



## SIWAREX<sup>®</sup> U “Getting started”

Info

Status 08.11.2007



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### Warning

Means that death, severe injury or extensive damage to equipment **can be** caused, if the respective safety measures are not taken.

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### Caution

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

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### Caution

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

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Intended Utilization

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### Warning

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We have tested the contents of this document for compatibility with the hardware and software described. 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 next revision. We are grateful for any suggestions for improvement.

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# 1 Preface

## 1.1 Purpose of the Information

All of the information required for setting up the system with SIWAREX U “Getting started” is in this information.

## 1.2 Preparations for the “Getting started” software

**This demo-software shows the setup work required for the SIWAREX U in SIMATIC S7 through a set of examples. This demo-software may be changed, copied or expanded. Any claims resulting from the use of the demo-software are excluded.**

## 1.3 Required Basic Knowledge

In order to understand the product information, certain knowledge concerning the SIMATIC automation technology and SIWAREX U is required. Weighing technology knowledge is also an asset.

## 1.4 Further Support

Do you have any more questions about using the SIWAREX U? 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 relevant Internet site.

<http://www.siemens.com/weighing-technology>

## 2 Scope of Delivery

### 2.1 System Prerequisites

The project has been created for the following automation system:

- CPU 315-2 DP
- Touch Panel TP270 (Full version)

The project is made up of two parts:

- STEP7 Software for the CPU
- WinCC flexible Software for the Touch Panel TP270.

Both parts can set up again to be used with other devices:

- STEP7 Software with all CPUs from series S7-300 and S7-400 and a head ET 200M.
- WinCC flexible Software can be converted in the HMI devices which are available in WinCC flexible.

The basic equipment is also required for the setup work – the configuration package SIWAREX U for SIMATIC S7 (Order number 7MH4950-1AK01). This configuration package consists of the following:

- SIWATOOL U Commissioning program for Windows
- Hardware Update (HSP) for the SIMATIC Manager hardware catalog
- Standard function block for operating the SIWAREX U in SIMATIC S7 (included in the project “Getting started”)
- Device manuals in several languages

System prerequisites for using SIWAREX U “Getting started”:

- SIMATIC STEP7 Version 5.4 and higher
- WinCC flexible 2005 Version SP1 HF7 and higher



## 3 Overview

### 3.1 General

SIWAREX U (Compact Scale) is a versatile and flexible weighing module, which can be used wherever static scales are to be used in the SIMATIC S7 automation system or a force measurement is necessary.

The SIWAREX U function module (FM) takes full advantage of all the features of the modern automation system, including the integrated communication, the diagnostic system and the configuration tools.

The SIWAREX U "Getting started" software supports you in starting with application setup. A scale can be controlled by the operator using a control unit SIMATIC HMI e.g. TP270. The software is open and provided with commentary, so that the user can change the software, expand it and easily modify it according to customer wishes.

### 3.2 Benefits

SIWAREX U "Getting started" is characterized by a number of clear advantages:

- Complete solutions for a scale
- Open and prepared for project-specific extensions
- SIWAREX U – integrated messages through message bits

### 3.3 Application Range

SIWAREX U "Getting started" is the optimal solution anywhere that integrating weighing technology directly into the automation system would be advantageous. Weighing is then a component of complex processes which are controlled by the automation system.

### 3.4 Structure

The project is made up of two parts:

- STEP7 software for the SIMATIC CPU
- WinCC flexible project (integrated in SIMATIC Manager)

Of course the message bits can be integrated into the customer's message system.

### 3.5 Function

Weight measurement is run completely from the weighing module as if in separately constructed weighing electronics. The integration in SIMATIC allows weight values to be transferred directly into the PLC program. This way, there is sensible task distribution: the weighing functions are performed in the SIWAREX-U module, latching and signal linking is done in the PLC.

SIWAREX U “Getting started” takes over the tasks of a standardized program in the SIMATIC S7. In SIWAREX U “Getting started”, the FB scales are called, the commands and adjustment values are passed on to the scales corresponding with the progress of the process and the data from the scales is prepared for the visualization.

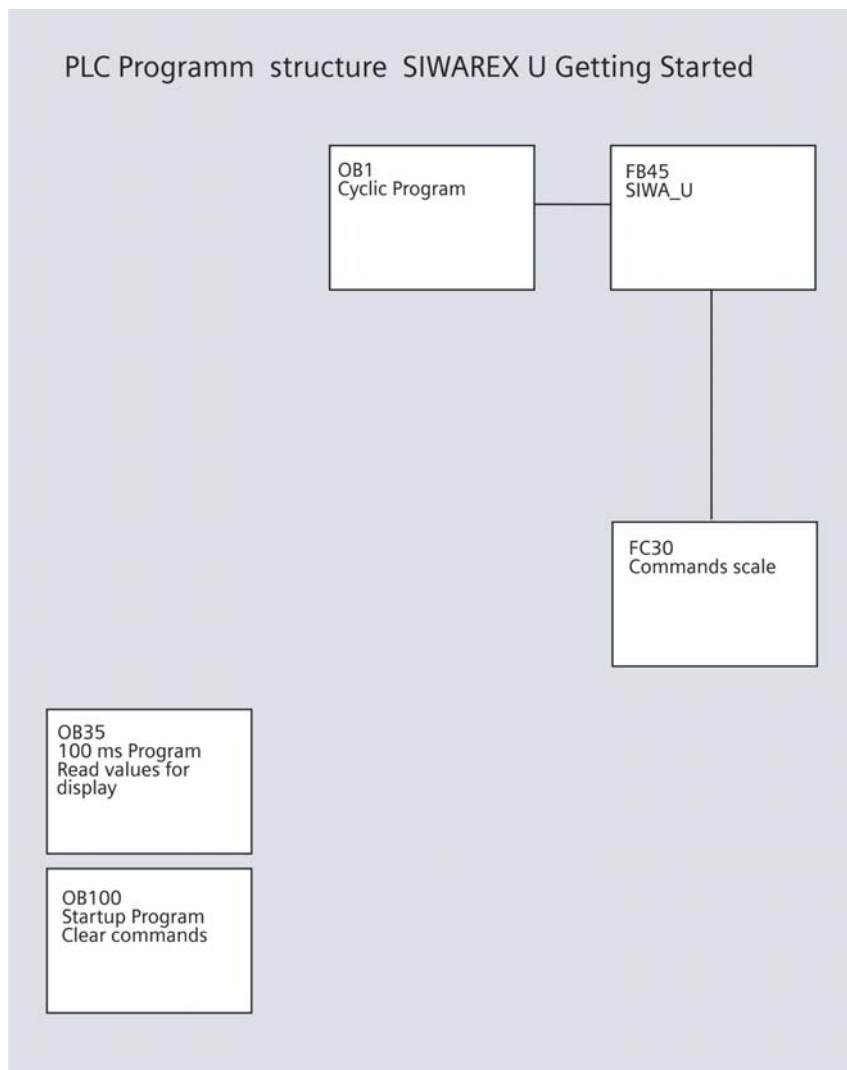


Figure 3-1 Program structure STEP7 for SIWAREX U “Getting started”

### 3.6 Commissioning- and Service with SIWATOOL U

SIWATOOL U is part of the scope of the delivery of the SIWAREX U configuration package for SIMATIC S7 (Order number 7MH4950-1AK01). To perform commissioning, the program must be installed on a PC first. The PC and SIWAREX U are connected by the cable provided as an accessory.

Using the SIWAREX U “Getting started” program, the adjustment parameters and limit values can be changed at a later time and the scale can be also be similarly readjusted using a Touch Panel like with SIWATOOL U.

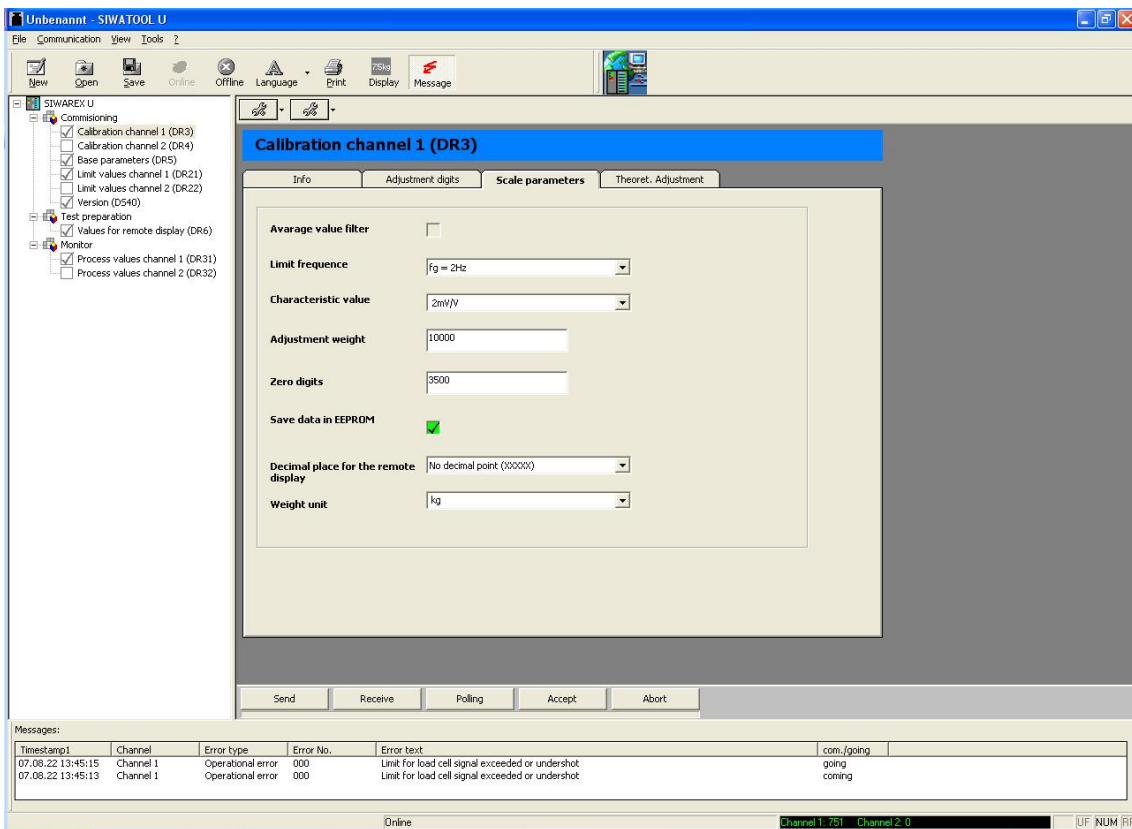


Figure 3-2 Initial commissioning with SIWATOOL U

# 4 Operator Info

## 4.1 General

The description for the operator should describe the operation and monitoring of the weighing installation. The description corresponds with the current status of the SIWAREX U “Getting started” software. The descriptions for individual scale parameters and scale functions can be found in the SIWAREX U and are not explained individually in the display of the individual SIWAREX U “Getting started” screens. All of the existing screens are shown in this product info.

## 4.2 Start Screen

The program starts with the scale view. The start screen can be replaced with another image such as a customer logo.

## 4.3 Scale View

The operator of the scale can perform operations and monitoring from the Scale View image. The weight is displayed in the centre of the screen. The explanation of the function of the buttons is found in chapter: Meaning of the Function Keys 4.9.

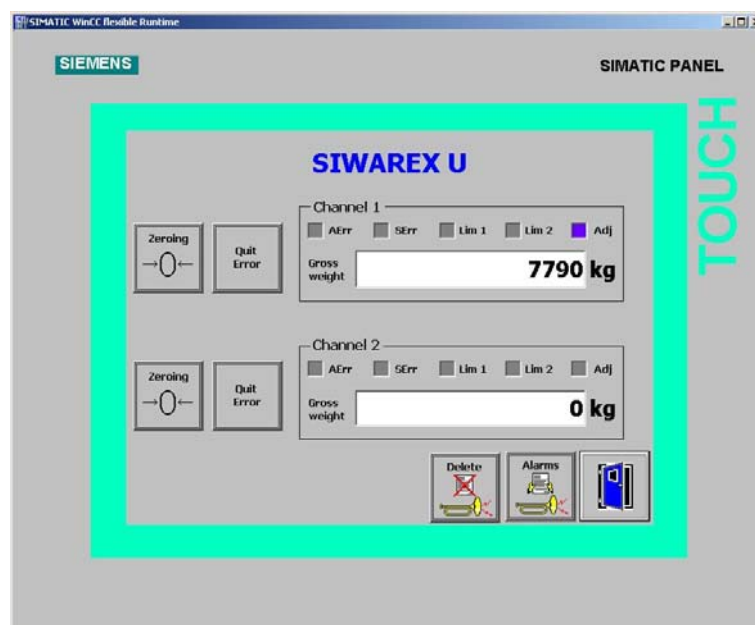


Figure 4-1 Start screen for Touch Panel TP270

## 4.4 Menu

The operator can control and observe from this menu screen or he can select the service section for commissioning the scale.

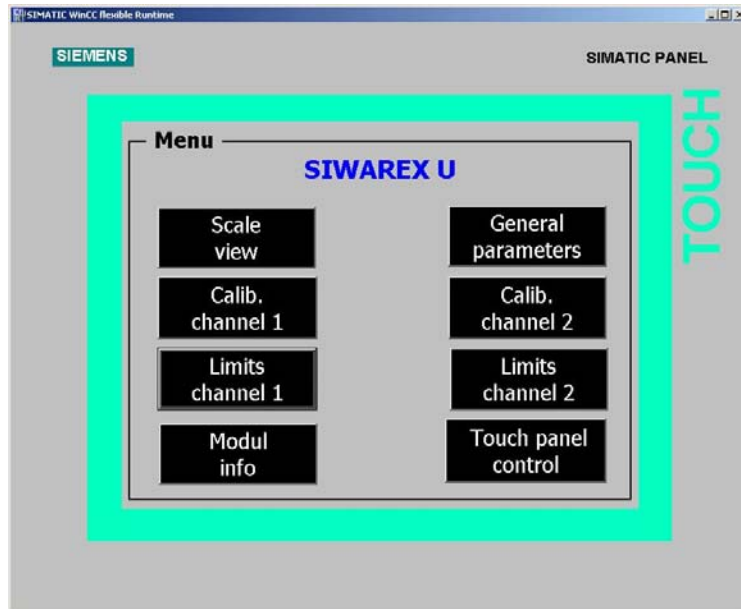


Figure 4-2 Screen – Menu for SIWAREX U

## 4.5 Scale adjustment Channel 1

The following screens can be selected for scale adjustment:

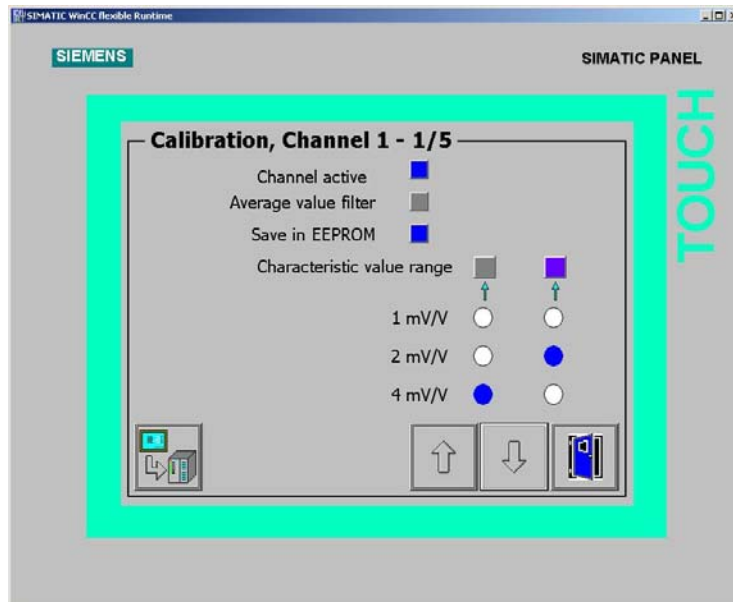


Figure 4-3 Screen – Scale adjustment Page 1

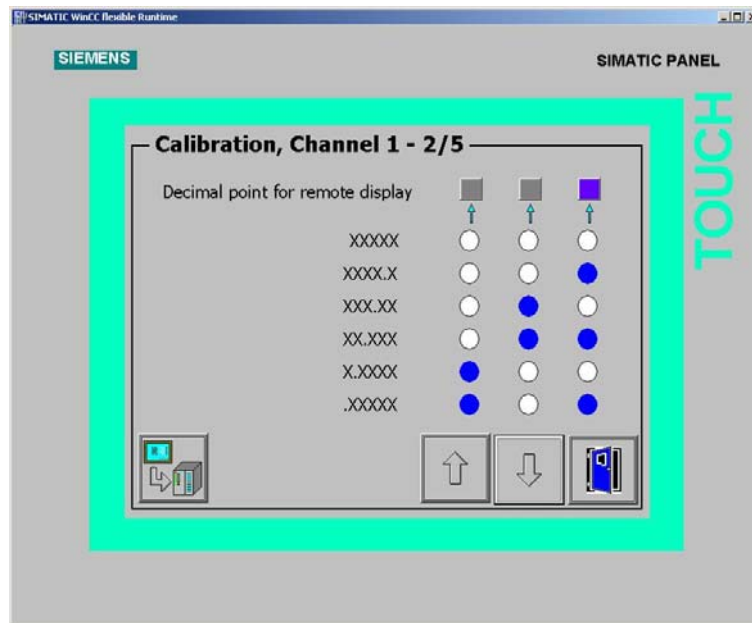


Figure 4-4 Screen – Scale adjustment Page 2

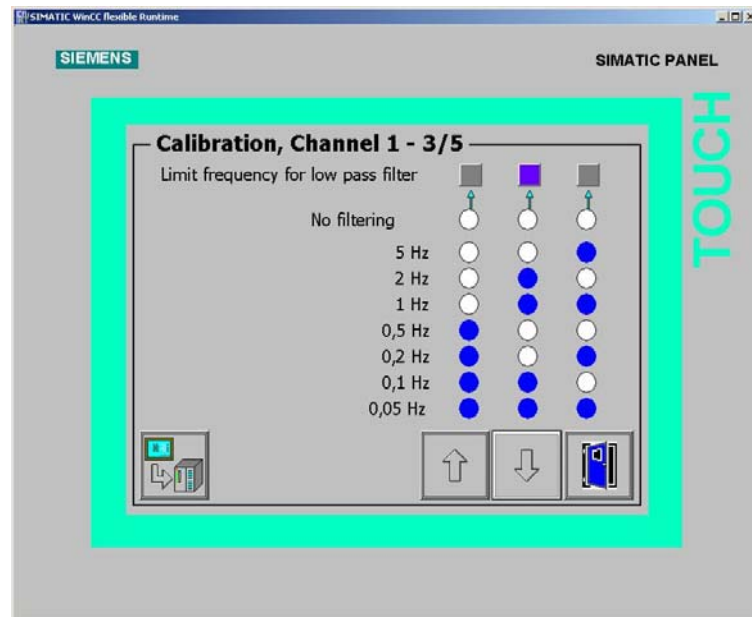


Figure 4-5 Screen – Scale adjustment Page 3

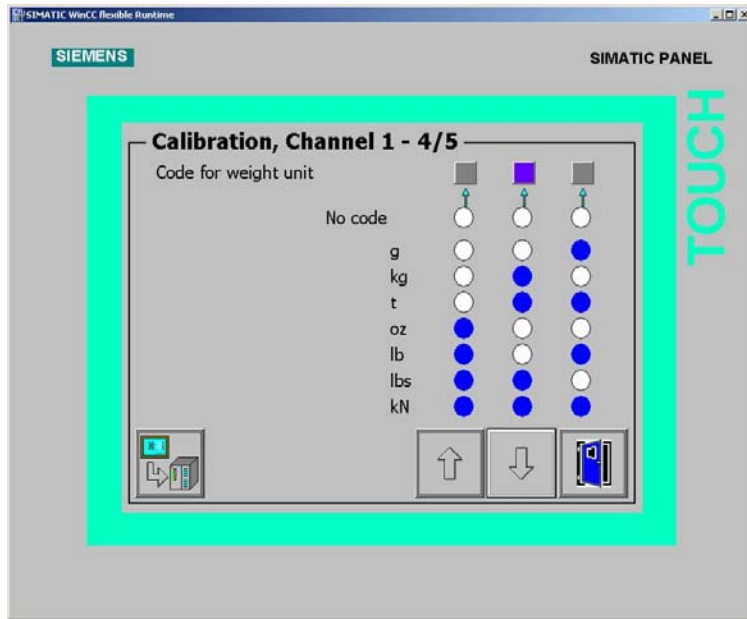


Figure 4-6 Screen – Scale adjustment Page 4

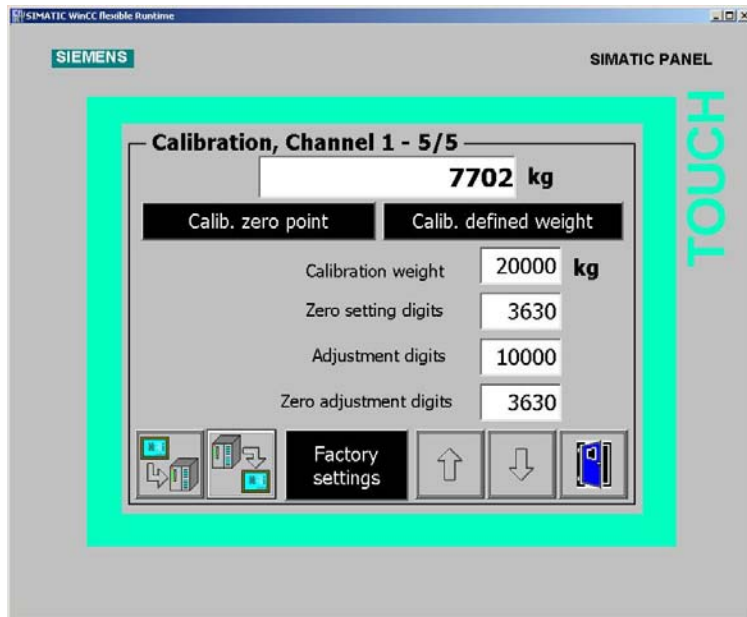


Figure 4-7 Screen – Scale adjustment Page 5

## 4.6 Scale Limit values

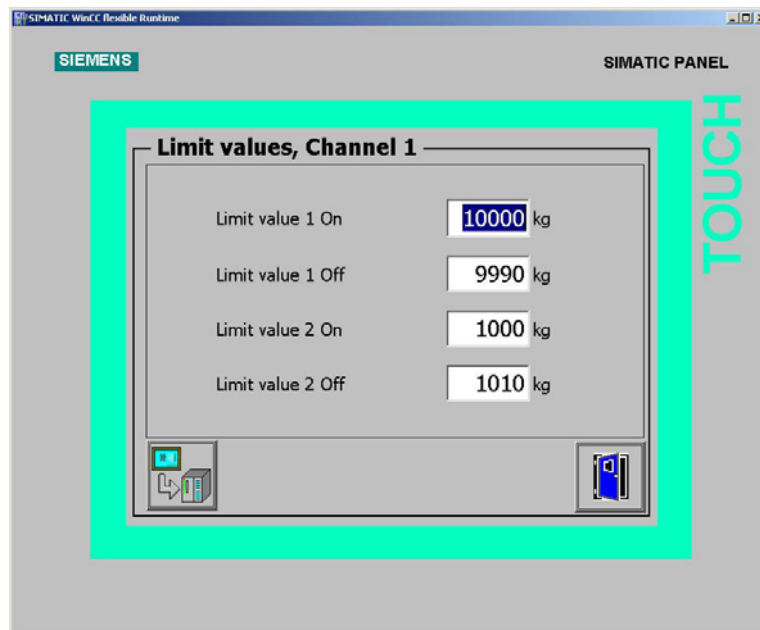


Figure 4-8 Screen – Limit values

## 4.7 General parameters and module info

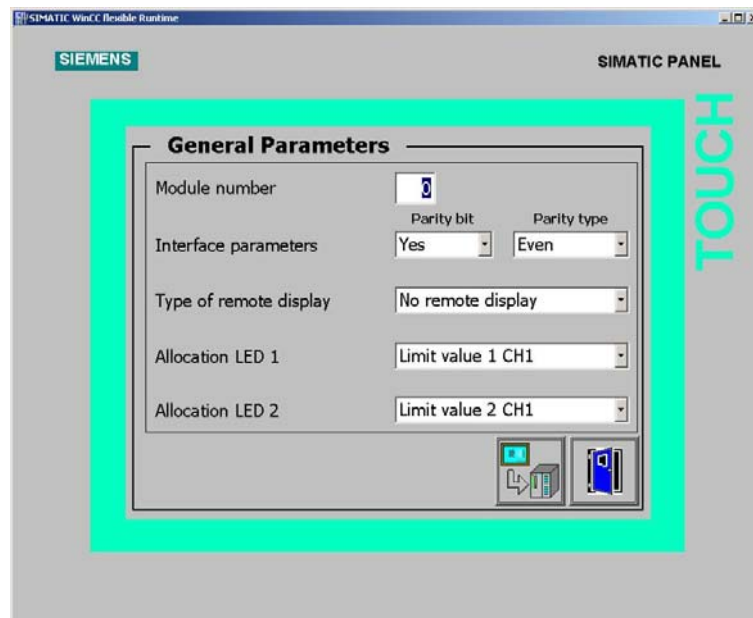


Figure 4-9 Screen - General module parameters



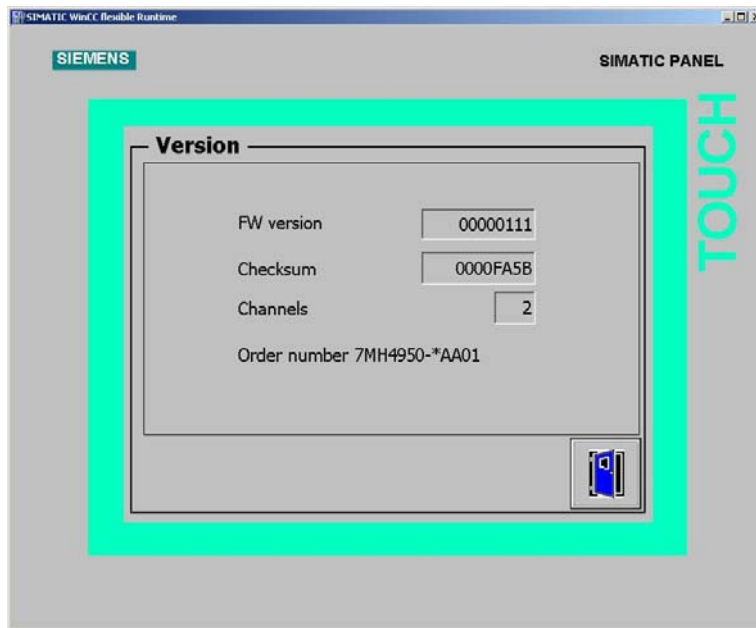


Figure 4-10 Screen – Module info

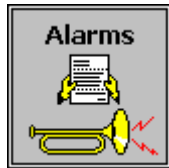
## 4.8 Touch panel settings



Figure 4-11 Screen - Touch panel settings

## 4.9 Meaning of the Function Keys

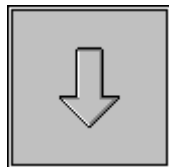
The function keys have the following meaning:



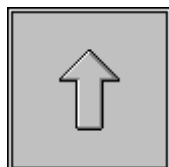
View alarm buffer



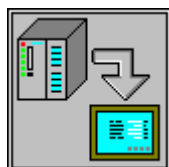
Reset current alarms



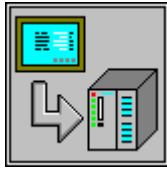
Next page



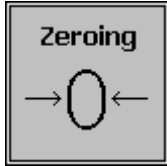
Previous page



Read appropriate data record out of SIWAREX U



Send appropriate data record to SIWAREX U



Scale zeroing



Previous screen



Quit error

# 5 Configuring

## 5.1 Command Groups

The SIWAREX U "Getting started" software is defined for operation with a scale.

## 5.2 Program installation in STEP7

You can find the SIWAREX U module in SIMATIC HW catalogue by the Function Modules (FM) of SIMATIC S7 300 group.

If you can not find SIWAREX U in the SIMATIC Manager the SIWAREX U module must first be inserted in the HW catalogue. Select the function "Install HW updates" from the „Tools“ menu. Then select „Install from file“. The file for updating the SIWAREX U module is located in the HSP\_FOR\_SIWAREX U directory of the SIWAREX U configuration package for S7 (Order number 7MH4950-1AK01).

If you are using the same SIMATIC CPU, as in the project, you can simply load the software from the project into the CPU. The program can be run immediately afterward.

If you are using a different CPU, the hardware must be planned in the HW\_Konfig first. The current CPU must be deleted and replaced with the new CPU in this case. When asked whether the program should also be deleted, enter "No".

Then transfer the program modules (FBs, FCs, OBs, DBs but not the SDB) to the module folder in the new CPU.

## 5.3 Command Manager FC30

The commands of a scale are controlled by the appropriate function FC30. Using function FC30 the commands can be executed on the scale by three different job slots with different priorities.

CMD1 has the highest priority, CMD3 the lowest.

Calling the command manager is done in the OB1 in network 3. The commands are actuated through various points in the program:

- by the operator at OP/TP with priority 2
- by time OB35 with priority 3

Priority 1 is not occupied.

CALL "Fc Execute command"

```

iCmdInput          := "DB_SIWA_U".i_CMD_CODE_INPUT
boCmdEnable        := "DB_SIWA_U".bo_CMD_EN
boCmdInProgress    := "DB_SIWA_U".bo_CMD_IN_PROGRESS
boCmdFinishedOk    := "DB_SIWA_U".bo_CMD_FINISHED_OK
boCmdErr           := "DB_SIWA_U".bo_CMD_ERR
sCmd_1             := DB9.DBD30
sCmd_2             := DB9.DBD34
sCmd_3             := DB9.DBD38

```

Figure 5-1 Calling the FC Command Manager

The input variable s\_Cmd\_1 contains the command code and the control bits for the command handling.

If FC30 is used as a command manager, the commands may not be transferred directly to the SIWAREX by calling FB45, but through structure CMD1, CMD2, CMD3.

<b>s_CMD1</b>	<b>STRUCT</b>		<b>Command input 1</b>
i_CMD1_Code	INT	0	Command code
bo_CMD1_Trigger	BOOL	FALSE	Command trigger
bo_CMD1_InProgress	BOOL	FALSE	Command in progress
bo_CMD1_FinishedOk	BOOL	FALSE	Command finished ok
bo_CMD1_FinishedError	BOOL	FALSE	Command finished with error

Figure 5-2 Structure (UDT1) for command manager

## 5.4 Calling the Scale FB

Calling the FB SIWA\_U is done in OB1. The FB is called with the following parameters:

```
CALL "SIWA_U" , DB10
ADDR          :=256
DB_SCALE      :=9
DB_VECTOR     :=8
CMD_IN        :="DB_SIWA_U".i_CMD_CODE_INPUT
CMD_INPR      :="DB_SIWA_U".bo_CMD_IN_PROGRESS
CMD_FOK       :="DB_SIWA_U".bo_CMD_FINISHED_OK
CMD_ERR       :="DB_SIWA_U".bo_CMD_ERR
CMD_ERR_C     :="DB_SIWA_U".b_CMD_ERR_CODE
REF_COUNT1    :="DB_SIWA_U".b_CYCLE_COUNT_CH1
SC_STATUS1    :="DB_SIWA_U".b_SCALE_STATUS_CH1
ASYNC_ERR1    :="DB_SIWA_U".w_OPR_ERR_MSG_CH1
GROSS1        :="DB_SIWA_U".i_GROSS_WEIGHT_CH1
FLT_RAW1      :="DB_SIWA_U".w_ADC_VALUE_FILTERED_CH1
REF_COUNT2    :="DB_SIWA_U".b_CYCLE_COUNT_CH2
SC_STATUS2    :="DB_SIWA_U".b_SCALE_STATUS_CH2
ASYNC_ERR2    :="DB_SIWA_U".w_OPR_ERR_MSG_CH2
GROSS2        :="DB_SIWA_U".i_GROSS_WEIGHT_CH2
FLT_RAW2      :="DB_SIWA_U".w_ADC_VALUE_FILTERED_CH2
FB_ERR        :="DB_SIWA_U".bo_FB_ERR
FB_ERR_C      :="DB_SIWA_U".b_FB_ERR_CODE
START_UP      :="DB_SIWA_U".bo_STARTING_UP
RESTART       :="DB_SIWA_U".bo_RESTART
CMD_EN        :="DB_SIWA_U".bo_CMD_EN
```

Figure 5-3 Call Parameters for FB SIWA\_U

## 5.5 Alarms

The message texts and help texts (German and English) are integrated in the control unit.

Of course, the user can delete these program sections and use his own message system.

## 5.6 Configuring with WinCC flexible

The software is for setup for showing a scale in TP270.

The conversion to other SIMATIC HMI devices is possible.

WinCC flexible offers a selection of target devices for the conversion.

## **5.7 Program installation in WinCC flexible**

If you are using the planned CPU and TP270, the program is ready for operation immediately after loading into the TP270 (or Start of Runtime in WinCC flexible). When loading with the MPI interface, use MPI-address=1 for TP270, MPI-address=2 for the CPU.

### **5.7.1 Setting up another CPU**

If you are using another CPU, the project must be integrated into the new environment.

With Netpro the CPU can be connected again. Then WinCC flexible should be opened and under menu item Communication the connections as well as the tags should be checked. If necessary, connections have to be reimplemented and tags reconnected with the symbols.

In the last step, the project must be loaded to the target OP/TP.

### **5.7.2 Setting up another TP/OP**

If another SIMATIC-HMI device is used, the project must be integrated into the new environment. With the WinCC flexible Function "Change device type..." the requested HMI device can be selected from a list.

## 6 Technical Data

### 6.1 Program Scope

Memory requirements in the SIMATIC CPU:

OB /FB/FC	Approx. 5.5 kB
DB	Approx. 0.5 kB
Program scope WinCC flexible	Approx. 300 kB

Table 6-1 Required memory

### 6.2 Cycle Time

Cycle time example: CPU315-2 DP	Approx. 2 ms
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Table 6-2 Cycle time