

Level measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LUC500

Overview



SITRANS LUC500 is a complete ultrasonic level controller for monitoring and control of water distribution and wastewater collection systems, with energy-saving algorithms.

Benefits

- Monitoring and control in one device
- Integral telemetry interface (Modbus RTU/ASCII)
- Patented algorithm for calculation of pumped volume within 5 % accuracy
- Logging of pump runtime and number of pump starts
- Expandable with I/Os, RAM for data logging, dual point, SmartLinx communications, and RS 485 interface
- Simple system configuration and diagnostics with Siemens Dolphin Plus Windows-based software
- AC or DC power supply
- SITRANS LUC500 is available for rack mount, panel mount or wall mount

Application

It combines non-contacting ultrasonic technology, patented echo-processing techniques and proven application software to provide accurate level monitoring in liquids up to 15 m (50 ft).

It also effectively monitors flow in flumes, weirs and open channels. Five relays control any combination of pumps, gate valves and alarms. Further advantages include fault signaling and data logging for trend analysis. It can log the time, date and volume of up to 20 occurrences of combined sewer overflows (CSO).

The basic device has 8 digital inputs, 5 digital outputs, 1 analog input, 1 ultrasonic level point, differential/average capability and one RS 232 interface with Modbus RTU/ASCII protocol.

The device can be expanded by additional I/Os, more RAM, two channels, RS 485 or SmartLinx communications models as your needs grow.

It integrates seamlessly with SCADA or DCS systems or a PLC system to provide remote access to all system parameters (pumped volume, pump runtime, pump status). The integral telemetry interface (Modbus RTU/ASCII) allows remote control in real time.

- Key Applications: wet well/lift station control, weirs/flumes, open channels

Application of accessories

SITRANS LUC500 can be expanded to meet the requirements of a variety of applications.

Auxiliary I/O cards, RAM and data logging, dual-channel function and SmartLinx communications.

- Input/output cards
A single auxiliary I/O card can be installed in the SITRANS LUC500. The following I/O cards are available:
 - 2 analog inputs/2 analog outputs
 - 4 analog inputs
 - 4 analog outputs
 - 8 digital inputs
 - 8 digital inputs/2 analog inputs/2 analog outputs (wall mount only)
- Expanded memory card
The available RAM can be increased using this card. The data logging function is then available.
- Two-channel function
A second measuring point is provided on the SITRANS LUC500 to permit dual-channel measurements. This function is made available by ordering a software access code. Please contact your Siemens representative for details.
- Communications
The SITRANS LUC500 is offered with Modbus RTU/ASCII as a standard feature. Further industrial communications protocols are available with the addition of an optional SmartLinx card. The following protocols are currently available:
 - PROFIBUS DP
 - Allen Bradley Remote I/O
 - DeviceNet

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Technical specifications

Mode of operation		Power supply	
Measuring principle	Ultrasonic level measurement		100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA (17 W) or 12 ... 30 V DC, 20 W
Measuring range	0.3 ... 15 m (1 ... 50 ft)	Ultrasonic transducer	Compatible transducers: ST-H and EchoMax series XPS-10/10F, XPS 15/15F, XCT-8, XCT-12 and XRS-5
Measuring points	1 or 2	mA output signal	2-core copper conductor, twisted, shielded, 0.5 ... 0.75 mm ² (22 ... 18 AWG), Belden 8760 or equivalent is acceptable
Output		Displays and controls	
Ultrasonic transducer	44 kHz	Rack and panel mount	75 x 20 mm (3 x 0.8 inch) LCD (selectable backlighting)
Relays	5 relays, rated 5 A at 250 V AC, non-inductive <ul style="list-style-type: none"> • Wall Mount version: 4 SPST Form A relays, 1 SPDT Form C relay • Rack and Panel Mount version: 4 SPST Form A relays, 1 SPST Form B relay 	Wall mount	100 x 40 mm (4 x 1.5 inch) multi-field LCD, backlit
Accuracy		Programming	
Error in measurement	0.25 % of range or 6 mm (0.24 inch), whichever is greater		Using removable handheld programmer (ordered separately) or Dolphin Plus software (option)
Resolution	0.1 % of measuring range or 2 mm (0.08 inch), whichever is greater ¹⁾	Memory	
Temperature compensation	-50 ... +150 °C (-58 ... +302 °F) <ul style="list-style-type: none"> • Integral temperature sensor • External TS-3 temperature sensor (optional) • Programmable fixed temperature 	1 Mbyte RAM (static) with battery, 1 Mbyte flash EPROM	
Rated operating conditions		Certificates and approvals	
Ambient conditions		CE, FM, CSA	
Ambient temperature for enclosure	-20 ... +50°C (-4 ... +122 °F)	1) The measuring range corresponds to the distance from the zero point to the sensor face, plus any range extension (P801)	
Design			
Rack mount	DIN 3 HU/21 pitch, 4-rail plug-in unit suitable for standard 3 HU/84 pitch (19") rack		
Panel mount	Suitable for standard panel cutout DIN 43700 72 x 144 mm, 110 mm (4.33 inch) center height		
Weight (rack and panel mount)	1.5 kg (3.3 lb)		
Weight (wall mount)	2.5 kg (5.5 lb)		
Communications			
RS 232	Siemens Dolphin protocol, Modbus RTU and ASCII		
Option	SmartLinx compatible, RS 485		

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Selection and Ordering data	Order No.
SITRANS LUC500 A complete ultrasonic level controller for monitoring and control of water distribution and wastewater collection systems, with energy-saving algorithms.	7ML5001- ■■■■■ - ■■ A ■
Mounting Panel mount version Rack mount version for 19" rack Wall mount, standard enclosure Wall, 4 entry, M20 (valid with approval option 3 only)	1 2 3 5
Input voltage 100 ... 230 V AC 12 ... 30 V DC	A B
Number of measurement points Single point version Dual point version	A B
Data communications SmartLinx ready, no module SmartLinx PROFIBUS DP module SmartLinx Allen-Bradley Remote I/O module SmartLinx DeviceNet module	0 1 2 3
Protocol Modbus RTU/ASCII	1
Auxilliary memory None 1 Mbyte static RAM, including data logging module	0 1
Auxilliary I/O None 2 analog inputs and 2 analog outputs 4 analog inputs 4 analog outputs 8 digital inputs 8 digital inputs, 2 analog inputs and 2 analog outputs (only for wall mount)	A B C D E F
Approvals CSA, CE, UL (not available with mounting option 5) CE	2 3
Selection and Ordering data	Order code
Further designs Please add "-Z" to Order 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 English 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.	Order No. 7ML1998-5GL01 7ML1998-5GL31
Other Operating Instructions SmartLinx Allen-Bradley Remote I/O, English SmartLinx PROFIBUS DP, English SmartLinx PROFIBUS DP, German SmartLinx PROFIBUS DP, French SmartLinx DeviceNet, English Note: The appropriate SmartLinx Operating Instructions should be ordered as a separate line on the order.	7ML1998-1AP03 7ML1998-1AQ03 7ML1998-1AQ33 7ML1998-1AQ13 7ML1998-1BH02

Accessories

Accessories	Order No.
Handheld programmer	7ML1830-2AG
ERS500 Configuration Tool software, CD, cable kit, and License	7ML1930-1AE
ERS500 Configuration Tool software, License only	7ML1930-1AF
ERS500 Configuration Tool software, demo CD only	7ML1930-1AG
M20 cable gland kit (4 M20 cable glands, 4 M20 nuts, 4 washers) See SmartLinx product page 4/343 for more information.	7ML1930-1FV
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosures	7ML1930-1AC
Sunshield kit, 304 SS (wall mount only)	7ML1930-1GA
SITRANS RD100 Remote display - see Chapter 7	
SITRANS RD200 Remote display - see Chapter 7	
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 7	7ML5750-1AA00-0
Auxiliary Cards. Access code required¹⁾	
1 MByte static RAM extended memory	PBD:51034040
2 analog input / 2 analog output for rack and panel mount version	PBD:51034039
2 analog input / 2 analog output for wall mount version	PBD:51034044
8 digital input for rack and panel mount version	PBD:51034042
8 digital input for wall mount version	PBD:51034043
4 analog input for rack and panel mount version	PBD:51034045
4 analog input for wall mount version	PBD:51034046
4 analog output for rack and panel mount version	PBD:51034047
4 analog output for wall mount version	PBD:51034048
8 digital inputs, 2 analog inputs, 2 analog outputs, wall mount	PBD:51034272
Access code, dual point capability	7ML1830-1KA
Auxiliary Cards²⁾	
1 MByte static RAM extended memory	7ML1830-1KR
2 analog input / 2 analog output for rack and panel mount version	7ML1830-1KS
2 analog input / 2 analog output for wall mount version	7ML1830-1KT
8 digital input for rack and panel mount version	7ML1830-1KU
8 digital input for wall mount version	7ML1830-1LA
4 analog input for rack and panel mount version	7ML1830-1LB
4 analog input for wall mount version	7ML1830-1LC
4 analog output for rack and panel mount version	7ML1830-1LD
4 analog output for wall mount version	7ML1830-1LE
8 digital inputs, 2 analog inputs, 2 analog outputs, wall mount	7ML1830-1LF
¹⁾ Values of parameters P345 and P346 must be obtained from the customer in order to generate the order for the access code.	
²⁾ For replacement of auxiliary card or spare auxiliary card. Access code not required. Must be used only as replacement cards.	

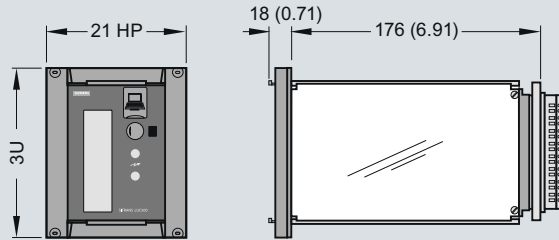
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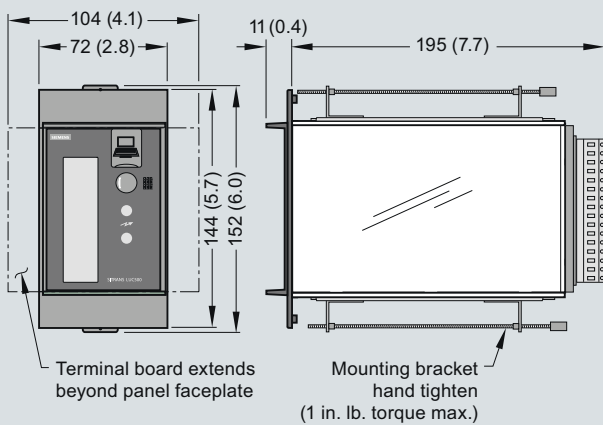
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Dimensional drawings

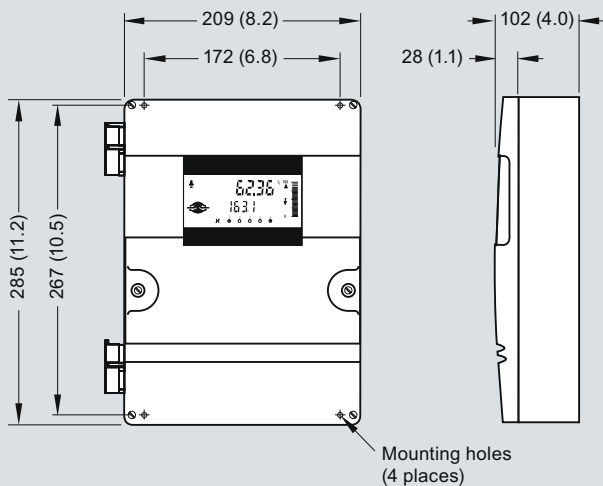
Rack mount unit



Panel mount unit



Wall mount unit



SITRANS LUC500, dimensions in mm (inch)

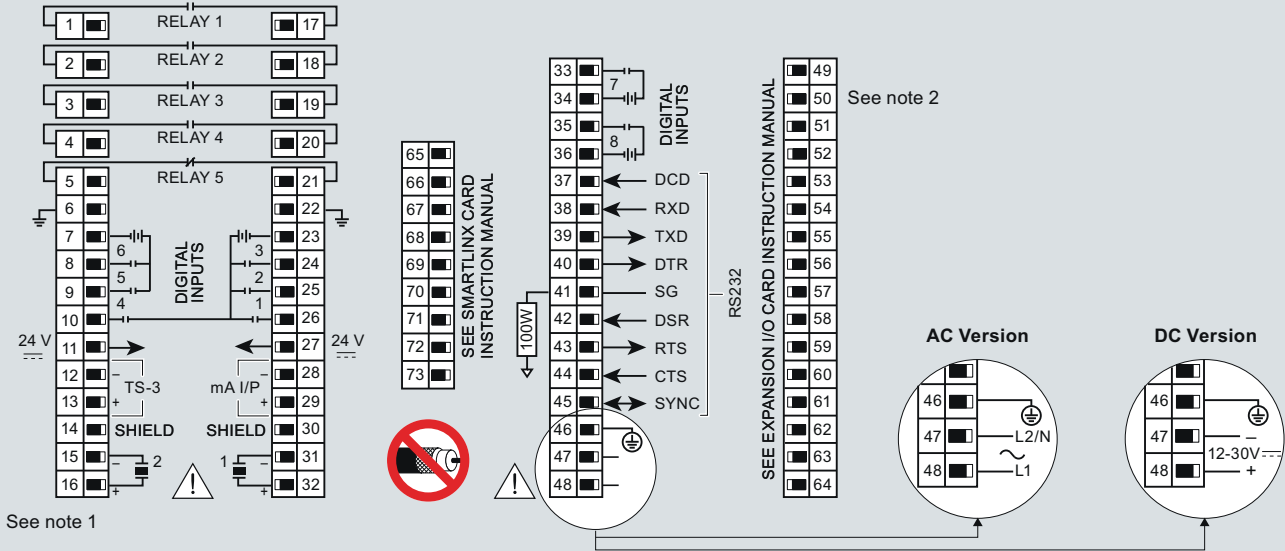
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Schematics

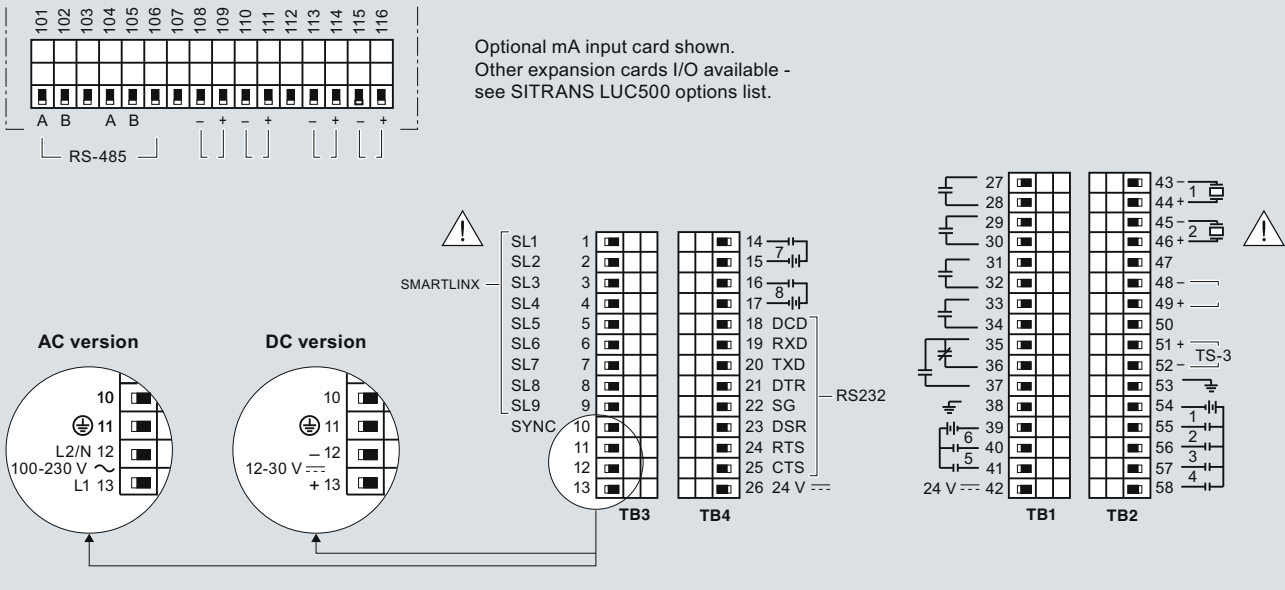
Rack and panel mount



Notes

1. Transducer uses 2 wire twisted pair with shield only.
2. Terminals 49-64 are for use with optional expansion I/O cards.

Wall mount



SITRANS LUC500 connections