

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 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.

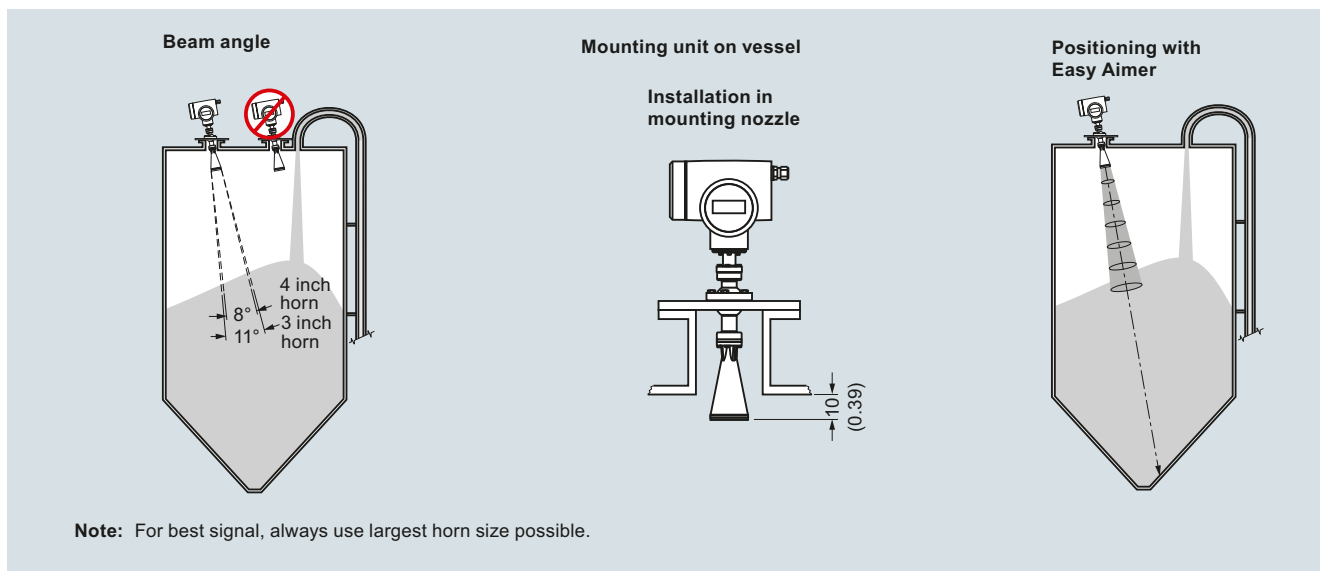
An optional dust cap is available for sticky solids. Optional air purging is also available for extremely sticky applications.

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



SITRANS LR460 installation, dimensions in mm (inch)

Technical specifications

Mode of operation	
Measuring principle	FMCW radar level measurement
Frequency	24.2 ... 25.2 GHz FMCW
Measuring range	0.35 ... 100 m (1.15 ... 328.08 ft)
Output	
Analog output (HART)	
• Signal range	Optically isolated
• 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
Performance (Reference conditions according to IEC 60770-1)	
Non-linearity	Greater of 25 mm (1 inch) or 0.25 % of span (including hysteresis and non-repeatability), over the full ambient temperature range
Non-repeatability	≤ 10 mm (0.4 inch)
Rated operating conditions	
Amb. temperature for enclosure	-40 ... +65 °C (-40 ... +149 °F)
Location	Indoor/outdoor
Installation category	II
Pollution degree	4
Medium conditions	
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
Design	
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

Programming	
Intrinsically Safe Siemens handheld programmer (ordered separately)	Infrared receiver
• Approvals for handheld programmer	IS model: 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)
Handheld communicator	HART Communicator 375
PC	SIMATIC PDM
Display (local)	Alphanumeric LCD for readout and entry
Power supply	
	100 ... 230 V AC ± 15 % (50/60 Hz), 6 W (12 VA)
	or
	24 V DC +25/-20 %, 6 W (optional)
Certificates and approvals	
General	CSA _{US/C} , CE, FM, RCM
Radio	European Radio (RED), Industry Canada, FCC, RCM
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 EAC Ex DIP A20 T _a 85 °C IP67
Optional equipment	
Dust cap	PTFE
Air purge connection	1/8" NPT

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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

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

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 extension¹⁾
3" horn antenna, fits 80 mm (3 inch) nozzles with 1 000 mm extension¹⁾
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 extension¹⁾
4" horn antenna, fits 100 mm (4 inch) nozzles with 1 000 mm extension¹⁾

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 M20 x 1.5
• 2 x 1/2" NPT
24 V DC
• 2 x M20 x 1.5
• 2 x 1/2" NPT

Approvals

General Purpose, CSAus/c, Industry Canada, FM, FCC, CE, RED, RCM
CSA/FM Class II, Div. 1, Groups E, F, and G, Class III
ATEX II 1/2 D T6, CE, RED

¹⁾ Available with Purge option 0 only

Article No.

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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

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

Operating Instructions

All literature is available to download for free, in a range of languages, at <http://www.siemens.com/processinstrumentation/documentation>

Accessories

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

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

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

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

One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), HART¹⁾

One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F), PROFIBUS PA¹⁾

SITRANS RD100, loop powered display - see Chapter 7

SITRANS RD200, universal input display with Modbus conversion - see Chapter 7

SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7

SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7

For applicable back up point level switch - see point level measurement section

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

Order code

Y15

C11

Article No.

7ML5830-2AJ

7ML1930-1BL

7ML1930-1BM

7MF4997-1DB

7ML1930-1AP

7ML1930-1AQ

7ML5741-...

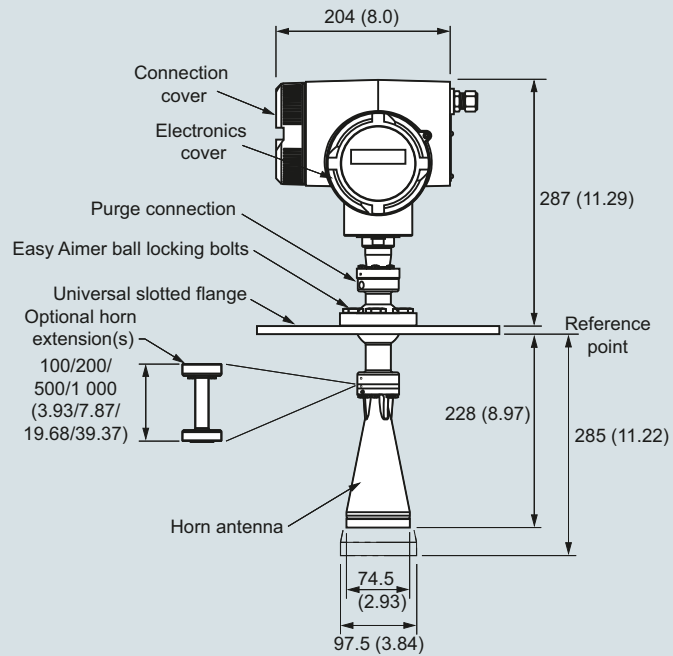
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Dimensional drawings

SITRANS LR460 (7ML5426)



SITRANS LR460, dimensions in mm (inch)

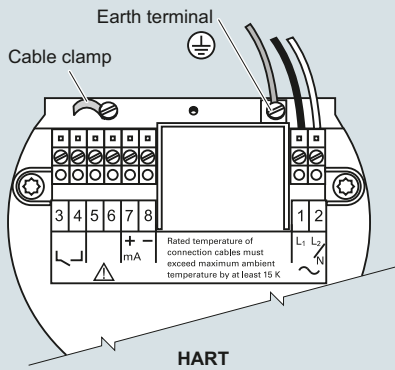
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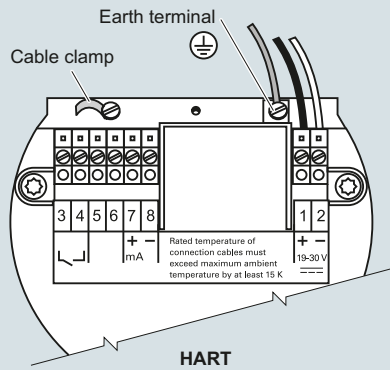
SITRANS LR460

Circuit diagrams

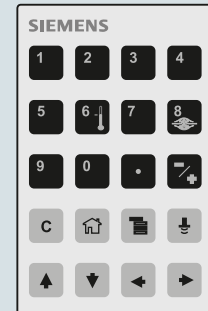
AC version



DC version

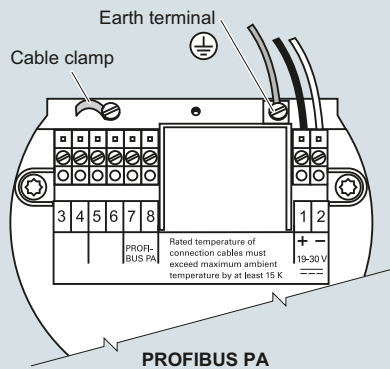
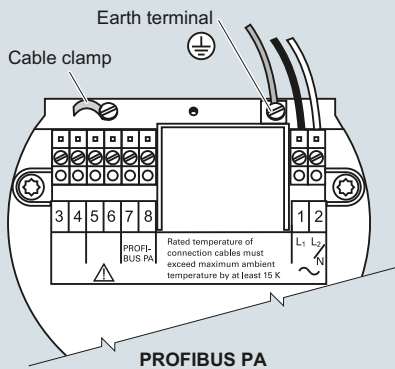


Hand programmer



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

Selection and ordering data

SITRANS LR260/LR460 Specials	Article No.	SITRANS LR260/LR460 Specials	Article No.
NOTE: LR260 head can be supplied with any LR250 process connection or antenna as special order. For LR250, this means a stronger signal and longer measurement range is possible.		SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, NPT cable inlet, approval option A, no process connection	A5E02213428
Process connection part kits - non-pressure-rated		SITRANS LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option D, no process connection	A5E03934184
SITRANS LR260/LR460, 100 mm extension for horn antenna, no purge ¹⁾	A5E01087872	SITRANS LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option E, no process connection	A5E03934187
SITRANS LR260/LR460, 200 mm extension for horn antenna, no purge ¹⁾	A5E01091262	SITRANS LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option F, no process connection	A5E03934191
SITRANS LR260/LR460, 100 mm extension for horn antenna with purge ¹⁾	A5E01261979	SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, M20 cable inlet, approval option E, no process connection	A5E37217558
SITRANS LR260/LR460, 200 mm extension for horn antenna with purge ¹⁾	A5E01261981	SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, ½" NPT cable inlet, approval option F, no process connection	A5E31820689
SITRANS LR260/LR460, horn 2", no purge, no emitter ¹⁾	A5E02083905	Sun shield for SITRANS LR260 enclosure, stainless steel	
SITRANS LR260/LR460, horn 3", no purge, no emitter ¹⁾	A5E01623511	A5E39142556	
SITRANS LR260/LR460, horn 4", no purge, no emitter ¹⁾	A5E01623512	Enclosure with electronics (LR460)	
SITRANS LR260/LR460, horn 2", with purge, no emitter ¹⁾	A5E02083906	SITRANS LR460 enclosure with board stack, HART communication, AC power, M20 cable inlet, approval option A, no process connection	A5E02182085
SITRANS LR260/LR460, horn 3", with purge, no emitter ¹⁾	A5E01623513	SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, AC power, M20 cable inlet, approval option A, no process connection	A5E02212422
SITRANS LR260/LR460, horn 4", with purge, no emitter ¹⁾	A5E01623514	SITRANS LR460 enclosure with board stack, HART communication, AC power, NPT cable inlet, approval option A, no process connection	A5E02212423
SITRANS LR260/LR460, 3" universal flat faced flange ¹⁾	A5E02303897	SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, AC power, NPT cable inlet, approval option A, no process connection	A5E02212424
SITRANS LR260/LR460, 4" universal flat faced flange ¹⁾	A5E01259467	SITRANS LR460 enclosure with board stack, HART communication, DC power, M20 cable inlet, approval option A, no process connection	A5E02212425
SITRANS LR260/LR460, 6" universal flat faced flange ¹⁾	A5E01261834	SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, DC power, M20 cable inlet, approval option A, no process connection	A5E02212426
SITRANS LR260/LR460 O-rings for Easy Aimer ¹⁾	A5E01261836	SITRANS LR460 enclosure with board stack, HART communication, DC power, NPT cable inlet, approval option A, no process connection	A5E02212428
Kit, Emitter for LR260/LR460 ¹⁾	A5E02360694	SITRANS LR460 enclosure with board stack, PROFIBUS PA communication, DC power, NPT cable inlet, approval option A, no process connection	A5E02212429
SITRANS LR260 lid with O-ring	A5E02465410	SITRANS LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option A, no process connection	
Purge conversion kit – non-pressure-rated (no flange or extension included)		SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, M20 cable inlet, approval option A, no process connection	
SITRANS LR260/LR460 purge conversion, 2" horn ¹⁾	A5E02083914	SITRANS LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option A, no process connection	
SITRANS LR260/LR460 purge conversion, 3" horn ¹⁾	A5E02083915		
SITRANS LR260/LR460 purge conversion, 4" horn ¹⁾	A5E02083916		
Enclosure with electronics (LR260)			
SITRANS LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option A, no process connection	A5E02203605		
SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, M20 cable inlet, approval option A, no process connection	A5E02213423		
SITRANS LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option A, no process connection	A5E02165924		

¹⁾ 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.