

SITRANS L Level instruments

Continuous measurement - Level controllers

MultiRanger 100/200

Overview



MultiRanger is a versatile short- to medium-range ultrasonic single- and multi-vessel level monitor/controller for virtually any application in a wide range of industries.

Benefits

- Digital input for back-up level override from point level device
- Communication using built-in Modbus RTU via RS-485
- Compatible with SmartLinx system and SIMATIC PDM and Dolphin Plus configuration software
- Single or dual point level monitoring
- Auto False-Echo Suppression for fixed obstruction avoidance
- Differential amplifier transceiver for common mode noise reduction and improved signal-to-noise ratio
- MultiRanger 100: level measurements, simple pump control, and level alarm functions
- MultiRanger 200: level, volume and flow measurements in open channels, differential control, extended pump control and alarm functions
- Wall and panel mounting options

Application

MultiRanger can be used on different materials, including fuel oil, municipal waste, acids, woodchips, or on materials with high angles of repose. MultiRanger offers true dual point monitoring, digital communications with built-in Modbus[®] RTU via RS-485, as well as compatibility with Dolphin Plus and SIMATIC PDM, allowing PC configuration and set-up. MultiRanger features Sonic Intelligence[®] advanced echo-processing software for increased reading reliability.

MultiRanger 100 offers cost-effective level alarming, as well as on/off and alternating pump control. MultiRanger 200 will monitor open channel flow and features more advanced relay alarming and pump control functions as well as volume conversion.

It is compatible with chemical-resistant Echomax[®] transducers that can be used in hostile environments at temperatures as high as 145 °C (293 °F).

Design

The MultiRanger is available in wall or panel mounting options.

Technical specifications

Mode of Operation

- Measuring Principle Ultrasonic level measurement
- Measuring range 0.3 to 15 m (1 to 50 ft)

Input

- Analog (only MultiRanger 200) 0 to 20 mA or 4 to 20 mA, from alternate device, scaleable
- Digital 10 to 50 V DC switching level
Logical 0 = < 0.5 V DC
Logical 1 = 10 to 50 V DC
Max. 3 mA

Output

- Echomax[®] Transducer 44 kHz
- Ultrasonic transducer Compatible transducers: ST-H and Echomax series XPS-10/10F, XPS 15/15F, XCT-8, XCT-12 and XRS-5
- Relays Rating 5 A at 250 V AC, non-inductive
 - Version with 3 relays 2 Form 'A' / 1 Form 'C'
 - Version with 6 relays 4 Form 'A' / 2 Form 'C'
- mA output 0 to 20 mA or 4 to 20 mA
 - Max. load 750 Ω, isolated
 - Resolution 0.1% of range

Accuracy

- Error in measurement 0.25% of range or 6 mm (0.24"), whichever is greater
- Resolution 0.1% of measuring range¹⁾ or 2 mm (0.08"), whichever is greater
- Temperature compensation
 - -50 to +150 °C (-58 to +302 °F)
 - Integral temperature sensor
 - External TS-3 temperature sensor
 - Programmable fixed temperature values
- Temperature error
 - Sensor 0.09% of range
 - Fixed temperature value 0.17% / °C deviation from programmed value

Rated operating conditions

Installation conditions

- Location Indoor/outdoor
- Installation category II
- Pollution degree 4

Ambient conditions

- Ambient temperature (housing) -20 to +50 °C (-58 to +122 °F)

Design

- Weight
 - Wall mount 1.37 kg (3.02 lbs.)
 - Panel mount 1.50 kg (3.31 lbs.)
- Material (housing) Polycarbonate
- Degree of protection (housing)
 - Wall mount IP65 / Type 4X / NEMA 4X
 - Panel mount IP54 / Type 3 / NEMA 3

1) Program range is defined as the empty distance to the face of the transducer plus any range extension



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Electrical connection

- Transducer and mA output signal 2-core copper conductor, twisted, with shield and drain conductor, 300 Vrms, 0.5 to 0.75 mm² (22 to 18 AWG), nominal capacitance between adjacent conductors @ 1kHz = 62.3 pF/m (10 pF/ft), nominal capacitance between conductor and shield @ 1 kHz = 108.3 pF/m (33 pF/ft)(Belden® 8760 or equivalent is acceptable).

- Max. separation between transducer and transceiver 365 m (1200 ft)

Displays and controls

100 x 40 mm (4 x 1.5") multi-block LCD with backlighting

- Programming

Programming using hand-held programmer, SIMATIC PDM or via PC with Dolphin Plus software

Power supply

- AC version

100 to 230 V AC ± 15%,
50 / 60 Hz, 36 VA (17 W)

- DC version

12 to 30 V DC (20 W)

Certificates and approvals

- CE², FM, CSA_{NRTL/C}, UL listed
- CSA Class I, Div. 2, Group A, B, C and D, Class II, Div.2, Group F and G, Class III (wall mount only)

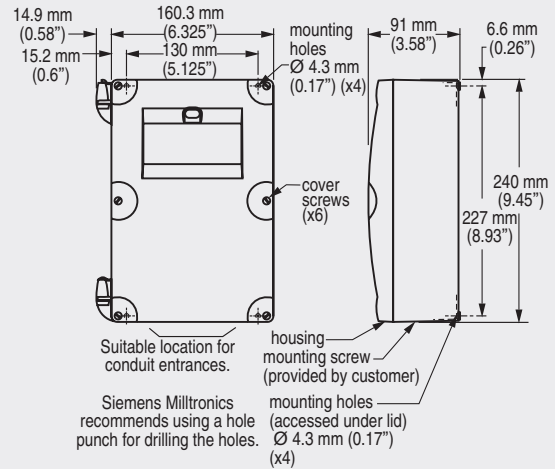
Communication

- RS-232 with Modbus RTU or ASCII via RJ-11 connector
- RS-485 with Modbus RTU or ASCII via terminal strips
- Optional: SmartLinx® cards or RS-485 modem kit

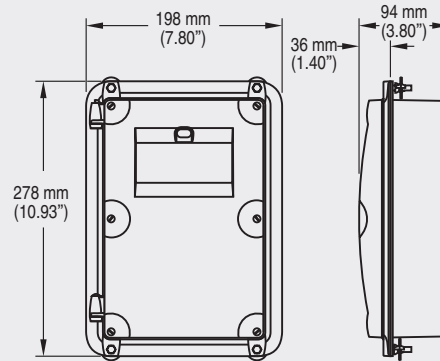
- 2) EMC performance available on request.

Dimensional drawings

Wall Mount Version



Panel Mount Version



MultiRanger dimensions

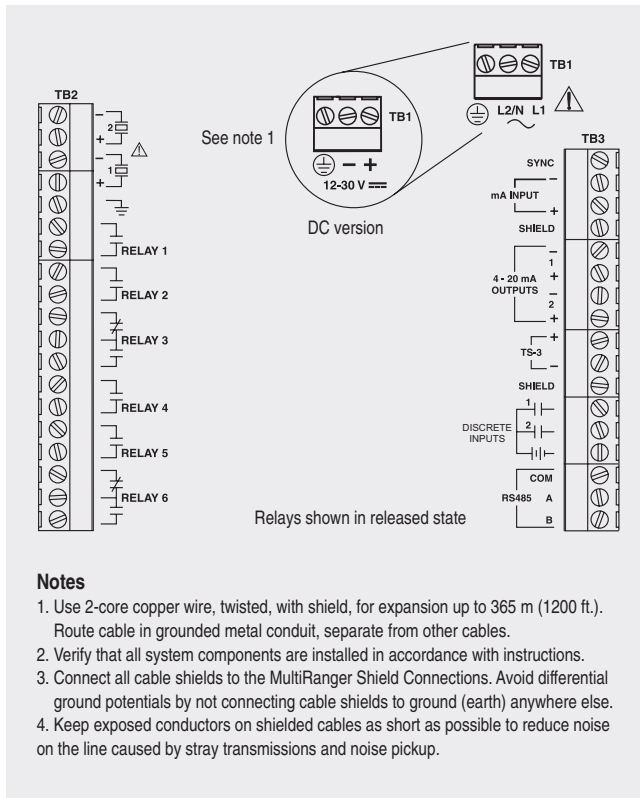


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Schematics



Notes

1. Use 2-core copper wire, twisted, with shield, for expansion up to 365 m (1200 ft.). Route cable in grounded metal conduit, separate from other cables.
2. Verify that all system components are installed in accordance with instructions.
3. Connect all cable shields to the MultiRanger Shield Connections. Avoid differential ground potentials by not connecting cable shields to ground (earth) anywhere else.
4. Keep exposed conductors on shielded cables as short as possible to reduce noise on the line caused by stray transmissions and noise pickup.

MultiRanger connection diagram

Ordering data

Order No.

MultiRanger

Versatile short- to medium-range ultrasonic single- and multi-vessel level monitor/controller for virtually any application in a wide range of industries

C) 7ML5033-

Versions

MultiRanger 100, level measurement only
MultiRanger 200, level, volume, flow, and differential measurements

1
2

Mounting, housing design

Wall mount, standard version
Wall mount, 4 entries, M20
Panel mount (CE, CSA_{USC}, FM, UL)

A
B
C

Power supply

100 to 230 V AC
12 to 30 V DC

A
B

Number of measurement points

Single point version
Dual point version

0
1

Communication (SmartLinX)

Without module
SmartLinX[®] Allen-Bradley[®] Remote I/O module
SmartLinX PROFIBUS DP module
SmartLinX DeviceNet[™] module
See SmartLinX product page on page 4/111 ff. for more information.

0
1
2
3

Output relays

3 relays, 2 form A, 1 form C, 250 V AC
6 relays, 4 form A, 2 form C, 250 V AC

1
2

Approvals

General Purpose CE, FM, CSA_{USC}, UL listed
CSA Class I, Div. 2, Group A, B, C and D; Class II, Div 2, Group F and G; Class III (for wall mount applications only)

A
B

Instruction Manual

English C) 7ML1998-5FB03
French C) 7ML1998-5FB13
Spanish C) 7ML1998-5FB23
German C) 7ML1998-5FB33
Note: The instruction manual should be ordered as a separate line on the order.

Other Instruction Manuals

SmartLinX Allen-Bradley Remote I/O, English C) 7ML1998-1AP03
SmartLinX PROFIBUS DP, English C) 7ML1998-1AQ03
SmartLinX PROFIBUS DP, German C) 7ML1998-1AQ32
SmartLinX PROFIBUS DP, French C) 7ML1998-1AQ12
SmartLinX DeviceNet, English C) 7ML1998-1BH02
Note: The appropriate SmartLinX instruction manual should be ordered as a separate line on the order.

Accessories

Hand-held programmer 7ML1830-2AK
Tag, stainless steel, 12 x 45 mm, one text line, suitable for enclosure PBD-45000786
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 5/98

Spare Parts

Power Supply Board (100 to 230 V AC) C) PBD-51035590
Power Supply Board (12 to 30 V DC) C) PBD-51035592
Display Board C) PBD-51035606

®Modbus is a registered trademark of Schneider Electric.

®Belden is a registered trademark of Belden Wire and Cable Company.

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

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

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



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