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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 signalling 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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SITRANS LUC500

Technical specifications

Mode of operation	
Measuring principle	Ultrasonic level measurement
Measuring range	0.3 ... 15 m (1 ... 50 ft)
Measuring points	1 or 2
Output	
Ultrasonic transducer	44 kHz
Relays	5 relays, rated 5 A at 250 V AC, non-inductive • 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
Accuracy	
Error in measurement	0.25% of range or 6 mm (0.24"), whichever is greater
Resolution	0.1% of measuring range or 2 mm (0.08"), whichever is greater[1)]
Temperature compensation	-50 ... +150 °C (-58 ... +302 °F) • Integral temperature sensor • External TS-3 temperature sensor (optional) • Programmable fixed temperature
Rated operating conditions	
Ambient conditions	
Ambient temperature for enclosure	-20 ... +50°C (-4 ... +122 °F)
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") center height
Weight (rack and panel mount)	1.5 kg (3.3 lbs)
Weight (wall mount)	2.5 kg (5.5 lbs)
Communications	
RS-232	Siemens Dolphin protocol, Modbus RTU and ASCII
Option	SmartLinx compatible, RS-485
Power supply	100 ... 230 V AC ± 15%, 50/60 Hz, 36 VA (17 W) or 12 ... 30 V DC, 20 W
Ultrasonic transducer	Compatible transducers: ST-H and Echomax series XPS-10/10F, XPS 15/15F, XCT-8, XCT-12 and XRS-5
mA output signal	2-core copper conductor, twisted, shielded, 0.5 ... 0.75 mm² (22 ... 18 AWG), Belden 8760 or equivalent is acceptable
Displays and controls	
Rack and panel mount	75 x 20 mm (3 x 0.8") LCD (selectable backlighting)
Wall mount	100 x 40 mm (4 x 1.5") multfield LCD, backlit
Programming	Using removable handheld programmer (ordered separately) or Dolphin Plus software (option)
Memory	1 Mbyte RAM (static) with battery, 1 Mbyte flash EPROM
Certificates and approvals	CE, FM, CSA

1) The measuring range corresponds to the distance from the zero point to the sensor face, plus any range extension (P801)

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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.	L)	**7ML5001-** ■■■■-■■A■
Mounting		
Panel mount version		1
Rack mount version for 19" rack		2
Wall mount, standard enclosure		3
Wall, 4 entry, M20 (valid with approval option 3 only)		5
Input voltage		
100 ... 230 V AC		A
12 ... 30 V DC		B
Number of measurement points		
Single point version		A
Dual point version		B
Data communications		
SmartLinx ready, no module		0
SmartLinx PROFIBUS DP module		1
SmartLinx Allen-Bradley Remote I/0 module		2
SmartLinx DeviceNet module		3
Protocol		
Modbus RTU/ASCII		1
Auxilliary memory		
None		0
1 Mbyte static RAM, including data logging module		1
Auxilliary I/O		
None		A
2 analog inputs and 2 analog outputs		B
4 analog inputs		C
4 analog outputs		D
8 digital inputs		E
8 digital inputs, 2 analog inputs and 2 analog outputs (only for wall mount)		F
Approvals		
CSA, CE, UL (not available with mounting option 5)		2
CE		3

L) Subject to export regulations AL: N, ECCN: 3A991X.

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")]: Measuring-point number/identification (max. 16 characters) specify in plain text		**Y15**
Operating Instructions		
English		**7ML1998-5GL01**
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.		**7ML1998-5GL31**
Other Operating Instructions		
SmartLinx Allen-Bradley Remote I/O, English	C)	**7ML1998-1AP03**
SmartLinx PROFIBUS DP, English	C)	**7ML1998-1AQ03**
SmartLinx PROFIBUS DP, German	C)	**7ML1998-1AQ33**
SmartLinx PROFIBUS DP, French	C)	**7ML1998-1AQ13**
SmartLinx DeviceNet, English Note: The appropriate SmartLinx Operating Instructions should be ordered as a separate line on the order.	C)	**7ML1998-1BH02**

Optional Equipment		Order No.
Handheld programmer		**7ML1830-2AG**
ERS500 Configuration Tool software, CD, cable kit, and License	B)	**7ML1930-1AE**
ERS500 Configuration Tool software, License only	B)	**7ML1930-1AF**
ERS500 Configuration Tool software, demo CD only	B)	**7ML1930-1AG**
M20 cable gland kit (4 M20 cable glands, 4 M20 nuts, 4 washers) See SmartLinx product page 5/120 for more information.		**7ML1930-1FV**
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line, suitable for enclosures		**7ML1930-1AC**
Sunshield kit, 304 SS (wall mount only)		**7ML1930-1GA**
SITRANS RD100 Remote display - see Chapter 8		
SITRANS RD200 Remote display - see Chapter 8		
SITRANS RD500 web, datalogging, alarming, ethernet, and modem support for instrumentation - see Chapter 8	K)	**7ML5750-1AA00-0**
Auxiliary Cards. Access code required[1]		
1 MB static RAM extended memory	L)	**PBD-51034040**
2 analog input / 2 analog output for rack and panel mount version	C)	**PBD-51034039**
2 analog input / 2 analog output for wall mount version	C)	**PBD-51034044**
8 digital input for rack and panel mount version	C)	**PBD-51034042**
8 digital input for wall mount version	C)	**PBD-51034043**
4 analog input for rack and panel mount version	C)	**PBD-51034045**
4 analog input for wall mount version	C)	**PBD-51034046**
4 analog output for rack and panel mount version	C)	**PBD-51034047**
4 analog output for wall mount version	C)	**PBD-51034048**
8 digital inputs, 2 analog inputs, 2 analog outputs, wall mount	C)	**PBD-51034272**
Access code, dual point capability	C)	**7ML1830-1KA**
Auxiliary Cards[2]		
1 MB static RAM extended memory	L)	**7ML1830-1KR**
2 analog input / 2 analog output for rack and panel mount version	C)	**7ML1830-1KS**
2 analog input / 2 analog output for wall mount version	C)	**7ML1830-1KT**
8 digital input for rack and panel mount version	C)	**7ML1830-1KU**
8 digital input for wall mount version	C)	**7ML1830-1LA**
4 analog input for rack and panel mount version	C)	**7ML1830-1LB**
4 analog input for wall mount version	C)	**7ML1830-1LC**
4 analog output for rack and panel mount version	C)	**7ML1830-1LD**
4 analog output for wall mount version	C)	**7ML1830-1LE**
8 digital inputs, 2 analog inputs, 2 analog outputs, wall mount	C)	**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.

B) Subject to export regulations AL: N, ECCN: EAR99S.
C) Subject to export regulations AL: N, ECCN: EAR99.
K) Subject to export regulations AL: N, ECCN: 5A991X.
L) Subject to export regulations AL: N, ECCN: 3A991X.

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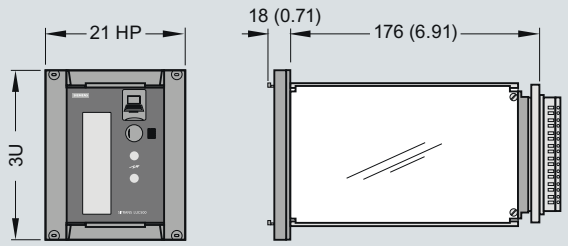
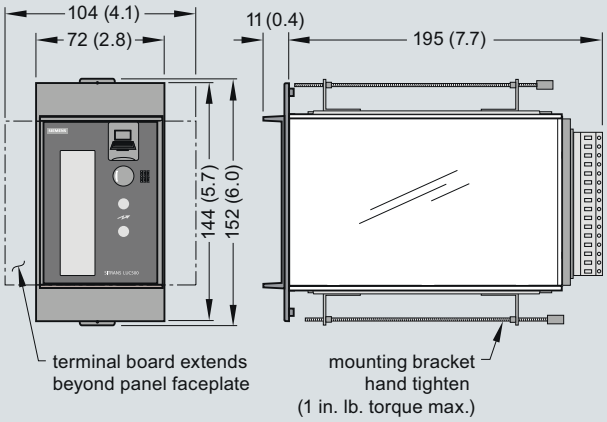
SITRANS LUC500

Dimensional drawings

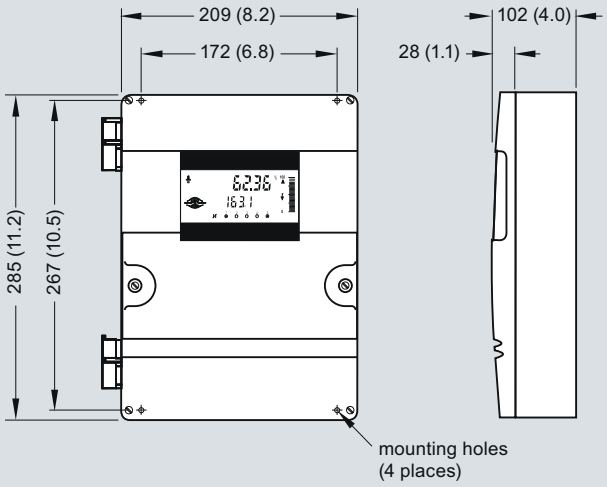
Rack Mount Unit



Panel Mount Unit



Wall Mount Unit



SITRANS LUC500, dimensions in mm (inch)

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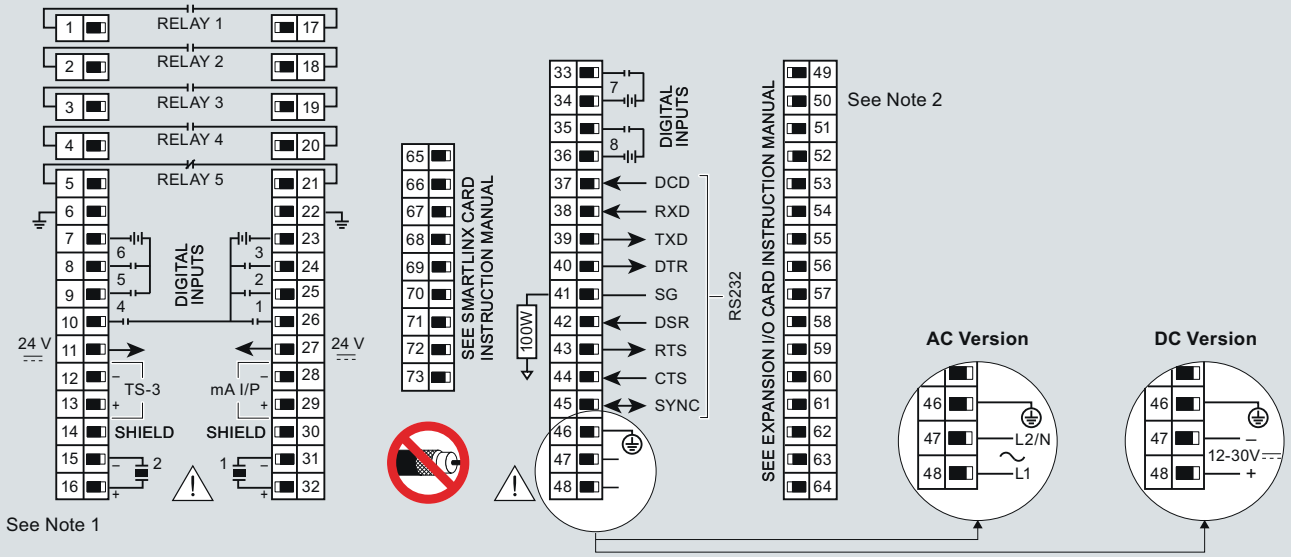
Schematics

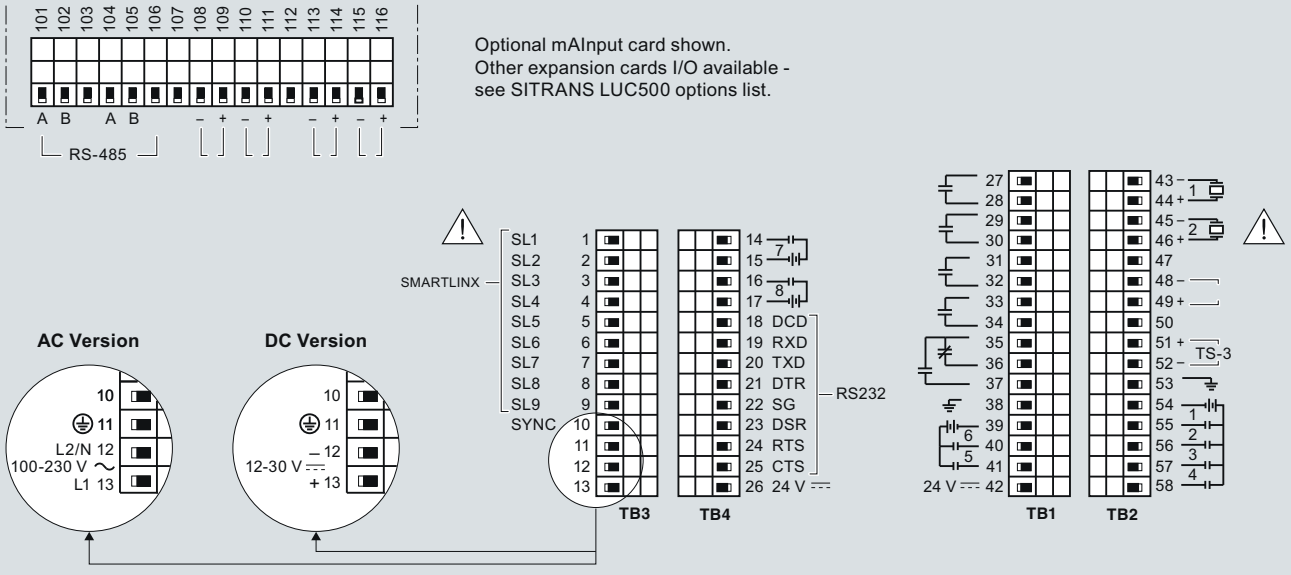
Rack and Panel Mount



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