

Weighing Electronics

Stand-alone electronics
Platform/hopper scale

SIWAREX WT231

Overview



SIWAREX WT231 weighing module

The SIWAREX WT231 is a weighing terminal for industrial use. Siemens standard components are installed in a stainless steel enclosure with numerous connection options. This ensures the tried and tested SIWAREX quality as standalone solution and is ideal for container weighers or platform scales.

Benefits

SIWAREX WT231 offers the following key advantages:

- Complete solution – no configuration in SIMATIC required
- Fast and easy commissioning due to intuitive operating concept
- The stainless steel enclosure permits applications in many diverse environments
- Integrated connecting terminals for up to 4 load cells
- Flexible connection to different systems through diverse interfaces
 - four digital inputs
 - four digital outputs
 - one analog output
 - RS 485 interface and Modbus RTU
- High resolution of the load cell signal of up to ± 4 million parts
- Comprehensive diagnostics functions
- Recovery-point for the simple restoration of all parameters
- Automatic calibration is possible without the need for calibration weights
- All diagnostic and error messages as well as all scale parameters in plain text
- 100 ... 240 V AC supply range

Application

SIWAREX WT231 is the optimum solution wherever strain gauge sensors, such as load cells, force sensors or torque measuring shafts, are used for measuring tasks. The typical applications of SIWAREX WT231 are:

- Non-automatic scales
- Fill level monitoring of silos and bunkers
- Measuring of crane and cable loads
- Load measuring for industrial lifts and rolling mills
- Force measuring, container weighers, platform scales and crane scales

Design

SIWAREX WT231 is a standalone weighing terminal based on the tried and tested Siemens SIWAREX WP231 products and the Siemens SIMATIC KTP 400 touch display. Supplemented with a connection board and a wide-range power supply, these components are preinstalled in a compact stainless steel enclosure. The enclosure can be wall mounted and has 9 cable entries, of which 5 are equipped with cable glands at the factory. A variety of interfaces support the integration into the plant environment.

The SIWAREX WT231 is preconfigured with the SIWAREX "Ready for use" software. This means that no further commissioning is required in SIMATIC.

Function

The primary task of SIWAREX WT231 is the measurement and conversion of sensor voltage into a weight value. Up to three interpolation points are used for the weight calculation. The signal can also be digitally filtered if required.

Weighing functions

There are commands available for zeroing and taring. Up to three different tare default values can be activated. The SIWAREX WT231 is calibrated at the factory. This means the scale can be automatically adjusted without adjustment weights, and modules can be replaced without the need to readjust the scale.

Monitoring and control of the scale signals and states

In addition to weight determination, the SIWAREX WT231 monitors two freely programmable limits (optionally min/max) as well as the empty range. A violation of the limit values is signaled.

1.3.1 Limits					
	Limit 1		Limit 2		Empty range
Limit "ON"	99,00	%	50,00	%	1,00 %
Delay "ON"	0,000	s	0,000	s	1,000 s
Limit "OFF"	98,00	%	49,00	%	% of 100,0 kg
Delay "OFF"	0,000	s	0,000	s	
Reference	Gross weight (% of max. weigh)				

SIWAREX WT231 operating view "Limit values"

Software

The touch panel is preconfigured with the SIWAREX "Ready for use" software. Thus the user interface is clearly structured and can be operated intuitively; the languages German, English, French, and Chinese are available. The structured menu-based operation facilitates the operation of the scale and supports the user through guided commissioning.

Furthermore, a variety of diagnostics options are offered. Using the trace function, weighing histories can be recorded and exported. There is also the option of simulating the behavior of the scale with the device.

The service tool "SIWATOOL V7", which is included in the optional configuration package, is required for reading out this trace data. In addition, using SIWATOOL a scale backup can be created and reimported whenever required. Thus, in the event of an error, the WT231 can be replaced within seconds without requiring a new adjustment.

Integration

Integration in the plant environment

Using the onboard RS 485 interface and the Modbus RTU protocol, the SIWAREX WT231 can be connected to many different automation systems or a PC.

Furthermore, 4 digital inputs, 4 digital outputs, and an analog output are available. Direct, straightforward further processing of alarms or status messages is thus made possible.

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Technical specifications

SIWAREX WT231	
Enclosure	Stainless steel enclosure (1.4301) with the interfaces: <ul style="list-style-type: none"> • 1 x wall bushing for power supply • 4 x wall bushing for load cell connection with EMC screw connection • 4 x wall bushing with blanking plugs • Ground connection bolt
Connection board	Internal connection board <ul style="list-style-type: none"> • Connection of up to 4 load cells • Type of analog output • Type of 24 V direct voltage
Integration in automation systems	Any automation systems Via RS 485 (Modbus RTU)
Communication interfaces	<ul style="list-style-type: none"> • RS 485 (Modbus RTU) • 4 digital outputs (24 V DC) • 4 digital inputs (24 V DC) • 1 analog output (0/4 ... 20 mA)
Commissioning options for the scale	Directly via the color touch panel and the preinstalled "Ready for use" operating software
Calibration approval	No
Internal resolution	up to ± 4 million parts
Number of measurements/second (internal)	100 Hz
Filter	<ul style="list-style-type: none"> • Low-pass filter 0.1 ... 50 Hz • Mean value filter
Weighing functions	<ul style="list-style-type: none"> • Gross • Net • Tare
Weight values	
Limits	<ul style="list-style-type: none"> • Min/max • Empty
Zeroing function	Per command
Tare function	Per command
Tare specification	Per command

SIWAREX WT231	
Load cells	Strain gauges in 4-wire or 6-wire system
Load cell excitation	
Supply voltage (regulated via feedback)	4.85 V DC
Permissible load resistance	
• R_{Lmin}	> 40 Ω
• R_{Lmax}	< 4 100 Ω
With SIWAREX IS Ex interface	
• R_{Lmin}	> 50 Ω
• R_{Lmax}	< 4 100 Ω
Load cell characteristic	1 ... 4 mV/V
Permissible range of measuring signal (at greatest set characteristic value)	-21.3 ... +21.3 mV
Max. distance of load cells	500 m (229.66 ft)
Auxiliary power supply	
Rated voltage	100 ... 240 V AC
Line frequency	50 ... 60 Hz
Max. power consumption	0.12 A
IP degree of protection to DIN EN 60529; IEC 60529	IP65
Climatic requirements	
T_{min} (IND) ... T_{max} (IND) (operating temperature)	
Vertical installation	0 ... +40 °C (32 ... 104 °F)
EMC requirements according to	EN 45501
Dimensions	264 x 185 x 97 mm (10.39 x 7.28 x 3.82 in)
Weight	4 kg (8.82 lb)

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Selection and ordering data

Selection and ordering data	Article No.		Article No.
SIWAREX WT231 Weighing terminal for industrial scales	7MH4965-2AA01	Cable (optional)	
SIWAREX WT231 Manual In various languages. Free download on the Internet at: http://www.siemens.com/weighing/documentation		Cable Li2Y 1 x 2 x 0.75 ST + 2 x (2 x 0.34 ST) – CY For connecting SIWAREX electronic weighing systems to junction box (JB), extension box (EB) and Ex interface or between two JBs. For permanent installation. Occasional bending is possible. External diameter: approx. 10.8 mm (0.43 in) Permissible ambient temperature -40 ... +80 °C (-40 ... +176 °F). Sold by the meter. • Sheath color: orange • For potentially explosive atmospheres. Sheath color: blue.	
Accessories		Commissioning	
SIWATOOL V4 & V7 Service and commissioning software for SIWAREX weighing modules	7MH4900-1AK01	Commissioning charge for one static scale with SIWAREX module (Travel and setup charge must be ordered separately) Scope: • Recording of data • Checking of mechanical installation of the scale • Checking of electrical wiring and function • Static adjustment of the scale Requirements: • Mechanical design functional • Modules electrically wired and tested • Adjustment weights available • Free access to scale	7MH4702-8AG 7MH4702-8AF
Ethernet cable patch cord 2 m (7 ft) For connecting SIWAREX WT231 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.	6XV1850-2GH20	Flat charge for travel and setup in Germany	9LA1110-8SN50-0AA0
SIWAREX JB junction box, aluminum housing For connecting up to 4 load cells in parallel, and for connecting multiple junction boxes.	7MH4710-1BA		
SIWAREX JB junction box, stainless steel housing For connecting up to 4 load cells in parallel.	7MH4710-1EA		
SIWAREX JB junction box, stainless steel housing (ATEX) For parallel connection of up to 4 load cells (for zone allocation, see manual or type-examination certificate).	7MH4710-1EA01		