The SoliTrak™ is an electro-mechanic level measuring instrument for the continuous measuring of level in hoppers, silos or tanks. This top mounted system is used for monitoring the level in applications such as powders, small grain bulk materials or coarse grain bulk materials. A bob weight is mounted at the end of a measuring rope or tape, which is wrapped on a motor driven rope roller. Upon contact with the bulk material, the bob weight returns and is drawn back to its upper stop position.

The housing is divided into two independent chambers (the rope chamber and the electronic chamber, seen below), which are sealed to each other to isolate electronics from the process. Only the rope chamber is in contact to the inside of the silo during the measurement. If the bob weight is in the upper stop position, it seals the opening between the unit and the silo. Pulses are generated during downward movement and the number of pulses can be processed directly in a PLC (programmable logic controller) or a counter.
Applications

Remote box SoliTrak
Connecting SoliTrak units with Modbus RTU network

Features:
- Programming of the SoliTrak units
- Display of level
- Start of measurement
- Display of diagnostics information

Sensor weight guide (solids measurement)

<table>
<thead>
<tr>
<th>Sensor weight</th>
<th>Application</th>
<th>Note</th>
<th>Fits through mounting hole</th>
</tr>
</thead>
<tbody>
<tr>
<td>PVC without pin</td>
<td>&gt;300 (18) granulate</td>
<td>flat</td>
<td>Standard weight</td>
</tr>
<tr>
<td>PVC with pin</td>
<td>&gt;300 (18) granulate, powder</td>
<td>steep</td>
<td>The pin penetrates into the material and avoids slipping or tilting of the sensor weight on the steep bulk surface.</td>
</tr>
<tr>
<td>Stainl. steel</td>
<td>&gt;300 (18) granulate, powder</td>
<td>flat, steep</td>
<td>The pin penetrates into the material and avoids slipping or tilting of the sensor weight on the steep bulk surface.</td>
</tr>
<tr>
<td>Claw</td>
<td>&gt;200 (12) coarse (e.g. stones)</td>
<td>steep</td>
<td>Avoids slipping or tilting on the steep bulk surface.</td>
</tr>
<tr>
<td>Folding cover</td>
<td>&gt;20 (1.2) light powder</td>
<td>flat, steep</td>
<td>Big surface prevents the sensor weight from sinking into the material.</td>
</tr>
<tr>
<td>Spider</td>
<td>&gt;40 (1.4) light powder</td>
<td>flat, steep</td>
<td>Big surface prevents the sensor weight from sinking into the material.</td>
</tr>
<tr>
<td>Bag</td>
<td>&gt;300 (18) granulate, powder</td>
<td>flat</td>
<td>Prevents damage of the conveying screw. To be filled with bulk material.</td>
</tr>
<tr>
<td>Float</td>
<td>-</td>
<td>liquids only</td>
<td>80°C (176°F)</td>
</tr>
</tbody>
</table>

*The above mentioned data is a guideline and is valid for material which has settled after filling. During the filling the bulk density can change (e.g. for fluidised material).
Cable entries
Depending on selected version (options see pos. 31):
CE  Screwed cable gland: 2x M20x1.5 and
ATEX  1x M25x1.5
     Blindplug: 2x M20x1.5
FM  Conduit ANSI B1.20.1: 1x NPT 3/4”
     and 2x NPT 1/2”
     Blindplug: 2x NPT 1/2”
Dimensions see page P12

Pos.1 Basic Type
C  SoliTrak Rope version (30m)
D  SoliTrak Tape version (40m)

Pos.2 Certificate
0  CE
M  FM General purpose

Pos.3 Process Temperature
A  max. + 80°C / 176°F
S  max. + 150°C / 302°F
T  max. + 250°C / 482°F

Pos.4 Power Supply
1  98 .. 253V 50-60Hz
3  20 .. 28V DC

Pos.5 Signal Output
D  0/4-20mA Modbus Relay counting pulse (5cm 10 cm / 1/6ft 1/3 ft)
B  0/4-20mA Modbus Electronic counting pulse (1cm 2.5 cm 1/20ft 1/10ft)
E  0/4-20mA Proflbus DP Relay counting pulse (5cm 10 cm 1/6ft 1/3ft)

Pos.6 Process Connection
X  Flange DN100 PN16 (EN1092 - 1) and flange 4” 150 lbs ANSI B16.5 (unit is fitting to this flange)
Y  Flange 2” and flange 3” 150 lbs ANSI B16.5 (unit is fitting to this flange)
A  Thread R 1-1/2 inch tapered DIN2999
B  Thread NPT 1-1/2 inch tapered ANSI B1.20.1
C  Thread NPT 3 inch tapered ANSI B1.20.1

Pos.7 Motor for high measurement frequency (1)
1  Standard
2  Brushless motor

Pos.8 Sensor weight (2,3)
Y  without(4)
A  PBC without pin only with rope version pos.1 C, max. 80°C
B  PVC with pin Max. 80°C
C  Stainless Steel
D  Claw Stainless Steel
E  Folding cover Max. 80°C, stainless steel, PA canvas
F  Spider Stainless Steel
G  Bag Max. 80°C, PA Canvas
H  Float Max. 80°C, PP

Basic type  1  2  3  4  5  6  7  8
SLT 3.00

All positions are available in special design (use code “2”).
1 Motor with increased service life
2 For use in Hazardous Locations (Dust Ex): It must be ensured, that no static discharge from the material surface can occur.
3 See Sensor weight guide on page P5.
4 Including mounting set for sensor weight (see page P17: Sensor weights.
Sensor weights, which can be used in case of possible static discharge, on request.
Pos. 25  Window in lid and external start button
Pos. 26  Internal heater
   Needed for: ambient temp. <-20°C (-4°F) or condense water inside silo or wet process atmosphere.
   (Note: <-20°C (-4°F) with ATEX or FM Class II on request possible)
Pos. 27  Length of socket pipe
   A  500 mm (19.7 in)
   B  1000 mm (39.4 in)
Pos. 28  Compressed air connector
   Quick coupling including counter part, for house diameter 9mm (0.35")
Pos. 29  Increased corrosion resistance
   All metal parts on process side coated, rope with plastic coating, use of stainless steel bearings.
   Available with: Rope version (pos.1, C), CE or FM general purpose. (Pos.2 0,M), 80°C (Pos.3 A), PVC weight (Pos.8 A,B)
Pos. 30  Increased process overpressure
   -0.5 to 1.7 bar (-7.3 to 25 psi) (only with CE Pos.2 0)
Pos. 31  Cable entry
   0  Screwed cable gland 1x M25x1.5 + 2x M20x1.5 + blindplug 2x M20x1.5
   A  Conduit 1x NPT 3/4" + 2x NPT 1/2" + blindplug 2x NPT 1/2"
Pos. 33  Preset fieldbus address (Modbus)
   Preset from address = "1" to "amount of ordered units." Address label on enclosure
   Termination resistor set on unit with highest address.

**INTERFACE MEASUREMENT (SOLIDS IN WATER)**

Implemented
- Internal heater
- Rope / tape roller with rubber coating to avoid slipping
- Plastic coated steel weight (rope version)
- Adjustment possibility for applications with soft/muddy material surface (rope version)

Cable entries
Depending on selected version (options see pos. 31):
**CE**
   Screwed cable gland: 2x M20x1.5 and 1x M25x1.5
   Blindplug: 2x M20x1.5

**ATEX**
   M25x1.5

**FM**
   Conduit ANSI B1.20.1: 1x NPT 3/4" and 2x NPT 1/2"
   Blindplug: 2x NPT 1/2"

Dimensions see page 12

---

For applications with soft/muddy or compact material surface

SoliTrak
Rope version

SoliTrak
Tape version

For applications with compact material surface
**INTERFACE MEASUREMENT (SOLIDS IN WATER)**

<table>
<thead>
<tr>
<th>Pos.1</th>
<th>Basic Type</th>
<th>Pos.2</th>
<th>Certificate</th>
</tr>
</thead>
<tbody>
<tr>
<td>E SoliTrak</td>
<td>E SoliTrak</td>
<td>0 CE</td>
<td></td>
</tr>
<tr>
<td>F SoliTrak</td>
<td>F SoliTrak</td>
<td>M FM General Purpose</td>
<td></td>
</tr>
</tbody>
</table>

**Pos.4 Power Supply**

| 1 | 98 .. 253V 50-60Hz |
| 3 | 20 .. 28V DC |

**Pos.5 Signal Output**

- D 0/4 - 20 mA Modbus Relay counting pulse (5cm 10 cm 1/6ft 1/3ft)
- B 0/4 - 20 mA Modbus Electronic counting pulse (1cm 2.5cm 1/20ft 1/10ft)
- E 0/4 - 20 mA Proflbus DP Relay counting pulse (5cm 10cm 1/6ft 1/3ft)

**Pos.6 Process Connection**

X Flange DN100 PN16, EN1092-1 and flange 4" 150lbs ANSI B16.5 (unit is fitting to this flange)

**Pos.7 Motor for high measurement frequency**

1 Standard
2 Brushless motor

**Order Code**

<table>
<thead>
<tr>
<th>Basic type</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
</tr>
</thead>
<tbody>
<tr>
<td>SLT</td>
<td>A</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

All positions are available in special design (use code “2”).

*Motor with increased service life.

**Options**

<table>
<thead>
<tr>
<th>Pos.25</th>
<th>Window in lid and external start button</th>
</tr>
</thead>
<tbody>
<tr>
<td>Pos.27</td>
<td>Length of socket pipe</td>
</tr>
<tr>
<td>A</td>
<td>500 mm (19.7&quot;)</td>
</tr>
<tr>
<td>B</td>
<td>1000 mm (39.4&quot;)</td>
</tr>
<tr>
<td>Pos.28</td>
<td>Compressed air connector</td>
</tr>
<tr>
<td>Quick coupling including counter part, for hose diameter 9mm (0.35&quot;)</td>
<td></td>
</tr>
<tr>
<td>Pos.29</td>
<td>Increased corrosion resistance</td>
</tr>
<tr>
<td>All metal parts on process side coated, rope with plastic coating, use of stainless steel bearings. Available with rope version (Pos.1 E)</td>
<td></td>
</tr>
<tr>
<td>Pos.30</td>
<td>Increased process overpressure</td>
</tr>
<tr>
<td>-0.5 to 1.7 bar (-7.3 to 25 psi) (only with CE Pos.2 0)</td>
<td></td>
</tr>
<tr>
<td>Pos.31</td>
<td>Preset fieldbus address (Modbus)</td>
</tr>
<tr>
<td>Enables easy commissioning with Remote Box 9000</td>
<td></td>
</tr>
<tr>
<td>Preset from address = &quot;1&quot; to “amount of ordered units.” Address label on enclosure.</td>
<td></td>
</tr>
<tr>
<td>Termination resistor set on unit with highest address.</td>
<td></td>
</tr>
</tbody>
</table>

**ACCESSORIES**

SoliTrak 9000 Remote Box
Connecting up to 10 units with Modbus RTU network.

Features:
- Programming of the SoliTrak units
- Display of level
- Start of measurement
- Display of diagnostics information

SoliTrak 9000 Remote Box
Panel mounting

Included parts
For easy installation and proper functioning of the Modbus network

- Biasing network (with Termination resistor)

**SoliTrak 9000 Remote Box**
Panel mounting

**SoliTrak Wall mounting**

**SoliTrak 9000 Panel mounting**

---

AC/DC converter
(for pos.4 2)

Material: PC (fibre glas reinforced)
Biasing network implemented.
AC/DC converter (for pos.4 2) implemented
**Extension Cables**
For connecting the SoliTrak Remote box or for building a Modbus network

- **Shielded cable**
  - Functionality up to 50m (164ft)
  - Price per meter: em300515

- **Twisted pair cable**
  - Functionality up to 1000m (3270ft)
  - Price per meter: em300516

- **Protection hose**
  - For installation of Modbus cable in ATEX Zone 21
  - Price per meter: em300529

- **Threaded hose coupling**
  - With thread M20 x 1.5. Fitting with protection hose em300529. Applicable for ATEX Zone 21.
  - Price per piece: em100530

**Weather protection cover**
For Ex only approved for Zone 22 or Division 2

- Price: zu300215

**Mounting Kit**
Bolts, washers and nuts for mounting the unit on a flange

<table>
<thead>
<tr>
<th>Material</th>
<th>Bolts</th>
<th>Washers</th>
<th>Nuts</th>
</tr>
</thead>
<tbody>
<tr>
<td>zu107000 Stainless Steel/A2</td>
<td>4 pieces M16x60</td>
<td>8 pieces</td>
<td>4 pieces</td>
</tr>
</tbody>
</table>

**Flange Sealing**
Sealings for mounting the unit on a flange.
Material: neoprene (85°C), temperature resistive plastic AFM30 (250°C)

<table>
<thead>
<tr>
<th>Suitable for flanges</th>
<th>Max. Temp.</th>
<th>Suitable Mounting Kit</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN100 PN16/4&quot;</td>
<td>+85°C (185°F)</td>
<td>zu107000</td>
</tr>
<tr>
<td>DN100 PN16/4&quot;</td>
<td>+250°C (482°F)</td>
<td>zu107000</td>
</tr>
<tr>
<td>2&quot;/3&quot; 150 lbs</td>
<td>+85°C (185°F)</td>
<td>zu107000</td>
</tr>
<tr>
<td>2&quot;/3&quot; 150 lbs</td>
<td>+250°C (482°F)</td>
<td>zu107000</td>
</tr>
</tbody>
</table>
**Basic type**

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>Length to bottom of sensor weight (in upper stop position): see next page</td>
</tr>
<tr>
<td>A</td>
<td>Length of socket pipe</td>
</tr>
<tr>
<td>200mm (7.9&quot;)</td>
<td>Optional 500mm (19.7&quot;) / 1000mm (39.4&quot;)</td>
</tr>
<tr>
<td>B</td>
<td>Diameter of socket pipe</td>
</tr>
<tr>
<td>Rope version with Flange DN100 / 4&quot;</td>
<td>Ø60mm (2.36&quot;)</td>
</tr>
<tr>
<td>All other versions</td>
<td>Ø40mm (1.57&quot;)</td>
</tr>
<tr>
<td>C</td>
<td>Housing extension</td>
</tr>
<tr>
<td>Flange version</td>
<td>80°C / 150°C: 95mm (3.74&quot;)</td>
</tr>
<tr>
<td>250°C</td>
<td>340mm (13.4&quot;)</td>
</tr>
<tr>
<td>Thread version</td>
<td>80°C / 150°C: 160mm (6.3&quot;)</td>
</tr>
<tr>
<td>250°C</td>
<td>340mm (13.4&quot;)</td>
</tr>
<tr>
<td>Rope</td>
<td>Ø1.25mm (0.49&quot;)</td>
</tr>
<tr>
<td>Tape</td>
<td>12x0.2mm (0.47x0.008&quot;)</td>
</tr>
</tbody>
</table>

**Flanges**

<table>
<thead>
<tr>
<th>Flanges</th>
<th>Diameter and Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>DN100 PN16 / 4&quot;</td>
<td>Ø90 .. 95.3mm (3.54 .. 3.75&quot;) slot Ø19mm (0.75&quot;)</td>
</tr>
<tr>
<td>2&quot; / 3&quot;</td>
<td>Ø60.4 .. 76.2mm (2.38 .. 3.0&quot;) slot Ø19mm (0.75&quot;)</td>
</tr>
</tbody>
</table>

**Materials**

<table>
<thead>
<tr>
<th>Component</th>
<th>Material</th>
</tr>
</thead>
<tbody>
<tr>
<td>Housing outside</td>
<td>Aluminium, powder coated</td>
</tr>
<tr>
<td>Housing inside</td>
<td>Aluminium</td>
</tr>
<tr>
<td>Housing extension</td>
<td>Aluminium, powder coated or 1.4305 (303)</td>
</tr>
<tr>
<td>Flange</td>
<td>80°C / 150°C: Aluminium, powder coated</td>
</tr>
<tr>
<td>250°C</td>
<td>1.4305 (303)</td>
</tr>
<tr>
<td>Thread</td>
<td>1.4301 (304)</td>
</tr>
<tr>
<td>Socket pipe</td>
<td>Flange version 80°C / 150°C: Aluminium</td>
</tr>
<tr>
<td>All other versions</td>
<td>1.4301 (304)</td>
</tr>
<tr>
<td>Rope</td>
<td>1.4301 (304)</td>
</tr>
<tr>
<td>Tape</td>
<td>1.4310 (301)</td>
</tr>
</tbody>
</table>

With option "Increased corrosion resistance":
All metal parts in contact with the process are coated.
The rope is plastic coated with PA.
The internal bearings are made of stainless steel.
Options and Accessories

Pos. 25
Window in lid and outside start button

Pos. 28
Compressed air connector

Sensor weights

Solids measurement: Rope version
All weights ca. 1,0kg (2.2lbs)
Solids measurement: Tape version
All weights ca. 2.1kg (4.6lbs)

Interface measurement: Rope version
Weight ca. 1.0kg (2.2lbs)

Interface measurement: Tape version
Weight ca. 2.1kg (4.6lbs)
**DIMENSIONS**

**SoliTrak Remote Box**

- **SoliTrak Panel mounting**
  - Dimensions: 130mm (5.12")
  - Mounting: DIN rail 35

- **SoliTrak Wall Mounting**
  - Depth: 90mm (35.4")
  - Mounting holes:
    - 256mm (10.17")
    - 180mm (7.09")

**Biasing network**
- Dimensions: 45mm (1.8")
- Mounting: DIN rail 35

**Terminal plug**
- Dimensions: 70mm (2.76")

**AC/DC converter**
- Dimensions: 80mm (3.15")
- Mounting: DIN rail 35

**SoliTrak Wall Mounting**
- Depth: 90mm (35.4")
- Mounting holes:
  - 120mm (4.72")
  - 229mm (9.01")
  - 165mm (6.50")
### Rope Roller
- sl102240 Rope roller with 30m rope
- sl102242 Rope roller with 30m rope for increased corrosion resistance (plastic coated)

### Tape Roller
- sb102240 Tape roller with 40m tape

### Sensor weights
All sensor weights are delivered including mounting set for proper fixing to the rope/tape and excluding rope/tape.

#### Solid Measurement
- sl102220 Sensor weight for rope PVC without pin
- sl102221 Sensor weight for rope PVC with pin
- sl102222 Sensor weight for rope Stainless steel Ø75mm (3.0”)
- sl102228 Sensor weight for rope Stainless steel Ø42mm (1.65”)
- sl102223 Sensor weight for tape Claw
- sl102224 Sensor weight for rope Folding Cover
- sl102225 Sensor weight for rope Spider
- sl102226 Sensor weight for rope Bag
- sl102227 Sensor weight for rope Float

#### Interface Measurement
- sl102230 Sensor weight for rope PVC with metal core
- sb102220 Sensor weight for tape Stainless steel

### Motor
- gm102202 Motor standard version
- gm102211 Motor brushless version

### Electronics
- pl102691 Electronics 98..253V 50-60Hz; 0/4-20mA; Modbus; Relay counting pulse (5cm 10cm 1/6ft 1/3ft)
- pl102690 Electronics 98..253V 50-60Hz; 0/4-20mA; Modbus; Electronic counting pulse (1cm 2.5cm 1/20 ft 1/10ft)
- pl102692 Electronics 98..253V 50-60Hz; 0/4-20mA; Profibus DP; Relay counting pulse (5cm 10cm 1/6ft 1/3ft)
- pl102696 Electronics 20..28VDC; 0/4-20mA; Modbus, Relay counting pulse (5cm 10cm 1/6ft 1/3ft)
- pl102695 Electronics 20..28VDC; 0/4-20mA; Modbus, Electronic counting pulse (1cm 2.5cm 1/20 ft 1/10ft)
- pl102697 Electronics 20..28VDC; 0/4-20mA; Relay counting pulse (5cm 10cm 1/6 ft 1/3ft)

### Internal Heater
- em100372 220 Ohms For power supply 98..253V 50-60Hz
- em100371 8 Ohms For power supply 20..28VDC

### Remote Box SoliTrak
- em100910 Panel 24 VDC
SPARE PARTS

Sensor weights
All sensor weights are delivered including stated parts for proper fixing to the rope / tape

Solids measurement: rope version
Solids measurement: tape version
Interface measurement: tape version
Interface measurement: rope version

Motor

Heater

Electronics

Remote Box SoliTrak

Delivery including: cable, plug, sealing, mounting tools