



**THE BEST IN ULTRASONIC LEVEL  
MEASUREMENT JUST GOT BETTER**





## Echomax® transducers redefine the limits for industrial application of ultrasonics

Major advances in product design have dramatically increased the acoustic power and sensitivity of Milltronics' new generation of Echomax® transducers. Now dynamically changing levels in processes involving extremely high temperatures, harsh chemicals, steamy solids and fine powders can be continuously monitored at temperatures as high as 150°C (300°F) and at ranges to 60m (200 ft.).

- ✓ TWO-WAY DYNAMIC IMPEDANCE MATCHING = HIGH OUTPUT AND SENSITIVE ECHO CAPTURE
- ✓ HIGHEST TEMPERATURE OPERATION AVAILABLE IN ANY ULTRASONIC SYSTEM: 150°C (300°F)
- ✓ RELIABLE IN LIQUIDS & SOLIDS FROM .3M TO 60M (1 FT. TO 200 FT.)
- ✓ SELF-CLEANING. LOW MAINTENANCE. NO MOVING PARTS TO CAUSE DOWNTIME.
- ✓ SIMPLE, ECONOMICAL INSTALLATION
- ✓ CHEMICALLY RESISTANT
- ✓ HERMETICALLY SEALED MODELS IMMUNE TO DUST, STEAM, TURBULENCE, CORROSIVES.
- ✓ AIMING LESS CRITICAL

Evolving from 40 years of experience, these transducers combine design principles, materials and manufacturing techniques for performance at a level previously beyond the reach of any ultrasonic technology. With an Echomax unit and one of our Ranger™ transceivers, you get the kind of reliability it takes to control levels in a wide range of solids, powders, liquids, slurries and sludges in a single vessel or a multiple tank farm.

### How our ultrasonic system works

The Milltronics system consists of a non-contacting chemical resistant transducer linked to a sophisticated electronic processor. The transducer continuously sends powerful, high frequency sonic pulses to the target surface and captures the reflected echoes on the return trip. The round trip time of each pulse is digitally converted into distance, level or volume by the microprocessor-based transceiver using advanced **Sonic Intelligence®** echo processing algorithms.

Unlike capacitance probes, electro-mechanical dippers and bubblers, Milltronics' non-invasive ultrasonic system never touches the process. No plugging, overflow, shortages or downtime. And no costly maintenance or chemical degradation.

### THE INSIDE STORY.

#### Why Milltronics Ultrasonic System is better.

Maximizing acoustic energy transfer is key to the echo capturing capabilities of any transducer. With Echomax, Milltronics' engineers have developed bi-directional dynamic acoustical impedance matching to maximize both the outgoing pulse of ultrasonic sound energy and the sensitivity of the transducer in the receiving mode. Working like a heavy duty piston, the patented, high temperature unidriver in the transducer directs an intense, narrow beam at the target and gets the most out of the reflected echo on the return trip.

#### In tune with perfect transmit/receive matching

Separation of transmit and receive circuitry and multi-layered acoustic matching material in the unidriver





Economical multi-point inventory control

optimizes echo reliability and greatly increases signal to noise ratio, a positive factor in high temperature applications like cement clinker and fly ash with a high angle of repose.

## AND THERE'S MORE

**Built-in temperature compensation** in all Echomax transducers automatically adjusts for velocity variations caused by air temperature changes in the vessel ensuring optimum accuracy from -40 to 150°C (-40 to 300°F). Installation is easier and wiring costs are less.

**The narrow beam pattern** with negligible side lobes gives reliable performance over the full temperature range even in narrow tanks. Mounting location is more flexible so obstacles can be avoided.

**Low ringing cuts blanking distance** to a minimum so you can use the full tank capacity and eliminate the need for tall standpipes. With uniformity as close as 0.3m (1 ft.) to the transducer face, you can depend on short range reliability.

**New, closed cell foam** is immune to moisture and temperature independent, opening the door to previously impossible applications.

**High sensitivity** across the transducer face improves performance on solids and is especially effective for long shots up to 60 m (200 ft.).

**Unique unidriver construction** extends operating temperature limits to 150°C (300°F).

### Self cleaning, low maintenance

Condensation, liquid and dust are atomized on contact with the highly active transducer face. The absence of build up reduces routine maintenance.

# Turn up the heat. These transducers are built for extremely hot, hostile conditions

*There are four series in the Echomax product line – each one specifically designed to deliver solutions for really tough process measurement problems. There is one to suit your application.*

## THE LONG SHOT XLS / XLT SERIES

**XLS/XLT 30:** Range up to 30m(100')

**XLS/XLT 60:** Range up to 60m(200')

**Temperature Rating:**

**XLS:** Up to 90°C (194°F)

**XLT:** Up to 150°C (300°F)

We've got the range for deep narrow bins up to 60 m [200 ft.] with these rugged, aluminum transducers. In liquids or bulk solids, from boiler condensate to hot tar, they deliver reliability at a cost per point that makes

them the obvious choice. With an upper temperature limit of 150°C (300°F), increased signal sensitivity and a maximum operating pressure of 800 psi, 8 bar, 120 PSI, you're in control in difficult applications such as limestone, cement clinker and hot stone. A beam angle of just 5° makes aiming in processes with steep angles of repose less critical for reliable monitoring. All models have a sealed aluminum face to withstand noisy, abusive environments.



XLS monitoring flour



## HERMETICALLY SEALED XPS AND XCT SERIES TRANSDUCERS – AN INDUSTRY FIRST

They said it couldn't be done. But XPS and XCT units are encapsulated with chemically-resistant Kynar® and hermetically sealed so they can be immersed, are resistant to steam and, without glued joints, withstand attack by harsh chemicals. These compact transducers are easily installed without flange mounting. Simpler, more effective ... at a lower cost.

## THE SURE SHOT XPS SERIES

**Range:** Up to 40m (130 ft.)

**Temperature Rating:** -40° to 95°C (-40° to 203°F)

Equally effective in applications as diverse as bauxite slurry and liquid sulphur, four versatile models monitor in temperatures up to 95°C (203°F), have excellent chemical immunity and require reduced aiming. For high dust applications, XPS performance is dramatically increased with water resistant, closed cell polypropylene foam facing.



Monitoring foaming effluent

## XCT SERIES CAN REALLY TAKE THE HEAT

**Range:** Up to 12m (40 ft.)

**Temperature Rating:** -40° to 145°C (-40° to 293°F)

For extremely hot, corrosive environments, the XCT series, with a temperature rating of up to 145°C (293°F), are particularly effective in food and chemical applications where contamination is a major concern. They are **Food Safe**, non-contacting and immune to most acids, alkalis and solvents.





Hermetically sealed XCT in an aggressive chemical application

## SONIC INTELLIGENCE<sup>®</sup>

The discriminating electronic brain that drives our patented software can differentiate between weak, "true" echoes generated in volatile, noisy bins, and false echoes from obstacles like ladders and pipes that confuse ordinary electronics.

**Sonic Intelligence<sup>®</sup>** employs complex echo processing algorithms to digitize the sonic echo profile of the vessel including curve shaping, statistical analysis, echo reform and digital filters to remove electrical interference.

It's this exceptional echo processing capability harnessed to the power and sensitivity of **Echomax** transducers that solves the tough problems in environments where turbulence, foam and extreme heat can stop other systems in their tracks.

### Easy, more economical installation

- Simplified cabling
- Built in temperature compensation, compatible with all electronics. No additional cable. Low installation costs.
- The transducer can be separated from the electronics by up to 365m (1200 ft.).

## Depend on the level best

*Echomax transducers are built to perform in the hot shots, the long shots, the ones no one else will even touch. Compare the performance of Echomax in these difficult applications and see for yourself.*

### HOT SOLIDS

Cement clinker  
Fly Ash  
Asphalt  
Hot Stone  
Gypsum  
Silica

### HOT LIQUIDS

Liquid Sulphur  
Food-pressurized  
Bitumen/Tar  
Zinc Dip  
Steel Strip  
Black liquor  
Cyanide

### FINE POWDERS

Plastic pellets, powders, flakes  
Carbon Black, Ore concentrates  
Flour, Powdered milk, Chalk



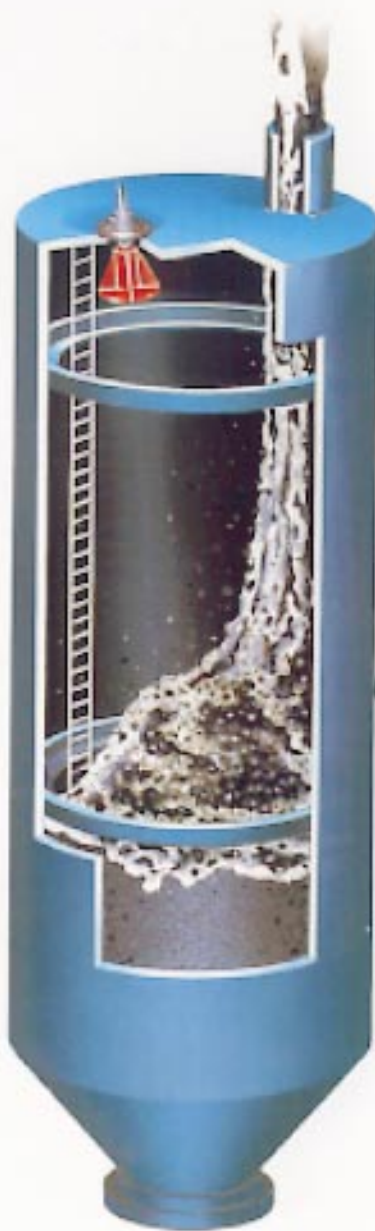
Monitoring levels in fine sand with a steep angle of repose.

**O**ther companies offer non-contacting ultrasonic level measurement. But only one company can deliver reliability in hostile, corrosive conditions at temperatures up to 150°C (300°F) and at ranges to 60m (200 ft.).

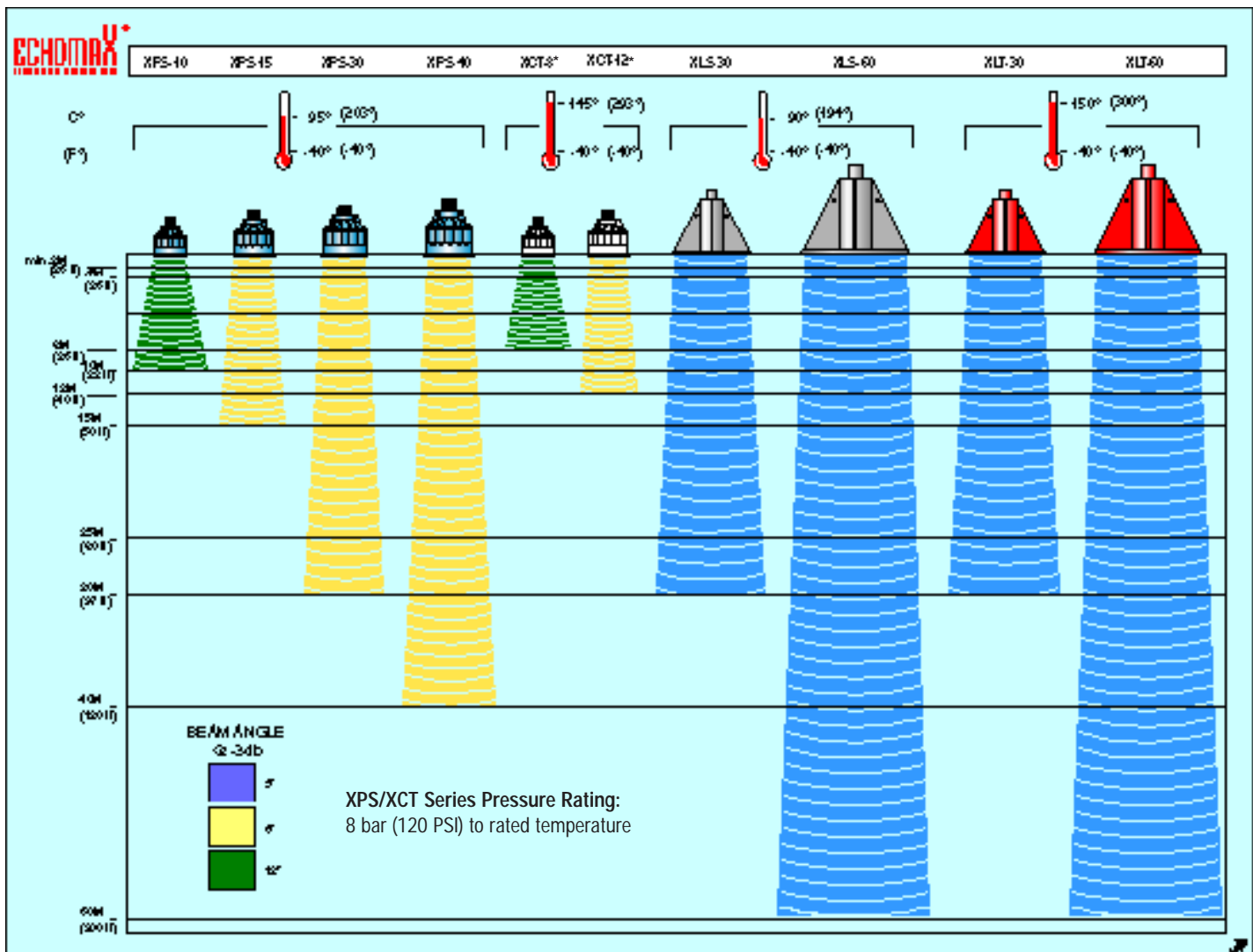
**MILLTRONICS.** Our ultrasonics are proven in steel, power, cement, food, chemical, mining, mineral processing, sand, gravel, water/wastewater and manufacturing processes. Over 200,000 applications in 91 countries. They work.

### Service support worldwide

We know yours is not a 9 to 5 operation. Your equipment has to run 24 hours a day. So if you need assistance, Milltronics assures you of expert technical support as close as the telephone. Our technical people are level specialists. After all, we pioneered the industrial application of low cost, high performance ultrasonic level measurement. This support is provided by Milltronics' worldwide sales and service network. Our products are rigorously tested in lab and field conditions and are backed with a 2-year warranty. That's our long term commitment to you.



# Echomax® Ranges



\*Minimum range 1.5 ft. (.45m)

## Transducer Flange Options

FLUSH TEFLON FACED FLANGED UNITS, FACTORY ASSEMBLED							
Model	XPS 10	XPS 15 / XPS 30	XCT 8				
Size	3", 4", 6"	6", 8"	3", 4"				
Material	CPVC	CPVC	Kynar®				
Type	JIS, DIN, ANSI	JIS, DIN, ANSI	Universal				
<b>MAXIMUM PRESSURE RATING:</b> XPS / XCT Series 2 bar differential (30 PSI) to rated temperature							
				FLUSH UNFACED FLANGED UNITS			
				Model	XCT 8	XCT 12	
Size	3", 4", 6"	4", 6", 8"					
Material	1" Derakane	1" Derakane					
Type	JIS, DIN or ANSI	JIS, DIN or ANSI					
SPLIT CLAMPING FLANGES FOR QUICK FIELD ASSEMBLY							
Model*	XPS 10 / XCT 8	XCT 15 / XCT 12					
Size‡	3", 4", 6"	6"					
*Alum. or 304 stainless ‡Universal bolt sizing							



Flush flanged XPS unit

## TS3 Temperature Sensor

With flanged transducers in some environments, a separate temperature sensor may be required – an exclusive option only from Milltronics. Thread size: 3/4" BSP or NPT. Max. operating temperature: 293°F (145°C).



Easy Aimer 304

## Easy Aimer 304

- Stainless steel •Quick sight
- Rated to 1 bar pressure differential
- Easier, smoother aiming
- 1" NPT or BSP conduit connection suitable for use with all Echomax transducers.

## Easy Aimer II

- Aluminum •Low cost •Weatherproof
- Rated to 1 bar pressure differential
- 3/4" NPT or BSP conduit connection. Suitable for use with all Echomax transducers.
- Temp. Rating: -40°F (-40°C) to 220°F (105°C)



XPS 10 with optional submergence shield

Stable operation in flood or overflow conditions is ensured with the optional submergence shield.



# SPECIFICATIONS: ECHOMAX® NON-CONTACTING ULTRASONIC TRANSDUCERS

Model	Min. Range		Max Range		Beam Angle -3dB	Hermetically Sealed Housing XPS & XCT	Foam Facing Opt.	Foam Temp. Rating	Built In Temp. Rating	Temp. Range Celsius (Fahrenheit)	Chemical Immunity Rating	Thread Size	Flange▲ Mount. Opt.	Freq. kHz (nom.)	Weight Kg (lbs.)
	M	Ft.	M	Ft.											
<b>THE SURE SHOT XPS SERIES</b>															
XPS-10	0.3	1	10	33	12°	Kynar® (blue)	√	95° (203°)	Yes	-40° to 95° (-40° to 203°)	Excellent	1" NPT 1" BSP	√	43	.75 (1.65)
XPS-15	0.3	1	15	50	6°	Kynar® (blue)	√	95° (203°)	Yes	-40° to 95° (-40° to 203°)	Excellent	1" NPT 1" BSP	√	43	1.28 (2.81)
XPS-30	0.6	2	30	100	6°	Kynar® (blue)	√	95° (203°)	Yes	-40° to 95° (-40° to 203°)	Excellent	1½" BSP/NPT	√	30	4.14 (9.12)
XPS-40	0.9	3	40	130	6°	Kynar® (blue)	√	65° (149°)	Yes	-40° to 95° (-40° to 203°)	Excellent	Compa- tible	√	22	7.9 (17.4)
<b>THE HOT SHOT XCT SERIES</b>															
XCT-8*	0.45	1.5	8	26	12°	Kynar® (white)	-	-	Yes	-40° to 145° (-40° to 293°)	Excellent	1" NPT 1" BSP	√	43	.75 (1.65)
XCT-12*	0.45	1.5	12	40	6°	Kynar® (white)	-	-	Yes	-40° to 145° (-40° to 293°)	Excellent	1" NPT 1" BSP	√	43	1.28 (2.81)
<b>THE LONG SHOT XLT / XLS SERIES ■</b>															
XLS-30	0.9	3	30	100	5°	Aluminum Grey	-	-	Yes	-40° to 90° (-40° to 194°)	Fair	1" NPT	-	22	4.4 (9.7)
XLS-60	1.8	6	60	200	5°	Aluminum Grey	-	-	Yes	-40° to 90° (-40° to 194°)	Fair	1" NPT	-	13	6.35 (14.0)
XLT-30	0.9	3	30	100	5°	Aluminum Red	-	-	Yes	-40° to 150° (-40° to 300°)	Fair	1" NPT	-	22	4.4 (9.7)
XLT-60	1.8	6	60	200	5°	Aluminum Red	-	-	Yes	-40° to 150° (-40° to 300°)	Fair	1" NPT	-	13	6.35 (14.0)

**Note:** Effective maximum range capability may vary depending on application. \* Food safe. FDA accepted.  
Our continuous program to improve products may result in changes in design and specifications without notice.  
For XRS-5, XKS-6, XPS-10F, see Technical Specification Sheets.

- ▲ All models can be blind flange mounted.
- Polyester covering is standard.

ECHOMAX® SERIES APPROVALS	
<b>CENELEC</b>	EEx m II T5: <b>XLS Series</b> . EEx m II T4: <b>XPS Series</b> . EEx m II T3: <b>XLT &amp; XCT Series, TS-3.</b>
<b>CSA</b>	Class I, II, Div. 1, Group A, B, C, D/E, F, G. Class III.
<b>FM</b>	Class I, II, Div. 2, Group A, B, C, D/F, G. Class III.
<b>FM</b>	XPS 10/15: Class I, II, Div. 1, Group A, B, C, D/E, F, G. Class III.
<b>CSA. FM.</b>	TS-3 Temperature sensor: Class I, Div. 1, Group C & D. Class II, Div. 1, Group E, F & G.
<b>NOTE</b>	XCT-8, unfaced only, CSA approved.
CONDENSED APPROVALS LISTING. CONSULT AGENCY APPROVAL GUIDE FOR DETAILS.	



Milltronics versatile line of sophisticated Ranger™ transceivers provide reliable level control in a single vessel or a multiple tank farm.

Representative



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A joint venture in Singapore, a sales office in Brazil and distributors in 56 countries.  
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