

Level measurement

Continuous level measurement – Ultrasonic controllers

SITRANS LU01 and LU02

Overview



The SITRANS LU01 is an ultrasonic long-range level controller for liquids and solids in a single vessel up to 60 m (200 ft). Handheld programmer shown is an accessory and must be ordered separately.

Benefits

- Single point, long-range level monitoring
- Easy to install; easy to program using removable infrared keypad (optional)
- Compatible with all EchoMax transducers
- Backlit LCD display with reading in standard engineering units
- Automatic level-to-volume conversion for standard or custom tank shapes
- Dolphin Plus compatible
- High/low alarms

Application

The system consists of a SITRANS LU01 monitor linked to a non-contacting ultrasonic transducer that can be mounted up to 365 m (1 200 ft) away. The SITRANS LU01 will measure distance, level or volume, and it features patented Sonic Intelligence echo processing software for superior reliability.

Readings are displayed in user-selectable linear engineering units on the backlit LCD.

Modules for popular industrial buses can be factory installed or added later to meet changing needs. No external gateway is required, reducing hardware and cabling costs.

- Key Applications: chemical storage, liquid storage, bulk solids storage (gravel, flour bins, grains, cereals), plastic pellets

Overview



The SITRANS LU02 is a dual point ultrasonic long-range level controller for liquids and solids in one or two vessels up to 60 m (200 ft). Handheld programmer shown is an accessory and must be ordered separately.

Benefits

- Dual point, long-range level monitoring
- Easy to install; easy to program using removable infrared keypad (optional)
- Compatible with all EchoMax transducers
- Backlit LCD display with reading in standard engineering units
- Automatic level-to-volume conversion for standard or custom tank shapes
- Dolphin Plus compatible
- High/low alarms

Application

SITRANS LU02 will measure liquids, solids or a combination of both in one or two vessels of different sizes, shapes and configurations up to 60 m (200 ft).

The system uses ultrasonic technology to measure level, space, distance, volume or average/differential. It features patented Sonic Intelligence echo processing software for superior reliability. Transducers can be mounted up to 365 m (1 200 ft) from the monitor.

Readings are displayed in user-selectable linear engineering units on the backlit LCD.

- Key Applications: chemical storage, liquid storage, bulk solids storage (gravel, flour bins, grains, cereals), plastic pellets, tripper car

Level measurement

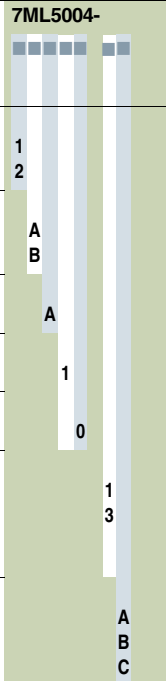
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Technical specifications

Mode of operation	
Measuring principle	Ultrasonic level measurement
Measuring range	0.3 ... 60 m (1 ... 200 ft)
Measuring points	SITRANS LU01: Max. one point; SITRANS LU02: Max. two points
Output signal	
Ultrasonic transducer	EchoMax series, ST-H transducers
Relays	4 SPDT Form C relays, rated at 5 A at 250 V AC, resistive load
mA output	0/4 ... 20 mA, optically isolated
• Max. load	750 Ω, isolated, 30 V
• Resolution	0.1 % of range
• Outputs	SITRANS LU01: Max. one mA output SITRANS LU02: Max. two mA outputs
Accuracy	
Error in measurement	0.25 % of range or 6 mm (0.24 inch), whichever is greater
Resolution	0.1 % of measuring range or 2 mm (0.08 inch), whichever is greater
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	
Weight	2.7 kg (6 lb)
Material (enclosure)	Polycarbonate
Degree of protection (wall mount)	IP65
Electrical connection	
Ultrasonic transducer cable extension	RG62-A/U coaxial cable with low capacitance
mA output signal	2-core copper conductor, twisted, shielded, 0.5 ... 0.75 mm ² (22 ... 18 AWG), Belden 8760 or equivalent is acceptable
Electrical connection and relay connection	Copper conductor according to local requirements, rated 250 V 5 A
Synchronization	Up to 16 LU01/LU02 units can be synchronized together

Power supply	
AC model	100/115/200/230 V AC ± 15 %, 50/60 Hz, 31 VA
DC model	18 ... 30 V DC, 25 W
Displays and controls	
Memory	51 x 127 mm (2 x 5 inch) graphics LCD with backlighting
Programming	EEPROM (non-volatile), no backup battery required
	Using removable programmer (ordered separately) or Dolphin Plus (option)
Certificates and approvals	
	CE, CSA _{US/C} , FM, ATEX II 3D Lloyd's register of Shipping (Categories ENV1, ENV2, ENV3 and ENV5)
Options	
External temperature sensor	TS-3
Communications	• Dolphin Plus: Siemens Windows-compatible interface and ComVerter link (infrared)

Selection and Ordering data	Article No.
SITRANS LU01/LU02	7ML5004-
Single or dual point ultrasonic long-range level monitoring system for liquids and solids, and ranges up to 60 m (200 ft).	
Number of measuring points	
LU01 version, 1 point	1
LU02 version, 2 points	2
Input voltage	
100/115/200/230 V AC, voltage selector switch	A
18 ... 30 V DC	B
Feature software	
Standard	A
Application software	
Standard	1
Data communications	
No module (SmartLinx ready)	0
Enclosure	
Wall mount	1
Wall mount, drilled, 6 x M20	3
Note: Cable glands are not included and should be ordered as a separate line on the order.	
Approvals	
CE, CSA _{US/C} , FM ¹⁾	A
CE	B
ATEX II 3D ²⁾	C

¹⁾ Available with enclosure option 1 only

²⁾ Available with enclosure option 3 only

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Selection and Ordering data	Order code
Further designs Please add "-Z" to Article 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 SITRANS LU01	Article No.
English	7ML1998-5BE02
French	7ML1998-5BE12
German	7ML1998-5BE32
SITRANS LU02	
English	7ML1998-5BD02
French	7ML1998-5BD12
German	7ML1998-5BD32
Note: The Operating Instructions should be ordered as a separate line item. This device is shipped with the Siemens Milltronics manual DVD containing the ATEX Quick Start and Operating Instructions library.	

M20 cable gland kit (4 M20 cable glands, 4 M20 nuts, 4 washers)
 TS-3 Temperature Sensor - see TS-3 on page 4/190
 Sunshield kit, 304 stainless steel

7ML1930-1FV
7ML1830-2AN
7ML1930-1GA

Spare parts

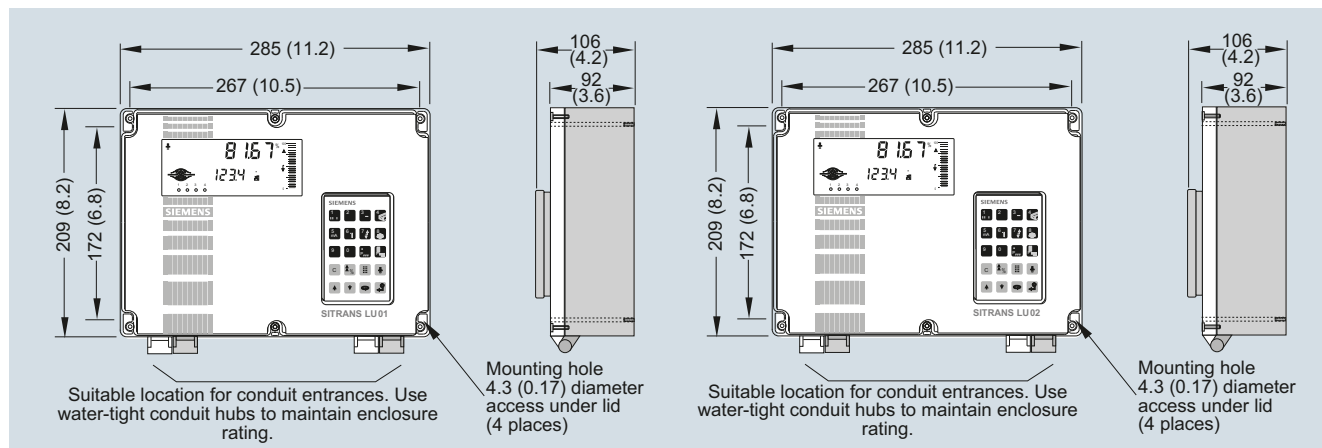
Card, LU01 mother main, AC, comm ready
 Card, LU02 mother main, AC, comm ready
 Card, LU02 daughter, comm ready
 Card, LU01 daughter, comm ready
 Card, display
 See SmartLinX product page 4/337 for more information.

7ML1830-1KX
7ML1830-1MA
7ML1830-1LP
7ML1830-1LN
7ML1830-1LQ

4

Selection and Ordering data	Article No.
Accessories	
Handheld programmer	7ML1830-2AN
Tag, stainless steel, 12 x 45 mm (0.47 x 1.77 inch), one text line, suitable for enclosures	7ML1930-1AC
M20 cable gland kit (6 M20 cable glands, 6 M20 nuts, 3 stop plugs)	7ML1830-1GM

Dimensional drawings



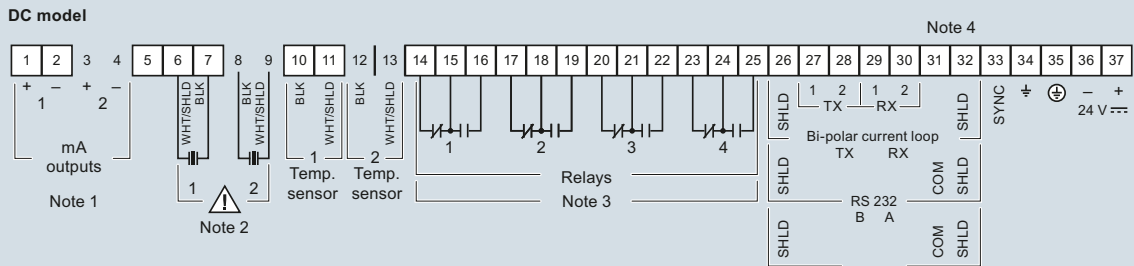
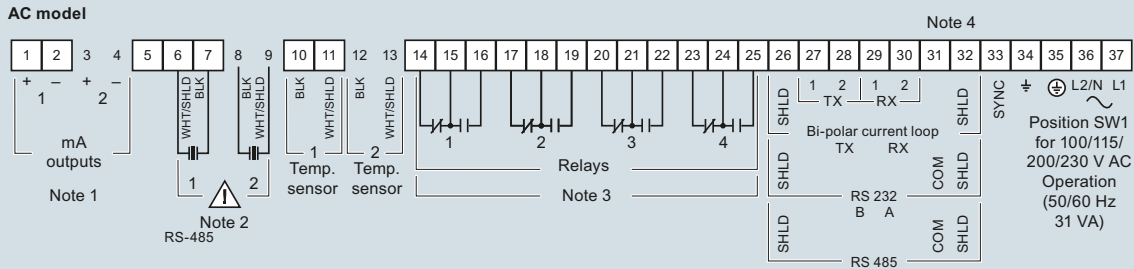
Dimensional drawings for SITRANS LU01 (left) and SITRANS LU02 (right), dimensions in mm (inch)

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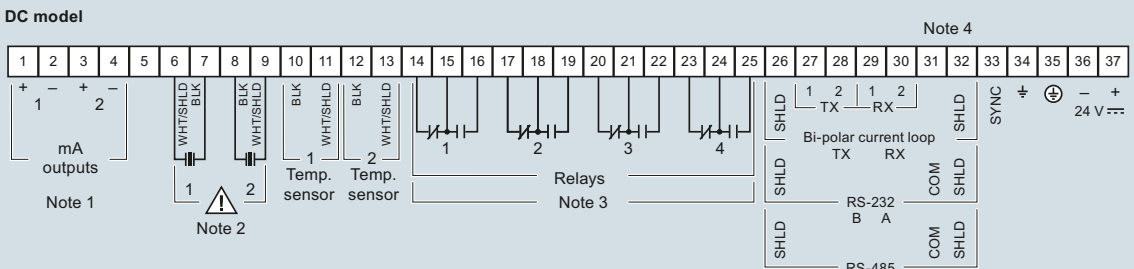
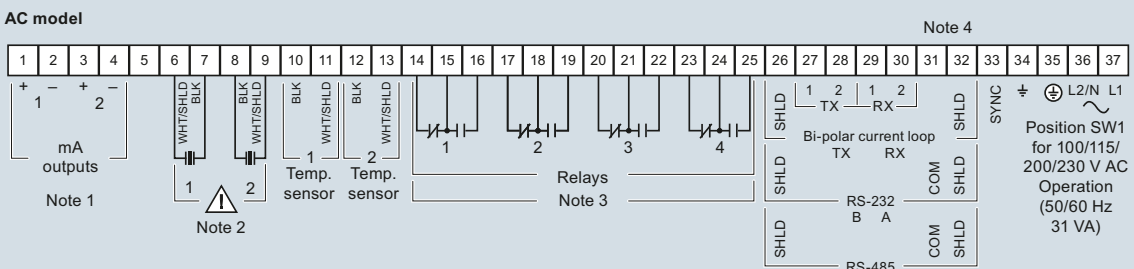
Schematics



Notes:

1. Optically isolated, 750 Ω max. load
2. Use RG62-A/U coaxial (or equivalent) for extensions up to 365 m (1 200 ft). Run in grounded metal conduit, separate from other wiring.
3. Each relay has 1 set of Form 'C' (SPDT) contacts, relay rated at 5 A 250 V AC, non-inductive, when equal or lower rated limiting fuses are installed.
4. Required if mounted adjacent to other SITRANS LU01 units or other specified Siemens Milltronics devices. Interconnect all 'SYNC' terminals with a single 18 AWG (0.5mm²) wire.

SITRANS LU01 connections



Notes:

1. Optically isolated, 750 Ω max. load
2. Use RG62-A/U coaxial (or equivalent) for extensions up to 365 m (1 200 ft). Run in grounded metal conduit, separate from other wiring.
3. Each relay has 1 set of Form 'C' (SPDT) contacts, relay rated at 5 A 250 V AC, non-inductive, when equal or lower rated limiting fuses are installed.
4. Required if mounted adjacent to other SITRANS LU01 units or other specified Siemens Milltronics devices. Interconnect all 'SYNC' terminals with a single 18 AWG (0.5 mm²) wire.

SITRANS LU02 connections