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Overview

MultiRanger 200 HMI 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

- 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
- Digital input for back-up level override from point level device
- Communication using built-in Modbus RTU via RS 485 and SIMATIC PDM configuration software
- Compatible with SmartLinx system: PROFIBUS DP, PROFINET (cyclic access of process values only), DeviceNet, Modbus TCP/IP, and EtherNet/IP
- 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
- Level, volume, and flow measurements in open channels, differential control, extended pump control, and alarm functions
- Wall and panel mounting options

Application

MultiRanger 200 HMI can be used with various materials, including, water, municipal waste, acids, woodchips, or on materials with high angles of repose. MultiRanger 200 HMI 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 set-up. MultiRanger 200 HMI features Sonic Intelligence advanced echo-processing software for increased reading reliability.

MultiRanger 200 HMI 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 are approved for hostile environments.

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

Design

The MultiRanger 200 HMI is available in wall or panel mounting options.

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Technical specifications

Mode of Operation	
Measuring principle	Ultrasonic level measurement
Measuring range	0.3 ... 15 m (1 ... 50 ft)
Measuring points	1 or 2
Input	
Analog	0 ... 20 mA or 4 ... 20 mA, from alternate device, scalable
Discrete	10 ... 50 V DC switching level Logical 0 ≤ 0.5 V DC Logical 1 = 10 ... 50 V DC max. 3 mA
Output	
EchoMax transducer	44 kHz
Ultrasonic transducer	Compatible transducers: ST-H and EchoMax series XPS-10, XPS-15/15F, and XRS-5
Relays	Rating 5 A at 250 V AC, non-inductive
mA output	0 ... 20 mA or 4 ... 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 inch), whichever is greater • ± 4 mm (0.16 inch) in combination with an XRS-5 transducer on ranges 4 m (13 ft) or less
Resolution	0.1 % of measuring range[1] or 2 mm (0.08 inch), whichever is greater
Temperature compensation	• -50 ... +150 °C (-58 ... +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	II
• Pollution degree	4
Ambient conditions	
• Ambient temperature (housing)	-20 ... +50 °C (-4 ... +122 °F)
• Storage temperature	-20 ... +50 °C (-4 ... +122 °F)

Mode of Operation	
Design	
Weight	
• Wall mount	1.22 kg (2.68 lb)
• Panel mount	1.35 kg (2.97 lb)
Material (enclosure)	Polycarbonate
Degree of protection (enclosure)	
• Wall mount	IP65/Type 4X/NEMA 4X
• Panel mount	IP54/Type 3/NEMA 3
Electrical connection	
• Transducer and mA output signal	2-core copper conductor, twisted, shielded, 0.5 ... 0.75 mm² (22 ... 18 AWG), Belden 8760 or equivalent is acceptable
• Max. separation between transducer and transceiver	365 m (1 200 ft)
Displays and controls	60 x 40 mm (2.36 x 1.57 inch) LCD 240 x 160 pixels resolution
Power supply	
AC version	100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA (17 W)
DC version	12 ... 30 V DC (20 W)
Certificates and approvals	• CE, RCM, EAC, KCC[2] • FM, $CSA_{US/C}$, UL • CSA Class I, Div. 2, Groups A, B, C, and D, Class II, Div. 2, Groups 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 for - PROFIBUS DP-V1, PROFINET (cyclic access of process values only) - DeviceNet, Modbus TCP/IP, EtherNet/IP

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

[2] EMC performance available on request

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Selection and ordering data

	Article No.
MultiRanger 200 Ultrasonic level controller ↗ Continuous, non-contact, 15 m (50 ft) range. Monitors level, volume, and open channel flow in liquids, slurries, and solids. ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal.	**7ML5033-** ■ ■ ■ ■ ■ - ■ ■
Versions	
MultiRanger 200, level, volume, flow, and differential measurements	**2**
Mounting, enclosure design	
4 button HMI, Wall mount, standard enclosure	**D**
4 button HMI, Wall mount, 4 entries, 4 M20 cable glands included	**E**
4 button HMI, Panel Mount	**F**
Input voltage	
100 ... 230 V AC	**A**
12 ... 30 V DC	**B**
Number of measurement points	
Single point version	**0**
Dual point version	**1**
Data communications (SmartLinx)	
Without module	**0**
SmartLinx PROFIBUS DP V0 module	**2**
SmartLinx DeviceNet module	**3**
SmartLinx PROFIBUS DP V1 module	**4**
SmartLinx PROFINET module[2]	**5**
SmartLinx EtherNet/IP module	**6**
SmartLinx Modbus TCP/IP module See SmartLinx product page 4/348 for more information.	**7**
Output relays	
6 relays (4 Form A, 2 Form C), 250 V AC	**2**
Approvals	
General Purpose CE, FM, $CSA_{US/C}$, UL listed, RCM, EAC, KCC	**A**
CSA Class I, Div. 2, Groups A, B, C, and D; Class II, Div. 2, Groups F and G; Class III[1]	**B**

[1] Available with Mounting/Enclosure design options D or E.

[2] SmartLinx PROFINET module is certified per standard V2.2.4.

	Order code
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	**Y15**
Test Certificate: Manufacturer's test certificate M to DIN 55350, Part 18 and to ISO 9000	**C11**
Operating Instructions	
All literature is available to download for free, in a range of languages, at	
http://www.siemens.com/processinstrumentation/documentation	
Optional equipment	Article No.
Tag, stainless steel, 12 x 45 mm, one text line, suitable for enclosures	**7ML1930-1AC**
Sunshield, 304 Stainless steel	**7ML1930-1GA**
SITRANS RD100, loop powered display - see Chapter 7	**7ML5741-...**
SITRANS RD150, remote digital display for 4 ... 20 mA and HART devices - see Chapter 7	**7ML5742-.....-....**
SITRANS RD200, universal input display with Modbus conversion - see Chapter 7	**7ML5740-...**
SITRANS RD300, dual line display with totalizer and linearization curve and Modbus conversion - see Chapter 7	**7ML5744-...**
Spare parts	
Power Supply Board (100 ... 230 V AC)	**7ML1830-1MD**
Power Supply Board (12 ... 30 V DC)	**7ML1830-1ME**
Removable terminal blocks	**A5E38824197**
Spare lid with HMI, MultiRanger 200 HMI/HydroRanger 200 HMI, wall	**A5E35778738**
Spare lid with HMI, MultiRanger 200 HMI/HydroRanger 200 HMI, panel	**A5E35778740**
SmartLinx DeviceNet module	**7ML1830-1HT**
SmartLinx PROFIBUS DP V1 module	**A5E35778741**
Smartlinx PROFINET IO module	**7ML1830-1PM**
SmartLinx Modbus TCP/IP, EtherNet/IP module	**7ML1830-1PN**

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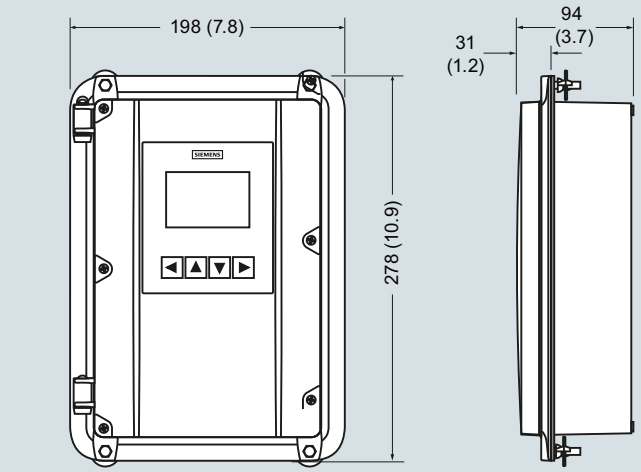
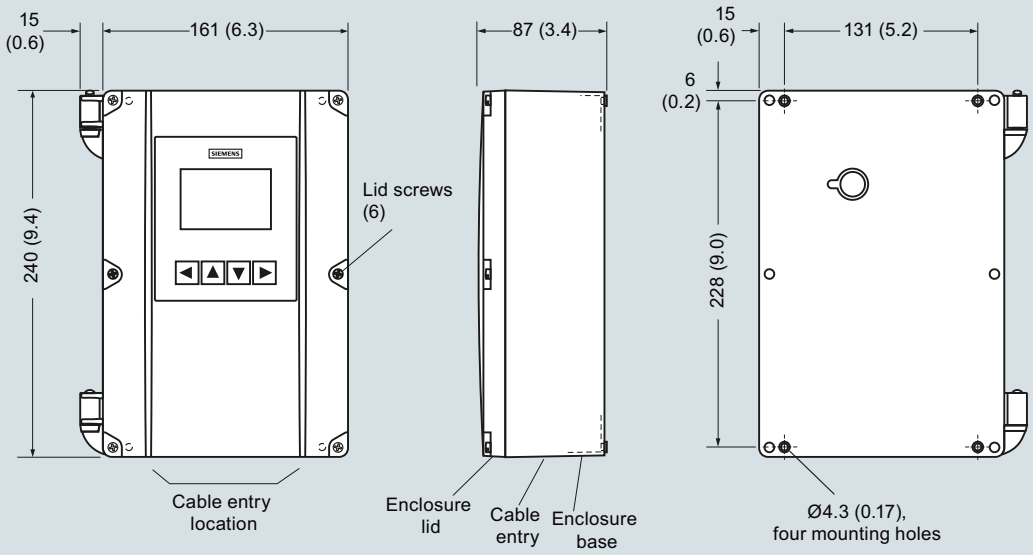
Dimensional drawings

Panel mount dimensions



Wall mount dimensions



MultiRanger 200 HMI, dimensions in mm (inch)

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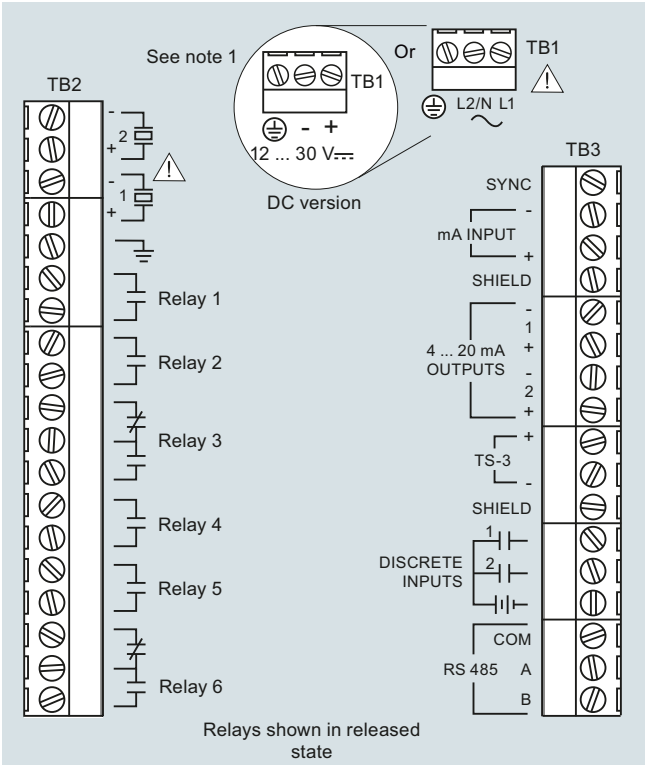
Circuit diagrams



Relays shown in released state

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.

MultiRanger 200 HMI connections