

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 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], 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.

Selection and ordering data

SITRANS LR110 Radar level transmitter Continuous, non-contact, 15 m (49.2 ft) range, for liquids, slurries, or solids, integrated cable connection										Article No. 7ML531 ● - ● ● ● 0 6 - 0 ● A 0									
Click on the Article No. for the online configuration in the PIA Life Cycle Portal.																			
Communications																			
HART (4 ... 20 mA)										0									
Modbus RTU ⁽⁴⁾⁽⁶⁾										3									
Bluetooth function																			
Without										0									
With										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																			
Ordinary Locations/General Purpose (Non-Ex), CE, cFM _{US} , cCSA _{US} , RCM ⁽²⁾																			
ATEX II 1G, 1/2G Ex ia IIC T4 Ga, Ga/Gb,																			
ATEX II 1D, 1/2D Ex ia IIIC T134°C Da, Da/Db;																			
Gas Ex-Zone 0/Class 1, Div. 1;																			
Dust Ex-Zone 20, 21, Class II & III Div. 1 ⁽¹⁾																			
ATEX II 2G Ex ib mb IIC T4 Gb;																			
ATEX II 1D, 1/2D Ex ta, ta/tb IIIC T200 121 °C Da, Da/Db,																			
ATEX II 2D Ex tb IIIC T200 134 °C Db;																			
ATEX II 1D, 1/2D Ex ta, ta/tb IIIC T200 142 °C Da, Da/Db,																			
ATEX II 2D Ex tb IIIC T200 155 °C Db;																			
Zone 1, 1/2, Zone 20, 21, 22, (Class I, Div. 2), Class II & III, Div. 1 ⁽¹⁾⁽³⁾																			

Selection and Ordering data	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
Inspection certificate 3.1 (EN 10204) - device with test data	C25
cFM _{US} , cCSA _{US} , ATEX, IECEx	E49
INMETRO, IA MASC	E25
NEPSI, CCOE	E27
ATEX, IECEx	E47
CSA-Japan-Ex	E29
EACEx ⁽⁵⁾	E24
WHG and VLAREM II	E61
NSF 61 Drinking Water and FDA, EG1935/2004	E84

Accessories	Article No.
Operating Instructions	
All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	
Accessories	
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

Accessories	Article No.
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
Bracket, 316L Stainless steel, 1 inch mount, 80 mm (3.1 inch) offset	A5E50507509
Bracket, 316L Stainless steel, 1 inch mount, 200 mm (7.9 inch) offset	A5E50507511
Bracket, 316L Stainless steel, 1.5 inch mount, 80 mm (3.1 inch) offset	A5E50507514
Bracket, 316L Stainless steel, 1.5 inch mount, 200 mm (7.9 inch) offset	A5E50507516
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 catalog page for more information)	7ML1830-1BQ
1" NPT locknut, plastic	7ML1830-1DS
1" BSP locknut, plastic	7ML1830-1DR
1-½" BSP locknut, plastic	7ML1830-1DP
Plastic adapter 1" BSP - 20 mm	7ML1830-1EA
Plastic adapter 1" NPT	7ML1930-1FX
Plastic adapter 1" NPT/M20	7ML1830-1EF

Selection and ordering data (continued)

Accessories	Article No.
Polypropylene adapter flange, 2"/DN50, universal, 1.5" NPT	A5E50868980
Polypropylene adapter flange, 2"/DN50, universal, 1.5" BSPT	A5E50868982
Polypropylene adapter flange, 3"/DN80, universal, 1.5" NPT	A5E50868988
Polypropylene adapter flange, 3"/DN80, universal, 1.5" BSPT	A5E50868998
Polypropylene adapter flange, 4"/DN100, universal, 1.5" NPT	A5E50869003
Polypropylene adapter flange, 4"/DN100, universal, 1.5" BSPT	A5E50869005
Note: other polypropylene adapter flange sizes available via PVR request.	
SIMATIC RTU3010C compact, remote data manager with alarming	6NH3112-0BA00-0-XX0
SIMATIC RTU3030C compact, remote data manager with alarming	6NH3112-3BA00-0-XX0
HART modem with USB interface	7MF4997-1DC
Intrinsically Safe barrier	7NG4124-1AA00
SITRANS RD100, loop powered display - see Chapter 7	7ML5741-.....

Accessories	Article No.
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-.....
SITRANS LT500, a versatile, single and multi-vessel level monitor/controller for virtually any application in a wide range of industries.	7ML60-.....
For applicable back up point level switch - see point level measurement section	

- 1) Must be ordered in combination with order codes E49, E25, E27, E47, E29, or E24.
- 2) Not available in combination with order codes E49, E25, E27, E47, E29, or E24.
- 3) When ordered in combination with NPT thread types, this option is available with any order code. When ordered in combination with BSPP or BSPT thread types, this option is only available with order codes E49, E25, E27, E47, E29.
- 4) Available only with Type of protection options A and G.
- 5) Available only with Type of protection option B.
- 6) Available only with Bluetooth option 1.

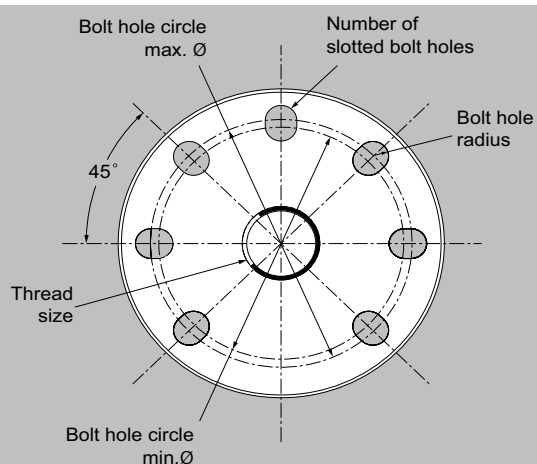
Technical specifications

SITRANS LR110	
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	
• 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)	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)
Minimum dielectric of the medium	1.6
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	Length options: 5 ... 100 m (16.4 ... 328.1 ft), 4 conductor, twisted pairs, 22 AWG, polyurethane jacket
Certificates and approvals	
	CE, cFMUS, cCSAUS, ATEX, IECEx, EACEx, CSA- Japan-Ex, RCM, INMETRO, NEPSI, CCOE, PESO, FDA, Reg. (EC) No. 1935/2004
Radio	CE, FCC, IC, Anatel, ICASA, NCC, KC, CITC, RCM, WPC, Telec, NBTC, MCMC
Marine	CE, FCC, IC, Anatel, ICASA, NCC, KC, CITC, RCM, WPC, Telec, NBTC, MCMC
Water monitoring, flow	MCERTS Class 1
Canadian Registration Number (CRN)	
• British Columbia	0F22218.51
• Alberta	0F20596.2
• Saskatchewan	0F2002.3
• Manitoba	0F7032.4
• Ontario	0F22218.5
• Quebec	0F05183.6
• New Brunswick	0F1490.07
• Nova Scotia	0F1490.08
• Prince Edward Island	0F1490.09

Technical specifications (continued)

SITRANS LR110	
• Newfoundland and Labrador	0F1490.0
• Yukon	0F1490.0Y
• Northwest Territories	0F1490.0T
• Nunavut	0F1490.0N
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).
SITRANS DTM	

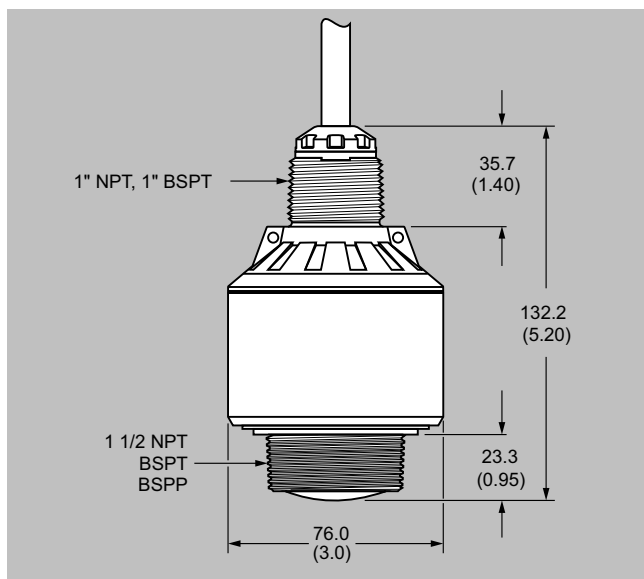
Options



Part number	Adapter flange size	OD ± 1	B.C.D. max. for slotted holes (bmax.) ± 0.75	B.C.D. min. for slotted holes (bmin.) ± 0.75	Bolt hole radius ± 0.25	Number of slotted holes	Thread size
A5E50868980 A5E50868982 A5E50868983	2"/DN50	200	160	150	R 9.5	8	1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868988 A5E50868998 A5E50869002	3"/DN80	200	160	150	R 9.5	8	1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868953 A5E50868975 A5E50869003 A5E50869005 A5E50869010	4"/DN100	229	191	175	R 9.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP
A5E50868976 A5E50868977 A5E50869012 A5E50869014 A5E50869015	6"/DN150	285	242	240	R 11.5	8	1" NPT, PP 1" BSPT, PP 1.5" NPT, PP 1.5" BSPT, PP 1.5" BSPP, PP

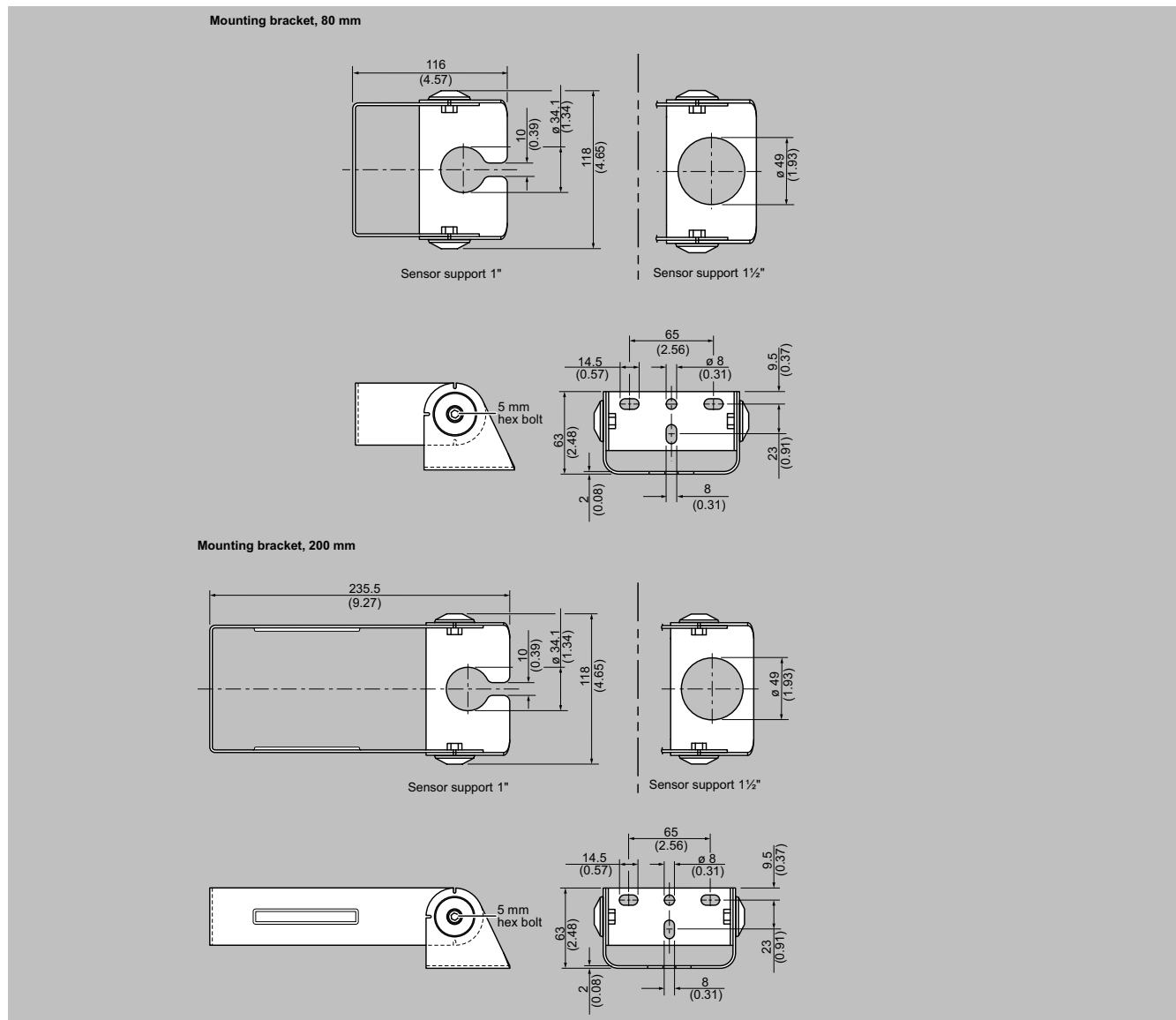
SITRANS LR110, Polypropylene adapter flange

Dimensional drawings



SITRANS LR110, dimensions in mm (inch)

Dimensional drawings (continued)



SITRANS LR110 mounting brackets, dimensions in mm (inch)

Circuit diagrams



SITRANS LR110 connections