SIEMENS

SIWAREX® FTA – PCS7

Advanced Process Library

Version 12/2013

SIWAREX FTA

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Safety

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

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

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

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

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

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

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

Qualified Personnel

The device/system may only be set up and used in conjunction with this documentation. Commissioning and operation of a device/system may only be performed by **qualified personnel**. Within the context of the safety notes in this documentation qualified persons are defined as persons who are authorized to commission, ground and label devices, systems and circuits in accordance with established safety practices and standards.

Prescribed Usage

Note the following:

⚠ WARNING
This device may only be used for the applications described in the catalog or the technical description and only in connection with devices or components from other manufacturers which have been approved or recommended by Siemens. Correct, reliable operation of the product requires proper transport, storage, positioning and assembly as well as careful operation and maintenance.

Trademarks

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Disclaimer of Liability

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

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TABELLEN

1 Preamble

1.1 Purpose of the Information

This manual contains all the information required to configure a PCS7 System using SIWAREX FTA for weighing applications. The functionality of the SIWAREX FTA itself is described in the FTA manual.

1.2 Required Basic Knowledge

In order to understand the manual, certain knowledge concerning the SIMATIC automation technology especially PCS7 is required. Weighing technology knowledge is also an asset.

1.3 Scope of this Manual

This software requires PCS7 V8.0 Update 1 and following SIWAREX FTA module:

Type	**Name**	**Order number**	**from product status (Version)**	
SIWAREX FTA	SIWAREX Flexible Technology Automatic Weighing Instrument*	7MH4900-2AA01	HW E-Rev. 1	FW V.5.x.y

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“.

1.4 Further Support

Do you have more questions concerning the use of SIWAREX FTA? Then please contact your Siemens representative or the technical support for SIWAREX
Tel.: +49 (0)721 595 2811 or open a Support Request
www.siemens.com/automation/support-request

Updated information on SIWAREX Weighing Technology as well as the newest versions of the SIWAREX user manuals can be found on the respective Internet Site.

http://www.siemens.com/siwarex

2 Scope of Delivery

The SftAwi function block is used to connect a SIWAREX FTA weighing module to PCS7 using the Advanced Process Library standards. PCS7 V8.0 Update 1 system is required.

In the first step, SIWAREX FTA must be integrated into the hardware catalogue by installing a HSP. The installation procedure and the HSP itself can be found in the Readme file on the CD.

While configuring the hardware configuration in the SIMATIC Manager, the following basic features of the module have to be defined:

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

Note: The diagnose alarms have to be activated to ensure the correct function of the function block.

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

SIWAREX FTA offers three different ways to access the modules parameters:

- Using the SIWATOOL V4 software and a PC locally on site (full access)
- Using the In- and Outputs of SftAwi and special command codes (full access)
- Using the OS faceplate (limited access)

This PCS7 package includes the following components:

- CFC blocks for scale functionality (SftAwi), command handling (CMD_AWI) and maintenance (MOD_SIWA)
- Text libraries for alarm messaging
- Example-Faceplate: can be extended or modified by using the Faceplate Designer
- Example-Project
- Commissioning Software “SIWATOOL V4”

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 an automatic or static weighing process is required. An automatic scale operation is characterized by a weighing procedure performed automatically according to a defined plan. For more detailed information about the different weighing operations of SIWAREX FTA please refer to the device manual.

3.2 Benefits

- Easy and seamless integration of automatic/static scales into PCS7
- High accuracy by using onboard I/Os for controlling of dosing-valves
- Integration in PCS7 Maintenance Station
- Ready-To-Use faceplates and function blocks
- Sophisticated firmware for special dosing/batching tasks

3.3 Scope of Application

SIWAREX FTA is the optimal solution where accuracy is required and seamless integration desired. Weighing is then an easy component of complex processes which are controlled by the automation system. Using the SIWAREX FTA software, calibratable weighing systems can be inexpensively realized, whether filling systems, totalizing scales, bagging operations, rotopackers and much more.

Typical application ranges:

- Filling
- Bagging
- Totalizing
- Check Weighing

The description of the different applications of the SIWAREX FTA module is not part of this document. Please refer to the SIWAREX FTA device manual for further information about the different functionalities of the module.

3.4 Structure

The project consists of two parts:

- SIWAREX FTA APL PCS7 AS Function Blocks
- SIWAREX FTA APL PCS7 OS Faceplates

The ALARM_8P messaging system is used as well. The messages from SIWAREX FTA are displayed to the operator. The message texts are stored in the provided text libraries.

3.5 Function

The weighing procedure is completely controlled by the weighing module itself and therefore completely independent from the CPU(-cycle).

Because of the flexible integration in SIMATIC it's possible to handle any situation.

SIWAREX-specific function blocks are available for executing commands and reading / writing parameters directly from the CPU into the weighing unit or the other way around. The scale(s) can be calibrated, operated and monitored by the faceplates.

3.6 Commissioning and Service with SIWATOOL V4

In general, a complete commissioning is possible with the SftAwi function block.

The faceplates allow to edit the adjustment parameters (DR3 = data record 3) and basic parameters (DR4).

In dosing mode, the setpoint (data record 20) and the dosing parameters (DR22 and DR23) can be defined from the faceplate. In addition weighing cycles can be started, stopped and canceled from the faceplate.

It is possible to commission the module using the SIWATOOL PC program too. Therefor no SIMATIC / PCS7 knowledge is required.

SIWATOOL V4 is included in the scope of delivery of the SIWAREX FTA configuration package for PCS7. The program must be installed on a PC. The PC is connected to the SIWAREX FTA using a serial RS232 cable (available as an accessory).

You can find a Quickguide for the commissioning of a SIWAREX FTA with SIWATOOL inside the PCS7 software package.

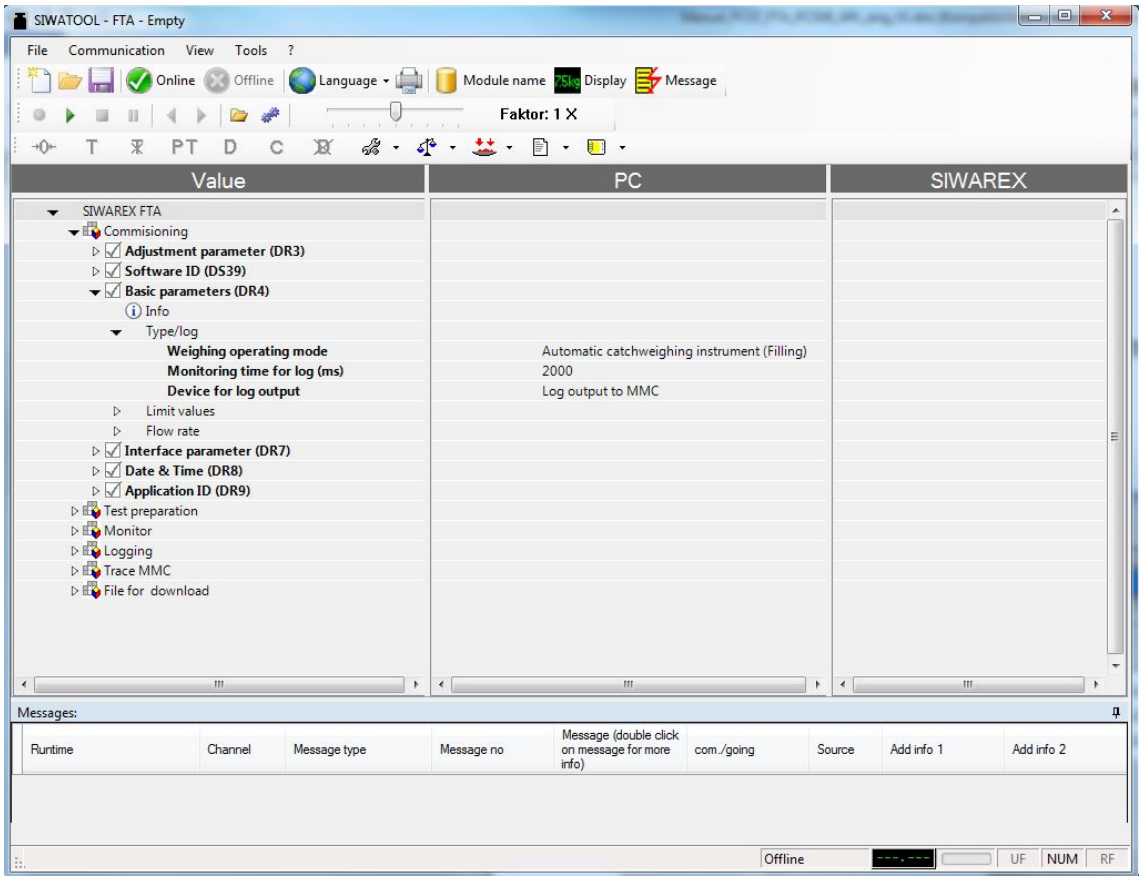


Fig. 3-1 Commissioning Software SIWATOOL V4

Note:

All data should be read into PCS7 after the scale has been adjusted with SIWATOOL. Data inside SIWAREX FTA will then be synchronized with data in the PCS7 project.

4 Description of the function blocks

4.1 Function block SftAwi

The block is used for controlling a SIWAREX FTA module. Data is transferred cyclically via the I/O interface and different data records are read from the module or transferred to the module acyclically. The message queue for the module is read out continuously and corresponding WinCC messages are issued.

For a detailed description of the SftAwi block and important information, please refer to the chapter “SftAwi driver block” inside the file *MANUALS \ MANUALS_PCS7 \ SftAwi_manual_eng.chm* on your software disc or open the online help via F1 in SIMATIC Manager.

4.1.1 Data-Record structure of SIWAREX modules

All parameter of SIWAREX modules are structured in data records (DR). These DR need to be read or written from the SIWAREX into the PLC or from PLC into SIWAREX with special command codes (see SIWAREX FTA manual). A DR can only be read / written completely! It’s not possible to read or write only a single parameter within a DR! Therefore the following steps are recommended in order to read / write parameters from / into the SIWAREX module:

Example:

The module is running in Automatic mode and a limit-value should be changed:

The limit-values are within data record 4 (see SIWAREX FTA manual). As it is not sure, that the data of DR4 in the CPU are the latest, it’s recommended to read DR4 first from the SIWAREX module into the CPU first. In Automatic mode the function block CMD_AWI can be used to execute this (and all other) command in a very easy way: The input parameter “RD_DR4” needs to be set TRUE. Afterwards the DR4 is read from the SIWAREX into the CPU.

After that the desired limit-value can be edited directly on the function block SftAwi. At the end the modified DR4 must be written back into the SIWAREX FTA module. This can be triggered by a positive edge on the input parameter “WR_DR4” of the CMD_AWI command block.

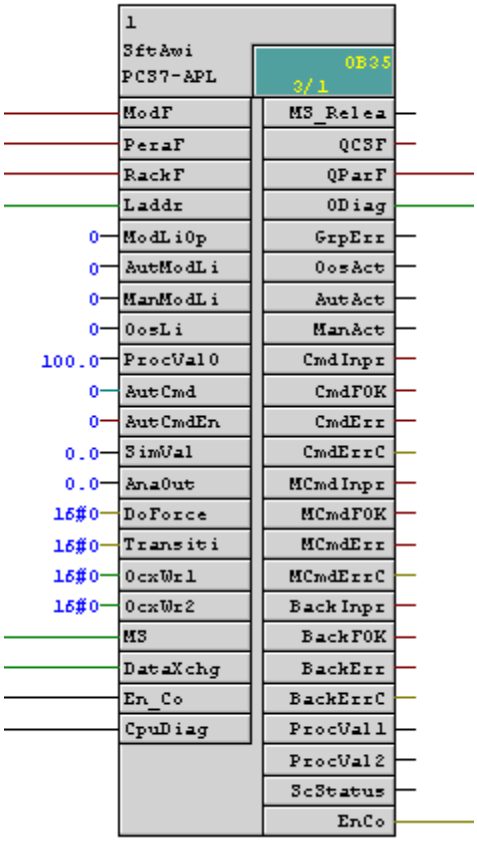


Fig. 4-1 Block SftAwi and CMD_AWI in a CFC

4.2 Function block CMD_AWI

The CMD_AWI block is used as a easy-to-use front-end block for executing commands from the driver block to the Siwarex FTA module in automatic mode.

For a detailed description of the CMD_AWI block please refer to the chapter “CMD_AWI command block” inside the file *MANUALS \ MANUALS_PCS7 \ SftAwi_manual_eng.chm* on your software disc or open the online help via F1 in SIMATIC Manager.

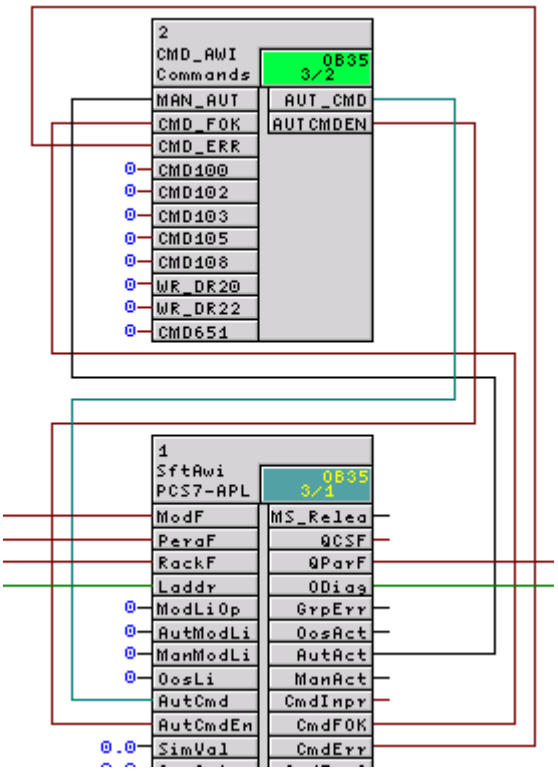


Fig. 4-2 Block CMD_AWI connected to SftAwi in a CFC

4.3 Function block MOD_SIWA

The block is used as the interface for a Siwarex scale module to the PCS 7 Maintenance Station.

For a detailed description of the MOD_SIWA block please refer to the chapter “MOD_SIWA maintenance block” inside the file *MANUALS \ MANUALS_PCS7 \ SftAwi_manual_eng.chm* on your software disc or open the online help via F1 in SIMATIC Manager.

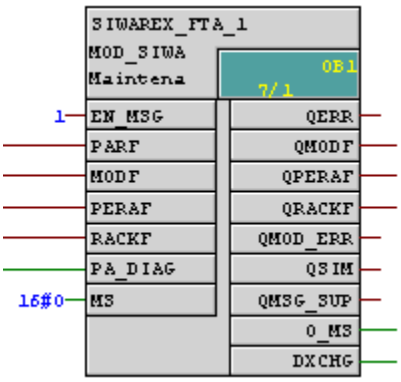


Fig. 4-3 Block MOD_SIWA

5 Description of the Faceplates

5.1 General

Operation and monitoring of the scale via WinCC faceplates is described below.

Descriptions of the individual scales parameters and scale functions are provided in the SIWAREX FTA manual and are not explained individually where each faceplate is displayed.

The example faceplate for the SIWAREX FTA modules was created with the Faceplate Designer. The WinCC images can be modified according to individual requirements.

Every time a new view is opened, the displayed parameters are refreshed automatically. The displayed parameters can be updated at any time by clicking the "Receive Data" button as well.

Note: After compiling the OS the OS project editor needs to be run once.

5.2 Typicals

The faceplates can be interconnected in the Graphics Designer (Dynamic Wizard -> Picture Functions -> Picture selection via measurement point). The faceplates themselves can be called via the provided typical.

2 different typicals are available:

Symbol	Selection in SftAwi block properties
	1
	2

Table 5-1 Typicals

The selected typical is imported by compiling the OS.

5.3 Faceplate Views

All views of the sample faceplate including their functions are described in the following sections.

5.3.1 Default View

The default view displays the current net weight of the scale and a number of selected status information. The Manual/Automatic/Out Of Service operating modes can also be selected.

In automatic mode, only reading of data records is permitted.

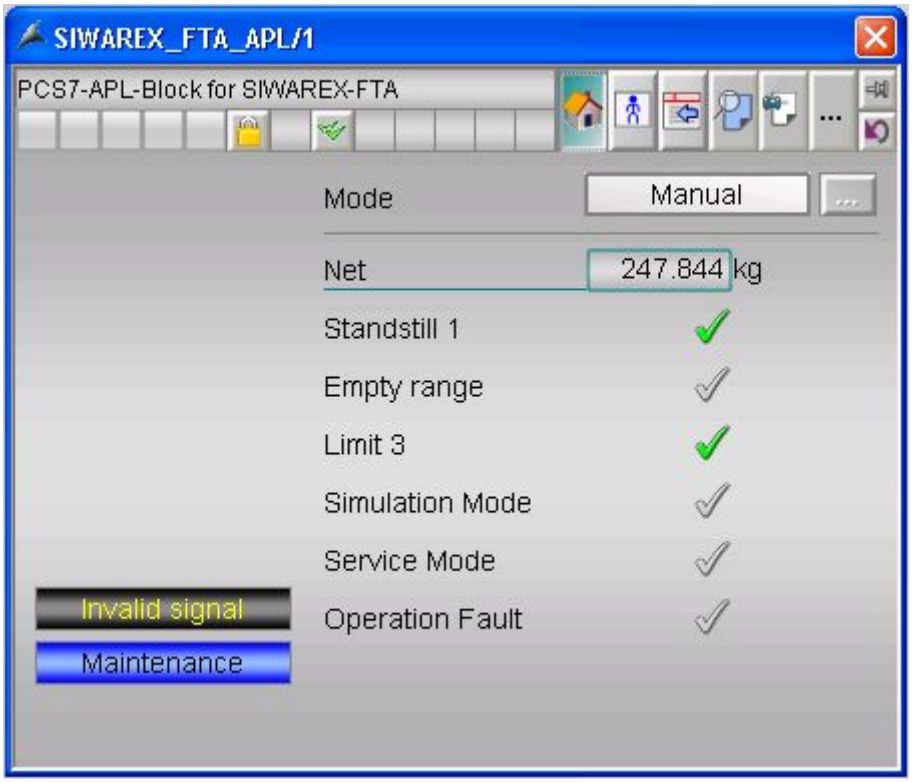


Fig 5-1 Default view

5.3.2 Dosing Data View

The set point (DR20) and the scale parameters 1 (DR22) can be specified for weighing procedures in the Dosing Data tab displayed in the Dosing view.

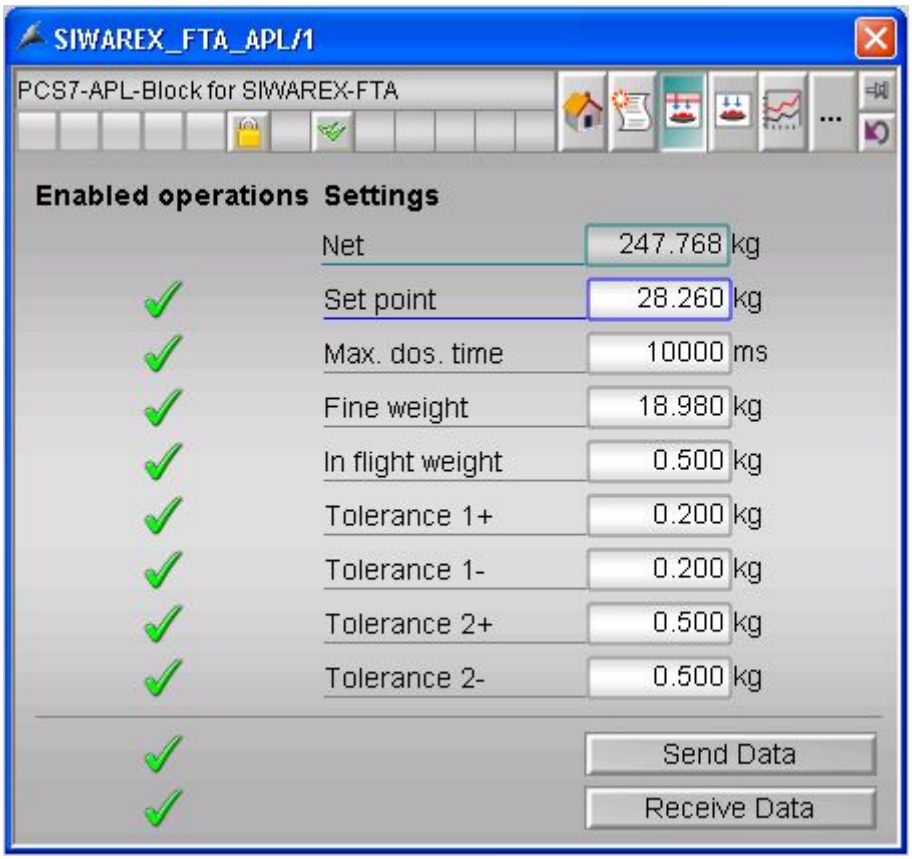


Fig 5-2 Dosing data view

5.3.3 Dosing View

The net weight, set weight and selection of scale status information are displayed in the dosing command view. The following dosing and weighing commands can be executed from the faceplate:

Dosing Commands:

- Stop dosing
- Start with tare/zeroing
- Start without tare/zeroing
- Continue
- Continue with inching
- Abort
- Rest weighing

Weighing commands:

- Set to zero
- Tare
- Delete tare memory

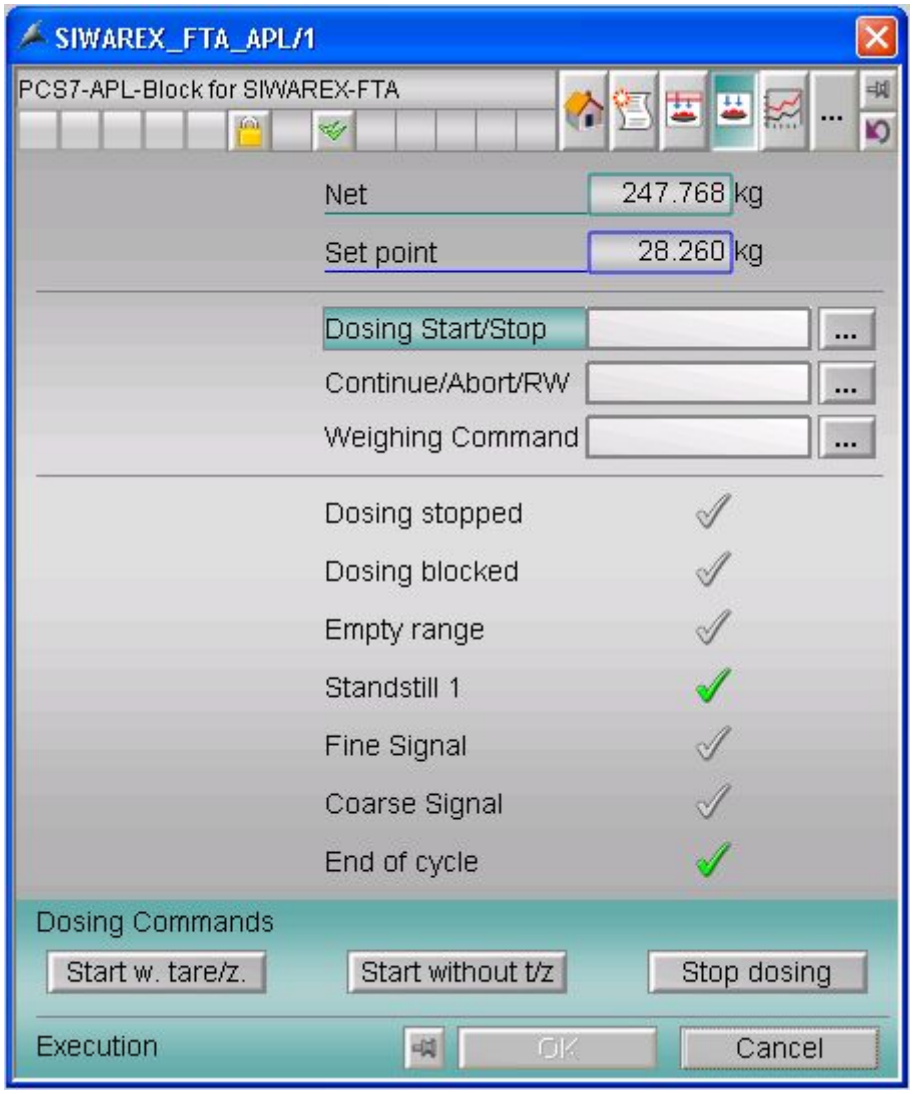


Fig. 5-3 Dosing view

5.3.4 Operation view

In the Operation view the operator can “Send / Receive all data”. In addition the following commands are possible:

Service / Calibration commands:

- Service Mode ON
- Service Mode OFF
- Adjustment zero valid
- Adjustment weight 1 valid
- Acknowledge error

Scale commands:

- Zero
- Tare
- Delete Tare

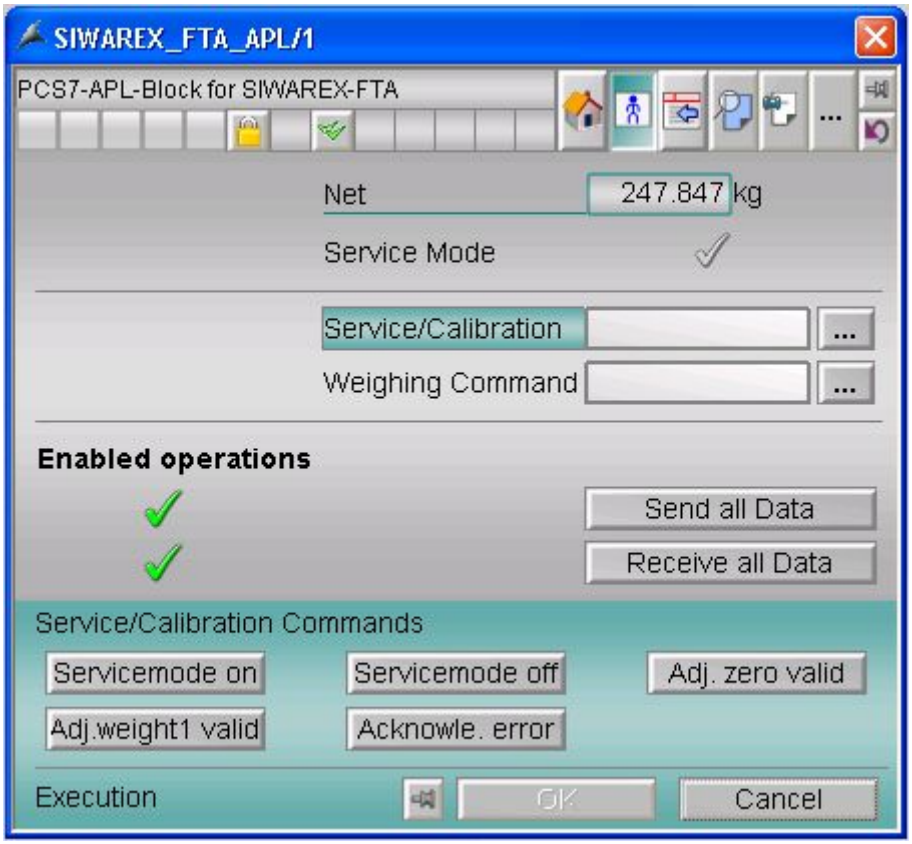


Fig. 5-4 Operation view

5.3.5 Parameter View

In this view the module can be released for maintenance.

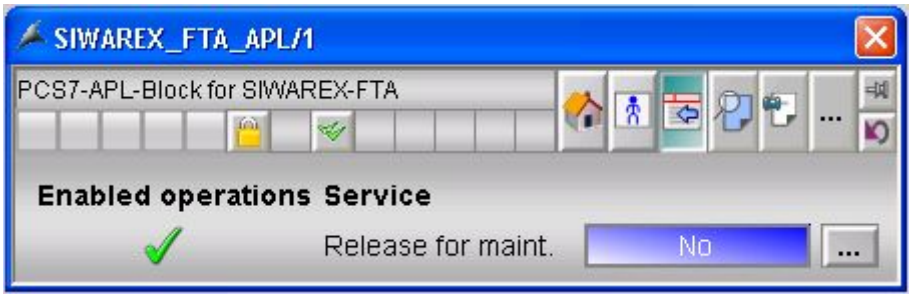


Fig. 5-5 Parameter View

5.3.6 Preview View

The actual net weight and enabled operations are displayed in the preview view.

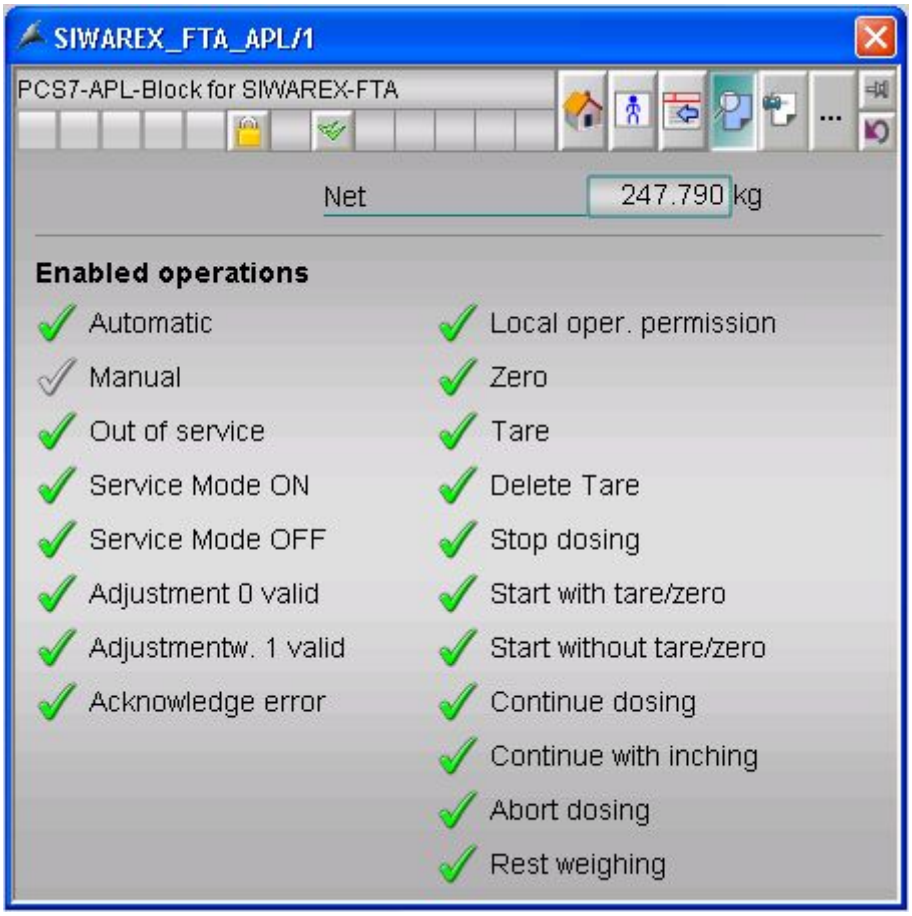


Fig. 5-6 Preview View

5.3.7 Calibration 1 view

The weighing range 1 and the Standstills 1, 2 and 3 are defined in the calibration 1 view. For further information about the single parameter, please refer to the SIWAREX FTA manual.

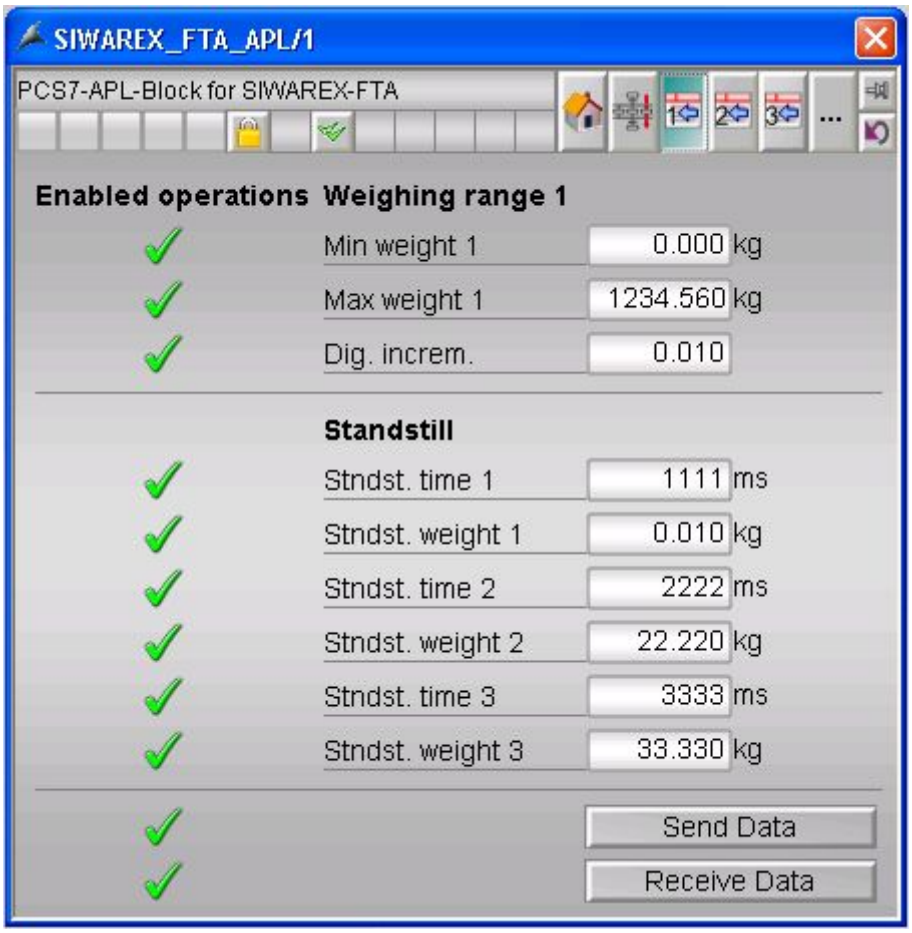


Fig. 5-7 Calibration 1 View

5.3.8 Calibration 2 view

The operator can define the frequency of the low pass filter, the characteristic value of the connected loadcells, the depth of the average value filter and the adjustment weight 1. The Adjustment digits 0 and 1 are calculated automatically by executing the commands “Adjustment zero valid” and “Adjustment weight 1” valid.

If the scale should be calibrated theoretically, the calculated digits can be entered by hand.

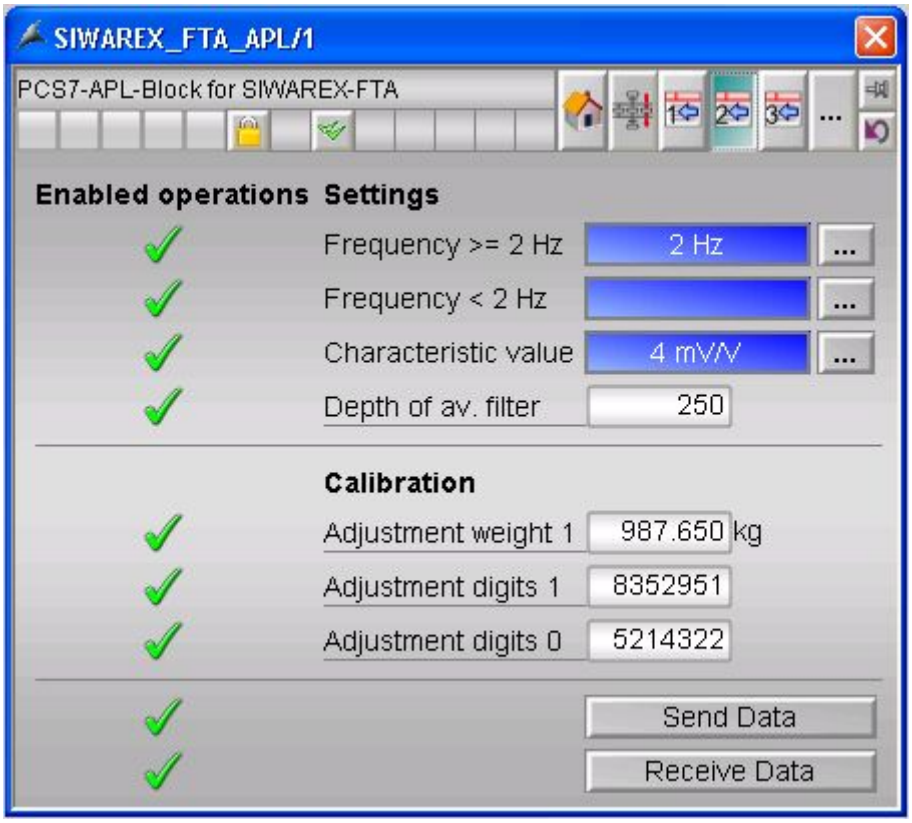


Fig. 5-8 Calibration 2 View

5.3.9 Baseparameter View

The limit 3 (always related to the gross weight) and the empty range of the scale can be defined.

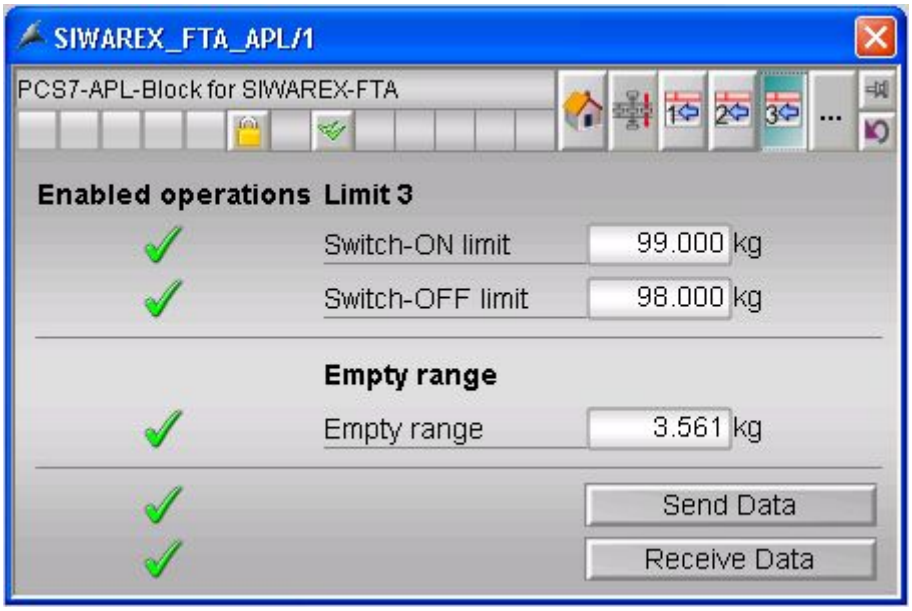
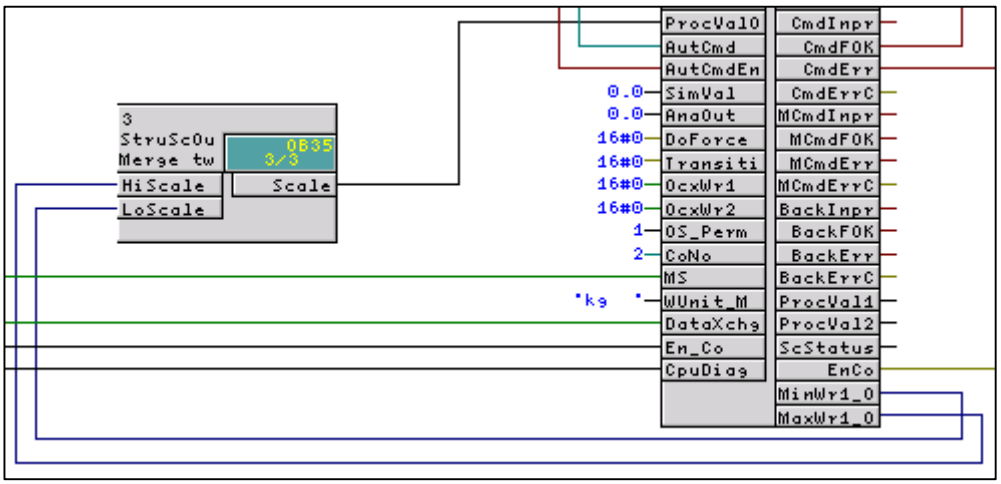


Fig. 5-9 Baseparameter View

5.3.10 Trends View

This view is the standard APL trendview. It shows the actual net weight. It is possible to change the scaling of the y-axis on the SftAwi block via the structure input “ProcValOpScale”. By using the standard PCS7 block “StrucScOu”, the “ProcValOpScale” can be interconnected with the outputs “MinWr1” and “MaxWr1”. By this the tred is scaled automatically to the weighing range of the scale.



5.3.11 Batch and Messages View

These are the PCS7 standard views for Batch and Messages.

5.4 Faceplate information

The faceplates were created with the standard WinCC tools, which are described in the documentation of the Faceplate-Designer.

Reading data record by changing views

By opening a new faceplate-view the data displayed in the new view are read out of the FTA card automatically. The SftAwi blocks executes the necessary command codes to the ManCmd input, if this command channel is not used for another command at this time.

6 Example Program

After the installation of the SIWAREX FTA APL Setup, the project “zXy70_12_SiwarexFTA“ can be found in the SIMATIC Manager. This project shows a PCS7 configuration for SIWAREX FTA with the CMD_AWI block or without.

The following parameters need to be check / adapted to your application:

- the hardware configuration
- I/O address of the SIWAREX FTA from the HW-Config connected to “Addr” Parameter of the SftAwi block.

7 Shortcuts

AS	Automation system
CFC	Continuous Function Chart (PCS7)
DO	Digital output
DI	Digital input
DR	Data record
FC	STEP7 Function call
FB	Function block
HSP	Hardware Support Package
HW	Hardware
OS	Operator Station
PC	Personal-Computer
SFC	System Function Call (System function)
SIWATOOL	Windows-Software Commissioning and Service of SIWAREX FTA