

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 ... 0.15 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, cFM _{US} , cCSA _{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).

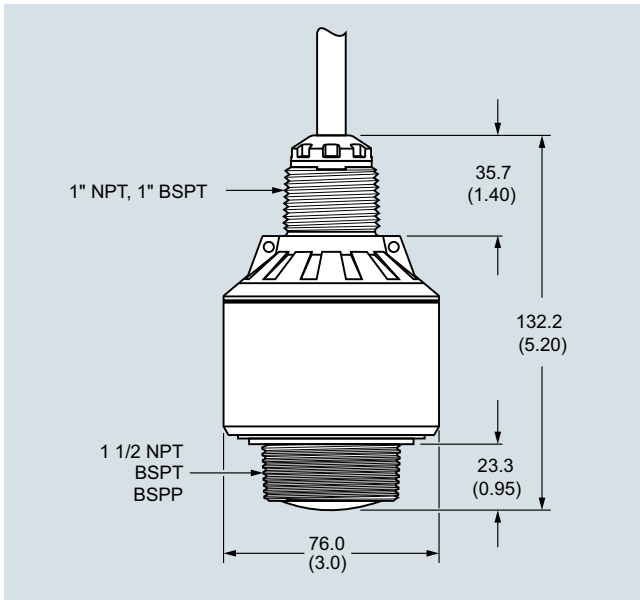
Selection and ordering data	Article No.	Order code																							
SITRANS LR110 Radar level transmitter Continuous, non-contact, 15 m (49.2 ft) range, for liquids, slurries, or solids, integrated cable connection Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	7ML531- - - 0 6 - 0 - A 0																								
Communications HART (4 ... 20 mA)	0																								
Bluetooth function Disabled Enabled	0 1																								
Cable length 5 m 10 m 30 m 50 m 100 m	A B C D E																								
Process connection 1-1/2" NPT [(Taper), ASME B1.20.1]/electrical connection 1" NPT R 1-1/2" [(BSPT), EN 10226]/electrical connection 1" BSPT G 1-1/2" [(BSPP), EN ISO 228-1]/electrical connection 1" BSPT	A B C																								
Type of protection Non Ex (ordinary locations/Class I, Div. 1) CE, cFM _{US} , cCSA _{US} , RCM ²⁾ Ex i (ia) (Gas Ex-Zone 0/Class 1, Div. 1) Dust Ex-Zone 20, 21, Class II & III Div. 1 ¹⁾ Ex Zone 1, 1/2, Zone 21, 22, (Class I, Div. 2), Class II & III, Div. 2 via encapsulation ³⁾	A B G																								
		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 cFM _{US} , cCSA _{US} , ATEX, IECEx INMETRO ⁴⁾ NEPSI ATEX, IECEx WHG and Vlaren																							
		Operating Instructions All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation																							
		Accessories																							
		<table border="1"> <thead> <tr> <th>Article No.</th> </tr> </thead> <tbody> <tr> <td>7ML1830-1AQ</td> </tr> <tr> <td>7ML1830-1AX</td> </tr> <tr> <td>7ML1830-1AU</td> </tr> <tr> <td>7ML1830-1GN</td> </tr> <tr> <td>7ML1830-1BK</td> </tr> <tr> <td>7ML1830-1BL</td> </tr> <tr> <td>7ML1830-1BM</td> </tr> <tr> <td>7ML1830-1BN</td> </tr> <tr> <td>7ML1830-1BP</td> </tr> <tr> <td>7ML1830-1BQ</td> </tr> <tr> <td>7ML1830-1DS</td> </tr> <tr> <td>7ML1830-1DR</td> </tr> <tr> <td>7ML1830-1EA</td> </tr> <tr> <td>7ML1930-1FX</td> </tr> <tr> <td>7ML1830-1EF</td> </tr> <tr> <td>6NH3112-0BA00-0XX0</td> </tr> <tr> <td>6NH3112-3BA00-0XX0</td> </tr> <tr> <td>7NG4124-1AA00</td> </tr> <tr> <td>7ML5741-.....-</td> </tr> <tr> <td>7ML5742-.....-</td> </tr> <tr> <td>7ML5740-.....-</td> </tr> <tr> <td>7ML5744-.....-</td> </tr> </tbody> </table>	Article No.	7ML1830-1AQ	7ML1830-1AX	7ML1830-1AU	7ML1830-1GN	7ML1830-1BK	7ML1830-1BL	7ML1830-1BM	7ML1830-1BN	7ML1830-1BP	7ML1830-1BQ	7ML1830-1DS	7ML1830-1DR	7ML1830-1EA	7ML1930-1FX	7ML1830-1EF	6NH3112-0BA00-0XX0	6NH3112-3BA00-0XX0	7NG4124-1AA00	7ML5741-.....-	7ML5742-.....-	7ML5740-.....-	7ML5744-.....-
Article No.																									
7ML1830-1AQ																									
7ML1830-1AX																									
7ML1830-1AU																									
7ML1830-1GN																									
7ML1830-1BK																									
7ML1830-1BL																									
7ML1830-1BM																									
7ML1830-1BN																									
7ML1830-1BP																									
7ML1830-1BQ																									
7ML1830-1DS																									
7ML1830-1DR																									
7ML1830-1EA																									
7ML1930-1FX																									
7ML1830-1EF																									
6NH3112-0BA00-0XX0																									
6NH3112-3BA00-0XX0																									
7NG4124-1AA00																									
7ML5741-.....-																									
7ML5742-.....-																									
7ML5740-.....-																									
7ML5744-.....-																									
		Easy Aimer 2, aluminum, NPT with 3/4" x 1" PVC coupling Easy Aimer 2, aluminum with M20 adapter and 1" and 1 1/2" BSPT aluminum couplings Easy Aimer 304, NPT with 1" stainless steel coupling Easy Aimer 304, with M20 adapter and 1" and 1 1/2" BSPT 304 stainless steel couplings FMS-200 universal box bracket, mounting kit FMS-210 channel bracket, wall mount FMS-220 extended channel bracket, wall mount FMS-310 channel bracket, floor mount FMS-320 extended channel bracket, floor mount FMS-350 bridge channel bracket, floor mount (see Mounting Brackets on page 4/186 for more information) 1" NPT locknut, plastic 1" BSP locknut, plastic Plastic adapter 1" BSP - 20 mm Plastic adapter 1" NPT Plastic adapter 1" NPT/M20 SIMATIC RTU3010C compact, remote data manager with alarming SIMATIC RTU3030C compact, remote data manager with alarming Intrinsically Safe barrier SITRANS RD100, loop powered display - see Chapter 7 SITRANS RD150, remote digital display for 4 to 20 mA and HART devices - 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 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.																							

Level measurement

Continuous level measurement
Radar level transmitters

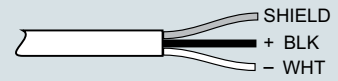
SITRANS LR110

Dimensional drawings



SITRANS LR110, dimensions in mm (inch)

Circuit diagrams



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

SITRANS LR120 Connections