

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 (cyclic access of process values only) and DeviceNET
- 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.

Level Measurement

Continuous level measurement - Ultrasonic controllers

MultiRanger 200 HMI

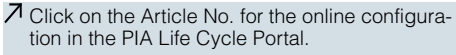
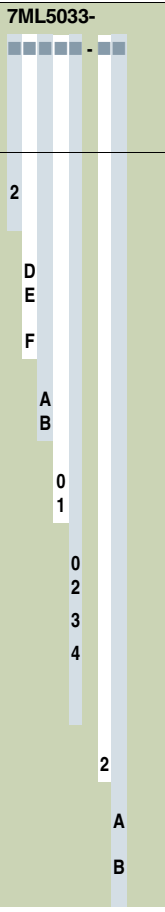


Technical specifications

Mode of Operation	
Measuring principle	Ultrasonic level measurement
Measuring range	0.3 ... 15 m (1 ... 50 ft)
Measuring points	1 or 2
Input	
Analogue	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
Resolution	0.1 % of measuring range ¹⁾ or 2 mm (0.08 inch), whichever is greater
Temperature compensation	<ul style="list-style-type: none"> • -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)

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 mm ² (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	
	<ul style="list-style-type: none"> • CE, RCM²⁾ • 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	
	<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 strips • Optional: SmartLinX cards for <ul style="list-style-type: none"> - PROFIBUS DPV1 (cyclic access of process values only) - DeviceNet

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

Selection and Ordering data	Article No.	Selection and Ordering data	Order code
MultiRanger 200 HMI Versatile short to medium-range ultrasonic single and multi-vessel level monitor/controller for virtually any application in a wide range of industries 	7ML5033- 	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)]: Y15 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	C11
Versions MultiRanger 200, level, volume, flow, and differential measurements 2		Operating Instructions English German Note: The instruction manual should be ordered as a separate line on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	Article No. AE535857004 A5E36182123
Mounting, enclosure design 4 button HMI, Wall mount, standard enclosure 4 button HMI, Wall mount, 4 entries, 4 M20 cable glands included 4 button HMI, Panel Mount	D E F	Other Operating Instructions SmartLinx PROFIBUS DPV1, English SmartLinx PROFIBUS DPV1, German Note: The appropriate SmartLinx Operating Instructions should be ordered as a separate line on the order. All literature is available to download for free, in a range of languages, at http://www.siemens.com/processinstrumentation/documentation	A5E36197302 A5E36197305
Input voltage 100 ... 230 V AC 12 ... 30 V DC	A B	Optional equipment Tag, stainless steel, 12 x 45 mm, one text line, suitable for enclosures Sun-shield, 304 Stainless steel USB to RS 232 adapter RS 232 to RJ11 COMMS adapter 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	7ML1930-1AC 7ML1930-1GA 7ML1930-6AK 7ML1830-1MC 7ML5741-... 7ML5740-... 7ML5744-... 7ML5750-...
Number of measurement points Single point version Dual point version	0 1	Spare parts Power Supply Board (100 ... 230 V AC) Power Supply Board (12 ... 30 V DC) Removable terminal blocks Spare lid with HMI, MultiRanger 200 HMI/HydroRanger 200 HMI, wall Spare lid with HMI, MultiRanger 200 HMI/HydroRanger 200 HMI, panel SmartLinx PROFIBUS DP V1 module	A5E36197302 A5E36197305
Data communications (SmartLinx) Without module SmartLinx PROFIBUS DPV0 module SmartLinx DeviceNet module SmartLinx PROFIBUS DPV1 module See SmartLinx product page 4/337 for more information.	0 2 3 4	7ML1830-1MD 7ML1830-1ME A5E38824197 A5E35778738 A5E35778740 A5E35778741	
Output relays 6 relays (4 Form A, 2 Form C), 250 V AC	2	• We can offer shorter delivery times for configurations designated with the Quick Ship Symbol  . For details see page 10/11 in the appendix.	
Approvals General Purpose CE, FM, CSA _{US/C} , UL listed, RCM CSA Class I, Div. 2, Groups A, B, C, and D; Class II, Div. 2, Groups F and G; Class III ¹⁾	A B		
¹⁾ Available with Mounting/Enclosure design options D or E • We can offer shorter delivery times for configurations designated with the Quick Ship Symbol  . For details see page 10/11 in the appendix.			

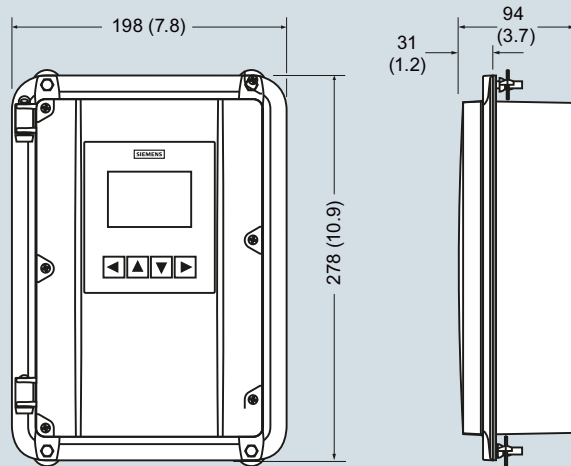
Level Measurement

Continuous level measurement - Ultrasonic controllers

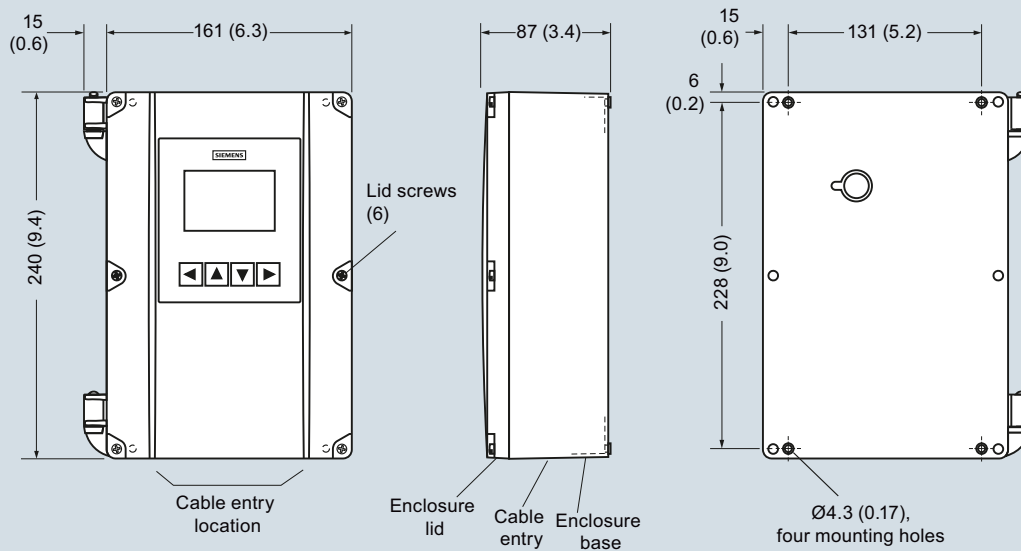
MultiRanger 200 HMI

Dimensional drawings

Panel mount dimensions

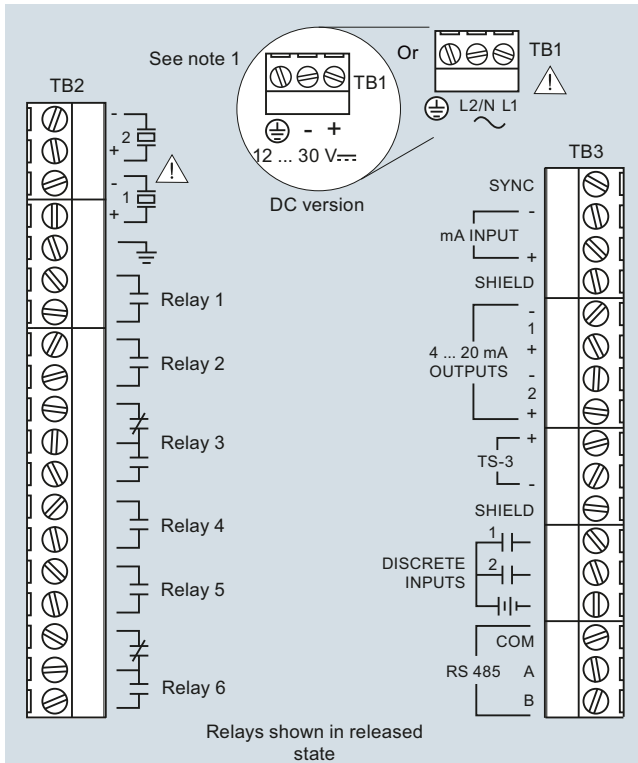


Wall mount dimensions



MultiRanger 200 HMI, dimensions in mm (inch)

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.

MultiRanger 200 HMI connections