

## Weighing Electronics

SIWAREX weighing electronics for SIMATIC  
Dosing/Filling/Bagging scale

### SIWAREX FTA

#### Overview



SIWAREX FTA (Flexible Technology, Automatic Weighing Instrument) is a versatile and flexible weighing module for industrial use. It can be used in both non-automatic and automatic weighing operation, for example the production of mixtures, and for filling, loading, monitoring and bag filling.

It has the corresponding scale approvals and is also suitable for legal-for-trade weighing systems.

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

#### Benefits

SIWAREX FTA is characterized by the following features:

- Uniform design, and totally integrated communication in SIMATIC S7 and SIMATIC PCS 7
- Uniform configuration with SIMATIC
- Direct use in the SIMATIC automation system
- Use in distributed plant concept through connection to PROFIBUS DP/PROFINET using ET 200M
- Measurement of weight or force with high resolution of 16 million intervals
- High accuracy 3 x 6 000d, legal-for-trade according to OIML R-76, R-51, R-61 and R-107
- Use with analog strain-gage load cells of types SIWAREX R and SIWAREX WL200
- Alternative option of connecting individual load cells from the manufacturers METTLER TOLEDO, Wipotec and PESA
- Legal-for-trade display with Windows-based panels, e.g. SIMATIC Comfort Panels
- Stepless or stepped dosing 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 adjustment of scale using the SIWATOOL FTA program
- Theoretical adjustment without adjustment weights
- Replacement of module without renewed adjustment of scale
- Recording of weighing sequence
- Alibi memory with calibration capability
- Can be used in Ex applications

#### Application

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

Thanks to its outstanding measuring properties, weights can be measured with extreme 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 (also big bag)
- Proportioning as deduction weighing or fill weighing
- Checking of individual quantities
- Loading or receiving of materials
- Static checkweigher
- Check weigher (in combination with Wipotec load cells)

#### Design

SIWAREX FTA is a function module of SIMATIC S7-300 which can be directly snapped onto the SIMATIC S7-300 or ET 200M backplane bus. Thanks to the snap-on mounting rail system, very little work is required to install/cable the 80 mm wide weighing module.

The load cells, the RS 485 serial interface, the analog output and the digital inputs and outputs are connected by means of the 40-pin standard front connector, the PC (RS 232) by means of a 9-pin SUB-D connector and the power supply by means of a separate 2-pin connector.

Operation of SIWAREX FTA in SIMATIC enables the weighing system to be completely integrated into the automation system.

### Function

The main tasks of the SIWAREX FTA are the high-precision measurement of the current 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 using a PLC program. This means that the tasks can be sensibly 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 for the various automatic weighing functions.

The following legal-for-trade weighing functions can be parameterized:

- NAWI (**N**on-**A**utomatic **W**eighing **I**nstrument) according to OIML R76
- AGFI (**A**utomatic **G**ravimetric **F**illing **I**nstrument) according to OIML R61
- ACI (**A**utomatic **C**atchweighing **I**nstrument) according to OIML R51
- DTAWI (**D**iscontinuous **T**otalizing **A**utomatic **W**eighing **I**nstrument (Totalizing Hopper Weigher)) according to OIML R107

### 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.

The SIWAREX FTA can easily be adapted to changes in the system technology thanks to the PLC's influence on the weighing process.

The SIWAREX FTA is already factory-calibrated. 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.

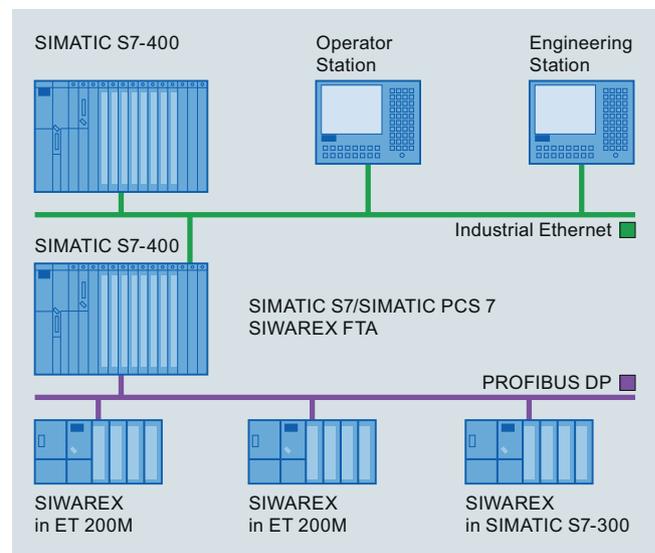
### Integration in SIMATIC

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

The right combination of SIMATIC components can produce optimum solutions for small, medium-size and large plants. The scales are operated and monitored using SIMATIC standard operator panels. Needless to say, these operator panels can also be simultaneously used for the operator control 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 Figure 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

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### SIWAREX FTA

#### Software

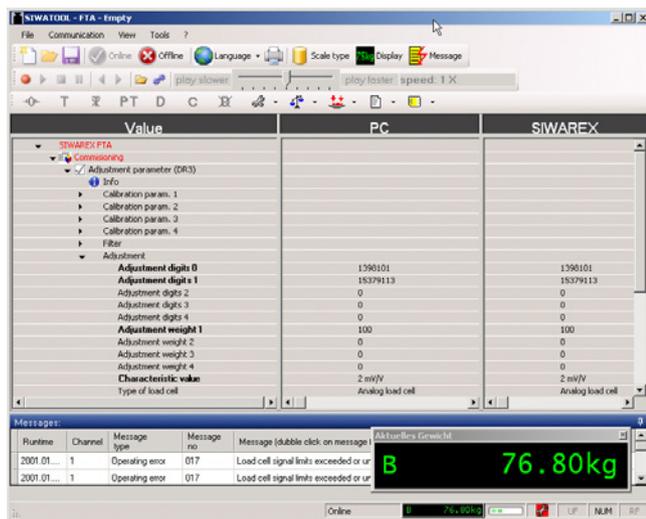
##### SIWATOOL FTA commissioning software

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

The program enables the scales to be set without the need for prior knowledge of the automation system. During servicing, the technician can use a PC to analyze and test the procedures in the scale. Reading out the diagnostics buffer from the SIWAREX FTA is extremely helpful when analyzing events.

The following are just some of the tasks that can be carried out using SIWATOOL FTA:

- Parameter assignment and calibration of the scale
- Testing of scale properties
- Saving and printing scale data
- Recording and analysis of weighing sequence



Settings in SIWAREX FTA software

It is extremely helpful to analyze the diagnostics buffer, which can be saved together with the parameters from the module in a backup file.

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

#### Upgrading firmware

A further program function 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 as required anywhere in the world.

#### 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.

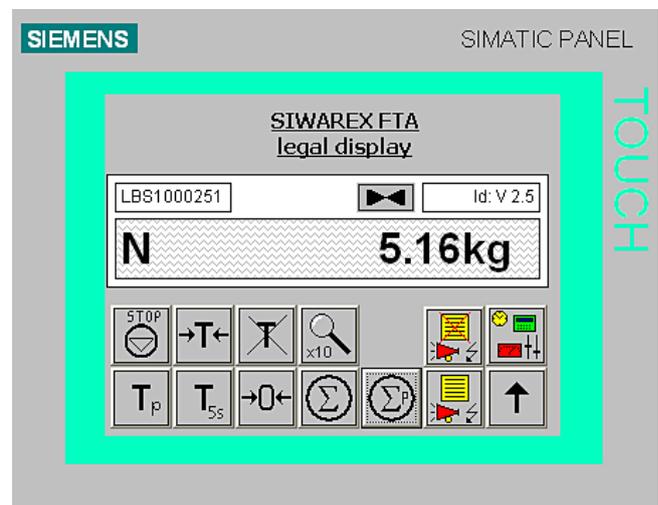
#### SIWAREX FTA – simple configuration

Integration in SIMATIC results in freely-programmable, modular weighing systems which can be modified according to operational requirements.

The ready-to-use SIWAREX FTA software "Getting started" is also available free-of-charge and shows beginners how to integrate the module into a STEP 7 program and offers a basis for application programming. This allows you to connect the scale very easily to an operator panel connected directly to the SIMATIC CPU.

#### Configuring the legal trade display on the panel

The software SecureOCX is available in systems running WinCC flexible. It provides a function for configuration of the legal trade display directly in WinCC flexible. In the TIA Portal, the SecureDisplay software is used. This is installed directly on a Windows CE-based panel (for example, SIMATIC Comfort Touch series). There is a separate "Getting Started" for using this software in the TIA Portal. This solution requires a SIMATIC CPU with an Ethernet port. SIMATIC Basic and Key Panels cannot be used.



Scale faceplate in the SIWAREX FTA "Getting started" software

In addition, the STEP 7 program SIWAREX FTA Multiscale provides a professional basis for the implementation of batching or filling plants.

## Technical specifications

SIWAREX FTA		SIWAREX FTA	
<b>Use in automation systems</b>		<b>Connection to load cells in Ex zone 1</b>	Optionally via SIWAREX IS Ex interface
S7-300	Directly or through ET 200M	<b>Ex approvals zone 2 and safety</b>	ATEX 95, FM, cUL <sub>US</sub> Haz. Loc.
S7-1500	Through ET 200M	<b>Auxiliary power supply</b>	
S7-400 (H)	Through ET 200M	Rated voltage	24 V DC
PCS 7 (H)	Through ET 200M	Max. power consumption	500 mA
<b>Communication interfaces</b>		Current consumption from backplane bus	typ. 55 mA
S7	Through backplane bus	<b>Inputs/outputs</b>	
RS 232	For SIWATOOL or printer connection	Digital inputs	7 DI electrically isolated
RS 485	For remote display or digital load cell	Digital outputs	8 DO electrically isolated
<b>Module parameterization</b>		Counter input	Up to 10 kHz
	Using SIMATIC S7	Analog output	
	Using SIWATOOL FTA software (RS 232)	• Current range	0/4 ... 20 mA
<b>Measuring properties</b>		• Updating rate	100 Hz
EU type approval as non-automatic weighing machine, trade class III	3 x 6 000 d ≥ 0.5 μV/e	<b>Approvals</b>	
Internal resolution	16 million parts		EU type approval (CE, OIML R76)
Internal/external updating rate	400/100 Hz		EU prototype test to MID (OIML R51, R61, R107)
<b>Several parameterizable digital filters</b>		<b>Degree of protection according to EN 60529; IEC 60529</b>	
	Critically damped, Bessel, Butterworth (0.05 ... 20 Hz), mean-value filter		IP20
<b>Weighing functions</b>		<b>Climatic requirements</b>	
Non-automatic weighing machine	OIML R76	$T_{min} (IND) \dots T_{max} (IND)$ (operating temperature)	
Automatic weighing machine	OIML R51, R61, R107	• Horizontal installation	-10 ... 60 °C (14 ... 140 °F)
<b>Load cells</b>		• Vertical installation	-10 ... 40 °C (14 ... 104 °F)
Strain gages in 4-wire or 6-wire system		<b>EMC requirements</b>	
3 characteristic value ranges	1, 2 or 4 mV/V		EN 61326, EN 45501, NAMUR NE21, Part 1
<b>Load cell powering</b>		<b>Dimensions</b>	
Supply voltage $U_S$ (rated value)	10.3 V DC		80 x 125 x 130 mm (3.15 x 4.92 x 5.12 in)
Max. supply current	184 mA	<b>Weight</b>	
Permissible load cell resistance			600 g (0.44 lb)
• $R_{Lmin}$	> 56 Ω		
	> 87 Ω with Ex interface		
• $R_{Lmax}$	≤ 4 010 Ω		
<b>Max. distance of load cells</b>			
When using the recommended cable:			
Standard	1 000 m (3 280 ft)		
In hazardous area <sup>1)</sup>			
• For gases of group IIC	300 m (984 ft)		
• For gases of group IIB	1 000 m (3 280 ft)		

<sup>1)</sup> For further details, see Ex interface, type SIWAREX IS.

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#### Selection and ordering data

Selection and ordering data	Article No.	Selection and ordering data	Article No.
<b>SIWAREX FTA</b> Legal-for-trade weighing electronics for automatic scales for S7-300 and ET 200M. EU type approval 3 x 6000 d Applications: proportioning, filling, bagging, loading. Note: Observe approval conditions for applications with obligation of verification. We recommend using our calibration set and contacting our SIWAREX hotline.	<b>7MH4900-2AA01</b>	<b>Calibration set for SIWAREX FTA</b> For verification of up to 5 scales comprising: • 3 x inscription foil for labeling • 1 x protection foil • Guidelines for verification, verification certificates and approvals, adaptable label, SIWAREX FTA Manual on CD-ROM	<b>7MH4900-2AY10</b>
<b>SIWAREX FTA Manual</b> Available in a range of languages Free download on the Internet at: <a href="http://www.siemens.com/weighing/documentation">http://www.siemens.com/weighing/documentation</a>		<b>SIWATOOL connecting cable</b> From SIWAREX FTA with serial PC interface, for 9-pin PC interfaces (RS 232) • 2 m long (6.56 ft) • 5 m long (16.40 ft)	<b>7MH4702-8CA</b> <b>7MH4702-8CB</b>
<b>SIWAREX FTA "Getting started"</b> Sample software shows beginners how to program the scales in STEP 7. Free download on the Internet at: <a href="http://www.siemens.com/weighing/documentation">http://www.siemens.com/weighing/documentation</a>		<b>Front connector, 40-pin</b> Required for each SIWAREX module • With screw contacts • With spring-loaded terminals	<b>6ES7392-1AM00-0AA0</b> <b>6ES7392-1BM01-0AA0</b>
<b>SIWATOOL V4 &amp; V7</b> Service and commissioning software for SIWAREX weighing modules	<b>7MH4900-1AK01</b>	<b>Shield contact element</b> Sufficient for one SIWAREX FTA module	<b>6ES7390-5AA00-0AA0</b>
<b>Configuration package SIWAREX FTA for SIMATIC PCS 7, Version 8.0 on CD-ROM</b> • HSP hardware support package for integrating SIWAREX FTA/FTC in STEP 7 • Function block for CFC • Faceplate • Manual	<b>7MH4900-2AK63</b>	<b>Shield connection terminal</b> Contents: 2 units (suitable for cable with diameter 4 ... 13 mm / 0.16 ... 0.51 in) Note: one shield connection terminal each is required for: • Scale connection • RS 485 interface • RS 232 interface	<b>6ES7390-5CA00-0AA0</b>
<b>SIWAREX PCS7 AddOn Library for PCS7 V8.x and V9.0</b> • Support of Profinet APL faceplates and function block for: • SIWAREX U • SIWAREX FTA • SIWAREX FTC_B (belt scale) • SIWAREX WP321 Classic faceplate and function block for: • SIWAREX FTC_L (Loss in weight)	<b>7MH4900-1AK61</b>	<b>S7 DIN rail</b> • 160 mm (6.30 in) • 480 mm (18.90 in) • 530 mm (20.87 in) • 830 mm (32.68 inch) • 2 000 mm (78.74 in)	<b>6ES7390-1AB60-0AA0</b> <b>6ES7390-1AE80-0AA0</b> <b>6ES7390-1AF30-0AA0</b> <b>6ES7390-1AJ30-0AA0</b> <b>6ES7390-1BC00-0AA0</b>
		<b>MMC memory</b> For data recording up to 32 MB, only for legal/for/trade applications R76, R51 and R107	<b>7MH4900-2AY21</b>

Selection and ordering data	Article No.	Article No.
<p><b>Remote displays (option)</b></p> <p>The Siebert S102 and S302 remote digital displays can be directly connected to the SIWAREX FTA via an RS 485 interface.</p> <p>Siebert Industrieelektronik GmbH Postfach 1180 D-66565 Eppelborn, Germany Tel.: +49 6806/980-0 Fax: +49 6806/980-999 Internet: <a href="http://www.siebert-group.com/en">http://www.siebert-group.com/en</a></p> <p>Detailed information is available from the manufacturer.</p>		<p><b>Cable (optional)</b></p> <p><b>Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY</b></p> <p>For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two JB's.</p> <p>For permanent installation. Occasional bending is possible.</p> <p>External diameter: approx. 10.8 mm (0.43 in)</p> <p>Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F).</p> <p>Sold by the meter.</p> <ul style="list-style-type: none"> <li>• Sheath color: orange</li> <li>• For potentially explosive atmospheres. Sheath color: blue.</li> </ul>
<p><b>SIWAREX JB junction box, aluminum housing</b></p> <p>For connecting up to 4 load cells in parallel, and for connecting several junction boxes</p>	7MH4710-1BA	<p><b>7MH4702-8AG</b> <b>7MH4702-8AF</b></p>
<p><b>SIWAREX JB junction box, stainless steel housing</b></p> <p>For connecting up to 4 load cells in parallel.</p>	7MH4710-1EA	<p><b>9LA1110-8SN50-0AA0</b></p>
<p><b>SIWAREX JB junction box, stainless steel housing (ATEX)</b></p> <p>For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).</p>	7MH4710-1EA01	<p><b>Commissioning</b></p> <p><b>Commissioning charge for one static scale with SIWAREX module</b></p> <p>(Travel and setup charge must be ordered separately)</p> <p>Scope:</p> <ul style="list-style-type: none"> <li>• Recording of data</li> <li>• Checking of mechanical installation of the scale</li> <li>• Checking of electrical wiring and function</li> <li>• Static adjustment of the scale</li> </ul> <p>Requirements:</p> <ul style="list-style-type: none"> <li>• Mechanical design functional</li> <li>• Modules electrically wired and tested</li> <li>• Adjustment weights available</li> <li>• Free access to scale</li> </ul>
<p><b>Ex interface SIWAREX IS</b></p> <p>For intrinsically-safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX electronic weighing system. Compatibility of load cells must be checked.</p> <ul style="list-style-type: none"> <li>• With short-circuit current &lt; 199 mA DC</li> <li>• With short-circuit current &lt; 137 mA DC</li> </ul>	<p><b>7MH4710-5BA</b></p> <p><b>7MH4710-5CA</b></p>	<p><b>9LA1110-8RA10-0AA0</b></p> <p><b>Flat charge for travel and setup in Germany</b></p>