Weighing and feeding guide
Complete solutions for a world of weighing applications

www.usa.siemens.com/weighing

So, what do you want to weigh?

Table of Contents

Introduction 2
Overview 4
SIWAREX weighing systems 6
SIWAREX load cells 8
Belt scales 10
Speed sensors 12
 Integrators 13
Accessories 14
Solids flowmeters 16
Weighfeeders 18
Totally Integrated Automation 20
Service and support 21
Process protection 22
Remote monitoring and digital displays 23
PI training 24
PI overview 25
Diagrams 26

Siemens: measuring the weight of the world.
Weighing and feeding solutions overview

**Platform scales**
- The most common scale in industry
- Siemens has a broad range of load cells and weighing electronics to build cost-effective platform scales

**Hopper weighing**
- Liquids, powders, solids, and gases are stored or produced in a variety of tanks and bins
- Measure the mass, no matter what kind of material is stored

**Batch system**
- Successful, high-quality products depend on precise dosing of ingredients
- Siemens’ high-quality measuring equipment ensures precise dosing

**Filling machines**
- Filling, sack filling, and big bag machines are used in a wide range of industries
- Siemens weighing electronics ensure the filling of solid or liquid goods is completed quickly and accurately

**Checkweighing**
- Ensures the correct weight of the product
- Siemens’ weighing electronics provide high functionality of the checkweigher in combination with SIWAREX load cells

**Loss-in-weight**
- A system with SIWAREX load cells and electronics gives you high levels of accuracy in continuous dosing applications

**Belt scales**
- Help maximize raw material usage, control inventories, and aid in consistent manufacturing
- Suitable to your specific application requirements

**Solids flowmeters**
- Accurately monitor the rate of material in gravity-fed pipes or chutes for production monitoring or precise recipe control

**Weighfeeders**
- Control the rate of material into or out of a process
- Flexible to meet any customer requirement
Successful target applications across every industry

Mining

- Monitoring throughput in mining production with Milltronics MSI belt scale

Aggregate

- Inventory stockpiles on stackers with Milltronics MUS belt scale

Cement

- Monitoring mill rejects with a SITRANS WF330 flowmeter

Steel

- Recipe control in sinter process with SITRANS WW300 weighfeeder

Power generation

- Rail car weighing with SIWAREX load cells

Pulp and paper

- Monitoring the rate of chip feeding into digesters with Milltronics MCS belt scale

Chemicals

- Loss-in-weight feeding with SIWAREX FTC

Pharmaceutical

- Bin weighing with SIWAREX load cells

Water/wastewater

- Continuous monitoring of sludge removed from wastewater with Milltronics MSI belt scale

Food and beverage

- Recipe control with SITRANS WW200 weighfeeder
SIWAREX – precision from a single source

With SIWAREX electronics and load cells, not only are you choosing the highest quality in construction, long-lasting performance, and easy integration into your weighing systems, you are also opening the doors to Siemens’ comprehensive spectrum of automation and instrumentation.

Automate all of your scales with SIWAREX weighing modules. Part of Siemens Totally Integrated Automation (TIA), SIWAREX modules can be integrated into SIMATIC S7 and expanded as required to meet your individual requirements.

With TIA, Siemens is the only manufacturer to offer an integrated range of products and systems for automation in all industry sectors.

And, offering you ultimate flexibility, SIWAREX WP weighing modules can be used in any PLC system or even without a PLC as a stand-alone device.

Resolution of 1 million parts

4 digital inputs and outputs, 1 analog output

Stand-alone functionality, direct access to HMI

Ethernet with Modbus TCP/IP, RS485 with Modbus RTU, S7-1200 SIMATIC Bus
In the name of good taste: modernization of dosing processes

Cheese company Bel produces a wide variety of products at its dairy in Sablé-sur-Sarthe in the northwest of France.

Application
- Five differential scales for dosing various powders required for production
- The system’s mechanical components were in very good condition, but the electronic control system was out of date, requiring costly and time-consuming maintenance
- A SIWAREX FTC was chosen to monitor the dosing procedure

Benefits
- Using the same mechanical components, the SIWAREX FTC electronic weighing system can now dose up to 40% larger quantities
- This results in a much better performance in the production process and in production consistency

Want more? Visit www.usa.siemens.com/weighing

<table>
<thead>
<tr>
<th>Order No.</th>
<th>SIWAREX U</th>
<th>SIWAREX CS</th>
<th>SIWAREX FTA</th>
<th>SIWAREX FTC</th>
<th>SIWAREX WP231</th>
<th>SIWAREX WP241</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical applications</td>
<td>Basic weighing and force measuring tasks, one or two channel modules available</td>
<td>Basic weighing and force measuring tasks</td>
<td>Automatic and non-automatic weighing, for production of mixtures, filling, loading, monitoring, checkweighing and bagging</td>
<td>Continuous weighing for conveyor scales, solids flowmeters and loss-in-weight feeders</td>
<td>Non-automatic weighing machines, fill level monitoring of silos, load measuring for industrial lifts and rolling mills, container weighing, platform and crane scales</td>
<td>Belt scales</td>
</tr>
<tr>
<td>Automation system integration</td>
<td>• S7-300 (directly or via ET 200M) • S7-400 (H), PCS 7 (H) (via ET 2005)</td>
<td>• S7-300 (directly or via ET 200M) • S7-400 (H), PCS 7 (H) (via ET 2005)</td>
<td>• S7-300 (directly or via ET 200M) • S7-400 (H), PCS 7 (H) (via ET 2005)</td>
<td>• S7-300 (directly or via ET 200M) • S7-400 (H), PCS 7 (H) (via ET 2005)</td>
<td>• S7-1200 (directly via SIMATIC bus) • Operator panel</td>
<td>• S7-1200 (directly via SIMATIC bus) • Operator panel</td>
</tr>
<tr>
<td>Resolution</td>
<td>65,000</td>
<td>65,000</td>
<td>16 million</td>
<td>16 million</td>
<td>1 million</td>
<td>1 million</td>
</tr>
</tbody>
</table>
SIWAREX load cells – the foundation of every scale

SIWAREX load cells have high precision and repeatability for weighing and batching processes. They are designed for a range of applications, especially when accuracy is a must. With Siemens, you can source both your load cells and electronics. Choose from our extensive, performance-graded line of weighing products – with everything you need for the whole range of tasks in your industry.

SIWAREX load cells are ideal in almost any industrial sector – food-processing, steel-making, chemical and pharmaceutical, to name a few.

With the diverse construction types and comprehensive, graded load classes ranging from three kilograms to 500 tons, you are sure to find the right load cell for your application.

Avoid installation troubles by complementing your load cells with SIWAREX mounting accessories. Mounting accessories get you ready for operation in the shortest possible period.
<table>
<thead>
<tr>
<th>SIWAREX WL230</th>
<th>SIWAREX WL230</th>
<th>SIWAREX WL250</th>
<th>SIWAREX WL260</th>
<th>SIWAREX WL270</th>
<th>SIWAREX WL270 K</th>
<th>SIWAREX WL280 RN</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>7MH5107</td>
<td>7MH5106</td>
<td>7MH5105</td>
<td>7MH5102/3/4/17/18</td>
<td>7MH5108</td>
<td>7MH5114 high temperature &amp; double bridge option</td>
</tr>
<tr>
<td>Type</td>
<td>Shear beam</td>
<td>Bending beam</td>
<td>S-Type</td>
<td>Single point</td>
<td>Compression</td>
<td>Compression</td>
</tr>
<tr>
<td>Typical</td>
<td>Container, overhead rail conveyor, and platform scales</td>
<td>Small scale containers and platform scales</td>
<td>Tank weighing, hybrid scales, or suspended container weighing</td>
<td>Small to medium platform scales and weighing machines</td>
<td>Containers, hoppers, and vehicle scales</td>
<td>Vehicle scales, overhead rail scales, container weighers</td>
</tr>
<tr>
<td>applications</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nominal load</td>
<td>0.5 to 5 t</td>
<td>10 to 500 kg</td>
<td>50 kg to 10 t</td>
<td>3 to 500 kg</td>
<td>10 to 200 t</td>
<td>2.8 to 500 t</td>
</tr>
<tr>
<td>(E&lt;sub&gt;max&lt;/sub&gt;)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Accuracy class and max. scale intervals</td>
<td>C3 to OIML R60; 3,000 intervals</td>
<td>C3 to OIML R60; 3,000 intervals</td>
<td>C3 to OIML R60; 3,000 intervals</td>
<td>C3 to OIML R60; 3,000 intervals</td>
<td>C3 to OIML R60; 3,000 intervals</td>
<td>0.1%</td>
</tr>
<tr>
<td>Min. scale intervals</td>
<td>E&lt;sub&gt;max&lt;/sub&gt;/15,000</td>
<td>E&lt;sub&gt;max&lt;/sub&gt;/6,000 to E&lt;sub&gt;max&lt;/sub&gt;/15,000</td>
<td>E&lt;sub&gt;max&lt;/sub&gt;/7,000 to E&lt;sub&gt;max&lt;/sub&gt;/12,000</td>
<td>E&lt;sub&gt;max&lt;/sub&gt;/7,500 to E&lt;sub&gt;max&lt;/sub&gt;/40,000</td>
<td>E&lt;sub&gt;max&lt;/sub&gt;/10,000</td>
<td>N/A</td>
</tr>
<tr>
<td>Max. working load</td>
<td>150% E&lt;sub&gt;max&lt;/sub&gt;</td>
<td>150% E&lt;sub&gt;max&lt;/sub&gt;</td>
<td>150% E&lt;sub&gt;max&lt;/sub&gt;</td>
<td>150% E&lt;sub&gt;max&lt;/sub&gt;</td>
<td>120% E&lt;sub&gt;max&lt;/sub&gt;</td>
<td>150% E&lt;sub&gt;max&lt;/sub&gt;</td>
</tr>
<tr>
<td>Supply voltage</td>
<td>5 to 12 V</td>
<td>5 to 12 V</td>
<td>5 to 12 V</td>
<td>5 to 12 V</td>
<td>5 to 12 V</td>
<td>5 to 12 V</td>
</tr>
<tr>
<td>Nominal characteristic</td>
<td>2 mV/V</td>
<td>2 mV/V</td>
<td>3 mV/V</td>
<td>2 mV/V</td>
<td>2 mV/V</td>
<td>1.5 ±0.2 mV/V</td>
</tr>
<tr>
<td>Degree of protection</td>
<td>IP68</td>
<td>IP68</td>
<td>IP67</td>
<td>IP65/IP67</td>
<td>IP68</td>
<td>IP68</td>
</tr>
</tbody>
</table>

Weighing system offers precise filling at high rates

Spanish company Automatització i Control Rovira, S.L. (AiCROV) provides filling solutions for a wide variety of products.

**Application**
- AiCROV uses a platform scale and a pallet scale to checkweigh up to 4,000 containers per hour
- Both scales use a single SIWAREX U weighing module in combination with SIWAREX WL260 SP-S SA series load cells

**Benefits**
- Even for simple level monitoring with SIWAREX U, the weighing module is fully integrated into the SIMATIC S7 control system
- Offers an efficient solution to weight recording that is also very easy to configure and ensures weighing precision

Want more? Visit www.siemens.com/weighing
Belt scales – the first choice for weighing systems

All Siemens Milltronics belt scales require very little maintenance and are fast and easy to install and calibrate. They have no moving parts, include corrosion-resistant load cells, and are designed for 150% of rated capacity and 300% of ultimate load cell capacity.

Milltronics MSI belt scale – unparalleled performance

Milltronics MSI features simple, proven construction built around the most effective load cell technology.

Structurally sound for the most demanding applications. Drop-in installation makes alignment simple and economical.

Simply put, Milltronics MSI is the easiest belt scale on the market to install and maintain.

Belt scale training – try our eLearning module about Siemens weighing technology and applications.

www.brainshark.com/siemensca/beltscales_EN
High-accuracy weighing improves steel company’s bottom line

Chinese company XinYu Steel produces and sells iron and steel products including plates, wires, rebars, tubes, and strips.

Application
• For measuring fine ore powder, coal powder, and coke, XinYu required belt scales with higher accuracy in line with industry standards for custody transfer
• Operators installed Siemens MMI belt scales, BW500 integrators, and SiTRANS WS300 shaft mounted speed sensors

Benefits
• Belt scales play a key role in the custody transfer, energy saving, and cost accounting
• The system gives unified management and monitoring of energy and raw materials connected to the network through the whole factory

Want more? Visit www.usa.siemens.com/weighing

<table>
<thead>
<tr>
<th>Milltronics MLC</th>
<th>Milltronics WD600</th>
<th>Milltronics MUS</th>
<th>Milltronics MCS</th>
<th>Milltronics MSI</th>
<th>Milltronics MMI</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7MH7126</td>
<td>7MH7185</td>
<td>7MH7123</td>
<td>7MH7125</td>
<td>7MH7122</td>
<td>7MH7122</td>
</tr>
<tr>
<td><strong>Typical industries</strong></td>
<td>Food, chemical, tobacco</td>
<td>Food, chemical, tobacco</td>
<td>Aggregate, agriculture, mining, steel</td>
<td>Aggregate, mining, steel</td>
<td>Cement, chemicals, steel, aggregate, food, mining</td>
</tr>
<tr>
<td><strong>Typical applications</strong></td>
<td>Process and load-out control, light-to medium-duty</td>
<td>Process and load-out control, light-to medium-duty</td>
<td>Stackers</td>
<td>Mobile crushers, weighfeeder retrofits</td>
<td>Industrial heavy-duty, for process and load-out control</td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±0.5 to 1%</td>
<td>±0.5 to 1%</td>
<td>±0.5 to 1%</td>
<td>±0.5 to 1%</td>
<td>±0.5 to 1%</td>
</tr>
<tr>
<td><strong>Capacity max.</strong></td>
<td>50 t/h (55 STPH)</td>
<td>100 t/h (110 STPH)</td>
<td>5000 t/h (5500 STPH)</td>
<td>2400 t/h (2640 STPH)</td>
<td>12000 t/h (13200 STPH)</td>
</tr>
<tr>
<td><strong>Approvals</strong></td>
<td>CE, C-TICK, GOST</td>
<td>CE, C-TICK, GOST</td>
<td>CE, C-TICK, GOST</td>
<td>CE, C-TICK, GOST</td>
<td>CE, C-TICK, GOST</td>
</tr>
<tr>
<td></td>
<td>Meets FDA/USDA requirements for food processing</td>
<td></td>
<td>ATEX, CSA, FM, IECEx</td>
<td>ATEX, SABS, Measurement Canada, OIML, MID, CSA, FM, CMC</td>
<td>ATEX, SABS, Measurement Canada, OIML, MID, CSA, FM, CMC</td>
</tr>
</tbody>
</table>

*Accuracy subject to the following: on factory approved installations the belt scale system’s totalized weight will be within the specified accuracy when compared to a known weighed material test sample. The test rate must be within the specified range of the design capacity and held constant for the duration of the test. The minimum material test sample must be equivalent to a sample obtained at the test flow rate for three revolutions of the belt or at least ten minutes running time, whichever is greater.
Speed sensors – reliable conveyor monitoring

Speed sensors play a key role in any belt scale measurement system – the overall system accuracy depends on a reliable speed signal. Siemens offers shaft-driven and belt-driven speed sensors that are easy and economical to install providing reliable and accurate signals.

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Milltronics TASS</th>
<th>Milltronics RBSS</th>
<th>SITRANS WS300</th>
<th>Bend pullies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Compact, low-profile, wheel-driven return belt speed sensor</td>
<td>High resolution, wheel-driven return belt speed sensor</td>
<td>Compact low to high resolution, pulley shaft-driven speed sensor</td>
<td>Self cleaning, drum and lagged drum pullies</td>
</tr>
</tbody>
</table>

**Benefits**

- Easy, low cost installation
- Compact, low-profile
- IP67 rated
- Rugged design
- Easy, low cost installation
- Increased mass for minimizing belt skip
- IP67 rated
- Intrinsically Safe (IS) version available*
- Rugged design
- Small, lightweight
- Long bearing life
- IP65 rated
- Intrinsically Safe (IS) version available*
- Pre-drilled mounting for SITRANS WS300 speed sensor
- Creates installation room for belt scale

**Approvals**

- CE, C-TICK, GOST
- Standard: CE, C-TICK, GOST IS: ATEX, CSA/FM, CE, C-TICK, GOST
- Standard and IS: CE, C-TICK, GOST, CSA, FM, ATEX, IECEx
- CE, C-TICK

*Pepperl+Fuchs switch isolator required to interface with integrator.
Integrators – state-of-the-art communications

Milltronics integrators

Milltronics integrators from Siemens incorporate proven electronic load cell balancing to perform basic and sophisticated measurement and flow control functions.

Our integrators display primary speed and load values, as well as derived values of rate and total on the LCD, or output the information as analog mA output, alarm relay, or remote totalizer or through several industrial communications protocols.

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Milltronics BW500/L</th>
<th>Milltronics BW500</th>
<th>Milltronics SF500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Compatibility</td>
<td>Milltronics MLC, MUS, MCS, MSI, and WD600</td>
<td>Milltronics MLC, MUS, MCS, MSI, MMI, WW100, WW200, WW300, and WD600</td>
<td>SITRANS WF100, WF200, WF250, WFS300, WFS320</td>
</tr>
<tr>
<td>Display output</td>
<td>Rate, totalized weight, belt loading, belt speed</td>
<td>Rate, totalized weight, belt loading, belt speed, PID, batching</td>
<td>Rate, totalized weight, PID, batching</td>
</tr>
<tr>
<td>Alarm relay</td>
<td>Two programmable SPST Form A contacts rated 5A at 250 V AC non-inductive, reversible</td>
<td>Five programmable SPST Form A contacts rated 5A at 250 V AC non-inductive, reversible</td>
<td>Five programmable SPST Form A contacts rated 5A at 250 V AC non-inductive, reversible</td>
</tr>
<tr>
<td>Approvals</td>
<td>CSA\textsubscript{NRTL/C}, FM, CE, C-TICK, GOST</td>
<td>CSA\textsubscript{NRTL/C}, FM, CE, C-TICK, GOST, NTEP, OIML, MID, Measurement Canada</td>
<td>CSA\textsubscript{NRTL/C}, FM, CE, C-TICK, GOST</td>
</tr>
<tr>
<td>Options</td>
<td>PROFIBUS DP, Allen-Bradley Remote I/O (AB RIO), DeviceNet, Profinet IO, Modbus TCP I/P, EtherNet IP industrial communication options</td>
<td>Two additional analog inputs; two outputs programmable for PID control, PROFIBUS DP, AB RIO, DeviceNet, Profinet IO, Modbus TCP I/P, EtherNet IP industrial communication options</td>
<td>Two additional analog inputs; two outputs programmable for PID control, PROFIBUS DP, AB RIO, DeviceNet, Profinet IO, Modbus TCP I/P, EtherNet IP industrial communication options</td>
</tr>
</tbody>
</table>

Belt scales meet the high demand of custody transfer

One of the UK’s largest quarrying companies and building materials suppliers provides materials such as sand, hard rock, and gravel.

Application

• To stay in line with custody transfer regulations, the company needed to replace an old belt scale that was no longer reliable or accurate
• Operators installed Siemens Milltronics MMI belt scales and Milltronics BW500 integrator, both approved for use in custody transfer applications

Benefits

• Exceptionally high accuracy – the scale is producing at ±0.25% of the nominal flow rate for the system
• New belt scale has greatly decreased maintenance requirements

Want more? Visit www.usa.siemens.com/weighing
Belt scale accessories – calibration made easy

Belt scale accessories give you effective stock control, reduce transaction costs, and protect your assets.

Mechanical calibration aids such as hoisting systems are used for test weights and calibration chains. Siemens belt scale accessories complete the package – everything needed for the whole range of belt scale-related tasks.

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Description</th>
<th>Benefits</th>
</tr>
</thead>
</table>
| 7MH7218    | Milltronics MWL weight lifter for use with MSI, MMI, MUS, and MCS belt scales. MWL safely applies and stores calibration test weights for belt loading simulation. | • Safe and easy application of belt scale reference weights with the operator remaining away from the conveyor.  
• Modular construction, easily adaptable to different conveyor widths.  
• Low profile allowing easy fit into belt conveyor.  
• Easy-to-store drive handle that can be applied to left or right side of MWL or motorized option.  
• Security pin to ensure safe storage of weight. |
| 7MH7161    | Milltronics test chains for dynamic belt loading simulation for Milltronics belt scales. All test chains are bushed and minimum length is 1.2 m (4 ft). | • Simulates dynamic scale loading of a known weight value, thus supplying the calibration reference.  
• A greater test load can be applied to high capacity belt scales and weighfeeders because most weighbridge designs can only accommodate a limited number of static weights.  
• High capacity test loading is especially important on systems using mechanical weighing elements and lever systems because they calibrate the systems with test load values close to normal operating loads. |
| 7MH7163    | Test chain storage reels for motor driven chain application and storage. All test chain storage reels come with a geared brake motor. | • Electronically apply and retract calibration test chains.  
• Important when high capacity test chains are used to calibrate belt scales.  
• An electronic geared brake motor rolls the chain onto the belt and over the weigh length. The brake will hold the chain in storage if power fails to the motor.  
• Available in multiple compartment styles to simulate different loading conditions. |
Chinese company Longyuan Construction has five 3000-ton-grade berths for loading cement products onto waiting ships.

**Application**
- The company found that decreased stability and durability of their existing belt scales was a growing problem
- Installed a Milltronics MMI belt scale with Milltronics BW500 integrator and SITRANS WS300 speed sensor

**Benefits**
- The new system has increased the company’s efficiency
- Belt scales have reduced ongoing maintenance expenses and lessened facility downtime

Want more? Visit [www.usa.siemens.com/weighing](http://www.usa.siemens.com/weighing)

---

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Termination boxes</th>
<th>Chart recorder</th>
<th>Ticket printer</th>
<th>Roll printer</th>
<th>Remote totalizer</th>
</tr>
</thead>
<tbody>
<tr>
<td>7MH7723-1ND, 7MH7723-1NE</td>
<td>7MH77261AL</td>
<td>7MH77261AK</td>
<td>7MH77261AT</td>
<td>7MH77231GG</td>
<td></td>
</tr>
</tbody>
</table>

**Benefits**
- Connect belt scale and speed sensor to a single point on the conveyor
- Track physical data for production totals
- Two alarms: high/low
- Alarms when 100% of set rate is exceeded or for below 20% of set rate
- Displays production total during power failure
- Prints totals to produce production records to meet the standards of approval agencies
- For continuous printing of totals to produce production records to meet the standards of approval agencies
- Two alarms: high/low
- Alarms when 100% of set rate is exceeded or for below 20% of set rate
- Displays production total during power failure

---

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Panel totalizer</th>
<th>Inclinometer</th>
<th>HMI</th>
</tr>
</thead>
<tbody>
<tr>
<td>7MH77261AU</td>
<td>7MH77261AP</td>
<td>7MH7726-1AW, 7MH7726-1AX, 7MH7726-1AY, 6AV66430AA011AX0, 6AV66420BA011AX1, 6AV66430CB011AX1</td>
<td></td>
</tr>
</tbody>
</table>

**Benefits**
- Displays production total during power failure
- Provides mA output based on angle of conveyor
- Remote access for up to four Milltronics BW500 integrators
- Single parameter access
- No PLC interface required
- Calibration and totalizer resets from panel

---

Smooth sailing in the cement industry with innovative belt scales

---
Improving accuracy and reducing costs in the grain industry

Grain terminals worldwide process a variety of grains to be used directly or manufactured into countless numbers of products.

Application
• Terminals using volumetric measurement such as screw conveyors for loading grain into trucks or rail cars only get between 5-10% accuracy
• Installing a SITRANS WF100 dry solids flowmeter immediately shows results

Benefits
• With an accuracy of ±1%, this flowmeter gives operators the ability to load rail cars and trucks to a higher capacity, reducing total shipping costs
• A variety of liners available for corrosion or abrasion resistance makes this flowmeter well suited for grain measurement

Want more? Visit www.usa.siemens.com/weighing
Strain gauge load cell based flowmeters

<table>
<thead>
<tr>
<th>Order No.</th>
<th>SITRANS WF100</th>
<th>SITRANS WF200</th>
<th>SITRANS WF250</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical industries</td>
<td>Food, chemical</td>
<td>Aggregates, food, cement</td>
<td>Cement</td>
</tr>
<tr>
<td>Typical applications</td>
<td>Monitoring of food ingredients, pet food blending, plastic pellet production, silica sand in glass making</td>
<td>Grinding mill rejects in cement, load-out of grains and seeds</td>
<td>Cement in aerated gravity conveyors</td>
</tr>
<tr>
<td>Accuracy*</td>
<td>±1% (33 to 100% of rate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacity range</td>
<td>3 to 200 t/h (3 to 220 STPH)</td>
<td>200 to 900 t/h (220 to 990 STPH)</td>
<td>200 to 900 t/h (220 to 990 STPH)</td>
</tr>
<tr>
<td>Approvals</td>
<td>CE, C-TICK, GOST, CSA, FM, ATEX, IECEx, stainless steel options meet FDA and USDA requirements for food processing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

LVDT based flowmeters

<table>
<thead>
<tr>
<th>Order No.</th>
<th>SITRANS WF330</th>
<th>SITRANS WF340</th>
<th>SITRANS WF350</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical industries</td>
<td>Chemicals, food, steel, power</td>
<td>Chemicals, food, steel, power</td>
<td>Cement</td>
</tr>
<tr>
<td>Typical applications</td>
<td>Fly-ash, lime dosing, cement flow and control in mining, flour stream monitoring</td>
<td>Fly-ash load-out, lime dosing, gypsum flow</td>
<td>Powders and granulates conveyed by aerated gravity conveyors, fly-ash load-out, precipitator dust</td>
</tr>
<tr>
<td>Accuracy*</td>
<td>±1% (33 to 100% of rate)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capacity range</td>
<td>0.2 to 300 t/h (0.2 to 330 STPH)</td>
<td>0.2 to 300 t/h (0.2 to 330 STPH)</td>
<td>0.2 to 300 t/h (0.2 to 330 STPH)</td>
</tr>
<tr>
<td>Approvals</td>
<td>CE, C-TICK, GOST, CSA, FM, ATEX, IECEx, stainless steel options meet FDA and USDA requirements for food processing</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

SITRANS WFS sensing heads

<table>
<thead>
<tr>
<th>Order No.</th>
<th>SITRANS WFS300</th>
<th>SITRANS WFS320</th>
</tr>
</thead>
<tbody>
<tr>
<td>Typical applications</td>
<td>For use with SITRANS WF330, 340, 350 flowmeters</td>
<td></td>
</tr>
<tr>
<td>Particle size (maximum)</td>
<td>13 mm (0.5”)</td>
<td>25 mm (1”)</td>
</tr>
<tr>
<td>Flow rate: Minimum Maximum</td>
<td>0.2 t/h (0 to 0.2 STPH)</td>
<td>20 t/h (0 to 22 STPH)</td>
</tr>
<tr>
<td>Product temp. (max.)</td>
<td>232 ºC (450 ºF)</td>
<td></td>
</tr>
</tbody>
</table>

*Accuracy subject to the following: on factory approved installations the flowmeter system’s totalized weight will be within the specified accuracy when compared to a known weighed material test sample. The test rate must be within the specified range of the design capacity and held constant for the duration of the test. The minimum material test sample must be equivalent to a sample obtained at the test flow rate for at least ten minutes running time.
Weighfeeders – crucial weighing, made to order

SITRANS weighfeeders are configured to meet your application needs, guaranteeing the perfect fit. Ranging from light- to heavy-duty, these weighfeeders deliver fast, reliable, and uninterrupted service no matter what your application. Virtually maintenance-free construction delivers unmatched performance from food processing to aggregates and everything in between.

Weighfeeders are indispensable when automated production processes require continuous inline weighing and feeding. Flanged belting is available on most models so that product is not lost during transport. The height of the flange depends on model and application. Belt widths and conveyor lengths are made to measure for the required solution.
### SITRANS WW100  
**Order No.** 7MH7180  
**Typical industries** Chemicals, tobacco, food  
**Typical applications** High-accuracy, low-capacity for minor ingredient additives  
**Design rate range** 0.045 to 18 t/h (100 lbs/h to 20 STPH)  
**Accuracy** ±0.25 to 0.5%  
**Approved range** 10 to 100% based on speed  
**Approvals** Stainless steel options meet USDA and FDA requirements for food processing, CE, C-TICK

### SITRANS WW200  
**Order No.** 7MH7300-8  
**Typical industries** Chemicals, food, tobacco  
**Typical applications** Low- to medium-capacity for minor ingredient additives  
**Design rate range** 0.45 to 100 t/h (1,000 lbs/h to 110 STPH)  
**Accuracy** ±0.5% or better  
**Approved range** 10 to 100% based on speed  
**Approvals** Stainless steel options meet USDA and FDA requirements for food processing

### SITRANS WW300  
**Order No.** 7MH7400-7  
**Typical industries** Aggregates, cement, mining, steel, power, pulp and paper  
**Typical applications** Medium- to high-capacity for macro ingredient additives  
**Design rate range** 4.5 to 800 t/h (5 to 880 STPH)  
**Accuracy** ±0.5% or better  
**Approved range** 10 to 100% based on speed  
**Approvals** Stainless steel options meet USDA and FDA requirements for food processing

*Accuracy subject to the following: on factory approved installations the weighfeeder system’s totalized weight will be within the specified accuracy when compared to a known weighed material test sample. The test rate must be within the specified range of the design capacity and held constant for the duration of the test. The minimum material test sample must be equivalent to a sample obtained at the test flow rate for three revolutions of the belt or at least ten minutes running time, whichever is greater.*

---

**Feeding the process correctly helps feed the world treats**

In Canada, one of the largest breakfast cereal manufacturers in the world produces millions of granola bars each year.

**Application**
- The production of this company’s granola bars starts with the feeding of basic ingredients such as rice husks from a large hopper.
- Operators installed a SITRANS WW100 weighfeeder

**Benefits**
- The weighfeeder’s compact design meant that it could fit directly under the hopper with few modifications.
- Maintenance is minimal and simple, with the SITRANS WW100’s cantilevered design, the belt can be removed and replaced in less than five minutes.

**Want more? Visit** [www.usa.siemens.com/weighing](http://www.usa.siemens.com/weighing)
Totally Integrated Automation

Products from the controller level to the field level

With Totally Integrated Automation (TIA), Siemens provides a comprehensive, integrated product and system spectrum for the efficient automation of the entire production process.

TIA enables realization of perfectly tailored automation solutions to meet all individual production requirements.

Thanks to the uniquely integrated qualities of TIA, companies are able to optimize their production processes, accelerate time to market, and reduce production costs – while maintaining a high level of investment security and minimizing overall project complexity.

Communication flexibility

Siemens TIA approach offers ease of connection to a DCS system such as SIMATIC PCS 7 using industrial standards. Siemens provides communication flexibility, supporting:

- SIMATIC PDM
- PROFIBUS
- HART
- FOUNDATION Fieldbus
- Model 375 HART field communicator and Emerson AMS
- SmartLinx (cards are available for PROFIBUS DP, Modbus TCP IIP, Ethernet IIP, Profinet IO, Allen-Bradley Remote I/O, and DeviceNet
- FDT Software via SITRANS DTM

Milltronics BW500/L, BW500, and SF500 integrators offer PROFIBUS DP connection through a SmartLinx module. SIWAREX FTC function module is integrated into SIMATIC S7/PCS 7 and uses the features of this automation system, such as integral communication, diagnostics, and configuration tools.

Dolphin Plus configuration software

Instrument configuration software for Milltronics BW500/L, BW500, and SF500 that allows you to quickly and easily configure, monitor, tune, and diagnose Siemens weighing devices remotely using a desktop PC or in the field using a laptop. Features include: real-time monitoring and adjustment of parameters; on-screen visualization of process values; copying of data for programming several devices; generation of configuration reports within seconds.

SIWATOOL

SIWATOOL is a special program for adjusting and servicing SIWAREX weighing modules with a Windows operating system. The program enables the scales to be commissioned without the need for prior knowledge of the automation system. When servicing, the technician can use a PC to analyze and test the procedures in the scale, as well as reading out the diagnostics buffer from the SIWAREX electronics. Features include: parameterization and adjustment of the scale; testing of scale properties; saving and printing scale data; and recording and analysis of weighing sequences.

PROFIBUS communications offer Totally Integrated Automation

Siemens offers a range of instruments that connect to a PROFIBUS network. PROFIBUS is the fieldbus standard for complete production plants in all process sectors, and helps manufacturers achieve operational excellence and cost savings throughout the complete service life. It is the network solution with the most advantages for Totally Integrated Automation (TIA) providing digital communications between the automation system and field instrumentation on a single serial bus.
Service and support

Custom engineering
Siemens provides custom-engineered products to solve your special application needs. From material compatibility challenges to unique size requirements, Siemens custom engineering team can help.

Service around the world
Plants must function reliably at all times. Efficient and effective process instrumentation and analytics are an indispensable requirement to this end. You also need to be certain of fast and competent service from your supplier.

Siemens is a global company that reacts locally. Whether you require consulting, quick delivery, or installation of new devices, the Siemens network of specialists is available to you around the world, wherever your location.

Service around the clock
Our online support system offers rapid, comprehensive assistance regardless of time or location. From product support to service information, Siemens Industry online support is your first choice – around the clock, 365 days a year.

www.usa.siemens.com/pisupport
Process protection

Process protection devices are like an insurance policy for your plant, except better. These devices warn you of problems before they occur or before they develop into something more serious. Motion sensors – letting you know if machinery is going too fast, too slow, or has stopped altogether. Acoustic sensors – protecting your valuable machinery and equipment, detecting subtle noises that you may not hear over the noise of the plant.

<table>
<thead>
<tr>
<th>Order No.</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>7MH7144</td>
<td>Milltronics MFA 4p – Highly sensitive single set-point motion sensor system used with MSP probes</td>
</tr>
<tr>
<td>7MH7158</td>
<td>SITRANS WM100 – Heavy-duty stand-alone zero-speed alarm switch</td>
</tr>
<tr>
<td>7MH7560</td>
<td>SITRANS AS100 – Acoustic sensor detects high frequency emissions from friction of the impact of dust, powders, and granules and solids in motion</td>
</tr>
<tr>
<td>7MH7562</td>
<td>SITRANS CU02 – Operates with the SITRANS AS100 to provide reliable continuous protection for bulk solids flow; two relays are fully programmable</td>
</tr>
</tbody>
</table>

Motion detection means process protection

The largest of its kind in Canada, the Seymour-Capilano Filtration Plant (SCFP) supplies drinking water to residents of Vancouver, Canada.

Application

- Monitoring the screw conveyor’s motion is crucial to keeping operations running smoothly in the sludge dewatering and disposal system
- The plant uses process protection devices: Milltronics MFA 4p motion failure alarm controller and Siemens heavy-duty motion sensing probe

Benefits

- Siemens motion sensing devices protect SCFP’s process and the plant’s valuable equipment
- With tons of solid sludge material moving through the screw conveyor each day, operators are immediately aware of any stoppages

Want more? Visit www.usa.siemens.com/weighing
Remote monitoring and displays

Process monitoring anywhere

Siemens remote displays give you an inexpensive view into your weighing processes. From a simple display to a remote monitoring solution, you choose what is best for you.

SITRANS RD100 is rated for indoor and outdoor applications, in hot or cold environments, and in safe or hazardous areas.

SITRANS RD200 can present data from as many as 100 displays to your local computer.

SITRANS RD500 is a remote data manager providing remote monitoring through data logging, web access, and alarming for instrumentation.

<table>
<thead>
<tr>
<th>SITRANS RD100</th>
<th>SITRANS RD200</th>
<th>SITRANS RD500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>7ML5741</td>
<td>7ML5740</td>
</tr>
<tr>
<td>Input types</td>
<td>4 to 20 mA</td>
<td>Universal current, voltage, RTD, thermocouple</td>
</tr>
<tr>
<td>Power input</td>
<td>Loop powered</td>
<td>12 to 36 V DC, 12 to 24 V AC, 6W max.</td>
</tr>
<tr>
<td>Display</td>
<td>3½ digit display</td>
<td>4 digit display</td>
</tr>
<tr>
<td>Accuracy</td>
<td>±0.1% of span ±1 count</td>
<td>Input type dependent</td>
</tr>
<tr>
<td>Approvals</td>
<td>FM, CSA hazardous approvals</td>
<td>CE, UL, cUL</td>
</tr>
</tbody>
</table>
Learn everything you need to know about instrumentation from the experts

When you need to know more, Siemens provides a full schedule of instrumentation training opportunities for our customers.

Led by field-tested instructors, our hands-on training includes application simulation, a full range of process instruments, and complete industrial communication networks.

Whether it's weighing technology or process instrumentation training (level, flow, pressure, temperature, and communications), we've got you covered.

For current information and schedules, visit our website at: www.usa.siemens.com/pitraining

Have a question or need more information? Email us at: piatraining.industry@siemens.com
Prefer to talk to us in person? Call us at: 1-800-365-8766, Prompt 7

Our weighing technology center, for example, offers customer-specific training, demonstrations, and hands-on device testing in simulated applications.

Join one of our standard training sessions or ask for a special tutorial focused on a specific application.

The following weighing and feeding applications are available:

- Batching
- Dosing
- Loss-in-weight
- Checkweighing
- Weighfeeder
- Belt scale
- Solid flowmeter
- Load weighing
- Filling

More information about our weighing training:
www.usa.siemens.com/pitraining
Our process instrumentation, analytics, automation, and drives product range

Siemens offers the most comprehensive product range for monitoring your processes, with solutions for even the most difficult applications. With Siemens, you can control, monitor, and integrate your operations into a system that works reliably and seamlessly.

<table>
<thead>
<tr>
<th>Level</th>
<th>Flow</th>
<th>Weighing</th>
<th>Pressure</th>
<th>Temperature</th>
<th>Positioning</th>
<th>Power supplies</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Process protection</th>
<th>Process controllers</th>
<th>Remote displays</th>
<th>Process recorders</th>
<th>Gas analytics</th>
<th>SIMATIC</th>
<th>Industrial communication</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Motors</th>
<th>Gear reducers</th>
<th>Motion control</th>
<th>Control gear</th>
<th>PLCs</th>
<th>Drives</th>
<th>HMIs</th>
</tr>
</thead>
<tbody>
<tr>
<td>![Motors icon]</td>
<td>![Gear reducers icon]</td>
<td>![Motion control icon]</td>
<td>![Control gear icon]</td>
<td>![PLCs icon]</td>
<td>![Drives icon]</td>
<td>![HMIs icon]</td>
</tr>
</tbody>
</table>
Load cell applications

Proper application and installation of the load cell will ensure accurate repeatable results:

<table>
<thead>
<tr>
<th>Ideal load application</th>
<th>Not centered</th>
<th>Not in measuring direction, not vertical</th>
<th>With leverage</th>
<th>With torque</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Ideal load application" /></td>
<td><img src="image2" alt="Not centered" /></td>
<td><img src="image3" alt="Not in measuring direction, not vertical" /></td>
<td><img src="image4" alt="With leverage" /></td>
<td><img src="image5" alt="With torque" /></td>
</tr>
</tbody>
</table>

Ideal base
- Horizontally aligned
- Stiff
- Surface quality appropriate

<table>
<thead>
<tr>
<th>Rough surface</th>
<th>Undefined support</th>
<th>Support bends through</th>
<th>Support too weak</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image6" alt="Ideal base" /></td>
<td><img src="image7" alt="Rough surface" /></td>
<td><img src="image8" alt="Undefined support" /></td>
<td><img src="image9" alt="Support bends through" /></td>
</tr>
</tbody>
</table>

Flowmeter applications

There are several different feed conditions where a solids flowmeter can be applied. Siemens flowmeters provide accurate, efficient measurements for some of the following most common applications:

<table>
<thead>
<tr>
<th>Screw conveyor</th>
<th>Rotary feeder</th>
<th>Drag conveyor</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image11" alt="Screw conveyor" /></td>
<td><img src="image12" alt="Rotary feeder" /></td>
<td><img src="image13" alt="Drag conveyor" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Belt conveyor</th>
<th>Bucket elevator</th>
<th>Vibratory feeder</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image14" alt="Belt conveyor" /></td>
<td><img src="image15" alt="Bucket elevator" /></td>
<td><img src="image16" alt="Vibratory feeder" /></td>
</tr>
</tbody>
</table>
Optimizing your belt scale

Belt conveyor terminology

- Hopper
- Skirtboards
- Tail pulley
- Impact idlers
- Return idlers
- Bend pulley
- Vertical gravity take-up
- Snub pulley
- Head pulley
- Carrying idlers
- Return idlers
- Belt scale
- Hopper skirtboards
- Concave style conveyor
- Convex style conveyor
- Tail pulley
- Impact idlers
- Return idlers
- Bend pulley
- Vertical gravity take-up
- Snub pulley
- Head pulley
- Carrying idlers
- Return idlers
- Belt scale

Belt scale installation – location considerations*

Belt tension

Material flow

Least tension and variation

Most tension and variation

Belt scale should be installed as far from the infeed with the least amount of belt tension.

Concave style conveyor

- Minimum 12 m (40 ft)
- Tangent points of curve

Convex style conveyor

- Minimum 6 m (20 ft)
- Tangent points of curve

- Minimum 12 m (40 ft)

Suitable belt scale idlers

<table>
<thead>
<tr>
<th>Flat conveyor idler</th>
<th>Troughed conveyor idler</th>
<th>Offset conveyor idler**</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image1" alt="Flat conveyor idler" /></td>
<td><img src="image2" alt="Troughed conveyor idler" /></td>
<td><img src="image3" alt="Offset conveyor idler" /></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>V-Roll (2 Roll) conveyor idler</th>
<th>Catenary idler</th>
<th>Wire rope conveyor idler</th>
<th>Good belt flexion</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image4" alt="V-Roll (2 Roll) conveyor idler" /></td>
<td><img src="image5" alt="Catenary idler" /></td>
<td><img src="image6" alt="Wire rope conveyor idler" /></td>
<td><img src="image7" alt="Good belt flexion" /></td>
</tr>
</tbody>
</table>

Suitable belt considerations

<table>
<thead>
<tr>
<th>Belt too stiff</th>
</tr>
</thead>
<tbody>
<tr>
<td><img src="image8" alt="Belt too stiff" /></td>
</tr>
</tbody>
</table>

*These positions are ideal. For geometry outside these guidelines, please contact Siemens technical support. **Acceptable in some applications.