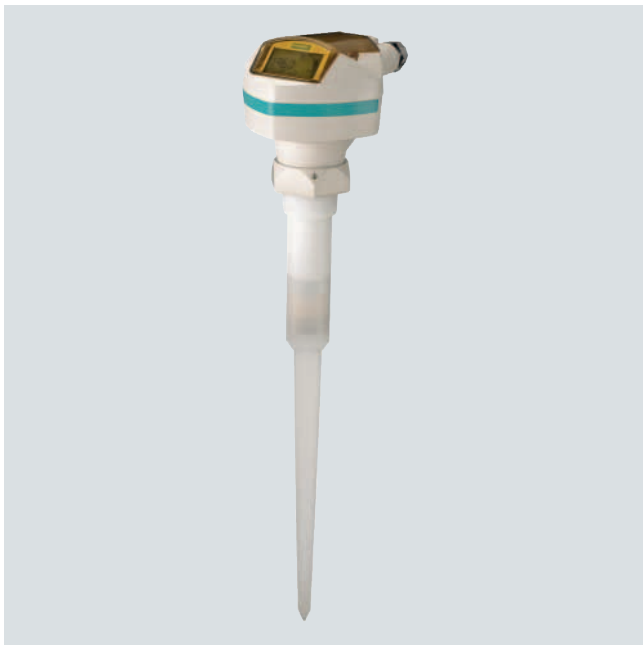


# Level Measurement

## Continuous level measurement - Radar transmitters

### SITRANS Probe LR

#### 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®
- Patented Process Intelligence® signal processing
- Extremely high signal-to-noise ratio
- Auto False-Echo Suppression of false echoes

#### Application

The Probe LR is ideal for applications with chemical vapours, temperature gradients, vacuum or pressure, such as tank farms, chemical storage, digesters and long-range applications. 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.

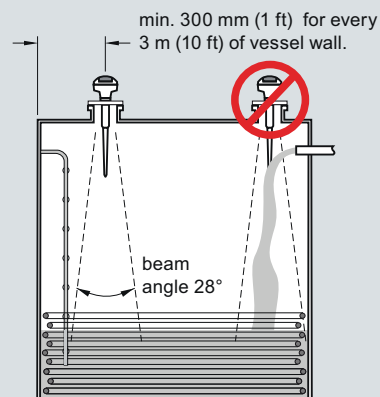
SITRANS Probe LR incorporates Process Intelligence® signal processing. The Probe LR also has a high signal-to-noise ratio leading to improved reliability.

Start-up 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.

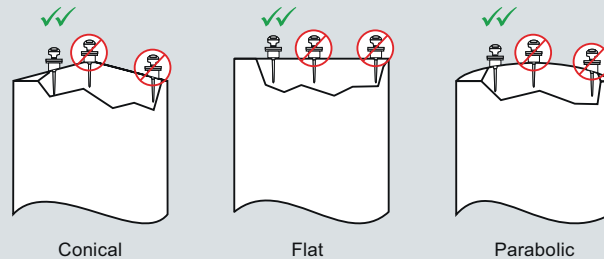
- Key Applications: tank farms, chemical storage, wastewater wet well

#### Configuration

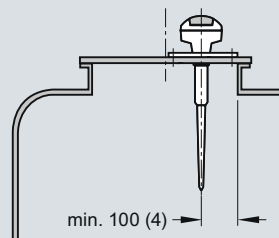
##### Installation



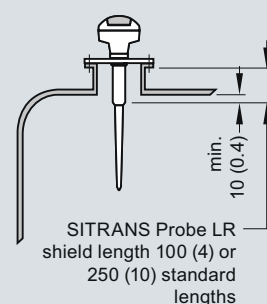
##### Mounting unit on vessel



##### 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

<b>Mode of operation</b>	
Measuring principle	Pulse radar level measurement
Frequency	5.8 GHz (North America 6.3 GHz)
Measuring range	0.3 ... 20 m (1.0 ... 65 ft)
<b>Output</b>	
Analog output	4 ... 20 mA
Accuracy	± 0.02 mA
Span	Proportional or inversely proportional
Communications	HART®
<b>Performance (reference conditions)</b>	
Accuracy	± the greater of 0.1 % of range or 10 mm (0.4")
Influence of ambient temperature	0.003 %/K
Repeatability	± 5 mm (2")
Fail-safe	mA signal programmable as high, low or hold (LOE)
<b>Rated operating conditions</b>	
Installation conditions	
• Location	Indoor/outdoor
Ambient conditions (enclosure)	
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
• Installation category	I
• Pollution degree	4
<b>Medium conditions</b>	
Dielectric constant $\epsilon_r$	$\epsilon_r > 1.6$ (for $\epsilon_r < 3$ , use stillpipe)
Vessel temperature	-40 ... +80 °C (-40 ... +176 °F)
Vessel pressure	3 bar g (43.5 psi g)
<b>Design</b>	
Enclosure	
• Body construction	PBT (Polybutylene Terephthalate)
• Lid construction	PEI (Polyether Imide)
• Cable inlet	2 x M20x1.5 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	
• Material	Polypropylene rod, hermetically sealed construction
• Dimensions	Standard 100 mm (4") shield for maximum 100 mm (4") nozzle or optional 250 mm (10") 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]
<b>Power supply</b>	
	• Nominal 24 V DC with max. 550 $\Omega$ , maximum 30 V DC
	• 4 ... 20 mA
<b>Certificates and approvals</b>	
General	CSA <sub>US/C</sub> , CE, FM, C-TICK
Marine	• Lloyd's Register of Shipping • ABS Type Approval
Radio	FCC, Industry Canada and European (R&TTE), C-TICK

### Hazardous

- Europe
- USA
- Canada
- Brazil - INMETRO

ATEX II 1G EEx ia IIC T4

Intrinsically Safe barrier required  
FM Class I, Div. 1, Groups A,B,C,D; Class II, Div. 1, Groups E,F, G; Class III

Intrinsically Safe barrier required  
CSA Class I, Div. 1, Groups A,B,C,D; Class II, Div. 1, Group G; Class III

BR-Ex ia IIC T4

### Programming

Handheld programmer

HART communicator 375

PC

SIMATIC PDM

Intrinsically safe Siemens handheld programmer (optional)

Infrared receiver

- 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

HART® is a registered trademark of the Hart Communications Foundation.

# Level Measurement

## Continuous level measurement - Radar transmitters

### SITRANS Probe LR

#### Selection and Ordering data

##### 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)

#### Enclosure

Plastic, (PBT), 2 x 1/2" NPT  
Plastic, (PBT), 2 x M20x1.5

#### Antenna type/Material - (max. 3 bar and +80 °C)

Polypropylene Antenna  
1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 100 mm shield  
R 1 1/2" [(BSPT), EN 10226], c/w integral 100 mm shield  
G 1 1/2" [(BSPP), EN ISO 228-1], c/w integral 100 mm shield  
1 1/2" NPT [(Taper), ANSI/ASME B1.20.1], c/w integral 250 mm shield  
R 1 1/2" [(BSPT), EN 10226], c/w integral 250 mm shield  
G 1 1/2" [(BSPP), EN ISO 228-1], c/w integral 250 mm shield

#### Approvals

General Purpose, CE<sup>1)</sup>  
General Purpose, FM, CSA<sub>US/IC</sub><sup>2)</sup>  
CSA Class I, Div 1, Groups A, B, C, D, Class II, Div. 1 Group G, Class III, Intrinsically Safe with suitable barrier<sup>2)</sup>  
FM, Class I, II and III, Div 1, Groups A, B, C, D, E, F, G, Intrinsically Safe with suitable barrier<sup>2)</sup>  
ATEX II 1G EEx ia IIC T4, Intrinsically Safe with suitable barrier<sup>1)</sup>

#### Communication/Output

4 to 20 mA, HART<sup>®</sup>

<sup>1)</sup> Includes European Radio approvals (R&TTE), 5.8 GHz, C-TICK

<sup>2)</sup> Includes FCC Radio approvals, 6.3 GHz for North America only

C) Subject to export regulations AL: N, ECCN: EAR99

Order No.

C) 7ML5430-

0

1

2

A

B

C

D

E

F

A

B

C

D

E

1

#### Selection and Ordering data

##### Further designs

Please add "-Z" to Order No. and specify Order code(s).

Acrylic coated, stainless steel tag [13 x 45 mm  
Stainless steel tag [69 x 50 mm (2.71 x 1.97")]:  
Measuring-point number/identification (max. 16 characters) specify in plain text

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

##### Operating Instructions

English

French

Spanish

German

Note: The Operating Instructions should be ordered as a separate item on the order.

This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.

##### Additional Operating Instructions

Multi-language Quick Start manual

##### Optional equipment

Handheld programmer, Intrinsically Safe, ATEX II 1G, EEx ia

HART<sup>®</sup> 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 ... +80 °C (-40 ... +176 °F)<sup>1)</sup>

SITRANS RD100 Remote display - see Chapter 8

SITRANS RD200 Remote display - see Chapter 8

SITRANS RD500 Remote display - see Chapter 8

##### Spare parts

Plastic lid

<sup>1)</sup> Product shipped with plastic cable gland, rated to -20 °C. If -40 °C rating required, then metallic cable gland is recommended.

C) Subject to export regulations AL: N, ECCN: EAR99

D) Subject to export regulations AL: N, ECCN: EAR99H

Order code

Y15

C11

Order No.

C) 7ML1998-5HR02

C) 7ML1998-5HR11

C) 7ML1998-5HR21

C) 7ML1998-5HR32

C) 7ML1998-5QP81

7ML5830-2AH

D) 7MF4997-1DA

D) 7MF4997-1DB

7ML1930-1AP

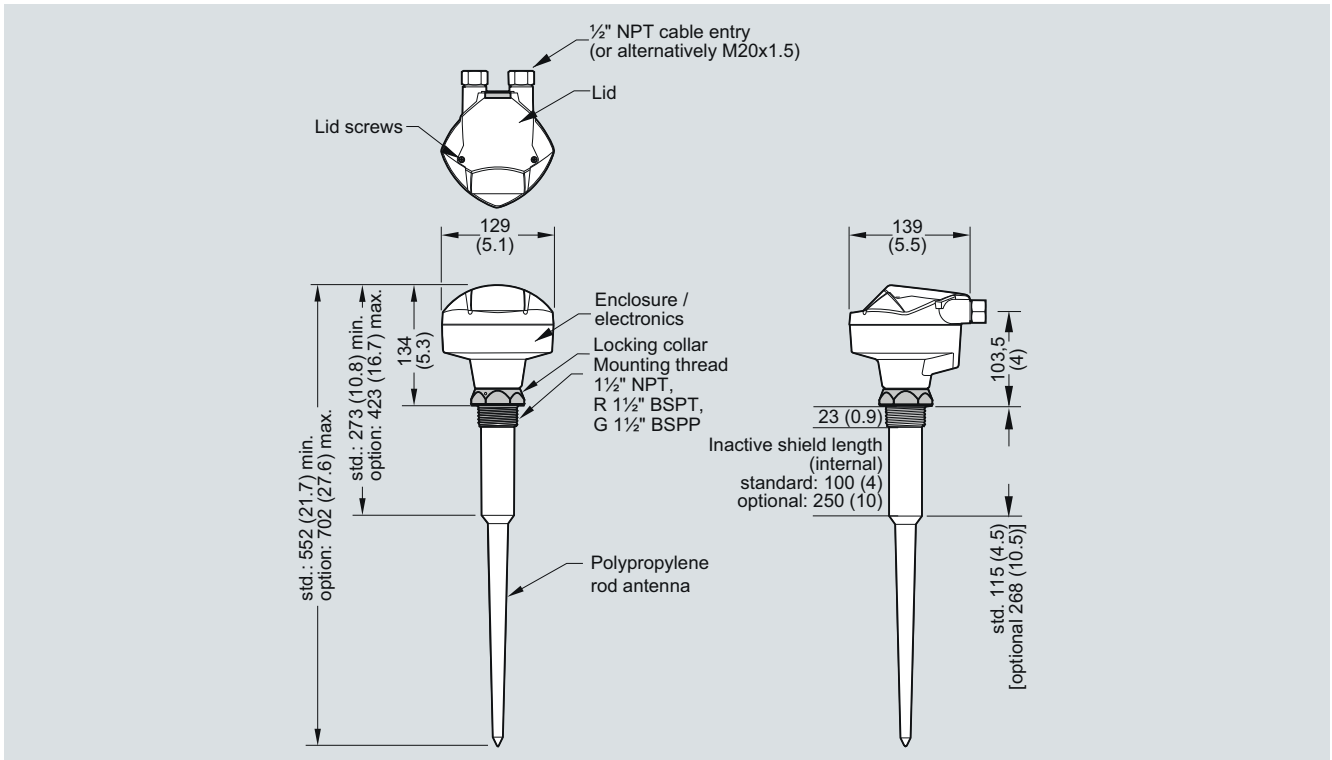
7ML1830-1KB

# Level Measurement

## Continuous level measurement - Radar transmitters

SITRANS Probe LR

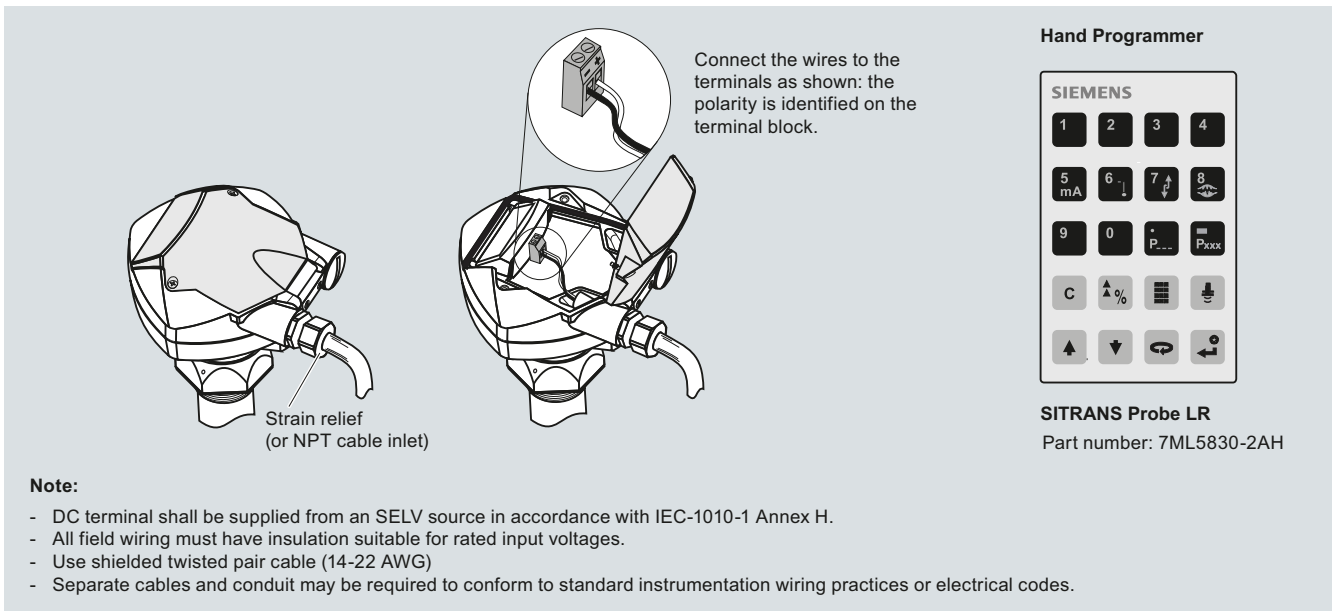
### Dimensional drawings



SITRANS Probe LR, dimensions in mm (inch)

5

### Schematics



SITRANS Probe LR connections

# FINE CONTROLS (UK) LTD



Fine Controls have been supplying process controls & instrumentation equipment since 1994, & now serves an ever expanding customer base, both in the UK & globally.

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**Temperature:** Temperature Probes & Thermowells, Temperature transmitters, Temperature Regulators & Temperature Displays

**Level:** Level Transmitters & Switches

**Pressure:** Pressure Gauges & Transmitters, Precision & High Pressure Regulators & I-P Converters, Volume boosters.

**Precision Pneumatics:** Pressure Regulators, I-P Converters, Volume Boosters, Vacuum Regulators

**Valves:** Solenoid & Pneumatic Valves, Control Valves & Positioners, Actuated Ball, Globe or Diaphragm Valves & Isolation Valves

**Services:** Repair, Calibration, Panel Build, System Design & Commissioning

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