NETWORK TECHNOLOGIES INC
1275 Danner Dr Tel:330-562-7070
Aurora, OH 44202 Fax:330-562-1999
www.networktechinc.com

E-ULT

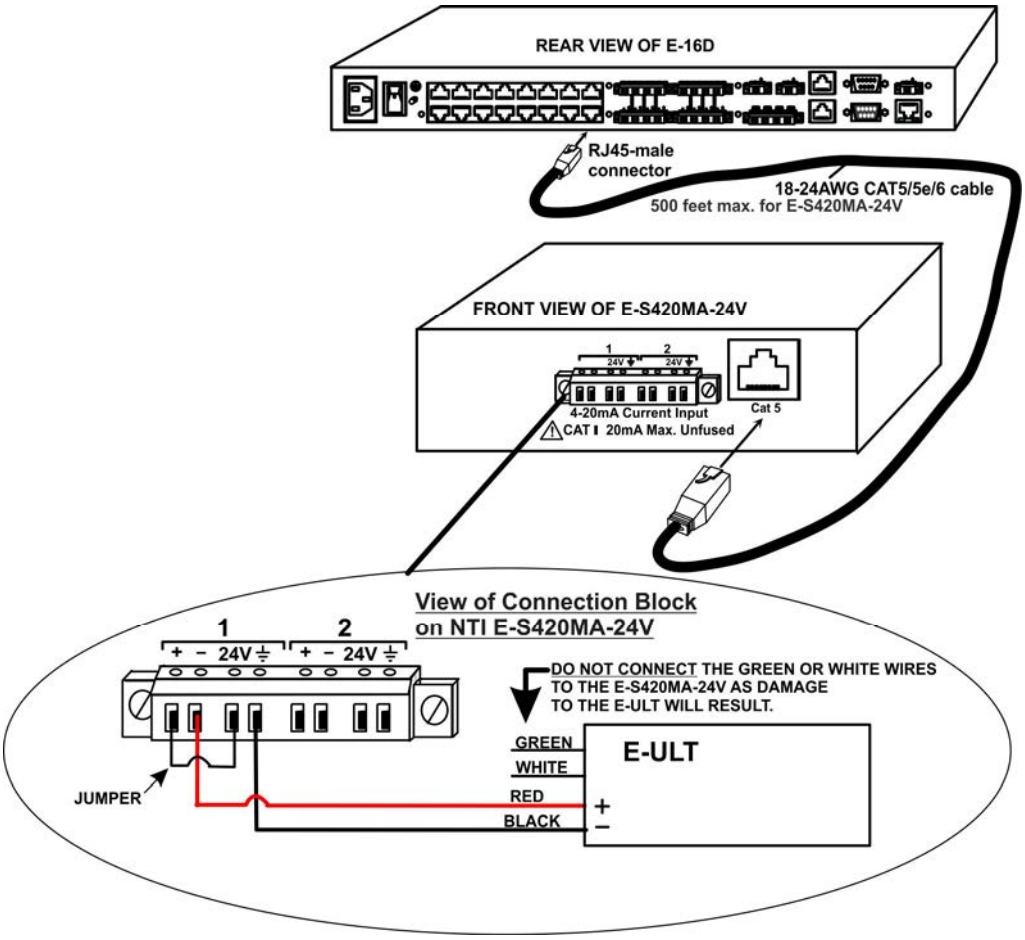
Ultrasonic Level Transmitter

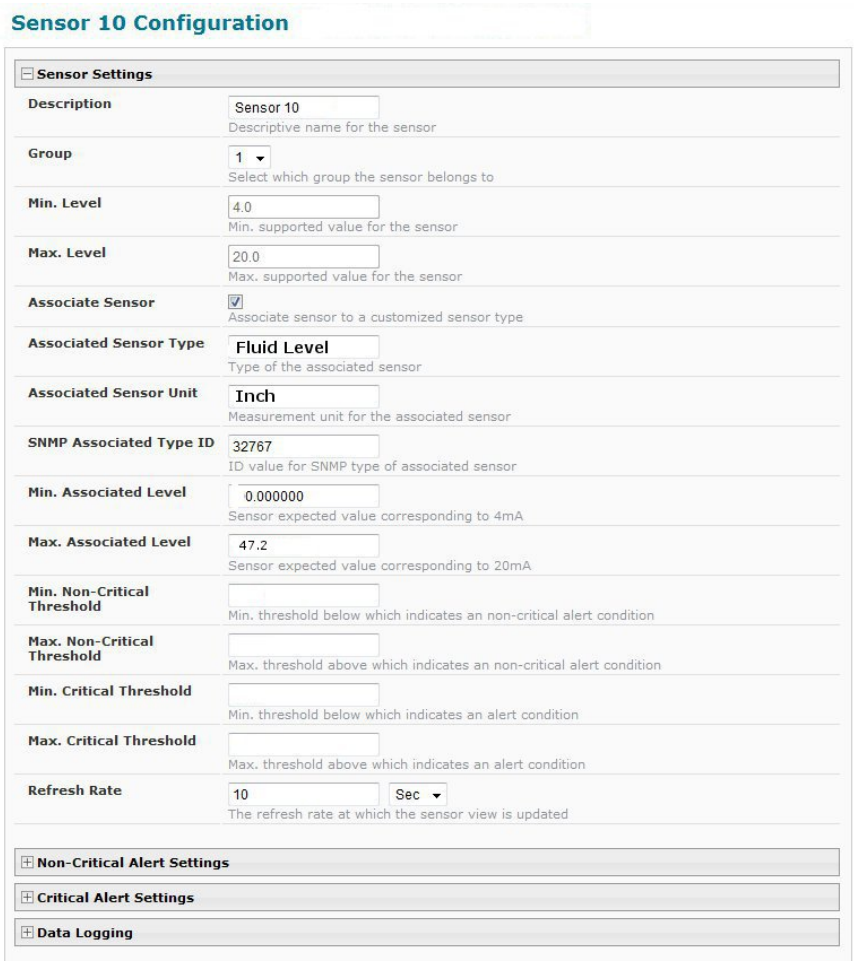
Guide for Installation with an ENVIROMUX Server Environment Monitoring System

E-ULT is a general purpose non-contact ultrasonic level switch, controller and transmitter for small tanks (49.2" (1.25 m) or smaller) or feed applications integrating process or control automation of small tanks mounted on tools, skids or machines. The rugged PVDF enclosure is well suited for a wide range of corrosive, waste or slurry type media. The E-ULT can be used for atmospheric day tank, process vessel or dispenser, pump lift station and waste sump applications to name a few. Level indication can be monitored via connection to an NTI Server Environment Monitoring System.

The E-ULT may be connected to the terminal block of an NTI E-S420MA-24V 4-20mA Sensor Converter. The E-S420MA-24V can then be connected to an RJ45 Sensor port on an E-2D, E-5D, or E-16D Server Environment Monitoring System (SYSTEM). Using a SYSTEM, the E-ULT can be monitored automatically and the SYSTEM can be configured to alert users of variations in levels sensed by the E-ULT.

Follow the wiring diagram below to connect the E-ULT to a 4-20MA Sensor Converter and then configure the SYSTEM to provide users with alert messages as defined in the sensor configuration within the SYSTEM. An example of that configuration can be found on page 2.





(Example of possible E-ULT sensor configuration in the E-16D)

Specifications

Range:	49.2" (1.25 m)
Accuracy:	0.125" (3 mm)
Resolution:	0.019" (0.5 mm)
Beam width:	2" (5 cm)
Dead band:	2" (5 cm)
Supply voltage:	24 VDC (loop)
Loop resistance:	400Ω max @ 24 VDC
Consumption:	0.5W
Signal output:	4-20 mA, two-wire reversible mA
Loop fail-safety:	4 mA, 20 mA, 21 mA, 22 mA, hold last
Configuration:	WebCal® USB 2.0
Temp. comp.:	Automatic over range
Process temp.:	F: -20° to 140° C: -7° to 60°
Ambient temp.:	F: -31° to 140° C: -35° to 60°
Pressure:	MWP = 30 PSI
Enclosure:	Type 6P encapsulated, corrosion resistant & submersible
Encl. material:	Polycarbonate
Strain relief mat.:	Santoprene
Trans. material:	PVDF
Cable length:	48" (1.2 m)
Cable jacket mat.:	Polyurethane
Process mount:	1" NPT *
Mount. gasket:	Viton®
Classification:	General purpose
Approvals:	CE, cFMus

*** For 1" G process mount, contact NTI product consultant.**

In the above example, we assume the tank used has the sensor mounted 49.2” from the bottom of the tank. With a 2” dead band, the maximum fluid level (“maximum associated level”) would be 47.2”. Therefore a 20mA output from the sensor would be equal to a full tank. An empty tank (“minimum associated level”) would be equal to a 4mA output.

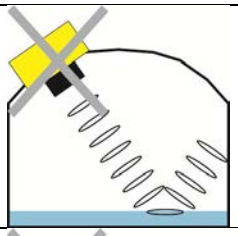
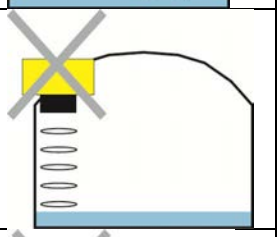
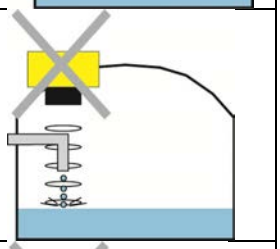
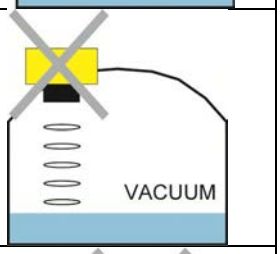
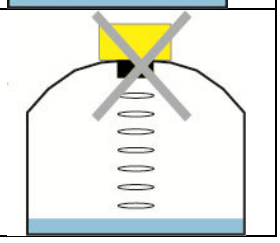
For instruction on configuring the E-ULT, refer to the manual packaged with the unit.

Installation

The E-ULT should always be mounted perpendicular to the liquid surface and installed using the provided Viton® mounting gasket. Make sure that the fitting and transmitter threads are not damaged or worn. Always **hand-tighten** the transmitter within the fitting. Perform an installed leak test under normal process conditions prior to system start up. **Note: The preferred mounting fitting for the E-ULT is a reducer bushing (2" thread x 1" thread).**

MOUNTING GUIDE

1. Do not mount at an angle.
2. Liquid should never enter the dead band.
3. Side Wall:
    a. Mount at least 2" from the side wall.
4. Do not mount where obstacles will intrude into sensor's beam width.
    a. Beam Width: 2" (5cm) diameter.
5. Do not mount in a vacuum
6. Avoid mounting in the center of a dome top tank.
7. In cone bottom tank, position the sensor over the deepest part of the tank.

Do not install at angle relative to the liquid.	
Do not install within 2" of tank sidewall.	
Do not install with objects in the beam.	
Do not install in applications with vacuum.	
Do not install in the center of a dome top tank.	

INSTALLATION IN EXISTING FITTINGS

If the existing fitting is larger than the threads of the E-ULT , select a reducer bushing to make a proper fit.

METAL TANKS

NTI ultrasonic transmitters have been optimized for use in non-metallic fittings.

1. For best performance, avoid the use of metallic fittings.
    a. Use a plastic 2" x 1" reducer bushing or a plastic 1" flange for metallic tanks.
2. While installations directly into a 1" metal fitting are not recommended, acceptable results may be obtained if the 1" fitting is a half coupling in form and the outer diameter of the coupling is tightly wrapped in vinyl tape to dampen vibration.

Installation

FITTING SELECTION

Check the part number to determine the required fitting mount size and thread type. E-ULT is commonly installed in tank adapters, flanges, brackets or standpipes. **Note:** Always include the gasket when installing the E-ULT .

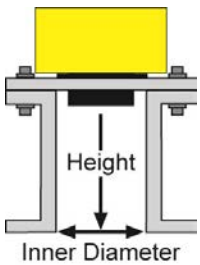
1. **Tank Adapter:** Select a tank adapter fitting.

    a. For best results, select a 2” tank adapter and add a thread x thread reducer bushing.

    b. Avoid tank adapter (thread x thread) styles and/or pipe stops forward of the installed transducer.
    c. Always mount the tank adapter so the majority of the fitting is outside the tank.
        i. **Note:** Never mount the tank adapter upside down or where the bulk of the material is inside the tank.

2” Tank Adapter Socket x Thread	**Tank Adapter w/ 2”x1” Reducer Bushing**	**Tank Adapter Thread x Thread**
		
		Do not use thread x thread

2. **Riser:** Installations with tall, narrow risers can impede the acoustic signal.
    a. **Core Out Concrete:** Applications where a concrete tank ceiling has been cored out can also be considered as a riser type application. In these applications follow a 2:1 ratio (Core Height to Inner Diameter) for the diameter of the core.
    b. **E-ULT:**



Riser Specifications	
Inner Diameter	**Maximum Height**
2” (5cm)	4” (10cm)
4” (10cm)	8” (20cm)
6” (15cm)	12” (30cm)

Note: Do not exceed the dimensions listed above.

Note: If attempting to raise the sensor above the top of the tank to allow for a higher fill capacity, avoid the use of tall and narrow risers. The example to the left exceeds the dimensions listed in the **Riser Specifications** chart. Use a larger tank adapter which takes into account the **Riser Specifications**.

Installation

3. **Flange :** If installing on a flange, select a flange with a thread that is above the plane of the flange.

   a. Avoid the use of blind flanges with tapped threads or flanges where the threads are even with
   b. the plane of the flange, such as the Banjo 1" Poly ANSI Flange (series AF100).

   c. Use a flange with a 2” thread and add a 2” to 1” reducer bushing to complete the installation.

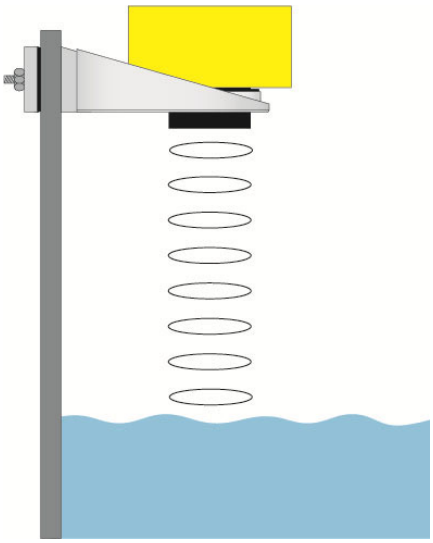
2” Flange w/ thread out of plane

1” Flange w/ thread in plane

Do not use thread in plane

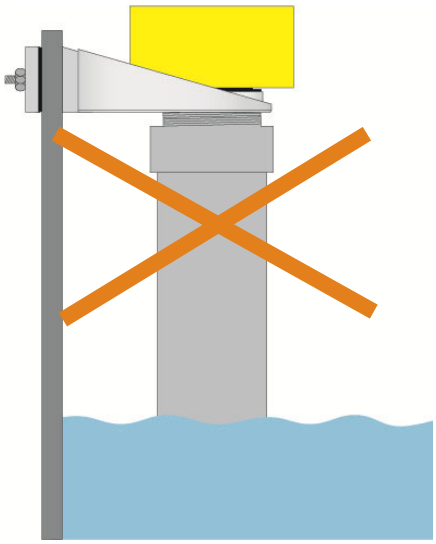
2” Flange w/ Reducer Bushing

4. **Side Mount Bracket:** For installations in open tanks and sumps, use the optional side mount bracket. (Contact your NTI product consultant for more information)



Bracket only

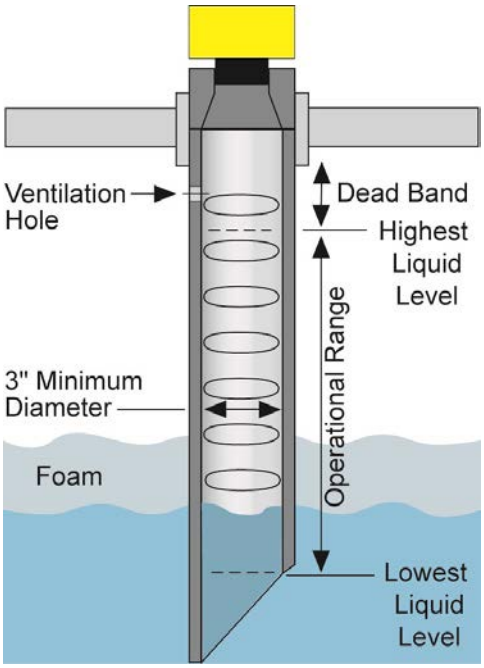
Bracket w/ reducer

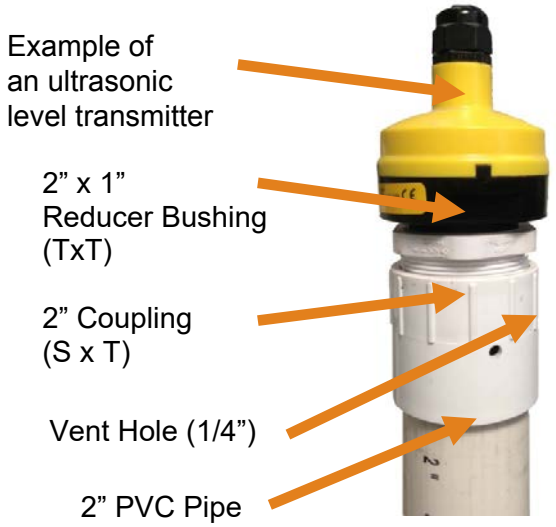


Note: The Side Mount Bracket **is not designed** for use with stand pipes or as a method to secure stand pipes. There are too few threads to properly hold the sensor and the stand pipe.

5. **Stand Pipe:** A standpipe maybe used to dampen turbulence or separate surface foam from the point of measurement in the application.

   a. Pipe can be made of any material.
   b. Select a 3” ID pipe for the stand pipe.
      i. A 2” pipe (minimum pipe size) is usable.
      ii. Pipe series larger than 3” can also be used.
   c. Use a coupling and reducer bushing to attach the E-ULT to the pipe.
      i. Use a plastic reducing bushing (I.e. 2”T x 1”T) fitting.
   d. The pipe length should run the measurement span and the bottom of the pipe should remain submerged at all times to prevent foam from entering the pipe.
   e. Cut a 45°notch at the bottom of the pipe and drill a 1/4”pressure equalization hole within the dead band of the sensor.
   f. The pumps should not drive liquid past the open end of the stand pipe which causes the liquid in the pipe to oscillate.





Transmitter attached to a (2”x1” reducer bushing) and 2” Coupling (S x T).

Avoid the use of a tee within the stand pipe. A tee can create false signals that will negatively effect the sensor’s performance.

WARRANTY INFORMATION

The warranty period on this product (parts and labor) is two (2) years from the date of purchase. Please contact Network Technologies Inc at **(800) 742-8324** (800-RGB-TECH) or **(330) 562-7070** or visit our website at http://www.networktechinc.com for information regarding repairs and/or returns. A return authorization number is required for all repairs/returns.

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