Level measurement guide

Complete level solutions

A new level of experience in all of your applications.

usa.siemens.com/level
Transparency. Connectivity. Intelligence.

The eyes and ears of digitalization.

Enormous potential benefits await your operations with Industry 4.0. With unparalleled control and access, you now have complete knowledge of what’s happening in your plant at all times.

But even in the age of digital, you still need accurate, reliable, and rugged process instrumentation. Because if field instruments are unable to supply the right data, even the most sophisticated digitalization initiative won’t help.

Take the MultiRanger/HydroRanger ultrasonic level controller. Connect it to Siemens MindSphere Cloud for Industry and see your operations open up before you. Access to all sensor data and device parameters allows you to compare level readings with external sensors – compare outside temperatures to river levels combined with rain fall gauges to predict flood zones. Intelligent level monitoring brings intelligent operations.

With the knowledge that no single technology can address the needs of all industrial applications, Siemens provides a complete range of level measurement devices. All backed by our global support network, providing experienced sales and technical assistance when and where you need it.
Table of contents

Level technology selector 4
Radar for solids 6
Radar for liquids and slurries 8
Guided wave radar 10
Ultrasonic controllers and transmitters 12
Ultrasonic Echomax transducers 14
Hydrostatic 16
Capacitance 18
Level by weight 20
Load cells for level weighing 22
Vibratory and paddle switches 24
RF Capacitance and ultrasonic switches 26
Remote monitoring and displays 28
Training, sales and support, TIA 30
# Level technology selector

- preferred
- condition dependent

<table>
<thead>
<tr>
<th>Conditions</th>
<th>Measurement</th>
<th>Ultrasound</th>
<th>Radar</th>
<th>Guided wave radar</th>
<th>RF Capacitance</th>
<th>Gravimetric</th>
<th>Hydrostatic pressure</th>
<th>Vibration</th>
<th>Capacitance</th>
<th>Paddle</th>
<th>Ultrasonic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Level</td>
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<tr>
<td>Interface (liquid/liquid)</td>
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<tr>
<td>Interface (liquid/solid)</td>
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<tr>
<td>Volume</td>
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<tr>
<td>Mass</td>
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<tr>
<td>Flow (open channel)</td>
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</tr>
</tbody>
</table>

## Level Application

| Changing density                  |             |           |       |                   |                |             |                      |           |             |        |            |
| Changing dielectric               |             |           |       |                   |                |             |                      |           |             |        |            |
| Aggressive chemicals*             |             |           |       |                   |                |             |                      |           |             |        |            |
| Pressure/vacuum                   |             |           |       |                   |                |             |                      |           |             |        |            |
| High temperature                  |             |           |       |                   |                |             |                      |           |             |        |            |
| Cryogenic                         |             |           |       |                   |                |             |                      |           |             |        |            |
| Turbulence                        |             |           |       |                   |                |             |                      |           |             |        |            |
| Steam                             |             |           |       |                   |                |             |                      |           |             |        |            |
| Hydrocarbon vapors/solvents       |             |           |       |                   |                |             |                      |           |             |        |            |
| Foam                              |             |           |       |                   |                |             |                      |           |             |        |            |
| Buildup                           |             |           |       |                   |                |             |                      |           |             |        |            |
| High viscosity                    |             |           |       |                   |                |             |                      |           |             |        |            |
| Dust                              |             |           |       |                   |                |             |                      |           |             |        |            |
| Solids powders                    |             |           |       |                   |                |             |                      |           |             |        |            |
| Solids granules/pellets < 25 mm (1") |           |           |       |                   |                |             |                      |           |             |        |            |
| Solids > 25 mm (1")               |             |           |       |                   |                |             |                      |           |             |        |            |

* Check chemical compatibility.
Siemens level measurement

Monitoring water levels in open channels. Tracking the amount of grain in a silo. Measuring oil in a tank. Simply put, level measurement tells you how much material is at a given location.

The right instrument for your application

With the knowledge that no single technology can address the needs of all industrial applications, Siemens provides a complete range of level measurement devices. Ultrasonics. Radar. Guided wave radar. Capacitance. Point level. Gravimetric. Hydrostatic.

Complementing our level technology are Siemens analytics, automation, and drives for industries around the globe:

- Flow
- Weighing
- Pressure
- Temperature
- Positioning
- Power supplies
- Process protection
- Process controllers
- Remote displays
- Process recorders
- Gas analytics
- Gear reducers
- Motors
- Control systems
- Industrial communication
- PLCs
- HMIs
- Drives
- Motion control
Narrow beam and high frequency for reliable measurement of solids.

Radar for solids

SITRANS LR560 is the easiest to use solids radar transmitter on the market. With a high frequency of 78 GHz, 4 degree narrow beam, and short wavelength, it performs reliably on solids material from practically any installation location.

For extremely low dielectric, low density powders, the 25 GHz SITRANS LR460 is the preferred solution. Featuring a horn antenna with an 8 degree beam, the 4-wire FMCW SITRANS LR460 has proven itself in thousands of applications.

Siemens solids radar transmitters easily tackle dusty environments and are not affected by temperature changes.
<table>
<thead>
<tr>
<th></th>
<th>SITRANS LR560</th>
<th>SITRANS LR460</th>
<th>SITRANS LR260</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
<td>7ML5440</td>
<td>7ML5426</td>
<td>7ML5427</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>40 m (131 ft)</td>
<td>100 m (328 ft)</td>
<td>100 m (328 ft)</td>
</tr>
<tr>
<td><strong>Process temperature</strong></td>
<td>-40 to 100 °C (-40 to 212 °F)</td>
<td>-40 to 200 °C (-40 to 392 °F)</td>
<td>-40 to 200 °C (-40 to 392 °F)</td>
</tr>
<tr>
<td><strong>Process pressure</strong></td>
<td>Up to 3 bar g (43.5 psi g) option</td>
<td>0.5 bar g (7.25 psi g) max.</td>
<td>Up to 3 bar g (43.5 psi g), process connection dependent</td>
</tr>
</tbody>
</table>
| **Key features** | • Graphical Quick Start Wizard for easy and fast setup  
• Push buttons or optional Intrinsically Safe infrared handheld programmer  
• Air purge connection included  
• Aimer flange for optimizing readings in the silo cone area | • Intrinsically Safe infrared handheld programmer  
• Extremely high signal yields high performance (high signal-to-noise ratio)  
• Quick Start Wizard for setup  
• PTFE antenna cover  
• Air purge connection | • Reliable and accurate – high signal and low noise yields high performance  
• Graphical HMI makes operation simple with plug-and-play setup using the intuitive Quick Start Wizard  
• Optional dust cover and air purge available |
| **Communications or outputs** | • HART, PROFIBUS PA, or FOUNDATION Fieldbus  
• Enhanced EDD for SIMATIC PDM, Emerson AMS Device Manager, SITRANS DTM (for PACTware), 375/475 handheld, for configuration and diagnostics | • HART or PROFIBUS PA  
• Enhanced EDD for SIMATIC PDM | • HART or PROFIBUS PA  
• Enhanced EDD for SIMATIC PDM and SITRANS DTM (for PACTware) for configuration and diagnostics |
Wide range of process connections and antennas for most materials.

Radar for liquids and slurries

SITRANS LR250 is your first choice for liquid level measurement in storage and process vessels to 20 meters (66 ft). With its range of antennas, this transmitter can handle whatever you need it to. Its new encapsulated antenna and class-leading range of process connections mean that hygienic applications are no problem for this instrument.

For process vessels which may include turbulence, buildup, or foam, choose SITRANS LR200. Its low frequency better suits this environment and functions reliably in applications up to 20 meters (66 ft).

And for basic continuous monitoring, SITRANS Probe LR offers a small process connection for easy installation. It’s low frequency operation means high immunity against condensation or deposits.
<table>
<thead>
<tr>
<th>SITRANS LR250</th>
<th>SITRANS Probe LR</th>
<th>SITRANS LR200</th>
</tr>
</thead>
<tbody>
<tr>
<td>Universal applications</td>
<td>Low-cost basic applications</td>
<td>Severe process conditions</td>
</tr>
<tr>
<td>Order No.</td>
<td>7ML5431, 7ML5432, 7ML5433</td>
<td>7ML5430</td>
</tr>
<tr>
<td>2-wire, 25 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage/process vessels.</td>
<td>2-wire, 6 GHz pulse radar level transmitter for basic continuous monitoring of liquids in storage vessels.</td>
<td>2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids. Ideally suited for complex, turbulent process vessels.</td>
</tr>
<tr>
<td>Range</td>
<td>20 m (66 ft)</td>
<td>-40 to 200 °C (-40 to 392 °F), process connection dependent</td>
</tr>
<tr>
<td>Process temperature</td>
<td>-40 to 200 °C (-40 to 392 °F), process connection dependent</td>
<td>-40 to 80 °C (-40 to 176 °F)</td>
</tr>
<tr>
<td>Process pressure</td>
<td>Up to 40 bar g (580 psi g), process connection dependent</td>
<td>Up to 3 bar g (43.5 psi g)</td>
</tr>
<tr>
<td>Key features</td>
<td>• Narrow beam for easy setup and high performance • Process Intelligence – advanced echo processing for unparalleled performance • Graphical HMI • Quick Start Wizard and display diagnostics • 3-A, EHEDG EL Class 1 and EL Class 1 aseptic certification with TFM 1600 PTFE-wetted antenna parts (FDA and USP Class VI approved) for hygienic and sanitary environments • Antennas for aggressive conditions (acids, alkalis, and other corrosive chemicals) • SIL 2 for functional safety</td>
<td>• Process Intelligence echo processing • Hermetically sealed shielded polypropylene rod antenna with threaded process connection</td>
</tr>
<tr>
<td>Communications or outputs</td>
<td>• HART, PROFIBUS PA, or FOUNDATION Fieldbus • Enhanced EDD for SIMATIC PDM, Emerson AMS, SITRANS DTM (for PACT ware), 375/475 handheld, for configuration and diagnostics</td>
<td>• HART</td>
</tr>
</tbody>
</table>
Simple installation for interface or level monitoring that works.

Guided wave radar


Measuring interface or level? We can do that. Quick and easy setup with local four-button programming, and menu-driven Quick Start Wizard and remote display with fast USB interface gets you operational in minutes, saving you time and money.

Advanced echo processing gives you unrestricted measurement down the length of the entire probe, so you’ll always have accurate readings even in small containers.
<table>
<thead>
<tr>
<th>SITRANS LG Family</th>
<th>Hygienic and corrosives</th>
<th>General liquids</th>
<th>Bulk solids</th>
<th>Extreme conditions</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
<td>7ML5880</td>
<td>7ML5881</td>
<td>7ML5882</td>
<td>7ML5883</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td><strong>Cable version: 4 mm (0.16”), max. length 32 m (105 ft)</strong></td>
<td><strong>Exchangeable cable version: 2 mm (0.08”), 4 mm (0.16”) max. length 75 m (246 ft)</strong></td>
<td><strong>Exchangeable cable version: 4 mm (0.16”), 6 mm (0.24”), 11 mm (0.43”) max. length 60 m (196.8 ft)</strong></td>
<td><strong>Exchangeable cable version: 2 mm (0.08”), 4 mm (0.16”) max. length 60 m (196.8 ft)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Rod version: 8 mm (0.31”), max. length 4 m (13 ft)</strong></td>
<td><strong>Exchangeable rod version: 8 mm (0.31”) max. length 6 m (19.7 ft)</strong></td>
<td><strong>Exchangeable rod version: 16 mm (0.63”) max. length 6 m (19.7 ft)</strong></td>
<td><strong>Exchangeable rod version: 16 mm (0.63”) max. length 6 m (19.7 ft)</strong></td>
</tr>
<tr>
<td></td>
<td><strong>Coaxial version: 21.3 mm (0.84”), 42 mm (1.62&quot;) max. length 6 m (19.7 ft)</strong></td>
<td><strong>Coaxial version: 21.3 mm (0.84”), 42 mm (1.62&quot;) max. length 6 m (19.7 ft)</strong></td>
<td><strong>Coaxial version: 42 mm (1.62&quot;) max. length 6 m (19.7 ft)</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Accuracy</strong></td>
<td>±2 mm (0.08”)</td>
<td>±2 mm (0.08”)</td>
<td>±2 mm (0.08”)</td>
<td>±2 mm (0.08”)</td>
</tr>
<tr>
<td><strong>Key features</strong></td>
<td>• High-grade stainless steel rod for hygienic, food and beverage, and pharmaceutical applications &lt;br&gt;• Suitable for foam, aggressive vapors, or material buildup &lt;br&gt;• Ideal for small vessels &lt;br&gt;• Stainless steel housing for high-pressure/temperature cleaning &lt;br&gt;• Autoclave version available &lt;br&gt;• PFA coated sensor &lt;br&gt;• SIL 2</td>
<td>• Reliable and accurate in all liquids – raw materials, storage, and processing &lt;br&gt;• Suitable for foam, buildup, and steam &lt;br&gt;• Easy switch from interface to level measurement &lt;br&gt;• Second barrier for aggressive materials, including ammonia &lt;br&gt;• SIL 2</td>
<td>• Reliable and accurate measurement in powders, granules, and extreme dust such as plastic applications &lt;br&gt;• Continuous probe condition monitoring ensures operational safety and application reliability &lt;br&gt;• Probe analysis allows for measurement under loss of echo situations due to low dk &lt;br&gt;• SIL 2</td>
<td>• Extreme conditions with high or low pressures or temperatures &lt;br&gt;• Strong construction with dual seal to ensure its integrity in tough applications including ammonia &lt;br&gt;• Real-time measurements for applications in steam boilers &lt;br&gt;• Safety rated for 72 hours of unattended operation &lt;br&gt;• SIL 2</td>
</tr>
<tr>
<td><strong>Communications or outputs</strong></td>
<td>4 to 20 mA/HART, PROFIBUS, Modbus, and Foundation Fieldbus, Support for SIMATIC PDM, Emerson AMS, DTM (for PACTware), 375/475 handheld, for configuration and diagnostics</td>
<td>4 to 20 mA/HART, PROFIBUS, Modbus, and Foundation Fieldbus, Support for SIMATIC PDM, Emerson AMS, DTM (for PACTware), 375/475 handheld, for configuration and diagnostics</td>
<td>4 to 20 mA/HART, PROFIBUS, Modbus, and Foundation Fieldbus, Support for SIMATIC PDM, Emerson AMS, DTM (for PACTware), 375/475 handheld, for configuration and diagnostics</td>
<td>4 to 20 mA/HART, PROFIBUS, Modbus, and Foundation Fieldbus, Support for SIMATIC PDM, Emerson AMS, DTM (for PACTware), 375/475 handheld, for configuration and diagnostics</td>
</tr>
</tbody>
</table>
For close to thirty years, the MultiRanger 200 and HydroRanger 200 have been the industry standard for level measurement in a world of industries. Now we’ve made the best even better. These enhanced controllers give you unparalleled ease of use, setup in under a minute, customer-driven features, and PROFIBUS DPV1 PROFINET, TCP/IP, Ethernet.

As well, with world-leading accuracy of ±1 mm (0.04”), SITRANS LUT400 gives you confidence in your measurements across a wide range of industries.

SITRANS Probe LU uses Auto False-Echo Suppression for fixed obstruction avoidance, providing you with unmatched reliability.

The SITRANS LU150 is a cost-effective, short-range, non-contacting ultrasonic level measurement transmitter that combines both the sensor and electronics into a one-piece, sealed unit.
<table>
<thead>
<tr>
<th>SITRANS LUT400</th>
<th>MultiRanger100/200/ HydroRanger200</th>
<th>SITRANS Probe LU</th>
<th>SITRANS LU150</th>
</tr>
</thead>
<tbody>
<tr>
<td>High accuracy and data logging</td>
<td>Differential measurement and six control relays</td>
<td>HART or PROFIBUS PA communications</td>
<td>Short range, simple measurements</td>
</tr>
<tr>
<td>Order No.</td>
<td>7ML5050</td>
<td>7ML5033/7ML5034</td>
<td>7ML5221</td>
</tr>
</tbody>
</table>

**Key features**

- SITRANS LUT400 are compact, single point, long range ultrasonic controllers for continuous level or volume measurement of liquids, slurries, and solids, and high accuracy monitoring of open channel flow.
- MultiRanger/HydroRanger are versatile short- to medium-range ultrasonic single and multi-vessel level monitor/controllers for virtually any application in a wide range of industries.
- SITRANS Probe LU is a 2-wire loop-powered level measurement transmitter for measuring storage vessels, filter beds, and open channel flow in the water and wastewater, food, and chemical industries.
- SITRANS LU150 is a short-range integrated ultrasonic level transmitter – ideal for liquids and slurries in your open or closed vessels.

- Digital receiver for high performance and reliability in noisy applications
- Intuitive ease of use
- Advanced pump, alarm, and flow control features with three relays
- Integrated datalogger
- Real time clock with daylight saving time and energy-saving algorithms
- Range of models for simple level measurement or pump control to more complex for differential level, open channel measurement, advanced pump control, alarming, and gate control
- Auto False-Echo Suppression to avoid false echoes from fixed obstructions
- Intuitive ease of use
- Six relays
- Superior functionality and plug-and-play performance
- Programming via PC software or infrared handheld programmer
- IP68 rated
- Level, volume, and flow measurement
- -40 to 85 °C (-40 to 185 °F)
- PVDF or ETFE transducer for chemical compatibility
- Easy to install and maintain
- Easy two-button programming
- PVDF transducer for chemical compatibility
- -30 to 60 °C (-22 to 140 °F)
- IP68 rated

**Communications or outputs**

- HART: EDDs for SIMATIC PDM, Emerson AMS Device Manager, and Field Communicator 375, plus SITRANS DTM for FDTs
- RS-485 with Modbus RTU or ASCII
- Compatible with SIMATIC PDM via Modbus RTU, PROFINET, or PROFIBUS
- SmartLinx cards for PROFINET, Modbus TCP/IP, Ethernet/IP, PROFIBUS DP, DeviceNet
- HART or PROFIBUS PA
- EDD for SIMATIC PDM for remote configuration and diagnostics
- FDT such as PACTware or Fieldcare via SITRANS DTM (HART version only)
- 4 to 20 mA output

Order No.:
- 7ML5050
- 7ML5033/7ML5034
- 7ML5221
- 7ML5201

Order No.
Ultrasonic Echomax transducers

Siemens Echomax ultrasonic level transducers provide trouble-free, reliable performance. Our non-contacting transducers are impervious to dust, moisture, vibrations, flooding, and high temperatures. With the ability to detect submergence – when paired with a submergence shield – and an active face to reduce material buildup, these transducers are a perfect fit for a range of industrial applications. Siemens transducers are easy to install and require little to no maintenance.

Echomax transducers feature Sonic Intelligence (when paired with a Siemens controller), our field-proven echo processing algorithms which guarantee the most reliable performance possible. And how about our unmatched beam angle – stronger pulse and sensitivity in a compact beam make our ultrasonic transducers the most powerful in the industry.

Active face technology keeps the transmitter free of material buildup.
<table>
<thead>
<tr>
<th>Echomax XRS-5</th>
<th>Echomax ST-H</th>
<th>Echomax XPS-10</th>
<th>Echomax XPS-15 (standard and F models*&lt;sup&gt;)&lt;/sup&gt;</th>
<th>Echomax XPS-30</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flumes and weirs</td>
<td>Installation flexibility</td>
<td>Liquids, solids, slurries</td>
<td>Deep wells and solids</td>
<td></td>
</tr>
<tr>
<td>Order No.</td>
<td>7ML1106</td>
<td>7ML1100</td>
<td>7ML1115, 7ML1118, 7ML1171</td>
<td>7ML1123</td>
</tr>
<tr>
<td>Max. range</td>
<td>8 m (26 ft)</td>
<td>10 m (33 ft)</td>
<td>XPS-10: 10 m (33 ft) XPS-15: 15 m (50 ft)</td>
<td>30 m (98 ft)</td>
</tr>
<tr>
<td>Min. range</td>
<td>0.3 m (1 ft)</td>
<td>0.3 m (1 ft)</td>
<td>0.3 m (1 ft)</td>
<td>0.6 m (2 ft)</td>
</tr>
</tbody>
</table>
| Enclosure | • PVDF copolymer and CSM face  
• IP68 rated  
• CPVC Flange  
• PTFE face with CPVC Flange  
• Submergence detection with shield | • ETFE  
• PVDF  
• IP68 rated  
• 2" and 1" process connections | • PVDF  
• IP68 rated  
• PVDF with CPVC Flange  
• PTFE face with CPVC Flange  
• Submergence detection with shield | • PVDF  
• IP68 rated  
• PVDF with CPVC Flange  
• PTFE face with CPVC Flange |

All Siemens transducers have one or more of the following approvals: CE, CSA, ATEX, SAA, ABS, and Lloyd’s Register of Shipping.

*FM Class 1 Div 1 approved.
Hydrostatic level measurement with Siemens gauge, absolute, and differential pressure transmitters is a low cost option for direct mounting or mounting with remote seals on tanks and vessels. These instruments can handle extreme chemical and mechanical loads as well as electromagnetic interference. They are widely applied in chemical and petrochemical industries.
<table>
<thead>
<tr>
<th></th>
<th>SITRANS LH100</th>
<th>SITRANS LH300</th>
<th>SITRANS P320</th>
<th>SITRANS P500</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
<td>7MF1570</td>
<td>7MF1575</td>
<td>7MF036</td>
<td>7MF56x</td>
</tr>
<tr>
<td><strong>Hydrostatic level transmitter for direct mounting in tanks and vessels.</strong></td>
<td><strong>Hydrostatic level transmitter for direct mounting in tanks and vessels.</strong></td>
<td><strong>Hydrostatic level transmitter for mounting with remote seal on open or closed vessels with corrosive or non-corrosive liquids.</strong></td>
<td><strong>Hydrostatic level transmitter for mounting with remote seal on open or closed vessels with corrosive or non-corrosive liquids.</strong></td>
<td></td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>3 m to 20 m H₂O (9 ft to 60 ft H₂O)</td>
<td>1 m to 40 m H₂O (3 ft to 120 ft H₂O)</td>
<td>50m (167ft) H₂O</td>
<td>60m (210ft) H₂O</td>
</tr>
<tr>
<td><strong>Process temperature</strong></td>
<td>-10 to 80 °C (14 to 176 °F)</td>
<td>-10 to +80 °C (14 to 176 °F)</td>
<td>-40 to 100 °C (-40 to 212 °F)</td>
<td>-40 to 125 °C (-40 to 257 °F)</td>
</tr>
<tr>
<td><strong>Process pressure</strong></td>
<td>N/A</td>
<td>N/A</td>
<td>depending on process connection</td>
<td>depending on process connection</td>
</tr>
</tbody>
</table>
| **Key features**        | • Compact stainless steel enclosure and sensor  
                         • Easy installation  
                         • Intrinsically Safe  
                         • Special measuring ranges: 0 to 3 mH₂O to 0 to 30 mH₂O  
                         • Cable length up to 100 m (328 ft)  
                         • Compact stainless steel transmitter with Al2O3 ceramics sensor  
                         • Sensor purity 99.6%  
                         • Easy installation  
                         • Special measuring ranges: 0 to 1 mH₂O to 0 to 160 mH₂O  
                         • Cable length up to 1000 m (3300 ft)  
                         • With remote seals up to 400 °C (752 °F)  
                         • Self-diagnostic elements for parameterization  
                         • Intrinsically Safe  
                         • Explosion proof and flame proof  
                         • SIL 2/3 approved  
                         • Corrosion-resistant diaphragm and process connections  
                         • Range of different process connections  
                         • With remote seals up to 400 °C (752 °F)  
                         • Diagnostics for customized configuration  
                         • Outstanding accuracy and excellent long-term stability  
                         • Short response times  
                         • Intrinsically Safe  
                         • Explosion proof and flame proof  
                         • Corrosion-resistant diaphragm and process connections  
                         • SIL 2 approved  
                         • Range of different process connections  |
| **Communications or outputs** | N/A | 4 to 20 mA | • HART  
                         • Enhanced EDD for SIMATIC PDM, Emerson AMS, SITRANS DTM (for PACTware), 375/475 handheld, for configuration and diagnostics  
                         • HART  
                         • Enhanced EDD for SIMATIC PDM, Emerson AMS, SITRANS DTM (for PACTware), 375/475 handheld, for configuration and diagnostics  |
Tried and tested for a wide range of applications, Siemens inverse frequency shift capacitance continuous level transmitters are suitable for liquids, solids, and interface applications. Siemens capacitance instruments use active-shield technology to ensure true and accurate level readings are recorded from the material surface.

SITRANS LC300 is ideal for standard and industrial applications in the chemical, hydrocarbon processing, and food and beverage industries.
### SITRANS LC300

<table>
<thead>
<tr>
<th>Feature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
<td>7ML567x</td>
</tr>
<tr>
<td><strong>Inverse frequency shift capacitance level transmitter</strong></td>
<td>Transmitter for liquids and solids applications; ideal for standard industrial applications in chemical, hydrocarbon processing, food and beverage.</td>
</tr>
</tbody>
</table>
| **Range**              | Rod: max. length 5.5 m (18 ft)  
                          | Cable: max. length 25 m (82 ft)                                          |
| **Process temperature**| -40 to 200 °C (-40 to 392 °F)                                              |
| **Process pressure**   | Up to 35 bar g (511 psi g)                                                 |
| **Key features**       | • Active-Shield technology  
                          | • Push-button calibration  
                          | • Integrated local display  
                          | • Inverse frequency approach provides high resolution |
| **Communications or outputs** | 4 to 20 mA                                                                 |

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SITRANS LC300
Level by weight

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 instrumentation.

Automate all of your scales with SIWAREX weighing modules. Part of Siemens Totally Integrated Automation (TIA), SIWAREX modules can be integrated into SIMATIC and expanded as required to meet your individual requirements.
### SIWAREX WT231

<table>
<thead>
<tr>
<th>Standalone</th>
<th>S7-1200 integrated</th>
<th>ET 200SP integrated</th>
<th>S7-300 integrated</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>7MH4965-2AA01</td>
<td>7MH4960-2AA01</td>
<td>7MH4950-1AA01</td>
</tr>
<tr>
<td>Typical applications</td>
<td>Fast basic weighing and force measuring tasks like platform, silo or hopper scales, built-in a rugged stand-alone solution.</td>
<td>Fast basic weighing and force measuring tasks like platform, silo or hopper scales, seamless integrated into SIMATIC S7-1200 environment.</td>
<td>Fast and accurate weight measurement applications.</td>
</tr>
</tbody>
</table>
| Automation system integration | • RS485 (Modbus RTU)  
• 0/4-20mA  
• Four digital outputs  
• Four digital inputs | • SIMATIC S7-1200 (directly via SIMATIC bus)  
• Operator panel  
• Automation systems from other manufacturers, via Ethernet (Modbus TCP/IP) or RS-485 (Modbus RTU) | • SIMATIC S7-400  
• SIMATIC S7-300  
• SIMATIC S7-1200  
• SIMATIC S7-1500 via SIMATIC ET 200SP distributed I/O | • SIMATIC S7-300 (directly or via SIMATIC ET 200M)  
• SIMATIC S7-400 (H)  
• SIMATIC PCS 7 (H) (via SIMATIC ET 200M) |
| Accuracy         | 0.05%              |                     |                   |
| SIMATIC PCS7 integration | –                  | –                   | Via SIMATIC PCS7 add-on software package including faceplate and function block |
Load cells for level weighing

SIWAREX load cells have high precision and repeatability of 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 systems – 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 300 grams to 500 tons (6.6 pounds to 551 short tons), you are sure to find the right load cell for your application.
<table>
<thead>
<tr>
<th></th>
<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><strong>Type</strong></td>
<td>Shear beam</td>
<td>Bending beam</td>
<td>S-Type</td>
<td>Single point</td>
<td>Compression</td>
<td>Compression</td>
<td>Ring-torsion</td>
</tr>
<tr>
<td><strong>Order No.</strong></td>
<td>7MH5107</td>
<td>7MH5106</td>
<td>7MH5105</td>
<td>7MH5118</td>
<td>7MH5108/10</td>
<td>7MH5114</td>
<td>7MH5113</td>
</tr>
<tr>
<td><strong>Typical applications</strong></td>
<td>Container, overhead rail convey-or, 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, conveyor small scales</td>
<td>Containers, hoppers, and vehicle scales</td>
<td>Vehicle scales, overhead rail scales, container weighers</td>
<td>Container, conveyor, platform and roller table scales</td>
</tr>
<tr>
<td><strong>Nominal load (Emax)</strong></td>
<td>0.5 to 5 t (0.55 to 5.5 short tons)</td>
<td>10 to 500 kg (22 to 1102 lbs)</td>
<td>50 kg to 101 (110 lbs to 11 short tons)</td>
<td>10 to 500 kg (22 to 1102 lbs)</td>
<td>10 to 2001 (11 to 220 short tons)</td>
<td>2.8 to 500 t (3 to 551 short tons)</td>
<td>60 kg to 60 t (132 lbs to 66 short tons)</td>
</tr>
<tr>
<td><strong>Accuracy class and max. scale intervals</strong></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>C3 to OIML R60; 3,000 intervals</td>
<td>0.1% C3, C4, C5 3,000...5,000</td>
</tr>
<tr>
<td><strong>Degree of protection</strong></td>
<td>IP68</td>
<td>IP68</td>
<td>IP67</td>
<td>IP68/IP69K</td>
<td>IP68</td>
<td>IP68</td>
<td>IP66/IP68</td>
</tr>
</tbody>
</table>
Vibratory and paddle switches

With options as simple or sophisticated as you need them to be, Siemens point level devices are your answer.

Whether you’re looking for backup high- or low-level detection, interface, or dry run protection – these switches will reduce your maintenance, downtime, and equipment replacement costs.

Remote testing? Not a problem. A range of Siemens point level instruments now feature convenient remote testing via single or two-channel remote test signal conditioners or your control system.

Product buildup? In addition to Siemens capacitance technology’s immunity to buildup, rotating point level devices specialize in low bulk density applications, ensuring accurate readings even in dusty, turbulent, and vaporous environments.

Need functional safety in your application? Siemens offers the world’s first rotary paddle switch with SIL options in addition to a series of SIL instruments in all our point level lines.

Whatever your requirement, Siemens has a switch solution.
SITRANS LVS100  SITRANS LVS200  SITRANS LVL100  SITRANS LVL200  SITRANS LPS200

Dry powder solids
Order No. 7ML5735 7ML5731-4 7ML5745 7ML5746/7ML5747/7ML5748 7ML5725-8/7ML5730

Vibrating point level switch for dry powder, fine grain, and granular bulk solids with densities starting at 30 g/l (1.9 lb/ft³).
Vibrating point level switch for dry powder, fine grain, and granular bulk solids with densities as low as 5 g/l (0.3 lb/ft³).
Compact vibrating level switch for liquid and slurry and pump protection. Ideal for use in confined spaces.
Standard vibrating level switch for all liquid and slurry and pump protection. For use in SIL-2 applications.
Rotary paddle switch for point level detection of powder and granular solids with bulk densities as low as 15 g/l (0.94 lb/ft³).

Range
170 mm to 4 m (6.7” to 13 ft) Rigid extension: 165 mm to 4 m (6.5” to 13 ft) Extended model 700 mm to 20 m (27.5” to 65 ft)
Compact insertion length of 40 mm (1.5”)
Compact insertion length starting at 40 mm (1.5” to 13 ft) Options Extensions up to 4 m (13 ft) 100 mm to 10 m (4” to 30 ft)

Process temperature
-40 to 150 °C (-40 to 302 °F) -40 to 150 °C (-40 to 302 °F) -40 to 150 °C (-40 to 302 °F) -50 to 250 °C (-58 to 482 °F) -196 to +450 °C (-321 to +842 °F)
-25 to 600 °C (-13 to 1112 °F)

Process pressure
Up to 10 bar g (145 psi g) Up to 10 bar g (145 psi g) Pressure to 30 bar options available -1 to 64 bar g (-14.5 to 928 psi g) -1 to 160 bar/100 to 16000 kPa (-14.5 to 2320 psig) Up to 0.5 bar g (7.25 psi g) Optional up to 10 bar g (145 psi g)

Key features
- High, low and demand level detection
- Compact design
- Replaceable electronics
- Interface model for solids in liquids
- Best-in-industry lowest density measurement
- Unaffected by external vibrations
- Remote build-up monitoring
- Test function
- Fault monitoring for corrosion, loss of vibration, or line break to the piezo drive
- Compact design for tight spaces
- ½” process connections
- Continuous fault monitoring
- SIL 2 for high level and dry run applications
- Hygienic options
- Remote testing options
- Optional hinged vane
- 5 seal ingress protection
- Motor switches off during alarm for long service life
- Friction clutch design prevents impact damage
- Rotation failure monitoring
RF Capacitance and ultrasonic switches

Our level switches offer superior performance while reducing maintenance, downtime, and equipment replacement cost. Their robust design lasts in harsh and abrasive environments, guaranteeing a long service life and low cost of ownership. They are easy to set up and connect to any alarm or control system.

Our unique inverse frequency shift approach to capacitance technology ensures accurate, reliable, and repeatable measurement, even in dusty, turbulent, and vaporous environments or in situations with product buildup. Because even a small level change creates a large and detectable change in frequency, Siemens Pointek CLS series provides excellent resolution while consistently outperforming conventional devices.
<table>
<thead>
<tr>
<th>Pointek CLS100</th>
<th>Pointek CLS200</th>
<th>Pointek CLS300</th>
<th>Pointek ULS200</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Order No.</strong></td>
<td>7ML5501/7ML5610</td>
<td>7ML5630-4/7ML5640-4</td>
<td>7ML5660-2/7ML5660-2</td>
</tr>
<tr>
<td><strong>RF capacitance switch</strong></td>
<td>RF capacitance switch for level detection in constricted spaces, interfaces, solids, liquids, slurries, and foam.</td>
<td>RF capacitance switch with a high level of chemical resistance; level detection of interfaces, solids, liquids, slurries, foam, and simple pump control.</td>
<td>RF capacitance switch for detecting solids, liquids, slurries, and interface in demanding conditions: pressures, temperatures, corrosive and abrasive materials.</td>
</tr>
<tr>
<td><strong>Range</strong></td>
<td>100 mm (4&quot;) insertion</td>
<td>Rod: 100 mm to 5.5 m (4&quot; to 18 ft)</td>
<td>Rod: 350 mm to 1 m (14 to 40&quot;)</td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>-30 to 100 °C (-22 to 212 °F)</td>
<td>-40 to 125 °C (-40 to 257 °F) with thermal isolator</td>
<td>-40 to 400 °C (-40 to 752 °F) high temperature version</td>
</tr>
<tr>
<td><strong>Process</strong></td>
<td>Up to 10 bar g (145 psi g)</td>
<td>Up to 25 bar g (365 psi g)</td>
<td>Up to 35 bar g (511 psi g)</td>
</tr>
<tr>
<td><strong>Key Features</strong></td>
<td>• Inverse frequency provides high resolution • Sensitivity adjustment • Level detection independent of tank wall/pipe • Multiple outputs • SensGuard for abrasive applications • PPS or PVDF probe options • IP68</td>
<td>• Inverse frequency provides high resolution • Multiple outputs • SensGuard for abrasive applications • PVDF probe options • IP68 • Display • Profibus PA</td>
<td>• Inverse frequency provides high resolution • Active-Shield • Multiple outputs • Five dip switches for special adjustments • IP68 • Display • Profibus PA</td>
</tr>
</tbody>
</table>
Remote monitoring and displays

Ideal for remote monitoring applications including inventory levels, regulatory monitoring, remote maintenance alarming, or process and environmental monitoring, SITRANS RD500 remote data manager helps you stay connected and informed. SITRANS RD500 provides remote monitoring through datalogging, web access, and alarming.

SITRANS RD100, SITRANS RD200, and SITRANS RD300 remote displays bring you the flexibility of seeing instrumentation readings in a convenient location for your operators. There are times when information in the control room or on the instrument is not enough. Siemens’ selection of displays gives you an inexpensive view into your processes.
<table>
<thead>
<tr>
<th>SITRANS RD100</th>
<th>SITRANS RD200</th>
<th>SITRANS RD300</th>
<th>SITRANS RD500</th>
</tr>
</thead>
<tbody>
<tr>
<td>Order No.</td>
<td>7ML5741</td>
<td>7ML5740</td>
<td>7ML5744</td>
</tr>
<tr>
<td>Input types</td>
<td>2-wire loop-powered enclosed remote digital display for process instrumentation.</td>
<td>Universal input, panel mount, remote digital display for process instrumentation.</td>
<td>Dual-line, panel mount, remote digital display for process instrumentation.</td>
</tr>
<tr>
<td>Digits</td>
<td>3.5 digit display</td>
<td>4 digit display</td>
<td>Dual-line 6 digit display</td>
</tr>
</tbody>
</table>
| Key features  | • 2-wire loop-powered  
• Two-step configuration  
• Intrinsically Safe, non-incendive  
• Serviceability without loop interruption  
• Factory calibrated | • Easy to read in all conditions  
• Temperature and process meter  
• Software supports monitoring and configuration  
• Alarm indication and process control  
• Provides power to instrument  
• Modbus RTU output | • Easy to read, dual-line display  
• 32-point linearization and square root function  
• Nine digit totalizer  
• Flexible outputs with up to eight relays and eight digital I/O for process control alarming  
• Modbus RTU output  
• Multi-pump alternation control  
• Software supports monitoring and configuration | • 128 conventional I/O  
• Ethernet TCP/IP, HTML, Modbus TCP, FTP, email  
• Cellular support  
• Expandable 1GB memory (2GB optional) |
| Operating temperature | -40 to 85 °C (-40 to 185 °F) | 0 to 65 °C (32 to 149 °F) | -40 to 65 °C (-40 to 149 °F) | 0 to 50 °C (32 to 122 °F) |
Sales 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. siemens.com/automation/service&support

PI training

Maximize your skills with factory-certified training
Siemens provides a full schedule of Process Instrumentation training opportunities for Siemens employees, channel partners, and customers. The PI Introductory Training courses are designed for new sales and service employees to learn the product lines, the technologies, and the applications. These courses are also prerequisites for the advanced technology courses which provide in-depth application training.

Designed for hands-on learning, all courses are led by field-tested instructors who combine extensive application and instrumentation knowledge with seasoned training experience. Our PI Training Center is specifically designed to optimize your classroom time. It is fully equipped with application simulation stations, a full range of PI instruments, and complete industrial communication networks.

For current information and schedules, visit our website at: siemens.com/pi-training
Totally integrated automation

Products from the controller level to the field level

With Totally Integrated Automation (TIA), Siemens is the only provider of an end-to-end integrated portfolio of products and systems for the automation of the entire production workflow. From the goods receiving area to the finished goods warehouse.

Totally Integrated Automation reduces the complexity of the automation solution and enables what really counts: the practical combination of optimally coordinated individual components without interface problems.

Totally Integrated Automation integrates not only the production process but all parts of the company from the field level to the management level. The result: a perfectly coordinated overall concept that enables higher productivity.

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 375/475 HART field communicator and Emerson AMS
- SmartLinx (cards are available for PROFIBUS DP, Modbus RTU, and DeviceNet)
- FDT Software via SITRANS DTM
Measuring everything that matters:  
www.usa.siemens.com/pi

Siemens Process Instrumentation offers best-in-class measurement and seamless integration into your automation system. We are the total solution provider for flow, level, pressure, temperature, weighing, positioners and more.

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