

# SITRANS L Level instruments

## Continuous measurement - Level controllers

### HydroRanger 200

#### Overview



HydroRanger 200 is an ultrasonic level controller for up to six pumps, and provides control, differential control, and open channel flow monitoring.

#### Benefits

- Monitors wet wells, weirs and flumes
- Digital communications with built-in Modbus RTU via RS-485
- Compatible with SmartLinx system and Dolphin Plus configuration software
- Single or dual point level monitoring
- 6 relays standard
- Anti-grease ring / tide mark build-up
- Differential amplifier transceiver for common mode noise rejection and improved signal-to-noise ratio
- Wall and panel mounting options

#### Application

For water authorities, municipal water and wastewater plants, HydroRanger 200 is an economical, low-maintenance solution delivering control efficiency and productivity needed to meet today's exacting standards. It offers single- or dual-point monitoring with 6 relays standard, as well as digital communications with built-in Modbus RTU via RS-485.

HydroRanger 200 is compatible with Dolphin Plus, allowing for PC configuration and set-up. Sonic Intelligence<sup>®</sup> advanced echo-processing software provides increased reading reliability.

HydroRanger 200 uses proven continuous ultrasonic echo ranging technology to monitor water and wastewater of any consistency up to 15 m (50 ft) in depth. Achievable resolution is 0.1% with accuracy to 0.25% of range. Unlike contacting devices, HydroRanger 200 is immune to problems caused by suspended solids, harsh corrosives, grease or silt in the effluent, reducing downtime.

The HydroRanger 200 is available in wall or panel mounting versions.

#### Technical specifications

##### Mode of Operation

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

##### Input

Analog	0 to 20 mA or 4 to 20 mA, from alternate device, scaleable
Discrete	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 <sup>®</sup> 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 4 Form A / 2 Form C
mA output	0 to 20 mA or 4 to 20 mA
- Max. load	750 $\Omega$ , 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 range <sup>1)</sup> or 2 mm (0.08"), whichever is greater
Temperature compensation	<ul style="list-style-type: none"> <li>• -50 to +150 °C (-58 to 302 °F)</li> <li>• Integral temperature sensor in transducer</li> <li>• External TS-3 temperature sensor</li> <li>• Programmable fixed temperature values</li> </ul>
Temperature error	0.09% of range
• Sensor	0.17% / °C deviation from programmed value
• Fixed temperature value	

##### Rated operating conditions

###### Installation conditions

Location	Indoor / outdoor
Installation category	II
Pollution degree	4

###### Ambient conditions

Ambient temperature (housing)	-20 to +50 °C (-5 to 122 °F)
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##### 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

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### HydroRanger 200

#### Cable

Transducer and mA output signal 2-core copper conductor, twisted, with shield and drain conductor, 300 Vrms, 0.5 to 0.75 mm<sup>2</sup> (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 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

CE<sup>2</sup>, FM, CSA<sub>NRTL/C</sub>, 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

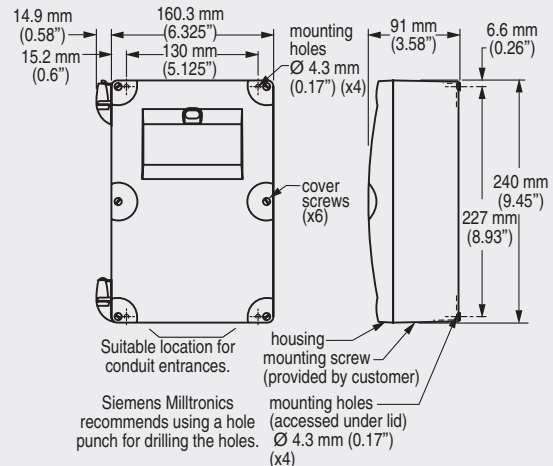
- RS-232 with Modbus RTU or ASCII via RJ-11 connector
- RS-485 with Modbus RTU or ASCII via terminal strips
- Optional: SmartLinx<sup>®</sup> cards or RS-485 modem kit

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

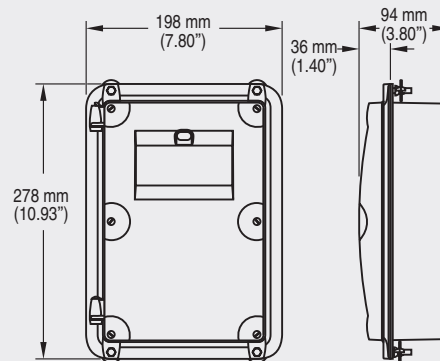
2) EMC performance available upon request.

#### Dimensional drawings

##### Wall Mount Version



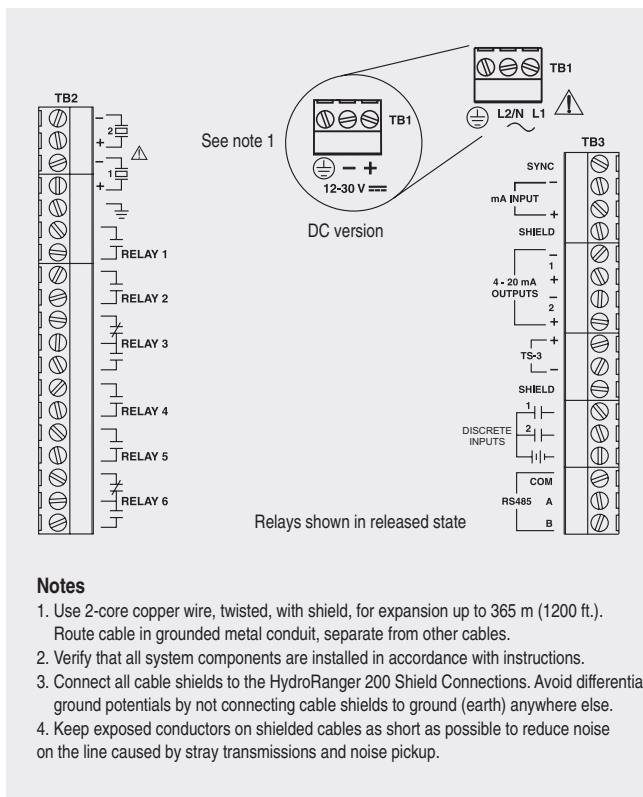
##### Panel Mount Version



HydroRanger 200 dimensions

### HydroRanger 200

#### 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 HydroRanger 200 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.

HydroRanger 200 connections

#### Ordering data

Order No.

<b>HydroRanger 200</b>	C) <b>7ML5034-</b>
Ultrasonic level controller for up to six pumps that provides control, differential control, and open channel flow monitoring	
<b>Mounting</b>	1 2 3
Wall mount, standard version	
Wall mount, 4 entries, M20	
Panel mount (CE, CSA <sub>US/C</sub> , FM, UL)	
<b>Power supply</b>	A B
100 to 230 V AC	
12 to 30 V DC	
<b>Number of measurement points</b>	A B
Single point version	
Dual point version	
<b>Communication (SmartLinx)</b>	0 1 2 3
Without module	
SmartLinx <sup>®</sup> Allen-Bradley <sup>®</sup> Remote I/O module	
SmartLinx PROFIBUS DP module	
SmartLinx DeviceNet <sup>™</sup> module	
See SmartLinx product page on page 4/111 ff. for more information.	
<b>Approvals</b>	1 2
General Purpose CE, FM, CSA <sub>US/C</sub> , 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)	
<b>Instruction Manual</b>	C) <b>7ML1998-5FC01</b>
English	
Note: The instruction manual should be ordered as a separate line on the order.	
<b>Other Instruction Manuals</b>	
SmartLinx Allen-Bradley Remote I/O, English	C) <b>7ML1998-1AP03</b>
SmartLinx PROFIBUS DP, English	C) <b>7ML1998-1AQ03</b>
SmartLinx PROFIBUS DP, German	C) <b>7ML1998-1AQ32</b>
SmartLinx PROFIBUS DP, French	C) <b>7ML1998-1AQ12</b>
SmartLinx DeviceNet, English	C) <b>7ML1998-1BH02</b>
Note: The appropriate SmartLinx instruction manual should be ordered as a separate line on the order.	
<b>Accessories</b>	
Hand-held programmer	<b>7ML1830-2AM</b>
Tag, stainless steel, 12 x 45 mm, one text line, suitable for enclosure	C) <b>PBD-45000486</b>
M20 cable gland kit (6 M20 cable glands, 6 M20 nuts, 3 stop plugs)	<b>7ML1830-1GM</b>
TS-3 Temperature Sensor -- see TS-3 pricing sheet on page 4/76	
<b>Spare Parts</b>	
Power Supply Board (100 to 230 V AC)	C) <b>PBD-51035590</b>
Power Supply Board (12 to 30 V DC)	C) <b>PBD-51035592</b>
Display Board	C) <b>PBD-51035606</b>

<sup>®</sup>Modbus is a registered trademark of Schneider Electric.

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

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

<sup>™</sup>DeviceNet is a trademark of Open DeviceNet Vendor Association (ODVA)

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