Level measurement
Continuous level measurement
Radar level transmitters

SITRANS LR110

■ Overview

SITRANS LR110 is a compact radar transmitter for continuous level measurement of liquids, slurries, or solids to a range of 15 m (49.2 ft).

■ Benefits

- Bluetooth connectivity for easy setup with SITRANS mobile IQ
- Chemically resistant PVDF enclosure
- HART 7.0 or Modbus RTU (in preparation) communication for intelligent integration into your application
- W band FMCW radar yields narrow beam with small antenna for superior performance in short range applications
- Approved for open air applications outside of a tank
- 2 mm accuracy and zero near range distance yields optimum inventory management capability
- Compact design fits in limited space installations
- Hazardous area variants available for safe use in explosive gas or dust environments.

■ Application

SITRANS LR110 is a W band FMCW radar level transmitter, packaged in a hermetically sealed PVDF enclosure for years of trouble-free reliable measurement service.

4 to 20 mA loop powered with HART [optional 4-wire Modbus RTU (in preparation)], providing accurate level measurement to ranges of 15 m (49.2 ft). Measurement is possible non-intrusively through plastic vessel tops for easy installation. Programming is convenient using the Bluetooth connection and SITRANS mobile IQ application on your smart device.

■ Technical specifications

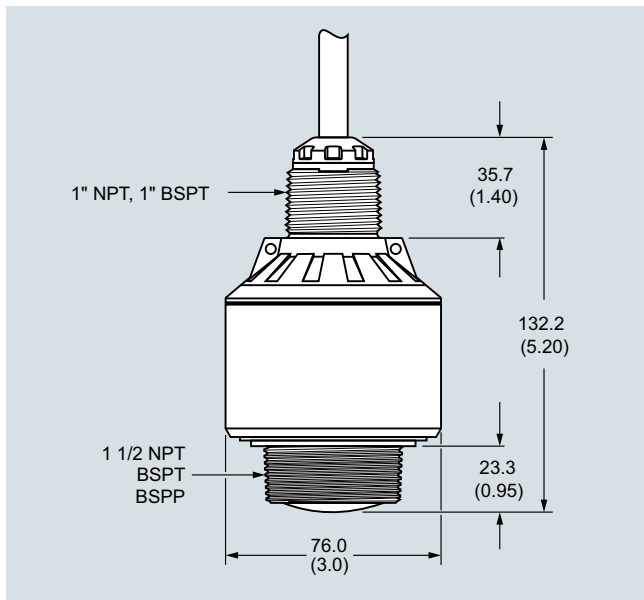| Mode of operation	
Measuring principle	W band FMCW radar
Measuring range	0 ... 15 m (0 ... 49.2 ft)
Frequency	80 GHz nominal
Beam angle	8°
Power Supply	
HART	
• Voltage	12 ... 35 V DC
• Current	4 ... 20 mA
Modbus (in preparation)	
• Voltage	8 … 30 V DC
• Current	38 mA at 8 V DC/17 mA at 30 V DC
Communications	
4 ... 20 mA	HART 7.0
Modbus (4-wire option) (in preparation)	RTU
Accuracy	± 2 mm (range 0.25 ... 015 m), ± 10 mm (range 0 ... 0.25 m)
Rated operating conditions	
Vessel pressure	-1 ... +3 bar (14.50 ... 43.51 psi g)
Ambient temperature	-40 ... +80 °C (-40 ... +176 °F)
Process temperature	-40 ... +80 °C (-40 ... +176 °F)
Storage temperature	-40 ... +80 °C (-40 ... +176 °F)
Design	
Weight	0.5 kg (1.1 lb), plus 0.1 kg/m (0.2 lb/ft) cable length
Material (enclosure)	PVDF
Process connection	1-½" NPT, 1-½" BSPT or 1-½" BSPP
Degree of protection	IP66/IP68
Cable connection	1" NPT or 1" BSPT threaded connection
• HART	Length options: 5 ... 100 m (16.4 ... 328.1 ft), 2 conductor, twisted with shield 18 AWG, PVC jacket
• Modbus version (in preparation)	Length options: 5 ... 100 m (16.4 ... 328.1 ft), 4 conductor, twisted pairs, 22 AWG, polyurethane jacket
Certificates and approvals	CE, $_C$FM$_{US}$, $_C$CSA$_{US}$, ATEX, IECEx, RCM, FCC, Industry Canada, INMETRO, NEPSI, FDA/(EG)1935/2004
Programming	
SITRANS mobile IQ App	SITRANS mobile IQ is a Bluetooth app that provides an intuitive interface to quickly configure, set up and monitor SITRANS LR100 series. For more information: http://www.siemens.com/mobileIQ
SIMATIC PDM	SIMATIC PDM allows for remote PC configuration and diagnostics (for installation on a network).

© Siemens 2020

Level measurement
Continuous level measurement
Radar level transmitters

SITRANS LR110

Selection and ordering data

	Article No.
	7ML531-

SITRANS LR110 Radar level transmitter

Continuous, non-contact, 15 m (49.2 ft) range, for liquids, slurries, or solids, integrated cable connection

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

7ML531- ■ **-** ■ ■ ■ **0 6 - 0 - A 0**

Communications

HART (4 ... 20 mA)	0

Bluetooth function

Disabled	0
Enabled	1

Cable length

5 m	A
10 m	B
30 m	C
50 m	D
100 m	E

Process connection

1-½" NPT [(Taper), ASME B1.20.1]/ electrical connection 1" NPT	A
R 1-½" [(BSPT), EN 10226]/ electrical connection 1" BSPT	B
G 1-½" [(BSPP), EN ISO 228-1]/electrical connection 1" BSPT	C

Type of protection

Non Ex (ordinary locations/Class I, Div. 1) CE, CFMUS, CCSAUS, RCM[2]	A
Ex i (ia) (Gas Ex-Zone 0/Class 1, Div. 1) Dust Ex-Zone 20, 21, Class II & III Div. 1[1]	B
Ex Zone 1, ½, Zone 21, 22, (Class I, Div. 2), Class II & III, Div. 2 via encapsulation [3]	G

	Order code
Further designs	
Please add "**-Z**" to Article No. and specify Order code(s).	
Tag (device parameter, max. 32 characters) plate stainless steel 304/1.4301	**Y15**
CFMUS, CCSAUS, ATEX, IECEx	**E49**
INMETRO[4]	**E25**
NEPSI	**E27**
ATEX, IECEx	**E47**
WHG and Vlaren	**E61**
Operating Instructions	
All literature is available to download for free, in a range of languages, at	
http://www.siemens.com/processinstrumentation/documentation	

Accessories	Article No.
Easy Aimer 2, aluminum, NPT with ¾" x 1" PVC coupling	**7ML1830-1AQ**
Easy Aimer 2, aluminum with M20 adapter and 1" and 1½" BSPT aluminum couplings	**7ML1830-1AX**
Easy Aimer 304, NPT with 1" stainless steel coupling	**7ML1830-1AU**
Easy Aimer 304, with M20 adapter and 1" and 1½" BSPT 304 stainless steel couplings	**7ML1830-1GN**
FMS-200 universal box bracket, mounting kit	**7ML1830-1BK**
FMS-210 channel bracket, wall mount	**7ML1830-1BL**
FMS-220 extended channel bracket, wall mount	**7ML1830-1BM**
FMS-310 channel bracket, floor mount	**7ML1830-1BN**
FMS-320 extended channel bracket, floor mount	**7ML1830-1BP**
FMS-350 bridge channel bracket, floor mount (see Mounting Brackets on page 4/186 for more information)	**7ML1830-1BQ**
1" NPT locknut, plastic	**7ML1830-1DS**
1" BSP locknut, plastic	**7ML1830-1DR**
Plastic adapter 1" BSP - 20 mm	**7ML1830-1EA**
Plastic adapter 1" NPT	**7ML1930-1FX**
Plastic adapter 1" NPT/M20	**7ML1830-1EF**
SIMATIC RTU3010C compact, remote data manager with alarming	**6NH3112-0BA00-0XX0**
SIMATIC RTU3030C compact, remote data manager with alarming	**6NH3112-3BA00-0XX0**
Intrinsically Safe barrier	**7NG4124-1AA00**
SITRANS RD100, loop powered display - see Chapter 7	**7ML5741-.....-.**
SITRANS RD150, remote digital display for 4 to 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
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-.....-..**
For applicable back up point level switch - see point level measurement section	

[1] Must be ordered in combination with order codes E49, E25, E27, or E47.

[2] Cannot be ordered in combination with order codes E49, E25, E27, or E47.

[3] Available only with Order code E47.

[4] MASC approval is also included when ordered with Type of protection option G.

4

Level measurement
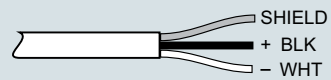## Continuous level measurement
Radar level transmitters

SITRANS LR110

Dimensional drawings

1" NPT, 1" BSPT

35.7 (1.40)

132.2 (5.20)

1 1/2 NPT BSPT BSPP

23.3 (0.95)

76.0 (3.0)

SITRANS LR110, dimensions in mm (inch)

Circuit diagrams

SHIELD
+ BLK
− WHT

12 ... 35 V DC
4 ... 20 mA
Loop powered

SITRANS LR120 Connections