

Level instruments

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.

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.

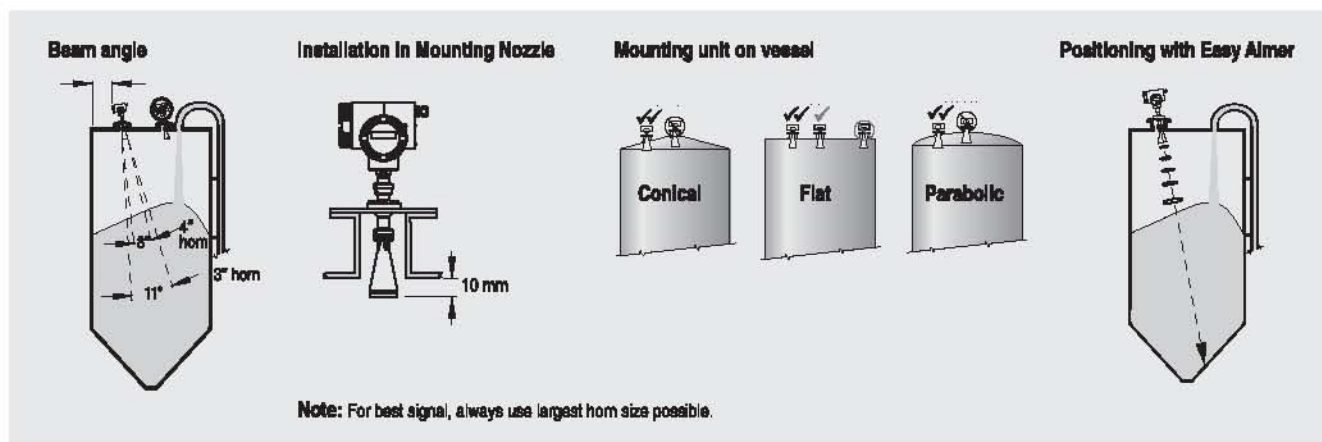
The characteristics of 24 GHz and high signal-to-noise ratio contribute to exceptional signal reflection, regardless of the dielectric value of the medium.

Key applications: long-range dusty applications, cement powder, fly-ash, coal, flour, grain, plastics

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

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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	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 (including hysteresis and non-repeatability), over the full ambient temperature range
• 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 g (7.25 psi g) 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 ½" 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 g (7.25 psi g) max. pressure
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Programming

Intrinsically Safe Siemens 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, C-TICK
• Radio	European Radio (R&TTE), Industry Canada, FCC, C-TICK
• 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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Selection and Ordering data

Order No.

SITRANS LR460

L) 7ML 5 4 2 6 -

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" (80 mm)

4" (100 mm)

6" (150 mm)

Antenna

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 extension¹⁾

3" horn antenna, fits 80 mm (3") nozzles with 1000 mm extension¹⁾

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 extension¹⁾

4" horn antenna, fits 100 mm (4") nozzles with 1000 mm extension¹⁾

Purge (self-cleaning) connection

No purge connection

Purge connection

Output/Communication

4 to 20 mA, HART®

PROFIBUS PA

Power supply/cable inlet

100 to 230 V AC

• 2 x M20x1.5

• 2 x ½" NPT

24 V DC

• 2 x M20x1.5

• 2 x ½" 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

Further designs

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

Stainless steel tag [69 x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters); specify in plain text

0 0 0 0 0 0

A

B

C

A

B

C

D

E

F

G

H

J

K

0

1

0

1

A

B

C

D

A

B

C

Order code

C11

Y15

Selection and Ordering data

Order No.

SITRANS LR460

L) 7ML 5 4 2 6 -

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!

Instruction manual

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 instruction manual library.

Accessories

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

HART modem/USB

(for use with a PC and SIMATIC PDM)

One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) (available for HART only - two cable glands required)

One metallic cable gland M20x1.5, rated -40 to +80 °C (-40 to +176 °F) with integrated shield connection (available for PROFIBUS PA)

SITRANS RD100 Remote display -

see RD100 on page 5/304

SITRANS RD200 Remote display -

see RD200 on page 5/306

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

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

Note 1: available with no pressure rating, 0.5 bar g maximum. Please contact nacc.smpi@siemens.com for special requests.

0 0 0 0 0 0

C) 7ML1998-5JM02

C) 7ML1998-5JM11

C) 7ML1998-5JM32

C) 7ML1998-5QW82

7ML5830-2AJ

7ML1930-1BL

7ML1930-1BM

D) 7MF4997-1DA

D) 7MF4997-1DB

7ML1930-1AP

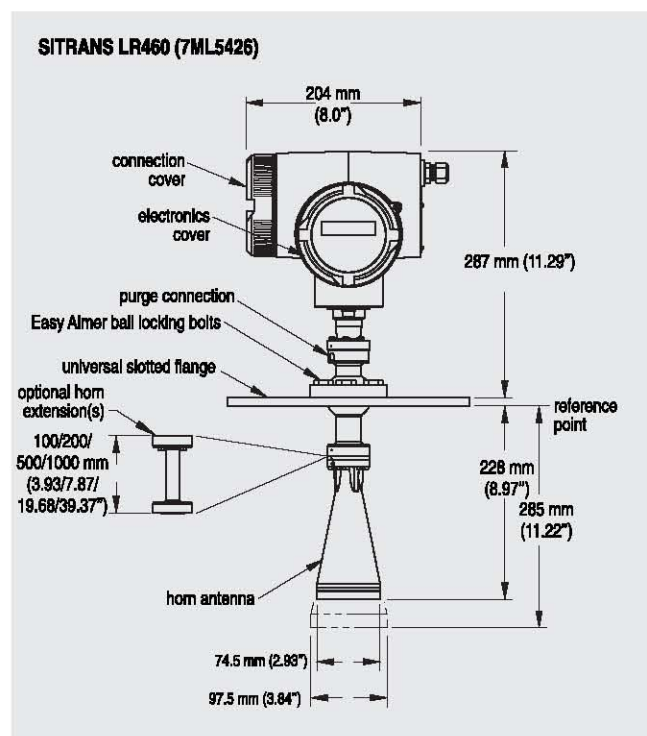
7ML1930-1AQ

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Dimensional drawings



SITRANS LR460 dimensions

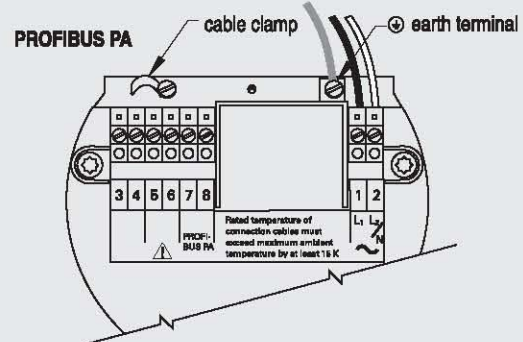
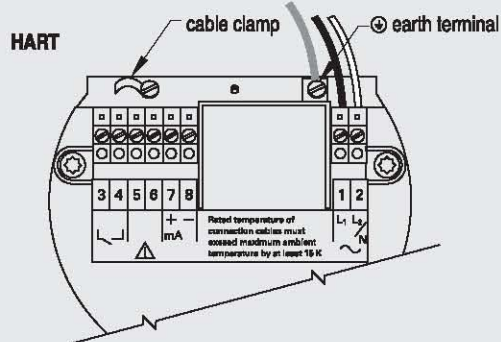
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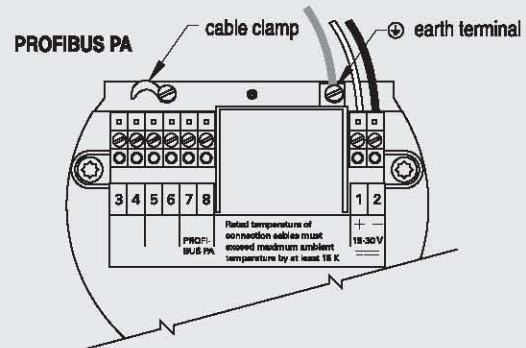
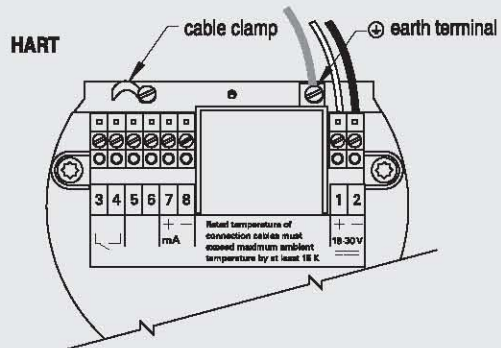
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Schematics

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



SITRANS LR460 connections