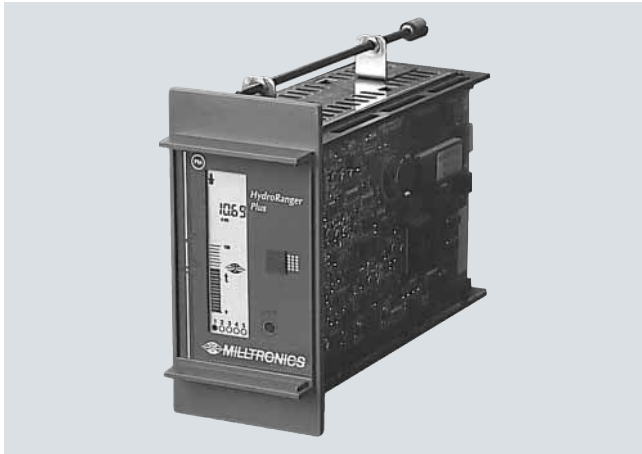


Level instruments

Continuous level measurement - Ultrasonic controllers

HydroRanger Plus

Overview



HydroRanger Plus is an ultrasonic level controller for control of wet wells and reservoir pump operations, differential control and open channel flow monitoring, using energy-saving algorithms.

Benefits

- Outputs for alarms, chart recorders, controllers and integration of existing systems
- Monitors wet wells, weirs and flumes
- Energy-saving function with built-in real-time clock
- Special control mode to reduce grease rings and other deposits
- Integral temperature compensation
- Pump performance monitoring
- System monitoring and network analysis

Application

The system is effective in wet wells, weirs, and flumes where foam and turbulence are typical operating conditions. It can be customized to meet your specific application needs – from measuring flow rate in a narrow flume to volume in a ferric chloride storage tank.

The system consists of the electronics housed in a wall-mounted enclosure and a hermetically sealed, corrosion-resistant Echomax[®] transducer. These components can be separated by up to 365 m (1200 ft).

Optional submergence shields ensure consistent operation in wet wells where the transducer may be submerged during flooding from rainfall or a power outage. Siemens patented detection software can differentiate between a submerged condition and a high level.

- Key Applications: wet wells, weirs, flumes

Technical specifications

Mode of operation

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

Output	
• Ultrasonic transducer	44 kHz
• Relays	5 alarm/control relays, 1 SPDT Form C per relay, rated 5 A at 250 V AC, resistive load
• mA output	0/4 to 20 mA, optically isolated
- Max. load	1 k Ω
- Resolution	0.1 % of 20 mA
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 ¹⁾
• Temperature compensation	-50 to +150 °C (-58 to +302 °F) <ul style="list-style-type: none"> • Integral temperature sensor • External TS-3 temperature sensor (optional) • Programmable fixed temperature
Rated operating conditions	
<u>Ambient conditions</u>	
• Ambient temperature for enclosure	-20 to +50 °C (-4 to +122 °F)
Design	
• Rack mount	DIN 3 HU/14 pitch, 4 rail plug-in unit suitable for standard 84 pitch (19") rack
• Panel mount	Suitable for standard panel cutout DIN 43700, 72 x 144 mm, 100 mm center height
• Degree of protection (wall mount)	IP65/NEMA 4X/Type 4X
• Weight (rack and panel mount)	0.87 kg (1.9 lbs)
• Weight (wall mount)	1.5 kg (3.3 lbs)
• Material (enclosure)	Polyester/polycarbonate alloy
Electrical connection	
Commercially available copper conductor according to local requirements, rated 250 V/5 A	
• Ultrasonic transducer cable extension	RG 62-A/U coaxial cable with low capacitance
• mA output signal	2-core copper conductor, twisted, shielded, 0.5 to 0.75 mm ² (22 to 18 AWG), Belden [®] 8760 or equivalent is acceptable
Power supply	
100/115/200/230 V AC, \pm 15%, 50/60 Hz, 15 VA and/or 9 to 30 V DC, 8 W	
• Ultrasonic transducer	Compatible transducers: ST-H and Echomax series XPS-10/10F, XPS 15/15F, XCT-8, XCT-12 and XRS-5
Displays and controls	
Rack and panel mount	75 x 20 mm (3 x 0.8") LCD (selectable backlighting)
Wall mount	100 x 40 mm (4 x 1.5") multifield LCD, backlit
Programming	
Removable programmer or optional Dolphin Plus	
Memory	
EEPROM (non-volatile), no backup battery required	
Certificates and approvals	
CE ²⁾ , FM, CSA _{US/CA} , C-TICK	

¹⁾ The measuring range corresponds to the distance from the zero point to the sensor face, plus any range extension.

²⁾ EMC certificate available on request

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

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Selection and Ordering data	Order No.
HydroRanger Plus, rack and panel mount L) <p>Non-contacting ultrasonic echo ranging technology monitor that comes standard with a backlit display Measuring range: 0.3 m to 15 m (1 to 50 ft)</p>	7ML1025-
	01
Mounting/device version Version for 19" rack (requires terminal block; see accessories) Version for panel	1 2
Approvals CE (EN 61326), CSA _{US/C} , FM, C-TICK	C
Input voltage 100 V AC, 9 to 30 V DC 115 V AC, 9 to 30 V DC 200 V AC, 9 to 30 V DC 230 V AC, 9 to 30 V DC	A B C D
Further designs Please add "-Z" to Order No. and specify Order code(s).	Order code
Stainless steel tag [69 x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text	Y15
Instruction manual English French German Note: The instruction manual should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete Quick Start and instruction manual library.	Order No. C) 7ML1998-1AC02 C) 7ML1998-1AC12 C) 7ML1998-1AC32
Accessories Handheld programmer Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line suitable for enclosures Terminal block for rack mount TS-3 Temperature Sensor - see TS-3 on page 5/186 SITRANS RD100 Remote display - see RD100 on page 5/304 SITRANS RD200 Remote display - see RD200 on page 5/306	7ML1830-2AC 7ML1930-1AC 7ML1830-1JL
Spare parts Card, Analog HydroRanger Plus Rack/Panel Card, daughter Card, display, backlit	C) 7ML1830-1LR C) 7ML1830-1LS C) 7ML1830-1LX

Selection and Ordering data	Order No.
HydroRanger Plus, wall mount L) <p>Non-contacting ultrasonic echo ranging technology monitor that comes standard with a backlit display Measuring range: 0.3 m to 15 m (1 to 50 ft)</p>	7ML1028-
	A0
Input voltage 100 V AC, 9 to 30 V DC 115 V AC, 9 to 30 V DC 200 V AC, 9 to 30 V DC 230 V AC, 9 to 30 V DC	1 2 3 4
Approvals CE; FM General Purpose; CSA Class I, Div. 2, C-TICK	C
Mounting/enclosure version Standard enclosure (NEMA 4X) Standard enclosure prepared for five M20 cable glands	1 3
Further designs Please add "-Z" to Order No. and specify Order code(s).	Order code
Stainless steel tag [69 x 50 mm (2.71 x 1.97")]: Measuring-point number/identification (max. 16 characters) specify in plain text	Y15
Instruction manual English French German Note: The instruction manual should be ordered as a separate line item on the order. This device is shipped with the Siemens Milltronics manual CD containing the complete Quick Start and instruction manual library.	Order No. C) 7ML1998-1AC02 C) 7ML1998-1AC12 C) 7ML1998-1AC32
Accessories Handheld programmer Tag, stainless steel, 12 x 45 mm (0.47 x 1.77"), one text line suitable for enclosures M20 cable gland kit (6 M20 cable glands, 6 M20 nuts, 3 stop plugs) TS-3 Temperature Sensor - see TS-3 on page 5/186 SITRANS RD100 Remote display - see RD100 on page 5/304 SITRANS RD200 Remote display - see RD200 on page 5/306	7ML1830-2AC 7ML1930-1AC 7ML1830-1GM
Spare parts Card, mother main Card, daughter Card, display	C) 7ML1830-1LV C) 7ML1830-1LW C) 7ML1830-1LU

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

L) Subject to export regulations AL: N, ECCN: 3A991X

Level instruments

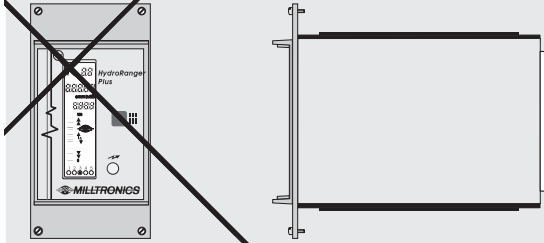
Continuous level measurement - Ultrasonic controllers

HydroRanger Plus

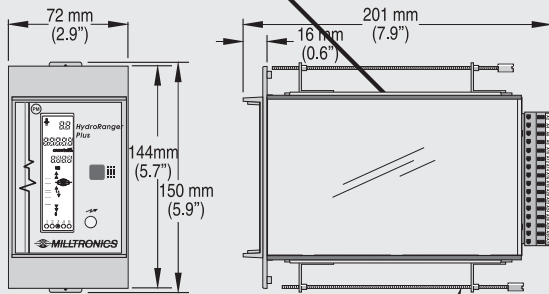
Dimensional drawings

Rack Mount

DIN 3U/14HP, 4 rail plug-in unit suitable for standard 84 HP (19") subrack. (Terminal is customer supplied or available as optional accessory.)

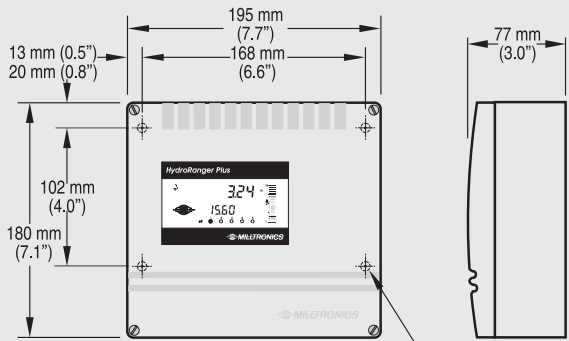


Panel Mount



Slip on mounting bracket top and bottom screws to be tightened to no more than 5.9 Nm (1 inch/lb.) torque.

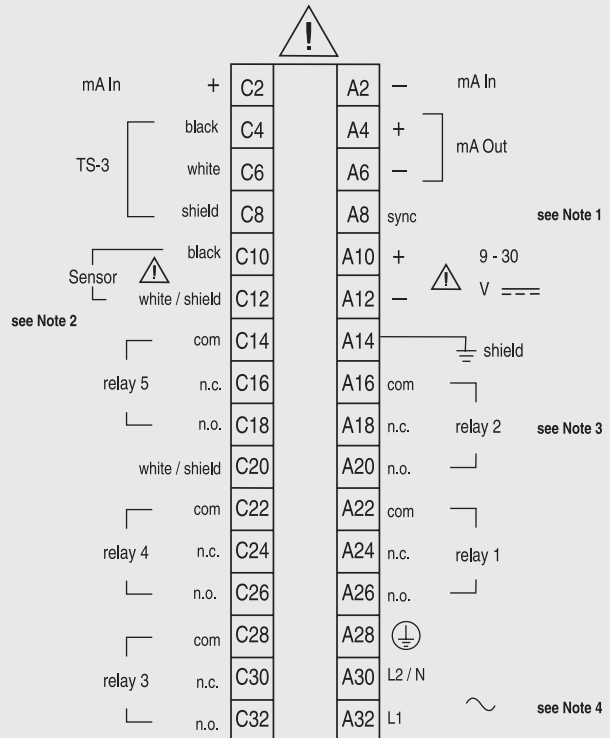
Wall Mount



Suitable location for conduit entrances. Use water-tight conduit hubs to maintain enclosure rating. mounting holes, Ø 4.5 mm (0.18"), 4 places

HydroRanger Plus dimensions

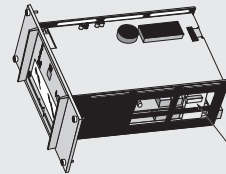
Schematics



Notes

1. Required only if mounted adjacent to other Siemens Milltronics equipment. Interconnect all 'SYNC' terminals with a single 18 AWG (0.5 mm²) wire.
2. Use RG-62 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. Relay de-energized when in alarm conditions and energized for pump control.
4. Before applying AC power (mains), ensure the correct voltage is selected. Never operate the HydroRanger Plus with the ground (earth) wire disconnected.

Voltage Selection



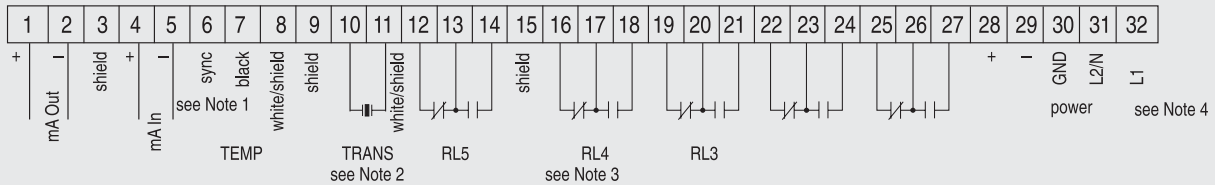
Voltage Selection Switches

HydroRanger Plus connections, rack and panel mount

Level instruments

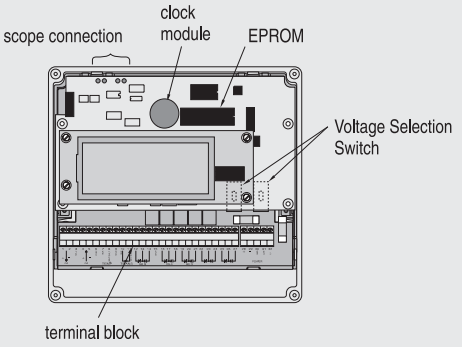
Continuous level measurement - Ultrasonic controllers

HydroRanger Plus



Notes

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- Before applying AC power (mains), ensure the correct voltage is selected. Never operate the HydroRanger Plus with the enclosure lid open, or with the ground (earth) wire disconnected.



HydroRanger Plus connections, wall mount