

Overview



SITRANS Probe LR is a 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft).

Benefits

- Uni-Construction polypropylene rod antenna standard
- Easy installation and simple startup
- Programming using infrared Intrinsically Safe handheld programmer, SIMATIC PDM or HART handheld communicator
- Communication using HART
- Process Intelligence signal processing
- Auto False-Echo Suppression of false echoes

Application

The Probe LR is ideal for applications with chemical vapors, temperature gradients, vacuum or pressure, such as simple chemical storage or water treatment vessels. SITRANS Probe LR has a range of 0.3 to 20 m (1 to 65 ft).

Probe LR is designed for safe and simple programming using the Intrinsically Safe handheld programmer without having to open the instrument's lid. It has a standard Uni-Construction polypropylene rod antenna that offers excellent chemical resistance and is hermetically sealed. The Uni-Construction antenna includes an internal, integrated shield that eliminates vessel nozzle interference.

SITRANS Probe LR incorporates Process Intelligence signal processing. The Probe LR also has a high signal-to-noise ratio leading to improved reliability.

Startup is easy with as few as two parameters for basic operation. Programming is simple using SIMATIC PDM, HART handheld communicator or the Intrinsically Safe handheld programmer.

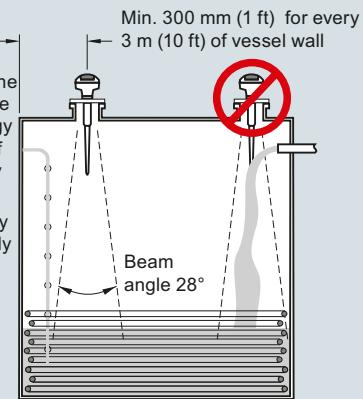
- Key Applications: chemical storage, wastewater wet well, and drilling mud

Configuration

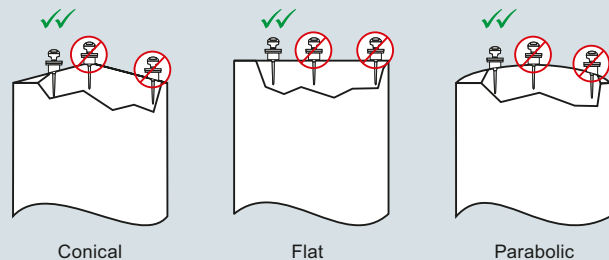
Installation

Note:

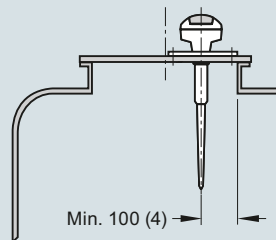
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the rod antenna.



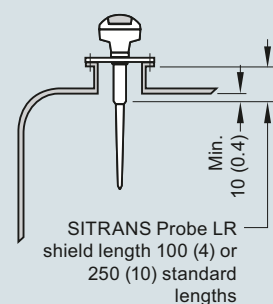
Mounting unit on vessel



Mounting on a manhole cover



Mounting on a nozzle



SITRANS Probe LR installation, dimensions in mm (inch)

Level Measurement

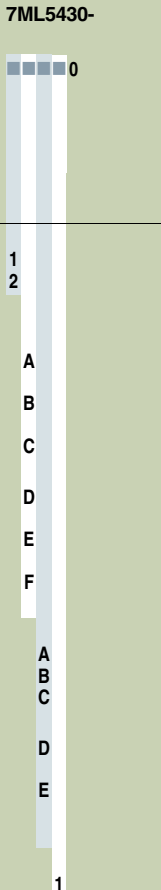
Continuous level measurement
Radar transmitters

SITRANS Probe LR

Technical specifications

Mode of operation	
Measuring principle	Pulse radar level measurement
Frequency	C-band, approx. 6 GHz
Measuring range	0.3 ... 20 m (1.0 ... 65 ft)
Output	
Analog output	4 ... 20 mA
Accuracy	± 0.02 mA
Span	Proportional or inversely proportional
Communications	HART
Performance (reference conditions)	
Accuracy	± the greater of 0.1 % of range or 10 mm (0.4 inch)
<ul style="list-style-type: none"> From end of antenna to 600 mm (23.62 inch) Remainder of range 10 mm (0.4 inch) or 0.1 % of span (whichever is greater) 	40 mm (1.57 inch) 10 mm (0.4 inch) or 0.1 % of span (whichever is greater)
Influence of ambient temperature	0.003 %/K
Repeatability	± 5 mm (2 inch)
Fail-safe	mA signal programmable as high, low or hold (LOE)
Rated operating conditions	
Installation conditions	
<ul style="list-style-type: none"> Location 	Indoor/outdoor
Ambient conditions (enclosure)	
<ul style="list-style-type: none"> Ambient temperature Installation category Pollution degree 	-40 ... +80 °C (-40 ... +176 °F) I 4
Medium conditions	
Dielectric constant ϵ_r	> 3.0
Vessel temperature	-40 ... +80 °C (-40 ... +176 °F)
Vessel pressure	3 bar g (43.5 psi g)
Design	
Enclosure	
<ul style="list-style-type: none"> Body construction Lid construction Cable inlet 	PBT (Polybutylene Terephthalate) PEI (Polyether Imide) 2 x M20 x 1.5 or 2 x 1/2" NPT with adapter
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6, IP67, IP68
Weight	1.97 kg (4.35 lb)
Antenna	
<ul style="list-style-type: none"> Material Dimensions 	Polypropylene rod, hermetically sealed construction Standard 100 mm (4 inch) shield for maximum 100 mm (4 inch) nozzle or optional 250 mm (10 inch) long shield
Process connections	1 1/2" NPT [(Taper), ANSI/ASME B1.20.1] R 1 1/2" [(BSPT), EN 10226] G 1 1/2" [(BSPP), EN ISO 228-1]

Power supply	<ul style="list-style-type: none"> Nominal 24 V DC with max. 550 Ω, maximum 30 V DC 4 ... 20 mA
Certificates and approvals	
General	CSA _{US/C} , CE, FM, RCM
Marine	<ul style="list-style-type: none"> Lloyd's Register of Shipping ABS Type Approval
Radio	FCC, Industry Canada, RED, RCM
Hazardous	
<ul style="list-style-type: none"> Intrinsically Safe (Brazil) Intrinsically Safe (Canada) Intrinsically Safe (Europe) Intrinsically Safe (International) Intrinsically Safe (Russia/Kazakhstan) Intrinsically Safe (USA) 	INMETRO Ex ia IIC T4 Ga CSA Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Group G; Class III ATEX II 1G EEx ia IIC T4 IECEx Ex ia IIC T4 EAC Ex ia FM Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III
Programming	
Handheld programmer	HART communicator 375
PC	SIMATIC PDM
Intrinsically safe Siemens handheld programmer (optional)	Infrared receiver
<ul style="list-style-type: none"> Approvals (handheld programmer) 	ATEX II 1G EEx ia IIC T4 CSA and FM Class I, Div. 1, Groups A, B, C, D, T6 at max. ambient
Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages

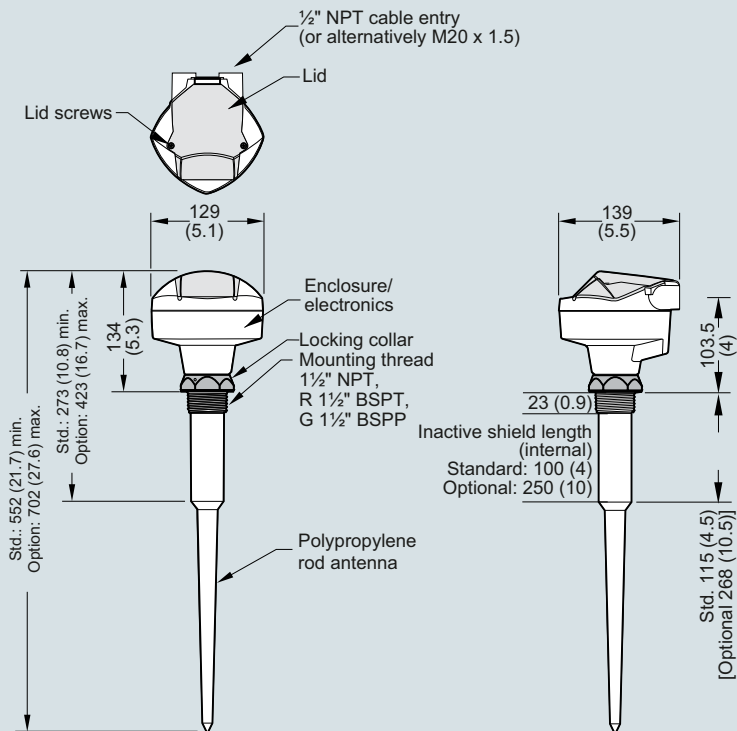
Selection and Ordering data	Article No.	Selection and Ordering data	Order code
SITRANS Probe LR 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft). Max. 3 bar g (43.5 psi g) pressure and 80 °C (176 °F) ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	↗ 7ML5430- 	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	
Enclosure/Cable inlet Plastic, (PBT), 2 x 1/2" NPT Plastic, (PBT), 2 x M20 x 1.5	1 2	Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Antenna type/Material - (max. 3 bar and 80 °C) Polypropylene Antenna 1/2" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 100 mm shield R 1/2" [(BSPT), EN 10226], comes with integral 100 mm shield G 1/2" [(BSPP), EN ISO 228-1], comes with integral 100 mm shield 1/2" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 250 mm shield R 1/2" [(BSPT), EN 10226], comes with integral 250 mm shield G 1/2" [(BSPP), EN ISO 228-1], comes with integral 250 mm shield	A B C D E F	Accessories Handheld programmer, Intrinsically Safe, ATEX II 1G, Ex ia 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) 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	Article No. 7ML5830-2AH 7MF4997-1DB 7ML1930-1AP 7ML5741-... 7ML5740-... 7ML5744-... 7ML5750-...
Approvals General Purpose, CE, RED, RCM General Purpose, CSA _{US/C} , FM, FCC CSA Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Group G, Class III, FCC, Intrinsically Safe FM, Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Intrinsically Safe IECEx Ex ia IIC T4; ATEX II 1G EEx ia IIC T4, RED, RCM, Intrinsically Safe; INMETRO Ex ia IIC T4 Ga; EAC	A B C D E	Spare parts Plastic lid For applicable back up point level switch - see point level measurement section	7ML1830-1KB
Communication/Output 4 ... 20 mA, HART	1		

Level Measurement

Continuous level measurement
Radar transmitters

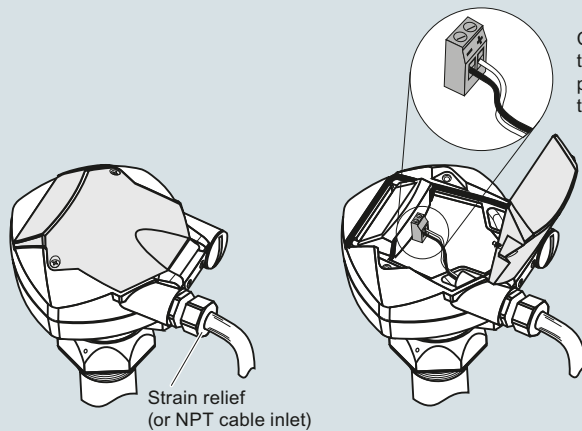
SITRANS Probe LR

Dimensional drawings

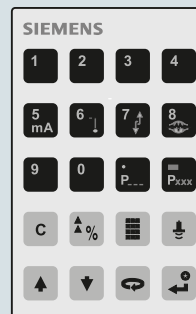


SITRANS Probe LR, dimensions in mm (inch)

Circuit diagrams



Hand Programmer



SITRANS Probe LR

Part number: 7ML5830-2AH

Notes:

- DC terminal shall be supplied from an SELV source in accordance with IEC-1010-1 Annex H.
- All field wiring must have insulation suitable for rated input voltages.
- Use shielded twisted pair cable (14-22 AWG).
- Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS Probe LR connections