

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 and SmartLinx 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 (1200 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.

An on-board communications port automatically configures for RS-232, RS-485 or bi-polar current loop. The SITRANS LU01 will connect to a DCS or PLC using Siemens SmartLinx[®] interface modules, giving you remote 2-way communication and full parameter access.

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 and SmartLinx 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 (1200 ft) from the monitor.

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

It features an onboard communications port that automatically configures for RS-232, RS-485 or bi-polar current loop. It will connect to a DCS or PLC using Siemens SmartLinx[®] interface modules, giving you remote 2-way communication and full parameter access. 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, tripper car

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Technical specifications

| | | | |
|--|--|-----------------------------------|---|
| Mode of operation | | Power supply | |
| Measuring principle | Ultrasonic level measurement | AC model | 100/115/200/230 V AC ± 15 %, 50/60 Hz, 31 VA |
| Measuring range | 0.3 ... 60 m (1 ... 200 ft) | DC model | 18 ... 30 V DC, 25 W |
| Measuring points | SITRANS LU01: Max. one point; SITRANS LU02: Max. two points | Displays and controls | 51 x 127 mm (2 x 5") graphics LCD with backlighting |
| Output signal | | Memory | EEPROM (non-volatile), no backup battery required |
| Ultrasonic transducer | Echomax series, ST-H transducers | Programming | Using removable programmer (ordered separately) or Dolphin Plus (option) |
| Relays | 4 SPDT Form C relays, rated at 5 A at 250 V AC, resistive load | Certificates and approvals | <ul style="list-style-type: none"> • CE, CSA_{US/CA}, FM, ATEX II 3D • Lloyd's register of Shipping (Categories ENV1, ENV2, ENV3 and ENV5) |
| mA output | 0/4 ... 20 mA, optically isolated | Options | External temperature sensor |
| • Max. load | 750 Ω, isolated, 30 V | Communications | <ul style="list-style-type: none"> • SmartLinX: protocol-specific modules as interface for popular industrial fieldbus systems • Dolphin Plus: Siemens Windows[®]-compatible interface and ComVerter link (infrared) |
| • Resolution | 0.1 % of range | | |
| • Outputs | SITRANS LU01: Max. 1 mA output SITRANS LU02: Max. 2 mA outputs | | |
| 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 | | |
| 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 | | |
| Rated operating conditions | | | |
| Ambient conditions | | | |
| • Ambient temperature for enclosure | -20 ... +50 °C (-4 ... +122 °F) | | |
| Design | | | |
| Weight | 2.7 kg (6 lbs) | | |
| 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 | | |

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Selection and Ordering data

SITRANS LU01/LU02

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
LU02 version, 2 points

Input voltage

100/115/200/230 V AC, voltage selector switch
18 ... 30 V DC

Feature software

Standard

Application software

Standard

Data communications

No module (SmartLinX ready)
SmartLinX Allen-Bradley® Remote I/O module
SmartLinX PROFIBUS DP module
SmartLinX Modbus® RTU module

Enclosure

Wall mount
Wall mount, drilled, 6 x M20

Approvals

CE, CSA_{US/C}, FM¹⁾
CE²⁾
ATEX II 3D¹⁾

¹⁾ Available with enclosure option 1 only

²⁾ Available with enclosure option 3 only

C) Subject to export regulations AL: N, ECCN: EAR99

Order No.

C) 7ML5004-

1 2

A B

A

1

0

1

2

3

1

3

A

B

C

Selection and Ordering data

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

SITRANS LU01

English

C) 7ML1998-5BE02

French

C) 7ML1998-5BE12

German

C) 7ML1998-5BE32

SITRANS LU02

English

C) 7ML1998-5BD02

French

C) 7ML1998-5BD12

German

C) 7ML1998-5BD32

Note: The Operating Instructions should be ordered as a separate line item.

This device is shipped with the Siemens Milltronics manual CD containing the complete ATEX Quick Start and Operating Instructions library.

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) 7ML1998-1AQ12

SmartLinX Modbus, English

C) 7ML1998-1BF01

SmartLinX Modbus, German

C) 7ML1998-1BF31

SmartLinX Modem, English

C) 7ML1998-1BG01

Note: The appropriate SmartLinX Operating Instructions should be ordered as a separate line on the order.

Accessories

Handheld programmer

7ML1830-2AN

Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line, suitable for enclosures

7ML1930-1AC

M20 cable gland kit (6 M20 cable glands, 6 M20 nuts, 3 stop plugs)

7ML1830-1GM

TS-3 Temperature Sensor - see TS-3 on page 5/191

7ML1830-2AN

Spare parts

Card, LU01 mother main, AC, comm ready

C) 7ML1830-1KX

Card, LU02 mother main, AC, comm ready

C) 7ML1830-1MA

Card, LU02 daughter, comm ready

C) 7ML1830-1LP

Card, LU01 daughter, comm ready

C) 7ML1830-1LN

Card, display

C) 7ML1830-1LQ

See SmartLinX product page 5/310 for more information.

C) Subject to export regulations AL: N, ECCN: EAR99

®Modbus is a registered trademark of Schneider Electric.

®Allen-Bradley is a registered trademark of Rockwell Automation.

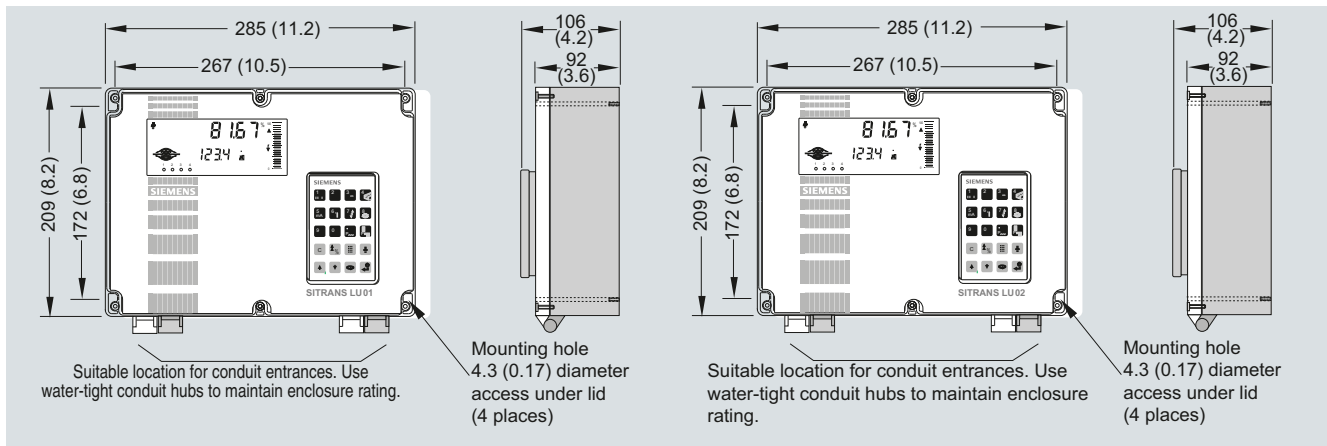
™DeviceNet is a trademark of Open DeviceNet Vendor Association (ODVA).

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Dimensional drawings



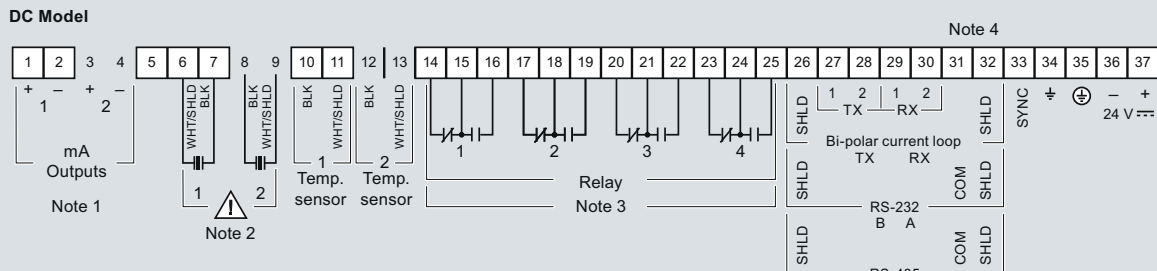
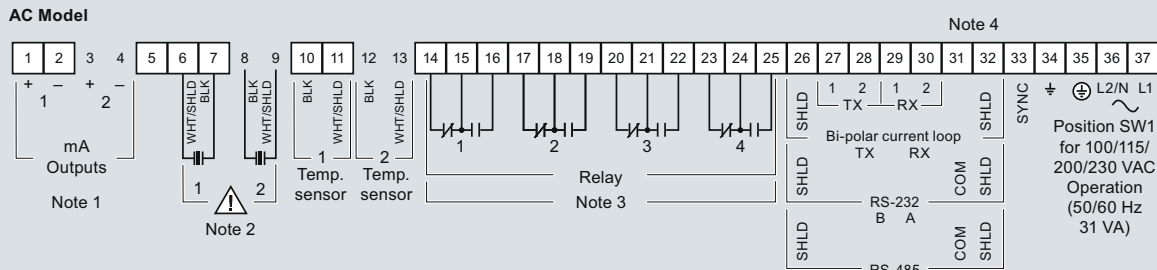
Dimensional drawings for SITRANS LU01 (left) and SITRANS LU02 (right), dimensions in mm (inch)

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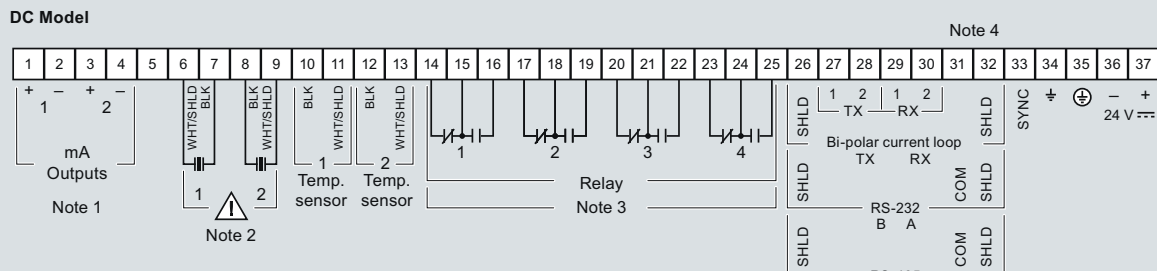
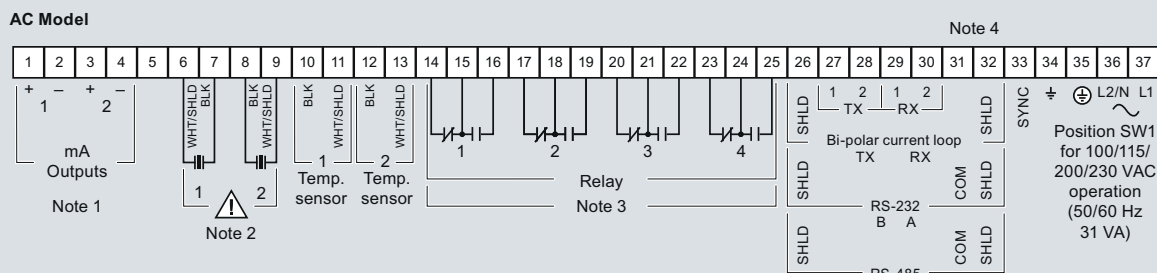
Schematics



Notes:

1. Optically isolated, 750 Ω max. load
2. Use RG62-A/U coaxial (or equivalent) for extensions up to 365 m (1200 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



Note:

1. Optically isolated, 750 Ω max. load
2. Use RG62-A/U coaxial (or equivalent) for extensions up to 365 m (1200 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 LU02 connections