

SITRANS L Level instruments

Continuous level measurement - Radar transmitters

SITRANS LR 460

Overview



The SITRANS LR 460 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

Application

SITRANS LR 460 provides excellent results even during conditions of extreme dust. The integral Easy Aimer included on the SITRANS LR 460 allows for easy positioning for optimum measurement on solids.

Process Intelligence onboard SITRANS LR 460 means advanced signal processing is harnessed for reliable operation on both simple and difficult solids application.

SITRANS LR 460 features a robust enclosure, flange and horn components. It is virtually unaffected by atmospheric or temperature conditions within the vessel.

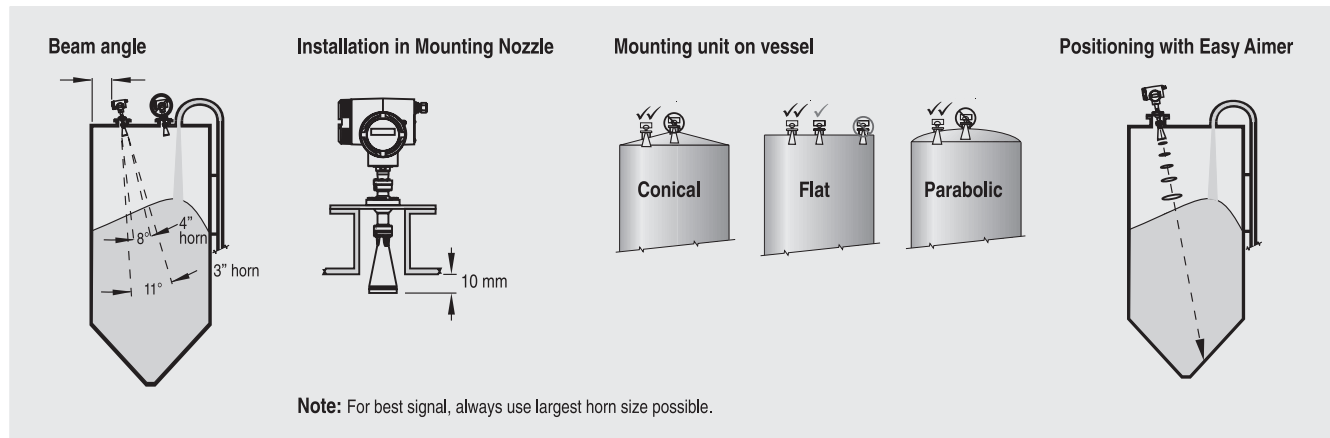
An optional dust cap is available for sticky solids. Optional air purging is also available for extremely sticky applications.

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 LR 460 installation

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Technical specifications

Mode of operation

Measuring principle	FMCW radar level measurement
Frequency	24.2 to 25.2 GHz FMCW
Measuring range	0.35 to 100 m (1.15 to 328.08 ft)

Output

Analog output (HART)	
• Signal range	Optically isolated 4 to 20 mA
• 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 (pending)	
	Layer 1 and 2, Class A, Profile 3.01

Performance (Reference conditions according to IEC 60770-1)

• Non-linearity	greater of 25 mm (1") or 0.25% of span
• Non- repeatability	≤ 10 mm (0.4")

Rated operating conditions

• Amb. temperature for enclosure	-40 to +65 °C (-40 to +149 °F)
• Location	Indoor/outdoor
• Installation category	II
• Pollution degree	4

Medium conditions

Dielectric constant	$\epsilon_r > 1.4$
Process temperature range	-40 to +200 °C (-40 to +392 °F)
Vessel Pressure	0.5 bar (7.25 psi) maximum

Design

Weight	Approx. 6.1 kg (13.4 lbs) with 3" universal flange
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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, 316L stainless steel, flat faced, with integral Easy Aimer	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 (7.25 psi) max. pressure
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Programming

Intrinsically Safe Siemens Milltronics handheld programmer (ordered separately)	Infrared receiver
- 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 @ 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 to 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
• Radio	European Radio (R&TTE), Industry Canada, FCC
• Hazardous Areas	CSA/FM Class II, Div. 1, Groups E, F and G, Class III ATEX II 1D, 1/2 D, 2D T85°C

Optional equipment

Dust cap	PTFE
Air purge connection	1/8" NPT

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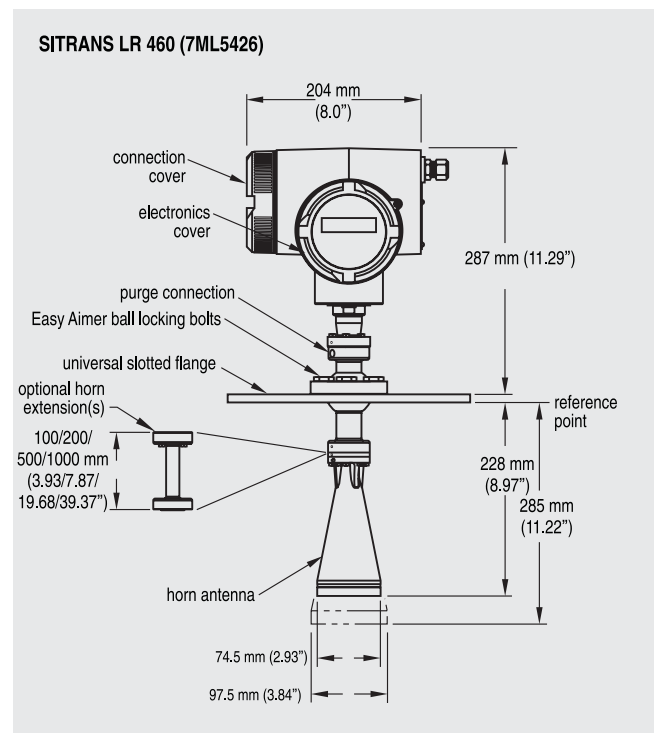
SITRANS LR 460

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Selection and Ordering data	Order No.
SITRANS LR 460	C) 7ML5426 -
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); ideal for measurement in extreme dust.	0 0 - 0 0
Order handheld programmer separately!	
Process connection	
Universal, flat faced, 0.5 bar (7.25 psi) maximum, with integral Easy Aimer ball	
3" (80 mm)	A
4" (100 mm)	B
6" (150 mm)	C
Antenna	
3" horn antenna, fits 80 mm (3") nozzles	A
3" horn antenna, fits 80 mm(3") nozzles with 100 mm extension	B
3" horn antenna, fits 80 mm (3") nozzles with 200 mm extension	C
3" horn antenna, fits 80 mm (3") nozzles with 500 mm extension ¹⁾	D
3" horn antenna, fits 80 mm (3") nozzles with 1000 mm extension ¹⁾	E
4" horn antenna, fits 100 mm (4") nozzles	F
4" horn antenna, fits 100 mm (4") nozzles with 100 mm extension	G
4" horn antenna, fits 100 mm (4") nozzles with 200 mm extension	H
4" horn antenna, fits 100 mm (4") nozzles with 500 mm extension ¹⁾	J
4" horn antenna, fits 100 mm (4") nozzles with 1000 mm extension ¹⁾	K
Purge (self-cleaning) connection	
No purge connection	0
Purge connection	1
Output/Communication	
4 to 20 mA, HART	0
PROFIBUS PA (pending)	1
Power supply/cable inlet	
100 to 230 V AC	A
• 2 x M20x1.5	B
• 2 x 1/2" NPT	C
24 V DC	D
• 2 x M20x1.5	
• 2 x 1/2" NPT	
Approvals	
General Purpose, CSA _{US/C} , Industry Canada, FCC, CE and R&TTE	A
CSA/FM Class II, Div. 1, Groups E, F, and G, Class III	B
ATEX II 1/2 D T6, CE, R&TTE	C
Further designs	Order code
Please add "-Z" to Order No. and specify Order code(s).	
Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	C11
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text	Y15

Selection and Ordering data	Order No.
Instruction manual	
English	C) 7ML1998-5JM01
German	C) 7ML1998-5JM31
Multi-language Quick start manual (Due to ATEX regulations, one Quick start manual is included with every ATEX certified product.)	C) 7ML1998-5QW81
This device is shipped with the Siemens Milltronics manual CD containing the complete instruction manual library.	
Accessories	
Handheld programmer Intrinsically Safe, EEx ia	C) 7ML5830-2AJ
Dust cap, PTFE, for 3"/80 mm horn	7ML1930-1BL
Dust cap, PTFE, for 4"/100 mm horn	7ML1930-1BM
HART modem/RS-232 (for use with a PC and SIMATIC PDM)	D) 7MF4997-1DA
HART modem/USB (for use with a PC and SIMATIC PDM)	D) 7MF4997-1DB
One metallic cable gland M20x1.5, rated -40 °C (-40 °F) to +80 °C (+176 °F) (available for HART only)	7ML1930-1AP
One metallic cable gland M20x1.5, rated -40 °C (-40 °F) to +80 °C (+176 °F) with integrated shield connection (available for PROFIBUS PA)	7ML1930-1AQ
¹⁾ available with Purge option 0 only	
C) Subject to export regulations AL: N, ECCN: EAR99	
D) Subject to export regulations AL: N, ECCN: EAR99H	

Dimensional drawings



SITRANS LR 460 dimensions

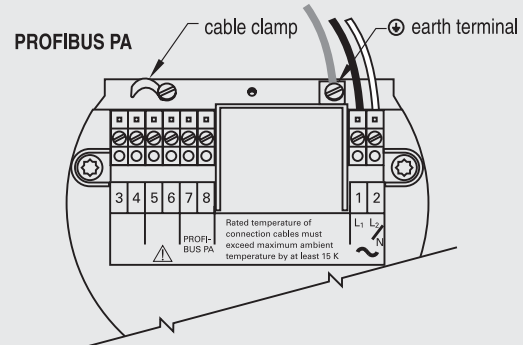
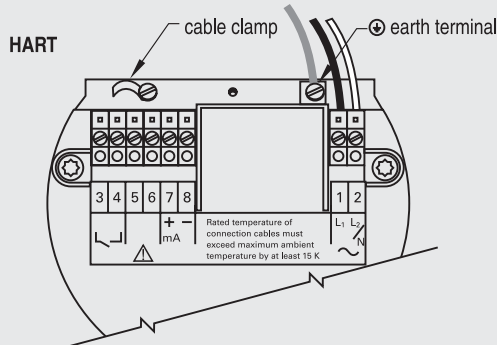
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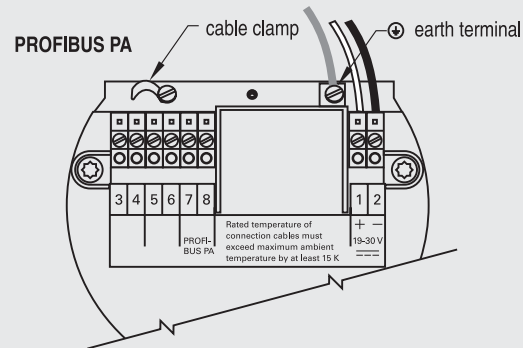
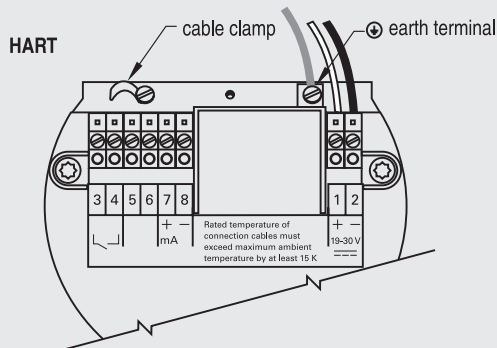
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Schematics

AC version



DC version



Notes

- 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

Hand Programmer

Part number:
7ML5830-2AJ



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SITRANS LR 460 connections