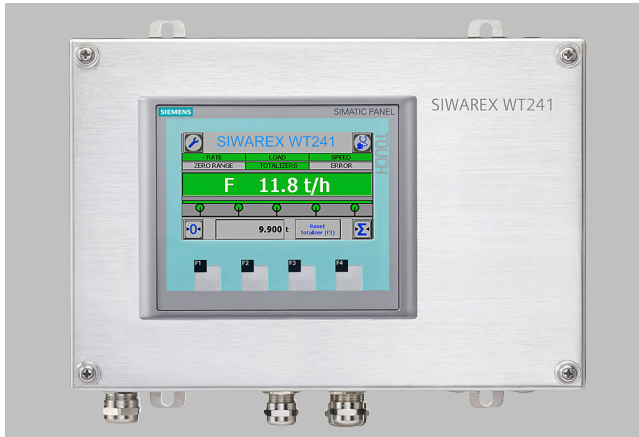## Overview

The SIWAREX WT241 is a weighing terminal for belt scales. 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 belt scales.

Benefits

SIWAREX WT241 offers the following key advantages:
- Complete solution – no configuration in SIMATIC required
- Fast and easy commissioning due to intuitive operating concept
- Stainless steel enclosure permits applications in many diverse environments
- Integrated terminals for up to 4 load cells (1 ... 4 mV/V)
- Flexible connection to different systems through diverse interfaces
  - Four digital inputs (24 V DC)
  - Four digital outputs (24 V DC)
  - One analog output (0/4 ... 20 mA)
  - RS 485 interface and Modbus RTU
- High resolution of load cell signal of up to ± 4 million parts
- Comprehensive diagnostics functions
- All diagnostic and error messages, as well as all scale parameters, in plain text
- Recovery point for simple restoration of all parameters
- Multiple calibration methods: using test weights, test chain, automatically or via material batch
- Specification of belt inclination angle
- 6 separately resettable totalization memories
- Simulation of speed and belt load for test purposes
- Parameterizable pulse signal (24 V DC) for external totalizer
- Correction of material flow rate by means of correction factor

Application

SIWAREX WT241 is the optimal solution wherever belt scales are used that demand high accuracy, high user-friendliness, and comprehensive adjustment options.
The typical applications of the SIWAREX WT241 are determining the current material flow rate, belt load, and belt speed. Furthermore, 6 totalizers are available for evaluating the amount of material conveyed.

Design

SIWAREX WT241 is a stand-alone weighing terminal based on the tried and tested Siemens SIWAREX WP241 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 nine cable entries, of which five are equipped with cable glands at the factory. A variety of interfaces support the integration into the plant environment.
The integrated connection board permits the direct connection of the belt scales and of the speed sensor.
The SIWAREX WT241 is preconfigured with the SIWAREX "Ready for Use" software. This means that no further commissioning is required in SIMATIC.

Function

The main tasks of the SIWAREX WT241 are:
- To measure the belt speed
- To measure and convert the sensor voltage into a weight value
- To calculate material quantities and flow rates.

The volume of material conveyed is recorded in 6 totalization memories.
Four different options are available for rapid commissioning:
- Automatic calibration
  The calibration is calculated automatically using the load cell parameters entered. Only the zero point has to be calculated at the actual plant.
- Calibration with calibration weights or test weights
  Test weights are secured to the weighing equipment and the conveyor belt is started. The calibration values are determined while the belt is running. The zero point must also be calculated.
- Calibration with test chain
  Instead of test weights, a chain of a known weight can be placed on the measuring points of the belt. The calibration values are calculated as for calibration with test weights.
- Calibration via material batch
  This method can be used if a volume of material is available, but neither test weights nor a chain are available. The material can either be preweighed or weighed afterwards. It is conveyed over the belt scale. Then the weighing module calculates the calibration characteristic automatically.

If "Automatic set to zero" is active, the electronic weighing system automatically executes a "set to zero" procedure when the belt reaches the "set to zero" area.
Extensive diagnostics functions are available. Diagnostic messages are output to the different interfaces. In simulation mode, both the speed and the belt load can be specified by the user. This makes it possible to test many functions in advance without operating belt scales. Both the digital inputs/outputs and the analog output can also be simulated for test purposes. The "Trace" function is extremely helpful for optimizing the plant or when troubleshooting. It records the weighing history stored in the internal module memory (e.g. material flow rate, belt load, speed) and exports it to Excel in a graphical format.
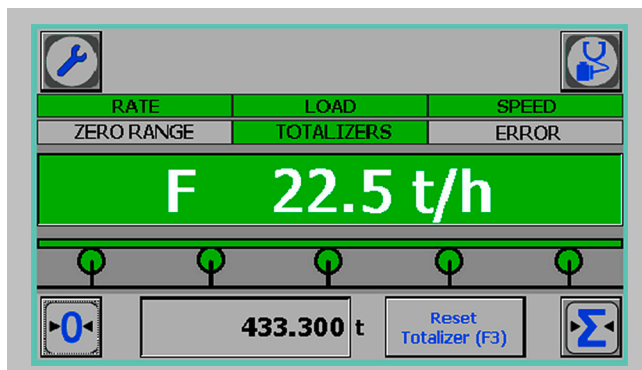The service tool "SIWATOOL V7", which is included in the optional configuration package, is required for reading out this trace data. In addition, using SIWATOOL a scale backup can be created and reimported whenever required. This means that in the event of a fault, the WT241 can be replaced within seconds, without the need for recalibration.

Function (Continued)

SIWAREX WT241 weighing terminal operating view

Monitoring the scale signals and states

Using the onboard RS 485 interface and the Modbus RTU protocol, the SIWAREX WT241 can be connected to a wide range of different automation systems or to 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.

Software

The touch panel is preconfigured with the SIWAREX "Ready-for-use" software. This gives the user interface a clear structure and makes it intuitive to operate: English, German, French and Chinese versions 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, for example. It is also possible to simulate the behavior of the scale.

Selection and ordering data

Selection and ordering data	Article No.
SIWAREX WT241 **Weighing terminal for belt scales**	7MH4965-4AA01
SIWAREX WT241 Equipment Manual	
In various languages.	
Free download on the Internet at: http://www.siemens.com/weighing/documentation	
Accessories	
SIWATOOL V4 & V7	7MH4900-1AK01
Service and commissioning software for SIWAREX weighing modules	
Ethernet cable patch cord 2 m (7 ft)	6XV1850-2GH20
For connecting SIWAREX WT241 to a PC (SIWATOOL), SIMATIC CPU, panel, etc.	
Protective film 4" widescreen	6AV2124-6DJ00-0AX0
For KTP400 Basic 1st Generation, KTP400 Basic 2nd Generation and KTP400 Comfort	
Spare parts	
Connection board SIWAREX WT2x1	A5E46650277
For connecting load cells and speed sensor in SIWAREX WT2x1 as spare part	

Selection and ordering data (Continued)

Selection and ordering data	Article No.
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

SIWAREX WT241	
Enclosure	Stainless steel enclosure (1.4301) with the interfaces: • 1 × wall bushing for power supply • 4 × wall bushing for load cell connection with EMC screw connection • 4 × wall bushing with blanking plugs • Ground connection bolt
Connection board	Internal connection board • Connection of up to 4 load cells • Device version of analog output • Connection of speed sensor • 24 V direct voltage design
Integration in automation systems	
Any automation systems	Via RS 485 (Modbus RTU)
Communication interfaces	• RS 485 (Modbus RTU) • 4 digital outputs (24 V DC) • 3 digital inputs (24 V DC) • 1 speed sensor input (24 V DC, up to 5 kHz) • 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
Updating time for material flow rate	100 ms
Filter	
Filter for material flow rate	Low-pass filter 0.1 ... 50 Hz
Filter for weight values	Low-pass filter 0.1 ... 50 Hz
Filter for belt speed	Low-pass filter 0.1 ... 50 Hz
Weighing functions	
Readout data	• Weight • Belt load • Material flow rate • Accumulated total • Main total • Free totals 1 ... 4 • Belt speed

■ **Technical specifications** (Continued)

SIWAREX WT241	
Limits (min./max.)	• Belt load
	• Material flow rate
	• Belt speed
Zero-setting function	On command or automatic set to zero
Load cells	Strain gauges in 4-wire or 6-wire system
Load cell powering	
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 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 × 185 × 97 mm (10.39 × 7.28 × 3.82 inch)
Weight	4 kg (8.82 lb)