SIEMENS

SIWAREX® FTA Getting Started

Info

Status 06.2012

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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.

Caution
means that you can cause light injuries or damage to equipment, if the respective safety measures are not taken.

Caution
means that damage can be done to equipment if the respective safety measures are not taken.

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.

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Warning
The device may only be utilized with the replacement parts described in the catalog 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 depend 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.

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Getting Started in TIA Portal with SIWAREX FTA

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1 Preface

1.1 Purpose of the Information

This information contains all information required for setting the system up with SIWAREX FTA Getting Started.

1.2 Preparations for the Getting Started software

This demo-software shows the setup work required for the SIWAREX FTA in TIA-Portal through a set of examples. This demo-software may be changed, expanded (but not the FB "SIWA_FTA", DB_VECTOR and DB_SCALE) or copied. 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 SIWARIX FTA is required. Weighing technology knowledge is also an asset.

1.4 Further Support

Do you have more questions concerning the use of 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.siemens.com/siwarex

2 Scope of Delivery

2.1 System Prerequisites

The project is setup for the CPU 315-2 DP and Touch Panel MP 377 12'' TOUCH. So it consists of the STEP7 Software for the CPU and the WinCC Software for the Touch Panel MP 377 12'' Touch. The project is set up in TIA-Portal V13.

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

- STEP7 Software with all CPUs from series S7-300 and S7-400.
- WinCC Software can be converted in the HMI devices which are available in WinCC. Please also consider the number of available online languages
- At the moment it is not possible to implement a legal-for-trade display such as SecureOCX in S7 classic.

The message system (FC2) is bit-based. This way, incoming messages from SIWAREX FTA are shown to the operator.

For configuration you need the basic equipment additionally - the configuration package SIWAREX FTA for SIMATIC S7 and TIA-Portal (order number 7MH4900-2AK02). This configuration package consists of the following:

- SIWATOOL FTA commissioning program for Windows
- HSP for the installation of the module in the SIMATIC Manager hardware catalogue (only for S7-Classic)
- Standard software for operating the SIWAREX FTA in SIMATIC S7 and TIA-Portal
- Device manuals in several languages
- Quick Guides for fast commisioning
- Set-up for PCS7 Library (configuration package for PCS7 only)
- SIWAREX FTA SecureOCX – AddOn for WinCC flexible for configuration of the calibration display (only for S7-Classic)

The system prerequisites for using SIWAREX Getting Started:

- TIA-Portal V13 UPD1

3 Overview

3.1 General

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

The SIWAREX FTA Getting Started software supports starting the setup of applications. Using the SIMATIC HMI control unit e.g. MP 377 12'' TOUCH, a scale can be controlled by the operator. 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.

For operation of more than one scale in a batch plant or for mixing, the SIWAREX MULTISCALE software is available, for operating more than one scale in bagging, filling or loading stations, the SIWAREX MULTIFILL software is available (see *Accessories and Expansions 7*).

3.2 Benefits

SIWAREX Getting Started has many advantages:

- Complete, multilingual solution for a scale
- can be used for autarchic or networked scales
- open and prepared for project-specific extensions
- SIWAREX FTA – integrated messages through ALARM_S or bit messages system

3.3 Application Range

SIWAREX FTA Getting Started is the optimal solution anywhere that direct weighing technology integration in the automation system is advantageous. Weighing is then a component of complex processes which are controlled by the automation system. Using the SIWAREX FTA software, calibratable weighing systems can be inexpensively constructed, whether they are filling systems, unloading stations, bagging operations or rotopackers.

Typical application ranges:

- Liquid Filling
- Bagging in a packaging plant
- Material unloading at an unloading point

3.4 Structure

The project contains the STEP7 software for the SIMATIC CPU and the WinCC screens.

The messaging system is also used. In this way the messages from SIWAREX FTA are displayed to the operator. In this message system the messages are generated via the bit message system FC2. Of course the customer can replace the message system with his own message system.

3.5 Function

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 way, there is sensible task distribution: the extremely fast weighing functions are handled in SIWAREX-FTA, the latching and signal linking is done in the PLC.

SIWAREX FTA Getting Started takes over the job of a standardized sequencing program in the SIMATIC S7. In SIWAREX FTA Getting Started, the scale FB is called, the commands and set values are handed onto the scales corresponding to the process status and the scale data is prepared for the visualization.

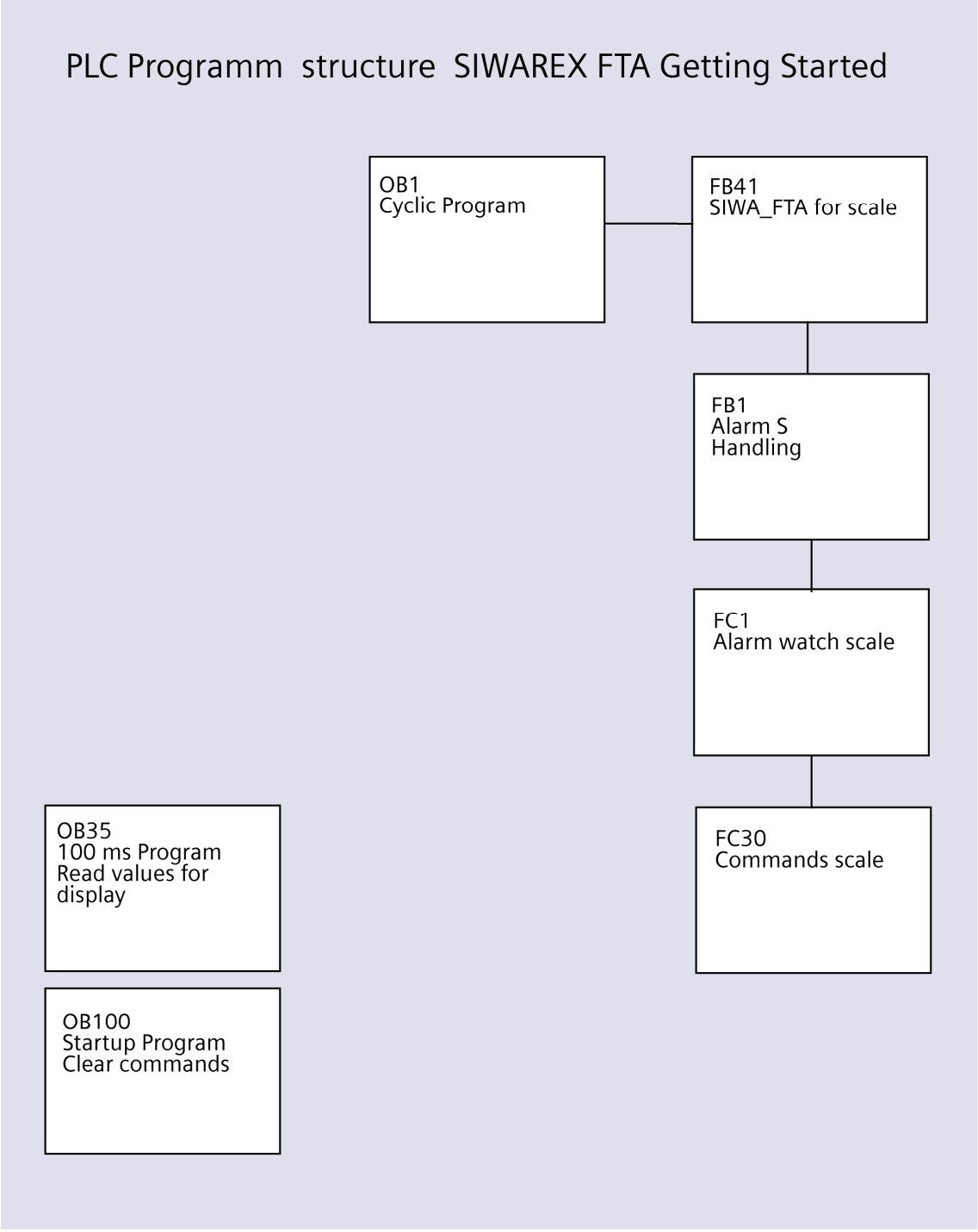


Fig. 3-1 Program structure STEP7 for SIWAREX Getting Started

3.6 Commissioning- and Service with SIWATOOL FTA

SIWATOOL FTA is part of the scope of delivery of the configuration package SIWAREX FTA for SIMATIC S7 (order number 7MH4900-2AK01). To perform the commissioning, the program must first be installed on a PC. The PC and SIWAREX FTA are connected by the cable provided as an accessory.

Since not all SIWAREX FTA parameters can be set with SIWAREX Getting Started, the initial commissioning of the scale is handled with a PC and the SIWATOOL FTA program.

Using the SIWAREX FTA Getting Started program, the adjustment parameters (data record 3) and the basis data (data record 4) can be changed later and the scale can be adjusted afterward.

In dosing operation, the set value (data record 20) and the weighing parameters (DS22 and DS23) can be set with the TP/OP.

The interface parameters (data record 7) can only be defaulted and the optional MMC card only parameterized when commissioning with SIWATOOL FTA.

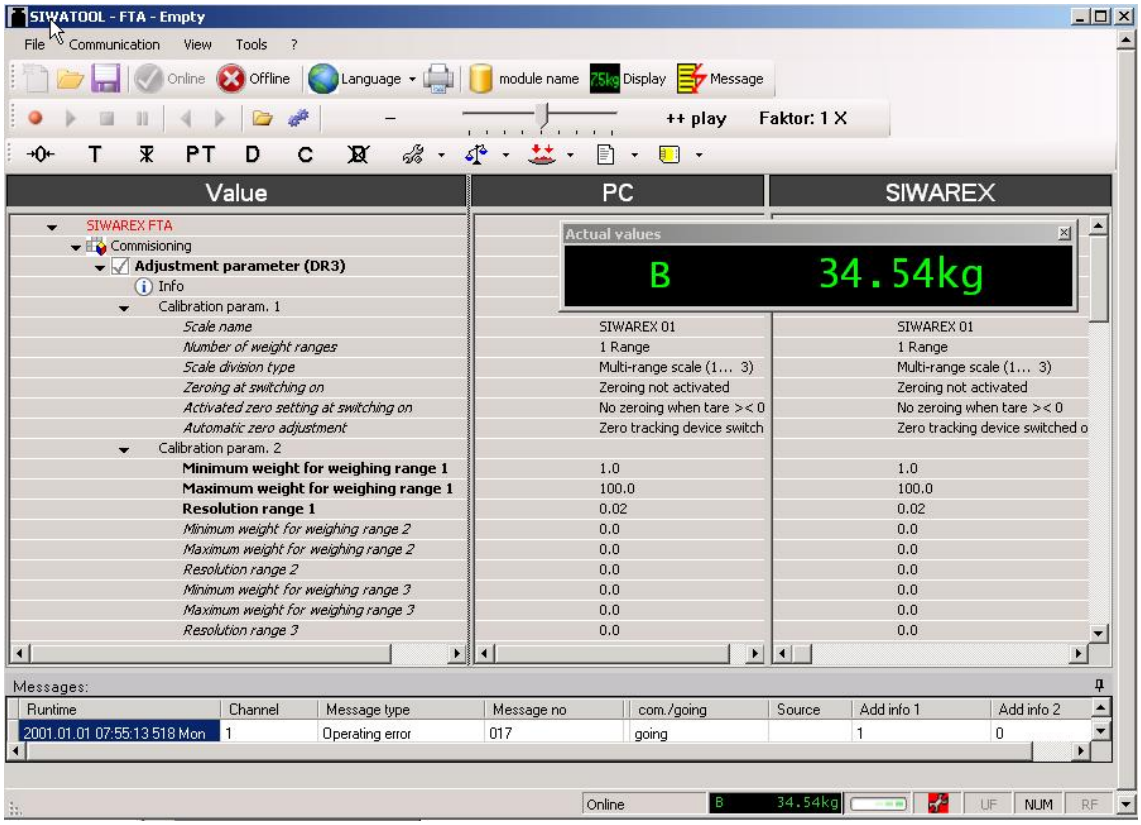


Fig. 3-2 Initial commissioning with SIWATOOL FTA

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 FTA Getting Started software.
The descriptions of the individual scale parameters and the weighing functions are in the SIWAREX FTA manual and are not explained individually with the individual images from SIWAREX FTA Getting Started.
All of the available images are indicated in this product info.

4.2 Languages

At the moment seven languages (English, German, French, Italian, Spanish, Russian and Chinese) are available in Getting Started. The message texts in German language are also German, in all other languages English.

Languages, which shall not be used, must be deactivated in WinCC under Languages & resources-> Project languages.

4.3 Start Screen

The program starts with the language selection as the start screen. The start screen can be defined with another image with a customer logo. After selection of the language the scale view is opened.

4.4 Scale View

The operator of the scale can perform operations and monitoring from the Scale View image. In the left-hand part of the image, the current dosing step is shown. On the right-hand side, the results of the tolerance control and the dosing/emptying status is shown.

In the centre of the image, you will find the weight display and in the lower area, the function actuation buttons (for the touch panel).

The explanation of the function of the buttons is found in chapter: Meaning of the Function Keys *4.9*.

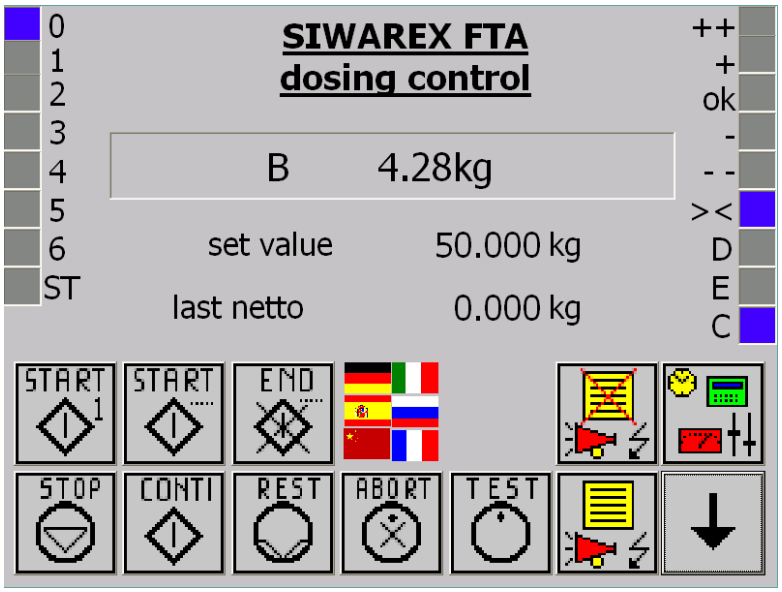


Fig. 4-1 Operating and Monitoring a Scale

The next screen is an alternative screen for operating and monitoring a loading station.

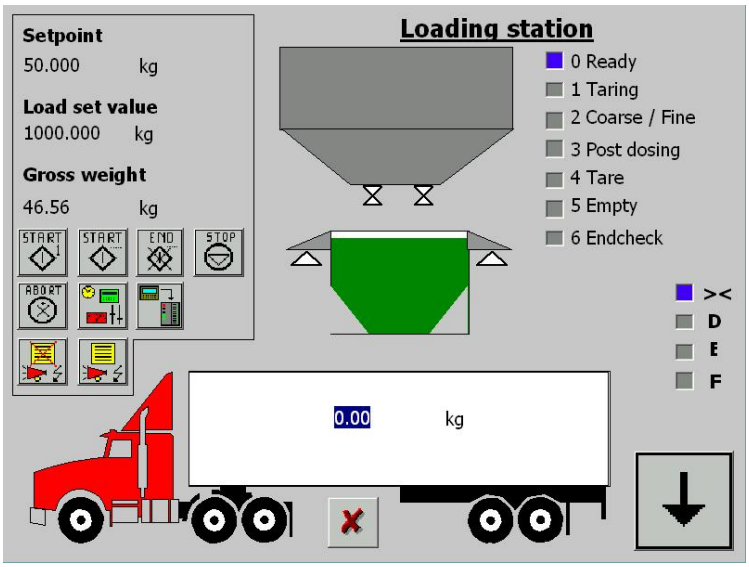


Fig. 4-2 Operating and Monitoring a loading station

In the next screen can be used by the calibration officer in calibration technical acceptance of the scale. At the moment an SIEBERT display has to be used to display the legal-for trade weight value.

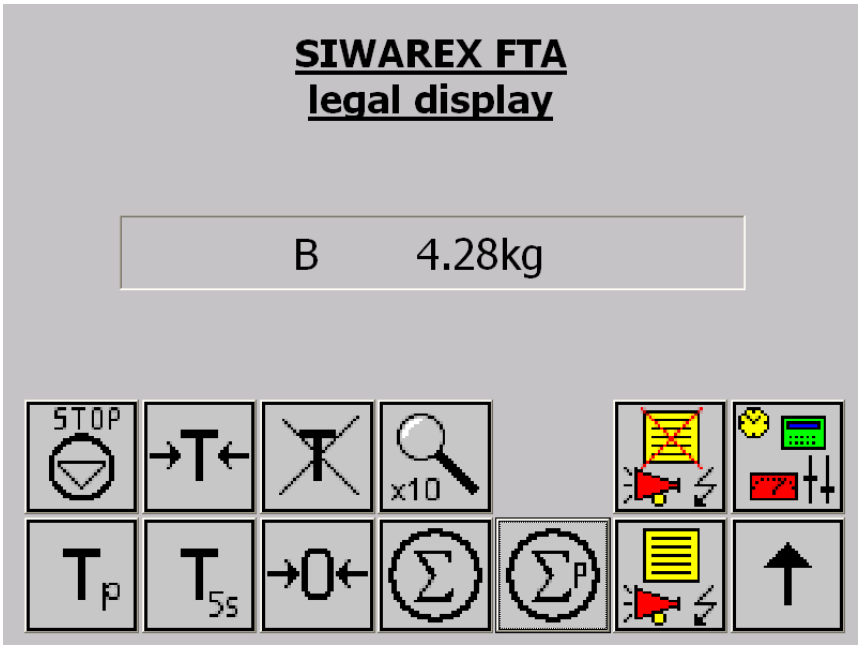


Fig. 4-3 Weight display of a scale

4.5 Scale parameters

The scale parameters are divided into two groups:
- scale parameters I
- scale parameters II

The behavior of the scale during the dosing procedure is defined by defining the weighing parameters.

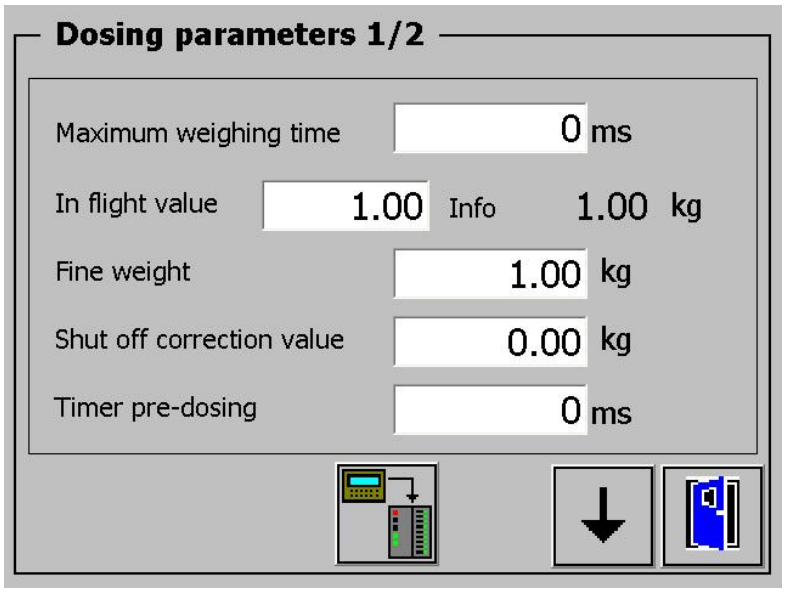


Fig. 4-4 Input of dosing parameters I page 1

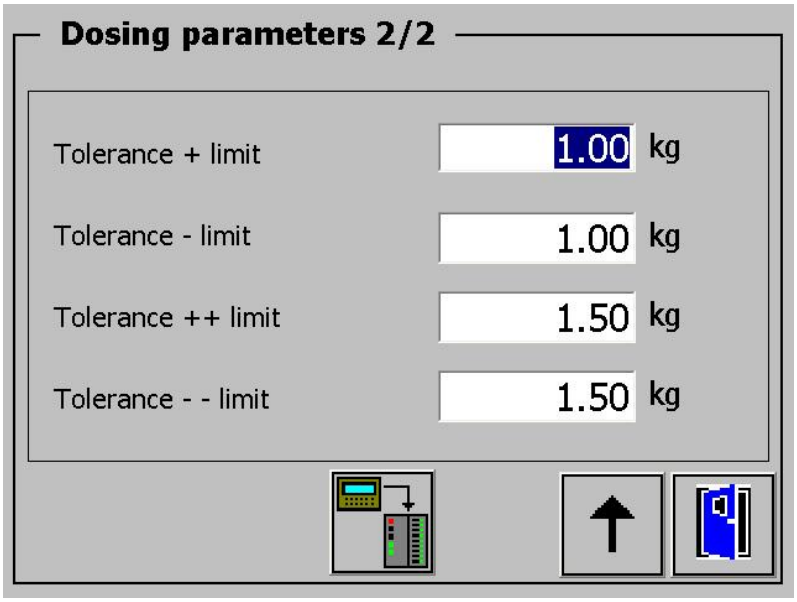


Fig. 4-5 Input of dosing parameters I page 2

The scale parameters II determine the general system behavior during dosing.

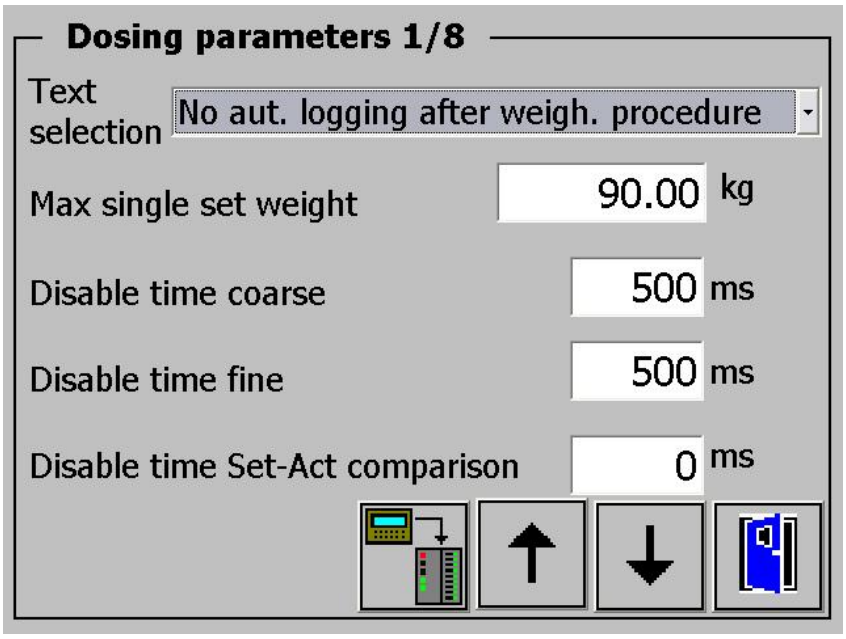


Fig. 4-6 Input of the dosing parameters II page 1

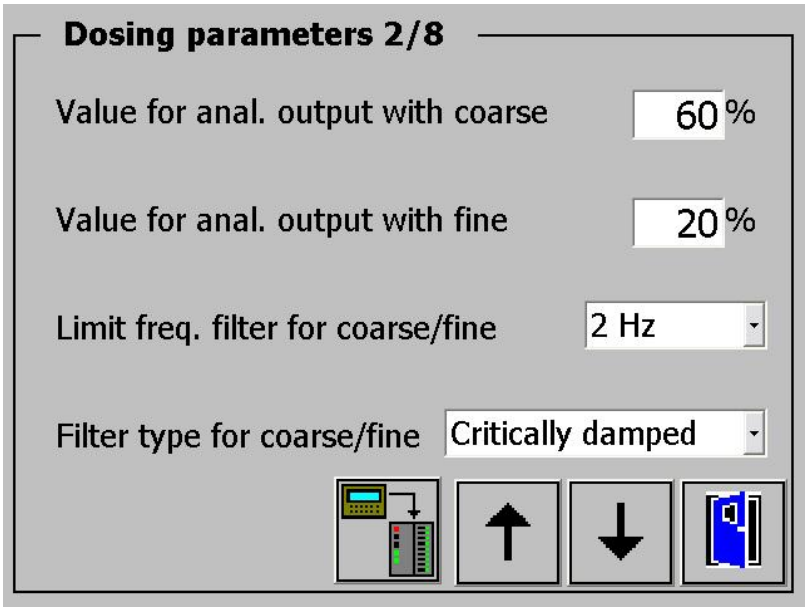


Fig. 4-7 Input of the dosing parameters II page 2

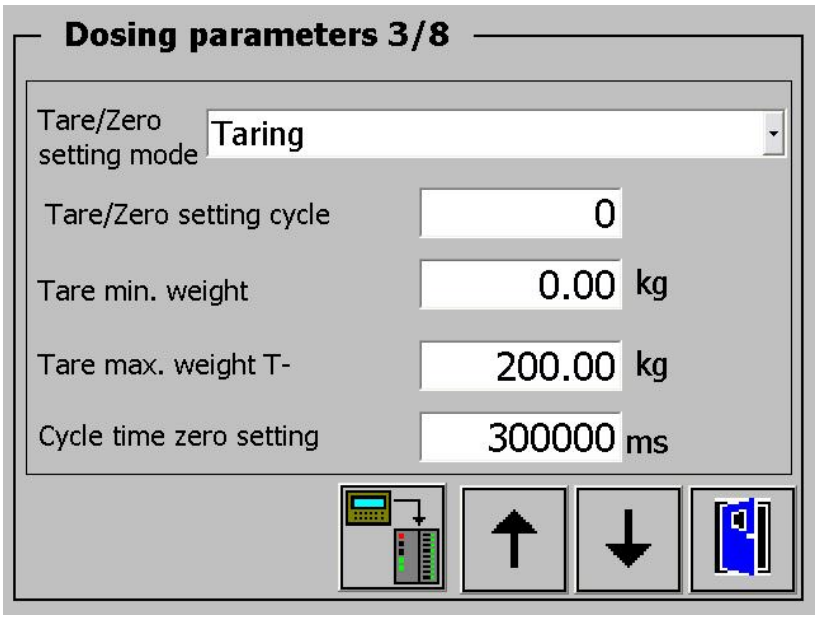


Fig. 4-8 Input of the dosing parameters II page 3

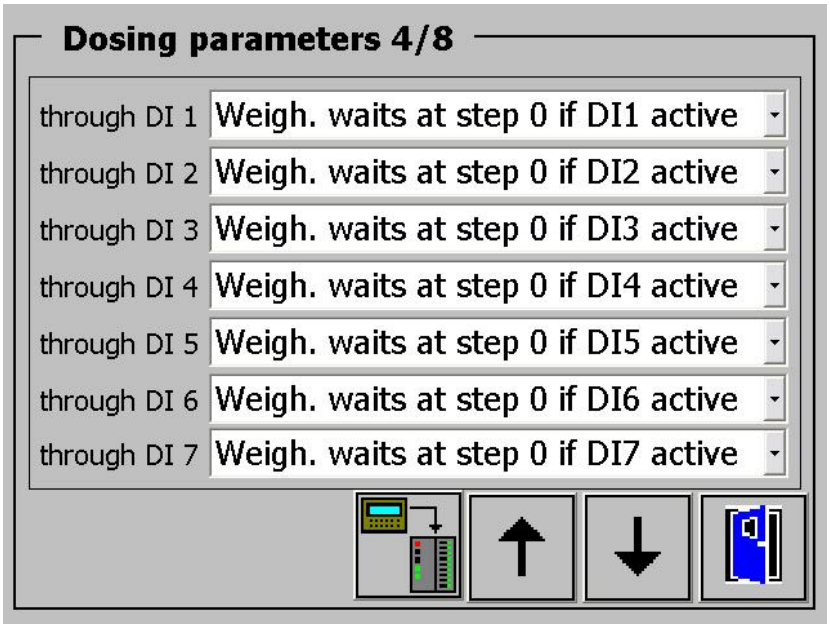


Fig. 4-9 Input of the dosing parameters II page 4

Every dosing step can be blocked by a signal at the digital input of the SIWAREX FTA. Blocking prevents the intended functions from being executed. Dosing can be continued after clearing the blockage.

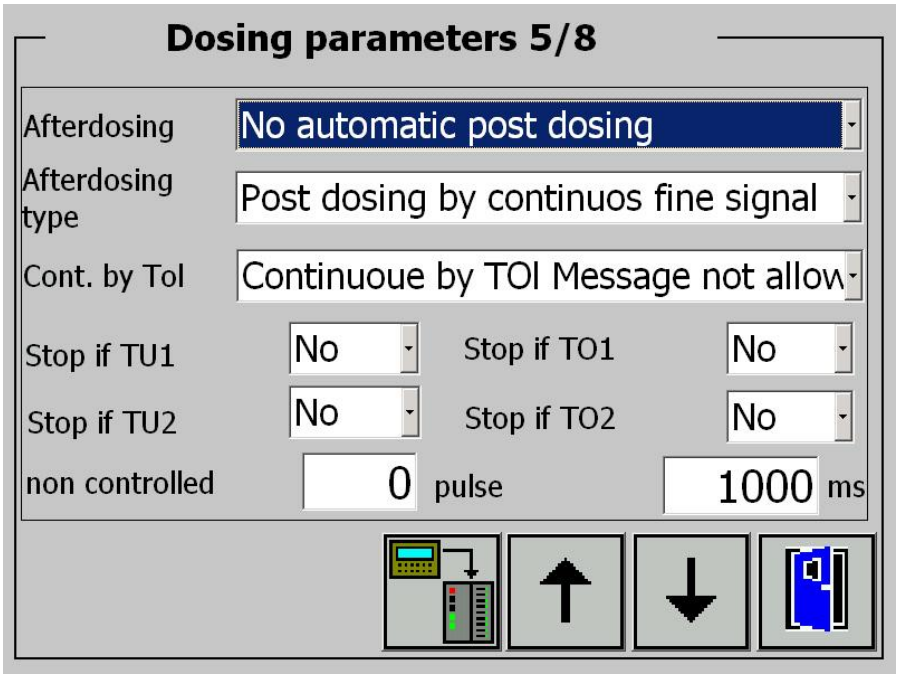


Fig. 4-10 Input of the dosing parameters II page 5

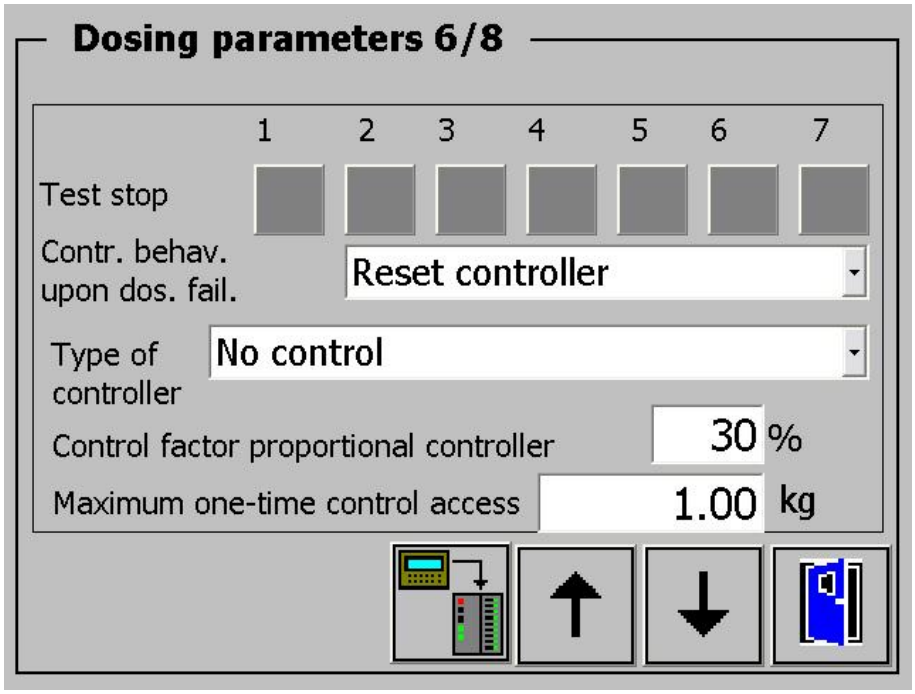


Fig. 4-11 Input of the dosing parameters II page 6

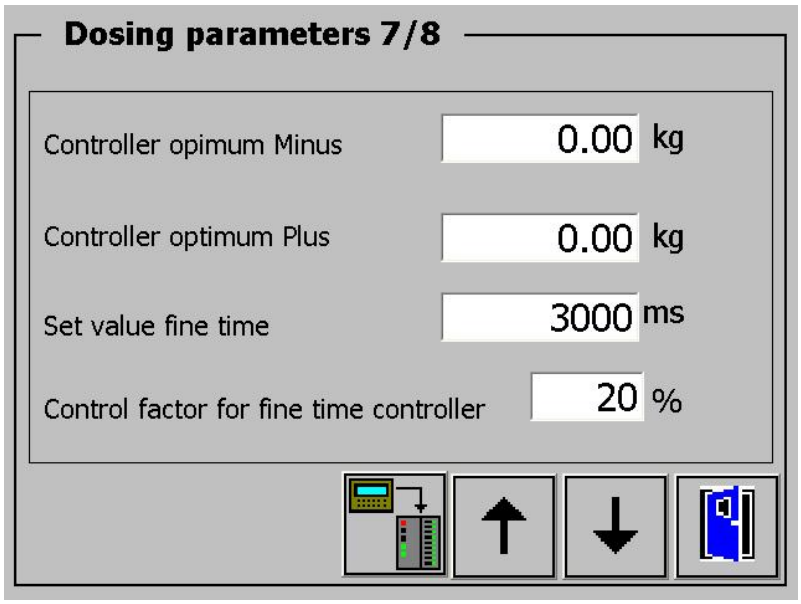


Fig. 4-12 Input of the dosing parameters II page 7

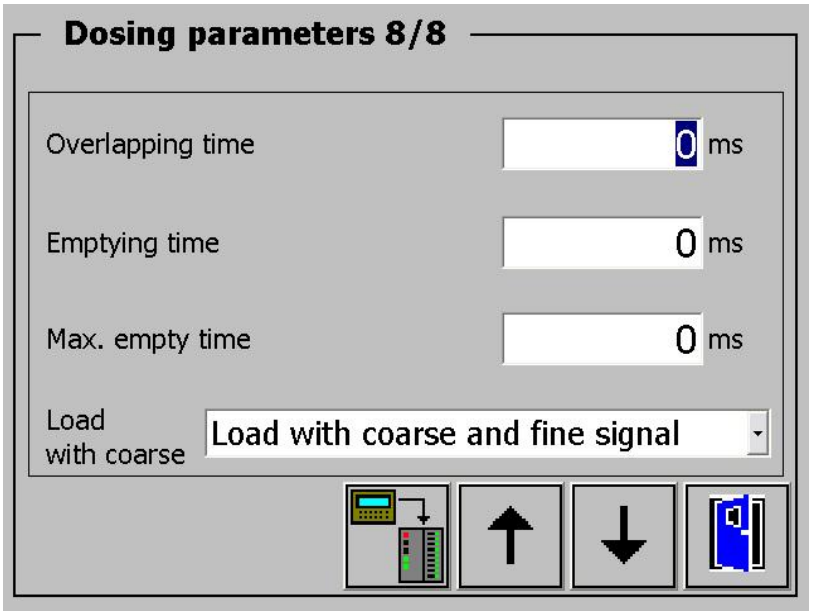


Fig. 4-13 Input of the dosing parameters II page 8

4.6 Set value definition, load set value, preset tare

The set weight, load set value and preset tare are set in separate screens.

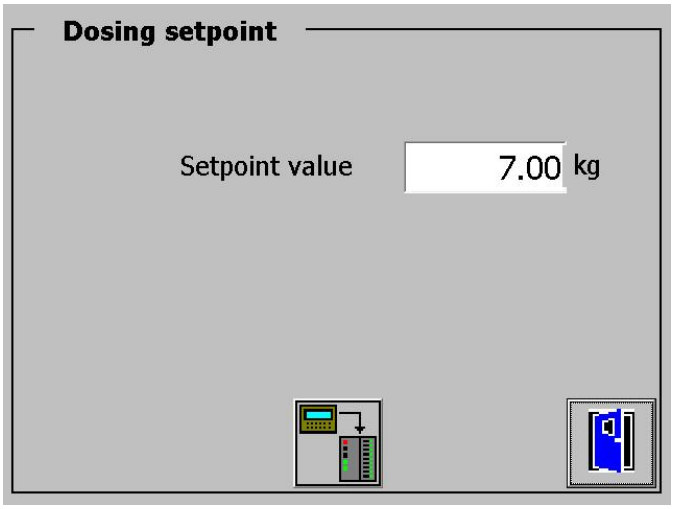


Fig. 4-14 Setpoint input

4.7 Service section

In the Service section the screen for system settings with the Touch Panel can be selected. The display language can also be determined in this system menu. Several languages are available.
The other two selection options concern the commissioning of a scale:

- Adjustment
- Setting of the basic parameters
- Read / write SIWAREX parameters
- Activate communication to digital load cell Mettler Toledo

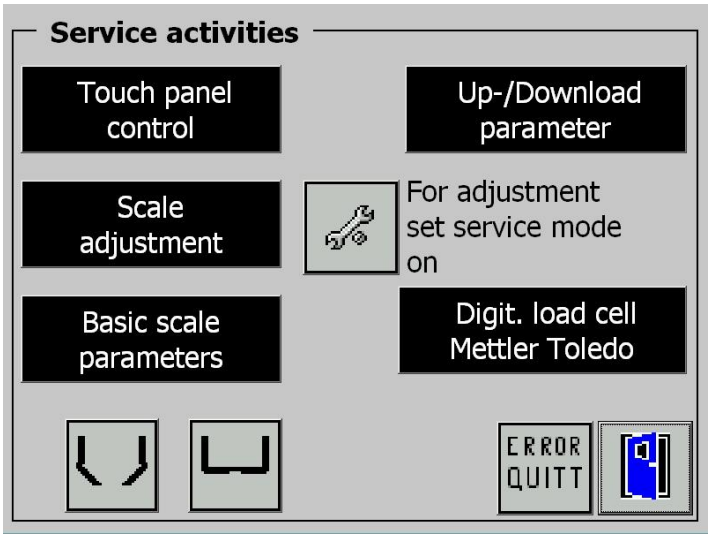


Fig. 4-15 Function selection in the service section

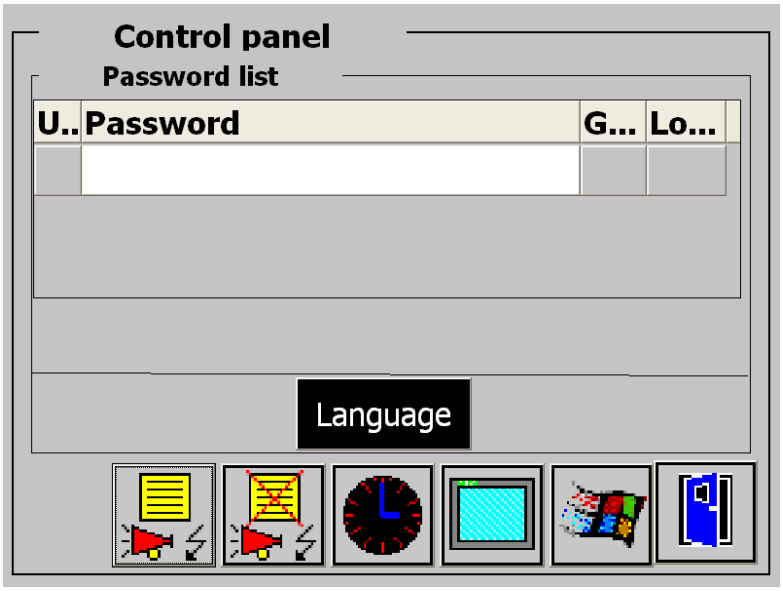


Fig. 4-16 Settings on the Touch Panel

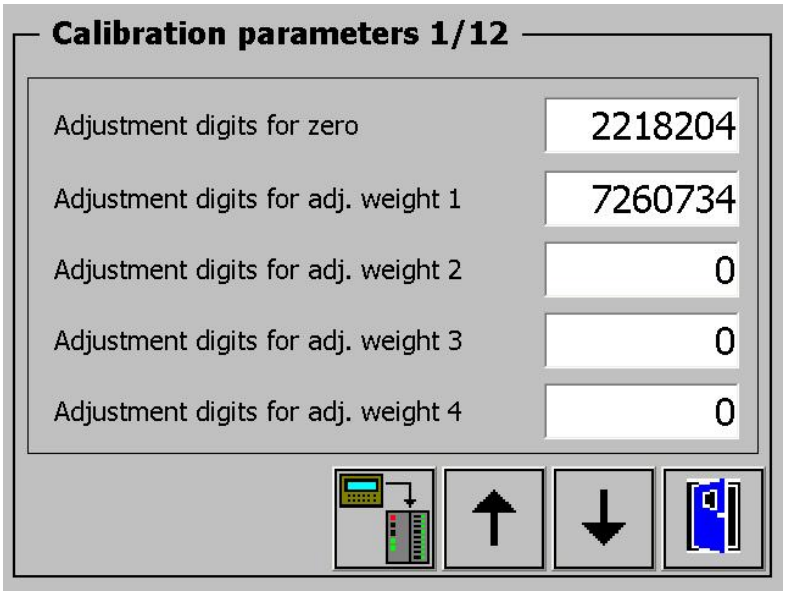
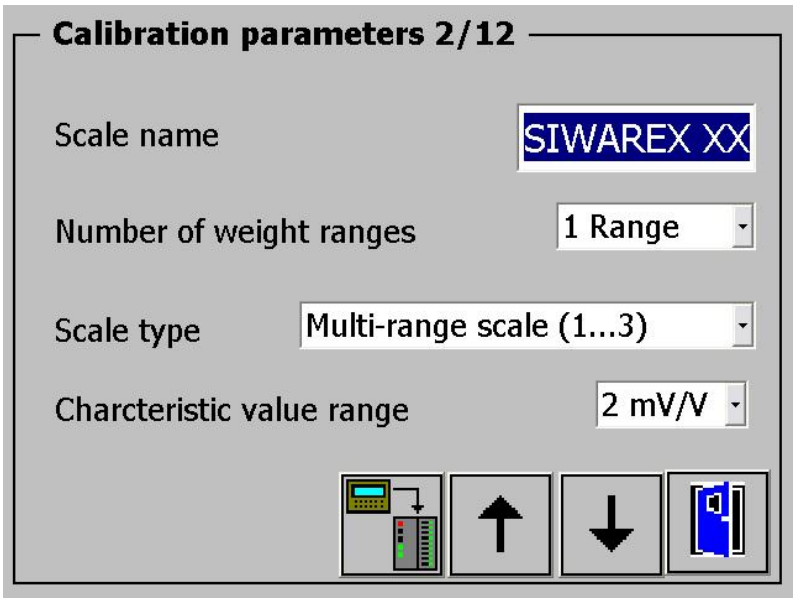


Fig. 4-17 Scale adjustment page 1

Fig. 4-18 Scale adjustment page 2



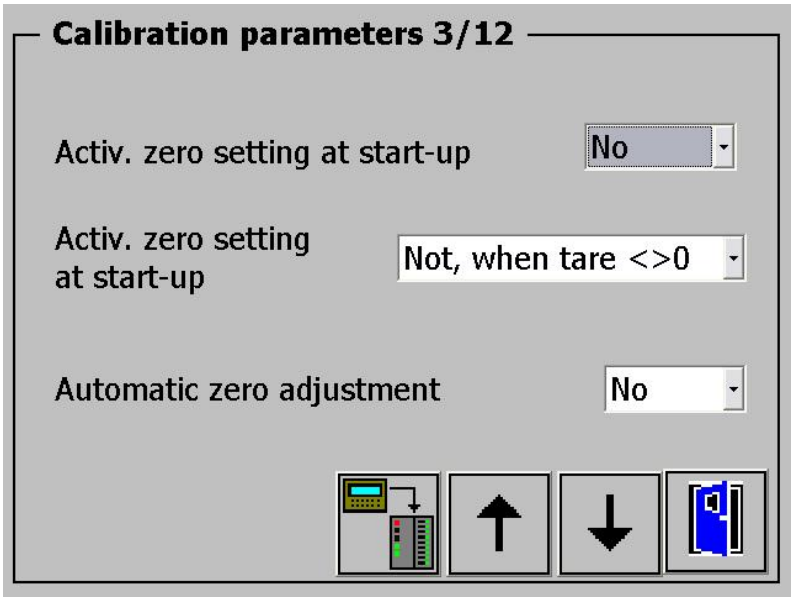
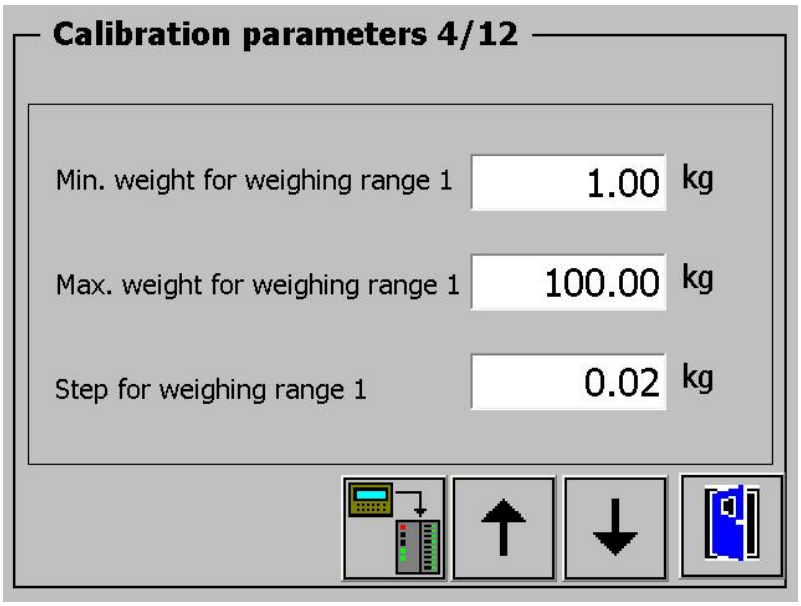


Fig. 4-19 Scale adjustment page 3

Fig. 4-20 Scale adjustment page 4



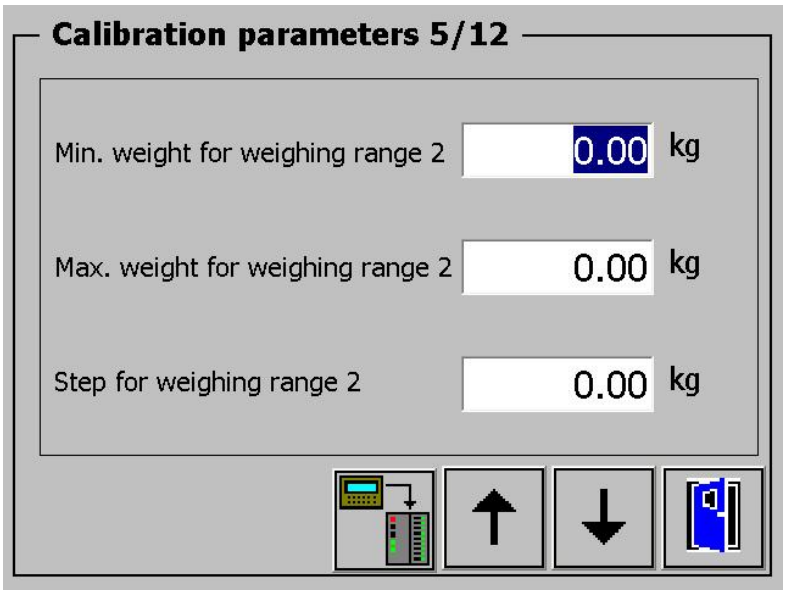


Fig. 4-21 Scale adjustment page 5

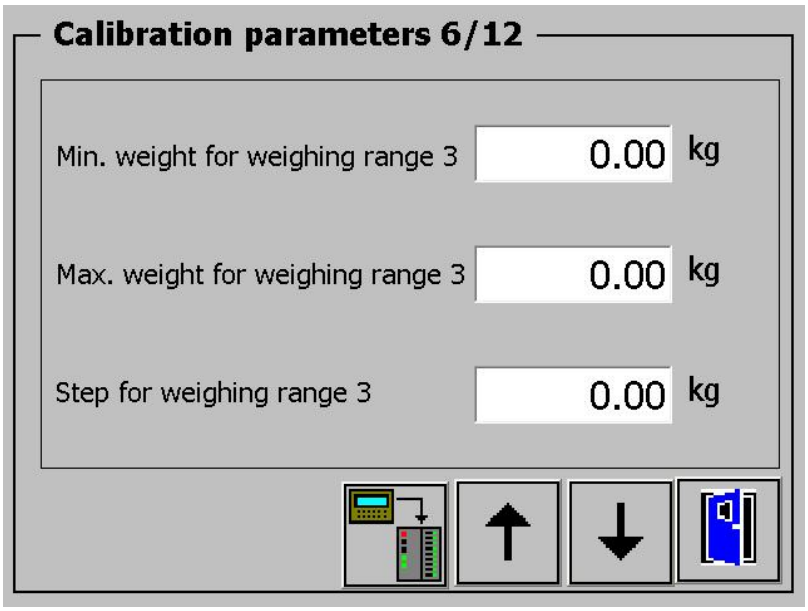


Fig. 4-22 Scale adjustment page 6

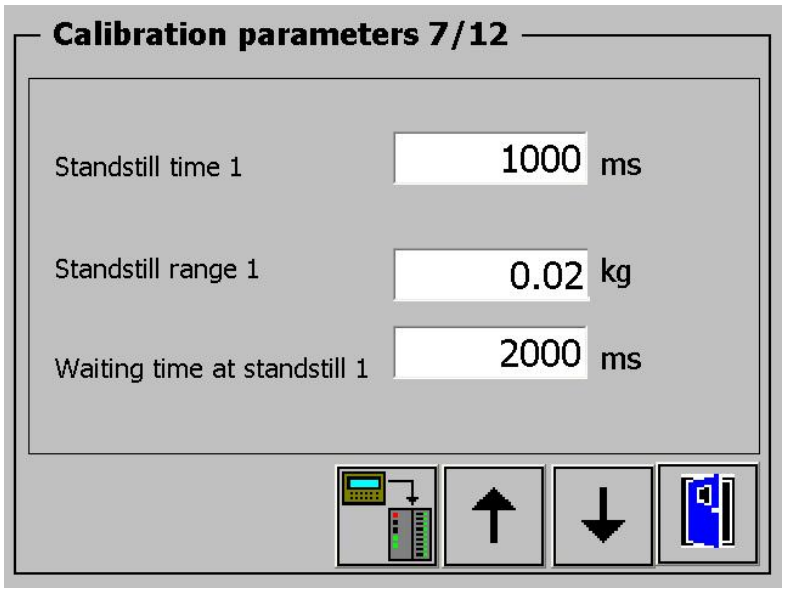


Fig. 4-23 Scale adjustment page 7

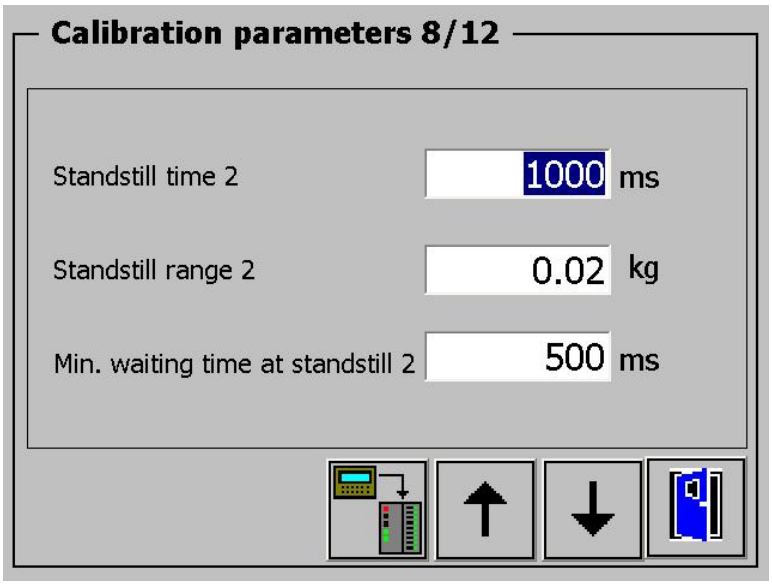


Fig. 4-24 Scale adjustment page 8

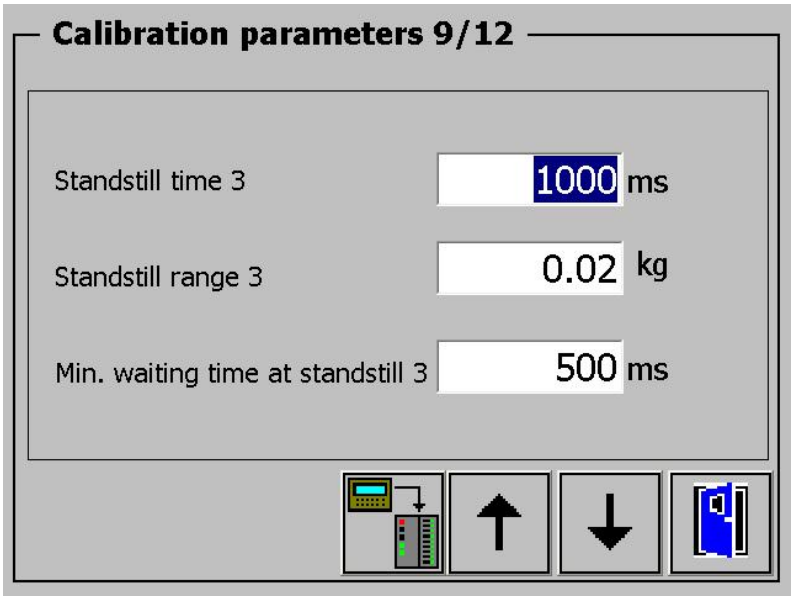


Fig. 4-25 Scale adjustment page 9

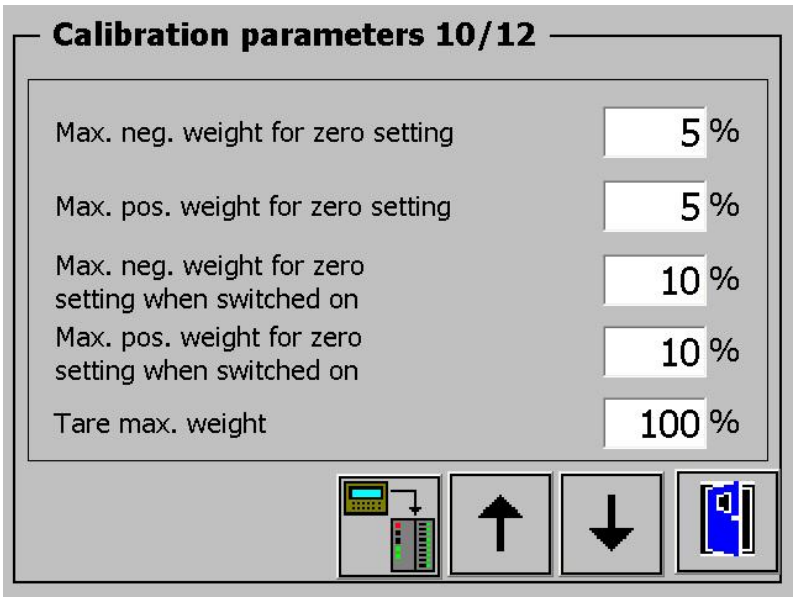


Fig. 4-26 Scale adjustment page 10

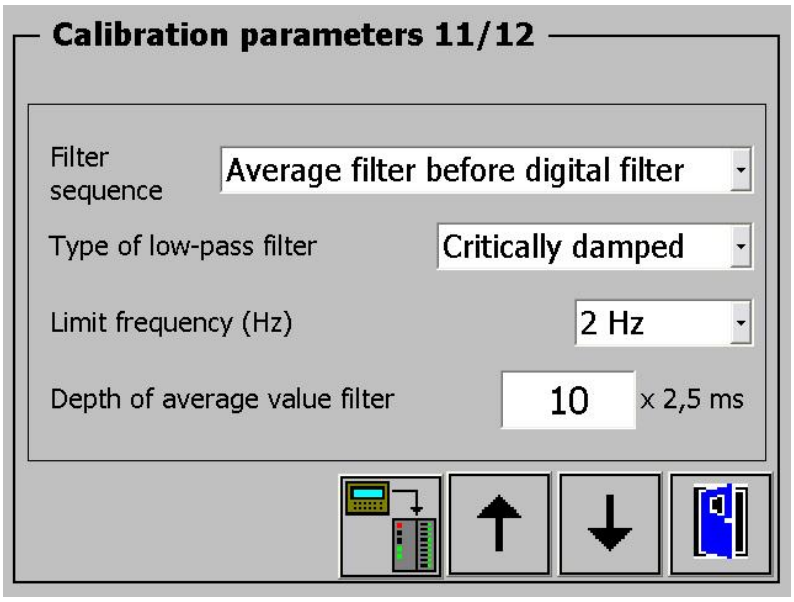


Fig. 4-27 Scale adjustment page 11

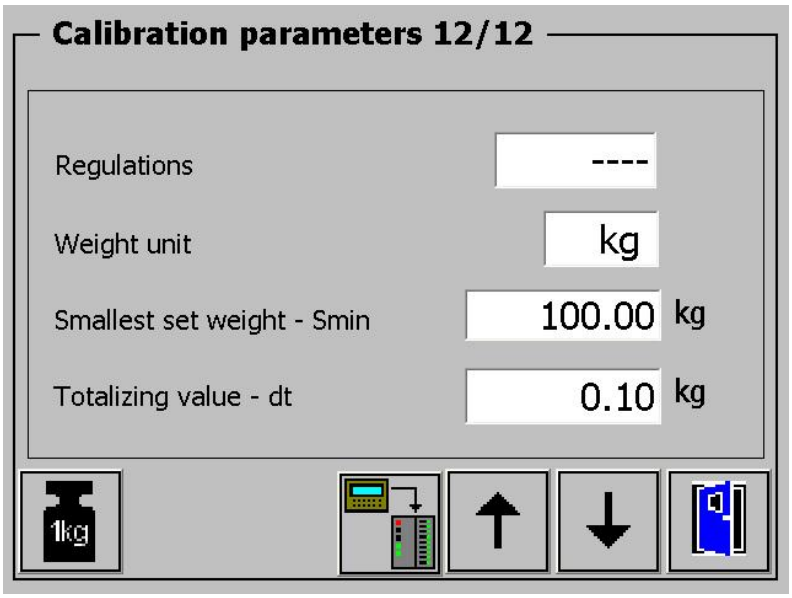


Fig. 4-28 Scale adjustment page 12

The screen for adjusting the scale is selected with the button

.

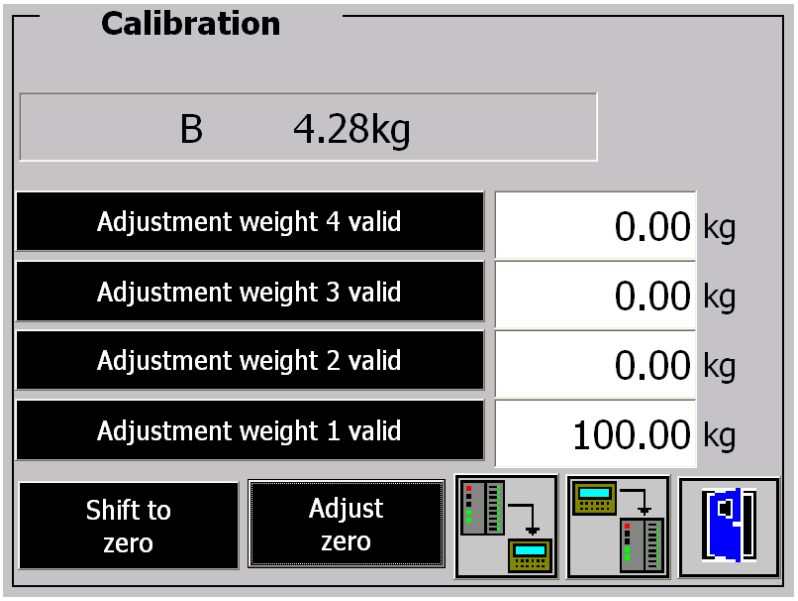


Fig. 4-29 Adjust scale

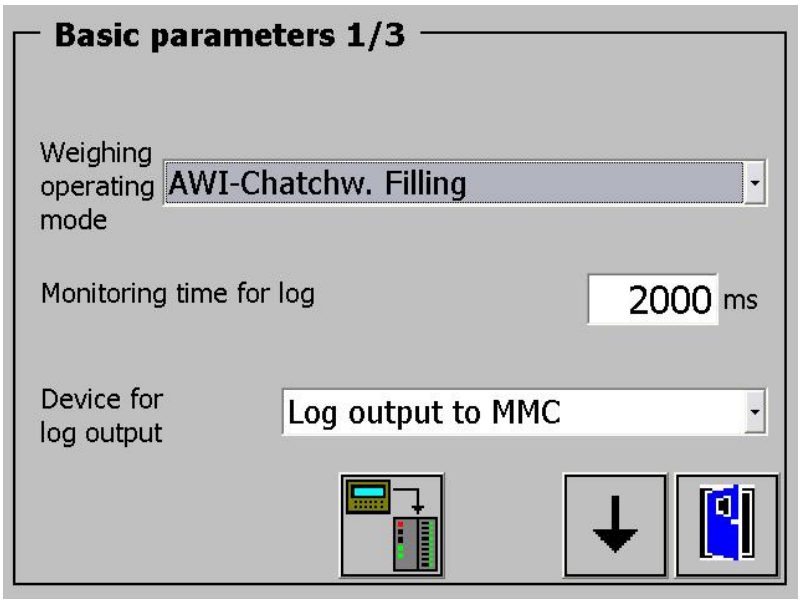


Fig. 4-30 Basic parameters page 1

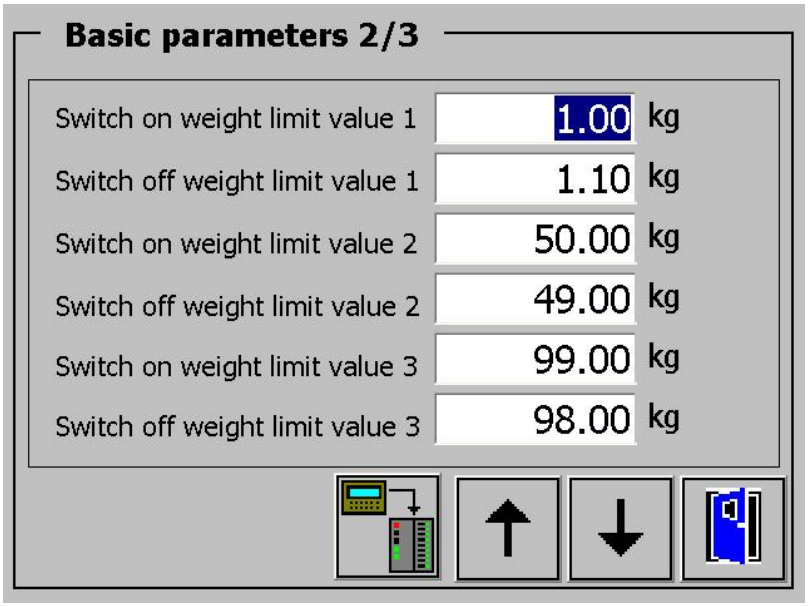


Fig. 4-31 Basic parameters page 2

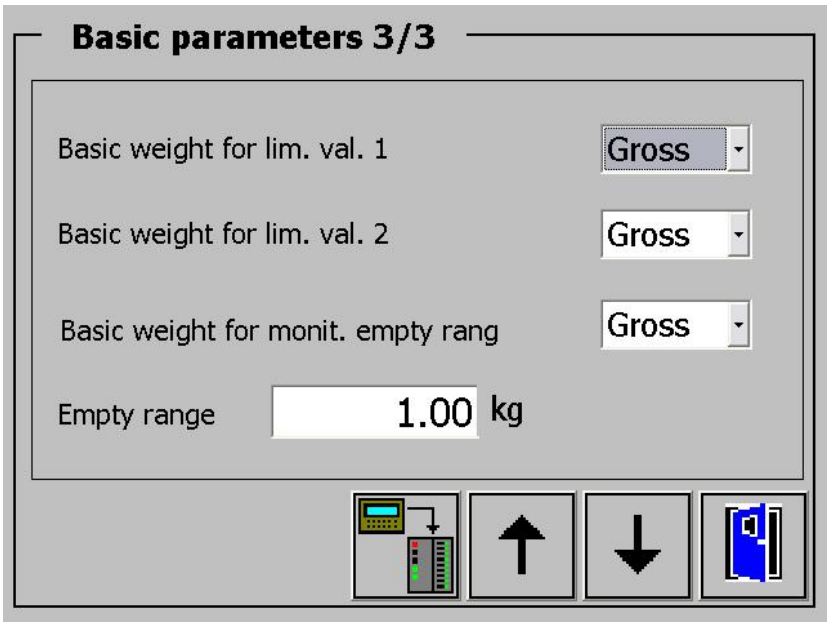


Fig. 4-32 Basic parameter page 3

4.8 Weighing Protocols

Protocols can be selected and displayed with this screen.

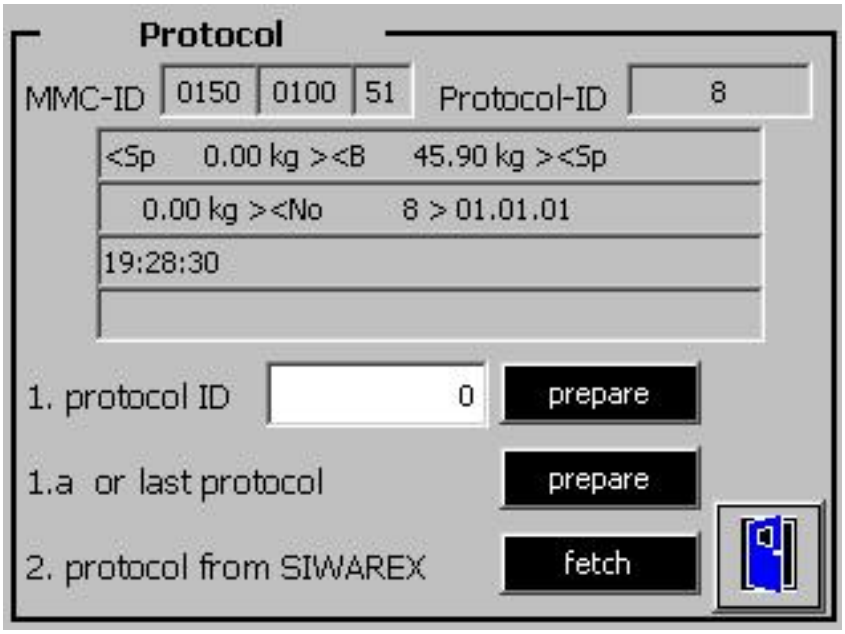


Fig. 4-33 Weighing Protocol

4.9 Meaning of the Function Keys

The function keys have the following meaning:

Start single dosing

Start continuous operation

End continuous operation

Stop current weighing

Continue stopped weighing

Residual weighing

Activate check stop

Cancel

Language selection

View alarm buffer

Reset current alarms

Next page

Previous page

Tare

Delete tare weight

Activate preset tare

Show tare weight for 5 sec.

Scale zero setting

Show total 1 for 5 sec.

Log and then delete total 1

Activate 10-fold resolution for 5 sec.

Read appropriate data record out of SIWAREX FTA

Send appropriate data record to SIWAREX FTA

Switch service mode on and off

Switch empty on

Switch empty off

Select the screen for scales adjustment

Previous screen

5 Commands

5.1 Command Groups

The SIWAREX FTA Getting Started software is parametered for operation with a one scale. The project is setup for the CPU 315-2 DP and MP 377 12'' TOUCH.

5.2 Program installation in STEP7

You can find the SIWAREX FTA module in SIMATIC HW catalogue in the group of function modules.

If you are using the same SIMATIC CPU 315-2 DP, you simply load the module from the project into the CPU. The program can be run immediately afterward. When loading with the MPI interface use MPI-address=1 for MP377, MPI-address=2 for the CPU.

5.2.1 Setting up another CPU

If you are using another CPU, it can easily be exchanged.

With Netpro the CPU can be connected again. Then WinCC should be opened and under menu item Connections 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.

5.2.2 Setting up another TP/OP

The software is prepared for a scale with a touch panel MP277 12'' Touch.

Changing of the device type is possible (select WinCC project/ Properties/ change device).

WinCC shows a list of devices which can be used.

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. 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_SCALE".i_CMD_INPUT,
           boCmdEnable              := "DB_SCALE".bo_CMD_ENABLE,
           boCmdInProgress          := "DB_SCALE".bo_CMD_IN_PROGRESS,
           boCmdFinishedOk          := "DB_SCALE".bo_CMD_FINISHED_OK,
           boCmdErr                 := "DB_SCALE".bo_CMD_ERR,
           sCmd_1                   := DB12.DBD   40,
           sCmd_2                   := DB12.DBD   44,
           sCmd_3                   := DB12.DBD   48);
```

Fig. 5-1 Calling the FC Command Manager

The input variable s_CMD1 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 SIWAREX by calling the FB41 but by the structure CMD1, CMD2, CMD3.

s_CMD1	**STRUCT**		**Command input 1**
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

Fig. 5-2 Calling the FC Command Manager

5.4 Scale Call

Calling the FB_SIWAREX_FTA is done in the OB1. The FB is called with the following parameters:

```
CALL "SIWA_FTA" , DB    10 (
           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".dw_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);
```

Fig. 5-3 Calling the scale in OB1

5.5 Alarms

For AlarmS messaging system:

The alarms for the scale are decoded with the FC1 and passed onto the FB1 for alarm generation with ALARM_S.

Alarm generation is supported by the systematics of the ALARM_S modules SFC18 and SFC19. In the indicated scope, the scale messages are monitored.

Monitoring the display word INDW from the scale call using the FB_SIWA block is not integrated in the "Getting started" package.

Note

When using the "Getting Started" package, ensure that after removing the display device e.g. MP 377 12'' TOUCH from the system in online operation, no more alarms are generated. After connecting the des MP 377 12'' TOUCH to the system again, the SIMATIC CPU must be started in RUN again.

For bit messaging system:

In the bit messaging system there will be set a bit in the pointer area for each message. In the WinCC flexible project there are messages prepared for up to 4 SIWAREX modules.

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

5.6 Configuring with WinCC flexible

The software is setup for the display of a scale in MP 377 12'' TOUCH.

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 CPU 315-2 DP and MP 377 12'' TOUCH, the program is immediately ready for operation after loading onto the MP 377 12'' TOUCH. When loading via the MPI interface, use the MPI address=1 for the MP 377 12'' TOUCH, for the CPU MPI address=2.

5.7.1 Calibratable display

Compare Device Manual SIWAREX FTA

5.7.2 Planning 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.

5.7.3 Planning 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

	ALARM S	Bit messages system
OB /FB/FC	ca. 9.8 kB	ca. 5.8 kB
DB	ca. 3.7 kB	ca. 2.5 kB
Program scope WinCC	ca. 1300 kB	ca. 1300 kB

Table 6-1 Required memory

6.2 Cycle Time

Exemplary cycle time for Getting started with one scale in CPU 315-2 DP	ca. 5 ms

Table 6-2 Cycle time

7 Accessories and Expansions

For operation with more than one scale, more planning packages are available:

- SIWAREX MULTIFILL (order number 7MH 4900-2AM01) for simultaneous operation with more than one bagging, filling or unloading scales.
- SIWAREX MULTISCALE (order number 7MH 4900-2AL01) for the simultaneous operation of more than one scale using a predefined recipe.