

## Level Measurement

Continuous level measurement  
Ultrasonic controllers

### MultiRanger 100/200

#### Overview



MultiRanger 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

- Digital input for back-up level override from point level device
- Communication using built-in Modbus RTU via RS 485
- Compatible with SmartLinX communication options or SIMATIC PDM via RS 485
- 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
- MultiRanger 100: level measurements, simple pump control, and level alarm functions
- MultiRanger 200: level, volume, and flow measurements in open channels, differential control, extended pump control, and alarm functions
- Wall and panel mounting options

#### Application

MultiRanger can be used on different materials, including fuel oil, municipal waste, acids, woodchips, or on materials with high angles of repose. MultiRanger 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 setup. MultiRanger features Sonic Intelligence advanced echo-processing software for increased reading reliability.

MultiRanger 100 offers cost-effective level alarming, as well as on/off and alternating pump control. MultiRanger 200 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 can be used in hostile environments at temperatures as high as 145 °C (293 °F).

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

#### Design

The MultiRanger is available in wall or panel mounting options.

#### Technical specifications

<b>Mode of Operation</b>	
Measuring principle	Ultrasonic level measurement
Measuring range	0.3 ... 15 m (1 ... 50 ft)
Measuring points	1 or 2
<b>Input</b>	
Analog (MultiRanger 200 only)	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
<b>Output</b>	
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 1 SPST Form A
<ul style="list-style-type: none"> <li>• Version with 1 relay (MultiRanger 100 only)</li> <li>• Version with 3 relays</li> <li>• Version with 6 relays</li> </ul>	2 SPST Form A/1 SPDT Form C 4 SPST Form A/2 SPDT Form C
mA output	0 ... 20 mA or 4 ... 20 mA
<ul style="list-style-type: none"> <li>• Max. load</li> <li>• Resolution</li> </ul>	750 Ω, isolated 0.1 % of range
<b>Accuracy</b>	
Error in measurement	0.25 % of range or 6 mm (0.24 inch), whichever is greater
Resolution	0.1 % of measuring range <sup>1)</sup> or 2 mm (0.08 inch), whichever is greater
Temperature compensation	<ul style="list-style-type: none"> <li>• -50 ... +150 °C (-58 ... +302 °F)</li> <li>• Integral temperature sensor</li> <li>• External TS-3 temperature sensor (optional)</li> <li>• Programmable fixed temperature values</li> </ul>
<b>Rated operating conditions</b>	
Installation conditions	
<ul style="list-style-type: none"> <li>• Location</li> <li>• Installation category</li> <li>• Pollution degree</li> </ul>	Indoor/outdoor II 4
Ambient conditions	
<ul style="list-style-type: none"> <li>• Ambient temperature (housing)</li> </ul>	-20 ... +50 °C (-4 ... +122 °F)

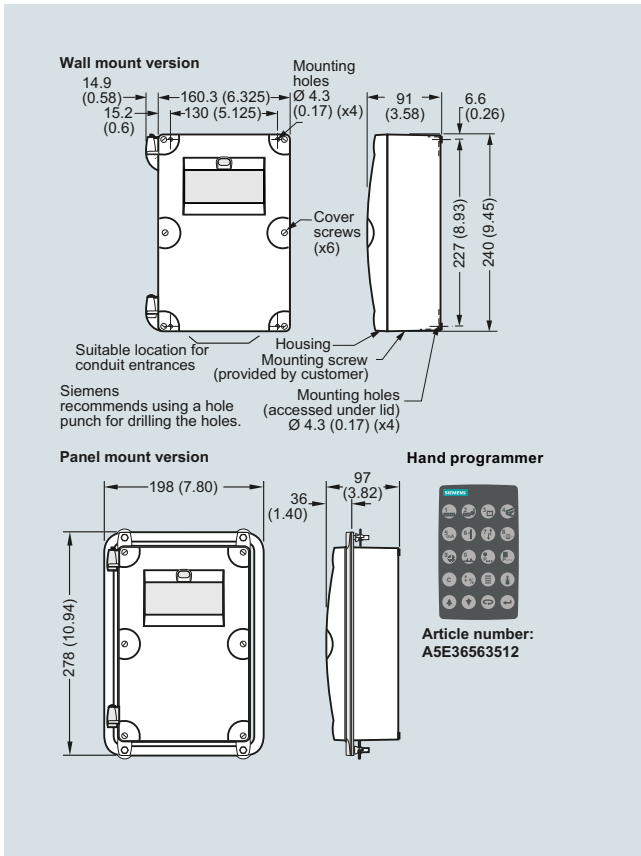
<b>Design</b>	
Weight	
<ul style="list-style-type: none"> <li>• Wall mount</li> <li>• Panel mount</li> </ul>	1.37 kg (3.02 lb) 1.50 kg (3.31 lb)
Material (enclosure)	Polycarbonate
Degree of protection (enclosure)	
<ul style="list-style-type: none"> <li>• Wall mount</li> <li>• Panel mount</li> </ul>	IP65/Type 4X/NEMA 4X IP54/Type 3/NEMA 3
Electrical connection	
<ul style="list-style-type: none"> <li>• Transducer and mA output signal</li> <li>• Max. separation between transducer and transceiver</li> </ul>	2-core copper conductor, twisted, shielded, 0.5 ... 0.75 mm <sup>2</sup> (22 ... 18 AWG), Belden 8760 or equivalent is acceptable 365 m (1 200 ft)
<b>Displays and controls</b>	
	100 x 40 mm (4 x 1.5 inch) multi-block LCD with backlighting
Programming	Programming using hand-held programmer, SIMATIC PDM or via PC with Dolphin Plus software
<b>Power supply</b>	
AC version	100 ... 230 V AC ± 15 %, 50/60 Hz, 36 VA (17 W)
DC version	12 ... 30 V DC (20 W)
<b>Certificates and approvals</b>	
	<ul style="list-style-type: none"> <li>• CE, RCM, EAC, KCC<sup>2)</sup></li> <li>• Lloyd's Register of Shipping</li> <li>• ABS Type Approval</li> <li>• FM, CSA<sub>US/C</sub>, UL listed</li> <li>• CSA Class I, Div. 2, Groups A, B, C, and D, Class II, Div. 2, Groups F and G, Class III (wall mount only), ATEX II 3D, EAC Ex</li> </ul>
<b>Communication</b>	
	<ul style="list-style-type: none"> <li>• RS 232 with Modbus RTU or ASCII via RJ-11 connector</li> <li>• RS 485 with Modbus RTU or ASCII via terminal strips</li> <li>• Optional: SmartLinX cards for <ul style="list-style-type: none"> <li>- PROFIBUS DP</li> <li>- DeviceNet</li> </ul> </li> </ul>

<sup>1)</sup> Program range is defined as the empty distance to the face of the transducer plus any range extension

<sup>2)</sup> EMC performance available on request

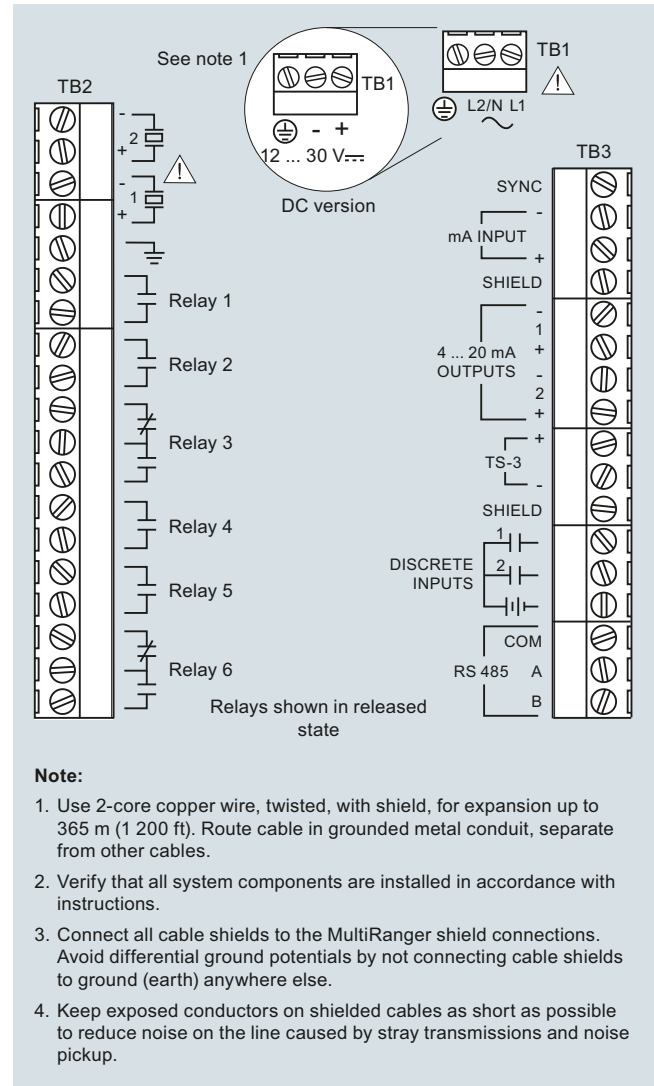


**Dimensional drawings**



MultiRanger 100/200, dimensions in mm (inch)

**Circuit diagrams**



MultiRanger 100/200 connections