprise system / ALE connections" to open the workplace for ALE connections. By double-clicking the next empty table line with the left mouse button, you can create a new ALE connection that you can edit in the property view.

ALE connections

The "ALE connections" menu provides the following parameter setting options:

General



You specify the name of the ALE connection and an address here. Under "Outgoing" you specify the output "Port" and the "Path" (URL) that the client of the enterprise system should use to connect to the RF-MANAGER. These settings are relevant for both the synchronous and asynchronous read procedures for RFID data and for providing the alarms of the RFID system.

You can also specify the "Workplaces" that are scanned by the ALE connection.

Under "Activate", you can activate the ALE connection. Alternatively, you can activate the ALE connection in the "Configuration" view at runtime.

Parameterizing workplaces (Page 245)

Note

Assigning addresses to more than one ALE connection

When you create more than one ALE connection, they must differ on the basis of either the address or port number.

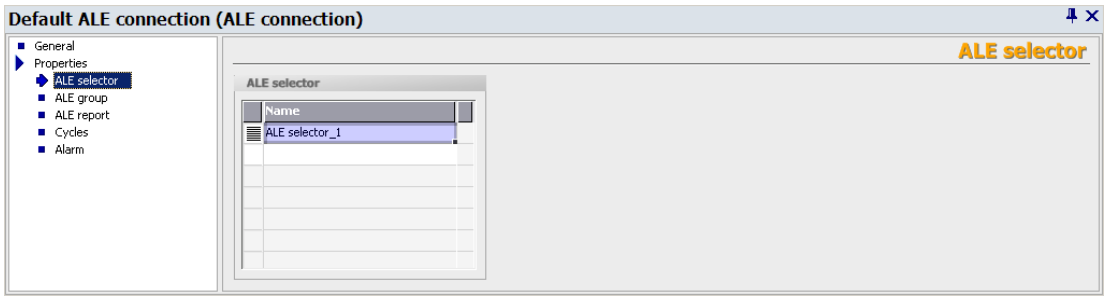
Note

Standard ALE connection

The application automatically creates a standard ALE connection to which all workplaces are assigned that are not explicitly assigned to other ALE connections. A standard ALE connection exists because there would otherwise be components in the system that would have no connection to an enterprise system and their data could therefore not be accessed. You can, however, assign a new ALE connection to all workplaces of the standard ALE connection. Then, their connection to the standard ALE connection is removed.
The standard workplace is, however, always assigned to the standard ALE connection and cannot be deleted.

Properties

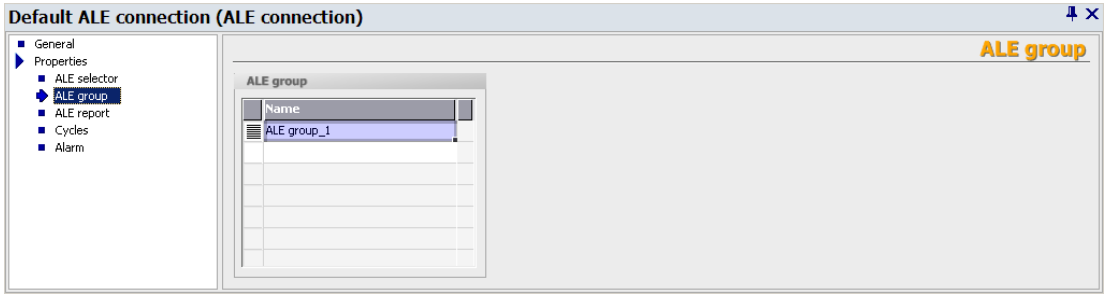
- **ALE selector**



You assign selectors to the ALE connection here. You can select these from the drop-down list or create them. If you do not assign a selector to the connection, all incoming data records will be passed on.

Parameterizing ALE selectors (Page 265)

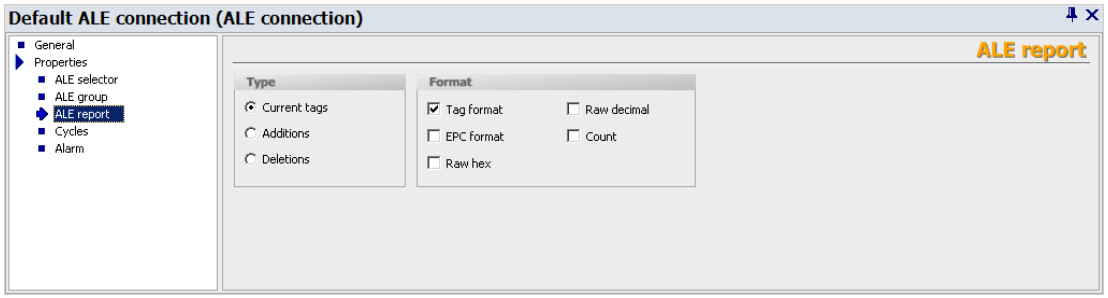
- **ALE group**



The data records passed on by the ALE selectors can be combined into groups here. You can use groups to arrange the data records in accordance with specific criteria and to increase the clarity of the information. You can select the groups from the drop-down list or create them.

Parameterizing ALE groups (Page 268)

- **ALE report**



You can parameterize the notification procedure of the ALE connection here. These settings are relevant for both the synchronous and asynchronous read procedures.

You can specify under "Type" whether all the tags already scanned by the reader ("Current tags") should be reported or only the newly arrived tags ("Additions") or only the tags that are no longer detected by the reader ("Deletions").

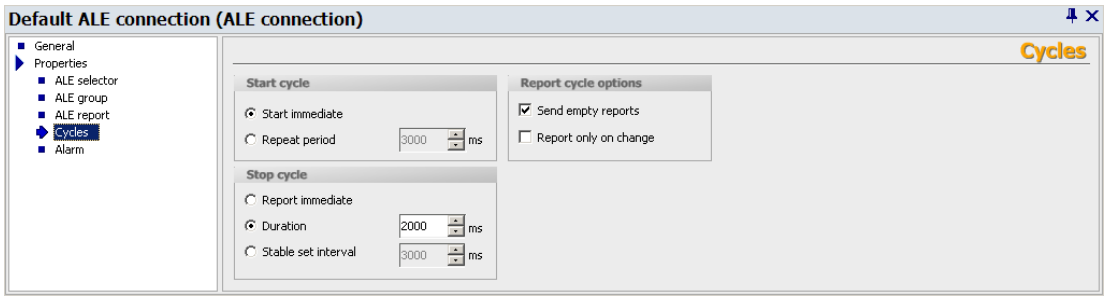
Under "Tag format" you specify the formats in which the tag IDs are stored in the report and the number of EPCs in a group ("Count").

The output format of the ID is specified under "Tag format".

The available options are as follows:

Format	Formatting	Example of output format
EPC format	With complete prefix	urn:epc:id:sgtin:0652642.800031.400
Tag format	With complete prefix	urn:epc:tag:sgtin-96:3.0652642.800031.400
Raw hex	With complete prefix	urn:epc:raw:96.x307427D58B0D47C000000190
Raw decimal	With complete prefix	urn:epc:raw:96.149957039779689235352817504 16

- **Cycles**



You specify the report cycles here. These settings are relevant for both the synchronous and asynchronous read procedures.

You can specify the type of start cycle - "Start immediate"or enter a "Repeat period" in milliseconds.

There are three ways to specify the stop cycle: Using "Report immediate", "Duration" or "Stable set interval".
When "Duration" is selected, you can define a period during which the report is open and therefore data can flow into it. It must be taken into account that the interval defined here must be at least as long as the longest "Read timeout" parameterized under "Data sources".
When "Stable set interval" is selected, you can define an interval that on elapsing will cause the report to close if no new events have occurred.
If you specified a "Repeat period" for the start cycle, this period must be longer than a period selected under "Stable set interval" or "Duration".

Finally, under "Report cycle options", you can specify whether reports should be sent when there are no new events ("Send empty reports") and whether reports should only be sent if a new event occurs ("Report only on change").

Note

Report cycle parameterization

The parameter settings for the report cycle affect the time interval to be parameterized under "Workplaces" during which the ALE connection can scan its workplaces ("Acquisition cycle").

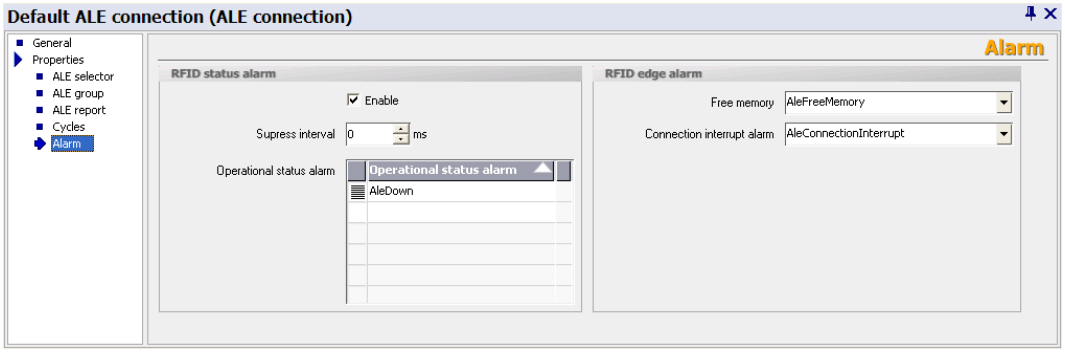
Example: If you selected "Start immediate" and a time of 200 milliseconds was set under "Duration", a second scan will be performed with synchronous data access and an acquisition cycle of 100 milliseconds.

Parameterizing workplaces (Page 245)

See also:

Help system *Understanding and optimizing the scanning of RFID tags*

- **Alarm**



You can parameterize sections of the alarm system here. Alarms can be defined here under "RFID edge alarm" that provide information about the spare memory space ("Free memory"), and about any interruption of the ALE connection ("Connection interrupt alarm").

Under "RFID status alarm", you can define alarms that output connection information ("Operational status alarm"). You can assign more than one RFID status alarm to an ALE connection here. You can select all these alarms from the drop-down list or create them.

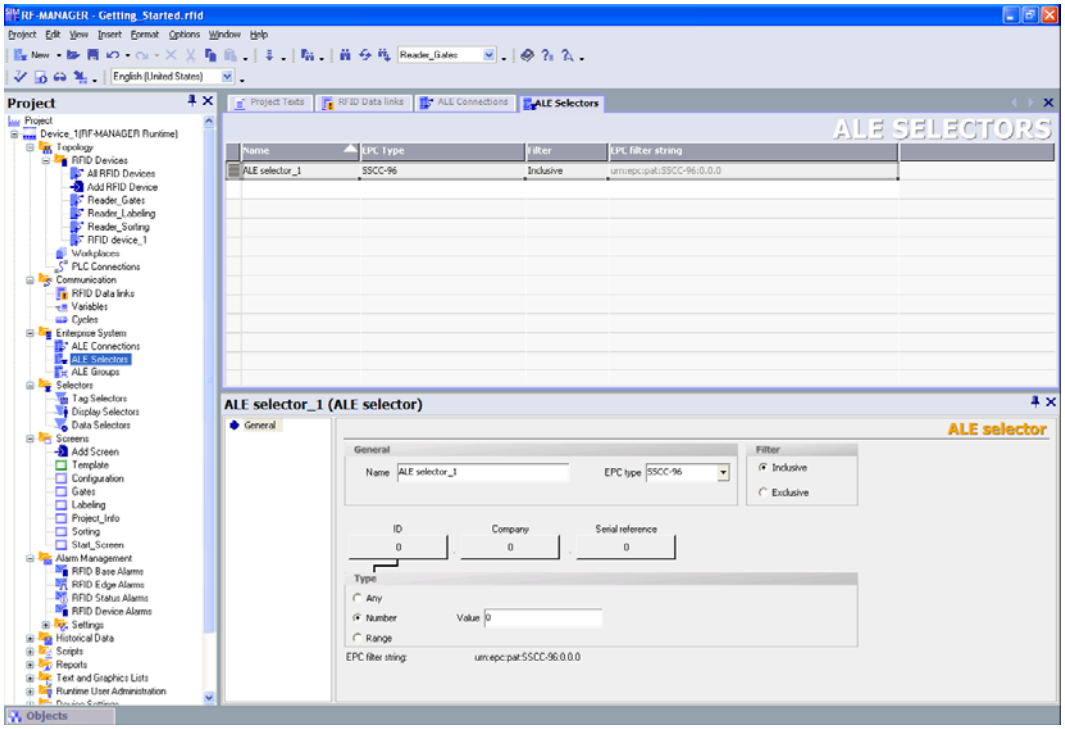
If you select the "Enable" option, changes in operational status will be monitored. You can specify the change that triggers one of the RFID status alarms selected here when configuring the individual alarms. For further details, please read the section "Working with alarms".

Under "Suppress interval", you can specify the length of time that multiple alarms or alarms triggered at short intervals should be suppressed.

RFID alarms (Page 302)

3.6.2 Parameterizing ALE selectors

In the "ALE selectors" submenu, by specifying the EPC type to be used, you can create selectors that limit the data flow from RF-MANAGER to an enterprise system. ALE selectors can only sort EPC data; filtering of the freely parameterizable user data is not possible.



Note

Filtering of ISO data is not supported

Due to the structure of ISO 18000-6B tags, filtering of ISO data through ALE selectors is not possible.

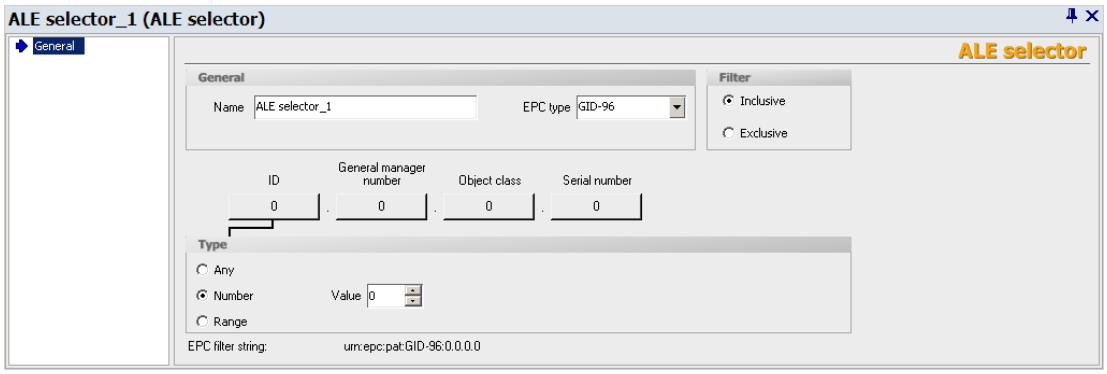
Procedure

Click in the project view with the right mouse button on "Enterprise system / ALE selectors". Select the option "Add ALE selector". A new editor for the ALE selector appears in the workplace.
Alternatively, you can also use the left mouse button to double-click "Enterprise system / ALE selectors". You can then create a new editor for ALE selectors in the next empty line in the workplace.
The ALE selector can be edited in the property view.

ALE selectors

The "ALE selectors" menu provides the following parameter setting options:

General



You can assign a name to the ALE selector here and select the EPC type used. The ALE selector is based on the EPC structure in accordance with the type used - this results in the provided parameters that correspond to the individual EPC data fields.

EPC type	Data fields
GID-96	General manager number, object class, serial number
SGTIN-64	ID, company prefix, reference to the element, serial number
SGTIN-96	ID, company prefix, reference to the element, serial number
SSCC-64	ID, company prefix, reference series
SSCC-96	ID, company prefix, reference series
SGLN-64	ID, company prefix, site reference
SGLN-96	ID, company prefix, site reference
GRAI-64	ID, company prefix, stock type, serial number
GRAI-96	ID, company prefix, stock type, serial number
GIAI-64	ID, company prefix, individual stock reference
GIAI-96	ID, company prefix, individual stock reference
DoD-96	ID, government managed identifier, serial number
DoD-64	ID, government managed identifier, serial number

Note

Further information

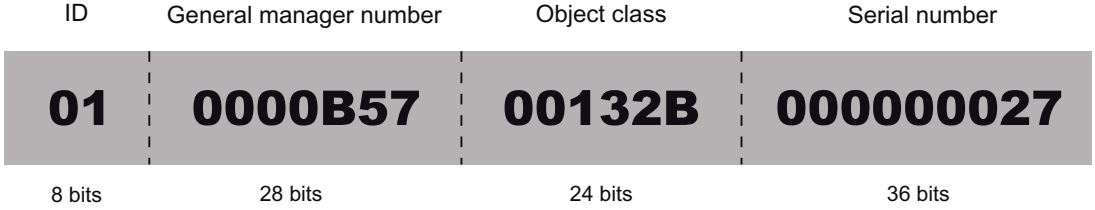
Refer to the document *EPCglobal Tag Data Standards* for further information about the structure of the individual EPC types. This can be downloaded from the EPCglobal site www.epcglobalinc.org .

You can now filter the contents of these fields according to the following criteria:

- "Any": The EPC data field can have any value
- "Number": The EPC data field must have a specific value assigned to it
- "Range" The value of the EPC data field must lie within an assigned range of values

If the "Inclusive" option is activated, all the tags are supplied that correspond to the parameterized filtering criteria. If this option is not activated ("Exclusive"), all the tags are supplied that do not correspond to the parameterized filtering criteria.

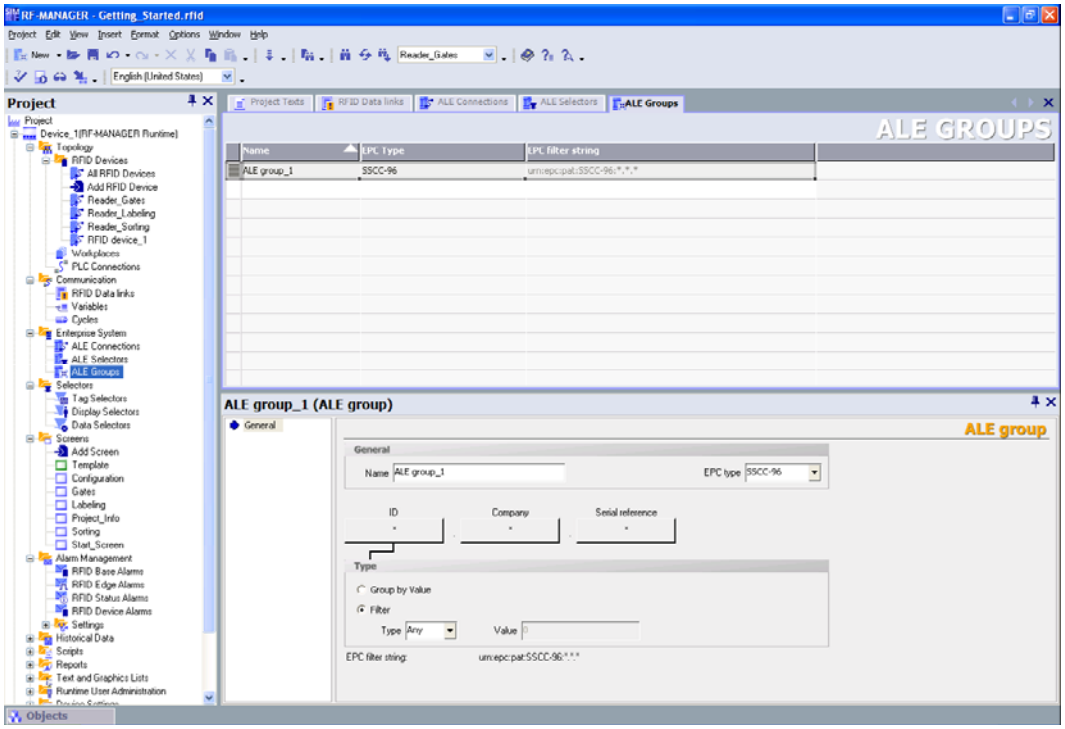
Example of the structure of a GID 96 bit code



- **ID:** identifies the subsequent EPC number identifier or length, type, structure or version of the EPC
- **General manager number:** identifies the company/corporation
- **Object class:** corresponds to the article number
- **Serial number:** consecutive number of the article

3.6.3 Parameterizing ALE groups

You can create EPC groups in the submenu "ALE groups" by determining the EPC type used. They determine how the data records that have passed through the filter should be grouped for the report to the ALE client. ALE groups therefore support structuring of the data in accordance with requirements.



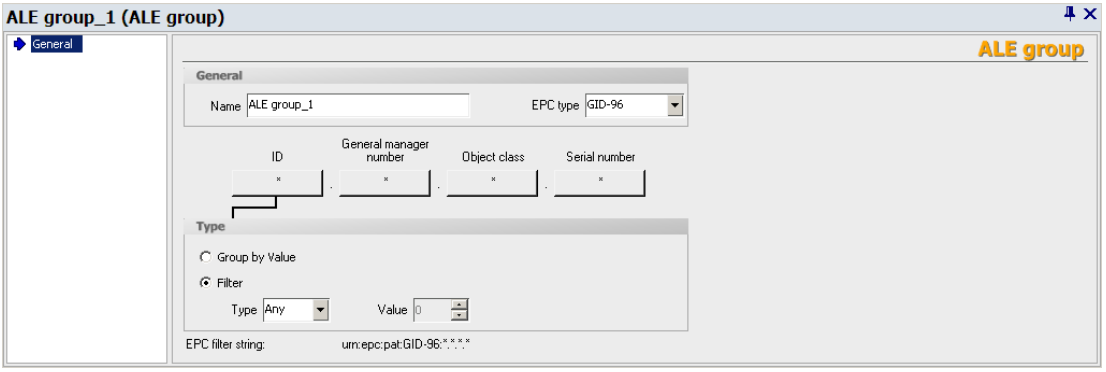
Procedure

Click in the project view with the right mouse button on "Enterprise system / ALE groups". Select the option "Add ALE group". A new table for the ALE group appears in the workplace. You can edit this in the properties dialog box.
Alternatively, you can use the left mouse button to double-click on "Enterprise system / ALE groups" to open a new tab for the ALE group in the workplace. You can create a new group here by double-clicking an empty line of the table with the left mouse button here. You can edit it in the properties dialog box.

ALE groups

The "ALE groups" menu provides the following parameter setting options:

General



You can assign a name to the ALE group here and select the EPC type used. The ALE group is based on the EPC structure in accordance with the type used - this results in the provided parameters that correspond to the individual EPC data fields.

EPC type	Data fields
GID-96	General manager number, object class, serial number
SGTIN-64	ID, company prefix, reference to the element, serial number
SGTIN-96	ID, company prefix, reference to the element, serial number
SSCC-64	ID, company prefix, reference series
SSCC-96	ID, company prefix, reference series
SGLN-64	ID, company prefix, site reference
SGLN-96	ID, company prefix, site reference
GRAI-64	ID, company prefix, stock type, serial number
GRAI-96	ID, company prefix, stock type, serial number
GIAI-64	ID, company prefix, individual stock reference
GIAI-96	ID, company prefix, individual stock reference
DoD-96	ID, government managed identifier, serial number
DoD-64	ID, government managed identifier, serial number

Note

Additional information

Refer to the document *EPCglobal Tag Data Standards Version 1.1 Rev.1.27* for additional information about the structure of the individual EPC types.

Under "Group by value", you can allow groups to be created automatically for each different value.

Alternatively, you can create ALE groups under "Filter" using the above-mentioned data fields. Available selection criteria:

- "Type - Any": Regardless of its value, the EPC data field belongs to the ALE group
- "Type - Number": The EPC data field must have a specific value in order to belong to the ALE group
- "Type - Value range": The EPC data field must have an assigned value range in order to belong to the ALE group

3.7 Parameterizing selectors

In the "Selectors" section of the project tree, you can set basic parameters for the selectors that you are using in your RFID system. You can define selectors for controlling tag acquisition by the reader, to reduce the amount of data in the screens and to reduce the volume of information flowing through the notification channels

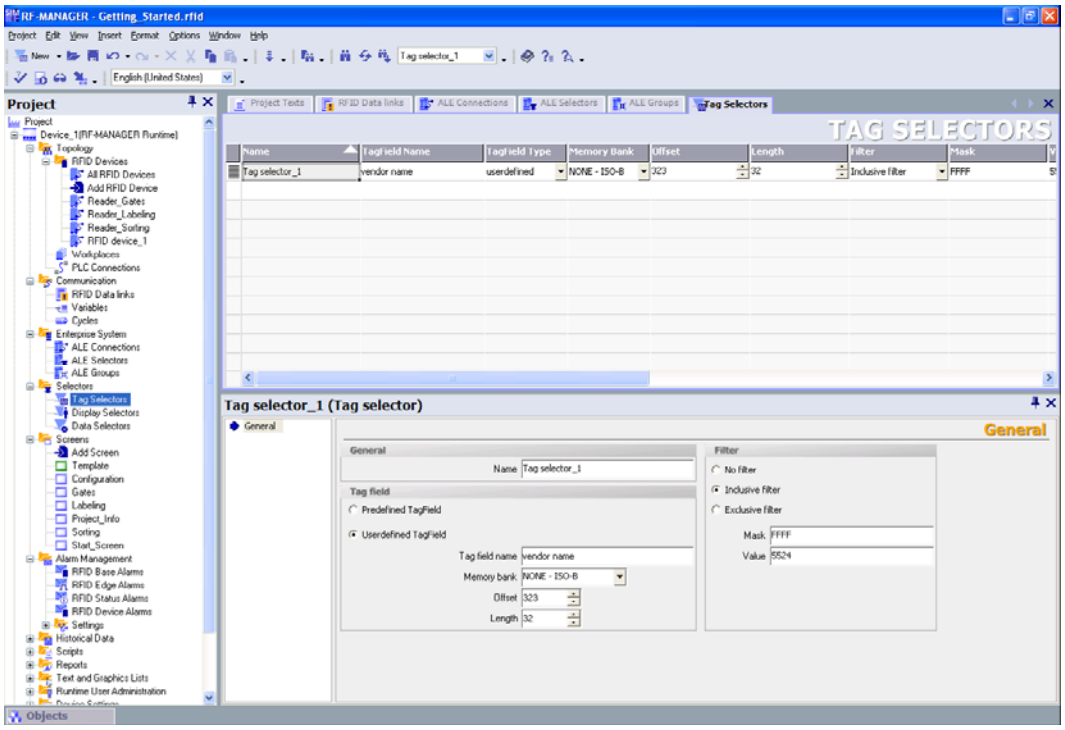
Overview of the RF-MANAGER architecture (Page 21)

The filters are parameterized in the following stages:

- Tag selectors
- Display selectors
- Data selectors

3.7.1 Parameterizing tag selectors

In the "Tag selectors" submenu, you can define mechanisms that use HEX character strings to control the detection of tags by the reader. Tag selectors are based on the EPC data and on the freely parameterizable user data. Tag selectors are components of data sources.



In combination with tag fields, tag selectors determine which data are read. When the read data are filtered, tag selectors determine which tags are passed on and which are rejected.

You can use the tag fields to filter on the basis of the values of the EPC components. For this purpose, you must select one of the predefined and unchangeable tag fields.

If you want to filter on the basis of freely definable user data, new tag fields must be created for this purpose.

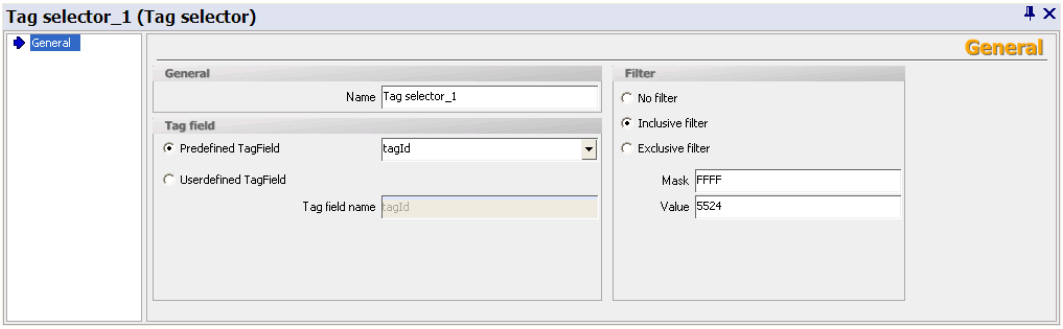
Procedure

Click in the project view with the right mouse button on "Selectors > Tag selectors". Select the option "Add tag selector". A new table for the tag selector appears in the working area. You can edit this in the property view.
Alternatively, you can use the left mouse button to double-click on "Selectors > Tag selectors" to open a new tab for tag selectors in the workplace. You can create a new selector here by double-clicking an empty line of the table with the left mouse button here. You can edit it in the property view.

Tag selectors

The "Tag selectors" menu provides the following parameter setting options:

General



You can assign a name to the selector under "General".

If you want to filter on the basis of "EPC components", select a "Predefined tag field" ("AccessPassword", "KillPassword" or "TagID").

If you want to filter on the basis of freely definable user data, select the option "User-defined tag field". Specify a name under "Tag field name". You can assign an address to the memory bank under "Memory bank". The "Offset" parameter supplies the start address offset within the memory bank in bits. Finally, enter the length of the tag field in bits in the "Length" parameter.

Regardless of the type of filtering, the following applies: You must enter a HEX character string under "Mask" that specifies the bit positions that are applicable to filtering with regard to the tag fields used. "Value" defines a HEX character string that specifies the bit values for the bit positions.

Example

Contents of the freely parameterizable tag field	1	2	3	4	5	6
Mask	0	F	F	F	0	0
Value	0	2	3	4	0	0

If the "Inclusive filter" option is activated, all the tags are supplied that correspond to the filtering criteria - which was the case in the above example.

If the inclusive option is not activated ("Exclusive filter"), all the tags are supplied that do **not** correspond to the filtering criteria. If several tag selectors are created and they are assigned to a data source, a tag will only be supplied if it matches at least one inclusive filter and does not match any exclusive filter.

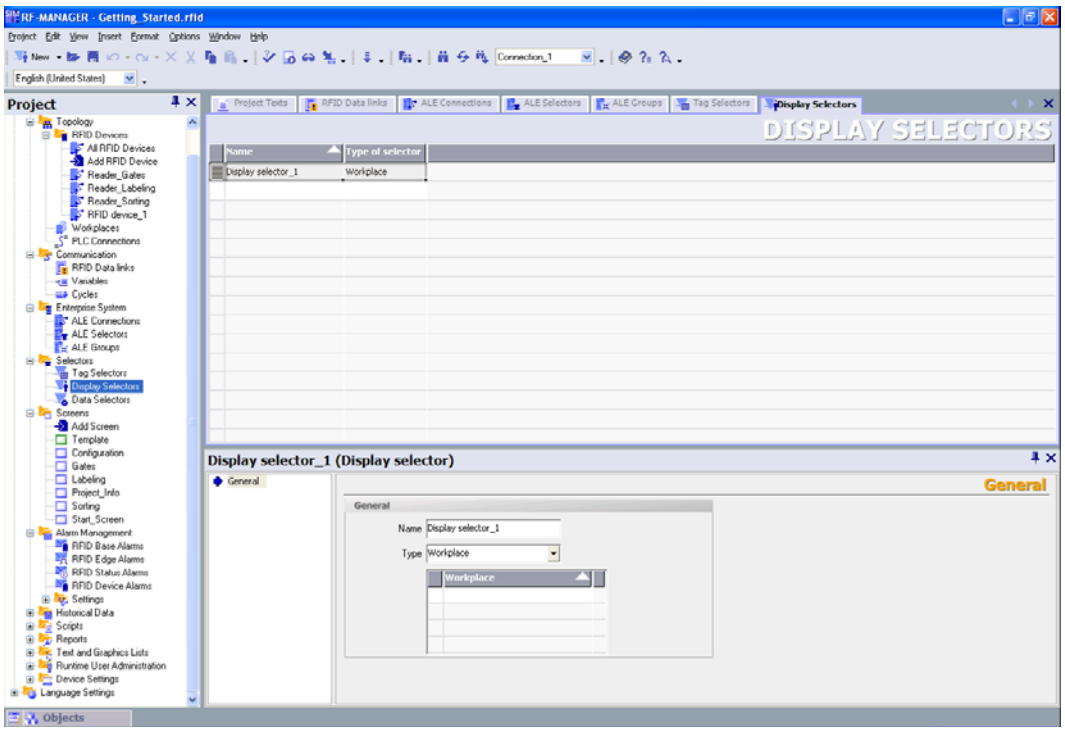
If you only want to read the RFID data, activate the option "No filter" - then filtering will not be performed.

If, for example, from a large number of tags, only the tags of two manufacturers should be supplied, you will need two tag selectors. For each of these, you must specify a field under "Tag field name" that contains the manufacturer's name and activate the "Inclusive filter" option. Under "Mask / Value". one of the manufacturers must be parameterized for each tag selector.

If you want to work with several tag selectors, but the parameterization does not permit it, you must configure several data sources with the same antennas.

3.7.2 Parameterizing display selectors

In the "Display selectors" submenu, you can define selectors that determine which data is displayed in an "RFID view" screen object at runtime.



RFID view (Page 495)

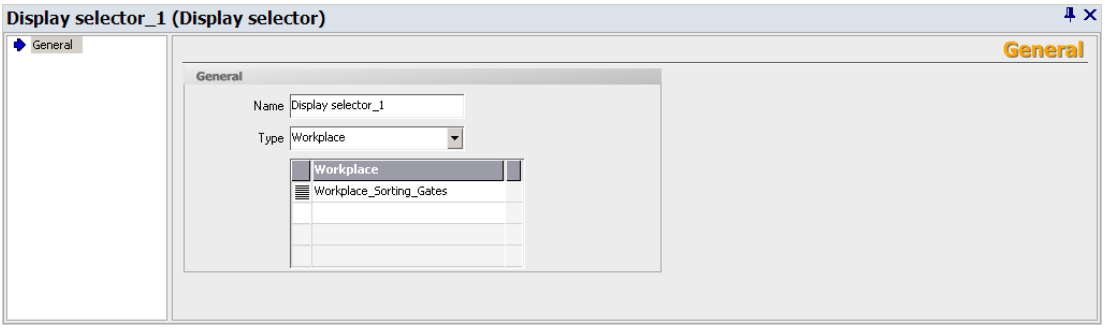
Procedure

Right-click on "Selectors > Display selectors" in the project view. Select the option "Add display selector". A new table for the display selector appears in the workplace. You can edit this in the property view.
Alternatively, you can use the left mouse button to double-click on "Selectors > Display selectors" to open a new tab for display selectors in the workplace. You can create a new selector here by double-clicking an empty line of the table with the left mouse button here. You can edit it in the property view.

Display selectors

The "Display selectors" menu provides the following parameter setting options:

General

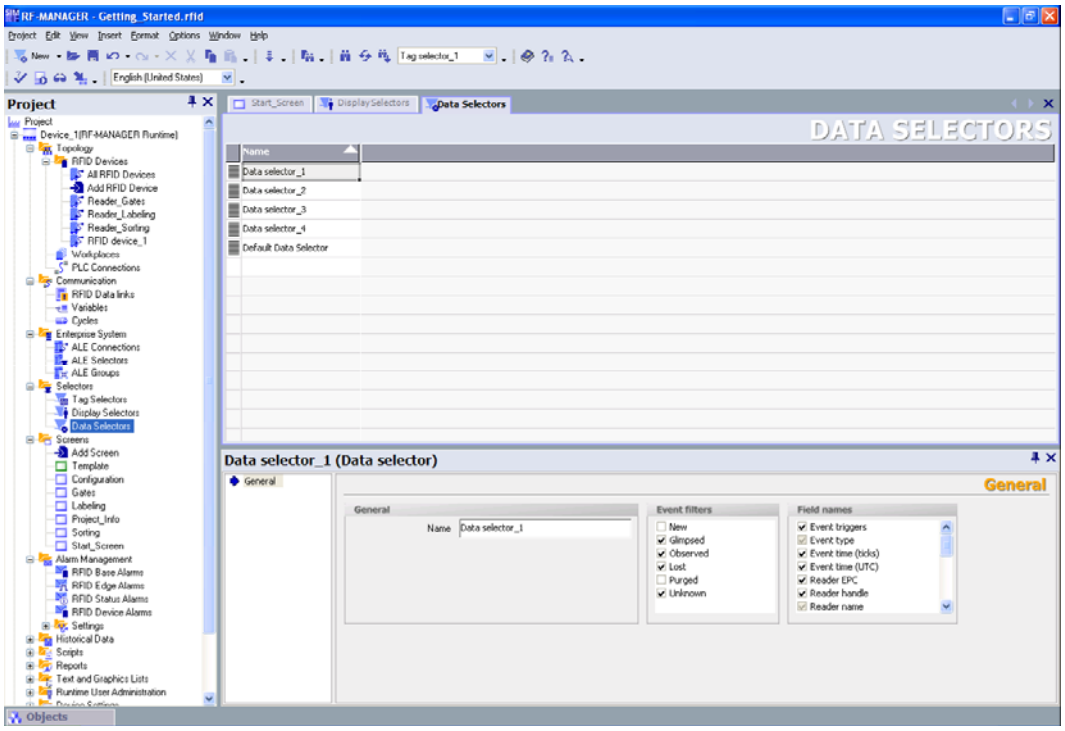


You can assign a name to the selector and set its reference point here. First select the type of reference point under "Type" ("Workplace", "RFID device" or "Data source"). You can select the reference point from the drop-down list or create them. You can also select several reference points. In accordance with your selection, only the events of the selected reference point will be displayed in the "RFID view" screen object.

Parameterizing workplaces (Page 245)

3.7.3 Parameterizing data selectors

In the "Data selectors" submenu, you can define selectors that will further reduce the volume of information and determine which information should be passed on. Data selectors are components of notification channels and can only be used with the asynchronous read procedure.



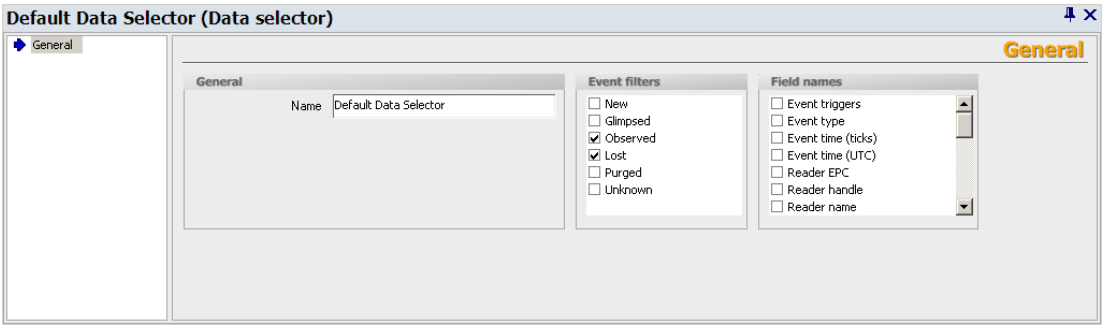
Procedure

Right-click on "Selectors > Data selectors" in the project view. Select the option "Add data selector". A new table for the data selector appears in the working area. You can edit this in the property view.
Alternatively, you can use the left mouse button to double-click on "Selectors > Data selectors" to open a new tab for data selectors in the workplace. You can create a new data selector here by double-clicking an empty line of the table with the left mouse button here. You can edit it in the property view.

Data selectors

The "Data selectors" menu provides the following parameter setting options:

General



You can assign a name to the data selector and link it to the tags by means of "Event filters" with reference to the status description - in accordance with the settings made under "Smoothing". The set event types are transferred to the enterprise system. You can select up to six predefined event filters. (for an explanation, see Section)

You can also assign reader fields to the data selector. These determine which information (e.g. reader name or tag type) will be displayed on the Runtime System and or the ALE client.

Available reader fields	
Name	**Meaning**
Event trigger	Read trigger that led to creation of the event
Event type	Event type / Status description of the tags
Event time (ticks)	Time of event in ticks
Event time (UTC)	Time of event in UTC format
Reader EPC	EPC of the reader specified by the manufacturer
Reader handle	Number for identification of the reader
Reader name	Name of the reader
Reader role	Role of the reader
Reader time (ticks)	Time of event handover in ticks
Reader time (UTC)	Time of event handover in UTC format
RSSI value	Signal strength of the tag (is only provided by RF670R)
Tag type	Tag type used
Tag ID	ID of the tag
Data source name	Name of the data source
Notification channel name	Name of the notification channel
Notification channel trigger	Name of the notification channel trigger
Transmitting antenna	Name of the antenna that was transmitting when the tag was detected.
All event fields	-
All reader fields	-
All notification fields	-
All supported fields	-

Note

Reader fields without data selectors

If a data selector is not configured, all the information supported by the reader is transferred as standard. This corresponds to the above-mentioned option "All supported fields".

Note

Standard data selector

RF-MANAGER automatically creates a standard data selector that cannot be deleted. This is automatically assigned to the first notification channel to be created. As soon as you have created a new data selector, assignment of the standard data selector can be removed.

3.8 Working with variables

You will find information about working with variables in the following chapters.
There are two aspects to this:

- Internal variables
- External variables

Internal variables

Internal variables do not have any connection to the reader or PLC. They are saved in the memory of the runtime system. Therefore, only this runtime system has read and write access to the internal variables. You create internal variables, for example, in order to execute local calculations. You can use all basic data types for internal variables.

External variables

External variables are used to exchange process values between the runtime system and reader or PLC.

An external variable is the image

- Of a defined memory location in the PLC or
- Of inputs/outputs of a reader

in the runtime system.

The runtime system and the PLC both have read and write access to the memory location in the PLC. Both the runtime system and the reader can access the memory location of the inputs/outputs of a reader.

Since external variables are also the image of a storage location in the PLC, the applicable data types depend on the PLC which is connected to the runtime system.

Data types for PLC variables

Basic data types are available for all configurations.

In addition, you can also use other data types for external variables which are intended specifically for the PLC to which a connection exists.

A detailed listing of the basic data types and the data types for a connection to S7 controllers and readers can be found under *Data types if connecting to S7* and *Data types if connecting to readers*.

Note

In addition to the external variables, area pointers can be used for communication between the runtime system and the PLC. You can set up and activate the area indicators in the "PLC connections" editor. Detailed information about the area indicators can be found under "Communication."

Updating variable values in scripts and functions

Scripts and system functions always fetch the value of an external variable that is stored in the memory of the runtime system. When the runtime system starts up, the current value will be read from the PLC or reader and stored in the memory of the runtime system. The variable value will then be updated with the set cycle time. Scripts and functions first access variable values read from the PLC at the previous scan cycle checkpoint.

3.8.1 Elements and Basic Settings

3.8.1.1 "Variables" editor

Introduction

In the "Variables" editor, you create and configure variables.

Open

To open the "Variables" editor, create a new variable or edit a variable displayed in the Object View.

As an alternative, you can open the "Variables" editor by double-clicking on the entry "Variables" in the Project View.

Layout

The "Variables" editor displays all variables that are in a folder.

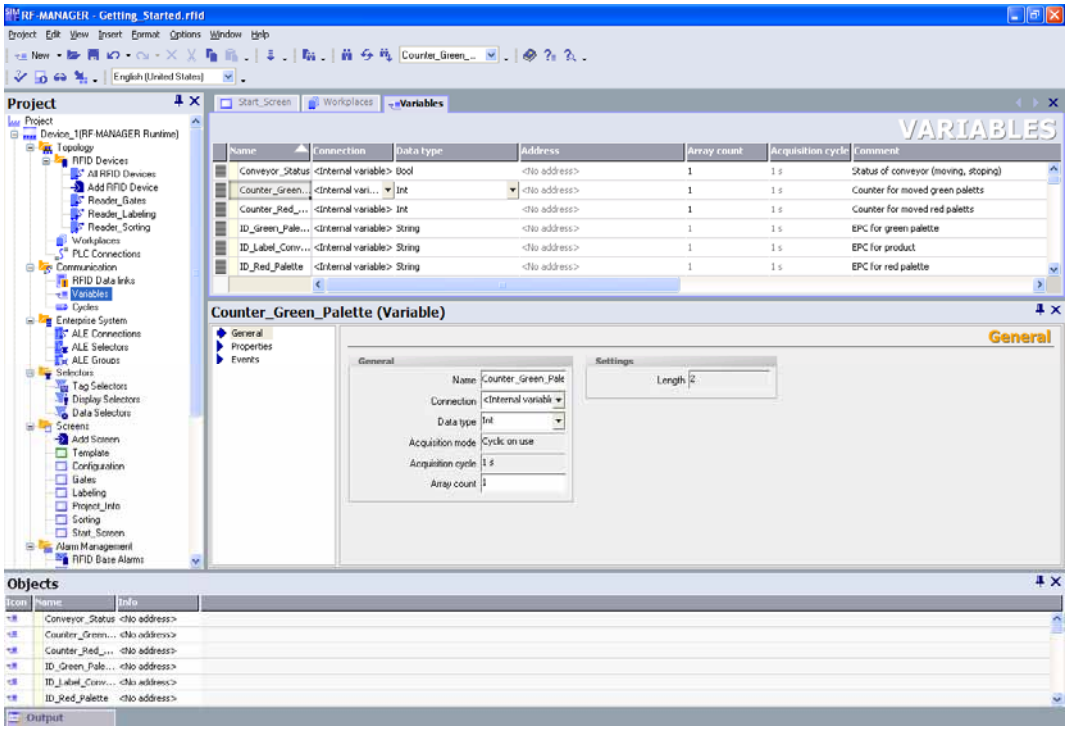


Figure 3-20 "Variables" editor

Workplace

All variables are displayed in a table in the workplace. You can edit the properties of the variables in the table cells. You can sort the table according to the entries in a column by clicking on the column header.

You can configure the selection of columns to suit your needs. The configured column selection will be saved whenever the project is saved. It is linked with the user name that you used when logging into Microsoft Windows.

Properties dialog box

Here you configure variables. The properties dialog box offers the same information and settings as the workplace table.

The properties dialog box has a tree structure on the left from which you can select the various properties categories. The fields for configuring the selected properties category are shown on the right in the properties window.

See also

Basic Settings for Variables and Arrays (Page 282)

Properties of a Variable (Page 284)

3.8.1.2 Basic Settings for Variables and Arrays

Introduction

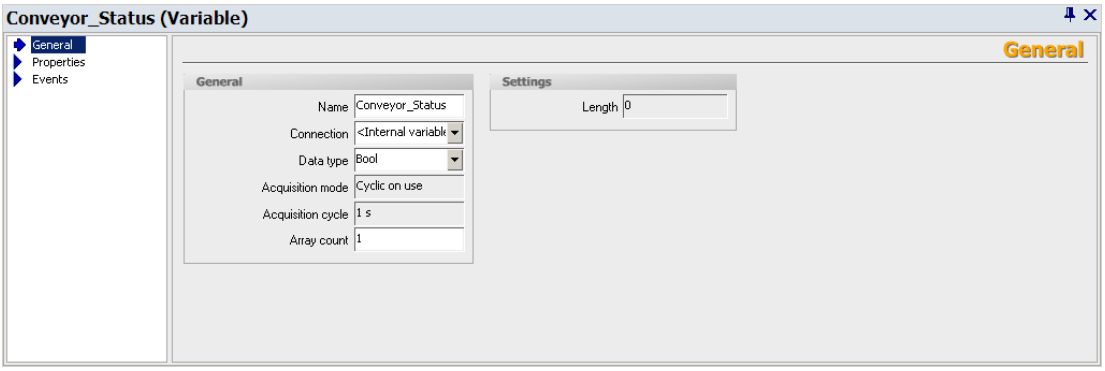
You can configure the properties of variables and array elements in the tabular editors and also in the corresponding properties dialog boxes.

The respective properties dialog box offers the same information and settings as the Variables editor.

Structure of the properties dialog box

All properties dialog boxes have a tree structure on the left from which you can select the various properties categories. The fields for configuring the currently selected properties category are shown on the right in the properties dialog box.

Properties dialog box for variables



In the properties dialog box for variables, you can configure the following properties of the selected variables:

Entry in the tree structure	Fields	
"General"	"Name" "Connection" "Data type" "Acquisition mode" "Acquisition cycle" "Array count" "Length"	
"Properties"		
"Addressing" (for external variables only)	"Inports" "Outports"	For reader
	"Area", e.g. "DB" or "DBW"	For PLC

Entry in the tree structure	Fields
"Settings"	"Hi limit - disabled" "Hi limit constant" "Upper limit - variable" "Lo limit - disabled" "Lo limit constant" "Lower limit - variable" Limit check
"LinearScaling" (for external variables only)	"PLC end value" "PLC start value" "Runtime system end value" "Runtime system start value"
"Basic settings"	"Start value" "Update code"
"Comment"	Text field for entering the comment
"Multiplexing"	Index variable with a variable list from which the relevant variables are selected at runtime
"Events"	
"Value change"	List of functions that will be processed if the value changes
"Hi limit exceeded"	List of functions that will be processed if the hi limit is exceeded
"Lower limit violated"	List of functions that will be processed if the value drops below the lower limit

See also

"Variables" editor (Page 280)

3.8.2 Working with variables

3.8.2.1 Properties of a Variable

Introduction

In the RF-MANAGER, certain properties can be configured for every variable.

The properties determine how you can use the variable in your configuration.

Principle

The following properties can be set for variables:

- "Name"

  Every variable has a name which you can choose. Note, however, that the name may only occur once within the variable folder.

- "Connection" to the PLC or to the reader and "Acquisition cycle" of the variables

  For external variables, you must specify the PLC or reader to which the runtime system is connected since these variables represent memory locations in the PLC or the image of the inputs/Outputs of the reader. The available data types for a variable and their address in the memory of the PLC or reader depend on the type of PLC or reader.

  Furthermore, you must specify how often the variable should be updated.

- "Data type" and "Length"

  The data type of a variable determines

  – What type of value is saved in a variable.

  – How these values are stored internally.

  – Which value range can be accepted by the variables as a maximum.

  Two simple examples of data types are "Int" for saving integers or "String" for saving character strings. You can input leading zeros in values for variables of data type "Int".

  For text variables of the type "String" or "StringChar", you can also set the "Length" of the variable in bytes. For all other data types, the value of "Length" is fixed.

- "Array elements"

  You can assemble variables from a number of the same type of array elements. Array elements are saved in consecutive memory locations.

  You can use array variables mainly for working with many items of data of an identical format.

- "Comment"

  You can enter a comment for each variable to provide for a more exact documentation of your project.

- "Limits"

  You can specify a value range with an upper and lower limit range for each variable. If, for example, an entered value that should be stored in the variable lies outside the permitted limits, this value will not be loaded and an appropriate system alarm is output. If the value lies outside the value range, a function list for outputting alarms can be processed.

- "Start value"

  You can configure a start value for every variable. The variable will be set to this value at runtime start. In this manner, you can ensure that the project will begin in a defined state every time it is started.

All properties which were configured when the variable was created can be modified with the object list later where the variable is used.

Example: Create a variable and configure its limit values. Link this variable to an I/O field. The limit values which were set when the variable was created can be modified with the object list later when the I/O field is configured.

3.8.2.2 Communication with the PLC with external variables

Introduction

External variables are used to exchange data between the runtime system and PLC.

Principle

An external variable is the image of a defined memory location in the PLC. The runtime system and the PLC both have read and write access to this memory location.

The fact that the runtime system can access data on the PLC affects which properties are available when you configure the variables. The configuration possibilities supported by the following variable properties depend on the PLC or reader that is connected to the runtime system:

- "Addressing"
- "Data type"

With linear scaling, you can adjust the value range of external variables to suit the requirements of the configuration.

Addressing

If you create an external variable in RF-MANAGER, you must specify the same address as it has in the PLC program. This enables both the runtime system and the PLC to access the same memory location.

Data type

Since external variables are the image of a defined storage location in the PLC, the available data types depend on the PLC which is connected to the runtime system.

A detailed listing of the basic data types and the data types for a connection to S7 controllers can be found under *Data types if connecting to S7*.

A change from communications driver A to communications driver B may cause discrepancy in the following special situations:

- The data type is recognized, but the address range cannot be interpreted.
  In this case, the default address range of the data type is used.
- No suitable data type is found.
  The default data type of the communications driver will be used in such a situation.

Acquisition cycle

The acquisition cycle determines when the runtime system will read the value of an external variable. Normally, the value is updated at regular intervals as long as the variable is shown in the screen. The interval for regular updates is set with the acquisition cycle. You can either choose a default acquisition cycle, or define a user-specific cycle.

An external variable can also be updated independent of the display in the screen, for example, by triggering a value change for the variable functions. Please note that frequent read operations increase communication load.

Linear Scaling

You can configure a linear scaling for numerical data types. The data in a PLC for an external variable can be mapped to a specific value range in the RF-MANAGER project.

Example: The user enters length dimensions in centimeters although the controller expects inches. The entered values are automatically converted before they are forwarded to the controller. Using linear scaling, the value range [0 ... 100] on the PLC can be mapped to the value range [0 ... 254] in the runtime system.

3.8.2.3 Communication with digital inputs/outputs of readers

Principle

The RF670R/RF660R readers have digital inputs/outputs. The inputs can be used to trigger automation tasks.

The digital inputs/outputs of a reader are external variables of the BOOL type from a logical point of view. With the RF-MANAGER, you can create a specific number of Boolean variables. For RF670R, for example, these are four input variables and four output variables. These variables can be used for process control and process display.

The four inputs or outputs of the reader can be combined in one input or one output variable respectively of the BYTE type.

RF620R/RF630R/RF300

The RF620R/RF630R/RF300 readers have no real physical inputs/outputs. In the operating mode "With Presence = true", however, these reader offer a function that permits feedback via tags in the antenna field (presence). This presence is provided in the form of a virtual input (as InPort00). To be able to evaluate the presence in the application, this input can be addressed as a variable. If a trigger of type "IO edge" or "I/O level" is linked to this input, the activation is dependent on presence.

Examples: With the "IO edge" type, as soon as a tag enters the field, a single read process is initiated. With the "IO level" type, reading takes place as long as a tag is in the field.

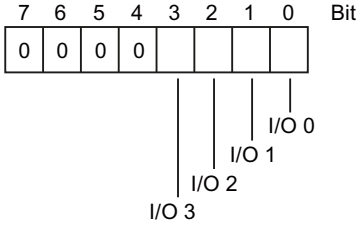
Likewise, the input can be used to set a trigger.

RF670R application example

You are connecting a light barrier to the digital input of an RF670R. Pallets with tags interrupt the light barrier and therefore activate a trigger in the notification channel. The tags are read. This event can be displayed, for example, through one of the variables in the runtime system that references the digital input.

At the same time, this event activates a digital input to place a branch point after the light barrier via a script or system functions and to distribute the pallets in accordance with requirements. Positioning the branch point can also be displayed, for example, through one of the variables in the runtime system that references the digital output.

If you combine the outputs of a reader in a variable of the BYTE type, you can, for example, set the required outputs of the reader simultaneously. The Hex value "05" must be entered in the relevant byte for setting outputs 0 and 2. By using a variable of the BYTE type, you can obviate the need to transfer 2 variables of the BOOL type.



In this way, you can achieve synchronous updating of the digital outputs or synchronized evaluation of the digital inputs of a reader.

RF620R/RF630R/RF300 application example

You want to recognize in an output field in a screen that a tag is present in the reader's field. For this purpose, link the Boolean variable of the output field to the virtual "Inport00" of the reader under "Variable > Properties > Address". If the reader is operated in the mode "With Presence = true", the value is set to 1 as long as a tag is in the reader's field.

If you want to indicate the number of present tags in the output field, the variable must be of the BYTE type and "Inport00-PresenceCount" must be selected as address. Via the variable trigger "Value change" further actions can be triggered, if required.

Properties

The following properties can be set for external variables:

- "**Name**"

  Every variable has a name which you can choose. Note, however, that the name may only occur once within the variable folder.

- "**Connection**" to the reader and "**Poll cycle**" of the variables

  For external variables, you must specify the reader with which the runtime system is connected. Furthermore, you must specify how often the variable should be updated.

- "**Data type**" and "**Length**"

  The data types permitted for the external variables of a reader are BOOL and BYTE. The value of "Length" is predefined.

- "**Comment**"

  You can enter a comment for each variable to provide for a more exact documentation of your project.

- "**Start value**"

  You can configure a start value for every variable. The variable will be set to this value at runtime start. In this manner, you can ensure that the project will begin in a defined state every time it is started.

All properties which were configured when the variable was created can be modified with the object list later where the variable is used.

Addressing

If you create an external variable in the RF-MANAGER, you must specify the input or output port that you use for reader inputs/outputs.

Poll cycle

The poll cycle determines when the runtime system will read the value of an external variable. The update is usually implemented at regular intervals and it is controlled by an poll cycle. You can either choose a default poll cycle, or define a user-specific cycle. Please note that frequent read operations increase communication load.

3.8.3 Updating the variable value in Runtime

Introduction

Variables contain values which change during runtime. Value changes are handled differently at internal and external variables.

Principle

If a start value has been configured for the variable, the variable will be set to this value when the runtime system starts up. The values of variables change during runtime.

During runtime, you have the following options for changing the value of a variable:

- By executing a system function, for example, "SetValue."
- By operator input, for example, in an I/O field.
- By a value assignment in a script.
- A value change in an external variable in the PLC or reader.

Updating the value of external variables

Method for updating the value of an external variable:

- Updating after an acquisition cycle

  Normally, variables are updated after an acquisition cycle as long as the variable appears in a screen. The acquisition cycle determines the cycle for updating the value of a variable on the runtime system. You can either choose a default acquisition cycle, or define a user-specific cycle.

- When the setting "Cyclic continuous" is activated

  If this setting is activated, the variable will be updated in runtime, even if it is not found in the currently open screen. This function is set, for example, for variables which are configured to trigger a function list in the event of a change in their value.

  Only use the "Cyclic continuous" setting for variables that must truly be updated. Frequent read operations increase communication load.

- On demand

  The variable is updated by calling the system function "UpdateVariable" or when a screen is constructed.

See also

Cycle basics (Page 291)

3.8.4 Cycle basics

Introduction

Cycles are used to control project sequences that are run at regular intervals. Common applications are the acquisition cycle and the update cycle. Besides the cycles predefined in RF-MANAGER, you can also define your own cycles.

Principle

In runtime, actions that are performed at regular intervals are controlled by cycles. Typical applications for cycles include the acquisition of external variables and the updating of screens.

- Acquisition cycle

  The acquisition cycle of the variable determines when the runtime system will read the value of an external variable from the PLC or reader. Set the acquisition cycle to suit the rate of change of the values.

  If the acquisition cycle is set too low, it will strongly increase the communication load.

The smallest value for a cycle is 100 ms. The values of all other cycles are always an integer multiple of the smallest value.

If the standard cycles predefined in RF-MANAGER do not satisfy the requirements of your project, it is possible to define your own cycles. These custom cycles must, however, be based on the standard cycles.

Application example

Use cycles, for example, to log your system at regular intervals or to provide reminders of the maintenance intervals.

See also

Updating the variable value in Runtime (Page 290)

3.9 Creating screens

3.9.1 Basic principles

3.9.1.1 Screen Basics

Introduction

You can use RF-MANAGER to create screens for configuring and operating/monitoring RFID systems and their components. When you create your screens, the predefined object support you in simulating your plant, displaying production processes and defining values.

Screen design

You add screen elements you need for visualization of the RFID system, and configure these to suit the requirements of your system.

A screen may consist of static and dynamic elements.

- Static elements such as text or graphic objects do not change their status in runtime.
- Dynamic elements change their status based on the production process. They visualize current RFID data of the runtime system in the form of alphanumeric displays. Operator input boxes in the runtime system also belong to the category of dynamic elements.

Function keys and softkeys

A function key is a physical key on the runtime system to which you can assign one or more functions in RF-MANAGER. These functions are triggered when the operator presses the relevant key on the runtime system.

A function key can be assigned global or local functions.

Global function keys always trigger the same action, regardless of the currently displayed screen.

Function keys assigned local functions are softkeys. They trigger different actions, based on the currently displayed screen on the runtime system. This assignment applies only to the screen in which you have defined the function key.

Navigation

All configured screens must be integrated into the operating sequence of the RFID system, in order to enable runtime access to these in the runtime system. Here you can use the "Screens" editor to configure buttons and function keys for calling other screens.

An RF-MANAGER project which consists of multiple screens offers the following screen navigation options in runtime:

- Navigation by means of navigating buttons
- Navigating with the help of function keys

Buttons or function keys can be configured in the RF-MANAGER.

3.9.1.2 "Screens" Editor

Introduction

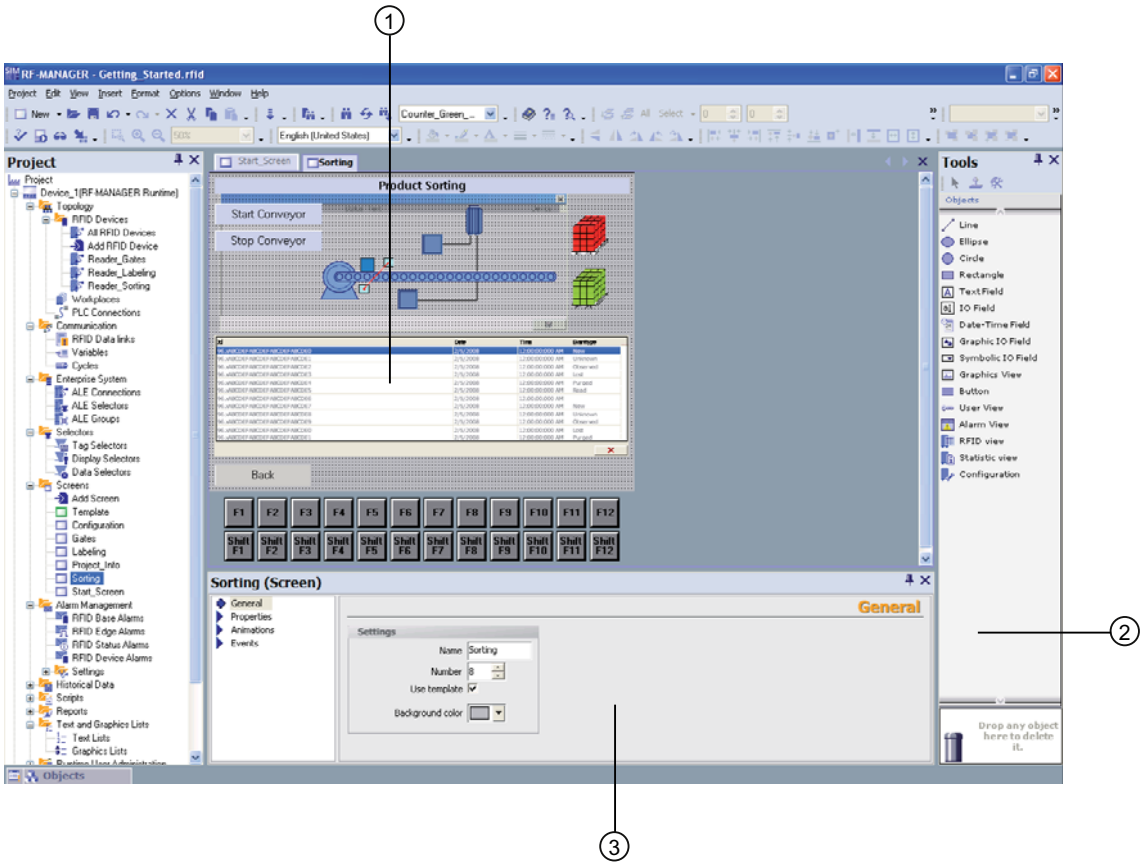
You configure your screens in the "Screens" editor. This editor is formed by the combination of a graphic programming software and a plant visualization tool. You can access the screen editor in the project view.

Open

Double-click "Add screen" in the "Screens" group of the project view,

The workspace opens with a new screen.

Layout



① Workplace

② Toolbox

③ Properties dialog box

Workplace

You configure screens in the workplace.

Toolbox

The toolbox contains a selection of simple and complex objects which you can add to your screens, for example, graphic objects or operating elements.

Properties dialog box

The content of the properties dialog box is determined by the object you have currently selected in the workplace.

- The properties of a selected object can be viewed and edited in the properties dialog box.
- If you have not selected an object on the active screen, the properties of this screen are shown and can be edited in the properties dialog box.

3.9.1.3 Procedures

Procedures

To create screens, you need to take the following initial steps:

- Create a draft of the project structure, i.e. define the structure and the number of screens.

  Example: Subsystems can be visualized in separate screens and merged in a master screen.
- Define your screen navigation control strategies.
- Adapt the template.

  The template which is stored in RF-MANAGER for the selected runtime system applies to all your project screens. In this template, you can define objects locally and assign global function keys. You can store the objects you want to integrate into all screens in the permanent view.

3.9.2 Working with objects

3.9.2.1 Overview of objects

Introduction

Objects are graphic elements which you use to design the plant displays of your project.

The "Toolbox" contains various types of objects which are frequently required for use in plant displays.

The Toolbox view can be faded in and out using the "Toolbox" command in the "View" menu. The Toolbox view can be moved to any position on the screen.

Screen objects

Icon	Object	Notes
	"Line"	You can select straight, rounded or arrow-shaped line ends.
	"Ellipsis"	You can fill an ellipsis with a color or a pattern.
	"Circle"	You can fill the circle with a color or a pattern.
	"Rectangle"	The corners of a rectangle can be rounded. You can fill the rectangle with a color or a pattern.
	"Text box"	You can enter one or several lines of text in a "Text box" and define the font and the font color. You can add a background color or pattern to a text box.
	"I/O field"	An I/O field can have the following functions in the runtime system: • Output of the values in a variable • Operator input of values; these input values are saved to a variable. • Combined input and output; the operator can here edit the output value of the variable and thus set a new value. You can define limits for the variable values shown in the I/O field. Set "Hide input" if you want to hide operator input in runtime.
	"Date-time box"	A "Date / time box" may have the following runtime functions: • Output of the date and time • Combined input and output; the operator can here edit the output values in order to reset the date and time. The system time or a corresponding variable may be used as source to define the date and time. The date can be output in extended format, for example, Tuesday, December 31, 2003, or in short format, for example, 12/31/2003.

Icon	Object	Notes
	"Symbolic I/O field"	A symbolic I/O field can have the following functions in the runtime system: • Output of text list entries • Combined input and output; the operator can here select a text from a text list in order to change the content of the symbolic I/O field.
	"Graphic I/O field"	A graphic I/O field can have the following functions in the runtime system: • Output of graphic list entries • Combined input and output; the operator can here select a graphic from a graphic list in order to change the content of the graphic I/O field.
	"Graphic view"	The "Graphic view" shows you on one screen all of the graphic objects created by means of an external graphic programming tool. Graphic objects can be shown in the following formats: "*.emf", "*.wmf", "*.dib", "*.bmp", "*.jpg", "*.jpeg", "*.gif" and "*.tif". In the "Graphic view", you can also integrate graphic objects of other graphic programming tools as OLE (object linking and embedding) objects, for example. OLE objects opened and edited in the graphic program in which they were created directly from the properties dialog box of the graphic view.
	"Button"	The operator can use a button to control a plant. You can configure functions for a button.
	"User view"	In RF-MANAGER ES, you can use passwords to control access to screen objects. In the "User view", an administrator can manage users on the runtime system at runtime. In the "User view", user who do not have administrator privileges can change their password in runtime.
	"Alarm view"	In the alarm view, the operator can view selected alarms or alarm events in the alarm buffer or the alarm log in runtime.
	RFID view	Visualization of RFID data communication
	Statistics view	Visualization of RFID statistical data
	Configuration	Visualization and changing of RFID configuration data

3.9.2.2 Object Groups

Principle

You can organize multiple object in a group. In your screen, you edit an object group in the same way you edit a single object. You can also edit any object of the group separately.

In contrast to the multiple selection function which shows the selection rectangles of single objects, the system displays only one selection rectangle for the complete group.

You can edit any object of the group separately. To do so, change to the single-object editing mode. In this mode, you can access all of the properties of a single object you have selected from the group.

3.9.2.3 External graphics

Introduction

In RF-MANAGER you can use images created with an external graphic editor. To view the images, you must have stored them in the image browser of your RF-MANAGER project. Importing is performed through graphics objects.

The following image types can be stored in the image browser:

- As an image file in one of the following formats:

  *.bmp, *.dib, *.ico, *.emf, *.wmf, *.gif, *.tif, *.jpeg or *.jpg

- As OLE object which is embedded in RF-MANAGER and linked to an external graphic editor. With an OLE link, the external graphic editor can be opened from RF-MANAGER. The linked object can be edited with the graphic editor. OLE will only work if the external graphic editor is installed on your PC and supports OLE.

Using images from the image browser

Screen applications for images from the image browser:

- Graphic view
- Image lists

Transparent graphics

RF-MANAGER also supports the use of images with a transparent background. When you insert an image with a transparent background in an RF-MANAGER graphic object, the transparency is replaced by the background color defined in the RF-MANAGER graphic object. The selected background color is permanently linked to the image. If you use the image in another RF-MANAGER graphic object, it is displayed with the same background color as the graphic object which was configured first. If you want to use the image with different background colors, you have to add this image to the image browser again under a different name. Assign the additional background color to the appropriate RF-MANAGER graphics object when you use the image.

3.9.3 Options of assigning dynamic update functions

Introduction

All objects for input and output demonstrate dynamic reactions in Runtime. You can also assign dynamic properties for objects. An example of this feature is the graphic of a tank filling level, which is dynamically updated based on the respective process value. Another example of dynamic object properties is a button which triggers a particular function.

Dynamic objects

You can assign dynamic properties to any graphic object. Programming options:

- The object changes its appearance: Color or flashing properties.
- The screen object is animated.
- The object is shown or hidden.

The following additional options are available for the operator control elements:

- Operator control of an object is enabled or locked.
- The operator control, e.g. clicking, of an object triggers an event which is configured to execute a function list.

Dynamic control and object properties

Dynamic update is an element of the object properties. Which dynamic update functions and events are actually available depends on the selected object. When you copy an object, its dynamic update functions are included.

3.9.4 Working with function keys

Introduction

A function key is a key on the runtime system which can be assigned user-defined functions. A function list can be configured for the "Press" and "Release" events for the key.

A function key can be assigned global or local functions.

Global assignment

Global function keys always trigger the same action, regardless of the currently displayed screen.

Global function keys are configured once in the template. A global assignment applies to all screens of the selected runtime system which are based on this template.

Global function keys reduce programming effort considerably, because there is no need to assign these global keys to each individual screen.

Local assignment

Local function keys in displays can trigger a different action in each screen. This assignment applies only to the screen in which you have defined the function key.

Using a local function key, you can override global function keys and the local function keys of a template.

Note

When a screen containing local function keys is covered by an alarm screen or an alarm window at runtime, the function keys are still enabled in the Runtime system.

Hotkey assignment

You can assign hotkeys to command elements such as buttons

Visualizing the assignment

Table 3- 1 The following table shows which symbols indicate the assignment of the function keys:

Function key	Description
	Unassigned
	Used globally

Function key	Description
	Used locally
	Used locally (local assignment overwrites global assignment)

3.9.5 The Advantage of Layers

Layers

You use layers to process the objects of a screen differently. A screen consists of 32 layers. By assigning objects to the layers, you specify the hierarchic levels in the screen. Objects of the layer 0 are located at the screen background, while objects of the layer 31 are located in the foreground.

The objects of an individual layer are also arranged hierarchically. When you create a display, the object inserted first in the layer is placed at the back. Each further object is placed one position towards the front. Within a layer, you can move the objects forwards and backwards.

Principle of the layer technique

One level of the 32 levels is always active. New objects you add to the screen are always assigned to the active layer. The number of the active layer is indicated in the "Layer" toolbar and in the Properties view of the screen. The active layer is highlighted in color in the properties view of the screen.

When you open a screen, all 32 layers of the screen are displayed. You can hide all levels apart from the active level in the properties view of the screen. Then you can explicitly edit objects of the active layer.

Application examples

You can use levels, for example, in the following cases:

- To hide the labels of objects while you are editing.
- To hide objects, such as alarm windows, while you configure further screens.

3.10 Structure of an alarm system

3.10.1 Basic principles

Introduction

The RF-MANAGER supports the following alarms:

- RFID alarms

  RFID alarms provide information about the operating states of the RFID system, e.g. of a reader, and are activated by it. Apart from the predefined RFID alarms, it is also possible to configure additional RFID alarms.

- System alarms

  System alarms are predefined to indicate certain system statuses of the runtime system. These are activated by the runtime system.

Tasks of the alarm system

- Display on the runtime system: To report events or states that occur in the RFID system. A state is reported as soon as it occurs.
- Reporting: Alarm events are output to a printer.
- Logging: Alarm results are saved for further editing and evaluation.
- Transfer to a higher-level system Alarm events are transferred to the higher-level system.

3.10.1.1 RFID alarms

Introduction

RFID alarms provide information about the operating states of the reader and are activated by the reader. Events in RFID process operation can also trigger alarms.
An RFID alarm comprises the number, alarm text and assignment to an alarm class. The alarm text can also contain internal system variables that indicate the cause of the alarm more precisely. The alarms can be archived.

Activating RFID alarms

The reader or the runtime system activates an alarm when an error occurs.

Types of RFID alarms

There are two types of RFID alarms:

Name	Description
RFID base alarms	Alarms that inform the user about errors and malfunctions. These are activated by system events. They can refer to: Antennas Example: Antennas report errors with reading of tag data (writing failed - base alarm)
RFID status alarms	Alarms that inform the user about a change in status. They can refer to: RFID devices, antennas, data sources, notification channel, ALE connection Example: Data source has switched to "Inactive" status (SourceDown - status alarm)
RFID edge alarms	Alarms that inform the user whether and in which direction thresholds have been overshot. They can refer to: RFID devices, ALE connections Example: The free memory on a reader has undershot a fixed limit (ReaderFreeMemory - edge alarm)
RFID device alarms	Hardware-specific alarms of an RFID device that are triggered by the firmware of the reader. See the documentation for the reader used

Editing RFID alarms

Every type of RFID alarm can be edited in a dedicated editor.

Alarm variables

The text of any alarm can contain output fields.

Displaying RFID alarms in the runtime system

In the basic settings for the alarm system, you can determine which type of RFID alarms are displayed on the runtime system and for how long an RFID alarm is displayed.
To display RFID alarms on the runtime system, use the "Alarm view" and "Alarm window" objects

3.10.1.2 System alarms

Introduction

System alarms provide information about operating states of the runtime system and are output by it. System alarms can range from notes to serious errors.

A system alarm comprises the number and text of the alarm and its assignment to an alarm class. The alarm text can also contain internal system variables that indicate the cause of the alarm more precisely. Only certain properties can be configured for system alarms. The alarms can be archived.

Note

Viewing and editing system alarms

System alarms can only be viewed and edited in RF-MANAGER if you have selected the option "Display all" under "Options > Settings > Workplace > Project View".

Triggering of system alarms

The runtime system outputs an alarm when a specific system state or error occurs.

Displaying system alarms in the runtime system

In the basic settings for the alarm system, you can specify for how long a system alarm is displayed.
To display system alarms in the runtime system, use the objects "Alarm View" and "Alarm Window".
When these objects are configured in a screen or in the template, select the "System" alarm class in both cases.

3.10.1.3 Alarm classes

Introduction

Alarm classes mainly determine how alarms will appear when they are displayed on the runtime system. Alarm classes are also used to group alarms for various means of display. RF-MANAGER has both predefined alarm classes and the option to configure user-defined alarm classes.

Available alarm class settings

The following settings can be defined for each alarm class:

- Acknowledge: Alarms in this class must be acknowledged.
- Texts, colors, and flash modes to identify each alarm status when alarms are displayed
- An alarm log for logging all events related to alarms in this class.
- A text placed in front of the alarm number to indicate the alarm class when alarms are displayed in the runtime system.
- An e-mail address to which all messages about events related to the alarms in this class will be sent.

Predefined alarm classes

Alarm	Predefined alarm classes	Description
System alarm	System	Class for system alarms that notify the operator about the operating states of the runtime system. This alarm class cannot be used for user-defined alarms.
RFID alarm	RFID alarm	Class for RFID alarms that require an immediate response from the user.
	RFID critical	Class for RFID alarms that provide information about critical system states.
	RFID debug	Class for RFID alarms that provide information about debug levels.
	RFID emergency	Class for RFID alarms that provide the information that the system can no longer be accessed.
	RFID error	Class for RFID alarms that provide information about errors.
	RFID information	Class of RFID alarms that contain information about errors.
	RFID note	Class for RFID alarms that provide information about normal system states.
	RFID warning	Class of RFID alarms that contain warnings.

Note

Changing properties of the alarm classes

Only very specific properties can be changed for predefined alarm classes. The name and the acknowledgement response of a predefined alarm class cannot be changed.

3.10.1.4 Acknowledge alarms

Introduction

For alarms displaying critical or hazardous operating and process states, a stipulation can be made requiring the plant operator to acknowledge the alarm.

Mechanisms for acknowledging alarms

An alarm can be acknowledged by the operator in the runtime system. Acknowledgment can be performed by the operator in the following ways:

- Function keys
- Softkeys or buttons in screens

In addition, alarms can be acknowledged through system functions in function lists or scripts.

Alarms requiring acknowledgment

The alarm class determines whether or not the alarm must be acknowledged.

Alarm classes essentially define how alarms will appear when shown on the runtime system as well as the acknowledgement behavior. RF-MANAGER has both predefined alarm classes and the option to configure user-defined alarm classes.

3.10.2 Displaying Alarms

3.10.2.1 Displaying alarms in the runtime system

Options for displaying alarms in the runtime system

RF-MANAGER offers the following possibilities for displaying alarms in the runtime system:

- Alarm view

  The alarm view is configured for a certain screen. More than one alarm can be displayed simultaneously, depending on its configured size. More than one alarm view can be configured for different alarm classes and in different screens. The alarm view can be configured in such a way that it includes only one alarm line.

- Alarm window

  The alarm window is configured in the screen's template and is thus a component of all screens in a project. More than one alarm can be displayed simultaneously, depending on its configured size. An event can trigger closing and reopening of the alarm window. Alarm windows are saved in their own layer for the practical reason that this allows them to be specifically hidden during the configuration.

Additional signal: Alarm indicator

The alarm indicator is a configured graphic symbol that is displayed on the screen when an alarm activates. The alarm indicator is configured in the screen's template and is thus a component of all screens in a project.

The alarm indicator can have one of two states:

- Flashing: At least one unacknowledged alarm is pending.
- Static: The alarms are acknowledged but at least one of them is not yet deactivated.

Function lists can be used to configure the responses of the runtime system.

3.10.2.2 Filtering the display of alarms

Introduction

In the enhanced alarm view and in the alarm window you have the option to filter the display of alarms by means of the alarm text of the alarms. A character string or the value of a filter variable is used as the filter criterion. In Runtime, only the alarms whose alarm text contains the configured character string or the character string from the filter variable are displayed. The filter only applies to the display in runtime. All alarms are retained in the alarm buffer.

Filtering rules

For filtering using a fixed filter entry, configure a character string in the properties of the Alarm View. All the alarms which contain the full character string in the alarm text are displayed in runtime.

For filtering that can be changed, use a variable for the filter criterion. You can assign the variable at runtime, for example, by entering the required character string in an I/O field. The display of the alarms is filtered in accordance with the contents of the variable.

Behavior of the filter

- If the filter entry is empty, all the pending alarms are displayed.
- The filter variable is superordinate to the permanently configurable character string. If a permanently assigned character string and filter variable are assigned during configuration, the alarms are filtered by the contents of the filter variable. If the filter variable is empty, filtering is implemented based on the permanently assigned character string.
- The filter function is case sensitive. Wildcards and general expressions are not recognized.
- The filter function is not language dependent. A configured character string remains the same after a language change.
- The length of the filter entry is limited to the maximum length of the alarm text.

Configure filtering in the properties of the alarm view or the alarm window.

Filtering is not possible for the following alarm views:

- Simple alarm view
- Alarm line
- Alarm window which is automatically displayed
- Alarm view which is configured for displaying alarms of an alarm log
- Alarm window which is configured for displaying alarms of an alarm log

3.10.2.3 Logging and reporting alarms

Evaluation and documentation of alarms

In addition to real time displays of alarm events in the "alarm view" and "alarm window," RF-MANAGER offers the following options for evaluating and documenting alarms:

- Alarm events can be printed out immediately upon occurrence.
- Alarm events from the alarm buffer can be printed out in report form.
- Alarm events can be logged in an alarm log.
- Logged alarm events can be displayed on the runtime system or printed out in report form.

Printing Alarms Immediately

You can enable or disable the printing of alarms for the entire project in the basic settings for the alarm system. In addition, printing of each individual alarm can be enabled.

Logging of alarms

Alarm classes are used to configure assignment of alarms to an alarm log. An alarm log can be specified for each alarm class. All events related to the alarms of this alarm class are logged in the specified alarm log.

Logging of alarms

The properties of the "Print alarm" object are used to configure the assignment of alarms to a report. In addition to the data source (alarm buffer or alarm log), filtering is also possible on the basis of alarm classes.

3.10.2.4 System Functions for Alarm Editing

System functions

System functions are predefined functions you can use to implement many tasks during runtime even without having any programming knowledge. You can use system functions in a function list.

The table shows all of the system functions available for editing alarms and manipulating their display.

System function	Effect
EditAlarm	Triggers the "Edit" event for all selected alarms.
ClearAlarmBuffer	Deletes alarms from the alarm buffer on the runtime system.
AlarmViewEditAlarm	Triggers the event "Edit" for all alarms selected in the given alarm screen.
AlarmViewShowOperatorNotes	Displays the configured operator notes of the alarm selected in the given alarm screen.
SetAlarmReportMode	Switches the automatic logging of alarms on the printer on or off.
ShowAlarmWindow	Hides or shows the alarm window on the runtime system.
ShowSystemAlarm	Displays the value of the supplied parameter as a system alarm on the runtime system.
AcknowledgeAlarm	Acknowledges all selected alarms.
AlarmViewAcknowledgeAlarm	Acknowledges the alarms selected in the given alarm view.

Events for alarms and objects for alarm indication

The following events can occur during runtime in the case of alarms and in the case of objects for alarm displays. A function list can be configured for each event.

Object	Configurable events
Alarm view	Enable Deactivate
Alarm window	Enable Deactivate
Alarm indicator	Click Click when flashing
RFID alarms	Activate Deactivate Acknowledge Edit

Provision of RFID alarms to the enterprise system

The enterprise system can log on to the runtime system through a defined interface (ALE+) for the purpose of receiving RFID alarm events. When the alarm status changes in the runtime system, it is supplied to the enterprise system immediately. This takes place until the enterprise system logs off again.

For detailed information about the transfer functions, refer to the *ALE+ Function Manual*.

3.10.3 Elements and Basic Settings

3.10.3.1 Alarm Components and Properties

Properties of alarms

An alarm always comprises the following components:

- Alarm text

  The alarm text contains a description of the alarm. Each character of the alarm text can be formatted.

  It can contain output fields for RFID parameters. The alarm buffer retains the instantaneous value at the time at which the alarm status changes.

- Alarm number

  The alarm number is used to reference an alarm. The alarm number is unique within the following types of alarms:

  – RFID base alarms
  – RFID edge alarms
  – RFID status alarms
  – RFID device alarms
  – System alarms

- Alarm triggers:

  – Trigger on function units of the RFID system

- Alarm class

  The appearance of the alarm on indication in the runtime system can be controlled by its association with an alarm class. The alarm class also determines whether and where the corresponding alarm is logged and whether it requires acknowledgement.

These components are freely selected or entered for each alarm.

Optional alarm properties

The behavior of an alarm can also be defined by the following properties:

- Infotext

  Operator notes can contain additional information about an alarm. Operator notes are displayed in a separate window in the runtime system when the operator presses the <HELP> button.

- Automatic logging

  In addition to the option of enabling and disabling automatic logging of alarms for the entire project, it is also possible to enable logging for each individual alarm.

3.10.3.2 Alarm settings

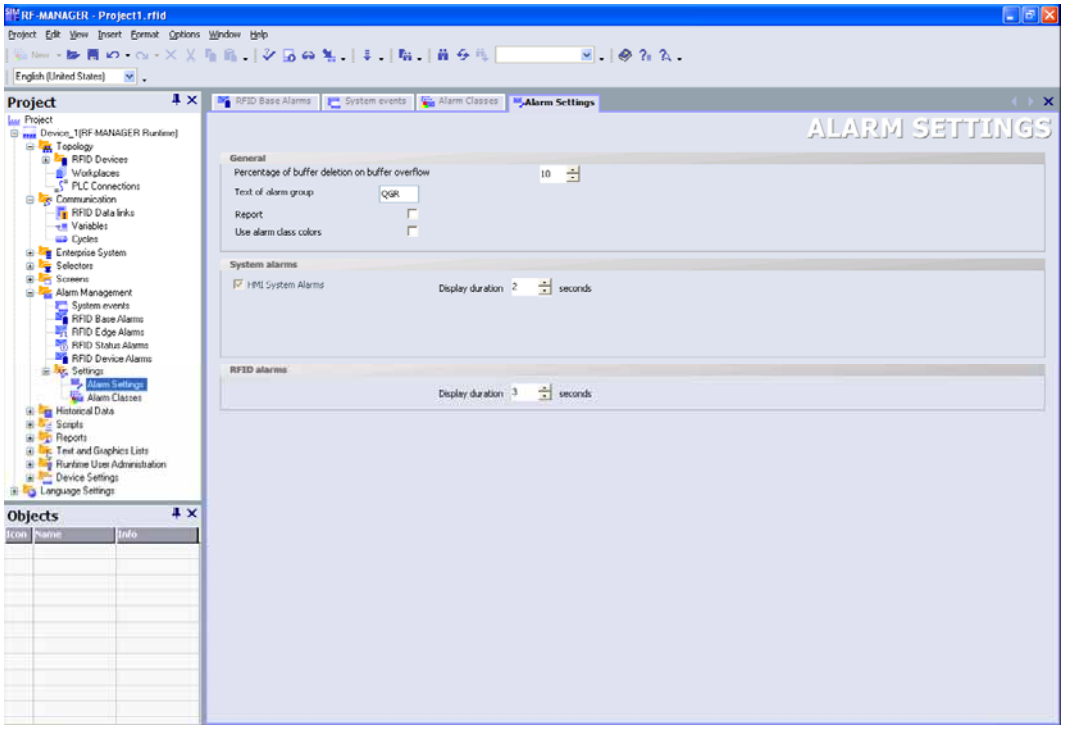
Introduction

In principle, the RF-MANAGER alarm system is functional using the default settings. You only need to change these default settings if you want to adapt the alarm system behavior to specific plant conditions.

Opening the basic settings

In the project view, double-click "Alarm settings" in the "Alarms > Settings" group.

Layout



Workplace

You define the settings for the alarm system in the workplace.

In the "System alarms" area you select, for example, how long the system alarms should be displayed on the runtime system.

In the "RFID alarms" area, select the display interval following which RFID base alarms and RFID device alarms will be automatically deactivated.

3.10.3.3 Basic Principles of Editors

Editors for configuring alarms

The following editors are available in RF-MANAGER for configuring alarms:

- "System alarms" for changing alarm texts of system alarms
- "RFID alarms": One editor each for creating and editing RFID base alarms, RFID status alarms and RFID edge alarms as well as one editor for changing RFID device alarms
- "Alarm classes" for creating and changing alarm classes

Changing the column display

The column display can be configured as follows:

- You can show or hide individual columns using the context menu (right-click) for the column header.
- You can change the column width by dragging the right margin of a column header.
- By dragging a column header, you change the order of the columns.
- You can sort the table according to the entries in a column by clicking on the column header. Click the same column header again to reverse the sort order.

  The corresponding column header is marked with an arrow. The arrow direction determines the sort order.

Deleting and copying objects

One or more whole objects can be deleted or copied if you select the entire table row for each object using the icon on the left side of the row.

Filling in multiple table rows automatically by dragging

In tabular editors of RF-MANAGER, you can fill in multiple table rows in one operation.

- Creating multiple new objects (alarms, or alarm classes) with similar properties:
  - Sort the table so that the table row to be copied is at the bottom.
  - Select the first element in the row to be copied.
  - Keeping the left-hand mouse button pressed, drag the lower right-hand corner of the selected table element downwards into the blank part of the table.
- Transferring a property to more than one existing object (for example, changing the suppression period):
  - Select the table element with the relevant property.
  - Keeping the left-hand mouse button pressed, drag the lower right-hand corner of the selected table element downwards across the table rows to be modified.

Dragging and dropping within a table

A drag-and-drop operation can be used to copy an individual property (such as an alarm text or a color) from one table element to another.

See also

"RFID alarms" editors (Page 314)

"System alarms" editor (Page 316)

"Alarm classes" editor (Page 317)

3.10.3.4 "RFID alarms" editors

Introduction

There a a number of editors for RFID alarms. You create the RFID alarms using the relevant editor: and define their properties:

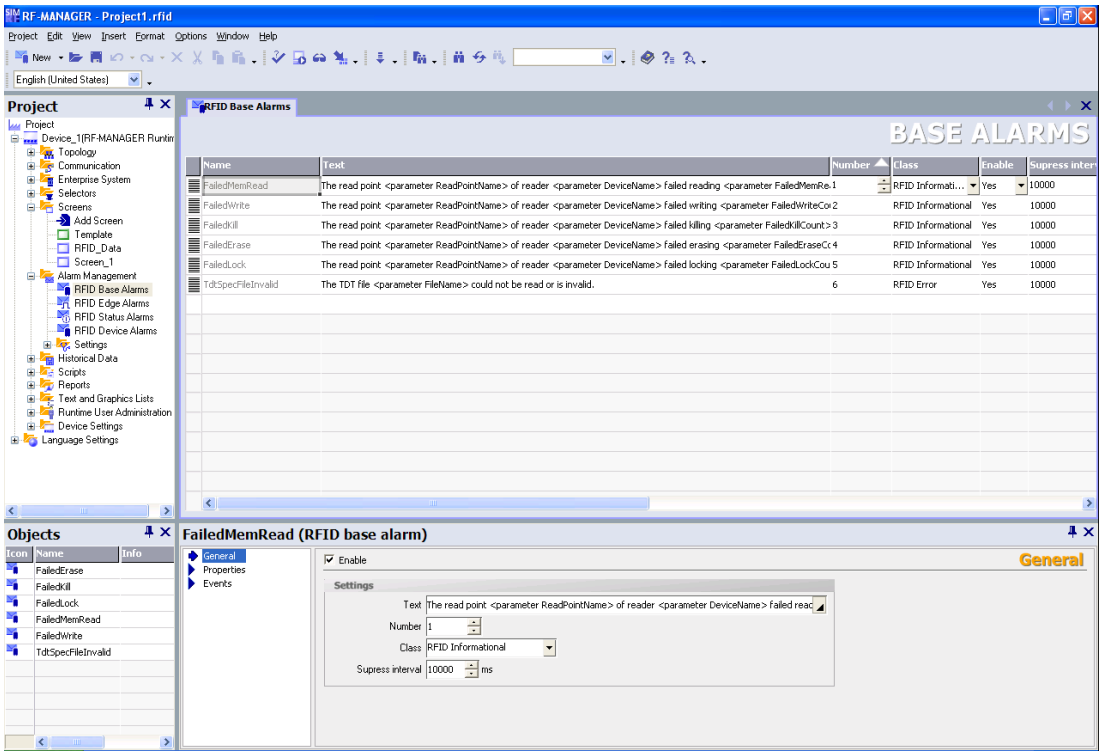
- RFID base alarms
- RFID status alarms
- RFID edge alarms
- RFID device alarms

Open

Double-click the "Alarms" group in the project view and select one of the following RFID alarms:

- "RFID base alarms"
- "RFID status alarms"
- "RFID edge alarms"
- "RFID device alarms"

Layout



Workplace

All RFID alarms are displayed in a table in the workplace. You can edit the properties of the RFID alarms in the table cells. You can sort the table according to the entries in a column by clicking on the column header.

Properties dialog box

Here you configure RFID alarms. The properties dialog box offers the same information and settings as the workplace table.

3.10.3.5 "System alarms" editor

You can view all system alarms and change the alarm texts in the "System alarms" tabular editor.

Opening the "System alarms" editor

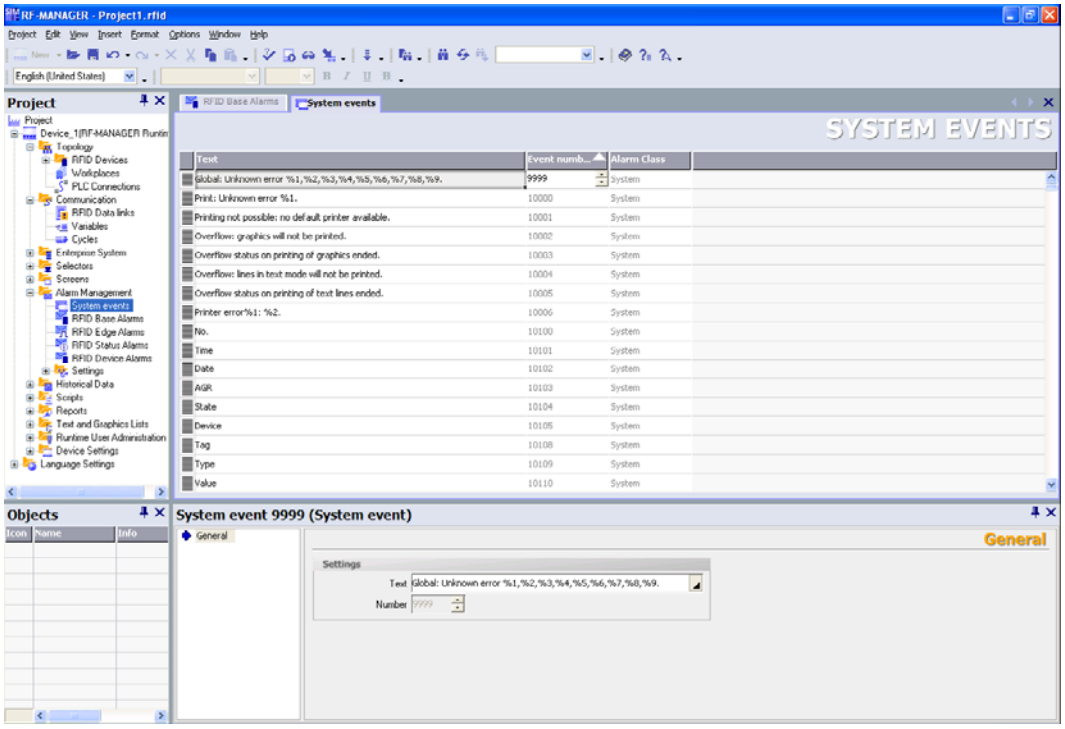
In the Project View, double-click "System alarms" in the "Alarms" group.

Note

Viewing and editing system alarms

System alarms can only be viewed and edited in RF-MANAGER if you have selected the option "Display all" under "Options > Settings > Workplace > Project View".

Layout



Workplace

All the system alarms are displayed in a table in the workplace. You can edit the alarm text of the alarms in the table cells. You can sort the table according to the entries in a column by clicking on the column header.

Properties dialog box

The alarm text of the system alarms can be modified in the properties dialog box. The alarm number and alarm class are assigned by the system.

See also

Basic Principles of Editors (Page 313)

3.10.3.6 "Alarm classes" editor

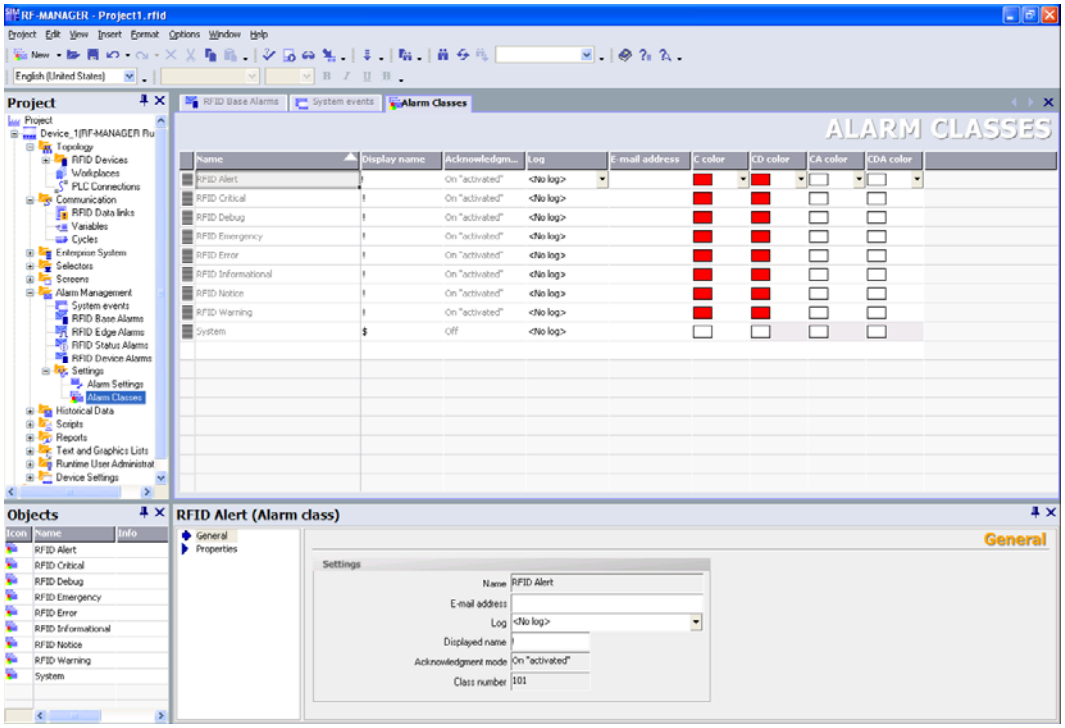
Introduction

You create alarm classes and specify their properties in the "Alarm classes" tabular editor.

Opening the "Alarm Classes" editor

In the project view, double-click "Alarm classes" in the "Alarms > Settings" group.

Layout



Workplace

All the alarm classes are displayed in a table in the workplace. You can edit the properties of the alarm classes in the table cells. You can sort the table according to the entries in a column by clicking on the column header.

Properties dialog box

Here you configure alarm classes. The properties dialog box offers the same information and settings as the workplace table.

See also

Basic Principles of Editors (Page 313)

3.10.4 Working with alarms

3.10.4.1 Acknowledge alarms

Introduction

For alarms displaying critical or hazardous operating and process states, a stipulation can be made requiring the plant operator to acknowledge the alarm.

Mechanisms for acknowledging alarms

An alarm can be acknowledged by the operator in the runtime system. Acknowledgment can be performed by the operator in the following ways:

- Function keys
- Softkeys or buttons in screens

In addition, alarms can be acknowledged through system functions in function lists or scripts.

Alarms requiring acknowledgment

The alarm class determines whether or not the alarm must be acknowledged.

Alarm classes essentially define how alarms will appear when shown on the runtime system as well as the acknowledgement behavior. RF-MANAGER has both predefined alarm classes and the option to configure user-defined alarm classes.

3.10.4.2 Reporting alarms

Introduction

Configure a report in RF-MANAGER with which you can output the alarms from the alarm buffer or an alarm log.

Output data of an alarm report

In order to report the alarms from the alarm buffer or an alarm log, insert the "Print alarm" object from the toolbox view into a report. Select the object in order to have the properties displayed in the properties dialog box. Configure the data selection for the report in the properties dialog box.

The following data can be output in the report:

- Current alarms from the alarm buffer
- Alarms from an alarm log

Specify the alarm classes which you want to output for the selected source.

- RFID alarm classes
- Custom alarm classes

Specify the sequence of the alarms for the output. The following selections are possible:

- Oldest alarm first
- Most recent alarm first

In order to output the alarms of a certain period, connect the "Display beginning" and "Display end" fields to variables. The variables can be supplied in runtime with the date and time for the first or the last alarm of the period.

3.10.5 Alarm logging

3.10.5.1 Basic principles of alarm logging

Introduction

In the project, alarms indicate fault and operating states of the runtime system and the reader. RF-MANAGER lets you log alarms and document operational states and error states of the plant.

Principle

You can configure alarm logging. The alarms to be logged are assigned to an alarm log via the alarm class. Every alarm belongs to a specific alarm class. When configuring an alarm class, enter the alarm log to be used.

You can save alarms from various alarm classes in a single log.

When you create a log, you specify the log properties and select the log behavior.

A log contains the following data:

- Date and time of alarm
- Alarm text
- Alarm number
- Alarm status
- Alarm class
- Alarm procedure
- Values of the output fields contained in the alarm text
- Device

Note

The alarm text and the device are only logged if this has been configured in the properties of a log.

See also

Alarm logging (Page 321)

"Alarm logs" editor (Page 322)

Basic settings for alarm logs (Page 323)

Alarm logging (Page 325)

Displaying logged alarms on screens (Page 325)

3.10.5.2 Alarm logging

Introduction

To log alarms, you group them in alarm classes. Each alarm class can be recorded in a separate log. You specify the log behavior when configuring the log.

Log types

In RF-MANAGER, you can select from the following log types:

1. Circular log
2. Segmented circular log
3. Log with system alarm
4. Log with execution of system functions

Alarms can be logged automatically or managed by an operator.

Storage media

Log data can be saved either in a file or in a database. Saved data can undergo additional processing in other programs, e.g. for analysis purposes.

Displaying log contents

You can display log contents on the runtime system. To do so, you must configure an alarm view.

See also

"Alarm logs" editor (Page 322)

Basic settings for alarm logs (Page 323)

Alarm logging (Page 325)

Displaying logged alarms on screens (Page 325)

3.10.5.3 "Alarm logs" editor

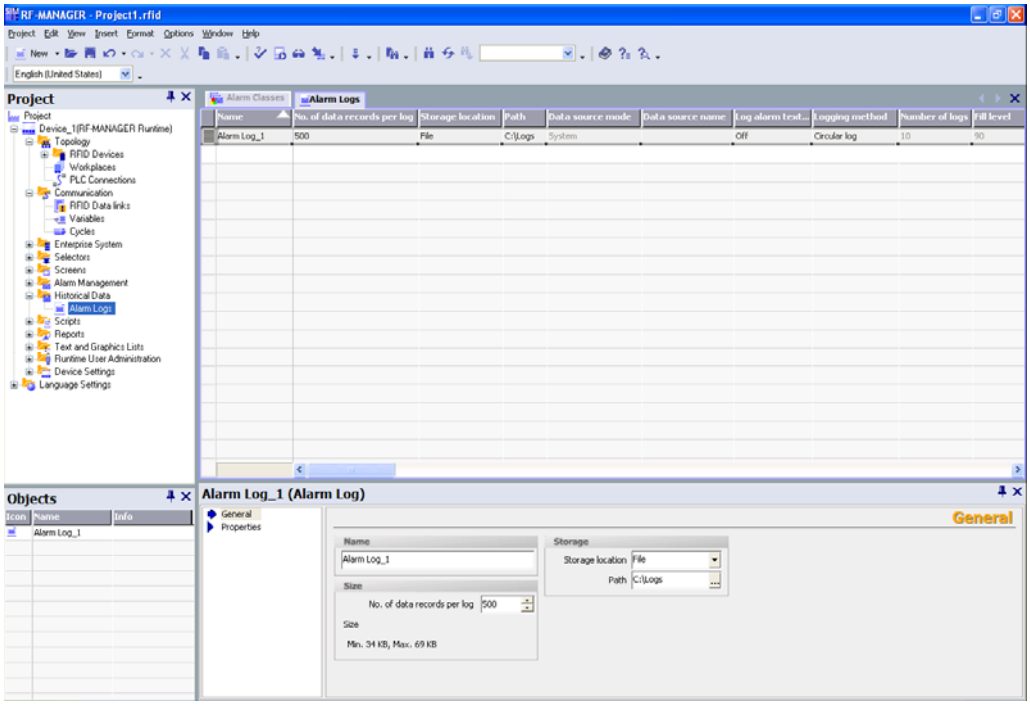
Introduction

In the "Alarm logs" table editor, you configure alarm logs for logging alarm classes and define their properties.

Opening the "Alarm logs" editor

Double-click on "Alarm logs" in the project window in the "Log" group to open the "Alarm log" editor.

Layout



Workplace

All alarm logs are displayed in a table in the workplace. You can edit the properties of the alarm logs in the table cells. You can sort the table according to the entries in a column by clicking on the column header.

Properties dialog box

Here you configure alarm logs. The properties dialog box offers the same information as the workplace table.

See also

Basic settings for alarm logs (Page 323)

Alarm logging (Page 325)

3.10.5.4 Basic settings for alarm logs

Introduction

The properties of an alarm log can be defined in the "Alarm log" editor or in the Properties window for logs.

General properties

- Name

  The name of the alarm log is freely selectable but the name must include at least one letter or one number.

  Note

  The characters which can be used in the name of the data source depend on the storage location.

  - If the storage location "File" is used, the following characters may not be used:
    \ / * ? : " < > |
  - If the storage location "Database" is used, the following characters may not be used:
    a-z A-Z 0-9 _ @ # $
    However, the characters _ @ # $ may not be used as the first character of the name.

- Memory location

  The alarm log may be stored in an ODBC database or in a separate "*.csv" file. Select "File" or "Database" as the storage location correspondingly.

  Depending on the configuration of the runtime system, you can select the local hard disk of the PC or, if present, a network drive as "path."

  If you have chosen an ODBC database as the storage location, you have the name suggested by the system (system-defined data source name) or enter one yourself (user-defined data source name).

- Size

  The size of the log is calculated from the number of data records and the rough size of an entry. The size of an entry is dependent, amongst other things, on whether the alarm text is to be logged with it.

Alarm log properties

- Start-up behavior

  Under Enable you can specify that logging starts when runtime is started. Enable the checkbox "Enable logging at runtime start."

  You can also control the behavior at runtime start in other ways. Enable "Reset log" if you want to overwrite previously logged data with the new data or "Append data to existing log" if you want to append new data to an existing log.

  Note

  System functions can be used to control the restart of a log during runtime.

- Logging method

  Here you can specify what should happen when the log is full. You can choose one of the following options:

  – Circular log

    When the log is full, the oldest entry will be overwritten.

  – Segmented circular log

    Multiple logs of the same size will be created and filled one after the other. When all logs are completely full, the oldest log is overwritten.

  – Display system message when

    When a defined status is reached a system alarm is displayed.

  – Trigger event

    The event is triggered as soon as the log is full.

- Settings

  Define whether the alarm text should be stored each time an alarm is logged. The alarm texts will be logged in the current runtime language.

- Comments

  Here you can enter descriptive text regarding the log.

See also

"Alarm logs" editor (Page 322)

Alarm logging (Page 325)

3.10.5.5 Alarm logging

Introduction

In runtime, alarms can be stored in logs for later evaluation. When configuring the logging of alarms and alarm classes, the user defines the log in which the alarms are to be stored and whether just the alarm events are stored or the associated alarm texts and variable values, too.

Principle

Several steps are involved in alarm logging:

- Creating and configuring alarm logs

  When creating an alarm log, the following must be defined:

  – General settings, e.g. name, size, storage location

  – Behavior at runtime start

  – Behavior when the log is full

- Configuring logging of the alarms in an alarm class

  An alarm log can be specified for each alarm class in which the alarm events are stored during runtime.

- Further processing logged alarms

  The logged alarms can be evaluated directly in your RF-MANAGER project, e.g. in an alarm view, or via another application, e.g. Excel.

See also

Displaying logged alarms on screens (Page 325)

3.10.5.6 Displaying logged alarms on screens

Introduction

During runtime, you can display logged alarms on the screens of the runtime system. During this process, alarms in an alarm class are downloaded from the log database and presented in an alarm view.

Principle

You must configure an alarm view to display logged alarms on the runtime system. When configuring an alarm view, specify the alarm class of the alarms to be displayed.

3.10.5.7 Structure of a CSV file

Introduction

In the *.csv (Comma separated value) file format, table columns (name and value of entry) are separated by a semicolon. Each table row ends with a carriage return.

Example of a CSV file

This example shows a file with logged alarms:

```
"Time_ms";"MsgProc";"StateAfter";"MsgClass";"MsgNumber";"Var1";...;"
Var8";"TimeString";"MsgText";"PLC"37986550590,27;1;1;3;110001;"";...
;"";"30.06.99 13:12:51";"Change to operating mode
'online'";37986550682,87;1;1;3;140010;"";...;"";"30.06.99
13:12:59";"Connection established: PLC_1, Station 2, Rack 0,
Position 2";
```

Structure of a log file in CSV format

The following values are entered in the individual columns of an RF-MANAGER log file:

Parameters	Description
Time_ms	Specify a time stamp as a decimal value (see below for conversion)
Msg_Proc	Alarm procedure: 0 = Unknown alarm procedure 1 = System alarm 9 = RFID base alarm 10 = RFID edge alarm 11 = RFID status alarm 12 = RFID device alarm
State after	Alarm event: 0 = Activated/Deactivated 1 = Activated 2 = Activated/Acknowledged/Deactivated 3 = Activated/Acknowledged 6 = Activated/Deactivated/Acknowledged
Msg_Class	Alarm class: 0 = No alarm class 3 = System 64 to 99 = Alarm classes configured by the user 100 = RFID emergency 101 = RFID alarm 102 = RFID critical 103 = RFID fault 104 = RFID warning 105 = RFID note 106 = RFID information 107 = RFID debug
Msg Number	Alarm number
Var1 to Var8	Alarm variable value as STRING
Time string	Time stamp as STRING, i.e., readable date format
Msg text	Alarm in a readable STRING
PLC	Alarm localization (relevant device)

Conversion of the decimal value in the time stamp

If the value needs to be processed using a different program, proceed as follows:

1. Divide Time_ms by 1,000,000.

   Example: 37986476928 : 1.000.000 = 37986,476928

2. The whole number portion (37986) is the date calculated from 31.12.1899.

   You can now convert the time stamp value to days in Excel by assigning a corresponding format from the "Date" group to the cells, which contain the time stamp.
   Result: 37986 results in 31.12.2003

3. The value after the comma (0,476928) indicates the time:
   - Multiply the value (0.476928) by 24 to obtain the hours (11.446272).
   - Multiply the remainder (0.446272) by 60 results in the minutes (26.77632).
   - Multiply the remainder (0.77632) by 60 results in the seconds (46.5792).

Overall result 11:26:46,579
This conversion is supported by Microsoft Excel, for example.

3.10.5.8 Accessing the ODBC log database directly

Introduction

The storage location of a log can be a database or a file.

The database is addressed by means of its "Data source name" (DSN). Select the database you would like to use RF-MANAGER in the Windows Start menu under Settings > Control panel > ODBC data sources.

To store log data, specify the "Data source name" (DSN) instead of a directory name when making your configuration settings. With the DSN, you are referencing the database and the storage location.

Application

The entire functional scope of the database is available for additional processing and evaluation of log data.

Principle

You create the data source that connects to the database on the same computer that contains the runtime software. You then specify the DSN configured here when you create a log in the RF-MANAGER.

Using the ODBC interface, you can access the database directly with other programs such as MS Access or MS SQL server.

With the "StartProgram" system function, you can also configure a program call (for MS Access, for example) on the runtime system. This does not interrupt the runtime program sequence.

3.11 Working with PLC connections

3.11.1 Fundamentals

3.11.1.1 Basic principles of communication

Communication partners

The communication partner can be a SIMATIC S7 PLC. The communication partners can be interconnected via direct cable connection or network. The data transferred between the communication partners are used to represent control values and to logically combine them with RFID data.

3.11.1.2 Principle of the communication

Introduction

RF-MANAGER controls communication between the runtime system and the reader or PLC by means of variables and area pointers.

Communication using variables

In RF-MANAGER, variables are centrally managed in the "Variables" editor. There are external and internal variables. External variables are used for communication, An external variable is the image of a defined memory location in the PLC or reader. A runtime system and the PLC or reader have read and write access to this memory location. Those read and write operations may cyclic or event-triggered.

In your configuration, create variables that point to specific addresses in the PLC or reader. The runtime system reads the value from the specified address and displays it. The operator can also make an input on the runtime system that is then written to the address on the PLC/reader.

Communication using area pointers

Area pointers are used to exchange data of specific user data areas. Area pointers are parameter fields the RF-MANAGER uses in Runtime to obtain information about the location and size of data areas of the PLC/reader. During communication, the PLC/reader and the runtime system read and write information for each other in these data areas. Based on the evaluation of data stored in these areas, the PLC/reader and runtime system trigger defined actions.

The RF-MANAGER uses the following area pointers:

- Screen number
- Date/time PLC
- Coordination

Communication drivers

A communication driver is a software component that establishes a connection between an RFID system and a runtime system and thus allows the transfer of process values to the RF-MANAGER variables. RF-MANAGER provides a communication driver for connection to SIMATIC S7.

Users can select the interface, the profile and the transmission speed for each specific communication partner.

3.11.2 Elements and Basic Settings

3.11.2.1 The PLC Connections editor

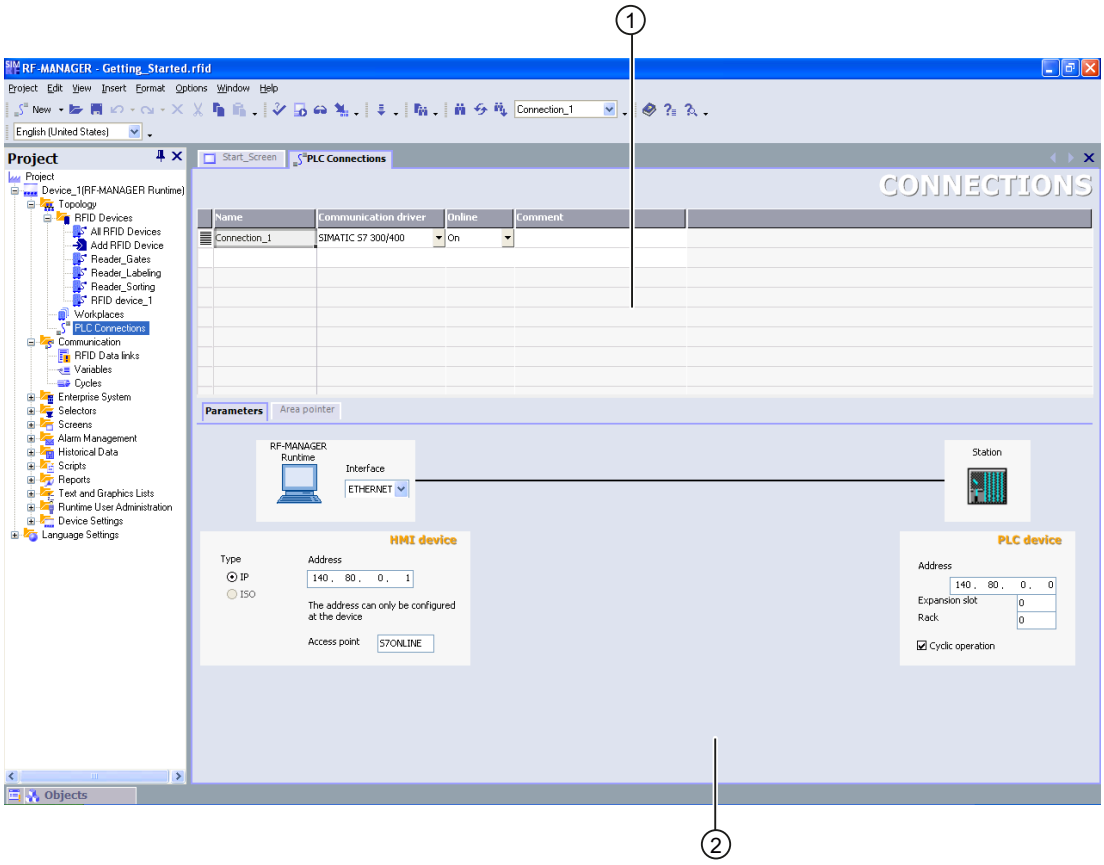
Introduction

In the "PLC connections" editor, you create and configure connections.

Open

Select "PLC connections" from the project view, and then open the shortcut menu. Select "Add PLC connection" from in this shortcut menu. The new connection will be created and opened in the workplace.

Layout



① Workplace

② Tabs

Workplace

All connections are visualized in the workplace in tabular format. You select the communication drivers from the table cells, and edit the relevant connection properties. You can sort the table according to the entries in a column by clicking on the column header.

Tabs

Using the "Parameters" tab you can configure the settings for the communication drivers selected in the table. Select the settings for the runtime system, the network and for the controller.

Using the "Area pointers" tab you can configure the area pointers of the connections.

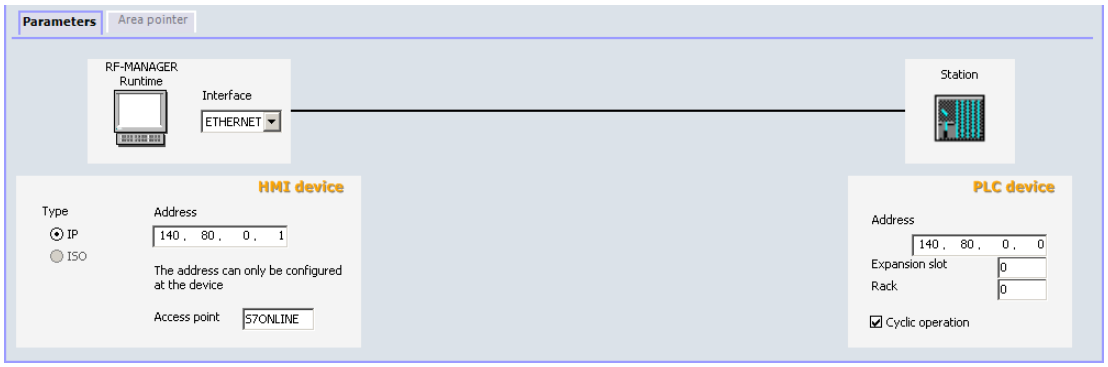
3.11.2.2 Parameters for connections

Introduction

Select the "Parameters" tab of the "PLC connections" editor to configure the properties of a connection between the runtime system and the communication partner.

Layout

The communication partners are visualized schematically on the "Parameters" tab. This tab provides the "Runtime system", "Network" and "Controller" areas where you can declare the parameters of the relevant interface used.



The system sets default parameters. Always ensure consistency on the network whenever you edit parameters.

Note

Protocol description

For detailed information on configurable parameters, refer to the description of the supported protocols In the SIMATIC RF-MANAGER Information System.

3.11.2.3 Area pointers for connections

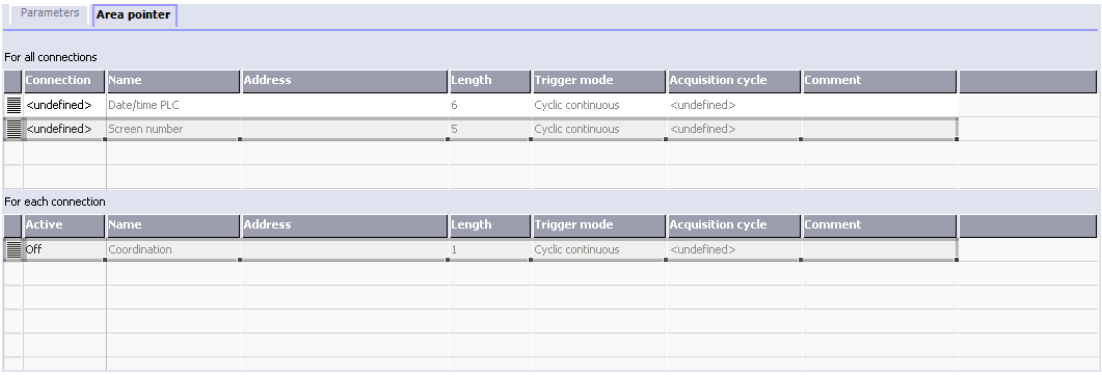
Introduction

Using the "Area pointer" tab of the "PLC connections" editor, you can configure the usage of the available area pointers.

Layout

The "Area pointer" tab contains two tables of area pointers. The "For all connections" table contains those area pointers which are created only once in the project and can be used for only one connection.

The "For each connection" table contains the area pointers you can set separately for each available connection.



Note

Protocol description

For detailed information on the area pointers and their configuration, refer to the description of the supported protocols in the SIMATIC RF-MANAGER Information System.

3.12 Working with reports

3.12.1 Working with the Report System

Introduction

Logs are used in the RF-MANAGER to document plant statuses. You can log alarms in order to generate shift logs.

Overview

You can edit the report files in the graphic editor. In this editor, you configure the layout of the reports and determine the output data. You can add various objects for the output of data to a report file.

You can create separate report files for reporting different types of data. You can set the triggering of the output separately for each report file. You can choose to trigger the output of data at a specific time or in defined intervals, or by other events.

The modular structure of these features allows you to explicitly configure reports for different requirements.

Application examples

Create a shift log which outputs e.g. any error events at the end of a shift.

You can create a log which outputs alarms of a certain class or type.

3.12.2 Structure of reports

Structure of a report

The reports in RF-MANAGER all have the same basic structure. They are subdivided into different sections as shown in the figure below.

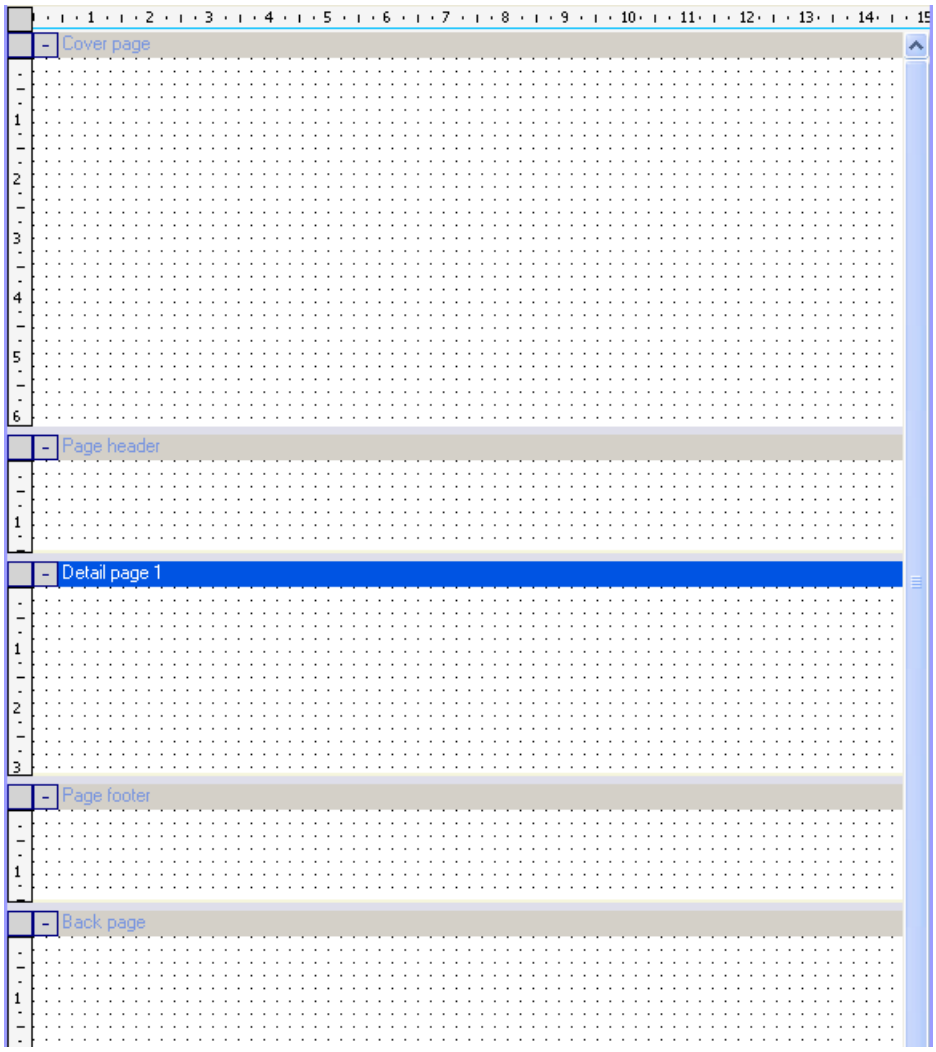


Figure 3-21 Report

The individual sections are used to output different data and can contain general objects and specific report objects.

- Report header

  The report header serves as the cover sheet for a report. The report header is used to output the project title and general information on the project. The report header is output without page header and without page footer. The report header is output once at the start of a report.

- Report footer

  The report footer is used as the final page of a report. The report footer is used to output a summary of the report or other information which is required at the report end. The report footer is output without page header and without page footer. The report footer is output once at the end of a report.

- Page header

  The page header is output with every page of a report. The page header is used to output the date, time, title or other general information.

- Page footer

  The page footer is output with every page of a report. The page footer is used to output the page numbers, the total number of pages or other general information.

- Page

  The runtime data are output in the "Detail page" area. The objects for outputting the runtime data are inserted in the "Detail page" area. When you output the data, page breaks are added automatically depending on the amount of data. You can also insert several pages into a report in order to optically separate the configuration of various output objects.

The creation of a report is described in the "Creating a report" chapter.

See also

Working with reports (Page 339)

3.12.3 Elements and Basic Settings

3.12.3.1 "Reports" editor

Introduction

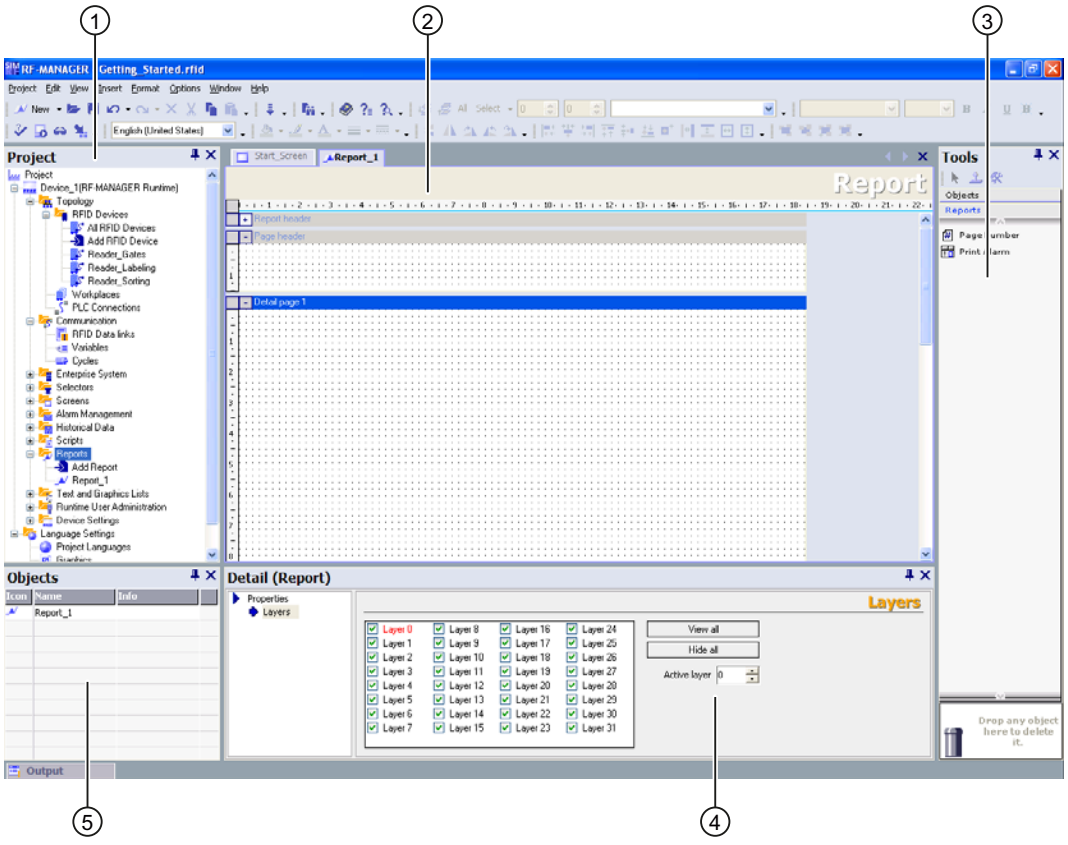
You can create and edit reports with the report editor.

Open

Select the "Reports" entry in the project view and open the pop-up menu. Select the "New report" command in the pop-up menu. A new report is created and opened in the workplace.

In order to open an existing report, double-click in the object view on the desired report. The selected report is opened.

Layout



① Project view
② Workplace
③ Toolbox
④ Properties dialog box
⑤ Object view

Menu bar

The menu bar contains all commands required for operating RF-MANAGER. Any available shortcut keys are indicated next to the menu commands.

Toolbars

The toolbars contain the buttons most often used.

Select "View > Toolbars" to show or hide the specific toolbars. The ⌄ button of a toolbar is used to display or hide the individual buttons of this toolbar.

Workplace

You configure the reports in the workplace.

Toolbox

The toolbox gives you access to the objects required to configure a report. The objects are inserted into the report using the drag-and-drop function.

Properties dialog box

When an object is selected, you can edit the properties of the selected object in the properties dialog box.

When no object is selected, you can edit the properties of the active area of a report in the properties dialog box.

See also

Using the toolbox view (Page 338)

3.12.3.2 Using the toolbox view

Introduction

The toolbox view contains a selection of objects which you can insert into your reports in the "Simple objects" and "Report objects" groups.

Changing default properties

Default properties are preset for the various object types in the toolbox view. When you insert an object from the toolbox view into a report, the object takes over these default properties.

You can customize the default properties of an object type to suit the requirements of your project. When you change the default properties of an object type, the properties of objects which have already been inserted are retained. You should therefore adapt the default properties before you insert the objects.

The default properties of the objects are coupled to the user names under which you are logged on in the operating system.

In order to change the default properties, you open the pop-up menu of an object in the toolbox view. Select the command "Edit default properties." The "Properties" dialog box is displayed. Adapt the default properties of the object to the requirements of your project.

Displaying the toolbox view

With the "View ▸ Toolbox view" menu you can display or hide the toolbox view.

See also

"Reports" editor (Page 336)

3.12.4 Working with reports

Introduction

New logs have to be created in order to log runtime data. As an alternative, you can adapt existing logs to your requirements. Specify in the logs which data are to be logged in runtime.

In the RF-MANAGER you can create any number of logs and control the output of the individual logs differently.

See also

Structure of reports (Page 334)

3.12.4.1 Summary

Introduction

When creating a report, you specify the individual sections and contents. Configure the contents of the following sections:

- Report header
- Page header
- Page
- Page footer
- Report footer

Configuration overview

Objects from the toolbox view are available for designing a report and configuring the data for the output. Some objects have a limited functional scope when used in a report compared to similar objects of the screen editor. An I/O field can, for example, only be used as an output field.

When a report is created in the report editor, it is displayed as wysiwyg. The dynamic object for outputting the data, for example "Print alarm", is an exception. The configured height of this object is irrelevant to the output format since the size of the dynamic object depends of the existing amount of data. Page breaks are inserted consecutively on the pages depending on the amount of data. You can only insert one object into each page of a report. Objects which are positioned on the same page below this dynamic object are not output. The "Print alarm" object is inserted automatically with the width configured for the report. The width of the output follows the configured width of the report.

A new report always only contains one page. This page represents a page for the output. If required, you can insert further pages into the report. To do so, move the cursor onto the title bar of an existing page and open the pop-up menu with the right mouse button. The commands "Insert page before" and "Insert page after" are used to insert a new page before or after the existing page. The pages have a consecutive number assigned to them. A maximum of 10 pages is permitted per report. If you create more than 10 pages, the consecutive numbers of the superfluous pages are placed in pointed brackets (for example: Page <11>). The superfluous pages are not taken into consideration for the output. The "Delete page" command in the pop-up menu of a page is used to delete the selected page.

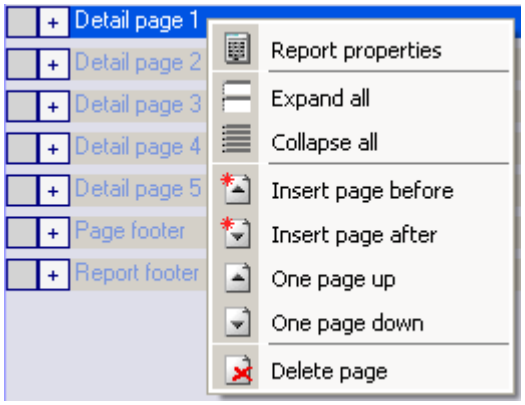
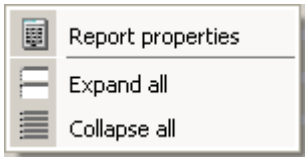


Figure 3-22 Pop-up menu of a page

The sequence of the created pages can be changed subsequently. To do so, move the cursor onto the desired page and open the pop-up menu with right mouse button. Select the corresponding command "One page up" or "One page down" in the pop-up menu. The page is moved correspondingly. The consecutive numbering of the pages is retained. If, for example, Page 4 is moved "One page up" by means of the corresponding command, Pages 3 and 4 are swapped.

The individual report sections can be closed in order to obtain a better overview in the workplace. In order to minimize or maximize, click on the node before the section designation.

You can also display or hide all the areas simultaneously. To do so, move the cursor onto the title bar of a report area and open the pop-up menu with the right mouse button. Select the corresponding command "Display all" or "Hide all" in the pop-up menu.



See also

Working with reports (Page 339)

Adapting the report properties (Page 341)

Use of report objects (Page 344)

3.12.4.2 Adapting the report properties

Introduction

You edit the output options and the format options for the report in the report properties. The following property groups are available:

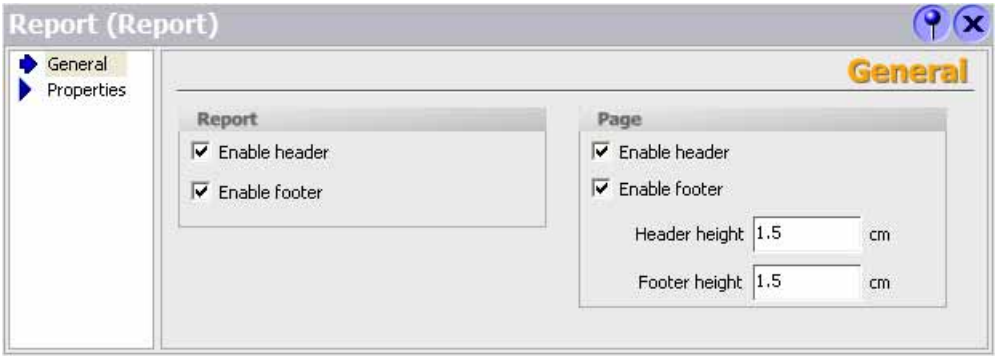
- General
- Properties/Display

Requirements

- The report whose properties are to be changed must be open.
- The properties dialog box has to be open.

Editing the report properties

Move the mouse pointer to the report to be edited in the project view or to the title of a report area, e.g. to the title line of the "Header". Open the pop-up menu with the right button and select the command "Document properties." The report properties are displayed in the properties dialog box.



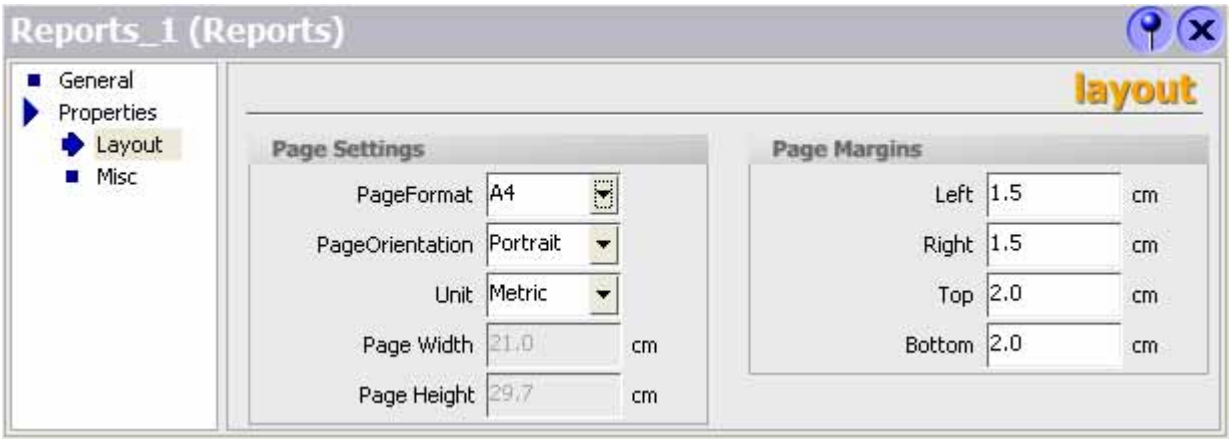
Activate the "General" properties group in the properties dialog box.

Activate or de-activate the output of the report header and report footer in the "Report" area.

Activate or de-activate the output of the page header and page footer in the "Page" area.

If the output of a report area is de-activated, this area is identified in the title bar by an "(X)."

Activate the "Properties/Display" properties group in the properties dialog box.



Select the page format for the output in the "Page" field.

As an alternative, select the "User defined" format. You can then enter values for your own format in the "Width" and "Height" fields.

Select the portrait or landscape format in the "Page orientation" field.

Select the unit of measurement for setting the page size and page margins in the "Unit" field.

Set the size of the page margins by using the fields in the "Page margins" area. The page margins set may not be smaller than the page margins set at the printer.

See also

Summary (Page 339)

3.12.4.3 Objects for report creation

Introduction

Objects can be either graphics elements for laying out your project report or dynamic elements for outputting data.

The objects are made available in the "Simple objects" object group in the toolbox view.

The special report objects are also available for creating reports. The special report objects are contained in the "Report objects" object group.

Basic objects

Icon	Object	Description
	Line	The line is an open object. The line length and angle are defined by the height and width of the rectangle enclosing the object. The line ends can be represented as arrows or dots.
	Ellipse	The ellipse is an enclosed object which can be filled with a color or pattern. You can customize the width and height of an ellipse in order to align it horizontally or vertically.
	Circle	The circle is an enclosed object which can be filled with a color or pattern. The circle diameter can be adjusted freely.
	Rectangle	The rectangle is an enclosed object which can be filled with a color or pattern. The height and width of a rectangle can be varied freely in order to allow a horizontal or vertical adjustment. The corners of a rounded rectangle can be rounded off as required.
	Text field	The field for static text is an enclosed object which can be filled with a color or pattern. The static test is entered in a text field of any size. You can enter single or multiple line text for all configured languages.
	"I/O field"	The I/O field can only be used as an output field in a report. With an "I/O field" you can output values with the following data formats: Binary, date, date-and-time, decimal, hexadecimal, string and time.
	"Date-time box"	The date and time are output in a report with the "Date-time" field. You can output the system time or connect a RF-MANAGER variable through which the "Date/time" field is supplied with corresponding values.
	"Graphic I/O field"	The graphical I/O field can only be used as an output field in a report. The field is used to select graphics from a graphics list. This allows you to display, for example, states of variables graphically. Example: Instead of the values 0 and 1, you can output one graphic each for a closed and an open valve.

Icon	Object	Description
	"Symbolic I/O field"	The symbolic I/O field can only be used as an output field in a report. The field is used to select texts from a text list. This allows you to display, for example, states of variables in text form. Example: Instead of the values 0 and 1, you output "Motor OFF" and "Motor ON" for the state of a motor.
	"Graphic view"	The graphics object offers the possibility of inserting graphics which were created with other programs into a report. You can insert graphics or images with the following formats: "*.emf", "*.wmf", "*.dib" and "*.bmp." You define the size and the graphics object properties.

See also

Use of report objects (Page 344)

Summary (Page 339)

3.12.4.4 Use of report objects

Introduction

Special objects are available for logs under the "Log objects" section in the toolbar. These objects are intended exclusively for use in reports.

Overview of the objects

Icon	Object	Short description
	Page number	Outputs the page number in a report. The object only has to be inserted once in a report, for example in the page footer.
	Print alarm	Outputs alarms in a report.

See also

Reporting alarms (Page 345)

Summary (Page 339)

3.12.5 Reporting alarms

Introduction

Configure a report in RF-MANAGER with which you can output the alarms from the alarm buffer or an alarm log.

Output data of an alarm report

In order to report the alarms from the alarm buffer or an alarm log, insert the "Print alarm" object from the toolbox view into a report. Select the object in order to have the properties displayed in the properties dialog box. Configure the data selection for the report in the properties dialog box.

The following data can be output in the report:

- Current alarms from the alarm buffer
- Alarms from an alarm log

Specify the alarm classes which you want to output for the selected source.

- RFID alarm classes
- Custom alarm classes

Specify the sequence of the alarms for the output. The following selections are possible:

- Oldest alarm first
- Most recent alarm first

In order to output the alarms of a certain period, connect the "Display beginning" and "Display end" fields to variables. The variables can be supplied in runtime with the date and time for the first or the last alarm of the period.

See also

Working with reports (Page 339)

Use of report objects (Page 344)

Editing output parameters for an alarm log (Page 346)

Outputting a report (Page 349)

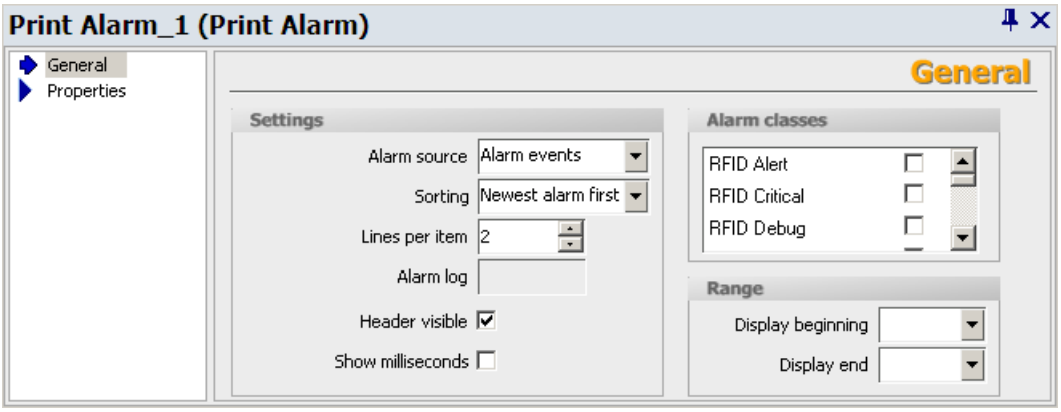
3.12.5.1 Editing output parameters for an alarm log

Introduction

The output parameters for an alarm log are edited in the properties dialog box. The "Print alarm" object has to be inserted in a report in order to display the properties. The properties dialog box has to be open.

Output parameters of "Print alarm"

Select the "Print alarm" object in the workplace. The properties of the object are displayed in the properties dialog box. Select the data source and configure the selection and the layout of the data for the output in the "General" category.

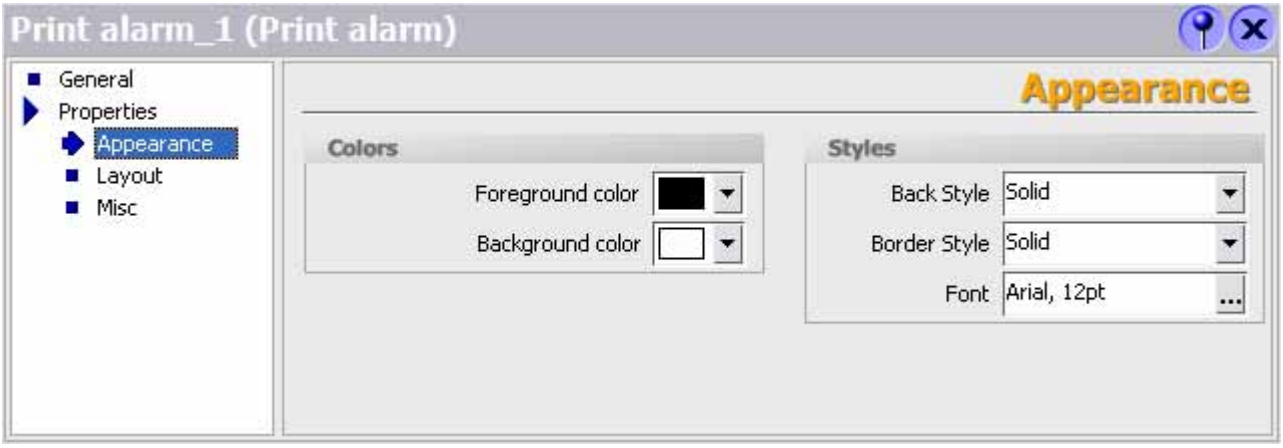


The following entries are available for the output of alarms:

Attribute	Function	Requirements
"Source for alarms"	This is used to select the alarm source. You can select from the following options: • Alarm events • Alarm log	
"Sorting"	Is used to specify the sequence for the output. You can select from the following options: • Oldest alarm first • Most recent alarm first	
"Lines per entry"	This specifies the number of lines available per alarm. The required number of lines depends on the number and width of the selected columns in for the output as well as the font used and the paper format of the printer.	
"Page header visible"	Used to specify whether the table is to be output with column headers.	
"Alarm log"	Is used to select the alarm log for the output.	An alarm log has to be selected as the alarm source in the "Source for alarms."

Attribute	Function	Requirements
"Alarm classes"	Is used to select the alarm classes for the output. You can select from the following options: • RFID alarm classes • Custom alarm classes • System alarms	
"Display beginning"	Used to select the first alarm for outputting the alarms of a specific period. Connect the field via the selection list to a variable. Supply the variable in runtime with a start value, for example via an input field.	The variable must be of the type "Date and time."
"Display end"	Used to select the last alarm for outputting the alarms of a specific period. Connect the field via the selection list to a variable. Supply the variable in runtime with an end value, for example via an input field.	The variable must be of the type "Date and time."

Select the "Appearance" subcategory in the "Properties" category. Configure the foreground color, the background color, the style and the font settings.

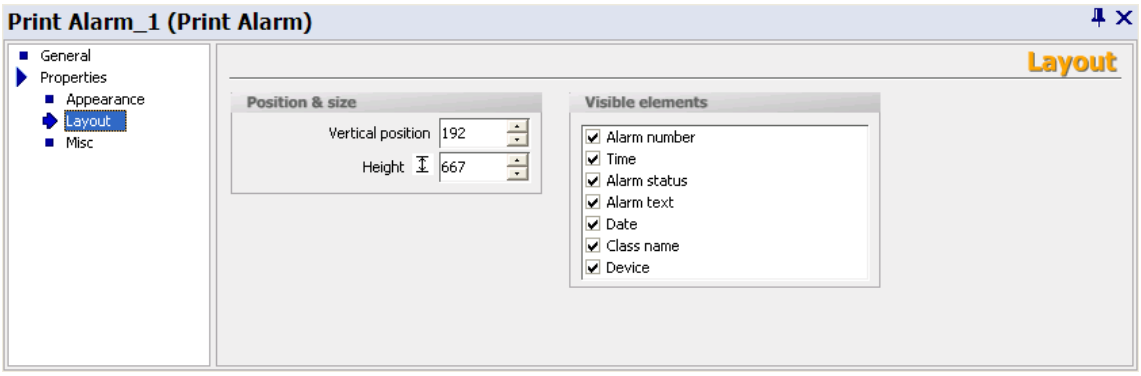


Select the "Layout" subcategory in the "Properties" category. Configure the position and size of the "Print alarm" object. Select the columns for the output in the report in the "Visible elements" area.

The following columns can be output:

- "Alarm number"
- "Time"
- "Alarm status"
- "Alarm text"
- "Date"

- "Alarm class"
- "Device"



Note

The height of the "Print alarm" object configured in the report is irrelevant to the output. Since a large amount of data can occur during the report output, the "Print alarm" object is extended dynamically so that all the data arising can be output. If the page length is exceeded, an automatic page break is carried out.

See also

Reporting alarms (Page 345)

3.12.6 Outputting a report

Introduction

RF-MANAGER offers the following options for outputting a report:

Time-controlled output, for example:

- Non-recurring, time-controlled output
- Output repeated at intervals

Event-controlled output, for example:

- Through a change in the variable value
- Through activating a configured button in a screen
- Overflow of a log
- Using a script

Configuration of the output

Time-controlled output is configured through the scheduler. The report output can furthermore be controlled by system events which are made available by the scheduler.

Event-controlled output of an object is configured directly at a variable, a button in the screen, or in a log.

Note

The logs are output on the standard printer.

See also

Working with reports (Page 339)

3.13 User administration

3.13.1 Field of application of the user administration

Principle

The access security system controls user access to data and functions in runtime to prevent unauthorized operations. Safety-relevant operations are already limited to specified user groups when a project is being created. For this purpose, users and user groups are set up and have characteristic access rights, the authorizations, assigned to them. Required operation authorizations are configured for objects. For example, operators only have access to specific function keys. Commissioning engineers, on the other hand, have unlimited access during runtime.

Definition

Users, user groups and authorizations are administered centrally in the user administration.

The user administration controls access to data and functions during runtime. For this purpose, users and user groups are created, administered and transferred to the runtime system in the engineering system. In Runtime you manage the users and passwords by using the "User view".

Application example

You create and configure an access protection in order to protect operating elements, such as input fields and function keys, against unauthorized operation. Only specified persons or operator groups can change parameters and settings and call functions.

CAUTION
Access protection does not protect against incorrect operations. You are responsible for ensuring that only correspondingly trained and authorized personnel design, commission, operate and maintain, etc. plants and machines. Access protection is not suitable for defining work routines and monitoring their observance.

See also

"Users" user administration (Page 352)

"Groups" user administration (Page 354)

3.13.2 Structure of the user administration

Authorizations are not assigned directly to users in the user administration, but rather to user groups. A user is then, for example, assigned to the "Operators" user group and receives its authorizations. Authorizations do not have to be assigned individually to each user, only to the user group.

In a different environment, other users occur. The authorizations and user groups of the project, however, remain unchanged. Only users are re-assigned to the user groups, for example "Operators."

The user administration separates the administration of the users from the configuration of the authorizations. This ensures flexibility at the access protection.

See also

"Users" user administration (Page 352)

"Groups" user administration (Page 354)

3.13.3 Elements and Basic Settings

3.13.3.1 "Users" user administration

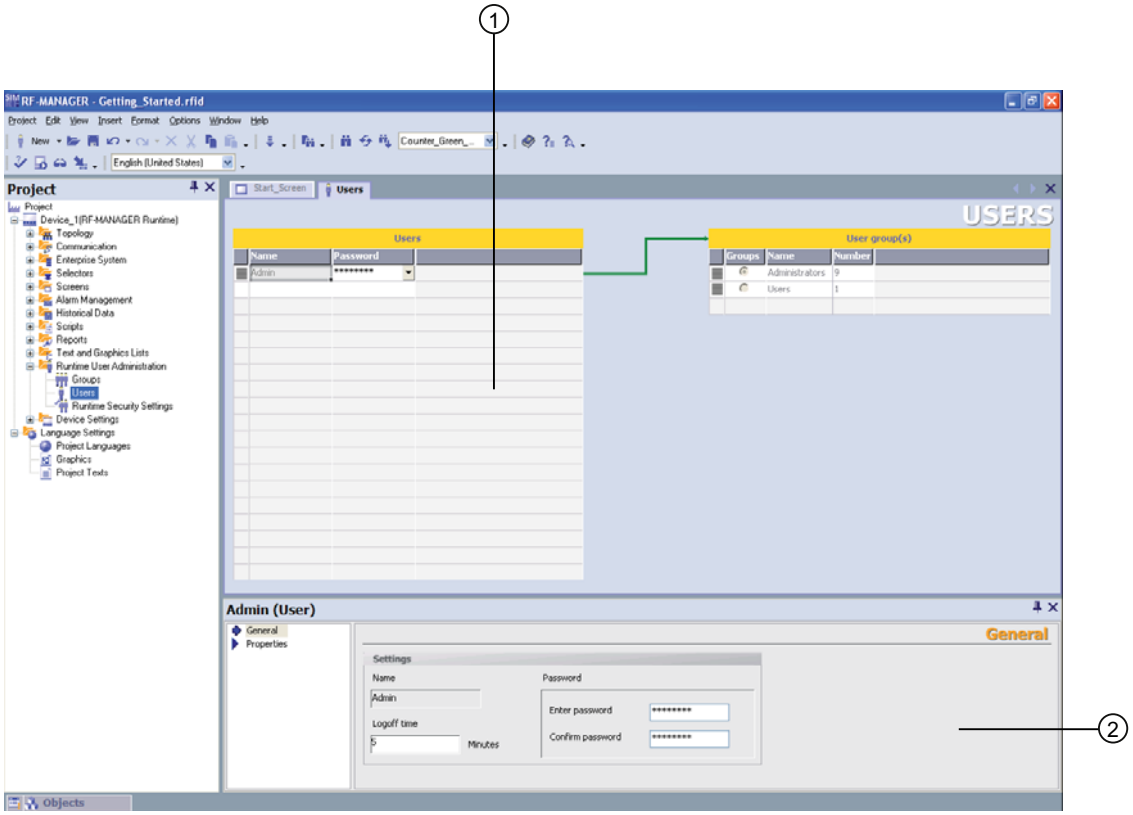
Introduction

In user administration you administer users and user groups in order to control access to data and functions in runtime. The user administration is divided into the administration of the users and the administration of the user groups. This section describes the administration of the users.

Open

You open the administration of the users in the project window by double-clicking on "Users."

Layout



① Workplace
② Properties dialog box

Workplace

The "Users" workplace shows the existing users and the user groups to which they are assigned.

Note

A user can only be assigned to one user group.

Properties dialog box

When a user has been selected, edit the password and the time after which the user is logged off automatically in the "General" group.

See also

"User" workplace (Page 355)

3.13.3.2 "Groups" user administration

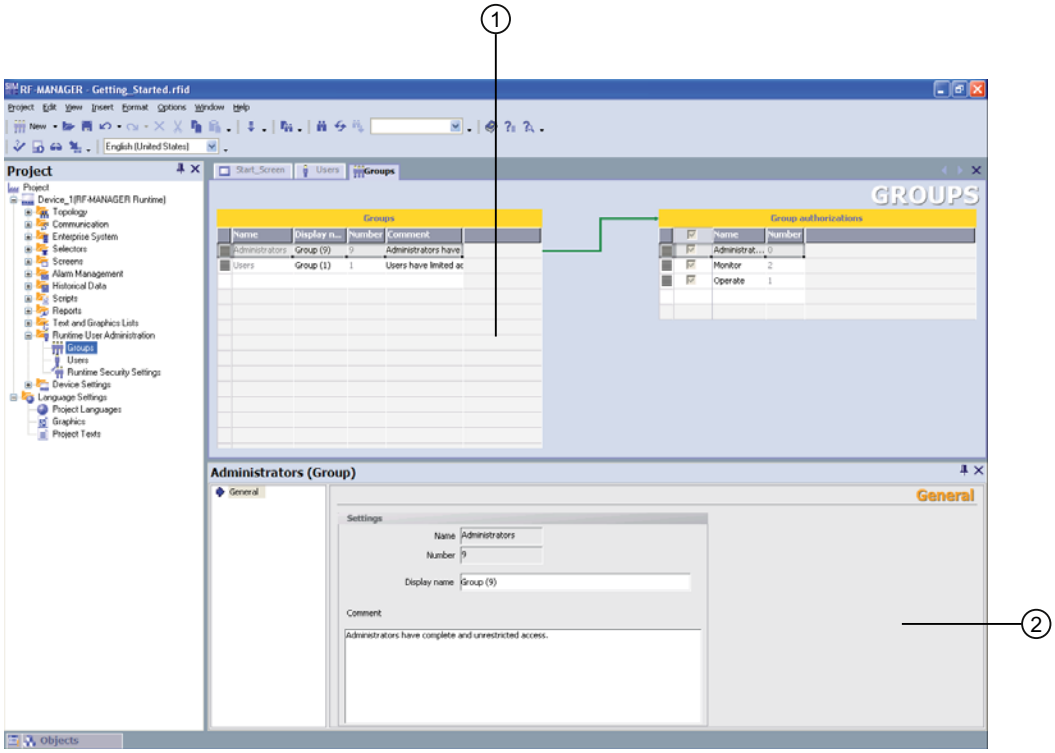
Introduction

In user administration you administer users and user groups in order to control access to data and functions in runtime. The user administration is divided into the administration of the users and the administration of the user groups. This section described the administration of the user groups.

Open

You open the administration of the user groups in the project window by double-clicking on "Groups."

Layout



① Workplace
② Properties dialog box

Workplace

The "Groups" workplace shows the existing user groups and their authorizations.

Properties dialog box

When a user group or an authorization is selected, you can edit the designation and the comment in the "General" group.

See also

"User groups" workplace (Page 356)

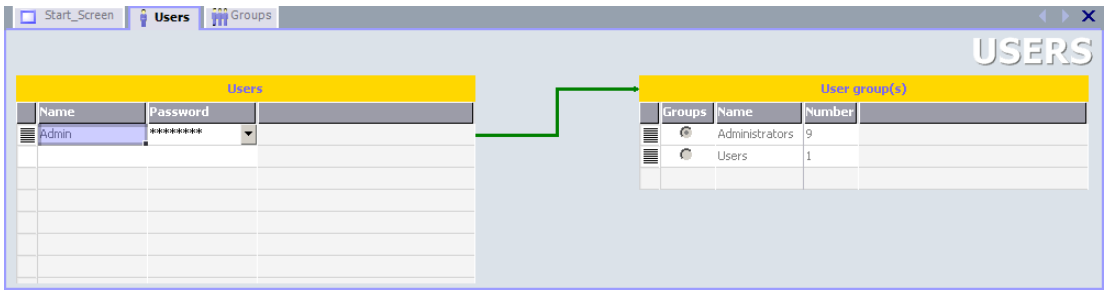
3.13.3.3 "User" workplace

Introduction

The "Users" workplace lists the users and user groups in table form. You administrate the users and assign them to a user group.

Principle

The workplace consists of the "Users" and "Groups of the user" tables.



The "Users" table shows the existing users. When you select a user in this table, the "Groups of the user" table displays the user group to which the user is assigned.

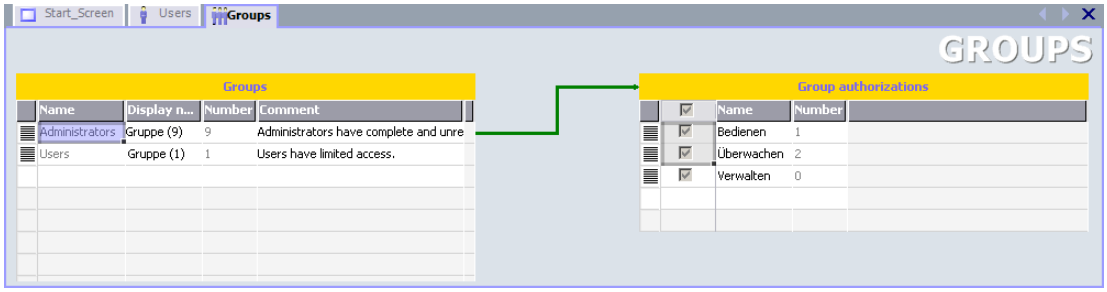
3.13.3.4 "User groups" workplace

Introduction

The "Groups" workplace shows a table of the user groups and their authorizations. You administer the user groups and assign authorizations to them.

Principle

The workplace consists of the "Groups" and "Group Authorizations" tables.



The "Groups" table shows the existing user groups. When you select a user group in this table, the "Group Authorizations" table shows the authorizations which were assigned to the user group.

The number of the user group and of the authorization is assigned by the user administration. The designations and descriptions are assigned by you.

3.13.4 Working with the user administration

3.13.4.1 Users in Runtime

Principle

In the engineering system you create users and user groups and allocate authorizations to them. You configure objects with authorizations. After starting the Runtime system, all objects which were configured with an authorization are protected against unauthorized access in runtime.

User view

When you configure a user view in the engineering system, you can administer users in the user view following starting of the Runtime system.

CAUTION
Changes in the user view are effective immediately in runtime. Changes in runtime are not updated in the engineering system. When the users and user groups are transferred from the engineering system to the runtime system, all the changes in the user view are overwritten after a user prompt and based on the transfer settings.

Exporting and importing user data

The users and passwords existing in a runtime system are exported by means of a system function and imported to a different runtime system. This ensures that the user administrations of the different runtime systems have the same status.

3.13.4.2 Access security

Introduction

You configure an authorization at an object in order to protect it against access. All logged-on users who have this authorization can access the object. When a user does not have authorization to operate an object, the logon dialog is displayed automatically.

Note

Several system functions are available under "User administration" so that user, password and user group can be edited.

3.14 System functions and runtime scripting

3.14.1 Basic principles

3.14.1.1 Fundamentals of system functions and runtime scripting

Introduction

RF-MANAGER provides predefined system functions for common configuration task. You can use them to perform many tasks in Runtime and need no programming skills to do so.

You can use Runtime scripting to solve more complex problems. Runtime scripting has a programming interface which can be used to access some of the project data in runtime. The use of runtime scripting is aimed at project planners with knowledge of Visual Basic (VB) and Visual Basic Script (VBS).

Use of system functions

System functions provide support if you wish to assign a function to an operating element:

- Writing/reading of tags
- Locking/destroying tags
- Setting the output port of a reader
- Set a bit in the PLC
- Value changes of a variable
- Starting logging

System functions can be configured in function lists and scripts.

Use of runtime scripting

VBScript is supported as a programming language. The use of runtime scripting allows flexibility in the realization of configurations. Create scripts with runtime scripting when extra functionality in runtime is needed, e.g.:

- Conversion of values

  You use scripts to convert values between different measurement units, e.g. cm to inch.

- Automation of production sequences

  A script can control a production sequence, for example, by transferring RFID data to a PLC. The PLC then makes a decision about the subsequent steps on the basis of the RFID data.

Scripts

You can save your own VB script code in a script. You use the script just like a system function in the project. You have access to the variables of a project in the script. In addition, you can use all standard VBS functions in the script. You can call other scripts and system functions in the script.

Execution of system functions and scripts

System functions and scripts are executed in runtime after the onset of a configured event (e.g. a mouse click on a button).

During configuration make sure that not too many scripts are activated at the same time. Furthermore, generally avoid running the system at 100 % load for longer periods.

Scripts are processed at lower priority so as not to interfere with operation or the representation of values. If system utilization is extreme, the scripts to be executed are therefore first only premarked for execution. The maximum size of the premarked list depends on the runtime system.

If more scripts than can be premarked are activated at one time, during a screen change for example, excess calls are discarded and a system alarm displayed.

Recursion level

The recursion level in scripts is limited by the stack size of the runtime system. In Runtime, an unrestricted number of recursions leads to a system error message. Therefore, please limit the number of recursions in a script.

3.14.1.2 System functions

Introduction

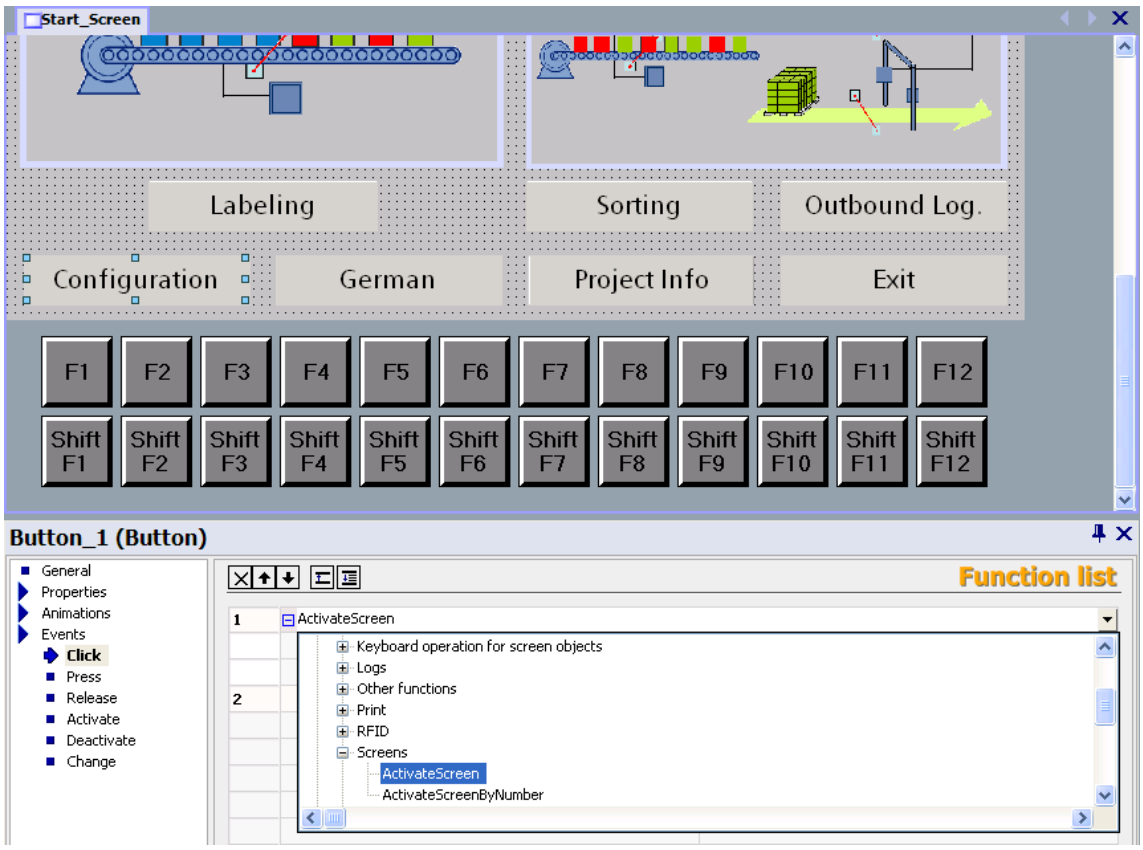
System functions are pre-defined functions you can use to implement many tasks in runtime even without having any programming knowledge, e.g.:

- Calculations, for instance the increasing of a variable value to a specific or variable amount.
- Logging functions, e.g. starting an alarm log
- Settings, e.g. setting an output port in the reader.
- Alarms, for instance after change of user.

Purpose

You use system functions in a function list or in a script. You cannot change system functions, since system functions are pre-defined functions.

When configuring a function list, select the system functions from a selection list that is sorted by categories:



When you want to use a system function in the script, you select it from a selection list. You can call up the selection list in the script with <Ctrl+Space>.

Language dependency

The names of the system functions are dependent on the set project language. The functionality can then be recognized immediately by the project planner.

Exception: When calling up system functions in a script, please use the English name for the system function. You can find the English name of the system function in the system function reference.

3.14.1.3 Use of system functions

Introduction

A function list is processed in runtime when the configured event occurs. The operator triggers an event, for instance by pressing a function key on the runtime system. An event can also be triggered by the system, for instance if a process value falls below a limit value.

Applications

You can configure system functions on all the objects that are able to react to an event. You can use system functions directly in function lists and scripts and thereby control the course.

- Function List

  System functions are processed sequentially in a function list, that is, from the first to the last system function. In order to avoid waiting times, system functions with a longer running time (for instance file operations) are processed simultaneously. For instance, a subsequent system function will already be performed even though the previous system function has not yet been completed.

- Script

  In a script, you use system functions in connection with orders and requirements in the code. This way, you execute a script depending on a specific system state. In addition, return values of system functions can be evaluated, for example. Depending on the return value, test functions are then carried out, for example, which in turn affect the course of the script.

3.14.1.4 Scripts

Introduction

You program VB script codes in a script. You use finished scripts in the project just like a system function. When creating a script, you determine its type and define transfer parameters. Scripts of the type "Function" have a return value. Scripts of the type "Sub" are referred to as procedures and have no return value.

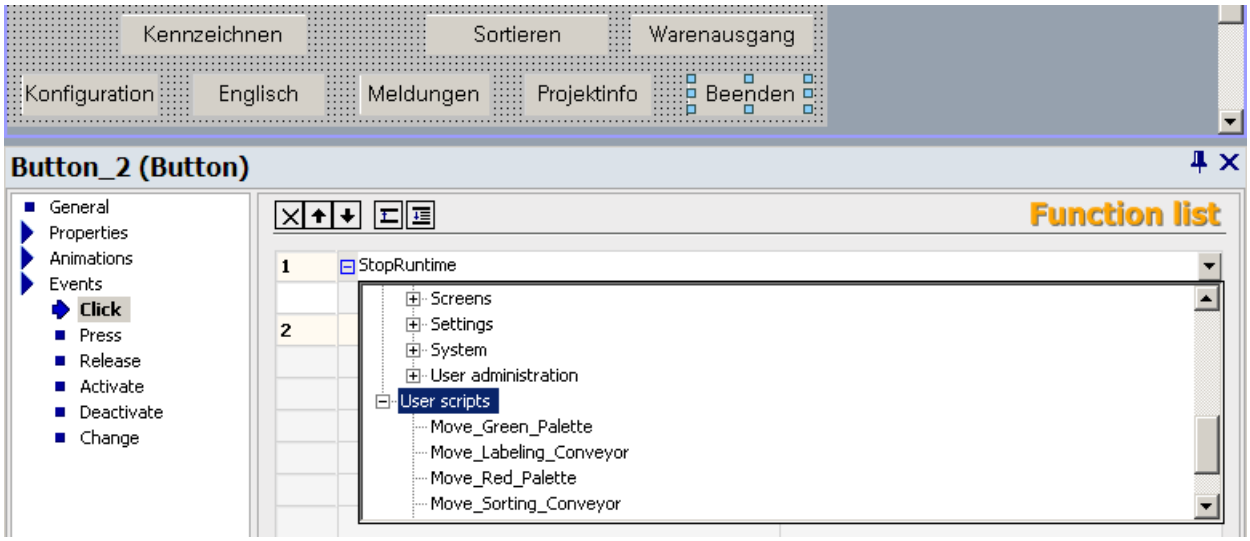
Properties of scripts

You can call up other scripts and system functions in a script. When calling up a system function, please use the English name of the system function. You can use the full scale of language from Microsoft VBScript in scripts. Functions and methods for user interaction are excluded, for instance "MsgBox".

Organization of scripts

Scripts are stored in the project database. The available scripts are listed in the project view under scripts.

If you want to use a script in a function list, you can find the scripts in the selection list under user scripts.



3.14.1.5 Use of scripts

Principle

Scripts provide more flexibility by using control elements of a programming language.

Using scripts in runtime, you implement individual solutions in a project, for instance:

- Configuring an advanced functions list

  You use a script just like a function list by calling up system functions and other scripts in the script.

  You can execute system functions and scripts in the script dependent on conditions, or have them repeated. You then add the script to a functions list.

- Programming new functions

  Scripts are available in the entire project. You use scripts just as you would system functions. You can define delivery parameters and return values for these scripts. You use scripts, e.g. to convert values.

See also

Fundamentals of system functions and runtime scripting (Page 358)

3.14.2 Working with function lists

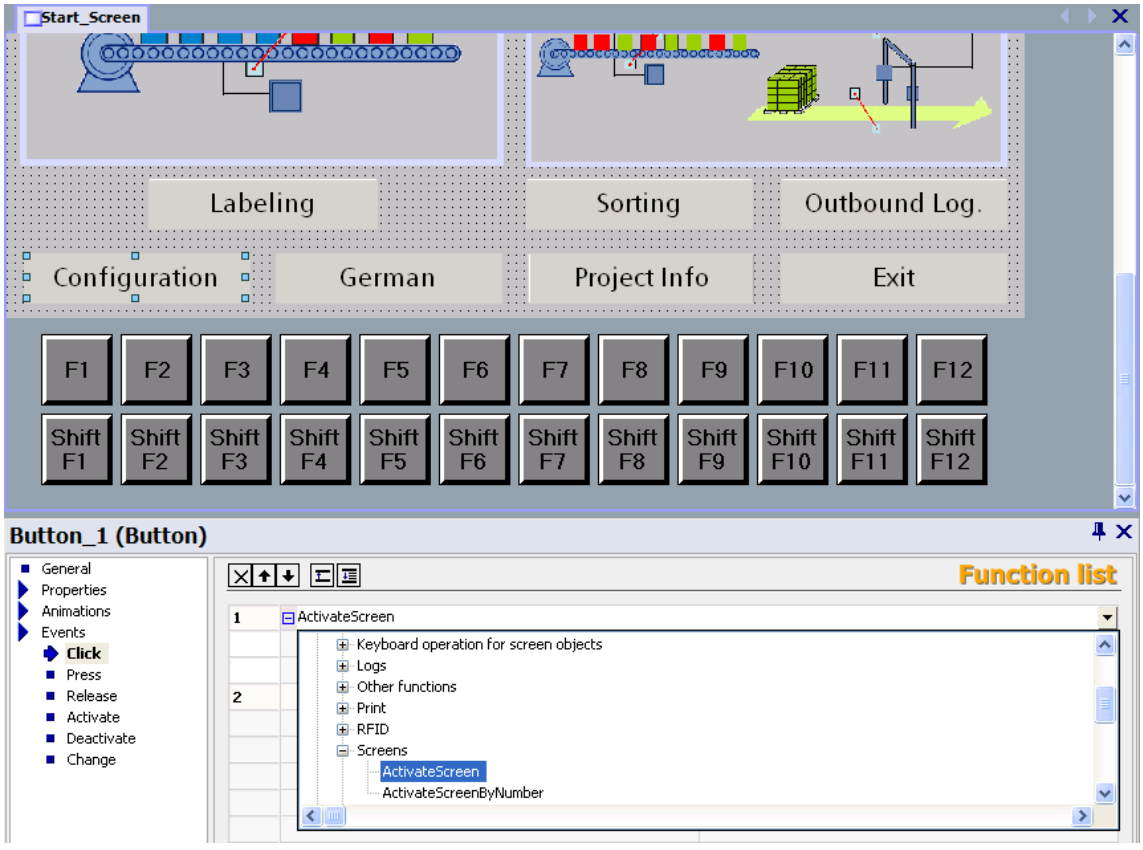
3.14.2.1 Basic principles of the functions list

Introduction

When the configured event occurs, several system functions and scripts are performed with the function list.

Principle

The function list is configured for an event of an object, e.g. a screen object or a variable. The events which are available depend on the selected object.



Events occur only when the project is in runtime. Events include:

- Value changes of a variable
- Status changes of alarms
- Pressing of a button

You can configure a function list precisely on every event.

See also

System functions (Page 360)

Fundamentals of system functions and runtime scripting (Page 358)

3.14.2.2 Properties of a function list

Status information

During configuration the project data is tested in the background. A status information returns in each function list the status of the respective system functions and scripts.

The status information has the following meaning:

- Orange: Function list is not performed in runtime because at least one system function or a script has not been supplied completely with parameters.

Completion of system functions and scripts

System functions and scripts in a function list are processed in runtime sequentially from top to bottom. In order to avoid waiting times, system functions with a longer running time (for instance file operations) are processed simultaneously. For instance, a subsequent system function will already be performed even though the previous system function has not yet been completed.

To avoid programming sequential and conditional procedures, use a script with loops, conditional statements and cancellation requirements.

3.14.3 Elements and Basic Settings

3.14.3.1 Scripts

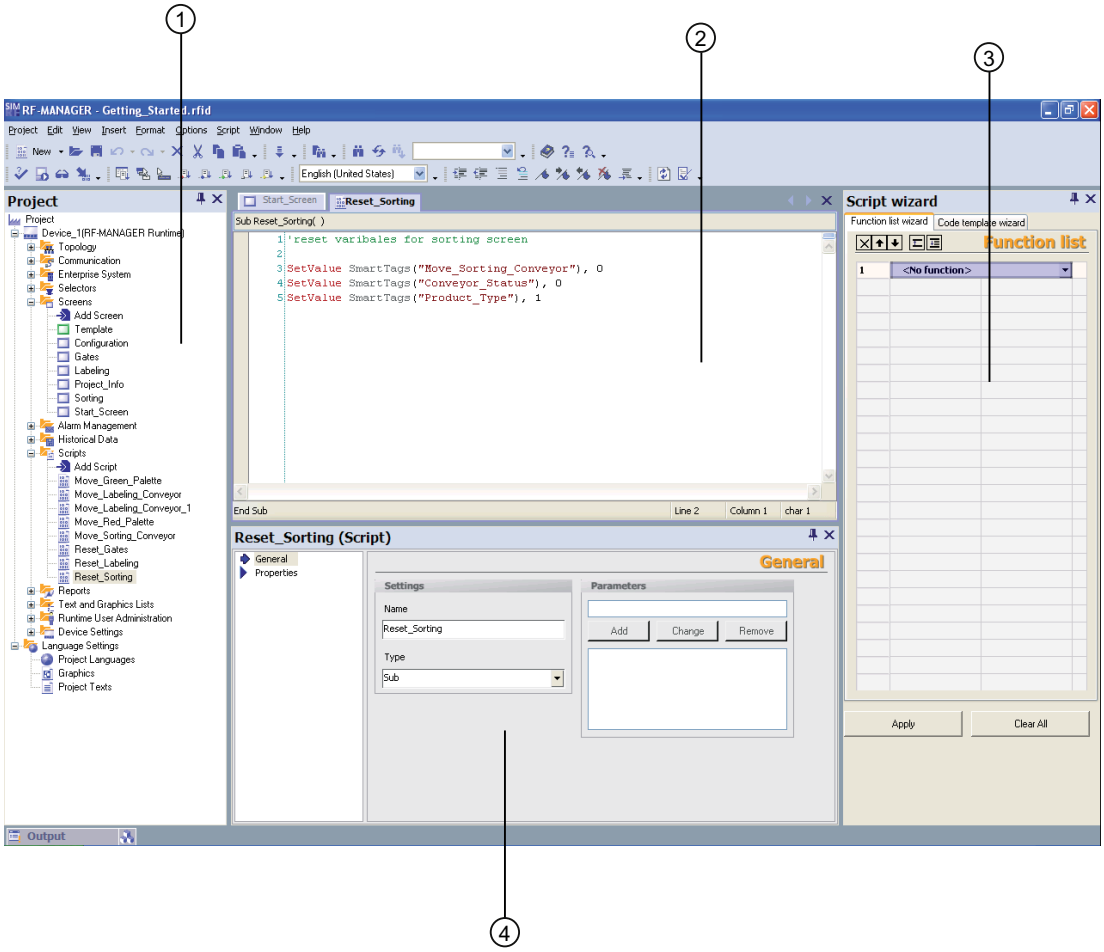
Introduction

Create and edit scripts in the script editor.

Open

The script editor opens automatically when a new script is created or an existing script is opened.

Layout



① Project View
② Workplace
③ Script wizard (toolbox view)
④ Properties dialog box

Menu bar

The menu bar contains all commands required for operating RF-MANAGER. Any available shortcut keys are indicated next to the menu commands.

"Scripts" toolbar

The commands for synchronizing objects and variables as well as for checking script syntax are located in the "Script" toolbar.

"Advanced Edit" toolbar

In the symbol bar "Advanced Edit", you will find commands for the following actions:

- Working with bookmarks
- Indenting and reverse-indenting of code

- Commenting code
- Jumping to a specific code line

"IntelliSense" toolbar

The commands for displaying selection lists, e.g. all available system functions or VBS constants, are found in the "IntelliSense" toolbar.

Workplace

Create and edit scripts in the work area. The creation of scripts is supported by syntax emphasis and IntelliSense.

Properties dialog box

Configure the script in the properties dialog box. You determine whether the script is a procedure or a function. Furthermore you can declare parameters for the script.

"Script Wizard"

In the "Script Wizard", system functions and scripts are set up with assigned parameters just as in a function list. The filed system functions and scripts are also transferred to the active script from the "Script Wizard." In this way, you only need to perform the parameter assignment once.

If system functions or scripts have already been configured on an event, these are transferred to the "Script Wizard" using copy and paste. Only system functions which are allowed in a script may be filed in the "Script Wizard." When you use copy and paste to transfer system functions that you cannot use in a script, these system functions will be marked.

See also

Properties of the "Script" editor (Page 369)

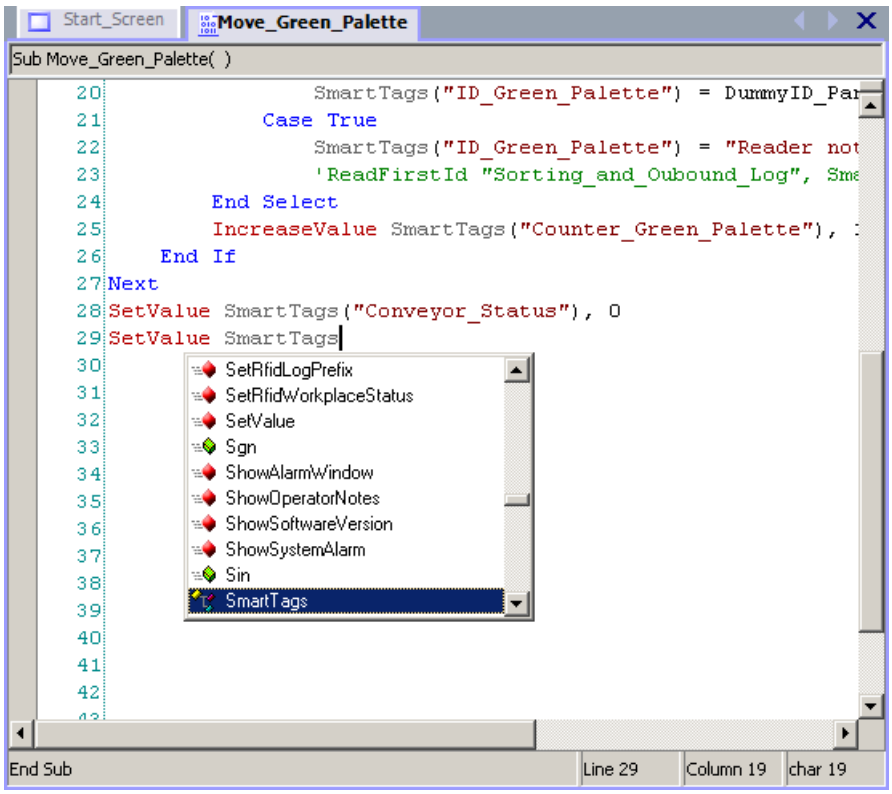
3.14.3.2 Properties of the "Script" editor

Introduction

The script editor supports you during programming with functionalities such as IntelliSense and emphasized syntax. In addition, you can, for example, create references to variables with the drag-and-drop function.

IntelliSense

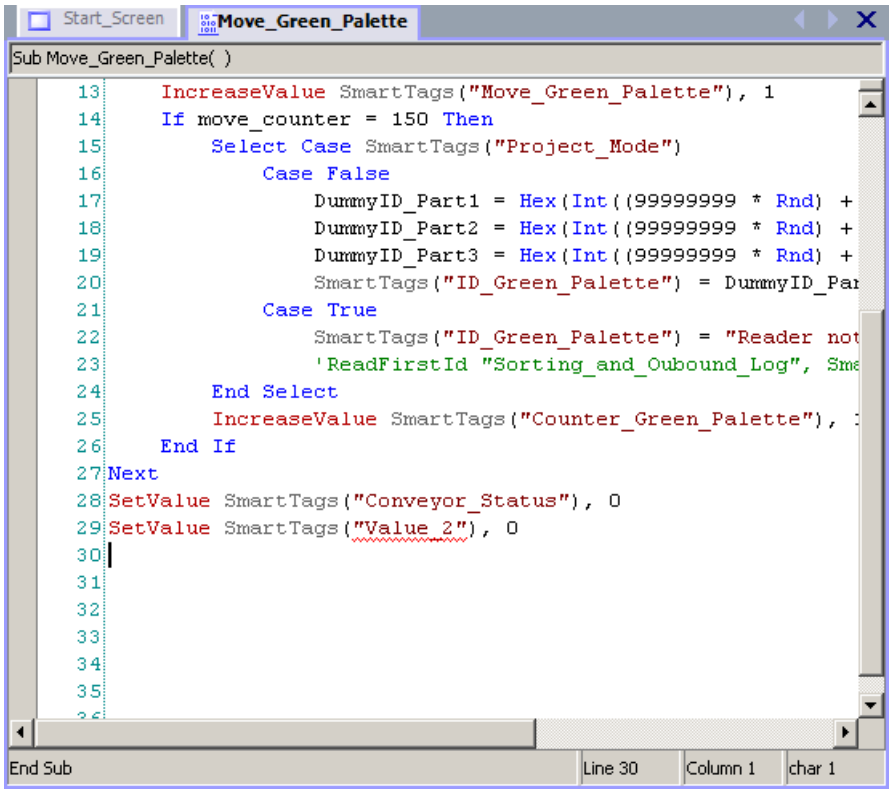
When you access objects or methods, you are supported by IntelliSense:



The methods and properties which the given object possesses can be selected from the selection list.

Syntax emphasis

In the script editor, keywords are emphasized by different colors. Objects which the script editor recognizes are displayed in bold. Unknown words are underlined with a red wavy line:



The table shows the pre-set colors for the most important keywords.

Color	Meaning	Example
Blue	Keyword (VBS)	Dim, If, Then
Cyan	Script	FahrenheitToCelsius
Brown	System function	IncreaseValue
Red	Variable	Tag_1
Green	Comment	'This is a comment'

Synchronization of objects

When opening the script, instances of objects (e.g. variables) are automatically synchronized with the configuration data. If a variable has been renamed in the "Variables" editor, for example, this change also affects the script. If the affected script is opened during modification, the renamed object will be underlined with a blue wavy line. You perform the synchronization manually in the script editor.

Object list

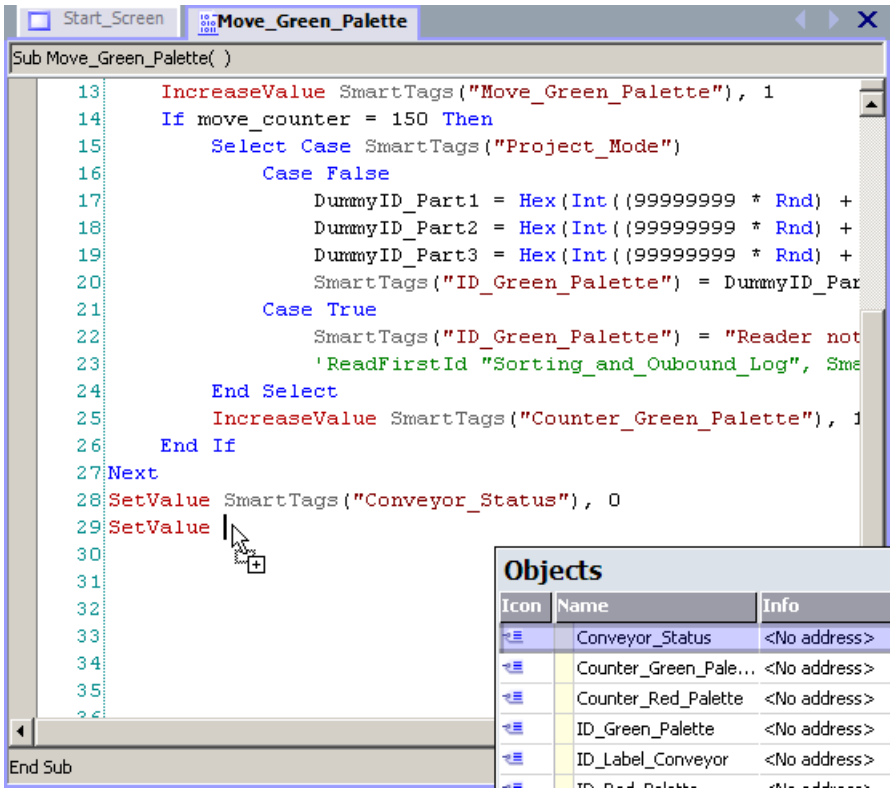
Using the key sequence <Alt+Right>, you call up the object list in which all available objects are displayed depending on the context. The object list can be called up during the assignment of parameters, for example, or when using listings.

Example: You want to reference an existing process screen by means of the screen list. Enter "ActivateScreen" in the Scripts editor and then call up the object list with <Alt+Right>. All existing process screens in the project are listed for you in the object list:

Select the desired process screen and take on the selection with <Return>.

Drag-and-drop

If a variable is required in the script, it can be pulled from the object window.

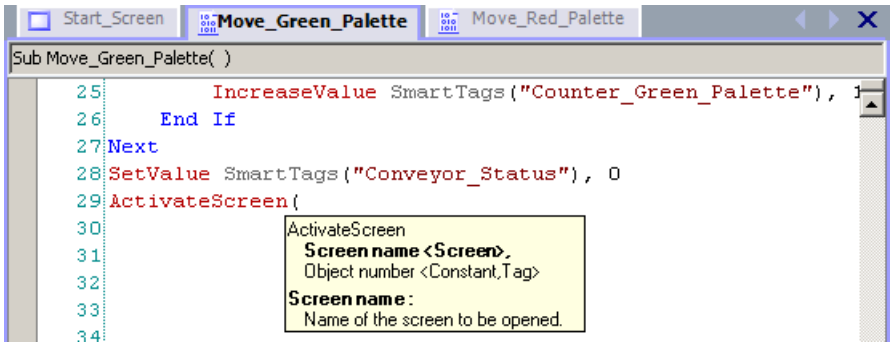


Help functions

During programming you will be shown automatically short descriptions of the necessary parameters for the methods and system functions. In addition, the following help functions are available in the script editor:

- Tooltip

  Unknown or incorrectly written keywords will be underlined with a wavy line. When you move the mouse over a keyword, Tooltip appears:



  For known keywords, Tooltip shows the type of keyword.

- ParameterInfo

  The ParameterInfo offers information concerning the syntax and the parameters of a system function or a VBS standard function.

- Context sensitive help

  The context sensitive help offers information concerning system functions, VBScript language elements, objects, etc.

  If information about an object, a method or a property is needed, move the mouse pointer over the corresponding keyword and press <F1>. This allows you to reach the corresponding reference description in the online help.

See also

Scripts (Page 366)

3.14.4 Creating scripts

3.14.4.1 Access to variables

Introduction

In the script you have access to external and internal variables which you set up in the project. The value of a variable can be read or changed in runtime.

Furthermore, you can set up local variables as a counter or as buffer storage in the script.

The script fetches the value of the external variable from Runtime memory. At the start of Runtime, the actual value will be read from the reader or PLC and written to Runtime memory. The variable value will then be updated with the set cycle time. The script first accesses variable values read from the reader or PLC at the previous scan cycle checkpoint.

Project variables

If the variable name in the project corresponds to the VBS name conventions, the variable can be used directly in the script:

```
'VBS_Example_03
If BeltDriveOilTemperature > 100 Then [instruction]
```

If the variable name in the project does not correspond to the VBS name conventions, then the variable must be referenced by means of the "Smart tags" list. In the following example, the variable name contains the & sign, which is not allowed according to VBS name conventions:

```
'VBS_Example_04
SmartTags("Test&Trial")= 2005
```

The VBS name conventions are found in the help for VBS in the information system.

Local variables

You define local variables in the script using the Dim statement. Local variables can be used only within the script. Therefore, they do not appear in the "Variables" editor.

In the script, you use a local variable, for example, as counter in a For statement.

```
'VBS_Example_05
Dim intCount
For intCount = 1 To 10[Instruction]Next
```

Note

You have to use a local variable if you need a variable for a "For statement". Project variables are not allowed within a "For statement".

Access to variables in a script

If a variable is used whose name was first assembled in the script at runtime, this variable should be configured with the "Cyclic continuous" acquisition mode.

If you configure the variables with the "Cyclic on use" acquisition mode, you have to ensure that the script is only called in a screen where the variable is also used in another place, in an I/O field for example.

3.14.4.2 Call up of scripts and system functions in the scripts

Principle

System functions and other scripts can be called up in a script.

Call up a system function or a script without return value ("Sub") as follows:

```
<Function name> [Parameter1], [Parameter2], [...]
```

A system function or a script with return value ("Function") is called up by means of assignment to an expression:

```
<Expression> = <Function name> ([Parameter1, Parameter2,... [Parameter N])
```

If you do not want to evaluate the return value, use the call up as you would for a system function or a script without return value.

Particularities when calling up system functions

You can insert system functions and scripts into the script from the "Script Wizard." The system functions are displayed in the currently configured language in the "Script Wizard."

When calling up a system function in the script, always use the English name of the system function:

```
SetValue Tag1, 64
```

You can find the English name of the system function in the system function reference under "Syntax." The set project language is not taken into consideration.

The following rules apply to the parameter delivery for system functions:

- Constants.

  If you use a constant as a parameter, then the parameter type must correspond to one of the three data types: Integer, double or string. The available constants are shown in a selection list when assigning parameters. The usual VBS conventions apply to constants.

- Variables

  Independent of the spelling, variables are always delivered as "Call by reference." When the variable to be delivered corresponds to the VBS name conventions, the variable name can be delivered without the keyword SmartTags:

  ```
  SetValue Tag1, 64
  ```

  or

  ```
  SetValue SmartTags("Tag1"), 64
  ```

- References to objects, e.g. process screens and logs

  An object reference is delivered as parameter in quotation marks:

  ActivateScreen "MainScreen", 0

Particularities when calling up scripts

When calling up a script, parameters are delivered as "Call by Reference." When you deliver a variable as a parameter, for example, the value assignments in the script have an immediate effect on the value of the variable.

3.14.4.3 Synchronization of tags and objects

Introduction

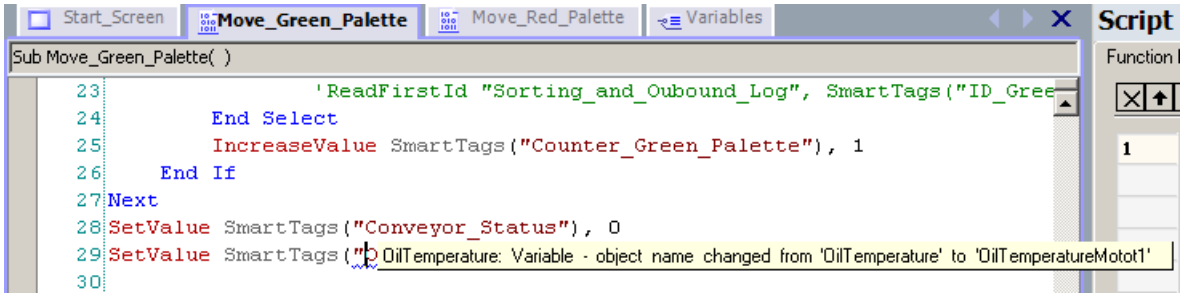
If you change an object name in the RF-MANAGER, the change affects the entire project. Changes of this type can be marked in the script and can then be "synchronized".

Application example

In the variable editor you defined the variable "Oil Temperature" which you want to use in a script. During the configuration rename this variable "OilTemperatureMotor1" in the variable editor.

- Script was open during the renaming:

  The now invalid variable name is underlined by a blue wavy line in the script. When you move the mouse pointer over the variable name, Tooltip appears. When you click on the button "Synchronize", the variable is renamed in the script:



- Script was closed during the renaming

  When the script is reopened, the variable is automatically synchronized.

3.14.5 Debugging

3.14.5.1 Debugging Scripts

Introduction

Debugging allows you to test your scripts in runtime for logical programming errors. For example, you can test whether the proper values were delivered to the variables, and whether cancellation terms are realized correctly.

To debug your scripts use exclusively the "Microsoft Script Debugger" or the "Microsoft Script Editor" supplied with Microsoft Office XP.

Constraints

The following restrictions apply for the SIMATIC Panel PC 420/427B with Windows XPe:

- The "Microsoft Script Debugger" and the "Microsoft Script Editor" that is supplied with Microsoft Office XP are not authorized and may not be installed.

  Use a standard PC to debug your scripts. Further information on debugging can be found in the online help under "System functions and Runtime Scripting > Debugging".

- No logging to the "System" database

  If you want to configure logs on the SIMATIC Microbox 420/427B, you may not use the "Database / System" setting, because the SQL server that is required cannot be run together with the activated Enhanced Write Filter (EWF).

Error types

The following error types are distinguished when debugging:

- Runtime error

  A runtime error occurs when you try to perform an invalid or incorrect instruction, e.g. when a variable is not defined.

  You use the instruction "On Error Resume Next" in the script to intercept runtime errors. With this setting, the script executes the next statement when a runtime error is detected. You can check the error code with the error object in the next line. In order to stop the processing of runtime errors in the script, use the instruction "On Error Goto 0". Additional information about error processing is found in the Microsoft VBS help in the information system.

- Logical error

  A logical error occurs when the event you are expecting does not take place, e.g. because a condition was checked incorrectly. In order to resolve logical errors, go through the script step by step in order to identify the part of the script which does not function.

3.14.5.2 Integrating the debugger

Installing a Script Debugger for the RF-MANAGER

A script debugger must be installed in order to search for errors in scripts with the RF-MANAGER.

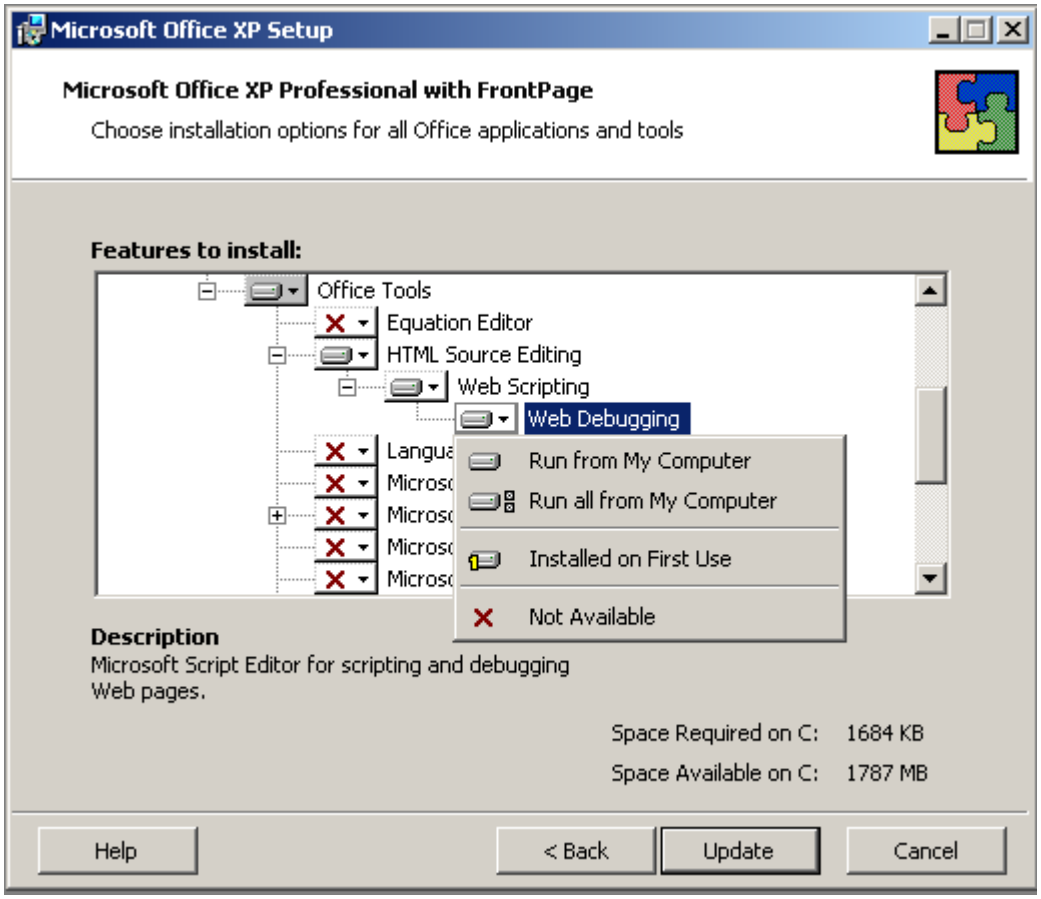
The following script debuggers have been tested and released:

- Microsoft Script Editor by Office XP
- Microsoft Script Debugger

An installed script debugger is either started automatically when a runtime occurs in a script or manually with the command "Start runtime system with script debugger".

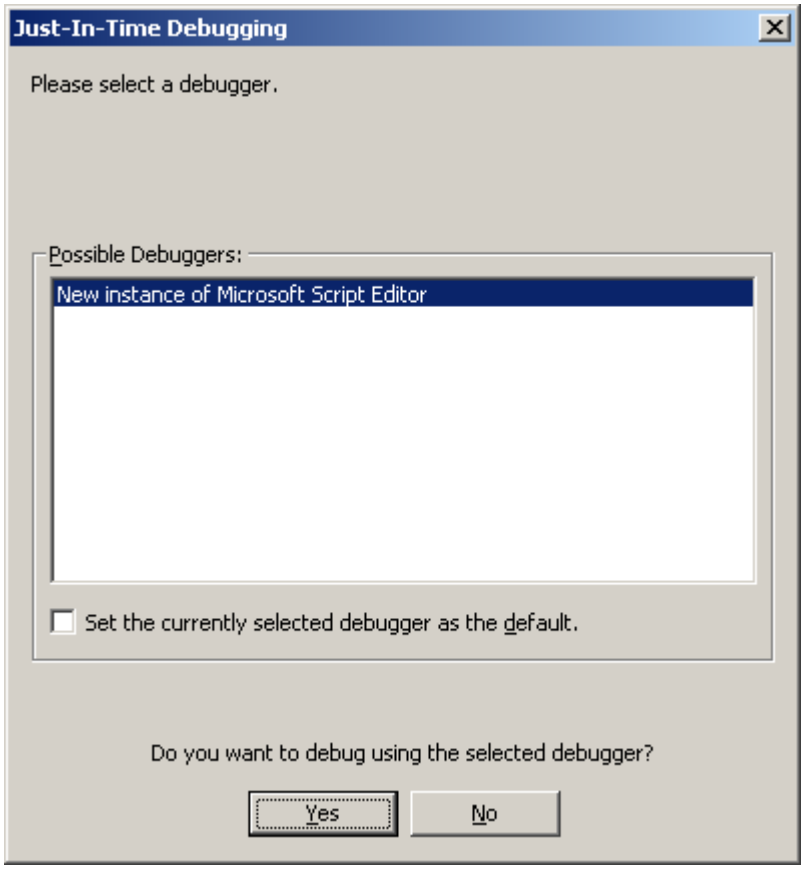
Microsoft Script Editor

The Microsoft Office XP component "Microsoft Script Editor" contains such a script debugger. If the default settings were used to setup Microsoft Office, the "Microsoft Script Editor" component was set for ("Installed on First Use"). If you wish to explicitly install this component, you must specify it in the Microsoft Office setup. Click on "Web Debugging" in the component selection window and select the option "Run from My Computer".

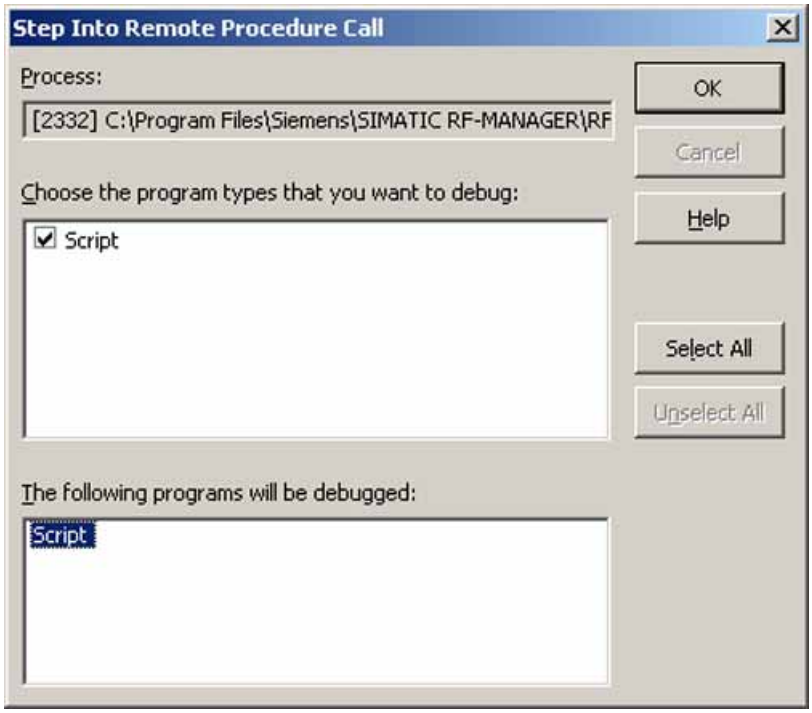


If a project is activated in RF-MANAGER with the command "Start runtime system with script debugger", a dialog with a list of available script debuggers appears when the first script is run.

Other installed script debuggers such as "Microsoft Visual Interdev" or "Microsoft Visual Studio .NET" may appear in the list. Select "Microsoft Script Editor" and confirm your selection by clicking "Yes".



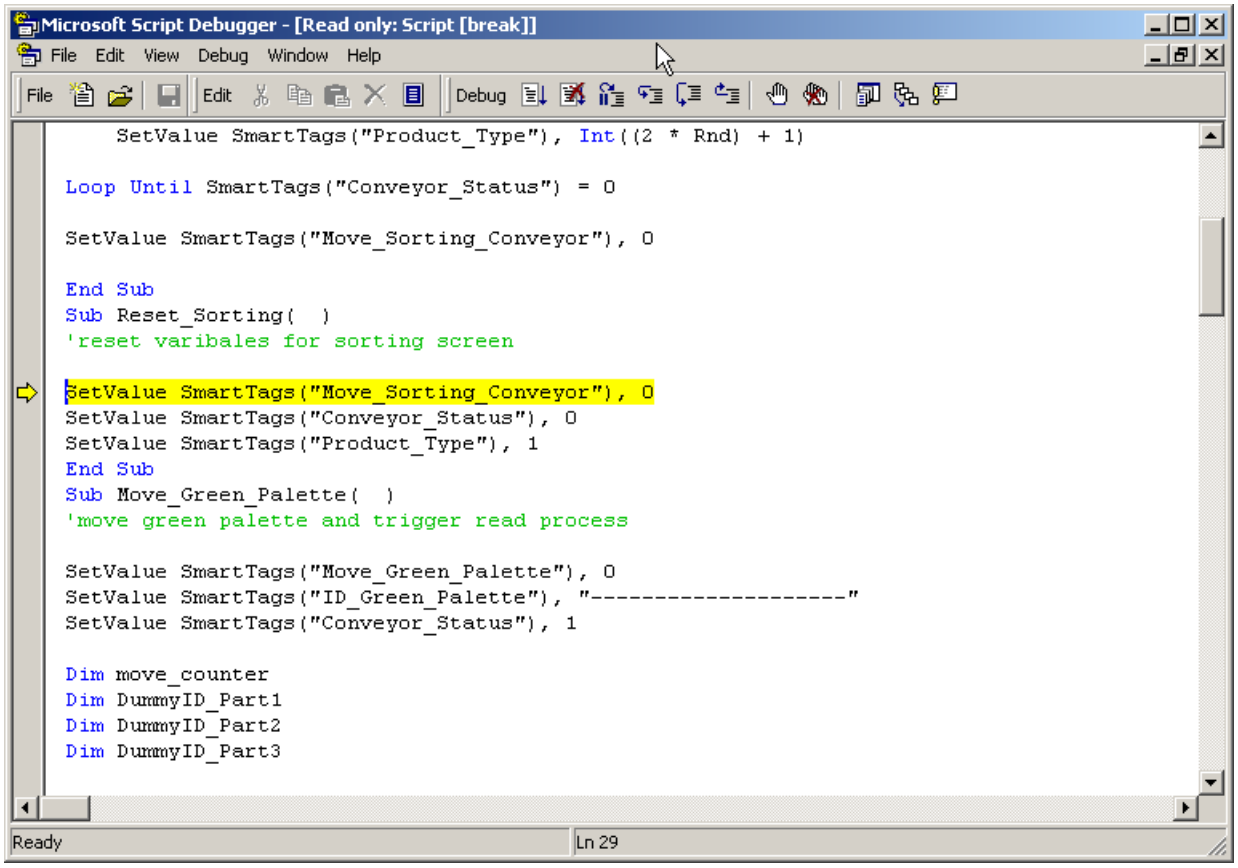
Activate the "Script" program object in the "Step Into Remote Procedure Call" dialog and confirm your selection with "OK".



The "Microsoft Script Editor" is started. Execution is stopped at the first line of the first script.

Microsoft Script Debugger

If no script debugger is available, you can download the "Microsoft Script Debugger" (scd10en.exe) for free from Microsoft (www.microsoft.com). It will be started automatically by the RF-MANAGER once it is installed.



Note

The "Microsoft Script Debugger" is not supported when another script debugger system is available on your computer!

Script Debugger Does Not Start When Runtime Starts

If you have installed a script debugger, and the "Start Runtime with Script Debugger" command does not run it, make the following settings in the Windows registry to set Microsoft Script Debugger as default Just-In-Time (JIT) Debugger:

- "HKEY_CLASSES_ROOT\CLSID\{834128A2-51F4-11D0-8F20-00805F2CD064}]
  (Default)="ScriptDebugSvc Class"
  "AppID"="{A87F84D0-7A74-11D0-B216-080000185165}"
- [HKEY_CLASSES_ROOT\CLSID\{834128A2-51F4-11D0-8F20-00805F2CD064}\LocalServer32]
  (Default)="c:\\Program Files\\Microsoft Script Debugger\\msscrdbg.exe"
- [HKEY_CLASSES_ROOT\CLSID\{834128A2-51F4-11D0-8F20-00805F2CD064}\ProgID]
  (Default)="ScriptDebugSvc.ScriptDebugSvc.1"
- [HKEY_CLASSES_ROOT\CLSID\{834128A2-51F4-11D0-8F2000805F2CD064}\VersionIndependentProgID]
  (Default)="ScriptDebugSvc.ScriptDebugSvc"

The "LocalServer32" file path must point to the installation folder of Microsoft Script Debugger. You must edit the path name accordingly if Microsoft Script Debugger is installed in a different folder.

3.14.6 Synchronization of functions in the runtime system

3.14.6.1 Execution of the function list in runtime

Principle

In runtime a function list is completed from top to bottom. A distinction is made between synchronous completion and asynchronous completion, so that no waiting periods ensue during completion. The distinction is made by the system by evaluating the different runtimes of the system functions. Scripts are always processed synchronously independent of the runtime. If a system function returns an error status, the completion of the function list is cancelled.

Synchronous completion

During synchronous completion, the system functions in a function list are performed one after another. The previous system function must be finished before the next system function can be performed.

Asynchronous completion

System functions, which perform file operations such as storing and reading, have a longer runtime than system functions which, for example, set a variable value.

Therefore, system functions with longer runtimes are performed asynchronously. While a system function such as CopyLog writes to a storage medium, the next system function is already being performed. Due to the parallel completion of system functions, waiting periods at the runtime system are avoided.

3.14.6.2 Execution of scripts in runtime

Principle

Only one script at a time can be performed in runtime. If several scripts are waiting to be edited, the scripts are lined up in a queue and completed one after another.

Note

A loop in a script therefore blocks the execution of other scripts in the queue even if the scripts are triggered asynchronously.

The RF-MANAGER supports a maximum nesting depth of eight scripts. Please note that the nesting depth is not checked.

Note

If a script is configured for the "Runtime-Stopp" event, only those functions may be used in the script which are specified as configurable objects in the reference of the "Runtime-Stopp" system function.

Ensure that the ending of the runtime is not interfered with by the execution of the script.

3.15 Configuring multi-lingual projects

3.15.1 Working with multiple languages

Multi-lingual configuration in the RF-MANAGER

You can configure your projects in multiple languages using the RF-MANAGER. There are various reasons for creating a project in multiple languages:

- You would like to provide multiple languages to the various operators in a plant. The project is created in multiple languages because the service personnel do not speak the same language as the operators. Example: A Runtime system is used in Germany, but the service personnel understand only English.

Translating project texts

With the RF-MANAGER, you can directly enter project texts in several languages in various editors, for example in the "Screens" editor or the "Project texts" editor. In addition, the RF-MANAGER provides options for exporting and importing your configuration for translation purposes. This is particularly advantageous if you configure projects containing a large amount of text and want to have it translated.

Language management and translation in the RF-MANAGER

The following areas of the project view are used to manage languages and translate texts in the RF-MANAGER.

Area	Short description
Project languages	Management of project languages, editing language, and reference language.
Languages and fonts	Management of runtime languages and fonts used in the Runtime system.
Project texts	Central management of configured texts in all project languages.
Graphic browser	Management of graphics and their language-dependent variants.

3.15.2 Language terms in RF-MANAGER

Principle of languages in the RF-MANAGER

Multi-language capability is implemented on various language levels in the RF-MANAGER.

User interface language and project languages

Two language levels are differentiated in the RF-MANAGER:

- User interface language

  During configuration, text is displayed in the RF-MANAGER menus and dialog boxes in the user interface language. You select the user interface language to be used when you install the RF-MANAGER. You can change the user interface language with the menu command "Options > Settings."

- Project languages

  Project languages are used to create a project in multiple languages.

The two language levels are completely independent of one another. For example, you can create English projects at any time using a German user interface and vice versa.

Project languages

The following project languages have been released for the RF-MANAGER:

- German
- English

You can generally also configure in any language available in Windows. However, restrictions may apply when some languages are used for configuration, such as:

- The Runtime system does not support languages that are written right-to-left, such as Hebrew or Arabic.
- Language-specific fonts are not available.
- Non-editable texts stored in the RF-MANAGER are displayed in English.

The following languages are differentiated within the project languages.

- Reference language

  The reference language is the language that you use to configure the project initially.

  During configuration, you select one of the project languages as the reference language. You use the reference language as a template for translations. All of the texts for the project are first created in the reference language and then translated. While you are translating the texts, you can have them displayed simultaneously in the reference language.

- Editing language

  You create the translations of the texts in the editing language.

  Once you have created your project in the reference language, you can translate the texts into the remaining project languages. For this purpose, you select one of the project languages as the editing language and edit the texts for this language. You can change the editing language at any time.

  Note

  When switching the project languages, the assignment to the keys on the keyboard also changes. In the case of some languages (e.g. Spanish), switching the keyboard assignment is not possible due to the operating system. In this case, the keyboard assignment is switched to English.

- Runtime languages

  The runtime languages are those project languages made available to the runtime system.

  You must provide appropriate operator control elements so that the operator can switch between languages during runtime.

3.15.3 Language Settings

3.15.3.1 Settings for languages in the operating system

Introduction

The operating system settings on the configuration PC influence the language management of the RF-MANAGER in the following areas:

- Selection of project languages
- Regional format of dates, times, currency, and numbers
- Displaying ASCII characters

Language settings in the Operating System

A language is not available as a project language unless it is installed in the operating system.

- Settings in Windows XP:

  You can call the "Regional and Language Options" dialog using the control panel icon of the same name in "Start > Settings > Control Panel > Date, Time, Language, and Regional Options." Afterwards, you can install your choice of languages on the "Languages" tab.

The Input Method Editor (IME) is available in Windows for configuring Asian texts. Without this editor, you can display Asian text but not edit it. For more information on the Input Method Editor, refer to the documentation for Windows.

Regional format of dates, times, currency, and numbers

The RF-MANAGER specifies a fixed date and time format in the Date - Time field for the selected project language and runtime language.

In order for dates, times, and numbers to be presented correctly in the selected editing language, this language must be set in the Regional Options on the Control Panel.

Displaying ASCII characters

With text output fields, the display of ASCII characters as of 128 depends on the set language and the operating system being used.

If the same special characters are to be displayed on different computers, then the computers must use the same operating system and country settings.

3.15.3.2 Operating system settings for Asian languages

Settings on Western operating systems

If you want to enter Asian characters, you must activate the support for this language in the operating system. To do this, open the Control Panel and select "Regional and Language Options". On the "Languages" tab, activate the check box "Install files for East Asian languages". Then click on "Details" under "Text Services and Input Languages". The dialog "Text Services and Input Languages" is opened. On the "Settings" tab add the required default input language under the "Installed Services".

For entering Asian characters on Western operating systems, the "Input Method Editor" must also be installed. To install, under Windows XP in the Control Panel open "Regional and Language Options" > Languages > Details". In the "Text Services and Input Languages" add the necessary default input language under "Installed Services".

To enter Asian characters when configuring, switch to the Asian entry method in the "Input Method Editor".

Settings on Asian operating systems (not yet released)

If you are configuring on an Asian operating system, to enter ASCII characters, e.g. for object names, you must switch to the English default input language. As the English default input language is included in the basic installation of the operating system, you do not need to install an additional input locale.

3.15.3.3 "Project Languages" editor

Introduction

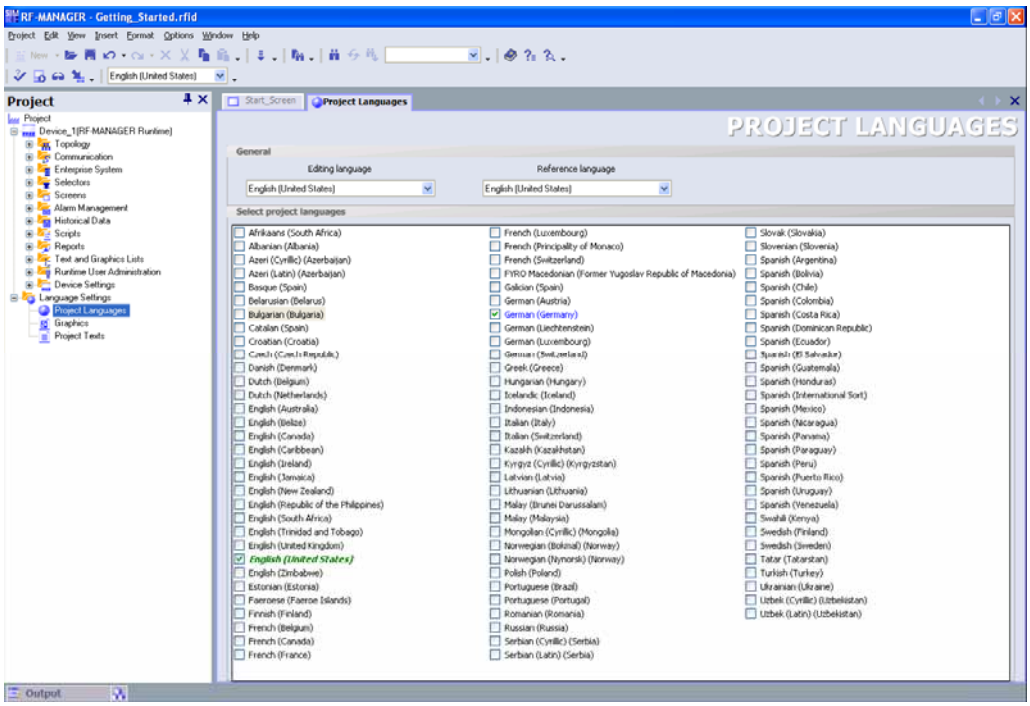
You select the languages for creating your project in the "Project Languages" Editor:

- The project languages for creating your project
- The reference language in which you configure the project initially.
- The editing language in which you translate the text.

Open

To open the "Project Languages" editor, double-click "Project Languages" in the "Language Settings" group in the "Project view."

Layout



Project languages

Here you enable the project languages for creating your project.

Reference language

Here you select the reference language from the project languages. The languages displayed are limited to those that you enabled in the list of available languages.

Editing language

Here you select the editing language from the project languages. The languages displayed are limited to those that you enabled as project languages in the list of available languages.

3.15.4 Creating a project in multiple languages

Translation methods

You first create a project for one language only and then test it.

Afterwards, you configure all other languages required. The following options are available:

- Direct translation of project texts in the editors used to create the individual objects.
- Central translation of project texts in the "Project texts" editor.
- Export of project texts, translation in another program, and import of translated texts to the RF-MANAGER.

Recommended workflow

1. Set a language you are familiar with as the reference language in the "Project languages" editor.

   At the start of configuration, the reference language should correspond to the editing language.
2. Create the project in this language. The reference language text is used as the source language for translation.
3. In the "Project languages" editor, set one of the other project languages as the editing language.
4. Translate all project texts into this language. You can perform the translation either directly in the individual editors or in the centralized "Project texts" editor where all project texts and their points of use are displayed.

   As an alternative,, you can export the texts to a *.csv file, have them translated, and then import the translated texts back into your project.
5. If necessary, adapt the graphics in the project to reflect the editing language or country-specific factors.
6. Repeat steps 3 to 5 for all other project languages.

Result

The project is now available in more than one language and the language can be changed in Runtime.

See also

Translating project texts in the editor (Page 392)

"Project texts" editor (Page 393)

3.15.4.1 Specific features of Asian and Eastern languages in the Engineering System

Introduction

When configuring for Asian languages or in an Asian language some specific features should be observed. These specific features must also be observed for other languages that have complex characters.

Basic principles of configuration

In order to ensure the full functionality of a project, when configuring in RF-MANAGER some elements should include no complex characters. The restrictions apply for the following elements:

- Object names
- Alarm texts

The object names in RF-MANAGER are unique names and therefore are not translated when switching between languages. As the object names are used and processed functionally, they are subject to some restrictions. The object names may not include any special characters, umlauts or complex characters. Affected object names are, for example, project names, variable names, screen names etc.

If you want to log alarms with alarm texts, then you may not use Asian Runtime language. When using an Asian Runtime language you cannot log alarm text, even if the alarm text itself is written, for example, in English. The restriction applies merely to logging, it is still possible to view and output in Runtime. Russian and other 1 Byte languages are not affected by this restriction.

User administration

No Asian or other complex characters may be used for user names and passwords.

Project documentation

You can optimize the appearance of the printout by selecting the respective Asian or Eastern font from the Configuration Dialog for the project documentation.

3.15.4.2 Translating project texts in the editor

Introduction

As a general rule, if you are creating a project for multiple languages, all texts are configured initially in a language you are familiar with. You use this language as the reference language for translation.

Define the project languages in the "Project languages" editor. Select the reference language and the respective editing language to which it should be translated, from the project languages.

Editors with language-dependent objects

The following editors contain language-dependent objects:

- Screens
- Reports
- RFID base alarms
- RFID edge alarms
- RFID status alarms
- RFID device alarms
- System alarms
- Text lists
- Graphics lists

Switching the editing language in the RF-MANAGER editors

You can switch the editing language by means of the "Language Settings" toolbar. The editing language applies to all editors.

Reference texts

As a general rule, if you are creating a project for multiple languages, all texts are configured initially in a language known to you. This language then serves as the reference language.

If you then switch the editing language to enter texts in another language, all of the text fields are empty.

The RF-MANAGER offers a convenient reference text function so that you have a template for translation. You can display the reference text window containing texts in the reference language in dialogs and editors.

3.15.4.3 "Project texts" editor

"Project texts" editor

You have access to all texts of a project in the "Project texts" editor.

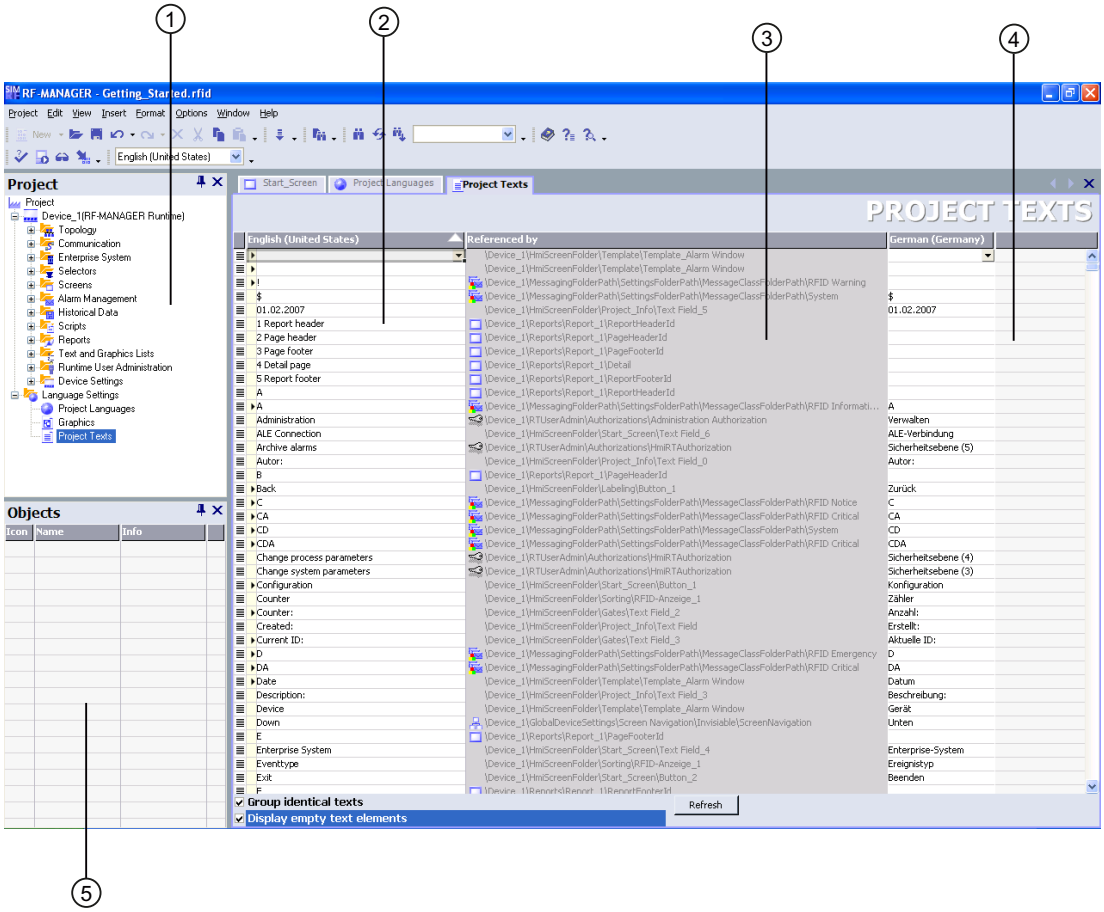
Examples:

- Texts in screens
- Alarms
- Comments
- Help texts
- Central text display

Opening the "Project texts" editor

To open the "Project texts" editor, double-click "Project texts" in the "Language Settings" group in the project view.

Structure of the "Project texts" editor



① Project View
② Reference language
③ Used by ...
④ Project languages
⑤ Object view

Elements in the "Project texts" editor

In the "Project texts" editor, a single column is created for each project language you have set. The text of a configured object is represented in all languages in a single row in the table. The rows are divided into the following columns.

- Reference language column

  The first column displays the texts in the reference language.

- Reference column

  The "Referenced by" column indicates the editor where the texts originated.

- Project languages

  The remaining columns display the texts in the other project languages provided the texts have already been translated.

Translation methods

You can translate the configured texts as follows:

- Internal translation of texts directly in the "Project texts" editor.

  This method is recommended for texts with little to be translated.

- External translation of texts using the export and import function.

  This method is recommended for large amounts of text to be translated or when there are many project languages.

The "Project texts" editor is linked to the other editors. Texts introduced here are automatically available in other editors as appropriate. You can also jump directly from the "Project texts" editor to the point of use of the object to be translated.

3.15.5 Use of language-dependent graphics

Language-dependent screen versions

You use the "Graphics" editor to import graphics into your project and manage their language-dependent versions. The graphics can then be linked to the screens of the project in the "Screens" editor. If you create a project in multiple languages, different graphics may be required for the various project languages due to the following:

- The graphics contain text.
- Cultural factors play a role in the graphics.

In both cases, you must produce language-dependent versions of the graphics.

Basic procedure

1. First, configure all screens for one language in the "Screens" editor.
2. Create a version of the graphics for each project language in a graphics program.
3. In the "Graphics browser" editor, you can import the language-dependent graphics into the project.

Result

The version of each graphic for the current editing language setting is displayed in the "Screens" editor. The version of each graphic for the current runtime language setting is displayed during runtime.

See also

"Graphics" editor (Page 396)

3.15.5.1 "Graphics" editor

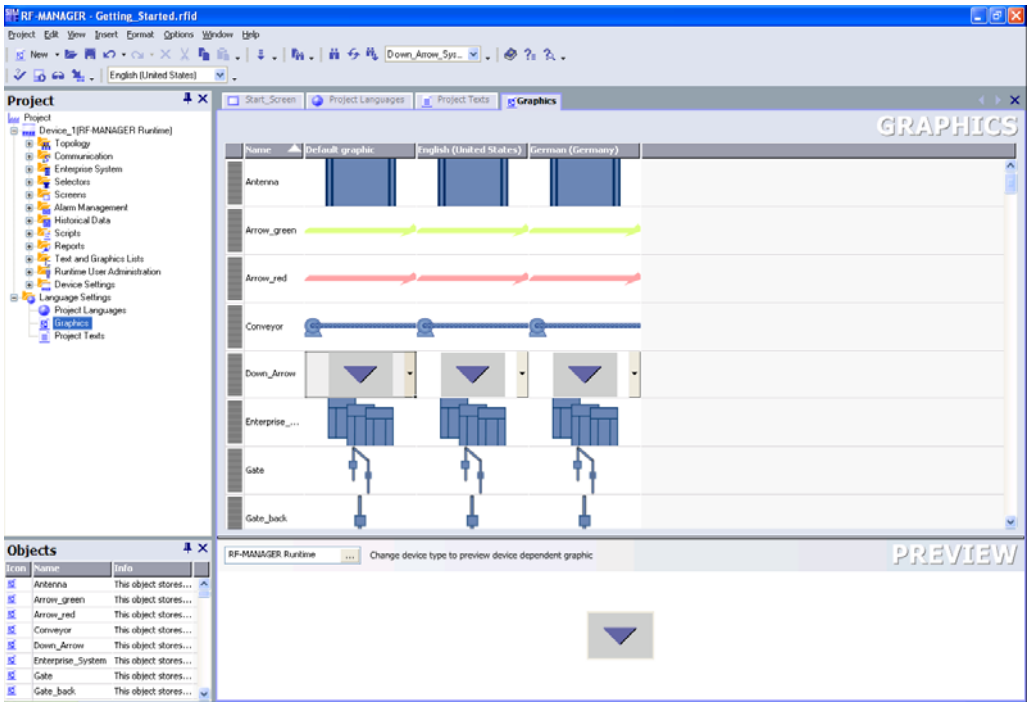
Introduction

You manage the configured graphic objects in multiple language versions in the "Graphics" editor.

Opening the "Graphics" editor

To open the "Graphics" editor, double-click the "Graphics" editor entry in the "Language Settings" group in the project view.

Structure of the "Graphics" editor



Workplace

Here all of the configured graphic objects are displayed in a table. A separate table column is created for each project language, which contains the versions of the graphics for that language.

In addition, you can specify a default graphic for each graphic to be displayed whenever a language-specific graphic for a project language does not exist.

Preview

Here you can preview the graphic displays on various runtime systems.

See also

Use of language-dependent graphics (Page 395)

3.15.6 Languages in Runtime

Using multiple runtime languages

You can decide which project languages are to be used as runtime languages in runtime. To enable the operator to switch between languages during runtime, you must configure a corresponding operator control element.

When runtime starts, the project is displayed according to the most recent language setting. When runtime starts the first time, the language with the lowest number in the "Order for language setting" is displayed.

Setting runtime languages during configuration

In the "Languages and Fonts" editor you can specify:

- The project languages to be available as runtime languages
- The order in which the languages are to be switched

3.15.6.1 Configuring language switching

Introduction

If multiple Runtime languages are to be available on the runtime system, you must configure language switching. This is necessary to enable the operator to switch between the various Runtime languages.

Methods for language switching

You can configure the following methods for language switching:

- Direct language selection

  Each language is set by means of a separate button. In this case, you create a button for each Runtime language.

- Change language

  The operator toggles the languages by means of a single button.

Regardless of the method used, the button names must be translated into each of the languages used. You can also configure an output field that displays the current language setting.

3.16 Project documentation

3.16.1 Basic principles

Introduction

Project documentation serves to print the configuration data of a RF-MANAGER project, e.g. a table containing the variables used and their parameters.

Purpose

You can output configuration data in a project report. You can output project reports for:

- A complete RF-MANAGER project
- A component of RF-MANAGER
- A single or multiple objects

Data is selected for output in accordance with the selected objects or components. The composition of the data is dependent on the selected output format "Compact" or "Complete" and is created by the system when the project report is generated.

If you output the configuration data of several or all the components of RF-MANAGER, a separate chapter is output for each component. A separate chapter is output for each RF-MANAGER screen in view of the possible data quantity.

You can open the project report in a preview before you start the output. The preview allows you to verify the project report.

Output media

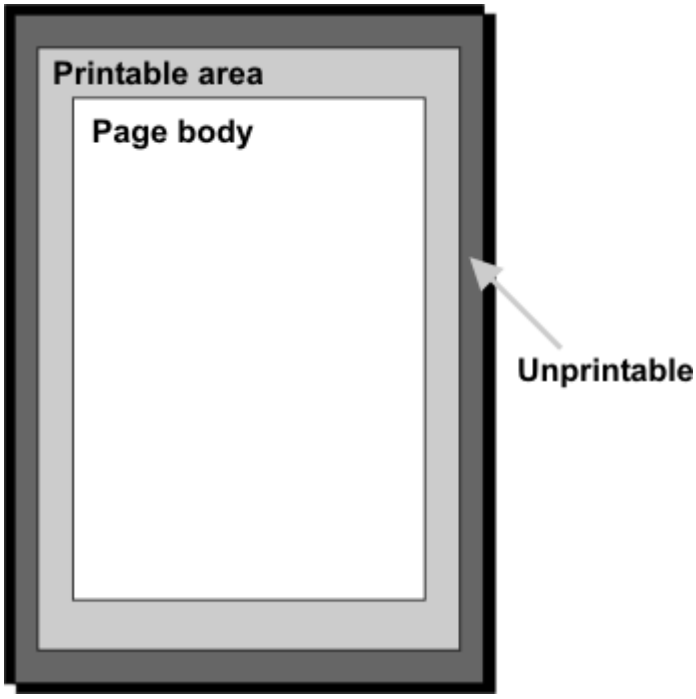
Project reports can be output to:

- A printer
- A file
- The screen

3.16.1.1 Structure of a layout

Introduction

A layout for the project documentation consists of a cover sheet and a formal contents sheet which is filled dynamically with the configuration data. If the data for output fills more than one page, the system will automatically insert page breaks. Layouts are divided into various areas. The page area displays the entire layout surface. The margins can be specified for this area. The printable area consists of the header, footer and the page body.



The header and footers are output on every page of a project report. The header and footer are not output on the cover sheet.

Layout of the cover sheet

General information about the project can be output on the cover sheet. The cover sheet contains predefined fields in which you can enter the corresponding information by means of a dialog box. The following information can be output on the cover sheet:

- Project name
- Company name
- Department name
- Author name
- Company logo
- Project logo

Layout of the contents pages

The configuration data are output on the contents pages. The following elements are output in a project report:

Line	Contents
Title	Designation for the selected components for the project report
Label	Designation of the objects, the attributes and the output RF-MANAGER screens.
Field	Output configured attribute values of objects.

The lines listed in the table are repeated for all the objects contained in the project report. Two formats are available for this output.

In "Compact" format the data are output in a five-column table. In "Compact" format the five most important attributes of an object are output. The five attributes to be output are preset in the system. The selection of these attributes cannot be modified.

In "Complete" format the data are output in two columns. In "Complete" format all the attributes of an object are output in the report.

The output format is selected in the "Print documentation" dialog box. Select the "Compact" or "Complete" format on the "Content" tab in the "Documentation of the properties" area.

3.16.2 Working with layouts

Introduction

The "Print documentation" dialog box is used to edit the layouts. Using this dialog, you can create new layouts and duplicate and delete existing layouts.

Overview

The RF-MANAGER provides a sample layout as the basis for a project report. The ready-made layout with its settings is always used if you use the  command button to create a new layout. RF-MANAGER generates the "standard layout" from the ready-made layout. The layout is used for the output of project reports using the "Print Selection" function.

The layouts for the project reports are saved centrally in RF-MANAGER and are therefore available to all users in any project. Configure the common properties of a layout for an RF-MANAGER project, e.g. author, company name, project name, header, footer, display used and the settings for the output. Duplicate this template several times and specify different configuration data for the output in each of these templates. For example, create a separate project report for each RF-MANAGER component.

A predefined style is provided for designing the project reports. You can change the style as required. The style is not saved with the individual layouts. A change in the style therefore affects all the existing layouts.

Commands for layout editing

The following commands are available in the "Print project documentation" dialog box to edit the layouts.

Button	Context-sensitive menu command	Hotkeys
	New	<CTRL+SHIFT+N>
	Duplicating	<CTRL+SHIFT+D>
	Delete	<Del>
	Rename	F2
	Printing	<CTRL+SHIFT+P>
	Preview	<CTRL+SHIFT+V>
	Export	<CTRL+SHIFT+E>

3.16.2.1 Editing a layout for the project documentation

Introduction

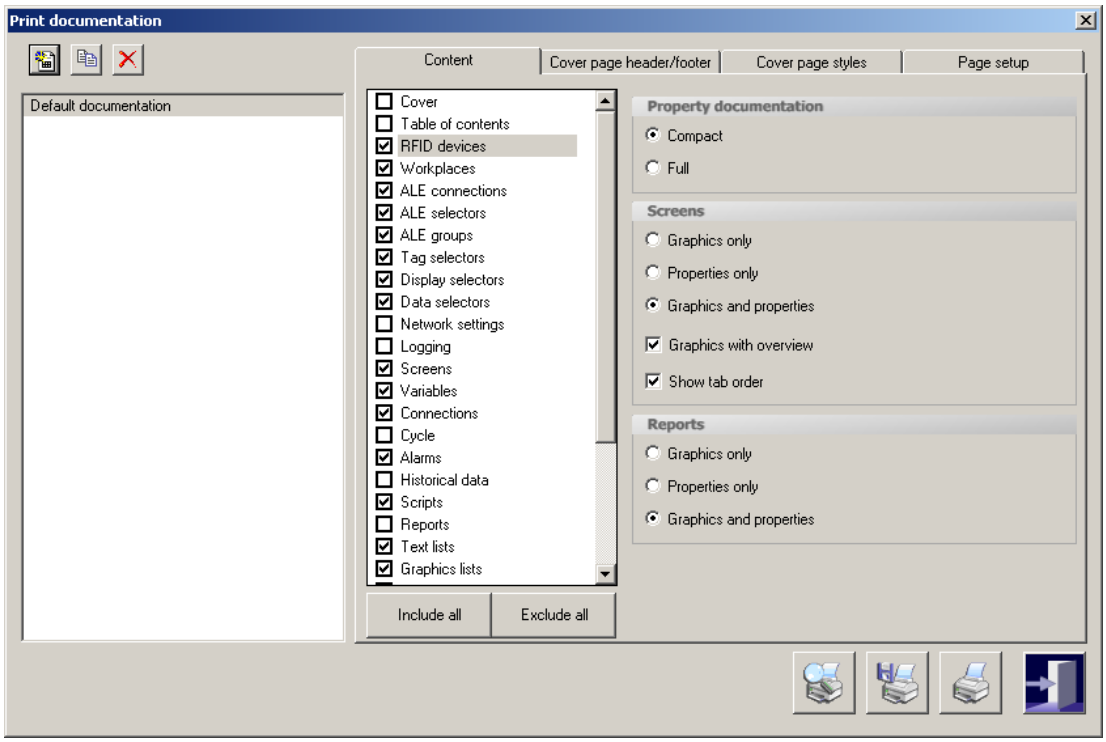
A layout is opened by using the "Print documentation" dialog box. The "Print documentation" dialog box is accessed via:

- The "Project > Print project documentation..." menu command
- The  command button in the "Print" toolbar.

Open the properties of the layout to be edited by using the mouse to select the layout.

Editing possibilities

The properties of the selected layout are displayed in the "Print project documentation" dialog box.



The following table shows the available categories and the editing possibilities.

Tab	Editing possibilities
"Content"	Is used to select the data for the output.
"Cover page header/footer"	Is used to enter the contents for the cover sheet, header and footer.
"Cover page styles"	Is used to configure the style.
"Page setup"	Is used to configure the paper format, the page orientation, the page margins and the height of the header and footer.

3.16.3 Creating a project report

3.16.3.1 Selecting the data for a project report

Introduction

The selection of the data depends on the selected output format in the layout used. Five attributes each specified by the system are output in the project report for each object in the "Compact" output format. All the attributes of all the configured objects of an RF-MANAGER component are output in the "Complete" output format.

Overview

Select the RF-MANAGER components for the output on the "Content" tab in the "Print documentation" dialog box. Select the output format "Compact" or "Complete" in the "Documentation of the properties" area. In the RF-MANAGER components "Screens" and "Reports" you can limit the output of the data. The following options are available:

- "Only graphics"
- "Only properties"
- "Graphics and properties"

Further selection options in the "Screens" area":

- "Graphics with overview", outputs the screens with the permanent window.
- "Show tab order" outputs the screens with the tab order.

3.16.3.2 Outputting of data of selected objects

Introduction

RF-MANAGER offers you the possibility to output the configuration data of individual objects. The output can also be carried out for several selected objects.

Overview

Select the objects for the data output in the project view or in the objects view.

The output of the configuration data of a selected object is always performed with the "standard layout". The desired output options have to be set in this layout. Selection of another layout is valid for the documentation of individual object data.

The configuration data of the selected objects are opened in the preview. Outputting to a printer can be started from the preview. The  button can be used to copy the data to the clipboard for further use.

3.16.3.3 Selecting the objects for project documentation

Introduction

RF-MANAGER offers various options for outputting the configuration data of individual or multiple objects of an RF-MANAGER component. Start the output using the:

- The main menu
- The toolbar
- The shortcut menu of selected objects

Selecting the objects

Activate the object view and select the desired RF-MANAGER component in the project view using the menu command "View > Objects" . The existing objects of the RF-MANAGER component are displayed in the objects view. Use the mouse to select one or more objects whose data you want to output in the object view.

You can also open the node of a RF-MANAGER component in the project view. The existing objects of the RF-MANAGER component are displayed. Select one or more objects using the mouse.

Outputting the data

RF-MANAGER provides several options for the output of data. After the object selection you start the output via:

- The  button.
- The "Print selection" command in the shortcut menu of the selection.
- The "Project > Print Selection" command in the menu bar

The configuration data are inserted into the "standard layout" and opened in the preview window.

3.17 Planning jobs

3.17.1 Field of application of the scheduler

Definition

In the scheduler, you link system functions or scripts to an event. For example, you link the SendEMail system function to the "Runtime stop" event so that an e-mail is always sent to a particular recipient at the end of operation.

A task therefore exists: When the event occurs, the linked function is called. An e-mail is sent when Runtime ends.

Application example

The scheduler is used to execute event-controlled jobs automatically. For example, you use a job to automate the following:

- Regular swap out of log data
- Printout of an alarm report when an alarm buffer overflow occurs
- Printout of a report at shift end

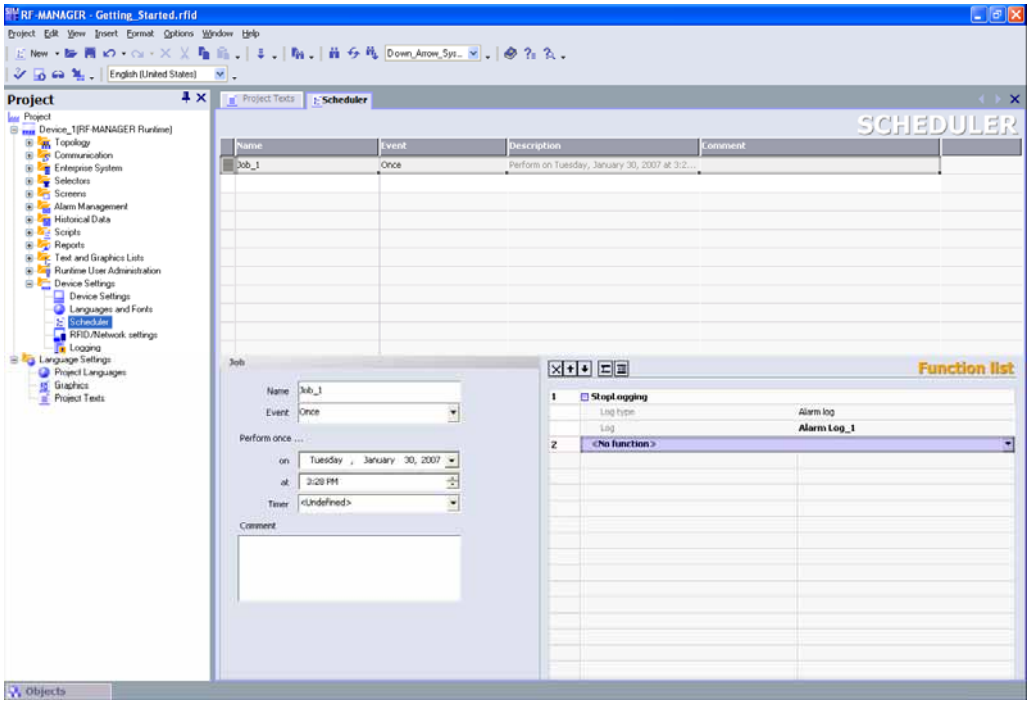
See also

Scheduler (Page 408)

3.17.2 Working with jobs and events

Introduction

A job consists of a triggering event and a "function list".



Definition

The scheduler differentiates between time-based events and system events. A time-based event occurs at a particular time, for example, "Starting daily at 12:00". Examples of system events are "Runtime stop" and "Change user".

The event occurs either cyclically, for example "Starting daily at 12:00", or acyclically, for example "Change user".

The function list contains a system function or a script in each line.

Job sequence

When the event occurs, the scheduler starts the jobs associated with the event. The jobs are executed consecutively. A job is executed by executing the function list line-by-line.

In the case of a system event, only one job per runtime system can be configured and executed.

Note

If many jobs are executed within short intervals, time delays can occur. In the case of a cyclic event, make sure that all of the jobs are executed before the next event occurs.

Timer for time-based events

To make dynamic changes to the configured start time during runtime for daily, annual or one-off events, select an internal variable as a timer. The value of the variable determines the start time for the job during runtime.

NOTICE
The variable must be of the "DateTime" type.

See also

Scheduler (Page 408)

3.17.3 elements

3.17.3.1 Scheduler

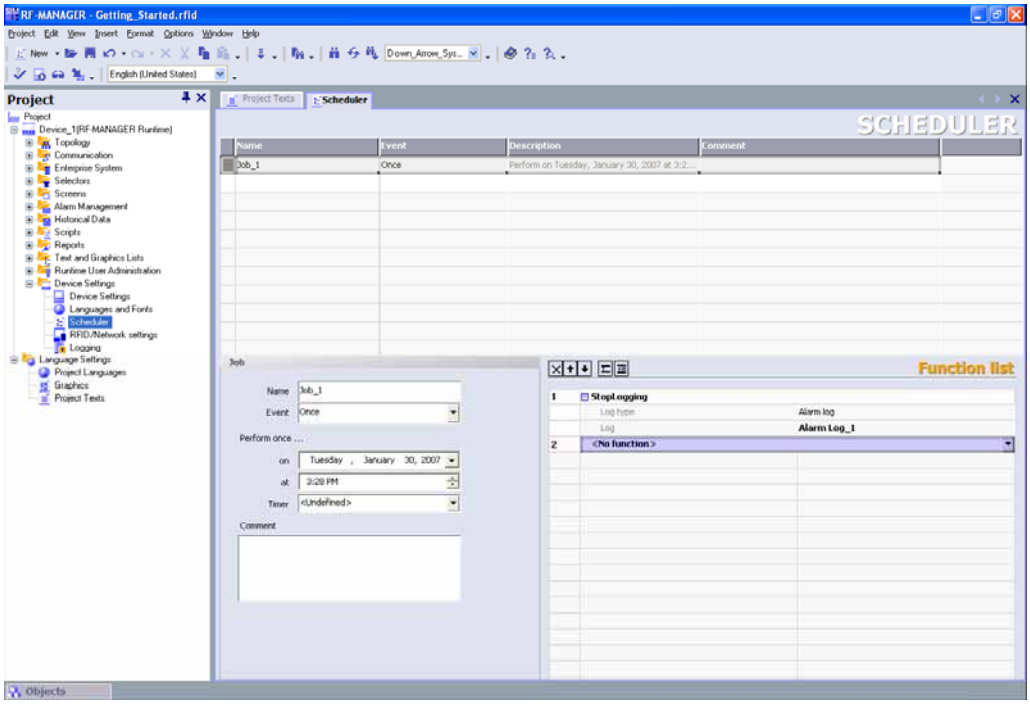
Introduction

In the scheduler, you plan a job by configuring a function list for an event.

Open

Double-click on "Scheduler" to open it in the project view.

Layout



Workplace

The workplace shows the planned jobs.

See also

Workplace of the "Scheduler" editor (Page 409)

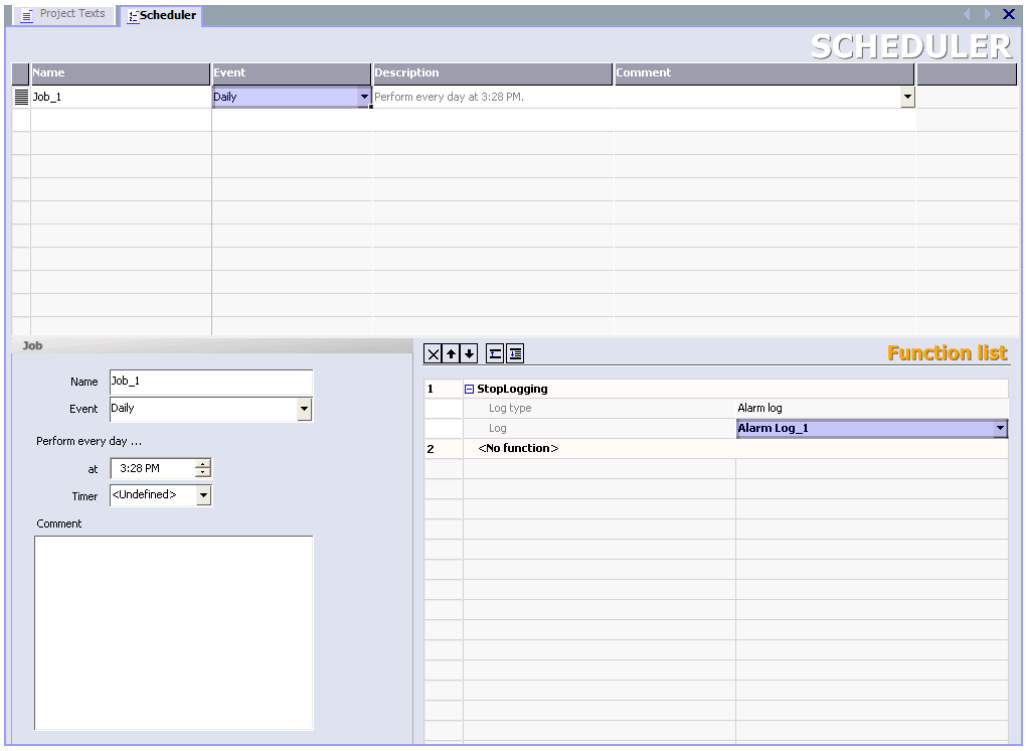
3.17.3.2 Workplace of the "Scheduler" editor

Introduction

The workplace shows the planned jobs, which consist of the triggering event and the function list.

Layout

The workplace consists of the table of jobs, the properties, and the function list.



The table of jobs shows the job, the triggering event, and additional information. You assign the label and a comment and select the event. The scheduler compiles a description of the job.

The properties also show the job along with the triggering event. The time-based event is specified in the properties.

In the function list you configure the functions or scripts to be executed in the job.

Note

The compiled description provides a written summary of the job including the timing for the job. You can obtain more detailed information using the tooltip function. by moving the mouse pointer over the selected element in the user interface.

3.18 Transfer

3.18.1 Fundamentals

3.18.1.1 Requirements for transfer

A transfer operation refers to the transfer of a compiled project file to the runtime system where the project is to run.

Requirement

After you have completed a configuration process, check the consistency of the project by using the menu "Project > Compiler > Check Consistency". After completing the consistency check, the system generates two compiled project files. This project files have the same name assigned to it as the project, however with the extensions "*.rfidx" and "*.xml". These compiled project files must be transferred to the runtime system.

Note

Engineering System and Runtime System on the same PC

If the Engineering System and Runtime System are on the same PC, a transfer is not necessary. The project files can be stored locally in any directory.

The runtime systems must be connected to the configuration computer to transfer the project files. Mobile data storage units can also be used to transfer the files.

Compile the project again if the *.pwx is not found and you receive an error message while transferring the data.

Basic procedure

1. Enter the transfer settings for the individual runtime systems in your RF-MANAGER project.
2. Enter the transfer mode on the runtime system to which the project is to be transferred in "RF-MANAGER 2008 Runtime Loader". The alternative options are as follows:
   - Using the "RF-MANAGER 2008 Runtime Loader"
   - By executing the system function "SetDeviceMode" with the option "Transfer"
3. Transfer the compiled project files from the configuration computer to the runtime systems. The project files are transferred to all runtime systems for which the respective check box is selected in the transfer settings.

Transfer mode

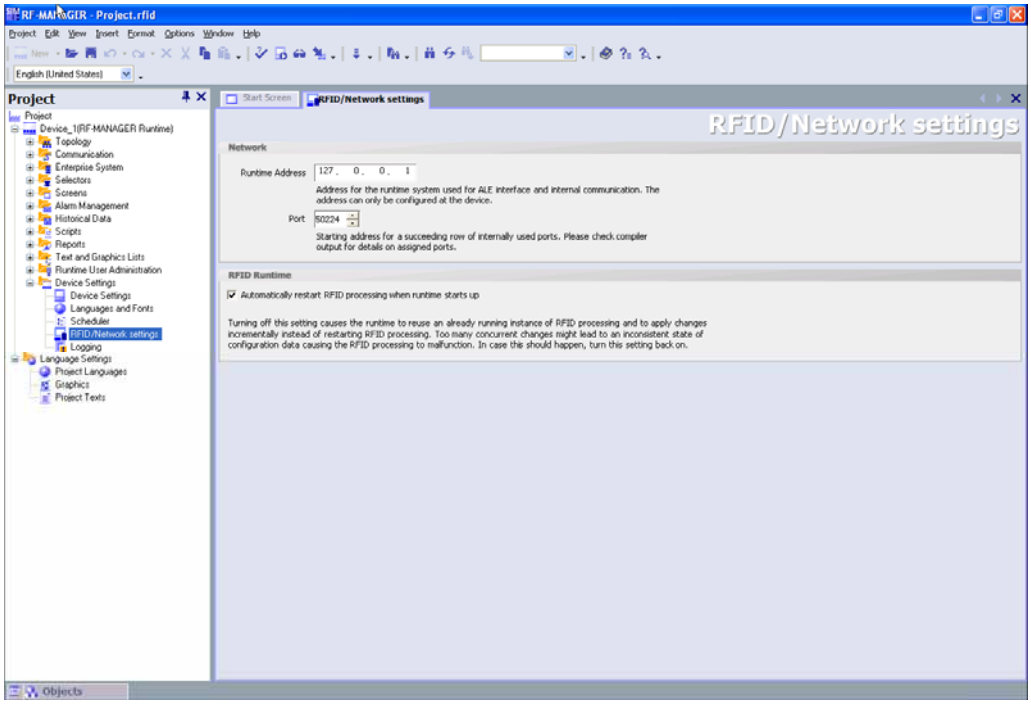
The runtime system must be in "transfer mode" for the transfer operation. If a project is not yet available on the PC, you must enable the transfer mode in the "RF-MANAGER 2008 Runtime Loader" manually before the first transfer operation.

This is however not necessary if you selected the "File" option in the "Transfer settings" and/or your engineering system and your runtime system are located on the same PC.

Automatic restart of RFID processing

When you make extensive changes to your configuration in the engineering system, stop RFID processing before you copy the changes. Use the system function "StopRfidProcessing" for this purpose or select "Stop RFID processing" in the Start Center. This shortens the subsequent starting phase considerably. It is generally recommended that RFID processing should be restarted after several project modifications.

Before any productive data has been supplied from the plant, the following possibility for transferring modified configuration data is available as an alternative: Check the box "Automatic restarting of RFID processing when runtime starts" under "Device settings > RFID/network settings".



When this box is disabled, only those changes implemented since the last start will be transferred for any RFID processing in progress. This can result in inconsistencies in the configuration which can cause malfunctions in RFID processing.

Data comparison with the runtime system

You can use the menu item "Data comparison with the runtime system" to save changes in the Engineering System that you made to your project at runtime in the "Configuration" screen object. In this procedure, the changes are saved in an "xml.sync" file and copied into the project in the Engineering System.

Otherwise the changes in the runtime system will be overwritten by the transfer.

See also

Transfer settings (Page 412)

Transfer project (Page 416)

3.18.1.2 Menu commands and toolbar buttons for the transfer operation

Menu commands

Menu commands for the transfer operation are located on the "Project > Transfer" menu. The following menu commands are available:

Command	Function
Transfer settings	Settings for transferring a compiled project file to the runtime systems. Only active if a project is selected.

Toolbar

A toolbar containing the following icons is provided in RF-MANAGER for transfer purposes.

Icon	
	Opens the transfer settings dialog

3.18.1.3 Transfer settings

Introduction

You can enter transfer settings individually for each runtime system of your project. The transfer settings include communication settings and selection of the runtime system for the transfer operation.

Selecting the runtime system for the transfer operation

When a transfer operation is performed, the compiled project file is transferred to all runtime systems of the project for which the respective check box is selected in the transfer settings on the configuration computer.

The relevant check box must be selected in the transfer settings on the configuration computer even if you use the context menu of the runtime system to start the transfer operation for this particular runtime system only.

Transfer modes

You can specify the following transfer modes:

- Ethernet network connection

  The configuration computer and runtime system are located in a network or are connected point-to-point. The transfer operation between the configuration computer and the HMI device takes place by means of an Ethernet connection.

- File

  The configuration computer and runtime system are identical or are connected in a network. The transfer operation is performed in a copy in Explorer.

Note

For file transfer, it is not necessary to manually activate transfer mode in the "SIMATIC RF-MANAGER 2008 Runtime Loader" .

The transfer mode setting for a runtime system is also applied if the runtime system is selected in the Project View and one of the commands on the "Project > Transfer" menu is selected.

Runtime system on another computer

If your runtime system is not located on your configuration computer, you must prepare your runtime system for transfer.

1. Call up the "SIMATIC RF--MANAGER 2008 Runtime Loader" for this purpose on your target system.
2. Select "Settings".
3. Check the "Activate" checkbox as shown in the screenshot below.

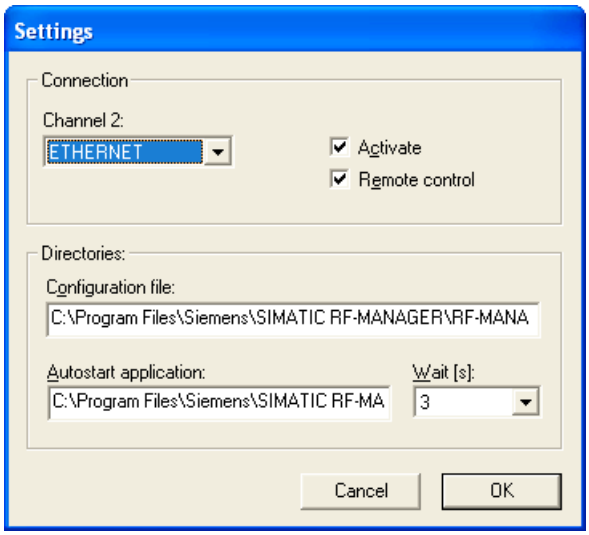


Figure 3-23 Runtime loader: Transfer settings

If necessary, you can also check the "Remote control" check box.

4. Click the "OK" button to confirm the settings.
5. Then select the "Transfer" option.

   The runtime system of the target computer now expects the compiled project files.

Remote control

If a project is running on the runtime system at runtime, transfer can be initiated via remote control for the test and startup phases.

To do this, the "Remote control" option must be set in the transfer settings of the runtime loader in the runtime system (see screenshot above).

During transfer via remote control, the running project is closed and the runtime system automatically switches to Transfer mode. If dialogs are still open on the runtime system, it is not possible to terminate the running project automatically. Close the dialog or cancel the transfer operation on the configuration computer.

Following a successful transfer, the newly transferred project file is automatically started.

Note

If you do not want to permanently enable the "Remote control" option on your target system, for example, because you want to prevent project files from being automatically transferred, you can also set the system function "SetDeviceMode" with the "Transfer" option on the target system.

Any project that is running at runtime would in this case be terminated once on transfer

Overwriting the password list

When the compiled project file is transferred, the password list present on the runtime system is overwritten by the corresponding configuration data. Consequently, the option exists to create passwords as part of the project, which are then available on each runtime system where the project has been transferred.

To prevent overwriting existing passwords, clear the respective check box. Another option for retaining the existing password list is to first make a backup copy of the list on the runtime system. Once the transfer operation has been performed, the password list can then be restored from the backup.

See also

Defining transfer settings (Page 415)

3.18.2 Transferring a project

3.18.2.1 Defining transfer settings

Introduction

You can specify transfer settings individually for each runtime system of your project. The transfer settings include communication settings and the selection of the runtime system for the transfer operation.

Requirements

An RF-MANAGER project is open.

Procedure

1. Click the  icon in the "Transfer" toolbar.

   The "Select devices for transfer..." dialog is displayed.
2. On the left, select the runtime system for which transfer settings are to be made.
3. Select each check box in front of the runtime system to which the compiled project files are to be transferred during the transfer operation.
4. Set the mode.
5. Set the parameters for the selected transfer mode:
   - Ethernet: Computer name or IP address
   - Adapt file: Destination directory
6. Select the appropriate check box if you want the password list that is present on the runtime system to be overwritten and thus reinitialized during the transfer operation.

Result

When a transfer operation is performed, the compiled project files are transferred to all runtime systems for which the check box is selected in the "Select devices for transfer..." dialog. The transfer mode set for each device is used for the transfer. The transfer takes place to the extent set.

When transferring over Ethernet, the "Remote control" option must be enabled in the runtime loader or you must execute the system function "SetDeviceMode" with the "Transfer" option.

See also

Transfer project (Page 416)

Transfer settings (Page 412)

3.18.2.2 Transfer project

Introduction

After successful compilation, transfer the compiled project files to the runtime systems on which the project is to run. This process is a transfer.

Note

If you initiate a transfer operation for a project that has not yet been compiled in its current version, the project is automatically compiled prior to the transfer.

The runtime systems must be connected to the configuration computer to transfer the project data.

Requirements

- The configuration has been completed.
- The runtime systems to which the project data are to be transferred are connected to the configuration computer.
- The transfer settings in the runtime loader for the runtime systems concerned are correct.
- The checkbox has been activated for at least one runtime system in the "Select device for transfer..." dialog.

Procedure

1. Use the same transfer mode setting on the runtime system as is used in the transfer settings of the RF-MANGER for the respective runtime system.
   – The transfer mode is set in the loader menu when the runtime system starts up: Either the "Remote control" option is activated or the system is explicitly switched to transfer mode.

   The memory location for the project file is preset and can be overwritten.
2. If transfer to **several** runtime systems should be performed simultaneously, click the  button in the "Transfer" toolbar. The "Select device for transfer ..." dialog opens. Activate the checkbox of all runtime systems to which a transfer is required and click the "Transfer" button.

   If you want to transfer the project to **only one** runtime system, select the "Transfer" command in the shortcut menu for the runtime system. The checkbox must also be selected for this runtime system in the transfer settings; otherwise the transfer operation will not be carried out.

   If you have not yet compiled the project file, it is compiled automatically before the transfer operation.

Result

The project files are transferred.

Once the transfer operation is successfully concluded, the "*.rfidx" and "*.xml" files are located in the specified directory on the respective runtime system. Any existing project is overwritten.

As soon as the transfer is finished, the runtime starts on the respective runtime system with the corresponding project file and displays the start screen.

If an error occurred during the transfer operation, the corresponding messages appear under "Transfer" in the Output Window.

Remote control

If a project is running in runtime on the runtime system, transfer can be initiated via remote control for the test and startup phases.

To do this, the "Remote control" option must be set in the transfer settings of the runtime loader in the runtime system.

During transfer via remote control, the running project is closed and the runtime system automatically switches to transfer mode. If dialogs are still open on the runtime system, it is not possible to terminate the running project automatically. Close the dialog or cancel the transfer operation on the configuration computer.

Following a successful transfer, the newly transferred project file is automatically started.

See also

Defining transfer settings (Page 415)

RF-MANAGER Runtime 4

4.1 Fundamentals

4.1.1 Introduction to the RF-MANAGER Runtime

Introduction

RF-MANAGER Runtime is user-friendly software for RFID processing and visulaization of the projects you have created with the RF-MANAGER programming software.

The RF-MANAGER is designed for processing, visualization and operation of RFID systems. The Runtime software has a window-based pixel-graphics user interface. With its quick response times, it supports reliable system operation.

Licensing

When you install the runtime software "RF-MANAGER Runtime", you need a license for unrestricted use. RF-MANAGER Runtime runs in a non-licensed mode if the licensing is missing.

Components of the RF-MANAGER

The configuration software RF-MANAGER Engineering System is used to create your project data on on the configuration computer under Windows.

You use the RF-MANAGER Runtime software to execute your configuration under Windows. You can also use RF-MANAGER Runtime on your configuration computer for testing and simulating the generated project file.

Virus scanner in runtime

An active virus scanner will increase system load, and may lead to disturbances in Runtime.

Always disable the virus scanner when you install an application. An active virus scanner may also cause operational disruptions of hardware expansions. When running RF-MANAGER, the tool may also block the process interfaces of your modules or block the readers. This fact disqualifies in particular dynamic virus protection via gatekeeper mechanisms.

Always run virus tests in offline mode, and then restart the computer before you activate Runtime.

Any automatic update of virus scanners initiated on the network may cause unnecessary load on the system. Always run virus scanner updates in offline mode, and then restart the computer before you activate Runtime.

4.1.2 Functional scope of RF-MANAGER Runtime

Functional scope

Functionality of RF-MANAGER Runtime:

- Parameterizing an RFID device: Stationary and mobile readers
- Commissioning, optimizing and maintaining the RFID system with Windows-compatible user interface
- Collect, filter, display and write RFID data
- Read and control reader inputs/outputs
- Interfacing to enterprise systems (ALE) for RFID data and alarms
- Large selection of standard I/O fields, vector graphics and buttons
- Integral alarm system
- Dynamic positioning of objects
- Logging of alarms
- Visual Basic Script for user functions
- Standard coupling with SIMATIC S7
- Input protection by means of user groups, passwords and log-off times
- Simulator for testing RFID projects
- Supplying RFID data to the PLC

4.1.3 System requirements

System requirements

	RF-MANAGER Engineering System	RF-MANAGER Runtime
Supported devices	Standard PC	Standard PC / SIMATIC Microbox PC 420 / SIMATIC Microbox PC 427B
Operating system	Windows XP Professional SP3 or higher	Windows XP Professional SP3 or higher (standard PC) Windows XP Embedded SP3 or higher (SIMATIC Microbox PC 420/ SIMATIC Microbox PC 427B)
CPU	Pentium IV or later with 1.6 GHz processor	Pentium III or later with 933 MHz processor (standard PC) Pentium III with at least 933 MHz processor (SIMATIC Microbox PC 420/ SIMATIC Microbox PC 427B)

	RF-MANAGER Engineering System	RF-MANAGER Runtime
Graphic	Resolution of at least 1024x768 / 1280x1024 recommended at least 256 colors	Resolution of at least 640x480 at least 256 colors
RAM	At least 1.0 GB / 2.0 GB recommended	At least 512 MB / 1024 MB recommended
Free memory space / hard disk	At least 1.5 GB	At least 256 MB excluding archives (standard PC) CompactFlash card with at least 512 MB (SIMATIC Microbox PC 420/ SIMATIC Microbox PC 427B)
	In addition to the space needed by RF-MANAGER, Windows also requires space on the hard disk, e.g. for the swap file. For additional information, refer to your Windows documentation.	
Additional hardware	CD-ROM drive (for installing the software) USB port for installing the licenses	
Reader for document display	Adobe Acrobat Reader 5.02	
Internet browser	Microsoft Internet Explorer V6.0 SP1 / SP2	
Multiple screens	The operating system function used to visualize the screen content on several monitors (Control Panel > Display > Settings) is not released with RF-MANAGER.	

4.2 Commissioning the runtime system

4.2.1 Installation of RF-MANAGER Runtime

Supported devices

RF-MANAGER Runtime will run on the following Windows-based systems:

- Standard PC
- SIMATIC Microbox PC 420
- SIMATIC Microbox PC 427B

Installation on the PC

You must install RF-MANAGER Runtime on your system if it has not already been installed.

The runtime software RF-MANAGER Runtime is located on the CD "SIMATIC RF-MANAGER". A license (license key) is required to run the Runtime software.

NOTICE
RF-MANAGER Runtime runs in demo mode only if you do not have a license. In demo mode, you are prompted to acknowledge specific messages at regular intervals.

1. Install the runtime software from the CD.

   If the autorun function is enabled for your CD-ROM drive, the CD browser is run automatically when the CD is inserted. Otherwise, run the setup by selecting "RF-MANAGER\Runtime\setup.exe" from the CD.
2. Select the user interface language of the Setup program under "Language."
3. Select "Installation", then run the "RF-MANAGER Runtime" setup.
4. Follow the setup instructions on the screen.
5. Install the license when you are prompted to do so.
6. Then install the currently available ServicePack (see "Installation instructions" manual)

Note

If, when installing the Runtime software, you do not have a license, you can install this later using the Automation License Manager. The Automation License Manager is automatically included in the RF-MANAGER setup.

4.2.2 Installation on Microbox PC

NOTICE
SIMATIC Microbox PC 420/427B The SIMATIC Microbox PC 420 and the SIMATIC Microbox PC 427B are only suitable for operation of the runtime system. The engineering system cannot be operated on the device.

Enhanced Write Filter (EWF)

Windows XP embedded includes a write filter, also called Enhanced Write Filter (EWF). Enhanced Write Filter (EWF) can be used to write-protect the system partition, for example in order to increase the lifetime of the CF card. For additional information, refer to the operating instructions.

Installation of the runtime system on a Windows XPe system

NOTICE
Installation Requirements Please note that the keyboard must be plugged in during installation.

1. In the Windows Start menu, select "Start -> Control Panel". Enter "cmd" and click the "OK" button.

   The input box opens.
2. Enter "ewfmgr c: -commitanddisable" in the box. The write protection for C: is switched off and the modified data is accepted.
3. Reboot the system in order to accept the changes.
4. Install the runtime system. (see Section)
5. In the Windows Start menu, select "Start -> Control Panel". Enter "cmd" and click the "OK" button.
6. Enter "ewfmgr c: -enable" in the box. The write protection for C: is switched on.
7. Reboot the system in order to accept the changes.
8. Install the RF-MANAGER Service Pack (see chapter).

4.2.3 Installation Service Pack

Requirement

SIMATIC RF-MANAGER 2008 must be installed.

Procedure

1. Start the file "SIMATIC_RF-MANAGER_2008_SP3.exe" by double-clicking the file name.
2. Follow the on-screen instructions.

Result

RF-MANAGER 2008 Service Pack is now installed on your computer.

In the installation folder, usually "C:\Program Files\ Siemens\SIMATIC RF-MANAGER\RF-MANAGER 2008 Support", five additional folders have been created by launching the Service Pack:

- ALEDatabridgeClient

  ALEDataBridgeClient is already fully installed following installation of the Service Pack, and it can be started via "SIMATIC > RF-MANAGER 2008 Runtime > AleDataBridgeClient". This demo application is based on the ALE+ Client API Library and uses the ALE interface to make files available in .csv (text), .sql (database), and .xml (structured text) formats.
  The documentation for the ALEDataBridgeClient can be found in the folder, along with the source files.

- ALE+Client Demo

  The ALE+Client Demo is already fully installed following installation of the Service Pack, and it can be started via "SIMATIC > RF-MANAGER 2008 Runtime > ALE+Client Demo". This demo application is based on the ALE+ Client API Library and uses the ALE interface to provide an overview of the functional scope of the interface. All supported commands can be run, and reports for files and messages can be displayed.
  Along with the source files, the folder contains comprehensive documentation on the use of the ALE+ interface and the ALE+Client Demo.

- RF610M
  The "RF610M" folder contains components to be installed on the respective devices if RF610M units are used with RF-MANAGER, as well as the installation documentation.

- RF310M

  The "RF310M" folder contains components to be installed on the respective devices if RF310M units are used with RF-MANAGER, as well as the installation documentation.

  Prerequisites: RF310M from the 2nd generation (G2) of the PSION basic device with the MLFB 6GT2803-0AB00

- Project samples

  The "Project samples" folder contains numerous example configurations for the new devices. The mode of operation of the readers and their integration into the RF-MANAGER can be followed in the projects.

4.2.4 Electrical installation

Connecting the PC to the controller

The PC is connected to the PLC via a communications processor. Please refer to the hardware description from the manufacturer for the proper electrical installation of your PC.

The table below shows the use of the interfaces:

PLC	PC interface
SIMATIC S7 via PPI	• via CP – CP 5511 – CP 5512 – CP 5611 – CP 5613 – CP 5614 • via PC/PPI adapter 1)
SIMATIC S7 via MPI	• via CP – CP 5511 – CP 5512 – CP 5611 – CP 5613 – CP 5614 • via PC/MPI adapter 2) • via PC adapter USB 2) • via Teleservice V5.1
SIMATIC S7 via PROFIBUS DP 3)	• via CP – CP 5511 – CP 5512 – CP 5611 – CP 5613 – CP 5614
SIMATIC S7 via Ethernet (TCP/IP)	• Via CP: – CP 1512 – CP 1612 – CP 1613

1) Point-to-point connection with S7-200 only, no configuration transfer

2) Point-to-point connection with S7-300 or S7-400 only

3) RF-MANAGER Runtime is an active node

4.2.5 Interfacing to the PLC

Interfacing to the PLC

Connect the runtime system to the PLC to test your project in combination with the PLC.

Set PG/PC interface

Communication with PROFIBUS DP

1. Open the dialog "Set PG/PC interface" in the Windows Start menu under "Settings > Control Panel.
2. Click the "Properties" button.

   Under "Network parameters", "DP" is selected as the profile.
3. Select "Universal (DP/FMS)" and confirm with "OK".
4. Click the "Properties" button again.
5. Select "DP" again under "Profile" and confirm with "OK".

MPI communication

1. Open the dialog "Set PG/PC interface" in the Windows Start menu under "Settings > Control Panel.
2. Click the "Properties" button and set the parameters for the runtime system on the "MPI network" tab sheet such that this is the only master on the bus.

   If you operate more than one runtime system over MPI, only one runtime system is permitted to be operated as a master on the bus. Check the network settings for the connected runtime systems.

Note

You will find detailed information regarding communication between the PLC and the runtime system in the section "Communication" in the Information System.

4.2.6 Settings of the Runtime software

You must set the following parameters for the runtime software in the RF-MANAGER configuration software:

- **Display for runtime system**

  In RF-MANAGER, you configure the Runtime layout of the generated project: Select whether to start the project in full-screen mode, or in a window smaller than the screen size. In full-screen mode, the project is zoomed to the full screen. There will be no window and operator control elements for this view.

  Note

  If the runtime system does not match the configured size (in pixels), the project appears only on a part of the screen when opened in full-screen mode.

  To start the system in full-screen mode, open the "Device settings" dialog box in the project view in RF-MANAGER. Under "Runtime Settings", set the "Full-screen mode" check box. You can hide the taskbar under WIndows as required. To hide the taskbar, select "Start > Settings > Taskbar", then clear the "Always on Top" and "Auto hide" check boxes on the "Taskbar properties" dialog box.

- **Dialog fonts**

  The dialog text will be shown in the standard font. You define the standard font in the "Languages and fonts" editor.

- **Disabling program switching**

  In order to prevent the operator from calling other applications in Runtime, you may lock program switching. To do so, open the "Device settings" dialog box in the project view, then set the "Disable program switching" and "Full-screen mode" check boxes. Also hide the taskbar under Windows as described earlier.

  Note

  If you decide to lock program switching, you should always configure a function key or button for calling the "StopRuntime" system function. Otherwise, it will not be possible to exit RF-MANAGER Runtime or Windows.

  When program switching is disabled, the <Ctrl+Alt+Del> keystroke function is also disabled.

- **Screen saver**

  A screensaver is no longer required for most modern screens and can even damage them. These monitors switch to hibernate mode as soon as the video signal has not changed for a specified time. A conventional screensaver would prevent this and thus reduce the service life of your monitor.

  Note

  In case you do want to use a screensaver, please note that RF-MANAGER Runtime is only released for operation with the standard Windows screensavers.

- **Setting the time zone**

  Make sure that the correct time zone is set on the PC on which the runtime software is installed. To set the time zone in Windows, select Start > Settings > Control Panel > Date/Time.

- **SMTP server setup**

  You can configure an SMTP server project-specifically for sending E-mail in ES under "Device settings > Device settings". This SMTP server will then apply to all runtime systems to which the project is transferred.
  If you want to change the SMTP server on a runtime system individually, you can do this in the Windows control panel under "RF-MANAGER Internet settings".

- **Using ports**

  You will need the port addresses for configuring communication over Ethernet.

  The table below shows the ports used in RF-MANAGER.

	Port address TCP/IP	**Port address UDP**
SendEmail	25	
Transfer (via Ethernet; PC Loader; PC)	2308 alternative 50523	
Logging (via Ethernet) CSV file	139, 445	137, 138
Logging (via Ethernet) database		
RF-MANAGER	4684	
RF-MANAGER	Configurable	
Reader discovery		30718

Note

When the RF-MANAGER runtime project is generated, additional ports that are used by RF-MANAGER internally are displayed in the output window.

4.2.7 Testing a project

4.2.7.1 Prerequisites for operating a project with a reader

If you want to operate a project with a reader, the following requirements must be fulfilled:

- At least one reader is connected to the PC.
- The reader must have communications capability.

Connecting and parameterizing readers

Depending on the reader model, there are different connection and commissioning methods for the reader:

- Stationary readers (Page 90):
  - RF670R
  - RF660R
  - RF620R/RF630R, RF310R, RF340R, RF350R, RF380R
- Mobile readers (Page 108):
  - RF310M
  - RF610M

Connecting and parameterizing stationary readers

Use of DHCP (Dynamic Host Configuration Protocol)

Introduction

A DHCP server ensures that IP addresses are automatically assigned to DHCP-capable network clients in a network segment. The DHCP server uses the MAC address of the network client for this purpose. The IP addresses are assigned due to permanent assignment of a MAC address to an IP address. The readers of the RF600 family with Ethernet connection are DHCP-capable.
Mechanisms that extend beyond this, such as dynamic assignment of IP addresses or Domain Name Service (DNS), are not supported.

Requirements for activating DHCP

A DHCP server must be present in the network segment.

An up-to-date list of permanent assignments between MAC addresses and IP addresses must be stored in the DHCP server. This list must be maintained by your responsible IT staff member.

You will find the MAC addresses of readers:

- on the enclosure next to the RJ45 socket

NOTICE
Ensure that the DHCP server is running and the reader is entered in the list. Otherwise RF-MANAGER Basic will be unable to establish a connection to the reader following activation.

RF670R

Connecting stationary readers to the parameterization computer

You have the following options for connecting a reader of the RF600 series to your parameterization computer via Ethernet:

- Ethernet connection (10/100 Mbit/s) via RJ45 cable, either over an Ethernet network (connection via hubs or switches) or as a point-to-point link using a crosslink cable directly between a PC and a reader.

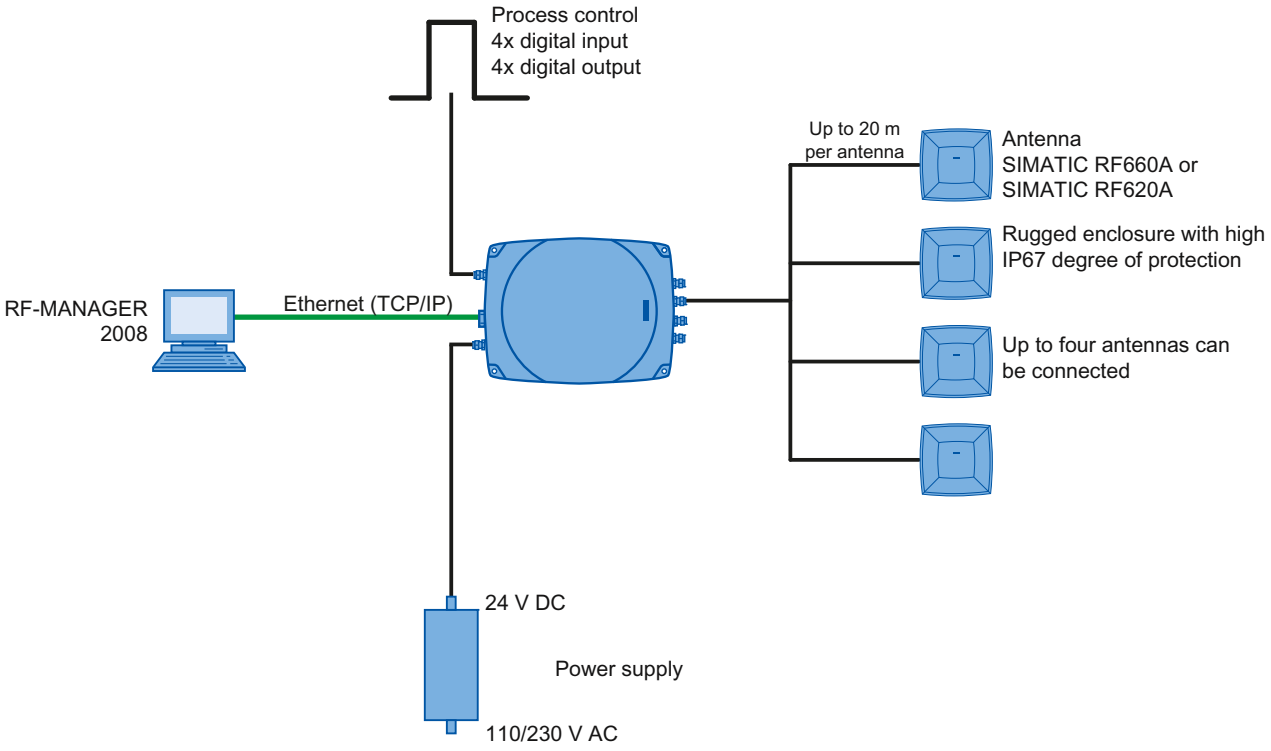
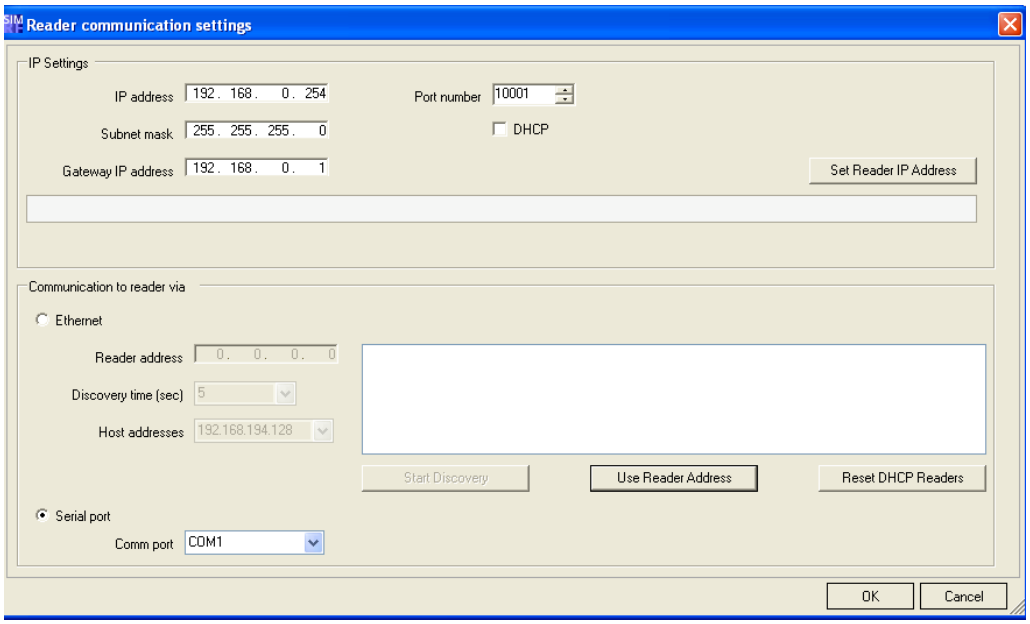


Figure 4-1 Overview of configuration of the RF670R reader

Connecting the stationary reader to the parameterization computer over Ethernet

Procedure	
1	Disconnect the reader from the power supply.
2	Connect the Ethernet interface of the reader to the hub/switch to which your parameterization computer is also connected over an RJ45 cable. It is strongly advised that you use the accessory cables approved by Siemens for each reader. When using RJ45 cables from other manufacturers, there is a risk that the cable will be difficult to remove from the socket of the reader. For PnP connections, a crosslink cable **must** be used if the network card in the PC does not support autocrossover.
3	Connect the reader to the power supply.

Providing the reader with communications capability



1. Select "Project > Reader configuration > Reader communication settings".
2. If the reader has not been pre-parameterized, use the "Start Discovery" button to activate the automatic reader search function in the application.

   All readers connected via Ethernet will be shown in the list.

   Note that the network card you have used to connect the reader is selected under the network address.
3. Select the desired reader.

4. Click the button "Use Reader Address" to adopt the IP address in the "IP Settings".
5. In the "IP Settings" menu, you can now set new Ethernet parameters for the reader. These include:
   - The IP address,
   - The subnet mask
   - The IP address of the gateway

   Click the "Set Reader IP Address" button to transfer the new settings to the reader. Alternatively, DHCP can also be set.

NOTICE
Deactivate firewall If you want to parameterize a reader of the RF600 family over Ethernet, deactivate your firewall before communication starts between the parameterization computer and the reader. Otherwise, it may not be possible to connect.

NOTICE
Avoid simultaneous Ethernet access to readers The applications RF-Manager Basic and RF-Manager 2008 cannot simultaneously access the same reader of the RF600 family via Ethernet. Only start applications that are currently required. Make sure that all RF-Manager Basic 2010 components are deactivated.

Providing the reader with communications capability using the RF-MANAGER Basic

As an alternative to using the RF-MANAGER Engineering System, you can use the "RF-MANAGER Basic 2010" software, which is included in the scope of supply of the reader, to provide the reader with communications capability:

1. In the "Reader" menu, select the command "Set Reader IP Address".
2. If the reader has not been pre-parameterized, use the Start Discovery button to activate the automatic reader search function in the application.

   All readers connected via Ethernet will be shown in the list.

   Note that the network card you have used to connect the reader is selected under the network address.
3. Select the desired reader.
4. Click the button "Use Reader Address" to adopt the IP address in the "IP Settings".
5. In the "IP Settings" menu, you can now set new Ethernet parameters for the reader. These include:
   - The IP address,
   - The subnet mask
   - The IP address of the gateway

   Click the "Set Reader IP Address" button to transfer the new settings to the reader. Alternatively, DHCP can also be set.

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Deactivate firewall If you want to parameterize a reader of the RF600 family over Ethernet, deactivate your firewall before communication starts between the parameterization computer and the reader. Otherwise, it may not be possible to connect.

NOTICE
Avoid simultaneous Ethernet access to readers The applications RF-Manager Basic and RF-Manager 2008 cannot simultaneously access the same reader of the RF600 family via Ethernet. Only start applications that are currently required. Make sure that all RF-Manager 2008 Runtime components are deactivated.

Note

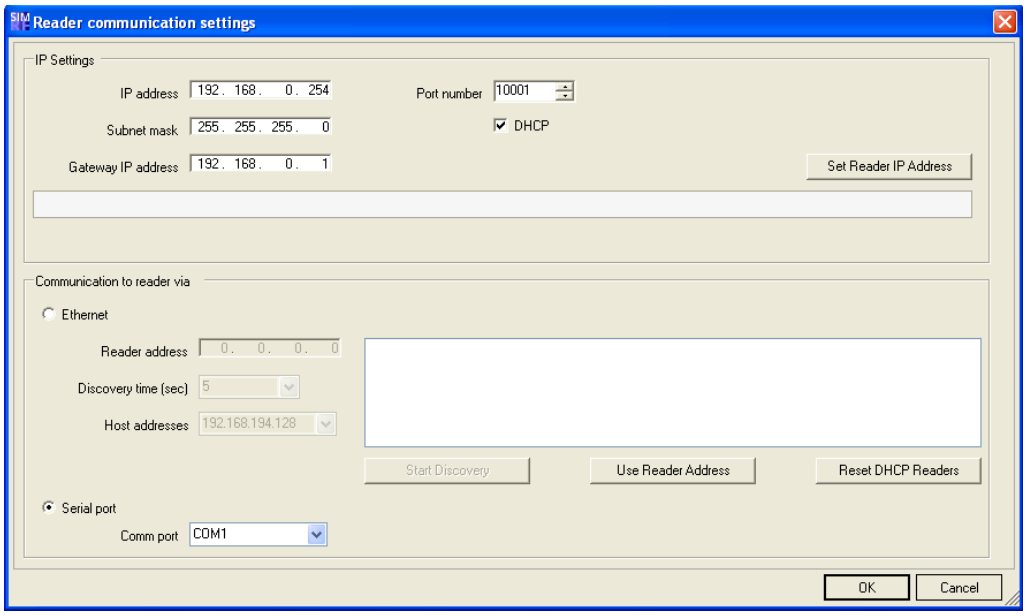
For more information on DHCP

See Chapter Enabling DHCP (Page 95)

Enabling DHCP

The RF670R reader can be switched over to DHCP mode using the "Communication settings" menu item in RF-MANAGER.

Procedure



1. Connect the reader that should be switched over to DHCP mode to the parameterization computer via the Ethernet interface.
2. Select "Project > Reader configuration > Reader communication settings" and click the option "DHCP" to activate it.

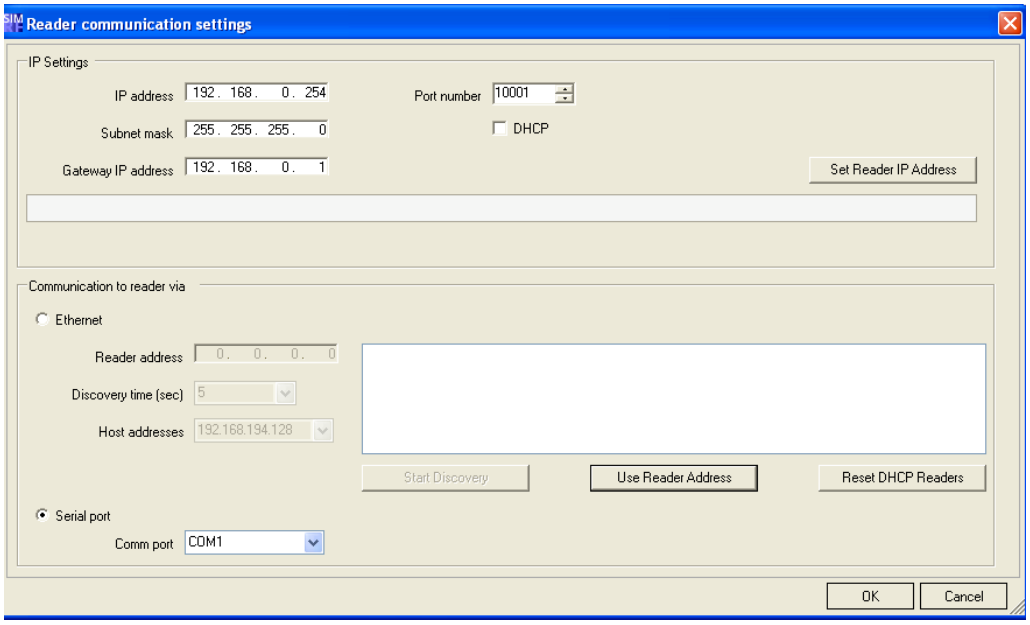
   The DHCP mode is activated for the selected reader.
3. Click the "Set Reader IP Address" button.

   The new settings are transferred to the reader.
4. Disconnect the Ethernet connection between the reader and the parameterization computer again.

Disabling DHCP

The DHCP mode can be disabled for the RF670R reader via the Communication settings menu item in RF-MANAGER.

Procedure



1. Connect the reader for which DHCP mode should be disabled to the parameterization computer via the Ethernet interface.
2. Select "Project > Reader configuration > Reader communication settings" and click the option "DHCP" to deactivate it.

   The DHCP mode is deactivated for the selected reader.
3. Click the "Set Reader IP Address" button.

   The new settings are transferred to the reader.
4. Disconnect the Ethernet connection between the reader and the parameterization computer again.

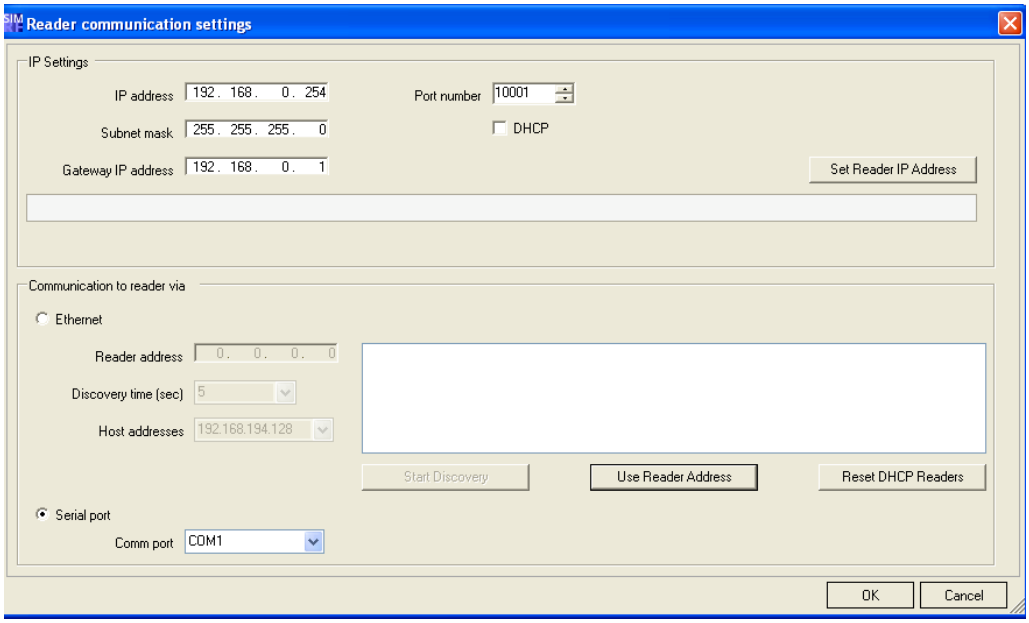
Restoring default settings on a DHCP reader

Note

Please note that this functionality is currently only available for the SIMATIC RF670R reader.

If DHCP is activated on a reader but no DHCP server is available, no connection can be made to that reader because it does not have an IP address.

Procedure



To assign the reader a new unambiguous IP address, proceed as follows:

1. Disconnect the affected reader from the network and connect it point-to-point with the configuration computer.
2. Select "Project > Reader configuration > Communication settings".
3. Click the "Reset DHCP Readers" button.

   The reader is reset to the default IP address and DHCP is deactivated.

4. Assign a new unique IP address to the reader.
5. Disconnect the reader from the parameterization computer and reconnect it to the network.

NOTICE
Several readers with identical IP address It is recommended that the affected reader is disconnected from the network and connected point-to-point with the configuration computer. If the reader remains in the network, all DHCP readers in the network are restored to their default settings and thus have identical IP addresses, because the "Reset DHCP Readers" button works on all DHCP readers in the network simultaneously. You must then disconnect all DHCP readers from the network, connect each point-to-point with the configuration computer, and successively assign each DHCP reader an unambiguous new IP address.

Result

The reader has an unambiguous IP address and can be addressed via the network, e.g. to make settings.

RF660R

Connecting stationary readers to the parameterization computer

You have two alternatives for connecting a reader of the RF660 series to your parameterization computer:

- Serial connection through RS232 cable.
- Ethernet connection (10/100 Mbit/s) via RJ45 cable, either over an Ethernet network (connection via hubs or switches) or as a point-to-point link using a crosslink cable directly between a PC and a reader.

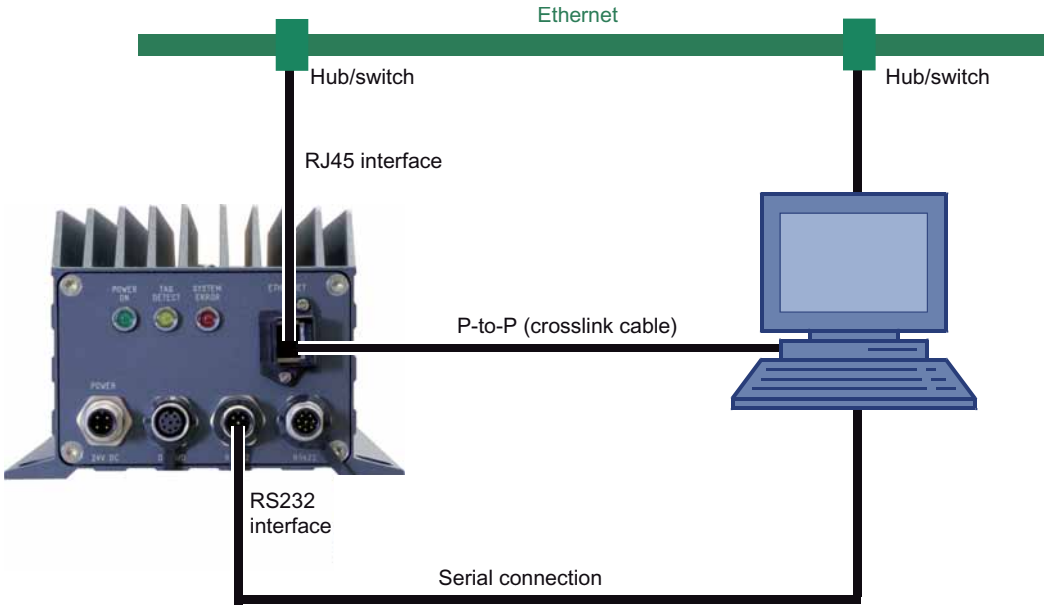


Figure 4-2 Connection options from reader to parameterization computer

Note

Setting-up an Ethernet connection

If you want to connect and parameterize a stationary reader of the RF660 family over Ethernet, initial contact must be made over a serial connection, i.e.: a serial connection over an RS232 cable must be available.

Connecting the stationary reader to the parameterization computer over a serial interface

Procedure	
1	Disconnect the reader from the power supply.
2	Connect the serial interface of the reader to a spare COM port of your parameterization computer using the RS232 cable (Order No. 6GT 2891-0GH50 or 6GT 2891-0GN10).
3	Connect the reader to the power supply.

Connecting the stationary reader to the parameterization computer over Ethernet

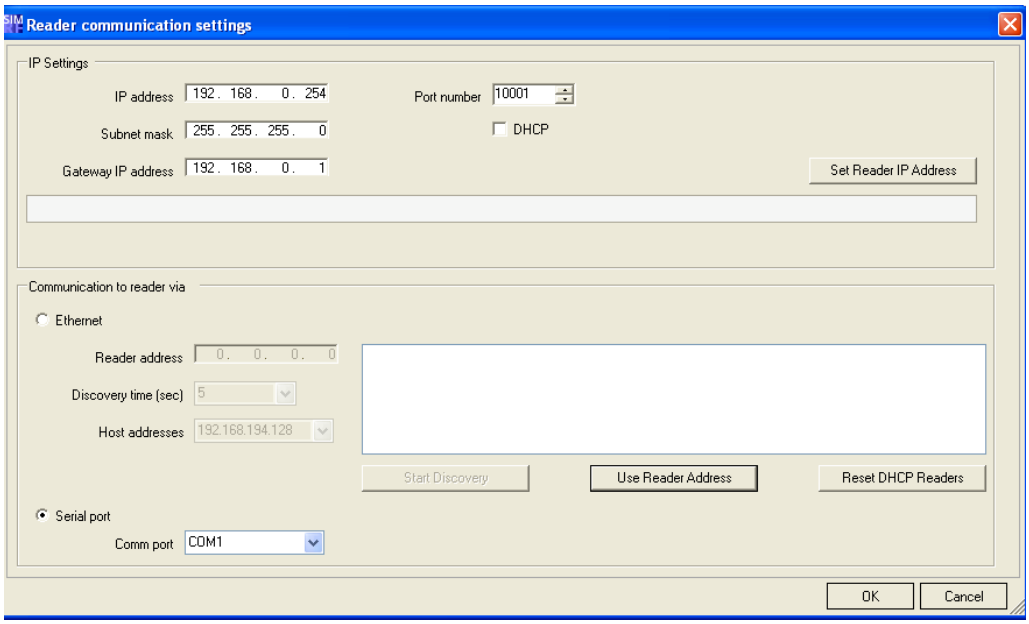
Procedure	
1	Disconnect the reader from the power supply.
2	Connect the Ethernet interface of the reader to the hub/switch to which your parameterization computer is also connected over an RJ45 cable. It is urgently recommended that the connecting cable (Order No. 6GT 2891-0HN10 or 6GT 2891-0HN20) is used when connecting via a hub/switch. When using RJ45 cables from other manufacturers, there is a risk that the cable will be difficult to remove from the socket of the reader. For point-to-point links, a crosslink cable **must** be used.
3	Connect the reader to the power supply.

Providing the stationary reader with communications capability

There are two possibilities for providing the reader with communications capability:

- Using the RF-MANAGER Engineering System
- Using the configuration software included in the scope of supply of the reader.

Providing the reader with communications capability using the RF-MANAGER Engineering System



1. Select "Project > Reader configuration > Reader communication settings".
2. In the "Reader communication settings" menu, you can
   - specify the reader's IP address and port number under "**Ethernet**" if the reader has already been pre-parameterized.

     If the reader has not been pre-parameterized, use the "Start Discovery" button to activate the automatic reader search function in the application.
   - Specify the required COM interface for initial contact between the parameterization computer and RF660R reader under "**Serial port**".
3. In the "IP Settings" menu, you can set new Ethernet parameters for the reader. These include:
   - The IP address,
   - The IP address of the gateway
   - The subnet mask
   - and the port number

   Click the "Set Reader IP Address" button to transfer the new settings to the reader. Alternatively, DHCP can also be set.

NOTICE
Deactivate firewall If you want to parameterize a reader of the RF600 family over Ethernet, deactivate your firewall before communication starts between the parameterization computer and the reader. Otherwise, it may not be possible to connect.

NOTICE
Avoid simultaneous Ethernet access to RF660R readers The SIMATIC RF660R Configuration Software and the RF-MANAGER cannot simultaneously access the same reader of the RF660 family via Ethernet. If you require simultaneous access, connect the reader and the SIMATIC RF660R Configuration Software over the serial interface.

Establishing the communication capability of the RF660R reader using the SIMATIC RF660R Configuration Software

As an alternative to using the RF-MANAGER Engineering System, you can use the SIMATIC RF660R Configuration Software that is included in the scope of supply of the reader to provide the reader with communications capability:

- The radio profile applicable to your country has been set up.
  ("Welcome" screen)
- A permanent IP address has been assigned to the reader or DHCP has been activated.

  Note when using DHCP that a specific pre-installed infrastructure is required.
  ("Ethernet and notify channel settings" menu)
- Alarm channel configuration is set to "**None**".
  ("Ethernet and notify channel settings" menu)
- Read trigger mode is set to "On application request".

  Specification of a value / change in the default value for the "Minimum trigger duration" is not necessary.
  ("Trigger settings" menu)
- The reader is in "Stand-alone" mode.
  ("Reader mode settings" menu)

Note

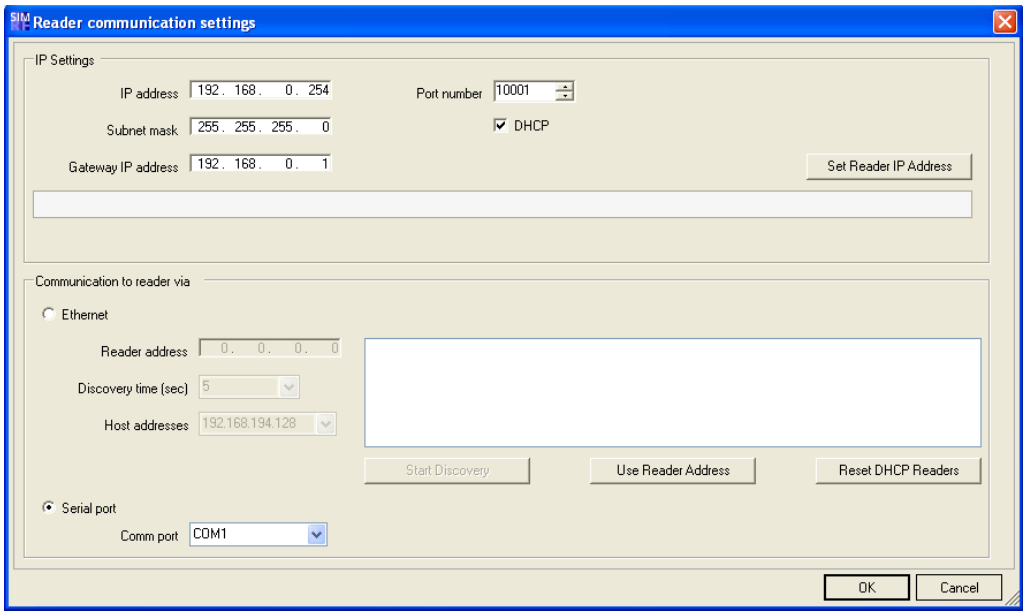
For more information on DHCP

See Chapter Enabling DHCP (Page 103)

Enabling DHCP

The RF660R reader can be switched over to DHCP mode using the "Communication settings" menu item in RF-MANAGER.

Procedure



1. Connect the reader that should be switched over to DHCP mode to the parameterization computer.
2. Select "Project > Reader configuration > Reader communication settings" and click the option "DHCP" to activate it.

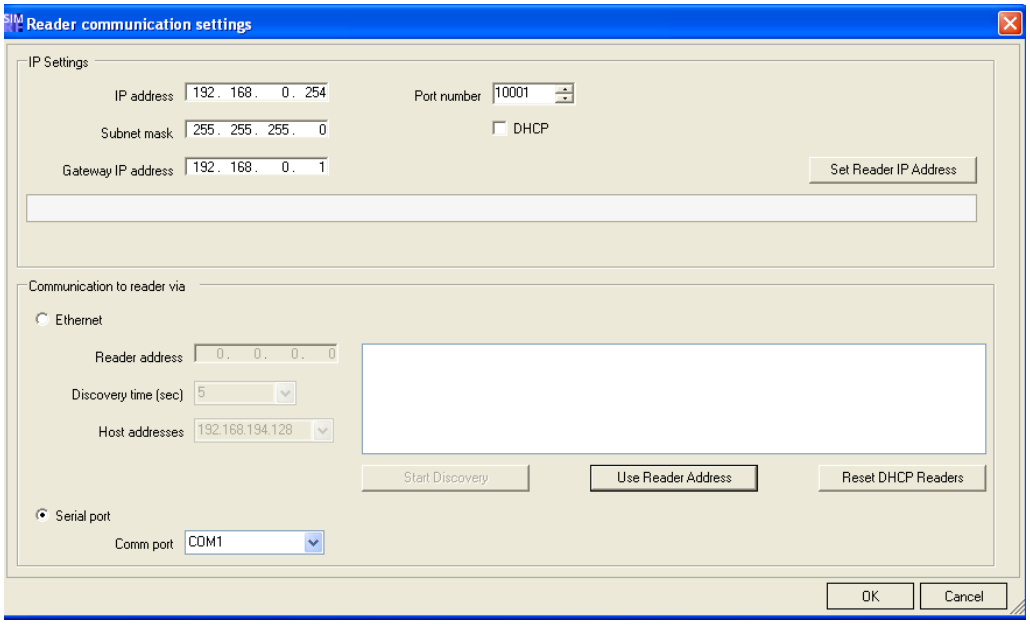
   The DHCP mode is activated for the selected reader.
3. Click the "Set Reader IP Address" button.

   The new settings are transferred to the reader.
4. Disconnect the connection between the reader and the parameterization computer again.

Disabling DHCP

The DHCP mode can be disabled for the RF660R reader via the Communication settings menu item in RF-MANAGER.

Procedure



1. Connect the reader for which the DHCP mode is to be deactivated to the parameterization computer.
2. Select "Project > Reader configuration > Reader communication settings" and click the option "DHCP" to deactivate it.

   The DHCP mode is deactivated for the selected reader.
3. Click the "Set Reader IP Address" button.

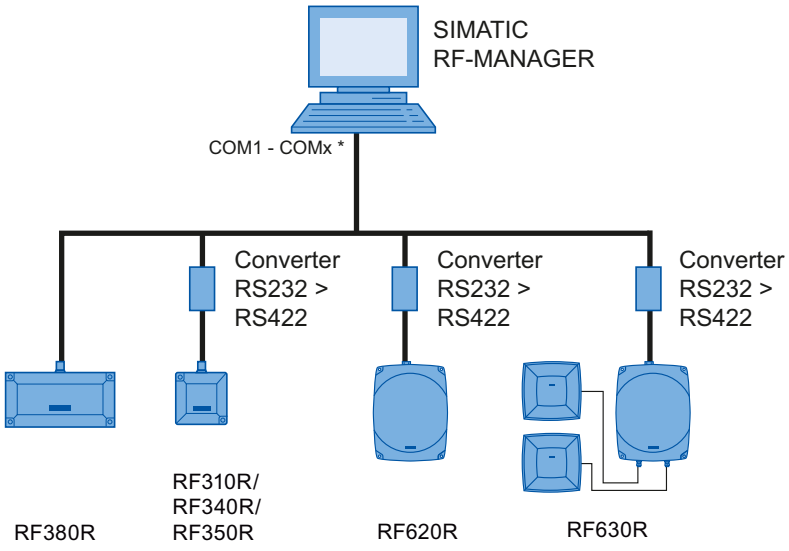
   The new settings are transferred to the reader.
4. Disconnect the connection between the reader and the parameterization computer again.

RF620R/RF630R, RF310R, RF340R, RF350R, RF380R

Connecting the stationary reader to the parameterization computer over a serial interface

You have two alternatives for connecting a reader to your parameterization computer:

Reader	Connection option
RF620R/RF630R RF310R, RF340R, RF350R,	• Serial connection via RS232/RS422 interface converter
RF380R	• Serial connection through RS232 cable



* Readers are connected via one COM port each on PC

Figure 4-3 Reader to parameterization computer connection options

Connecting the stationary reader to the parameterization computer via RS232/RS422 interface converters

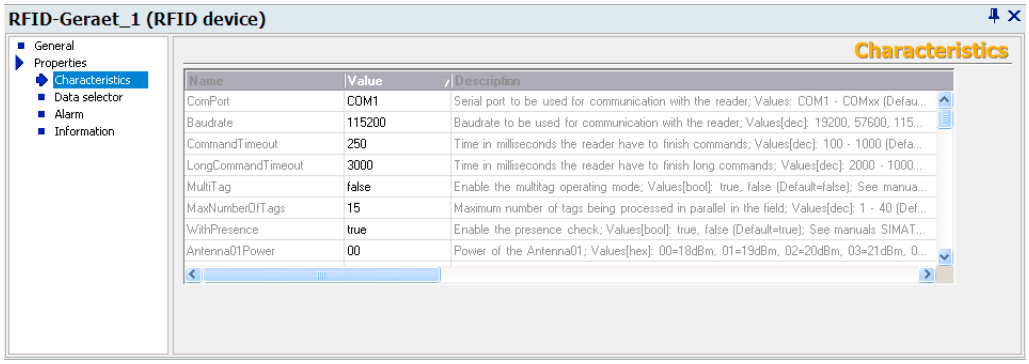
Procedure	
1	Disconnect the reader from the power supply.
2	Connect the serial COM interface of the reader to an RS232/RS422 interface converter. Then connect the interface converter to your PC via an RS232 cable. A list of which interface converters have been tested by Siemens along with their pin assignment can be found in the RF600 System Manual, chapter "Integration into networks".
3	Connect the reader to the power supply.

Connecting the stationary reader to the parameterization computer over a serial interface

Procedure	
1	Disconnect the reader from the power supply.
2	Connect the serial interface of the reader to a spare COM port of your parameterization computer using the RS232 cable (Order No. 6GT 2891-0GH50 or 6GT 2891-0GN10).
3	Connect the reader to the power supply.

Providing the reader with communications capability

Providing the reader with communications capability

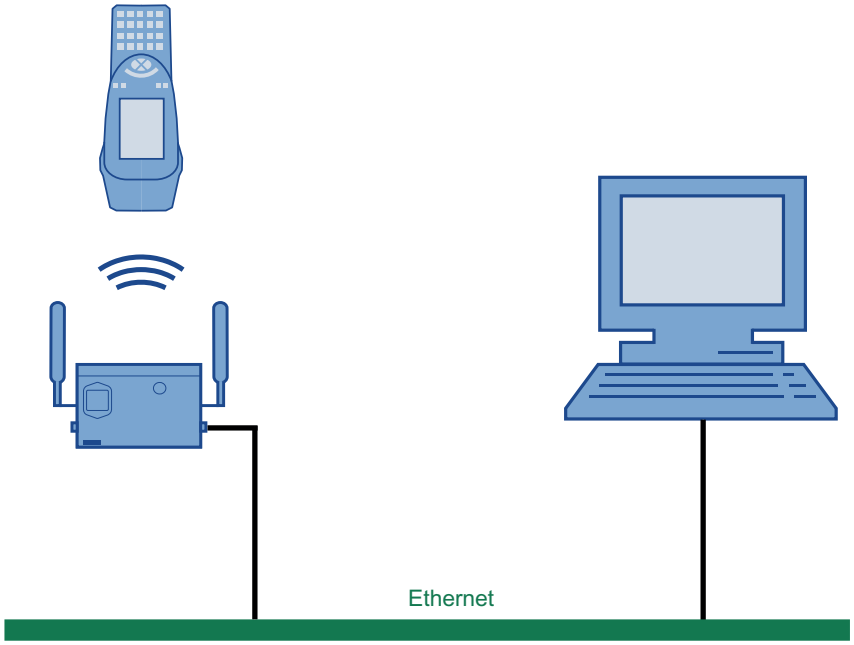


1. Enter the ComPort and baud rate in the dialog box "RFID-Gerät>Eigenschaften>Eigenschaften".

Connecting and parameterizing mobile readers (RF310M/RF610M)

Preconditions for parameterization of the WLAN connection

- The mobile reader must be ready for operation (the battery is charged).
- The mobile reader must contain a WLAN card.
- A WLAN connection must exist between the reader and the network of the PC, e.g. via an access point.
- Information regarding the WLAN settings must be available.
- The operating mode of the mobile reader must be set to "Supervisor".



Overview of procedure

1. Make settings in the Engineering System.
2. Parameterize the WLAN card in the mobile reader.
3. Assign the IP address if a DHCP server is not used.
4. Start the application on the mobile reader.

Settings in the Engineering System

1. **Enter IP address of the reader**

   Enter the assigned IP address in the device settings of the mobile reader ("RFID devices > RFID device_X").

2. **Enter the network address of the PC**

   Enter the network address of the PC in the network settings ("Device settings > RFID / network settings").

Note

An automatic reader search is not possible in the Engineering System

The automatic reader search via "Project > Reader configuration > Communication settings" does not function in the case of mobile readers.

Parameterize the WLAN card in the mobile reader

Two examples are given below for the procedure that you can follow for configuring the WLAN card of a mobile reader. The examples pertain to the SIMATIC RF610M mobile reader, but are also applicable to the SIMATIC RF310M mobile reader.

Consult your network administrator to ensure that the WLAN connection is set up correctly. You will find detailed information on configuring the WLAN in the operating instructions for the PSION WORKABOUT PRO.

Please note that "WPA 2" encryption is only possible in Example 2.

Example 1

With this procedure, the active radio network is automatically displayed and "WPA 2" encryption is not possible.

1. Set the operating mode to "Supervisor" in SIMATIC RF610M.
2. In SIMATIC RF610M, select "Start > Programs > Summit > SCU"
3. Under "Active Config", select "**Third party**".
4. To activate these changes, set the device to "Power down" mode by pressing the <FN> key followed by the <ENTER> key. Then restart the device by pressing the <ENTER> key.
5. Select the required active radio network in the dialog that subsequently appears.
6. Click the "Connect" button and enter the respective encryption code under "Authentication" and "Network key".
7. Click on the "OK" button.

Example 2

1. In the mobile reader, select "Start > Programs > Summit > SCU"
2. Click on the "Config" tab.
3. Select the "New" button to create a new profile setting
4. Enter a name for the profile setting.
5. At least make the following settings:
   - **SSID** (name of the radio network), e.g. "RF610M"
   - **Auth** Type (security level): e.g. "Shared"
6. Select the encryption required under "Encryption": e.g. "WPA 2".
7. Then click the button "WEP/PSK Keys". Enter the encryption code and confirm with "OK".
8. Click the "Commit" button to confirm the settings.
9. In the "Main" tab, under "Active config", select the profile that should be active.

Note

Other encryption possibilities

You can also use other encryption methods, depending on the access point. "WEP" encryption is no longer regarded as secure; you should not use this.

Enter the IP address in the mobile reader

If a DHCP server is not present in the network, you must enter the IP address in the mobile reader:

1. Double-click the WLAN icon in the taskbar for this purpose.
2. Click the "Configure" button and select "Specify an IP address". Enter the IP address.

You can also enter the IP address in the following manner: "Start > Settings > Control Panel > Network and Dial-up Connections" and select the appropriate connection.

Notes on working with RF-MANAGER and a mobile reader

Display in the task bar

After establishing the connection between the mobile reader and RF-MANAGER, note the symbol in the task bar.

It provides the following information about the radio connection:

Green:	A radio connection exists
Red:	A radio connection does not exist

Working with RF-MANAGER and the mobile reader

To start working with the mobile reader, activate the "RF-MANAGER" application by double-clicking the desktop icon for the mobile reader.

Note

Display the MAC and IP address

Double-click the icon in the taskbar. The MAC address and IP address are displayed in the "Wireless Statistics" and "IP Information" tab sheets.

Use of DHCP (Dynamic Host Configuration Protocol)

Introduction

A DHCP server ensures that IP addresses are automatically assigned to DHCP-capable network clients in a network segment. The DHCP server uses the MAC address of the network client for this purpose. The IP addresses are assigned due to permanent assignment of a MAC address to an IP address. The readers of the RF600 family with Ethernet connection are DHCP-capable.
Mechanisms that extend beyond this, such as dynamic assignment of IP addresses or Domain Name Service (DNS), are not supported in RF-MANAGER.

RF-MANAGER always uses fixed IP addresses internally. If a reader is replaced and receives the IP address of a reader that is already known, the new reader will be reparameterized when the connection is established. The new reader will then function without any further modification to the project configuration.

Requirements for activating DHCP

A DHCP server must be present in the network segment.

An up-to-date list of permanent assignments between MAC addresses and IP addresses must be stored in the DHCP server. This list must be maintained by your responsible IT staff member.

You will find the MAC addresses of readers:

- In the case of mobile readers, in the "Wireless statistics" tab

  Double-click the WLAN icon in the taskbar and access the "Wireless statistics" tab.

NOTICE
Ensure that the DHCP server is running and the readers are entered in the list. Otherwise RF-MANAGER will be unable to establish a connection to a reader following activation.

- DHCP can be used with the mobile reader if a WLAN card is inserted and the card is parameterized (seeParameterize the WLAN card in the mobile reader (Page 109)).

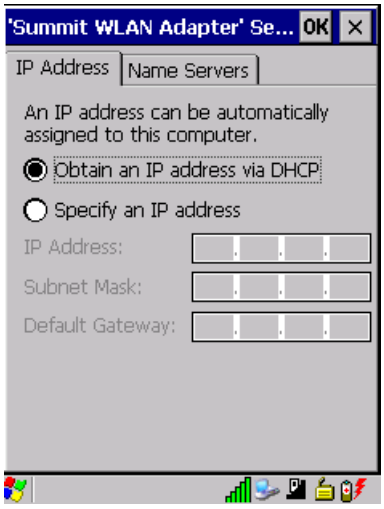
Enabling DHCP

The mobile reader is switched to DHCP mode using the integral device menu. Proceed as follows:

1. Double-click the WLAN icon in the taskbar.

   Select "IP Information > Configure" to access the tab sheet for enabling DHCP mode.

2. Activate the button "Obtain an IP address via DHCP" here.



Alternatively, you can call up the tab sheet for enabling DHCP mode via "Start > Settings > Control Panel > Network and Dial-up Connections > Selection of the appropriate connection > IP Information > Configure".

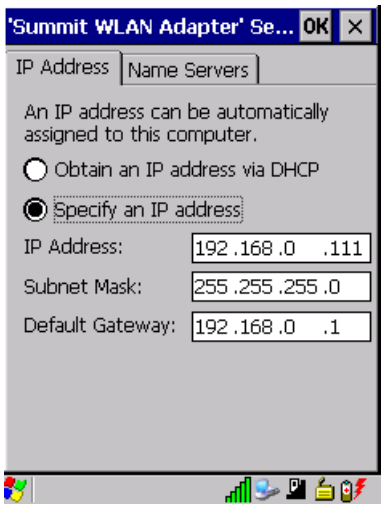
Disabling DHCP

If you want to disable DHCP mode for a mobile reader, proceed as follows:

1. Double-click the icon in the taskbar.

   Select "IP Information > Configure" to access the tab sheet for disabling DHCP mode.

2. Deactivate the button "Obtain an IP address via DHCP" here.



Benefits of replacing a reader with DHCP

DHCP mode allows a reader to be replaced without the need for modifying the configuration in the project. The IT staff member only has to change the NAC address in the DHCP server.

Mobile reader: SIMATIC RF310M and SIMATIC RF610M

Enable DHCP mode on the mobile reader as described above under *Mobile reader: SIMATIC RF310M, SIMATIC RF610M > Enabling DHCP*.

If the new reader is detected by RF-MANAGER and its configuration is not in accordance with the settings in the project, the reader will be automatically reparameterized.

4.2.7.2 Using the simulator

The RF-MANAGER is supplied with a simulator which you can use to test the essential components of the RFID project.

The simulator is a separate application.

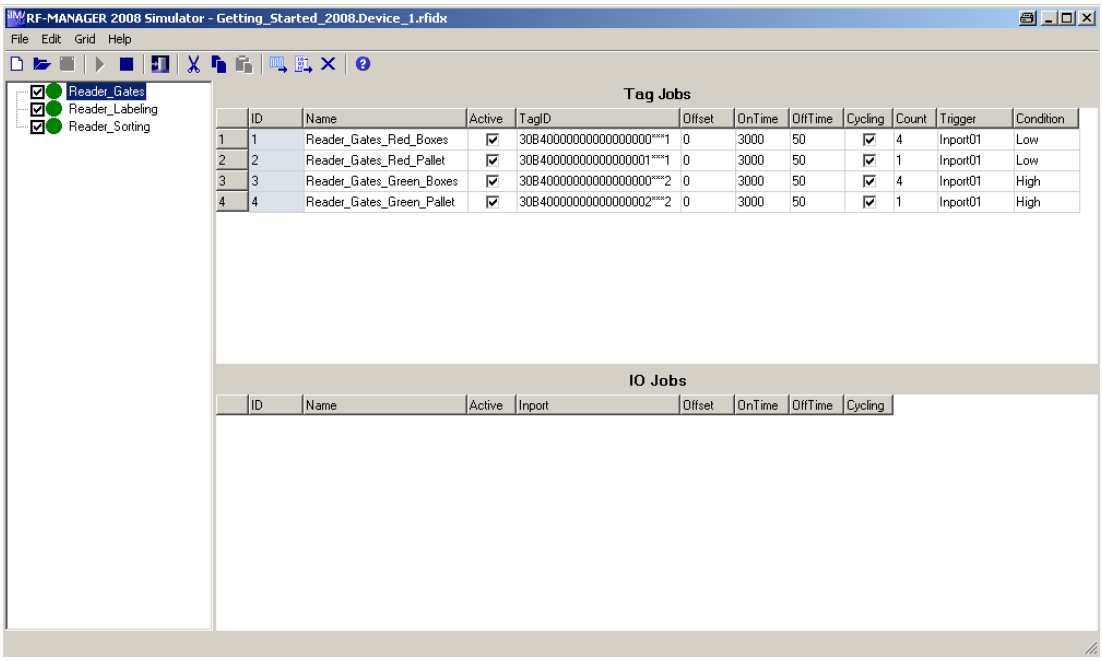
You can use the simulator to simulate operation of the readers used in your projects using pre-defined tag events in the runtime system. The tag events are created in a simulation table. Tag IDs can be defined simply and conveniently in this table. It is also possible to trigger several tag IDs simultaneously.

You can also simulate reader inputs on the runtime system. The I/O events are also created in a simulation table. You can easily define the reader inputs and their conditions in this table.

Simulated reader inputs can also be used to trigger tag events.

Simulation of tags

During simulation, you can use a simulation table to create any number of tag jobs with predefined tag events for the readers configured in the Engineering System. These jobs are independent of each other and can execute once, cyclically or triggered by reader inputs.



The created jobs can be set to active or inactive. You can also copy the jobs and delete individual jobs.

Simulation of reader inputs

Using the simulation table I/O jobs, you can simulate reader inputs with predefined time events on the runtime system.

For detailed information please see the simulator help system.

Handling instructions

The following steps show the basic procedures for simulating a project.

1. Start by creating a project as it is going to be run later with an interconnected controller.
2. Save and compile the project.
3. Launch the simulator directly from the running configuration software. Select "Compiler" > start Runtime with simulator" from the "Project" menu.
   When you simulate the project for the first time, the simulator is started with new, empty simulation tables; only the previously configured readers are shown. You can then create the required jobs for each reader and parameterize them using "Edit > Insert".
   If you have already created a simulation table for your project, it will then be opened automatically. The simulation table "*.rfidsim" contains all the settings that you made for the simulation. These settings can be changed.
4. You can save all settings made in this table for project simulation to a file. To do so, select "File > Save" in the Simulator, then type in a file name ("*.rfidsim".) You can now always retrieve these settings in order to simulate your project again.
5. When you click the Start button, simulation will be started in the runtime system.

4.2.7.3 Basic functional test of the RF670R using the SIMATIC RF-MANAGER Basic

Requirements

If problems occur when using the RF670R reader, you can check the general functionality as follows:

- The antenna configuration must be as shown in the figure below.
- The reader is connected to the SIMATIC RF-MANAGER Basic.
- RF-Manager 2008 and RF-Manager 2008 Runtime must not have been started.

Procedure

To check whether the reader can read a tag, proceed as follows:

1. Open the RF-MANAGER Basic.
2. Select the IP address of the reader to be checked (see).
3. Hold a tag on an electromagnetically neutral base in the middle in front of the antennas.

NOTICE
As a base use wood or plastic, for example, but definitely do not use any metallic or field-influencing materials.

4. In the menu "View", select the "Diagnosis View" command or click the icon.

   The "Diagnosis View" dialog box is opened.
5. Click "Start".

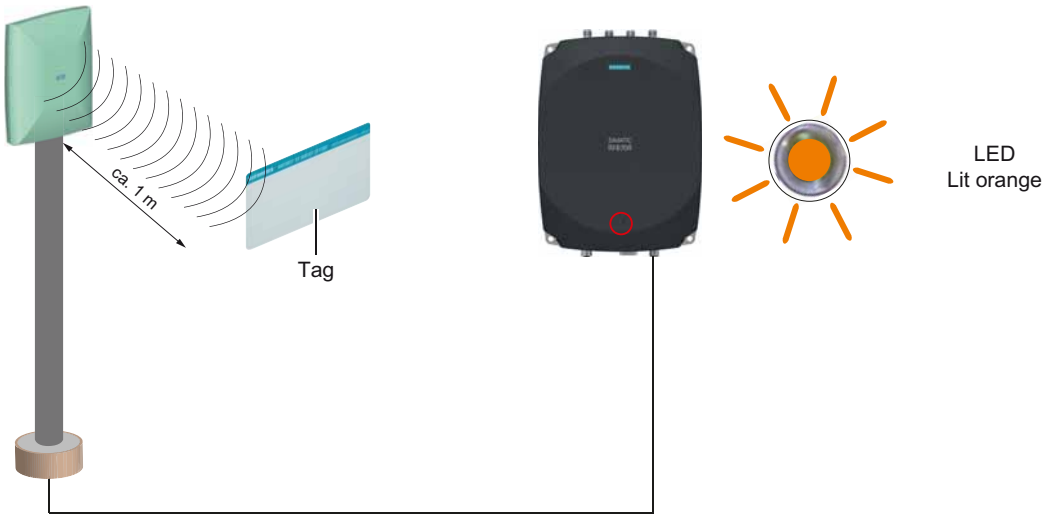


Figure 4-4 Configuration to test the RF670R

Result

If the tag in the field can be read by the reader, it will appear in the list in the "Diagnosis View" dialog. In addition, the orange LED of the RF670R indicates that a tag recognized by the reader is presently located in the field.

4.2.7.4 Basic functional test of the RF660R using the SIMATIC RF660R Configuration Software

Requirements

If problems occur when using the RF660R reader, you can check the general functionality as follows:

- The antenna configuration must be as shown in the figure below.
- Alternative configuration:

  The antennas are installed above one another. Mounting height of the first antenna 1 m above the ground, the second antenna 2 m above the ground (bottom edge of antenna in each case)
- Reader must be in the "Autonomous" operating mode.
- The reader must be connected to the *RF660R Configuration Software*.

Procedure

Hold a tag on an electromagnetically neutral base in the middle in front of the antennas.

NOTICE
As a base use wood or plastic, for example, but definitely do not use any metallic or field-influencing materials.

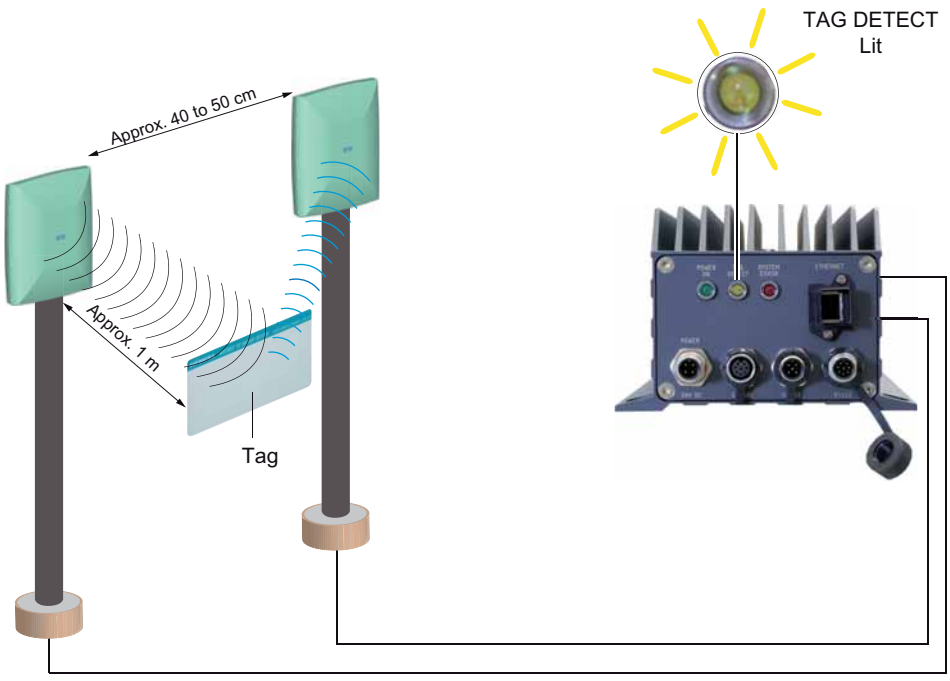


Figure 4-5 Configuration to test the RF660R

Result

The "Tag Detect" LED of the RF660R starts to light up yellow.

Event monitor

To view the tag ID, ID type, protocol and time stamp of the transmitted tag, click the "Event monitor" button in the *RF660R Configuration Software*.

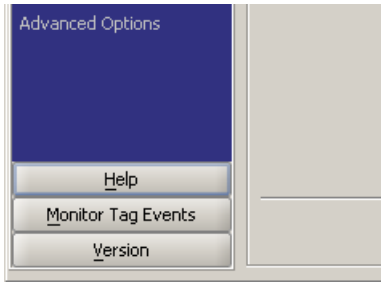


Figure 4-6 Event monitor button

The following window is displayed:

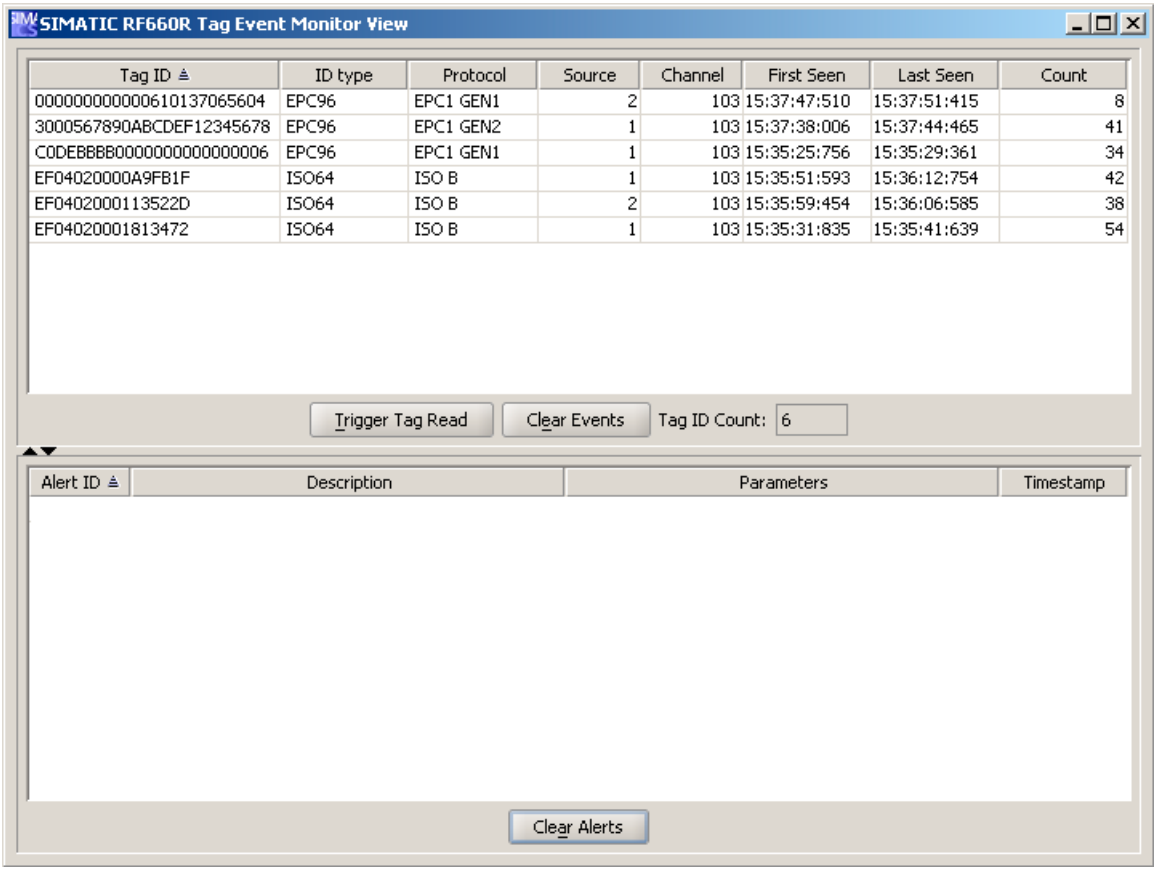


Figure 4-7 Tag event monitor

4.2.8 Starting the project

Introduction

You can start the project after it has been transferred.

Project start modes

Options for starting an RF-MANAGER project on a Runtime PC:

- Running it from the Explorer

  You can run the project by double-clicking the file name of your project with the extension ".rfid" in Windows Explorer.

- Starting together with Runtime

  Enter the project file in "RfmHmiRT.ini" in order to run it with the start of Runtime by means of the Windows Start menu.

- Run from the command line

  You can start your project using "Run" in the Windows start menu by entering the following command line, for example:

  ```
  "c:\Programme\Siemens\SIMATIC RF-MANAGER\SIMATIC RF-MANAGER 2008
  Runtime\RfmHmiRT.exe" c:\project\myproject.rfidx
  ```

  and then pressing <Enter>.

- Autostart
  - If your project is linked to the Autostart directory of the Windows start menu, it will be automatically upon system startup.
  - It is also possible to define the autostart settings in the "Settings" dialog box of the Runtime loader.

  Note

  You can start the loader with the Windows Start menu command "SIMATIC\SIMATIC RF-MANAGER Runtime\SIMATIC RF-MANAGER Runtime Loader".

  RF-MANAGER Runtime comprises two parts:
  - Runtime for monitoring
  - Runtime for RFID processing.

When it is activated, both parts are started using the current configuration data.

4.2.9 Data comparison with the runtime system

Introduction

You can use the option "Data comparison with the runtime system" to save changes in the Engineering System that you made to your project at runtime in the "Configuration" view. In this procedure, the changes are saved in an xml.sync file and copied into the project in the Engineering System.

General procedure

1. Save your project modifications in the Configuration View in runtime.
2. In the Engineering System, select the option "Project > Data comparison with the runtime system".
3. Select the corresponding runtime system. If only one runtime system is available, this will be selected automatically.
   When the runtime system with the project to be compared is located on a PC other than the engineering system, select the option "Use transfer settings".
4. Then click on "Compare data".

The progress of data comparison is indicated in the output window. Any warnings or error messages will also be displayed here. When the procedure is completed, the message "Data comparison completed" is displayed in the output window.

Note

Check the option "Use transfer settings"

To avoid mistakes, you should check whether the option "Use transfer settings" is enabled or not before every synchronization procedure.

Using the object option

You can use the option "Create new objects" to refine the data comparison and adapt it to your specific requirements. In this case, comparison of each change to a multiply referenced object in the runtime system will result in the creation of new objects.

Application example
In RF-MANAGER, you configure a data selector and use it in five notification channels on five readers. This means that: You create an object with five references.
At runtime, you change the parameterization of the data selector for four of the five notification channels. If you selected the option "Create a new object" for data comparison, four new objects (in this case data selectors) are created and saved back to the project.
If you did not select the option "Create new object", no new objects will be created and the properties of the first imported data selector will be saved back to the project. The data selector will still represent an object with five references.

Displaying the data comparison report

You can display the data comparison report in XML format for each runtime system. Detailed information on the last synchronization procedure is saved in this file.
To display the report, select the option "Project > Data comparison with the runtime system". Select the appropriate runtime system and then click "Data comparison report".

Displaying the progress of data comparison

You can display the progress of data comparison in TXT format for each runtime system. Information on all previous comparison procedures is saved in this file.
To display the progress, select the option "Project > Data comparison with the runtime system". Select the appropriate runtime system and then click "Progress of data comparison".

See also

Configuration (Page 500)

4.2.10 Backup configuration data

Several years of operation in a rugged industrial environment may damage the hard disk drive of your runtime system. To ensure that you can retrieve all programs and settings to the new hard disk, create a backup copy of your hard disk configuration data. For detailed instructions for creating a backup, please see the documentation of the backup software that you have chosen.

4.2.11 Stop runtime

Introduction

You specify the operations for terminating Runtime in the configuration.

Procedure

- When Runtime is running in window mode, you can close it simply by clicking "Close". Alternatively, you can also exit the runtime system via the Start Center in the quick start bar.
- When Runtime is running in full-screen mode, you can close it by means of the program switching function and the Task Manager.
- When Runtime is running in full-screen mode and program switching is disabled for the project, the closing sequence of Runtime must be configured separately. Actuate the relevant button to close Runtime.

Note

RF-MANAGER Runtime comprises two parts:

- Runtime for monitoring
- Runtime for RFID processing.

When Runtime is terminated, only the part "Runtime for monitoring" is ended. The part "Runtime for RFID processing" continues to run and can be terminated using the system function "StopRfidProcessing". Alternatively, you can also exit the runtime system via the Start Center in the quick start bar.

Note

Please note that it can take some time to exit RF-MANAGER runtime.

4.3 Functionality in Runtime

4.3.1 Screen objects in Runtime

Overview

The runtime system of RF-MANAGER offers the following objects for operation and display:

- Button
- I/O field
- Graphic I/O field
- Symbolic I/O field
- Alarm indicator
- Alarm view
- Alarm window
- Date/time field
- User view
- RFID views
- Statistics view
- Configuration

4.3.2 Alarms in Runtime

Alarms

Alarms indicate events and states in the runtime system which have occurred in the plant or in the runtime system itself.

An alarm may contain the following information:

- Date
- Time
- Alarm text
- Device
- Status
- Alarm class
- Alarm number

Alarm classes

Alarms are assigned to various alarm classes.

- System

  System alarms indicate states or events which occur in the runtime system.

  System alarms provide information on occurrences such as operator errors or communication faults.

- Predefined alarm classes

  Class of alarms that provide information about errors and other system alarms.

- Custom alarm classes

  The properties of this alarm class must be defined in the configuration

Alarm buffer

Alarm events are saved to an internal, temporary buffer.

Alarm logging

When alarm logging is enabled, alarm events are output directly to the printer.

You can set the logging function separately for each alarm. The system outputs "activated" and "deactivated" alarm events to the printer.

The output of alarms of the "System" class to a printer must be initiated by means of the corresponding alarm buffer. This outputs the content of the alarm buffer to the printer. To be able to initiate this print function, you need to configure a corresponding control object in the project.

Alarm log

Alarm events are stored in an alarm log, provided this alarm log is configured.

Alarm view

The alarm view shows selected alarms or events from the alarm buffer or alarm log. By means of configuration, the display can be filtered in such a way that only alarms that contain a specific character string will be shown.

Alarm window

If configured, an alarm window shows all pending alarms of a particular alarm class. The alarm window is displayed as soon as a new alarm occurs.

You can configure the order in which the alarms are displayed. You can choose to display the alarms in ascending or descending order of their occurrence. The alarm window can also be set to indicate the exact location of the fault, including the date and time of the alarm event. By means of configuration, the display can be filtered in such a way that only alarms that contain a specific character string will be shown.

Alarm indicator

The alarm indicator is a configured graphic symbol that is displayed on the screen when an alarm activates. The alarm indicator is configured in the screen's template and is thus a component of all screens in a project.

The alarm indicator can have one of two states:

- Flashing: At least one unacknowledged alarm is pending.
- Static: The alarms are acknowledged but at least one of them is not yet deactivated.

Function lists can be used to configure the responses of the runtime system.

4.3.3 Variables in the runtime system

Definition

Variables correspond to defined memory areas in the runtime system, to which values are written and/or from which values are read. This action can be initiated by the reader or PLC, or by the operator on the runtime system.

4.3.4 Log files in the runtime system

Overview

Alarm events can be saved in logs.

Examples of alarm events are the activated and deactivated events occurring with a fault alarm.

Memory options

Depending on the configuration, the logs are written to a file or stored in a database set up for this purpose.

- Logging to a CSV file

  The project engineer must have specified a folder path for storing the CSV file containing your logged data. This references the storage location.

  CSV format table columns are separated by separators, the table rows are terminated by a line break character. This allows you to evaluate or edit your log data using an external text editor or spreadsheet program, for example.

- Logging to a database

  By storing your log files in a database, you can utilize the full database functionality for further processing and analysis of the logged data.

  The following databases have been tested and released for RF-MANAGER:

  – MS Data Engine 97 and MS Data Engine 2000
  – MS Access 97 and MS Access 2000
  – MS SQL Server 7.0 and MS SQL Server 2000

The following types of log are used in RF-MANAGER:

- Circular log
- Segmented circular log
- Log with level-dependent system alarm
- Log file with data volume-based system alarm

Alarm logs

Alarms in the project indicate fault states and operating states of the plant. Alarms can be displayed in the screens on the runtime system. RF-MANAGER lets you log alarms and document operational states and error states of the plant.

The following data are logged to the file:

- Date and time of alarm
- Alarm number
- Alarm tags (up to 8)
- Alarm status
- Alarm text (optional)
- Device (optional)

All alarms are assigned to a specific alarm class. All alarm classes can be logged.

Alarms can be logged either automatically, or by operator intervention.

The contents of log files can be displayed in the runtime system if a corresponding alarm view has been configured.

4.3.5 Reports in the runtime system

Overview

Reports are used to document plant processes. The log content and layout are specified in the project, as is the event triggering the printout of the report.

For example, a report can be configured for output at the end of a shift, in order to document faults.

Output

Reports are printed in Runtime either automatically, e.g. by means of a scheduler, or manually, e.g. by means of a function key.

Printing reports

Reports are output to the printer in graphic mode. The use of a serial printer is not recommended because of the accumulated data volume.

For proper output, the printer must support the paper format and page layout of the report.

Note

The value of a variable in the report is read and output at the moment of printing. A substantial time may elapse between printing out the first and the last page of a report consisting of several pages. The same variable can therefore be output on the last page with a different value to that on the first page.

4.3.6 System functions and scripts in Runtime

Purpose

System functions and scripts are used in Runtime for the following purposes:

- To perform actions
- To control the system
- To utilize the properties of the runtime system
- To make system settings online in the runtime system

In RF-MANAGER, each system function and each script is linked to an object, such as a button, field or screen, and an event. As soon as the event occurs, the system function is triggered.

System functions

System functions are predefined functions that are used to implement many tasks in Runtime, such as:

- Writing/reading tags
- Calculations, e.g. increasing a variable value by a specific or variable amount
- Logging functions, e.g. starting an alarm log
- Settings, e.g. setting a bit in the reader.
- Alarms, e.g after a different user logs on.

Scripts

Scripts may also be included in the project for specific applications which may require additional functions. For the creation of scripts, RF-MANAGER provides an interface to Microsoft Visual Basic Script (VBScript). This allows you to integrate additional functions, such as:

- conversion of values, e.g. between different physical units (temperatures)
- Evaluation of several reader I/Os

The status can be checked based on the returned values, and appropriate measures can thus be initiated.

Events

The object and the selected function determine what events can be defined as triggers for executing a system function.

For example, the events "Change Value", "Below Lower Limit" and "Above Upper Limit" are associated with the "Variable" object. The "Loaded" and "Cleared" events are associated with the "Screen" object.

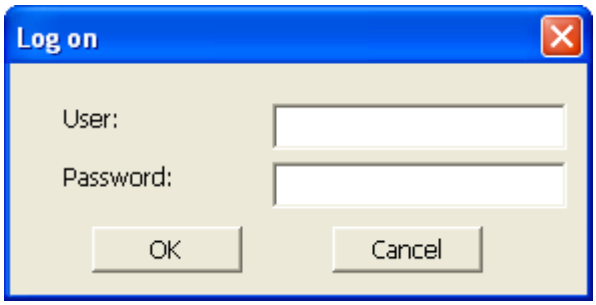
4.3.7 Security in the runtime system

Overview

The configuration engineer can protect the operation of a project by implementing a security system. The security system is based on authorizations, user groups and users.

The security system of the runtime system is based on authorizations, user groups and users.

If operator control objects protected by a password are operated, the runtime system requests the entry of a password. A login screen is displayed in which you enter your user name and password. After logging on, you can operate the operator control objects for which you have the necessary authorizations.



The login dialog can be set up by the configuration engineer via an individual operator control object.

In the same way, the configuration engineer can set up an operator control object to log off. After logging off, objects assigned password protection can no longer be operated; to do so, log in again.

User groups and authorizations

Project-specific user groups are created by the configuration engineer. The "Administrators" group is included in all projects by default. User groups are assigned authorizations. The authorization required for an operation is specifically defined for each individual object and function in the project.

Users

Each user is assigned to exactly one user group.

Users can be created as follows:

- By the configuration engineer during configuration
- By the administrator on the runtime system
- By a user with "Administration" authorization to the user administration on the runtime system

Passwords

Only registered users may log on to Runtime by entering their user name and password. The passwords can be assigned by the configuring engineer, by the "Admin" user (or by users who have "Administration" authorization), or by the user himself.

The authorizations of a user after logging in depends on the user group to the user is assigned.

After the project is transferred, only the administrator is authorized to create user accounts, make user group assignments, and change passwords. Any other users who are subsequently assigned to the "Administrator" group by the administrator may also carry out these tasks.

The user data are encrypted and saved on the runtime system to protect it from loss due to power failure.

Note

Depending on the transfer settings, changes to the user data are overwritten when the project is transferred again.

Logoff times

A logoff time is specified in the system for each user. If the time between any two user actions, e.g. entering a value or changing screens, exceeds this logoff time, the user is automatically logged off. The user must then log in again to continue to operate objects assigned password protection.

User view

Use the User View to display the users on the runtime system.

User	Password	Group	Logoff time
Admin	********	Group (9)	5
PLC User	********	Group (1)	5
User 1	********	Group (1)	5

Export and import

The users, passwords, group assignments and logoff times established on the runtime system can be exported and then imported on a different runtime system. This prevents you having to enter all of the data again on another runtime system.

NOTICE
When importing, the currently valid user data is overwritten. The imported user data and passwords are valid immediately.

4.3.8 Further operating options in Runtime

Print functions

Print functions available in online mode:

- Hardcopy

  You can print the content of the currently displayed screen if you utilize the "Print screen" system function in your configuration.

- Printing alarms

  Each alarm event that occurs (activated, deactivated) is also sent to a printer.

- Printing reports

4.4 Operating a project in Runtime

4.4.1 Basic principles

Introduction

Operation of a system is dependent on the way that the project was created. This chapter contains general information on the settings for the Runtime software and the operation of predefined screen objects.

Screen objects provide general system functions. Screen objects may have been used and configured in screens of the project.

Multi-key operation

Multi-key operation may initiate unwanted actions: You must only operate one function key or button at a given time.

Change language

RF-MANAGER allows you to configure a multilingual project. Up to five of these project languages can be loaded simultaneously onto the runtime system.

You can switch between the individual languages in Runtime, provided this function has been configured. When languages are switched, the language-dependent objects such as texts or formats are displayed in another language. Objects that may contain language-relevant texts include:

- Alarms
- Screens
- Text lists
- Help texts
- Date/time
- Decimal symbol
- Static texts

4.4.1.1 Operation using mouse and keyboard

Operation with the keyboard

The navigation options listed in the table can be used for keyboard operations in a screen.

Navigation	PC
Next field right/left	<Shift+Right> / <Shift+Left>
Next field up/down	<Shift+Down> / <Shift+Up>
To the right/left in the field	<Right> / <Left>

The other function keys on the PC are assigned as follows:

Key	Function
<Enter>	Applies a value (e.g. in unmarked input fields) or opens a selection list. If the I/O field is marked (highlighted in color), the runtime system will switch to the special editing mode. Now, only one character will be marked in the field. Use the cursor keys <Up>/<Down> to scroll through a character table. Use the <Right>/<Left> cursor keys to move the cursor to the next or previous input position. Press <Enter> or <Esc> to exit from the entry mode. The characters entered up to this point will be either applied or discarded.
<Esc>	Interrupts the input.
<Tab>	Selects the next available screen object in the configured tab sequence.
<Shift+Tab>	Selects the previously available screen object in the configured tab sequence.
<F1> … <F12>, <Shift+F1> … <Shift+F12>	Triggers a function, e.g. screen selection.

⚠ CAUTION

If you press a function key after a screen change, the associated function in the new screen may be triggered before the new screen is fully displayed.

Controlling Windows with the keyboard

You may also use the keyboard to control the operating system of your runtime system. See your Windows manual for detailed information. The most important key combinations are shown in the table below.

Navigation	Runtime system
Open start menu	<Ctrl+Esc>
Show the shortcut menu of the selected element	<Shift+F10>
Select all	<Ctrl+A>
Display properties of the selected element	<Ctrl+Enter>
Explorer:	
Change folder	<F4>
Change display areas	<F6>
Activate menu bar	<F10>
Dialogs:	
Go to next field	<Tab>
Back to previous field	<Shift+Tab>
Open next tab	<Ctrl+Tab>
Open previous tab	<Ctrl+Shift+Tab>

Operation with the mouse

A lightning symbol attached to the mouse pointer indicates that the screen object, for example a button, may be operated with the mouse.

4.4.2 Operating graphic objects

4.4.2.1 Button

Purpose

A button is a virtual key on the screen of the runtime system that can have one or more functions.

Layout

The layout of the button depends on the button type.

- Button with text: The text shown on the button gives information regarding the status of the button.
- Button with graphic: The graphic shown on the button gives information regarding the status of the button.
- Invisible: The button is not visible in the runtime system.

Operation

Depending on the configuration, you can operate the button in the following ways:

- Standard operation: Click on the button.
- Event: An event is triggered when you operate the button, e.g. when you click it. The processing of a function list can be configured to the event.

Operation behavior

The operation may be followed with a optical feedback. However, note that the optical feedback only indicates a completed operation and not whether the configured functions were actually executed.

Operation with mouse and keyboard

Operation with the mouse

1. Click the button.

Operation with the keyboard

1. Press the <Tab> key until the button is selected.
2. Press <Enter> or <Space Bar>.

4.4.2.2 I/O field

Purpose

You enter numeric or alphanumeric values in an I/O field. For example, a numeric value could be the number "80" as a temperature reference, an alphanumeric value could be the text "Service" as a user name.

Layout

The layout of the I/O field depends on the configuration:

- Numerical I/O field

  For input of numbers in decimal, hexadecimal or binary format.
- Alphanumerical I/O field

  For input of character strings.
- I/O field for date and time

  For input of calendar dates or time information. The format depends on the set configuration.
- I/O field for password entry

  For concealed entry of a password. The entered character string is displayed with placeholders (*).

Operation

Depending on the configuration, you can operate the I/O field in the following ways:

- Standard operation: Enter a value in the I/O field.
- Event: An event is triggered when you operate the I/O field, e.g. when you activate it. The processing of a function list can be configured to the event.

Operation behavior

Limit value test of numerical values

Tags can be assigned limit values. The entered value is then only accepted if the value lies within the configured limits.

If an entered value exceeds a configured limit value, e.g. "80" with a limit value "78", the entered value is rejected. If an alarm window is configured, then a system alarm is displayed automatically.

Decimal places for numerical values

If a numeric input field is configured with a specific number of decimal places, decimal places in excess of the limit are ignored. Empty decimal places are filled with "0" after the number is confirmed.

Hidden input

A "*" is displayed for every character during hidden input. The data format of the value entered cannot be recognized.

Operation with mouse and keyboard

Operation with the mouse

1. Click in the I/O field with the mouse pointer.
2. Type in the relevant value.
3. Confirm your input with <Enter> or cancel it with <Esc>.

Operation with the keyboard

1. Press the <Tab> key until the I/O field is selected.
2. Enter the value.
3. Confirm your input with <Enter> or cancel it with <Esc>.

Alternative operation with the keyboard

1. Press the <Tab> key until the I/O field is selected.
2. Press <Return>. The object changes to the specific editing mode. Now, only one character will be marked in the field.
3. Use the <Up>/<Down> cursor keys to scroll through a character table.
4. Use the <Right>/<Left> cursor keys to move the cursor to the next or previous input position.
5. Confirm your input with <Enter> or cancel it with <Esc>.

4.4.2.3 Graphic view

Purpose

The graphic view displays graphics.

Layout

The layout of the graphic is dependent on the configuration. The graphic view can, for example, be automatically adapted to the size of the graphic.

Operation

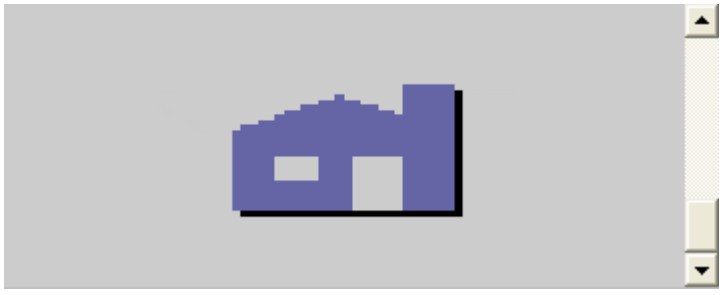
The graphic view is for display only and cannot be operated.

4.4.2.4 Graphic I/O field

Purpose

A graphic I/O field can have the following functions in the runtime system:

- Output of graphic list entries
- Combined entry and output



Operation

Depending on the configuration, you can operate the graphic I/O field in the following ways:

- Standard operation: Select an entry from the graphic list.
- Event: An event is triggered when you operate the graphic I/O field, e.g. when you activate it. The processing of a function list can be configured to the event.

Operation behavior

If the graphic I/O field displays a cactus image, you have not defined a graphic to be output for a specific value in your project.

The contents of the graphic I/O field change color in the runtime system to show that it is now activated.

The frame in 3D is only shown graphically in an output field.

Operation with mouse and keyboard

Operation with the mouse

1. Click on the graphic I/O field. The drop-down list opens.
2. Click on the scroll bar with the mouse pointer. Move the scroll bar in the desired direction while holding down the left mouse button.
3. Select the desired entry. The selection list is closed and the entry is displayed.

Operation with the keyboard

1. Press the <Tab> key until the graphic I/O field is selected.
2. Press <Enter>. The drop-down list opens.
3. Select the desired entry from the selection list. Toggle between the next or previous entry by using the cursor keys <Left>, <Right>, <Up> and <Down>.
4. Confirm your input with <Enter> or cancel it with <Tab> or <Esc>.

4.4.2.5 Symbolic I/O field

Purpose

A symbolic I/O field can have the following functions in the runtime system:

- Output of text list entries
- Combined entry and output

Operation

Depending on the configuration, you can operate the symbolic I/O field in the following ways:

- Standard operation: Select an entry from the text list.
- Event: An event is triggered when you operate the symbolic I/O field, e.g. when you activate it. The processing of a function list can be configured to the event.

Operation behavior

If the symbolic I/O field contains a blank text line in the selection list, an entry has not been defined in the project for a specific value. The contents of the symbolic I/O field change color in the runtime system to show that it is now activated.

Operation with mouse and keyboard

Operation with the mouse

1. Left mouse click on the symbolic I/O field. The drop-down list opens.
2. Click on the scroll bar with the mouse pointer. Move the scroll bar in the desired direction while holding down the left mouse button.
3. Select the desired entry with the left mouse button. The selection list is closed and the entry is displayed.

Operation with the keyboard

1. Press the <Tab> key until the symbolic I/O field is selected.
2. Press <Enter>. The drop-down list opens.
3. Select the desired entry from the selection list. Toggle between the next or previous entry by using the cursor keys <Left>, <Right>, <Up> and <Down>.
4. Confirm your input with <Enter> or cancel it with <Tab> or <Esc>.

4.4.2.6 Alarm indicator

Description

Purpose

During runtime, the alarm indicator is displayed if alarms of the specified alarm class are pending or require acknowledgement.

Layout

The alarm indicator can have one of two states:

- Flashing: At least one unacknowledged alarm is pending.
- Static: The alarms are acknowledged but at least one of them is not yet deactivated. The number indicates the number of queued alarms.

Operation

The alarm indicator can only be operated using the mouse. Depending on the configuration, you can operate the alarm indicator in the following ways:

- Standard operation: Activate the alarm indicator.
- Event: The alarm window is shown or hidden by operating the alarm indicator, e.g. by clicking. The processing of a function list can be configured to the event.

Operation behavior

Depending on the configuration, when operating the alarm indicator an alarm window is opened.

Operation with the mouse

Operation with the mouse

1. Click on the alarm indicator with the mouse pointer. Depending on the configuration, the alarm window is opened.
2. Use the Close icon to close the Alarm window and be able to operate the screens. The alarm window can be opened again by clicking on the alarm indicator.

4.4.2.7 Alarm view

Purpose

Alarms are indicated in the alarm view or in the alarm window in the runtime system. The layout and operation of the alarm window correspond to that of the alarm view.

Layout

Depending on the configuration, in the alarm view different columns with information regarding an alarm or an alarm event are displayed. Establishes that only alarms that contain a specific character string will be displayed in the alarm text.

Operation

Depending on the configuration you can:

- Change the column sequence
- Change the order in which the alarms are displayed
- Editing alarms
- Acknowledge alarms

Controls

The buttons have the following functions:

Button	Function
	Displays an alarm operator note
	Editing alarms
	Acknowledge alarms

Operation with mouse and keyboard

Introduction

Within an alarm view there is a tabulator sequence that enables the operating elements and the last selected alarm to be selected via the keys of the runtime system.

Operation with the mouse

1. Click on the alarm to be edited.
2. Click on the operating element you wish to use.

Operation with the keyboard

1. Press the <Tab> key until the list of displayed alarms is selected in the alarm view.
2. Click on the alarm to be edited. You can use the keys <Pos1>,<End>,<Up> and <Down> for this.
3. Press the <Tab> key until the operating element you wish to use is selected.
4. Press <Enter>.

Alternative operation

Depending on the configuration, you can also operate the alarm view via the function keys.

Example: Change the sequence of the columns

1. Select the "Alarm view" screen object using the mouse pointer.
2. Select "Edit" from the shortcut menu.

   Then you can edit the screen object.
3. Choose the column header e.g. the "Date" column header.
4. While holding down the mouse button, drag the column header to the column header "Time".

Example: Change the order of the columns

1. Select the "Alarm view" screen object using the mouse pointer.
2. Select "Edit" from the shortcut menu.

   Then you can edit the screen object.
3. Click on the column header.
4. Click the same column header again to reverse the sort order.

Example: Acknowledging an alarm

1. Select the "Alarm view" screen object using the mouse pointer.
2. Select "Edit" from the shortcut menu.

   Then you can edit the screen object.
3. Select the alarm to be acknowledged.
4. Click on the  button.

Example: Edit alarm

1. Select the "Alarm view" screen object using the mouse pointer.
2. Select "Edit" from the shortcut menu.

   Then you can edit the screen object.
3. Click on the alarm to be edited.
4. Click on the  button.

Operation behavior

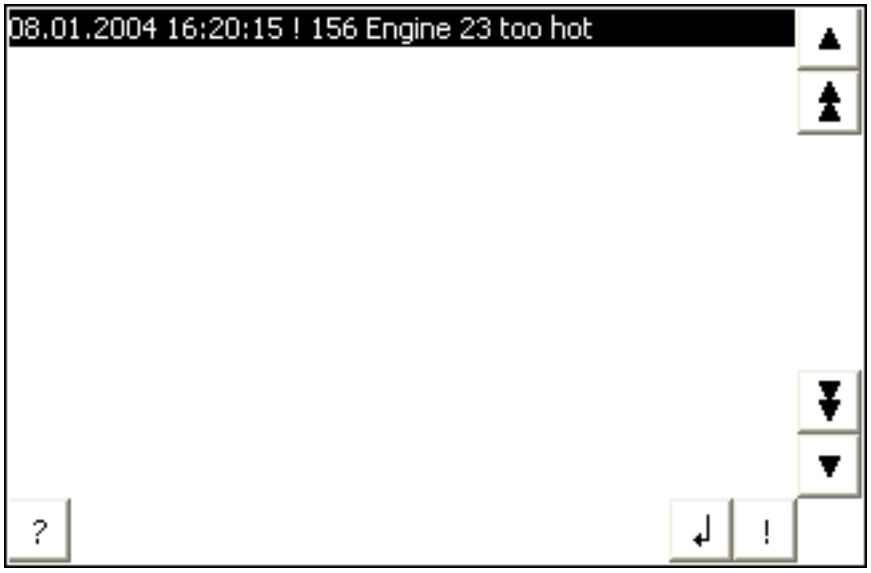
When you edit an unacknowledged alarm, it is acknowledged automatically.

4.4.2.8 Simple alarm view

Description

Purpose

The simple alarm view shows selected alarms or alarm events from the alarm buffer or alarm log. The layout and operation of the simple alarm window correspond to that of the simple alarm view.



Layout

Depending on the configuration, in the alarm view different columns with information regarding an alarm or an alarm event are displayed.

Operation

Depending on the configuration you can:

- Acknowledge alarms
- Edit alarms

Controls

The buttons have the following functions:

Button	Function
	Acknowledging an alarm
	Edit alarm
	Displays an alarm operator note
	Shows the full text of the selected alarm in a separate window, the alarm text window. In the alarm text window, you can view alarm text that requires more space than is available in the Alarm view. Close the alarm text window with  .
	Scrolls one alarm up
	Scrolls one page up in the alarm view
	Scrolls one page down in the alarm view
	Scrolls one alarm down

Operation with mouse and keyboard

Introduction

Within the simple alarm view there is a tabulator sequence that enables the operating elements and the last selected alarm to be selected via the keys of the runtime system.

Operation with the mouse

1. Click on the alarm to be edited.
2. Click on the operating element you wish to use.

Operation with the keyboard

1. Press the <Tab> key until the list of displayed alarms is selected in the alarm view.
2. Click on the alarm to be edited. You can use the keys <Home>,<End>,<Up> and <Down> for this.
3. Press the <Tab> key until the operating element you wish to use is selected.
4. Press <Enter>.

Alternative operation

Depending on the configuration, you can also operate the alarm view via the function keys.

Example: Acknowledging an alarm

1. Select the alarm to be acknowledged.
2. Click on the ! button.

Example: Edit alarm

1. Click on the alarm to be edited.
2. Click on the ↵ button.

Example: Calling the infotext

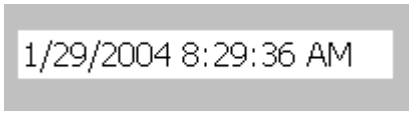
1. Click on the alarm to be edited.
2. Click on the ? command button.
3. To close the window for displaying the operator note, press the × button or use the key combination <Alt+F4>.

4.4.2.9 Date/time field

Purpose

A "Date / time box" may have the following runtime functions:

- Output of the date and time
- Combined input and output; here the operator can edit the output values so as to reset the date and time.



Layout

The layout in the date/time field depends on the language set in the runtime system.

The date can be displayed in detail (e.g. Tuesday, 31 December 2003) or in short form (31.12.2003).

Operation

Depending on the configuration, you can operate the date/time field in the following ways:

- Standard operation: Change date and time.

Operation behavior

When the operator of the runtime system ignores the syntax when entering values, or enters illegal values, the system rejects these. Instead, the original values (plus the time that has elapsed in the meantime) will appear in the date/time field and a system alarm will be displayed on the runtime system.

Operation with mouse and keyboard

Operation with the mouse

1. Click in the date/time field.
2. Type in the relevant value.
3. Confirm your input to the runtime system with <Return> or cancel it with <Esc>.

Operation with the keyboard

1. Press the <Tab> key until the date/time field is selected.
2. Enter the value.
3. Confirm your input with <Enter> or cancel it with <Esc>.

Alternative operation with the keyboard

1. Press the <Tab> key until the date/time field is selected.
2. Press <Enter>. The object changes to the specific editing mode. Now, only one character will be marked in the field.
3. Use the <Up>/<Down> cursor keys to scroll through a character table.
4. Use the <Right>/<Left> cursor keys to move the cursor to the next or previous input position.
5. Confirm your input with <Enter> or cancel it with <Esc>.

4.4.2.10 User view

Purpose

The user view is used by the administrator to manage user accounts, group assignments and user passwords.

Users can change their passwords and logoff times.

User	Password	Group	Logoff time
Admin	********	Group (9)	5
PLC User	********	Group (1)	5
User 1	********	Group (1)	5

Layout

The user view contains four columns for the user, password, group and log-off time. The passwords are encrypted by means of asterisks.

- All users on the runtime system are displayed in the User View to the administrator or to a user with administrator authorizations.
- When user administration authorization is lacking, only the personal user entry is displayed.

Operation

Depending on the configuration you can:

- Manage users, e.g. create, delete.
- Change existing user data.
- Export or import user data.

Change existing user data

The following options are available for the range of changes that can be made:

- The administrator or a user with user administration authorization can change the data for all users on the runtime system in the User View.
  - User name
  - Group assignment
  - Password
  - Logoff times
- Users without user management permission can only change their own user data.
  - Password
  - Logoff time

Note

Names or passwords entered in the user view may not contain any special characters, such as / " § $ % & ' ?.

Export or import user data

A user view contains all users, passwords, group assignments and logoff times set up in the runtime system. To eliminate the necessity of re-entering all data again on another runtime system, you can export the user data, and then import it to another runtime system. However, this is only possible if this function has been configured.

Note

Do not export the password list immediately after changing it. Exit the "User View" object after making changes and wait until the changes have been written to a file before performing the export.

NOTICE
The currently valid passwords are overwritten during an import. The imported user data and passwords are valid immediately.

Operation with mouse and keyboard

Operation with the mouse

1. Click on the user view with the mouse pointer.
2. Click on the user to be edited.
3. Edit the user data.

Operation with the keyboard

1. Press the <Tab> key until the user view is selected.
2. Click on the user to be edited. You can use the keys <Home>,<End>,<Up> and <Down> for this.
3. Edit the user data

Example: Creating Users

1. Click on an empty line in the "User" column of the user view with the mouse pointer.
2. Then enter the user name. Press <Enter>.
3. Use <Right> to select the next field.
4. Assign a password and a logoff time in the same way and then select the group.

Example: Changing group assignments

1. Click in the "Group" field with the mouse pointer.
2. Select a group from the selection list. Or you can use the cursor keys <Home>,<End>,<Up> and <Down> for this.
3. Confirm the entry with <Enter>.

Example: Delete a user

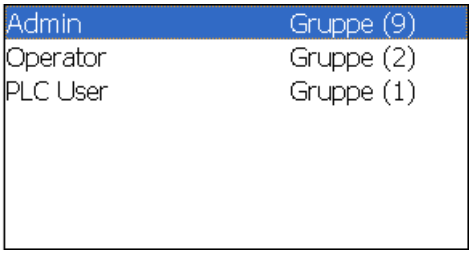
1. Click on the user view with the mouse pointer.
2. Select the user you wish to delete.
3. Select the "Delete" option in the context menu.

4.4.2.11 Simple user view

Description

Purpose

If insufficient space is available for the user element or if a change to the user data instigated by a user must be implemented, the simple user view can be used to display users on the runtime system.



Layout

The layout depends on the user rights.

- All users on the runtime system are displayed in the User View to the administrator or to a user with administrator authorizations.
- When user administration authorization is lacking, only the personal user entry is displayed.

Operation

Depending on the configuration you can:

- Manage users, e.g. create, delete.
- Change existing user data.
- Export or import user data.

Operation with mouse and keyboard

Operation with the mouse

1. Click on the user name to be processed with the mouse pointer.
2. Change the user data. Custom user data (name, password, group, logoff time) is entered sequentially in several dialogs.
3. use the "OK" button to confirm the entries.

Operation with the keyboard

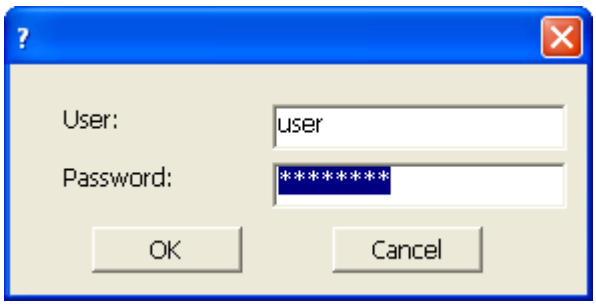
1. Keep pressing the <Tab> key until the simple user view is selected.
2. Click on the user to be edited.
3. Confirm the selection by pressing the <Enter> key. You can change the user data in the following dialogs.
4. use the "OK" button to confirm the entries.

The following table shows the available key operations for entering custom user data in the dialogs:

Key	Function
<Up>/<Down>:	Selects the previous/next user
<Tab>	Selects the next element in the dialog
<Enter>	Opens the next dialog
<Del>	Deletes the selected user.

Example: Changing user data

1. Click on the user name to be processed with the mouse pointer. The following dialog opens:



2. If necessary, change the user name and password. Click on the "OK" button. The following dialog opens:

3. If necessary, change the user group and the logoff time. Click on the "OK" button.

Example: Delete a user

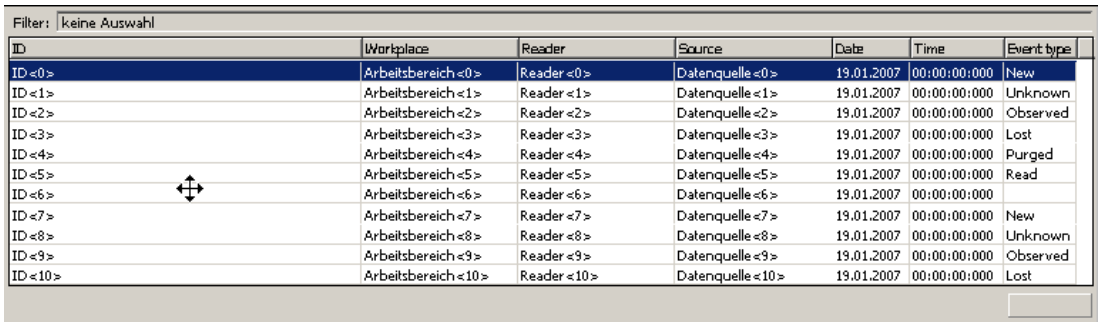
1. Keep pressing the <Tab> key until the simple user view is selected.
2. Select the user you wish to delete.
3. Delete the user by pressing the <Del> key.
4. Click "OK" to close the dialog box.

4.4.2.12 RFID view

Purpose

You can use the "RFID view" screen object to display tag events or the tags that are currently present in the field at runtime depending on the project specifications. The content of the display is dependent on the display selector used. This is named in the screen object header.

Parameterizing display selectors (Page 273)



NOTICE
Preventing loss of data To ensure that all tag events are recorded, you should open the "RFID view" screen before the read procedures are performed.

Layout

The tag events are presented in tabular form and contain the following information:

Parameter	Meaning
ID	ID of the read tag (the output format is specified in the project)
Workplace	Name of the workplace that received the tag data
Reader	Name of the reader that read the tag data
Data source	Name of the data source that read the tag
Date	Date of the read procedure
Time	Time of the read procedure

Parameter	Meaning
Event type	Description of filtering status
Counters	Number of tags*
RSSI	RSSI value when acquiring a tag
Antenna	Name of the antenna at which the tag was read

*Depending on the parameterization in the "General" group in RF-MANAGER, the "Counter" can have the following meaning:

Parameter	Meaning
Tags in field 1)	All the tags are displayed that are currently detected by the reader and that are in the "Observed" state.
Tag events 1)	All those tags will be displayed whose status changes (e.g. from "Glimpsed" status to "Observed" status).
Tag events (number) 1)	All tags are displayed whose status has changed. If the same status change occurs again for a tag, the event counter in the previous alarm is incremented and a new alarm is not displayed.
1) Only one selection can be active at a time	

Operation

You can:

- Delete events
- Change the column sequence
- Change the respective column width

Controls

The buttons have the following functions:

Button	Function
	Delete all events

Example: Change the sequence of the columns

1. Select the "RFID view" screen object using the mouse pointer.
2. Select "Edit" from the shortcut menu.

   Then you can edit the screen object.
3. Choose the column header e.g. the "Date" column header.
4. While holding down the mouse button, drag the column header to the column header "Time".

Example: Change the order of the columns

1. Select the "RFID view" screen object using the mouse pointer.
2. Select "Edit" from the shortcut menu.
   Then you can edit the screen object.
3. Click on the column header.
4. Click the same column header again to reverse the sort order.

Example: Changing the column width

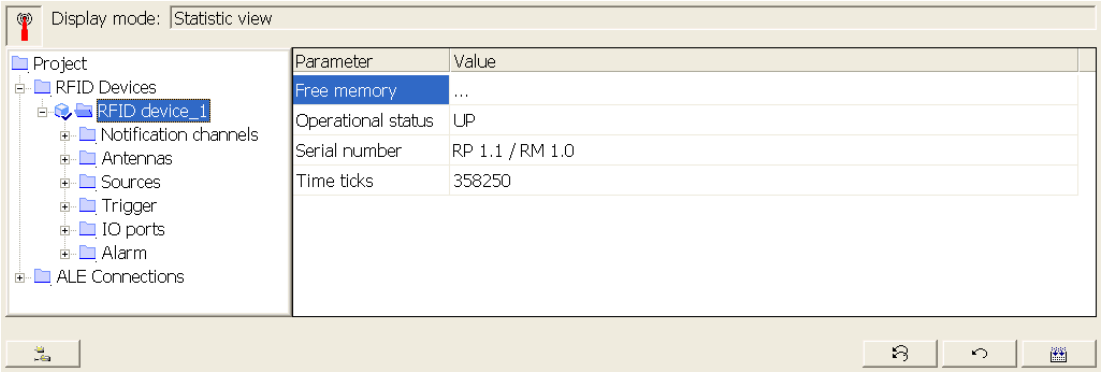
1. Select the "RFID view" screen object using the mouse pointer.
2. Select "Edit" from the shortcut menu.
   Then you can edit the screen object.
3. Move the mouse pointer to the line that separates two column headers.
4. Keep pressing the left mouse button while you adjust the column width as required.

4.4.2.13 Statistics view

Purpose

You can use the "Statistics view" screen object to display the following at runtime:

- Statistical information
- Operational status of the components of your system (e.g. failed write attempts)



Layout

In the "Statistics view" screen object, the components of your system are visualized in the form of a tree structure in the left-hand window area. When individual components are selected, the associated parameters and their values appear in the right-hand window area.

If you selected advanced mode under "General" when parameterizing the statistics display using the editor, the parameters will only be displayed in English. In user mode, the display is language specific.

The status symbols in the tree structure have the following meaning:

Icon	Meaning
	The component and its subcomponents are ready for operation
	The component and its subcomponents are not ready for operation
	The status of the component cannot be determined
	The component and its subcomponents are not in a uniform state.

Operation

You can:

- Display statistical values
- Reset statistical values
- Display operational status of the components
- Change the column sequence
- Change the respective column width

Controls

The buttons have the following functions:

Button	Function
	Open up the tree structure
	Reset all statistical values of the complete system
	Reset a selected statistical value
	Refresh a display

Note

Refresh a display

The display can be updated in two different ways:

- Using the button  .
- By parameterizing a polling cycle in the "Statistics view" editor under "General".

Example: Changing the column width

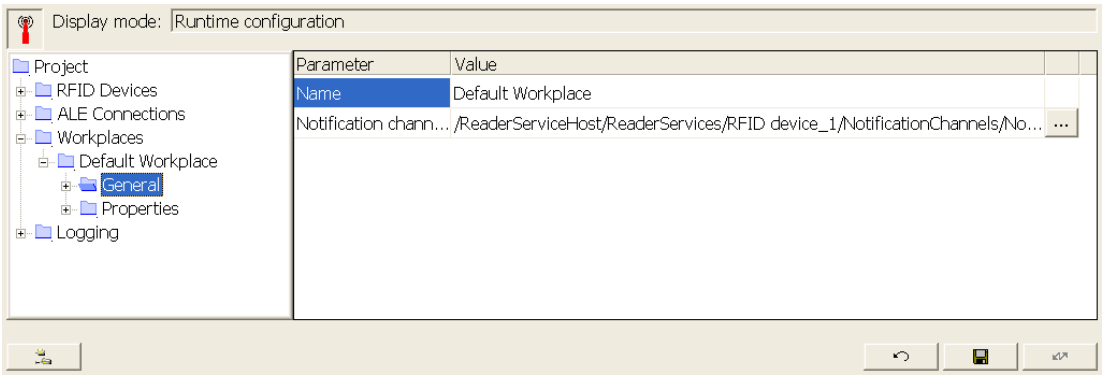
1. Select the "Statistics view" screen object using the mouse pointer.
2. Select "Edit" from the shortcut menu.

   Then you can edit the screen object.
3. Move the mouse pointer to the line that separates two column headers.
4. Keep pressing the left mouse button while you adjust the column width as required.

4.4.2.14 Configuration

Purpose

In the Configuration screen object, you can make changes to the project configuration at runtime. The view is used to commission and optimize your RFID system. You can reparameterize individual components, e.g. the antenna power. You can also delete individual parameters or display the operational status of the components of your system.



Layout

In the "Configuration" screen object, the components of your system are visualized in the form of a tree structure in the left-hand window area. When individual components are selected, the associated parameters and their values appear in the right-hand window area. If you want to edit a value, click in the appropriate field and make the change.

If you selected advanced mode under "General" when parameterizing the statistics display using the editor, the parameters will only be displayed in English. In user mode, the display is language specific.

The status symbols in the tree structure have the following meaning:

Icon	Meaning
	The component and its subcomponents are ready for operation
	The component and its subcomponents are not ready for operation
	The status of the component cannot be determined
	The components and their subcomponents are not in a uniform state

Note

Refresh a display

A refresh period can be specified for the display by parameterizing a polling cycle in the editor of the Configuration view under "General".

Operation

You can:

- Edit the values of parameters
- Delete parameters
- Add parameters
- Display operational status of the components
- Change the column sequence
- Change the respective column width

Controls

The buttons have the following functions:

Button	Function
	Delete parameters
	Add parameters
	Open up the tree structure
	Activate changes to the project. The changes are not saved and will be lost when the runtime system is rebooted. It is generally recommended that the changes be simply activated and then the new project configuration tested.
	Activate and save changes to the project. Following a successful test, the changes can be saved. Only saved changes can be synchronized with the Engineering System. To prevent loss of data, note that all changes implemented subsequent to the last archived status will be saved.
	Undoing changes to the project. If a new project configuration results in errors, you can undo the changes. To prevent loss of data, note that all changes implemented subsequent to the last archived status will be undone.

Data comparison with the runtime system

When you make changes to your system at runtime in the "Configuration" screen object, save them and save the changes back to the Engineering System. Select the menu item "Project > Data comparison with the runtime system..." for this purpose.

This is the only way to ensure that the changes that are implemented at runtime for the purposes of system optimization are not lost when the project is transferred again.

Example: Changing the column width

1. Select the "Configuration" screen object using the mouse pointer.
2. Select "Edit" from the shortcut menu.

   Then you can edit the screen object.
3. Move the mouse pointer to the line that separates two column headers.
4. Keep pressing the left mouse button while you adjust the column width as required.

Technical specifications

5

5.1 Released operating systems

The RF-MANAGER has been approved for the following operating systems:

- Microsoft Windows XP Professional SP2 or higher
- Windows XP Embedded / SP2 (for SIMATIC Microbox PC 420/427B)

5.2 Released databases

Logging with RF-MANAGER Runtime is released for the following databases:

- MS SQL Server: MS SQL Server 2000 was tested
- MS Access: MS Access 2000 and MS Access XP were tested
- MS Data Engine: MS Data Engine 2000 and MS Data Engine XP were tested

5.3 System alarms

Introduction

System alarms provide information about internal states of the runtime system, reader and PLC.

The overview below shows the causes of system alarms and how to eliminate the cause of error.

Some of the system alarms described in this section are relevant to individual runtime systems based on their range of features.

Note

New system alarms

You will find the latest additions to the system alarms in the Readme file or in the Information System.

Note

System alarms are only indicated if an alarm window was configured. System alarms are output in the language currently set on your runtime system.

System alarm parameters

System alarms may contain encrypted parameters which are relevant to troubleshooting because they provide a reference to the source code of the Runtime software. These parameters are output after the text "Error code:"

Meaning of the system alarms

Number	Effect/cause	Remedy
10000	The print job could not be started or was canceled due to an unknown error. Faulty printer setup. Or: No permission is available for accessing the network printer. Power supply failure during data transfer.	Check the printer settings, cable connections and the power supply. Set up the printer once again. Obtain a network printer authorization. If the error persists, contact the Hotline!
10001	No printer is installed or a default printer has not been set up.	Install a printer and/or select it as the default printer.
10002	Overflow of the graphics buffer for printing. Up to two images are buffered.	Allow sufficient intervals between successive print jobs.
10003	Images can now be buffered again.	—
10004	Overflow of the buffer for printing lines in text mode (e.g. alarms). Up to 1000 lines are buffered.	Allow sufficient intervals between successive print jobs.
10005	Text lines can now be buffered again.	—
10006	The Windows printing system reports an error. Refer to the output text and the error ID to determine the possible causes. Nothing is printed or the print is faulty.	Repeat the action if necessary.

Number	Effect/cause	Remedy
20010	An error has occurred in the specified script line. Execution of the script was therefore aborted. Note the system alarm that may have occurred prior to this.	Select the specified script line in the configuration. Ensure that the variables used are of the allowed types. Check system functions for the correct number and types of parameters.
20011	An error has occurred in a script that was called by the specified script. Execution of the script was therefore aborted in the called script. Note the system alarm that may have occurred prior to this.	In the configuration, select the script that has been called directly or indirectly by the specified script. Ensure that the variables used are of the allowed types. Check system functions for the correct number and types of parameters.
20012	The configuration data is inconsistent. The script could therefore not be generated.	Recompile the configuration.
20013	The scripting component of RF-MANAGER Runtime is not correctly installed. Therefore, no scripts can be executed.	Reinstall RF-MANAGER Runtime on your PC. Regenerate your project with "Project > Generator > Rebuild all" and transfer the project to the runtime system.
20014	The system function returns a value that is not written in any return variable.	Select the specified script in the configuration. Check if the script name has been assigned a value.
20015	Too many successive scripts have been triggered in short intervals. When more than 20 scripts are queued for processing, any subsequent scripts are rejected. In this case, the script indicated in the alarm is not executed.	Find what is triggering the scripts. Extend the times, e.g. the polling time of the variables which trigger the scripts.
30010	The variable could not accept the function result, e.g. when it has exceeded the value range.	Check the variable type of the system function parameter.
30011	A system function could not be executed because the function was assigned an invalid value or type in the parameter.	Check the parameter value and variable type of the invalid parameter. If a variable is used as a parameter, check its value.
40010	The system function could not be executed since the parameters could not be converted to a common variable type.	Check the parameter types in the configuration.
40011	The system function could not be executed since the parameters could not be converted to a common variable type.	Check the parameter types in the configuration.
50000	The runtime system is receiving data faster than it is capable of processing. Therefore, no further data is accepted until all current data have been processed. Data exchange then resumes.	—
50001	Data exchange has been resumed.	—
60000	This alarm is generated by the “ShowSystemAlarm” function. The text to be displayed is transferred to the function as a parameter.	—
60010	The file could not be copied in the direction defined because one of the two files is currently open or the source/target path is not available. It is possible that the Windows user has no access rights to one of the two files.	Restart the system function or check the paths of the source/target files. Using Windows NT/2000/XP: The user executing RF-MANAGER Runtime must be granted access rights for the files.
60011	An attempt was made to copy a file to itself. It is possible that the Windows user has no access rights to one of the two files.	Check the path of the source/target file. Using Windows NT/2000/XP with NTFS: The user executing RF-MANAGER Runtime must be granted access rights for the files.

Number	Effect/cause	Remedy
70010	The application could not be started because it could not be found in the path specified or there is insufficient memory space.	Check if the application exists in the specified path or close other applications.
70011	The system time could not be modified. The error message only appears in combination with the area pointer "Date/time control". Possible cause: • The Windows user has no right to modify the system time. If the first parameter in the system alarm is displayed with the value 13, the second parameter indicates the byte containing the incorrect value.	Check the time which is to be set. Using Windows NT/2000/XP: The user executing RF-MANAGER Runtime must be granted the right to change the system time of the operating system.
70012	An error occurred when executing the function "StopRuntime" with the option "Runtime and operating system". Windows and RF-MANAGER Runtime are not closed. One possible cause is that other programs cannot be closed.	Close all programs currently running. Then close Windows.
70013	The system time could not be modified because an invalid value was entered. Incorrect separators may have been used.	Check the time which is to be set.
70014	The system time could not be modified. Possible causes: • An invalid time was transferred. • The Windows user has no right to modify the system time. • Windows rejects the setting request.	Check the time which is to be set. Using Windows NT/2000/XP: The user executing RF-MANAGER Runtime must be granted the right to change the system time of the operating system.
70015	The system time could not be read because Windows rejects the reading function.	—
70016	An attempt was made to select a screen by means of a system function. This is not possible because the screen number specified does not exist. Or: A screen could not be generated due to insufficient system memory. Or: The screen is blocked. Or: Screen call has not been executed correctly.	Check the screen number in the function or job with the screen numbers configured. Assign the number to a screen if necessary. Check the information about the screen call and whether the screen is blocked for certain users.
70018	Acknowledgment that the password list has been successfully imported.	—
70019	Acknowledgment that the password list has been successfully exported.	—
70020	Acknowledgment for activation of alarm reporting.	—
70021	Acknowledgment for deactivation of alarm reporting.	—
70022	Acknowledgment to starting the Import Password List action.	—
70023	Acknowledgment to starting the Export Password List action.	—

Number	Effect/cause	Remedy
70024	The value range of the variable has been exceeded in the system function. The calculation of the system function is not performed.	Check the desired calculation and correct it if necessary.
70025	The value range of the variable has been exceeded in the system function. The calculation of the system function is not performed.	Check the desired calculation and correct it if necessary.
70026	No other screens are stored in the internal screen memory. No other screens can be selected.	—
70030	The configured parameters of the system function are faulty. The connection to the new PLC has not been established.	Compare the parameters configured for the system function with the parameters configured for the controllers and correct them as necessary.
70031	The controller configured in the system function is not an S7 controller. The connection to the new controller was not established.	Compare the S7 controller name parameter configured for the system function with the parameters configured for the controller and correct them as necessary.
70032	The object configured with this number in the tab order is not available in the selected screen. The screen changes but the focus is set to the first object.	Check the number of the tab order and correct it if necessary.
70033	An e-mail cannot be sent because a TCP/IP connection to the SMTP server no longer exists. This system alarm is generated only at the first attempt. All subsequent unsuccessful attempts to send an e-mail will no longer generate a system alarm. The event is regenerated when an e-mail has been successfully sent in the meantime. The central e-mail component in RF-MANAGER Runtime attempts, in regular intervals (1 minute), to establish the connection to the SMTP server and to send the remaining e-mails.	Check the network connection to the SMTP server and re-establish it if necessary.
70034	Following a disruption, the TCP/IP connection to the SMTP server could be re-established. The queued e-mails are then sent.	—
70036	No SMTP server for sending e-mails is configured. An attempt to connect to an SMTP server has failed and it is not possible to send e-mails. RF-MANAGER Runtime generates the system alarm after the first attempt to send an e-mail.	Configure an SMTP server: In RF-MANAGER Engineering System using "Device settings > Device settings" Or In Windows Control Panel over "RF-MANAGER Internet settings"
70037	An e-mail cannot be sent for unknown reasons. The contents of the e-mail are lost.	Check the e-mail parameters (recipient etc.).
70038	The SMTP server has rejected sending or forwarding an e-mail because the domain of the recipient is unknown to the server or because the SMTP server requires authentication. The contents of the e-mail are lost.	Check the domain of the recipient address or deactivate the authentication on the SMTP server if possible. SMTP authentication is currently not used in RF-MANAGER Runtime.

Number	Effect/cause	Remedy
70039	The syntax of the e-mail address is incorrect or contains illegal characters. The contents of the e-mail are discarded.	Check the e-mail address of the recipient.
70040	The syntax of the e-mail address is incorrect or contains illegal characters.	—
70041	The import of the user management was aborted due to an error. Nothing was imported.	Check your user management or transfer it again to the panel.
80001	The log specified is filled to the size defined (in percent) and must be stored elsewhere.	Store the file or table by executing a ‘move’ or ‘copy’ function.
80002	A line is missing in the specified log.	—
80003	The copying process for logging was not successful. In this case, it is advisable to check any subsequent system alarms, too.	—
80006	Since logging is not possible, this causes a permanent loss of the functionality.	In the case of databases, check if the corresponding data source exists and start up the system again.
80009	A copying action has been completed successfully.	—
80010	Since the storage location was incorrectly entered in RF-MANAGER, this causes a permanent loss of the functionality.	Configure the storage location for the respective log again and restart the system when the full functionality is required.
80012	Log entries are stored in a buffer. If the values are read to the buffer faster than they can be physically written (using a hard disk, for example), overloading may occur and recording is then stopped.	Log fewer values. Or: Increase the logging cycle.
80013	The overload status no longer applies. Archiving resumes the recording of all values.	—
80014	The same action was triggered twice in quick succession. Since the process is already in operation, the action is only carried out once.	—
80015	This system alarm is used to report DOS or database errors to the user.	—
80016	The logs are separated by the system function "CloseAllLogs" and the incoming entries exceed the defined buffer size. All entries in the buffer are deleted.	Reconnect the logs.
80017	The number of incoming events cause a buffer overflow. his can be caused, for example, by several copying actions being activated at the same time. All copy jobs are deleted.	Stop the copy action.
80019	The connection between RF-MANAGER and all logs were closed, for example, after executing the system function "CloseAllLogs". Entries are written to the buffer and are then written to the logs when a connection is re-established. There is no connection to the storage location and the storage medium may be replaced, for example.	—

Number	Effect/cause	Remedy
80020	The maximum number of simultaneously copy operations has been exceeded. Copying is not executed.	Wait until the current copying actions have been completed, then restart the last copy action.
80021	An attempt was made to delete a log which is still busy with a copy action. Deletion has not been executed.	Wait until the current copying actions have been completed, then restart the last action
80022	An attempt was made to start a sequence log, which is not a sequence log, from a log using the system function "StartSequenceLog". No sequence log file is created.	In the project, check • if the "StartSequenceLog" system function was properly configured • if the variable parameters are properly provided with data on the runtime system.
80023	An attempt was made to copy a log to itself. The log is not copied.	In the project, check • if the "CopyLog" system function was properly configured • if the variable parameters are properly provided with data on the runtime system.
80024	The "CopyLog" system function does not allow copying when the target log already contains data ("Mode" parameter). The log is not copied.	Edit the "CopyLog" system function in the project if necessary. Before you initiate the system function, delete the destination log file.
80025	You have canceled the copy operation. Data written up to this point are retained. The destination log file (if configured) is not deleted. The cancellation is reported by an error entry RT_ERR at the end of the destination log.	—
80026	This alarm is output after all logs are initialized. Values are written to the logs from then on. Prior to this, no entries are written to the logs, irrespective of whether RF-MANAGER Runtime is active or not.	—
80028	The alarm returns a status report indicating that the logs are currently being initialized. No values are logged until the alarm 80026 is output.	—
80029	The number of logs specified in the alarm could not be initialized. The logs are initialized. The faulty log files are not available for logging jobs.	Evaluate the additional system alarms , related to this alarm which is also generated. Check the configuration, the ODBC (Open Database Connectivity) and the specified drive.
80030	The structure of the existing log file does not match the expected structure. Logging is stopped for this log.	Delete the existing log data manually, in advance.
80031	The log in CSV format is corrupted. The log cannot be used.	Delete the faulty file.
80032	Logs can be assigned events. These are triggered as soon as the log is full. If RF-MANAGER Runtime is started and the log is already full, the event is not triggered. The log specified no longer logs data because it is full.	Close RF-MANAGER Runtime, delete the log, then restart RF-MANAGER Runtime. Or: Configure a button which contains the same actions as the event and press it.
80033	"System Defined" is set in the data log file as the data source name. This causes an error. No data is written to the database logs, whereas the logging to the CSV logs works.	Install MSDE again.

Number	Effect/cause	Remedy
80034	An error has occurred in the initialization of the logs. An attempt has been made to create the tables as a backup. This action was successful. A backup has been made of the tables of the corrupted log file and the cleared log was restarted.	No action is necessary. However, it is recommended to save the backup files or delete them in order to make the space available again.
80035	An error has occurred in the initialization of the logs. An attempt has been made to create backups of the tables and this has failed. No logging or backup has been performed.	It is recommended to save the backups or to delete them in order to release memory.
80044	The export of a log was interrupted because Runtime was closed or due to a power failure. When Runtime restarted, it was detected that the export needed to be resumed.	The export resumes automatically.
80045	The export of a log was interrupted due to an error in the connection to the server or at the server itself.	The export is repeated automatically. Check: • the connection to the server • if the server is running • if there is enough free space on the server.
80046	The destination file could not be written while exporting the log.	Check if there is enough space on the server and it you have permission to create the log file.
80047	The log could not be read while exporting it.	Check if the storage medium is correctly inserted.
80049	The log could not be renamed while preparing to export it. The job can not be completed."	Check if the storage medium is correctly inserted and if there is sufficient space on the medium.
80050	The log which shall be exported is not closed. The job can not be completed.	Make sure the "CloseAllLogs" system function is called before using the "ExportLog" system function. Change the configuration as required.
110000	The operating mode was changed. "Offline" mode is now set.	—
110001	The operating mode was changed. "Online" mode is now set.	—
110002	The operating mode was not changed.	Check the connection to the readers.
110003	The operating mode of the specified controller was changed by the system function "SetConnectionMode". The operating mode is now "offline".	—
110004	The operating mode of the specified controller has been changed by the system function "SetConnectionMode". The operating mode is now "online".	—
110005	An attempt was made to use the system function "SetConnectionMode" to switch the specified controller to "online" mode, although the entire system is in "offline" mode. This changeover is not allowed. The controller remains in "offline" mode.	Switch the complete system to "online" mode, then execute the system function again.
130000	The action was not executed.	Close all other programs. Delete files no longer required from the hard disk.
130001	The action was not executed.	Delete files no longer required from the hard disk.
130002	The action was not executed.	Close all other programs. Delete files no longer required from the hard disk.

Number	Effect/cause	Remedy
130003	No data medium found. The operation is canceled.	Check, for example, if • the correct data medium is being accessed • the data medium is inserted
130004	The data medium is write-protected. The operation is canceled.	Check if access has been made to the correct data carrier. Remove the write protection.
130005	The file is read only. The operation is canceled.	Check if access has been made to the correct file. Edit the file attributes if necessary.
130006	Access to file failed. The operation is canceled.	Check, for example, if • the correct file is being accessed • the file exists • another action is preventing simultaneous access to the file
130007	The network connection is interrupted. Data cannot be saved or read over the network connection.	Check the network connection and eliminate the cause of error.
130010	The maximum nesting depth can be exhausted when, for example, a value change in a script results in the call of another script and the second script in turn has a value change that results in the call of yet a further script etc. The configured functionality is not supported.	Check the configuration.
140000	An online connection to the controller is established.	—
140001	The online connection to the controller was shut down.	—
140003	No variable updating or writing is executed.	Check the connection and if the controller is switched on. Check the parameter definitions in the Control Panel using "Set PG/PC interface". Restart the system.
140004	No variable update or write operations are executed because the access point or the module configuration is faulty.	Verify the connection and check if the controller is switched on. Check the access point or the module configuration (MPI, PPI, PROFIBUS) in the Control Panel with "Set PG/PC interface". Restart the system.
140005	No variable updating or writing is executed because the runtime system address is incorrect (possibly too high).	Use a different runtime system address. Verify the connection and check if the controller is switched on. Check the parameter definitions in the Control Panel using "Set PG/PC interface". Restart the system.
140006	No variable updating or writing is executed because the baud rate is incorrect.	Select a different baud rate in RF-MANAGER (according to module, profile, communication peer, etc.).

Number	Effect/cause	Remedy
140007	Variable updating and writing are not performed because the bus profile is faulty (see %1). The following parameters cannot be entered in the registration database: 1: Tslot 2: Tqui 3: Tset 4: MinTsdr 5: MaxTsdr 6: Trdy 7: Tid1 8: Tid2 9: Gap factor 10: Retry limit	Check the user-defined bus profile. Check the connection and if the controller is switched on. Check the parameter definitions in the Control Panel using "Set PG/PC interface". Restart the system.
140008	No variable updating or writing is executed because baud rate is incorrect. The following parameters cannot be entered in the registration database: 0: General error 1: Incorrect version 2: The profile cannot be entered in the registration database. 3: The subnet type cannot be entered in the registration database. 4: The target rotation time cannot be entered in the registration database. 5: Highest address (HSA) faulty.	Check the connection and if the controller is switched on. Check the parameter definitions in the Control Panel using "Set PG/PC interface". Restart the system.
140009	Variables are not updated or written because the module for S7 communication was not found.	Reinstall the module in the Control Panel using "Set PG/PC interface".
140010	No S7 communication partner found because the controller is shut down. DP/T: The option “PG/PC is the only master” is not set in the Control Panel under “Set PG/PC interface.”	Switch the controller on. DP/T: If only one master is connected to the network, disable "PG/PC is the only master" in "Set PG/PC interface". If several masters are connected to the network, enable these. Do not change any settings, for this will cause bus errors.
140011	No variable updating or writing is executed because communication is down.	Check the connection and that the communication partner is switched on.
140012	There is an initialization problem (e.g. when RF-MANAGER Runtime was closed in Task Manager). Or: Another application (e.g.STEP7) with different bus parameters is active and the driver cannot be started with the new bus parameters (transmission rate, for example).	Restart the runtime system. Or: Run RF-MANAGER Runtime, then start your other applications.
140013	The MPI cable is disconnected and, thus, there is no power supply.	Check the connections.
140014	The configured bus address is in already in use by another application.	Edit the runtime system address in the controller configuration.

Number	Effect/cause	Remedy
140015	Wrong transmission rate Or: Faulty bus parameters (e.g.HSA) Or: Runtime system address > HSA or: Wrong interrupt vector (interrupt does not arrive at the driver)	Correct the relevant parameters.
140016	The hardware does not support the configured interrupt.	Change the interrupt number.
140017	The set interrupt is in use by another driver.	Change the interrupt number.
180000	A component/OCX received configuration data with a version ID which is not supported.	Install a newer component.
180001	System overload because too many actions running in parallel. Not all the actions can be executed, some are rejected.	Several remedies are available: • Increase the configured cycle times or basic clock. • Generate the alarms at a slower rate (polling). • Initiate scripts and functions at greater intervals. If the alarm appears more frequently: Restart the runtime system.
190000	It is possible that the variable is not updated.	—
190001	The variable is updated after the cause of the last error state has been eliminated (return to normal operation).	—
190002	The variable is not updated because communication with the controller is down.	Activate the communication using the system function "SetDeviceMode" or "SetConnectionMode".
190004	The variable is not updated because the configured variable address does not exist.	Check the configuration.
190005	The variable is not updated because the configured controller type does not exist for this variable.	Check the configuration.
190006	The variable is not updated because it is not possible to map the controller type in the data type of the variable.	Check the configuration.
190007	The variable value is not modified because the connection to the controller is interrupted or the variable is offline.	Set online mode or reconnect to the controller.
190008	The threshold values configured for the variable have been violated, for example, by • a value entered • a system function • a script	Observe the configured or current threshold values of the variable.
190009	An attempt has been made to assign the variable a value which is outside the permitted range of values for this data type. For example, a value of 260 was entered for a byte variable or a value of -3 for an unsigned word variable.	Observe the range of values for the data type of the variables.

Number	Effect/cause	Remedy
190010	Too many values are written to the variable (for example, in a loop triggered by a script). Values are lost because only up to 100 actions are saved to the buffer.	The following remedies are available: • Increase the time interval between multiple write actions. • Do not use an array variable longer than 6 words when you configure an acknowledgment on the runtime system using "Read acknowledgment variable".
190011	Possible cause 1: The value entered could not be written to the configured controller variable because the high or low limit was exceeded. The system discards the entry and restores the original value. Possible cause 2: The connection to the controller was interrupted.	Make sure that the value entered lies within the range of values of the control variables. Check the connection to the PLC.
190012	It is not possible to convert a value from a source format to a target format, for example: An attempt is being made to assign a value to a counter that is outside the valid, PLC-specific value range. A variable of the type Integer should be assigned a value of the type String.	Check the range of values or the data type of the variables.
200000	Coordination is not executed because the address configured in the controller does not exist/is not set.	Change the address or set up the address in the controller.
200001	Coordination is canceled because the write access to the address configured in the PLC is not possible.	Change the address or set the address in the controller at an area which allows write access.
200002	Coordination is not carried out at the moment because the address format of the area pointer does not match the internal storage format.	Internal error
200003	Coordination can be executed again because the last error state is eliminated (return to normal operation).	—
200004	The coordination may not be executed.	—
200005	No more data is read or written. Possible causes: • The cable is defective • The PLC does not respond, is defective, etc. • System overload	Check that the cable is connected and that the PLC is OK. Restart the system if the system alarm persists.
230000	The value entered could not be accepted. The system discards the entry and restores the previous value. Either • The value range has been exceeded • Illegal characters have been entered • The maximum permitted number of users has been exceeded	Enter a practical value or delete any unneeded users.
230002	The currently logged in user is not granted write access rights. The system therefore discards the input and restored the previous value.	Log on as a user with appropriate rights.

Number	Effect/cause	Remedy
230003	Changeover to the specified screen failed because the screen is not available/configured. The current screen remains selected.	Configure the screen and check the screen selection function.
230005	The value range of the variable has been exceeded in the I/O field. The original value of the variable is retained.	Observe the range of values for the variable when entering a value.
240000	RF-MANAGER Runtime is operating in demo mode. You have no authorization or your authorization is corrupted.	Install the authorization.
240001	RF-MANAGER Runtime is operating in demo mode. Too many variables are configured for the installed version.	Load an adequate authorization / powerpack.
240002	RF-MANAGER Runtime is operating with a time-limited emergency authorization.	Restore the full authorization.
240003	Authorization failed. Without authorization, RF-MANAGER will run in demo mode.	Restart RF-MANAGER Runtime or reinstall it.
240004	Error while reading the emergency authorization. RF-MANAGER Runtime is operating in demo mode.	Restart RF-MANAGER Runtime, install the authorization or repair the authorization (see Commissioning Instructions Software Protection).
240005	The Automation License Manager has detected an internal system fault. Possible causes: • A corrupt file • A defective installation • No free space for the Automation License Manager etc.	Reboot the runtime system. If this does not solve the problem, remove the Automation License Manager and install it again.
260000	An unknown user or an unknown password has been entered in the system. The current user is logged off from the system.	Log on to the system as a user with a valid password.
260001	The logged in user does not have sufficient authorization to execute the protected functions on the system.	Log on to the system as a user with sufficient authorization.
260002	This alarm is triggered by the system function "TrackUserChange".	—
260003	The user has logged off from the system.	—
260004	The user name entered into the user view already exists in the user administration.	Select another user name because user names have to be unique in the user administration.
260005	The entry is discarded.	Use a shorter user name.
260006	The entry is discarded.	Use a shorter or longer password.
260007	The login timeout value entered is outside the valid range of 0 to 60 minutes. The new value is discarded and the original value is retained.	Enter a login timeout value between 0 and 60 minutes.
260009	You have attempted to delete the user "Admin". This user is a fixed component of the user management and cannot be deleted.	If you need to delete a user, because perhaps you have exceeded the maximum number permitted, delete another user.

Number	Effect/cause	Remedy
260012	The passwords entered in the "Change Password" dialog and the confirmation field are not identical. The password has not been changed. User will be logged off.	You have to log on to the system again. Then enter the identical password twice to be able to change the password.
260013	The password entered in the "Change Password" dialog is invalid because it is already in use. The password has not been changed. User will be logged off.	You have to log on to the system again. Then enter a new password that has not been used before.
260014	User has unsuccessfully attempted to log on 3 times in succession. The user has been locked out and assigned to group no. 0.	You can log on to the system with your correct password. Only an administrator can change the assignment to a group.
270001	There is a device-specific limit as to how many alarms may be queued for output (see the operating instructions). This limit has been exceeded. The view no longer contains all the alarms. However, all alarms are written to the alarm buffer.	—
270002	The view shows alarms of a log for which there is no data in the current project. Wildcards are output for the alarms.	Delete older log data if necessary.
310000	An attempt is being made to print too many reports in parallel. Only one log file can be output to the printer at a given time; the print job is therefore rejected.	Wait until the previous active log was printed. Repeat the print job if necessary.
310001	An error occurred on triggering the printer. The report is either not printed or printed with errors.	Evaluate the additional system alarms related to this alarm. Repeat the print job if necessary.
330022	Too many dialogs are open on the runtime system.	Close the dialogs that are not required on the runtime system.
330026	The password will expire after the number of days shown.	Enter a new password.
500000	The system function cannot be executed due to an error. The function code is displayed.	Dependent on the function and error. Logging can be activated to locate the cause of the error.
500001	The system function cannot be executed due to an error. The function code and the error code are displayed.	Dependent on the function and error. Logging can be activated to locate the cause of the error.
500002	The system function cannot be executed due to an error. The function code, error code and other additional information are displayed.	Dependent on the function and error. Logging can be activated to locate the cause of the error.
500010	The number of configured readers exceeds the maximum number of readers specified by the license key.	Reduce the number of configured readers or purchase a license key with a larger maximum number of readers.
500013	Access from an RFID data link to the RFID data of RFID processing has failed. The data is accessed following activation of the RFID data link (an RFID data link that has been newly created in the project is activated by default).	The RFID data link automatically attempts to access the RFID data again. If access was possible, a message to indicate success will be output with the message number 500014. If this message does not appear after some time, terminate the complete RF-MANAGER runtime system (including the RFID processing) and restart it.

Number	Effect/cause	Remedy
500014	A previously failed access from an RFID data link to the RFID data of RFID processing was successfully executed.	—
500015	The configured buffer size for an RFID data link was exceeded. New RFID data for the RFID data link are rejected.	Ensure that the RFID data link can write the received RFID data in the configured variables in time (check the coordination procedure). Every data record that can be written in the variable is removed from the buffer for the RFID data link. If necessary, increase the buffer size of the RFID data link in the engineering system ("Number of entries in buffer").
500016	This alarm indicates that an RFID data record received from an RFID data link was inconsistent and therefore could not be processed.	A direct remedy is not available. If the alarm appears frequently, terminate the complete RF-MANAGER runtime system (including the RFID processing) and restart it.
500019	An attempt is being made to connect to RFID processing. RFID processing is a stand-alone component of RF-MANAGER Runtime that is activated by the rest of RF-MANAGER Runtime and that communicates with it through TCP/IP.	—
500020	Connection to RFID processing was successful.	—
500021	The connection to RFID processing was interrupted. Possible causes: 1) RFID processing has been terminated (e.g. by means of the system function StopRfidProcessing). 2) RFID processing is no longer able to maintain the connection due to an error.	1) Start RFID processing again (e.g. by means of the system function StartRfidProcessing). 2) Logging can be activated to locate the cause of the error. Rectify by terminating RFID processing and starting it again. In severe cases, exit RF-MANAGER Runtime, if necessary change the communication timeouts in the INI files "RfmHmiRTRfid.ini" and "RfmRfidRT.ini" and then start Runtime again.
500022	It was not possible to start RFID processing. Possible causes: 1) The path to RFID processing specified in the INI file "RfmHmiRTRfid.ini" is no longer the installation/storage location of the executable file for RFID processing (RfmRfidRT.exe). 2) The system is overloaded.	1) Change the path for the executable file for RFID processing (RfmRfidRT.exe) in the INI file "RfmHmiRTRfid.ini" to the actual storage location. 2) Terminate processes that are not required.
500023	The RFID configuration data could not be loaded by the RFID processing function. Possible causes: 1) The default port required for transferring the RFID configuration data is already reserved by another process. 2) The RFID configuration data are not consistent and/or the RFID processing function has error status	1) Edit the default port in the INI file "RfmHmiRTRfid.ini" 2) Logging can be activated to locate the cause of the error. Rectify by terminating RF-MANAGER Runtime complete with RFID processing, edit the project in the Engineering System and generate it again, then start Runtime again.
500024	The RFID configuration data is activated. The RFID configuration data is transferred to RFID processing.	—
500025	RFID processing is started. RFID processing is a stand-alone component of RF-MANAGER Runtime that is activated by the rest of RF-MANAGER Runtime and that communicates with it through TCP/IP.	—

Number	Effect/cause	Remedy
500029	Parameters that have been changed in the configuration view could not be activated, i.e. they could not be written in RFID processing.	Logging can be activated to locate the cause of the error. Enter valid values for the relevant parameters and write them again
500030	Changes to the RFID configuration that have been activated but not yet saved could not be undone.	Try again. Logging can be activated to locate the cause of the error. In severe cases, terminate RFID processing and start it again. NOTICE: All changes that have not yet been saved will be lost.
500031	Changes to the RFID configuration that have been activated but not yet saved could not be saved.	Try again. Logging can be activated to locate the cause of the error. In severe cases, terminate RFID processing and start it again. NOTICE: All changes that have not been saved will be lost.
500032	Statistical parameters for RFID processing displayed in the statistics view could not be reset to their default value.	Try again. Logging can be activated to locate the cause of the error. In severe cases, terminate RFID processing and start it again. NOTICE: All statistics parameters will be reset.
500033	The attempt to reset the statistical values of an RFID reader by means of a statistics view has failed.	Try again. Logging can be activated to locate the cause of the error. In severe cases, terminate RFID processing and start it again. NOTICE: All statistics parameters will be reset.
500034	An attempt was made to modify and activate parameters of an RFID reader by means of a configuration display. It was not possible to start configuration of the reader.	Try again. Logging can be activated to locate the cause of the error. In severe cases, terminate RFID processing and start it again. NOTICE: All previously activated changes that have not been saved will be lost.
500035	An attempt was made to modify and activate parameters of an RFID reader by means of a configuration display. It was not possible to complete configuration of the reader. NOTICE: The reader configuration may be inconsistent.	Try again. Logging can be activated to locate the cause of the error. In severe cases, terminate RFID processing and start it again. NOTICE: All previously activated changes that have not been saved will be lost.
500036	Parameters that have been changed in the configuration view could not be activated, i.e. they could not be written in RFID processing.	Logging can be activated to locate the cause of the error. Enter valid values for the relevant parameters and write them again.
500038	A configuration view or statistics view was unable to read the RFID configuration data from RFID processing.	Reload the page with the configuration view or statistics view. If this does not rectify the error, exit and restart RFID processing.
500045	The RF-MANAGER runtime system is trying to generate a system alarm due to a system error reported by RFID processing. Creation of the system alarm has failed.	The system alarm will be automatically transferred to the RF-MANAGER runtime system once more. If the system alarm cannot be generated this time, terminate the complete RF-MANAGER runtime system (including the RFID processing) and restart it.
500046	Access by the RF-MANAGER runtime system to the RFID alarms stored in RFID processing has failed. They are normally accessed following successful build-up of the connection to RFID processing.	The RF-MANAGER runtime system automatically tries to access the RFID alarms again. If access was possible, a message to indicate success will be output with the message number 500047. If this message does not appear after some time, terminate the complete RF-MANAGER runtime system (including the RFID processing) and restart it.
500047	Previously failed access by the RF-MANAGER runtime system to the RFID alarms stored in RFID processing was successfully repeated.	—

Number	Effect/cause	Remedy
500048	An error occurred while an RFID alarm was being acknowledged.	Acknowledge more than once. Ensure that RFID processing was started and the connection between RFID processing and RF-MANAGER runtime has been established. If acknowledgement is still not possible, terminate RFID processing and restart it. In severe cases, terminate the complete RF-MANAGER runtime system and start it again.
500049	All system alarms that appear in RF-MANAGER Runtime are transferred via RFID processing to an enterprise system that is connected over an ALE connection. For this reason, system alarms from the rest of RF-MANAGER Runtime must be transferred to RFID processing. The alarms are stored in a buffer until they can be transferred to RFID processing. This alarm indicates overflow of the internal buffer. Newly arising system alarms are rejected and no longer transferred to RFID processing or the enterprise system. This can occur if RFID processing is inactive or if communication between RFID processing and the rest of RF-MANAGER Runtime is faulty.	Start RFID processing (e.g. by means of the system function StartRfidProcessing). If the error occurs with RFID processing active, terminate RFID processing and restart it. In severe cases, terminate the complete RF-MANAGER runtime system and start it again.
500050	The connection to a reader could not be established.	Check the power supply of the RFID reader. Check the communication settings of the reader: Network mode (the reader can only be operated in Ethernet mode with RF-MANAGER), network address, port number. Check whether the reader is connected to the RF-MANAGER workstation via the network. In severe cases, switch the power supply to the reader off and on again and/or terminate and restart RFID processing.
500051	An RFID reader has been successfully configured.	—
500052	The connection to an RFID reader has been established.	—
500053	The connection to an RFID reader has been interrupted. This alarm typically occurs when the reader is reconfigured when RFID processing is active (changes to the device settings and restarting of the runtime system from the engineering system when "Restart RFID processing when RF-MANAGER Runtime starts up"). If this alarm arises during normal operation (not reconfiguration), there is a problem with the reader.	In the case of reconfiguration, this is not an error message. Rather, the connection to the reader is disconnected, the internal settings for the device are adapted and the connection to the reader is established again. If the alarm occurs during normal operation (not reconfiguration), check the power supply and network connection of the RFID reader and establish it again. In severe cases, terminate RFID processing and start it again.
500054	This is a so-called RFID logging alarm: When logging is active, the outputs of certain log levels are not only entered in the specified logging file and the console but they are also displayed as system alarms. The relevant log outputs are also supplied to the user interface where they are directly visible to the plant operator.	—

Number	Effect/cause	Remedy
500055	A reader generates a device-specific error. In the case of SIMATIC RF660R readers, the error numbers and error texts are identical to those that are documented in the additional information of the RF660R manual. This system alarm only occurs in individual cases. In general, device-specific errors of readers are not indicated by means of system alarms, but instead using RFID device alarms.	This is dependent on the cause of error, i.e. the reported error number. Refer to error number from additional information in RF660R manual.
500056	The RFID system function to be executed is unknown.	Check and correct the syntax of the system function to be executed.
500057	The parameters for a function are invalid or contain the wrong values or types.	Check that the parameters for system functions are of the correct type (especially important in scripts).
500058	1) Error messages that are directly triggered by the RF660 hardware. 2) In the case of "WriteTagId", this error message will sometimes be generated even though the function was performed successfully.	For 1) Refer to error number from additional information in RF660 manual. For 2) With "ReadFirstTagId" / "ReadNextTagId", check whether the tag still has the old ID or whether it has already received the new ID with "WriteTagId".
500059	The connection to RFID processing was interrupted. Possible causes: 1) RFID processing has been terminated (e.g. by means of the system function StopRfidProcessing). 2) RFID processing is no longer able to maintain the connection due to an error.	1) Start RFID processing again (e.g. by means of the system function "StartRfidProcessing"). For 2) Logging can be activated to locate the cause of the error. Rectify by terminating RFID processing and starting it again. In severe cases, exit RF-MANAGER Runtime, if necessary change the communication timeouts in the INI files "RfmHmiRTRfid.ini" and "RfmRfidRT.ini" and then start Runtime again.
500060	The workplace transferred to a system function as a parameter is unknown.	Check and correct the transferred workplace.
500061	The workplace set in "SetRfidWorkplaceStatus" cannot currently perform status changeover.	Try again.
500062	The reader transferred to a system function as a parameter is unknown.	Check and correct the transferred reader.
500063	The reader set in "SetRfidDeviceStatus" cannot currently perform status changeover.	Try again.
500064	One or more tags were detected by a reader, but could not be read.	Check and modify read settings (protocol, read cycles, timeouts). Remove tags from the field and place them back in the field. Replace defective tags with new ones.
500065	The data source transferred to a system function as a parameter is unknown.	Check and correct the transferred data source.
500066	A command that was sent from RFID processing to the reader hardware is not supported by the reader. This system alarm does not occur during normal operation of the reader with RF-MANAGER.	—
500067	A command that was sent from the RFID runtime system to the RF660R reader hardware produced an error.	Refer to error number from additional information in RF660R manual.
500068	An invalid duration (value < 0) was set for a read command ("ReadFirstTagId").	Set duration to a sensible value (≥ 0).

Number	Effect/cause	Remedy
500069	The workplace transferred as a parameter to a system function is invalid, i.e. it can not be used in the current project configuration with this function.	Check and correct the transferred workplace.
500070	A tag is not present in the field (for "WriteTagId").	Tags moving into the field.
500071	Several tags exist in the field and a "WriteTagId" command was issued without a tag ID for identifying the tag that should be written.	The parameter for the tag ID in the "WriteTagId" function must reference a valid tag that is present in the field.
500072	The addressed tag is locked and the function can therefore not be executed.	First unlock the tags using the lock functions.
500073	The password transferred for accessing a tag is invalid (for "KillTag", "WriteTagId", "LockEpcGen2Tag" / "LockIsoTag").	Use the correct password.
500074	The tag is read-only. This error occurs on writing.	Use another tag.
500075	A conversion file does not exist for the specified tag format. This error can only occur when new formats are used following delivery of RF-MANAGER.	Contact the manufacturer to find out if an update of the conversion file will be supplied with the next hot fix/service pack.
500076	A parameter value for the "TranslateEpc" function undershoots the permitted lower limit.	Refer to limit value for parameter in the documentation and use the valid value.
500077	A parameter value for the "TranslateEpc" function overshoots the permitted upper limit.	Refer to limit value for parameter in the documentation and use the valid value.
500078	A parameter value for the "TranslateEpc" function contains invalid characters.	Refer to permitted value range for parameter in the documentation and use the valid value.
500079	An invalid name was used for a parameter of the "TranslateEpc" function.	Refer to permitted parameters in the documentation and use the valid value.
500080	When values were converted by the "TranslateEpc" function, an overflow occurred in the permitted value ranges.	Check that the tag ID used is valid.
500081	Conversion of a tag ID failed.	Check formats, parameters and parameter values.
500082	A conversion rule could not be found for the tag ID. 1) The tag ID does not comply with any existing format or the format has been entered incorrectly (too long, too short, too few characters/sections). 2) The conversion file does not contain a section that concerns the format. Occurs in the case of the "TranslateEpc" function, but also when tags with invalid formats are read (for transfer over ALE).	Normally only case 1) occurs. A tag ID started with a valid header, but the subsequent information was invalid. Correct the user format.
500083	A tag ID can not be correctly interpreted by the RFID processing function. This can be a tag ID that has been read from a tag or a tag ID that has been transferred to the "TranslateEPC" system function as a parameter.	Ensure that a correct tag ID is read or transferred.
500084	Activation of the RFID configuration data has been performed and successfully completed.	—

Number	Effect/cause	Remedy
500085	Activation of the RFID configuration data has failed.	Try again by starting the runtime system from the engineering system again. If it occurs repeatedly, in the engineering system under RFID/Network Settings, check the box "Automatic restarting of RFID processing when runtime starts" and start runtime again. With this measure, RFID processing that is already running will also be restarted when the runtime system restarts and it will be completely reconfigured (no delta configuration).
500089	During configuration or reconfiguration of an RFID reader, an error has occurred.	Start the runtime system again from the engineering system. If it occurs repeatedly, in the engineering system under RFID/Network Settings, check the box "Automatic restarting of RFID processing when runtime starts" and start runtime again. With this measure, RFID processing that is already running will also be restarted when the runtime system restarts and the reader will be completely reconfigured (no delta configuration). In particularly severe cases, switch the power supply to the reader off and on again.
500090	RFID processing cannot be started due to an internal error.	Start the runtime system again from the engineering system.
500091	RFID processing has been successfully started.	—
500092	The alarms buffered in RFID processing (RFID alarms and system alarms) have exceeded the maximum permissible buffer size. A specific number of alarms has been rejected. This can occur when there is no enterprise system connected over an ALE connection that can accept the alarms.	If an enterprise system is not connected over an ALE connection, this system alarm only provides information and does not constitute an error. To ensure that no alarms are lost, an enterprise system must always be connected.
500093	RFID processing is terminated and shut down.	—
500100	The RFID data link set in "SetRfidDataLinkStatus" cannot currently perform status changeover.	Try again.
500110	The trigger transferred to a system function as a parameter is unknown.	Check and correct the transferred trigger.
500111	The tag could not be found in the field with the tag ID that was transferred as a parameter with a system function.	Move the tag with the relevant tag ID into the field. Check and correct the transferred tag ID. Check and modify read settings (protocol, read cycles, timeouts).
500112	The tag field transferred to a system function as a parameter is unknown.	Check and correct the transferred tag field.
500113	The system function "ReadNextTagId" was called for a workplace without a preceding "ReadFirstTagID".	Use "ReadFirstTagID" with the required workplace. "ReadNextTagId" can then be called with this workplace.

Appendix A

A.1 Service & Support

A.1.1 Technical Support

Technical Support

You can access technical support for all IA/DT projects via the following:

- Phone: + 49 (0) 911 895 7222
- Fax: + 49 (0) 911 895 7223
- E-mail (mailto:support.automation@siemens.com)
- Internet: Online support request form: (www.siemens.com/automation/support-request)

A.1.2 Contact partner

Contact partner

If you have any further questions on the use of our products, please contact one of our representatives at your local Siemens office.

The addresses are found on the following pages:

- On the Internet (www.siemens.com/automation/partner)
- In Catalog CA 01
- In Catalog FS 10 specially for factory automation sensors

A.1.3 Service & support for industrial automation and drive technologies

Service & support for industrial automation and drive technologies

You can find various services on the Support homepage (www.siemens.com/automation/service&support) of IA/DT on the Internet.

There you will find the following information, for example:

- Our newsletter containing up-to-date information on your products.
- Relevant documentation for your application, which you can access via the search function in "Product Support".
- A forum for global information exchange by users and specialists.
- Your local contact for IA/DT on site.
- Information about on-site service, repairs, and spare parts. Much more can be found under "Our service offer".

A.1.4 RFID homepage

RFID homepage

For general information about our identification systems, visit RFID homepage (www.siemens.com/simatic-sensors/rf).

A.1.5 Technical documentation on the Internet

Technical documentation on the Internet

A guide to the technical documentation for the various products and systems is available on the Internet:

SIMATIC Guide manuals (www.siemens.com/simatic-tech-doku-portal)

A.1.6 Online catalog and ordering system

Online catalog and ordering system

The online catalog and the online ordering system can also be found on the Industry Mall Homepage (http://www.siemens.com/industrymall).

A.1.7 Training

Training center

We offer appropriate courses to get you started. Please contact your local training center or the central training center in

D-90327 Nuremberg.

Phone: +49 (0) 180 523 56 11
(€ 0.14 /min. from the German landline network, deviating mobile communications prices are possible)

For information about courses, see the SITRAIN homepage (www.sitrain.com).

Glossary

Active field

Area with minimum field strength containing the sensing range. Within this sensing range, data can be read from the tag or written to the tag.

Active surface

See active field

See active field

Active surface

See active field

See active field

Active tag/transponder

Active transponders are battery-operated, i.e. they obtain the energy required to save data on the microchip from a built-in battery. They are usually in an idle state and do not transmit data in order to increase the energy source's service life. The transmitter is only activated when it receives a special activation signal.

ALE interface

Application Level Events (ALE) specifies an interface over which RFID data can be requested from higher-level systems. The data volume is reduced via ALE connections and the quality of the data stream is improved at the same time. The ALE interface can be used by higher-level systems for both synchronous and asynchronous reading of RFID data. ALE clients therefore only have a logical view of workplaces, detailed knowledge of the RFID system or readers is no longer necessary.
For an ALE connection, ALE groups can also be configured that specify how the data records that have been passed on should be grouped for the report to the ALE client.

AM

Amplitude modulation; data are present in the changes in carrier frequency amplitude.

Amplitude modulation

See AM

Antenna switching

The change antenna function switches antennas over between transmitting (TX) and receiving (RX) in accordance with the rotation principle. In practice, the system transmits on one antenna at one time and receives on the other antennas.

Antennas

Antennas read/write RFID data from/to the tags. They pass the read data onto the data sources.

AS

See Automation system

ASM

Interface module, see communication modules

Automation system (AS)

A programmable logical controller (PLC) of the SIMATIC S7 system, comprising a central controller, a CPU and various I/O modules.

Battery-free data storage unit

Mobile data storage units which operate without batteries (see transponders). Power is supplied to the data storage unit across an electromagnetic alternating field.

Baud

Unit (digits per second).

Baud rate

The baud rate describes the data transmission's digit rate.

Byte

One byte represents a group of eight bits.

CE guidelines

See CE Label

CE Label

Communauté Européenne (product mark of the European Union)

Communication modules

Communication modules are used to integrate the identification systems in SIMATIC or SINUMERIK systems, or to connect them to PROFIBUS, PROFINET, PC or any other system. Once supplied with the corresponding parameters and data, they handle data communication. They then make the corresponding results and data available. Suitable software blocks (FB/FC for SIMATIC; C libraries for PCs with Windows) ensure easy and fast integration in the application.

Continuous Wave

See CW

CW

Continuous Wave; data are present in the carrier frequency which is switched on and off.

Data rate

The rate at which data are exchanged between the tag and reader. Typical units are bits per second or bytes per second.

Data sources

Data sources are the basic components for reading RFID data. They encapsulate the antennas assigned to them and the data received by them for the subsequent function units. In general, one RFID device can also contain more than one data source. Various different data sources can be defined so that mutually independent tasks can be performed with the same reader.

Data transfer rate

Number of characters which can be transmitted from a tag to a reader within a defined time. Baud rates are also used to specify how fast a reader can read information.

Data transmission rate

Unit of measurement for the volume of data transmitted within a unit of time, e.g. bytes/s, see also Baud

dB

See Decibel

dBm

Dimensional unit for the transmitted power in the logarithmic relation to 1 mW (Milliwatt).

0 dBm = 1 mW, +23 dBm = 200 mW, +30 dBm = 1 W

dBr

dB(relative); a relative difference to a reference value

Decibel (dB)

Unit of measurement for the logarithmic relationship between two variables.

Detuning

UHF antennas are tuned to receive a particular electromagnetic wavelength from the reader. If the antenna is too close to metal or a metallic material, it can be detuned, making the performance deteriorate.

DHCP

Dynamic Host Configuration Protocol

Distant field communication

RFID antennas emit electromagnetic waves. If a tag is further than one full wavelength from the transmit antenna of the reader, this is known as a distant field. If it is within one complete wavelength, this is known as the near field.

The wavelength in the UHF RFID system is approximately 33 cm.

The distant field weakens according to the square of the distance to the antenna and the near field weakens according to the cube of the distance to the antenna. Passive RFID systems based on distant field communication (UHF and microwave systems) have a greater read range than systems based on near field communication (typically low-frequency and high-frequency systems).

Dwell time

The dwell time is the time during which the transponder dwells within the sensing range of a reader. The reader can exchange data with the transponder during this time.

Dynamic mode

In dynamic mode, the data carrier moves past the reader at a traversing rate which depends on the configuration. Various checking mechanisms ensure error-free data transfer even under extreme environmental conditions.

EAN

European article number. Standardized barcode used in Europe, Asia and South America. Is administered by EAN International.

EBS

Equipotential **B**onding **S**trip

Effective Isotropic Radiated Power

See EIRP

Effective Radiated Power

See ERP.

EIRP

Effective Isotropic Radiated Power; unit of measurement for the transmission power of antennas (referred to an isotropic radiator) mainly used in the USA. EIRP is specified in Watt, and is not equal to ERP. (0 dbi = –2.14 dBm)

Electromagnetic compatibility (EMC)

Electromagnetic compatibility is the ability of an electrical or electronic device to operate satisfactorily in an electromagnetic environment without affecting or interfering with the environment over and above certain limits.

EMC

See Electromagnetic compatibility

EMC directive

Guidelines for electromagnetic compatibility This guideline relates to any electrical or electronic equipment, plant or system containing electric or electronic components.

EPC

Electronic Product Code. Standardized number system for identifying articles with a data width of either 64, 96 or 256 bits.

EPCglobal

The non-profit organization EPCglobal Inc. develops standards for uniform use of RFID technology throughout the entire supply chain spanning different countries and sectors. Development of the EPC (Electronic Product Code) was an important step in the direction of RFID standardization.

Equipotential bonding

Potential differences between different parts of a plant can arise due to the different design of the plant components and different voltage levels. It is necessary to compensate for these differences by equipotential bonding. this is done by combining the equipotential bonding conductors of power components and non-power components on a centralized equalizing conductor (EBS = **E**quipotential **B**onding **S**trip).

ERP

Effective Radiated Power; unit of measurement for the power of antennas (referred to an ideal dipole) mainly used in Europe. ERP is specified in Watt, and is not equal to EIRP. (0dbm = + 2.14 dBi)

ESD directive

Directive for handling **E**lectrostatic **S**ensitive **D**evices

ETSI

European Telecommunications Standard Institute

European Article Numbering

See EAN.

eXtensible markup language

See XML.

FCC

Federal Communications Commission (USA)

FHSS

Frequency Hopping Spread Spectrum; frequency hopping procedure.

FM

Frequency modulation; data are present in the changes in the frequency of the carrier frequency.

Frequency hopping

Frequency hopping technique Automatic search for free channels.

In frequency hopping mode, data packets are transmitted between communication partners on continuously changing carrier frequencies. This makes it possible to react to interference from devices transmitting signals in the same frequency range (channel). If an attempt to send a data packet is unsuccessful, the packet can be transmitted again on a different carrier frequency. By default the RF600 uses this procedure (FCC) only in the USA and Canada.

Frequency modulation

See FM.

Frequency Shift Keying

See FSK

FSK

Modulation, Frequency Shift Keying; data are present in the changes between two frequencies.

ICNIRP

International Commission of Non Ionizing Radiological Protection

ICRP

International Commission of Radiological Protection

Interface modules

See communication modules

Interrogator

See readers

ISO

International Standard Organization

ISO 18000

Standard for data exchange of RFID systems between reader and transponder. There are various subdefinitions of this standard for the various approved frequency ranges for RFID. For example, the range 865 ... 868 MHz is described in ISO 18000-6.

LAN

Local Area Network

LBT

Listen Before Talk; the reader only transmits when the channel is free.

Limit distance

The limit distance is the maximum clear distance between reader antenna and transponder at which the transmission can still function under normal conditions.

Mass recording

The capability of a reader to record several or many transponders quasi-simultaneously and to read the code. Contrary to the multi-tag capability, the reader is not able to specifically address individual tags.

MDS

Mobile data memory, see transponder

MES

Manufacturing Execution System

Metal-free area

Distance/area which must be maintained between the transponder and metal in order to prevent interference during data transfer between the transponder and reader.

Mobile Data Memory (MDS)

Mobile data memory, see transponder

Modulation

Modulation is a procedure with which one or more characteristics (e.g. phase, amplitude, frequency) of a carrier oscillation are modified according to the response of a modulating oscillation.

MTBF

Mean Time Between Failures of a device

Multi-tag capability

Multi-tag capability means that a reader can communicate simultaneously with different data carriers. Therefore the reader can specifically address a transponder with its UID (see also mass recording).

Near field communication

RFID antennas emit electromagnetic waves. If a tag is further than one full wavelength from the transmit antenna of the reader, this is known as a distant field. If it is within one complete wavelength, this is known as the near field.

The wavelength in the UHF RFID system is approximately 33 cm.

The distant field weakens according to the square of the distance to the antenna and the near field weakens according to the cube of the distance to the antenna. Passive RFID systems based on near field communication (typically low-frequency and high-frequency systems) have a greater read range than systems based on distant field communication (typically UHF and microwave systems).

Notification channels

One or more data sources are assigned to notification channels as data suppliers. Notification channels are used for asynchronous read procedures. The notification channel passes on the RFID data to the data sources assigned to it in accordance with the configured triggering mechanism (notification channel trigger) and the data selector. Notification channels can reference more than one data source. The information from notification channels (if they have been created) is also requested in the synchronous read procedure.

Passive tag/transponder

A tag without its own power supply. Passive transponders obtain the energy required to supply the microchips from the radio waves they receive.

PDM

Pulse width modulation; data are present in the pulse width.

Phase modulation

See PM

PLC

Programmable Logic Controller, see PLC.

Programmable logic controller; electronic device used in automation engineering for open-loop and closed-loop control tasks. The typical modules of a PLC are the CPU, power supply (PS) and various input/output modules (I/O).

Programmable controller: The programmable logical controllers (PLC) of the SIMATIC system consist of a central controller, one or more CPUs, and various other modules (e.g. I/O modules).

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PM

Phase modulation; data are present in the changes in carrier frequency phase.

Programmable Logic Controller

See PLC.

Programmable logic controller

See PLC

Pulse width modulation

See PDM

Radio Frequency Identification

See RFID.

Read procedures

There are two different techniques for reading the data sources:

- Synchronous read procedure
  A synchronous read procedure is when an ALE client of the enterprise system logs onto the report of the ALE interface and receives the required data automatically.
- Asynchronous read procedure
  An asynchronous read procedure is when an ALE client of the enterprise system logs onto the report of the ALE interface and receives the data automatically. This continues until the client logs off again.

Read rate

Number of tags which can be read within a defined time.
The read rate can also be used for the maximum rate at which data can be read from a tag. The unit is bits per second or bytes per second.

Reader (also interrogator)

Readers transfer data between the mobile data storage units (tags or transponders) and the higher-level systems. The data, including the energy required for processing and sending back, are transmitted to the transponder across an electromagnetic alternating field. This principle enables contact-free data transmission, ensures high industrial compatibility and works reliably in the presence of contamination or through non-metallic materials.

Reader talks first

A passive tag communicates in the read field of a reader with the reader. The reader sends energy to the tags which only reply when they are explicitly requested. The reader is able to find tags with a specific serial number commencing with either 1 or 0.
If more than one tag responds, the reader can scan all tags commencing with 01 and subsequently with 010. This is referred to as "walking" on a binary tree, or "tree walking".

Reading range

The distance within which a reader can communicate with a tag. Active tags can cover a greater distance than passive tags because they use a battery to send signals.

Report

A combination of rules which manage communications systems.

RFID

Radio Frequency Identification; a method of identifying items using electromagnetic waves. The reader supplies energy to the tag and communicates with it.

RFID device

The RFID device is a function block in RF-MANAGER and represents a reader. The following components are active in this function block: Antennas, data sources and notification channels.

RFID systems

SIMATIC RF identification systems control and optimize material flow and production sequences. They identify reliably, quickly and economically, use non-contact data communication technology, and store data directly on the product. They are also resistant to contamination.

RH circular

Right hand circular polarization

RTNC

Connector standard (Reverse TNC). Industrial coaxial connector with screw coupling, can be used for frequencies of up to 2 GHz. The mechanical design of the RTNC connector is not compatible with the TNC connector.

RTTE

Radio and Telecommunications Terminal Equipment

SCM

Supply Chain Management

Secondary fields

In addition to the main sensing range (antenna's main direction of transmission) there are secondary fields. These secondary fields are usually smaller than the main fields. The shape and characteristics of the secondary field depend on the metallic objects in the surroundings. Secondary fields should not be used in configuring.

Selectors

An RFID system that has been configured using RF-MANAGER recognizes different types of selectors. These are distinguished as follows:

- Tag selectors
  Tag selectors are components of data sources. They determine which tag data areas should be read or routed on. They also define which tags should be supplied or filtered out on the basis of the contents of these data areas. In this case, a tag selector orientates itself on the tag ID or the freely parameterizable user data of the tag.
- Data selectors
  Data selectors are components of notification channels. They further dilute the information stream and specify which information should be passed on.
  In general, data selectors can also supply additional information (reader fields). This includes, for example, the time of the read.
- ALE selectors
  ALE selectors reduce the data volume in accordance with the requirements of higher-level systems and pass on the information in the form of ALE reports. ALE selectors can only sort EPC data; filtering of the freely parameterizable user data is not possible.

SELV

Safety Extra Low Voltage

Sensing range

Area in which reliable data exchange between transponder and reader is possible due to a particular minimum field strength.

Smoothing

Smoothing is a technique that is used to optimize the read quality. The RF-MANAGER marks the read event with a status description for the tag (e.g.: detected for the first time, reliably detected, lost) and adds these states to the read results. Time intervals are defined using this technique - for example, how long a tag detected for the first time has to be "seen" for it to be regarded as reliably detected. This allows tags to be excluded that have been unintentionally detected briefly in the boundary areas of the reader.

SSB

Single Sideband Modulation. SSB is similar to AM (amplitude modulation), however, only one sideband is sent instead of two sidebands. This saves 50% of the spectrum required in the HF channel without affecting the signal/data rate. For RFID applications, an HF carrier must also be sent to supply energy to the tag. Sending a carrier is many times not required for other SSB applications, since the HF carrier itself does not contain any data.

Static mode

In static mode the transponder is positioned at a fixed distance (maximum: limit distance) exactly above the reader.

Tag

See transponder

Tag talks first

A passive tag communicates in the read field of a reader with the reader. When a tag reaches the field of a reader, it immediately indicates its presence by reflecting a signal.

TARI

Abbreviation of Type A Reference Interval. Duration (period) for representation of a bit with content 0.

TCP/IP

Transmission Control Protocol/Internet Protocol

Telegram cycles

A passive tag communicates in the read field of a reader with the reader. When a tag reaches the field of a reader, it immediately indicates its presence by reflecting a signal. Transmission of a read or write command is implemented in three cycles. They are called "Telegram cycles". One or two bytes of user data can be transferred with each command. The acknowledgment or response transfer (status or read data) takes place in three further cycles.

Template

The template is a configuration file (*.rf660r) which contains all of the country-specific parameters (such as radio and tag protocol settings) required for operating the reader.

TNC

Connector designation (Threaded Neill Concelman).

Industrial coaxial connector with screw coupling, can be used for frequencies of up to 2 GHz.

Transceiver (transmitter/receiver)

Combination of transmitter and receiver. A unit which can both send and receive electromagnetic waves.

Transmission distance

Distance between communication module and transponder

Transponder

An invented word from transmitter and responder. Transponders are used on the product, the product carrier, the object, or its transport or packaging unit, and contain production and manufacturing data, i.e. all application-specific data. They follow the product through assembly lines, transfer and production lines and are used to control material flow.

Because of their wireless design, transponders can be used, if necessary, at individual work locations or manufacturing stations, where their data can be read and updated.

Tree walking

See Reader talks first.

Triggers

Triggers represent activation mechanisms that can be used to control asynchronous read and filter procedures. These are distinguished as follows:

- Read triggers
  Read triggers cause the data source to read the data from the tags that are located in the field of the antennas. A continuous trigger can, for example, be configured that will cause the antennas to read constantly.
- Notification channel triggers
  Notification channel triggers cause the notification channel to transfer the data from the data source assigned to it. A continuous trigger can, for example, be configured that will cause data to be transferred constantly.

UHF

Ultra-high frequency; frequency range from 300 MHz to 3 GHz. UHF RFID tags usually operate between 866 MHz and 960 MHz. This corresponds to a wave length of approx. 33 cm.

UID

User IDentifier; the UID is an unambiguous number in the transponder, assigned by the manufacturer. The UID is unambiguous, and can usually also be used as a fixed code. The UID is used to specifically address a transponder

Ultra High Frequency

See UHF.

User IDentifier

See UID

VESA

Video Electronics Standards Association (authority that defines standards for the PC industry)

Walking

See Reader talks first.

WLAN

Wireless LAN

Workplaces

Workplaces are used as an abstraction of the hardware. The relevant data sources and notification channels are grouped here into workplaces using the RF-MANAGER. In practice, workplaces are combinations of readers.

Write/read distance

See transmission distance

writer

See readers

XML

eXtensible markup language; XML is a language derived from SGML with which other languages (document types) can be described. In the meantime, XML has become a widely used method for distributing information over the Internet. Data exchange between reader and read station is carried out using XML commands.

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