SIEMENS

SIWAREX® FTA

Device Manual

Status 08.12.2003

Warning and Safety Terms
This manual contains notices that are for your personal safety and to prevent damage to devices or surroundings. These notices are indicated by a warning triangle and are presented as follows depending on the degree of danger:

Danger
means that serious material damage, severe injury or even death **will** result if the corresponding safety precautions are not followed carefully.

Warning
means that serious material damage, severe injury or even death **can** result if the corresponding safety precautions are not followed carefully.

Caution
means that material damage or minor injuries can result if the corresponding safety precautions are not followed carefully.

Caution
means that material damage can result if the corresponding safety precautions are not followed carefully.

Attention
refers to important information on the product, handling of a product or a corresponding segment of the documentation to which special attention should be given.

Qualified Personnel
Installation and operation of a device may only be performed by **qualified personnel**. Qualified personnel in a technical safety sense within this manual are personnel that have the qualifications for installing, grounding and identifying all devices, systems and circuits according to the applicable technical safety standards.
Intended Utilisation

Warning
The device may only be utilised with the replacement parts described in the catalogue and the technical description and only with foreign or external devices and components that are approved or suggested by Siemens.
Fault-free and safe operation of the product depends on proper transport, proper storage, assembly, installation, operation and maintenance.

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Disclaimer
We have tested the contents of this document for compatibility with the described hardware and software. This does not exclude the possibility of discrepancies in which case, we do not guarantee the complete compatibility of this document. The information in this document is assessed regularly and any necessary corrections are included in the following revision.
We are grateful for any suggestions of improvement.

SIWAREX FTA

Weighing Electronics for Automatic Scale

Device Manual

Revision 12/2003
Order Number 7MH4900-2AB11

Contents

Images

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1 Preface

1.1 Purpose of This Manual

All of the information required to construct and operation the SIWAREX FTA is found in this manual.

1.2 Fundamental Knowledge Requirements

To understand this manual, a general knowledge of SIMATIC automation technology is required. Weighing technology is also beneficial.

1.3 Scope of this Manual

This manual refers to the SIWAREX FTA module:

Type	Name	Order number	from product status (Version)	
SIWAREX FTA	SIWAREX F**lexible** T**echnology** A**utomatic Weighing Instrument***	7MH4900-2AA01	**HW V1.0.0**	**FW V.1.1.1**

Table 1-1 Validity of This Manual

*The name corresponds with the naming conventions of the OIML - Organisation Internationale de Metrologie Legale and means „Automatic Weighing Instrument“.

Note

This manual contains the description of all modules that are valid at the time of publication.

We reserve the right to deliver production information along with new modules or modules with a newer product status that contains the current information on the module.

The layout of this manual is based on activities that must be performed in the scope of project planning, commissioning, operation and service / maintenance.

Chapter	Description of Content
1 Preface	Notes on using this manual
2 Scope of Delivery	Description of the SIWAREX FTA scope of delivery
3 Preface	Overview of -Structure - Functionality - System integration of SIWAREX FTA
4 Hardware Planning and Assembly	Description - of individual hardware components - of structure and installation - of connections - of operating preparation.
5 Weighing Functions	Description of all weighing parameters and corresponding functions.
6 Commands	Description of commands that can be executed by SIWAREX FTA
7 Messages and Diagnostics	Description of error messages with notes on problem solutions
8 Programming in SIMATIC STEP 7	Description of data exchange with the SIMATIC CPU. This chapter is only meant for users who wish to write their own application software.
9 Project planning in SIMATIC PCS 7	Description for the PCS 7 project planning package
10 Commissioning using a PC – SIWATOOL FTA	Description - Software installation - Software functions
11 Firmware-Update with SIWATOOL FTA	Description - Software installation - Software functions
12 Calibrating Applications	Description of conditions for calibration
13 Accessories	Ordering information for optional components such as: - Digital remote display - Micro Memory Card - Exi-Interface
	Technical Data
15 Index	
16 Abbreviations	

Table 1-2 Chapter Overview

1.4 Further Support

Do you have more questions about using the SIWAREX FTA? Then please contact your Siemens representative in the office or business location that is responsible for your area or technical support for SIWAREX - Tel.: +49 (0)721 595 2811.

Updated information on SIWAREX Weighing Technology can be found on the respective Internet Site.

http://www.siwarex.com

2 Scope of Delivery

2.1 Scope of Delivery

A bus connector for the SIMATIC bus, the conformity details from the manufacturer and a sheet of additional product information belong to the SIWAREX FTA scope of delivery.

For planning your work with the SIWAREX FTA, you will need:

- The SIWAREX FTA project planning package for SIMATIC S7

or

- The SIWAREX FTA project planning package for SIMATIC PCS7

These are not components included in the scope of delivery and must be ordered separately.

The corresponding project planning package is combined of the following components:

- SIWATOOL commissioning program for Windows
- Set-up for the installation of the module in the SIMATIC Manager hardware catalogue
- Standard software for operating the SIWAREX FTA in SIMATIC S7
- Manual in several languages
- Set-up for PCS7 Library (Project planning package for PCS7 only)
- SIWAREX FTA OCX – AddOn for ProTool for project planning with the calibration display (TP/OP/MP 170B/270/370)

Application sample software can be very helpful for the first programming steps. This software can be downloaded, free-of-charge over the Internet (www.siwarex.com).

With software packages:

- SIWAREX Multiscale for batch systems
- SIWAREX Multifill for filling/bagging operations

there is a specially designed STEP 7 software available which enables a very effective system software development.

The required optional accessories are provided in chapter *13 Accessories*.

3 Product Overview

3.1 General Information

SIWAREX FTA (**F**lexible **T**echnology, **A**utomatic Weighing Instrument) is a versatile and flexible weighing module which can be utilised wherever a scale should fulfil its tasks automatically. Automatic scale operation is characterised by an weighing procedure performed automatically according to a defined plan.

The function module (FM) SIWAREX FTA is integrated in SIMATIC and uses all features of the modern automation system such as integrated communication, diagnostics system and project planning tools to its advantage.

The scale functionality of the SIWAREX FTA includes the non-automatic scale (Non automatic weighing instrument conforming with OIML R-76), the automatic scale for balancing (Automatic gravimetric filling Instrument conforming with OIML R-61), the automatic scale for catch weighing (Automatic catch weighing instrument conforming with OIML R-51) and the automatic scale for discontinuous totalising (Discontinuous totalising automatic weighing instrument conforming with OIML R-107)

3.2 Benefits

SIWAREX FTA is characterised by a few clear advantages:

- Uniform structure and universal communication through the integration in the SIMATIC S7 and SIMATIC PCS7
- Uniform project planning with SIMATIC
- Direct application in SIMATIC automation system
- Application in the decentralised system concept by connecting to PROFIBUS DP through ET 200M
- Weight measurement or force to resolutions of 16 million parts
- Precision of 3 x 6000d, calibratable (0.5 µV per e)
- Calibratable display with SIMATIC HMI standard operator panels
- Measurement rates of internal 2.5 msec, external 10 msec
- Exact dosage switching signals (< 1 msec)
- Several dosage speeds
- Smooth or step controlled dosage control
- Parameter definable inputs and outputs
- Automatic weighing operation parameter setting for different applications

- Flexible adjustment for various SIMATIC requirements
- Simple parameter definition with the SIWATOOL program through the RS 232 interface
- Theoretical adjustment without any adjustment weights possible
- Module exchanging without readjusting the scale is possible
- Scale status recording
- Intrinsically safe load cell supply for Ex-Zone 1 (optional)
- Application in Ex-Zone 2
- Extensive diagnostic functions

3.3 Range of Application

SIWAREX FTA is the optimal solution wherever weighing technology requires high speed and precision. Because of the high resolution (3 x 6000 d, calibratable), scales can be built to work precisely over broad areas. Calibratable weighing systems, whether a filling system, unloading station, bagging operation, rotopacker, mixer or control stations can be constructed with the SIWAREX FTA. Typical fields of application are e.g.:

- Liquid filling
- Bagging in a packaging system
- Weighing catch levels as well as level decrease weighing and fill weighing
- Catch level testing
- Material loading with totalising

3.4 Structure

SIWAREX FTA is a function module (FM) of the SIMATIC S7-300 and can be read directly on the SIMATIC S7-300- or ET 200M bus board. Installation / cabling efforts for the 80 mm wide module are simplified with the profile rail assembly (snap-in technology).

Connecting load cells, power supply and the serial interface is all done through the 40 pin standard front connector.

Operation of the SIWAREX FTA in SIMATIC guarantees complete integration of weighing technology in the automation system.

3.5 Function

The primary task of the SIWAREX FTA consists of the precise measurement of the current weight values in up to three measurement ranges and the exact control of the weighing procedure. The control of the weighing procedure is completely run from the weighing module as if in separately constructed weighing electronics. The integration in SIMATIC enables the progress of the weighing procedure to be influenced directly from the PLC program however. This enables reasonable task distribution: The extremely fast weighing functions are performed in the SIWAREX module, latching and signal linking is done in the PLC.

There are different automatic weighing procedures for which SIWAREX FTA can be configured optimally by defining the corresponding parameters.

The following operating modes can be defined:

- Non Automatic Weighing Instrument – conforming with OIML R-76
- Automatic Gravimetric Filling Instrument – conforming with OIML R-61 (AWI)
- Automatic catch weighing instrument – conforming with OIML R51 (AWI)
- Automatic Totalising Filling Instrument- totalising – conforming with OIML R 107 (AWI)

During the weighing procedure, SIWAREX FTA monitors and controls a multitude of signals. The optimised system internal data exchange enables a direct evaluation of weighing signals and states in the PLC program.

The weighing procedure influence on the PLC enables a flexible adjustment to suit the changes in the system technology.

SIWAREX FTA is already adjusted in-house. Therefore, the scale can be adjusted to theoretical settings without using any adjustment weights and modules can be exchanged without readjusting the scale. Exchanging modules during running operation is also possible when working with “active bus modules”.

The SIWAREX FTA has two serial interfaces. An RS 485 interface is used for connecting digital remote displays. A PC can be connected to the RS 232 interface for setting SIWAREX FTA parameters.

The weighing module SIWAREX FTA can also be used in explosion hazard areas (zones 21 and 22). Load cells are supplied with inherent safety with zone 1 applications using an optional Ex-interface SIWAREX IS.

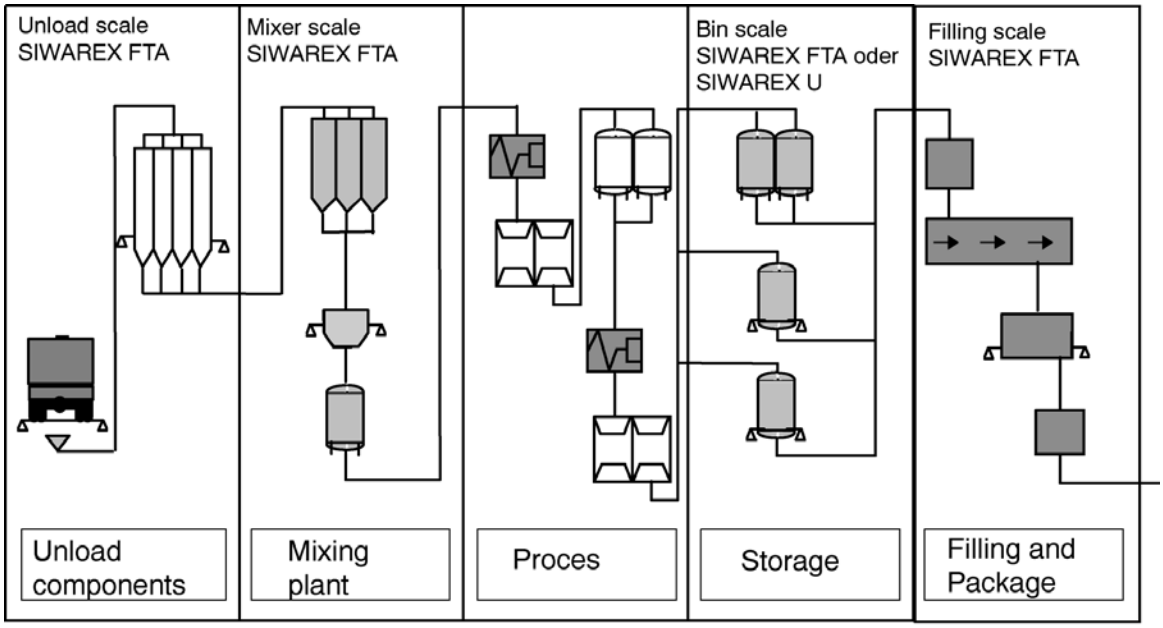


Image 3-1 Areas of application SIWAREX FTA in the production chain

3.6 System Integration in SIMATIC

SIWAREX FTA is completely integrated in the SIMATIC S7 and SIMATIC PCS7. The user is absolutely free to configure his automation solution including the weighing application as desired. The optimal solution can be created for small, medium and large systems by selectively combining the SIMATIC components. The project planning package and the example applications for SIMATIC can help you to quickly and efficiently create customer specific or branch specific solutions. The following image shows a typical assembly for a medium sized system.

For project planning with SIMATIC PCS 7, the completed function block FB SIWA for the automation system and the graphic blocks for the operator station are used.

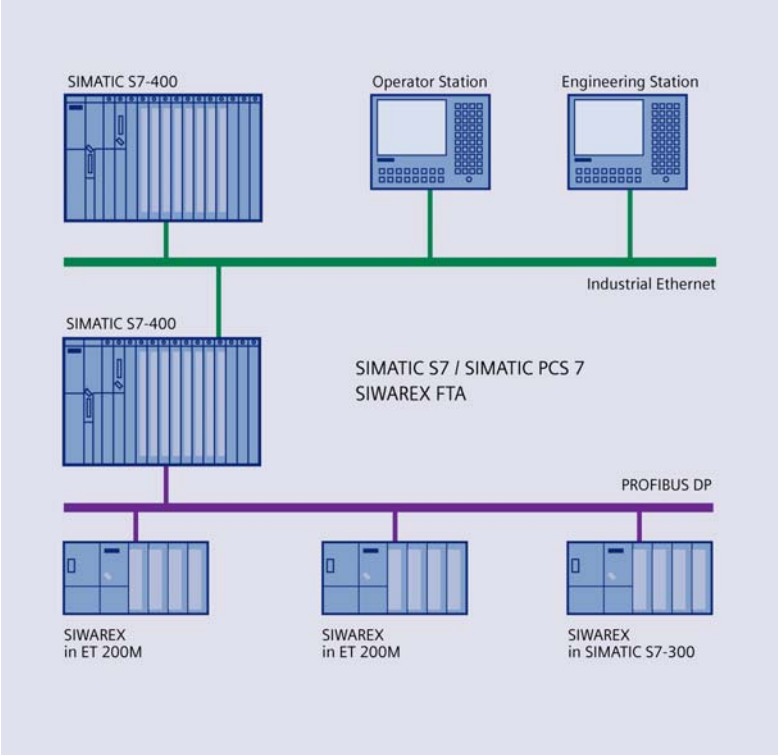


Image 3-2 Configuration SIMATIC S7/PCS7 with SIWAREX FTA

3.7 Commissioning and Service with SIWATOOL FTA

For commissioning, there is a special program SIWATOOL FTA for Windows operating systems.

The program enables commissioning of the scale without having to understand automation technology. During a service procedures, you can analyse the processes in the scale and test them with the help of a PC. Reading the diagnostics buffer from the SIWAREX FTA is very helpful in analysing events.

Besides complete access to all parameters, memory or print-outs of the weighing file, the program can create weighing curves as well.

SIWATOOL FTA can also be used for reading the contents of the calibratable records from the calibratable scale memory.

The following image shows the structure of the individual program windows.

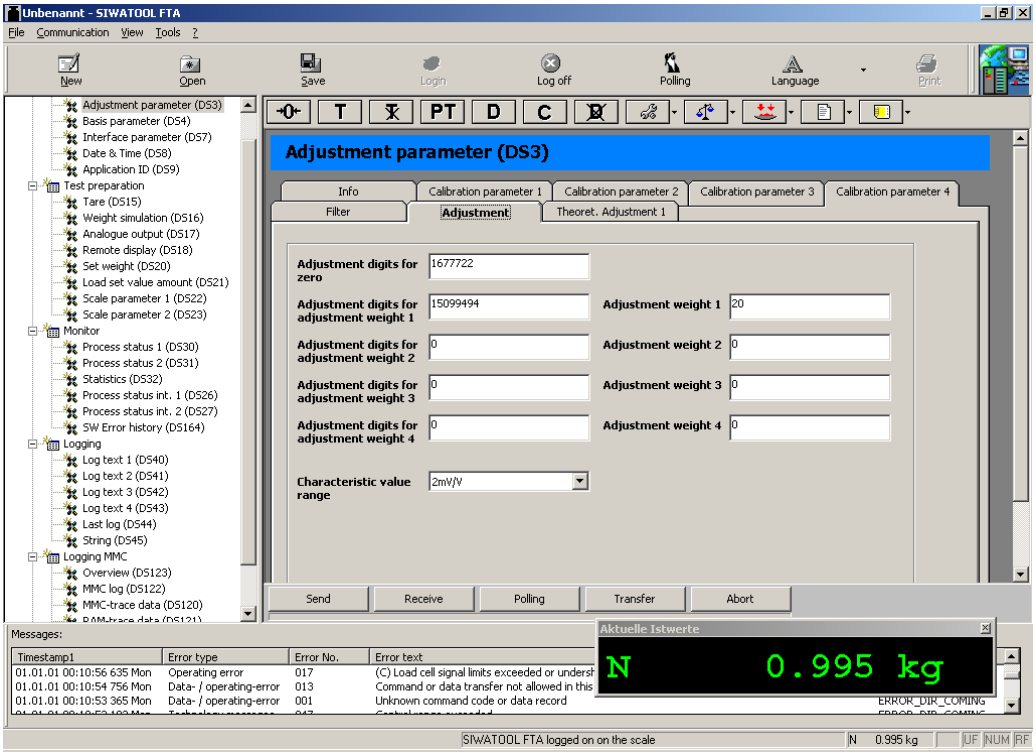


Image 3-3 SIWATOOL FTA Overview

Not only does the SIWATOOL FTA support the user for program entry. Analysing the diagnostics buffer, the contents of which can be saved together with the parameters after reading from the module is also very helpful.

A trace mode exists in the SIWAREX FTA module for optimising weighing progress. The recorded data can be displayed in a curve diagram using the MS Excel.

The following image shows the progress of a weighing procedure displayed with the SIWATOOL FTA.

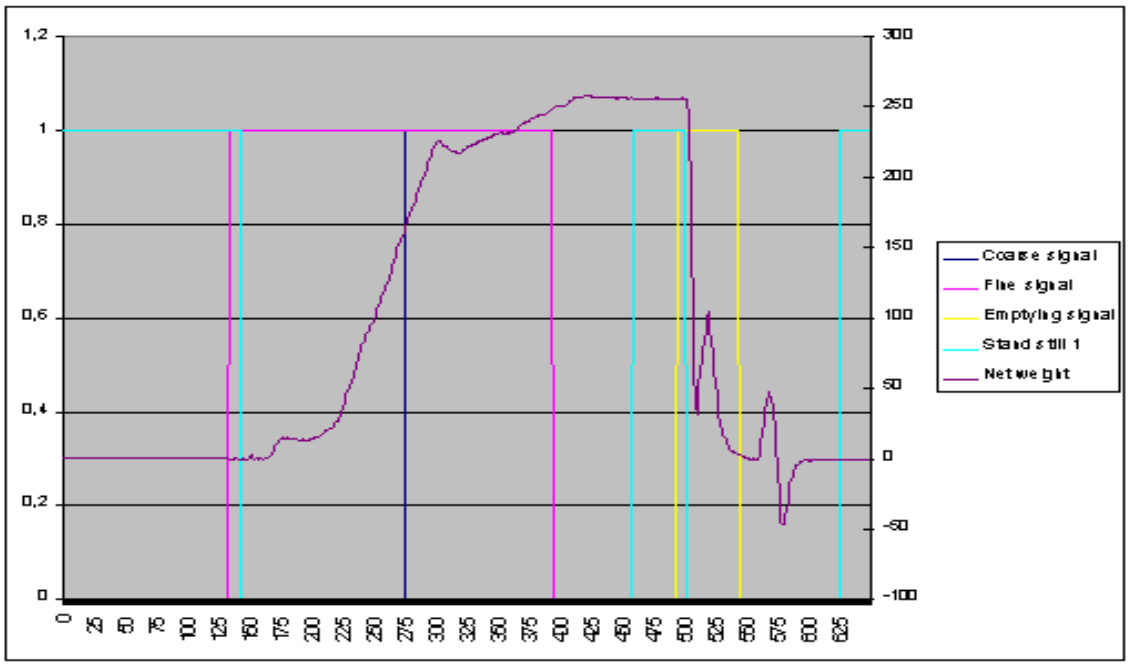


Image 3-4 Weighing procedure progress displayed from the tracing in SIWAREX FTA

3.8 Firmware Download with SIWATOOL FTA

Another feature of the SIWATOOL FTA program helps loading a new firmware version for SIWAREX FTA on-site. It allows you to perform firmware upgrades at any time and from anywhere.

3.9 Reading the stored weighing logs with SIWATOOL FTA

The weighing logs are stored on an MMC (Micro Memory Card) that is inserted into the SIWAREX FTA for the period of time defined in the weights and measures act. If a person disagrees with the results of a certain weighing procedure, the weighing data for that weighing procedure can be reconstructed from the MMC memory.

3.10 Quick Installation with SIWATOOL FTA Wizzard

The Function Wizzard is very helpful in defining parameters for the first time. The user answers several questions provided in dialogs and the program defines the correct parameters for SIWAREX FTA based on these answers.

4 Hardware Planning and Assembly

Warning Notes

This chapter contains information required for hardware planning, assembly and preparations for operation.

The technical safety information is to be strictly adhered to.

Warning

Unqualified intervention in the device/system or not adhering to the warning notices can result in serious injury or damage to equipment. Only qualified personnel are permitted access to the operational components of this device / system.

Warning

The unit has been developed, manufactured, tested and documented according to the corresponding safety standards. The device itself will not cause any danger to equipment or personal health under normal circumstances.

Danger

Installation and start-up operation is not permitted until it is guaranteed that the machine in which these components are to be integrated corresponds with the guidelines 89/392/EWG.

4.1 Planning the Hardware in SIMATIC

SIWAREX FTA is a function module (FM) in the SIMATIC S7 300 automation system. It can be installed in all places that are constructed for function modules.

Utilisation with the SIMATIC S7 300 is possible in central operation, in an expansion device or decentralised in the ET 200M system.

Operation in the SIMATIC S7 400 is only possible decentralised in the ET 200M system. In this case, the active back-plane bus can be used.

In estimating the maximum number of SIWAREX FTA's that can be integrated within one system, the following information may be helpful.

Total width	Current requirements (5V) from SIMATIC back-plane bus	Application memory requirements in the SIMATIC CPU
n x 80 mm	n x 50 mA	3500 Bytes + n x 1200 Bytes

Table 4-1 Requirements for n SIWAREX FTA

Max. amount in central operation – 8 SIWAREX FTA

Max. amount with multi-line expansion – 8 SIWAREX FTA per line

Max. amount in system ET 200M – 7 SIWAREX FTA per station

Selecting the suitable SIMATIC CPU, the SIMATIC HMI (Human Machine Interface) and communication modules does not only depend on SIWAREX FTA requirements but also on the overall job that the automation system has to perform.

4.2 EMC-Compatible Structure

SIWAREX FTA is a high-precision measurement device which has to dependably measure the slightest signal. Proper assembly and cabling is an absolute must for interference free operation.

4.2.1 Definition: EMC

EMC (Electromagnetic Compatibility) describes the ability of an electrical device to function in a defined electromagnetic environment without being influenced by its surroundings and without negatively influencing the surroundings.

4.2.2 Introduction

Although SIWAREX FTA was developed for use in industrial environments and meets high EMC specifications, you should do some EMC planning before

installing your controller to determine and take into account any possible interference sources.

4.2.3 Possible Effects of Interference

Electromagnetic interference can influence the automation system and SIWAREX FTA in various ways:

- Electromagnetic fields that have direct influence on the system
- Interference that infiltrates the environment through the bus signals (PROFIBUS-DP etc.)
- Interference through process cabling (e.g. measurement lines)
- Interference infiltrating the system through the power supply and/or protective ground

Error-free functionality of the SIWAREX FTA can be influenced by interference.

4.2.4 Coupling Mechanisms

Depending on the means of distribution (conductive or non-conductive bound) and the distance between the interference source and the device, interference can be introduced through four different coupling mechanisms into the automation system.

Galvanic coupling

Capacitive coupling

Inductive coupling

Radiation coupling

4.2.5 Five Basic Rules for Guaranteeing EMC

If you follow these five basic rules, EMC can be guaranteed in most cases!

Rule 1: Large conductive grounding surface connections

Ensure that while installing the automation devices, a well-made ground connection is made between the inactive metal components (see following section).

Connect all inactive metal components and low-impedance components with ground (broad cross-section).

Use screw connections on painted or anodised metal surfaces either with special contact washers or remove the insulated protective surface in the contact areas.

Do not use aluminium if at all possible for ground connections. Aluminium oxidises easily and is therefore less suitable for grounding connections.

Find a central location for connections between the grounding point and the ground wiring system.

Rule 2: Proper and organised wiring

Separate the cabling into groups (high-voltage lines, power supply lines, signal lines, ground wiring, data lines, etc.).

Run the high-voltage lines and ground wiring or data cables in separate channels or bundles.

Run measurement lines as close to grounding surfaces as possible (e.g. support beams, metal rails, cabinet panels).

Rule 3: Fasten cable shielding

Ensure that the cable shielding is connected properly.

Use shielded data wiring only. The shielding must be fastened to ground using a large surface area on both ends.

The shielding of measurement lines must be fastened to ground on both ends.

Run cable shielding directly under the SIWAREX FTA on the shielding channelling. The shielding is to be run to the connection terminal.

The connection between the shielding rail / ground rail and the cabinet /housing must be low impedance.

Use metallic or metal-plated connector housings for the shielded data lines.

Rule 4: Special EMC measures

All inductivity that is to be controlled should be connected with suppressors.

Use interference suppressed fluorescent lighting or incandescent lamps for illuminating cabinets or housings in the immediate vicinity of your controller.

Rule 5: Uniform reference potential

Create a uniform reference potential and ground all electrical operational elements.

Run sufficiently dimensioned potential equalizing cabling if potential differences exist or are to be expected between system components in the system. A potential equalisation is mandatory for Ex applications.

4.3 Assembly on the Profile Rail

When assembling the SIMATIC components and the SIWAREX FTA, the assembly regulations (AR) for the SIMATIC S7 must be fulfilled completely.

SIWAREX FT is assembled in the following steps.

1. Check for whether the SIMATIC bus connector is connected to the left of the SIWAREX FTA in the module group.
2. Connect the SIMATIC bus connector for the following module group in the SIWAREX if necessary.
3. Install the shielding strip under SIWAREX.
4. Hang the SIWAREX FTA in its place.
5. Fasten the SIWAREX FTA with 2 screws in the lower area of the module.
6. Label the SIWAREX FTA corresponding to your identification system.

4.4 Connections and Cabling

4.4.1 Connection areas for SIWAREX FTA

The following connection areas are found on the front:

- Screw-in connector for 24 V power supply
- 40 pin connector for load cell connection, digital input and output, RS 485, analogue output, counter input
- 9 pin (female) D-sub connector for RS 232 to PC or printer connection

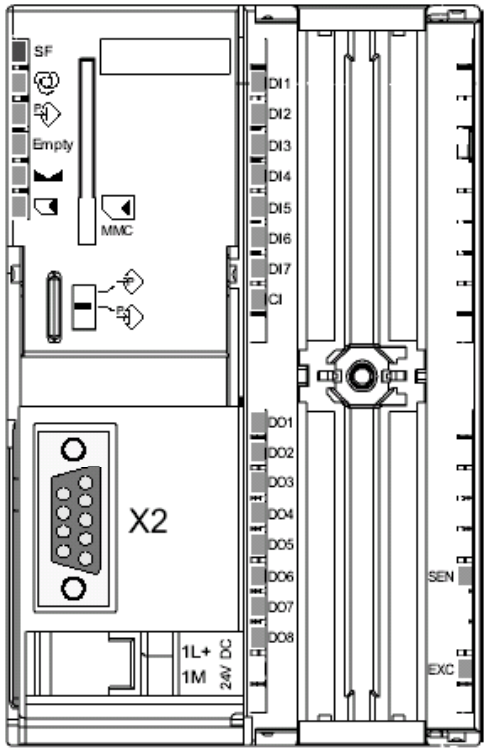


Image 4-1 SIWAREX FTA Front View

4.4.2 Shield connection

Special attention must be given to the shield strip for shielded lines. The interference resistance of the system can only be guaranteed if the properly constructed.

A cable is shielded to decrease the affects of magnetic, electrical and electromagnetic interference on this line. Interference on cable shielding is routed to ground through shielding rails that are conductively connected with the housing. To ensure that this interference stream does not become a source of interference, a low impedance connection to ground is especially important.

Use only lines with mesh-shielding. Shielding should provide at least 80% coverage.

For fastening the meshed shielding, use only metal cable clamps. The clamps must cover as much shielding as possible and ensure a good contact.

Shield clamps must be ordered separate to the grounding elements. The area covered by the shielding clamp is to be chosen corresponding with the cable diameter.

Approximately 1.5 cm of the cable insulation must be exposed in the area of the cable to be fastened with the shielding clamp. The exposed shielding is then pressed firmly against the grounding element with the shielding clamp.

The following figure shows a proper shielding clamp assembly

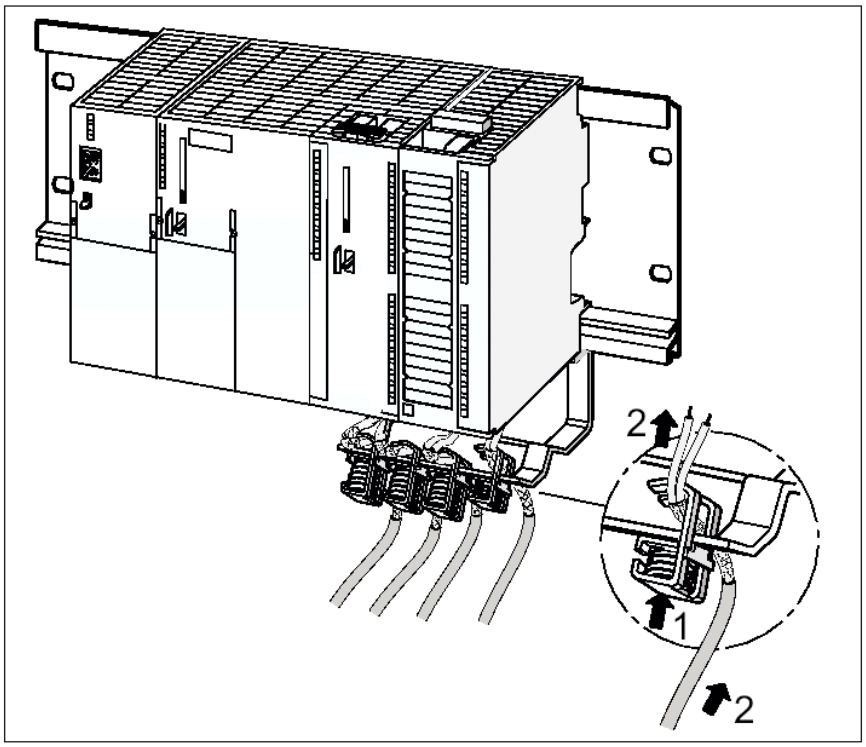


Image 4-2 Shield clamp assembly

The shielding should be pressed against the shielding rail by the shielding clamp.

4.4.3 Connecting the 24 V power supply

The 24 V supply voltage is connected with a screw connector. The connection is found in the lower area of the module groups next to the D-sub connector for RS 232.

Note

In central operation in the S7 300 system, the SIMATIC CPU and SIWAREX FTA is to be connected to the same 24 V power supply.

Termination	Signal	Remark
1L+	24 V DC 1L+	Power supply +
1M	24 V DC 1M	Power supply M

Table 4-2 Power supply connection

4.4.4 Connection to front connector

The SIMATIC construction guidelines apply for connecting the 40 pin connector.

Flexible cables with a cross-section of 0.25 to 1.5 mm^2 can be used. Remove the insulation from the cable for 6 mm and install wire end sleeves.

4.4.5 Load cell connections

Sensors equipped with strain gauges and that meet the following conditions can be connected to the SIWAREX FTA:

- Characteristic value 1.... 4 mV/V
- Supply voltage of 10.2 V is permitted

The connection is made to the 40 pin front connector. The connection should be made using the cable described in chapter *Accessories*.

Termination Clamp	Signal	Remark
X1.34	AGND	Analogue ground (only if required)
X1.35	SEN+	Sensor line +
X1.36	SEN-	Sensor line -
X1.37	SIG+	Measurement line +
X1.38	SIG-	Measurement line -
X1.39	EXC+	Supply voltage +
X1.40	EXC-	Supply voltage -

Table 4-3 Load cell connection

The following rules are to be followed when connecting load cells (WZ).

Using a junction box is required if more than one LC is connected (the LC must be connected parallel to one-another).

If the distance from LC to SIWAREX FTA is greater than the existing length of the LC connection cable then the extension box EB is to be used.

2. The cable shielding is normally run on the cable guide supports of the junction box.
   In case of the danger of potential equalisation currents on the cable shielding, a potential equalisation conductor is to be run parallel to the load cell cable or the shield clamp is to be used in the junction box to the shield strip. Using the potential equalisation conductor is the preferred method of dealing with EMC (Electromagnetic Compatibility).

3. Twisted pair cable is required for the indicated wiring:

- Sensor lines (+) and (-)
- Measurement voltage lines (+) and (-)
- Supply voltage lines (+) and (-)

4. The shielding must be attached to the shielding strip on the SIWAREX FTA.

The two images below show load cell connection using 4-wire and 6-wire systems.

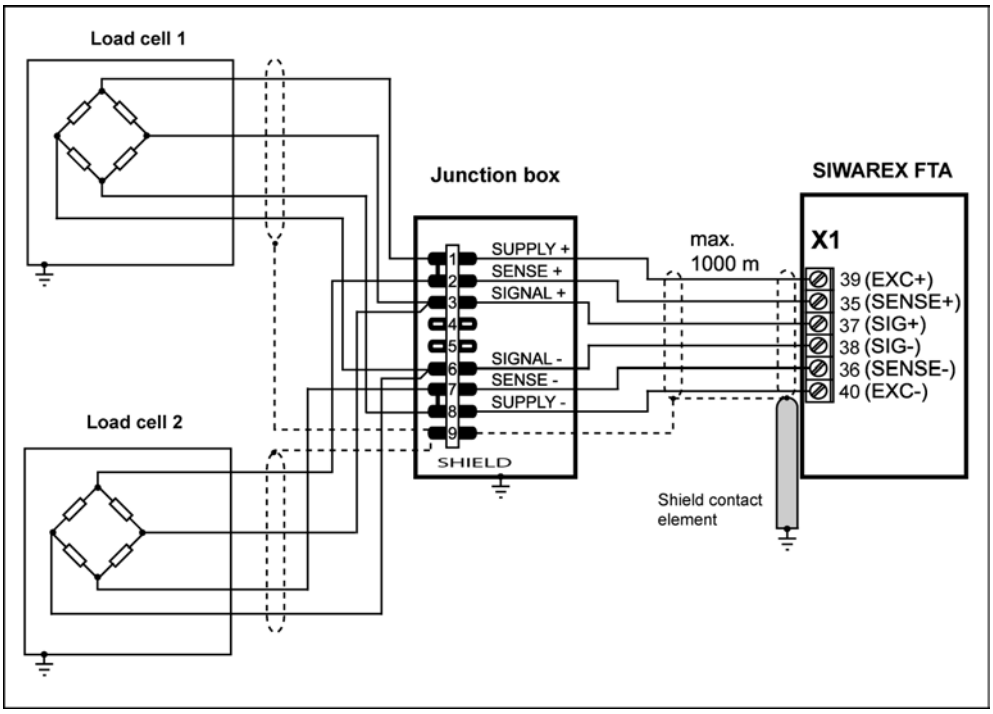


Image 4-3 Load cell connection in 4-wire system

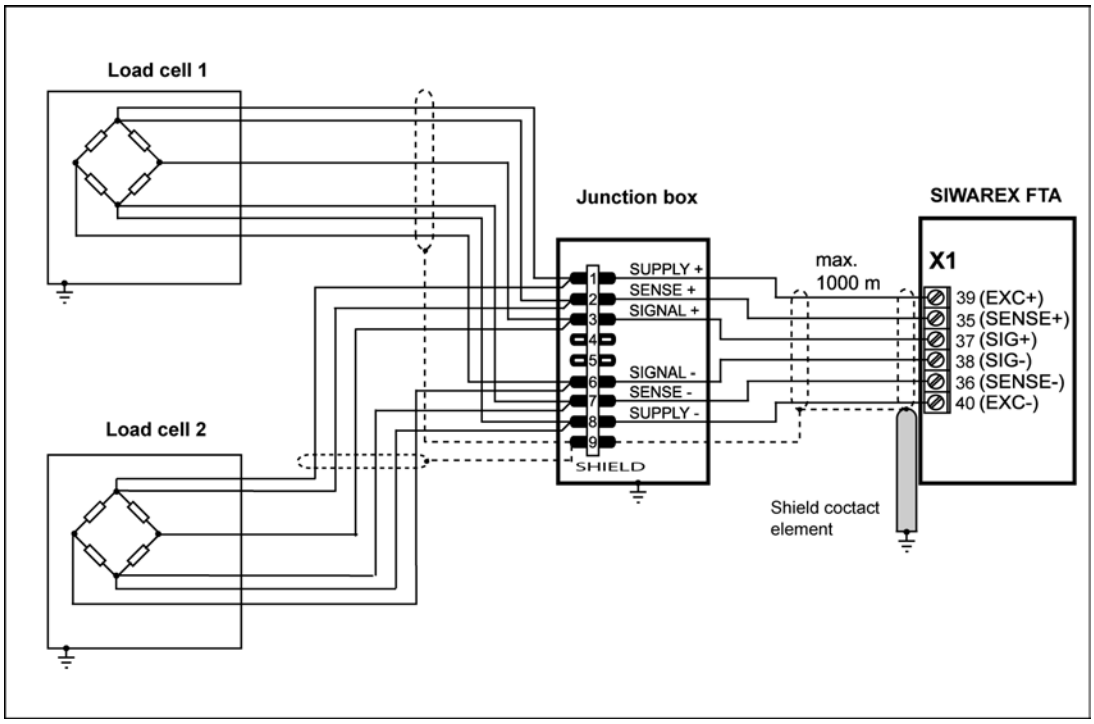


Image 4-4 Load cell connection in 6-wire system

4.4.6 Digital Inputs

SIWAREX FTA has 7 digital inputs. These inputs are potentially isolated from the module group. They have a common reference point (M).

The functionality of each input can be defined with parameters.

DI status is indicated with LEDs on the front of the SIWAREX FTA.

Warning

The inputs may only be activated if your functional allocation is known and the activation will not cause any harm.

Termination Clamp	Signal	Remark
X1.1	DI 1	Parameter definable function
X1.2	DI 2	Parameter definable function
X1.3	DI 3	Parameter definable function
X1.4	DI 4	Parameter definable function
X1.5	DI 5	Parameter definable function
X1.6	DI 6	Parameter definable function
X1.7	DI 7	Parameter definable function
X1.8	2M	Reference ground for digital inputs

Table 4-4 Digital input connections

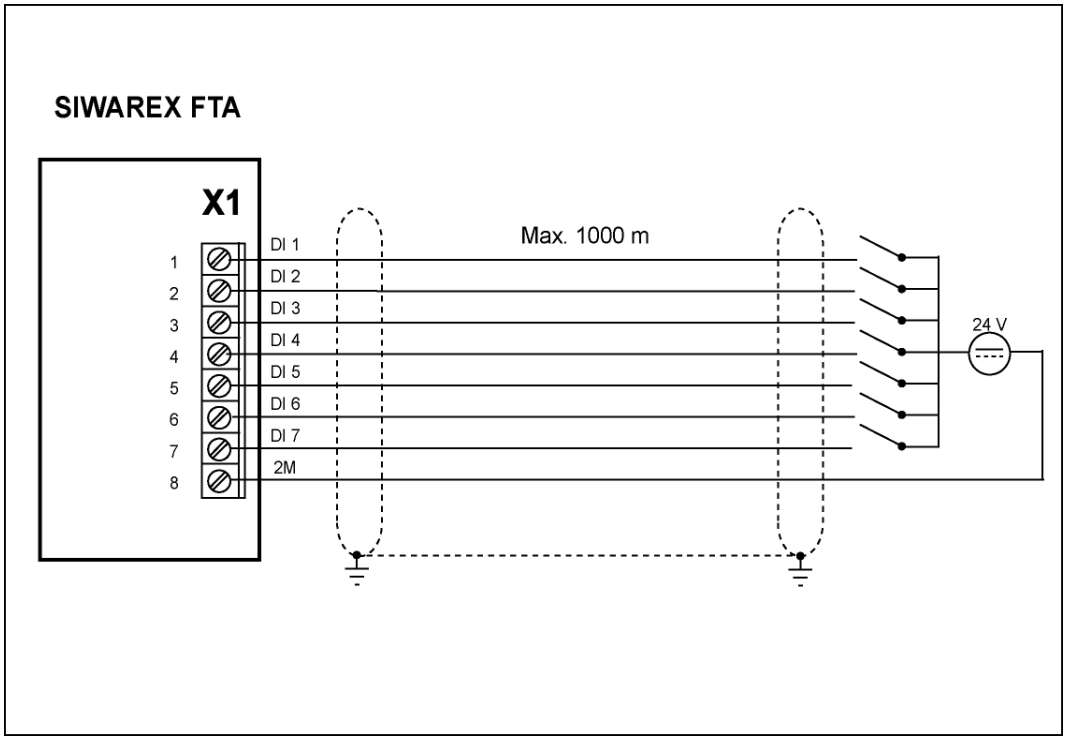


Image 4-5 Digital inputs

4.4.7 Counter Input

The counter input serves as the connection to the pulse encoder which is required during weighing start-up for continuous operation. Twisted pair wiring should be used for the connections.

Termination Clamp	Signal	Remark
X1.9	CI+	Counter input +
X1.10	CI-	Counter input -

Table 4-5 Pulse encoder connection

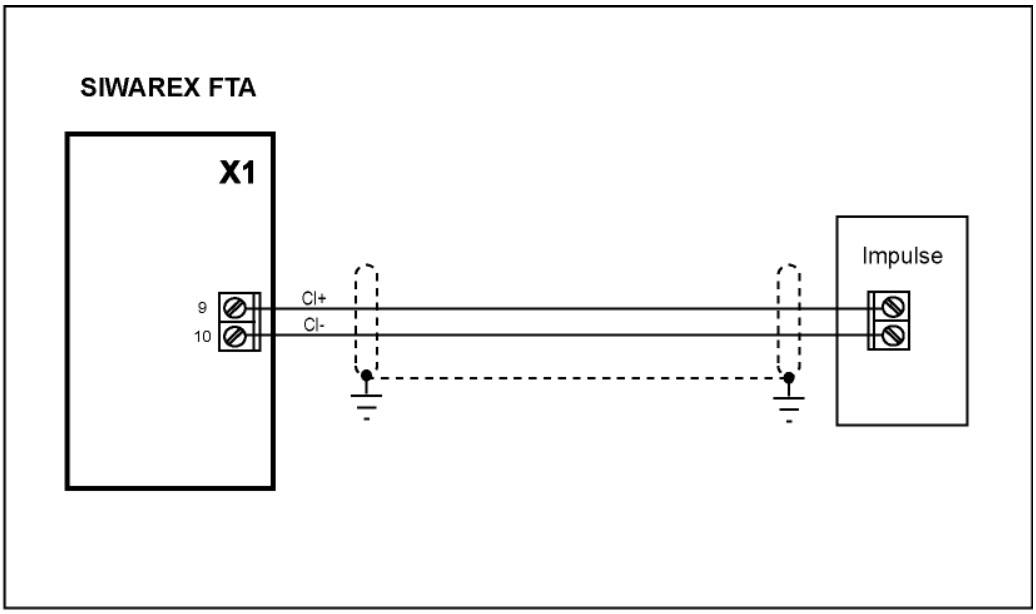


Image 4-6 Counter input

4.4.8 Digital Outputs

The SIWAREX FTA has eight potential isolated digital outputs (DO) with a nominal voltage of +24 V and an output current of maximum 0.5 A per output (max. total current 2 A).

These outputs are potentially isolated from the module group. The outputs share common potential. They have a common ground and a secure 24 V supply. They are short-circuit and overload protected.

DO status is indicated with LEDs on the front of the SIWAREX FTA.
When connecting inductive consumers, the digital output that is used must be equipped with a free-wheeling diode.

Termination Clamp	Signal	Remark
X1.11	DO 1	Parameter definable function
X1.12	DO 2	Parameter definable function
X1.13	DO 3	Parameter definable function
X1.14	DO 4	Parameter definable function

Termination Clamp	Signal	Remark
X1.15	DO 5	Parameter definable function
X1.16	DO 6	Parameter definable function
X1.17	DO 7	Parameter definable function
X1.18	DO 8	Parameter definable function
X1.19	3L+	24 V for digital outputs
X1.20	3M	Ground for digital outputs

Table 4-6 Digital output connections

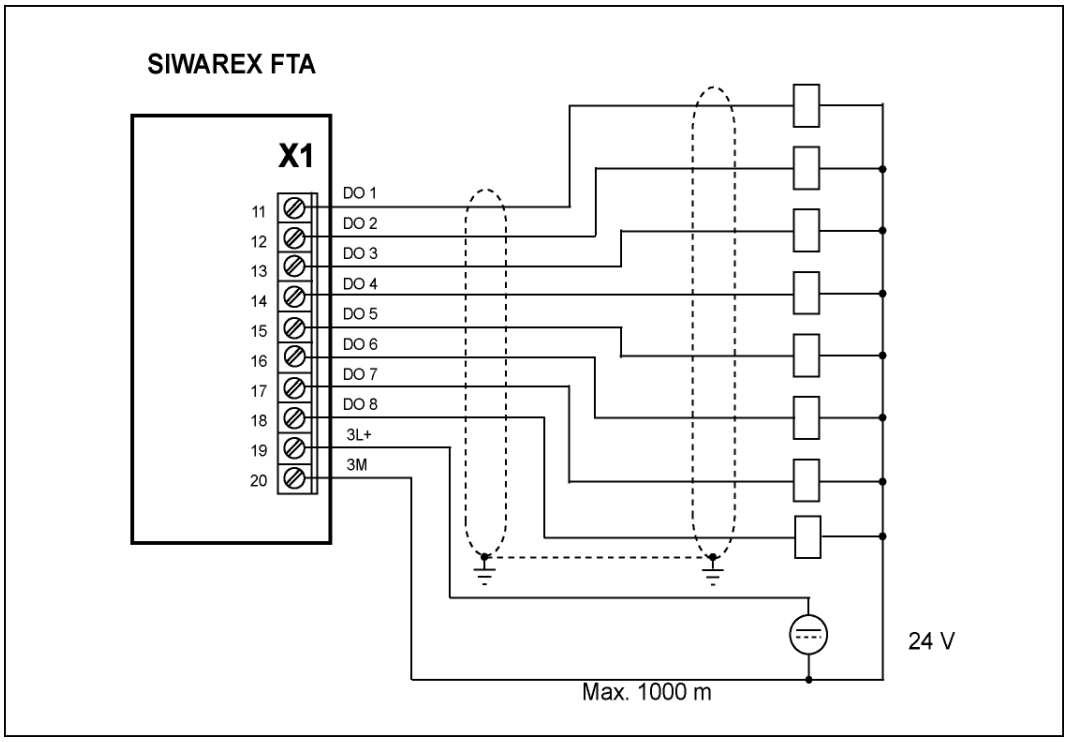


Image 4-7 Digital outputs

4.4.9 Analogue Output

Termination Clamp		Signal	Remark
X1.29		IOUT+	Analogue output +
X1.30	IOUT-	Analogue output -	

Table 4-7 Analogue output connections

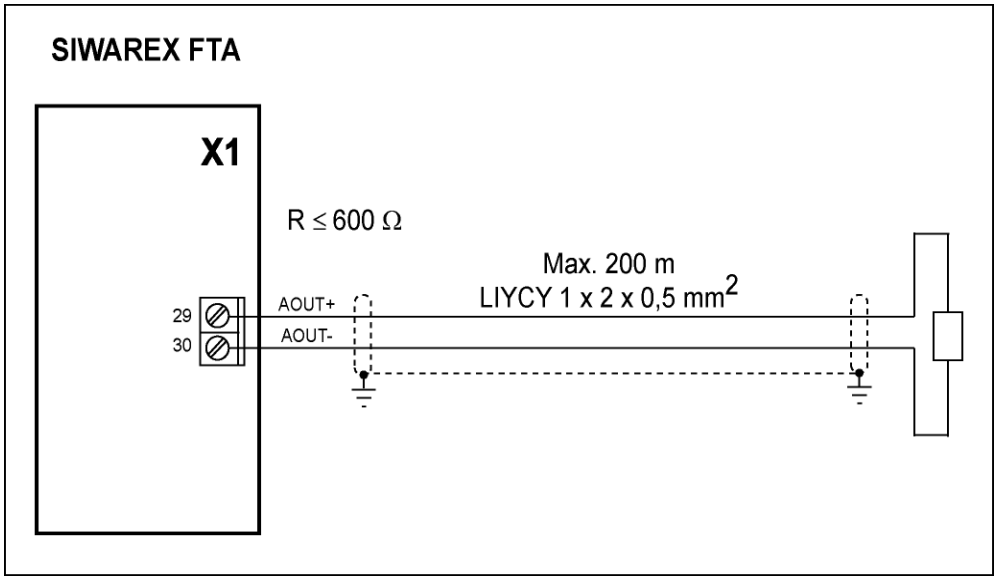


Image 4-8 Analogue output

4.4.10 RS 485 Interface

Termination Clamp	Signal	Remark
X1.21	485a	Input Ta
X1.22	485b	Input Tb
X1.23	485a	Output Ta
X1.24	485a	Output Tb
X1.25	RTa	Termination resistor RTa
X1.26	RTb	Termination resistor RTb

Table 4-8 RS 485 connections

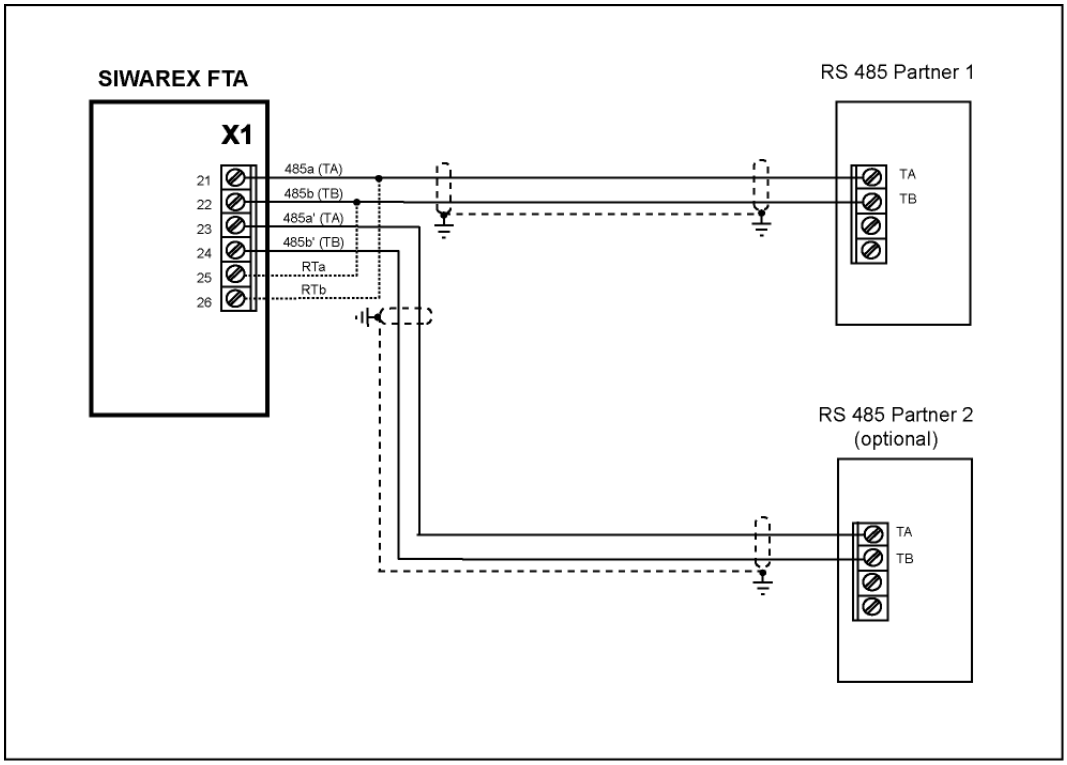


Image 4-9 RS 485 connection

4.4.11 Connecting the Remote Display by the Siebert company

One or more Siebert Type S11 displays can be connected to the RS485 interface. When connecting a single display, ensure that the RTa and RTb bridges are wired. When installing the S11 for operation, the same parameters that have been set by the SIWATOOL FTA for RS 485 are to be defined.

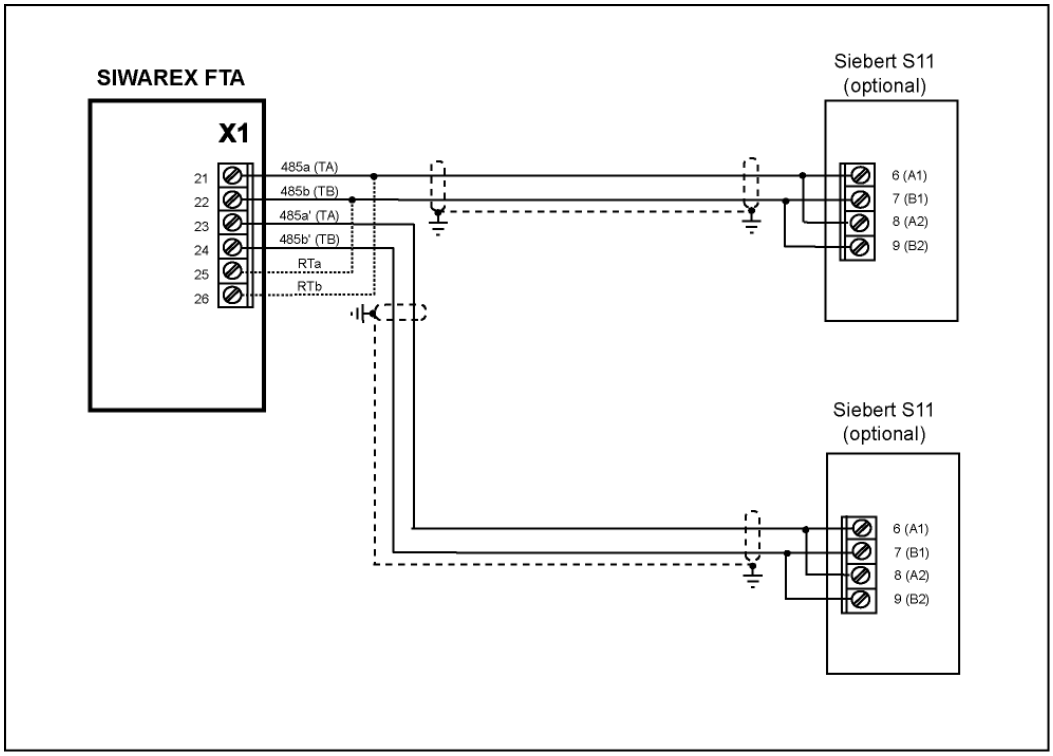


Image 4-10 S11 Display Connection

4.4.12 PC Connection for SIWATOOL FTA

Table RS 232 Interface

Termination Clamp	Signal	Remark
X2	9 pin D-type	RS 232 Interface

Table 4-9 PC Connection

Cables are provided for connecting the PC (see *Accessories*)

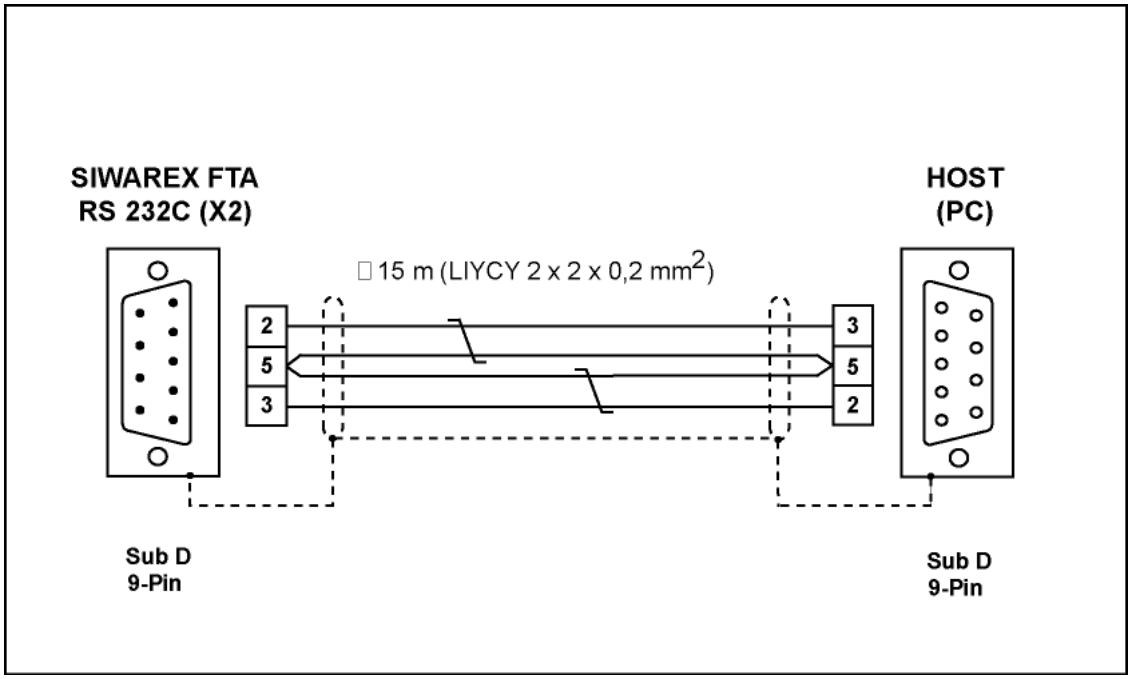


Image 4-11 PC Connection

4.4.13 LED Indicators

Label	LED colour	LED	Description
SF	Red	LED 1 upper left	System Fault Hardware fault
	Green	LED 2	Weighing cycle active (flashing)
	Green	LED 3	Write protect for calibration data activated
	Green	LED 4	Scale in empty range
	Green	LED 5	Scale at stand-still
	Green	LED 6	Micro Memory Card is operation ready
EXC	Green	LED 7	Load cell supply
SEN	Green	LED 8	Supply voltage feedback from load cells

Table 4-10 Indicators (LED)

4.4.14 Using the Micro Memory Card

A SIMATIC Micro Memory Card can be used for saving the calibratable records or for recording weighing states. Approximately 16 MB of data can be stored on the MMC described in chapter *Accessories*.

Warning notice

After formatting the MMC with SIWAREX FTA, it can no longer be used in the SIMATIC CPU. Therefore, the MMC should be labelled correspondingly.

4.5 Operational Preparation

Introduction

At this point in the commissioning procedure, after assembling the module group and making all connections, you should perform a partial functionality test for the SIWAREX FTA and the connected components.
The individual steps for partial testing are to be performed in the following sequence:

Visual check

Check all previously performed steps for proper execution, i.e.:

- Is there any external damage to the module group?
- Are the modules situated in the proper positions?
- Are all fastening screws properly tightened?
- Are all connecting cables properly connected and fastened tightly?
- Is the frontal connection made properly?
- Is the shielding properly attached to the shielding conductor for all corresponding cables?
- Is the profile rail connected to the ground conductor?
- Are all tools, materials or components that do not belong to the S7 or SIWAREX FTA removed from the profile rail and the module group?

Connect SIWAREX FTA with 24 V supply

Switch power supply on.
Proper initialisation of the SIWAREX FTA in the SIMATIC can only be guaranteed if:

- the S7 SPU (with decentralised connection with IM 153-1) and the SIWAREX FTA are switched on at the same time
  or
- the SIWAREX FTA is switched on first

LED check on the SIWAREX FTA

After attaching the 24V supply voltage and a short initialisation phase (internal testing is indicated by LED running pattern), the SIWAREX FTA goes into operational status. The following LEDs must have the status that is indicated below if the unit is running correctly:

LED (EXC) --> ON status
LED (SEN) --> ON status
LED (SF) --> OFF status

5 Weighing Functions

5.1 General Information

The SIWAREX FTA can be used either as a non-automatic weighing instrument or an automatic weighing instrument. The operating mode is determined by the application and is defined during scale commissioning.

The selected operating mode and the defined parameters are very important to the behaviour of the SIWAREX FTA in the process.
The parameters are set with default values from the manufacturer. Using the "Load default values" command, the parameter definitions defined in manufacturing are loaded.

The default parameters are defined so that the scale is immediately ready for each operating mode. Not all parameters must be re-entered for each operating mode. By changing a parameter, the behaviour of the scale is changed respectively. The advantage of this solution is that you can define how many default values should be retained and how much that the behaviour of the scale has to be changed for the application.

All parameters are split into data records (DS). The data records are organised according to process steps (tasks) that you have to perform during the commissioning phase or during the process itself.

In the following parameter description, you will find a description of the weighing functions that are influenced by that parameter.
The parameters of a data record are shown in a table to start with. This is then followed by the exact parameter description for the parameters of that data record.

After receiving a new parameter, SIWAREX FTA runs a plausibility check. If there is a parameter error then the data record will not be accepted (stored) by the SIWAREX FTA and a "synchronous" message is generated (see chapter *7 Messages and Diagnostics*).

5.2 DS3 Adjustment Parameter (NAWI, AWI)

The adjustment parameter must be tested for every weighing procedure and changed if necessary.

The scale is basically defined using the adjustment parameters and by performing the adjustments. In calibration operation, the data of the DS3 cannot be changed after the calibration is complete.

Procedure:

- Check all parameters and change if necessary.
- Send DS3 to the scale
- Perform scale adjustment
- Receive DS3 from the scale

Name	Type	Address	Default	Range of Values / Explanation	Re-erence
(6) Adjustment					
Adjustment digits for Adjustment zero 0	DINT	DBD000	1677722	0 to: 2^{24} Other definitions not permitted.	*5.2.1*
Adjustment digits for Adjustment weight 1	DINT	DBD004	15099494	0 to: 2^{24} Other definitions not permitted.	*5.2.1*
Adjustment digits for Adjustment weight 2	DINT	DBD008	0	0 to: 2^{24} Other definitions not permitted.	*5.2.1*
Adjustment digits for Adjustment weight 3	DINT	DBD012	0	0 to: 2^{24} Other definitions not permitted.	*5.2.1*
Adjustment digits for Adjustment weight 4	DINT	DBD016	0	0 to: 2^{24} Other definitions not permitted.	*5.2.1*
Adjustment weight 1	REAL	DBD020	50	> 0 Other definitions not permitted.	*5.2.1*
Adjustment weight 2	REAL	DBD024	0	> 0 Other definitions not permitted.	*5.2.1*
Adjustment weight 3	REAL	DBD028	0	> 0 Other definitions not permitted.	*5.2.1*
Adjustment weight 4	REAL	DBD032	0	> 0 Other definitions not permitted.	*5.2.1*
Characteristic value range	BYTE	DBB036	0	1: Characteristic value to 1mV/V 2: Characteristic value to 2mV/V 4: Characteristic value to 4mV/V Other definitions not permitted.	*5.2.2*
(5) Filter					
Filter sequence	BYTE	DBB037	0	Bit 0 : 0: Averaging filter before digital filter 1: Digital filter before averaging filter Bits 1 to 7 not set	*5.2.3*
Type of low pass filters	BYTE	DBB038	0	0: critically damped 1: Bessel-Filter 2: Butterworth Filter Other definitions not permitted.	*5.2.4*
Limit frequency	BYTE	DBB039	4	0: No filter 1: fg = 20Hz 2: fg = 10Hz 3: fg = 5Hz 4: fg = 2Hz	*5.2.5*

Name	Type	Address	Default	Range of Values / Explanation	Re-erence
				5: fg = 1Hz 6: fg = 0,5Hz 7: fg = 0,2Hz 8: fg = 0,1Hz 9: fg = 0,05Hz Other definitions not permitted.	
Depth of averaging filter	WORD	DBW040	10	[0 ... 250] x 2.5 msec 0: Averaging filter deactivated Other definitions not permitted.	*5.2.6*
(1) Adjustment parameter I		0			
Scale name	STRING [10]	DBB042	„SIWAREX XX“		*5.2.7*
Number of weight ranges	BYTE	DBB054	1	1 Range 2 Ranges 3 Ranges Other definitions not permitted.	*5.2.8*
Scale type	BYTE	DBB055	0	Bit 0:: 0: Multi-range scale 1: Multi-resolution scale	*5.2.9*
Zero setting activated at start-up			0	Bit 1 : 0: Switch-on zero setting device switched off; 1: Switch-on zero setting device switched on	*5.2.10*
Activated zero setting at start-up, if scale is tared			0	Bit 2 : 0: Switch-on zero setting, not when tare ≠ 0 1: Switch-on zero setting, when tare ≠ 0	*5.2.11*
Automatic zero adjustment			0	Bit 3 : 0: Zero tracking device switched off; 1: Zero tracking device switched on Bit 4 - 7 not set	*5.2.12*
(2) Calibration parameter II					
Min. weight for Weighing range 1	REAL	DBD056	1		*5.2.13*
Max. weight for weighing range 1	REAL	DBD060	100		*5.2.14*
Numeral step for weighing range 1	REAL	DBD064	0,02	Numeral step weighing range 1 ($1*10^k$, $2*10^k$, $5*10^k$, k ? N_0) Other definitions not permitted.	*5.2.15*
Min. weight for Weighing range 2	REAL	DBD068	0		*5.2.16*
Maximum weight for weighing range 2	REAL	DBD072	0		*5.2.17*
Numeral step for weighing range 2	REAL	DBD076	0	Numeral step weighing range 2 ($1*10^k$, $2*10^k$, $5*10^k$, k ? N_0) Other definitions not permitted.	*5.2.18*
Min. weight for Weighing range 3	REAL	DBD080	0		***5.2.19***
Maximum weight for weighing range 3	REAL	DBD084	0		***5.2.20***
Numeral step for weighing range 3	REAL	DBD088	0	Numeral step weighing range 3 ($1*10^k$, $2*10^k$, $5*10^k$, k ? N_0)	***5.2.21***

Name	Type	Address	Default	Range of Values / Explanation	Re-erence
				Other definitions not permitted.	
(3) Calibration parameter III					
Stand-still time 1	TIME	DBB092	1000sec	msec	***5.2.22***
Stand-still range 1	REAL	DBD096	0,02	Stand-still range 1 in weight unit	***5.2.23***
Waiting time for stand-still 1	TIME	DBB100	2000	If there is no stand-still then the corresponding weighing command is cancelled with an operational instruction with 0 setting, otherwise the wait-time is waited out. If no stand-still has been achieved when the waiting time has elapsed then an error message is generated and the dosing is stopped. For weighing instructions that are activated by a user, a setting in the of approximately 2000 msec is recommended. (During the weighing cycle, this time is not monitored)	***5.2.24***
Max. negative weight for zero setting when switching on	BYTE	DBB104	10	Negative range for Switch-on zero setting device [in % of weighing $range_{max}$] (Entry of Pos- + Neg. zero set value must not exceed 20% with country code „OIML“)	***5.2.25***
Max. positive weight for zero setting when switching on	BYTE	DBB105	10	Positive range for Switch-on zero setting device [in % of weighing $range_{max}$] (Entry of Pos- + Neg. zero set value must not exceed 20% with country code „OIML“)	***5.2.26***
Maximum negative weight for zero setting	BYTE	DBB106	1	Negative range for zero setting device [in % of weighing $range_{max}$] (Entry of Pos- + Neg. zero set value must not exceed 4% with country code „OIML“)	***5.2.27***
Maximum positive weight for zero setting	BYTE	DBB107	3	Negative range for zero setting device [in % of weighing $range_{max}$] (Entry of Pos- + Neg. zero set value must not exceed 4% with country code „OIML“)	*5.2.28*
Tare max. weight T-	BYTE	DBB108	100	Subtractive tare device range [in % of WR_{max} with multi-range scale] [in % of WR_1 with multi-resolution scale] (Entry may not exceed 100% with country code "OIML")	*5.2.29*
Reserve 1	BYTE	DBB109	0	Reserve 1	
Reserve 2	WORD	DBW110	0	Reserve 2	
Regulations	STRING [4]	DBB112	“----“	„OIML“ : = Regulation Code OIML „----„: = No Regulation Code	***5.2.30***
Unit of measurement	STRING [4]	DBB118	kg		***5.2.31***
(4) Calibration parameter IV					
Stand-still range 2	REAL	DBD124	0,12	Stand-still range 2 cm weight unit Effective when starting a weighing procedure	*5.2.32*
Stand-still time 2	TIME	DBB128	1000	msec	*5.2.33*
Minimum waiting time at stand-still 2	TIME	DBB132	500	Minimum waiting time at standstill at the start of a weighing procedure (msec) 0: No waiting time active	*5.2.34*
Stand-still range 3	REAL	DBD136	0,02	Stand-still range 3 cm weight unit Effective after switching off fine current.	*5.2.35*
Stand-still time 3	TIME	DBB140	1000	msec	*5.2.36*
Minimum waiting time at stand-still 3	TIME	DBB144	500	Minimum waiting time at stand-still after switching off fine signal (msec) 0 No waiting time active	*5.2.37*

Name	Type	Address	Default	Range of Values / Explanation	Re-erence
Smallest set weight ∑min	REAL	DBD148	100 Wizzard: = WB_{max}	Must only be entered with SWT operating mode.	*5.2.38*
Distribution value dt	REAL	DBD152	0,1	dt can correspond with the numerical step in WB_{nmax}	*5.2.39*
Reserve 3	REAL	DBD156	0	Reserve 3	
Reserve 4	BYTE	DBB160	0	Reserve 4	
Reserve 5	BYTE	DBB162	0	Reserve 5	
		162			

Table 5-1 DS3 Allocation

5.2.1 DS3 - Adjustment digits 0, 1, 2, 3, 4, for the zero point and Adjustment weights 1, 2, 3, 4

The analogue measurement value coming from the load cells is converted into a digital value with an analogue-digital converter. A weight value is then calculated from this digital value. All functions of the SIWAREX FTA then use this weight value for performing their tasks.

To calculate the weight value from the digital value, the characteristic curve of the measurement system must be determined. In the simplest case, the characteristic curve is defined through points 0 and 1. The first operating point (point 0) is always determined by the empty scale alone with its own construction weight. The weight of its own construction, the scale load cells deliver a measurement voltage to the SIWAREX FTA. After the analogue-digital conversion of the measurement voltage, the digital value (adjustment digit 0) is assigned the zero point.

If the scale is loaded with a known calibration weight (e.g. with 50 % of the measurement range), then the second operation point can be determined. The new digital value from the digital-digital converter is now assigned with the calibration weight.

The characteristic curve can be further adjusted using a maximum of three other points that must lie above point 1.

Ensure that the difference between two adjustment weights is at least 5% of the measurement range.

The adjustment consists of the following steps:

Define adjustment weights and other parameters of the DS 3 data record.

Send DS 3 to the scale

Give the instruction "Valid adjustment weight = 0"

Load the scale with the defined calibration weight

Give the instruction "Valid adjustment weight = 1"

Receive the DS 3 from the scale

Store the data to memory (disk)

The adjustment sequence for the increasing adjustment weight must be retained.

Example:

Zero point = 0.0 kg (always)	results in 5.800.000 Digits
Adjustment weight 1 = 100 kg	results in 10 100 000 Digits

This defines the characteristic curve (0 is entered as the weight value for further adjustment weights) and the scale can now perform the calculations for the weight values over the entire measurement range.

Note:

Since the maximum value for adjustment digits is 15 099 494 and the value for completely empty load cells (without the weight of the construction itself) is 1 677 722, the plausibility of the characteristic curve can be roughly estimated to determine load deviations for example.

The image clarifies the connection between the adjustment digits and the adjustment weight.

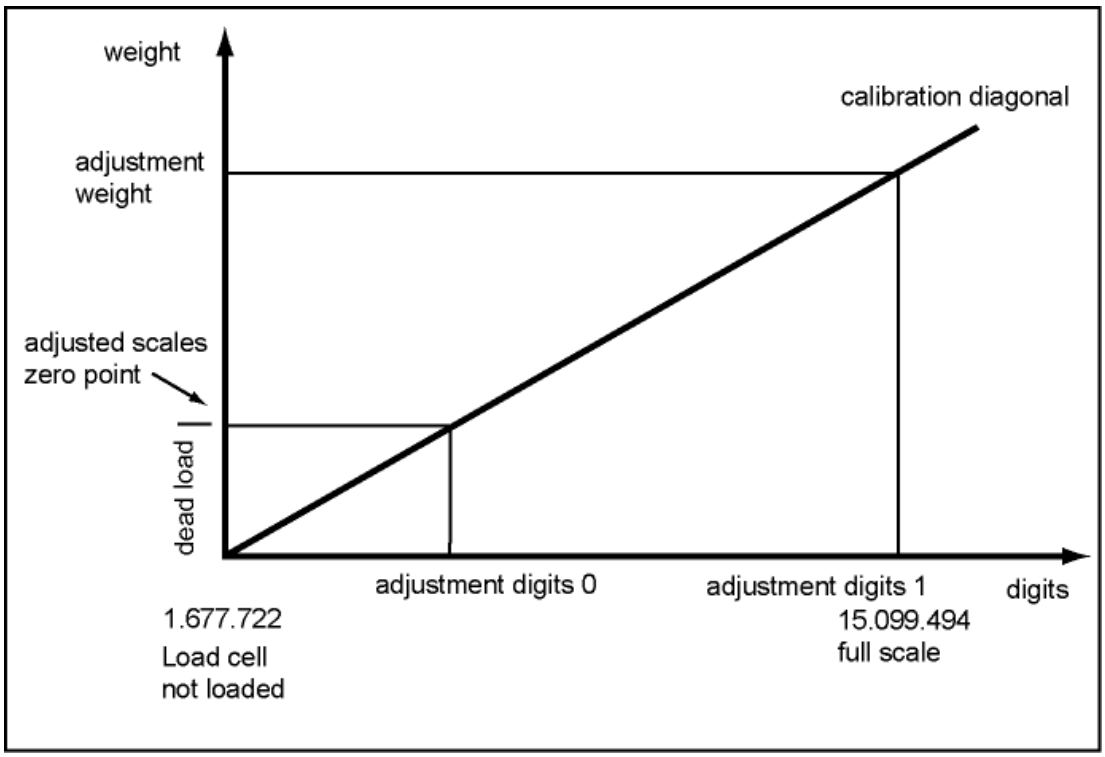


Image 5-1 Adjustment digits and weight value

If the adjustment weights and adjustment digits of a SIWAREX FTA are known then the adjustment procedure does not have to be performed. These are simply sent to the SIWAREX FTA with the DS3 data record and the scale is immediately operational (after an official calibration run on the scale, sending the DS3 is no longer possible).

The SIWATOOL FTA supports you in quickly performing an adjustment.

Possibility 1:

After commissioning and after the adjustment, all data records of the scale are read from SIWAREX FTA and are stored as scale file SceleX.FTA.

Identical scales can now be put into operation immediately. Connect the PC with the new scale and activate the "Send all data records" function. This also transfers the adjustment weights and the adjustment digits - the characteristic curve is defined immediately. The same applies for exchanging a SIWAREX FTA of course.

Possibility 2:

Use the SIWAREX FTA - function "Theoretical Adjustment" and determine the characteristic curve of the scale from the technical data of the load cells alone. In that case, proper construction of the scale is necessary.

Note

Normally, defining two operation points is sufficient to determine the characteristic curve of the scale. Other operation points must only be defined on non-linear systems - New digital values (adjustment digits 2, 3, 4) are assigned with other calibration weights (e.g. 70%, 80%, 100% of the measurement range).

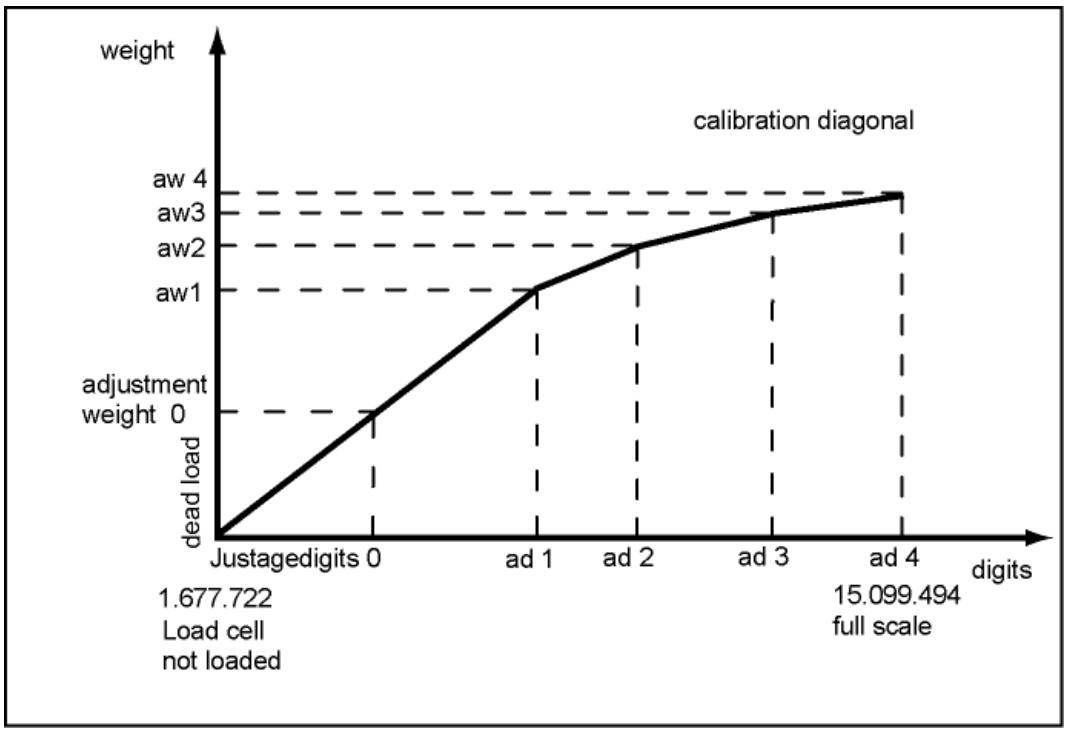


Image 5-2 Linearisation of the Scale's Characteristic Curve

5.2.2 DS3 - Characteristic value range

Depending on the characteristic value of the connected load cells, the value 1 mV/V, 2 mV/V or 4 mV/V must be selected. Since the SIWAREX FTA supplies the load cells with approximately 10 V, the measuring input is redefined according to the expected measurement voltage (max. 10 mV, max. 20 mV or max. 40 mV).

If the characteristic value of the connected load cells is at e.g. 2.85 mV/V then the next higher characteristic value must be set normally, i.e. 4 mV/V.

5.2.3 DS3 – Filter sequence of the signal filter

Changing the filter sequence can be an advantage in some cases. Normally, the signal is first filtered by the average value filter.

5.2.4 DS3 - Type of low pass filters

3 types of filter are available to choose from, for suppressing interference

(critically damped, Bessel filter, Butterworth filter). The selection is performed empirically. The following figures show the step responses of the three filters (fg = 2 Hz).

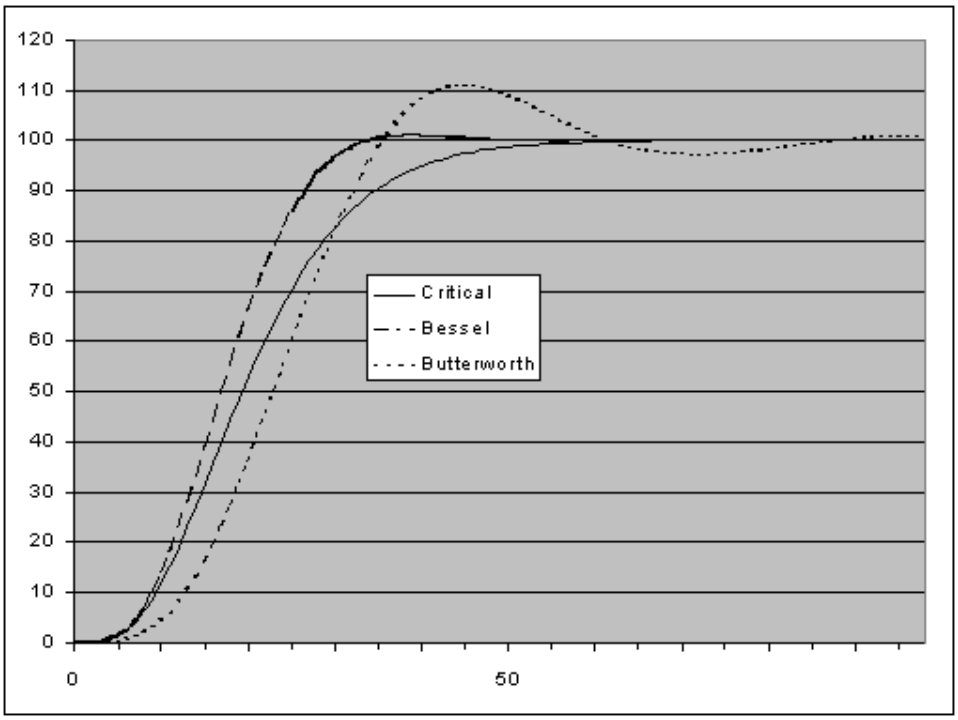


Image 5-3 Digital low pass filter step response

5.2.5 DS3 - Limit frequency

Defining the limit frequency is very important for suppressing interference. The "speed" of the scale's reaction to the change in measurement value is set by defining the limit frequency.

A value of e.g. 2 Hz leads to a relatively quick scale reaction to a weight change, a value of e.g. 0.5 Hz makes the scale "sluggish".

5.2.6 DS3 - Type of average value filters

The average value filter is used to calm the weighing value compensating for random interference. The weight value is constructed from the average value of the n weight value, which is calculated by the SIWAREX FTA with a measurement rate of 10 msec, e.g. at n=10, 10 values are taken to create the average value Every 10 msec, the oldest value is dropped and the newest value is taken into account for the calculation.

5.2.7 DS3 - Scale Name

The name consists of maximum 10 characters and can be selected as you wish.

Note

The scale name can no longer be changed after the official calibration.

5.2.8 DS3 - Number o f weight ranges

SIWAREX FTA can be defined as a scale with one, two or three different measurement ranges. Depending on the construction type certification, the numeral step can be defined separately for every range.

5.2.9 DS3 - Scale type

If the number of ranges is greater than one then the scale type can be defined as a multi-range scale or a multi-resolution scale.

Information on the function of a multi-range- or multi-resolution-scale can be found in EN 45 501.

Note

If only one range is defined then this entry is meaningless.

5.2.10 DS3 - Activate zero setting on start-up

The scale can be set to zero automatically by switching the supply voltage on. On calibratable scales, a weight value of +/- 10% of the max. measurement range can be set to zero on start-up.

Attention

In non-calibratable operation (no OIML restrictions), a full scale can also be set to zero after activating this function. Limiting the effectiveness is possible by entering the max. and min. weight however. See Max. Min. Weight for dss zero setting at start-up.

5.2.11 DS3 - Activated zero setting at start-up, if scale is tared

The scale can be set to zero automatically by switching the supply voltage on. If the above function is activated, there is still the question of whether zero setting at start-up should be run if the tare is unequal to zero.

If the answer is yes then the tare is also deleted with the zero setting, if no then no zero setting is performed on the scale.

5.2.12 DS3 - Automatic zero adjustment

Zero setting the scale can be performed with the "Zero setting" instruction if required.

The automatic zero adjustment sets the scale to zero without an instruction if it slowly drifts away from the zero point. Slow drifting is presumed if the conditions of standard EN45501 have been met.

Attention

In non-calibratable operation (no OIML restrictions), a full scale can also indicate zero after a period of time subject to a slow drift when this function is activated. Using this function you must prevent an overload of the scale.

5.2.13 DS3 - Minimum weight for weighing range 1

The weight value can be used for calibratable recording with the numeral step for measurement range 1 only above the minimum weight. The minimum weight is defined by an adjustment or a calibration. The minimum weight depends on the number and type of load cells used.

The value can be set to 0 on non-calibratable scales.

5.2.14 DS3 - Maximum weight for weighing range 1

The weight can be used for calibrating purposes with the numeral step for measurement range 1 only under the maximum weight. The maximum weight is defined with the adjustment.

The maximum weight depends on the number and type of load cells used.

5.2.15 DS3 - Numeral Step for weighing range 1

The numeral step for weighing range 1 can be defined according to standard EN 45501 (0.0001 to 50)

5.2.16 DS3 - Minimum weight for weighing range 2

The weight value can be used for calibratable recording with the numeral step for measurement range 2 only above the minimum weight. The minimum weight is defined by an adjustment or a calibration. The minimum weight depends on the number and type of load cells used.

The value can be set to 0 on non-calibratable scales.

Note

If only one range is defined then this entry is meaningless.

5.2.17 DS3 - Maximum weight for weighing range 2

The weight can be used for calibrating purposes with the numeral step for measurement range 2 only under the maximum weight. The maximum weight is defined with the adjustment.

The maximum weight depends on the number and type of load cells used.

Note

If only one range is defined then this entry is meaningless.

5.2.18 DS3 - Numeral step for weighing range 2

The numeral step for weighing range 2 can be defined according to standard EN 45501 (0.0001 to 50)

If only one range is defined then this entry is meaningless.

5.2.19 DS3 - Minimum weight for weighing range 3

The weight value can be used for calibratable recording with the numeral step for measurement range 3 only above the minimum weight. The minimum weight is defined by an adjustment or a calibration. The minimum weight depends on the number and type of load cells used.

The value can be set to 0 on non-calibratable scales.

Note

If only one or two ranges are defined then this entry is meaningless.

5.2.20 DS3 - Maximum weight for weighing range 3

The weight can be used for calibrating purposes with the numeral step for measurement range 3 only under the maximum weight. The maximum weight is defined with the adjustment.

The maximum weight depends on the number and type of load cells used.

Note

If only one or two ranges are defined then this entry is meaningless.

5.2.21 DS3 - Numeral step for weighing range 3

The numeral step for weighing range 1 can be defined according to standard EN 45501 (0.0001 to 50)

Note

If only one or two ranges are defined then this entry is meaningless.

5.2.22 DS3 - Stand-still time 1

Stand-still monitoring is used for recognising a stable scale balance.

The scale stand-still is defined if the weight value is changed within a defined time (stand-still time) by less than a defined deviation range (Stand-still value). Stand-still 1 is used in static scale operation (Instructions: Zero setting, Taring, Log output).

5.2.23 DS3 - Stand-still range 1

Stand-still monitoring is used for recognising a stable scale balance.

The scale stand-still is defined if the weight value is changed within a defined time (stand-still time) by less than a defined deviation range (Stand-still value). Stand-still 1 is used in static scale operation (Instructions: Zero setting, Taring, Log output).

The functionality of the stand-still monitor clarifies the following image.

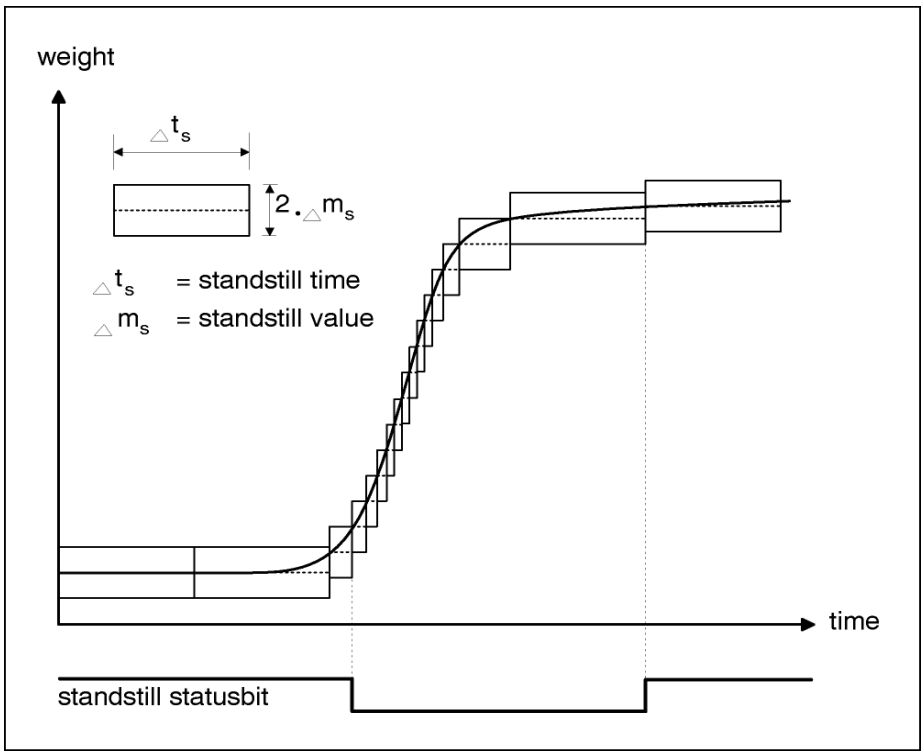


Image 5-4 Stand-still monitoring

5.2.24 DS3 - Waiting time for stand-still 1

To prevent the necessity of having to cancel a weighing instruction (only taring, printing and zero setting in static operation) when the stable weight of the scale is not defined, the waiting time is given for stand-still 1. Only the scale instruction tare, output log or zero setting was not possible after this time has elapsed is the corresponding technology message generated.

5.2.25 DS3 - Maximum negative weight for zero setting at start-up

Zero setting means automatic zero setting on the scale when the power supply is switched on.

If the zero setting when switching on the supply voltage has been activated then the definition will limit the affect of the function. The reference point for the effectiveness of the limitation is not the current weight, it is the weight that was displayed by the scale without a previous zero setting.

5.2.26 DS3 - Maximum positive weight for zero setting at start-up

Zero setting means automatic zero setting on the scale when the power supply is switched on.

If the zero setting when switching on the supply voltage has been activated then the definition will limit the affect of the function. The reference point for the effectiveness of the limitation is not the current weight, it is the weight that was displayed by the scale without a previous zero setting.

5.2.27 DS3 - Maximum negative weight for zero setting

The current gross weight of the scale is defined as zero for zero setting.

For the zero setting, the definition can be used to limit the influence of the function. The reference point for the effectiveness of the limitation is not the current gross weight, it is the weight that was displayed by the scale without a previous zero setting.

On scales in calibratable operation, the restriction between the negative and positive weight for zero setting is 4% of the maximum weighing range.

5.2.28 DS3 - Maximum positive weight for zero setting

For the zero setting, the definition can be used to limit the influence of the function. The reference point for the effectiveness of the limitation is not the current weight, it is the weight that was displayed by the scale without a previous zero setting.

On scales in calibratable operation, the restriction between the negative and positive weight for zero setting is 4% of the maximum weighing range.

5.2.29 DS3 - Tare max. load T-

SIWAREX FTA accepts every weight value which is less than %-record of the maximum weighing range with multi-range scales or weighing range 1 with multi-resolution scales.

On scales in calibratable application, the value is limited to 100% of the maximum weighing range.

5.2.30 DS3 - Regulations

Scales in calibratable application have certain restrictions. The "OIML" entry (country code) activates these restrictions They are deactivated by entering "----".

5.2.31 DS3 - Unit of measurement

A 4 character string can be used as the unit of measurement, e.g.: t, kg, lbs

5.2.32 DS3 - Stand-still range 2

Stand-still monitoring is used for recognising stable scale balance after starting an automatic weighing procedure.

After the start weighing procedure with taring instruction, the SIWAREX FTA waits for stand-still 2. The scale stand-still is defined if the weight value is changed within a defined time (stand-still time) by less than a defined deviation range (Stand-still value).

Note

With scales using calibration, the definition cannot be greater than for stand-still 1.

5.2.33 DS3 - Stand-still time 2

Stand-still monitoring is used for recognising stable scale balance after starting an automatic weighing procedure.

After the start weighing procedure with taring instruction, the SIWAREX FTA waits for stand-still 2. The scale stand-still is defined if the weight value is changed within a defined time (stand-still time) by less than a defined deviation range (Stand-still value).

Note

With scales using calibration, the definition cannot be less than for stand-still 1.

5.2.34 DS3 - Minimum waiting time for stand-still 2

To prevent the necessity of having to cancel a weighing instruction with taring or zero setting as soon as it is given, when the stable weight of the scale is not defined, the waiting time is given for stand-still 1. Only if the weighing instruction could not be executed after this time has elapsed is a corresponding technology error output.

5.2.35 DS 3 - Stand-still range 3

Stand-still monitoring is used for recognising stable scale balance after switching off the fine signal.

The scale stand-still is defined if the weight value is changed within a defined time (stand-still time) by less than a defined deviation range (Stand-still value).

Note

With scales using calibration, the definition cannot be greater than for stand-still 1.

5.2.36 DS3 - Stand-still time 3

Stand-still monitoring is used for recognising stable scale balance after switching off the fine signal.

The scale stand-still is defined if the weight value is changed within a defined time (stand-still time) by less than a defined deviation range (Stand-still value).

Note

With scales using calibration, the definition cannot be less than for stand-still 1.

5.2.37 DS3 - Minimum waiting time for stand-still 3

To delay the evaluation of the stand-still after switching off the fine signal, the minimum waiting time is given for stand-still 3. The evaluation of stand-still 3 is only begun after this time has elapsed.

5.2.38 DS 3 - Smallest set weight ∑min

If the scale is supposed to be used as an automatic weighing instrument with weight totalising, the smallest set weight (load) must be defined. The scale will only start a weighing procedure if the set value for the overall quantity is higher than this limit value.

5.2.39 DS 3 - Totalising value dt

If the scale is supposed to be used as an automatic weighing instrument with weight totalising, a scaling value must be defined. The total of several weighing procedures is output with this scaling value.

5.3 DS 4 Basis parameter (NAWI, AWI)

The base parameters determine further features of a scale which are responsible for its basic behaviour. The parameters must be checked and changed if necessary.

DS4 is not subject to the write protect in calibratable operation.

Procedure:

- Check all parameters and change if necessary.
- Send DS 4 to the scale

Name	Type	Address	Default	Range of Values / Explanation	ɜference
Operating mode / Logs		0			
Weighing operating mode	BYTE	DBB000	3 Wizzard – Direct definition	0 - NAWI-filling procedure (see *5.3.2*) 1 - NAWI-emptying procedure (see *5.3.3*) 2 - AWI single/continuous operation Filling (see *5.3.4*) 3 - AWI Catchw. filling (see *5.3.5*) 4 - AWI Catchw. Emptying (see *5.3.6*) 5 - AWI Check (see *5.3.7*) 6 - AWI-Totalising with tare re-weighing (see *5.3.8*) Other definitions not permitted.	*5.3.1*
Reserve 1	BYTE	DBB001	0	Reserve 1	
Reserve 2	WORD	DBW002	0	Reserve 2	
Monitoring time for recording	TIME	DBD04	2000	Time within which, a recording task must be ended (msec)	*5.4.9*
Device for log output	BYTE	DBB008	1	Bit 0 : 0 = Log output to RS232 interface 1 = Log output to MMC Bits 1 to 7 not used	*5.4.10*
Reserve 3	BYTE	DBB009	0	Reserve 3	
Limit values					
Basis weight for limit value 1	BYTE	DBB010	0	Bit 0 : 0 = Basis for limit value 1 is the gross weight 1 = Basis for limit value 1 is the net weight	*5.4.11*
Basis weight for limit value 2			0	Bit1 : 0 = Basis for limit value 2 is the gross weight 1 = Basis for limit value 2 is the net weight	*5.4.12*
Basis weight for monitoring the empty range			0	Bit 3 : 0: Basis for empty range is the gross weight 1: Basis for empty range is the net weight Bits 4 to 7 not used	*5.4.13*
Reserve 4	BYTE	DBB011	0	Reserve 4	
Empty range	REAL	DBD012	1 Wizzard: WB_{max}*0,01	For filling procedures this depends on parameters, for emptying procedures relative to gross	*5.4.14*
Start-up weight limit value 1	REAL	DBD016	1 Wizzard: WB_{max}*0,01		*5.4.15*
Shut-down weight limit value 1	REAL	DBD020	1,1 Wizzard: WB_{max}*0,01		*5.4.16*

Name	Type	Address	Default	Range of Values / Explanation	eference
			1		
Start-up weight limit value 2	REAL	DBB024	50 Wizzard: WB_{max}*0,5		*5.4.17*
Shut-down weight limit value 2	REAL	DBB028	49 Wizzard: WB_{max}*0,49		*5.4.18*
Start-up weight limit value 3	REAL	DBB032	99 Wizzard: WB_{max}*0,99	Limit value 3 corresponds with overfill limit	*5.4.19*
Shut-down weight limit value 3	REAL	DBB036	98 Wizzard: WB_{max}*0,98		*5.4.20*
Through-put					
Minimum through-put Limit value 1	REAL	DBB040	0	0: No monitoring > 0 minimum through-put [1/sec]	*5.4.21*
Minimum through-put Limit value 2	REAL	DBB044	0	0: No monitoring > 0 minimum through-put [1/sec]	*5.4.22*
Filter depth of average value filter for through-put calculation	BYTE	DBB048	5	[0...255] X 10 msec	*5.4.23*
Reserve 5	BYTE	DBB049	0	Reserve 5	
		50			

Table 5-2 DS4 Allocation

5.3.1 DS 4 - Scale operating mode (Scale type)

This parameter is used to select the suitable weighing instrument program. One of these weighing operating modes applies depending on the task description.

5.3.2 DS 4 - Weighing operating mode: NAWI Filling Procedure

Non-automatic weighing instrument – according to OIML R-76 – only accepts service and adjustment commands and "zero setting" and "taring" weighing instructions. The net weight increases with increasing load on the scale. No dosing functions are supported.

5.3.3 DS 4 - Weighing operating mode: NAWI Emptying Procedure

Non-automatic weighing instrument – according to OIML R-76 – only accepts service and adjustment commands and "zero setting" and "taring" weighing instructions. The net weight increases with decreasing load on the scale. No dosing functions are supported.

5.3.4 DS 4 - Weighing operating mode: AWI Single/Continuous Operation Filling

Automatic Gravimetric Filling Instrument – conforming with OIML R-61 - Automatic Weighing Instrument (AWI) type. The scale doses individual amounts in single or continuous operation according to a repetitive schema. Emptying the scale is part of the automatic operation cycle.

The weighing procedure is clarified by the following image

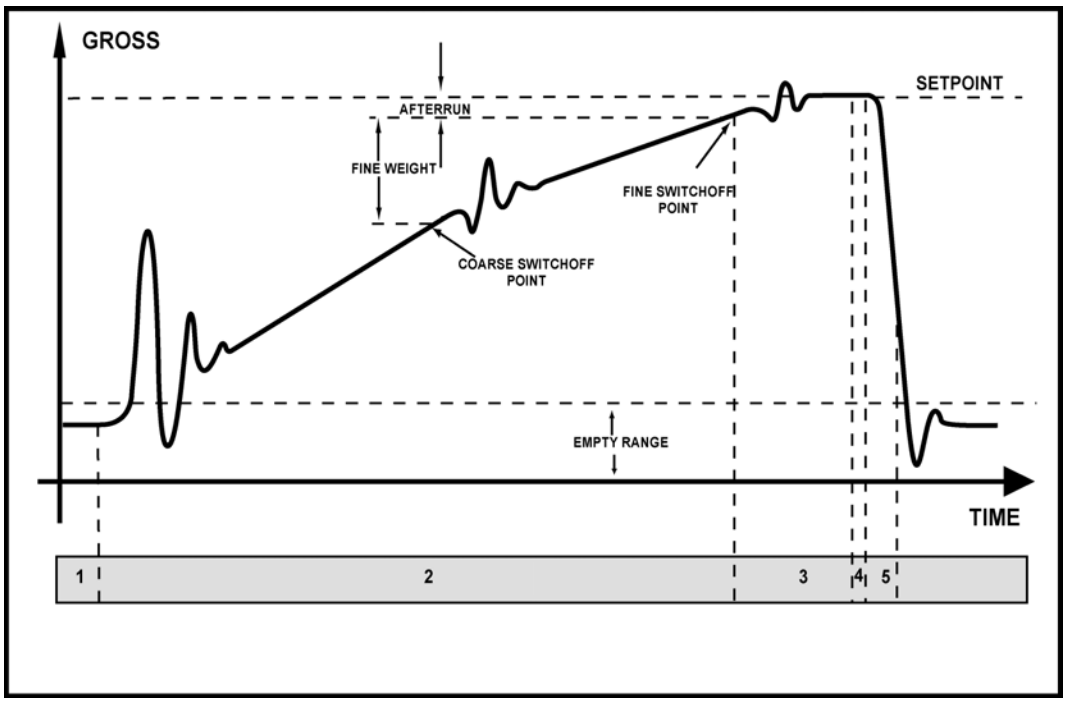


Image 5-5 Weighing steps in automatic filling operation AWI

5.3.5 DS 4 - Weighing operating mode: AWI Catchw. Filling

Automatic catch weighing instrument – conforming with OIML R-51 - Automatic Weighing Instrument (AWI) The scale doses individual amounts in single action. Emptying the scale is not part of the automatic operation cycle. The net weight increases with increasing load on the scale.

The weighing procedure is clarified by the following image

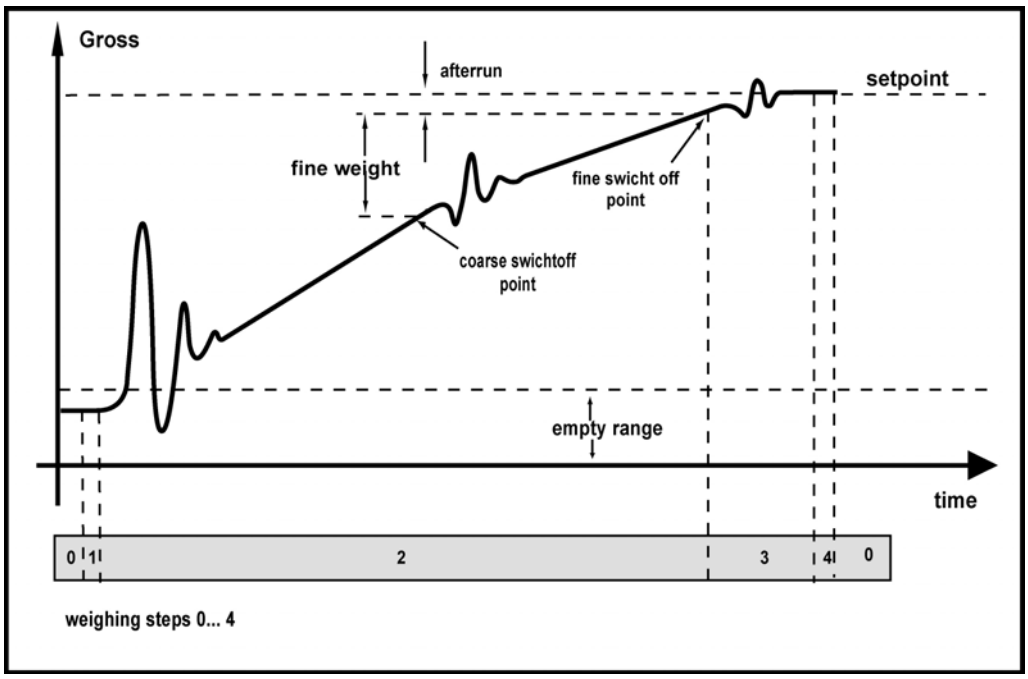


Image 5-6 Weighing steps for catch weighing with filling AWI

5.3.6 DS 4 - Weighing operating mode: AWI Catchw. Emptying

Automatic catch weighing instrument – conforming with OIML R-51 - Automatic Weighing Instrument (AWI) The scale doses individual amounts in single action. Filling the scale is not part of the automatic operation cycle. The net weight decreases with increasing load on the scale.

The weighing procedure is clarified by the following image

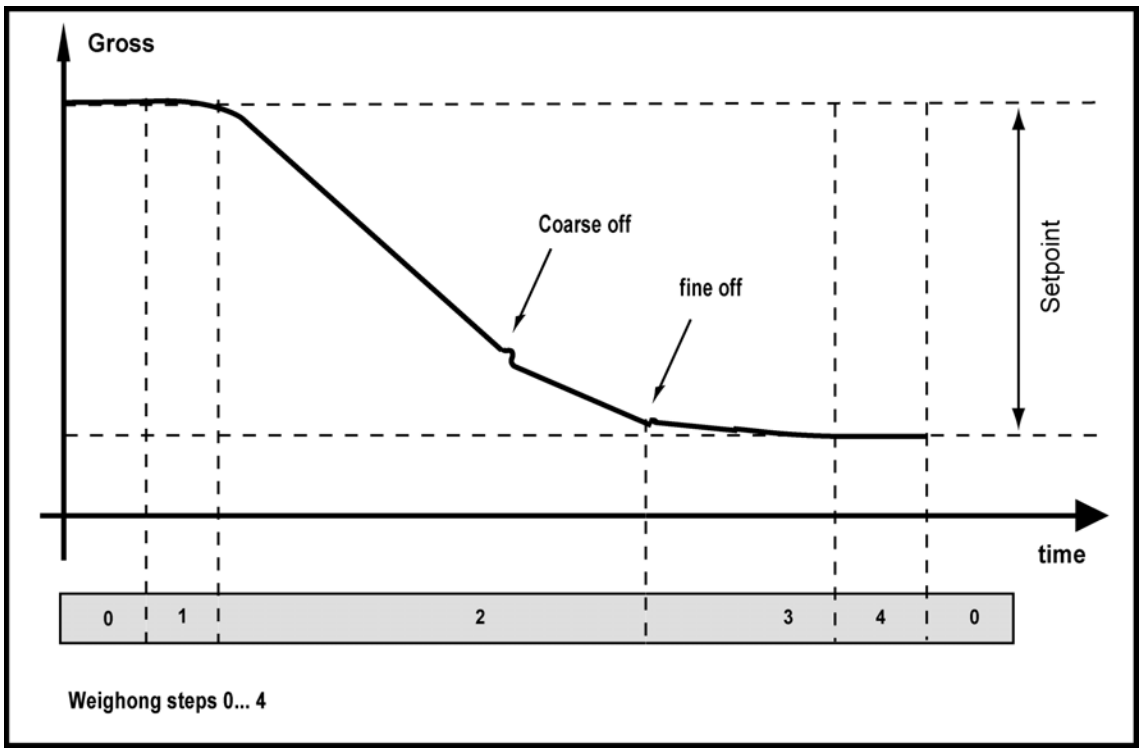


Image 5-7 Weighing steps for catch weighing with emptying AWI

5.3.7 DS 4 - Weighing operating mode: AWI Check

Automatic catch weighing instrument – conforming with OIML R-51 – Automatic Weighing Instrument (AWI). The scale defines and tests the individual amounts in static single action. Putting the weighing part on the scale is done automatically, acquiring the weight is performed in static status.

The test procedure is clarified by the following image.

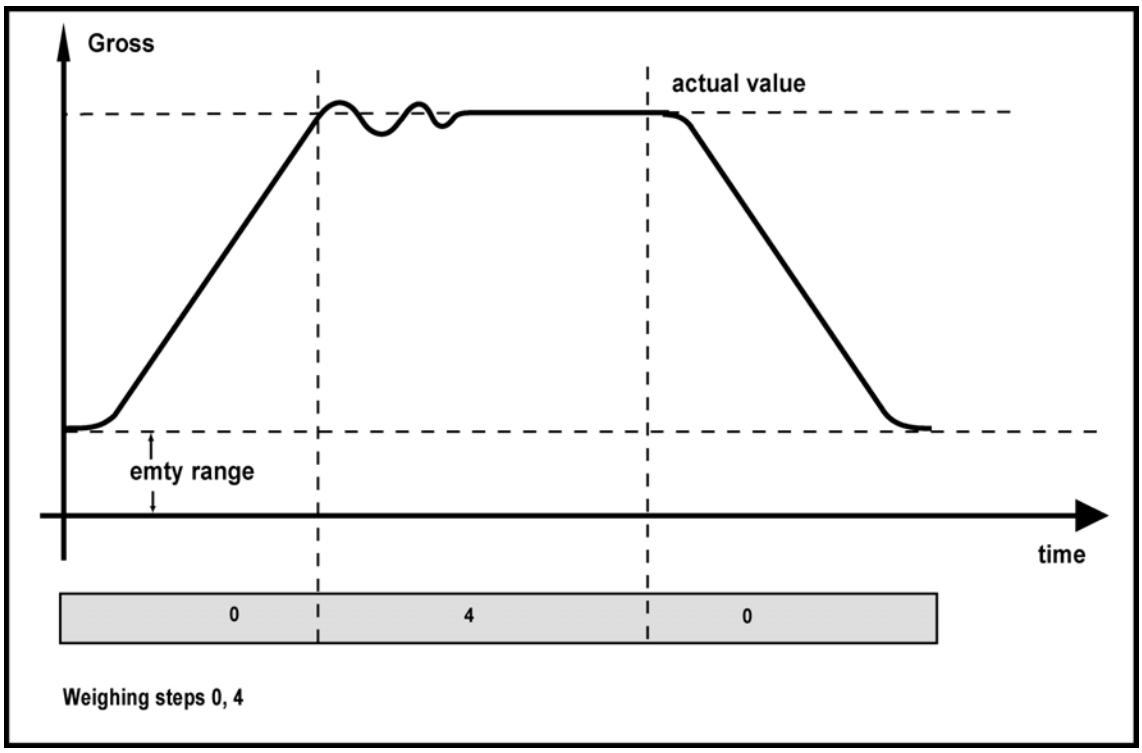


Image 5-8 Weighing steps for a weight recording (check) AWI

5.3.8 DS 4 - Weighing operating mode: AWI Totalising with Tare Re-weighing

Automatic Totalising Filling Instrument – conforming with OIML R-107 – Automatic Weighing Instrument (AWI). The scale doses out the entire amount in individual portions. Emptying the scale is part of the automatic operating cycle and is important for determining amounts.

The start of the weighing procedure sets the scale to zero. The scale container is then filled. After filling, the scale waits for stand-still 3, switches to sampling operation and tares. After emptying and achieving stand-still 2, the achieved net weight is totalised.

The weighing procedure is clarified by the following image

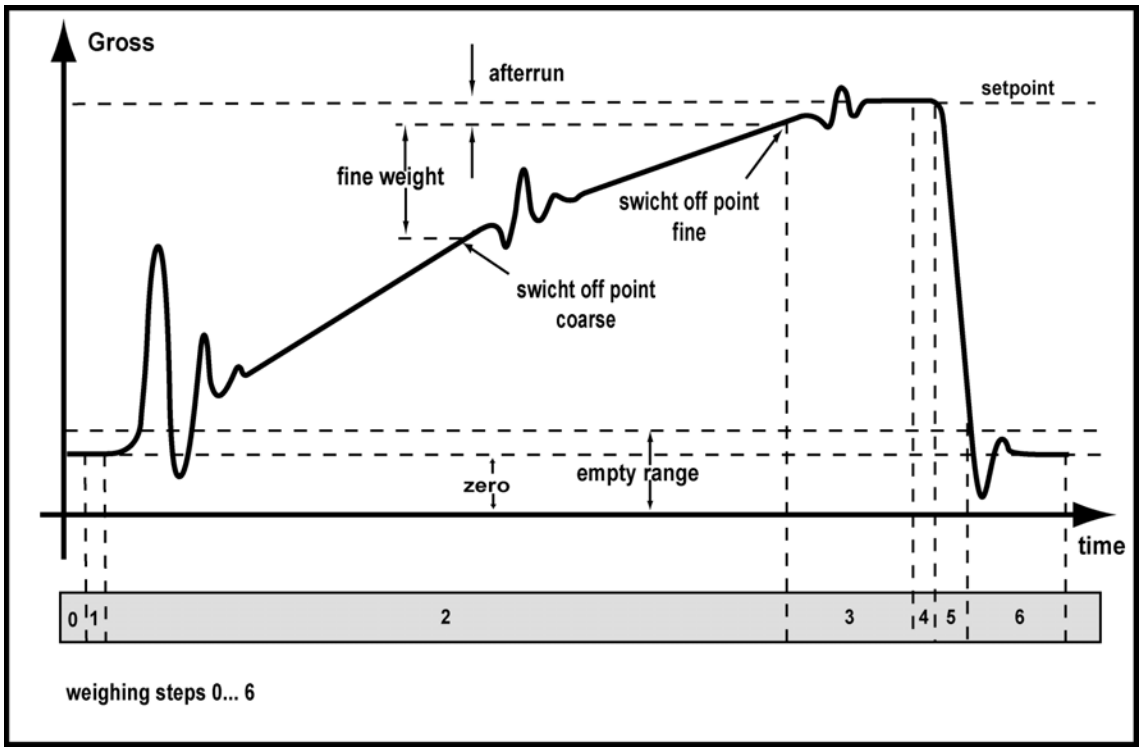


Image 5-9 Weighing steps for AWI Totalising

5.4 Weighing Steps – Standard weighing procedure

Every weighing procedure can be split into various steps.

Although weighing procedures are different for different operating modes, the individual steps can be standardised. These standardised steps enable the evaluation of the scale status at any point in time.

The user can pause the processing of a step by blocking it. The block affects the start of the step, i.e. SIWAREX FTA switches from step 2 to step for example, but if step 3 is blocked, it waits at the beginning of step 3 until the block for step 3 is deactivated.

A released block for a step cannot be used on that step again.

Activating the check stop with the "Check stop" instruction has another effect.

If a check-stop is activated before or during the processing of a step then SIWAREX FTA completes the current step and switches to "stopped" status. The "Continue" instruction starts the operation again from the current point.

5.4.1 Processing weighing step 0 - Wait

The scale is waiting in weighing step 0. If step 0 is blocked, no start instruction is accepted. After enabling step 0, the scale waits for the start instruction. When the start instruction is received, a check is performed to determine whether the instruction can be executed or not. If YES, it switches to step 1. If step 1 is blocked, SIWAREX FTA waits for the enable at the beginning of step 1.

Relevant status bit	Description of the status bit	Step 0 neutral phase		
		Beginning	Run-time	End
NAWI				
10	Waiting for stand-still	0	0	0
11	Standstill 1	1/0	1/0	1/0
25	Empty message	1/0	1/0	1/0
AWI				
0	Weighing step 0	1	1	1
1	Weighing step 1	0	0	0
2	Weighing step 2	0	0	0
3	Weighing step 3	0	0	0
4	Weighing step 4	0	0	0
5	Weighing step 5	0	0	0
6	Weighing step 6	0	0	0
7	Weighing step 7	0	0	0
8	Post dosing active	0	0	0
9	Coarse signal	0	0	0
10	Fine signal	0	0	0
11	Timer pre-dosing	0	0	0
12	Empty signal	0	0	0
13	Weighing stopped	0	0	0
14	Halted for check stop	0	0	0
15	Check stop follows	1/0	1/0	0
16	Weighing aborted	0	0	0
17	Step blocked	1/0	0	0
18	To2	1/0	1/0	0
19	To1	1/0	1/0	0
20	Tolerance good	1/0	1/0	0
21	Tu1	1/0	1/0	0
22	Tu2	1/0	1/0	0
23	Tolerance bad	1/0	1/0	0
24	Standstill 2	1/0	1/0	1/0
25	Standstill 3	1/0	1/0	1/0
27	Block set/actual comparison	1/0	1/0	1/0
28	Continuous start active	1/0	1/0	1/0
30	Cycle end	0	0	0
31	End load operation	0	0	0

Table 5-3 Signal states in step 0

Note: 1/0 – can be 0 or 1

5.4.2 Description of Weighing step 1 – Taring/Zero setting

If step 1 is blocked, then no activities in step 1 are performed. After enabling step 1, the scale waits for standstill 2 (only if taring or zero setting is defined). When the standstill is achieved, the taring or the zero setting is performed. If no check stop has been activated, the SIWAREX FTA switches to step 2.

Relevant status bit	Description of the status bit	Step 1 Tare / Zero setting			
		Beginning	Run-time	End	
NAWI					
10	Waiting for stand-still	1/0	1/0	0	
11	Standstill 1	1/0	1/0	1	
25	Empty message	1/0	1/0	1/0	
AWI					
0	Weighing step 0	0	0	0	
1	Weighing step 1	1	1	1	
2	Weighing step 2	0	0	0	
3	Weighing step 3	0	0	0	
4	Weighing step 4	0	0	0	
5	Weighing step 5	0	0	0	
6	Weighing step 6	0	0	0	
7	Weighing step 7	0	0	0	P
8	Post dosing active	0	0	0	r
9	Coarse signal	0	0	0	ü
10	Fine signal	0	0	0	f
11	Timer pre-dosing	0	0	0	s
12	Empty signal	0	0	0	t
13	Weighing stopped	1/0	1/0	1/0	o
14	Halted for check stop	0	0	1/0	p
15	Check stop follows	1/0	1/0	0	
16	Weighing aborted	0	1/0	1/0	m
17	Step blocked	0	0	0	ö
18	To2	0	0	0	g
19	To1	0	0	0	l
20	Tolerance good	0	0	0	i
21	Tu1	0	0	0	c
22	Tu2	0	0	0	h
23	Tolerance bad	0	0	0	
24	Standstill 2	1/0	1/0	1/0	
25	Standstill 3	1/0	1/0	1/0	
27	Block set/actual comparison	1/0	1/0	1/0	
28	Continuous start active	1/0	1/0	1/0	
30	Cycle end	0	0	0	
31	End load operation	0	0	0	

Table 5-4 Signal states in step 1

Note: 1/0 – can be 0 or 1

5.4.3 Description of Weighing step 2 – Coarse/Fine

If step 2 is blocked, then no activities in step 2 are performed. After enabling step 2, the coarse and fine weighing procedures are performed When the fine signal is switched off, a check performed to determine whether a check stop requirement is active. If no check stop has been activated, the SIWAREX FTA switches to step 3.

Relevant status bit	Description of the status bit	Step 2 Weigh			
		Beginning	Run-time	End	PS
NAWI					
10	Waiting for stand-still	0	0	0	
11	Standstill 1	1/0	1/0	1/0	
25	Empty message	1/0	0	0	
AWI					
0	Weighing step 0	0	0	0	
1	Weighing step 1	0	0	0	
2	Weighing step 2	1	1	1	
3	Weighing step 3	0	0	0	
4	Weighing step 4	0	0	0	
5	Weighing step 5	0	0	0	
6	Weighing step 6	0	0	0	
7	Weighing step 7	0	0	0	P
8	Post dosing active	0	0	0	r
9	Coarse signal	1	1/0	0	ü
10	Fine signal	1	1	0	f
11	Timer pre-dosing	1/0	0	0	s
12	Empty signal	0	0	0	t
13	Weighing stopped	1/0	1/0	1/0	o
14	Halted for check stop	0	0	1/0	p
15	Check stop follows	1/0	1/0	0	
16	Weighing aborted	1/0	1/0	1/0	m
17	Step blocked	1/0	0	0	ö
18	To2	0	0	0	g
19	To1	0	0	0	l
20	Tolerance good	0	0	0	i
21	Tu1	0	0	0	c
22	Tu2	0	0	0	h
23	Tolerance bad	0	0	0	
24	Standstill 2	1/0	1/0	1/0	
25	Standstill 3	1/0	1/0	1/0	
27	Block set/actual comparison	1/0	1/0	1/0	
28	Continuous start active	1/0	1/0	1/0	
30	Cycle end	0	0	0	
31	End load operation	0	0	0	

Table 5-5 Signal states in step 2

Note: 1/0 – can be 0 or 1

5.4.4 Description of weighing step 3 - Post dosing

If step 3 is blocked, then no activities in step 3 are performed. After step 3 is enabled, SIWAREX FTA waits for standstill 2. If standstill 2 exists then the tolerance check is performed and post dosing occurs if necessary. If no check stop has been activated, the SIWAREX FTA switches to step 4.

Relevant status bit	Description of the status bit	Step 3 Trailing, Post dosing			
		Beginning	Run-time	End	PS
NAWI					
10	Waiting for stand-still	0	0	0	
11	Standstill 1	1/0	1/0	1/0	
25	Empty message	0	0	0	
AWI					
0	Weighing step 0	0	0	0	
1	Weighing step 1	0	0	0	
2	Weighing step 2	0	0	0	
3	Weighing step 3	1	1	1	
4	Weighing step 4	0	0	0	
5	Weighing step 5	0	0	0	
6	Weighing step 6	0	0	0	
7	Weighing step 7	0	0	0	P
8	Post dosing active	1/0	1/0	0	r
9	Coarse signal	0	0	0	ü
10	Fine signal	1/0	1/0	0	f
11	Timer pre-dosing	0	0	0	s
12	Empty signal	0	0	0	t
13	Weighing stopped	1/0	1/0	1/0	o
14	Halted for check stop	0	0	1/0	p
15	Check stop follows	1/0	1/0	0	
16	Weighing aborted	1/0	1/0	1/0	m
17	Step blocked	1/0	0	0	ö
18	To2	0	0	0	g
19	To1	0	0	0	l
20	Tolerance good	0	0	0	i
21	Tu1	0	0	0	c
22	Tu2	0	0	0	h
23	Tolerance bad	0	0	0	
24	Standstill 2	1/0	1/0	1/0	
25	Standstill 3	1/0	1/0	1/0	
27	Block set/actual comparison	1/0	1/0	1/0	
28	Continuous start active	1/0	1/0	1/0	
30	Cycle end	0	0	0	
31	End load operation	0	0	0	

Table 5-6 Signal states in step 3

Note: 1/0 – can be 0 or 1

5.4.5 Description of weighing step 4 - End/Intermediate check

If step 4 is blocked, then no activities in step 4 are performed. After enabling step 4, SIWAREX FTA waits for standstill 2, if a control weighing procedure has been performed, to perform the evaluation of the past weighing procedure. If no control weighing procedure is to be performed, a check is performed to determine whether a check stop is activated and if not, SIWAREX FTA switches to step 5. With the totalising scale (AWI), the switch is made to emptying weighing and taring.

Relevant status bit	Description of the status bit	Step 4 TOL check, Statistic data			
		Beginning	Run-time	End	PS
NAWI					
10	Waiting for stand-still	0	0	0	
11	Standstill 1	1/0	1/0	1	
25	Empty message	0	0	0	
AWI					
0	Weighing step 0	0	0	0	
1	Weighing step 1	0	0	0	
2	Weighing step 2	0	0	0	
3	Weighing step 3	0	0	0	
4	Weighing step 4	1	1	1	
5	Weighing step 5	0	0	0	
6	Weighing step 6	0	0	0	
7	Weighing step 7	0	0	0	P
8	Post dosing active	0	0	0	r
9	Coarse signal	0	0	0	ü
10	Fine signal	0	0	0	f
11	Timer pre-dosing	0	0	0	s
12	Empty signal	0	0	0	t
13	Weighing stopped	1/0	1/0	1/0	o
14	Halted for check stop	0	0	1/0	p
15	Check stop follows	1/0	1/0	0	
16	Weighing aborted	1/0	1/0	1/0	m
17	Step blocked	1/0	0	0	ö
18	To2	0	0	1/0	g
19	To1	0	0	1/0	l
20	Tolerance good	0	0	1/0	i
21	Tu1	0	0	1/0	c
22	Tu2	0	0	1/0	h
23	Tolerance bad	0	0	1/0	
24	Standstill 2	1/0	1/0	1/0	
25	Standstill 3	1/0	1/0	1/0	
27	Block set/actual comparison	1/0	1/0	1/0	
28	Continuous start active	1/0	1/0	1/0	
30	Cycle end	0	0	0	
31	End load operation	0	0	0	

Table 5-7 Signal states in step 4

Note: 1/0 – can be 0 or 1

5.4.6 Description of weighing step 5 - Empty

If step 5 is blocked, then no activities in step 5 are performed. After enabling step 5, the empty signal is output. If emptying has finished, a check is performed to determine whether a check stop requirement exists and if not, the switch to step 6 (only with totalising weighing - AWI) or to step 0.

Relevant status bit	Description of the status bit	Step 5 Empty			
		Beginning	Run-time	End	PS
NAWI					
10	Waiting for stand-still	0	0	0	
11	Standstill 1	1	1/0	1/0	
25	Empty message	0	0	1	
AWI					
0	Weighing step 0	0	0	0	
1	Weighing step 1	0	0	0	
2	Weighing step 2	0	0	0	
3	Weighing step 3	0	0	0	
4	Weighing step 4	0	0	0	
5	Weighing step 5	1	1	1	
6	Weighing step 6	0	0	0	
7	Weighing step 7	0	0	0	P
8	Post dosing active	0	0	0	r
9	Coarse signal	0	0	0	ü
10	Fine signal	0	0	0	f
11	Timer pre-dosing	0	0	0	s
12	Empty signal	1	1	0	t
13	Weighing stopped	1/0	1/0	1/0	o
14	Halted for check stop	0	0	1/0	p
15	Check stop follows	1/0	1/0	0	
16	Weighing aborted	1/0	1/0	1/0	m
17	Step blocked	1/0	0	0	ö
18	To2	0	0	0	g
19	To1	0	0	0	l
20	Tolerance good	0	0	0	i
21	Tu1	0	0	0	c
22	Tu2	0	0	0	h
23	Tolerance bad	0	0	0	
24	Standstill 2	1/0	1/0	1/0	
25	Standstill 3	1/0	1/0	1/0	
27	Block set/actual comparison	1/0	1/0	1/0	
28	Continuous start active	1/0	1/0	1/0	
30	Cycle end	0	0	0	
31	End load operation	0	0	0	

Table 5-8 Signal states in step 5

Note: 1/0 – can be 0 or 1

5.4.7 Description of weighing step 6 - End control AWI

If step 6 is blocked, then no activities in step 6 are performed. After step 6 is enabled, a check is performed to determine whether standstill 3 exists. If YES then the weight recording and totalling are performed. A check is then performed to determine whether a check stop requirement exists and if not, the switch to step 0 is made.

Relevant status bit	Description of the status bit	Step 6 Statistic data, Balance (Tare re-weigh)			
		Beginning	Run-time	End	PS
NAWI					
10	Waiting for stand-still	0	0	0	
11	Standstill 1	1/0	1/0	1	
25	Empty message	1	1	1	
AWI					
0	Weighing step 0	0	0	0	
1	Weighing step 1	0	0	0	
2	Weighing step 2	0	0	0	
3	Weighing step 3	0	0	0	
4	Weighing step 4	0	0	0	
5	Weighing step 5	0	0	0	
6	Weighing step 6	1	1	1	
7	Weighing step 7	0	0	0	P
8	Post dosing active	0	0	0	r
9	Coarse signal	0	0	0	ü
10	Fine signal	0	0	0	f
11	Timer pre-dosing	0	0	0	s
12	Empty signal	0	0	0	t
13	Weighing stopped	1/0	1/0	1/0	o
14	Halted for check stop	0	0	1/0	p
15	Check stop follows	1/0	1/0	0	
16	Weighing aborted				m
17	Step blocked	1/0	0	0	ö
18	To2	0	0	0	g
19	To1	0	0	0	l
20	Tolerance good	0	0	0	i
21	Tu1	0	0	0	c
22	Tu2	0	0	0	h
23	Tolerance bad	0	0	0	
24	Standstill 2	1/0	1/0	1/0	
25	Standstill 3	1/0	1/0	1/0	
27	Block set/actual comparison	1/0	1/0	1/0	
28	Continuous start active	1/0	1/0	1/0	
30	Cycle end	0	0	0	
31	End load operation	0	0	0	

Table 5-9 Signal states in step 6

5.4.8 Description of Weighing Step 7

Weighing step 7 is currently not utilised (Reserve).

5.4.9 DS 4 - Monitoring time for Logging

If weighing result logging is activated with an instruction or automatically, SIWAREX FTA monitors whether the procedure has been completed within the defined amount of time. If not, an error is generated.

5.4.10 DS 4 - Device for log output

Logs can be output to a connected printer or to the Micro Memory Card (MMC). The contents of the log are defined in data records DS 40 to DS 43.

5.4.11 DS 4 - Basis weight for the limit value 1

The limit values can be defined in reference to the gross weight or the net weight of the scale. This way, a very coarse dosage (net reference) or a refilling of the scale container (gross reference) can be defined for example.

5.4.12 DS 4 - Basis weight for the limit value 2

The limit values can be defined in reference to the gross weight or the net weight of the scale. This way, a very coarse dosage (net reference) or a refilling of the scale container (gross reference) can be defined for example.

5.4.13 DS 4 - Basis weight for monitoring the empty range

The limit value for monitoring the empty range can be defined in reference to the gross weight or the net weight of the scale.

5.4.14 DS 4 - Empty range

The value for the empty range is a limit value. If the weight value is below this limit value, SIWAREX FTA determines an "empty" status which is output as status information.

5.4.15 DS 4 - Switch-on weight limit value 1

Switch-on and shut-off weights can be defined separately for a limit value. This way, a minimum value monitor and a maximum value monitor can be made with a hysteresis.

Maximum value monitor is created with the following entry:

Switch-on value > shut-off value

Minimum value monitor is created with the following entry:

Switch-on value < shut-off value

The following image shows the functionality of limit values 1, 2, 3

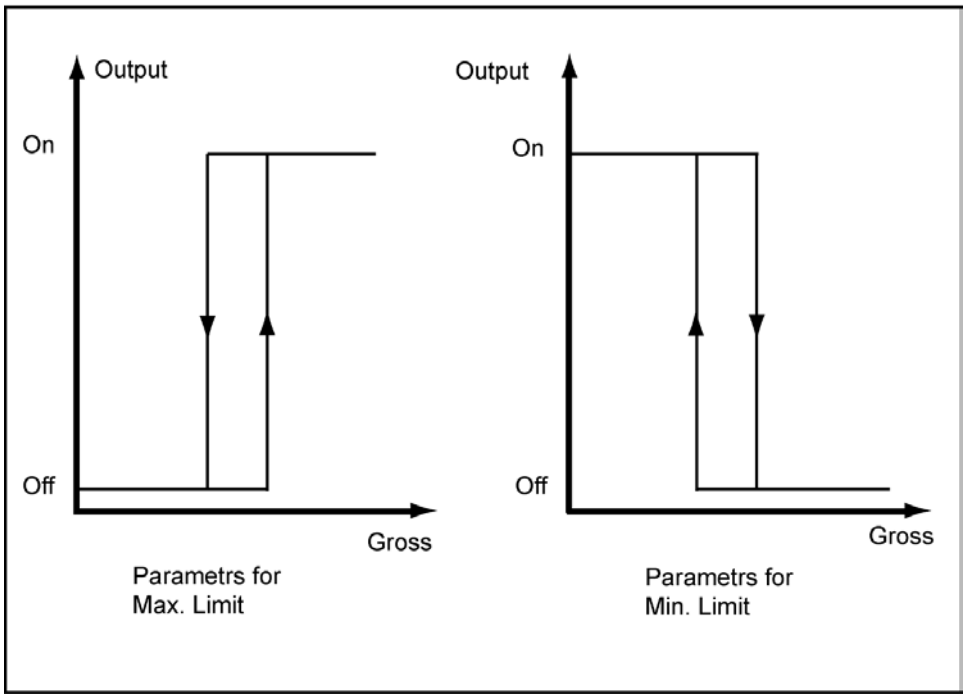


Image 5-10 Defining limit value parameters

5.4.16 DS 4 - Shut-off weight limit value 1

See: Switch-on weight limit value 1

5.4.17 DS 4 - Switch-on weight limit value 2

See: Switch-on weight limit value 1

5.4.18 DS 4 - Shut-off weight limit value 2

See: Switch-on weight limit value 1

5.4.19 DS 4 - Switch-on weight limit value 3

Switch-on and shut-off weights can be defined separately for a limit value. With limit value 3, only the maximum weight monitor can be used The base weight for limit value 3 is always the gross weight.

5.4.20 DS 4 - Shut-off weight limit value 3

If the value is below the limit value, the status information is reset to "limit value 3".

5.4.21 DS 4 - Minimum through-put limit value 1

The through-put measurement is performed continuously. As soon as the determined through-put value falls below the limit value, it is indicated in the status display.

5.4.22 DS 4 - Minimum through-put limit value 2

The through-put measurement is performed continuously. As soon as the determined through-put value falls below the limit value, it is indicated in the status display.

5.4.23 DS 4 - Filter depth of averaging filter for through-put calculation

A separate average value filter is used for the through-put measurement. The through-put value is generated from the average value of the through-put value which SIWAREX FTA calculates with a measurement rate of 10 msec.

5.5 DS 7 Interfaces (NAWI, AWI)

The parameters that define the behaviour of the SIWAREX FT on the interfaces are defined in DS7. If an interface is not used the default values can be left alone.

- Change parameters if required.
- Send DS 7 to the scale

Name	Type	Address	Default	Range of Values / Explanation	Reference
S7-Interface		0			
Reserve	BYTE	DBB000	0		
Source for the weight simulation	BYTE	DBB001	0	0: Weight simulation inactive 1: Weight simulation value of SIMATIC 2: Weight simulation value of RS232 Other definitions not permitted.	*5.5.1*
Decade used for rounding the decimal places of the process values (Float weight values)	BYTE	DBB002	3	0: Round to 0 decimal places 1: Round to 1 decimal place 2: Round to 2 decimal places 3: Round to 3 decimal places 4: Round to 4 decimal places 5: Round to 5 decimal places 6: Round to 6 decimal places	*5.5.2*
Reserve	BYTE	DBB003	0	Reserve	
Force service operation	BYTE	DBB004	0	Bit 0 : 0: Outputs in service operation - Forced operation not possible 1: Outputs in service operation - Forced operation possible Bit 1 - 7 not used	*5.5.3*
Process value 1 for fast output to the SIMATIC CPU	BYTE	DBB005	1	Various process values are available for selection after listing.	*5.5.4*
Process value 2 for fast output to the SIMATIC CPU	BYTE	DBB006	2	Various process values are available for selection after listing.	*5.5.5*

Name	Type	Address	Default	Range of Values / Explanation	Reference
Reserve 2	BYTE	DBB007	0	Reserve 2	
S7-Alarm					
Definition of process alarm 0	WORD	DBB008	0	Value 0 - No process alarm generation Value range 1 – 0FFh Number of the technical error Value range 100h – 13Fh 100h+ 0...1Fh Bit-No. NAWI-status bit - coming 100h+ 20h...3Fh Bit-No. AWI Status flag - coming Value range 200h – 23Fh 200h+ 0...1Fh Bit-No. NAWI status bit - going 200h+ 20h...3Fh Bit-No. AWI status bit - going	*5.5.6*
Definition of process alarm 1	WORD	DBB010	0	Value 0 - No process alarm generation Value range 1 – 0FFh Number of the technical error Value range 100h – 13Fh 100h+ 0...1Fh Bit-No. NAWI-status bit - coming 100h+ 20h...3Fh Bit-No. AWI Status bit - coming Value range 200h – 23Fh 200h+ 0...1Fh Bit-No. NAWI status bit - going 200h+ 20h...3Fh Bit-No. AWI status bit - going	*5.5.6*
Definition of process alarm 2	WORD	DBB012	0	Value 0 - No process alarm generation Value range 1 – 0FFh Number of the technical error Value range 100h – 13Fh 100h+ 0...1Fh Bit-No. NAWI-status bit - coming 100h+ 20h...3Fh Bit-No. AWI Status bit - coming Value range 200h – 23Fh 200h+ 0...1Fh Bit-No. NAWI status bit - going 200h+ 20h...3Fh Bit-No. AWI status bit - going	*5.5.6*
Definition of process alarm 3	WORD	DBB014	0	Value 0 - No process alarm generation Value range 1 – 0FFh Number of the technical error Value range 100h – 13Fh 100h+ 0...1Fh Bit-No. NAWI-status bit - coming 100h+ 20h...3Fh Bit-No. AWI Status bit - coming Value range 200h – 23Fh 200h+ 0...1Fh Bit-No. NAWI status bit - going 200h+ 20h...3Fh Bit-No. AWI status bit - going	*5.5.6*
Definition of process alarm 4	WORD	DBB016	0	Value 0 - No process alarm generation Value range 1 – 0FFh Number of the technical error Value range 100h – 13Fh 100h+ 0...1Fh Bit-No. NAWI-status bit - coming 100h+ 20h...3Fh Bit-No. AWI Status bit - coming Value range 200h – 23Fh 200h+ 0...1Fh Bit-No. NAWI status bit - going	*5.5.6*

Name	Type	Address	Default	Range of Values / Explanation	Reference
				200h+ 20h...3Fh Bit-No. AWI status bit - going	
Definition of process alarm 5	WORD	DBB018	0	Value 0 - No process alarm generation Value range 1 – 0FFh Number of the technical error Value range 100h – 13Fh 100h+ 0...1Fh Bit-No. NAWI-status bit - coming 100h+ 20h...3Fh Bit-No. AWI Status bit - coming Value range 200h – 23Fh 200h+ 0...1Fh Bit-No. NAWI status bit - going 200h+ 20h...3Fh Bit-No. AWI status bit - going	*5.5.6*
Definition of process alarm 6	WORD	DBB020	0	Value 0 - No process alarm generation Value range 1 – 0FFh Number of the technical error Value range 100h – 13Fh 100h+ 0...1Fh Bit-No. NAWI-status bit - coming 100h+ 20h...3Fh Bit-No. AWI Status bit - coming Value range 200h – 23Fh 200h+ 0...1Fh Bit-No. NAWI status bit - going 200h+ 20h...3Fh Bit-No. AWI status bit - going	*5.5.6*
Definition of process alarm 7	WORD	DBB022	0	Value 0 - No process alarm generation Value range 1 – 0FFh Number of the technical error Value range 100h – 13Fh 100h+ 0...1Fh Bit-No. NAWI-status bit - coming 100h+ 20h...3Fh Bit-No. AWI Status bit - coming Value range 200h – 23Fh 200h+ 0...1Fh Bit-No. NAWI status bit - going 200h+ 20h...3Fh Bit-No. AWI status bit - going	*5.5.6*
S7 - FB Life bit monitoring time	TIME	DBB024	0	0 = S7- Life bit monitor switched off 1 to n = Monitor time [msec]	*5.5.7*
Analogue output		0			
Weight for zero point(0 or 4 mA)	REAL	DBB028	0	Value output with the 0 or 4 mA	*5.5.8*
Reference for end value (20 mA)	REAL	DBB032	0	Value output with the 20 mA.	*5.5.9*
Replacement value for the analogue output at OD	REAL	DBB036	0	Replacement value which is output with the active OD signal if defined.	*5.5.10*
Source for the analogue output	BYTE	DBB040	0	0 = Control signals-SIMATIC 1 = Ext. default value with DS 17 2 = Gross 3 = Net Coarse/fine default values Other definitions not permitted.	*5.5.11*
Current range for the analogue output	BYTE	DBB041	0	Bit 0 : 0: 0 .. 20mA 1: 4 .. 20mA	*5.5.12*

Name	Type	Address	Default	Range of Values / Explanation	Reference
				Bit 1 – 7 unused	
RS232		0			
RS232-printer baud rate	BYTE	DBB042	3	0 = 1200 Bit/sec. 1 = 2400 Bit/sec. 2 = 4800 Bit/sec. 3 = 9600 Bit/sec. Other definitions not permitted.	*5.5.13*
RS232-XON/XOFF for printer RS232-RTS/CTS for printer	BYTE	DBB043	1	Bit 0 : 0: XON/XOFF transmission control OFF 1: XON/XOFF transmission control ON Bit 1 : 0: CTS/RTS transmission control OFF 1: CTS/RTS transmission control ON Bit 2 : Reserved, must always be 0 Bit 3 – 7 unused	*5.5.14*
RS485		0			
Log selection	BYTE	DBB044	0	0: No device 1: SIEBERT Display S11	*5.5.15*
Decimal place for the remote display	BYTE	DBB045	0	0 to 4 Other definitions not permitted.	*5.5.16*
RS485-Baudrate	BYTE	DBB046	3	0 = 1200 Bit/sec. 1 = 2400 Bit/sec. 2 = 4800 Bit/sec. 3 = 9600 Bit/sec. 4 = 19200 Bit/sec. Other definitions not permitted.	*5.5.17*
RS485-character parity RS485-Data-Bits RS485-Stop-Bits	BYTE	DBB047	0 1 0	Bit 0 : 0: Even 1: odd Bit 1 : 0: 7 data bits 1: 8 data bits Bit 2 : 0: 1 Stop Bit 1: 2 Stop Bits Bit 3 - 7 not used	*5.5.18*
Digital outputs		0			
Definition of digital output 1	BYTE	DBB048	0FFh	Value range 00h – 3Fh 0...1Fh Bit-No. NAWI status flag 20h...3Fh Bit-No. AWI status flag FFh output always inactive	*5.5.19*
Definition of digital output 2	BYTE	DBB049	0FFh	Value range 00h – 3Fh 0...1Fh Bit-No. NAWI status flag 20h...3Fh Bit-No. AWI status flag FFh output always inactive	*5.5.19*
Definition of digital output 3	BYTE	DBB050	0FFh	Value range 00h – 3Fh 0...1Fh Bit-No. NAWI status flag 20h...3Fh Bit-No. AWI status flag FFh output always inactive	*5.5.19*
Definition of digital output 4	BYTE	DBB051	0FFh	Value range 00h – 3Fh 0...1Fh Bit-No. NAWI status flag 20h...3Fh Bit-No. AWI status flag	*5.5.19*

Name	Type	Address	Default	Range of Values / Explanation	Reference
				FFh output always inactive	
Definition of digital output 5	BYTE	DBB052	0FFh	Value range 00h – 3Fh 0...1Fh Bit-No. NAWI status flag 20h...3Fh Bit-No. AWI status flag FFh output always inactive	5.5.19
Definition of digital output 6	BYTE	DBB053	0FFh	Value range 00h – 3Fh 0...1Fh Bit-No. NAWI status flag 20h...3Fh Bit-No. AWI status flag FFh output always inactive	5.5.19
Definition of digital output 7	BYTE	DBB054	0FFh	Value range 00h – 3Fh 0...1Fh Bit-No. NAWI status flag 20h...3Fh Bit-No. AWI status flag FFh output always inactive	5.5.19
Definition of digital output 8	BYTE	DBB055	0FFh	Value range 00h – 3Fh 0...1Fh Bit-No. NAWI status flag 20h...3Fh Bit-No. AWI status flag FFh output always inactive	5.5.19
Level definition for digital outputs 1....8	BYTE	DBB056	0	Bit 0 : DA1 -> 0 = high active: 1 = low active .... Bit 7 : DA8 -> 0 = high active: 1 = low active	5.5.20
Replacement values for digital outputs 1 .... 8 upon fault or OD signal	BYTE	DBB057	0	Bit 0 : Replace value digital output 1 .... Bit 7 : Replace value digital output 8	5.5.21
Activate - Digital output replacement values for operational faults	BYTE	DBB058	0	Bit 0 : 0: Replacement output upon operating error deactivated 1: Replacement output upon operating error activated Bit 1 - 7 not used	5.5.22
Reserve 3	BYTE	DBB059	0	Reserve 3	
Digital inputs		0			
Definition of digital input 1	BYTE	DBB060	0	0 = No command 1- 254 = Command code 255 = Step-on condition. (see DS -7 Scale parameter/Step control 5.15.15)	5.5.23
Definition of digital input 2	BYTE	DBB061	0	0 = No command 1- 254 = Command code 255 = Step-on condition. (see DS - Scale parameter/Step control)	5.5.23
Definition of digital input 3	BYTE	DBB062	0	0 = No command 1- 254 = Command code 255 = Step-on condition. (see DS - Scale parameter/Step control)	5.5.23
Definition of digital input 4	BYTE	DBB063	0	0 = No command 1- 254 = Command code 255 = Step-on condition. (see DS - Scale parameter/Step control)	5.5.23
Definition of digital input 5	BYTE	DBB064	0	0 = No command 1- 254 = Command code 255 = Step-on condition. (see DS - Scale parameter/Step control)	5.5.23
Definition of digital input 6	BYTE	DBB065	0	0 = No command 1- 254 = Command code 255 = Step-on condition. (see DS - Scale parameter/Step control)	5.5.23
Definition of digital input 7	BYTE	DBB066	0	0 = No command 1- 254 = Command code 255 = Step-on condition. (see DS - Scale	5.5.23

Name	Type	Address	Default	Range of Values / Explanation	Reference
				parameter/Step control)	
Level definition for digital inputs 1...7	BYTE	DBB067	0	Bit 0 : Digital input 1 -> 0 = high active: 1 = low active .... Bit 6 : Digital input 7 -> 0 = high active: 1 = low active Bit 7 : not used.	*5.5.24*
Measurement time for pulse input	TIME	DBB068	1 sec	100 to 10000 ms Other definitions not permitted.	*5.5.25*
Reserve 4	DWORD	DBB072	0	Reserve 4	
MMC Parameter		0			
Log overflow Trace overflow Memory for trace	BYTE	DBB076	3	Bit 0 : 0: with full memory, the logging procedures are stopped 1: with full memory, the oldest entries are overwritten Bit 1 : 0: No overwriting of trace data is possible 1: The oldest trace data is overwritten when the card is full Bit 2 : 0: Trace data is stored in RAM 1: Trace data is stored in the MMC Bit 3 - 7 not used	*5.5.26*
Memory segment for trace function	BYTE	DBB077	50	Up to 100% but the total for trace function and log may not exceed 100%	*5.5.27*
Memory segment for logs	BYTE	DBB078	50	Up to 100% but the total for trace function and log may not exceed 100%	*5.5.28*
Trace function Recording cycle	BYTE	DBB079	1	1...n x 10 msec	*5.5.29*
		80			

Table 5-10 DS 7 Allocation

5.5.1 DS 7 - Source for Weight Simulation

Instead of the actual weight determination, a weight simulation can be activated for test purposes. The simulated weight values can be defined over the SIMATIC interface or the RS232 interface (SIWATOOL FTA). The weight simulation makes commissioning a scale much easier in certain situations.

5.5.2 DS 7 - Decade used for rounding the decimal places of the process values

This parameter can be used to define to how many decimal places that the (weight) process values should be rounded. This entry decouples the display of weight values which trigger the restrictions of the calibration requirements and the values that are used in the control software.

5.5.3 DS 7 - Force in Service Operation

After activating this function, the digital outputs can be forced independent of their parameter definitions. Force control is only possible in service operation and only with the SIMATIC interface.

Warning

Before using this function, you must ensure that the system will not achieve any hazardous state that could be caused by forced control of digital outputs of the SIWAREX FTA.

5.5.4 DS 7 - Process value 1 for fast output to the SIMATIC CPU

The current process values can be read as data packages (data records in the SIMATIC CPU using function block FB41. Transferring a large data record can last for several CPU cycles and puts a load on system performance.

If a process value should be quickly transferred to the SIMATIC CPU immediately after its creation in the SIWAREX FTA then the peripheral interface of the SIWAREX FTA can be used. The data is read by the FB41 cyclically and provided for the user as an output variable. In automatic scale operation, the current net weight (Selection number 2) is normally important.

The selection is made from the following list.

Selection number	Process value
0	NAWI-Status
1	Gross weight (Process value)
2	Net weight (Process value)
3	Tare (process value)
4	Gross-/Net weight (calibratable numeral step)
5	Gross-/Net weight (calibratable numeral step x 10)
6	Tare (calibratable)
7	Pulse counter value
8	Temperature
9	Operating error (32 bit information)
10	Unfiltered ADC value
11	Filtered ADC value (for process value)
12	Through-put / sec
30	AWI status
31	Distribution memory 1
32	Distribution memory 2
33	Total number of weightings
34	Number of control weigh procedures
35	Number of weightings over TO2
36	Number of weightings over TO1
37	Number of weightings opt.
38	Number of weightings less than TU1
39	Number of weightings less than TU2
40	Number of weightings bad
41	Reserve

Selection number	Process value
42	Set value
43	Actual weight average value
44	Standard deviation
45	Last actual weight
46	Weighing procedures per hour
47	Performance per hour
48	Current trailing weight
49	Current fine weight
50	Filtered ADC value (for coarse-, fine signal)
51	Current load set value

Table 5-11 Selection list for process values

5.5.5 DS 7 - Process value 2 for fast output to the SIMATIC CPU

Process value 2 can be defined just the same as process value 1 (see above). In automatic scale operation, the current AWI status (Selection number 30) is normally important.

5.5.6 DS 7 - Definition of the process alarms 0, 1, 2, 3, 4, 5, 6, 7

The process alarms can be defined with this parameter. The module can generate process alarms in the SIMATIC CPU. The control program can react immediately to an event this way. Defining a process alarm is explained with the example of process alarm 0. The explanation applies for process alarms 1 to 7 as well.

If parameter value 0 is defined for process alarm 0 then no process alarms are generated.

By entering a value unequal to zero, a process alarm is allocated according to the following procedures:

Value range 1 to 255

Number of the technology message. If the defined technology error occurs then process alarm 0 is generated.

Value range 256 to 319

Number of the bit from the NAWI- or AWI status (see DS 30). If the defined status occurs then process alarm 0 is generated.

256+ 0... 31 Bit-No. NAWI Status bit - coming

288+ 0... 31 Bit-No. AWI Status bit - coming

Value range 512 to 575

Number of the bit from the NAWI- or AWI status (see DS 30). If the defined status goes then process alarm 0 is generated.

512+ 0... 31 Bit-No. NAWI Status bit - going

544+ 0... 31 Bit-No. AWI Status bit - going

5.5.7 DS 7 - S7-FB-Life bit Monitoring Time

By monitoring a life bit, the SIWAREX FTA can determine whether the FB is ensuring continuous communication with the SIMATIC CPU. If the FB does not respond then an operating error is output after the defined time-span has elapsed. Monitoring is active in SIMATIC_CPU RUN status.

5.5.8 DS 7 - Weight for zero point (0 or 4 mA)

A weight for the range start can be defined when defining the range parameters for the analogue output.

5.5.9 DS 7 - Weight for end value (20 mA)

A weight for the range end can be defined when defining the range parameters for the analogue output.

5.5.10 DS 7 - Replacement Value for the Analogue Output with OD

A weight can be defined for the analogue output, for which a corresponding signal is output if the OD signal (Output Disable) exists.

Normally this corresponds with the SIMATIC CPU status - STOP.

5.5.11 DS 7 - Source for the Analogue Output

The source for the analogue output can be defined with this parameter. The weight values from the defined source are output as current signals corresponding with the parameter definitions for start and end ranges.

The following sources are available:

0 - Control value form the SIMATIC (FB)

1 - Default value from the DS 17

2 - Gross weight

3 - Net weight

4 - Coarse/fine default values

5.5.12 DS 7 - Current range for the Analogue Output

The analogue output can be operated with current range 0 ... 20 mA or 4 ... 20 mA.

5.5.13 DS 7 - RS232 Printer baud rate

If a printer is connected to the RS232 interface, the following baud rates can be defined.

1200 Bit/sec

2400 Bit/sec

4800 Bit/sec

9600 Bit/sec

5.5.14 DS 7 - RS232- Printer transfer control

The transfer control parameters for the RS232 interfaces can be defined as follows:

XON/XOFF (for printer protocol only)

0: XON/XOFF transmission control OFF

1: XON/XOFF transmission control ON

RTS/CTS (for printer protocol only)

0: CTS/RTS transmission control OFF

1: CTS/RTS transmission control ON

5.5.15 DS 7 – Protocol selection for RS 485

The following protocols can be set for the RS485 interface

- No protocol
- Protocol for the Siebert Display S11

5.5.16 DS 7 - Decimal Place for Remote Display

If a Siebert display is to be connected to the RS485 interface then the decimal place for displaying the non-calibratable process values can be defined.

5.5.17 DS 7 – RS 485-Baudrate

The following protocols can be set for the RS485 interface:

0 = 1200 Bit/sec

1 = 2400 Bit/sec

2 = 4800 Bit/sec

3 = 9600 Bit/sec

4 = 19200 Bit/sec

5.5.18 DS 7 - RS485-character frame

Parity:

0: Even

1: odd

Number of data bits:

0: 7 data bits

1: 8 data bits

Number of stop bits:

0: 1 stop bit

1: 2 stop bits

5.5.19 DS 7 - Definition of the Digital Outputs 1, 2, 3, 4, 5, 6, 7, 8

The definition of the digital outputs can be defined with this parameter. Assigning a bit from the pool of status bits for the scale causes the output to be active (active can be signal level 0 or 1 - see below) if the bit is set.

When assigning a number between 0 and 63, the digital output is assigned to a status bit of the scale and when assigning a number > 63, the output remains inactive.

0... 31 Bit-No. NAWI status flag

31 + 0... 31 Bit-No. AWI status flag

Value range 64 to 255 Output always inactive

5.5.20 DS 7 - Level definitions for digital outputs 1 to 8

After assigning the definitions for digital outputs to a status bit, the signal that the output should have when it is active can be determined.

E.g. Digital output 1 (DO1) is determined with bit 0:

If bit 0 is 0 then DO1 is high active and if bit 0 is 1 then DO1 is low active,

If bit 1 is 0 then DO2 is high active and if bit 1 is 1 then DO2 is low active,

etc.

5.5.21 DS 7 - Replacement value for DO 1 to DO 8 with Interference or Output Disable

Normally, the outputs are reset with a SIMATIC CPU STOP. This behaviour corresponds with the default setting.

If it makes sense to set an output with a SIMATIC CPU STOP, you can define it with this parameter.

E.g. Digital output 1 (DO1) is determined with bit 0:

If bit 0 is 0 then DO1 is also 0 with OD signal.

If bit 0 is 1 then DO1 is 1 with OD signal.

The digital output 1 (DO2) is determined with bit 1:

If bit 1 is 0 then DO2 is also 0 with OD signal.

If bit 1 is 1 then DO2 is 1 with OD signal.

etc.

Warning

If an output is to be set with the SIMATIC CPU STOP then you must ensure that it does not lead to a hazardous situation.

5.5.22 DS 7 - Replacement values for digital outputs with operational faults

Normally, the outputs are reset when there is a module group fault (operating error).. This behaviour corresponds with the default setting.

If it makes sense to set an output with a fault, you can define it with this parameter.

E.g. Digital output 1 (DO1) is determined with bit 0:

If bit 0 is 0 then DO1 is also 0 with fault.

If bit 0 is 1 then DO1 is 1 with fault.

The digital output 1 (DO2) is determined with bit 1:

If bit 1 is 0 then DO2 is also 0 with fault.

If bit 1 is 1 then DO2 is 1 with fault.

etc.

Warning

If an output is to be set with the fault (operating error) then you must ensure that it does not lead to a hazardous situation.

5.5.23 DS 7 - Definition of the Digital Inputs 1, 2, 3, 4, 5, 6, 7

The definition of the digital inputs can be defined with this parameter. This can be done by assigning a command or a step-on condition.

Commands:

If the signal 1 appears at the defined input then the assigned command is executed. To assign a command to an input, its command number (1 to 256) must be entered (see Command list). By entering 0, the input is assigned as unused.

Step-on condition

The step-on condition allows you to influence the weighing procedure through the control program of the SIMATIC (see chapter *8.4.8*).

Entering the value 255 defines the input for the step-on conditions. In the second step, you must define which step-on condition that the input is responsible for. This is done by defining scale parameter 2 (see DS 23 – *Step control*).

5.5.24 DS 7 - Level definitions for digital inputs 1 to 7

After assigning the definition for digital inputs to a command or a step-on condition, you can define which signal that the should be interpreted as active on the input.

E.g. Digital input 1 (DI1) is determined with bit 0:

If bit 0 is 0 then DI1 is high active and if bit 0 is 1 then DI1 is low active,

If bit 1 is 0 then DI2 is high active and if bit 1 is 1 then DI2 is low active,

etc.

5.5.25 DS 7 - Measurement time Pulse input

The measurement time can be defined between 1000 and 10000 Milliseconds for the counter input. Pulses are counted using the defined time intervals and are output as process values.

5.5.26 DS 7 - MMC Log Overflow, MMC Trace Overflow, Target storage for trace function

Bit 0 is used for defining how the logging should be performed in the calibratable MMC memory when the memory is full.

0: with full memory, the logging procedures are stopped

1: with full memory, the oldest entries are overwritten

Bit 1 is used for defining how the logging of trace data should continue if memory is full.

0: No overwriting of trace data is possible when MMC memory is full.

1: The oldest trace data is overwritten when MMC memory is full

The trace function is described in *5.5.29*

Bit 2 defines which memory is used for recording the trace data.

0: Trace data is stored in RAM

1: Trace data is stored in the MMC

The trace function is described in *5.5.29*

5.5.27 DS 7 - Memory segment for trace function

The MMC memory can be used for recording the trace data and for recording the calibratable scale logs.

The percentage of MMC memory that is available for the trace function is defined with this parameter.

Up to 100% is permitted in this definition but the total for trace function and calibratable log may not exceed 100%

The trace function is described in *5.5.29*

5.5.28 DS 7 - Memory segment for log

The MMC memory can be used for recording the trace data and for recording the calibratable scale logs.

The percentage of MMC memory that is available for the calibratable logs is defined with this parameter.

Up to 100% is permitted in this definition but the total for trace function and calibratable log may not exceed 100%

The trace function is described in *5.5.29*

5.5.29 DS 7 - Trace function recording cycle

Every n-te measurement (n x 10 msec) is recorded. When recording to RAM, $n \geq 1$ is possible and when recording to MMC, $n \geq 5$ is possible.

The recording can be started with the "Start Recording" 70 command and stopped with "End recording" 71 command.

A recording element has a length of 64 bytes and contains several measurement values and status bits.

Name	Type	Length	Range of Values / Explanation
Timestamp1	DATE&TIME	8	
AWI status	ULONG	4	status bit
NAWI-Status	ULONG	4	status bit
Unfiltered raw value	ULONG	4	Unfiltered digit value from ADC
Filtered raw value	LONG	4	Filtered digit value
Net_Process	FLOAT	4	Net weight
Gross_Process	FLOAT	4	Gross weight
Filtered raw value 2	LONG	4	Filtered digit value from filter level 2

Name	Type	Length	Range of Values / Explanation
Net rough/fine shut-off	FLOAT	4	Net weight for rough / fine shut-off
Rough shut-off point	FLOAT	4	Coarse current shut-off point
Fine shut-off point	FLOAT	4	Fine current shut-off point
Reserved	UBYTE[n]	16	Reserved
		64	

Table 5-12 Trace element data

The recorded values can be read with the SIWATOOL FTA and exported to MS Excel or text file.

If the trace function is defined for recording to circulating memory, it can be used for constructing a status recorder. The command for starting the recording can come from the SIMATIC control program and the command for stopping can also come from the control program, e.g. if you want to record and save the progress of a procedure.

5.6 DS 8 Date / Time (NAWI, AWI)

SIWAREX FTA has its own hardware clock. The actual date and time can be read through DS8. The date and time can be set on the module group using this data record if required.

Procedure:

- Set date and time.
- Send DS 8 to the scale

Name	Type	Address	Default	Range of Values / Explanation	Refe-rence
Date / Time					
Date / Time	DATE_AND_TIME, DT	DBD000	01.01.01 00:00:00 000 Mo	Date&Time in SIMATIC-Format	
		4			

Table 5-13 DS 8 Allocation

5.7 DS 9 Info on Module (NAWI, AWI)

No definitions can be made in DS9. The data record uses the information on the inner life of the module.

Name	Type	Address	Default	Range of Values / Explanation	Reference
Info on module					
CRC Checksum	DWORD	DBW000	0	-	
Length of firmware in bytes	DWORD	DBW004	0	-	
Copyright	STRING [26]	DBB008	0	„Copyright Siemens AG “	
Module name	STRING [10]	DBB036	SIWAREX XX		
Application	STRING [4][8]	DBB048	„AWI “ „NAWI“ „xxxx“ „xxxx“ „xxxx“ „xxxx“ „xxxx“ „xxxx“	Application identification	
File name	STRING [20]	DBB082	0		
Version recognition Function status Data structure version Correction status	BYTE [4]	DBB104	0	Byte 0 (ASCII) before delivery approval B = Laboratory status P = Pilot R = Release S = Special status after delivery approval V = Version K = Correction status Byte 1 Function status xx (Main function changes or calibratable changes 0 ... 99) Byte 2 Version DS structure yy (indicated changes in the data structure) 0 ... 99 Byte 3 Correction status zz (small changes or error corrections) 0 ... 99	
Creation date	STRING [10]	DBB108	0		
Creation time	STRING [8]	DBB120	0		
Boot loader version	WORD	DBW130	0		
Scale type	STRING [4]	DBB132	„AWI" or „NAWI“		
Reserve	WORD	DBW138	0	Reserve	
		140			

Table 5-14 DS 9 Allocation

5.7.1 DS 9 - Info on Module

The information on the SIWAREX FTA module are for identifying the module group at the manufacturer (e.g. for repair). This information has no influence on user operation.

5.8 DS 15 Tare entry (NAWI, AWI)

DS 15 is used for an external tare weight definition.

Procedure:

- Enter tare weight
- Send DS 15 to the scale
- Activate the "Accept tare entry (24)" command

Name	Type	Address	Default	Range of Values / Explanation	Refe-rence
Tare entry					
Tare entry	REAL	DBD000	0	External tare entry (Preset Tare).	*5.8.1*
		4			

Table 5-15 DS 15 Allocation

5.8.1 DS 15 - Tare Entry

DS 15 is used for an external tare weight definition. After the entry with the DS 15, the tare value is not yet activated. The transfer to the tare memory of the SIWAREX FTA is then made with the "Accept tare entry" command (see command code *24*)

5.9 DS 16 Weight Simulation Entry (NAWI, AWI)

If the DS 16 has been defined as the source for the weight simulation (see DS 7 *Source for the weight simulation*) then the measurement input of the SIWAREX FTA is deactivated by defining a weight value with the DS 16 and the defined value is "simulated" as a weight value.

Procedure:

- Check for whether DS 16 has been defined as the source for the weight simulation in DS 7
- Enter a value to be simulated
- Send DS 16 to the scale

Name	Type	Address	Default	Range of Values / Explanation	Reference
Simulation					
Weight simulation entry	REAL	DBD000	0	Default value for weight simulation (is used instead of the gross weight e.g. for test)	*5.9.1*
		4			

Table 5-16 DS 16 Allocation

5.9.1 DS 16 - Weight simulation entry

If the DS 16 has been defined as the source for the weight simulation (see DS 7 *Source for the weight simulation*) then the measurement input of the

SIWAREX FTA is deactivated by defining a weight value with the DS 16 and the defined value is "simulated" as a weight value. This way, system components can be tested although the scale is not yet completely constructed.

5.10 DS 17 Analogue Output Control (NAWI, AWI)

If DS17 has been defined as the source for the analogue output (see DS 7 *Source for the analogue output*) then sending a weight value will output a corresponding output stream on the analogue output.

Procedure:

- Check for whether DS 17 has been defined as the source for the analogue output in DS 7
- Check the parameter definition of the analogue output (see DS 7 *Weight for zero point* and following parameters).
- Enter value in DS 17
- Send DS 17 to the scale

Name	Type	Address	Default	Range of Values / Explanation	Reference
Analogue output					
Ext. Definition for analogue output	REAL	DBD000	0	Analogue output control with a default value.	*5.10.1*
		4			

Table 5-17 DS 17 Allocation

5.10.1 DS 17 - Ext. Definition for Analogue Output

If the DS 17 has been defined as the source for controlling the analogue output (see DS 7 *DS 7 - Source for the* Analogue Output) then the analogue output is controlled with the defined value with a definition of a weight value on DS 17. This way, the analogue output can be set continuously from the SIMATIC control program.

5.11 DS 18 Control Display (NAWI, AWI)

A value can be defined through DS18 which is to be shown on the remote display. This way, the SIEBERT remote display can be used for displaying values that are calculated in the SIMATIC.

Procedure:

- Enter value in DS 18
- Send DS 18 to the scale

Name	Type	Address	Default	Range of Values / Explanation	Reference
Display					
Ext. Remote display definition	REAL	DBD000	0	Remote display control with a default value.	
		4			

Table 5-18 DS 18 Allocation

5.12 DS 20 Set Weight (AWI)

The set value for a weighing procedure that can change often in a process is passed onto the scale through DS 20. Normally, the set weight is changed when switching materials.

Procedure:

- Define the set weight
- Send DS 20 to the scale

Name	Type	Address	Default	Range of Values / Explanation	Reference
Set weight					
Set weight	REAL	DBD000	50 Wizzard: WR_{nmax}*0.5	Set weight for the weighing procedure	
		4			

Table 5-19 DS 20 Allocation

5.13 DS 21 Load set value (AWI)

In loading operation, the overall amount of the material to be loaded is defined. The scale performs the individual weighing procedure according to the defined set weight for an individual weighing procedure In loading operation , the set weight is defined with zero. Procedure:

- Define the set weight
- Send DS 20 to the scale

Name	Type	Address	Default	Range of Values / Explanation	Reference
Load set value					
Load set value	REAL	DBD000	1000 Wizzard: WB_{nmax}*10	Total set weight for filling operation	
		4			

Table 5-20 DS 21 Allocation

5.14 DS 22 Scale Parameter 1 (AWI)

The weighing parameters that change more often in the process are defined in DS 22. Normally, these parameters are changed for switching materials and are then sent to the SIWAREX FTA again.

Procedure:

- Define all parameters according to the material properties
- Send DS 22 to the scale
- If required, check parameters using tests

Name	Type	Address	Default	Range of Values / Explanation	Reference
Scale parameter 1					
Maximum weighing time	Time	DBD000	0	0: deactivated, Definition in msec.	*5.14.1*
Trailing weight	REAL	DBD004	1 Wizzard WB_{nmax} * 0,01	Trailing amount after switching fine signal off	*5.14.2*
Fine weight	REAL	DBD008	20 Wizzard: WB_{nmax}*0,2	Amount for dosing during the fine signal	*5.14.3*
Shut-off correction value	REAL	DBD012	0	+/- value for moving the shut-off point for the fine signal	*5.14.4*
Timer pre-dosing	TIME	DBD016	0	0: deactivated > 0: Pre-dosing time in msec	*5.14.5*
TO1	REAL	DBD020	0,2 Wizzard: WB_{nmax} * 0,002	Upper tolerance limit TO1 (entry of the permitted positive deviation from set weight)	*5.14.6*
TU1	REAL	DBD024	0,2 Wizzard: WB_{nmax} * 0,002	Lower tolerance limit TU1 (entry of the permitted negative deviation from set weight)	*5.14.6*
TO2	REAL	DBB028	0,5 Wizzard: WB_{nmax} * 0,005	Entry of the upper tolerance limit 2, must be greater than TO1.	*5.14.6*
TU2	REAL	DBB032	0,5 Wizzard: WB_{nmax} * 0,005	Entry of the lower tolerance limit 2, must be greater than TU1.	*5.14.6*
		36			

Table 5-21 DS 20 Allocation

5.14.1 DS 22 - Maximum Weighing Time

The weighing time is started with the start of a weighing procedure. After the defined time has elapsed, a test is performed to determine whether the weighing procedure will take longer. If yes then a technology error "Weighing time exceeded" is generated. The weighing procedure is not influenced by the technology error message.

5.14.2 DS 22 - Trailing Weight

The trailing weight should correspond with the amount to add to the amount of the dosage from the coarse- and fine-signal after switching the fine signal off. This means, the fine shut-off point can be calculated as follows:

Fine shut-off point = Set value – trailing weight

The proportional controllers can offset the fine shut-off point by determining the new trailing weight.

5.14.3 DS 22 - Fine Weight

The fine weight entry should correspond with the material amount that was dosed during the fine signal (after switching off the coarse signal until switching off the fine signal). The defined value should be measured so that the material flow can be stabilised by the time that the fine signal is switched off. This means, the coarse shut-off point can be calculated as follows:

coarse shut-off point = Set value – Fine weight – Trailing weight

The proportional controllers can offset the rough shut-off point by determining the new trailing weight.

5.14.4 DS 22 - Shut-off correction value

The shut-off correction value for the fine signal changes the fine shut-off point by the defined entry. The resulting fine shut-off point offset can be used to deliberately achieve an over-dosage or under-dosage. This can be used to compensate for interfering forces such as pressure, vacuum, etc., occurring with the dosage.

5.14.5 DS 22 - Timer pre-dosing

If an output has been defined for the pre-dosing (*see DS 7 - Definition of the Digital Outputs* 1, 2, 3, 4, 5, 6, 7, 8) then the time that is started with the weighing procedure start and which controls a coarse pre-dosing that depends on time can be defined with this parameter. This can be used if another dosing step (coarse 1, coarse 2) is required in addition to coarse and fine steps for example.

5.14.6 DS 22 –Tolerance TO1, Tolerance TU1, Tolerance TO2, Tolerance TU2

4 values can be defined for the tolerance evaluation. Based on this value, the results of the automatic operation are tested with reference to the set value. The values are defined so that TO2 > TO1 and TU2 > TU1.

This way, 2 tolerance bands are defined around the set value.

The tolerance evaluation is performed after switching the fine signal off if the scale stabilises and stands still.

The following image shows the progress of the tolerance evaluation over time.

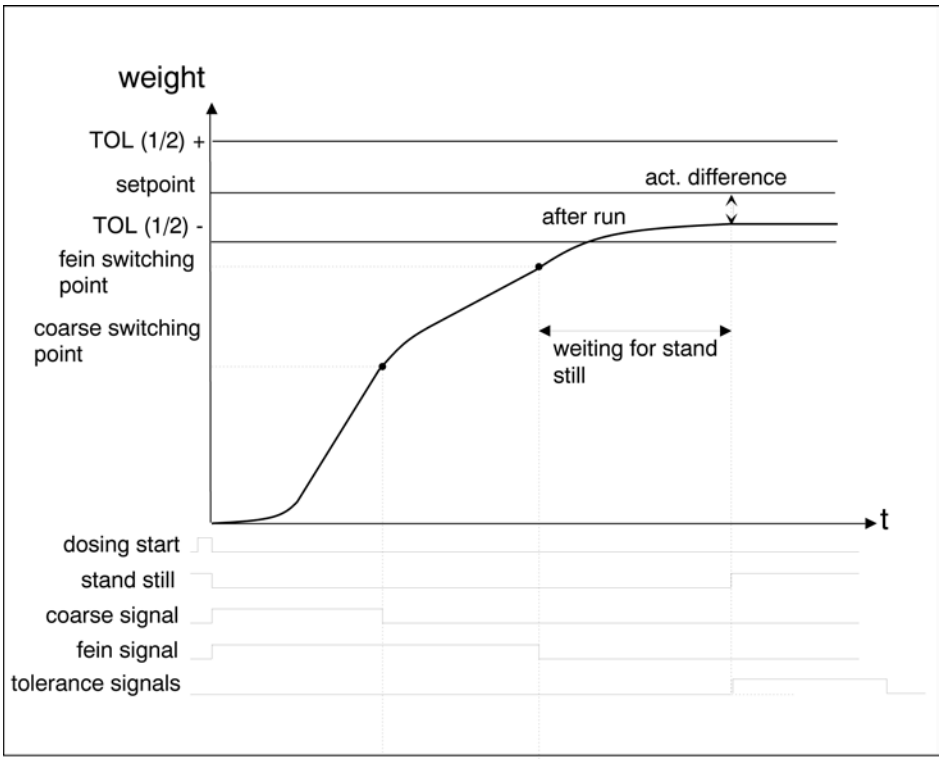


Image 5-11 Tolerance evaluation progress by time with TU1 status

The result of the tolerance evaluation is output based on the defined tolerance values. All information on the weighing result is distributed with 6 status bits.

TO1 – upper tolerance value 1

TO2 – upper tolerance value 2

TU1 – lower tolerance value 1

TU2 – lower tolerance value 2

Good - within tolerance band from TU1 to TO1

Off - outside of tolerance TU2 to TO2 (can be used for sorting the weighing material)

Status output condition	TO2	TO1	Good	TU1	TU2	Off
Net weight from TU1 to TO1	0	0	1	0	0	0
Net weight above TO1 to TO2	0	1	0	0	0	0
Net weight above TO2	1	0	0	0	0	1
Net weight from TU2 to under TU1	0	0	0	1	0	0
Net weight under TU2	0	0	0	0	1	1

Table 5-22 Tolerance information evaluation

5.15 DS 23 Scale parameter 2 (AWI)

Weighing parameters are held in DS23. These are normally typical to the scale and do not depend heavily on the changing material properties within a limited extent.
Procedure:

- Adjust all parameters corresponding to their purpose
- Send DS 23 to the scale
- If required, check parameters using tests

Name	Type	Address	Default	Range of Values / Explanation	eference
Scale parameter 2		0			
Text selection for automatic logging	BYTE	DBB000	1	0: No autom. logging after the weighing procedure 1: autom. logging with text 1 2: autom. logging with text 2 3: autom. logging with text 3 4: autom. logging with text 4 Other definitions not permitted.	
Reserve 1	BYTE	DBB001	0	Reserve 1	
Reserve 2	WORD	DBB002	0	Reserve 2	
Max. single set weight	REAL	DBD004	90 Wizzard: WB_{nmax}*	Maximum set weight for a single	*5.15.2*
Inhibition time coarse	TIME	DBD008	500	0: deactivated After switching the coarse signal on, no weight evaluation is performed for the defined amount of time (msec)!	
Inhibition time fine	TIME	DBD012	500	0: deactivated After switching the coarse signal off, no weight evaluation is performed for the defined amount of time (msec)!	*5.15.4*
Inhibition time Set-Act-comparison	TIME	DBD016	0	After the command for starting the inhibition time, the actual weight is not monitored during the weighing procedure for the defined amount of time.	*5.15.5*
Default value for analogue output with coarse	BYTE	DBB020	60	Analogue output value if coarse signal active (in %)	
Default value for analogue output with fine	BYTE	DBB021	40	Analogue output value if fine signal active (in %)	*5.15.7*
Dosing filter type	BYTE	DBB022	0	Filter type for dosage control 0: critically damped 1: Bessel-Filter	*5.15.8*

Name	Type	Address	Default	Range of Values / Explanation	eference
				2: Butterworth Filter Other definitions not permitted.	
Dosing filter limit frequency	BYTE	DBB023	2	0: No filter 1: fg = 20Hz 2: fg = 10Hz 3: fg = 5Hz 4: fg = 2Hz 5: fg = 1Hz 6: fg = 0,5Hz 7: fg = 0,2Hz 8: fg = 0.1Hz 9: fg = 0´.05Hz Other definitions not permitted.	*5.15.9*
Tare / Zero setting		0			
Tare / Zero setting mode	BYTE	DBB024	0	0: No taring, no zero setting at weighing start 1: Zero setting 2: Tare 3: Taring with average value 4: Taring using external entry tare Other definitions not permitted.	*5.15.10*
Tare / Zero setting cycle	BYTE	DBB025	0	0: Every weighing is nullified or tared 1: Tipping is not nullified or tared 2...99: 2…99 tippings not nullified or tared Other definitions not permitted.	*5.15.11*
Reserve 3	WORD	DBB026	0	Reserve 3	
Tare min. weight	REAL	DBB028	0	Taring or ext. tare entries are only executed if gross > tare minimum weight 0: No monitoring of the tare minimum weight	*5.15.12*
Tare max. weight	REAL	DBB032	0	Tarring or ext. Tare entries are only executed if gross < tare maximum weight 0: No monitoring of the tare maximum weight	*5.15.13*
Cycle time for zero setting	TIME	DBB036	300000 msec	If 0, then no time controlled zero setting Unequal 0: Time between two zero settings Note: Zero setting / taring is performed after 15min at the latest with weighing operating mode AWI and country code "OIML"	*5.15.14*
Step control / check stop					
Step control through digital input 1	BYTE	DBB040	0	Instead of defined command codes for the digital inputs, step-on conditions can be influenced through the inputs for dosing control (prerequisite in DS interface parameters is identification 0xFF). 0: Weighing waits at step 0 if DI1 is active; 1: Weighing waits at step 1 if DI1 is active 2: Weighing waits at step 2 if DI1 is active ... 7: Weighing waits at step 7 if DI1 is active Other definitions not permitted.	*5.15.15*
Step control through digital input 2	BYTE	DBB041	0	Instead of defined command codes for the digital inputs, step-on conditions can be influenced through the inputs for weighing control (prerequisite in DS interface parameters is identification 0xFF). 0: Weighing waits at step 0 if DI2 is active; 1: Weighing waits at step 1 if DI2 is active 2: Weighing waits at step 2 if DI2 is active ... 7: Weighing waits at step 7 if DI2 is active Other definitions not permitted.	*5.15.15*
Step control through digital input 3	BYTE	DBB042	0	Instead of defined command codes for the digital inputs, step-on conditions can be influenced through the inputs for weighing control (prerequisite in DS interface parameters is identification 0xFF).	*5.15.15*

Name	Type	Address	Default	Range of Values / Explanation	eference
				0: Weighing waits at step 0 if DI3 is active; 1: Weighing waits at step 1 if DI3 is active 2: Weighing waits at step 2 if DI3 is active ... 7: Weighing waits at step 7 if DI3 is active Other definitions not permitted.	
Step control through digital input 4	BYTE	DBB043	0	Instead of defined command codes for the digital inputs, step-on conditions can be influenced through the inputs for weighing control (prerequisite in DS interface parameters is identification 0xFF). 0: Weighing waits at step 0 if DI4 is active; 1: Weighing waits at step 1 if DI4 is active 2: Weighing waits at step 2 if DI4 is active ... 7: Weighing waits at step 7 if DI4 is active Other definitions not permitted.	*5.15.15*
Step control through digital input 5	BYTE	DBB044	0	Instead of defined command codes for the digital inputs, step-on conditions can be influenced through the inputs for weighing control (prerequisite in DS interface parameters is identification 0xFF). 0: Weighing waits at step 0 if DI5 is active; 1: Weighing waits at step 1 if DI5 is active 2: Weighing waits at step 2 if DI5 is active ... 7: Weighing waits at step 7 if DI5 is active Other definitions not permitted.	*5.15.15*
Step control through digital input 6	BYTE	DBB045	0	Instead of defined command codes for the digital inputs, step-on conditions can be influenced through the inputs for weighing control (prerequisite in DS interface parameters is identification 0xFF). 0: Weighing waits at step 0 if DI6 is active; 1: Weighing waits at step 1 if DI6 is active 2: Weighing waits at step 2 if DI6 is active ... 7: Weighing waits at step 7 if DI6 is active Other definitions not permitted.	*5.15.15*
Step control through digital input 7	BYTE	DBB046	0	Instead of defined command codes for the digital inputs, step-on conditions can be influenced through the inputs for weighing control (prerequisite in DS interface parameters is identification 0xFF). 0: Weighing waits at step 0 if DI7 is active; 1: Weighing waits at step 1 if DI7 is active 2: Weighing waits at step 2 if DI7 is active ... 7: Weighing waits at step 7 if DI7 is active Other definitions not permitted.	*5.15.15*
Reserve 4	BYTE	DBB047	0	Reserve 4	
Monitoring time step control	TIME	DBB048	0	0: No monitoring >0 Time definition for the monitoring If no further stepping to the next weighing step is performed within the defined time then the "Step-on Timeout" technology error is generated.	*5.15.16*
Definition check stop	BYTE	DBB052	0	Bit 0 : No check stop Bit 1 : Weighing goes to check stop after step 1 Bit 2 : Weighing goes to check stop after step 2 ... Bit 7 : Weighing goes to check stop after step 7 Other definitions not permitted.	*5.15.17*
Reserve 5	BYTE	DBB053	0	Reserve 5	
Post dosing tolerance					

Name	Type	Address	Default	Range of Values / Explanation	eference
check					
Automatic dosing	BYTE	DBB054	0	Bit 0 : 0: No automatic post dosing 1: autom. post dosing for Tol-1 deviation	5.15.18
Dosing method				Bit 1 : 0: post dosing with continuous fine signal 1: post dosing pulse mode	5.15.19
Stop if more than TO1				Bit 2 : 0: Weighing procedures not stopped because of tolerance errors 1: Weighing stopped because of tolerance error (weight above TO1)	5.15.20
Stop if more than TO2				Bit 3 : 0: autom. Weighing procedures not stopped because of tolerance errors 1: Weighing stopped because of tolerance error (weight above TO2) Bits 4 to 7 not used	5.15.21
Control pause	BYTE	DBB055	0	0: All weighing procedures are checked for tolerance deviations 1: A weighing procedure is not checked for tolerance deviations 2...98: 2...98 weighing procedures are not checked for tolerance deviations, 99 no check Other definitions not permitted.	5.15.22
Pulse duration for pulse dosing	TIME	DBD056	1000 msec	Pulse duration of fine signal (in msec)	5.15.23
Controller					
Controller behaviour at scale fault	BYTE	DBB060	0	Bit 0 : 0: Reset controller for technology error (weighing fault) 1: Limit controller to max. Access Bits 1 to 7 not used	
Selection for type of controller	BYTE	DBB061	0	0: No control for switching off the rough-/fine-signal 1: Proportional controller without fine signal time controller 2: Proportional controller with fine-signal time controller 3: Fine signal time controller without proportional controller Other definitions not permitted.	5.15.25
Control factor Proportional controller	BYTE	DBB062	30	[0…100 %] Other definitions not permitted.	5.15.26
Reserve 5a	BYTE	1	0	Reserve 5a	
Maximum one-time control access	REAL	DBD064	1	Limitation for maximum one-time control access of proportional controller	5.15.27
Controller optimum Plus	REAL	DBD068	0	0…WR_{max}	
Controller optimum Minus	REAL	DBD072	0	0…WR_{max}	5.15.29
Set value for fine time	TIME	DBD076	3000	Definition of set time for the fine signal-time controller	5.15.30
Control factor fine time controller	BYTE	DBB080	20	0...100 [%] Other definitions not permitted.	5.15.31
Reserve 6	BYTE	DBB081	0	Reserve 6	

Name	Type	Address	Default	Range of Values / Explanation	eference
Empty					
Reserve 7	WORD	DBB082	0	Reserve 7	
Overlapping time	TIME	DBD084	0	The overlapping time must be less than the emptying time The next scale start can be performed early by the amount of overlapping time, while emptying	*5.15.32*
Emptying time	TIME	DBD088	0	0: Emptying depending on empty range >0: Empty after defined time	*5.15.33*
Maximum emptying time	TIME	DBD092	2 sec	0: Monitoring switched off >0: After the emptying time has elapsed and the empty range has not been achieved, a technology error is output	*5.15.34*
Filling					
Empty with Rough	BYTE	DBB096	0	Bit 0 : 0: All weighing procedures in totalising operation controlled with coarse and fine signal 1: Only coarse current is used for weighing, the last 5 weighing procedures are executed with coarse and fine signals however Bits 1 to 7 not used	*5.15.35*
Reserve 8	BYTE	DBB097	0	Reserved	

Table 5-23 DS 23 Allocation

5.15.1 DS 23 - Text Selection for automatic logging

For automatic logging of weighing results, a message text consisting of 4 predefined text blocks can be selected by the user. These text blocks are defined in DS 40 to DS 43. (see *5.21*).

5.15.2 DS 23 - Max. single set weight

The set value for an individual weighing procedure is checked with this definition.

5.15.3 DS 23 - Inhibition time - Coarse

After switching the coarse signal on, deviations can occur in the weighing and this can cause large measurement deviations which lie in the area of the shut-off point. If the evaluation of the weight value is not sensible during these oscillations, the coarse inhibition time can be defined. The Coarse inhibition time is started with the coarse signal and the weight determination is blocked for the duration of the defined inhibition time.

Prematurely shutting off the coarse signal can be prevented in this way.

5.15.4 DS 23 - Fine Inhibition time

After switching the coarse signal off, the fine signal is dosed again. If the fine signal could be shut off by weighing deviations then the fine inhibition time can be determined. The Fine inhibition time is started by switching the coarse signal off and the weight determination is blocked for the duration of the defined inhibition time.

5.15.5 DS 23 - Inhibition time Set-Act comparison

After the command that starts the inhibition time, the actual weight will not be monitored for the defined amount of time.

Deactivating the function is done when the defined inhibition time has elapsed or with a command. This function is advantageous when using discharge aids.

5.15.6 DS 23 - Default value for analogue output with course

If the output of a fixed value has been defined during the coarse-/fine-signal (see DS 7 *Source for the analogue output*) then the output current during the coarse signal is defined with the parameter (1... 100%).

5.15.7 DS 23 - Default value for analogue output with fine

If the output of a fixed value has been defined during the coarse-/fine-signal (see DS 7 *Source for the analogue output*) then the output current during the fine signal is defined with the parameter (1... 100%).

5.15.8 DS 23 - Filter type for dosing

A separate low-pass filter is used exclusively for the precise control of switching the coarse and fine signal off. Normally, these settings should correspond with the settings for the filter in DS3.

The filter type can be defined with this parameter.

5.15.9 DS 23 - Limit Frequency Filter for dosing

A separate low-pass filter is used exclusively for the precise control of switching the coarse and fine signal off. Normally, these settings should correspond with the settings for the filter in DS3.

The limit frequency of the low-pass filter can be defined with this parameter.

5.15.10 DS 23 - Tare-/Zero setting mode

This parameter defines whether the scale starts with:

- neither taring nor zero setting,
- zero setting,
- taring,
- taring with a tare average value (from 10 taring procedures),
- or the external tare definition (see *DS 15 - Tare Entry*).

5.15.11 DS 23 - Tare / Zero setting cycle

The entry defined how often the scale must perform a taring or zero setting:

- 0: Every weighing is nullified or tared
- 1: Tipping is not nullified or tared
- 2 to 99: 2 to 99 tippings not nullified or tared

Note

In calibrating applications with the SIWAREX FTA as an automatic weighing instrument for emptying operation, a taring or zero setting is performed automatically after the defined time of 15 minutes has elapsed (see DS 3 *Regulations*).

5.15.12 DS 23 - Tare minimum weight

Along with the parameter tare max. weight, a weighing range can be defined within which taring is permitted.

5.15.13 DS 23 - Tare max. weight

Along with the parameter tare min. weight, a weighing range can be defined within which taring is permitted.

5.15.14 DS 23 - Time period for zero setting

With a definition of "0", the time controlled zero setting for the scale is not performed. A definition unequal to "0" means that the scale performs a zero setting automatically after this time has elapsed.

Note

The time controlled zero setting is not performed in the scale cycle.

In calibrating applications with the SIWAREX FTA as an automatic weighing instrument for emptying operation, a taring or zero setting is performed automatically after the defined time of 15 minutes has elapsed (see DS 3 *Regulations*).

5.15.15 DS 23 - Step control through digital input 1, 2, 3, 4, 5, 6, 7

Instead of definable command codes for the digital inputs, step-on conditions can be controlled by the inputs for scale control (in DS 7, designation 0xFF is defined with the definition of the digital inputs, see *Definition of digital input 1*).

The following applies for digital input DI1:

0: Weighing waits at step 0 if DI1 is active;

1: Weighing waits at step 1 if DI1 is active

2: Weighing waits at step 2 if DI1 is active

...

7: Weighing waits at step 7 if DI1 is active

The digital inputs 2 to 7 are defined similar to this.

5.15.16 DS 23 - Monitor time step control

This definition enables the monitoring of the duration of a process step:

- 0: No monitoring
- >0 Time definition for the monitoring

If no further stepping to the next process step is performed within the defined time then the "Step-on Timeout" technology error is generated.

5.15.17 DS 23 - Definition check stop points

A check stop can be effective at the end of a step. This parameter can be used to define the check stop points. After activating the command "Check stop" (see command *107*), SIWAREX FTA stops at the next point of the process. With the "Continue" command (see command *103*), the automatic processing can continue.

5.15.18 DS 23 - Automatic post dosing

After switching off the fine signal, the SIWAREX FTA waits for the stand-still. Next is the tolerance check. This parameter is for defining whether dosing should be done automatically if the weight is less than the set value minus the lower tolerance TU1:

0: No automatic post dosing

1: Automatic post dosing when below TU1 deviation

5.15.19 DS 23 - Post dosing type

The type of automatic post dosing is defined with this parameter:

0: post dosing with continuous fine signal

1: post dosing pulse mode

5.15.20 DS 23 - Stop on TO1

This parameter defines whether the automatic processing should stop if the current net weight increases to more than the set value plus TO1.

0: Weighing procedures not stopped for tolerance error

1: Weighing stopped because of tolerance error (weight above TO1)

5.15.21 DS 23 - Stop on TO2

This parameter defines whether the automatic processing should stop if the current net weight increases to more than the set value plus TO2.

0: Weighing procedures not stopped for tolerance error

1: Weighing stopped because of tolerance error (weight above TO2)

5.15.22 DS 23 - Control pauses

To increase the material throughput, it may be sensible in certain filling systems to avoid checking every weighing procedure (applies only in SWA operating mode).

This parameter defines how often that the tolerance check should be done.

0: Tolerance deviation checked every weighing procedure.

1: A weighing procedure is not checked for tolerance deviations

2 to 98: 2 to 98 weighing procedures are not checked for tolerance deviations

99: No tolerance deviation checking

5.15.23 DS 23 - Pulse duration in pulse dosing

If the automatic post dosing in pulse dosing operation is defined, this parameter can be used to define the fine signal pulse duration. The pause time is then made up of the minimum time value at stand-still 2 and from the waiting for meeting conditions for stand-still 2.

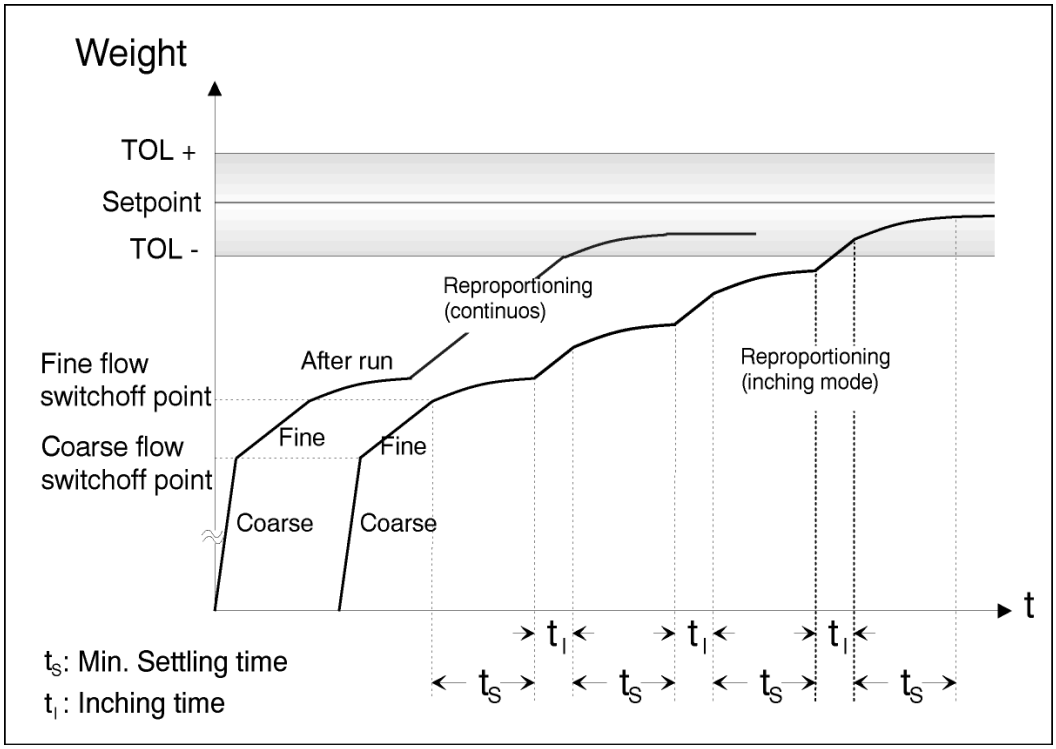


Image 5-12 Automatic post dosing with tolerance TU1

5.15.24 DS 23 - Controller behaviour with dosage fault

If used with parameters Fine weight, Inhibition times, Trailing

If a technology error occurs during the weighing procedure this parameter can define how the proportional controller or the fine-time-controller should act – limiting the control in this case only or reset the parameter to the original value.

5.15.25 DS 23 - Selection for type of controller

Two controllers are integrated in SIWAREX FTA: A proportional controller for correcting the definition for the trailing weight and a fine signal time controller for ensuring the defined duration for the fine signal.

It is also possible to run both controllers at the same time.

5.15.26 DS 23 - Control factor Proportional controller

The proportional controller sets the definition for the trailing weight to adjust it to the actual trailing amounts.

The determined deviation of the weighing net value from the weighing set value is multiplied with the defined control factor (Control factor Proportional controller) and is used for the next filling as a correction set amount.

The trailing weight for the following weighing procedures is calculated according to the following formula:

$G_{(n+1)} = G_n + (S – A)n \bullet C/100\%$

$G_{(n+1)}$	Trailing weight for the next weighing procedure
G_n	Trailing weight for the last weighing procedure
S	Set weight
A	Net weight for the last weighing procedure
C	Control factor for proportional controller in %
n	Current weighing procedure
n+1	Following weighing

5.15.27 DS 23 - Maximum one-time correction with the proportional controller

The proportional controller sets the definition for the trailing weight to adjust it to the actual trailing amounts. By defining the maximum correction value, the one-time change can be limited by the controller. This limits runaway values to the maximum correction value.

The trailing weight is modified by the value

$(S – A)n \bullet C/100\%$

If the calculation of a larger value as the maximum correction value, only the maximum correction value is used for the correction of the trailing weight. Therefore, the formula for calculating the trailing weight is now:

$G_{(n+1)} = G_n$ + maximum correction value

5.15.28 DS 23 - Controller Optimum Plus

By defining the Controller Optimum Plus parameter, a weight tolerance is defined above the set weight within which the proportional controller should not control to a finer degree.

5.15.29 DS 23 - Controller Optimum Minus

By defining the Controller Optimum Plus parameter, a weight tolerance is defined below the set weight within which the proportional controller should not control to a finer degree.

5.15.30 DS 23 - Set value for fine time

If the fine time controller has been activated (see controller type selection *5.15.25*) then the desired duration can be set for the fine signal.

The fine time controller optimises the fine signal duration by setting the fine weight and therefore the rough current shut-off point. The shut-off point is set so that the

actual duration of the fine signal in a controlled status corresponds with the defined value. The control deviation is defined after the end of the fine dosing:

$$t_{Diff} = t_{Set} - t_{Act}$$

t_{Diff} = Control difference (s)

t_{Set} = Fine set time (s) (=Default value)

t_{Act} = Fine actual time (s)

The set value for the fine time is defined by the user depending on the material properties.

5.15.31 DS 23 - Control factor fine time controller

The controller sets the rough shut-off point by changing the fine weight.

$$F_{n+1} = F_n + (K * D_{Fine} * t_{Diff})$$

F_n = Fine weight for current weighing procedure

F_{n+1} = Fine weight for next weighing procedure

K = Control factor fine time controller

D_{Fine} = Throughput to shut-off time point for the fine signal

t_{Diff} = Control difference (deviation)

5.15.32 DS 23 - Overlapping time

The overlapping time can be used in combination with emptying over time.

The next start can be advanced by the overlapping time although the emptying procedure is not yet ended.

Note

For emptying over time, you should take measures to ensure that the scale is actually empty after the emptying time has elapsed.

5.15.33 DS 23 - Emptying time

Emptying over time is activated with an entry unequal to 0. The empty signal is activated for the defined time. When this time period has elapsed, the empty signal is reset.

The emptying procedure is ended when the empty range is achieved with a definition of =0.

5.15.34 DS 23 - Maximum empty time

If emptying is not ended after a duration of time and is performed after achieving the empty range instead, a monitoring time can be defined here. The monitoring time is started with the empty signal. If the empty range has not be been achieved when this time has elapsed, a technology message is output.

5.15.35 DS 23 - Filling with coarse

For filling operation, you can define whether filling should be completed with coarse and fine signals or only with coarse signals.

When filling with "Coarse signal only", the last 5 weighing procedures are run with coarse and fine signals.

5.16 DS 30 Process values 1 (NAWI, AWI)

The current states and data in the scale can be monitored using process values 1 and 2.

Observing the selected data is very helpful in test operation for optimising parameters. In addition, if the SIWAREX FTA is controlled by the SIMATIC CPU then the status can also be observed.

Name	Type	Address	Range of Values / Explanation	Reference
NAWI status bits	DWORD	DBD000	32 status displays for NAWI	
AWI status bits	DWORD	DBD004	32 status displays for AWI	
Gross process value	REAL	DBD008	Current gross weight (Process value)	
Net process value	REAL	DBD012	Current net weight (Process value)	
Tare process value	REAL	DBD016	Current tare weight (Process value)	
G/N weight	REAL	DBD020	Current weight (numeral step from DS3)	
G/N weight_x10	REAL	DBD024	Current weight (numeral step from DS3)	
Tare	REAL	DBD028	Current tare weight (numeral step from DS3)	
Last net weight	REAL	DBD032	Net weight of the last monitored weighing procedure (numeral step from DS3)	
Pulse counter value	DWORD	DBD036	Current pulse counter value	
Distribution memory 1	REAL DOUBLE	DBD040	Current distribution memory 1 value. Format in STEP7 cannot be read (numeral step from DS3)	
Distribution memory 2	REAL	DBD048	Current distribution memory 2 value (numeral step from DS3)	
		52		

Table 5-24 DS 30 Allocation

5.16.1 DS 30 - NAWI-Status bits

Bit No.	Name	Range of Values / Explanation	Reference
0	WR1	Weight within weighing range 1	
1	WR2	Weight within weighing range 2	
2	WR3	Weight within weighing range 3	
3	Limit 1	Limit value 1 activated	
4	Limit 2	Limit value 2 activated	
5	Limit 3	Limit value 3 activated	
6	Tared (NET)	Set if the scale is tared	
7	Preset Tare	Set if the scale was tared with tare input	
8	Max+9e	Set if maximum load is exceeded by 9 e	
9	¼d-Zero	Set if the weight does not exceed ¼ d	
10	Waiting for stand-still	Set if the scale waits for a stand-still after the weighing start.	
11	Standstill 1	Stand-still 1 exists	
12	Scale adjusted	Set if the scale is adjusted (calibrated)	
13	Error on DI	Set if a command could not be executed on a digital input	
14	Simulation active	Set if the weight simulation has been activated	
15	Service operation active	Set if service operation has been activated	
16	Printing log	The log is being printed.	
17	RS232-Print not possible	The log cannot be printed.	
18	MMC inserted	The MMC is in position	
19	MMC ready	The MMC is formatted and ready for recording	
20	MMC-trace ready	The MMC is ready for the trace function	
21	MMC-log ready	The MMC is ready for logging	
22	Trace active	The trace function is activated	
23	Min. through-put 1 overshot	Through-put monitor 1 activated	
24	Min. through-put 2 overshot	Through-put monitor 2 activated	
25	Empty message	Scale in empty range	
26	Calibration data protection	The switch for protecting the calibration data is switched on	
27			
28			
29			
30			
31	Operating error	At least one operating error (fault) exists	

Table 5-25 DS 30 - NAWI status bits

5.16.2 DS 30 - AWI status flags

Bit No.	Name	Range of Values / Explanation	Reference
0	Weighing steps	Current weighing control step 0 to 7	
1			
2			
3			
4			
5			
6			
7			
8	Post dosing active	Post dosing is active	
9	Course signal	The coarse signal is switched on	
10	fine signal	The fine signal is switched on	
11	Timer pre-dosing	The timer for pre-dosing is active	
12	Empty signal	The empty signal is switched on	
13	Weighing stopped	The weighing cycle has been stopped	
14	Weighing stopped because of check stop	The weighing cycle has been stopped because of the check stop command	

Bit No.	Name	Range of Values / Explanation	Reference
15	Check stop follows	The weighing cycle will be stopped by a check stop (is set with the check stop command and reset if the check stop is achieved)	
16	Last weighing procedure aborted	Last weighing procedure aborted with "Residual weighing" or "Reset weighing control".	
17	Weighing blocked	Set if the step-on to the next step in the weighing cycle is blocked because of a missing step enable.	
18	TO2	Net weight above the TO2 limit	
19	TO1	Net weight above TO1	
20	Good	Net weight in tolerance TU1 to TO1	
21	TU1	Net weight under TU1 but over TU2	
22	TU2	Net weight under TU2	
23	TOL bad	Net weight under TU2 or over TO2	
24	Standstill 2	Stand-still 2 exists	
25	Standstill 3	Stand-still 3 exists	
26	Reserve 1		
27	Block set/actual comparison active	The set/actual comparison is blocked, the weighing procedure is running without a weight evaluation!	
28	Continuous start active	Continuous start for the cycle sequence is activated	
29	Reserve 2		
30	Cycle end	The weighing cycle has ended	
31	Charge end	The emptying operation has ended	

Table 5-26 DS 30 - AWI status flags

5.16.3 DS 30 - Gross process value

The momentary gross weight value

5.16.4 DS 30 - Net process value

The momentary net weight value

5.16.5 DS 30 - Tare process value

The momentary tare weight value

5.16.6 DS 30 - B/N weight

The momentary weight value which will be used for the main display.

5.16.7 DS 30 - B/N weight_x10

The momentary weight value in increased resolution which will be used for the main display.

5.16.8 DS 30 - Tare

The momentary tare weight value (numeral step from DS3).

5.16.9 DS 30 - Net weight

The net weight of the last weighing procedure with tolerance control (numeral step from DS3).

5.16.10 DS 30 - Pulse counter value

The momentary value of the pulse counter (counter input).

5.16.11 DS 30 - Totalising memory 1 (calibratable)

The current value in totalizing memory 1. Since the value can be very large, data type DOUBLE (REAL having 8 bytes) was selected. SIMATIC S7 does not support the data type but the value can be displayed on the PC for example (numeral step from DS3).

5.16.12 DS 30 - Totalising memory 2

The momentary value in totalising memory 2 (numeral step from DS3).

5.17 DS 31 Process values 2 (NAWI, AWI)

The current states and data in the scale can be monitored using process values 1 and 2.

Observing the selected data is very helpful in test operation for optimising parameters. In addition, if the SIWAREX FTA is controlled by the SIMATIC CPU then the status can also be observed.

Name	Type	Address	Range of Values / Explanation	Reference
Process values extended				
Through-put / sec	REAL	DBD000	Actual through-put (amount per second)	
Current trailing weight	REAL	DBD004	Current trailing weight (initialised with default upon receipt of the filling parameter)	
Current fine weight	REAL	DBD008	Current fine weight (initialised with default upon receipt of the filling parameter)	
Unfiltered ADC value	DINT	DBW012	Direct value from the analogue/digital converter, unfiltered.	
Filtered ADC value after filter 1	DINT	DBW016	Direct value from the analogue/digital converter, after filter 1 (DS3).	
Filtered ADC value after filter 2	DINT	DBW020	Direct value from the analogue/digital converter, after filter 2 (DS23).	
Reserved	REAL	DBD024	Not used.	
Current set value in load operation	REAL	DBD028	Actual set weight of an individual weighing procedures in filling operation.	
Operating error bit coded	DWORD	DBB032	Current status of the 32 operating errors (faults).	
Date / Time	DATE_AND_TIME	DBD036	Actual date and time in SIWAREX in SIMATIC format.	
Current temperature	INT	DBB044	Current temperature °C	
Digital input states	BYTE	DBB046	Current status of the digital inputs	

Name	Type	Address	Range of Values / Explanation	Referer ce
Reserved	BYTE	DBB047	Reserved	
Impedance reference value	INT	DBB048	Measured impedance value for load cells [0.1Ω]	
Impedance value	INT	DBB050	Current impedance value for load cells [0.1Ω]	
		52		

Table 5-27 DS 31 Allocation

5.17.1 DS 31 - Through-put per second

The momentary through-put value in weight units per second.

5.17.2 DS 31 - Current trailing weight

The trailing weight that is being used.

5.17.3 DS 31 - Current fine weight

The fine weight that SIWAREX FTA is using at the moment.

5.17.4 DS 31 - Unfiltered ADC value

The value of the analogue/digital converter at the moment - not filtered.

5.17.5 DS 31 - Filtered ADC value after the signal filter

The value of the analogue/digital converter at the moment - after filtering in signal filter (DS3).

5.17.6 DS 31 - Filtered ADC value after the dosing filter

The value of the analogue/digital converter at the moment - after filtering in dosing filter (DS).

5.17.7 DS 31 - Current set value in load operation

The momentary value for the set value in load operation.

5.18 DS 32 Statistic data (AWI)

The statistic data provides information on weighing quality. Creating statistic data is restarted with the “Delete statistic data” command and will carry on until the next time that it is deleted.

Name	Type	Address	Range of Values / Explanation	Reference
Statistic data				
Total number of weightings	DINT	DBD000	Number of weighing procedures (with and without tolerance check)	
Number of weighing procedures with tolerance check	DINT	DBD004	Number of weighing procedures with tolerance check	
Number of weighing procedures over TO2	DINT	DBD008	Number of weighing procedures with tolerance check over tolerance limit TO2	
No. weigh procedures over TO1	DINT	DBD012	Number of weighing procedures with tolerance check over tolerance limit TO1	
Number of weighing procedures good	DINT	DBD016	Number of weighing procedures with tolerance check within tolerance limits TU1 to TO1.	
No. weigh procedures under TU1	DINT	DBD020	Number of weighing procedures with tolerance check under tolerance limit TU1	
No. weigh procedures under TU2	DINT	DBD024	Number of weighing procedures with tolerance check under tolerance limit TU2	
Number of weighing procedures bad	DINT	DBD028	Number of weighing procedures with tolerance check outside tolerance limits TU2 or TO2	
Reserve 0	DINT	DBD032	Reserve 0	
Reserve 1	DINT	DBD036	Reserve 1	
Set weight	REAL	DBD040	Current set weight (calibratable numeral step, with AWI application and country code "OIML" rounded to the corresponding numeral step)	
Average value of net weight	REAL	DBB044	Average value of the net weights checked for tolerance errors	
Standard deviation of net weights	REAL	DBB048	Standard deviation of the net weights checked for tolerance errors	
Performance per hour	REAL	DBB052	Performance per hour [e.g. g/h, kg/h or t/h] is projected based on the net weight of the last weighing procedure.	
Weighing procedures per hour	INT	DBW056	Weighing procedures per hour projected based on the last weighing procedure (time for one weighing cycle).	
		58		

Table 5-28 DS 32 Allocation

5.18.1 DS 32 - Total number of weighing procedures

Number of weighing procedures since the last statistic data deletion.

5.18.2 DS 32 - Number of weightings with tolerance check

The number of weighing procedures in which a tolerance check has been performed.

5.18.3 DS 32 – Classification of tolerance evaluation

The statistics of the results of a tolerance check provides information on the quality of the weighing procedures. Following results are produced:

Number of weigh procedures over tolerance TO2

Number of weigh procedures over tolerance TO1 but not greater than TO2

Number of good weighing procedures (in tolerance band from TU1 to TO1)

Number of weigh procedures under tolerance TO1 but not less than TO2

Number of weigh procedures under tolerance TU2

Number of weigh procedures for sorting (bad), greater than TO2 or less then TU2

5.18.4 DS 32 - Set weight

The momentary set weight for automatic operation.

5.18.5 DS 32 - Average net weight value

The current average value of the net weight checked for tolerance errors.

5.18.6 DS 32 - Standard deviation of net weight from 10

The current standard deviation of the net weight checked for tolerance errors.

5.18.7 DS 32 - Performance per hour

Performance per hour [e.g. g/h, kg/h or t/h] is determined based on the net weight of the last weighing procedure and its duration.

5.18.8 DS 32 - Weightings per hour

The number of weigh procedures per hour is projected, based on the duration of the last weighing cycle for one hour.

5.19 DS 34 ASCII weight value (NAWI, AWI)

The ASCII weight value corresponds with the value on the main display of the scale.

The data record is displayed in a separate window by activating the function "ActValue" in SIWATOOL FTA.

Name	Type	Address	Default	Range of Values / Explanation	Reference
Current weight in ASCII format	STRING[16]	DBB000	-	Current weight in ASCII format as output on the display	
		18			

Table 5-29 DS 34 Allocation

SIWAREX FTA controls the content of the DS 34 depending on the technical weighing situation.

Display example:

	Net Gross	Weigh range	Spa-ce	Weight value									Weight Unit
Weight (Tare memory ≠ 0)	N	1	•	•	•	•	2	2	0	,	5	0	•kg•
Weight	B	2	•	•	•	•	•	•	0	,	0	3	•t••
Weight increase	B	2	•	•	•	•	1	0	,	0	0	3	•kg•
Operating error	•	•	•	•	•	•	E	r	r	•	0	1	••••
Total1	S	•	•	•	•	•	1	0	,	0	0	3	•kg•
Tare	T	•	•	•	•	•	•	•	0	,	0	3	•t••
Weight simulation active	•	•	•	•	•	•	•	t	E	S	t	•	••••
Max+9e exceeded	B	3	–	–	–	–	–	–	–	–	–	–	••••

Table 5-30 Display example for weight display

If the scale is defined as a single range scale only, then a scale is displayed in place of the weighing range.

5.20 DS 35 Coded information for calibratable display (NAWI, AWI)

From the content of the DS 35, the calibratable display is shown on the display of the SIMATIC OP/TP.

Name	Type	Address *1	Default	Range of Values / Explanation	Reference
Coded data fro calibratable weight display	Hex	32		Content is not made public	
		32			

Table 5-31 DS 35 Allocation

5.21 DS 40 to 43 Log text 1 to 4 (NAWI, AWI)

The logs can be defined in data records DS40 to DS 43. A log text can either be printed automatically or on command or it can be saved in the calibratable MMC memory.

Log text entries 1 to 4 are composed of fixed segments such as title and label and of variable fields.

The variable fields can contain various values from the SIWAREX FTA.

In addition, 4 designation variables can be defined in addition to the process variables. These designations are 4*16 bytes long and can be specified at any time by the SIMATIC CPU. DS 40 to 43 cannot be defined through the SIMATIC CPU.

Name	Type	Address	Default	Range of Values / Explanation	Reference
Log text 1					
Log text 1	STRING[160]	DBB000	LF,'FF0C',SP,'FF0D', SP,'FF0F',SP,SP,'FF 05',CR,EOT; (Prot.-ID, Date, Time, Weight)	Place holder for field functions "OFFh,Index" (here shown with *f*xx. Unused characters are initialised with 0 (for possible process values see below)	
		162			

Table 5-32 DS 40 Allocation

Index (for log output 0xFF,nn)	**Value**	**Field length**	**Field layout (example)** (for log field only)
NAWI fields			
13	Gross process value	14	•12345.678•kg•
14	Net process value	14	•12345.678•kg•
15	Tare process value	14	•12345.678•kg•
16	B/N weight calibratable (Format see **5.19**)	18	<N1•12345.678•kg•> <B1•-12345.67•kg•>
17	Tare (calibratable)	18	<PT•12345.678•kg•>
18	Pulse counter value	10	1234567890
19	Log ID	16	<No•1234567890•>
20	Date (dd.mm.yy)	8	27.12.02
21	Date (yy-mm-dd)	8	02-12-27
22	Time	8	13:05:00
23	String 1	16	Milk powder•••••
24	String 2	16	Bread crumbs••••
25	String 3	16	Sugar•••••••••
26	String 4	16	Flour••••••••••
27	Through-put / sec	16	•1234567.8•kg•/sec
28	Scale name	10	<Flour_scale1>
AWI fields			
52	Distribution memory 1	18	<S1•12345.678•kg•>
53	Distribution memory 2	16	S2•12345.678•kg•
54	Total number of weightings	6	•12345
55	Number of control weigh procedures	6	•12345
56	Number of weighing procedures over TO2	6	•12345
57	No. weigh procedures over TO1	6	•12345
58	Number of weighing procedures good	6	•12345
59	No. weigh procedures under TU1	6	•12345
60	No. weigh procedures under TU2	6	•12345
61	Number of weighing procedures bad	6	•12345
62	Reserved	6	•12345
63	Set value	18	<Sp•12345.678•kg•>
64	Net weight average value	14	-12345.678•kg•
65	Standard deviation	14	•12345.678•kg•
66	Last net weight	14	•12345.678•kg•
67	Weighing procedures per hour	8	12345•/h
68	Performance per hour	16	•1234567.8•kg•/h
69	Reserved	-	-
70	Current load set value	14	•12345.678•kg

Table 5-33 Process values for log field allocation

5.22 DS 44 Last log (NAWI, AWI)

The log data up to the next logging procedure are stored in DS 44. If required, the contents can be output again.

Name	Type	Address	Default	Range of Values / Explanation	Reference
Last log					
MMC-ID	BYTE[5]	DBB000	0	1 byte manufacturer identification + 4 bytes serial number, with log output to RS232 interface always 0	
Reserve 1	BYTE	DBB005	0	Reserve 1	
Reserve 2	WORD	DBB006	0	Reserve 2	
Log ID	DINT	DBD008	0	Identification for saved log text	
Last log data	STRING[160]	DBB012	STRING[160] = 0H	Log text for last logging procedure	
		174			

Table 5-34 DS 44 Allocation

5.22.1 DS 44 - MMC-ID

Identification of the MMC card.

5.22.2 DS 44 - Log ID

Log ID is a single time log number which can be used for identifying the log. The number is incremented with every logging procedure.

5.22.3 DS 44 - Last log data

The last log data that was output can be read until the next logging procedure.

5.23 DS 45 String (NAWI, AWI)

The strings are text that can be inserted in the logs as variables. The contents of the string can be defined using the SIWATOOL FTA or from the control program of the SIMATIC CPU.

Name	Type	Address	Default	Range of Values / Explanation	Reference
String					
String 1	STRING[16]	DBB000	"String 1 "	16 string 1	
String 2	STRING[16]	DBB018	"String 2 "	16 string 2	
String 3	STRING[16]	DBB036	"String 3 "	16 string 3	
String 4	STRING[16]	DBB054	"String 4 "	16 string 4	
		72			

Table 5-35 DS 45 Allocation

5.24 DS 120/121 Trace - Data logging

Measurement values and actual states in the weighing process can be stored in RAM memory of the SIWAREX FTA or in the MMC card with the trace function.

When recording to RAM, SIWATOOL FTA reads the trace elements through data record 120, when recording to MMC through data record 121.

The recording can be started with the "Start Recording" command *70* and stopped with "End recording" command *71*.

By defining parameters in data record DS 7 *MMC Parameter* the trace function can be defined. The data record cannot be read through the SIMATIC CPU.

Name	Type	Length bytes	Range of Values / Explanation	Reference
Timestamp1	DATE&TIME	8	Time stamp for data logging	
NAWI-Status bits	ULONG	4	Status bits (see 5.16.1)	
AWI status bits	ULONG	4	Status bits (see 5.16.2)	
Unfiltered ADC value	ULONG	4	Unfiltered digit value from ADC	
Filtered ADC value	ULONG	4	Filtered digit value from ADC	
Net process value	FLOAT	4	Net weight	
Gross process value	FLOAT	4	Gross weight	
Filtered ADC value G/F	ULONG	4	Filtered digit value from ADC out of filter level 2	
Net for rough/fine	FLOAT	4	Net weight for rough/fine shut-off	
Coarse shut-off point	FLOAT	4	Process weight value at coarse current shut-off point	
Fine shut-off point	FLOAT	4	Process weight value at fine current shut-off point	
Reserve 1	UBYTE[n]	16	Reserve 1	
		64		

Table 5-36 Construction of a logging element

The evaluation of the collected data can be completed with the SIWATOOL FTA and MS Excel or similar programms. All of the logged elements that have been recorded are stored in the Excel table or text files and can be read in a graph over time.

The progress of the weighing procedure can be analysed and optimised.

In the event of sporadic events in the system, the recording can be activated as circulating memory and can be ended with a condition in the SIMATIC control program at any time. The subsequent evaluation can help to explain a sporadic event in the system. A simultaneous evaluation of the message buffer, in which the last 100 events are stored (evaluation with SIWATOOL FTA) offers a good basis for an analysis or a remote analysis.

An element requires 64 bytes. If the recording is run e.g. once per 50 msec., memory of 1280 bytes per second is required.

In the simplest case, the RAM of the SIWAREX FTA can be used for the logging procedure. The measurement values can be recorded for approx. 10 minutes at the logging speed mentioned above.

5.25 DS 123 Data content MMC

By reading the DS 122, you can define which data are to be stored on the Micro Memory Card with the SIWATOOL FTA. Based on this information, the user can read targeted recordings and logs.

Name	Type	Length	Range of Values / Explanation	Refe-rence
Log ID	ULONG	4	*Depending on the log output RS232 / MMC, this ID is shown as follows* RS232 The ID is incremented with every log output (not with repeat") and is stored and managed in RAM memory. This number is only reset with default values. MMC The ID is incremented with every log output (not with repeat") and is stored and managed in MMC memory. This number can only be reset by deleting or formatting the card.	
MMC ID	UBYTE[5]	5	1 byte manufacturer ID and 4 bytes serial number	
Reserve 1	UBYTE	1	Reserve 1	
Reserve 2	USHORT	2	Reserve 2	
MMC – memory capacity	ULONG	4	MMC - total memory capacity in bytes	
Available MMC capacity for log data	ULONG	4	Capacity of the MMC for log data [Bytes]	
Available capacity for trace data	ULONG	4	Display depending on defined trace target; RAM or MMC in interface parameters [Bytes]	
Oldest MMC-Log-ID	ULONG	4	Oldest element	
Youngest MMC-Log-ID	ULONG	4	Youngest element	
Oldest MMC-Trace-ID	ULONG	4	Oldest element	
Youngest MMC-Trace-ID	ULONG	4	Youngest element	
Oldest RAM-Trace-ID	ULONG	4	Oldest element	
Youngest RAM-Trace-ID	ULONG	4	Youngest element	
		48		

Table 5-37 Overview of MMC data

5.26 DS 122 Log data MMC

By reading the DS 122, you can define which log data are to be read from the MMC with the SIWATOOL FTA.

A log can then be read for a defined log ID.

Name	Type	Length	Range of Values / Explanation	Referenc
MMC-ID+	UBYTE[5]	5	1 byte manufacturer ID + 4 bytes serial number	
Reserve 1	UBYTE	1	Reserve 1	
Length	USHORT	2	[n] number of valid data bytes in the log text; if 0, then the requested log number does not exist	
Log ID	ULONG	4	Identification for saved log text	
Log text	UBYTE[n]	174	Log text 1|2|3|4	
Block check character	USHORT	2	CRC16 (MMC-ID + Log ID + Log text[n])	
		188		

Table 5-38 MMC log

6 Commands

6.1 Command groups

The SIWAREX commands are divided into groups. The combining of the commands into a group is done according to their functionalities.

Every command has a unique number. A command can be sent via various interfaces (SIMATIC, SIWATOOL FTA, digital input).

Every time that a command is sent to SIWAREX FTA, a check must be made for whether the command has been executed correctly. The data and operating errors (synchronous errors) that are generated provide information on why the command could not be executed.

The group **Service- and adjustment commands** is used during the commissioning of the scale. As long as the scale is not adjusted, it can only be used in service operation. Switching to service operation is indicated in the status bits.

The group of **Scale commands NAWI** contains all commands that affect the handling of a statistic scale. Normally, commands that have anything to do with the operation of the SIWAREX FTA as a **N**on-**A**utomatic **W**eighing **I**nstrument (e.g. zero setting, taring).

The extensive group of **Scale commands AWI** is used for controlling scale processes. The basic behaviour of the SIWAREX FTA is defined one time by defining parameters. In the defined operating mode, the individual scale procedures are controlled by the commands from this command group.

The group of **Log commands** contains commands that control the log output to a printer or the calibratable storage of the logs to the MMC.

Use of the Micro Memory Card MMC is controlled with commands from the command group **Micro Memory Commands**.

After receiving a command, SIWAREX FTA checks for whether the command can be executed. If the check results are negative, the user is informed of the cause by an output of a "synchronous" message (see chapter *7 Messages and Diagnostics*).

Note

If the module group is in operating status "Hardware fault" or operating error then only commands (8) Load Default Values, (1) Service On, (2) Service Off and (9) Acknowledge Error, (108) ABORT are accepted. All other commands are rejected with data/operating error 21.

6.2 Command list

Code	Command explanation	Executable in following operating states
	Service and adjustment commands	
1	**Switch on service mode** The SIWAREX must be switched to service operation to perform the adjustment. A non-adjusted scale cannot get out of service operation.	No weighing cycle
2	**Switch off service mode** After the adjustment, service operation can be switched off. Only then can the scale accept weighing commands.	Service operation
3	**Adjustment zero valid** The beginning of the characteristic curve - zero point of the scale - is defined with the momentary dead-load.	Service operation
4	**Adjustment weight 1 valid** The first adjustment weight is assigned with the momentary weight.	Service operation
5	**Adjustment weight 2 valid** The second adjustment weight is assigned with the momentary weight.	Service operation
6	**Adjustment weight 3 valid** The third adjustment weight is assigned with the momentary weight.	Service operation
7	**Adjustment weight 4 valid** The fourth adjustment weight is assigned with the momentary weight.	Service operation
8	**Load factory settings** All parameters are set to the status that was assigned originally by the manufacturer.	Service operation
9	**Acknowledge error**	All

Code	Command explanation	Executable in following operating states
	Operating errors and fatal system errors that have led to a reboot are acknowledged. The damaged operating status is aborted if no other operating errors exist.	
10	**Run impedance check** The resistance of the load cells is measured and compared with the stored impedance reference value.	No weighing cycle, Service
11	**Set impedance reference** The resistance of the load cells is determined and stored as a reference value for future impedance checks.	No weighing cycle, Service
	Scale commands	
21	**Zeroing** The current weight is set to zero. In calibratable operation ("OIML"), only possible with restrictions (-1%, +3%). The tare is deleted at the same time.	No weighing cycle, Service operation
22	**Tare** The current weight is set to zero and the weight display is designated as "Net" and "Tare" at the same time.	No weighing cycle
23	**Delete tare** The tare is deleted. The current weight is displayed and designations of "Net" are changed to "Gross", the designation "Tare" or "Preset-Tare" is reset.	No weighing cycle
24	**Accept tare entry** The defined tare is accepted as tare and at the same time, "Preset tare" is designated together with the weight display.	No weighing cycle
25	**Switch on increased resolution** Activate output / display of the calibratable weight value with increased resolution for 5 seconds.	All
26	**Display tare weight**	All

Code	Command explanation	Executable in following operating states
	Activate output / display of the tare value for 5 seconds.	
	Log commands	
31	**Output log text 1** Log output with text layout 1.	No weighing cycle
32	**Output log text 2** Log output with text layout 2.	No weighing cycle
33	**Output log text 3** Log output with text layout 3.	No weighing cycle
34	**Output log text 4** Log output with text layout 4.	No weighing cycle
35	**Repeat last logging procedure** The last log output is repeated.	Not in service.
	Micro Memory Commands	
70	**Start recording/trace** The recording (trace function) should start	Not in service.
71	**End recording/trace** The activated recording (trace function) is ended.	Not in service.
72	**Delete logs in MMC** The logs stored in the Micro Memory Card are deleted.	Service operation
73	**Delete trace in MMC** The recorded data (trace function) stored in the Micro Memory Card are deleted.	All
74	**Delete trace in RAM** The stored data (trace function) in the RAM memory are deleted.	All
75	**Format MMC**	Service

Code	Command explanation	Executable in following operating states
	The Micro Memory Card parameters are defined corresponding with the definitions in the module data. All of the stored content in the MMC is deleted.	operation
76	**Delete all MMC data (log data, measurement data, …)** The data stored in the Micro Memory Card are deleted.	Service operation
	Scale commands	
100	**Start weighing with tare zero setting mode** Start weighing with previous zero setting or taring corresponding with the setting for tare / zero setting mode.	No weighing cycle, No service
101	**Start weighing without tare zero setting mode** Start weighing without zero setting or taring. This is only permitted in non-calibratable operation (country code not "OIML").	No weighing cycle, No service
102	**Start continuous weighing** Continuous start of sequential weighing cycles. (Only possible in operating AWI mode)	No weighing cycle, No service
103	**Continue** Continue the weighing cycle. Weighing and emptying are continued with this command.	Stopped
104	**Continue weighing with pulse dosing** Weighing is continued in pulse dosing operation only (Pulse / Pause).	Stopped
105	**Stop (halt immediately) in weighing cycle** Stops immediately for weighing or emptying, the scale stops and remains in "stopped" status. Possible commands to follow: 103 – Continue 104 – Continue weighing with pulse dosing 108 – Abort 110 – Residual weighing	Weighing cycle

Code	Command explanation	Executable in following operating states
106	**End continuous operation** The current weighing is completed and then the continuous operation is ended.	Stopped, weighing cycle
107	**Activate check stop** The scale is stopped at the next defined step for the check stop. Continued with: 103 – Continue 104 – Continue weighing with pulse dosing 108 – Abort 110 – Residual weighing	Not in service.
108	**Abort** The stopped weighing cycle is ended with no further activity. No automatic emptying is performed. The previous weight is not taken into account in the totalising calculation.	Stopped
109	**Empty on** This command activates the emptying signal in halted-state (no weighing active) If the emptying time is 0 then the emptying signal is activated until the weight is in the empty range. Independent from this, the emptying can be ended with command 118.	No weighing cycle
110	**Residual weighing** If required, a running weighing procedure is stopped and the emptying process is started immediately. The current weight is balanced before emptying. In certain cases, continuous operation is ended.	Stopped, Dosing cycle
111	**Set-Act-comparison inhibition time activation** The set-actual comparison is not performed for a defined time period. Shortening the defined time and therefore the immediate ending of the inhibition time set actual comparison can be achieved with command 112.	Weighing cycle
112	**Stop inhibition time Set-Act-comparison**	Stopped,

Code	Command explanation	Executable in following operating states
	The activated inhibition time is stopped early	weighing cycle
113	**Logging and deleting totalising memory 1** This command is only executed if total 1 is contained in the log text.	No weighing cycle
114	**Deletes totalizing memory 1** Permitted only if country code is not "OIML"	No weighing cycle
115	**Deletes totalizing memory 2** Totalising memory 2 can be deleted at any time.	No weighing cycle
116	**Delete statistic data** The statistic data is deleted except for totalising memories	No weighing cycle
117	**Output totalising memory 1 for 5 sec** The content of the totalising memory 1 is output instead of the calibratable weight value.	No weighing cycle
118	**Empty Off** The empty that was started with command 109 is ended immediately.	No weighing cycle

Table 6-1 SIWAREX FTA command list

The commands in the table above can be activated over all interfaces.

More commands can be activated on the SIMATIC S7 interface of the FB SIWA_FTA.

Command group	Description
1... 199	Commands are passed on to the module group without reading or writing from or to data records (scale, weighing, logging commands). The meanings of these commands correspond with the settings in table XX.
203... 245...399	Read a data record 3 ... 45. The numbers 246 ... 399 are reserved for expansions.
403... 445...599	Write a data record 3 ... 45. The numbers 446 ... 599 are reserved for expansions.

Command group	Description
601... 699	Range for combined commands. The function block SIWA_FTA (FB41^) can transfer several data records in sequence.
601	Read DS30 and DS31
602	Read DS34 and DS35
649	Read all data records in the SIWAREX FTA.
651	Write scale data 1 (DS22) and set weight (DS20) to the SIWAREX FTA and then start the weighing procedures with command 100 (Start weighing with Tare / Zero setting mode)
652	Write scale data 1 (DS22) and emptying quantity (DS21) to SIWAREX FTA and then start the weighing procedure with command 100 (Start weighing with Tare/Zero setting mode)
653	Write scale data 1 (DS22) and set value (DS20) to SIWAREX FTA and then start the weighing procedure with command 102 (Start weighing in continuous operation with Tare/Zero setting mode)
654	Write scale data 1 (DS22) and emptying quantity (DS21) to SIWAREX FTA and then start the weighing procedure with command 102 (Start weighing in continuous operation with Tare / Zero setting mode)
699	Write data blocks DS3, DS4, DS7, DS8, DS15, DS18, DS21, DS22, DS23, DS45 to SIWAREX FTA.

Table 6-2 Command groups of SIWAREX FTA

More information on command transfers from the control program using the SIMATIC interface can be found in chapter *8 Programming in SIMATIC STEP 7*

7 Messages and Diagnostics

7.1 Message types

The SIWAREX FTA messages are divided into different types.

Asynchronous messages can be generated at any time by an unpredictable event. The internal and external hardware faults (operating messages) and the technology messages that can occur spontaneously during a weighing procedure.

Synchronous messages are always the response to user activity.

There are data errors if a plausibility error is determined in a data package that the user wants to send to the module group and the module does not accept that data package. These are operating errors if the module group in the current operating status cannot execute the given command.

The status displays are not messages in this respect. The status display describes the status of the scale in normal operation and can be monitored or evaluated at any time.

7.2 Message paths

The SIWAREX FTA messages are passed on to the user by various paths. During project planning, it is important to choose the right path for routing and processing the messages.

Basically, the messages are processed for two purposes:

- For display on an operating panel
- For connection to control software to control certain reactions in a process.

The following message paths are possible:

- Message buffer output to the SIWATOOL FTA commissioning program
- Output through the SIWA_FTA function block to its message outputs
- Diagnostics alarms in SIMATIC CPU with OB82 evaluation
- Process alarms in the SIMATIC CPU with evaluation in the process alarm OBs.

7.3 Recognising messages using SIWATOOL FTA

A message buffer is integrated in the module and holds up to 99 entries. If the number of messages in the message buffer reaches 99 then a new message will immediately delete the oldest message. The message buffer can be read at any time with SIWATOOL FTA (menu point "Read all data records") and can be saved together with the scale parameters. This helps in recognising, analysing and solving problems in the system.

7.4 Recognising messages using the FB SIWA_FTA

All of the messages of the SIWAREX module can be recognised and processed in the controller using the FB SIWA_FTA. Additional errors in the processing of the FB SWIA_FTA are put out through the FB_ERR output variable (see chapter *8 Programming in SIMATIC STEP 7.*)

7.5 Recognising messages using the diagnostic alarms in the SIMATIC-CPU

Operating messages (hardware faults) are recognised in the SIMATIC CPU with diagnostic alarms. For more information, see chapter *8 Programming in SIMATIC STEP 7*.

Recognising messages with process alarms.

Process alarms enable the user to respond flexibly to technology messages or to the corresponding status information. For more information, see chapter *8 Programming in SIMATIC STEP 7*.

7.6 Message lists Data and operating errors

Error No.	Data and operating errors - description	Solution
1-1	**Unknown command code**	
1	Unknown command code	The SIWAREX does not recognise the command code and cannot execute the command Check the command code.
2-3	**Action not allowed in service operation**	
2	Action not permitted in service operation	Only certain commands or data entries are permitted in service operation. The last command or the last sent

Error No.	Data and operating errors - description	Solution
		data cannot be accepted by the scale in service operation. The following commands are not allowed: Start a weighing procedure (100, 101, 102) Taring (22, 24) Output log (31 to 35) Trace Start/Stop (70, 71) Switch to normal operation.
3	Service operation cannot be deactivated since the assembly is not adjusted	A non-adjusted module group cannot be switched to normal operation. Fist, adjust the scale and then you can get out of service operation. A theoretical adjustment can be performed with SIWATOOL FTA.
4-4	**Action only permitted in service operation**	
4	Action only permitted in service operation	Only certain commands or data entries are permitted in normal operation. The last command or the last sent data cannot be accepted by the scale in normal operation. Switch to service operation. The following activities are only possible in service operation: Load factory settings command (8) Switch off service operation (2) Adjustment commands (3, 4, 5, 6, 7) Delete/Format MMC (72 to 75) Send DS3
5-10	**Action only permitted in service operation**	
5	Calibration parameter transfer with active write protect not permitted	The calibration parameters (DS3) can only be changed with non-active write protection (switch on the front down). First, deactivate the write protection. This also applies for internal data records DS26, DS27. Attention! A pre-calibrated scale will lose its calibration.
6	Adjustment command with active write protect not permitted	The adjustment commands can only be executed with the write protect active (switch on the front in lower position). First, deactivate the write protection. Attention! A pre-calibrated scale will lose its calibration.
7	Download not possible since write protect is active	Downloading the firmware may only be done if the write protection is inactive (switch on front down). First, deactivate the write protection. Attention! A pre-calibrated scale will lose its calibration.
8		Reserved
9		Reserved
10		Reserved
11-19	**Action not permitted in weighing cycle**	

Error No.	Data and operating errors - description	Solution
11	Data record transfer or command transfer to weighing cycle not permitted	The data record or the command is not permitted to be activated during the weighing cycle. Send the data or the command outside of the weighing cycle. The following commands are not permitted in weighing cycle: Switch on service operation (1) Impedance measurements (10, 11) Zero setting-, Tare commands (21, 22, 23, 24) Print log (31, 32, 33, 34) Deleting, formatting MMC (72, 73, 74, 75) Start commands (100, 101, 102) Abort (108) Emptying on / off (109, 118) Delete total, statistic (113, 114, 115, 116
12	Command cannot be executed because the previous command is not finished yet.	A new command cannot interrupt the execution of the current command. Activate the command after the current command has finished executing. This message is generated in the following instances: Start command (100, 101, 102) while log output to printer is still running Repeated setting of the data records with default values (8) within one second Execute one of the following commands if the required stand-still has not occurred: Continue a weighing procedure (103, 104), Adjustment commands (3, 4, 5, 6, 7), Tare command (22, 23, 24), Print log (31, 32, 33, 34)
13	Command or data transfer not allowed in this operating status	A new command cannot be executed in this operating status.
14	Continue command (104, 104) not possible	The command can no longer be executed since a scale error caused implausible switching points.
15	Set value in cycle not plausible	The set value to be used is greater then the maximum set value in DS23.
16		Reserved
17		Reserved
18		Reserved
19		Reserved
20-20	**Command not permitted since scale is not adjusted**	
20	Command not allowed, scale not adjusted	The activated command is not allowed since the scale is not yet adjusted. Switch to service operation and adjust the scale.
21-21	**Command not allowed since the assembly is damaged the OD is active**	
21	Command not allowed since the assembly is damaged the OD is active	The activated command is not allowed since the scale has a fault or SIMATIC CPU is in STOP status. Correct the error (red LED on the front must go off).
22-28	**Error in the DI/DO interface parameters**	

Error No.	Data and operating errors - description	Solution
22	DI assignment not allowed	You have assigned the digital inputs incorrectly. Correct your assignments.
23	DO assignment not allowed	You have assigned the digital outputs incorrectly. Correct your assignments. The outputs may only be defined with numbers 0 to 63 and 255.
24	DI assignment for step-on condition not permitted	You have assigned the digital inputs incorrectly for enabling weighing steps. Correct your assignments. In NAWI operating mode, no step-on conditions can be defined.
25	Time range for pulse input not allowed	The definition of the measurement time for the pulse input is incorrect. The permitted range lies between 100 msec and 10000 msec. Correct your definition.
26		Reserved
27		Reserved
28		Reserved
29-34	**Error in the interface parameters Analogue output**	
29	Ext. Analogue default value not plausible	Current value entry for the analogue output lies outside the defined (DS7) range. Enter a smaller value.
30	Analogue output replacement value not plausible.	The replacement value for the analogue output lies outside the defined (DS7) range. Enter a smaller value.
31	Analogue zero value to analogue end value implausible	The default analogue zero value or analogue end value is incorrect. Change at least one of the values.
32		Reserved
33		Reserved
34		Reserved
35-42	**Interface parameter error**	
35	Baud rate not permitted for RS232	The baud rate for the RS232 interface is not permitted. Define the baud rate.
36	Process alarm assignment or process value assignment implausible	The assignment of the process alarm or the process values in DS7 for the S7 interface is incorrect. Change your assignment.
37	Baud rate not defined for RS485	The baud rate for the RS485 interface is not defined. Define the baud rate.
38		Reserved
39		Reserved
40		Reserved
41		Reserved
42		Reserved
43-50	**Trace not possible**	
43	Trace task not possible since MMC full	
44	Trace task cannot be executed, since MMC is defective or non-existent	
45	Trace recording cycle too small	The trace cycle in DS7 is too short. Define parameters for a longer trace cycle (for MMC minimum 5 x 10 msec).
46		Reserved

Error No.	Data and operating errors - description	Solution
47		Reserved
48		Reserved
49		Reserved
50		Reserved
51		Reserved
51		Reserved
52		Reserved
53		Reserved
54		Reserved
55		Reserved
56-62	**Log text not plausible**	
56	Log text too long	The log text with the fill parameters is too long of the end character (EOT) is missing. Change the log text. Ensure that the proper number of characters for the corresponding field are used in place of the respective print field code. The overall length of the text filled with values may not exceed 160 characters (including printer control character but not the terminating EOT).
57	Log text contains fields that are not permitted	Log text contains fields that are not permitted Change the log text.
58	Log text contains angle-brackets	Log text contains angle-brackets Remove the angle-brackets from the log text.
59		Reserved
60		Reserved
61		Reserved
62-75	**Log or MMC command not possible**	
62	Logging not possible since the weight lies outside of the weighing range	The logs can only be output within the weighing range in calibratable operation (Code OIML in DS3).
63	Logging output not possible since the SIWATOOL FTA driver is active	The log cannot be output at this time since the SIWATOOL FTA program is active on the interface. Disconnect the PC and connect the printer.
64	Logging output not possible since the printer is not ready	The log cannot be printed since the printer is not ready. Check the printer.
65	Logging output not possible since a print job is still running	The log cannot be printed since another print job is still running. Wait until the current print job is complete.
66	Logging not possible since the MMC is full	Logging is not possible since the MMC is full. Switch MMCs.
67	Logging task cannot be executed, since MMC is defective or non-existent	Logging is not possible since the MMC is defective. Switch MMCs.
68	Log output not possible since there is no data available.	Repeating the last log printout not possible since there was no print-out or the stored data is defective.
69		Reserved
70	Logging output not possible since the log ID is not in the print text	Log output is not possible since the content of the text does not contain the log ID. Define the log ID in the text. This entry is necessary if the calibratable weight is contained in the log text in calibratable operation

Error No.	Data and operating errors - description	Solution
		(Specifications Code OIML in DS 3).
71		Reserved
72		Reserved
73		Reserved
74		Reserved
75		Reserved
76-93	**Plausibility error Calibration parameter**	
76	Value range Adjustment digits exceeded	The adjustment digits definition is too large. Enter a smaller value. The highest permitted value is 16 777 215.
77	Regulation code not permitted	The regulation code is incorrect. Enter the proper code. Permitted is ---- or OIML..
78	Zero setting range > 4% or zero setting range exceeded	The zero definition range or zero setting range is too large. This is the case if you have entered a zero setting range > 4% of the maximum weighing range or > 20 % in the zero setting range in DS 3 in calibratable operation (Specifications Code OIML in DS 3). The sum of negative and positive values always apply here. Reduce the zero definition range or zero setting range.
79	Number of weight ranges not allowed	The number of the weighing range is incorrect. Enter 1, 2 or 3.
80		Reserved
81	Relationship between weighing ranges implausible	The definitions for the weighing range (Max. and Numerical step) are incorrect. With a multi-segment scale, the min-value of the next higher range must equal the max-value of the next lower range. The max-value must be higher than the min-value. With a multi-range scale, the min-value and max-value in sequential ranges must always be greater and the max-value of a range just always be greater than the min-value. Check parameter definitions.
82	Numeral step not plausible	At least one numeral step in DS 3 is incorrect. The following numeral steps are permitted as numeral steps for the three weighing ranges and the distribution value: 50, 20, 10, 5, 2, 1, .., 0.5, 0.2, 0.1, 0.05, 0.02, 0.01, 0.005, 0.002, 0.001, 0.0005, 0.0002, 0.0001. In calibratable operation (Specifications Code OIML in DS 3) the numeral step in all three weighing ranges may not be less than one 6000th of the weighing range max-value. In calibratable operation, the total numeral step (Specifications Code OIML in DS 3) may not be less than the numeral step of weighing range 1. The numeral step of a weighing range may not be less than the numeral step in the next lower lying weighing range. Check the parameter.
83	Filter parameter implausible	Filter parameter definitions in DS 3 not plausible. Check the codes for the filter type (0..2) and the limit

Error No.	Data and operating errors - description	Solution
		frequency (0..9).
84	Characteristic value not plausible	The characteristic value defined in DS 3 is incorrect. Set the parameter to a valid value (1, 2 or 4).
85	Averaging filter length not permitted	The mean value filter in DS 3 has incorrectly defined parameters. Set the parameter for the depth of the mean value filter to maximum 250.
86	Adjustment weight error	The defined adjustment weights are incorrect. The weight values must increase or be 0 if not used.
87		Reserved
88		Reserved
89		Reserved
90		Reserved
91		Reserved
92		Reserved
93		Reserved
94-104	**Scale command cannot be executed**	
94	Adjustment weight too small	The adjustment weight in DS 3 is too low. Increase the difference to the adjustment weight. The measurement value between two sequential adjustment weights must have a difference of at least 2% of the measurement range.
95	Reserved	Reserved
96	Tare T exceeded	The subtractive Tare has been exceeded. This error is generated in the following cases: With the Tare command, the gross value lies over the defined permitted tare range. An externally defined tare value is negative. An externally defined tare value is greater than the max-value of weighing range 1 on a multi-segment scale. An externally defined tare value is greater than the defined max tare value [%] of the largest weighing range in calibratable operation (specifications Code OIML in DS 3) of a multi-range scale.
97	Totalising memory 1 deletion not permitted	The distribution memory cannot be deleted. The command "Delete distribution memory 1" (114) is not permitted in calibratable operation. Use command (113) - "Delete/Log calibratable distribution memory 1". The command "Delete calibratable distribution memory 1" (113) can only be terminated in calibratable operation (Specifications Code OIML in DS 3) if log text 1 (DS40) contains the distribution memory 1 field. Check the parameters.
98	Totalising memory already deleted	The delete totalizing memory command could not be executed since the memory is already deleted.
99	Totalising memory 1 could not be logged	Logging the distribution memory has failed. Check the output device. Check additional technological faults for indications as to the cause of the fault. A technology fault is generated indicating the cause.
100	Weight outside zero definition range	Zero setting cannot be performed since the current zero

Error No.	Data and operating errors - description	Solution
		point lies outside the defined zero setting range in DS 3 or the current gross value lies above the largest defined weighing range value.
101	Scale command cannot be executed since not at standstill 1	The weighing command (Taring, Zero setting, Logging) cannot be executed because Standstill 1 does not lie within the standstill time defined in DS 3.
102	Adjustment weight missing	Adjustment command cannot be executed because the respective adjustment weight in DS 3 has not been entered.
103		Reserved
104		Reserved
105-110	**Plausibility error Base parameter**	
105	Weighing operating mode not allowed or unknown	Weighing operating mode in DS 4 is not correct. Enter a correct weighing operating mode.
106	Limit values implausible	The default limit values in DS 4 are not plausible. Limit value 3 may only be operated as a max-limit value (On ≥ Off). Correct limit value 3.
107		Reserved
108		Reserved
109		Reserved
110		Reserved
111-135	**Plausibility error Weighing parameter**	
111	Number tare-zero position cycles not allowed	The number for the tare/zero definition cycle is incorrect (max. 100). Enter a correct value.
112	Value for control weighing pauses incorrect	The default for pauses between the control weighing procedures is incorrect (max. 100). Correct the definition.
113	Empty overlapping time too long	The emptying overlap time in DS 23 is too large. The maximum may only correspond with the emptying time that is defined there.
114	Min.-/Max.-tare implausible	The limits for tare in DS 23 are not plausible. Tare minimum and maximum weight may not be less. The tare maximum weight must be larger than the minimum weight. Correct the entry.
115	Log text No. assignment for automatic logging is incorrect	The log text number in DS 23 is incorrect. Correct the number (0...4).
116	Operating mode not allowed or unknown	The default for the tare/zero setting mode in DS 23 is incorrect. Correct the default (0..4).
117	Fine time too short	Fine time must be greater than Inhibition time Fine. Correct the default in DS 23.
118	Tolerance range implausible	The default for tolerance ranges TO1, TU1, TO2, TU2 must be corrected. TU2 must be greater than TU1 and TO2 greater than TO1. Check parameter definitions in DS 22.
119		Reserved
120		Reserved
121		Reserved
122		Reserved

Error No.	Data and operating errors - description	Solution
123		Reserved
124		Reserved
125		Reserved
126		Reserved
127		Reserved
128		Reserved
129		Reserved
130		Reserved
131		Reserved
132		Reserved
133		Reserved
134		Reserved
135		Reserved
136-165	**Plausibility error Weighing parameter**	
136	Start not possible because the set value is not permitted	The set value in DS 20 is invalid. It may not be 0 nor may it be greater than the maximum permitted set value for a single fill in DS 23. Correct the parameter.
137		Reserved
138	Start not possible since the fine shut-off point is not plausible.	Start not possible since the default for the trailing weight or the shut-off correction value is not plausible. The following must apply: (Current trailing - shut-off correction value) <= Set value. Check the default in DS 22.
139		Reserved
140		Reserved
141	Start not possible because of possible overfilling	Start not possible since the defined set value does not match the current scale status. The following must apply: Current gross + set value (DS20) – current trailing + shut-off correction value < maximum weighing range
142	Start blocked	Start not possible since a blockage is set in weighing step 0.
143	Start not possible since the loading quantity or the residual quantity is too small	The defined loading quantity is too low or start is not possible because the residual quantity that is still to be loaded is too little. The quantity to be loaded in DS 21 is less than the defined minimum weight definition in DS 3. Correct the value. The quantity to be loaded in DS 21 is lower than the current trailing weight in DS 22. Correct the value. The quantity to be loaded in DS 21 is lower than the minimum weighing range value in DS 3. Correct the values. A dosage in SWT-loading operation cannot be started since the residual quantity is less than the defined minimum weight. E.G. If everything has been loaded already or the loading procedure has been aborted. Give command "Delete calibratable distribution memory" (113) to activate a new loading procedure.
144		Reserved
145	Start not possible since the	Start not possible since the set value is less than the

Error No.	Data and operating errors - description	Solution
	set value < min. WB1	minimum weight of weighing range 1 DS 3. Increase the set value.
146	Reserved	Reserved
147	Start not possible since tolerance limit (n) is implausible	The tolerance definitions are not plausible. During the start or while transferring the DS 20 or 22 in the cycle, a set value was set which is less than at least one of the tolerance limits TU2, TU1, TO1, TO2. Check tolerance definitions or the set value.
148	Check stop not possible	Check stop not possible since no check stop has been defined.
149	Start not possible since the distribution memory 1 can overflow	Start not possible since the totalising of actual values in distribution memory 1 overflowed in calibratable operation (Specifications Code OIML in DS 3). Evaluate the distribution memory and them delete them.
150	Command impossible since SIMATIC CPU is in STOP	The command can only be executed in SIMATIC CPU RUN status. This applies for the following commands (Codes): Start a dosing procedure (100, 101, 102) Step-on (103, 104) Residual weighing (110) Emptying on/off (109, 118)
151		Reserved
152		Reserved
153		Reserved
154		Reserved
155		Reserved
156		Reserved
157		Reserved
158		Reserved
159		Reserved
160		Reserved
161		Reserved
162		Reserved
163		Reserved
164		Reserved
165		Reserved
166-175	**Number format error in data record**	
166	Date Time implausible	Data and time definition not plausible. Correct the definition. The following are allowed: Year: 0..99 Month: 1..12 Day: 1..28/29/30/31 (depending on the month) Hours: 0..23 Minutes: 0..59 Seconds: 0..59 Weekday: 1..7
167	Time definition implausible	The definition for a time definition is not plausible. Check the following conditions: DS3: Standstill times 1, 2 or 3 must be at least

Error No.	Data and operating errors - description	Solution
		100 msec DS4: Timeout value for the log output monitor must be at least 1000 msec DS23: Inching time must be greater than 0 DS23: The emptying time may not be greater than the maximum emptying time
168	Default percentage value > 100%	The percentage definition is greater than 100%. Decrease one of the following entries. DS3: Maximum weight for zero setting and zero setting (pos. / neg.) and tare max. load DS7: Sum of memory segment for trace function and log function DS23: Default value for analogue output (Coarse, Fine) DS23: Control factor Fine time controller DS23: Control factor Proportional controller
169	Negative default value not permitted	Negative default value not permitted. Change the entry. The following values may not be negative: DS 3: Adjustment weight 1..4 Numeral steps 1..3, Total numeral step Standstill value 1..3 Transfer-Minimum weight DS 15: Tare default value DS 20: Set value DS 21: Loading quantity DS 22: Tolerance limits TU1, TU2, TO1, TO2 DS 23: Max. Single fill Maximum controller access Controller optimum plus/minus
170	Number range for weighing values exceeded	The number range of a definition is not permitted. The following values must be larger -100 000 000 and less than 100 000 000: DS3: Adjustment weight 1, 2, 3 or 4 Minimum, maximum weight and numeral step of weighing range 1, 2 or 3 Standstill range 1, 2 or 3 Smallest set weight and distribution value (in addition, the lowest set weight must be greater than or equal to the minimum weight for weighing range 1) DS4: Empty range Switch on or shut-off weight of limit value 1, 2 or 3 DS7 - Analogue output: Weight for zero value, End value Replacement value DS15: Tare definition DS16: Weight simulation definition

Error No.	Data and operating errors - description	Solution
		DS20: Set value DS22: (All weights in addition < Maximum weighing range + 9 weighing steps) Trailing weight Fine weight Shut-off correction value TO1, TO2, TU1, TU2 DS23: Max. Single set value Max. Single controller access Controller Optimum Plus/Minus
171	Checksum error	Checksum error in data record 26 or 27. The data was falsified or the DS versions do not match.
172	Selection code unknown	In the parameters, there is a number for selecting a characteristic which has no meaning. The following values must be retained: DS3: Source for weight simulation 0..2 Decade for the curve 0..6 Source for the analogue output 0..4 DS23: Filter type 0..2 Limit frequency Filter 0..9 Tare-/Zero setting mode 0..4 Controller type selection 0..3
173		Reserved
174		Reserved
175		Reserved
176-177	**Impedance error**	
176	Impedance error	Impedance error is generated if the deviation in impedance is greater than 10 % of the reference value or if an error has occurred in the measurement
177		Reserved
178-199	**Standard Data-/op-error**	
178		Reserved
		Reserved
180		Reserved
181		Reserved
182		Reserved
183		Reserved
184		Reserved
185		Reserved
186		Reserved
187		Reserved
188		Reserved
189		Reserved
190		Reserved
191		Reserved
192		Reserved

Error No.	Data and operating errors - description	Solution
193		Reserved
194		Reserved
195		Reserved
196		Reserved
197		Reserved
198		Reserved
199		Reserved

Table 7-1 List of Data and Operating Errors

7.7 Message list Technology messages

Error No.	Technology message - description	Solution
1-10	**MMC error**	
1	Card function not executable	MMC defect or non-existent. MMC check required. This error is generated: ▪ If a trace entry should be made on the MMC but no formatted MMC is available. ▪ If the MMC is deleted while a log-/trace entry is being made. ▪ If after inserting the MMC, it contains data errors that cannot be restored.
2	Trace recording aborted since the MMC is full	The trace recording was aborted since no further memory is available. If this recording is defined on the MMC, insert a new MMC. Set the method of recording before formatting the MMC so that the oldest data is automatically overwritten by the new data. If record to RAM is set then read the data, if desired, and delete the trace memory. Set the method of recording if you want to automatically overwrite the oldest data.
3	Recording aborted since the parameters have been changed	Trace-recording aborted since the recording device was redefined during the recording procedure.
4	Automatic logging not possible since the MMC is full	Logging to MMC cannot be performed since there is no more memory left on the MMC. Insert a new MMC.
5	MMC error	The defined cycle for the trace recording cannot be processed. There could be problems with the MMC. Insert a new MMC. If the problem still occurs, decrease the recording cycle of the trace function in the DS7 or record to the RAM memory (MMC Parameter in DS 7).
6		Reserved
7		Reserved
8		Reserved
9		Reserved
10		Reserved
11-20	**Log output error**	
11	Log error	Logging the used text is not possible since a code that is not defined for a variable field has been entered. Check the log text in DS40, 41, 42 or 43.
12	Timeout print-out	A print job was not complete within the predefined monitor time for logging in DS4. Check the output device or increase the

Error No.	Technology message - description	Solution
		monitoring time.
13	Error Output device not ready	Logging not possible because the defined output device is not ready. If the printer is defined as the output device, check whether the printer is connected properly and that it is installed and ready for operation. If the MMC is defined as the output device, check whether a formatted MMC is inserted.
14	Logging not possible since the weight lies outside of the weighing range	Logging is not possible because the weight lie outside of the weighing range for a calibratable application (Code in DS3 OIML).
15		Reserved
16	Logging not possible, Protokoll-ID error	Logging is not possible because no protocol ID was defined in the protocol string (calibratable application, Code in DS3 - OIML).
17	Logging is not possible, printer not ready	Logging is not possible because the printer has not indicated that it is ready. Check the printer.
18	Logging is not possible, MMC is defective	Logging is not possible because the MMC is defective or has been removed. Change the MMC or insert a formatted MMC.
19	Logging is not possible, SIWATOOL program is active	Logging is not possible because the SIWATOOL program is active on the interface. Disconnect the connection to the PC and connect a printer.
20		Reserved
21-40	**Weighing function error**	
21	Weighing command thrown out for lack of a standstill	Taring/zero setting or logging is not possible because no standstill was achieved within standstill time 1 in DS 3.
22	Zero setting is not possible	The start-up weight lies outside of the defined value range defined in DS 3 for the maximum positive and negative weight for zero setting.
23	Zero setting / taring not possible	Zero positions or zero setting not possible because the gross lies outside the zero setting range or taring not possible because the tare maximum load has been exceeded.
24		Reserved
25		Reserved
26		Reserved
27		Reserved
28		Reserved
29		Reserved
30		Reserved
31		Reserved

Error No.	Technology message - description	Solution
32		Reserved
33		Reserved
34		Reserved
35		Reserved
36		Reserved
37		Reserved
38		Reserved
39		Reserved
40		Reserved
41-100	**Error in the weighing cycle**	
41	Timeout step switching	Step-on to next weighing step has not occurred within the time defined in DS23.
42	Inhibition time violation coarse	After the coarse inhibition time has elapsed or during the inhibition time set/actual comparison, the fine shut-off point was exceeded.
43	Inhibition time violation fine	After the fine inhibition time has elapsed or during the inhibition time set/actual comparison, the fine shut-off point was exceeded.
44	Weighing time exceeded	Weighing procedure not completed within the weighing time defined in DS22.
45	Empty time exceeded	Emptying was not completed within the weighing time defined in DS23.
46	Weighing procedure stopped, range exceeded for zero setting or with taring	The weighing procedure was stopped because zeroing or zero setting or taring was not possible. Gross outside of zero setting range Tare maximum load exceeded Current gross weight is less than the minimum tare weight defined in DS 23.
47	Control range exceeded	The determined set quantity for the proportional or fine time controller is greater than the maximum one-time control access defined in DS 23. Depending on the definition for controller behaviour for weighing faults in DS23, no regulating is performed or the set amount is limited to the maximum control access value.
48	Weighing stopped because of CPU stop	A dosing is stopped if the S7-CPU is set to stop status.
49	Weighing stopped because of dosing error	A dosing error leads to shut-off points for coarse and fine current that are not plausible.
50		Reserved
51		Reserved
52	Weighing stopped, shut-off point is not plausible	Dosing stopped since a dosing error led to shut-off points for coarse and fine signals that were not plausible.
53	Weighing was stopped because set	Dosing stopped because a set value was

Error No.	Technology message - description	Solution
	value < minimum weight	determined which was less than the minimum weight of the weighing range 1 in DS 3 or is equal to 0 during a SWT fill.
54	Weighing procedure stopped because weighing range was exceeded	Dosing stopped because the set value does not match the current scale status. The following must apply: Current gross + set value (DS20 or current loading set value with SWT) – current trailing + shut-off correction value < maximum weighing range
55	Weighing stopped because the fine shut-off point is not plausible	Dosing is stopped because the definition for the trailing weight or the shut-off correction value is not plausible. The following must apply: (Current trailing - shut-off correction value) <= set value.
56	Weighing stopped because of overflow in totalizing memory 1	Dosing stopped because totalising the actual values caused an overflow in distribution memory 1 in calibratable operation (Specifications Code OIML in DS 3). Evaluate the distribution memory and delete it.
57	Weighing stopped because the residual set value is too low	Dosing stopped because the quantity to still be loaded is too small. The set value to be loaded is less than the minimum weighing range value in DS 3.
58	Weighing stopped because weight is outside measurement range	Dosing stopped because current weight is higher than the permitted measurement value range by at least 9 weighing steps.
59	Weighing stopped because there is a tolerance error	Dosing stopped because there is a tolerance error. This error is only generated if a test has been defined for tolerance band 1 or 2 in DS 23.
60	Weighing stopped because nothing is loaded	Loading stopped because nothing has been emptied for the last fill or less than the minimum weight of weighing range 1 (DS3) was emptied with specification code = OIML (DS3).
61	Weighing stopped because net weight was too high	Dosing stopped because the net weight already lies above the coarse weight.
62		Reserved
63		Reserved
64		Reserved
65		Reserved
66		Reserved
67		Reserved
68		Reserved
69		Reserved
70		Reserved
71		Reserved
72		Reserved

Error No.	Technology message - description	Solution
73		Reserved
74		Reserved
75		Reserved
76		Reserved
77		Reserved
78		Reserved
79		Reserved

Table 7-2 List of Technology Messages

7.8 Message list of operating messages

If an error generates an operating message, the red SF LED on the front of the assembly is illuminated. The operating messages are generated coming and going.

(K) - coming, (G) - going

Error No.	Operating messages - description	Solution
1-16	**Internal module error Going**	
1	(G) Reboot caused by error in RAM read-write testing	The error can mean that the module is defective. This error must be reset with the "Error acknowledge" command. *Note: The error is deleted with the acknowledgement but is not set anywhere because there is no longer any activity with a RAM error → Watchdog, Error 2*
2	(G) Reboot caused by watchdog error (mandatory acknowledgment)	The module must be reset because of a critical error. This error must be reset with the "Error acknowledge" command.
3	(G) Reboot caused by program code error (mandatory acknowledgment)	The error can mean that the module is defective. This error must be reset with the "Error acknowledge" command. Contact the SIWAREX hotline.
4	(G) Lost process alarm	Process alarm on the S7 interface
5	(G) Parameter error (data loss)	Parameter error (Data loss). One or more data records stored in retentive memory are defective. Load the defective data records e.g. using command Set default values or transfer the affected records individually.
6		Reserved
7		Reserved
8		Reserved
9		Reserved
10		Reserved
11		Reserved
12		Reserved
13		Reserved
14		Reserved
15		Reserved
16		Reserved
17-32	**External error Going**	
17	(G) Limits for load cell signals exceeded or undershot	The measurement is too high. Measure the measurement voltage with a multi-metre and check the load cells. Check the characteristic

Error No.	Operating messages - description	Solution
		value set in DS3.
18	(G) line-break	The connection to the load cells has been broken. Check the load cell connection.
19	(G) ADC error	The AD converter must be reset because of a fault.
20	(G) Timeout Lifebit	The SIMATIC-CPU not updated the lifebit within the defined period of time. Communication through the FB SIWA has been disturbed.
21		
22		
23		
24		
25		
26		
27		
28		
29		
30		
31		
32		
129-144	**Internal module error Coming**	
129	(K) Reboot caused by error in RAM read-write testing	The error can mean that the module is defective. This error must be reset with the "Error acknowledge" command. *Note: The error is deleted with the acknowledgement but is not set anywhere because there is no longer any activity with a RAM error → Watchdog, Error 2*
130	(K) Reboot caused by watchdog error (mandatory acknowledgment)	The module had to reboot because of a critical error. This error must be reset with the "Error acknowledge" command.
131	(K) Reboot caused by program code error (mandatory acknowledgment)	The error can mean that the module is defective. This error must be reset with the "Error acknowledge" command. Contact the SIWAREX-Hotline.
132	(K) Lost process alarm	Process alarm lost on the S7 interface
133	(K) Parameter error (data loss)	Parameter error (Data loss). One or more data records stored in retentive memory are defective. Load the defective data records e.g. using command Set default values or transfer the affected records individually.
134		
135		

Error No.	Operating messages - description	Solution
136		
137		
138		
139		
140		
141		
142		
143		
144-160	**External error Coming**	
144		
145	(K) Limits for load cell signals exceeded or undershot	The measurement signal is too high. Measure the measurement voltage with a multi-metre and check the load cells. Check the characteristic value in DS3.
146	(K) line-break	The connection to the load cells has been broken. Check the load cell connection.
147	(K) ADC error	The AD converter must be reset because of a fault.
148	(K) Timeout Lifebit	The SIMATIC-CPU not updated the lifebit within the defined period of time. Communication through the FB SIWA has been disturbed.
149		
150		
151		
152		
153		
154		
155		
156		
157		
158		
159		
160		

Table 7-3 List of Operating Messages

8 Programming in SIMATIC STEP 7

8.1 General Information

SIWAREX FTA was developed specifically for operation with the SIMATIC S7. The hardware construction is described in detail in chapter *4*. SIWAREX FTA is projected as a function module in the SIMATIC manager. In order for the SIWAREX FTA to be accepted into the module assembly catalogue of the SIMATIC manager, the SETUP program (SETUP_FOR_SIMATIC on the project planning package CD) must be executed.
A project is delivered with the standard software that is required for the operation with the SIWAREX FTA and is included with the project planning package. Example programs are also available on the Internet. An example program shows how application software can be created and how simply messages can be generated.
Using an example program (S7_SAMPLES)and creating your own supplements for various applications is recommended e.g. using the message block for SIWAREX FTA since the processing and displaying of errors exhibited by SIWAREX is performed very simply.
Another level concerns programs that can be pre-fabricated for certain applications (SIWAREX Multiscale and SIWAREX Multifill). These programs are professional extensions of the example programs concerning functionality, number of weighing procedures and/or materials.

8.2 SIWAREX FTA in the HW Configuration

During project planning for the hardware configuration in the SIMATIC manager, the basic properties of the module are defined:

- The peripheral address of the module
- Diagnostic alarm enable
- Process alarm enable
- Behaviour for CPU stop

SIWAREX FTA requires 16 bytes in the input and output areas.

Other scale specific parameters that are also changed during the control program run-time can be defined in two different ways:

- Using the SIWATOOL FTA parameter definition tool
- By defining the parameters in a scale data block and then transferring them to the SIWAREX FTA. Cyclic communication between the SIWAREX FTA module and the SIMATIC CPU is established through the FB SIWA_FTA function block (FB41).

8.3 SIWAREX FTA in cyclic STEP 7 - Program

SIWAREX FTA communicates with the SIMATIC CPU with the function block FB SIWA_FTA. While programming the call, an instance data block is created for the FB SIWA_FTA. Besides the instance data block, **a scale DB is required for every Scale SIWAREX FTA**, in which the scale parameters are stored. The UDT that comes with it can also be used for creating the scale DB.

The vector DB must also be loaded in the SIMATIC CPU. **A vector DB can be used by more than one SIWAREX FTA**.

The function block FB SIWA_FTA and the data block are found on the CD for the project planning package SIWAREX FTA for SIMATIC S7 in the S7_Software directory.

The function block FB SIWA_FTA is called one time for each scale in the application program cyclically in a program level (e.g. in OB1) and provided with call parameters.

```
CALL  "SIWA_FTA" , DB10
 ADDR        :=256
 DB_SCALE    :=12
 DB_VECTOR   :=11
 CMD_IN      :="DB_SCALE".i_CMD_INPUT
 SIM_VAL     :="DB_SCALE".r_SIM_VALUE
 ANA_OUT     :="DB_SCALE".r_ANALOG_OUT_VALUE
 DO_FORCE    :="DB_SCALE".b_DIG_OUTPUT_FORCE
 TRANSITION  :="DB_SCALE".b_TRANSITIONS
 CMD_INPR    :="DB_SCALE".bo_CMD_IN_PROGRESS
 CMD_FOK     :="DB_SCALE".bo_CMD_FINISHED_OK
 CMD_ERR     :="DB_SCALE".bo_CMD_ERR
 CMD_ERR_C   :="DB_SCALE".b_CMD_ERR_CODE
 REF_COUNT   :="DB_SCALE".b_INFO_REFRESH_COUNT
 PROC_VAL1   :="DB_SCALE".r_PROCESS_VALUE1
 PROC_VAL2   :="DB_SCALE".w_PROCESS_VALUE2
 SC_STATUS   :="DB_SCALE".dw_SCALE_STATUS
 ERR_MSG     :="DB_SCALE".bo_ERR_MSG
 ERR_MSG_TYPE:="DB_SCALE".b_ERR_MSG_TYPE
 ERR_MSG_C   :="DB_SCALE".b_ERR_MSG_CODE
 FB_ERR      :="DB_SCALE".bo_FB_ERR
 FB_ERR_C    :="DB_SCALE".b_FB_ERR_CODE
 START_UP    :="DB_SCALE".bo_START_UP_IN_PROGRESS
 CMD_EN      :="DB_SCALE".bo_CMD_ENABLE
 ERR_MSG_Q   :="DB_SCALE".bo_ERR_MSG_QUIT
NOP   0
```

Image 8-1 FB SIWA_FTA call parameters.

8.4 Call parameters for FB SIWA_FTA

The call parameters of the FB SIWA_FTA are described in the following section. The call parameters are defined as variables in the scales DB when delivered. It is possible to define the call parameters with other variables of the same type.

While calling the FB SIWA_FTA, the number of the instance DB to be generated must be defined.

8.4.1 ADDR:= 256, Input, INT

SIWAREX FTA requires 16 bytes in the input and output range of the SIMATIC CPU for operation. The ADDR parameter must correspond wit the definition in the HW configuration.

8.4.2 DB_SCALE:= 12, Input, INT

A scale DB must be defined for every scale, in which the parameter of the SIWAREX FTA and the current actual value are found. The number of the DB can be selected as desired. DB12 has been defined as the scale DB in the project planning package. In addition, the UDT12 is also provided as a template for creating block modules.

8.4.3 DB_VECTOR:= 11, Input, INT

The content of the vector DB may not be modified by the user. It must be loaded one time only per SIMATIC CPU, independent of the number of SIWAREX FTA modules that are used. The number of the DB can be selected as desired.

8.4.4 CMD_IN:= "DB_SCALE".i_CMD_INPUT, Input, INT

The user controls all command using this input variable, whether for transferring a data record or executing a weighing task. The commands are described in chapter *6*. The user prepares the command number using this variable and triggers the command using variable CMD_EN:= "DB_SCALE".bo_CMD_ENABLE (see chapter *8.4.23*). The FB SIWA_FTA does not delete the command number, it resets the trigger variable CMD_EN:= "DB_SCALE".bo_CMD_ENABLE after detecting the trigger instead.

8.4.5 SIM_VAL:= "DB_SCALE".r_SIM_VALUE, Input, REAL

If the simulation has been enabled (see chapter *5.5.1*), the value to be simulated can be defined on this input. The value should be found in the weighing range of the weighing instrument.

8.4.6 ANA_OUT:= "DB_SCALE".r_ANALOG_OUT_VALUE, Input, REAL

If control of the analogue outputs has been enabled (see chapter *5.5.11*), the value to be controlled can be defined on this input. The value should be found in the defined range of the weighing instrument.

8.4.7 DO_FORCE:= "DB_SCALE".b_DIG_OUTPUT_FORCE, Input, BYTE

If forced control of the digital outputs has been enabled (see chapter *5.5.3*), the value to be controlled can be defined on this input. Bit 0 corresponds with digital output 0, bit 1 corresponds with digital output 1, etc.

8.4.8 TRANSITION:= "DB_SCALE".b_TRANSITIONS, Input, BYTE

The user can influence the continuation of the weighing procedure. The weighing process is split into steps and one step is only executed if the respective bit for the transition is not set (see chapter *5.4*). If the value of the variable is set to 0, then the weighing progress is not halted in any segment and its continuance is exclusively the result of the weighing process.

8.4.9 CMD_INPR:= "DB_SCALE".bo_CMD_IN_PROGRESS, Output, BOOL

This bit informs the user that a command is being processed at the moment.

8.4.10 CMD_INPR:= "DB_SCALE".bo_CMD_FOK, Output, BOOL

This bit informs the user that a command has been executed successfully (Command complete without errors).

8.4.11 CMD_ERR:= "DB_SCALE".bo_CMD_ERR, Output, BOOL

This bit informs the user that a command has not been executed. The bit is set for one cycle (edge) only. The cause can be evaluated in the same cycle with variable CMD_ERR_C:= "DB_SCALE".b_CMD_ERR_CODE. The number is decoded in the table „Data and Operating Errors“ in chapter *7.6*. If no error code is defined, the error must be evaluated in "DB_SCALE".b_FB_ERR_CODE.

8.4.12 CMD_ERR_C:= "DB_SCALE".b_CMD_ERR_CODE, Output, BYTE

If a command is not executed (completed with error) the error code number is output here. The number that is output is decoded in the table „Data and Operating Errors“ in chapter *7.6*. The value remains in the output until the next command is triggered. The evaluation is to be performed when the set bit CMD_ERR:= "DB_SCALE".bo_CMD_ERR appears. If an error code is defined, the error must be evaluated in "DB_SCALE".b_FB_ERR_CODE.

8.4.13 REF_COUNT:= "DB_SCALE".b_INFO_REFRESH_COUNT, Output, BYTE

The current output values which are prepared as output variables of the FB SIWA_FTA are read cyclically by the FB through the peripheral range. SIWAREX FTA updates the values internally in a 10 msec rhythm. Every update is assigned a number which can be used in the SIMATIC CPU like a time stamp.

8.4.14 PROC_VAL1:= "DB_SCALE".r_PROCESS_VALUE1, Output, REAL

The selected process value can be output using this variable (See chapter *5.5.4*). The gross weight or the net weight of the scale is normally output here.

8.4.15 PROC_VAL2:= "DB_SCALE".w_PROCESS_VALUE2, Output, DWORD

The selected process value is output using this variable (See chapter *5.5.5*). The status of the automatic weighing instrument AWI (see chapter *5.16.2*) is normally output here.

8.4.16 SC_STATUS:= "DB_SCALE".dw_SCALE_STATUS, Output, DWORD

The status of the non-automatic weighing instrument NAWI (see chapter *5.16.1*) is always output through this variable.

8.4.17 ERR_MSG:= "DB_SCALE".bo_ERR_MSG, Output, BOOL

All messages that are prepared by SIWAREX FTA are prepared in an output buffer on the module. If a new message appears, this bit is set. The user can evaluate the meaning using variables RR_MSG_TYPE:= "DB_SCALE".b_ERR_MSG_TYPE and ERR_MSG_C:= "DB_SCALE".b_ERR_MSG_CODE. After the message is acknowledged by the user (ERR_MSG_Q:= "DB_SCALE".bo_ERR_MSG_QUIT), the bit is reset by the function block.

8.4.18 ERR_MSG_TYPE:= "DB_SCALE".b_ERR_MSG_TYPE, Output, BYTE

The user is shown which message is there with variable:

Bit 0 – Operating message (Fault)

Bit 1 – Technology error

Bit 2 – Data or operating error

8.4.19 ERR_MSG_C:= "DB_SCALE".b_ERR_MSG_CODE, Output, BYTE

The user is informed of the message number with this variable (suitable for ERR_MSG_TYPE:= "DB_SCALE".b_ERR_MSG_TYPE). After the evaluation of the message, the user indicates to the FB that the message has been evaluated (with variable ERR_MSG_Q:= "DB_SCALE".bo_ERR_MSG_QUIT) and the FB SIWA_FTA is ready to output the next message if one exists.

8.4.20 FB_ERR:= "DB_SCALE".bo_FB_ERR, Output, BOOL

If an error has occurred during the processing of the function block itself, it is indicated through this variable.

Warning

If a processing error occurs for FB SIWA_FTA, we have to assume that the variables that have been output do not correspond with the actual status in the module.

8.4.21 FB_ERR_C:= "DB_SCALE".b_FB_ERR_CODE

The error number of the FB SIWA_FTA is output through this variable.

The following messages can be output:

Bit 0 - DB_SCALE or DB_VECTOR are missing or have incorrect lengths

Bit 1 - Error with internal call for SFC58 or SFC59, the value RET_VAL is entered in DW4 for one cycle in the scale DB

Bit 2 - Error interpreting a data record / command, defined data record or command number is incorrect.

Bit 3 - Lifebit error, SIWAREX FTA not responding

Bit 4 - Peripheral data could not be read in this cycle

Bit 5 - Activated command was interrupted with a restart

Bit 6 - Reserved

Bit 7 - Reserved

Warning

If a processing error occurs for FB SIWA_FTA, we have to assume that the variables that have been output do not correspond with the actual status in the module.

8.4.22 START_UP:= "DB_SCALE".bo_START_UP_IN_PROGRESS

Communication between the SIWAREX FTA and the FB SIWA_FTA is synchronised when the SIWAREX FTA module is restarted (normally when the SIMATIC CPU is started). The bit can be output for more than one cycle.

8.4.23 CMD_EN:= "DB_SCALE".bo_CMD_ENABLE

After entering the command number in the CMD_IN:= "DB_SCALE".i_CMD_INPUT variable, the execution of the command is triggered with this bit. To prevent the command from being triggered more than one time, the bit should be created as an edge.

8.4.24 ERR_MSG_Q:= "DB_SCALE".bo_ERR_MSG_QUIT

After evaluating a message with variable ERR_MSG_C:= "DB_SCALE".b_ERR_MSG_CODE the user acknowledges this message. FB SIWA_FTA can then output the next message.

8.5 Allocation in the Scale DB

The following describes the contents of the scale DB. All components of the SIMATIC STEP7 software for SIWAREX FTA are in the English language.

DB	DS	Name	Type	Default	Comment
0.0	0.0	i_DB_Lenght	INT	1128	Length of DB
2.0	2.0	i_MaxLifeBitCyc	INT	10	Lifebit error message after n cycles
4.0	4.0	i_SFC_Err_C	INT	0	Error code of SFC58/59 when occurred
6.0	6.0	i_CMD_INPUT	INT	0	Command code input
8.0	8.0	bo_CMD_ENABLE	BOOL	FALSE	Command enable
8.1	8.1	bo_CMD_IN_PROGRESS	BOOL	FALSE	Command in progress
8.2	8.2	bo_CMD_FINISHED_OK	BOOL	FALSE	Command finished ok
8.3	8.3	bo_CMD_ERR	BOOL	FALSE	Command error occurred
9.0	9.0	b_CMD_ERR_CODE	BYTE	B#16#0	Command error code
10.0	10.0	r_SIM_VALUE	REAL	0.000000e+000	Simulation value for weight
14.0	14.0	r_ANALOG_OUT_VALUE	REAL	0.000000e+000	Analogue output value
18.0	18.0	b_TRANSITIONS	BYTE	B#16#0	Transition for automatic weighing step
19.0	19.0	b_DIG_OUTOUT_FORCE	BYTE	B#16#0	Force digital output for service
20.0	20.0	b_REFRESH_COUNT	BYTE	B#16#0	Refresh counter
22.0	22.0	r_PROCESS_VALUE1	REAL	0.000000e+000	Process value 1
26.0	26.0	w_PROCESS_VALUE2	DWORD	DW#16#0	Process value 2
30.0	30.0	dw_SCALE_STATUS	DWORD	DW#16#0	Scale status info
34.0	34.0	bo_ERR_MSG	BOOL	FALSE	New error message occurred
34.1	34.1	bo_ERR_MSG_QUIT	BOOL	FALSE	Error message quit
35.0	35.0	b_ERR_MSG_TYPE	BYTE	B#16#0	Error messages type
36.0	36.0	b_ERR_MSG_CODE	BYTE	B#16#0	Error message code
37.0	37.0	bo_FB_ERR	BOOL	FALSE	Error in function block occurred
38.0	38.0	b_FB_ERR_CODE	BYTE	B#16#0	Error code for function block
39.0	39.0	bo_START_UP_IN_PROGRESS	BOOL	FALSE	Start up of function block in progress
40.0	40.0	S_CMD_STATUS_ 1	BYTE	B#16#0	Command status input (additional fc1)
44.0	44.0	S_CMD_STATUS_ 2	BYTE	B#16#0	Command status input (additional fc1)
48.0	48.0	S_CMD_STATUS_ 3	BYTE	B#16#0	Command status input (additional fc1)
52.0	52.0	r_DB_RES92	WORD	W#16#0	
54.0	54.0	r_DB_RES93	WORD	W#16#0	
56.0	56.0	r_DB_RES94	WORD	W#16#0	
58.0	58.0	r_DB_RES95	WORD	W#16#0	
60.0	60.0	r_DB_RES96	WORD	W#16#0	
62.0	62.0	r_DB_RES97	WORD	W#16#0	
64.0	64.0	r_DB_RES98	WORD	W#16#0	
66.0	66.0	r_DB_RES99	WORD	W#16#0	
68.0	68.0	W_Intern	WORD	W#16#0	Reserved for internal use
70.0	70.0	s_JUST_DAT	STRUCT		DR3: Calibration parameters
70.0	0.0	d_CALIB_DIGITS0	DINT	L#1677722	Calibration digits for 0
74.0	4.0	d_CALIB_DIGITS1	DINT	L#15099494	Calibration digits for 1
78.0	8.0	d_CALIB_DIGITS2	DINT	L#0	Calibration digits for 2

DB	DS	Name	Type	Default	Comment
82.0	12.0	d_CALIB_DIGITS3	DINT	L#0	Calibration digits for 3
86.0	16.0	d_CALIB_DIGITS4	DINT	L#0	Calibration digits for 4
90.0	20.0	r_CALIB_WEIGHT1	REAL	0.000000e+000	Calibration weight for 1
94.0	24.0	r_CALIB_WEIGHT2	REAL	0.000000e+000	Calibration weight for 2
98.0	28.0	r_CALIB_WEIGHT3	REAL	0.000000e+000	Calibration weight for 3
102.0	32.0	r_CALIB_WEIGHT4	REAL	0.000000e+000	Calibration weight for 4
106.0	36.0	b_SIGAL_RANGE	BYTE	B#16#2	Signal range (1=1mV/v, 2=2mV/V, 4=4mV/V)
107.0	37.0	bo_FILT_PARA	BOOL	FALSE	Position of the average value filter (Average first=0, low pass=1)
108.0	38.0	b_FILT_TYPE	BYTE	B#16#0	Filter type
109.0	39.0	b_FILT_FREQ	BYTE	B#16#1	Filter low pass frequency
110.0	40.0	i_FILT_DEPTH	INT	128	Filter depth of average value filter
112.0	42.0	s_SCALE_ID	STRING[10]	'SIWAREX FT'	Scale identity
124.0	54.0	b_RANGES	BYTE	B#16#1	Amount of weighing ranges
125.0	55.0	bo_SCALE_TYPE_BY_RANGE	BOOL	FALSE	Multi range (0), multi resolution (1)
125.1	55.1	bo_ZERO_POWER_ON	BOOL	FALSE	Automatic zero by power on (yes=1, no=0)
125.2	55.2	bo_ZERO_POWER_ON_TARE	BOOL	FALSE	Automatic zero by power on and 0<tare>0 (yes=1, no=0)
125.3	55.3	bo_ZERO_AUTOMATIC	BOOL	FALSE	Automatic zeroing (yes=1, no=0)
126.0	56.0	r_MIN_WR1	REAL	0.000000e+000	Minimum for weighing range 1
130.0	60.0	r_MAX_WR1	REAL	0.000000e+000	Maximum for weighing range 1
134.0	64.0	r_INCREMENT_WR1	REAL	0.000000e+000	Digital increment for weighing range 1
138.0	68.0	r_MIN_WR2	REAL	0.000000e+000	Minimum for weighing range 2
142.0	72.0	r_MAX_WR2	REAL	0.000000e+000	Maximum for weighing range 2
146.0	76.0	r_INCREMENT_WR2	REAL	0.000000e+000	Digital increment for weighing range 2
150.0	80.0	r_MIN_WR3	REAL	0.000000e+000	Minimum for weighing range 3
154.0	84.0	r_MAX_WR3	REAL	0.000000e+000	Maximum for weighing range 3
158.0	88.0	r_INCREMENT_WR3	REAL	0.000000e+000	Digital increment for weighing range 3
162.0	92.0	t_TIME_ST_STILL_SCALE	TIME	T#1S	Stand still time in ms
166.0	96.0	r_WEIGHT_ST_STILL_SCALE	REAL	0.000000e+000	Stand still weight
170.0	100.0	t_TIME_WAIT_ST_STILL	TIME	T#5S	Min waiting time for stand still
174.0	104.0	b_PWRON_ZERO_NEG_VALUE	BYTE	B#16#10	Zeroing negative range by power on (% of WR3)
175.0	105.0	b_PWRON_ZERO_POS_VALUE	BYTE	B#16#10	Zeroing positive range by power on % of WR3
176.0	106.0	b_ZERO_NEG_VALUE	BYTE	B#16#1	Zeroing negative range (% of WR3)
177.0	107.0	b_ZERO_POS_VALUE	BYTE	B#16#3	Zeroing positive range (% of WR3)
178.0	108.0	b_TARA_MAX	BYTE	B#16#0	Tara range (% of WR3)
179.0	109.0	b_Reserve	BYTE	B#16#0	Reserve
180.0	110.0	i_Reserve	INT	0	Reserve
182.0	112.0	s_LEGAL_TRADE	STRING[4]	'OIML'	OIML or no OIML
188.0	118.0	s_WEGHT_UNIT	STRING[4]	'kg '	Unit for weight
194.0	124.0	r_WEIGHT_ST_STILL_2	REAL	0.000000e+000	Stand still weight 2
198.0	128.0	t_TIME_ST_STILL_2	TIME	T#1S	Stand still time 2 in ms
202.0	132.0	t_MIN_TIME_ST_STILL_2	TIME	T#0MS	Min waiting time for stand still 2
206.0	136.0	r_WEIGHT_ST_STILL_3	REAL	0.000000e+000	Stand still weight 3
210.0	140.0	t_TIME_ST_STILL_3	TIME	T#0MS	Stand still time 3 in ms
214.0	144.0	t_MIN_TIME_ST_STILL_3	TIME	T#0MS	Min waiting time for stand still 3
218.0	148.0	r_MIN_DOSING_VALUE	REAL	0.000000e+000	Minimum dosing value for totalising
222.0	152.0	r_INCREMENT_TOTAL	REAL	0.000000e+000	Digital increment for totalised weight value

DB	DS	Name	Type	Default	Comment
226.0	156.0	r_Reserve	REAL	0.000000e+000	Reserve (max. load)
230.0	160.0	b_Reserve1	BYTE	B#16#0	Reserve
231.0	161.0	b_Reserve2	BYTE	B#16#0	Reserve
	=162		END_STRUCT		
232.0	232.0	s_BASIC_PARA	STRUCT		DR4: Basic scale parameters
232.0	0.0	b_SCALE_TYPE	BYTE	B#16#0	Scale type (all types non automatic/automatic)
233.0	1.0	b_Reserve1	BYTE	B#16#0	Reserve
234.0	2.0	i_Reserve2	WORD	W#16#0	Reserve
236.0	4.0	t_TIME_OUT_PRINT	TIME	T#2S	Time out printer
240.0	8.0	bo_PROT_PARA	BOOL	FALSE	Weighing protocol output (printer=0, memory card=1)
241.0	9.0	b_Reserve3	BYTE	B#16#0	Reserve
242.0	10.0	bo_LIMIT1_PARA	BOOL	FALSE	Limit 1 based on gross weight (0) or net weight (1)
242.1	10.1	bo_LIMIT2_PARA	BOOL	FALSE	Limit 2 based on gross weight (0) or net weight (1)
242.2	10.2	bo_EMPTY_G_N	BOOL	FALSE	Basic for empty detection gross/net
243.0	11.0	b_Reserve4	BYTE	B#16#0	Reserve
244.0	12.0	r_EMPTY_RANGE	REAL	0.000000e+000	Empty range
248.0	16.0	r_LIMIT1_ON	REAL	0.000000e+000	Value for limit 1 on
252.0	20.0	r_LIMIT1_OFF	REAL	0.000000e+000	Value for limit 1 off
256.0	24.0	r_LIMIT2_ON	REAL	0.000000e+000	Value for limit 2 on
260.0	28.0	r_LIMIT2_OFF	REAL	0.000000e+000	Value for limit 2 off
264.0	32.0	r_LIMIT3_ON	REAL	0.000000e+000	Value for limit 3 on
268.0	36.0	r_LIMIT3_OFF	REAL	0.000000e+000	Value for limit 3 off
272.0	40.0	r_MIN_FLOW1	REAL	0.000000e+000	Minimum flow (1/s) limit value 1
276.0	44.0	r_MIN_FLOW2	REAL	0.000000e+000	Minimum flow (1/s) limit value 2
280.0	48.0	b_MIN_FILTER_DEPTH_FLOW	BYTE	B#16#0	Filter depth of average value filter for minimum flow check
281.0	49.0	b_Reserve5	BYTE	B#16#0	
	=50		END_STRUCT		
	282.0	s_INTERFACES_PARA	STRUCT		DR7: Parameter for interfaces
282.0	0.0	Reserve	BOOL	FALSE	Reserve
283.0	1.0	b_SIM_SOURCE_ACTIV	BYTE	B#16#0	Source for simulation of weight
284.0	2.0	b_VAL_AFTER_DEC_POINT	BYTE	B#16#0	Weight value correction after decimal point
285.0	3.0	b_Reserve1	BYTE	B#16#0	Reserve 1
286.0	4.0	bo_FORCE_IN_SERVICE_EN	BOOL	FALSE	Enable force digital output in service mode (yes=1, no=0)
287.0	5.0	b_PROCESS_VALUE1	BYTE	B#16#0	Index for process value 1
288.0	6.0	b_PROCESS_VALUE2	BYTE	B#16#0	Index for process value 2
289.0	7.0	b_Reserve2	BYTE	B#16#0	Reserve 2
290.0	8.0	w_PROCESS_ALARM0	WORD	W#16#0	Process alarm 0
292.0	10.0	w_PROCESS_ALARM1	WORD	W#16#0	Process alarm 1
294.0	12.0	w_PROCESS_ALARM2	WORD	W#16#0	Process alarm 2
296.0	14.0	w_PROCESS_ALARM3	WORD	W#16#0	Process alarm 3
298.0	16.0	w_PROCESS_ALARM4	WORD	W#16#0	Process alarm 4
300.0	18.0	w_PROCESS_ALARM5	WORD	W#16#0	Process alarm 5
302.0	20.0	w_PROCESS_ALARM6	WORD	W#16#0	Process alarm 6
304.0	22.0	w_PROCESS_ALARM7	WORD	W#16#0	Process alarm 7
306.0	24.0	t_S7_FB_LIFEBIT	TIME	T#0MS	Lifebit check (0=off, 1.....n=sec)
310.0	28.0	r_ANALOG_OUT_ZERO	REAL	0.000000e+000	Value for analogue output for 0/4 mA

DB	DS	Name	Type	Default	Comment
314.0	32.0	r_ANALOG_OUT_END	REAL	0.000000e+000	Value for analogue output for 20 mA
318.0	36.0	r_ANALOG_OUT_CONST	REAL	0.000000e+000	Value for analogue output when OD-signal
322.0	40.0	b_ANALOG_OUT_SOURCE	BYTE	B#16#0	Source for control of analogue output
323.0	41.0	bo_ANALOG_OUT_0_4_20_MA	BOOL	FALSE	Parameter for analogue output (0=0.....20 mA, 1=4....20 mA)
324.0	42.0	b_PRINTER_BD_RATE	BYTE	B#16#0	Printer baud rate
325.0	43.0	bo_RS232_XON_XOFF	BOOL	FALSE	0=XON/XOFF off, 1=XON/XOFF on
325.1	43.1	bo_RS232_RTS_CTS	BOOL	FALSE	0=RTS/CTS off, 1=RTS/CTS on
326.0	44.0	b_RS485_PROT	BYTE	B#16#0	Protocol for RS484(0=non, 1=SIEBERT S11)
327.0	45.0	b_DEC_POINT_DISPLAY	BYTE	B#16#0	Decimal point for SIEBERT Display
328.0	46.0	b_RS485_BD_RATE	BYTE	B#16#0	RS485- baud rate
329.0	47.0	bo_RS485_PARITY	BOOL	FALSE	Parity
329.1	47.1	bo_RS485_DATA_BITS	BOOL	FALSE	Data bits
329.2	47.2	bo_RS485_STOP_BITS	BOOL	FALSE	Stop bits
330.0	48.0	b_DO1_FUNC	BYTE	B#16#0	Function for digital output 1
331.0	49.0	b_DO2_FUNC	BYTE	B#16#0	Function for digital output 2
332.0	50.0	b_DO3_FUNC	BYTE	B#16#0	Function for digital output 3
333.0	51.0	b_DO4_FUNC	BYTE	B#16#0	Function for digital output 4
334.0	52.0	b_DO5_FUNC	BYTE	B#16#0	Function for digital output 5
335.0	53.0	b_DO6_FUNC	BYTE	B#16#0	Function for digital output 6
336.0	54.0	b_DO7_FUNC	BYTE	B#16#0	Function for digital output 7
337.0	55.0	b_DO8_FUNC	BYTE	B#16#0	Function for digital output 8
338.0	56.0	b_DO1_H_L_ACTIV1	BOOL	FALSE	High/low active for digital output 1
338.1	56.1	b_DO2_H_L_ACTIV2	BOOL	FALSE	High/low active for digital output 2
338.2	56.2	b_DO3_H_L_ACTIV3	BOOL	FALSE	High/low active for digital output 3
338.3	56.3	b_DO4_H_L_ACTIV4	BOOL	FALSE	High/low active for digital output 4
338.4	56.4	b_DO5_H_L_ACTIV5	BOOL	FALSE	High/low active for digital output 5
338.5	56.5	b_DO6_H_L_ACTIV6	BOOL	FALSE	High/low active for digital output 6
338.6	56.6	b_DO7_H_L_ACTIV7	BOOL	FALSE	High/low active for digital output 7
338.7	56.7	b_DO8_H_L_ACTIV8	BOOL	FALSE	High/low active for digital output 8
339.0	57.0	b_DO1_BY_ERROR1	BOOL	FALSE	Digital output 1 active by error or OD-signal
339.1	57.1	b_DO2_BY_ERROR2	BOOL	FALSE	Digital output 2 active by error or OD-signal
339.2	57.2	b_DO3_BY_ERROR3	BOOL	FALSE	Digital output 3 active by error or OD-signal
339.3	57.3	b_DO4_BY_ERROR4	BOOL	FALSE	Digital output 4 active by error or OD-signal
339.4	57.4	b_DO5_BY_ERROR5	BOOL	FALSE	Digital output 5 active by error or OD-signal
339.5	57.5	b_DO6_BY_ERROR6	BOOL	FALSE	Digital output 6 active by error or OD-signal
339.6	57.6	b_DO7_BY_ERROR7	BOOL	FALSE	Digital output 7 active by error or OD-signal
339.7	57.7	b_DO8_BY_ERROR8	BOOL	FALSE	Digital output 8 active by error or OD-signal
340.0	58.0	bo_OUT_DIGIT_BY_ERR_EN	BOOL	FALSE	Enable digital output by error (1=active, 0=not active)
341.0	59.0	b_Reserve4	BYTE	B#16#0	Reserve
342.0	60.0	b_DI1_FUNC	BYTE	B#16#0	Function for digital input 1
343.0	61.0	b_DI2_FUNC	BYTE	B#16#0	Function for digital input 2
344.0	62.0	b_DI3_FUNC	BYTE	B#16#0	Function for digital input 3
345.0	63.0	b_DI4_FUNC	BYTE	B#16#0	Function for digital input 4
346.0	64.0	b_DI5_FUNC	BYTE	B#16#0	Function for digital input 5
347.0	65.0	b_DI6_FUNC	BYTE	B#16#0	Function for digital input 6
348.0	66.0	b_DI7_FUNC	BYTE	B#16#0	Function for digital input 7

DB	DS	Name	Type	Default	Comment
349.0	67.0	b_DI1_PARA1	BOOL	FALSE	High/low active for digital input 1
349.1	67.1	b_DI2_PARA1	BOOL	FALSE	High/low active for digital input 2
349.2	67.2	b_DI3_PARA1	BOOL	FALSE	High/low active for digital input 3
349.3	67.3	b_DI4_PARA1	BOOL	FALSE	High/low active for digital input 4
349.4	67.4	b_DI5_PARA1	BOOL	FALSE	High/low active for digital input 5
349.5	67.5	b_DI6_PARA1	BOOL	FALSE	High/low active for digital input 6
349.6	67.6	b_DI7_PARA1	BOOL	FALSE	High/low active for digital input 7
350.0	68.0	t_COUNT_TIME	TIME	T#1S	Time basic for input counter
354.0	72.0	dw_Reserve5	DWORD	DW#16#0	Reserve
358.0	76.0	bo_MMC_PROT_OVERWR_MODE	BOOL	FALSE	MMC Protocol data storage overwrite mode (0=no, 1=yes)
358.1	76.1	bo_MMC_TRACE_OVERWR_MODE	BOOL	FALSE	MMC Trace date storage overwrite mode (0=no, 1=yes)
358.2	76.2	bo_MMC_RAM_TRACE	BOOL	FALSE	Trace data write in 0=RAM, 1=MMC
359.0	77.0	b_MMC_TRACE_SIZE	BYTE	B#16#0	MMC Trace memory size (%)
360.0	78.0	b_MMC_PROT_SIZE	BYTE	B#16#0	MMC memory size (%) for protocol
361.0	79.0	b_MMC_TRACE_CYCLE	BYTE	B#16#0	Trace cycle
	=80.0		END_STRUCT		
	362.0	s_DATE_TIME	STRUCT		DR8: Date and time
362.0	0.0	s_DATE_TIME_DATA	DATE_AND_TIME	DT#90-1-1-0:0:0.000	Date and time for siwarex
	=8.0		END_STRUCT		
	370.0	s_APPL_ID_DATA	STRUCT		DR9: Application identification
370.0	0.0	dw_CRC_CHECK	DWORD	DW#16#0	CRC checksum of the application software
374.0	4.0	dw_LENGHT	DWORD	DW#16#0	Application software length
378.0	8.0	s_COPYRIGHT	STRING[26]	''	
406.0	36.0	s_MODUL_NAME	STRING[10]	''	
418.0	48.0	s_APPL_ID	STRING[32]	''	
452.0	82.0	s_FILE_NAME	STRING[20]	''	
474.0	104.0	ch_APPL_VERSION	CHAR	' '	Application version
475.0	105.0	b_APPL_F_Version	BYTE	B#16#0	Function identification
476.0	106.0	b_APPL_DR_Version	BYTE	B#16#0	Data record structure identification
477.0	107.0	b_APPL_VERSION_NO	BYTE	B#16#0	Application version number
478.0	108.0	s_CREATION_DATE	STRING[10]	''	Creation date
490.0	120.0	s_CREATION_TIME	STRING[8]	''	Creation time
500.0	130.0	w_VERSION_BOOT	WORD	W#16#0	Boot version
502.0	132.0	s_SCALE_TYPE	STRING[4]	''	Type of scale
508.0	138.0	Reserve	WORD	W#16#0	Reserve
	=140.0		END_STRUCT		
	510.0	s_TARE_CONTROL	STRUCT		DR15: Tare control
510.0	0.0	r_TARE_VALUE	REAL	0.000000e+000	Tare set value
	=4.0		END_STRUCT		
	514.0	s_SIMULATION_CONTROL	STRUCT		DR16: Simulation control
514.0	0.0	r_SIMULATION_VALUE	REAL	0.000000e+000	Simulation value for weight
	=4.0		END_STRUCT		
	518.0	s_ANALOG_OUT_CONTROL	STRUCT		DR17: Analogue output control
518.0	0.0	r_ANALOG_OUT_VALUE	REAL	0.000000e+000	analogue output value
	=4.0		END_STRUCT		

DB	DS	Name	Type	Default	Comment
	522.0	s_DISPLAY_CONTROL	STRUCT		DR18: Additional control for digital display
522.0	0.0	r_DISPLAY_VALUE_ADD	REAL	0.000000e+000	Additional value for digital display
	=4.0		END_STRUCT		
	526.0	s_DOSING_SET_POINT	STRUCT		DR20: Dosing set point
526.0	0.0	r_SET_POINT_VALUE	REAL	0.000000e+000	Set point for dosing cycle
	=4.0		END_STRUCT		
	530.0	s_DOSING_LOAD	STRUCT		DR21: Dosing set point for load
530.0	0.0	r_SET_POINT_LOAD_VALUE	REAL	0.000000e+000	Set point for load
	=4.0		END_STRUCT		
	534.0	s_DOSING_PARA	STRUCT		DR22: Dosing parameters
534.0	0.0	t_MAX_DOS_TIME	TIME	T#10S	Maximum time for dosing cycle
538.0	4.0	r_IN_FLIGHT_VALUE	REAL	0.000000e+000	In flight value
542.0	8.0	r_FINE_VALUE	REAL	0.000000e+000	Fine value
546.0	12.0	r_COMPENSATION_VALUE	REAL	0.000000e+000	Fine switch off correction
550.0	16.0	t_TIMER_FOR_PREDOSING	TIME	T#0MS	Timer for pre-dosing
554.0	20.0	r_TOL_VAL_TO1	REAL	0.000000e+000	First tolerance band plus
558.0	24.0	r_TOL_VAL_TU1	REAL	0.000000e+000	First tolerance band minus
562.0	28.0	r_TOL_VAL_TO2	REAL	0.000000e+000	Second tolerance band plus
566.0	32.0	r_TOL_VAL_TU2	REAL	0.000000e+000	Second tolerance band minus
	=36.0		END_STRUCT		
	570.0	s_DOSING_SYSTEM_PARA	STRUCT		DR23: Dosing system parameter
570.0	0.0	b_TEXT_NO_AUTO	BYTE	B#16#0	Text number for automatic protocol by finished
571.0	1.0	b_Reserve1	BYTE	B#16#0	Reserve
572.0	2.0	w_Reserve2	WORD	W#16#0	Reserve
574.0	4.0	r_MAX_SETPOINT_UNLOAD	REAL	0.000000e+000	Maximum set-point for one dosing (unload scale type)
578.0	8.0	t_DISABLE_TIME_COARSE	TIME	T#500MS	Disable time for coarse dosing
582.0	12.0	t_DISABLE_TIME_FINE	TIME	T#500MS	Disable time for fine dosing
586.0	16.0	t_DISABLE_TIME_COMPARE	TIME	T#0MS	Max disable time for dosing comparator
590.0	20.0	b_COARSE_ANALOG_OUT_VAL	BYTE	B#16#0	Analogue value when coarse signal on
591.0	21.0	b_FINE_ANALOG_OUT_VAL	BYTE	B#16#0	Analogue value when fine signal on
592.0	22.0	b_FILTER_TYPE_DOSING	BYTE	B#16#0	Filter type for coarse/fine control
593.0	23.0	b_FILTER_FREQ_DOSING	BYTE	B#16#0	Filter coarse/fine low pass frequency
594.0	24.0	b_TARA_ZERO_PROG	BYTE	B#16#0	Selection of tare/zeroing programme for automatic dosing
595.0	25.0	b_TARA_ZERO_CYCLE	BYTE	B#16#0	Cycle for not tarring or zeroing by automatic dosing
596.0	26.0	w_Reserve3	WORD	W#16#0	Reserve
598.0	28.0	r_TARA_MINIMUM_VAL	REAL	0.000000e+000	Minimum tare value
602.0	32.0	r_TARA_MAXIMUM_VAL	REAL	0.000000e+000	Maximum tare value
606.0	36.0	t_TIME_FOR_ZEROING	TIME	T#5M	TIME between two automatic zeroing
610.0	40.0	b_WAIT_BY_DI_0_IN_STEP_N	BYTE	B#16#0	Dosing is waiting in step n (0.....7) by digital input no 0 on
611.0	41.0	b_WAIT_BY_DI_1_IN_STEP_N	BYTE	B#16#0	Dosing is waiting in step n (0.....7) by digital input no 1 on
612.0	42.0	b_WAIT_BY_DI_2_IN_STEP_N	BYTE	B#16#0	Dosing is waiting in step n (0.....7) by digital input no 2 on
613.0	43.0	b_WAIT_BY_DI_3_IN_STEP_N	BYTE	B#16#0	Dosing is waiting in step n (0.....7) by digital input no 3 on
614.0	44.0	b_WAIT_BY_DI_4_IN_STEP_N	BYTE	B#16#0	Dosing is waiting in step n (0.....7) by digital input no 4 on
615.0	45.0	b_WAIT_BY_DI_5_IN_STEP_N	BYTE	B#16#0	Dosing is waiting in step n (0.....7) by digital input no 5 on
616.0	46.0	b_WAIT_BY_DI_6_IN_STEP_N	BYTE	B#16#0	Dosing is waiting in step n (0.....7) by digital input no 6 on
617.0	47.0	b_Reserve4	BYTE	B#16#0	Reserve

DB	DS	Name	Type	Default	Comment
618.0	48.0	t_TIME_FOR_NEXT_STEP	TIME	T#0MS	Waiting time for one step while dosing
622.0	52.0	bo_Reserve5	BOOL	FALSE	Reserve
622.1	52.1	bo_CHECK_STOP_END_STEP_1	BOOL	FALSE	Check stop after step 1
622.2	52.2	bo_CHECK_STOP_END_STEP_2	BOOL	FALSE	Check stop after step 2
622.3	52.3	bo_CHECK_STOP_END_STEP_3	BOOL	FALSE	Check stop after step 3
622.4	52.4	bo_CHECK_STOP_END_STEP_4	BOOL	FALSE	Check stop after step 4
622.5	52.5	bo_CHECK_STOP_END_STEP_5	BOOL	FALSE	Check stop after step 5
622.6	52.6	bo_CHECK_STOP_END_STEP_6	BOOL	FALSE	Check stop after step 6
622.7	52.7	bo_CHECK_STOP_END_STEP_7	BOOL	FALSE	Check stop after step 7
623.0	53.0	b_Reserve6	BYTE	B#16#0	Reserve
624.0	54.0	bo_AUTOM_AFTER_DOSING	BOOL	FALSE	Automatic after dosing when tol-
624.1	54.1	bo_AFTER_DOSING_METHOD	BOOL	FALSE	Method for after dosing (0=conti, 1=inching)
624.2	54.2	bo_TOL_1_STOP	BOOL	FALSE	Dosing stop when outrange TOL_1
624.3	54.3	bo_TOL_2_STOP	BOOL	FALSE	Dosing stop when outrange TOL_2
625.0	55.0	b_PERIOD_NO_TOL_CHECK	BYTE	B#16#0	Period for no tolerance check
626.0	56.0	t_TIME_INCHING_PULS	TIME	T#1S	Time for fine signal pulse by inching mode
630.0	60.0	bo_CONTROLLER_RESET_ER R	BOOL	FALSE	Controller reset by error
631.0	61.0	b_CONTROLLER_TYPE	BYTE	B#16#0	Controller type
632.0	62.0	b_PROP_CONTR_FACTOR	BYTE	B#16#0	Factor for proportional controller
634.0	64.0	b_PROP_CONTR_LIMIT	REAL	0.000000e+000	Limit for proportional controller
638.0	68.0	r_PROP_CONTR_OPTI_PLUS	REAL	0.000000e+000	Proportional controller optimum plus
642.0	72.0	r_PROP_CONTR_OPTI_MINUS	REAL	0.000000e+000	Proportional controller optimum minus
646.0	76.0	t_MIN_FINE_TIME	TIME	T#1S	Minimum time for fine signal
650.0	80.0	b_F_TIME_CONTR_FACTOR	BYTE	B#16#0	Factor for fine time controller
651.0	81.0	b_Reserve7	BYTE	B#16#0	Reserve
652.0	82.0	w_Reserve8	WORD	W#16#0	Reserve
654.0	84.0	t_TIME_OVERLAP	TIME	T#0MS	Overlap time while emptying
658.0	88.0	t_TIME_EMPTYING	TIME	T#0MS	Emptying time
662.0	92.0	t_MAX_TIME_EMPTYING	TIME	T#0MS	Max time for emptying
666.0	96.0	bo_UNLOAD_ONLY_COARSE	BOOL	FALSE	Unload only coarse
667.0	97.0	b_Reserve9	BYTE	B#16#0	Reserve
	=98		END_STRUCT		
	668.0	s_PROCESS_VALUES	STRUCT		DR30: Process values
668.0	0.0	bo_STA_MIN_FLOW2	BOOL	FALSE	Status min flow 2
668.1	0.1	bo_STA_EMPTY	BOOL	FALSE	Status scale empty
668.2	0.2	bo_STA_LEGAL_DATA_PROT	BOOL	FALSE	Status legal data protection on
668.3	0.3	bo_STA_Reserve1	BOOL	FALSE	Status reserve
668.4	0.4	bo_STA_Reserve2	BOOL	FALSE	Status reserve
668.5	0.5	bo_STA_Reserve3	BOOL	FALSE	Status reserve
668.6	0.6	bo_STA_Reserve4	BOOL	FALSE	Status reserve
668.7	0.7	bo_STA_ERROR_OCURED	BOOL	FALSE	Status module error
669.0	1.0	bo_STA_PRINTING	BOOL	FALSE	Status printing protocol
669.1	1.1	bo_STA_RS232_BUSY_PC	BOOL	FALSE	Status rs232 busy by siwarex protocol
669.2	1.2	bo_STA_MMC_CONECTED	BOOL	FALSE	Status micro memory card conected

DB	DS	Name	Type	Default	Comment
669.3	1.3	bo_STA_MMC_READY	BOOL	FALSE	Status mmc ready and formated
669.4	1.4	bo_STA_MMC_READY_F_TRACE	BOOL	FALSE	Status mmc is ready for trace
669.5	1.5	bo_STA_MMC_READY_WEIGHT	BOOL	FALSE	Status mmc is ready for legal data
669.6	1.6	bo_STA_MMC_TRACE_ACTIV	BOOL	FALSE	Status mmc trace data is activ
669.7	1.7	bo_STA_MIN_FLOW1	BOOL	FALSE	Status min flow 1
670.0	2.0	bo_STA_MAX_9E	BOOL	FALSE	Status max plus 9 e
670.1	2.1	bo_STA_025_D_ZERO	BOOL	FALSE	Status zero 0.25 d
670.2	2.2	bo_STA_WAIT_STAND_ST1	BOOL	FALSE	Status waiting for stand still 1
670.3	2.3	bo_STA_ST_STAND_SCALE_ON	BOOL	FALSE	Status stand still 1 on
670.4	2.4	bo_STA_SCALE_CALIBRATED	BOOL	FALSE	Status scale ist calibrated
670.5	2.5	bo_STA_CMD_ERROR_ON_DI	BOOL	FALSE	Status comand error on digital input
670.6	2.6	bo_STA_SIMULATION_ON	BOOL	FALSE	Status weighing simulation is on
670.7	2.7	bo_STA_SERVICE_MODE_ON	BOOL	FALSE	Status service mode is on
671.0	3.0	bo_STA_WR1	BOOL	FALSE	Status weighing range 1
671.1	3.1	bo_STA_WR2	BOOL	FALSE	Status weighing range 2
671.2	3.2	bo_STA_WR3	BOOL	FALSE	Status weighing range 3
671.3	3.3	bo_STA_LIMIT1_ON	BOOL	FALSE	Status limit 1 is on
671.4	3.4	bo_STA_LIMIT2_ON	BOOL	FALSE	Status limit 2 is on
671.5	3.5	bo_STA_LIMIT3_ON	BOOL	FALSE	Status limit 3 is on
671.6	3.6	bo_STA_TARED	BOOL	FALSE	Status scale tared
671.7	3.7	bo_STA_TARED_BY_MANUAL	BOOL	FALSE	Status scale tared by manual
672.0	4.0	bo_STA_ST_STILL_PROC1_ON	BOOL	FALSE	Status stand still 2 on
672.1	4.1	bo_STA_ST_STILL_PROC2_ON	BOOL	FALSE	Status stand still 3 on
672.2	4.2	bo_STA_Reserve5	BOOL	FALSE	Status reserve
672.3	4.3	bo_STA_DISABL_COMPARA	BOOL	FALSE	Status disable set point comparator
672.4	4.4	bo_STA_CONTI_MODE_DOSING	BOOL	FALSE	
672.5	4.5	bo_STA_Reserve6	BOOL	FALSE	Status reserve
672.6	4.6	bo_STA_END_DOSING_CYCLE	BOOL	FALSE	Status continus mode on by dosing
672.7	4.7	bo_STA_END_CHARGE	BOOL	FALSE	Status end of one dosing cyclus
673.0	5.0	bo_STA_DOSING_CY_ABORTED	BOOL	FALSE	Status dosing is aborted
673.1	5.1	bo_STA_NEXT_STEP_WAITING	BOOL	FALSE	Status next step is waiting for trigger
673.2	5.2	bo_STA_TOL_PLUS_TO2	BOOL	FALSE	Status tol plus 2 on
673.3	5.3	bo_STA_TOL_PLUS_TO1	BOOL	FALSE	Status tol plus 1 on
673.4	5.4	bo_STA_TOL_OK	BOOL	FALSE	Status tol ok
673.5	5.5	bo_STA_TOL_MINUS_TU1	BOOL	FALSE	Status tol minus 1 on
673.6	5.6	bo_STA_TOL_MINUS_TU2	BOOL	FALSE	Status tol minus 2 on
673.7	5.7	bo_STA_TOL_BAD	BOOL	FALSE	Status tol bad
674.0	6.0	bo_STA_AFTER_DOSING	BOOL	FALSE	Status after dosing is activ
674.1	6.1	bo_STA_COARSE_SIGNAL_ON	BOOL	FALSE	Status coarse signal on
674.2	6.2	bo_STA_FINE_SIGNAL_ON	BOOL	FALSE	Status fine signal on
674.3	6.3	bo_STA_TIMER_PREDOSING	BOOL	FALSE	Status timer predosing is running
674.4	6.4	bo_STA_EMPTYING_SIG_ON	BOOL	FALSE	Status emptying signal is on
674.5	6.5	bo_STA_STOPPED	BOOL	FALSE	Status dosing cyclus temporarly stopped
674.6	6.6	bo_STA_CHECK_STPD	BOOL	FALSE	Status check stop follows
674.7	6.7	bo_STA_CHECK_STP_FOLLOW	BOOL	FALSE	Status check stop follows

DB	DS	Name	Type	Default	Comment
675.0	7.0	bo_STA_DOSING_STEP_0	BOOL	FALSE	Status dosing cyclus in step 0
675.1	7.1	bo_STA_DOSING_STEP_1	BOOL	FALSE	Status dosing cyclus in step 1
675.2	7.2	bo_STA_DOSING_STEP_2	BOOL	FALSE	Status dosing cyclus in step 2
675.3	7.3	bo_STA_DOSING_STEP_3	BOOL	FALSE	Status dosing cyclus in step 3
675.4	7.4	bo_STA_DOSING_STEP_4	BOOL	FALSE	Status dosing cyclus in step 4
674.5	7.5	bo_STA_DOSING_STEP_5	BOOL	FALSE	Status dosing cyclus in step 5
674.6	7.6	bo_STA_DOSING_STEP_6	BOOL	FALSE	Status dosing cyclus in step 6
675.7	7.7	bo_STA_DOSING_STEP_7	BOOL	FALSE	Status dosing cyclus in step 7
676.0	8.0	r_GROSS_WEIGHT_PROC	REAL	0.000000e+000	Actual weight process value gross
680.0	12.0	r_NET_WEIGHT_PROC	REAL	0.000000e+000	Actual weight process value net
684.0	16.0	r_TARE_WEIGHT_PROC	REAL	0.000000e+000	Actual weight process value tare
688.0	20.0	r_GROSS_NET_VALUE	REAL	0.000000e+000	Actual weight process legal value
692.0	24.0	r_GROSS_NET_VALUE_10X	REAL	0.000000e+000	Actual weight process legal value x 10
696.0	28.0	r_TARE_VALUE	REAL	0.000000e+000	Actual weight tare process legal value
700.0	32.0	r_LAST_DOSING_VALUE	REAL	0.000000e+000	Actual weight process last dosing cycle
704.0	36.0	d_COUNTER_VALUE	DINT	L#0	Actual counter value
708.0	40.0	r_TOTAL_VALUE1	DOUBLE	0.000000e+000	Actual total of loaded weight 1 (Non SIMATIC TYPE)
716.0	44.0	r_TOTAL_VALUE2	REAL	0.000000e+000	Actual total of loaded weight 2
	=52		END_STRUCT		
	720.0	s_PROCESS_VALUES_ADD	STRUCT		DR31: Additional process values
720.0	0.0	r_MATERIAL_FLOW	REAL	0.000000e+000	Actual material flow (Weight/s)
724.0	4.0	r_ACTUAL_IN_FLIHGT_VALUE	REAL	0.000000e+000	Actual in flight value calculated by siwarex
728.0	8.0	r_ACTUAL_FINE_VALUE	REAL	0.000000e+000	Actual fine value calculated by siwarex
732.0	12.0	d_ACTUAL_DIGIT	DINT	L#0	Actual digit value by AD-converter
736.0	16.0	d_ACTUAL_DIGIT_FILTER1	DINT	L#0	Actual digit value by AD-converter filter stage 1
740.0	20.0	d_ACTUAL_DIGIT_FILTER2	DINT	L#0	Actual digit value by AD-converter filter stage 2
744.0	24.0	r_NET_WEIGHT_FAST	REAL	0.000000e+000	Actual weight process value net fast
748.0	28.0	r_ACT_SETPOINT_UNLOAD	REAL	0.000000e+000	Actual set-point for unload
752.0	32.0	d_ACT_ERROR_SERVICE	DWORD	DW#16#0	Actual error (only for service)
756.0	36.0	s_ACTUAL_DATE_TIME_DATA	DATE_AND_TIME	DT#90-1-1-0:0:0.000	Actual date and time in siwarex
764.0	44.0	i_ANALOG_OUT_VALUE	INT	0	Actual analogue output value
766.0	46.0	b_ACTUAL_DI_INPUT	BYTE	B#16#0	Actual state of digital input
767.0	47.0	b_Reserve	BYTE	B#16#0	Reserve
768.0	48.0	i_SUPPLY_CURRENT_REF	INT	0	Supply current reference value
770.0	50.0	i_SUPPLY_CURRENT_CHECKED	INT	0	Supply current checked value
	=52		END_STRUCT		
	772.0	s_STATISTICS_DATA	STRUCT		DR32: Statistics data
772.0	0.0	i_COUNTER_CYCLE_TOTAL	DINT	0	Cycle counter
776.0	4.0	i_COUNTER_CHECKED_CYCL	DINT	0	Counter for checked cycle
780.0	8.0	i_COUNT_TO2_EX	DINT	0	Counter - more than tol plus2 band
784.0	12.0	i_COUNT_TO1_EX	DINT	0	Counter - inside tol plus2 band and more than tol plus1
788.0	16.0	i_COUNT_TOL_OK	DINT	0	Counter – tolerance ok
792.0	20.0	i_COUNT_TU1_LESS	DINT	0	Counter – less than tol minusTU1
796.0	24.0	i_COUNT_TU2_LESS	DINT	0	Counter – less than tol minusTU2
800.0	28.0	i_COUNT_TOL_BAD	DINT	0	Counter – tolerance bad

DB	DS	Name	Type	Default	Comment
804.0	32.0	i_Reserve0	DINT	0	Reserve
808.0	36.0	i_Reserve1	DINT	0	Reserve
812.0	40.0	r_ACTUAL_SETPOINT	REAL	0.000000e+000	Actual set point
816.0	44.0	r_ACTUAL_AVERAGE_VALUE	REAL	0.000000e+000	Actual average value by checked cycle
820.0	48.0	r_STANDARD_DEVIATION	REAL	0.000000e+000	Standard deviation
824.0	52.0	r_THRUPUT_PER_HOUR	REAL	0.000000e+000	Throughput per hour
828.0	56.0	i_CYCLUS_PER_HOUR	INT	0	Dosing cycles per hour
	=58		END_STRUCT		
	830.0	s_ASCII_VALUE	STRUCT		DR34: ASCII weight value
830.0	0.0	s_ASCII_WEIGHT	STRING[16]	''	Actual ASCII weight (same as for display)
	=18		END_STRUCT		
	848.0	s_KRYPTO_DATA	STRUCT		DR35: Crypto data for legal display
848.0	0.0	s_DATA	ARRAY[1..32]		Crypto data
			BYTE		
	=32		END_STRUCT		
	880.0	s_LAST_PROTOCOL_DATA	STRUCT		DR44: Last protocol data
880.0	0.0	s_MMC_ID1	WORD	W#16#0	MMC Id number1
882.0	2.0	s_MMC_ID2	WORD	W#16#0	MMC Id number2
884.0	4.0	s_MMC_ID3	BYTE	B#16#0	MMC Id number3
885.0	5.0	b_Reserve	BYTE	B#16#0	Reserve
886.0	6.0	w_Reserve	WORD	W#16#0	Reserve
888.0	8.0	d_PROTOCOL_ID	DINT	L#0	Id of protocol
892.0	12.0	s_LAST_PROTOCOL_DATA	STRING[160]	''	Text of last protocol
	=174		END_STRUCT		
	1054.0	s_ADD_TEXT	STRUCT		DR45: Additional text
1054.0	0.0	s_ADD_TEXT1	STRING[16]	''	Additional text 1
1072.0	18.0	s_ADD_TEXT2	STRING[16]	''	Additional text 2
1090.0	36.0	s_ADD_TEXT3	STRING[16]	''	Additional text 3
1108.0	54.0	s_ADD_TEXT4	STRING[16]	''	Additional text 4
	=72		END_STRUCT		
1126.0		I_DB_Lenght1	INT	1128	
	=1126		END_STRUCT		

Table 8-1 Scale DB Construction

8.6 Calibratable weight display on OP/TP/MP 170B, 270B, 370

For displaying the calibratable weight value, the same device that the operator uses for running the system can be used.

The calibratable main display for one or more scales can be one of the following devices:

TP170B, OP170B

TP270, OP270, MP270B

MP370

The SIMATIC HMI device can be connected with the MPI or to PROFIBUS. The calibratable display of the weight value can be connected to any position in the system hierarchy. The connection does not have to be sealed and future planning for operator windows are also not influenced by the calibratable weight display.

8.6.1 Functionality of the calibratable weight display

The value for the calibratable weight display is generated internally by the SIWAREX FTA, it is encoded and then provided in the data record DS 35 for the user.

The DS 35 data record is read by the FB SIWA_FTA and is put in the scale DB just like every other data record in a defined address.

The content of the DS 35 can be sent through bus connections to other SIMATIC CPUs or can be evaluated locally.

An AddOn for ProTool is used for evaluating - a special function which is in the position to decode the contents of the DS 35 and to display it in a special output field. This AddOn is called "Secured output" and must be installed separately to ProTool.

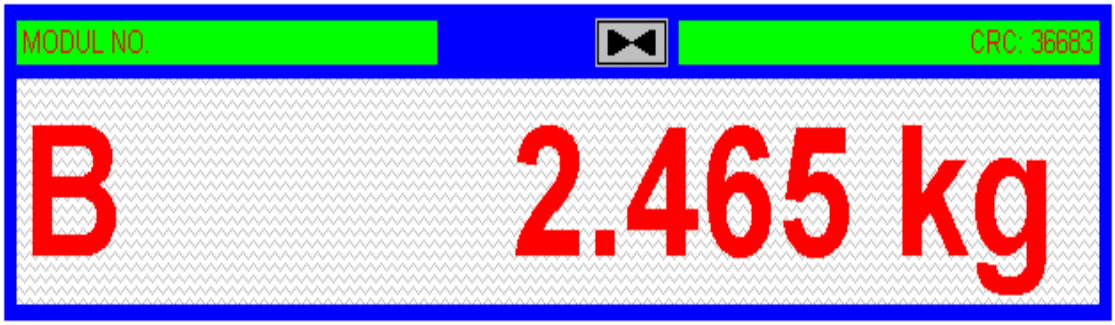


Image 8-2 Calibratable display in TP/OP

8.6.2 Installation and Project Planning for the Calibratable Weight Display

First, the OCX must be linked into the project planning environment of ProTool for the secured output. This is possible with version 6.0 SP2 ProTool(Pro) or higher.

The setup.bat program which can be used for performing the installation is found in the OCX_DISPLAY directory of the project planning package.

If the ProTool is not on drive C: or D: then the setup.bat program must be edited in an editor and rewritten to correspond with the drive that it is on.

After executing the setup.bat program, the Prootool.ini file must be changed according to the note in setup.bat.

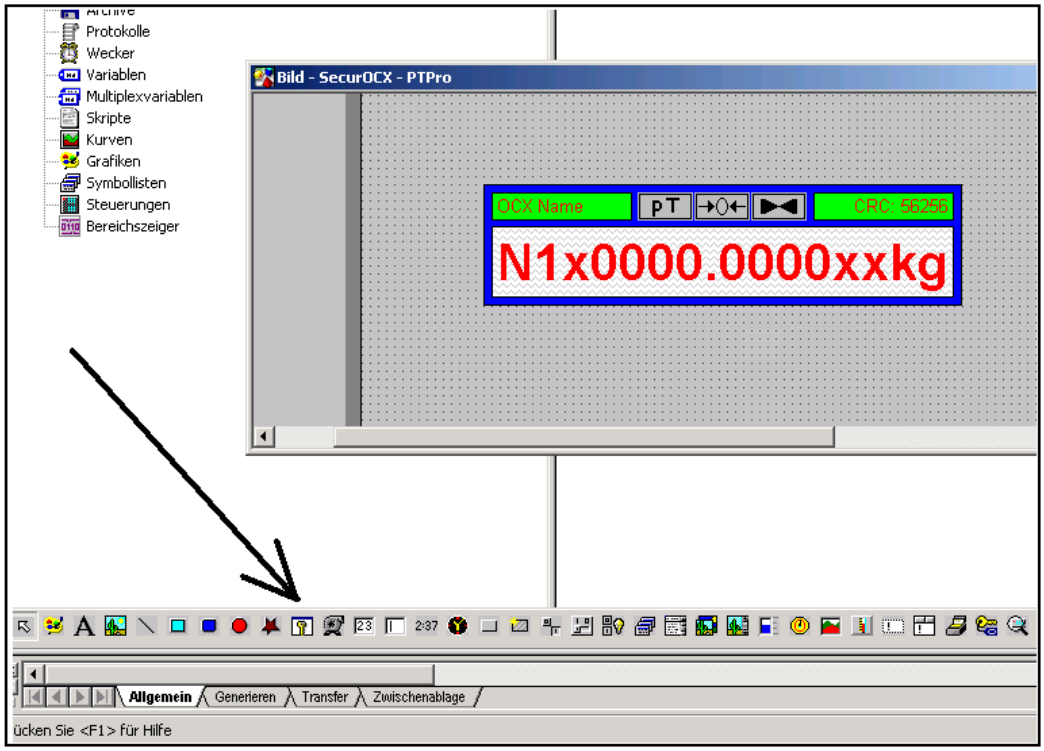


Image 8-3 "Secure output" function in ProTool

If ProTool is called again afterwards, a new function appears in the tool-bar (see arrow) - "Secure output", which is projected just as all other functions.

During planning, the address of the data record DS 35 must be defined. The variable is BYTE and has a length of 32 bytes.

The refresh rate lies somewhere around 200 to 300 msec which is comfortable to the eye.

Note

After converting a project to another target device, the secured output must be deleted in the images and projected again.

Note

When loading the project to the target device, a notice can be displayed which indicates that the OCX is not certified. This notice has no influence on the functionality of the AddOn.

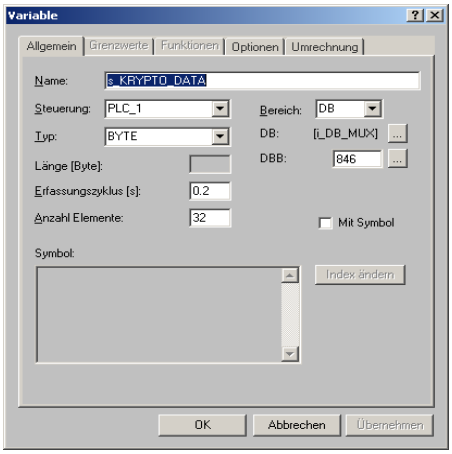


Image 8-4 Parameter of the SIWAREX FTA OCX

9 Project planning in SIMATIC PCS 7

9.1 General Information

The integration of SIWAREX FTA is possible as of PCS 7 version 6.0.

In the first step, SIWAREX FTA must be added to the hardware catalogue by running the SETUP_FOR_SIMATIC.

While planning the hardware configuration in the SIMATIC Manager, the basic features of the module are defined:

- The peripheral address of the module
- Enabling the diagnostic alarms
- Enabling the process alarms
- Behaviour in the case of a CPU-Stop

SIWAREX FTA takes up 16 bytes in the input and output area.

Other scale specific parameters that are also changed while the control program is running can be defined in three different ways.

- Using the SIWATOOL FTA parameter definition tool
- Internally by making the definition in FB641 and then transferring to SIWAREX FTA
- In the OS using the Faceplate.

The provided example – Faceplate can be expanded or modified using the Faceplate Designer.

The SIWAREX FB is described to start with, then the Face Plate from the operator's viewpoint and finally there are notes on project planning with the Faceplate.

9.2 FB for SIWAREX FTA

9.2.1 FB641 for CFC

The SFTA function block is integrated into an interrupt alarm-OB e.g. OB32. The block must also be integrated in the following OBs in the run sequence (done automatically in CFC):

OB82	Diagnostics alarm
OB100	New start

After starting up, the module identification for the installed module is read in order to determine parameter errors. The messages remain blocked for the number of cycles that have been defined in the parameters on input RUNUPCYC.

9.2.2 Function and Functionality

The block is used for controlling a SIWAREX FTA module group. Data is transferred cyclically through the peripheral interface and the various data records are read from the modules or transferred to the modules acyclically. The message queue of the modules is read continuously and respective WinCC messages are generated.

Note:

In the definition of the S7 interface in DS7, the values for PROCESS_VALUE_1 (*5.5.4*) and PROZESS_VALUE_2 (*5.5.5*) must be assigned as follows:

PROCESS_VALUE_1 = 2 (Net weight)

PROZESS_VALUE_2 = 30 (Scale status AWI)

9.2.3 Addressing and Driver Wizard

The IO addresses for the SIWAREX FTA modules must lie completely within the process image of the CPU. The LADDR input is switched with the base address of the SIWAREX FTA modules. Procedures:

Select input -> right mouse key -> switch to operand ... -> entry of e. g. EW512. The PCS7 driver wizard then automatically constructs all required driver blocks. Function block inputs MODF, PERAF and RACKF are defined by the driver wizard, the inputs SUBN1_ID, SUBN2_ID, RACK_NO, SLOT_NO, BASADR and DADDR are defined according to the data in the HW configuration.

9.2.4 Manual/Automatic

Switching between the two operating modes is either done using the OS operations via AUT_ON_OP (LIOP_SEL = 0) or by switching the input AUT_L (LIOP_SEL = 1). By selecting using the OS system, the corresponding AUTOP_EN and MANOP_EN enables are required. The defined operating mode is displayed on output QMAN_AUT (1: Auto, 0: Manual).

Manual operation: The commands are sent from the operator to the module through input MAN_CMD. Each change in the command code on this input is recognized as a new command. The source of data records to be sent to the modules are the manual inputs (extension '_M').

Automatic operation: The function block takes its commands on a positive edge on input AUTCMDEN from the switchable AUT_CMD input.
The source of data records to be sent to the modules are - as long as they exist - the automatic inputs (extension '_A'), and otherwise the manual inputs (extension '_M').

E A command sequence (e.g. read all data records) will only be interrupted by a new command code after the current command is completely executed.

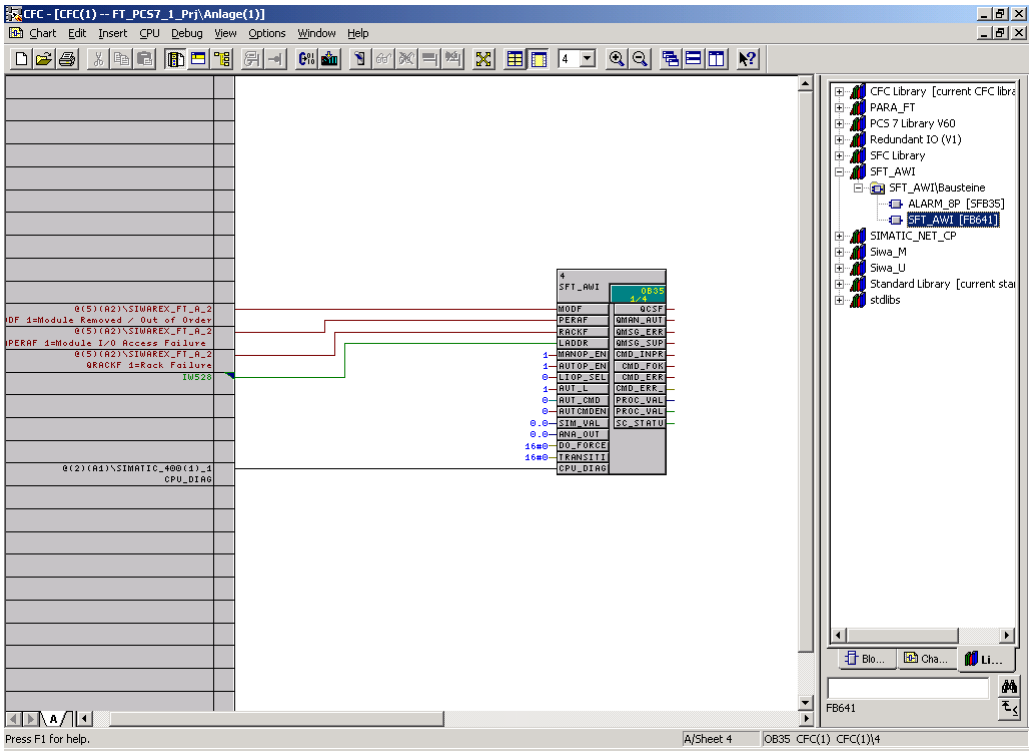


Image 9-1 SFTA function block in CFC

9.2.5 Data records

All data records that the S7 controller can access exist as individual parameters of the function block. The parameters of the data blocks that can be read have the extension '_O' for Output. The parameters of the data blocks that can be written to have the extension '_M' for Manual and are transferred to WinCC for visualization.

In addition, there are switchable automatic inputs (extension "_A") for data records 15 to 18 and 20 to 23 and these are used in automatic operation instead of the manual inputs as a source for writing the data records. If no automatic inputs exist for a data records then the values of the manual inputs are transferred to the modules in automatic operation. In certain cases, the manual inputs can be switched in the AS program but then they can no longer be used in WinCC.

9.2.6 Commands

The commands can also be taken from the command list.

9.2.7 Module error messages

The error message buffer on the SIWAREX FTA module group is read continuously by the block. If a message is read then the ERR_MSG output is set to "TRUE" for one cycle. Outputs ERR_MSG_TYPE and ERR_MSG_C contain the type of error and the error code of the respective message.

ERR_MSG_TYPE	Meaning
16#01	Operating messages (Fault)
16#02	Technological fault
16#04	Data or Operating Error
16#80	sent in addition with operating message (fault).

Table 9-1 CFC - Message types

The meaning of the error number codes can be found in the message lists.

Corresponding with the type of error, WinCC sets messages with text, technological error, data/operating error, internal or external error with the error code attached. These messages always have either a received or sent status. The error code of the last read error message is always present. The most important operating error messages are generated individually.

9.2.8 Allocating message text and message class to the block parameters

Message block ALARM_8P	Message-No.	Block parameter	Default message text	Message class
EV_ID1	1	QPARF	Parameter error	S
	2	CSF/QCSF	External error	S
	3	ERR_MSG/ ERR_MSG_TYPE/ ERR_MSG_C	Data/Operating error: @9%d@	S
	4	ERR_MSG/ ERR_MSG_TYPE/ ERR_MSG_C	Technological error: @10%d@	S
	5	QINT_03, 06..16	Internal error @8%d @[1)]	S
	6	QEXT_23..32	External error @8%d @[2)]	S
	7	QE_RDWR	Error during write-read test RAM	S
	8	QE_WDOG	Watchdog error	S
EV_ID2	1	QE_PALM	Process alarm lost	S
	2	QE_PARA	Parameter error (Data loss)	S
	3	QE_LIM	Control limits exceeded or undershot	S
	4	QE_WIRE	Line break	S
	5	QE_ADC	ADU error	S
	6	QE_TIMEOUT	Timeout Lifebit	S
	7	QE_MCC	MMC connected incorrectly	S
	8	QE_COMM	Comm.fault on ser. interface	S

1) Operating error with numbers 3 and 6 to 16
2) Operating error with numbers 23 to 32

Table 9-2 CFC – Message text from SFTA

9.2.9 Connections from SFTA (without data records)

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
MODF	1=Module error (switched by driver wizard)	BOOL	FALSE	I	
PERAF	1=Peripheral access error (switched by driver wizard)	BOOL	FALSE	I	
RACKF	1=Rack error (switched by driver wizard)	BOOL	FALSE	I	
SUBN1_ID	ID of primary Subnet (parameters set by driver wizard)	BYTE	16#FF	I	
SUBN2_ID	ID of redundant Subnet (parameters set by driver wizard)	BYTE	16#FF	I	

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
RACK_NO	Rack number (parameters set by driver wizard)	BYTE	0	I	
SLOT_NO	Slot number (parameters set by driver wizard)	BYTE	0	I	
BASADR	Base address of Siwarex-FT modules (parameters set by driver wizard)	INT	0	I	
DADDR	Diagnosis address of Siwarex-FT modules (parameters set by driver wizard)	INT	0	I	
LADDR	Base address of Siwarex-FT modules This input must be switched with the base address: Right mouse key -> Switch to Operand... -> e.g. EW512	WORD	0	I	
MANOP_EN	1= Enable for manual operation	BOOL	FALSE	I	
AUTOP_EN	1= Enable for Auto operation	BOOL	FALSE	I	
LIOP_SEL	Switchable input for Man/Auto switch AUT_L)1=Switching is active0= Operation is active	BOOL	FALSE	I	
AUT_L	Switchable input for MAN/AUTO (0=Man/1=Auto	BOOL	FALSE	I	
MSG_LOCK	1=Block messages	BOOL	FALSE	I	+
SAMPLE_T	Sample rate [sec]	REAL	0.1	I	
RUNUPCYC	Number of initial cycles	INT	10	I	
EV_ID1	Message ID	DWORD	0	I	
EV_ID2	Message ID	DWORD	0	I	
BA_EN	BATCH occupation enable	BOOL	FALSE	I	+
OCCUPIED	BATCH occupation identification	BOOL	FALSE	I	+
BA_ID	BATCH: running batch number	DWORD	0	I	+
BA_NA	BATCH batch designation	STRING[32]		I	+
STEP_NO	BATCH step number	DWORD	0	I	+
AUT_CMD	Automatic command	INT	0	I	
AUTCMDEN	1= Execute automatic command	BOOL	FALSE	I	
SIM_VAL	Simulation of weight value	REAL	0.0	I	
ANA_OUT	Value for analogue output	REAL	0.0	I	
DO_FORCE	Value for digital output	BYTE	16#00	I	
TRANSITION	Transition condition	BYTE	16#00	I	
SIG1_6	Free message EV_ID1/Message 6	BOOL	FALSE	I	
SIG1_7	Free message EV_ID1/Message 7	BOOL	FALSE	I	
SIG1_8	Free message EV_ID1/Message 8	BOOL	FALSE	I	
AUX2PR08	Message auxiliary value 8/ EV_ID2	ANY		IO	
AUX2PR09	Message auxiliary value 9/ EV_ID2	ANY		IO	
AUX2PR10	Message auxiliary value 10/ EV_ID2	ANY		IO	
AUT_ON_OP	Operating input: 0=Man, 1= Auto	BOOL	FALSE	IO	+
MAN_CMD	Manual command	INT	0	IO	+
CPY_M_A	1= Copy manual values to automatic values	BOOL	FALSE	IO	+
QCSF	1=External error	BOOL	FALSE	O	+
QPARF	1=Parameter error	BOOL	FALSE	O	
QMODF	1=Module error	BOOL	FALSE	O	
QPERAF	1=Peripheral access error	BOOL	FALSE	O	
QRACKF	1=Rack error	BOOL	FALSE	O	
SFC_ERR_C	Error code of the last SFC error	WORD	0	O	
L_DR_NO	Number of the last data record that was transferred	INT	0	O	
L_CMD	Number of the last command that was transferred	INT	0	O	
QMAN_AUT	1=AUTO, 0=Manual	BOOL	FALSE	O	+
QMANOP	1=Enable for manual operation	BOOL	FALSE	O	+
QAUTOP	1=Enable for automatic operation	BOOL	FALSE	O	+

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
M_CMD_EN	1=Enable operation for entering a new command	BOOL	FALSE	O	+
QMSG_ERR	1=Message error	BOOL	FALSE	O	
QMSG_SUP	1=Message suppression active	BOOL	FALSE	O	+
QMSGERR1	1=Message error 1	BOOL	FALSE	O	
QMSGERR2	1=Message error 2	BOOL	FALSE	O	
MSG_STAT1	Message status1	WORD	0	O	
MSG_ACK1	Messages acknowledged 1	WORD	0	O	
MSG_STAT2	Message status 2	WORD	0	O	
MSG_ACK2	Messages acknowledged 2	WORD	0	O	
CMD_INPR	Command is being executed	BOOL	FALSE	O	
CMD_FOK	Command has ended without errors	BOOL	FALSE	O	
CMD_ERR	Command finished but has errors	BOOL	FALSE	O	
CMD_ERR_C	Code of the last command error	BYTE	16#00	O	
REF_COUNT	Refresh counter	BYTE	16#00	O	
PROC_VAL1	Process value 1	REAL	0.0	O	+
PROC_VAL2	Process value 2	DWORD	16#00	O	+
SC_STATUS	Status	DWORD	16#00	O	
ERR_MSG	1= new error message	BOOL	FALSE	O	
ERR_MSG_TYPE	Type of error message	BYTE	16#00	O	
ERR_MSG_C	Code of the error message	BYTE	16#00	O	
FB_ERR	1=Error in the function block	BOOL	FALSE	O	
FB_ERR_C	Error code of the function block error	BYTE	16#00	O	
START_UP	Siwarex start-up	BOOL	FALSE	O	
QINT_x x=3 or 06.<= x <=.16	Internal error with number x	BOOL	FALSE	O	
QEXT_x 23.<= x <=.32	External error with number x	BOOL	FALSE	O	
QE_RDWR	Error during write-read test RAM	BOOL	FALSE	O	
QE_WDOG	Watchdog error	BOOL	FALSE	O	
QE_PALM	Process alarm lost	BOOL	FALSE	O	
QE_PARA	Parameter error (Data loss)	BOOL	FALSE	O	
QE_LIM	Control limits exceeded or undershot	BOOL	FALSE	O	
QE_WIRE	Line break	BOOL	FALSE	O	
QE_ADC	ADU error	BOOL	FALSE	O	
QE_TIMEOUT	Timeout Lifebit	BOOL	FALSE	O	
QE_MCC	MMC connected incorrectly	BOOL	FALSE	O	
QE_COMM	Communication fault on serial interface	BOOL	FALSE	O	

Table 9-3 CFC – SFTA connection without data records

9.2.10 Calibration parameter (Data record 3):

Inputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
CAL_D0_M	DR03: Calibration digits for 0	DINT	1677722	I	+
CAL_D1_M	DR03: Calibration digits for 1	DINT	15099494	I	+
CAL_D2_M	DR03: Calibration digits for 2	DINT		I	+
CAL_D3_M	DR03: Calibration digits for 3	DINT		I	+
CAL_D4_M	DR03: Calibration digits for 4	DINT		I	+
CAL_W1_M	DR03: Calibration weight for 1	REAL		I	+
CAL_W2_M	DR03: Calibration weight for 2	REAL		I	+
CAL_W3_M	DR03: Calibration weight for 3	REAL		I	+
CAL_W4_M	DR03: Calibration weight for 4	REAL		I	+

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
SI_RNG_M	DR03: Signal range (1=1mV/v, 2=2mV/V, 4=4mV/V)	BYTE	B#16#2	I	+
F_PARA_M	DR03: Position of the average value filter (Average first=0, low pass=1)	BOOL	B#16#2	I	+
F_TYPS_M	DR03: Signal filter type	BYTE		I	+
F_FRQS_M	DR03: Signal filter low pass frequency	BYTE	B#16#1	I	+
F_DEPTH_M	DR03: Filter depth of average value filter	INT	128	I	+
SC_ID_M	DR03: Scale identity	STRING [10]		I	+
RNG_M	DR03: Amount of weighing ranges	BYTE	B#16#1	I	+
TYPE_RNG_M	DR03: Multi range (0), multi resolution (1)	BOOL	B#16#1	I	+
Z_P_ON_M	DR03: Automatic zero by power on (yes=1, no=0)	BOOL	B#16#1	I	+
Z_P_ON_TARA_M	DR03: Automatic zero by power on and 0<tara>0 (yes=1, no=0)	BOOL	B#16#1	I	+
Z_AUTO_M	DR03: Automatic zeroing (yes=1, no=0)	BOOL	B#16#1	I	+
MIN_WR1_M	DR03: Minimum for weighing range 1	REAL		I	+
MAX_WR1_M	DR03: Maximum for weighing range 1	REAL		I	+
INC_WR1_M	DR03: Digital increment for weighing range 1	REAL		I	+
MIN_WR2_M	DR03: Minimum for weighing range 2	REAL		I	+
MAX_WR2_M	DR03: Maximum for weighing range 2	REAL		I	+
INC_WR2_M	DR03: Digital increment for weighing range 2	REAL		I	+
MIN_WR3_M	DR03: Minimum for weighing range 3	REAL		I	+
MAX_WR3_M	DR03: Maximum for weighing range 3	REAL		I	+
INC_WR3_M	DR03: Digital increment for weighing range 3	REAL		I	+
T_STILL1_M	DR03: Stand still time in ms	TIME	T#1S	I	+
W_STILL1_M	DR03: Stand still weight	REAL		I	+
T_WAIT_STILL1_M	DR03: Min waiting time for stand still	TIME	T#5S	I	+
PON_Z_NEG_M	DR03: Zeroing negative range by power on (% of WR3)	BYTE	B#16#10	I	+
PON_Z_POS_M	DR03: Zeroing positive range by power on % of WR3	BYTE	B#16#10	I	+
Z_NEG_V_M	DR03: Zeroing negative range (% of WR3)	BYTE	B#16#1	I	+
Z_POS_V_M	DR03: Zeroing positive range (% of WR3)	BYTE	B#16#3	I	+
TARA_MAX_M	DR03: Tara range (% of WR3)	BYTE		I	+
Res103_M	DR03: Reserve	BYTE		I	+
Res203_M	DR03: Reserve	INT		I	+
LEG_TRADE_M	DR03: OIML or no ----	STRING [4]		I	+
W_UNIT_M	DR03: Unit for weight	STRING [4]		I	+
W_STILL2_M	DR03: Stand still weight 2	REAL		I	+
T_STILL2_M	DR03: Stand still time 2 in ms	TIME	T#1S	I	+
MIN_T_STILL2_M	DR03: Min waiting time for stand still 2	TIME		I	+
W_STILL3_M	DR03: Stand still weight 3	REAL		I	+

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
T_STILL3_M	DR03: Stand still time 3 in ms	TIME		I	+
MIN_T_STILL3_M	DR03: Min waiting time for stand still 3	TIME		I	+
MIN_V_TOT_M	DR03: Minimum dosing value for totlising	REAL		I	+
INC_TOT_M	DR03: Digital increment for totalised weight value	REAL		I	+
Res303_M	DR03: Reserve (max. load)	REAL		I	+
Res403_M	DR03: Reserve	BYTE		I	+
Res503_M	DR03: Reserve	BYTE		I	+
Res504_M	DR03: Reserve	BYTE		I	+

Table 9-4 CFC – SFTA connections – DS3 inputs

Outputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
CAL_D0_O	DR03: Calibration digits for 0	DINT	1677722	O	
CAL_D1_O	DR03: Calibration digits for 1	DINT	15099494	O	
CAL_D2_O	DR03: Calibration digits for 2	DINT		O	
CAL_D3_O	DR03: Calibration digits for 3	DINT		O	
CAL_D4_O	DR03: Calibration digits for 4	DINT		O	
CAL_W1_O	DR03: Calibration weight for 1	REAL		O	
CAL_W2_O	DR03: Calibration weight for 2	REAL		O	
CAL_W3_O	DR03: Calibration weight for 3	REAL		O	
CAL_W4_O	DR03: Calibration weight for 4	REAL		O	
SI_RNG_O	DR03: Signal range (1=1mV/v, 2=2mV/V, 4=4mV/V)	BYTE	B#16#2	O	
F_PARA_O	DR03: Position of the average value filter (Average first=0, low pass=1)	BOOL	B#16#2	O	
F_TYPS_O	DR03: Signal filter type	BYTE		O	
F_FRQS_O	DR03: Signal filter low pass frequency	BYTE	B#16#1	O	
F_DEPTH_O	DR03: Filter depth of average value filter	INT	128	O	
SC_ID_O	DR03: Scale identity	STRING [10]		O	
RNG_O	DR03: Amount of weighing ranges	BYTE	B#16#1	O	
TYPE_RNG_O	DR03: Multi range (0), multi resolution (1)	BOOL	B#16#1	O	
Z_P_ON_O	DR03: Automatic zero by power on (yes=1, no=0)	BOOL	B#16#1	O	
Z_P_ON_TARA_O	DR03: Automatic zero by power on and 0<tara>0 (yes=1, no=0)	BOOL	B#16#1	O	
Z_AUTO_O	DR03: Automatic zeroing (yes=1, no=0)	BOOL	B#16#1	O	
MIN_WR1_O	DR03: Minimum for weighing range 1	REAL		O	
MAX_WR1_O	DR03: Maximum for weighing range 1	REAL		O	
INC_WR1_O	DR03: Digital increment for weighing range 1	REAL		O	
MIN_WR2_O	DR03: Minimum for weighing range 2	REAL		O	
MAX_WR2_O	DR03: Maximum for weighing range 2	REAL		O	
INC_WR2_O	DR03: Digital increment for weighing range 2	REAL		O	
MIN_WR3_O	DR03: Minimum for weighing range 3	REAL		O	
MAX_WR3_O	DR03: Maximum for weighing range 3	REAL		O	
INC_WR3_O	DR03: Digital increment for weighing range 3	REAL		O	
T_STILL1_O	DR03: Stand still time in ms	TIME	T#1S	O	
W_STILL1_O	DR03: Stand still weight	REAL		O	
T_WAIT_STILL1_O	DR03: Min waiting time for stand still	TIME	T#5S	O	

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
PON_Z_NEG_O	DR03: Zeroing negative range by power on (% of WR3)	BYTE	B#16#10	O	
PON_Z_POS_O	DR03: Zeroing positive range by power on % of WR3	BYTE	B#16#10	O	
Z_NEG_V_O	DR03: Zeroing negative range (% of WR3)	BYTE	B#16#1	O	
Z_POS_V_O	DR03: Zeroing positive range (% of WR3)	BYTE	B#16#3	O	
TARA_MAX_O	DR03: Tara range (% of WR3)	BYTE		O	
Res103_O	DR03: Reserve	BYTE		O	
Res203_O	DR03: Reserve	INT		O	
LEG_TRADE_O	DR03: OIML or no ----	STRING [4]		O	
W_UNIT_O	DR03: Unit for weight	STRING [4]		O	
W_STILL2_O	DR03: Stand still weight 2	REAL		O	
T_STILL2_O	DR03: Stand still time 2 in ms	TIME	T#1S	O	
MIN_T_STILL2_O	DR03: Min waiting time for stand still 2	TIME		O	
W_STILL3_O	DR03: Stand still weight 3	REAL		O	
T_STILL3_O	DR03: Stand still time 3 in ms	TIME		O	
MIN_T_STILL3_O	DR03: Min waiting time for stand still 3	TIME		O	
MIN_V_TOT_O	DR03: Minimum dosing value for totlising	REAL		O	
INC_TOT_O	DR03: Digital increment for totalised weight value	REAL		O	
Res303_O	DR03: Reserve (max. load)	REAL		O	
Res403_O	DR03: Reserve	BYTE		O	
Res503_O	DR03: Reserve	BYTE		O	

Table 9-5 CFC – SFTA connections – DS3 outputs

9.2.11 Base parameter (Data record 4):

Inputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
SC_TYPE_M04	DR04: Scale type (all types non automatic/automatic)	BYTE		I	+
Res104_M	DR04: Reserve	BYTE		I	+
Res204_M	DR04: Reserve	WORD		I	+
T_OUT_PR_M	DR04: Time out printer	TIME	T#2S	I	+
PROT_PARA_M	DR04: Weighing protocol output (printer=0, memory card=1)	BOOL	T#2S	I	+
Res304_M	DR04: Reserve	BYTE		I	+
LIMIT1_M	DR04: Limit 1 beased on gross weight (0) or net weight (1)	BOOL		I	+
LIMIT2_M	DR04: Limit 2 beased on gross weight (0) or net weight (1)	BOOL		I	+
EMPTY_GN_M	DR04: Basic for empty detection gross/netto	BOOL		I	+
Res404_M	DR04: Reserve	BYTE		I	+
EMPTY_RNG_M	DR04: Empty range	REAL		I	+
LIM1_ON_M	DR04: Value for limit 1 on	REAL		I	+
LIM1_OFF_M	DR04: Value for limit 1 off	REAL		I	+
LIM2_ON_M	DR04: Value for limit 2 on	REAL		I	+
LIM2_OFF_M	DR04: Value for limit 2 off	REAL		I	+

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
LIM3_ON_M	DR04: Value for limit 3 on	REAL		I	+
LIM3_OFF_M	DR04: Value for limit 3 off	REAL		I	+
MIN_FL1_M	DR04: Minimum flow (1/s) limit value 1	REAL		I	+
MIN_FL2_M	DR04: Minimum flow (1/s) limit value 2	REAL		I	+
MIN_F_D_FL_M	DR04: Filter depth of average value filter for minimum flow check	BYTE		I	+

Table 9-6 CFC – SFTA connections – DS4 inputs

Outputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
SC_TYPE_O04	DR04: Scale type (all types non automatic/automatic)	BYTE		O	
Res104_O	DR04: Reserve	BYTE		O	
Res204_O	DR04: Reserve	WORD		O	
T_OUT_PR_O	DR04: Time out printer	TIME	T#2S	O	
PROT_PARA_O	DR04: Weighing protocol output (printer=0, memory card=1)	BOOL	T#2S	O	
Res304_O	DR04: Reserve	BYTE		O	
LIMIT1_O	DR04: Limit 1 beased on gross weight (0) or net weight (1)	BOOL		O	
LIMIT2_O	DR04: Limit 2 beased on gross weight (0) or net weight (1)	BOOL		O	
EMPTY_GN_O	DR04: Basic for empty detection gross/netto	BOOL		O	
Res404_O	DR04: Reserve	BYTE		O	
EMPTY_RNG_O	DR04: Empty range	REAL		O	
LIM1_ON_O	DR04: Value for limit 1 on	REAL		O	
LIM1_OFF_O	DR04: Value for limit 1 off	REAL		O	
LIM2_ON_O	DR04: Value for limit 2 on	REAL		O	
LIM2_OFF_O	DR04: Value for limit 2 off	REAL		O	
LIM3_ON_O	DR04: Value for limit 3 on	REAL		O	
LIM3_OFF_O	DR04: Value for limit 3 off	REAL		O	
MIN_FL1_O	DR04: Minimum flow (1/s) limit value 1	REAL		O	
MIN_FL2_O	DR04: Minimum flow (1/s) limit value 2	REAL		O	
MIN_F_D_FL_O	DR04: Filter depth of average value filter for minimum flow check	BYTE		O	
Res504_O		BYTE		O	

Table 9-7 CFC – SFTA connections – DS4 outputs

9.2.12 Interface parameter (Data record 7):

Inputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
CLK_REQ_M	DR07: Request for time synchronization (yes=0, no=1)	BOOL		I	+
SIM_SRC_W_M	DR07: Source for simulation of weight	BYTE		I	+
DECPNT_M	DR07: Weight value correction after decimal point	BYTE		I	+
Res107_M	DR07: Reserve 1	BYTE		I	+
FRC_SERV_EN_M	DR07: Enable force digital output in service mode (yes=1, no=0)	BOOL		I	+

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
PROC_V1_M	DR07: Index for process value 1	BYTE		I	+
PROC_V2_M	DR07: Index for process value 2	BYTE		I	+
Res207_M	DR07: Reserve 2	BYTE		I	+
PR_AL0_M	DR07: Process alarm 0	WORD		I	+
PR_AL1_M	DR07: Process alarm 1	WORD		I	+
PR_AL2_M	DR07: Process alarm 2	WORD		I	+
PR_AL3_M	DR07: Process alarm 3	WORD		I	+
PR_AL4_M	DR07: Process alarm 4	WORD		I	+
PR_AL5_M	DR07: Process alarm 5	WORD		I	+
PR_AL6_M	DR07: Process alarm 6	WORD		I	+
PR_AL7_M	DR07: Process alarm 7	WORD		I	+
S7_LB_M	DR07: Lifebit check (0=off, 1.....n=sec)	TIME		I	+
AO_ZERO_M	DR07: Value for analog output for 0/4 mA	REAL		I	+
AO_END_M	DR07: Value for analog output for 20 mA	REAL		I	+
AO_CST_M	DR07: Value for analog output when OD-signal	REAL		I	+
AO_SRC_M	DR07: Source for control of analog output	BYTE		I	+
AO4_20_M	DR07: Parameter for analog output (0=0.....20 mA, 1=4....20 mA)	BOOL		I	+
PRT_BD_M	DR07: Printer baud rate	BYTE		I	+
RS232XONOFF_M	DR07: 0=XON/XOFF off, 1=XON/XOFF on	BOOL		I	+
RS232RTSCTS_M	DR07: 0=RTS/CTS off, 1=RTS/CTS on	BOOL		I	+
RS485_PROT_M	DR07: Protocoll for RS484(0=non, 1=SIEBERT S11)	BYTE		I	+
DECPNT_D_M	DR07: Decimal point for SIEBERT Display	BYTE		I	+
RS485_BD_M	DR07: RS485- baud rate	BYTE		I	+
RS485_PAR_M	DR07: Parity	BOOL		I	+
RS485_DATA_M	DR07: Data bits	BOOL		I	+
RS485_STOP_M	DR07: Stop bits	BOOL		I	+
DOF1_M	DR07: Function for digital output 1	BYTE		I	+
DOF2_M	DR07: Function for digital output 2	BYTE		I	+
DOF3_M	DR07: Function for digital output 3	BYTE		I	+
DOF4_M	DR07: Function for digital output 4	BYTE		I	+
DOF5_M	DR07: Function for digital output 5	BYTE		I	+
DOF6_M	DR07: Function for digital output 6	BYTE		I	+
DOF7_M	DR07: Function for digital output 7	BYTE		I	+
DOF8_M	DR07: Function for digital output 8	BYTE		I	+
DO_HL_A1_M	DR07: High/low active for digital output 1	BOOL		I	+
DO_HL_A2_M	DR07: High/low active for digital output 2	BOOL		I	+
DO_HL_A3_M	DR07: High/low active for digital output 3	BOOL		I	+
DO_HL_A4_M	DR07: High/low active for digital output 4	BOOL		I	+
DO_HL_A5_M	DR07: High/low active for digital output 5	BOOL		I	+
DO_HL_A6_M	DR07: High/low active for digital output 6	BOOL		I	+
DO_HL_A7_M	DR07: High/low active for digital output 7	BOOL		I	+
DO_HL_A8_M	DR07: High/low active for digital output 8	BOOL		I	+
DO_BY_E1_M	DR07: Digital output 1 activ by error or OD-signal	BOOL		I	+
DO_BY_E2_M	DR07: Digital output 2 activ by error or OD-signal	BOOL		I	+
DO_BY_E3_M	DR07: Digital output 3 activ by error or OD-signal	BOOL		I	+
DO_BY_E4_M	DR07: Digital output 4 activ by error or OD-signal	BOOL		I	+
DO_BY_E5_M	DR07: Digital output 5 activ by error or OD-signal	BOOL		I	+
DO_BY_E6_M	DR07: Digital output 6 activ by error or OD-signal	BOOL		I	+

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
DO_BY_E7_M	DR07: Digital output 7 activ by error or OD-signal	BOOL		I	+
DO_BY_E8_M	DR07: Digital output 8 activ by error or OD-signal	BOOL		I	+
DO_BY_E_EN_M	DR07: Enable digital output by error (1=aktiv, 0=not aktiv)	BOOL		I	+
Res407_M	DR07: Reserve	BYTE		I	+
DIF1_M	DR07: Function for digital input 1	BYTE		I	+
DIF2_M	DR07: Function for digital input 2	BYTE		I	+
DIF3_M	DR07: Function for digital input 3	BYTE		I	+
DIF4_M	DR07: Function for digital input 4	BYTE		I	+
DIF5_M	DR07: Function for digital input 5	BYTE		I	+
DIF6_M	DR07: Function for digital input 6	BYTE		I	+
DIF7_M	DR07: Function for digital input 7	BYTE		I	+
DI_HL_A1_M	DR07: High/low active for digital input 1	BOOL		I	+
DI_HL_A2_M	DR07: High/low active for digital input 2	BOOL		I	+
DI_HL_A3_M	DR07: High/low active for digital input 3	BOOL		I	+
DI_HL_A4_M	DR07: High/low active for digital input 4	BOOL		I	+
DI_HL_A5_M	DR07: High/low active for digital input 5	BOOL		I	+
DI_HL_A6_M	DR07: High/low active for digital input 6	BOOL		I	+
DI_HL_A7_M	DR07: High/low active for digital input 7	BOOL		I	+
CNT_T_M	DR07: Scanning time for input counter	TIME	T#1S	I	+
Res507_M	DR07: Reserve	DWORD		I	+
MMC_PR_OWR_M	DR07: MMC Protocol data storage overwrite mode (0=no, 1=yes)	BOOL		I	+
MMC_TR_OWR_M	DR07: MMC Trace date storage overwrite mode (0=no, 1=yes)	BOOL		I	+
MMC_RAM_TR_M	DR07: Trace data write in 0=RAM, 1=MMC	BOOL		I	+
MMC_TR_S_M	DR07: MMC Trace memory size (%)	BYTE		I	+
MMC_PR_S_M	DR07: MMC memory size (%) for protokoll	BYTE		I	+
MMC_TR_CYC_M	DR07: Trace cycle (1=10ms)	BYTE		I	+

Table 9-8 CFC – SFTA connections – DS7 inputs

Outputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
CLK_REQ_O	DR07: Request for time synchronization (yes=0, no=1)	BOOL		O	
SIM_SRC_W_O	DR07: Source for simulation of weight	BYTE		O	
DECPNT_O	DR07: Weight value correction after decimal point	BYTE		O	
Res107_O	DR07: Reserve 1	BYTE		O	
FRC_SERV_EN_O	DR07: Enable force digital output in service mode (yes=1, no=0)	BOOL		O	
PROC_V1_O	DR07: Index for process value 1	BYTE		O	
PROC_V2_O	DR07: Index for process value 2	BYTE		O	
Res207_O	DR07: Reserve 2	BYTE		O	
PR_AL0_O	DR07: Process alarm 0	WORD		O	
PR_AL1_O	DR07: Process alarm 1	WORD		O	
PR_AL2_O	DR07: Process alarm 2	WORD		O	
PR_AL3_O	DR07: Process alarm 3	WORD		O	
PR_AL4_O	DR07: Process alarm 4	WORD		O	
PR_AL5_O	DR07: Process alarm 5	WORD		O	
PR_AL6_O	DR07: Process alarm 6	WORD		O	
PR_AL7_O	DR07: Process alarm 7	WORD		O	

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
S7_LB_O	DR07: Lifebit check (0=off, 1.....n=sec)	TIME		O	
AO_ZERO_O	DR07: Value for analog output for 0/4 mA	REAL		O	
AO_END_O	DR07: Value for analog output for 20 mA	REAL		O	
AO_CST_O	DR07: Value for analog output when OD-signal	REAL		O	
AO_SRC_O	DR07: Source for control of analog output	BYTE		O	
AO4_20_O	DR07: Parameter for analog output (0=0.....20 mA, 1=4....20 mA)	BOOL		O	
PRT_BD_O	DR07: Printer baud rate	BYTE		O	
RS232XONOFF_O	DR07: 0=XON/XOFF off, 1=XON/XOFF on	BOOL		O	
RS232RTSCTS_O	DR07: 0=RTS/CTS off, 1=RTS/CTS on	BOOL		O	
RS485_PROT_O	DR07: Protocoll for RS484(0=non, 1=SIEBERT S11)	BYTE		O	
DECPNT_D_O	DR07: Decimal point for SIEBERT Display	BYTE		O	
RS485_BD_O	DR07: RS485- baud rate	BYTE		O	
RS485_PAR_O	DR07: Parity	BOOL		O	
RS485_DATA_O	DR07: Data bits	BOOL		O	
RS485_STOP_O	DR07: Stop bits	BOOL		O	
DOF1_O	DR07: Function for digital output 1	BYTE		O	
DOF2_O	DR07: Function for digital output 2	BYTE		O	
DOF3_O	DR07: Function for digital output 3	BYTE		O	
DOF4_O	DR07: Function for digital output 4	BYTE		O	
DOF5_O	DR07: Function for digital output 5	BYTE		O	
DOF6_O	DR07: Function for digital output 6	BYTE		O	
DOF7_O	DR07: Function for digital output 7	BYTE		O	
DOF8_O	DR07: Function for digital output 8	BYTE		O	
DO_HL_A1_O	DR07: High/low active for digital output 1	BOOL		O	
DO_HL_A2_O	DR07: High/low active for digital output 2	BOOL		O	
DO_HL_A3_O	DR07: High/low active for digital output 3	BOOL		O	
DO_HL_A4_O	DR07: High/low active for digital output 4	BOOL		O	
DO_HL_A5_O	DR07: High/low active for digital output 5	BOOL		O	
DO_HL_A6_O	DR07: High/low active for digital output 6	BOOL		O	
DO_HL_A7_O	DR07: High/low active for digital output 7	BOOL		O	
DO_HL_A8_O	DR07: High/low active for digital output 8	BOOL		O	
DO_BY_E1_O	DR07: Digital output 1 activ by error or OD-signal	BOOL		O	
DO_BY_E2_O	DR07: Digital output 2 activ by error or OD-signal	BOOL		O	
DO_BY_E3_O	DR07: Digital output 3 activ by error or OD-signal	BOOL		O	
DO_BY_E4_O	DR07: Digital output 4 activ by error or OD-signal	BOOL		O	
DO_BY_E5_O	DR07: Digital output 5 activ by error or OD-signal	BOOL		O	
DO_BY_E6_O	DR07: Digital output 6 activ by error or OD-signal	BOOL		O	
DO_BY_E7_O	DR07: Digital output 7 activ by error or OD-signal	BOOL		O	
DO_BY_E8_O	DR07: Digital output 8 activ by error or OD-signal	BOOL		O	
DO_BY_E_EN_O	DR07: Enable digital output by error (1=aktiv, 0=not aktiv)	BOOL		O	
Res407_O	DR07: Reserve	BYTE		O	
DIF1_O	DR07: Function for digital input 1	BYTE		O	
DIF2_O	DR07: Function for digital input 2	BYTE		O	
DIF3_O	DR07: Function for digital input 3	BYTE		O	
DIF4_O	DR07: Function for digital input 4	BYTE		O	

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
DIF5_O	DR07: Function for digital input 5	BYTE		O	
DIF6_O	DR07: Function for digital input 6	BYTE		O	
DIF7_O	DR07: Function for digital input 7	BYTE		O	
DI_HL_A1_O	DR07: High/low active for digital input 1	BOOL		O	
DI_HL_A2_O	DR07: High/low active for digital input 2	BOOL		O	
DI_HL_A3_O	DR07: High/low active for digital input 3	BOOL		O	
DI_HL_A4_O	DR07: High/low active for digital input 4	BOOL		O	
DI_HL_A5_O	DR07: High/low active for digital input 5	BOOL		O	
DI_HL_A6_O	DR07: High/low active for digital input 6	BOOL		O	
DI_HL_A7_O	DR07: High/low active for digital input 7	BOOL		O	
CNT_T_O	DR07: Scanning time for input counter	TIME	T#1S	O	
Res507_O	DR07: Reserve	DWORD		O	
MMC_PR_OWR_O	DR07: MMC Protocol data storage overwrite mode (0=no, 1=yes)	BOOL		O	
MMC_TR_OWR_O	DR07: MMC Trace date storage overwrite mode (0=no, 1=yes)	BOOL		O	
MMC_RAM_TR_O	DR07: Trace data write in 0=RAM, 1=MMC	BOOL		O	
MMC_TR_S_O	DR07: MMC Trace memory size (%)	BYTE		O	
MMC_PR_S_O	DR07: MMC memory size (%) for protokoll	BYTE		O	
MMC_TR_CYC_O	DR07: Trace cycle (1=10ms)	BYTE		O	

Table 9-9 CFC – SFTA connections – DS7 outputs

9.2.13 Date/Time (Data record 8):

Input/output:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
DT_M	DR08: Date and time for siwarex	DATE_AND_TIME		I	
DT_O	DR08: Date and time for siwarex	DATE_AND_TIME		O	

Table 9-10 CFC – SFTA connections – DS8

9.2.14 Application ID (Data record 9):

Outputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
CRC_CH_M	DR09: CRC checksum of the application software	DWORD		I	+
LENGTH_M	DR09: Application software lengh	DWORD		I	+
COPYRT_M	DR09: Copywrite	STRING [26]		I	+
MOD_NAME_M	DR09: Module name	STRING [10]		I	+
APPL_ID_M	DR09: Application identifier	STRING [32]		I	+
FILE_NAME_M	DR09: File name	STRING [20]		I	+
A_VER_M	DR09: Application version	CHAR		I	+
A_F_VER_M	DR09: Function identification	BYTE		I	+
A_DR_VER_M	DR09: Data record structure identification	BYTE		I	+
A_VER_NO_M	DR09: Application version number	BYTE		I	+

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
CREAT_D_M	DR09: Creation date	STRING [10]		I	+
CREAT_T_M	DR09: Creation time	STRING [8]		I	+
VER_BOOT_M	DR09: Boot version	WORD		I	+
SC_TYPE_M9	DR09: Type of scale	STRING [4]		I	+

Table 9-11 CFC – SFTA connections – DS9

9.2.15 Tare input weight (Data record 15):

Manual-, Automatic input and output:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
TARE_V_M	DR15: Tare set value	REAL		I	+
TARE_V_A	DR15: Tare set value	REAL		I	
TARE_V_O	DR15: Tare set value	REAL		O	

Table 9-12 CFC – SFTA connections – DS15

9.2.16 Weight simulation value (Data record 16):

Manual-, Automatic input and output:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
SIM_V_M	DR16: Simulation value for weight	REAL		I	+
SIM_V_A	DR16: Simulation value for weight	REAL		I	
SIM_V_O	DR16: Simulation value for weight	REAL		O	

Table 9-13 CFC – SFTA connections - DS16

9.2.17 Ext. Analogue default value (Data record 17):

Manual-, Automatic input and output:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
AO_V_M17	DR17: analog output value	REAL		I	+
AO_V_A17	DR17: analog output value	REAL		I	
AO_V_O17	DR17: analog output value	REAL		O	

Table 9-14 CFC – SFTA connections – DS17

9.2.18 Ext. display default value (Data record 18):

Manual-, Automatic input and output:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
DISP_V_ADD_M	DR18: Additional value for digital display	REAL		I	+
DISP_V_ADD_A	DR18: Additional value for digital display	REAL		I	
DISP_V_ADD_O	DR18: Additional value for digital display	REAL		O	

Table 9-15 CFC – SFTA connections – DS18

9.2.19 Set value (Data record 20):

Manual-, Automatic input and output:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
SP_V_M	DR20: Set point for dosing cycle	REAL		I	+
SP_V_A	DR20: Set point for dosing cycle	REAL		I	
SP_V_O	DR20: Set point for dosing cycle	REAL		O	

Table 9-16 CFC – SFTA connections – DS20

9.2.20 Fill amount (Data record 21):

Manual-, Automatic input and output:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
SP_LOAD_V_M	DR21: Set point for load (totalizing)	REAL		I	+
SP_LOAD_V_A	DR21: Set point for load (totalizing)	REAL		I	
SP_LOAD_V_O	DR21: Set point for load (totalizing)	REAL		O	

Table 9-17 CFC – SFTA connections – DS21

9.2.21 Fill parameter (Data record 22):

Manual inputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
MAX_DOS_T_M	DR22: Maximum time for dosing cycle	TIME	T#10S	I	+
IN_FL_V_M	DR22: In flight value	REAL		I	+
FINE_V_M	DR22: Fine value	REAL		I	+
COMP_V_M	DR22: Fine switch off correction	REAL		I	+
T_PREDOS_M	DR22: Timer for predosing	TIME		I	+
TO1_M	DR22: First tolerance band plus	REAL		I	+
TU1_M	DR22: First tolerance band minus	REAL		I	+
TO2_M	DR22: Second tolerance band plus	REAL		I	+
TU2_M	DR22: Second tolerance band minus	REAL		I	+

Table 9-18 CFC – SFTA connections – DS22 manual inputs

Automatic inputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
MAX_DOS_T_A	DR22: Maximum time for dosing cycle	TIME	T#10S	I	
IN_FL_V_A	DR22: In flight value	REAL		I	
FINE_V_A	DR22: Fine value	REAL		I	
COMP_V_A	DR22: Fine switch off correction	REAL		I	
T_PREDOS_A	DR22: Timer for predosing	TIME		I	
TO1_A	DR22: First tolerance band plus	REAL		I	
TU1_A	DR22: First tolerance band minus	REAL		I	
TO2_A	DR22: Second tolerance band plus	REAL		I	
TU2_A	DR22: Second tolerance band minus	REAL		I	

Table 9-19 CFC – SFTA connections – DS22 automatic inputs

Outputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
MAX_DOS_T_O	DR22: Maximum time for dosing cycle	TIME	T#10S	O	
IN_FL_V_O	DR22: In flight value	REAL		O	
FINE_V_O	DR22: Fine value	REAL		O	
COMP_V_O	DR22: Fine switch off correction	REAL		O	
T_PREDOS_O	DR22: Timer for predosing	TIME		O	
TO1_O	DR22: First tolerance band plus	REAL		O	
TU1_O	DR22: First tolerance band minus	REAL		O	
TO2_O	DR22: Second tolerance band plus	REAL		O	
TU2_O	DR22: Second tolerance band minus	REAL		O	

Table 9-20 CFC – SFTA connections - outputs

9.2.22 Dosing parameter (Data record 23):

Inputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
TXTNO_A_M	DR23: Text number for automatic protocol by finished	BYTE		I	+
Res123_M	DR23: Reserve	BYTE		I	+
Res223_M	DR23: Reserve	WORD		I	+
MAX_SP_UNLD_M	DR23: Maximum setpoint for one dosing (totalizing scale type)	REAL		I	+
DIS_COARSE_M	DR23: Disable time for coarse dosing	TIME	T#500MS	I	+
DIS_FINE_M	DR23: Disable time for fine dosing	TIME	T#500MS	I	+
DIS_COMPARE_M	DR23: Max disable time for dosing comparator	TIME		I	+
COARSE_AO_V_M	DR23: Analog value when coarse signal on	BYTE		I	+
FINE_AO_V_M	DR23: Analog value when fine signal on	BYTE		I	+
F_TYPE_D_M	DR23: FIlter type for dosing filter	BYTE		I	+
F_FREQ_D_M	DR23: Dosing filter low pass frequency	BYTE		I	+
TARA_Z_PROG_M	DR23: Selection of tara/zeroing programm for automatic dosing	BYTE		I	+
TARA_Z_CYC_M	DR23: Cycle for not tarring or zeroing by automatic dosing	BYTE		I	+
Res323_M	DR23: Reserve	WORD		I	+
TARA_MIN_V_M	DR23: Minimum tare value	REAL		I	+
TARA_MAX_V_M	DR23: Maximum tare value	REAL		I	+
T_FOR_Z_M	DR23: TIME between two automatic zeroing	TIME	T#5M	I	+
W_DI0_STEP_N_M	DR23: Dosing is waiting in step n (0.....7) by digital input no 0 on	BYTE		I	+
W_DI1_STEP_N_M	DR23: Dosing is waiting in step n (0.....7) by digital input no 1 on	BYTE		I	+
W_DI2_STEP_N_M	DR23: Dosing is waiting in step n (0.....7) by digital input no 2 on	BYTE		I	+
W_DI3_STEP_N_M	DR23: Dosing is waiting in step n (0.....7) by digital input no 3 on	BYTE		I	+
W_DI4_STEP_N_M	DR23: Dosing is waiting in step n (0.....7) by digital input no 4 on	BYTE		I	+
W_DI5_STEP_N_M	DR23: Dosing is waiting in step n (0.....7) by digital input no 5 on	BYTE		I	+
W_DI6_STEP_N_M	DR23: Dosing is waiting in step n (0.....7) by digital input no 6 on	BYTE		I	+
Res423_M	DR23: Reserve	BYTE		I	+
T_ONE_STEP_M	DR23: Time for one step while dosing	TIME		I	+

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
Res523_M	DR23: Reserve	BOOL		I	+
CH_STOP_STEP1_M	DR23: Check stop at the end of step 1	BOOL		I	+
CH_STOP_STEP2_M	DR23: Check stop at the end of step 2	BOOL		I	+
CH_STOP_STEP3_M	DR23: Check stop at the end of step 3	BOOL		I	+
CH_STOP_STEP4_M	DR23: Check stop at the end of step 4	BOOL		I	+
CH_STOP_STEP5_M	DR23: Check stop at the end of step 5	BOOL		I	+
CH_STOP_STEP6_M	DR23: Check stop at the end of step 6	BOOL		I	+
CH_STOP_STEP7_M	DR23: Check stop at the end of step 7	BOOL		I	+
Res623_M	DR23: Reserve	BYTE		I	+
AUTO_AFTER_DOS_M	DR23: Automatic after dosing when tol-	BOOL		I	+
AFTER_DOS_METH_M	DR23: Method for after dosing (0=conti, 1=inching)	BOOL		I	+
TO1_STOP_M	DR23: Dosing stop when outrange TO1	BOOL		I	+
TO2_STOP_M	DR23: Dosing stop when outrange TO2	BOOL		I	+
PER_NOTOL_CH_M	DR23: Period for no tolerance check	BYTE		I	+
T_INCH_P_M	DR23: Time for fine signal pulse by inching mode	TIME	T#1S	I	+
CNTR_R_ERR_M	DR23: Controller reset by error	BOOL	T#1S	I	+
CNTR_TYPE_M	DR23: Controller type	BYTE		I	+
PR_CNTR_F_M	DR23: Factor for proportional controller	BYTE		I	+
PR_CNTR_LIM_M	DR23: Limit for proportional controller	REAL		I	+
PR_CNTR_OPP_M	DR23: Proportional controller optimum plus	REAL		I	+
PR_CNTR_OPM_M	DR23: Proportional controller optimum minus	REAL		I	+
MIN_FINE_T_M	DR23: Minimum time for fine signal	TIME	T#1S	I	+
F_T_CNTR_M	DR23: Factor for fine time controller	BYTE		I	+
Res723_M	DR23: Reserve	BYTE		I	+
Res823_M	DR23: Reserve	WORD		I	+
T_OVLAP_M	DR23: Overlap time while emptying	TIME		I	+
T_EMPTY_M	DR23: Emptying time	TIME		I	+
MAX_T_EMPTY_M	DR23: Max time for emptying	TIME		I	+
UNLD_ONLY_COARSE_M	DR23: Unload only coarse	BOOL		I	+
Res923_M	DR23: Reserve	BYTE		I	+

Table 9-21 CFC – SFTA connections – DS23 inputs

Outputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
TXTNO_A_O	DR23: Text number for automatic protocol by finished	BYTE		O	
Res123_O	DR23: Reserve	BYTE		O	
Res223_O	DR23: Reserve	WORD		O	
MAX_SP_UNLD_O	DR23: Maximum setpoint for one dosing (totalizing scale type)	REAL		O	

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
DIS_COARSE_O	DR23: Disable time for coarse dosing	TIME	T#500MS	O	
DIS_FINE_O	DR23: Disable time for fine dosing	TIME	T#500MS	O	
DIS_COMPARE_O	DR23: Max disable time for dosing comparator	TIME		O	
COARSE_AO_V_O	DR23: Analog value when coarse signal on	BYTE		O	
FINE_AO_V_O	DR23: Analog value when fine signal on	BYTE		O	
F_TYPE_D_O	DR23: FIlter type for dosing filter	BYTE		O	
F_FREQ_D_O	DR23: Dosing filter low pass frequency	BYTE		O	
TARA_Z_PROG_O	DR23: Selection of tara/zeroing programm for automatic dosing	BYTE		O	
TARA_Z_CYC_O	DR23: Cycle for not tarring or zeroing by automatic dosing	BYTE		O	
Res323_O	DR23: Reserve	WORD		O	
TARA_MIN_V_O	DR23: Minimum tare value	REAL		O	
TARA_MAX_V_O	DR23: Maximum tare value	REAL		O	
T_FOR_Z_O	DR23: TIME between two automatic zeroing	TIME	T#5M	O	
W_DI0_STEP_N_O	DR23: Dosing is waiting in step n (0.....7) by digital input no 0 on	BYTE		O	
W_DI1_STEP_N_O	DR23: Dosing is waiting in step n (0.....7) by digital input no 1 on	BYTE		O	
W_DI2_STEP_N_O	DR23: Dosing is waiting in step n (0.....7) by digital input no 2 on	BYTE		O	
W_DI3_STEP_N_O	DR23: Dosing is waiting in step n (0.....7) by digital input no 3 on	BYTE		O	
W_DI4_STEP_N_O	DR23: Dosing is waiting in step n (0.....7) by digital input no 4 on	BYTE		O	
W_DI5_STEP_N_O	DR23: Dosing is waiting in step n (0.....7) by digital input no 5 on	BYTE		O	
W_DI6_STEP_N_O	DR23: Dosing is waiting in step n (0.....7) by digital input no 6 on	BYTE		O	
Res423_O	DR23: Reserve	BYTE		O	
T_ONE_STEP_O	DR23: Time for one step while dosing	TIME		O	
Res523_O	DR23: Reserve	BOOL		O	
CH_STOP_STEP1_O	DR23: Check stop at the end of step 1	BOOL		O	
CH_STOP_STEP2_O	DR23: Check stop at the end of step 2	BOOL		O	
CH_STOP_STEP3_O	DR23: Check stop at the end of step 3	BOOL		O	
CH_STOP_STEP4_O	DR23: Check stop at the end of step 4	BOOL		O	
CH_STOP_STEP5_O	DR23: Check stop at the end of step 5	BOOL		O	
CH_STOP_STEP6_O	DR23: Check stop at the end of step 6	BOOL		O	
CH_STOP_STEP7_O	DR23: Check stop at the end of step 7	BOOL		O	
Res623_O	DR23: Reserve	BYTE		O	
AUTO_AFTER_DOS_O	DR23: Automatic after dosing when tol-	BOOL		O	
AFTER_DOS_METH_O	DR23: Method for after dosing (0=conti, 1=inching)	BOOL		O	
TO1_STOP_O	DR23: Dosing stop when outrange TO1	BOOL		O	
TO2_STOP_O	DR23: Dosing stop when outrange TO2	BOOL		O	
PER_NOTOL_CH_O	DR23: Period for no tolerance check	BYTE		O	

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
T_INCH_P_O	DR23: Time for fine signal pulse by inching mode	TIME	T#1S	O	
CNTR_R_ERR_O	DR23: Controller reset by error	BOOL	T#1S	O	
CNTR_TYPE_O	DR23: Controller type	BYTE		O	
PR_CNTR_F_O	DR23: Factor for proportional controller	BYTE		O	
PR_CNTR_LIM_O	DR23: Limit for proportional controller	REAL		O	
PR_CNTR_OPP_O	DR23: Proportional controller optimum plus	REAL		O	
PR_CNTR_OPM_O	DR23: Proportional controller optimum minus	REAL		O	
MIN_FINE_T_O	DR23: Minimum time for fine signal	TIME	T#1S	O	
F_T_CNTR_O	DR23: Factor for fine time controller	BYTE		O	
Res723_O	DR23: Reserve	BYTE		O	
Res823_O	DR23: Reserve	WORD		O	
T_OVLAP_O	DR23: Overlap time while emptying	TIME		O	
T_EMPTY_O	DR23: Emptying time	TIME		O	
MAX_T_EMPTY_O	DR23: Max time for emptying	TIME		O	
UNLD_ONLY_COARSE_O	DR23: Unload only coarse	BOOL		O	
Res923_O	DR23: Reserve	BYTE		O	

Table 9-22 CFC – SFTA connections – DS23 outputs

9.2.23 Process values (Data record 30):

Outputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
SWR1_O	DR30: Status weighing range 1	BOOL		O	+
SWR2_O	DR30: Status weighing range 2	BOOL		O	+
SWR3_O	DR30: Status weighing range 3	BOOL		O	+
SLIM1_ON_O	DR30: Status limit 1 is on	BOOL		O	+
SLIM2_ON_O	DR30: Status limit 2 is on	BOOL		O	+
SLIM3_ON_O	DR30: Status limit 3 is on	BOOL		O	+
STARED_O	DR30: Status scale tared	BOOL		O	+
STARED_BY_M_O	DR30: Status scale tared by manual	BOOL		O	+
SMAX_9E_O	DR30: Status max plus 9 e	BOOL		O	+
S025D_Z_O	DR30: Status zero 0.25 d	BOOL		O	+
SWAIT_STILL1_O	DR30: Status waiting for stand still 1	BOOL		O	+
SSTILL1_ON_O	DR30: Status stand still 1 on	BOOL		O	+
SSC_CAL_O	DR30: Status scale ist calibrated	BOOL		O	+
SCMDERR_DI_O	DR30: Status comand error on digital input	BOOL		O	+
SSIM_ON_O	DR30: Status weighing simulation is on	BOOL		O	+
SSERV_MODE_ON_O	DR30: Status service mode is on	BOOL		O	+
SPRT_O	DR30: Status printing protocol	BOOL		O	+
SRS232_BUSY_O	DR30: Status rs232 busy by siwarex protocol	BOOL		O	+
SMMC_CON_O	DR30: Status micro memory card conected	BOOL		O	+
SMMC_RDY_O	DR30: Status mmc ready and formated	BOOL		O	+
SMMC_RDY_F_TR_O	DR30: Status mmc is ready for trace	BOOL		O	+
SMMC_RDY_W_O	DR30: Status mmc is ready for legal data	BOOL		O	+
SMMC_TR_A_O	DR30: Status mmc trace data is activ	BOOL		O	+
SMIN_FLOW1_O	DR30: Status min flow 1	BOOL		O	+
SMIN_FLOW2_O	DR30: Status min flow 2	BOOL		O	+
SEMPTY_O	DR30: Status scale empty	BOOL		O	+
SL_DATA_PROT_	DR30: Status legal data protection on	BOOL		O	+

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
O					
SRes130_O	DR30: Status reserve	BOOL		O	+
SRes230_O	DR30: Status reserve	BOOL		O	+
SRes330_O	DR30: Status reserve	BOOL		O	+
SRes430_O	DR30: Status reserve	BOOL		O	+
SERR_OC_O	DR30: Status module error	BOOL		O	+
SDOS_STEP0_O	DR30: Status dosing cyclus in step 0	BOOL		O	+
SDOS_STEP1_O	DR30: Status dosing cyclus in step 1	BOOL		O	+
SDOS_STEP2_O	DR30: Status dosing cyclus in step 2	BOOL		O	+
SDOS_STEP3_O	DR30: Status dosing cyclus in step 3	BOOL		O	+
SDOS_STEP4_O	DR30: Status dosing cyclus in step 4	BOOL		O	+
SDOS_STEP5_O	DR30: Status dosing cyclus in step 5	BOOL		O	+
SDOS_STEP6_O	DR30: Status dosing cyclus in step 6	BOOL		O	+
SDOS_STEP7_O	DR30: Status dosing cyclus in step 7	BOOL		O	+
SAFTER_DOS_O	DR30: Status after dosing is activ	BOOL		O	+
SCOARSE_ON_O	DR30: Status coarse signal on	BOOL		O	+
SFINE_ON_O	DR30: Status fine signal on	BOOL		O	+
ST_PREDOS_O	DR30: Status timer predosing is running	BOOL		O	+
SEMPTY_ON_O	DR30: Status emptying signal is on	BOOL		O	+
SSTOPPED_O	DR30: Status dosing cyclus temporarly stopped	BOOL		O	+
SCH_STPD_O	DR30: Status check stop	BOOL		O	+
SCH_STP_FOL_O	DR30: Status check stop follows	BOOL		O	+
SDOS_CY_ABO_O	DR30: Status dosing cyclus aborted	BOOL		O	+
SN_STEP_W_O	DR30: Status next step is waiting for trigger	BOOL		O	+
STO2_O	DR30: Status tol plus to2 on	BOOL		O	+
STO1_O	DR30: Status tol plus to1 on	BOOL		O	+
STOL_OK_O	DR30: Status tolerance ok	BOOL		O	+
STU1_O	DR30: Status tol minus to1 on	BOOL		O	+
STU2_O	DR30: Status tol minus to2 on	BOOL		O	+
STOL_BAD_O	DR30: Status tolerance bad	BOOL		O	+
SSTILL2_ON_O	DR30: Status stand still 2 on	BOOL		O	+
SSTILL3_ON_O	DR30: Status stand still 3 on	BOOL		O	+
SRes523_O	DR30: Status reserve	BOOL		O	+
SDIS_COMPARA_O	DR30: Status disable set point comparator	BOOL		O	+
SCONTI_MODE_DOS_O	DR30: Status continus mode on by dosing	BOOL		O	+
SRes630_O	DR30: Status reserve	BOOL		O	+
SEND_DOS_CYC_O	DR30: Status end of one dosing cyclus	BOOL		O	+
SEND_CHARGE_O	DR30: Status end of charge (unload mode)	BOOL		O	+
SGROS_WGT_O	DR30: Actual weight process value gross	REAL		O	+
SNET_WGT_O	DR30: Actual weight process value netto	REAL		O	+
STARE_WGT_O	DR30: Actual weight process value tare	REAL		O	+
SGROS_NET_V_O	DR30: Actual weihgt process legal value	REAL		O	+
SGROS_NET_V_10X_O	DR30: Actual weight process legal value x 10	REAL		O	+
STARE_V_O	DR30: Actual weight tare process legal value	REAL		O	+

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
SLAST_DOS_V_O	DR30: Actual weight process last dosing cyclus	REAL		O	+
SCOUNTER_V_O	DR30: Actual counter value	DINT		O	+
STOT_V1_O	DR30: Actual total of loaded weight 1	STRUCT		O	
STOT_V2_O	DR30: Actual total of loaded weight 2	REAL		O	+

Table 9-23 CFC – SFTA connections – DS30 outputs

9.2.24 Extended process values (Data record 31):

Outputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
M_FLOW_O	DR31: Actual materilaflow (Weight/s)	REAL		O	+
ACT_AFTERRUN_V_O	DR31: Actual in flight value calculated by siwarex	REAL		O	+
ACT_FINE_V_O	DR31: Actual fine value calculated by siwarex	REAL		O	+
ACT_TEMP_O	DR31: Actual Temperature	DINT		O	+
ACT_DIG_FS_O	DR31: Actual digit value by AD-converter signal filter	DINT		O	+
ACT_DIG_FD_O	DR31: Actual digit value by AD-converter dosing filter	DINT		O	+
NET_WGT_FAST_O	DR31: Actuel weight process value netto	REAL		O	+
ACT_SP_UNLD_O	DR31: Actual setpoint for unload	REAL		O	+
ACT_ERR_SERV_O	DR31: Actual error (only for service)	DWORD		O	+
ACT_DT_O	DR31: Actual date and time in siwarex	DATE_AND_TIME		O	
AO_V_O31	DR31: Actual analog output value	INT		O	+
ACT_DI_O	DR31: Actual state of digital input	BYTE		O	+
Res131_O	DR31: Reserve	BYTE		O	+
SEN_RES_REF_O	DR31: Sensor resistance reference value	INT		O	+
SEN_RES_CH_O	DR31: Sensor resistance actual check value	INT		O	+

Table 9-24 CFC – SFTA connections – DS31 outputs

9.2.25 Statistic data (Data record 32):

Outputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
CNT_CYC_TOT_O	DR32: Cyclus counter	INT		O	+
CNT_CH_CYC_O	DR32: Counter for tolerance checked cyclus	INT		O	+
CNT_TO2_EX_O	DR32: Counter - more than to2 plus band	INT		O	+
CNT_TO1_BAND_O	DR32: Counter - more than to1 plus band	INT		O	+
CNT_TOL_OK_O	DR32: Counter - tolerance ok	INT		O	+
CNT_TU1_BAND_O	DR32: Counter - less than TU1	INT		O	+
CNT_TU2_BAND_O	DR32: Counter - less than TU2	INT		O	+
CNT_TOL_BAD_O	DR32: Counter - Tolerance bad	INT		O	+
Res132_O	DR32: Reserve	INT		O	+
Res133_O	DR32: Reserve	INT		O	+
ACT_SP_O	DR32: Actual set point	REAL		O	+

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
ACT_AV_V_O	DR32: Actual average value by checked cyclus	REAL		O	+
STD_DEV_O	DR32: Standard deviation	REAL		O	+
THRU_PER_H_O	DR32: Thruput per hour	REAL		O	+
CYC_PER_H_O	DR32: Dosing cyclus per hour	INT		O	+

Table 9-25 CFC – SFTA connections – DS32 outputs

9.2.26 ASCII weight value (Data record 34):

Output:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
ASCII_WGT_O	DR34: Actual ASCII weigt (same as for display)	STRING [16]		O	+

Table 9-26 CFC – SFTA connections – DS34 outputs

9.2.27 Encryption data (Data record 35):

Output:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
DATAx_O 01<=x<=32	DR35: Kryptodata	BYTE		O	+

Table 9-27 CFC – SFTA connections – DS35 outputs

9.2.28 Last log data (Data record 44):

Outputs:

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
MMC_ID1_O	DR44: MMC Id number1	WORD		O	+
MMC_ID2_O	DR44: MMC Id number2	WORD		O	+
MMC_ID3_O	DR44: MMC Id number3	BYTE		O	+
Res144_O	DR44: Reserve	BYTE		O	+
Res244_O	DR44: Reserve	WORD		O	+
PROT_ID_O	DR44: Id of protocol	DINT		O	+
L_PROT_O	Text of last protocol	STRING [160]		O	+

Table 9-28 CFC – SFTA connections – DS44 outputs

9.2.29 Supplement string (Data record 45):

Inputs (Manual or Automatic):

Connection (Parameter)	Meaning	Data type	Default	Type	O&O
ADD_TXT1_M	DR45: Additional text 1	STRING [16]		I	+
ADD_TXT2_M	DR45: Additional text 2	STRING [16]		I	+
ADD_TXT3_M	DR45: Additional text 3	STRING [16]		I	+
ADD_TXT4_M	DR45: Additional text 4	STRING [16]		I	+

Table 9-29 CFC – SFTA connections – DS45 inputs

Outputs:

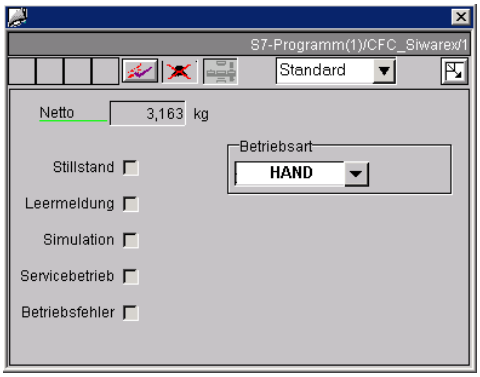
Connection (Parameter)	Meaning	Data type	Default	Type	O&O
ADD_TXT1_O	DR45: Additional text 1	STRING [16]		O	
ADD_TXT2_O	DR45: Additional text 2	STRING [16]		O	
ADD_TXT3_O	DR45: Additional text 3	STRING [16]		O	
ADD_TXT4_O	DR45: Additional text 4	STRING [16]		O	

Table 9-30 CFC – SFTA connections – DS45 outputs

9.3 Examples for image blocks for SIWAREX FTA

9.3.1 Faceplate display in OS

The example faceplate for the SIWAREX FTA modules was created with the Faceplate Designer from PCS7 version 6.0. The WinCC images and scripts that are created can be modified according to individual requirements.



The example faceplate includes the following views:

Image 9-2 Standard view for SIWAREX FTA

The operator can view the current net weight of the scale in this view, Stati. The Manual/Automatic operating modes can also be switched.

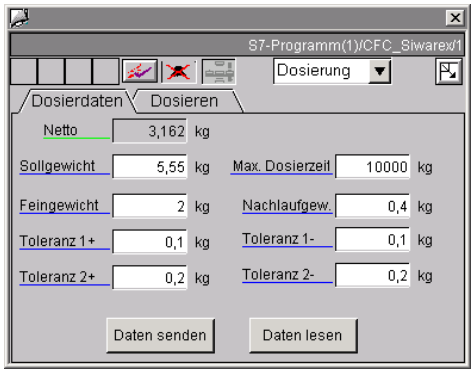


Image 9-3 Dosing data view

Parameters for the following weighing procedures can be defined in the dosing data view.

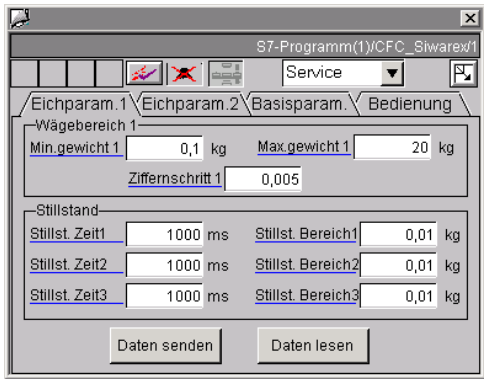


Image 9-4 Service view

There are several service views. Editing the data for all service views enables scale adjustment from the OS.

9.3.2 Faceplate Creation

Mainly, those standard items that are described in the documentation on the Faceplate Designer and that have been delivered with the Faceplate Designer are used. This description concentrates on the features that have been implemented for the SIWAREX FTA Faceplate.

Tabs

To help clarify matters, two Faceplate view with up to 4 tabs have been shown in different images. Switching between the tabs is done using function „SH6_ChangeView_tab.fct“. Each tab must have the name of the image that it is calling.

Operating authorization

In every view, an element having the name „Level5_MODE“ or „Level6_MODE“ is found. These elements do not only the enable operating authorization from the User Administrator but they also deny operating authorization in Automatic operating mode. This is done with function „SH6_CheckPermission_Plus.fct“, which is called when the image is loaded and when the operating mode is changed. Passing the operating mode to the individual elements is performed through direct connections.

Only the Manual-Automatic switch with the "single operating authorization" (level5) can be used with the default settings. All other operations require the "higher value operating authorization“ (level6).

Combo-boxes with several entries

Various combo-boxes have 3 or more entries. These combo-boxes are described further using an example of the combo-box for the dosing commands.

With a mouse click on the combo-box, the image „@PG_SFT_AWI_SCROLL_DOSEING.pdl“ is opened:

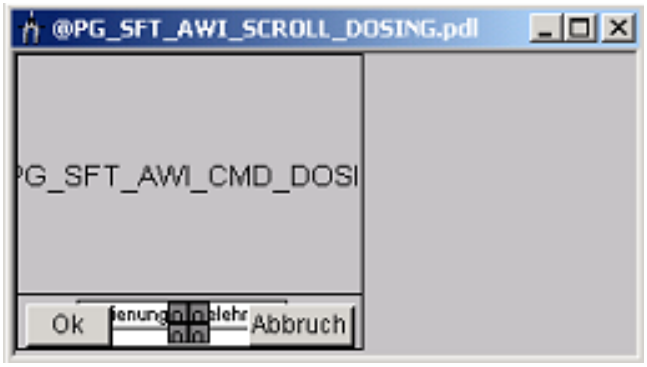


Image 9-5 Combo-box with several entries

The image „@PG_SFT_AWI_SCROLL_DOSEING.pdl“ is based on the „@FPD_BedAnalog.PDL“ image. The main difference is that the analogue value is not entered in the IO-field, instead, a command which has an analogue value assigned as the command code is selected. The commands are listed in individual text fields in the image @PG_SFT_AWI_CMD_DOSING.pdl“:

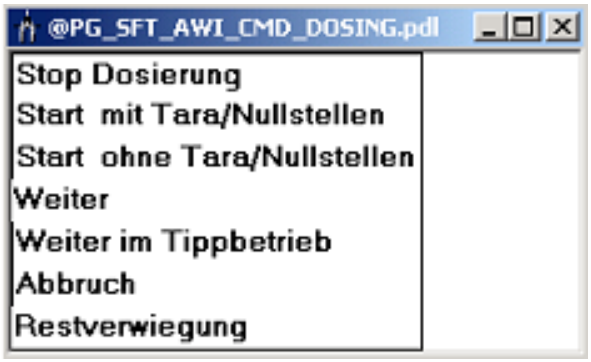


Image 9-6 Command selection

While selecting a command with the mouse, the command code is written into the IO-field "Value" of the „@PG_SFT_AWI_SCROLL_DOSEING.pdl“ image. If the output value „Value“ is changed then the transmitted command is highlighted in colour and the respective command code is transferred to the block with „OK“.

Faceplate Views

In all Faceplate views, the invisible objects in the WinCC runtime are also displayed. The switching of the individual elements can also be handled in the WinCC images.

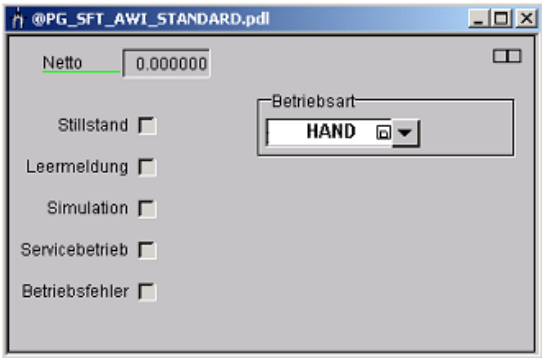


Image 9-7 Standard view

The net weight value and the various Stati are shown in this view. The operating mode can also be switched.

10 Commissioning using a PC – SIWATOOL FTA

10.1 General

The scale can be put into operation using the SIWAREX FTA program independent of commissioning the SIMATIC automation system.

The program is included with the delivery of the project planning package.
The program (Catalogue SIWATOOL_FTA) must be installed in the first step.
Memory requirements on the hard disk are less than 50 MB.

10.2 Windows and functions of the SIWATOOL FTA

The program windows are constructed so that navigating through the parameters of the SIWAREX FTA is made easier. In the left-hand portion, an overview of the parameters is shown in a tree structure. Grouping the parameters corresponds with the various activities which can occur during project planning, commissioning, testing and during service.
A data record in SIWAREX FTA belongs with every branch of the tree structure. Several parameters are combined in one data record. In the right-hand window, the parameters of a data record can be edited in index card format.
An information sheet is shown as the first index card. This information sheet informs the user of which tasks can be edited with the parameters of the selected data record. Sending, receiving or transferring always involves the entire data record and not an index card.

10.3 Offline Project Planning

All scale parameters can be edited and stored without the SIWAREX FTA. This can decrease the start-up time.
The parameters for several scales can be prepared in the office and only have to be transferred to the SIWAREX for commissioning.
Data can also be read from one scale in the operation and used for commissioning other scales.

10.4 Online Operation

To switch to online operation, the PC must be connected through the SIWATOOL cable (see *Accessories*) with SIWAREX FTA. The COM interface can be set up in the communications menu.
All parameters can be changed in online operation. A message window shows the current contents of the message buffer from SIWAREX FTA. The current process values can be observed in various windows. For testing purposes, all commands can be sent to the SIWAREX FTA.
For archiving, all data can be read and stored in a file or can be printed.

Warning

In online operation, all data in the module can be edited. The changes are not automatically fed into the respective scales-data records. You, as the user, must decide whether the data adjustment is necessary and whether it should be performed or not.

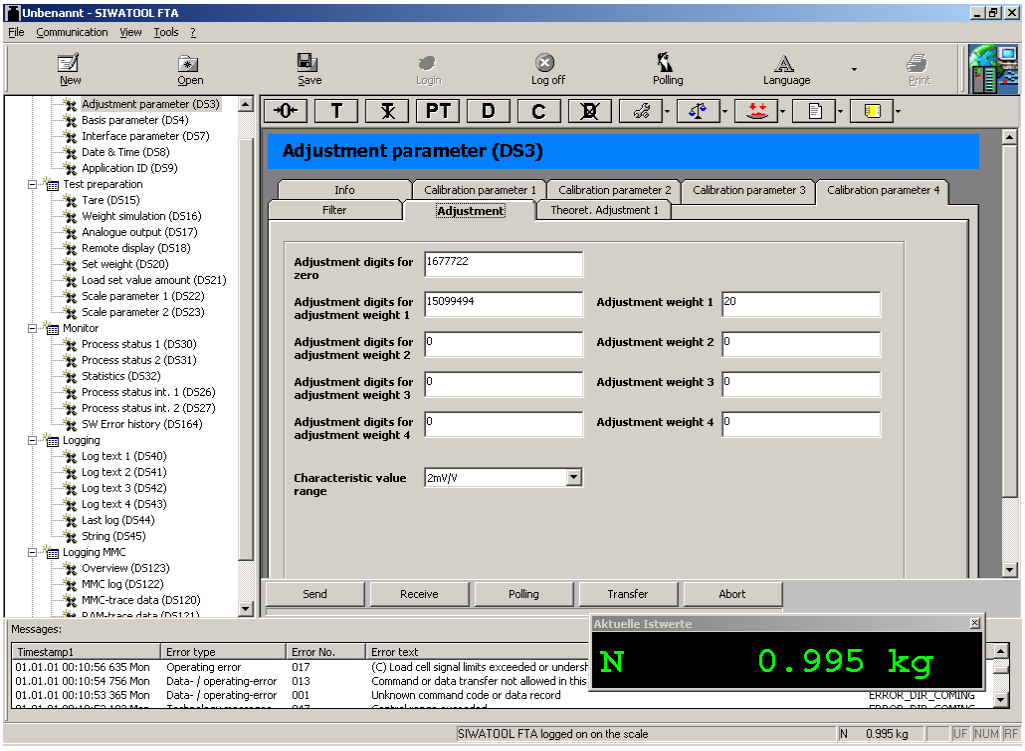


Image 10-1 SIWATOOL FTA Window Distribution

10.5 Assistance

After clicking on a data record in the left-hand program window, the „Info“ card can be selected from the right-hand program window. A description on a white area indicates the affect that the data record has on the scale's behaviour.

After selecting a card, a section of the respective data record is displayed as input and output fields. Besides the parameter identification, Tool Tips (text is displayed when the mouse is over the field) help to describe the parameter.

Clicking on the menu point "Help" opens the „SIWAREX FTA“ manual. The Acrobat Reader program must be installed in order to read the manual.

11 Firmware-Update with SIWATOOL FTA

11.1 Advantages of the Firmware-Update

If you want to utilize the firmware update offer on the SIWAREX internet pages (www.siwarex.com / Support), you are able to download the latest firmware cost-free and using the SIWATOOL FTA, you can transfer it to the modules.

The firmware is located in Flash memory. If required, new firmware can be transferred to the modules.

The new firmware can slightly vary from the earlier version - this is the case if the data structures of SIWAREX FTA parameters are not changed. In this case, loading the new firmware does not change the actual data.

If function expansion in the new firmware results in new internal data structures, new data records or changes within existing data records then the SIWAREX FTA assigns the parameters with default values after the download. Therefore, the original parameter status is read using the SIWATOOL FTA („Communication menu“, „Retrieve all data records“) and stored in a file.

Loading the firmware onto the SIWAREX FTA module is performed over several steps:

1. Switch the SIMATIC CPU to STOP.
2. Log SIWATOOL FTA in (online)
3. Select Firmware Download
4. Select Firmware file
5. Activate download mode with the checkmark
6. Start the transfer

The transfer can take up to several minutes.

After the transfer, SIWAREX FTA is restarted. Communication with SIWATOOL FTA must be reactivated.

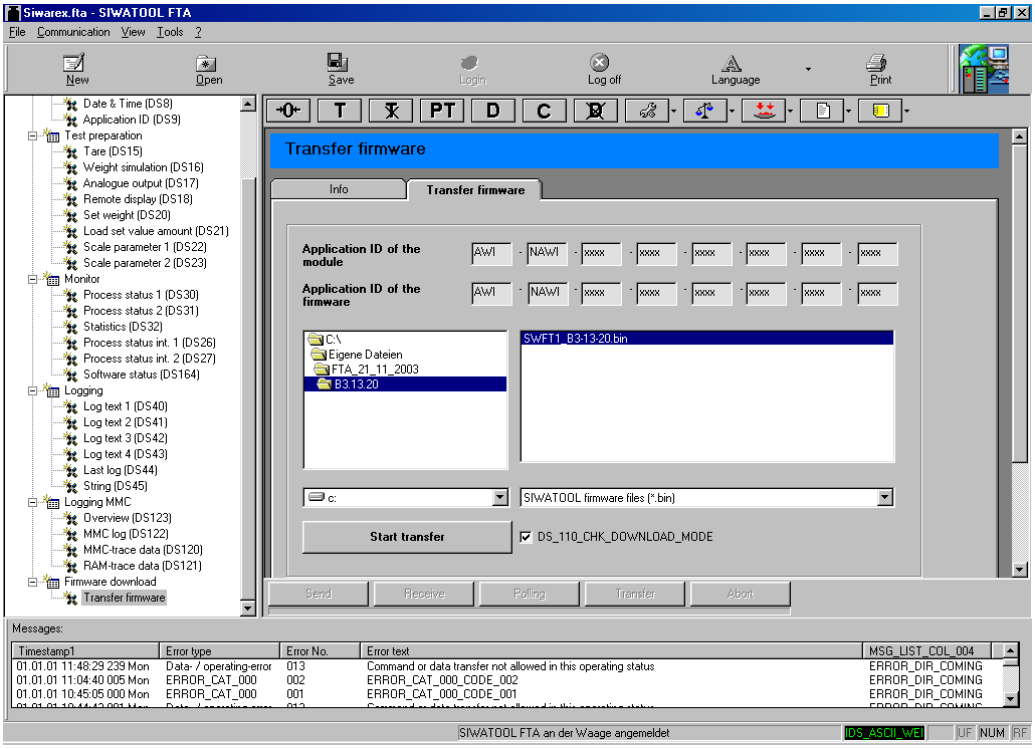


Image 11-1 Downloading Firmware with SIWATOOL FTA

Warning notice

During the firmware download, SIWAREX FTA down not respond to communication requests from the SIMATIC CPU. The CUP indicates the peripheral access error and if no respective organization block (OB) is programmed then the CPU can go to STOP.

Therefore, loading the firmware should only be done when the CPU is in STOP status.

12 Calibrating Applications

12.1 General Note

Attention
Calibratable scales may only be certified by a calibration expert or qualified representative.

Preparations

The following preparations must be made by the scale users before the actual certification by the calibration expert:

Start SIWAREX FTA
- Adjust the scale according to the device manual
- Check all of the points corresponding with (1), (2), (3) and (4).

(1) = European Regulations ER (90/384/EWG) on non-automatic weighing instruments
(2) = European Standards EN 45 501 for non-automatic weighing instruments
(3) = National regulations for automatic weighing instruments
(4) = The corresponding OIML recommendations for automatic weighing instruments

Calibration sticker

The calibration sticker is found in the calibration set which you can get as an accessory.

Certifying the SIWAREX FTA

The certification of the calibrated scale is done by a calibration expert from a recognised position.

Stamp of approval on SIWAREX FTA

After activating the write protection (WRP switch on the front), the calibration expert attaches the certification stamp and the calibration mark.

12.2 Calibratable main weight display

The calibratable main display for SIWAREX can either be done on a calibratable S11 display by the company Siebert or with certain standard SIMATIC OP/TPs (8.6). The application conditions and details can be found in the design certification for SIWAREX FTA.

12.3 Reading the calibratable logs with SIWATOOL FTA

The weighing log can be created on a calibratable printer or in the calibratable memory in the optional Micro Memory Card.

The capacity of the MMC should normally be sufficient for recording the scale logs for a period of 3 months. The MMC can be configured with SIWATOO FTA so that the data will overwrite older data when the memory is full. This creates a circulating buffer that conforms with the documentation of the calibration regulations.

A unique log ID is found in every weighing log that is stored. The log ID is very important because it is also printed out on the non-calibratable delivery note next to the amounts.

If anyone objects to a fixed delivery because of the delivered amount, the log ID is used to help find the log - either in a stack of paper logs or on the Micro Memory Card.

The SIWATOOL FTA is connected with SIWAREX for this reason. After entering the log ID, the data to be checked is read from the MMC, which is still in the SIWAREX FTA and is continuously storing the production scale data, and this data is then displayed.

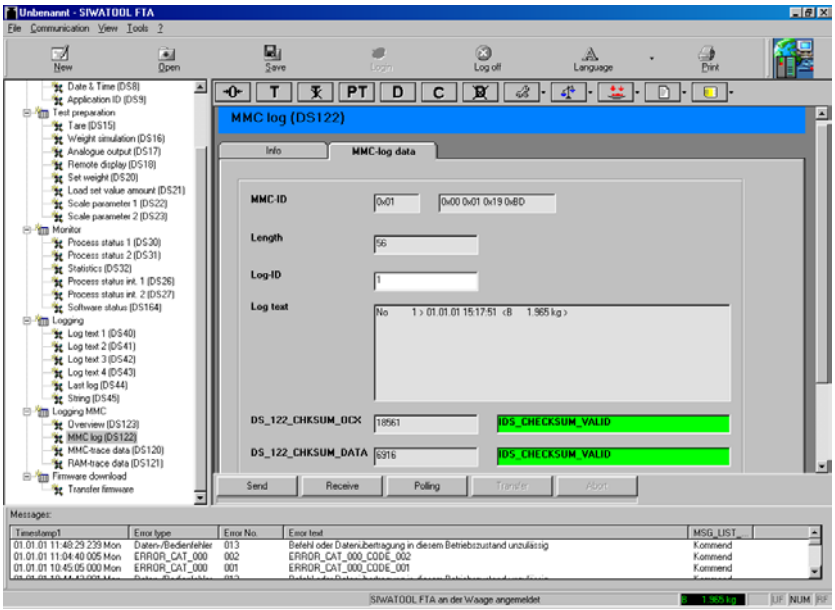


Image 12-1 Read the calibratable memory with SIWATOOL FTA

13 Accessories

There are necessary and optional accessories for the SIWAREX FTA.

The required accessories are indicated in the following table.

Description	Order No.
SIWAREX FTA Calibration weighing electronics for automatic weighing instruments for S7-300 and ET200M. EU Type Certification 3 x 6000d Application areas: Fast dosing, filling / bagging and emptying. Attention: Pay attention to certification conditions for calibrating applications.	**7MH4900-2AA01**
• **SIWAREX FTA Manual** (The device manual must be ordered separately.)	
• German	**7MH4900-2AB11**
• English	**7MH4900-2AB21**
SIWAREX FTA Project Planning Package for SIMATIC S7 on CD-ROM • SETUP for S7- Integration Step7 V5.2 • S7- Function block • PC parameter software SIWATOOL FTA • Manual on CD-ROM	**7MH4900-2AK01**
SIWAREX FTA Project Planning Package for PCS7 V6.0 on CD-ROM • SETUP for S7- Integration • Function block for the CFC-Plan • Face plate for WINCC • PC parameter software SIWATOOL FTA • Manual on CD-ROM	**7MH4900-2AK61**
SIWAREX Multiscale STEP 7-Software for SIWAREX FTA. Control of one or more scales for an expandable number of components and an optional number of recipes. Applications. Batch systems, mixing in production processes, CD-ROM	**7MH4900-2AL01**
SIWAREX Multifill STEP 7-Software for SIWAREX FTA. Control for filling and bagging operations for one or more filling stations and an optional number of materials, CD-ROM	**7MH4900-2AM01**
SIWATOOL connection cable from SIWAREX FTA with a serial PC interface, for 9 pin PC interfaces (RS 232)	
• **Length 2 m**	**7MH4702-8CA**
• **Length 5 m**	**7MH4702-8CB**
• **40-pin front connector** with screw contacts (required for every SIWAREX assembly), alternatively with spring-clamps - see next point	**6ES7 392-1AM00-0AA00**

Description	Order No.
• **40-pin front connector** with spring-clamps (required for every SIWAREX assembly), alternatively with screw contacts - see next point	**6ES7 392-1BM00-0AA00**
• **Shielding contact rail** sufficient for a SIWAREX FTA assembly	**6ES7 390-5AA00-0AA0**
• **Shielding connection clamp** Content: 2 pieces (suitable for cable of diameter 4 to 13 mm) Note: One shielding connection clamp is required for each of the following: - Scale connection - RS 485 interface - RS 232 interface	**6ES7 390-5CA00-0AA0**
• S7 profile rail	
- **160 mm**	**6ES7 390-1AB60-0AA0**
- **480 mm**	**6ES7 390-1AE80-0AA0**
- **530 mm**	**6ES7 390-1AF30-0AA0**
- **830 mm**	**6ES7 390-1AJ30-0AA0**
- **2.000 mm**	**6ES7 390-1BC00-0AA0**
Power supply PS 307 (only required if no DC 24 V is available) AC 120/230 V; DC 24 V	
• PS 307-1B; 2 A	**6ES7 307-1BA00-0AA0**
• PS 307-1E; 5 A	**6ES7 307-1EA00-0AA0**
• PS 307-1K; 10 A	**6ES7 307-1KA00-0AA0**
Label strips (10 pieces, replacements)	**6ES7 392-2XX00-0AA0**
Remote display (optional)	
The digital remote display model Siebert S11 can be connected directly through an RS 485 interface to the SIWAREX FTA Siebert Industrieelektronik GmbH Box 1180 D-66565 Eppelborn Tel.: 06806/980-0 Fax: 06806/980-999 Internet: http://www.siebert.de For detailed information, please contact the manufacturer.	
Connection and distribution box SIWAREX JB for parallel switching for load cells, optional	**7MH4710-1BA**
Expansion box SIWAREX EB for extending load cell cables, optional	**7MH4710-2AA**
Micro Memory Card (SIMATIC), optional	**6ES7953-8LF00-0AA0**
Calibration set – Accessories for a calibration certification (sticker plate, calibration marks, CD with samples and information)	**7MH4900-2AY10**
Ex-Interface, Type SIWAREX IS with ATEX certification for intrinsically safe connection of load cells, including the manual	
• • with short-circuit current < DC 199 mA	**7MH4710-5BA**
• • with short-circuit current < DC 137 mA	**7MH4710-5CA**
Cables (optional)	

Accessories

Description	Order No.
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY for connecting a SIWAREX FTA with connection and distribution box (JB), expansion box (EB) or Ex-Interface (Ex-I) as well as between two JBs, for stationary cabling, occasional bending is possible, 10.8 mm outer diameter for Environmental temperatures –20 to +70°C	**7MH4702-8AG**
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY, blue covered for connecting connection and distribution box (JB) or expansion box (EB) in explosion hazard areas and Ex-Interface (Ex-I) for stationary cabling, occasional bending is possible, blue PVC insulating cover, approx., 10.8 mm outer diameter for Environmental temperatures –20 to +70°C	**7MH4702-8AF**
Cable LiYCY 4 x 2 x 0.25 mm² for RS 485	**7MH4407-8BD0**

14 Technical Data

14.1 24 V power supply

An isolated function low voltage (according to EN60204-1) is to be ensured by the system power supply.

Rated voltage	DC 24 V
Static upper / lower limits	DC 20.4 V/28.8V
Dynamic upper / lower limits	DC 18.5 V/30.2 V
Non-periodic over-voltages	DC 35 V for 500 msec with a recovery time of 50 sec.
Max. current consumption	500 mA
Typical assembly power loss	7.5 W

Table 14-1 Data: 24 V power supply

14.2 Power supply from S7 back-plane bus

Current consumption from S7-300 back-plane bus	Typical 55 mA

Table 14-2 Data: Power supply from S7 back-plane bus

14.3 Load cell connection

EU type certification as non-automatic weighing instrument, class III	3 x 6000 d (pi = 0.4)
Precision with Ex-i-Interface	3 x 6000 d (pi = 0,5)
Error limits conforming with DIN1319-1 from measurement range end value at 20 °C ± 10 K	Measurement range 1m V/V: = 0,01 % Measurement range 2/4mV/V: = 0,005 %
Refresh rate internal / external	2.5 msec/10 msec
Internal resolution	16 million parts
3 measuring ranges	0 to 1 mV/V 0 to 2 mV/V 0 to 4 mV/V
Max. distance to load cell (calibratable)	1000 m (500 m)
Max. distance from load cell to Ex-i-Interface in Ex range	150/500 m for gas group IIC 1000 m for gas group IIB (see SIWAREX IS manual)
Lowest permitted input signal for a calibration value in calibrating operation	= 0.5 µV/e
Load cell power Voltage	Type DC 10.2 V *

Current	= 184 mA
Permitted load cell resistance without Ex-i-Interface	> 56 Ω < 4010 Ω
Permitted load cell resistance with Ex-i-Interface	> 87 Ù < 4010 Ù
Monitor for sensing inputs	Typical = 5 V Hysteresis 120 mV
Response time for sense line monitor	= 1 sec
Common mode rejection CMRR @50 Hz	Typical 120 dB
Measuring value filtering for low pass filter	0.05...20 Hz
Measuring value filtering for average value filter	2...250 values
Impedance measurement for load cells	Measuring range 56 Ω...4010 Ω Precision ±5% Repeat accuracy <1 %
Potential separation	500 V

* Values apply to assembly output

Table 14-3 Data: Load cell connection

14.4 Analogue output

The defined replacement value is output for active BASP-/OD signal (S7 CPU).	
Range 1	0 to 20 mA
Range 2	4 to 20 mA
Max. total error at 25 °C	< 0,5 % *
Refresh rate	10 msec
Load (incl. line resistance)	= 250 Ω, = 30 nF
Line length 0.5 mm^2	200 m
Temperature coefficient	max. ± 75 ppm / K
Resolution	12 Bit (4096 parts) **
Potential separation	500 V

* Definitions apply with current >0.5mA

** Resolution reduced by 20 % with operations 4 to 20 mA

Table 14-4 Data: Analogue output

14.5 Digital inputs (DI), Digital outputs (DO)

The defined value is always output on the DO for active BASP-/OD signal (S7 CPU). An inverse diode (recovery diode) is to be used on the consuming component with inductive loads on the DO.		
	DI	**DO**
Number	7	8
Rated voltage	DC 24 V	
Potential separation	500 V	
Voltage range for H signal	DC 15 V to 30 V	
Voltage range for L signal	DC -3 V to 5 V	
Input current (15 to 30 V)	2 to 15 mA	
Switching frequency	max. 50 Hz	max. 50 Hz

Rated current		0,5 A
Max. output current		0.6 A
max. total current of all outputs		2 A
Potential isolation		500 V
Voltage drop on assembly		< 0.25 V
Switching delay		= 12 msec
Short-circuit protection		Yes[1]

[1] output current pulsed with short-circuit

Table 14-5 Data: Digital inputs, Digital outputs

14.6 Counter input CI

Number	1
Rated voltage	DC 24 V
Potential separation conforming with IEC 1131, UL 508, CSA C22.2 NO. 142	500 V
Voltage range for H signal	DC 9 V to 30 V
Voltage range for L signal	DC -3 V to 5 V
Input current (15 to 30 V)	2 to 15 mA
Switching frequency	max. 10 kHz
Potential separation	500 V

Table 14-6 Data: Counter input CI

14.7 RS 232C interface

Baud rate	1200 to 115200 Baud
Data bits	8
Parity	Even
Stop bits	1
Max. distance	15 m
Signal level	Conforms with EIA-RS232C
Potential separation	500 V

Table 14-7 Data: RS 232C interface

14.8 RS 485 interface

Baud rate	1200 to 19200 Baud
Data bits	7 or 8
Parity	even / odd
Stop bits	1 or 2
Max. distance	1000m at 1200 Baud
Signal level	Conforms with EIA-RS485
Termination resistance	390Ω / 220Ω / 390Ω
Potential separation	500 V

Table 14-8 Data: RS 485 interface

14.9 Dimensions and Weight

Dimensions W x H x D	80 x 125 x130 mm
Weight	600 g

Table 14-9 Data: Dimensions and Weight

14.10 Mechanical requirements and data

Testing	Standards	Test values
Vibration in operation	DIN IEC 68-2-6 DIN IEC 721, Part 3-3 IEC 1131-2	Class 3M3 Testing Fc 10 ... 58 Hz: 0.075 mm amplitude 58 ...150 Hz: 9.8 m/s^2 10 cycles per axis 1 octave / min.
Shock in operation	DIN IEC 68-2-27 DIN IEC 721, Part 3-3 IEC 1131-2	Class 3M3 Test Ea 150 m/s^2, Half sinus Duration: 11 msec Number: 3 per axis each in neg. and pos. directions

Table 14-10 Data: Mechanical requirements

14.11 Electrical, EMC and climatic requirements

14.11.1 Electrical protection and safety requirements

Met requirements	Standards	Remarks
Safety guidelines	EN60204; DIN VDE 0113; IEC 1131; UL 508; CSA C22.2 No.142; FM class I, Div.2; UL/CSA	UL-/CSA-/FM Zone 2 certification upon request
Protection class	VDE 0106 Part 1 IEC 536	Protection class I, with protective conductor
IP protection	DIN 60529 IEC 529	In S7 frame: IP20 only SIWAREX FTA: IP10
Air and creepage distances	IEC 1131 UL508 CSA C22.2 No.142	Surge category II Pollution degree 2 Circuit board material IIIa Circuit track spacing 0.5 mm

Met requirements	Standards	Remarks
Isolation test	IEC 1131-2: 1992 CSA C22.2 No.142	Rated voltage 24 V Test voltage 500 V DC
Fire and burn protection	for ”Open Type Controller”: IEC 1131-2: 1992; UL 508	
Material	SN 36350 (3.93)	

Table 14-11 Data: Electrical protection and safety requirements

14.11.2 Electromagnetic Compatibility

Remarks	Standard	Degree of severity
Burst - Pulses on power supply lines:	DIN EN 61000-4-4 (DIN VDE 0843 T4)	2 kV (acc. 90/384/EWG 1 kV)
Burst- Pulses on data and signal lines :	DIN EN 61000-4-4 (DIN VDE 0843 T4)	2 kV (acc. 90/384/EWG 0,5 kV)
Electrostatic discharge (ESD)	DIN EN 61000-4-4 (DIN VDE 0843 T2)	6 kV
Electrostatic air discharge (ESD)	DIN EN 61000-4-4 (DIN VDE 0843 T4)	8 kV
Surge on power supply lines	DIN EN 61000-4-5 (DIN VDE 0839 T10)	± 2 kV unsym.* ± 1 kV sym.
Surge on data and signal lines :	DIN EN 61000-4-5 (DIN VDE 0839 T10)	± 1 kV unsym.*
HF disturbance (electromagnetic fields) 10 kHz to 80 MHz	DIN EN 61000-4-3 (DIN VDE 0843 T3)	up to 3 V/m
HF disturbance (electromagnetic fields) 80 MHz to 1000 MHz	DIN EN 61000-4-3 (DIN VDE 0843 T3)	up to 10 V/m (acc. 90/384/EWG 3 V/m)

Table 14-12 Data: Electromagnetic Compatibility

* must be protected with external protection elements
** for use in living areas, additional measures are required (e.g.: 8MC cabinets)

EMC For EMC, guidelines according to NAMUR NE21 Part1, as well as the European guidelines 90/384/EWG for non-automatic weighing instruments and 89/336/EWG concerning the emission and sensitivity of electromagnetic disturbance are taken into account.

14.12 Environmental conditions

The SIWAREX FTA is suitable for weather protected, stationary application in SIMATIC S7-300 systems. Conditions for application conforming with IEC 1131-2.

For use in extreme operating conditions (e.g. heavy dust, acidic moisture or gasses etc.), additional measures are to be taken such as B. Encapsulation.

Climatic requirements		
Remarks	Environmental conditions	Application ranges
Operating temperature: Vertical installation in S7-300 Horizontal installation in S7-300 Calibrated operation	 -10 to +60 °C -10 to +40 °C -10 to +40 °C	The S7-300 standard module groups may not be operated under 0°C
Storage and transport temperature	-40 to +70 °C	
Relative humidity	5 to 95 %	Without condensation, corresponding with relative humidity (RH) - Exposure level 2 according to DIN IEC 1131-2
Barometric pressure in operation	795 to 1080 hPa	
Barometric pressure in storage	660 to 1080 hPa	
Pollutant concentration	$SO_{2:}$ < 0,5 ppm; H_2S: < 0.1 ppm;	RH < 60% no condensation

Table 14-13 Data: Climatic requirements

15 Index

16 Abbreviations

ADC	Analogue-Digital Converter
ASCII	American Standard Code for Information Interchange
AWI	automatic weighing instrument
CPU	Central Processing Unit
DO	Digital output
DR	Data record
DI	Digital input
FC	STEP7 Function call
FB	Function block (S7)
FM	Function module (for S7-300)
G	Gross weight
HMI	Human machine interface (SIMATIC Operator Panel)
HW	Hardware
LC	Load cell(s)
MG	Module group
MMC	Micro-Memory-Card / Multi-Media-Card
MPI	Multi-Point-Interface
NAWI	non automatic weighing instrument
NSW	non automatic weighing instrument
OD	Output Disable (S7)
OIML	Organisation Internationale de Metrologie Legale
OM	Object manager for STEP 7 objects
O&O	Operating & Observing
OP	Operator Panel (SIMATIC)
P-BUS	Peripheral bus (S7)
PC	Personal-Computer
pT	preset Tara (predefined tare-weight for manual taring)
PTB	Physical-Technical-Organization (Certification authorities for calibratable scales)
RAM	random- access-memory
S7-300	Siemens Automation System for mid-range applications
S7-400	Siemens Automation System for the upper application range
SFC	System Function Call (S7)
STEP 7	Programming device software for SIMATIC S7
SWA	Automatic gravimetric filling instrument
SWE	Automatic Catchweighing instrument
SWT	Discontinuous totalising automatic weighing instrument
T	Tare weight
TIA	Totally Integrated Automation
TP	Touch Panel (SIMATIC)
UDT	Universal Data Table (S7)
WRP	Write Protection