## MultiRanger 200 HMI

### 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
- Compatible with SmartLinx system and SIMATIC PDM configuration software
- 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.

## 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<br>Logical 0 ≤ 0.5 V DC<br>Logical 1 = 10 ... 50 V DC<br>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]<br>or 2 mm (0.08 inch), whichever is greater |
| Temperature compensation | • -50 ... +150 °C (-58 ... +302 °F)<br>• Integral temperature sensor<br>• External TS-3 temperature sensor (optional)<br>• 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 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[2]<br>• FM, $CSA_{US/C}$, UL<br>• 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<br>• RS 485 with Modbus RTU or ASCII via terminal strips<br>• Optional: SmartLinx cards for<br>- PROFIBUS DPV1<br>- 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

## MultiRanger 200 HMI

| Selection and Ordering data | | Article No. |
|---|---|---|
| **MultiRanger 200 HMI**<br>Versatile short to medium-range ultrasonic single and multi-vessel level monitor/controller for virtually any application in a wide range of industries | | **7ML5033-** |
| ↗ Click on the Article No. for the online configuration in the PIA Life Cycle Portal. | | |
| **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 DPV0 module | ⬟ | **2** |
| SmartLinx DeviceNet module | ⬟ | **3** |
| SmartLinx PROFIBUS DPV1 module | | **4** |
| See SmartLinx product page for more information. | | |
| **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 | ⬟ | **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

⬟ We can offer shorter delivery times for configurations designated with the Quick Ship Symbol ⬟. For details see page 9/5 in the appendix.

| Selection and Ordering data | 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*** | Article No. |
| English | **AE535857004** |
| German | **A5E36182123** |
| Note: The instruction manual should be ordered as a separate line on the order. | |
| This device is shipped with the Siemens Level and Weighing manual DVD containing the complete ATEX Quick Start and instruction manual library. | |
| ***Other Operating Instructions*** | |
| SmartLinx PROFIBUS DPV1, English | **A5E36197302** |
| SmartLinx PROFIBUS DPV1, German | **A5E36197305** |
| SmartLinx PROFIBUS DP, English | **7ML1998-1AQ03** |
| SmartLinx PROFIBUS DP, German | **7ML1998-1AQ33** |
| SmartLinx PROFIBUS DP, French | **7ML1998-1AQ13** |
| SmartLinx DeviceNet, English | **7ML1998-1BH02** |
| Note: The appropriate SmartLinx Operating Instructions should be ordered as a separate line on the order. | |
| ***Optional equipment*** | |
| Tag, stainless steel, 12 x 45 mm, one text line, suitable for enclosures | **7ML1930-1AC** |
| Sun-shield, 304 Stainless steel | **7ML1930-1GA** |
| SITRANS RD100, loop powered display - see Chapter 7 | **7ML5741-...** |
| 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-...** |
| SITRANS RD500 web, universal remote monitoring solution for instrumentation - see Chapter 7 | **7ML5750-...** |
| ***Spare parts*** | |
| Power Supply Board (100 ... 230 V AC) | **7ML1830-1MD** |
| Power Supply Board (12 ... 30 V DC) | **7ML1830-1ME** |
| 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 PROFIBUS DP V1 module | **A5E35778741** |

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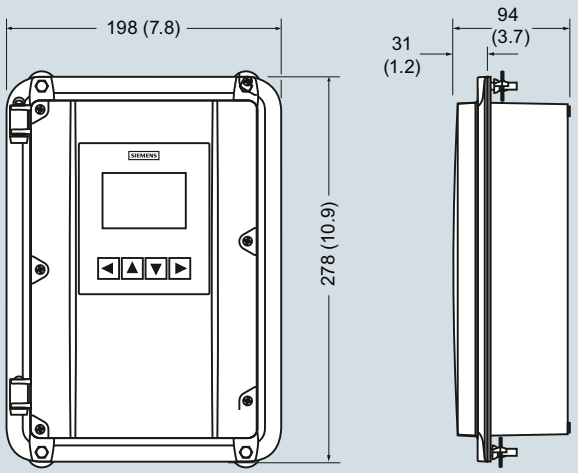
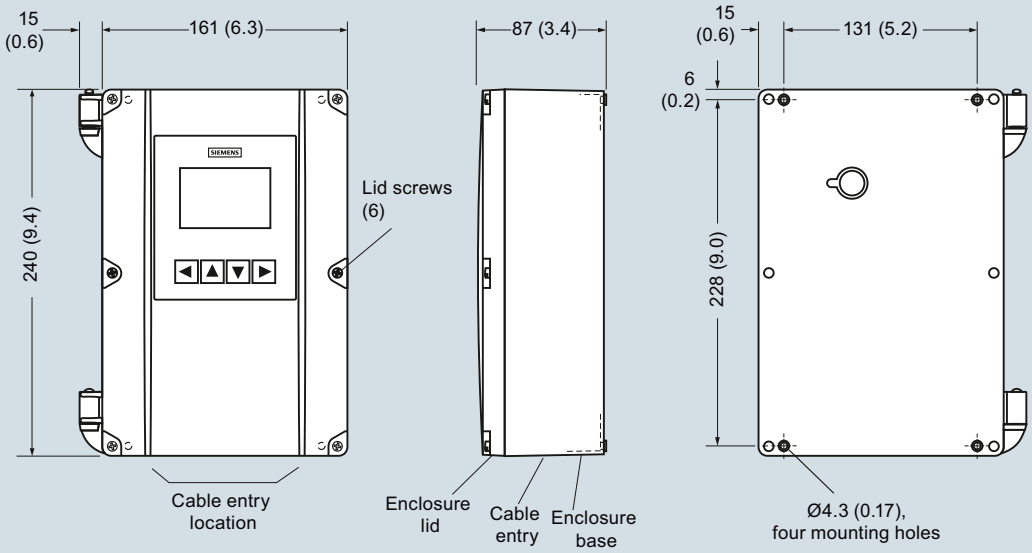
## Dimensional drawings

**Panel mount dimensions**

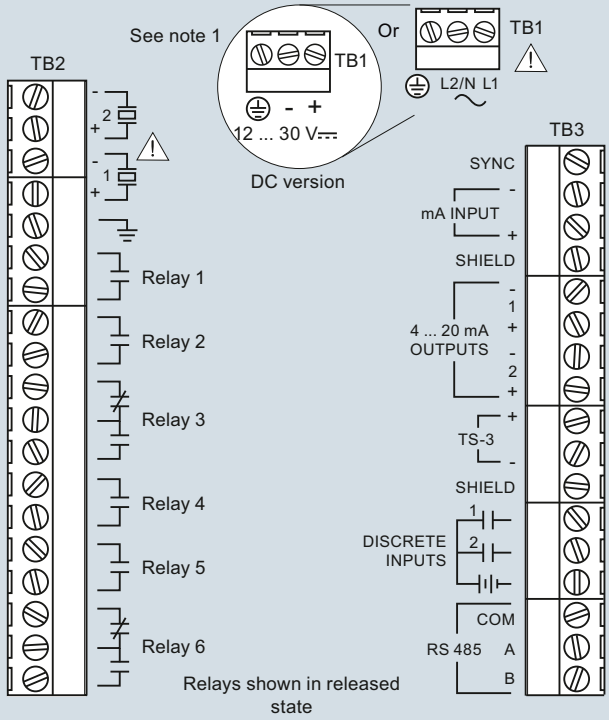



**Wall mount dimensions**




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

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