

# Level Measurement

## Continuous level measurement – Radar transmitters

### SITRANS LR460

#### Overview

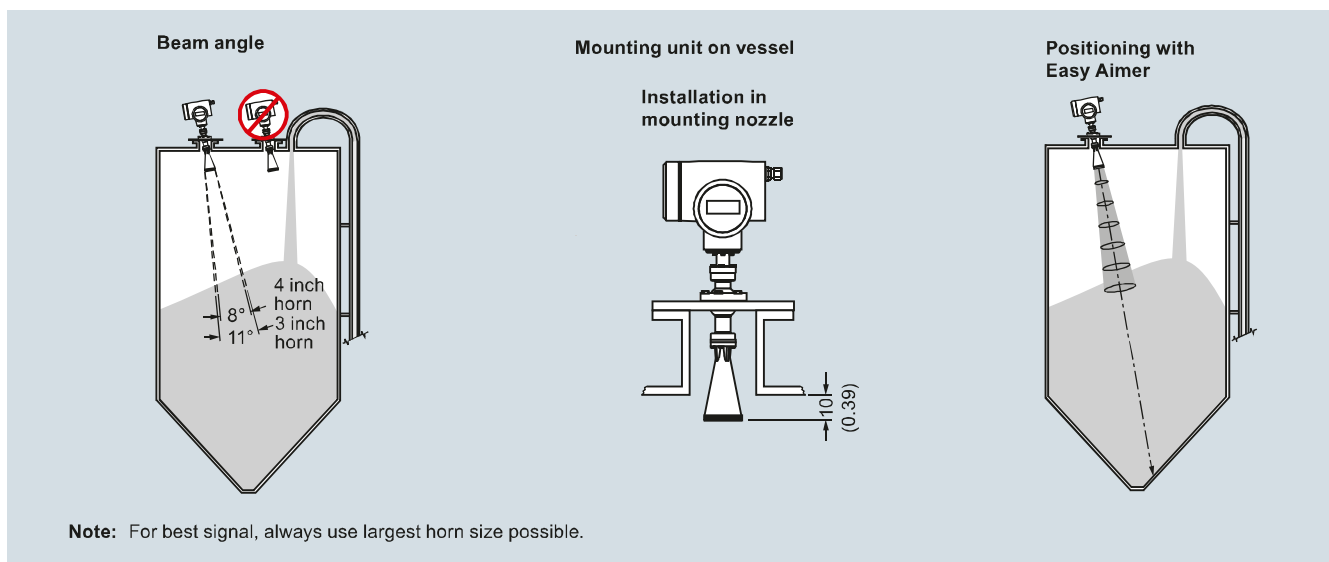


The SITRANS LR460 is a 4-wire, 24 GHz FMCW radar level transmitter with extremely high signal-to-noise ratio and advanced signal processing for continuous monitoring of solids up to 100 m (328 ft). It is ideal for measurement in extreme dust.

#### Benefits

- Process Intelligence for advanced signal processing and quick and easy adjustment
- Self-guided quick start wizard for plug and play start-up
- 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

#### Configuration



SITRANS LR460 installation, dimensions in mm (inch)

#### 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

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### 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 with ATEX II 1G EEx ia IIC T4, 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>		<b>Power supply</b>	
Analog output (HART)		Handheld communicator	HART Communicator 375
• Signal range	Optically isolated	PC	SIMATIC PDM
• Load	Max. 600 Ω	Display (local)	Alphanumeric LCD for readout and entry
• 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>Certificates and approvals</b>	
• Non-linearity	Greater of 25 mm (1 inch) or 0.25 % of span (including hysteresis and non-repeatability), over the full ambient temperature range	General	CSA <sub>US/IC</sub> , CE, FM, C-TICK
• Non-repeatability	≤ 10 mm (0.4 inch)	Radio	European Radio (R&TTE), Industry Canada, FCC, C-TICK
<b>Rated operating conditions</b>		Hazardous Areas	CSA/FM Class II, Div. 1, Groups E, F and G, Class III ATEX II 1D, 1/2 D, 2D T85 °C INMETRO ExtD A20 IP67 T85 °C GOST Ex DIP A20 T <sub>a</sub> 85 °C IP67
• Amb. temperature for enclosure	-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	$\epsilon_r > 1.4$	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	2x M20x1.5 or 1/2" 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		

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#### Selection and Ordering data

##### SITRANS LR460

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.

##### Order handheld programmer separately

##### Process connection

Universal, flat faced, 0.5 bar g (7.25 psi g) maximum with integral Easy Aimer ball

- 3 inch (80 mm)
- 4 inch (100 mm)
- 6 inch (150 mm)

##### Antenna

- 3" horn antenna, fits 80 mm (3 inch) nozzles
- 3" horn antenna, fits 80 mm (3 inch) nozzles with 100 mm extension
- 3" horn antenna, fits 80 mm (3 inch) nozzles with 200 mm extension
- 3" horn antenna, fits 80 mm (3 inch) nozzles with 500 mm extension<sup>1)</sup>
- 3" horn antenna, fits 80 mm (3 inch) nozzles with 1 000 mm extension<sup>1)</sup>
- 4" horn antenna, fits 100 mm (4 inch) nozzles
- 4" horn antenna, fits 100 mm (4 inch) nozzles with 100 mm extension
- 4" horn antenna, fits 100 mm (4 inch) nozzles with 200 mm extension
- 4" horn antenna, fits 100 mm (4 inch) nozzles with 500 mm extension<sup>1)</sup>
- 4" horn antenna, fits 100 mm (4 inch) nozzles with 1 000 mm extension<sup>1)</sup>

##### Purge (self-cleaning) connection

- No purge connection
- Purge connection

##### Output/Communication

- 4 ... 20 mA, HART
- PROFIBUS PA

##### Power supply/cable inlet

- 100 ... 230 V AC
- 2 x M20x1.5
- 2 x 1/2" NPT
- 24 V DC
- 2 x M20x1.5
- 2 x 1/2" NPT

##### Approvals

General Purpose, CSAus/c, Industry Canada, FM, FCC, CE and R&TTE, C-TICK

CSA/FM Class II, Div. 1, Groups E, F, and G, Class III

ATEX II 1/2 D T6, CE, R&TTE

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

#### Article No.

7ML5426-

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#### Selection and Ordering data

##### Further designs

Please add "-Z" to Article No. and specify Order code(s).

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)]:  
Measuring-point number/identification  
(max. 27 characters); specify in plain text

**Y15**

Manufacturer's test certificate: M to DIN 55350,  
Part 18 and to ISO 9000

**C11**

##### Operating Instructions

English

Article No.

**7ML1998-5JM02**

French

**7ML1998-5JM11**

German

**7ML1998-5JM32**

Multi-language Quick Start manual  
This device is shipped with the Siemens Milltronics  
manual DVD containing the ATEX Quick Start and  
Operating Instructions library.

**A5E32007360**

##### Accessories

Handheld programmer, Infra-red, Intrinsically Safe,  
EEx ia

**7ML5830-2AJ**

Dust cap, PTFE, for 3 inch/80 mm horn

**7ML1930-1BL**

Dust cap, PTFE, for 4 inch/100 mm horn

**7ML1930-1BM**

HART modem/RS 232  
(for use with a PC and SIMATIC PDM)

**7MF4997-1DA**

HART modem/USB  
(for use with a PC and SIMATIC PDM)

**7MF4997-1DB**

One metallic cable gland M20x1.5,  
rated -40 ... +80 °C (-40 ... +176 °F), HART<sup>1)</sup>

**7ML1930-1AP**

One metallic cable gland M20x1.5, rated  
-40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA<sup>1)</sup>

**7ML1930-1AQ**

SITRANS RD100 Remote display - see Chapter 7

SITRANS RD200 Remote display - see Chapter 7

SITRANS RD500 web, datalogging, alarming,  
ethernet, and modem support for instrumentation -  
see Chapter 7

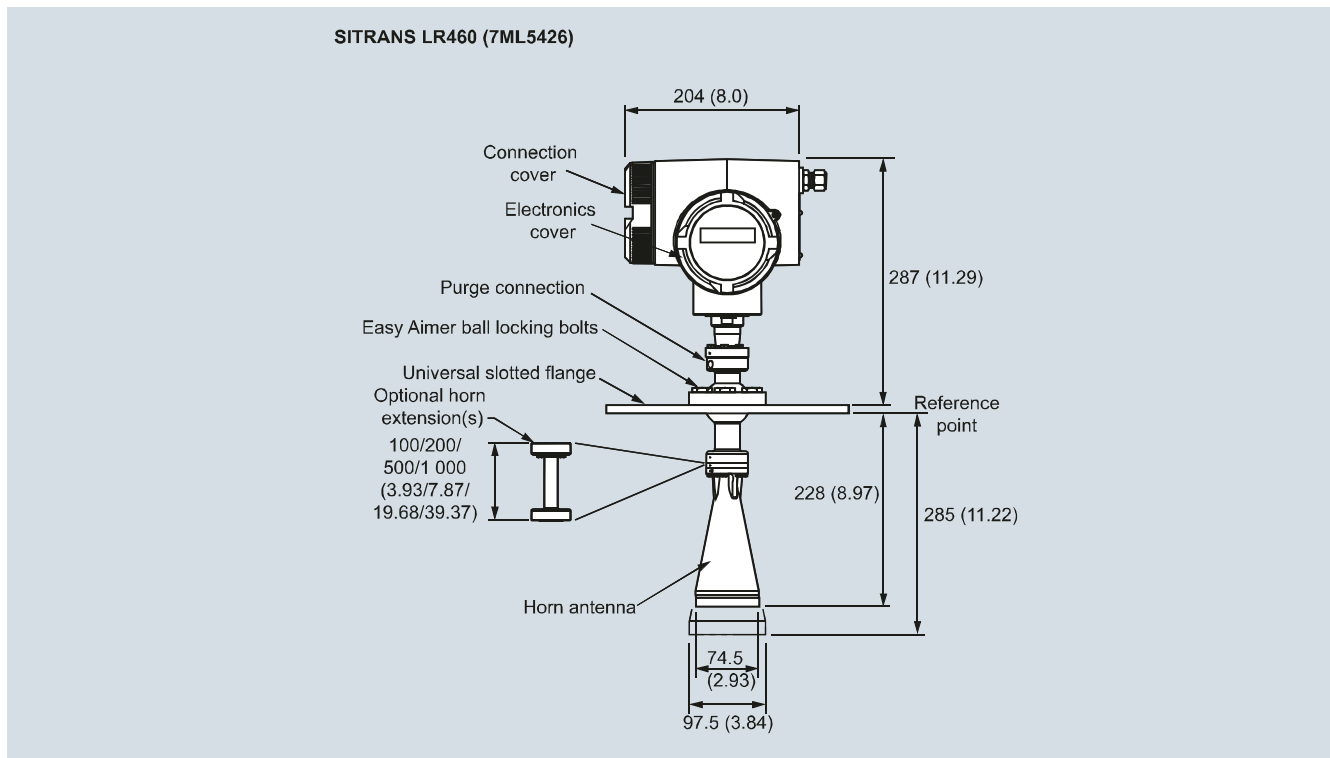
**7ML5750-  
1AA00-0**

<sup>1)</sup> Product shipped with plastic cable gland, rated to -20 °C.  
If -40 °C rating required, then metallic cable gland is recommended.

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## Dimensional drawings



SITRANS LR460, dimensions in mm (inch)

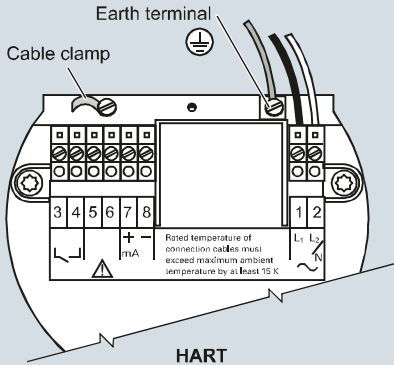
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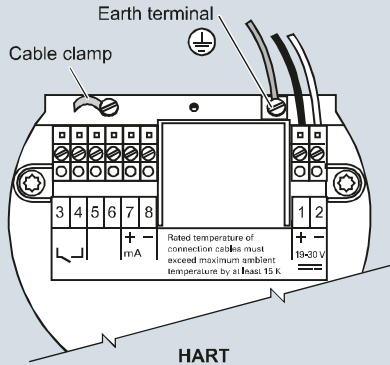
### SITRANS LR460

#### Schematics

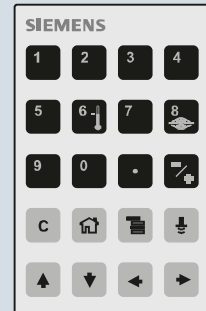
AC version



DC version

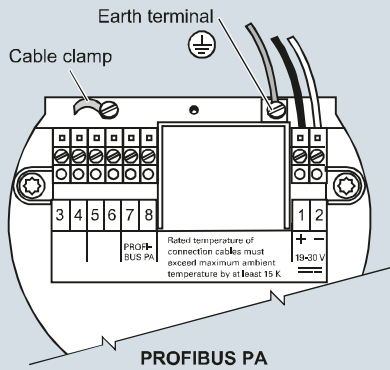
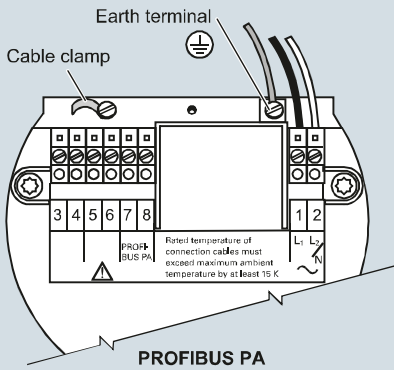


Hand programmer



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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

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