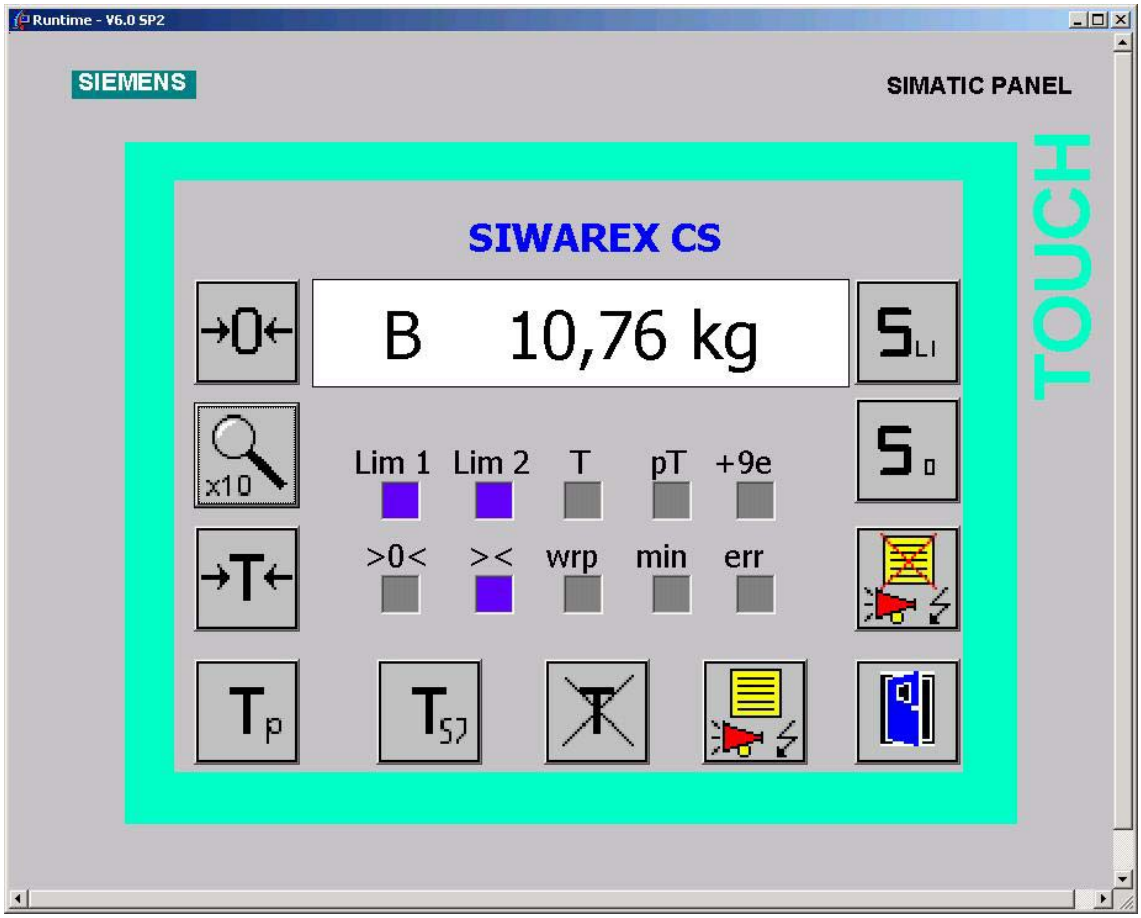
SIEMENS

SIWAREX® CS “Getting started”

Info

Status 20.06.2004



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We are grateful for any suggestions for improvement.

“Getting started” for SIWAREX CS

Information

Issue 06/2004

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1 Preface

1.1 Purpose of the Information

All of the information required for setting up the system with SIWAREX CS “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 CS 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 SIWARIX CS is required. Weighing technology knowledge is also an asset.

1.4 Further Support

Do you have any more questions about using the SIWAREX CS ? 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.siwarex.com

2 Scope of Delivery

2.1 System Prerequisites

The project has been created for the following ET 200S – heads:

- CPU head and Touch Panel TP270B (Full version)
- CPU 315-2 DP and High Feature – Head and Touch Panel TP270B (Full version)
- CPU 315-2 DP and Standard head (Mini-version without data record communication) and Touch Panel TP270B
- CPU 315-2 DP and Basic head (Mini-version without data record communication) and Touch Panel TP270B

The project is made up of two parts:

- STEP7 Software for the CPU
- ProTool Software for the Touch Panel TP270B.

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 200S.
- ProTool Software can be converted in the devices TP/OP/MP 170/270/370.

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

The basic equipment is also required for the setup work – the configuration package SIWAREX CS for SIMATIC S7 (Order number 7MH4910-0AK01). This configuration package consists of the following:

- SIWATOOL CS Commissioning program for Windows
- Hardware Update for the SIMATIC Manager hardware catalog
- Standard software for operating the SIWAREX CS in SIMATIC S7
- Device manuals in several languages

System prerequisites for using SIWAREX CS “Getting started”:

- SIMATIC STEP7 Version 5.2 and higher
- ProTool Version 6.0 and higher

3 Overview

3.1 General

SIWAREX CS (Compact Scale) is a versatile and flexible weighing module, which can be used wherever static scales are to be used in the ET 200S automation system or a force measurement is necessary.

The SIWAREX CS function module (FM) can be used in SIMATIC ET 200S and 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 CS “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. TP270B. 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 CS “Getting started” is characterized by a number of clear advantages:

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

3.3 Application Range

SIWAREX CS “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
- ProTool project (integrated in SIMATIC Manager)

A message block is also used. In this way, messages from SIWAREX CS are displayed to the operator. The messages are created on a bit basis with this

message block (FC2). Of course the message system 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-CS module, latching and signal linking is done in the PLC.

SIWAREX CS “Getting started” takes over the tasks of a standardized program in the SIMATIC S7. In SIWAREX CS “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.

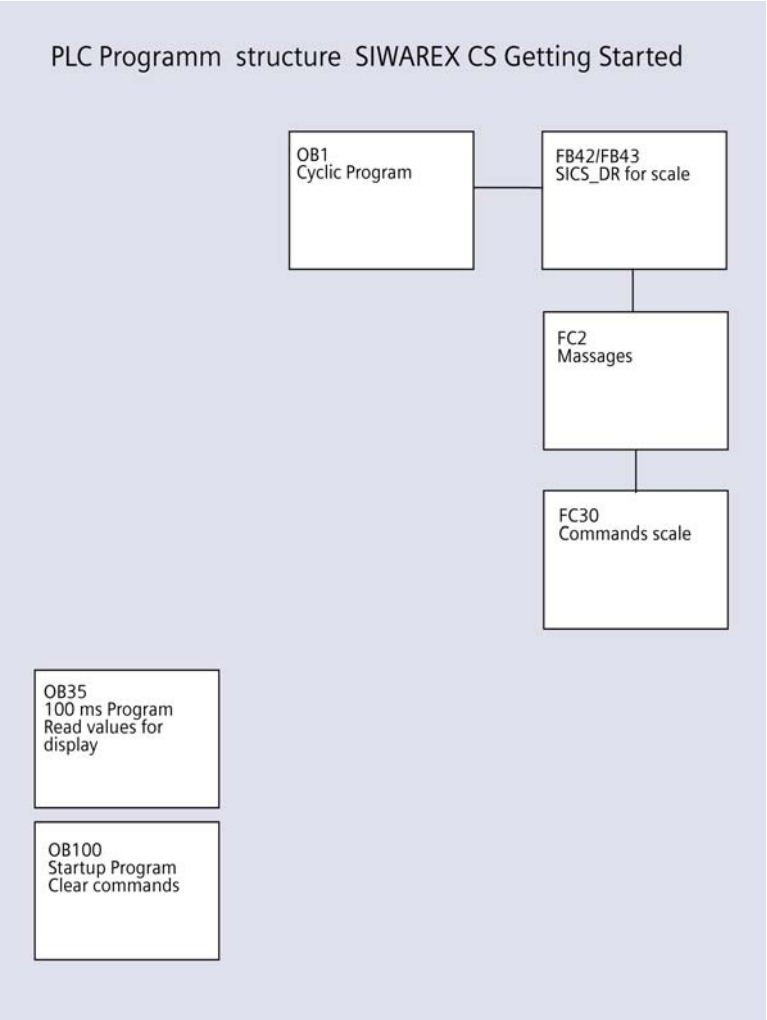

Figure 3-1 Program structure STEP7 for SIWAREX CS “Getting started”

3.6 Commissioning- and Service with SIWATOOL CS

SIWATOOL CS is part of the scope of the delivery of the SIWAREX CS configuration package for SIMATIC S7 (Order number 7MH4910-0AK01). To perform commissioning, the program must be installed on a PC first. The PC and SIWAREX FTA are connected by the cable provided as an accessory.

Using the SIWAREX CS “Getting started” program, the adjustment parameters (data record 3) and limit values (data record 4) can be changed at a later time and the scale can be also be similarly readjusted later using a Touch Panel like with SIWATOOL CS.

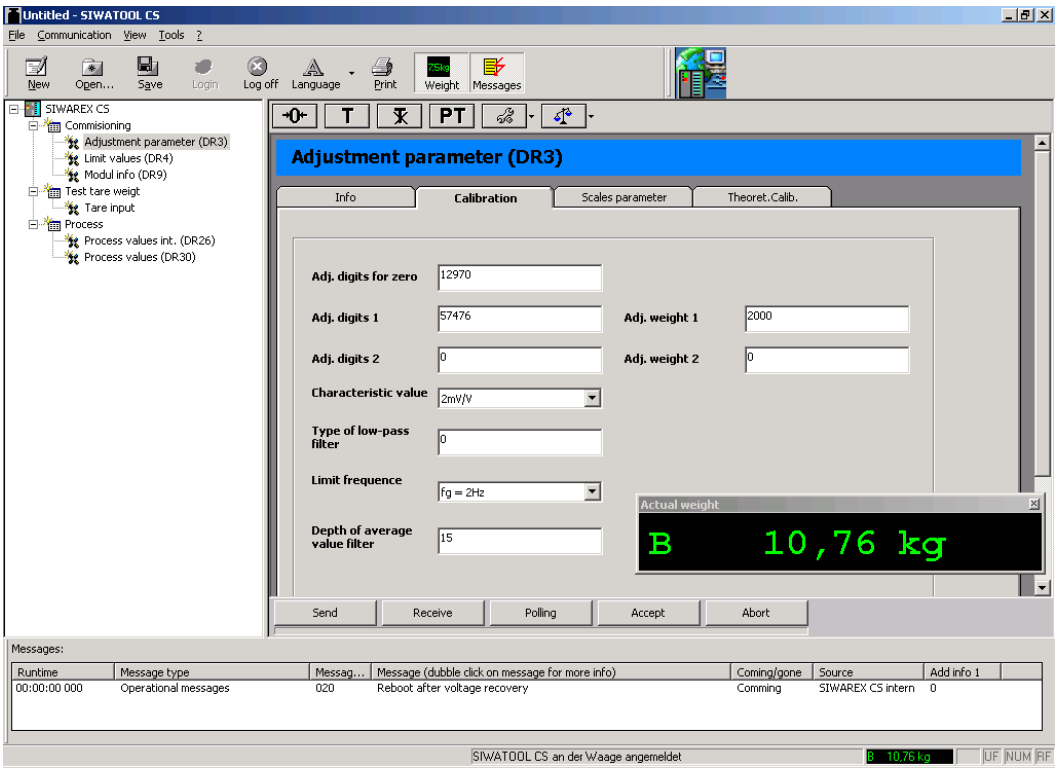

Figure 3-2 Initial commissioning with SIWATOOL CS

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 CS “Getting started” software.
The descriptions for individual scale parameters and scale functions can be found in the SIWAREX CS and are not explained individually in the display of the individual SIWAREX CS “Getting started” screens.
All of the existing screens are shown in this product info.

4.2 Start Screen

The program starts with the SIMATIC – Configuration screen . The scale view can be selected from this screen. 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 center of the screen.

The explanation of the function of the buttons is found in chapter: Meaning of the Function Keys *4.8*.

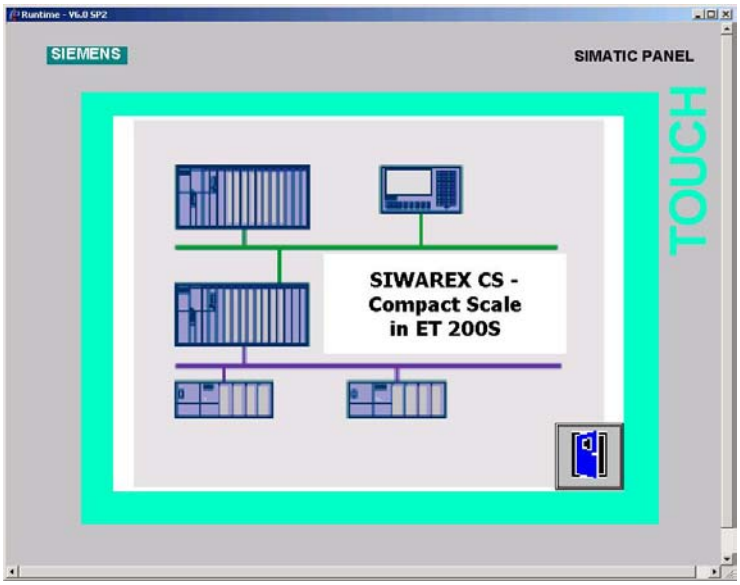

Figure 4-1 Start screen for Touch Panel TP270

4.4 Menu

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

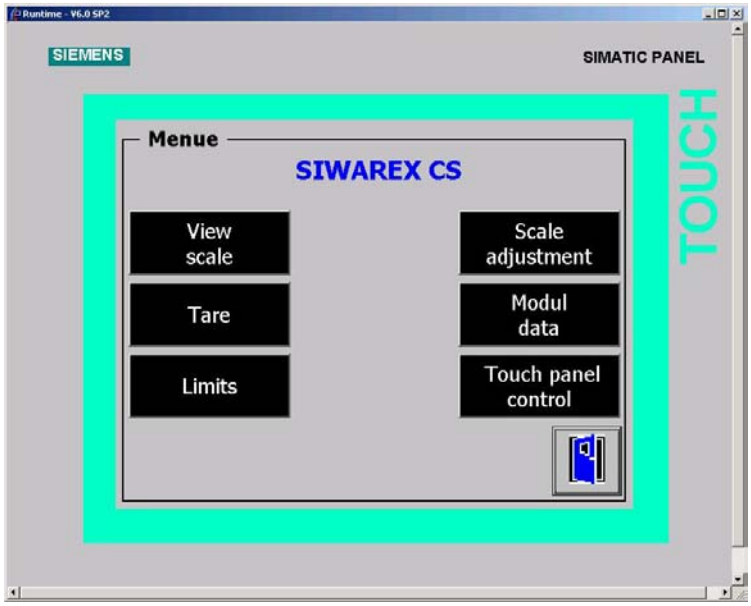

Figure 4-2 Screen – Menu for SIWAREX CS

4.5 Operating and Monitoring

In the scale view screen, the current scale status can be observed. Commands can be sent to the scale by pressing buttons.

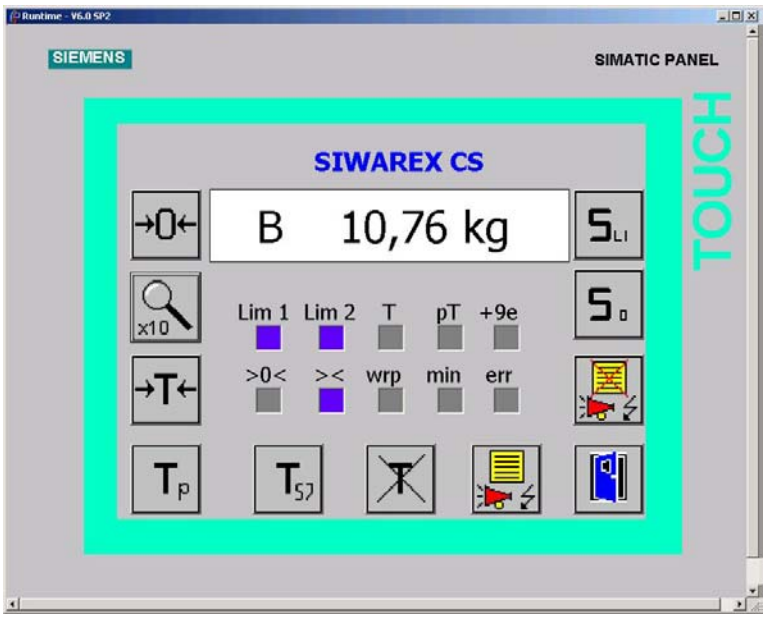

Figure 4-3 Screen – Operating and Monitoring

4.6 Service section

The following screens can be selected from the service section:

- Adjustment (5 screens)
- Read module data (1 screen)
- Settings for language and the Touch Panel

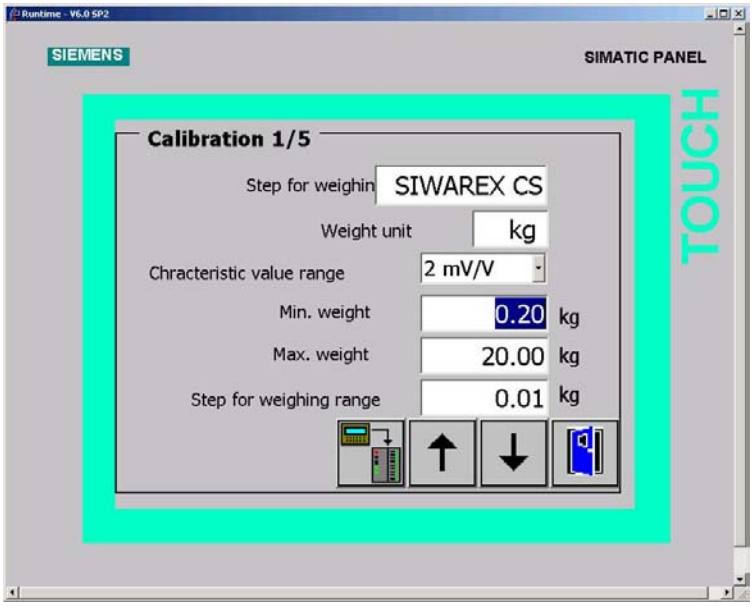

Figure 4-4 Screen – Scale adjustment Page 1

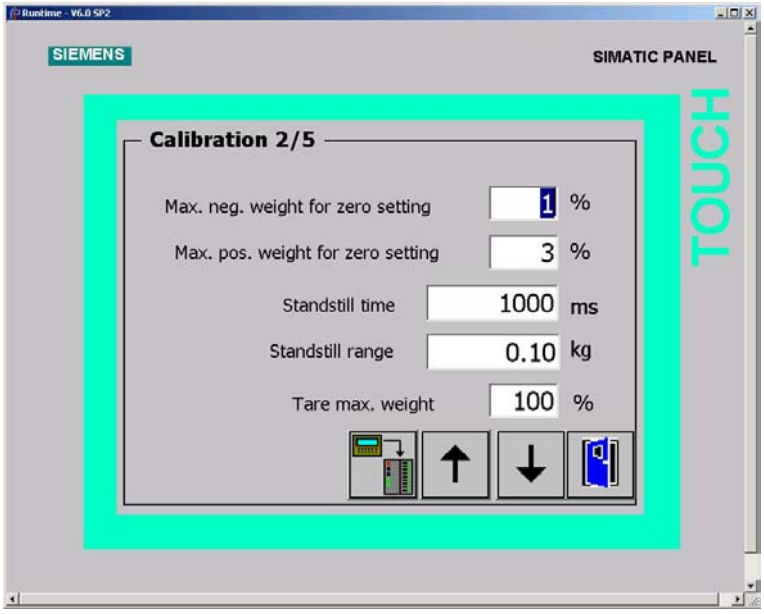

Figure 4-5 Screen – Scale adjustment Page 2

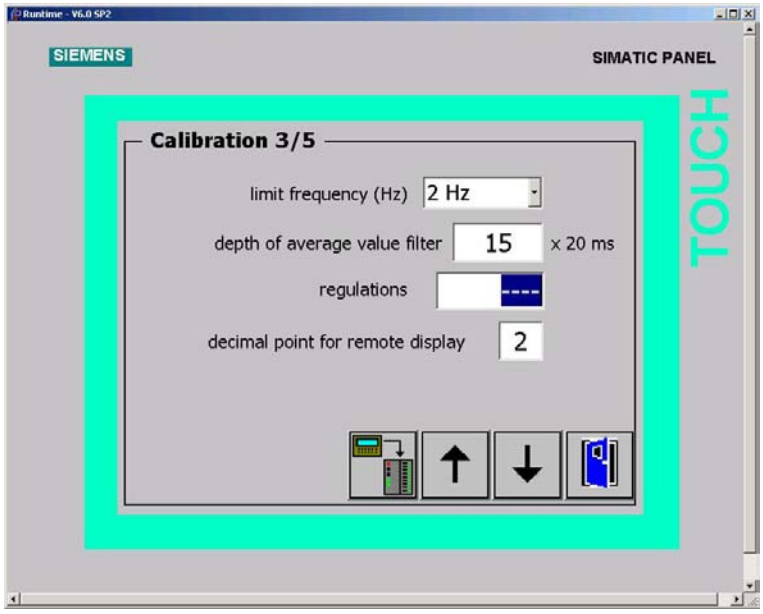

Figure 4-6 Screen – Scale adjustment Page 3

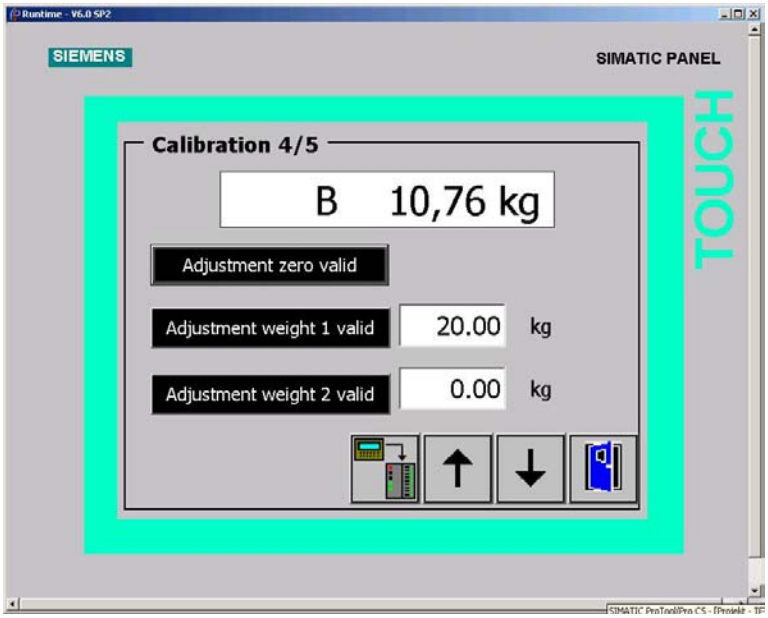

Figure 4-7 Screen – Scale adjustment Page 4

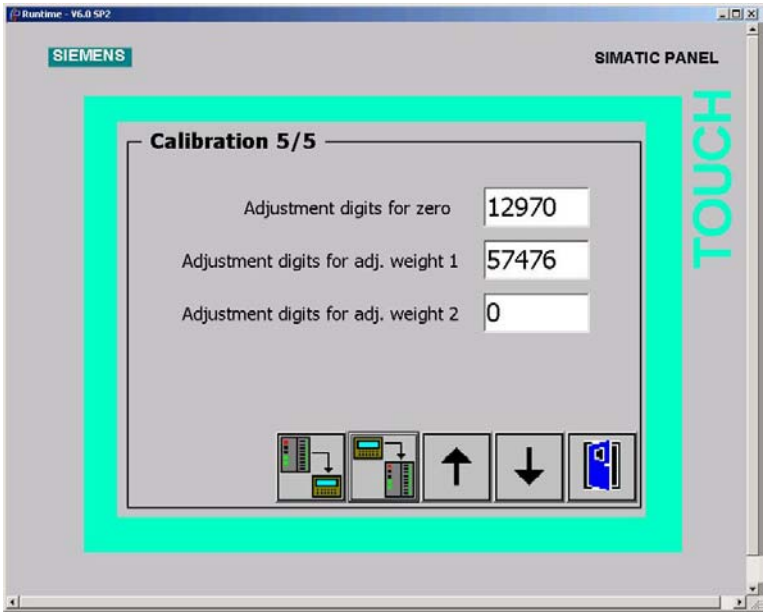

Figure 4-8 Screen – Scale adjustment Page 5

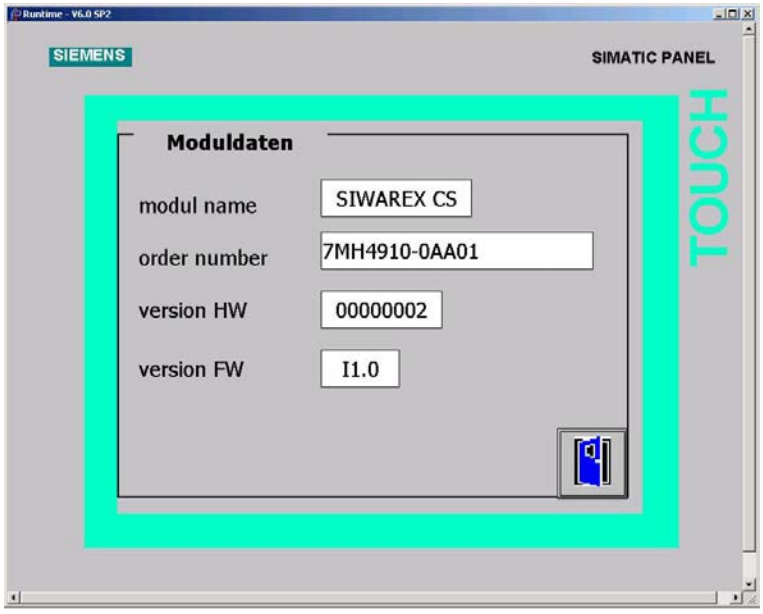

Figure 4-9 Screen – Read module data

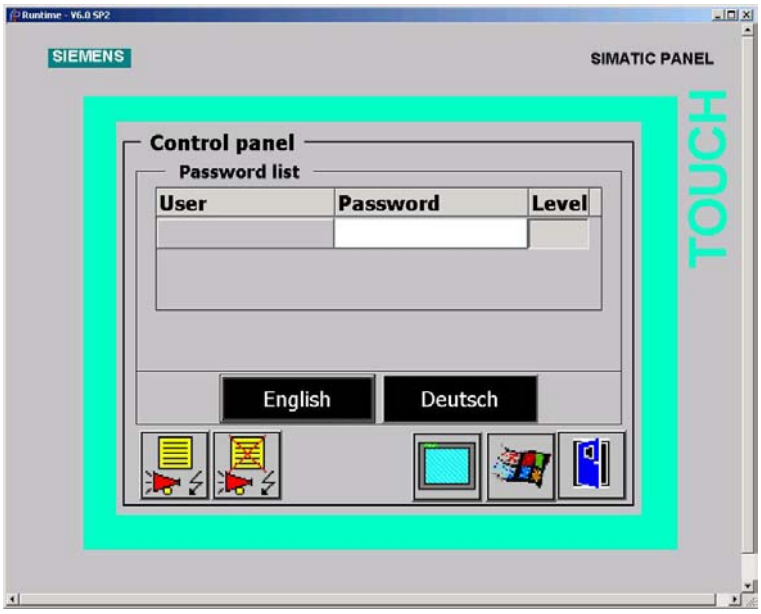

Figure 4-10 Screen – Settings for the Touch Panel

4.7 Scale parameters

The tare weight and the limit values can be predefined as weighing parameters for the SIWAREX CS.

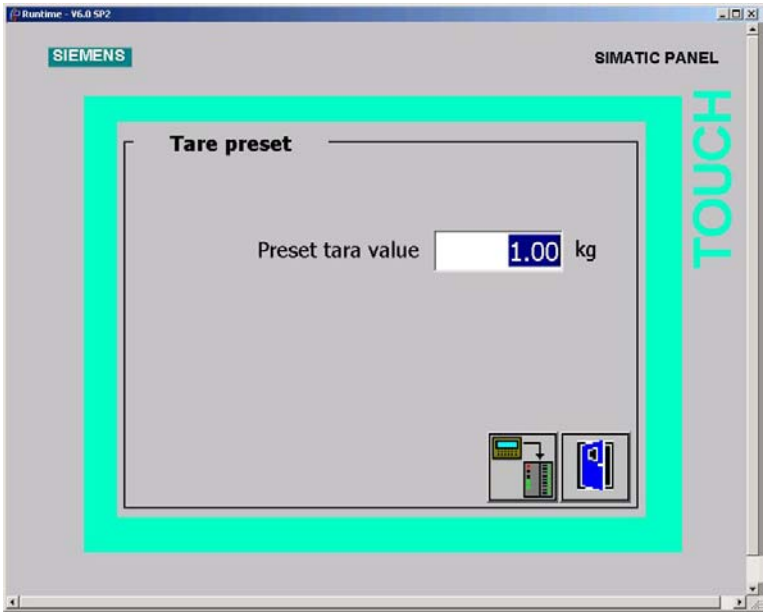

Figure 4-11 Screen – External tare definition

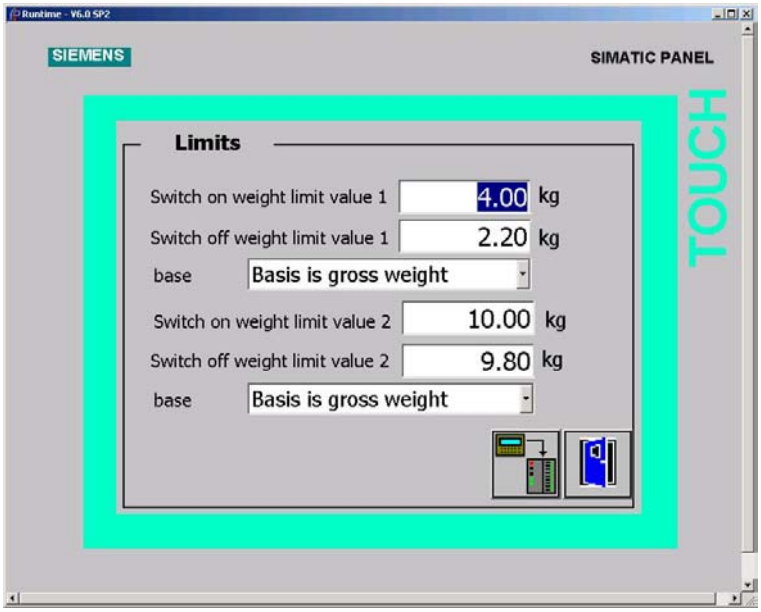

Figure 4-12 Screen – Limit value parameter

4.8 Meaning of the Function Keys

The function keys have the following meaning:

View alarm buffer

Reset current alarms

Next page

Previous page

Tare

Delete tare weight

Activate preset tare

Take tare weight from the SIMATIC

Show tare weight for 5 sec.

Scale zero setting

Activate 10-fold resolution for 5 sec.

Read appropriate data record out of SIWAREX FTA

Send appropriate data record to SIWAREX FTA

Save data record with limit values (DS4) in flash

Save data record with zero set values (DS26)

Previous screen

5 Configuring

5.1 Command Groups

The SIWAREX CS “Getting started” software is defined for operation with a scale.

5.2 Program installation in STEP7

You can find the SIWAREX CS module in SIMATIC HW catalog in PROFIBUS DP, ET 200S in the group of function modules.

If you can not find SIWAREX CS in the SIMATIC Manager the SIWAREX CS module must first be inserted in the HW catalog. Select the function "Install HW updates" from the „Tools“ menu. Then select „Install from file“. The file for updating the SIWAREX CS module is located in the UPDATE_FOR_SIMATIC_S7 directory of the SIWAREX CS configuration package for S7 (Order number 7MH4910-0AK01). After the update, SIWAREX CS can be found under the FM modules for ET 200S.

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_SCALE_CS".i_CMD_INPUT
      boCmdEnable    :="DB_SCALE_CS".bo_CMD_TRIGGER
      boCmdInProgress:="DB_SCALE_CS".bo_CMD_IN_PROGRESS
      boCmdFinishedOk:="DB_SCALE_CS".bo_CMD_FINISHED_OK
      boCmdErr       :="DB_SCALE_CS".bo_CMD_ERR
      sCmd_1         :=DB21.DBD24
      sCmd_2         :=DB21.DBD28
      sCmd_3         :=DB21.DBD32
```

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 FB42/FB43, but through 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

Figure 5-2 FC Command Manager Call

5.4 Calling the Scale FB

Calling the FB SICS_DR or SICS_BA is done in OB1. The FB is called with the following parameters:

For the Basic and Standard head, FB SICS_BA is called as follows:

```
CALL  "SICS_BA" , DB42
  ADDR              :=256
  DB_SCALE          :=22
  CMD_IN            :="DB_SCALE_CS".i_CMD_INPUT
  SEL_PROC_VAL      :="DB_SCALE_CS".b_SELECT_PROC_VAL
  EXT_TARA          :="DB_SCALE_CS".i_PRESET_TARE
  CMD_INPR          :="DB_SCALE_CS".bo_CMD_IN_PROGRESS
  CMD_FOK           :="DB_SCALE_CS".bo_CMD_FINISHED_OK
  CMD_ERR           :="DB_SCALE_CS".bo_CMD_ERR
  CMD_ERR_C         :="DB_SCALE_CS".b_CMD_ERR_CODE
  REF_COUNT         :="DB_SCALE_CS".b_INFO_REFRESH_COUNT
  ACT_SEL_PROC_VAL:="DB_SCALE_CS".b_SELECTED_PROC_VAL
  PROC_VAL1         :="DB_SCALE_CS".i_PROCESS_VALUE
  SC_STATUS         :="DB_SCALE_CS".w_SCALE_STATUS
  ERR_MSG_C         :="DB_SCALE_CS".b_OPR_ERR_MSG
  FB_ERR            :="DB_SCALE_CS".bo_FB_ERR
  FB_ERR_C          :="DB_SCALE_CS".b_FB_ERR_CODE
  START_UP          :="DB_SCALE_CS".bo_START_UP_IN_PROGRESS
  CMD_EN            :="DB_SCALE_CS".bo_CMD_TRIGGER
```

Figure 5-3 Call Parameters for FB SICS_BA

For the HF and CPU head, FB SICS_DRis called as follows:

```
CALL  "SICS_DR" , DB41
  ADDR              :=272
  DB_SCALE     :=21
  DB_VECTOR    :=20
  CMD_IN            :="DB_SCALE_CS".i_CMD_INPUT
  SEL_PROC_VAL      :="DB_SCALE_CS".b_SELECT_PROC_VAL
  EXT_TARA          :="DB_SCALE_CS".i_PRESET_TARE
  CMD_INPR          :="DB_SCALE_CS".bo_CMD_IN_PROGRESS
  CMD_FOK           :="DB_SCALE_CS".bo_CMD_FINISHED_OK
  CMD_ERR           :="DB_SCALE_CS".bo_CMD_ERR
  CMD_ERR_C         :="DB_SCALE_CS".b_CMD_ERR_CODE
  REF_COUNT         :="DB_SCALE_CS".b_INFO_REFRESH_COUNT
  ACT_SEL_PROC_VAL:="DB_SCALE_CS".b_SELECTED_PROC_VAL
  PROC_VAL1         :="DB_SCALE_CS".i_PROCESS_VALUE
  SC_STATUS         :="DB_SCALE_CS".w_SCALE_STATUS
  ERR_MSG_C         :="DB_SCALE_CS".b_OPR_ERR_MSG
  FB_ERR            :="DB_SCALE_CS".bo_FB_ERR
  FB_ERR_C          :="DB_SCALE_CS".b_FB_ERR_CODE
  START_UP          :="DB_SCALE_CS".bo_START_UP_IN_PROGRESS
  CMD_EN            :="DB_SCALE_CS".bo_CMD_TRIGGER
```

Figure 5-4 Call Parameters for FB SICS_DR

5.5 Alarms

The scale messages are decoded with the FC2 and converted into a bit message field. 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.

```
CALL  FC    2
    db_DB_ALARM    :=DB100
    i_FIRST_DBB    :=20
    bo_CMD_ERR     :="DB_SCALE_CS".bo_CMD_ERR
    b_CMD_ERR_CODE :="DB_SCALE_CS".b_CMD_ERR_CODE
    b_OPR_ERR_MSG  :="DB_SCALE_CS".b_OPR_ERR_MSG
    bo_FB_ERR      :="DB_SCALE_CS".bo_FB_ERR
    b_FB_ERR_CODE  :="DB_SCALE_CS".b_FB_ERR_CODE
    bo_DEL_BIT_AREA:=M20.0
    bo_EDGE_1      :=M20.1
    bo_EDGE_2      :=M20.2
```

Figure 5-5 Call parameter for the message block FC2

5.6 Configuring with ProTool

The software is for setup for showing a scale in TP270B.

The conversion to other SIMATIC HMI devices is possible.

ProTool offers a selection of target devices for the conversion.

5.7 Program installation in ProTool

If you are using the planned CPU and TP270B, the program is ready for operation immediately after loading into the TP270B (or Start of Runtime in ProTool). When loading with the MPI interface, use MPI-address=1 for TP270B, MPI-address=2 for the CPU and address 4 for the PROFIBUS head station.

5.7.1 Setting up another CPU

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

Select the controller from the Controllers menu in ProTool and link the controller for the communication with the OP/TP in the Parameter menu.

Then, activate the Restore symbol in the Edit menu.

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.

After activating the menu for project conversion, you are offered a list of possible target devices. Select the device from the list and perform the conversion.

The following procedures are handled as they are when using a new CPU – see *Setting up another CPU 5.7.1.*

6 Technical Data

6.1 Program Scope

Memory requirements are shown for the HF or the CPU header.

OB /FB/FC	Approx. 5.3 kB
DB	Approx. 0.7 kB
Program scope ProTool	Approx. 430 kB

Table 6-1 Required memory

6.2 Cycle Time

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

Table 6-2 Cycle time

7 Accessories and Expansions

Information on expansion software for SIWAREX “Getting started” can be obtained through the engineering office in Kaszkin: www.ib-kaszkin.de