MultiRanger Plus

The versatile ultrasonic level measurement system you can trust.
MultiRanger Plus

The industry standard for sound reasons

The MultiRanger Plus earned its reputation for rock solid dependability in some of the toughest and most versatile liquid and solids applications around. Over 85,000 at last count.

Its multi-functional capabilities and proven reliability have made it the right choice for monitoring virtually any short to medium range non-contacting ultrasonic measurement job up to 15 m (50 ft).

In addition to standard industrial bulk solids and liquid measurement in tanks and bins, these low maintenance ultrasonic units monitor open channel flow, determine actual lift station throughput, control as many as five pumps in wet wells and measure differential level.

And now, with an Echomax® compatible MultiRanger Plus unit, the system’s exceptional versatility has been extended further to include extremely hostile, high temperature processes up to 145°C (293°F). Materials as diverse as hot tar, liquid sulphur, woodchips and alumina and coal with high angles of repose, are just a few examples of its broadened application base.

Easy to use

The simplicity of the MultiRanger Plus starts with the patented, removable handheld programming system that communicates with the electronics through a non-invasive infrared interface. No wires, no tools, no disassembly, no hassle.

For initial setup, you simply key in the vessel dimensions, alarm settings and required display format – level, space, distance or volume – and the job is done. Programming values can be viewed during setup and operation so you don’t have to shut down the process to interrogate it. Level readings in feet, m, inches, mm or % are continuously displayed on the large, easy-to-read LCD. Air temperature and mA output values are also keypad selectable.

Reliable, continuous operation

Even on applications characterized by dust, turbulence and steam, or in vessels with agitators that cause interference, the system is completely self-adjusting. Sonic Intelligence® software constantly optimizes the most effective echo enhancement techniques with every variation in bin conditions. There is normally no need for operator involvement after initial setup and the infrared programmer can be taken away for security without affecting display value output or normal running mode.

Control Efficiency

Achievable resolution is 0.1% with accuracy to 0.25% of range. To increase utilization of available tank capacity, the MultiRanger Plus system provides an adjustable minimum range as short as 300 mm (12 inches). Adjustable short range blanking ignores unwanted, close-in echoes. Output from the electronics is a standard 4-20mA. There are 5 integral relays for control and alarm configurable for level, flow, total flow, volume or temperature. True galvanic isolation is available for connection to PLC’s or control systems.

Environmentally Sealed System Extends Working Life

The rugged, polycarbonate enclosure is completely sealed after installation to protect the electronics from condensation, corrosive vapours and chemicals. Milltronics non-invasive programmer eliminates any need to expose the interior to the elements for set up or adjustments. Mounting and wiring is simple. No special tools are required.

Preprogrammed Tank Shapes

Automatic volume conversion is available for eight preprogrammed vessel configurations providing a precise readout selectable either as percentage of volume or in any standard engineering unit. For custom vessel dimensions, there is an 11 point linearizer. This flexibility allows stocking inventory of just one unit providing for all short to medium range applications.

Efficient

The MultiRanger Plus system offers the advantages of the Echomax® ultrasonic system for all standard and non-linear tanks and bins, these low maintenance units have been proven reliable in the toughest applications.

As an option, the system can be extended further to include extremely hostile, high temperature processes up to 145°C (293°F). Materials as diverse as hot tar, liquid sulphur, woodchips and alumina and coal with high angles of repose, are just a few examples of its broadened application base.

Cost effective

For installations requiring a monitor, the station of choice is a remote reading system. Unlike the systems available with ultrasonic contacting that can cause interference, the MultiRanger Plus system can be used anywhere due to its non-existence.

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Efficient Pump Control
The MultiRanger Plus controls level in wetwells, reservoirs or general sump applications with as many as five pumps. These functions are geared specifically to applications with special pump sequencing requirements. Running time for each pump is automatically totalled, facilitating the scheduling of regular maintenance.

As an open channel monitor, the unit provides flow indication, totalization and flow or level alarms for a wide range of flumes and weirs. Output to a flow sampler is another feature.

Volumetric Flow
For installations in sewage lift stations requiring calculation of capacity utilization, the system provides an approximation of volumetric flow through the wet well. In any remote location the mA output can indicate well level while the unit displays a local reading, and/or transmits a remote reading of total volume pumped.

Cost effective, low maintenance system
Unlike the continual maintenance associated with mechanical devices, Milltronics ultrasonic system is self-cleaning and non-contacting so the opportunity for buildup that can cause malfunctions and potential environmental contamination is almost non-existent. When you factor in the proven reliability of our ultrasons and exceptional application versatility, the choice is clear. Our system works for you.

Service Support Worldwide
Milltronics assures you of expert technical support as close as the telephone. This support is provided by our worldwide sales and service network and our products are backed by a 2-year warranty.

Sheer versatility coupled with a track record for reliability has made the MultiRanger Plus the system of choice for a diverse range of level and volumetric applications. For example:

- It is used for differential level measurement across dikes in The Netherlands to prevent potential flooding disasters.
- For monitoring and controlling the levels of raw ore, flocculent and slurries, including sumps and thickeners, in gold mines in South Africa.
- To precisely control corn and bean levels in a rotary can filling operation in Australia.
- For continuous measurement of flare knockout tank levels in a hazardous oil and gas distillation process in the U.S.A. where high reliability is an absolute necessity.
- To automate the opening and closing of sluice gates at six sets of locks on The Manchester Ship Canal – a century old 48 km (30 mile) canal linking Manchester to the Irish Sea.
Performance at a level previously beyond the reach of any ultrasonic technology is what you get when you combine a non-contacting Echomax® transducer with the new Echomax Compatible MultiRanger Plus.

**Here’s what Echomax transducers mean to the efficient control of your process.**

Compact Echomax units continuously monitor levels at temperatures as high as 145°C (293°F) — the highest temperature operation available in any ultrasonic system. There are sensors for multipurpose, sanitary, high temperature and water/wastewater applications.

- Echo reliability is optimized through a patented sensor design that increases acoustic power and sensitivity and signal to noise ratio. A narrow beam angle maximizes the power of the signal in narrow bins and lift stations.
- There’s built in temperature compensation to ensure accuracy while simplifying installation and reducing wiring costs. Units can be installed 365 m (1200 ft.) from the electronics.
- Echomax transducers are virtually immune to build-up. Condensation, liquid and dust are atomized on contact with the highly active transducer face.
- Hermetic sealing in chemically resistant Kynar® allows blind flange mounting and equates to long term operating efficiency and low maintenance, even in extremely harsh environments. Factory faced teflon flanged versions are available on some models.

### Compatible Echomax Models

<table>
<thead>
<tr>
<th>RANGE*</th>
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<tbody>
<tr>
<td>XPS-10/10F 0.3 to 10 m (1-33 ft.)</td>
<td>XKS-6 0.3 to 6 m (1-20 ft.) For sanitary applications Stainless steel face</td>
</tr>
<tr>
<td>XPS-15 0.3 to 15 m (1-50 ft.)</td>
<td>XRS-5 0.3 to 5 m (1-16.5 ft.) Polypropylene housing Sealed rubber face</td>
</tr>
<tr>
<td>XCT-8 0.45 to 8 m (1.5-26 ft.)</td>
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<tr>
<td>XCT-12 0.45 to 12 m (1.5-40 ft.)</td>
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*Dependent on application  ‡FM version

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**ST25/ST50 Series Transducers**

Field proven ST Series transducers operate at maximum efficiency up to 15 m (50 ft.), at temperatures as high as 93°C (205°F). They are compact, easily installed and constructed for long life in harsh industrial processes. These transducers can be faced with different protective coatings for use in wet, corrosive environments and dry, dusty applications with high attenuation. Flanged, sanitary and submersible models are available.

**ST-H transducers** operate at a range up to 10 m (33 ft.) and are housed in a sealed, moulded Tefzel™ housing for corrosive applications.
Applications

Monitoring sludge level in an aeration basin at a wastewater treatment plant in Texas, U.S.A.

Milltronics ultrasonic system replaced a mechanical float to eliminate overflow of molasses used in animal feed production.

Effective on thick effluent with suspended solids at a U.K. leatherworks.

Measuring level in highly corrosive chemical storage tanks.

Tripper car application: Level measurement for infeed monitoring of wheat in a grain terminal in France.

Controlling nickel ore levels on a chute feeding the crusher.
Specifications

Operations

Modes of operations .................................. Level, space, differential level, total pumped volume, and open channel flow (OCM)
Range ........................................................ From 0.3 m (1 ft.) to 15 m (50 ft.), dependent on transducer used.
Number of points ...................................... One point level measurement, pump control and open channel measurement; two points for differential level.
Repeatability .............................................. 0.25% of range.
Resolution .................................................. 0.1% of range or 2 mm (0.08”), whichever is greater.
Echo Processing ......................................... Patented SONIC INTELLIGENCE® software.
Transducer Support ................................... XPS-10/10F*, XPS-15, XCT-8, XCT-12, XRS-5, XKS-6 Echomax® Transducers.
ST25 and ST50 series. ST-H.

Display ....................................................... High contrast 4 digit liquid crystal display, 18mm (0.7”) high
Relay Status Indicator .............................. 5 LED’s for alarm/pump controls

Units of Measure ........................................... m, cm, feet, inches and percent of span

Outputs

Relays ........................................................ 5 multi-purpose form “C” (SPDT) relays, rated 5 amps at 250 Vac non-inductive. Relays
assignable as alarms, pump controls, sample on time or flow, or totalizer. Adjustable dead-
band. Alarms are programmable for level, rate of change of level, differential
level, exclusive and inclusive band alarm on level, loss of echo and temperature.

Analog ....................................................... mA current loop into 350 ohms or 750 ohms, ±0.1% resolution. Programmable as either 4-20,
or 0-20, 40 or 200 mA.

Programming ............................................ Via keypad programmer, removable for security.

Parameter Retention ................................. Stored in EEPROM memory. Non-volatile, immune to power failure. No battery back-up required.

Volume Conversion .................................... 8 pre-programmed tank shapes plus custom level/volume facility.

Installation

Power Supply ........................................... 100/115/200/230 V ±15% stab selectable 15 VA max.
Wall mounted enclosure ............................ Polycarbonate. Size: 160 mm W X 240 mm H X 82 mm D (6.3” x 9.5” x 3.2”).
CSA type 4/NEMA 4X, IP 65

Transducer Cable Extensions ..................... Up to 365 m (1200 ft.) max. with RG-62A/U coaxial cable.

Operating Temperature ............................ -20°C to 50°C (5°F to 122°F) for the electronics.
Process Temperature .................................. -40°C to 145°C (-40°F to 293°F) depending on the transducer used.


Shipping Weight ...................................... 8.1 Kg (18 lb.)

Options

Power Supply ........................................... 12 Vdc or 24 Vdc operation: 10 to 18 Vdc and 18 to 36 Vdc, respectively
Temperature Compensation ....................... TS3 temperature sensor
Current Output Isolator ............................ 1000VAC loop isolator


Specifications subject to change without notice. *FM version  Y2K Compliant - Year 2000 Compliant

1954 Technology Dr., P.O. Box 4225, Peterborough, Ont., Canada K9J 7B1
Tel.: +1 705-745-2431  Fax: +1 705-741-0466
182 Normandy Rd., Box 339, South Melbourne, 3205, Australia
Tel.: +011-613-9695-2400 Fax: +011-613-9695-2450
August van de Wielelei 97, 2100 Deurne, Antwerp, Belgium
Tel.: +32(0)3326 45 54 Fax: +32(0)3326 05 25
Century House, Bridgewater Road, W.cersey, England W4 420
Tel.: +44 1895-450500 Fax: +44 1895-450501
Parc de la Sainte-Victoire, Bât. 5, 33590 Meyreuil, France
Tel.: +33 4 42 65 69 00 Fax: +33 4 42 58 63 95
Werftstrasse 47, D-40549 Düsseldorf, Germany
Tel.: +49 211 562 5025 Fax: +49 211 562 6030
1 Hoi Wan Street, Suite 602, Quarry Bay, Hong Kong
Tel.: +852-2856-3166 Fax: +852-2856-2962
Amores No. 1155, Col. del Valle, 03100 Mexico D.F., Mexico
Tel.: +52 5 575-27-28 Fax: +52 5 575-28-04
Nikkelstraat 10, NL-4823 AB Breda, The Netherlands
Tel.: +31(0)76 542 7 542 Fax: +31(0)76 542 8 542
709 Sheridan Drive, Arlington, Texas 76011
Tel.: +1 817-277-3543 Fax: +1 817-277-3894
A joint venture in Singapore, a sales office in Brazil and distributors in 56 countries.

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