SIWAREX MS
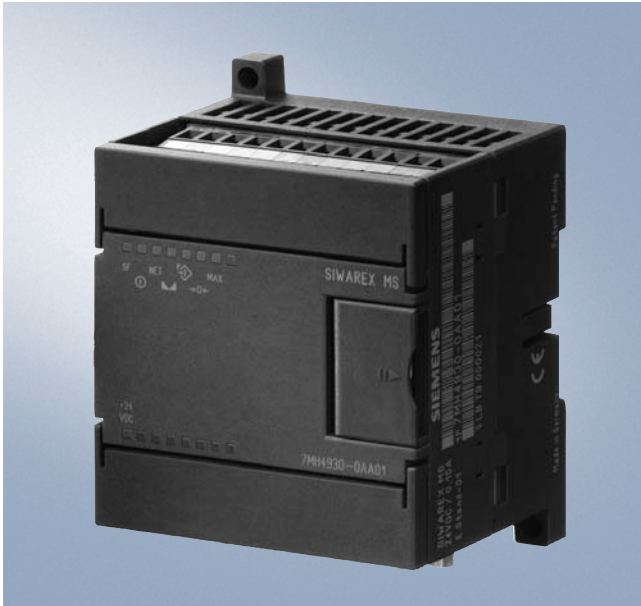
Overview

SIWAREX MS is a versatile weighing module for all simple weighing and force measuring tasks. The compact module is easy to install in the SIMATIC S7-200 automation systems The data for the actual weight can be accessed directly in the SIMATIC CPU without the need for any additional interfaces.

Benefits

SIWAREX MS offers the following key advantages:

- Uniform design technology and consistent communication in SIMATIC S7-200
- Uniform configuring with STEP 7-Micro/WIN
- Measurement of weight or force with a internal resolution of 65,000 parts and an accuracy of 0.05%
- Simple configuring with the ready to use PC software "Getting started"
- Simple adjustment of the scale using the SIWATOOL MS program via the RS 232 interface
- Supports theoretical adjustment without adjustment weights
- Supports replacement of module without renewed adjustment of scale
- For use in Ex zone 2, intrinsically-safe load cell powering for zone 1 using Ex interface.
- Direct connection of a remote display to the TTY interface is possible

Application

SIWAREX MS is the optimum solution wherever strain gauge sensors, such as load cells, force sensors or torque measuring shafts, are used for measuring tasks. The following are typical SIWAREX MS applications:

- Non-automatic weighing machines
- Simple discontinuous weighing processes
- Fill level monitoring of silos and bunkers
- Measuring of crane and cable loads
- Load measuring for industrial lifts and rolling mills
- Weighing in potentially explosive areas (zone 2 or zone 1 using Ex interface SIWAREX IS or Pi)
- Monitoring of belt tension
- Force measuring, weighing hoppers, platform scales and crane scales

Design

SIWAREX MS is a compact module in SIMATIC S7-200 and can be directly mounted on a 35 mm rail EN 50022 but is also suitable for direct wall mounting. The power supply, load cells and the optional remote display are all connected using screw-type terminals. The connection of the serial RS 232 interface is effected via a 9-pin Sub-D connector.

Function

The primary task of SIWAREX MS is the measurement of sensor voltage and the conversion of this measurement into a weight value. Up to 3 interpolation points are used for the weight calculation. If required, the signal can be digitally filtered.

As well as determining weights, the SIWAREX MS monitors two freely programmable limits (min./max. optional) and rapidly notifies the SIMATIC CPU using status bits if these values are exceeded.

The SIWAREX MS comes 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.
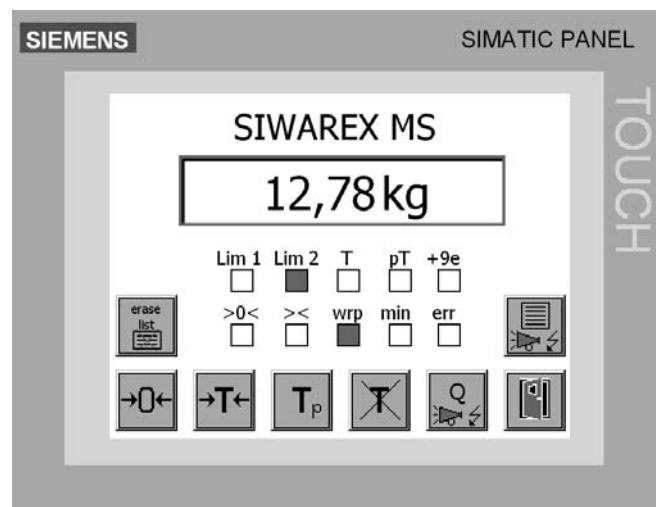
Consistent and uniform communication between all system components enables fast, reliable and cost-effective integration and diagnosis in industrial processes.

The SIWAREX MS has two serial interfaces. The TTY interface serves to connect digital remote displays. The remote displays show the weight value with status information.

A PC for parameterizing the SIWAREX MS can be connected through the RS 232 interface. Alternatively, this interface can also be used for serial connection (SIWAREX protocol) to a host computer (e.g. PC).

SIWAREX MS is integrated into the plant software with STEP 7-Micro/WIN. In contrast to serially linked weighing electronics, SIWAREX MS does not need costly additional modules to link it to SIMATIC.

Used in conjunction with SIWAREX MS, it is possible to configure freely programmable, modular weighing systems comprising one or more scales in SIMATIC S7-200.

Scale faceplate in the SIWAREX MS software "Getting started"

To facilitate incorporation of the module into a STEP 7 program and as a basis for application programming, the ready-to-use SIWAREX MS software "Getting started" is available free-of-charge in addition to the configuration package. A complete SIWAREX MS scale can then be simply implemented in SIMATIC together with a Touch Panel (e.g. TP 177micro) as the operator

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panel. This software is also included in the Micro Automation Set 6.

The software for scale adjustment, SIWATOOL MS, can be used to set the SIWAREX weigh beams using the familiar Windows interface without the need for SIMATIC expertise. Screen forms allow all user-definable parameters of the weigh beams to be specified, saved and printed for plant documentation. The diverse diagnostic options provided by SIWATOOL MS ensure fast fault locating in online mode.

The SIWAREX MS weighing module can be used for potentially explosive areas (zone 2). It can also be used for zone 1 by implementing an optional Ex interface, whereby SIWAREX MS must be installed in a safe area. The certification conditions must be observed.

Technical specifications

Integration in S7-200 automation systems	
• CPU 222 (6ES7212-1*B23-0XB0)	
• CPU 224 (6ES7214-1*D23-0XB0)	
• CPU 224XP (6ES7214-2*D23-0XB0)	
• CPU 226 (6ES7216-2*D23-0XB0)	
Communication interfaces	SIMATIC S7 Bus, RS 232, TTY
Connection of remote indicators (through TTY interface)	Weight value (gross, net)
Adjustment of scales settings	Using PC parameterization software SIWATOOL MS (RS 232)
Measuring properties	
• Error limit according to DIN 1319-1 of full-scale value at 20 °C ± 10 K	0,05%
• Internal resolution Data format of weight values	65.535 2 byte (fixed-point)
Number of measurements/second	50 or 30
Digital filter	0.05 - 5 Hz (in 7 steps), mean-value filter
Weighing functions	
• Weight values	Gross, net
• Limit values	2 (min./max.)
• Zero setting function	Per command
• Tare function	Per command
• Tare specification	Per command
Load cells	Strain gauges in 4-wire or 6-wire system
Load cell powering	
• Supply voltage U_s (rated value)	6 V DC typ.
• Max. supply current	≤ 150 mA
• Permissible load impedance	
- R_{Lmin}	> 40 Ω
- R_{Lmax}	< 4010 Ω
	With SIWAREX IS or SIWAREX Pi Ex interface:
- R_{Lmin}	> 87 Ω
- R_{Lmax}	< 4010 Ω
Load cell characteristic	1 mV/V to 4 mV/V
Permissible range of measuring signal (at greatest set characteristic)	-1.5 to +42.5 mV
Max. distance of load cells	500 m
Intrinsically-safe load cell supply	
Connection to load cells in Ex zone 1	Optionally via SIWAREX IS or SIWAREX Pi Ex interface

Ex approvals and safety	CE, ATEX 100a, FM, UL, cUL$_{US}$ Haz. Loc. (all available soon)
Supply voltage 24 V DC	
• Rated voltage	24 V DC
• Max. current consumption	130 mA
Supply voltage 5 V DC (from CPU)	
• Rated voltage	5 V DC
• Max. current consumption	145 mA
IP degree of protection to DIN EN 60529; IEC 60529	IP20
Climatic requirements	
$T_{min\ (IND)}$ to $T_{max\ (IND)}$) (operating temperature)	
• Vertical installation	0 ... +55 °C
• Horizontal installation	0 ... +40 °C
EMC requirements according to	EN 61326, EN 45501 NAMUR NE21, Part 1

Selection and Ordering Data

	Order No.
SIWAREX MS	**7MH4930-0AA01**
Weighing electronics for scales in SIMATIC S7-200 for applications that do not require official calibration	
SIWAREX MS Manual	
• German, English, Italian, Spanish, French	
Free download on the Internet at: www.siemens.com/weighing-technology	
Configuration package SIWAREX MS on CD-ROM for STEP 7-Micro/WIN, version 4.0 SP2 or higher	**7MH4930-0AK01**
• Software for SIWATOOL MS scale adjustment (German, English, Italian, Spanish, French)	
• Manuals on CD (German/English)	
• Micro/WIN library MicroScale for communication with SIWAREX MS	
SIWAREX MS "Getting started"	
Sample software for easy acquaintance with programming of the scale.	
Free download on the Internet at: www.siemens.com/weighing-technology	
SIWATOOL cable	
from SIWAREX M, FTA, FTC, MS with serial PC interface, for 9-pin PC interfaces (RS 232)	
• 2 m long A)	**7MH4702-8CA**
• 5 m long A)	**7MH4702-8CB**
Shield clamps for shield termination	**6ES5728-8MA11**
Pack of 10; 1 item required for each shielded cable	
Remote displays (option)	
The digital remote displays can be connected directly to the SIWAREX MS through the TTY interface.	
The following remote display can be used: S102	
Siebert Industrieelektronik GmbH P.O. Box 1180 D-66565 Eppelborn Tel.: 06806/980-0 Fax: 06806/980-999	
Internet: http://www.siebert.de	
Detailed information available from manufacturer.	

	Order No.
Accessories	
SIWAREX JB junction box, aluminium housing	**7MH4710-1BA**
for connecting up to 4 load cells in parallel, and for connecting several junction boxes	
SIWAREX JB junction box, stainless steel housing	**7MH4710-1EA**
for connecting up to 4 load cells in parallel	
Ex interface, type SIWAREX Pi	**7MH4710-5AA**
With UL and FM approvals, but **without ATEX approval**	**C71000-T5974-C29**
for intrinsically safe connection of weighing cells, suitable for weighing modules SIWAREX U, M, FTA, FTC, CS, MS and P. Not approved for use in the EU.	
Manual for Ex interface type SIWAREX Pi	**C71000-T5974-C29**
Ex interface, type SIWAREX IS	
With ATEX approval, but **without UL and FM approvals**	
for intrinsically safe connection of weighing cells, including manual, suitable for weighing modules SIWAREX U, M, FTA, FTC, CS, MS and P. Suitable for use in the EU.	
• With short-circuit current < 199 mA DC	**7MH4710-5BA**
• With short-circuit current < 137 mA DC	**7MH4710-5CA**
Cable (optional)	
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, orange sheath	**7MH4702-8AG**
To connect SIWAREX U, M, P, FTA, FTC, CS and MS to the junction box (JB), extension box (EB) or Ex interface (Ex-I) or between two JBs, for fixed laying, occasional bending is possible, 10.8 mm outer diameter, for ambient temperature -40 to +80°C	
Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) - CY, blue sheath	**7MH4702-8AF**
to connect the junction box (JB) or extension box (EB) in a potentially explosive atmosphere to the Ex interface (Ex-I), for fixed laying, occasional bending is possible, blue PVC insulating sheath, approx. 10.8 mm outer diameter, for ambient temperature -40 to +80 °C	
Cable LiYCY 4 x 2 x 0.25 mm²	**7MH4407-8BD0**
for TTY (connect 2 pairs of conductors in parallel), for connection of a remote display	

A) Liable to export regulations AL:N, ECCN: EAR99H.

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