

AiRanger SPL / DPL Plus / XPL Plus

New SmartLinx™ – ready for direct connection
to popular communication buses



 **MILLTRONICS**

We'll go to almost any length to measure up

Milltronics leads the world in non-contacting ultrasonic level measurement technology. Our reputation is built on pioneering powerful innovations in electronic and manufacturing technology so we can deliver solutions for really tough process measurement problems. We're first in monitoring bulk solids and liquid levels to 60 metres (200 ft.) at temperatures up to 150°C (300°F). With over 300,000 successful applications, we continue to set industry standards for product design and reliability.

The Level Best

Now, with introduction of the next generation **AiRanger SPL, DPL PLUS and XPL PLUS** systems with SmartLinX™ compatibility, control and measurement efficiency in single and multiple tank applications up to 60m (200 ft.) have been taken to new levels of performance. Their reliability has been field proven in extremely high temperature, steamy, dusty and corrosive environments. Caustics and fine powders are just a few examples of difficult applications where these systems have the edge.

AiRANGER SPL Improve process efficiency with the reliable, high performance AiRanger SPL - the single point solution for continuous level measurement on liquids, bulk solids or slurries up to 60m (200 ft.). Its advanced functionality goes beyond other single point systems, offering fast, accurate 32 bit multi-tasking processing, on board communications, easy pre-calibrated set-up, and more, at a low cost of ownership.



AiRANGER DPL PLUS The **AiRanger DPL PLUS** combines the economy of a single point unit with the flexibility that comes with a multi-frequency capability. One monitor to scan liquids, solids or both, in any two bins of differing size, shape and configuration.

AiRANGER XPL PLUS When your plant processes demand reliable level measurement data in 1 to 10 vessels of any shape or size, in any liquid and /or bulk solid, and in any environment, a single **AiRanger XPL PLUS** has the flexibility to get the job done.

All AiRanger systems have Milltronic's SmartLinX plug-in digital communications connectivity for direct 2-way communication with plantwide PLC, DCS and other industrial networks.

These compact level monitors are designed for rugged industrial use. They are simple to mount and have an easily accessible wiring area. The electronics are so powerful it is possible to place either unit up to 365 m (1200 ft.) from the transducers.



Mix short, medium and long range transducers together with one DPL Plus or XPL Plus for maximum productivity. Instead of being restricted by range or application, materials as diverse as cement and ammonia can be reliably scanned in bins up to 60 m (200 ft.) in height.



Long range level measurement in cement with a steep angle of repose.

Performance you can count on

Easy Set Up and Operation

The SPL, DPL Plus and XPL Plus systems are shipped from the factory pre-calibrated to satisfy typical liquid and solid applications without the need for detailed set-up. Just select a single parameter to switch between liquid and solid materials, enter the bin dimensions and the control unit is up and running.

Simplified Programming

Fine tuning for your specific process is simplified further with Quick Start parameters. You can quickly program to display either level, space, distance or volume in the engineering unit of your choice (% , ft., m, etc.). Just one entry adjusts the tracking speed for changing material levels in any vessel. Programming values can be viewed during set up and operation, so you don't have to shut down the process or switch between different display modes to interrogate it. As well as level, temperature and mA output values can also be selected.

Streamlined Communications Solutions

You can use the hand programmer for infrared communication with the electronics, or configure and diagnose the instrument remotely with Milltronics' Windows 95®-based Dolphin Plus software and a laptop or standard PC.

Built in Digital Communications Capability ... with a Difference

Milltronics' plug-in SmartLinx interface modules make it simple to link the AiRanger SPL, DPL Plus or XPL Plus directly to popular industrial buses. You have remote 2-way access to all instrument data required for improved productivity without additional wiring, maintenance and support costs. The appropriate SmartLinx module can be ordered with the unit today or field installed later so that you have complete flexibility to build the industrial communications network you need now or in the future.

Peripheral Communications Options

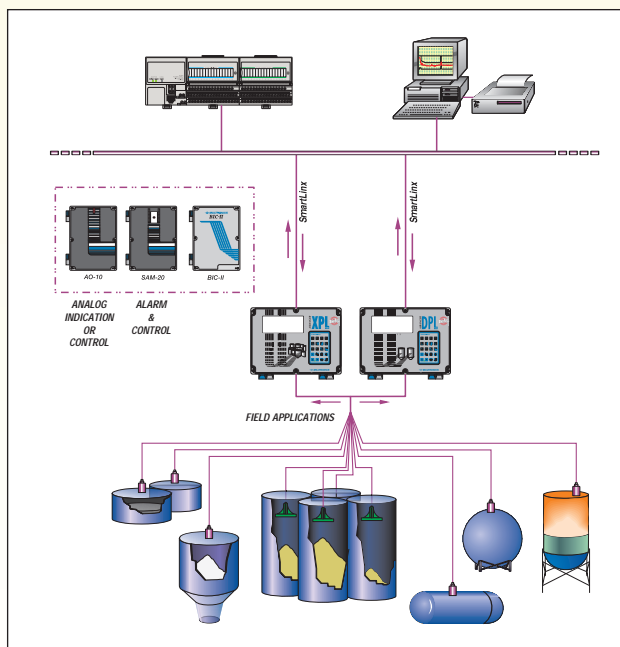
With a BIC II communications converter, all measured data from these AiRanger systems can be sent to a host computer, PLC or DCS equipped with an RS-232 and/or RS-422 port using Modbus ASCII protocol.

XPL Plus and BIC II systems support a virtually unlimited number of level points: 6 XPL Plus instruments can be connected to a BIC II, and up to 31 BIC II's can be interconnected.

For analog output and alarm relays, the XPL Plus connects to an AO-10 for 10 analog outputs and to a SAM 20 for 20 high and low alarm contacts, at a distance of up to 1500 m (5000 ft.).



Configure the instrument with the removable programmer or remotely using Dolphin Plus software.



Faster Scanning, Faster Monitoring

Data, processed up to 10 times faster than conventional systems, is continuously displayed in both numeric and icon formats on an easy-to-read LCD.

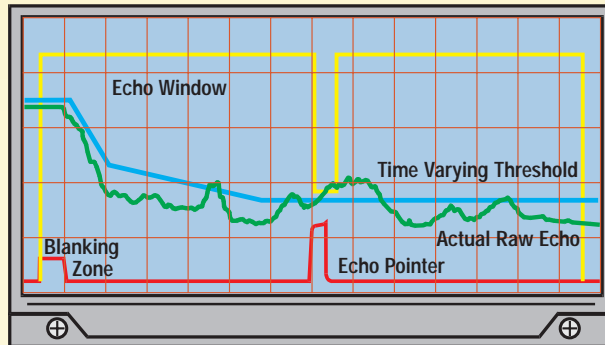
- A bar graph shows rapidly changing levels at a glance
- Two icons indicate if the vessel is filling or emptying
- The point # being scanned is visually displayed
- Arrows flash when 2-way communication is underway (BIC II)
- Priority scanning (XPL PLUS) shows rapidly changing levels in up to 5 vessels

The Milltronics Edge

SONIC INTELLIGENCE®

Sonic Intelligence® software is the electronic brain that drives the exceptional echo analysis performance of the AiRanger SPL, DPL Plus and XPL Plus. To process the raw echo profile at the high level of reliability you need in constantly changing and hostile environments, these patented echo processing algorithms digitize the sonic echo profile of the vessel to differentiate between the "true" echo, reflected from the solid or liquid surface, and false echoes generated by bin obstructions and acoustical or electrical noise.

Sonic Intelligence® selecting the true echo in a difficult solids application with a steep angle of repose.



Sonic Intelligence: It's artificial intelligence with smarts.



Multiple point level measurement in grain silos.



An AiRanger SPL is programmed with Dolphin Plus to monitor and control the level in flyash at a power plant in the far east.

Non-contacting level measurement in latex vessels.



Commitment to Quality

The heart of the SPL, DPL Plus and XPL Plus, the electronics, are manufactured using state of the art surface-mount technology. The board assembly is sealed in a compact, chemical resistant enclosure to ensure the integrity, consistency and long life of the entire unit. The payoff: many years of trouble free operation and low maintenance costs. Our ultrasonics are an evolution of over 25 years of real world application experience. They work.



The best in ultrasonic level measurement just got better.



Milltronics non-contacting ultrasonic level measurement system is comprised of just two components: an ultrasonic signal transducer and a remotely mounted electronic transceiver.

The transducer sends out a continuous series of ultrasonic pulses and receives the reflected echoes on the round trip from the liquid or solid surface being monitored. The microprocessor in the transceiver converts the signals into distance, level or volume, and displays this data as an LCD digital read out.

XLS 30 standard temperature and XLT 30 high temperature transducers.

In a perfect world, monitoring a liquid or solid level in a vessel and receiving a single, strong return echo from the reflecting surface is a simple process. But in reality, there are many factors that can complicate things. Turbulence, dust, echoes from false targets like ladders, beams or pipes, steam, and the effect of sound attenuation over distance, are just a few of the many elements that can test a system's capabilities to the limit.

With the sophistication of **Sonic Intelligence**[®] echo processing harnessed to the power of Milltronics' **ECHOMAX** transducers, applications previously beyond the scope of any ultrasonics are now possible.



XCT and XPS series transducers.

Take the XCT series transducers. They're hermetically sealed in space age Kynar[®] to monitor extremely hot corrosives and chemicals like cyanide and liquid sulphur at temperatures up to 145°C (293°F).

Need maximum acoustic power in hot, wet, dusty conditions? Four XPS series transducers can be foam faced to measure materials as diverse as fly ash, lime or bauxite slurry. They can be immersed, are resistant to steam and outperform in harsh chemical environments at temperatures up to 95°C (203°F).

For tall, narrow bins, the XLT/XLS series aluminum transducers deliver the longest shots in the industry ... and the most reliable. These heavy duty transducers operate effectively at ranges to 60m (200 ft.) in liquids and solids in hot (up to 150°C/302°F) hostile environments, a major advantage for difficult applications like cement and wood pulp.

All Echomax transducers feature built in temperature compensation and higher output which improves self cleaning capabilities and reduces maintenance to a minimum.

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XPL Plus/Echomax transducers monitor levels in hot, dusty clinker tanks.



Inventory in 26 chemical tanks is measured and controlled remotely with three XPL Plus instruments linked to a centralized computer system in this paint manufacturing process.

Specifications

AiRanger SPL and AiRanger DPL Plus

AiRanger XPL Plus

OPERATIONS

Measurement Range	0.3 m (1 ft.) to 60 m (200 ft.), dependent on transducer used	
Accuracy	0.25% of range or 6 mm (0.24"), whichever is greater, subject to application	
Resolution	0.1% of program range or 2 mm (0.08"), whichever is greater, subject to application	
Process Applications	Bulk solid and liquid level measurement. Detection or distance measurement, machinery position measurement, tripper car position (DPL only)	
Electronics: Ambient Temp.	-20°C to 50°C (-5° to 122°F)	
Process Temperature	-40°C to 150°C (-40° to 302°F), dependent on transducer used	
Echo Processing	Patented Sonic Intelligence® software	

Scan Points	SPL: 1 point DPL Plus: 2 points maximum	1 to 10 points
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INSTALLATION: Power Supply	100/115/200/230 Vac ±15% 50/60 Hz, 31 VA switch selectable
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INTERFACE

Outputs

Transducer Drive	150 to 315 V peak (dependent upon transducer model)	150 to 315 V peak (dependent upon transducer model)
Relays	4 programmable alarm/control relays, 1 form "C" SPDT contact per relay, rated at 5A/250 V ac, non-inductive	*SAM 20: 20 programmable alarm control relays, 1 form "C" SPDT contact per relay, rated at 5A/250 V ac, non-inductive
Analog	1 output (SPL) or 2 outputs maximum (DPL Plus), 0-20 or 4-20 mA, scalable. 0.1% resolution. 750Ω max. load, isolated	AO-10: 10 bank isolated analog outputs. 0-20 or 4-20 mA into 750Ω max. load.
Display	Backlit LCD, 51 mm x 127 mm (2" x 5") viewing area with custom graphics, 2 numeric displays	51 mm x 127 mm (2" x 5") LCD with custom graphics 2 numeric displays
Measurement Readings	Level, space, distance or volume in m, cm, mm, ft., in., % or any other units as programmed. Volume in desired units. Programmable conversion to any linear engineering units.	Level, space, distance or volume in m, cm, mm, ft., in., % or any other units as programmed. Volume in desired units. Programmable conversion to any linear engineering units.
Operating Status	Level bar graph, alarm, data communication, filling/emptying, temperature, rate of change, etc.	Level bar graph, alarm, point scanned, data communication, filling/emptying, temperature, rate of change, priority scanning up to 5 active vessels

ENCLOSURE: Wall Mount	Type 4X / NEMA 4X / IP 65 polycarbonate 285 mm W x 209 mm H x 92 mm D (11.2" x 8.2" x 3.6")
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PROGRAMMING	Via removable infrared programmer or optional Dolphin Plus, Milltronics Windows 95®-based software interface and infrared ComVerter link
Memory	EEPROM (non-volatile). No back-up battery required
Volume Conversion	8 pre-programmed tank configurations

PROGRAMMER	Hand-held 20 key programmer. 67 mm x 100 mm x 25 mm (2.6" x 4" x 1") general purpose enclosure
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Compatible Transducers	Echomax® series. ST-H, ST and LR Series.	
Temperature Compensation	-50° to 150°C (-58° to 302°F). Integral temperature sensor in Echomax transducers automatically compensate for temperature induced sound velocity variation	
	TS-3 temperature sensor when required (optional)	TS-3 temperature sensor when required (optional)
	SPL supports 1 TS-3 DPL Plus supports 2 TS-3's	XPL Plus supports 1-TS-3 or 10 TS-3's with optional TIB-9 card

COMMUNICATIONS OPTIONS

SmartLinx™	Plug-in protocol specific interface modules for direct connection to popular industrial communications networks
BIC II	BIC II converts the bi-polar communication current loop to remote RS-232 or RS-422
Dolphin Plus	Milltronics Windows® 95 based software interface and infrared ComVerter link

OPTIONS

XPL Plus Only:	Proprietary serial bipolar current loop communicates with AO-10 and SAM 20 up to 1500 m (5000 ft.) away
SAM 20:	20 relays programmable via XPL Plus for high, high high, low, or low low level, temperature, rate of change in bounds, out of bounds or loss of echo, alarm/control or pump control
AO-10:	10 analog outputs programmable via XPL Plus for range, proportional or inversely proportional to level, space or volume

Weight	2.7 kg (6 lbs.)
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Approvals	CE. CSA _{INTLUC} . Pending: FM.	CE. CSA _{INTLUC} . FM.
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Specifications subject to change without notice.
Y2K Compliant - Year 2000 Compliant



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