

# Level Measurement

## Continuous level measurement - Radar transmitters

SITRANS LR460

### Overview

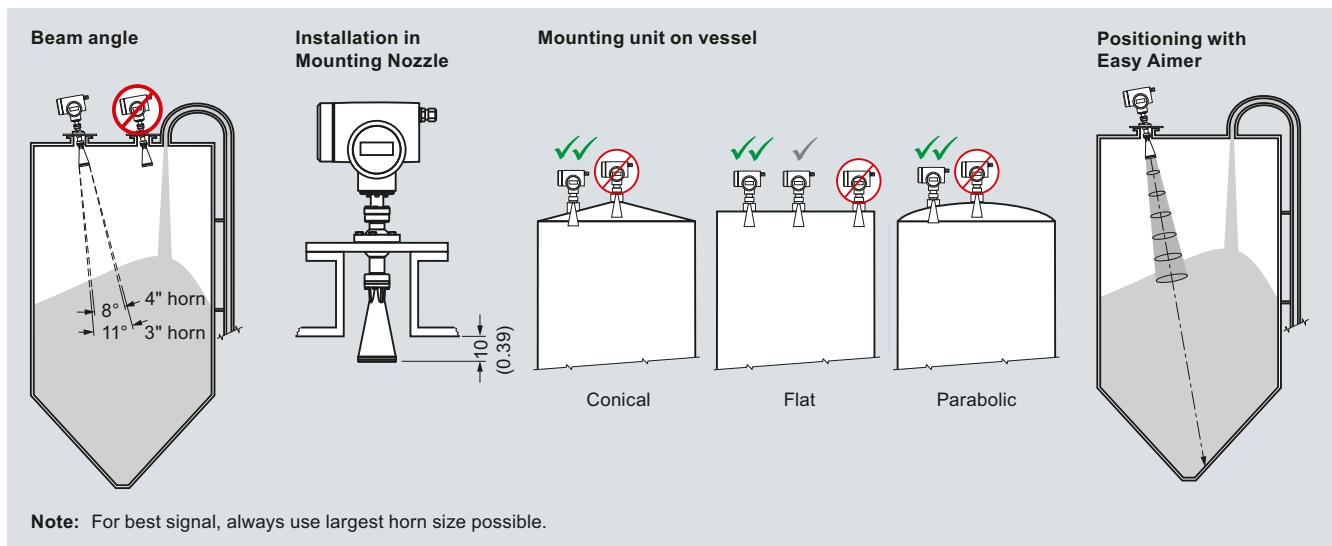


The SITRANS LR460 is a 4-wire, 24 GHz FMCW radar level transmitter with extremely high signal-to-noise ratio and advanced signal processing for continuous monitoring of solids up to 100 m (328 ft). It is ideal for measurement in extreme dust.

### 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 Intrinsicly 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 Intrinsicly 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	<ul style="list-style-type: none"> <li>Approvals for handheld programmer</li> </ul>	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>		Handheld communicator	HART Communicator 375
Analog output (HART)		PC	SIMATIC PDM
<ul style="list-style-type: none"> <li>Signal range</li> <li>Load</li> <li>Fail-safe</li> </ul>	Optically isolated Max. 600 Ω mA signal programmable as high, low or hold (LOE)	Display (local)	Alphanumeric LCD for readout and entry
Communication	HART, optional PROFIBUS PA	<b>Power supply</b>	
Digital output	Relay, NC or NO function, max. 50 V DC, max. 200 mA, rating 5 W	100 ... 230 V AC ±15 % (50/60 Hz), 6 W (12 VA) or 24 V DC +25/-20 %, 6 W (optional)	
PROFIBUS PA protocol	Layer 1 and 2, Class A, Profile 3.01	<b>Certificates and approvals</b>	
<b>Performance (Reference conditions according to IEC 60770-1)</b>		General	CSA <sub>US/C</sub> , CE, FM, C-TICK
Non-linearity	Greater of 25 mm (1") or 0.25 % of span (including hysteresis and non-repeatability), over the full ambient temperature range	Radio	European Radio (R&TTE), Industry Canada, FCC, C-TICK
Non-repeatability	≤ 10 mm (0.4")	Hazardous Areas	CSA/FM Class II, Div. 1, Groups E, F and G, Class III ATEX II 1D, 1/2 D, 2D T85 °C
<b>Rated operating conditions</b>		<b>Optional equipment</b>	
Amb. temperature for enclosure	-40 ... +65 °C (-40 ... +149 °F)	Dust cap	PTFE
Location	Indoor/outdoor	Air purge connection	1/8" NPT
Installation category	II		
Pollution degree	4		
<b>Medium conditions</b>			
Dielectric constant	$\epsilon_r > 1.4$		
Process temperature range	-40 ... +200 °C (-40 ... +392 °F)		
Vessel pressure	0.5 bar g (7.25 psi g) maximum		
<b>Design</b>			
Weight	Approx. 6.1 kg (13.4 lbs) with 3" universal flange		
Materials			
<ul style="list-style-type: none"> <li>Enclosure</li> <li>Degree of protection</li> <li>Cable inlet</li> </ul>	Die-cast aluminum, painted IP67/Type 4X/NEMA 4X/Type 6/NEMA 6 2x M20x1.5 or 1/2" NPT		
Process connections			
<ul style="list-style-type: none"> <li>Universal flanges, 316L stainless steel, flat faced, with integral Easy Aimer</li> </ul>	3"/80 mm, 4"/100 mm, 6"/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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SITRANS LR460

Selection and Ordering data	Order No.	Selection and Ordering data	Order code
<b>SITRANS LR460</b> 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. <b>Order handheld programmer separately!</b>	L) 7 ML 5 4 2 6 - 0 - 0 - 0	<b>Further designs</b> Please add "-Z" to Order No. and specify Order code(s). Stainless steel tag [69 x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text Test certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	Y15 C11
<b>Process connection</b> Universal, flat faced, 0.5 bar g (7.25 psi g) maximum with integral Easy Aimer ball 3" (80 mm) 4" (100 mm) 6" (150 mm)	A B C	<b>Operating Instructions</b> English French German Multi-language Quick Start manual This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.	Order No. C) 7ML1998-5JM02 C) 7ML1998-5JM11 C) 7ML1998-5JM32 C) 7ML1998-5QW82
<b>Antenna</b> 3" horn antenna, fits 80 mm (3") nozzles 3" horn antenna, fits 80 mm (3") nozzles with 100 mm extension 3" horn antenna, fits 80 mm (3") nozzles with 200 mm extension 3" horn antenna, fits 80 mm (3") nozzles with 500 mm extension <sup>1)</sup> 3" horn antenna, fits 80 mm (3") nozzles with 1000 mm extension <sup>1)</sup> 4" horn antenna, fits 100 mm (4") nozzles 4" horn antenna, fits 100 mm (4") nozzles with 100 mm extension 4" horn antenna, fits 100 mm (4") nozzles with 200 mm extension 4" horn antenna, fits 100 mm (4") nozzles with 500 mm extension <sup>1)</sup> 4" horn antenna, fits 100 mm (4") nozzles with 1000 mm extension <sup>1)</sup>	A B C D E F G H J K	<b>Accessories</b> Handheld programmer, Infra-red, Intrinsically Safe, EEx ia Dust cap, PTFE, for 3"/80 mm horn Dust cap, PTFE, for 4"/100 mm horn HART <sup>®</sup> modem/RS-232 (for use with a PC and SIMATIC PDM) HART <sup>®</sup> modem/USB (for use with a PC and SIMATIC PDM) One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART <sup>®</sup> <sup>1)</sup> One metallic cable gland M20x1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA <sup>1)</sup>	7ML5830-2AJ 7ML1930-1BL 7ML1930-1BM D) 7MF4997-1DA D) 7MF4997-1DB 7ML1930-1AP 7ML1930-1AQ
<b>Purge (self-cleaning) connection</b> No purge connection Purge connection	0 1	SITRANS RD100 Remote display - see Chapter 8 SITRANS RD200 Remote display - see Chapter 8 SITRANS RD500 Remote display - see Chapter 8	
<b>Output/Communication</b> 4 ... 20 mA, HART <sup>®</sup> PROFIBUS PA	0 1		
<b>Power supply/cable inlet</b> 100 ... 230 V AC • 2 x M20x1.5 • 2 x ½" NPT 24 V DC • 2 x M20x1.5 • 2 x ½" NPT	A B C D		
<b>Approvals</b> 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	A B C		

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

L) Subject to export regulations AL: N, ECCN: 3A991X

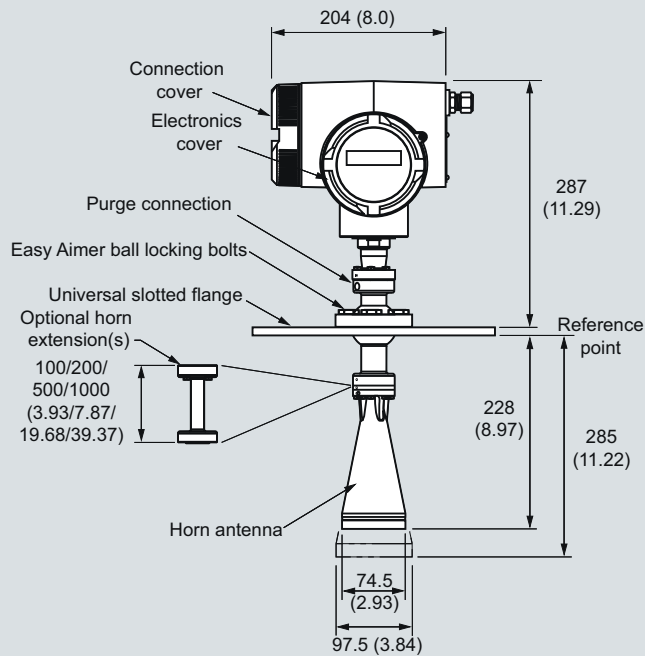
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### SITRANS LR460

#### Dimensional drawings

SITRANS LR460 (7ML5426)



SITRANS LR460, dimensions in mm (inch)

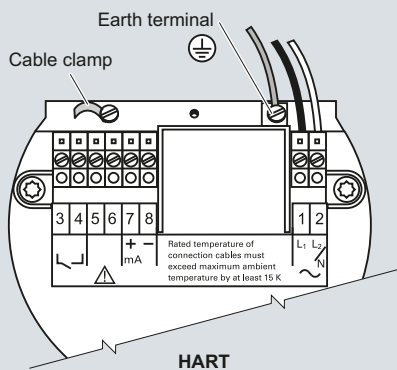
# Level Measurement

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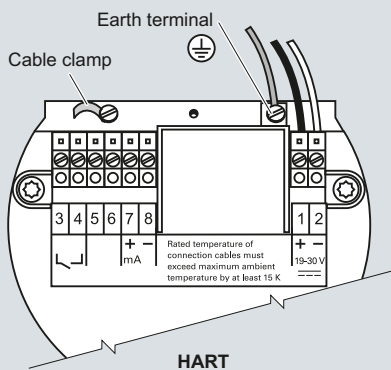
SITRANS LR460

### Schematics

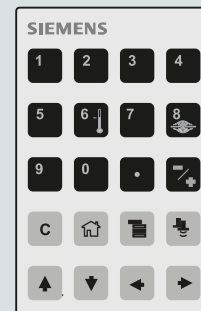
AC version



DC version

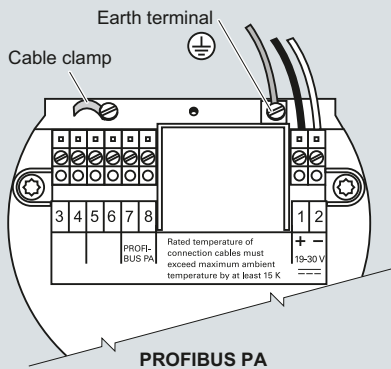
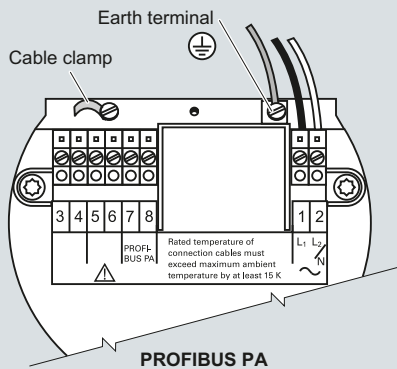


Hand Programmer



SITRANS LR460

Part number:  
7ML5830-2AJ



**Note:**

- Recommended torque on terminal clamping screws, 0.5 to 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


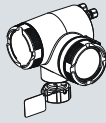
SITRANS LR460 connections

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### SITRANS LR260/LR460 Specials

SITRANS LR260/LR460 Specials	Order No.
<b>Process connection part kits - non-pressure-rated</b>	
LR260/LR460, 100 mm extension for horn antenna, no purge <sup>1)</sup>	<b>A5E01087872</b>
LR260/LR460, 200 mm extension for horn antenna, no purge <sup>1)</sup>	<b>A5E01091262</b>
LR260/LR460, 100 mm extension for horn antenna with purge <sup>1)</sup>	<b>A5E01261979</b>
LR260/LR460, 200 mm extension for horn antenna with purge <sup>1)</sup>	<b>A5E01261981</b>
LR260/LR460, horn 2", no purge, no emitter <sup>1)</sup>	<b>A5E02083905</b>
LR260/LR460, horn 3", no purge, no emitter <sup>1)</sup>	<b>A5E01623511</b>
LR260/LR460, horn 4", no purge, no emitter <sup>1)</sup>	<b>A5E01623512</b>
LR260/LR460, horn 2", with purge, no emitter <sup>1)</sup>	<b>A5E02083906</b>
LR260/LR460, horn 3", with purge, no emitter <sup>1)</sup>	<b>A5E01623513</b>
LR260/LR460, horn 4", with purge, no emitter <sup>1)</sup>	<b>A5E01623514</b>
LR260/LR460, 3" universal flat faced flange <sup>1)</sup>	<b>A5E02303897</b>
LR260/LR460, 4" universal flat faced flange <sup>1)</sup>	<b>A5E01259467</b>
LR260/LR460, 6" universal flat faced flange <sup>1)</sup>	<b>A5E01261834</b>
LR260/LR460 O-rings for Easy Aimer <sup>1)</sup>	F) <b>A5E01261836</b>
Kit, Emitter for LR260/LR460 <sup>1)</sup>	<b>A5E02360694</b>
LR260 lid with O-ring	<b>A5E02465410</b>
<b>Purge conversion kit - non-pressure-rated (no flange or extension included)</b>	
LR260/LR460 purge conversion, 2" horn <sup>1)</sup>	<b>A5E02083914</b>
LR260/LR460 purge conversion, 3" horn <sup>1)</sup>	<b>A5E02083915</b>
LR260/LR460 purge conversion, 4" horn <sup>1)</sup>	<b>A5E02083916</b>

SITRANS LR260/LR460 Specials	Order No.
<b>Enclosure with electronics</b>	
	
LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option A, no process connection	C) <b>A5E02203605</b>
LR260 enclosure with board stack, PROFIBUS PA communication, M20 cable inlet, approval option A, no process connection	C) <b>A5E02213423</b>
LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option A, no process connection	C) <b>A5E02165924</b>
LR260 enclosure with board stack, PROFIBUS PA communication, NPT cable inlet, approval option A, no process connection	C) <b>A5E02213428</b>
<b>Enclosure with electronics (LR460)</b>	
	
LR460 enclosure with board stack, HART communication, AC power, M20 cable inlet, approval option A, no process connection	L) <b>A5E02182085</b>
LR460 enclosure with board stack, PROFIBUS PA communication, AC power, M20 cable inlet, approval option A, no process connection	C) <b>A5E02212422</b>
LR460 enclosure with board stack, HART communication, AC power, NPT cable inlet, approval option A, no process connection	L) <b>A5E02212423</b>
LR460 enclosure with board stack, PROFIBUS PA communication, AC power, NPT cable inlet, approval option A, no process connection	L) <b>A5E02212424</b>
LR460 enclosure with board stack, HART communication, DC power, M20 cable inlet, approval option A, no process connection	L) <b>A5E02212425</b>
LR460 enclosure with board stack, PROFIBUS PA communication, DC power, M20 cable inlet, approval option A, no process connection	L) <b>A5E02212426</b>
LR460 enclosure with board stack, HART communication, DC power, NPT cable inlet, approval option A, no process connection	L) <b>A5E02212428</b>
LR460 enclosure with board stack, PROFIBUS PA communication, DC power, NPT cable inlet, approval option A, no process connection	L) <b>A5E02212429</b>

<sup>1)</sup> Available with no pressure rating, 0.5 bar g maximum.

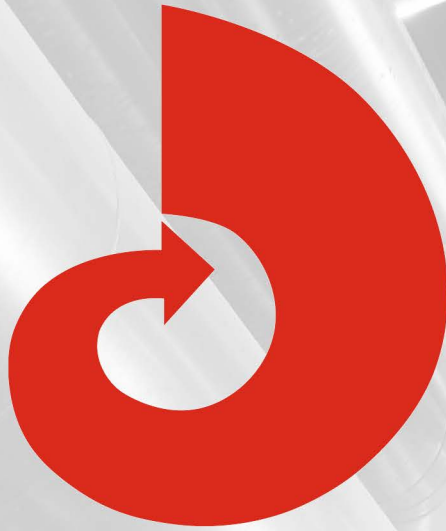
Please contact [nacc.smpi@siemens.com](mailto:nacc.smpi@siemens.com) for special requests.

C) Subject to export regulations AL: N, ECCN: EAR99

F) Subject to export regulations AL: 91999, ECCN: N

L) Subject to export regulations AL: N, ECCN: 3A991X

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