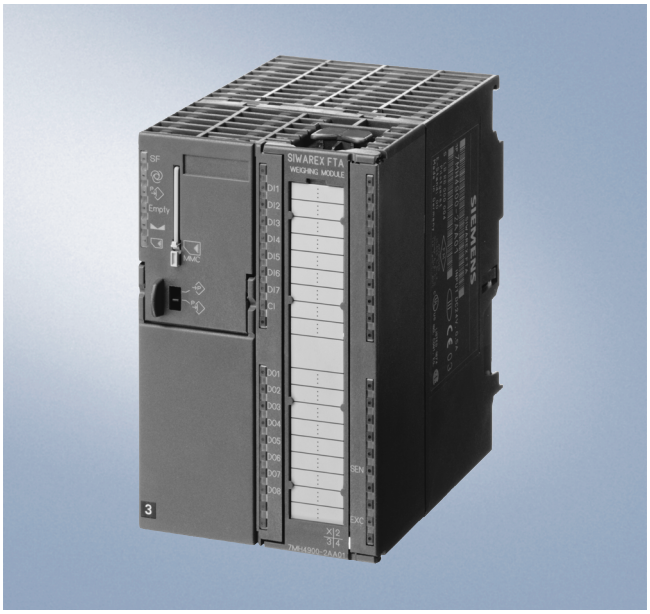
Overview



SIWAREX FTA weighing module

The SIWAREX FTA (Flexible Technology, Automatic Weighing Instrument) is a versatile and flexible weighing module for industrial use. It can be used for automatic and non-automatic weighing, e.g. for the production of mixtures, filling, loading, monitoring and bagging.

It has been assigned appropriate scale approvals and is also suitable for legal trade.

The SIWAREX FTA function module is integrated in SIMATIC S7/PCS7, and uses the features of this modern automation system, such as integral communication, diagnostics and configuration tools.

Benefits

- Uniform design, and totally integrated communication through integration in SIMATIC S7 and SIMATIC PCS 7
- Uniform configuring with SIMATIC
- Direct use in the SIMATIC automation system
- Use in distributed plant concept through connection to PROFIBUS DP via ET 200M
- Measurement of weight or force with high resolution of 16 million parts
- High accuracy 3 x 6000 d, legal-for-trade
- Legal-for-trade display with SIMATIC standard operator panels
- Continuous or stepped feed control
- Exact switching of dosing signals (< 1 ms)
- Parameterizable inputs and outputs
- Parameterizable for highly versatile applications
- Flexible adaptation to different requirements with SIMATIC
- Simple parameterization using the SIWATOOL FTA program
- Theoretical adjustment without adjustment weights
- Replacement of module without renewed adjustment of scale
- Recording of weighing process
- Legal-for-trade alibi memory
- Use possible for Ex applications

Application

The SIWAREX FTA weighing module is the optimum solution wherever high demands are placed on accuracy and speed.

As a result of its exceptional measuring properties, weights can be measured at high accuracy in up to three ranges.

SIWAREX FTA can be used to design legal-for-trade dosing systems such as filling plants, loading stations, bagging stations, rotopackers, mixers or test stations.

Typical fields of application include:

- Filling of liquids
- Bagging of solid matter
- Dosing as deduction weighing or fill weighing
- Checking of individual quantities
- Loading or receiving of materials

Design

The SIWAREX FTA is a function module of the SIMATIC S7-300 and can be snapped directly onto the SIMATIC S7-300 or ET 200M backplane bus. The installation/cabling requirements of the 80-mm wide weighing module are extremely low as a result of the DIN rail assembly and snap-on technique.

A standard 40-pin front plug is used to connect the load cells, the RS 485 serial interface, the analog output and the digital inputs/outputs, a 9-pin Sub-D plug to connect the PC (RS 232), and a separate 2-pin plug to connect the power supply.

Operation of the SIWAREX FTA in SIMATIC means that complete integration of the weighing technology into the automation system is guaranteed.

Function

The main tasks of the SIWAREX FTA are highly exact measurement of the actual weight in up to three measuring ranges, and exact control of the weighing procedures.

The weighing module controls the weighing procedures fully automatically. However, integration in SIMATIC means that it is also possible to directly influence the weighing procedures by means of a PLC program. This means that the tasks can be meaningfully divided: the very fast weighing functions are implemented in the SIWAREX FTA, the interlocking and logic functions in the SIMATIC CPU.

Weighing functions

The SIWAREX FTA is easy to parameterize according to the various automatic weighing functions.

The following weighing functions can be parameterized:

- *Non Automatic Weighing Instrument* according to OIML R76
- *Automatic Gravimetric Filling Instrument* according to OIML R61
- *Automatic Catchweighing Instrument* according to OIML R51
- *Discontinuous Totalizing Automatic Weighing Instrument* (Totalizing Hopper Weigher) according to OIML R107

SIWAREX FTA

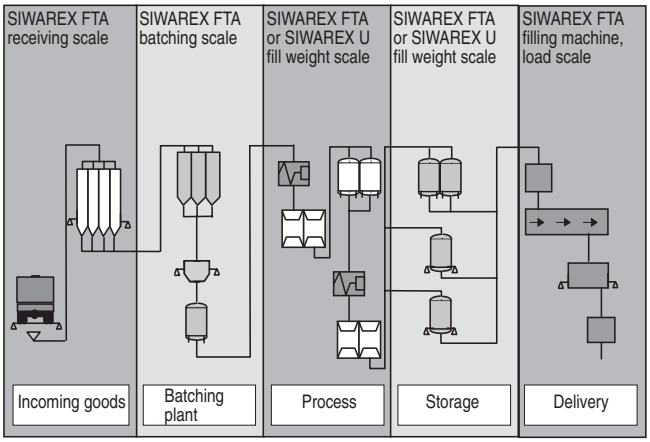
Monitoring and control of the load cell signals and statuses

During the weighing procedure, the SIWAREX FTA weighing module monitors and controls the load cell signals and statuses. The optimized exchange of data within SIMATIC permits direct evaluation of the load cell signals and statuses in the PLC program.

Influencing of the weighing sequences by the PLC means that the SIWAREX FTA can be adapted to modifications in the system technology without problem.

The SIWAREX FTA is already factory-adjusted. This means that the theoretical adjustment of the scale is possible without adjustment weights, and that modules can be replaced without readjustment of the scale. When using "active bus modules", replacement is also possible during operation.

Integration in SIMATIC



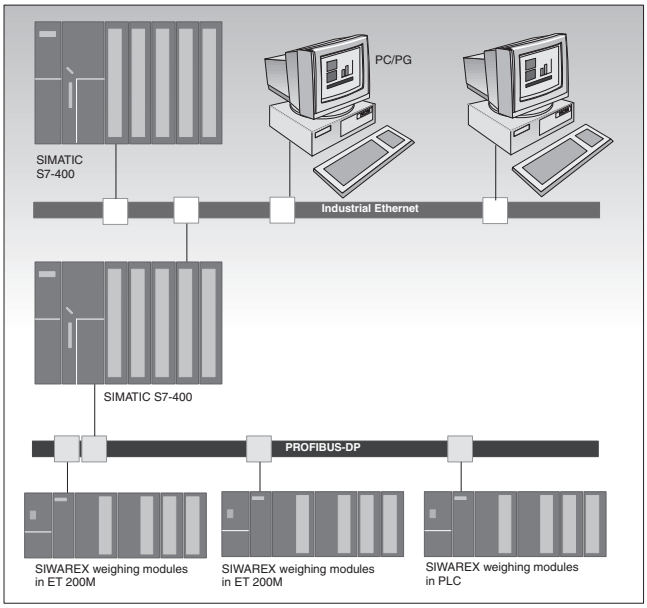
Applications of the SIWAREX FTA

SIWAREX FTA is completely integrated into the SIMATIC S7 and SIMATIC PCS 7. Users can configure their automation solution completely freely – including the weighing application.

Appropriate combination of SIMATIC components means that optimum solutions can be found for small, medium-size and large plants. The scales are operated and monitored using SIMATIC standard operator panels. These operator panels (also touch panels such as the TP170B) can of course also be simultaneously used for operation and monitoring of the plant.

Customized or sector-specific solutions can be developed extremely quickly using the configuration package and example applications for SIMATIC. The following Fig. shows a typical configuration of a medium-size plant.

The ready-to-use function blocks for the automation system and the faceplates for the operator station are used for the configuration in SIMATIC PCS 7.



SIMATIC S7/PCS 7 configuration with SIWAREX FTA

Software

SIWATOOL FTA commissioning software

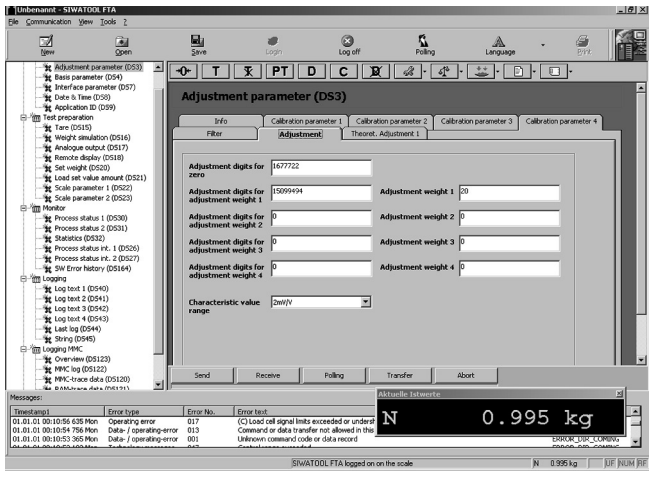
SIWATOOL FTA is a special program for commissioning and servicing, and executes with Windows operating systems.

The program permits commissioning of scales without knowledge of the automation system. When servicing, the technician can analyze and test the procedures in the scale using the PC. Reading out the diagnostics buffer from the SIWAREX FTA is extremely helpful when analyzing events.

The following work, *inter alia*, can be carried out using SIWATOOL FTA:

- Parameterization and adjustment of the scale
- Testing of scale properties
- Saving and printing scale data
- Recording and analysis of weighing sequence

The following Fig. shows the design of the individual program windows.



SIWATOOL FTA commissioning software

Fast pre-parameterization of the module can be carried out using the "Fast parameterization" function. The parameters are roughly adjusted following answering of a few questions.

It is also extremely helpful to analyze the diagnostics buffer which can be saved together with the parameters following reading out from the module.

The SIWAREX FTA weighing module includes a trace mode for optimization of weighing process. The recorded weight values and associated statuses can be displayed as traces using SIWATOOL FTA and MS Excel®.

Upgrading of firmware

A further program can be used to download a new firmware version onto the SIWAREX FTA on site. This means that firmware upgrades can be carried out on site and worldwide as required.

Reading out of weighing reports

The weighing reports are saved on an MMC (Micro Memory Card) inserted in the SIWAREX FTA for the duration specified by the weights and measures act. If complaints are received concerning a particular weighing procedure, the associated data can be read out of the MMC using SIWATOOL.

SIWAREX FTA – simple configuring

Simple STEP 7 example programs for the first steps are available on the Internet at the SIWAREX site http://www.siemens.com/weighing-technology.

In addition, the STEP 7 programs SIWAREX FTA Multiscale and SIWAREX FTA Multifill provide a professional basis for implementation of batching plants and filling plants.

Technical data

Use in automation systems	
• S7-300	Directly or via ET 200M
• S7-400 (H)	Via ET 200M
• PCS 7 (H)	Via ET 200M
Communications interfaces	SIMATIC S7, RS 232, RS 485
Module parameterization	Using SIMATIC S7
	Using SIWATOOL FTA software (RS 232)
Measuring properties	
• EC type approval as non-automatic weighing machine, trade class III	3 x 6000 d ≥ 0.5 µV/e
• Internal resolution	16 million parts
• Internal/external updating rate	400/100 Hz
Several parameterizable digital filters	Critically dampened, Bessel, Butterworth (0.05 ... 20 Hz), mean value filter
Weighing functions	
• Non-automatic weighing	OIML R76
• Automatic weighing	OIML R51, R61, R107
Load cells	Strain gages in 4-wire or 6-wire system
• 3 characteristic value ranges	1, 2 or 4 mV/V
Load cell powering	
• Supply voltage U_S (rated value)	10.3 V DC
• Max. supply current	184 mA
• Permissible load cell resistance	
- R_{Lmin}	> 56 Ω > 87 Ω with Ex interface
- R_{Lmax}	≤ 4010 Ω

Max. distance of load cells	
When using the recommended cable:	
• Standard	1000 m (500 m legal-for-trade)
• In hazardous area [1])	
- For gases of group IIC	300 m
- For gases of group IIB	1000 m
Connection to load cells in Ex Zone 1	Optionally via SIWAREX IS Ex Interface
Use in Ex Zone 2	ATEX 100a, FM, UL
	cUL_{US} Haz. Loc. (available soon)
Power supply	
Rated voltage	24 V DC
Max. current consumption	500 mA
Current consumption at backplane bus	Typ. 55 mA
Inputs/outputs	
Digital inputs	7 DI electrically isolated
Digital outputs	8 DO electrically isolated
Counter input	Up to 10 kHz
Analog output	
• Current range	0/4 to 20 mA
• Updating rate	100 Hz
Approvals	EC type approval (CE, OIML R76)
	OIML R51, R61, R107
Degree of protection to DIN EN 60 529; IEC 60 529	IP20
Climatic requirements (operating temperature)	
Vertical installation ($T_{min\ (IND)}$ ... $T_{max\ (IND)}$)	-10 ... 60 °C
Horizontal installation ($T_{min\ (IND)}$ ... $T_{max\ (IND)}$)	-10 ... 40 °C
EMC requirements	EN 61326, EN 45501, NAMUR NE21, Part 1
Dimensions in mm	80 x 125 x 130
Weight	600 g

[1]) Details see data sheet for SIWAREX IS.

SIWAREX FTA

Ordering data	Order No.
SIWAREX FTA Legal-for-trade weighing electronics for automatic scales for S7-300 and ET 200M. EC type approval 3 x 6000 d Applications: dosing, filling, bagging, loading. Note: observe approval conditions for applications with obligation of verification It is recommendable to use the calibration set	**7MH4900-2AA01**
SIWAREX FTA Manual (the Manual must be ordered separately)	
• German	**7MH4900-2AB11**
• English	**7MH4900-2AB21**
SIWAREX FTA configuration package for SIMATIC S7 on CD-ROM • SETUP for integration in Step 7 V5.2 • S7 function block • SIWATOOL FTA PC parameterization software • Manual	**7MH4900-2AK01**
SIWAREX FTA configuration package for PCS 7 V6.0 on CD-ROM • SETUP for S7 integration • Function block for CFC • Faceplate for WinCC • SIWATOOL FTA PC parameterization software • Manual	**7MH4900-2AK61**
Calibration set for SIWAREX FTA For verification of up to 5 scales comprising: • 1 x inscription foil for labeling • 1 x protection foil • 10 x EC verification marks (black M on green background) • Guidelines for verification, verification certificates and approvals, adaptable label • SIWAREX FTA Manual	**7MH4900-2AY10**
SIWAREX Multiscale STEP 7 software for SIWAREX FTA. Control of one or more scales for a scalable number of components and any number of recipes. Applications: batching plants, mixers in production process, CD-ROM	**7MH4900-2AL01**
SIWAREX Multifill STEP 7 software for SIWAREX FTA. Control of filling and bagging processes for one or more filling stations and any number of materials, CD-ROM	**7MH4900-2AM01**
SIWATOOL cable from SIWAREX FTA with serial PC interface, for 9-pin PC interfaces (RS 232)	
• 2 m long	**7MH4702-8CA**
• 5 m long	**7MH4702-8CB**
40-pin front plug with screw contacts (required for each SIWAREX module), alternatively with spring-loaded contacts	**6ES7 392-1AM00-0AA00**
40-pin front plug with spring-loaded contacts (required for each SIWAREX module), alternatively with screw contacts	**6ES7 392-1BM00-0AA00**
Shield contact element Sufficient for one SIWAREX FTA module	**6ES7 390-5AA00-0AA0**
Shield connection terminal Contents: 2 units (suitable for cable with diameter 4 ... 13 mm) Note: one shield connection terminal is required each for: • Scale connection • RS 485 interface • RS 232 interface	**6ES7 390-5CA00-0AA0**
S7 DIN rail	
• 160 mm	**6ES7 390-1AB60-0AA0**
• 480 mm	**6ES7 390-1AE80-0AA0**
• 530 mm	**6ES7 390-1AF30-0AA0**
• 830 mm	**6ES7 390-1AJ30-0AA0**
• 2000 mm	**6ES7 390-1BC00-0AA0**
PS 307 load power supply (only required if 24 V DC is not available), 120/230 V AC; 24 V DC	
• PS 307-1B; 2 A	**6ES7 307-1BA00-0AA0**
• PS 307-1E; 5 A	**6ES7 307-1EA00-0AA0**
• PS 307-1K; 10 A	**6ES7 307-1KA00-0AA0**

Remote display (option)

The Siebert S11 remote digital display can be directly connected to the SIWAREX FTA via an RS 485 interface.

Siebert Industrieelektronik GmbH
P.O. Box 1180
D-66565 Eppelborn
Tel.: +49 6806/980-0
Fax: +49 6806/980-999
Internet: http://www.siebert.de

Detailed information available from manufacturer.

SIWAREX JB junction box for connecting load cells in parallel	**7MH4710-1BA**
SIWAREX EB extension box for extending the load cell cable	**7MH4710-2AA**
Ex interface, type SIWAREX IS with ATEX approval for intrinsically-safe connection of load cells, including manual	
• With short-circuit current < 199 mA DC	**7MH4710-5BA**
• With short-circuit current < 137 mA DC	**7MH4710-5CA**
Special cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange to connect SIWAREX FTA to the junction box (JB), extension box (EB) or Ex interface (Ex-I), or between two JBs	**7MH4702-8AG**
Special cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue to connect the junction box (JB) or extension box (EB) in a potentially explosive atmosphere to the Ex interface (Ex-I)	**7MH4702-8AF**
Cable LiYCY 4 x 2 x 0.25 mm² for RS 485	**7MH4407-8BD0**

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