

#### Overview



The SITRANS LR460 is a 4-wire, 24 GHz FMCW radar level transmitter with extremely high signal-to-noise ratio and advanced signal processing for continuous monitoring of solids up to 100 m (328 ft). It is ideal for measurement in extreme dust and high temperature.

#### Benefits

- Process Intelligence for advanced signal processing and quick and easy adjustment
- Self-guided quick start wizard for plug and play startup
- 24 GHz provides superior reflective properties on solids surfaces
- 100 m (328 ft) range for long-range and difficult applications
- Easy Aimer optimizes signal quality on sloped surfaces
- Programming using infrared Intrinsically Safe handheld programmer or with SIMATIC PDM or HART handheld device

#### Application

SITRANS LR460 provides excellent results even during conditions of extreme dust. The integral Easy Aimer included on the SITRANS LR460 allows for easy positioning for optimum measurement on solids.

Process Intelligence onboard SITRANS LR460 means advanced signal processing is harnessed for reliable operation on both simple and difficult solids application.

SITRANS LR460 features a robust enclosure, flange and horn components. It is virtually unaffected by atmospheric or temperature conditions within the vessel.

An optional dust cap is available for sticky solids. Optional air purging is also available for extremely sticky applications.

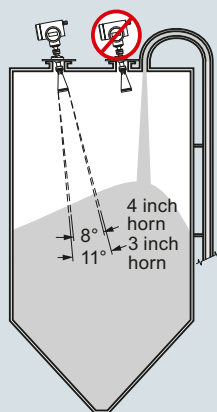
Safe on-site local programming is simple using the Intrinsically Safe handheld programmer. SIMATIC PDM can be used for easy remote programming using HART or PROFIBUS PA.

The characteristics of 24 GHz and high signal-to-noise ratio contribute to exceptional signal reflection, regardless of the dielectric value of the medium.

- Key Applications: long-range dusty applications, cement powder, fly-ash, coal, flour, grain, plastics

#### Configuration

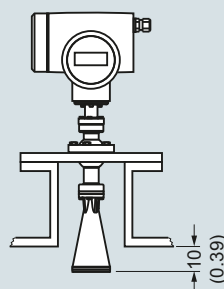
Beam angle



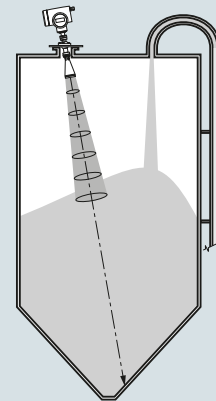
**Note:** For best signal, always use largest horn size possible.

Mounting unit on vessel

Installation in mounting nozzle



Positioning with Easy Aimer



SITRANS LR460 installation, dimensions in mm (inch)

## Level measurement

### Continuous level measurement

### Radar level transmitters

#### SITRANS LR460

#### Technical specifications

|                                                                                |                                                                                                                                                       |                                                                     |                                                                                                                                                                                                                                                                                                  |
|--------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Mode of operation</b>                                                       |                                                                                                                                                       | <b>Programming</b>                                                  |                                                                                                                                                                                                                                                                                                  |
| Measuring principle                                                            | FMCW radar level measurement                                                                                                                          | Intrinsically Safe Siemens handheld programmer (ordered separately) | Infrared receiver                                                                                                                                                                                                                                                                                |
| Frequency                                                                      | 24.2 ... 25.2 GHz FMCW                                                                                                                                | • Approvals for handheld programmer                                 | IS model:<br>ATEX II 1 GD Ex ia op is IIC T4 Ga,<br>ATEX II 1 GD Ex ia op is IIIC T135°C Da;<br>UKEX II 1 GD Ex ia op is IIC T4 Ga,<br>UKEX II 1 GD Ex ia op is IIIC T135°C Da,<br>CSA/FM Class I, Div. 1, Groups A, B, C, D T6 at max. ambient temperature of 40 °C (104 °F)                    |
| Measuring range                                                                | 0.35 ... 100 m (1.15 ... 328.08 ft)                                                                                                                   |                                                                     |                                                                                                                                                                                                                                                                                                  |
| <b>Output</b>                                                                  |                                                                                                                                                       | Handheld communicator                                               | HART Communicator 375                                                                                                                                                                                                                                                                            |
| Analog output (HART)                                                           |                                                                                                                                                       | PC                                                                  | SIMATIC PDM                                                                                                                                                                                                                                                                                      |
| • Signal range                                                                 | Optically isolated                                                                                                                                    | Display (local)                                                     | Alphanumeric LCD for readout and entry                                                                                                                                                                                                                                                           |
| • Load                                                                         | Max. 600 Ω                                                                                                                                            |                                                                     |                                                                                                                                                                                                                                                                                                  |
| • Fail-safe                                                                    | mA signal programmable as high, low or hold (LOE)                                                                                                     |                                                                     |                                                                                                                                                                                                                                                                                                  |
| Communication                                                                  | HART, optional PROFIBUS PA                                                                                                                            |                                                                     |                                                                                                                                                                                                                                                                                                  |
| Digital output                                                                 | Relay, NC or NO function, max. 50 V DC, max. 200 mA, rating 5 W                                                                                       |                                                                     |                                                                                                                                                                                                                                                                                                  |
| PROFIBUS PA protocol                                                           | Layer 1 and 2, Class A, Profile 3.01                                                                                                                  |                                                                     |                                                                                                                                                                                                                                                                                                  |
| <b>Performance (Reference conditions according to IEC 60770-1)</b>             |                                                                                                                                                       | <b>Power supply</b>                                                 | 100 ... 230 V AC ± 15 % (50/60 Hz), 6 W (12 VA)<br>or<br>24 V DC +25/-20 %, 6 W (optional)                                                                                                                                                                                                       |
| Non-linearity                                                                  | Greater of 25 mm (1 inch) or 0.25 % of span (including hysteresis and non-repeatability), over the full ambient temperature range                     | <b>Certificates and approvals</b>                                   |                                                                                                                                                                                                                                                                                                  |
| Non-repeatability                                                              | ≤ 10 mm (0.4 inch)                                                                                                                                    | General                                                             | cCSA <sub>US</sub> , CE, UKCA, FM, RCM                                                                                                                                                                                                                                                           |
| <b>Rated operating conditions</b>                                              |                                                                                                                                                       | Radio                                                               | European Radio (RED),<br>Industry Canada, FCC, RCM                                                                                                                                                                                                                                               |
| Amb. temperature for enclosure                                                 | -40 ... +65 °C (-40 ... +149 °F)                                                                                                                      | Hazardous Areas                                                     | CSA/FM Class II, Div. 1, Groups E, F, and G, Class III<br><br>ATEX II 1 D Ex ta IIIC T <sub>200</sub> 85°C Da;<br>UKEX II 1 D Ex ta IIIC T <sub>200</sub> 85°C Da;<br>IECEx Ex ta IIIC T <sub>200</sub> 85°C Da;<br>INMETRO Ex ta IIIC T <sub>200</sub> 85°C Da;<br>EAC Ex Ex ta IIIC T85°C Da X |
| Storage temperature                                                            | -40 ... +65 °C (-40 ... +149 °F)                                                                                                                      |                                                                     |                                                                                                                                                                                                                                                                                                  |
| Location                                                                       | Indoor/outdoor                                                                                                                                        |                                                                     |                                                                                                                                                                                                                                                                                                  |
| Installation category                                                          | II                                                                                                                                                    |                                                                     |                                                                                                                                                                                                                                                                                                  |
| Pollution degree                                                               | 4                                                                                                                                                     |                                                                     |                                                                                                                                                                                                                                                                                                  |
| <b>Medium conditions</b>                                                       |                                                                                                                                                       | <b>Optional equipment</b>                                           |                                                                                                                                                                                                                                                                                                  |
| Dielectric constant                                                            | ε <sub>r</sub> > 1.4                                                                                                                                  | Dust cap                                                            | PTFE                                                                                                                                                                                                                                                                                             |
| Process temperature range                                                      | -40 ... +200 °C (-40 ... +392 °F)                                                                                                                     | Air purge connection                                                | 1/8" NPT                                                                                                                                                                                                                                                                                         |
| Vessel pressure                                                                | 0.5 bar g (7.25 psi g) maximum                                                                                                                        |                                                                     |                                                                                                                                                                                                                                                                                                  |
| <b>Design</b>                                                                  |                                                                                                                                                       |                                                                     |                                                                                                                                                                                                                                                                                                  |
| Weight                                                                         | Approx. 6.1 kg (13.4 lb) with 3 inch universal flange                                                                                                 |                                                                     |                                                                                                                                                                                                                                                                                                  |
| Materials                                                                      |                                                                                                                                                       |                                                                     |                                                                                                                                                                                                                                                                                                  |
| • Enclosure                                                                    | Die-cast aluminum, painted                                                                                                                            |                                                                     |                                                                                                                                                                                                                                                                                                  |
| • Degree of protection                                                         | IP67/Type 4X/NEMA 4X/Type 6/NEMA 6                                                                                                                    |                                                                     |                                                                                                                                                                                                                                                                                                  |
| • Cable inlet                                                                  | 2 x M20 x 1.5 or ½" NPT                                                                                                                               |                                                                     |                                                                                                                                                                                                                                                                                                  |
| Process connections                                                            |                                                                                                                                                       |                                                                     |                                                                                                                                                                                                                                                                                                  |
| • Universal flanges, 304 stainless steel, flat faced, with integral Easy Aimer | 3 inch/80 mm, 4 inch/100 mm, 6 inch/150 mm (mates with flange EN 1092-1, ASME B16.5, or JIS B2238 bolt pattern), 0.5 bar g (7.25 psi g) max. pressure |                                                                     |                                                                                                                                                                                                                                                                                                  |

| Selection and ordering data                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     | Article No.                                    | Order code                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>SITRANS LR460 Radar level transmitter with horn</b><br>Continuous, non-contact, 100 m (328 ft) range, for challenging solids applications.<br>Click on the Article No. for the online configuration in the PIA Life Cycle Portal.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | <b>7ML5426-</b><br>0 0 0 0 0 0 0 0 0 0         | <b>Further designs</b><br>Please add "-Z" to Article No. and specify Order code(s).<br>Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]: Measuring-point number/identification (max. 27 characters); specify in plain text<br>Manufacturer's test certificate: M to DIN 55350, Part 18 and to ISO 9000                                                                                                                                                                                                                                                                                                                                                                                                                                                                               |
| <b>Process connection</b><br>Universal, flat faced, 0.5 bar g (7.25 psi g) maximum with integral Easy Aimer ball<br>3 inch (80 mm)<br>4 inch (100 mm)<br>6 inch (150 mm)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | A<br>B<br>C                                    | <b>Operating Instructions</b><br>All literature is available to download for free, in a range of languages, at<br><a href="http://www.siemens.com/processinstrumentation/documentation">http://www.siemens.com/processinstrumentation/documentation</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 |
| <b>Antenna</b><br>3" horn antenna, fits 80 mm (3 inch) nozzles<br>3" horn antenna, fits 80 mm (3 inch) nozzles with 100 mm extension<br>3" horn antenna, fits 80 mm (3 inch) nozzles with 200 mm extension<br>3" horn antenna, fits 80 mm (3 inch) nozzles with 500 mm extension <sup>1)</sup><br>3" horn antenna, fits 80 mm (3 inch) nozzles with 1 000 mm extension <sup>1)</sup><br>4" horn antenna, fits 100 mm (4 inch) nozzles<br>4" horn antenna, fits 100 mm (4 inch) nozzles with 100 mm extension<br>4" horn antenna, fits 100 mm (4 inch) nozzles with 200 mm extension<br>4" horn antenna, fits 100 mm (4 inch) nozzles with 500 mm extension <sup>1)</sup><br>4" horn antenna, fits 100 mm (4 inch) nozzles with 1 000 mm extension <sup>1)</sup> | A<br>B<br>C<br>D<br>E<br>F<br>G<br>H<br>J<br>K | <b>Accessories</b><br>Handheld programmer, Infra-red, Intrinsically Safe, EEx ia<br>Dust cap, PTFE, for 3 inch/80 mm horn<br>Dust cap, PTFE, for 4 inch/100 mm horn<br>HART modem/USB (for use with a PC and SIMATIC PDM)<br>One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART <sup>1)</sup><br>One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA <sup>1)</sup><br>SITRANS RD100, loop powered display - see Chapter 7<br>SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7<br>SITRANS RD200, universal input display with Modbus conversion - see Chapter 7<br>SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 |
| <b>Purge (self-cleaning) connection</b><br>No purge connection<br>Purge connection                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              | 0<br>1                                         | Article No.<br><b>7ML5830-2AJ</b><br><b>7ML1930-1BL</b><br><b>7ML1930-1BM</b><br><b>7MF4997-1DB</b><br><b>7ML1930-1AP</b><br><b>7ML1930-1AQ</b><br><b>7ML5741-.....-</b><br><b>7ML5742-.....-</b><br><b>7ML5740-.....-</b><br><b>7ML5744-.....-</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                     |
| <b>Output/Communication</b><br>4 ... 20 mA, HART<br>PROFIBUS PA                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 0<br>1                                         |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Power supply/cable inlet</b><br>100 ... 230 V AC<br>• 2 x M20 x 1.5<br>• 2 x ½" NPT<br>24 V DC<br>• 2 x M20 x 1.5<br>• 2 x ½" NPT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | A<br>B<br>C<br>D                               |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
| <b>Approvals</b><br>Ordinary Locations/General Purpose (Non-Ex), cCSA <sub>US</sub> , FM, IC, FCC, CE, UKCA, RED, RCM<br>CSA/FM Class II, Div. 1, Groups E, F, and G, Class III<br>ATEX II 1 D Ex ta IIIC T <sub>200</sub> 85°C Da;<br>UKEX II 1 D Ex ta IIIC T <sub>200</sub> 85°C Da;<br>IECEx SIR 06.0058X,<br>IECEx Ex ta IIIC T <sub>200</sub> 85°C Da;<br>INMETRO DNV 12.0089 X,<br>INMETRO Ex ta IIIC T <sub>200</sub> 85°C Da;<br>EAC Ex Ex ta IIIC T85°C Da X;<br>CE, UKCA, RED                                                                                                                                                                                                                                                                        | A<br>B<br>C                                    |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |

<sup>1)</sup> Available with Purge option 0 only.

## Level measurement

Continuous level measurement  
Radar level transmitters

### SITRANS LR460

#### Selection and ordering data

#### Article No.

#### Article No.

#### SITRANS LR460 Specials

##### Process connection part kits - non-pressure-rated

SITRANS LR460, 100 mm extension for horn antenna, no purge<sup>1)</sup>

**A5E01087872**

SITRANS LR460, 200 mm extension for horn antenna, no purge<sup>1)</sup>

**A5E01091262**

SITRANS LR460, 100 mm extension for horn antenna with purge<sup>1)</sup>

**A5E01261979**

SITRANS LR460, 200 mm extension for horn antenna with purge<sup>1)</sup>

**A5E01261981**

SITRANS LR460, horn 2", no purge, no emitter<sup>1)</sup>

**A5E02083905**

SITRANS LR460, horn 3", no purge, no emitter<sup>1)</sup>

**A5E01623511**

SITRANS LR460, horn 4", no purge, no emitter<sup>1)</sup>

**A5E01623512**

SITRANS LR460, horn 2", with purge, no emitter<sup>1)</sup>

**A5E02083906**

SITRANS LR460, horn 3", with purge, no emitter<sup>1)</sup>

**A5E01623513**

SITRANS LR460, horn 4", with purge, no emitter<sup>1)</sup>

**A5E01623514**

SITRANS LR460, 3" universal flat faced flange<sup>1)</sup>

**A5E02303897**

SITRANS LR460, 4" universal flat faced flange<sup>1)</sup>

**A5E01259467**

SITRANS LR460, 6" universal flat faced flange<sup>1)</sup>

**A5E01261834**

SITRANS LR460 O-Rings for Easy Aimer<sup>1)</sup>

**A5E01261836**

Kit, Emitter for LR460<sup>1)</sup>

**A5E02360694**

##### Purge conversion kit - non-pressure-rated (no flange or extension included)

SITRANS LR460 purge conversion, 2" horn<sup>1)</sup>

**A5E02083914**

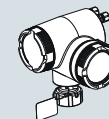
SITRANS LR460 purge conversion, 3" horn<sup>1)</sup>

**A5E02083915**

SITRANS LR460 purge conversion, 4" horn<sup>1)</sup>

**A5E02083916**

##### Enclosure with electronics (LR460)



SITRANS LR460 enclosure with board stack, HART communication, AC power, M20 cable inlet, approval option A, no process connection

**A5E02182085**

SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, AC power, M20 cable inlet, approval option A, no process connection

**A5E02212422**

SITRANS LR460 enclosure with board stack, HART communication, AC power, NPT cable inlet, approval option A, no process connection

**A5E02212423**

SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, AC power, NPT cable inlet, approval option A, no process connection

**A5E02212424**

SITRANS LR460 enclosure with board stack, HART communication, DC power, M20 cable inlet, approval option A, no process connection

**A5E02212425**

SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, DC power, M20 cable inlet, approval option A, no process connection

**A5E02212426**

SITRANS LR460 enclosure with board stack, HART communication, DC power, NPT cable inlet, approval option A, no process connection

**A5E02212428**

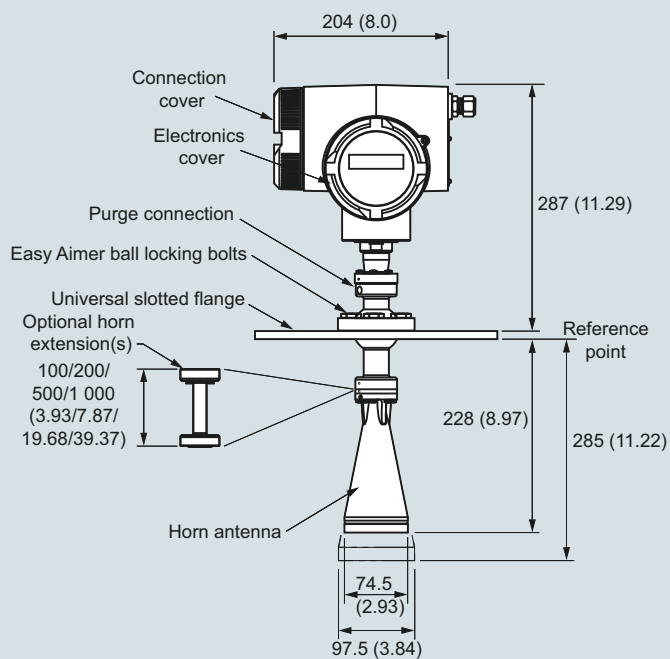
SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, DC power, NPT cable inlet, approval option A, no process connection

**A5E02212429**

<sup>1)</sup> Available with no pressure rating, 0.5 bar g maximum. Customers interested in a custom designed device should consult a local sales person. For more information, please visit [http://www.automation.siemens.com/aspa\\_app](http://www.automation.siemens.com/aspa_app).

## Dimensional drawings

SITRANS LR460 (7ML5426)



SITRANS LR460, dimensions in mm (inch)

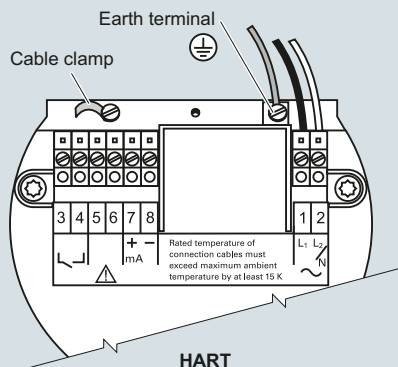
## Level measurement

Continuous level measurement  
Radar level transmitters

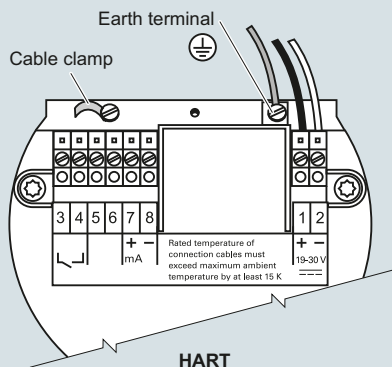
### SITRANS LR460

#### Circuit diagrams

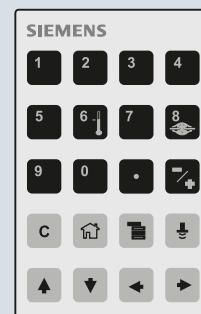
##### AC version



##### DC version

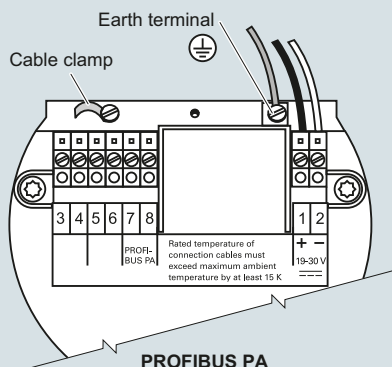
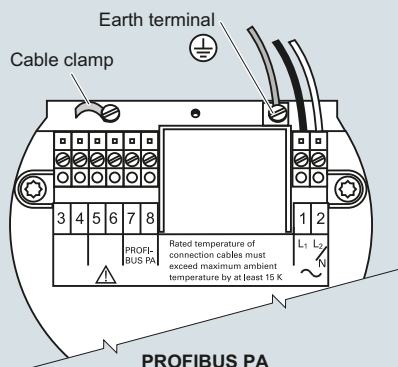


##### Hand programmer



##### SITRANS LR460

Part number:  
7ML5830-2AJ



##### Notes

- Recommended torque on terminal clamping screws, 0.5 ... 0.6 Nm
- 4 ... 20 mA, PROFIBUS PA, DC input circuits, 14 ... 20 AWG, shielded copper wire
- AC input circuit, min. 14 AWG copper wire
- All field wiring must have insulation suitable for at least 250 V
- The equipment must be protected by a 15 A fuse or circuit breaker in the building installation

SITRANS LR460 connections