

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.

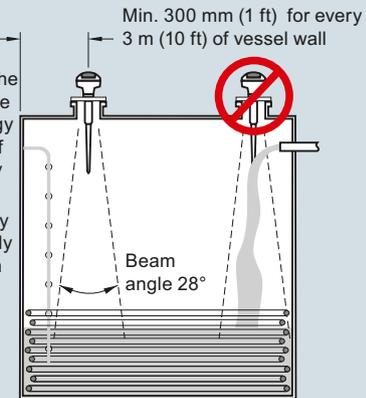
- Key Applications: chemical storage, wastewater wet well, and drilling mud

Configuration

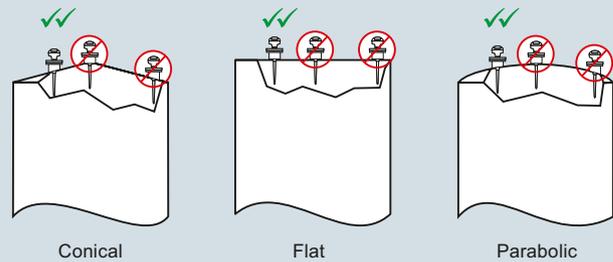
Installation

Note:

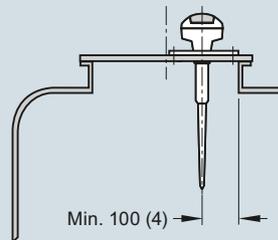
- Beam angle is the width of the cone where the energy density is half of the peak energy density.
- The peak energy density is directly in front of and in line with the rod antenna.



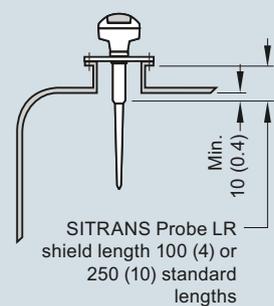
Mounting unit on vessel



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		Power supply	
Measuring principle	Pulse radar level measurement		<ul style="list-style-type: none"> Nominal 24 V DC with max. 550 Ω, maximum 30 V DC 4 ... 20 mA
Frequency	5.8 GHz (North America 6.3 GHz)	Certificates and approvals	
Measuring range	0.3 ... 20 m (1.0 ... 65 ft)	General	CSA _{US/C} , CE, FM, RCM
Output		Marine	<ul style="list-style-type: none"> Lloyd's Register of Shipping ABS Type Approval
Analog output	4 ... 20 mA	Radio	FCC, Industry Canada, and European (R&TTE), RCM
Accuracy	± 0.02 mA	Hazardous	
Span	Proportional or inversely proportional	<ul style="list-style-type: none"> Intrinsically Safe (Brazil) Intrinsically Safe (Canada) 	INMETRO Ex ia IIC T4 Ga CSA Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Group G; Class III
Communications	HART	<ul style="list-style-type: none"> Intrinsically Safe (Europe) Intrinsically Safe (International) Intrinsically Safe (Russia/Kazakhstan) Intrinsically Safe (USA) 	ATEX II 1G EEx ia IIC T4 IECEx Ex ia IIC T4 EAC Ex ia
Performance (reference conditions)		Programming	
Accuracy	± the greater of 0.1 % of range or 10 mm (0.4 inch)	Handheld programmer	HART communicator 375
<ul style="list-style-type: none"> From end of antenna to 600 mm (23.62 inch) Remainder of range 	40 mm (1.57 inch)	PC	SIMATIC PDM
Influence of ambient temperature	0.003 %/K	Intrinsically safe Siemens handheld programmer (optional)	Infrared receiver
Repeatability	± 5 mm (2 inch)	<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
Fail-safe	mA signal programmable as high, low or hold (LOE)	Display (local)	Multi-segment alphanumeric liquid crystal with bar graph (representing level) available in four languages
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	$\epsilon_r > 1.6$ (for $\epsilon_r < 3$, use stillpipe)		
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]		

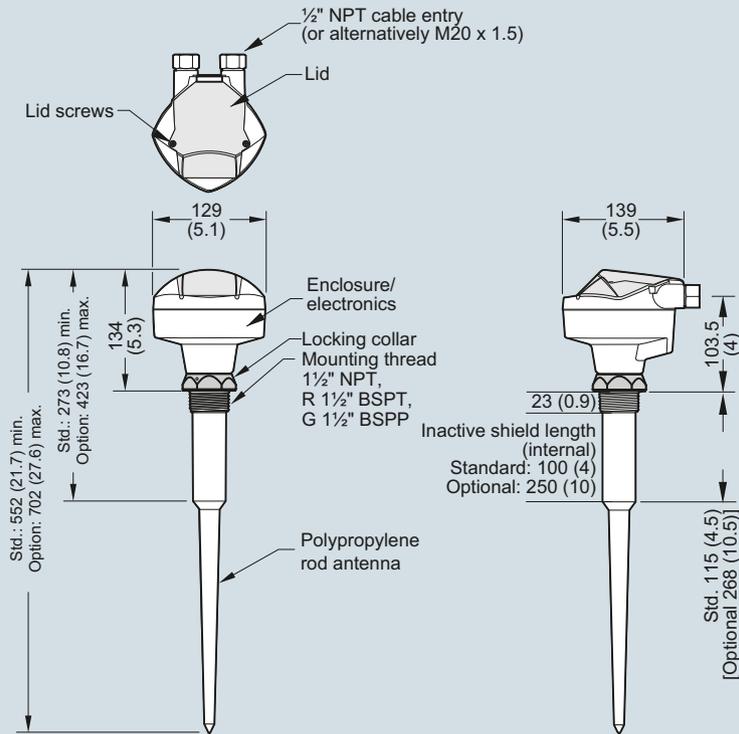
Selection and Ordering data	Article No.	Selection and Ordering data	Order code
SITRANS Probe LR 2-wire, 6 GHz pulse radar level transmitter for continuous monitoring of liquids and slurries in storage vessels with nominal pressure and temperature, to a range of 20 m (66 ft). Max. 3 bar g (43.5 psi g) 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)]: ● Y15 Measuring-point number/identification (max. 27 characters) specify in plain text Manufacturer's test certificate: ● C11 M to DIN 55350, Part 18 and to ISO 9000	
Enclosure/Cable inlet Plastic, (PBT), 2 x 1/2" NPT ● 1 Plastic, (PBT), 2 x M20 x 1.5 ● 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 1/2" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 100 mm shield ● A R 1 1/2" [(BSPT), EN 10226], comes with integral 100 mm shield ● B G 1 1/2" [(BSPP), EN ISO 228-1], comes with integral 100 mm shield ● C 1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], comes with integral 250 mm shield ● D R 1 1/2" [(BSPT), EN 10226], comes with integral 250 mm shield ● E G 1 1/2" [(BSPP), EN ISO 228-1], comes with integral 250 mm shield ● F		Accessories Handheld programmer, Intrinsically Safe, ATEX II 1G, Ex ia 7ML5830-2AH HART modem/USB (for use with a PC and SIMATIC PDM) 7MF4997-1DB One metallic cable gland M20 x 1.5, rated -40 ... +80 °C (-40 ... +176 °F) 7ML1930-1AP SITRANS RD100, loop powered display - see Chapter 7 7ML5741-... SITRANS RD200, universal input display with Modbus conversion - see Chapter 7 7ML5740-... SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7 7ML5744-... SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 7ML5750-... 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, R&TTE, RCM ● A General Purpose, CSA _{US/C} , FM, FCC ● B CSA Class I, Div. 1, Groups A, B, C, D, Class II, Div. 1, Group G, Class III, FCC, Intrinsically Safe ● C FM, Class I, II and III, Div. 1, Groups A, B, C, D, E, F, G, FCC, Intrinsically Safe ● D IECEx Ex ia IIC T4; ATEX II 1G EEx ia IIC T4, R&TTE, RCM, Intrinsically Safe; INMETRO Ex ia IIC T4 Ga; EAC ● E		Spare parts Plastic lid 7ML1830-1KB For applicable back up point level switch - see point level measurement section	
Communication/Output 4 ... 20 mA, HART ● 1			
● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 10/11 in the appendix.		● We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ●. For details see page 10/11 in the appendix.	

Level Measurement

Continuous level measurement - Radar transmitters

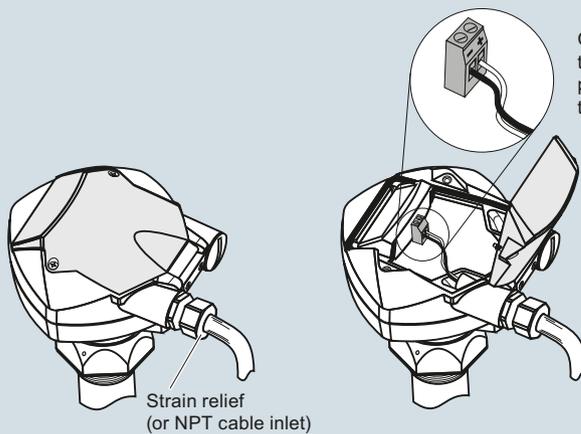
SITRANS Probe LR

Dimensional drawings

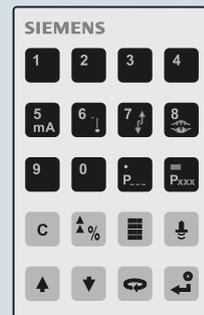


SITRANS Probe LR, dimensions in mm (inch)

Schematics



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