

ULTRASONIC LEVEL TRANSDUCER

OPERATING MANUAL

ULTRIX™ 100

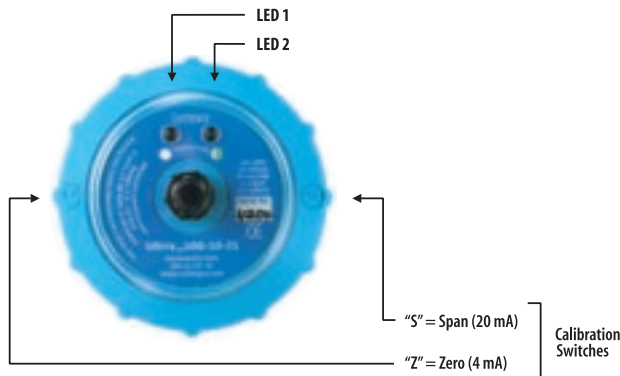


Setting Span and Offset

The 4 mA level and 20 mA level are calibrated using the magnetic key (provided) and are non-interactive. The calibration data is stored in EEPROM. The transmitter does not lose its calibration data on power failure.

To calibrate the 4 mA output, hold the transmitter at the proper distance for the 4mA level and touch the magnetic key against the "Z" (zero) calibration icon. LED2 and LED1 both switch ON green. Keep the transmitter steady and aimed at the level/target until the calibration routine is finished and LED1 turns OFF. The transmitter automatically returns to the measuring mode.

To set the 20 mA output, repeat the above procedure using the calibration icon "S" (span). Aim the transmitter towards the target surface when its at the 20 mA level and touch the magnetic key to the "S" icon.



INDICATING LED STATUS

		Power Up Mode – On power-up both LEDs illuminate solid green for 5 to 45 seconds while the sensor validates its signal.
		Normal Operation – Following power-up, this indicates a valid echo is being received and the transmitter is functioning normally.
		Invalid Range – An echo is being received but the distance is out of the calibrated range. The ULTRIX transmits the default mA.
		Calibrate / Validate Mode – When the transmitter is placed in the calibrate mode and the magnet is removed from the zero or span "target", both LEDs flash while the unit verifies the echo and stores the setting. If a valid echo and range are sensed, the unit will return to "Normal Operation".
		No Echo / Echo Loss – If no echo can be found for approximately one minute (after power up or during normal operation), LED 2 displays solid red. The ULTRIX transmits the default mA.
		Low Power – There is insufficient supply voltage to power the sensor. The unit doesn't pulse. Both LEDs are illuminated at 50% intensity.

Setting Response Rate and Default mA

The transmitter is factory configured with the response rate set to 17 ft per min and the default mA output set to 4 mA. The transmitter configuration can be changed to suit the application.

Response rate: 6, 17, 33, or 66 ft. per minute or instant
Default mA output: 3.8, 4, or 22 mA

TO ENTER CONFIGURATION MODE

Using two magnetic keys, simultaneously touch the Z (zero) and S (span) icons. The ULTRIX™ 100 enters the "Configure Response Rate" mode.

RESPONSE RATE SELECTION

The five options are displayed as follows:

RESPONSE RATE OPTIONS		
LED 1	LED 2	Response Rate
Off	Solid Green	Instant
Blinks Once	Solid Green	66 feet per minute
Blinks Twice	Solid Green	33 feet per minute
Blinks 3 Times	Solid Green	17 feet per minute
Blinks 4 Times	Solid Green	6 feet per minute

The ULTRIX 100 cycles through the above response rate options each time the magnetic key touches the Z (zero) icon.

To exit the Response Rate Adjustment mode and enter the Default mA mode, touch a magnetic key to the S (span) icon. (To exit the Configuration Mode, touch the S icon twice.)

DEFAULT mA SELECTION

The ULTRIX™ 100 has three default mA outputs to select from:

DEFAULT mA OPTIONS		
LED 1	LED 2	Default mA
Blinks Once	Flashing Green	3.8 mA
Blinks Twice	Flashing Green	4 mA
Blinks 3 Times	Flashing Green	22 mA

The ULTRIX 100 cycles through the above default mA options each time the magnetic key touches the Z (zero) icon.

To exit the Default mA mode (and the Configuration mode), touch the magnetic key to the S (span) icon.

Contegra's ULTRIX™ 100 is a two-wire ultrasonic level transmitter that provides non-contact measurement suitable for a wide range of media such as liquids, pastes, slurries, and solids. The ULTRIX transmits short ultrasonic pulses toward the sensed media. The time taken for the echoes to return to the sensor is calculated and converted into a 4-20 mA DC output that is proportional to the measured distance. The ULTRIX 100 sensors are self-contained, easy to install, accurate, reliable, and maintenance free.

The ULTRIX 100 transmitters are unique; they can be directly suspended from their signal cable and are NEMA 6. Additionally, they come with a Teflon® nose section for high chemical resistance and NPT threading for mounting on flanges or tanks.



Mounting Methods



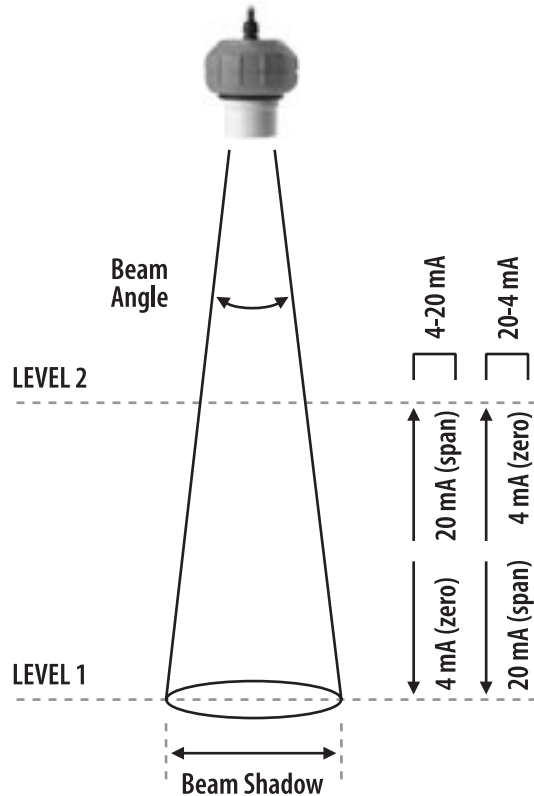
Suspend

Suspend the Ultrix from its own cable.



Threaded Boss or Flange

Hand tighten only. PVC fittings preferred.



NEMA 6: For indoor or outdoor use to protect against hose-direct water, temporary submersion and damage from external ice formation.

IP68: Protection against indefinite immersion

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Installation Notes

MOUNTING

- If the transmitter is flange mounted, use a PVC flange to improve acoustic de-coupling. Use the o-ring. Avoid cross-threading and do not overtighten.
- Mount the transmitter perpendicular to the reflecting surface.
- Mount an Open Channel Flow Sensor in the middle of the channel.
- Do not mount the transmitter in the center of the roof of the tank.
- Mount the sensor above its blanking distance – its minimum sensing range. (See specification section.)
- Do not mount the sensor where obstructions may provide false echoes.
- Avoid excessive vibration on the transmitter mountings. These can interfere with the return echo.
- Do not operate more than one transmitter in a tank.

ELECTRICAL CONNECTIONS

- The red wire is loop power and blue is signal return.
- Do not ground the shielding.
- Ensure the voltage across the transmitter is above 17VDC and below 30VDC.

CONFIGURATIION

If the ULTRIX 100 does not receive a good return signal, it transmits the default mA. Configure the control and alarm system to operate properly under this circumstance.

INTRINSICALLY SAFE INSTALLATIONS

EEx i,a IIC T6 Certification Parameters:

The I.S. transmitter is certified intrinsically safe only when used with an approved barrier.

Entity Parameters

$$U_i = 28 \text{ V}, I = 93 \text{ mA}, P = 0.65 \text{ W}, L_i = 4 \text{ uH}, C_i = 100 \text{ nF}$$

Inspection Authority SABS

Recommended Barriers

Active Galvanic MTL 7106 or equal
Isolated Repeater MTL 5041 or equal



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Specifications

SPECIFICATIONS	5	8	10	15	F (flow)
Range:	Liquid = 0.8-17' Solid = 0.8-8'	1.0-26' 1.0-12'	1.3-33' 1.3-16'	1.6-50' 1.6-24'	.8-10' —
Resolution:	.12"	.12"	.12"	.12"	.08"
Beam Angle (included):	7°	8°	10°	11°	7°
Beam "Shadow" Ratio:	1:0.12	1:0.15	1:0.20	1:0.20	1:0.12
Frequency (kHz):	56	52	44	35	56
Treading (NPT):	2"		2.5"		2"
Weight (including cable):	2.2 lbs		3.3 lbs		2.2 lbs

Power: 17 - 30 VDC, 0.48 watts maximum, reverse polarity and transient protection

Output: 4-20 mA (standard) or 20-4 mA

Load: $R_{max} = (V_{supply} - 17) \times 50$

Accuracy: 0.25% of maximum span (Integral temperature compensation)

Default Output: 3.8/4/22 mA selectable (4 mA std.)

Setup: Single magnetic key for independent span and offset adjustment (provided)

Dual magnetic keys for response rate and default mA adjustment

Memory: non-volatile EEPROM

Operating Temp: -3° F to 167° F (104° F for Intrinsically Safe versions)

Mounting: By the sensor's cable or NPT threading on nose section

Response Rate: Immediate or 6, 17, 33 or 66 ft/min (adj).

17 ft/min is standard. Model F is immediate only (for flow measurement).

Tracking Speed: 12 ft/s approaching, 15 ft/s receding

Maximum Pressure: 14 PSI

Material:

Housing: UPVC
Transducer: Teflon® *
O-ring: Nitrile
Cable: PVC (15 ft)

Enclosure Rating: NEMA 6 submersible, IP68 (epoxy potted interior)

Display: 2 operating / diagnostic LEDs on-board and visible

Ratings: UL 508 and CE certified (std.), Intrinsically safe models are EEx i,a IIC T6

* The transducers of the Ultrix 100-10 and -15 have PVC sidewalls to enable greater ultrasonic impulse strength.