

Level Measurement

Continuous level measurement - Ultrasonic controllers

HydroRanger 200 HMI

Overview



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

Benefits

- Easy to use HMI display with local four-button programming, menu-driven parameters, and Wizard support for key applications
- English, German, French, Spanish, Chinese, Italian, Portuguese, and Russian texts on the HMI
- Removable terminal blocks for ease of wiring
- Monitors wet wells, weirs and flumes
- Digital communications with built-in Modbus RTU via RS 485
- Compatible with SmartLinx system and SIMATIC PDM configuration software
- Single or dual point level monitoring
- 6 relays
- Auto False-Echo Suppression for fixed obstruction avoidance
- 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 HMI is an economical, low-maintenance solution delivering control efficiency and productivity needed to meet today's exacting standards. It offers single point monitoring with all models, and optional dual-point monitoring with 6 relay model. As well, it has digital communications with built-in Modbus RTU via RS 485.

The standard 6 relay HydroRanger 200 HMI will monitor open channel flow and features advanced relay alarming and pump control functions as well as volume conversion. It is compatible with SIMATIC PDM, allowing for PC configuration and set-up. Sonic Intelligence advanced echo-processing software provides increased reading reliability.

HydroRanger 200 HMI 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 HMI is immune to problems caused by suspended solids, harsh corrosives, grease or silt in the effluent, reducing downtime.

- Key Applications: wet wells, flumes/weirs, bar screen control

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Technical specifications

Mode of Operation		Design	
Measuring principle	Ultrasonic level measurement	Weight	
Measuring range	0.3 ... 15 m (1 ... 50 ft), transducer dependent	• Wall mount	1.22 kg (2.68 lb)
Measuring points	1 or 2	• Panel mount	1.35 kg (2.97 lb)
Input		Material (enclosure)	Polycarbonate
Analogue	0 ... 20 mA or 4 ... 20 mA, from alternate device, scalable (6 relay model)	Degree of protection (enclosure)	
Discrete	10 ... 50 V DC switching level Logical 0 ≤ 0.5 V DC Logical 1 = 10 ... 50 V DC Max. 3 mA	• Wall mount	IP65/Type 4X/NEMA 4X
Output		• Panel mount	IP54/Type 3/NEMA 3
EchoMax transducer	44 kHz	Cable	
Ultrasonic transducer	Compatible transducers: ST-H and EchoMax series XPS-10, XPS-15/15F, and XRS-5	• Transducer and mA output signal	2-core copper conductor, twisted, shielded, 300 Vrms, 0.82 mm ² (18 AWG), Belden 8 760 or equivalent is acceptable
Relays ¹⁾	Rating 5 A at 250 V AC, non-inductive	• Max. separation between transducer and transceiver	365 m (1 200 ft)
• Model with 6 relays	4 SPST Form A/2 SPDT Form C	Displays and controls	
mA output	0 ... 20 mA or 4 ... 20 mA	60 x 40 mm (2.36 x 1.57 inch) LCD 240 x 160 pixels resolution	
• Max. load	750 Ω, isolated	Power supply³⁾	
• Resolution	0.1 % of range	AC version	100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA (17 W)
Accuracy		DC version	12 ... 30 V DC (20 W)
Error in measurement	0.25 % of range or 6 mm (0.24 inch), whichever is greater	Certificates and approvals	
Resolution	0.1 % of measuring range or 2 mm (0.08 inch), whichever is greater ²⁾	<ul style="list-style-type: none"> • CE, RCM⁴⁾ • FM, CSA_{US/C}, UL listed • CSA_{US/C} Class 1, Div. 2, Groups A, B, C and D, Class II, Div. 2, Groups F and G, Class III (wall mount only) • MCERTS Class 2 approved for Open Channel Flow 	
Temperature compensation	<ul style="list-style-type: none"> • -50 ... +150 °C (-58 ... +302 °F) • Integral temperature sensor in transducer • External TS-3 temperature sensor (optional) • Programmable fixed temperature values 	Communication	
Rated operating conditions		<ul style="list-style-type: none"> • RS 232 with Modbus RTU or ASCII via RJ-11 connector • RS 485 with Modbus RTU or ASCII via terminal blocks • Optional: SmartLinX cards for <ul style="list-style-type: none"> - PROFIBUS DPV1 - DeviceNet 	
Installation conditions		<ol style="list-style-type: none"> 1) All relays certified for use with equipment that fails in a state at or under the rated maximums of the relays. 2) Program range is defined as the empty distance to the face of the transducer plus any range extension. 3) Maximum power consumption is listed. 4) EMC performance available upon request. 	
• Location	Indoor / outdoor		
• Installation category	II		
• Pollution degree	4		
Ambient conditions			
• Ambient temperature (enclosure)	-20 ... +50 °C (-4 ... +122 °F)		

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Selection and Ordering data

Siemens HydroRanger 200 HMI

Ultrasonic level controller for up to six pumps that provides control, differential control and open channel flow monitoring. The HydroRanger 200 HMI is also available as a level measurement controller only. Select option from number of measurement points options below.

Click on the Article No. for the online configuration in the PIA Life Cycle Portal.

Mounting

4 button HMI, Wall mount, standard enclosure
4 button HMI, Wall mount, 4 entries, 4 M20 cable glands included
4 button HMI, Panel Mount

Input voltage

100 ... 230 V AC
12 ... 30 V DC

Number of measurement points

Single point model, 6 relays
Dual point model, 6 relays

Communication (SmartLinx)

Without module
SmartLinx PROFIBUS DP V0 module
SmartLinx DeviceNet module
SmartLinx PROFIBUS DP V1 module
See SmartLinx product page for more information

Approvals

General Purpose CE, FM, CSA_{US/CA}, UL listed, RCM
CSA Class I, Div. 2, Groups A, B, C, and D;
Class II, Div. 2, Groups F and G; Class III¹⁾

Article No.

7ML5034-

4

5

6

A

B

A

B

0

2

3

4

1

2

Selection and Ordering data

Further designs

Please add "-Z" to Article No. and specify Order code(s).

Stainless steel tag [69 x 50 mm (2.71 x 1.97 inch)];
Measuring-point number/identification
(max. 27 characters), specify in plain text

Test Certificate: Manufacturer's test certificate M
to DIN 55350, Part 18 and to ISO 9000

Operating Instructions

English

German

Note: The Operating Instructions should be
ordered as a separate item on the order.

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

Other Operating Instructions

SmartLinx PROFIBUS DPV1, English

SmartLinx PROFIBUS DPV1, German

SmartLinx PROFIBUS DP, English

SmartLinx PROFIBUS DP, German

SmartLinx PROFIBUS DP, French

SmartLinx DeviceNet, English

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

Accessories

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

Sunshield kit, 304 stainless steel

SITRANS RD100, loop powered display -
see Chapter 7

SITRANS RD200, universal input display with
Modbus conversion - see Chapter 7

SITRANS RD300, dual line display with totalizer
and linearization curve and Modbus conversion -
see Chapter 7

SITRANS RD500 web, universal remote monitoring
solution for instrumentation - see Chapter 7

Spare parts

Power Supply Board (100 ... 230 V AC)

Power Supply Board (12 ... 30 V DC)

Replacement lid with 4 button HMI

SmartLinx PROFIBUS DP V1 module

Order code

Y15

C11

Article No.

A5E36281317

A5E36281391

A5E36197302

A5E36197305

7ML1998-1AQ03

7ML1998-1AQ33

7ML1998-1AQ13

7ML1998-1BH02

7ML1930-1AC

7ML1930-1GA

7ML5741-...

7ML5740-...

7ML5744-...

7ML5750-...

7ML1830-1MD

7ML1830-1ME

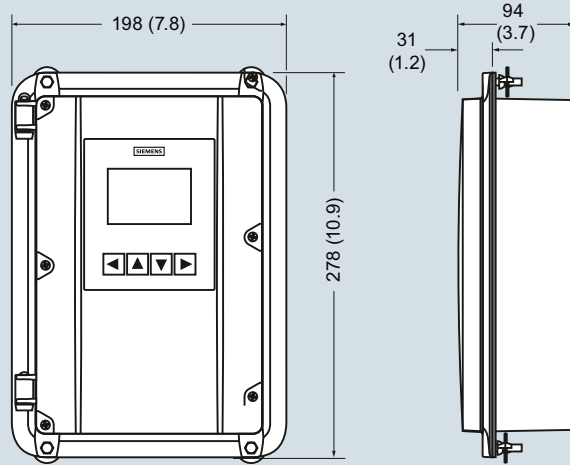
A5E35778738

A5E35778741

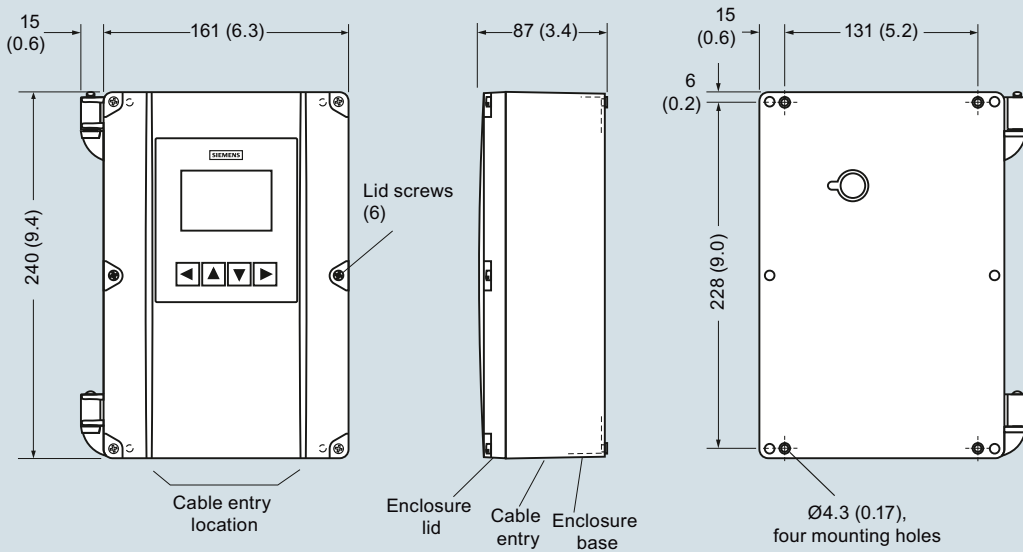
¹⁾ Available with Mounting/ Enclosure design options 4 or 5

Dimensional drawings

Panel mount dimensions



Wall mount dimensions



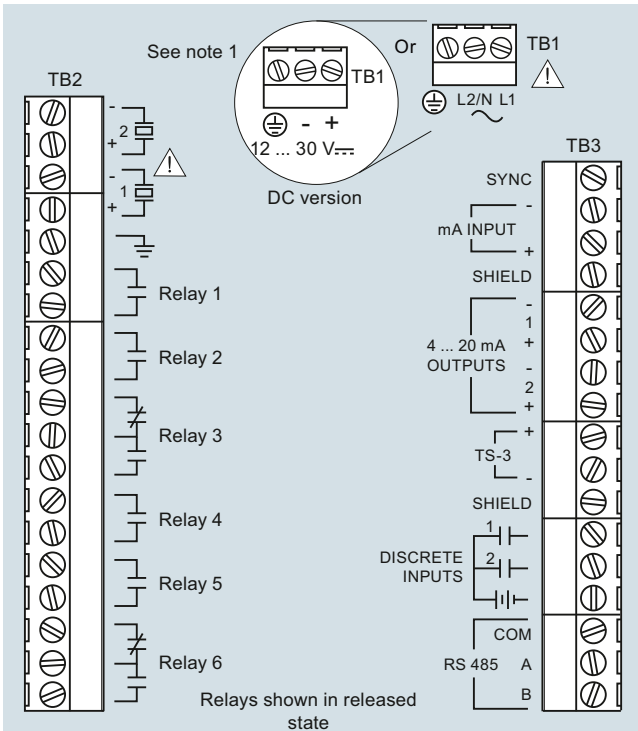
HydroRanger 200 HMI, dimensions in mm (inch)

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Schematics



Note:

1. Use 2-core copper wire, twisted, with shield, for expansion up to 365 m (1 200 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.

HydroRanger 200 HMI connections