

SIEMENS

Using SIWAREX FTA within STEP7

Quick Guide

For modules with order number 7MH4900-2AA01



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Introduction

SIWAREX FTA is a calibratable and versatile weighing electronics for SIMATIC S7, C7 and PCS7. It can be used for automatic and non-automatic weighing, e.g. for the production of mixtures, filling, loading, monitoring and bagging.

Purpose of this document for functional safety

This programming manual contains important information that you will require to commission and use the device.

It is aimed at persons who install the device mechanically, connect it electrically, parameterize and commission it, as well as at service and maintenance engineers.

Notes on warranty

The contents of this programming manual shall not become part of or modify any prior or existing agreement, commitment or legal relationship. All obligations on the part of Siemens AG are contained in the respective sales contract, which also contains the complete and solely applicable warranty conditions. Any statements on the device versions described in the programming manual do not create new warranties or modify the existing warranty.

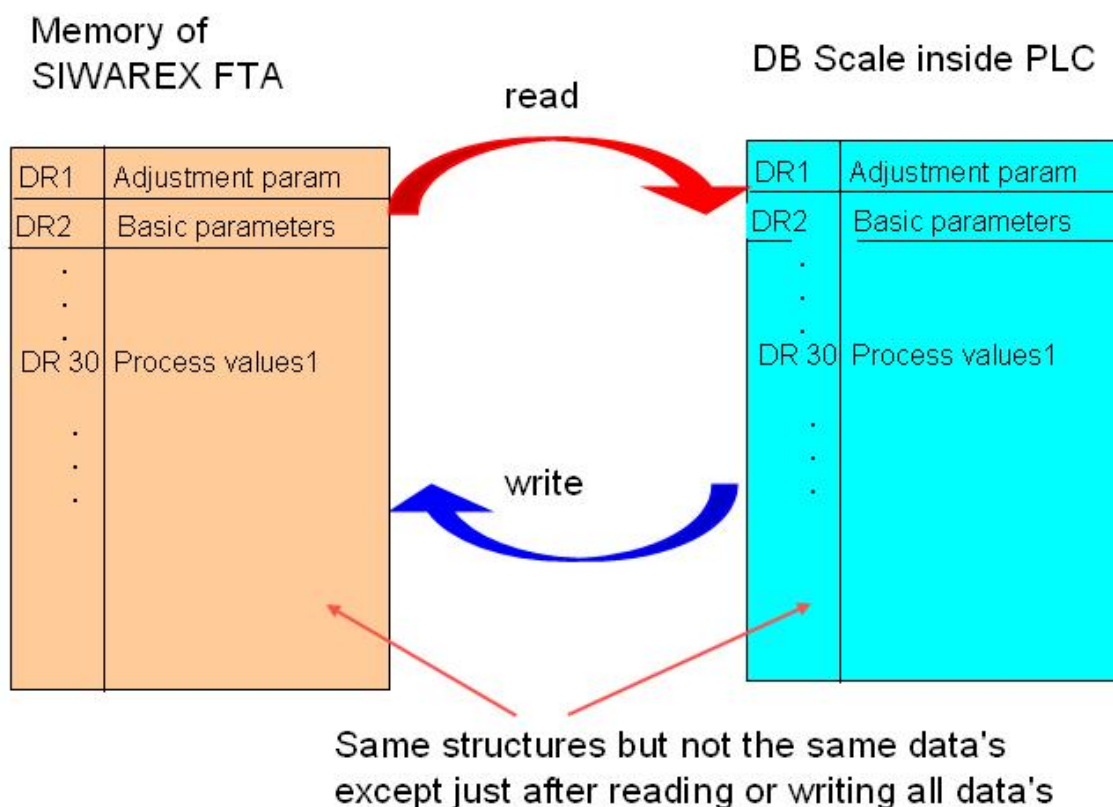
The content reflects the technical status at the time of printing. We reserve the right to make technical changes in the course of further development.

Validation of this document

This documentation is only valid in conjunction with the manual SIWAREX FTA.

2 Organisation of the memories

Since SIWAREX is working autonomous with a microprocessor, it has its own memory. A memory inside the PLC communicates with a memory of same structure inside SIWAREX module. All parameters of this memory are split into data records (DR). The data records are organised according to process steps (tasks) that you have to perform during the commissioning phase or during the process itself.

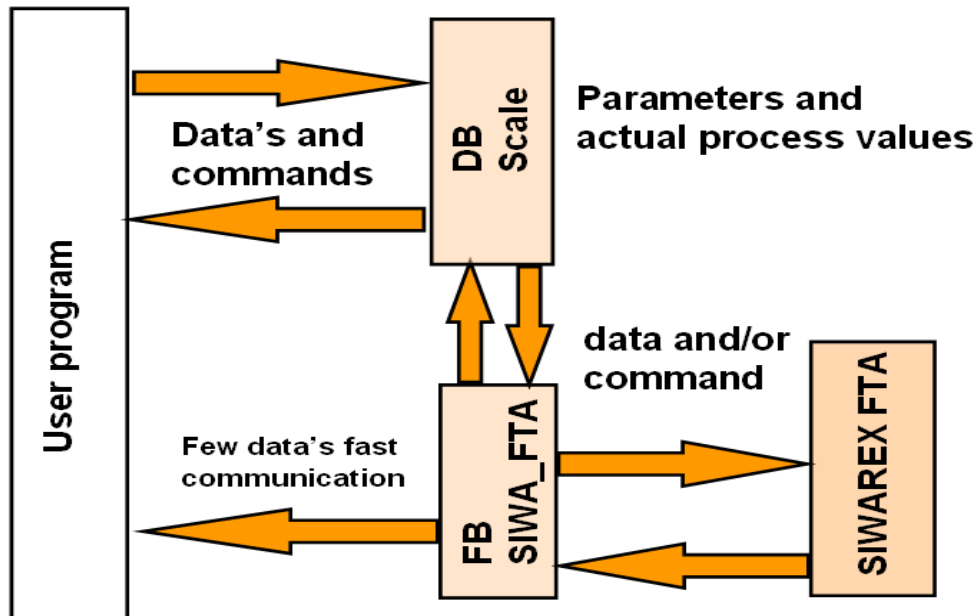


Parameterisation of the SIWAREX module is done by writing data's into its memory, Information's about the process is done by reading data's and order are given to SIWAREX by transferring specific data's to the FTA.

Data Record communication reduces the quantity of data's transferred to the minimum

3 Communication concept

The next picture explains how the orders and the data's are transferred to SIWAREX FTA.



To read data's, the user program gives a command code to the FB SIWA_FTA, the command for example "read data record 30" has a specific number in this case 230. Receiving this order SIWAREX FTA sends the DR30 to FB-SIWA_FTA, who transfers the DR30 into the appropriate location of DB-Scale.

To write data's the user program write first those data's into DB_Scale. Then, the user program gives a command code to the FB SIWA_FTA, the command for example "write data record 22" has a specific number in this case 422. FB SIWA_FTA read the DR22 from the appropriate location of DB-Scale and sends it to SIWAREX FTA.

The next screenshot shows the contain of the STEP7 project.

A31560b -- C:\Program Files\Siemens\Step7\57Proj\A31560b						
Object name	Symbolic name	Created in language	Size in the work me...	Type	Versic	
System data	---	---	---	SDB	---	
OB1	---	STL	796	Organization Block	1.1	
OB35	---	STL	108	Organization Block	1.1	
OB40	HW_INT0	STL	38	Organization Block	0.1	
OB82	I/O_FLT1	STL	38	Organization Block	0.1	
OB100	COMPLETE RESTART	STL	60	Organization Block	0.1	
FB41	SIWA_FTA	SCL	4200	Function Block	2.0	
FC2	---	STL	266	Function	1.1	
FC30	Fc Execute command	STL	348	Function	1.1	
DB10	---	DB	162	Instance data block ...	0.0	
DB11	DB_VECTOR	DB	414	Data Block	0.1	
DB12	DB_SCALE	DB	1644	Data block derived fr...	0.1	
DB100	DB_TP170B	DB	254	Data block derived fr...	0.0	
UDT1	UDT_COMMAND STATUS	STL	---	Data Type	0.1	
UDT12	UDT_SIWA_FTA	STL	---	Data Type	1.1	
UDT98	Udt_AlarmField Area	STL	---	Data Type	1.0	
UDT99	---	STL	---	Data Type	0.1	
CMD	CMD	---	---	Variable Table	0.1	
MSG & CMD	MSG & CMD	---	---	Variable Table	1.0	
SFB52	RDRFC	STL	---	System function block	1.0	
SFB53	WRREC	STL	---	System function block	1.0	

4 Giving an order to SIWAREX FTA

First you need to know which commands exist. A list of all orders is to be found in the chapter 6 of the manual:

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

A command is send thru defined data's inside the data block DB_Scale.

The function block FC Execute_Command. Manage a group of three commands, CMD1, CMD2 and CMD3. Those are foreseen to transfer orders to SIWAREX. CMD3 is used for OB35, CMD2 is used for the HMI panel and CMD1 is usually used by the STEP program. The three command blocks are to be found in the DB_Scale at address DBW40 to DBW50.

The background task of OB35 refresh, every 100ms, the DR30, 31, 34, 35 and the ASCII weight with crypto data's for legal for trade applications are also updated.

DB12 -- A31560b\SIMATIC 300(1)\CPU 315-2 DP						
	Address	Name	Type	Initial value	Actual value	Comment
25	40.0	s_CMD1.i_CMD1_Code	INT	0	0	Command code
26	42.0	s_CMD1.bo_CMD1_Trigger	BOOL	FALSE	FALSE	Command trigger
27	42.1	s_CMD1.bo_CMD1_InProgress	BOOL	FALSE	FALSE	Command in progress
28	42.2	s_CMD1.bo_CMD1_FinishedOk	BOOL	FALSE	FALSE	Command finished ok
29	42.3	s_CMD1.bo_CMD1_FinishedError	BOOL	FALSE	FALSE	Command finished with error
30	44.0	s_CMD2.i_CMD2_Code	INT	0	0	Command code
31	46.0	s_CMD2.bo_CMD2_Trigger	BOOL	FALSE	FALSE	Command trigger
32	46.1	s_CMD2.bo_CMD2_InProgress	BOOL	FALSE	FALSE	Command in progress
33	46.2	s_CMD2.bo_CMD2_FinishedOk	BOOL	FALSE	FALSE	Command finished ok
34	46.3	s_CMD2.bo_CMD2_FinishedError	BOOL	FALSE	FALSE	Command finished with error
35	48.0	s_CMD3.i_CMD3_Code	INT	0	0	Command code
36	50.0	s_CMD3.bo_CMD3_Trigger	BOOL	FALSE	FALSE	Command trigger
37	50.1	s_CMD3.bo_CMD3_InProgress	BOOL	FALSE	FALSE	Command in progress
38	50.2	s_CMD3.bo_CMD3_FinishedOk	BOOL	FALSE	FALSE	Command finished ok
39	50.3	s_CMD3.bo_CMD3_FinishedError	BOOL	FALSE	FALSE	Command finished with error

To send a command enter the command code at the address DBW40 as an integer.

40.0	s_CMD1.i_CMD1_Code	INT	0	0	Command code
42.0	s_CMD1.bo_CMD1_Trigger	BOOL	FALSE	FALSE	Command trigger
42.1	s_CMD1.bo_CMD1_InProgress	BOOL	FALSE	FALSE	Command in progress
42.2	s_CMD1.bo_CMD1_FinishedOk	BOOL	FALSE	FALSE	Command finished ok
42.3	s_CMD1.bo_CMD1_FinishedError	BOOL	FALSE	FALSE	Command finished with error

Then trigger the command by setting the bit s_CMD1.bo.CMD1_Trigger to “1” This bit has to be set with an edge to avoid double triggering of the command. The bit is automatically reset to “0”.

Bit s.CMD1.bo.InProgress indicates that the command is running, this can go for several OB1 cycles.

Bit s.CMD1.bo.FinishedOK indicates that the command was successfully terminated.

Bit s.CMD1.bo.FinishedError indicates for 1 cycle that the command was not completed. The code of the error is given in DB_Scale Byte 9 “b_CMD_Err_CODE”

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 bit CMD_ERR:= “DB_SCALE”.bo_CMD_ERR is set.

5 Reading and writing Data's

The data records described in Chapter 5 of the manual and also in SIWATOOL (see PDF-File SIWAREX_FTA_Quick Guide_SIWATOOL) may be read or written.

Always a complete Data Record can be transferred in one or another way.

The order number to read a Data Record is "2xx" where xx is the DR-Number.

For example read "Data Record 30" which contains weight and state of the scale is done with command "230".

Here an example of programming.

```

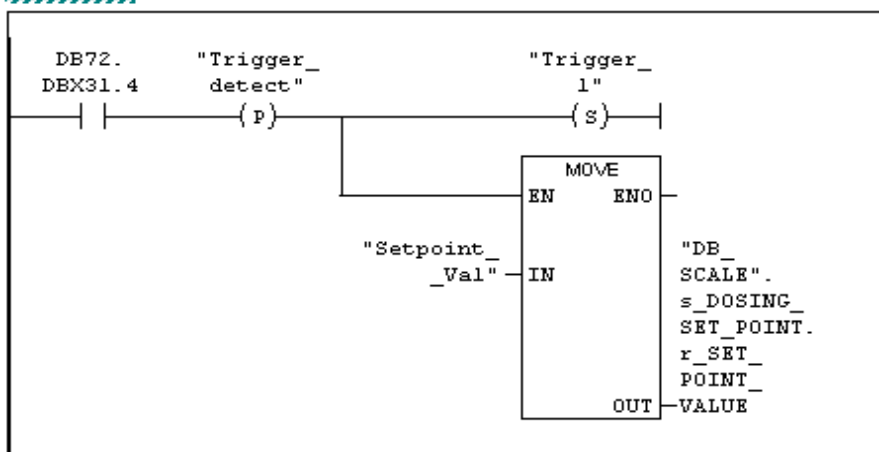
O      "DB_SCALE".s_CMD1.bo_CMD1_InProgress    // command in progress
O      "DB_SCALE".s_CMD1.bo_CMD1_Trigger      // command enabled
BEC
L      230
T      "DB_SCALE".s_CMD1.i_CMD1_Code
SET
S      "DB_SCALE".s_CMD1.bo_CMD1_Trigger

```

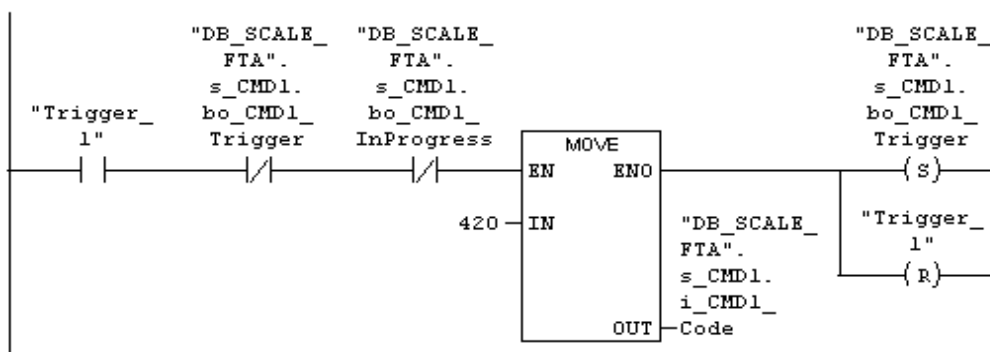
The order number to write a Data Record to SIWAREX is "4xx" where xx is the DR-Number.

For example to define the dosing setpoint you need to write first the value of the setpoint into DR20 this is address DB_Scale.DBD526. Then send the command "420" (Write DR20).

Network 1: Write Setpoint in DR20



Network 2: Transfer DR20 to Siwarex FTA



DB72.DBX 31.4 is the trigger to write the setpoint coming from the S7 program.

If you have any issues or suggestions regarding the related products or documents, please feel free to contact:

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