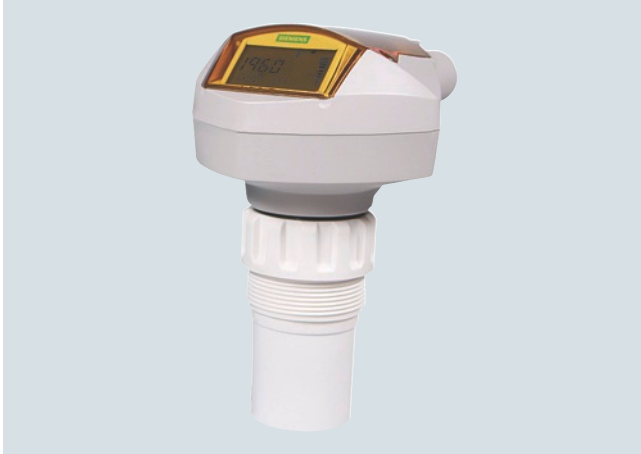


## Level measurement

Continuous level measurement  
Ultrasonic transmitters

### SITRANS Probe LU

#### Overview



SITRANS Probe LU is a 2-wire loop powered ultrasonic transmitter for level, volume and flow monitoring of liquids in open channels, storage vessels, and simple process vessels.

#### Benefits

- Continuous level measurement up to 12 m (40 ft) range
- Easy installation and simple startup
- Programming using infrared Intrinsically Safe handheld programmer, SIMATIC PDM or HART Communicator
- Communication using HART or PROFIBUS PA
- ETFE or PVDF transducers for chemical compatibility
- Sonic Intelligence signal processing
- Auto False-Echo Suppression for fixed obstruction avoidance
- Level to volume or level to flow conversion

#### Application

The SITRANS Probe LU is ideal for level monitoring in the water and wastewater industry, chemical storage vessels, and small bulk hoppers.

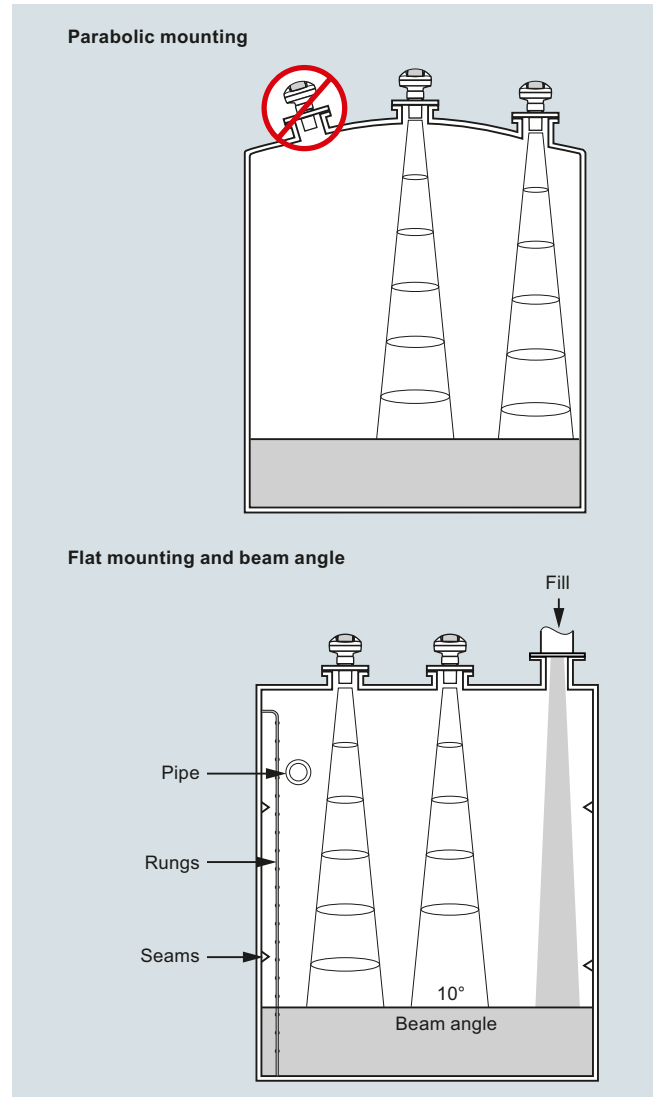
The range of SITRANS Probe LU is 6 or 12 m (20 or 40 ft). Using Sonic Intelligence, Auto False Echo Suppression for fixed obstruction avoidance, and accuracy of 0.15 % of range or 6 mm (0.25 inch), the Probe LU provides unmatched reliability.

The Probe LU offers two communications options: HART or PROFIBUS PA (Profile version 3.0, Class B).

The transducer on the Probe LU is available as ETFE or PVDF to suit the chemical conditions of your application. As well, for applications with varying material and process temperatures, the Probe LU incorporates an internal temperature sensor to compensate for temperature changes.

- Key Applications: chemical storage vessels, filter beds, liquid storage vessels

#### Configuration



SITRANS Probe LU mounting

#### Technical specifications

<b>Mode of operation</b>		<b>Process connection</b>	
Measuring principle	Ultrasonic level measurement	Threaded connection	2" NPT [(Taper), ANSI/ASME B1.20.1] R 2" [(BSPT), EN 10226] or G 2" [(BSPP), EN ISO 228-1]
Typical application	Level measurement in storage vessels and simple process vessels	Flange connection	3 inch (80 mm) universal flange
<b>Inputs</b>		Other connection	FMS 200 mounting bracket (see page 5/189) or customer supplied mount
Measuring range		<b>Display and Controls</b>	
• 6 m (20 ft) model	0.25 ... 6 m (10 inch ... 20 ft)	Interface	Local: LCD display with bar graph Remote: Available via HART or PROFIBUS PA
• 12 m (40 ft) model	0.25 ... 12 m (10 inch ... 40 ft)	Configuration	Using Siemens SIMATIC PDM (PC) or HART handheld communicator or Siemens infrared handheld programmer
Frequency	54 kHz	Memory	Non-volatile EEPROM
<b>Outputs</b>		<b>Power supply</b>	
mA/HART		4 ... 20 mA/HART	Nominal 24 V DC with 550 Ω maximum; maximum 30 V DC 4 ... 20 mA
• Range	4 ... 20 mA	PROFIBUS PA	12, 13, 15, or 20 mA depending on programming (General Purpose or Intrinsically Safe version) per IEC 61158-2
• Accuracy	± 0.02 mA	<b>Certificates and Approvals</b>	
PROFIBUS PA	Profile 3, Class B	General	CSA <sub>US/C</sub> , FM, CE, RCM
<b>Performance</b>		Marine (only applies to HART communication option)	• Lloyd's Register of Shipping • ABS Type Approval
Resolution	≤ 3 mm (0.12 inch)	Hazardous	
Accuracy	± the greater of 0.15 % of range or 6 mm (0.24 inch)	• Intrinsically Safe (Europe)	ATEX II 1G Ex ia IIC T4 Ga
Repeatability	≤ 3 mm (0.12 inch)	• Intrinsically Safe (USA/Canada)	CSA/FM, Class I, Div. 1, Groups A, B, C, D; Class II, Div. 1, Groups E, F, G; Class III T4
Blanking distance	0.25 m (10 inch)	• Intrinsically Safe (International)	SIR 13.0008X Ex ia IIC T4 Ga
Update time	≤ 5 s	• Intrinsically Safe (Brazil)	INMETRO Ex ia IIC T4 Ga
• 4/20 mA/HART version	≤ 5 s at 4 mA	• Non-incendive (USA)	FM Class I, Div. 2, Groups A, B, C, D T4
• PROFIBUS version	≤ 4 s at 15 mA current loop	<b>Handheld Programmer</b>	
Temperature compensation	Built-in to compensate over temperature range	Intrinsically Safe Siemens handheld programmer	Infrared receiver
Beam angle	10°	• Approvals for handheld programmer	ATEX II 1GD / IECEx SIR 09.0073 Ex ia IIC T4 Ga Ex iaD 20 T135 °C FM/CSA Class I, II, III, Div. 1, Groups A, B, C, D, E, F, G T6
<b>Rated operating conditions</b>		Ambient temperature	-20 ... 50 °C (-5 ... 122 °F)
Ambient conditions		Interface	Proprietary infrared pulse signal
• Location	Indoor/outdoor	Power	3 V lithium battery (non-replaceable)
• Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)		
• Storage temperature	-40 ... +80 °C (-40 ... +176 °F)		
• Relative humidity/ingress protection	Suitable for outdoor		
• Installation category	I		
• Pollution degree	4		
Medium conditions			
• Temperature at flange or threads	-40 ... +85 °C (-40 ... +185 °F)		
• Pressure (vessel)	0.5 bar g (7.25 psi g)		
<b>Design</b>			
Material (enclosure)	PBT (Polybutylene Terephthalate)		
Degree of protection	Type 4X/NEMA 4X, Type 6/NEMA 6/IP67/IP68 enclosure		
Weight	2.1 kg (4.6 lb)		
Cable inlet	2 x M20 x 1.5 cable gland or 2 x ½" NPT thread or 1 x M20 x 1.5 and 1 x ½" NPT		
Material (transducer)	Buna-N seal with ETFE (Ethylene Tetrafluoroethylene) or PVDF (Polyvinylidene Fluoride)		

## Level measurement

Continuous level measurement  
Ultrasonic transmitters

### SITRANS Probe LU

#### Selection and ordering data

#### Article No.

#### Order code

#### SITRANS Probe LU Ultrasonic level transmitter

Continuous, non-contact, up to 12 m (40 ft) range.  
Monitors level and volume in liquids and slurries.  
With optional PROFIBUS PA.

➤ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

#### Enclosure/Cable Inlet

Plastic (PBT), 1 x M20 x 1.5 and 1 x ½" NPT  
(no cable glands supplied)  
Plastic (PBT), 2 x M20 x 1.5 (includes  
1 general purpose cable gland: 7ML1930-1AM)  
Plastic (PBT), 2 x ½" NPT  
(no cable glands supplied)

#### Range/Transducer material

6 m (20 ft), ETFE  
6 m (20 ft), PVDF Copolymer  
12 m (40 ft), ETFE  
12 m (40 ft), PVDF Copolymer

#### Process connection

2" NPT [(Taper), ANSI/ASME B1.20.1]  
R 2" [(BSPT), EN 10226]  
G 2" [(BSPP), EN ISO 228-1]

#### Communication/Output

4 ... 20 mA, HART  
PROFIBUS PA

#### Approvals

General Purpose, FM, CSA<sub>US/C</sub>: CE, RCM, KCC  
Non-incendive, FM Class I, Div. 2,  
Groups A, B, C, D T5<sup>1)</sup>  
Intrinsically Safe, CSA/FM Class I, Div. 1,  
Groups A, B, C, D; Class II, Div. 1, Groups E, F, G;  
Class III T4<sup>2)</sup>  
Intrinsically Safe ATEX 1G/IECEx/INMETRO  
Ex ia IIC T4 Ga, RCM, KCC<sup>2)</sup>  
Intrinsically Safe ATEX 1G/IECEx/INMETRO  
Ex ia IIC T4 Ga, RCM, KCC<sup>3)</sup>  
Intrinsically safe, CSA/FM Class I, Div. 1,  
Groups A, B, C, D; Class II, Div. 1, Groups E, F, G;  
Class III T4<sup>3)</sup>

1) Available with Enclosure/Cable Inlet option 2 only.

2) Available with Communication option 2 only.

3) Available with Communication option 1 only.

7ML5221-

0

1

2

A

B

C

D

A

B

C

1

2

1

4

5

6

7

8

#### 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

Y15

#### Operating Instructions for HART/mA device

All literature is available to download for free, in a  
range of languages, at

<http://www.siemens.com/processinstrumentation/documentation>.

#### Accessories

Handheld programmer, Intrinsically Safe, EEx ia  
Handheld programmer, General Purpose approvals  
Handheld programmer, Infrared, Intrinsically Safe,  
PROFIBUS PA

Article No.

7ML5830-2AH

A5E36563512

7ML5830-2AJ

7MF4997-1DB

HART modem/USB  
(for use with a PC and SIMATIC PDM)

7ML1830-1DQ

2" BSP nylon plastic locknut

7ML1830-1DT

2" NPT nylon plastic locknut

7ML1830-1BT

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE  
Flange adapter for 2" NPT

7ML1830-1BU

3" ASME, DN 65 PN 10, JIS 10K 3B ETFE  
Flange adapter for 2" BSPT

7ML1930-1AM

One General Purpose polymeric cable gland  
M20 x 1.5, rated for -20 ... +80 °C (-4 ... +176 °F)

7ML1930-1AP

One metallic cable gland M20 x 1.5,  
rated -40 ... +80 °C (-40 ... +176 °F) for  
General Purpose or ATEX EEx e installations  
(available for HART only)

7ML1930-1AQ

One metallic cable gland M20 x 1.5,  
rated -40 ... +80 °C (-40 ... +176 °F) with integrated  
shield connection (available for PROFIBUS PA)

7ML1830-1BK

Universal box bracket, FMS-200

7ML1930-1GH

Probe LU rock guard and sunshield

7ML5741-.....-

SITRANS RD100, loop powered display -  
see Chapter 7

7ML5742-.....-

SITRANS RD150, remote digital display for  
4 ... 20 mA and HART devices - see Chapter 7

7ML5740-.....-

SITRANS RD200, universal input display with  
Modbus conversion - see Chapter 7

7ML5744-.....-

SITRANS RD300, dual line display with totalizer  
and linearization curve and Modbus conversion -  
see Chapter 7

7ML5744-.....-

For applicable back up point level switch see  
point level measurement section.

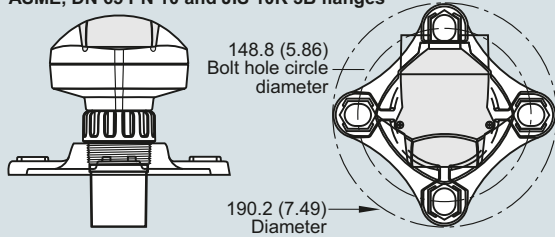
#### Spare Parts

Plastic lid

7ML1830-1KB

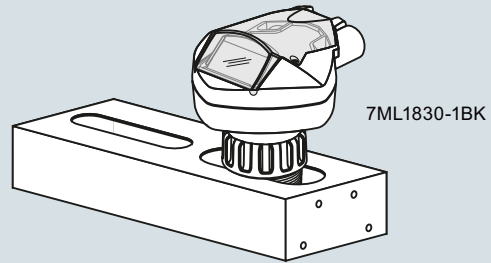
**Options**

Flange adapter for mating 2" NPT or 2" BSP process connections to 3" ASME, DN 65 PN 10 and JIS 10K 3B flanges



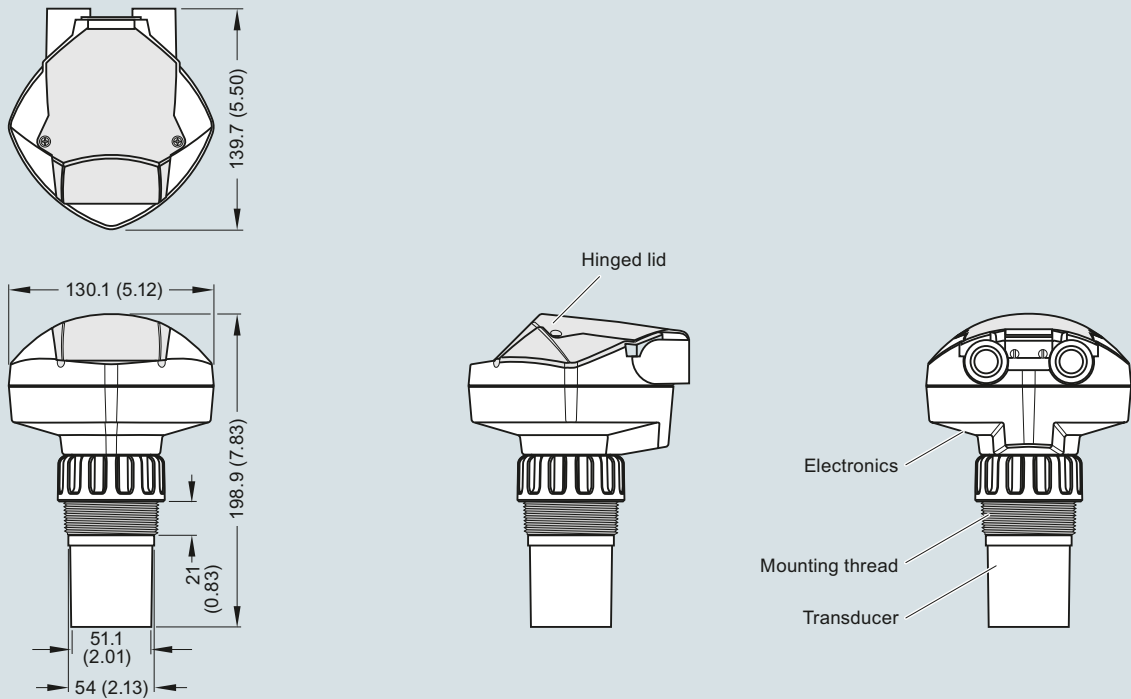
SITRANS Probe LU optional flange adapter, dimensions in mm (inch)

SITRANS Probe LU with FMS 200 universal box bracket



SITRANS Probe LU with optional mounting bracket

**Dimensional drawings**



**Note:** Above model is shown without M20 cable glands or 1/2" NPT conduit connectors.

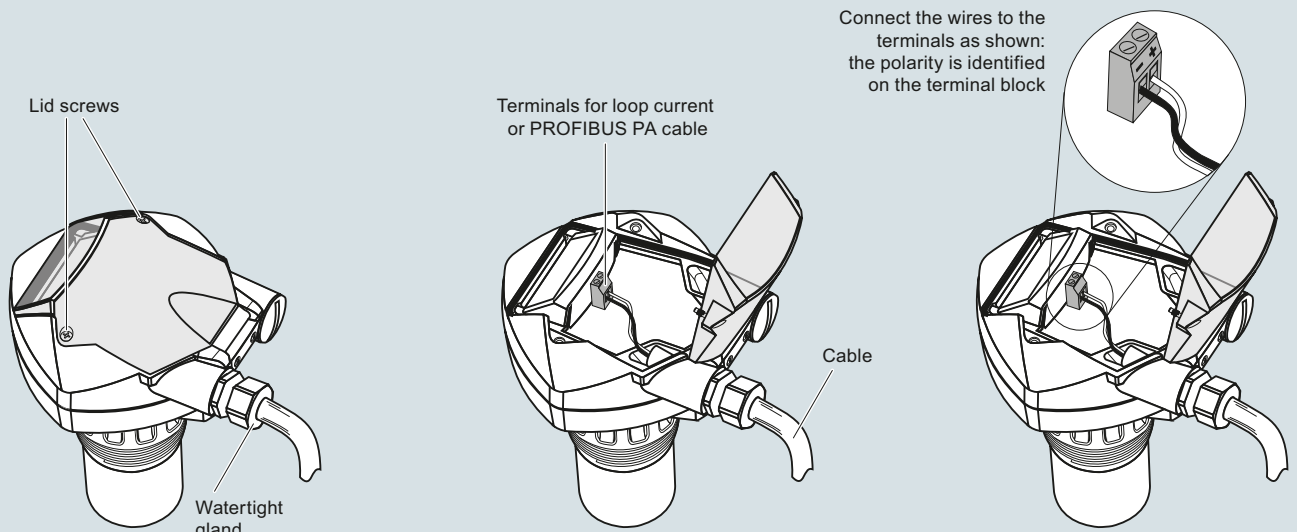
SITRANS Probe LU, dimensions in mm (inch)

## Level measurement

Continuous level measurement  
Ultrasonic transmitters

### SITRANS Probe LU

#### Circuit diagrams



#### Note:

- HART model above is shown with M20 cable glands. 1/2" NPT threaded connection is also available.
- 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.
- Separate cables and conduit may be required to conform to standard instrumentation wiring practices or electrical codes.

SITRANS Probe LU connections