## SITRANS L Level instruments

### Continuous measurement - Ultrasonic 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 overide from point level device
- Communication using built-in Modbus RTU via RS-485
- Compatible with SmartLinx system and SIMATIC PDM 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 SIMATIC PDM, allowing PC configuration and setup. 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).

Key Applications: wet wells, flumes/weirs, bar screen control, hoppers, chemical storage, liquid storage, crusher bins, dry solids storage

#### Design

The MultiRanger is available in wall or panel mounting options.

#### Technical specifications

#### **Mode of Operation**

Measuring principle Ultrasonic level measurement 0.3 to 15 m (1 to 50 ft) Measuring range Measuring points 1 or 2

#### Input

 Analog (only MultiRanger 200) 0 to 20 mA or 4 to 20 mA, from alternate device, scaleable

10 to 50 V DC switching level Discrete 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

 Relays Rating 5 A at 250 V AC, non-

inductive

1 SPST Form A - Version with 1 relay (MultiRanger 100 only)

2 SPST Form A /1 SPDT Form C - Version with 3 relays

- Version with 6 relays

4 SPST Form A/ 2 SPDT Form C 0 to 20 mA or 4 to 20 mA

 mA output - Max. load

750  $\Omega$ , isolated 0.1% of range

- Resolution

#### Accuracy

0.25% of range Error in measurement or 6 mm (0.24"), whichever is

greater Resolution

0.1% of measuring range<sup>1)</sup> 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 (optional)

• Programmable fixed temperature values

#### Rated operating conditions

#### Installation conditions

 Location Indoor/outdoor

Installation category

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• Pollution degree Ambient conditions

· Ambient temperature (housing)

-20 to +50 °C (-4 to +122 °F)

#### Design

Weight

- Wall mount 1.37 kg (3.02 lbs.) 1.50 kg (3.31 lbs.) - Panel mount Material (enclosure) Polycarbonate

• Degree of protection (enclosure)

- Wall mount IP65/Type 4X/NEMA 4X - Panel mount IP54/Type 3/NEMA 3

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## MultiRanger 100/200

Electrical connection		
Transducer and mA output signal	2-core copper conductor, twisted shielded, 0.5 to 0.75 mm² (22 to 18 AWG), Belden <sup>®</sup> 8760 or equiv alent is acceptable	
<ul> <li>Max. separation between trans- ducer and transceiver</li> </ul>	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 $\pm$ 15%, 50/60 Hz, 36 VA (17 W)	
• DC version	12 to 30 V DC (20 W)	
Certificates and approvals	• CE <sup>2)</sup>	
	<ul> <li>Lloyd's Register of Shipping</li> </ul>	
	<ul> <li>ABS Type Approval</li> </ul>	
	<ul> <li>FM, CSA<sub>NRTL/C</sub>, UL listed</li> </ul>	
	<ul> <li>CSA Class I, Div. 2, Groups A, B, C and D, Class II, Div.2, Groups F and G, Class III (wall mount only)</li> </ul>	
Communication	RS-232 with Modbus RTU or ASCII via RJ-11 connector	
	<ul> <li>RS-485 with Modbus RTU or ASCII via terminal strips</li> </ul>	
	<ul> <li>Optional: SmartLinx<sup>®</sup> cards for</li> </ul>	
	- PROFIBUS DP	
	- DeviceNet <sup>TM</sup>	
	- Allen-Bradley® Remote I/O	
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<sup>1)</sup> Program range is defined as the empty distance to the face of the transducer plus any range extension.

<sup>2)</sup> EMC performance available on request.

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#### MultiRanger 100/200

Selection and Ordering data	Order No.
MultiRanger 100/200 C) Versatile short to medium-range ultrasonic single and multi-vessel level monitor/controller for virtually any application in a wide range of industries	7 M L 5 0 3 3 -
Versions MultiRanger 100, level measurement only MultiRanger 200, level, volume, flow and differential measurements	1 2
Mounting, enclosure design Wall mount, standard enclosure Wall mount, 4 entries, 4 M20 cable glands included Panel mount (CE, CSAus/c, 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
Communication (SmartLinx) Without module SmartLinx® Allen-Bradley® Remote I/O module SmartLinx PROFIBUS DP module SmartLinx DeviceNet <sup>TM</sup> module See SmartLinx product page on page 5/179 for	0 1 2 3
more information.  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 relay (1 Form A), 250 V AC (available on Multi-Ranger 100 model only)	1 2 3
Approvals General Purpose CE, FM, CSAusic, UL listed CSA Class I, Div. 2, Groups A, B, C and D; Class II, Div 2, Groups F and G; Class III (for wall mount applications only)	A B
Further designs	Order code
Please add "-Z" to Order No. and specify Order code(s).	
Stainless steel tag [69 mm x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text	Y15

Selection and Ordering data		Order No.
Instruction manual English French Spanish	C)	7ML1998-5FB05 7ML1998-5FB13 7ML1998-5FB23
German C) Note: The instruction manual should be ordered as a separate line on the order.		7ML1998-5FB34
This device is shipped with the Siemens Milltronics manual CD containing the complete instruction manual library.	;	
Other instruction manuals SmartLinx Allen-Bradley Remote I/O, English SmartLinx PROFIBUS DP, English SmartLinx PROFIBUS DP, German SmartLinx PROFIBUS DP, French	C) C)	7ML1998-1AQ12
SmartLinx DeviceNet, English C) Note: The appropriate SmartLinx instruction manual should be ordered as a seperate line on the order.		7ML1998-1BH02
Accessories Handheld programmer Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line, suitable for enclosure		7ML1830-2AK 7ML1930-1AC
TS-3 Temperature Sensor - see TS-3 on page 5/119	)	
Spare parts Power Supply Board (100 to 230 V AC) Power Supply Board (12 to 30 V DC) Display Board See SmartLinx product page on page 5/179 for	C) C) C)	
more information.		

 $<sup>^{\</sup>circledR}\!\text{Modbus}$  is a registered trademark of Schneider Electric.

<sup>&</sup>lt;sup>®</sup>Belden is a registered trademark of Belden Wire and Cable Company.

<sup>&</sup>lt;sup>®</sup>Allen-Bradley is a registered trademark of Rockwell Automation.

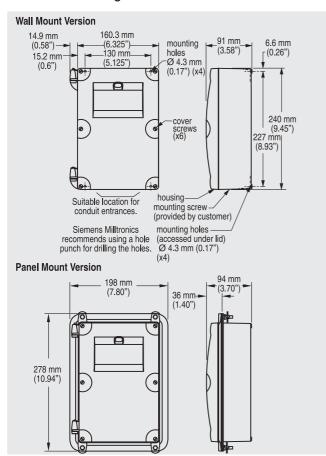
TMDeviceNet is a trademark of Open DeviceNet Vendor Association (ODVA) C) Subject to export regulations AL: N, ECCN: EAR99

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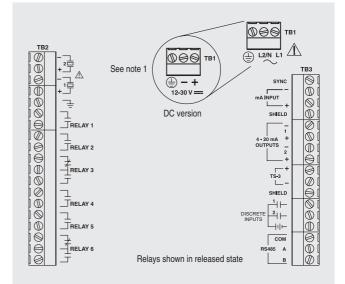
#### MultiRanger 100/200

#### Dimensional drawings



MultiRanger dimensions

#### Schematics



#### Notes

- 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.
- 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 connections