Overview

The SIWAREX WP341 is a compact, precise weighing electronics in the SIMATIC ET 200SP format.
With a width of just 20 mm it is one of the slimmest weighing electronics on the market, yet its firmware includes the functionalities of a continuous belt weighing electronics. Optionally the WP341 can be used for operation of solids flowmeters.
The load cells and the speed sensor are directly connected to the ET 200SP Base Unit (type U0) and therefore the complete system is directly integrated into the automation system.

Benefits

- Low space requirements with only 20 mm module width
- Seamless integration into SIMATIC ET 200SP
- 1 000 Hz sampling rate und processing time
- Dedicated firmware for continuous belt weighing applications
- Operation with SIMATIC S7-300, S7-400, S7-1200 and S7-1500 controllers
- Operation in Ethernet IP or Modbus TCP-based systems using ET 200SP multi-field bus IM
- Three digital inputs and outputs each ex works
- High degree of scalability in connection with all available SIMATIC standard components
- Open SIWAREX concept – all settings and parameters accessible, no encapsulated black box in the field
- Unrestricted access to all scale parameters and functions from the SIMATIC S7 Controller / HMI
- Internal, protocol memory for up to 1 000 000 entries
- Commissioning and maintenance from HMI or weighing electronics-internal web server
- Advanced diagnostic features in combination with SIWAREX DB

Application

SIWAREX WP341 offers a compact and extremely versatile solution for continuous belt weighing applications with high requirements for accuracy and performance.
Typical areas of application include:

- Belt weighers in recycling, mining, aggregate, cement, chemical and food industries
- Easy and completely integrated realization of weigh feeding applications
- Operation with solids flowmeters

Design

The SIWAREX WP341 is a technology module of the SIMATIC ET 200SP distributed I/O system.
Installation is on a type U0 BaseUnit. The load cells, serial RS 485 interface and digital inputs/outputs are wired directly on the BaseUnit with user-friendly push-in terminals. This makes is quick and easy to replace weighing electronics without any wiring effort. The web server is addressed via an Ethernet interface in the weighing electronics. Should more interfaces and I/O be required, they can be added with the ET 200SP system components.

Function

The load cells of the belt scale as well as the speed sensor are directly wired to the BaseUnit. The weighing electronics internally calculates the current flow rate based on the current weight and speed signal. Six individual totalizers are available and can be easily read out of the weighing electronics into the connected CPU. The totalizers are resettable by software command or alternatively by a 24 V signal connected to one of the on board digital inputs. Different methods of commissiong are supported: by test weight, by test chain, by material batch or based on load cell data.
A correction factor calculated by a material test can be applied. Additionally a correction factor curve based on different belt load levels can be defined. Digital signal filters for speed and load offer the possibility to optimize the results of the weighing process. A logging function for all calibration actions with time stamp provide a transparent and secure operation of the scale. In combination with the digital junction box SIWAREX DB up to four connected load cells can be individually monitored and diagnosed down from the single sensor up into the MES level.
The free of charge function block and HMI visualization give full access to all available data and parameters of the WP341 from the controller / HMI. Therefore the belt weighing application can be easily integrated into existing HMI visualizations and allow an intuitive operation and service of the scale.

Selection and ordering data

	Article No.
TM SIWAREX WP341 weighing electronics SIMATIC ET 200SP, TM SIWAREX WP341 HF, weighing electronics for continuous belt weighing applications	7MH4138-6CA00-0CU0
SIWAREX WP341 Equipment Manual Available in a range of languages Free download on the Internet at: http://www.siemens.com/weighing/documentation	
SIWAREX WP341 "Getting Started" sample project Sample software shows beginners how to program the scales in TIA Portal V16 Free download on the Internet at: http://www.siemens.com/weighing/downloads	
ET 200SP BaseUnit type U0	
• For opening a new potential group (white)	6ES7193-6BP00-0DU0
• For continuing an existing potential group (gray)	6ES7193-6BP00-0BU0
• Shield connection for ET 200SP incl. 5 shield connections	6ES7193-6SC00-1AM0

Selection and ordering data (Continued)

	Article No.
Accessories	
SIWAREX EB extension box For extending sensor cables	**7MH4710-2AA**
SIWAREX JB junction box, aluminum enclosure For connecting up to 4 load cells in parallel, and for connecting multiple terminal boxes.	**7MH5001-0AA20**
SIWAREX JB junction box, stainless steel enclosure For connecting up to 4 load cells in parallel.	**7MH5001-0AA00**
SIWAREX JB junction box, stainless steel enclosure (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or prototype test certificate).	**7MH5001-0AA01**
SIWAREX DB digital junction box For enhanced diagnostic and monitoring options in conjunction with SIWAREX WP electronics. Enclosure made of:	
• Aluminum	**7MH5001-0AD20**
• Stainless steel incl. ATEX and IECEx approval II 3 G Ex ec IIC T4 Gc and II 3 D Ex tc IIIC T120 °C Dc	**7MH5001-0AD01**
SIWAREX IS Ex interface For intrinsically safe connection of load cells. With ATEX approval (not UL/FM). Suitable for SIWAREX weighing electronics. Compatibility of load cells must be checked separately.	
• With short-circuit current < 199 mA DC	**7MH4710-5BA**
• With short-circuit current < 137 mA DC	**7MH4710-5CA**
Cable (optional)	
Cable Li2Y 1 × 2 × 0.75 ST + 2 × (2 × 0.34 ST) – CY For connecting SIWAREX electronic to junction box (JB), extension box (EB), digital junction box (DB), Ex interface (IS) or between two extension boxes. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 inch) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F) Sold by the meter.	
• Sheath color: orange	**7MH4702-8AG**
• Sheath color (for hazardous atmospheres): blue	**7MH4702-8AF**

Technical specifications

Article number	7MH4138-6CA00-0CU0
General information	
Product type designation	TM SIWAREX WP341 HF
• Product function	
• I&M data	Yes; I&M0 to I&M3
• Isochronous mode	No
• Adjustment of measuring range	Yes; ±0 ... 4 mV/V
• Engineering with	
• STEP 7 TIA Portal configurable/integrated from version	V16
• STEP 7 configurable/integrated from version	- / -
• PROFIBUS from GSD version/GSD revision	GSD as of Revision 5
• PROFINET from GSD version/GSD revision	GSDML V2.34
Supply voltage	
• Load voltage L+	
• Rated value (DC)	24 V
• Short-circuit protection	Yes
• Reverse polarity protection	Yes
Digital inputs	
Number of digital inputs	3
Digital inputs, parameterizable	Yes
Input characteristic curve in accordance with IEC 61131, type 3	Yes
• Input voltage	
• Type of input voltage	24 V DC
• Rated value (DC)	24 V
• for signal "0"	< 5 V DC
• for signal "1"	+11 to +30V
• permissible voltage at input, min.	-30 V
• permissible voltage at input, max.	30 V
• Input current	
• for signal "1", typ.	1.6 mA
• Input delay (for rated value of input voltage)	
• for technological functions	
• parameterizable	Yes
Digital outputs	
Number of digital outputs	3
Digital outputs, parameterizable	Yes
Short-circuit protection	Yes
• Digital output functions, parameterizable	
• Freely usable digital output	Yes
• Switching capacity of the outputs	
• with resistive load, max.	0.5 A
• Output voltage	
• Type of output voltage	DC
• Output delay with resistive load	
• "0" to "1", typ.	20 µs
• "1" to "0", typ.	30 µs

Technical specifications (Continued)

Article number	7MH4138-6CA00-0CU0
• Parallel switching of two outputs	
• for uprating	No
• Switching frequency	
• with resistive load, max.	500 Hz
• Total current of the outputs	
• Current per channel, max.	0.5 A; the total current of all outputs ≥ 0.6 A, the ambient temperature is reduced by -1 °C per 100 mA
• Current per module, max.	1.5 A; Observe derating
Encoder	
• Connection of signal encoders	
• For strain gauges (full bridges) with 4-conductor connection	Yes
• For strain gauges (full bridges) with 6-conductor connection	Yes
• Resistance of full bridge, min.	56 Ω; when using SIWAREX IS 87 ohm for 7MH4710-5BA; 180 ohm when using 7MH4710-5CA
• Resistance of full bridge, max.	4 100 Ω
Errors/accuracies	
Linearity error (relative to input range), (+/-)	0.001 %
Error limit according to DIN 1319-1	0.002 %; of full-scale value
Accuracy class	III
Temperature coefficient, zero point	≤ ±0.015 µV/K
Temperature coefficient, span	≤ ±5 ppm/K
1. Interface	
• Interface types	
• RS 485	Yes; Terminated internally with 390 Ω / 220 Ω / 390 Ω
2. Interface	
• Interface types	
• RJ 45 (Ethernet)	Yes; 10/100 Mbit/s
• Number of ports	1
• Protocols	
• IP protocol	Yes; IPv4
• Web server	Yes
Interface types	
• RJ 45 (Ethernet)	
• Autonegotiation	Yes
• Autocrossing	Yes
• RS 485	
• Transmission rate, max.	115.2 kbit/s
• Cable length, max.	1 000 m; ≤ 115 kbps, shielded cable
Protocols	
• Web server	
• HTTP	Yes
• HTTPS	Yes
Interrupts/diagnostics/status information	
Diagnostics function	Yes; Diagnostic alarm
Substitute values connectable	No
• Alarms	
• Diagnostic alarm	Yes; Parameterizable

Technical specifications (Continued)

Article number	7MH4138-6CA00-0CU0
• Hardware interrupt	Yes; Parameterizable
• Diagnoses	
• Monitoring the supply voltage	Yes
• Wire-break	Yes
• Short-circuit	Yes
• Group error	Yes; green/red DIAG LED
• Diagnostics indication LED	
• ERROR LED	Yes; green/red DIAG LED
• Monitoring of the supply voltage (PWR-LED)	Yes; green PWR LED
Integrated Functions	
Counter	Yes
• Number of counters	1
• Counting frequency, max.	8 kHz
• Load cell	
• permissible input signal per verification interval, min.	0.4 µV/e
• Sampling rate	1 024 Hz
• Resolution of input signal	±20 000 000 parts at 0 ... 4 mV/V
• Common mode voltage, min.	2.8 V
• Common mode voltage, max.	7.7 V
• input resistance of signal line, typ.	8 MΩ
• input resistance of sense line, typ.	300 MΩ
• Cable length, max.	500 m; when using the SIWAREX 7MH4702-8AG cable
• Measuring functions	
• Measuring range	
• -1 mV/V to +1 mV/V	Yes
• -2 mV/V to +2 mV/V	Yes
• -4 mV/V to +4 mV/V	Yes
Ambient conditions	
• Ambient temperature during operation	
• horizontal installation, min.	-30 °C
• horizontal installation, max.	60 °C
• vertical installation, min.	-30 °C
• vertical installation, max.	50 °C
• Altitude during operation relating to sea level	
• Installation altitude above sea level, max.	5 000 m; more than 2 000 m above sea level, the ambient temperature is reduced by -1 °C per 100 m
• Ambient air temperature-barometric pressure-altitude	1 080 ... 533 hPa (-1 000 ... 5 000 m above sea level)
Decentralized operation	
to SIMATIC S7-300	Yes
to SIMATIC S7-400	Yes
to SIMATIC S7-1200	Yes
to SIMATIC S7-1500	Yes
to standard PROFIBUS master	Yes
to standard PROFINET controller	Yes
Dimensions	
Width	20 mm

Technical specifications (Continued)

Article number	7MH4138-6CA00-0CU0
Height	57 mm
Depth	72 mm
Weights	
Weight, approx.	50 g