

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 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

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.

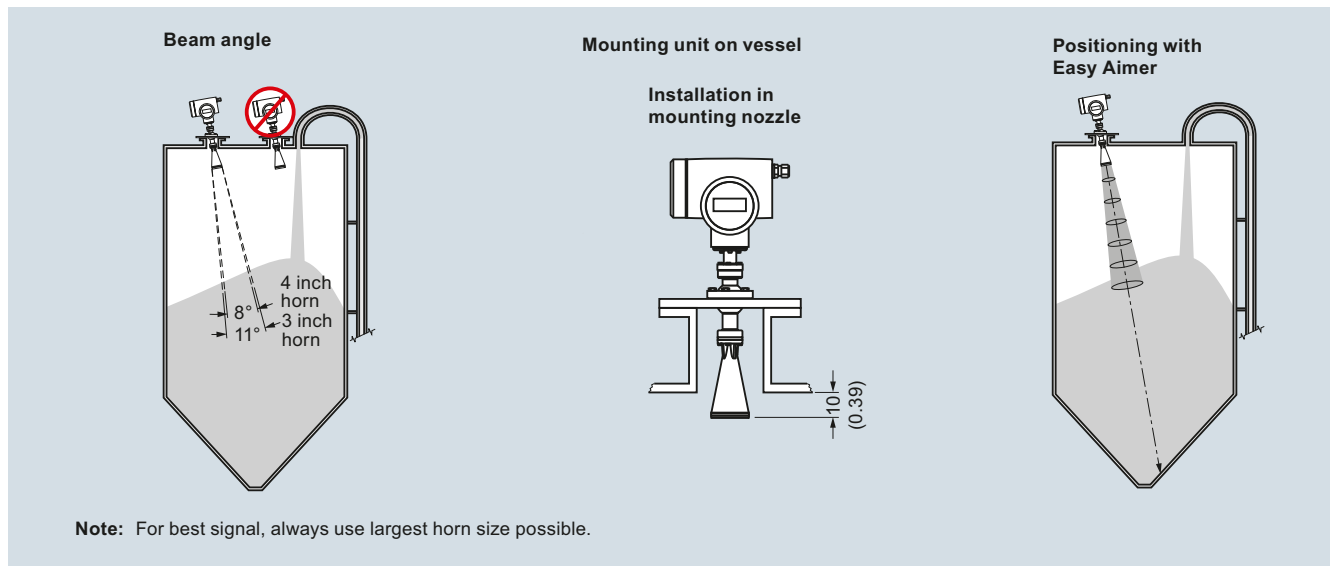
An optional dust cap is available for sticky solids. Optional air purging is also available for extremely sticky applications.

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		Programming	
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: 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)	Handheld communicator	HART Communicator 375
Output		PC	SIMATIC PDM
Analog output (HART)		Display (local)	Alphanumeric LCD for readout and entry
• Signal range	Optically isolated	Power supply	
• Load	Max. 600 Ω	100 ... 230 V AC ± 15 % (50/60 Hz), 6 W (12 VA)	
• Fail-safe	mA signal programmable as high, low or hold (LOE)	or	
Communication	HART, optional PROFIBUS PA	24 V DC +25/-20 %, 6 W (optional)	
Digital output	Relay, NC or NO function, max. 50 V DC, max. 200 mA, rating 5 W	Certificates and approvals	
PROFIBUS PA protocol	Layer 1 and 2, Class A, Profile 3.01	General	CSA _{US/C} , CE, FM, RCM
Performance (Reference conditions according to IEC 60770-1)		Radio	European Radio (R&TTE), Industry Canada, FCC, RCM
Non-linearity	Greater of 25 mm (1 inch) or 0.25 % of span (including hysteresis and non-repeatability), over the full ambient temperature range	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
Non-repeatability	≤ 10 mm (0.4 inch)	Optional equipment	
Rated operating conditions		Dust cap	PTFE
Amb. temperature for enclosure	-40 ... +65 °C (-40 ... +149 °F)	Air purge connection	1/8" NPT
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 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

➤ 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 ½" NPT
- 24 V DC
- 2 x M20 x 1.5
- 2 x ½" NPT

Approvals

- General Purpose, CSAUs/c, Industry Canada, FM, FCC, CE and R&TTE, RCM
- CSA/FM Class II, Div. 1, Groups E, F, and G, Class III
- ATEX II 1/2 D T6, CE, R&TTE

¹⁾ 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

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

Operating Instructions

- English
- German

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

This device is shipped with the Siemens Level and Weighing manual DVD containing the ATEX Quick Start and Operating Instructions library.

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.

7ML1998-5JM02

7ML1998-5JM32

7ML5830-2AJ

7ML1930-1BL

7ML1930-1BM

7MF4997-1DB

7ML1930-1AP

7ML1930-1AQ

7ML5741-...

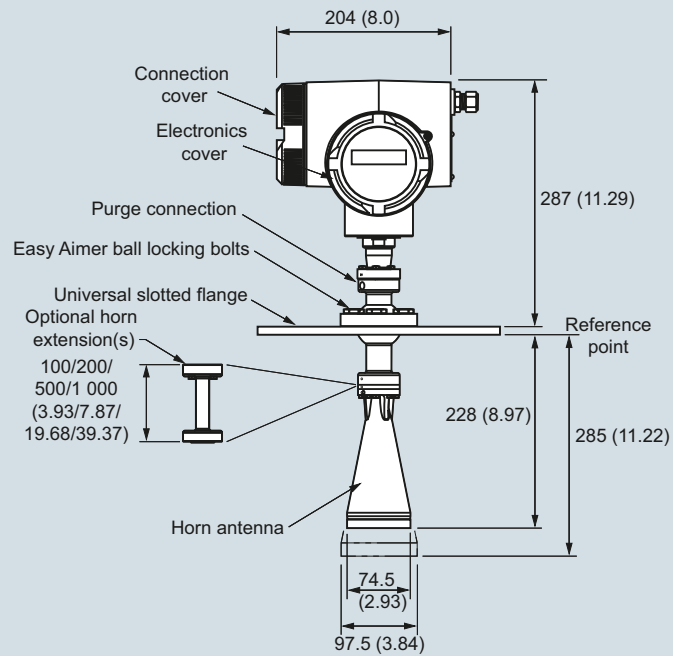
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Dimensional drawings

SITRANS LR460 (7ML5426)



SITRANS LR460, dimensions in mm (inch)

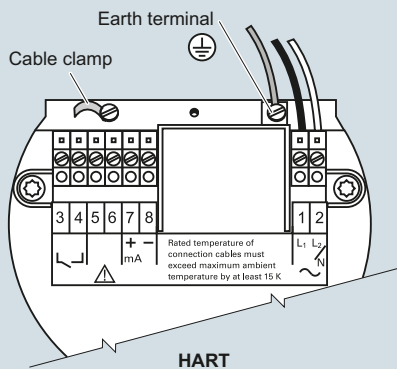
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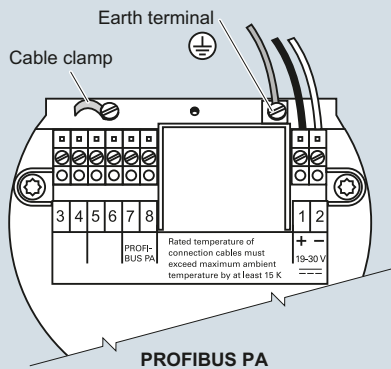
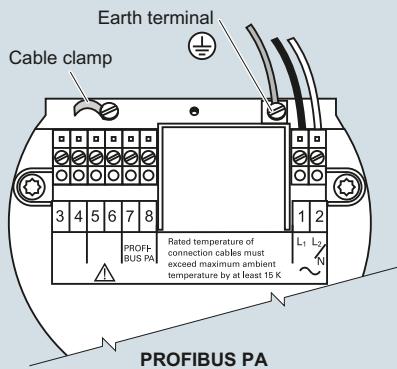
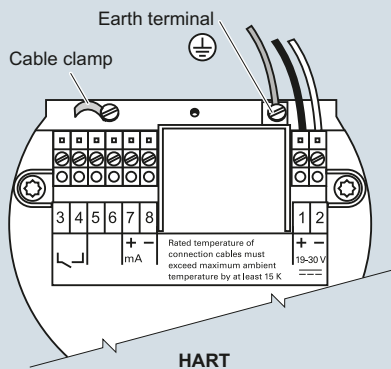
SITRANS LR460

Schematics

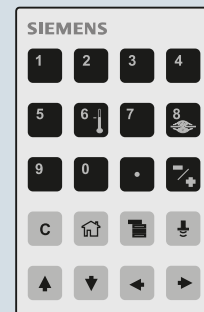
AC version



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

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Selection and ordering data

SITRANS LR260/LR460 Specials		SITRANS LR260/LR460 Specials	
	Article No.		Article No.
Process connection part kits - non-pressure-rated			
SITRANS LR260/LR460, 100 mm extension for horn antenna, no purge ¹⁾	A5E01087872	SITRANS LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option D, no process connection	A5E03934184
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 E, no process connection	A5E03934187
SITRANS LR260/LR460, 100 mm extension for horn antenna with purge ¹⁾	A5E01261979	SITRANS LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option F, no process connection	A5E03934191
SITRANS LR260/LR460, 200 mm extension for horn antenna with purge ¹⁾	A5E01261981	SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, M20 cable inlet, approval option E, no process connection	A5E37217558
SITRANS LR260/LR460, horn 2", no purge, no emitter ¹⁾	A5E02083905	SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, M20 cable inlet, approval option F, no process connection	A5E31820689
SITRANS LR260/LR460, horn 3", no purge, no emitter ¹⁾	A5E01623511	Enclosure with electronics (LR460)	
SITRANS LR260/LR460, horn 4", no purge, no emitter ¹⁾	A5E01623512		
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		
Purge conversion kit – non-pressure-rated (no flange or extension included)			
SITRANS LR260/LR460 purge conversion, 2" horn ¹⁾	A5E02083914	SITRANS LR260 enclosure with board stack, HART communication, M20 cable inlet, approval option A, no process connection	A5E02203605
SITRANS LR260/LR460 purge conversion, 3" horn ¹⁾	A5E02083915	SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, M20 cable inlet, approval option A, no process connection	A5E02213423
SITRANS LR260/LR460 purge conversion, 4" horn ¹⁾	A5E02083916	SITRANS LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option A, no process connection	A5E02165924
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	A5E02213428
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
SITRANS LR260 enclosure with board stack, HART communication, NPT cable inlet, approval option A, no process connection	A5E02165924	SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, NPT cable inlet, approval option A, no process connection	A5E02213428
SITRANS LR260 enclosure with board stack, PROFIBUS PA communication, NPT cable inlet, approval option A, no process connection	A5E02213428		

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.