



Practical solutions...at every level!

SiloPatrol® SMU

FEATURES & ADVANTAGES

- ▼ **Weight and cable-based “Smart” level sensor** provides continuous or on-demand level measurement and is unaffected by material characteristics such as dielectric constant, conductivity, dust and humidity.
- ▼ **Innovative Hall-effect sensor array** helps to eliminate the plumb bob from getting stuck in material by providing data to the microprocessor which in turn controls the amount of power to the robust direct-drive gear motor so it can pull the plumb bob harder if needed.
- ▼ **Wireless Bluetooth® set-up** allows operator to utilize a free configuration app on an Android-based device with Bluetooth® capability to easily access and configure the SMU set-up. (App available from Monitor's Web site or Google Play...Search for “SiloPatrol” or “ConfigureSensor”)
- ▼ **Modbus™ connectivity** lets the RS-485 version of SMU communicate with existing control systems.
- ▼ **Widened array of programmable features** including cable cycle limit and relay output for high or low distance threshold setting, error indication or cycle operate.
- ▼ **Split-compartment enclosure** isolates all electrical and electronic components from the process environment to ensure long-term reliable operation.
- ▼ **Uniquely designed wiper seal compartment** for fast, easy servicing or replacement if necessary.
- ▼ **Easy to install** means that the user-friendly design and technology does not require the services of an instrumentation technician.
- ▼ **Measuring range up to 150 feet (46m)** in storage vessels.

PRINCIPLE OF OPERATION

The heart of the **SiloPatrol®** Inventory Management System is an industry-leading cable-based “Smart” sensor called the Silo Monitoring Unit (SMU) that is designed to perform in some of the harshest and most dynamic level measurement conditions. The SMU with its state-of-the-art sensors including Hall-effect technology can be combined with a variety of operator interface and auxiliary output options to provide a practical vendor / remote managed inventory system designed for your specific requirements.

When a measurement cycle is initiated, either manually or automatically, the **SiloPatrol®** sensor (SMU) motor control system deploys a plumb bob, that is attached to a heavy-duty stainless steel cable, for descent into the vessel. The motor control circuitry regulates an optimal speed of descent that helps to eliminate cable slack, maximizes motor life and ensures that the plumb bob will stop when it contacts the material surface. In addition, the motor control system has a “Descend-Assist” feature that can be used to prevent the plumb bob from “clinging” to the socket that might occur in extreme applications. The SMU measures the amount of cable deployed during descent via its unique optical sensing system. Once the optical encoder determines that the plumb bob has reached the material surface, the microcontroller reverses the direction of the motor and transmits the distance value. During the ascent of the plumb bob, the SMU measures the amount of cable retrieved in order to reconfirm the distance measurement.

PRACTICAL APPLICATIONS

- ▼ Use when target material characteristics may change thereby eliminating need for re-calibration.
- ▼ Great economical choice when accuracy is important and periodic measurements are sufficient.
- ▼ Measuring technique provides peace-of-mind without concern of spurious reflections associated with other technologies.
- ▼ Typical applications include, but are not limited to: Grains, Feeds, Powders, Coal, Bulk Chemicals, Cement, Rocks, Sand, Limestone, Plastic Pellets, Plastic Regrind, Slurries, Liquids and Oils.
- ▼ Measure many liquids or slurries with optional ball float plumb bob or detect some settled solids covered in water with optional solid/water interface plumb bob.

For more detailed information, please contact a Monitor representative or visit Monitor's website at http://www.monitortech.com/product_c_c_sp.shtml



Level Blog - <http://monitortech.typepad.com>

Ordinary Loc.
Unit Shown



Now with Wireless
Bluetooth® Set-Up App



-OR- download free
Android™-based app from
Monitor Web site at
www.monitortech.com/apps
or scan QR-Code



Practical Tip


SiloPatrol provides reliable
long-range measurement of
materials with low dielectric
constants such as plastics.

OPTIONS

- ▼ Models to choose from:
 - ▼ Smart RS-485 version with Bluetooth® set-up for use with **HMI2** local operator interface or **SiloTrack™** inventory management software. Also includes Modbus connectivity to communicate with other operator interfaces or control systems being used at facilities that utilize Modbus. (Units are backwards compatible.)
 - ▼ Analog output version with Bluetooth® set-up for use as a standalone transmitter that provides an updated analog signal each time a new measurement is made. (Units are backwards compatible.)
- ▼ Choice of 0°, 5° or 10° freeze-resistant mounting flange.
- ▼ Selection of plumb bobs to fit specific application needs.
- ▼ Available options: ordinary location, CSA_{US/C} hazardous location, ATEX_{Ex} hazardous location, IECEx hazardous. (Hazardous location models do not include a view lens on cover.)
- ▼ **WirelessEZ** communication interface is available.
- ▼ Optional independent analog & relay outputs are offered for RS-485 systems using an Auxiliary Output Enclosure (AOE).

SPECIFICATIONS

More product specifications can be found on Monitor's Web site.

| | | |
|----------------------------------|---|--|
| Power Requirements: | 115VAC or 230VAC(±15%), 50/60Hz | Output Signal: Standard “Smart”: RS-485 half-duplex, isolated, proprietary protocol Address Selection - 1-16 (SiloPatrol); 1-247 (Modbus) Relay Output - 5A @ 250VAC max, isolated, dry contact Analog: 4-20mA, reversible to 20-4mA, isolated; Self powered 500 Ohms maximum loop resistance Relay Output – 5A @ 250VAC max, isolated, dry contact Enclosure: Cast aluminum w/ powder coat finish Mounting: Freeze-Resistant “K” flange, 8”dia w/ 7” bolt circle Listings / Approvals: CSA _{US/C} : Ordinary Locations; Class II, Groups E, F & G; Class III ATEX:  II 1/2 D c Ex tb IIIC T75°C Db IP66 (Ta -40°C TO +65°C) IECEx: Ex tb IIIC T75°C Db IP66 (Ta -40°C TO +65°C) CE Mark |
| Power Consumption: | 6VA continuous, 50VA intermittent | |
| Process Temperature: | -40°F to 300°F (-40° C to 150°C) | |
| Ambient Operating Temp.: | -40°F to 150°F (-40° C to 65°C) | |
| Max. Internal Bin Temp.: | Up to 300°F (149°C) with use of bare stainless steel cable; Up to 200°F (93°C) with use of nylon or polyethylene jacketed cables | |
| Max. Vessel Pressure: | 15 PSI | |
| Measurement Range: | 150 feet maximum (45.7 m) | |
| Measurement Rate: | 1.0ft/sec (typical) (0.3 m/s) | |
| Accuracy: | ± 0.25% of distance reading | |
| Repeatability: | 0.1ft (30 mm) | |
| Resolution: | 0.01ft (0.12in/3mm) | |
| Conduit Entry: | (2) 3/4” NPT | |
| Shipping Dimensions: (L x W x H) | 34 x 15 x 16” (864 x 381 x 406mm) | |
| Shipping Weight-Approx.: | 45lbs (20.4kg) -SMU, plumb bob, cable | |
| Air Purge Connection: | 1/4” NPT | |
| Wiring Distance (“smart”): | 3,280ft (1000m) max @ 9600 baud, 26 AWG | |
| Enclosure Rating: | NEMA 4X / ENCLOSURE TYPE 4X; IP66 | |

ORDERING INFORMATION

| SiloPatrol SE Silo Monitoring Unit (SMU SE) | | | | | | | | | | |
|---|---|--------|---|---|---|--|---|---|---|--------------|
| | | Select | | Output | | | | | | |
| | | 1 | | Standard "Smart" RS-485 communications | | | | | | |
| | | 3 | | 4-20mA analog output | | | | | | |
| | | | | Select | | Environment | | | | |
| | | | | 1 | | Ordinary locations | | | | |
| | | | | 2 | | Hazardous locations - CSA us/c (North America) | | | | |
| | | | | 3 | | Hazardous locations - ATEX / IECEx | | | | |
| | | | | Select | | Mounting Flange | | | | |
| | | | | 1 | | Standard K-flange | | | | |
| | | | | 2 | | 5° K-flange | | | | |
| | | | | 3 | | 10° K-flange | | | | |
| | | | | Select | | Cable Type | | | | |
| | | | | (Customer Specified Length up to 150ft [46m]) | | | | | | |
| | | | | 1 | | Nylon jacket | | | | |
| | | | | 2 | | Stainless steel | | | | |
| | | | | 3 | | Polyethylene jacket | | | | |
| | | | | Select | | Operating Voltage | | | | |
| | | | | 1 | | 115 VAC | | | | |
| | | | | 2 | | 230 VAC | | | | |
| 6 | - | 8 | 5 | X | X | - | X | X | 2 | Order Number |

ACCESSORIES ¹:

| Part # | Description |
|--------------------------|---|
| 6-2190 | Digestible Plumb Bob |
| 6-2021 | Cast Epoxy Plumb Bob |
| 6-3103 ¹ | Standard Cast Aluminum Plumb Bob |
| 6-3123 | Cast Aluminum with Teflon® Coating Plumb Bob |
| 6-3136 | 316 Stainless Steel Plumb Bob |
| 6-4106 | 316 Stainless Steel Inverted Cone Plumb Bob |
| 6-4126 | Teflon®-Coated 316 Stainless Steel Inverted Cone |
| 6-4108 | 316 Stainless Steel Ball Float |
| 6-4128 | Teflon®-Coated 316 Stainless Steel Ball Float |
| 6-4112 | Solid / Water Interface-Style SS Plumb Bob |
| 6-3125 | 5° Mounting Flange |
| 6-3128 | 10° Mounting Flange |
| 6-8010 | Tablet, WiFi / Bluetooth® |
| R0514-22001 ² | Belden® 9322 RS-485 communication cable (Overall Beldfoil® Shield - 100% Coverage, PVC Insulation, Chrome PVC Jacket, Nominal OD is .201" [5.10mm]) |

NOTES:

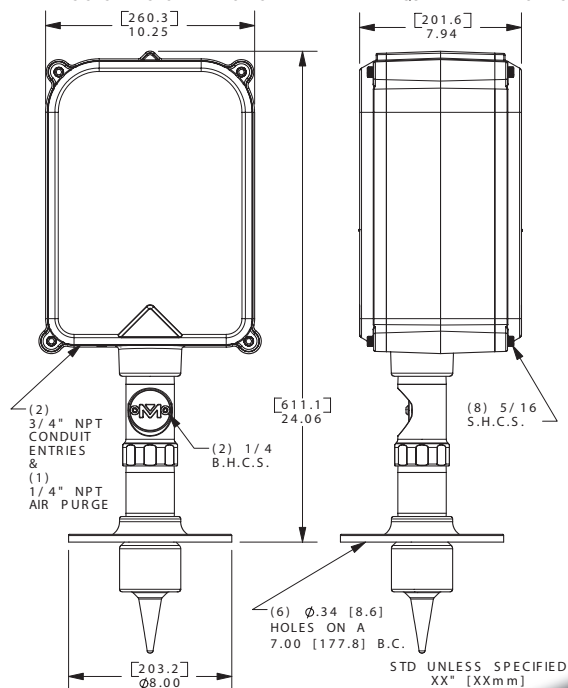
- NOTES:**
- 1 R-3103 cast aluminum plumb bob is included with each SMU SE.
 - 2 R0514-22001 cable is not for plenum installations.
Consult local electrical codes.

Information on this sheet is
subject to change
without notice.



MECHANICALS

DIMENSIONS ARE SHOWN IN INCHES WITH MILLIMETER EQUIVALENT IN BRACKETS



Teflon® is a registered trademark of Dupont Chemical Co.
Bluetooth® is a registered trademark of Bluetooth SIG, Inc.
Android, Google Play, and the Google Play logo
are trademarks of Google Inc.
Modbus™ is a trademark of
Schneider Electric / Modicon

MONITOR TECHNOLOGIES, LLC

44W320 Keslinger Road ▼ Elburn, IL 60119 USA
Tel: 1-630-365-9403 ▼ In US/CAN 1-800-766-6486
Fax: 1-630-365-5646 ▼ monitor@monitortech.com
www.monitortech.com
Blog: www.monitortech.typepad.com