

## Technical Support

Tel: 562.598.3015  
8:00 am and 5:00 pm PST Mon-Fri

[www.flowline.com/echopod](http://www.flowline.com/echopod) and select "Support"

Please make sure you have the Part & Serial number available

# FLOWLINE

**We Do Your Level Best!**

## Warranty

To register your product with Flowline, go to [www.flowline.com](http://www.flowline.com). On-line warranty registration can be found under contact Flowline on the navigation bar along the side of the home page.

Flowline warrants to the original purchaser of its products that such products will be free from defects in material and workmanship under normal use and service for a period which is equal to the shorter of one year from the date of purchase of such products or two years from the date of manufacture of such products.

This warranty covers only those components of the products which are non-moving and not subject to normal wear. Moreover, products which are modified or altered, and electrical cables which are cut to length during installation are not covered by this warranty.

Flowline's obligation under this warranty is solely and exclusively limited to the repair or replacement, at Flowline's option, of the products (or components thereof) which FLOWLINE SHALL HAVE NO OBLIGATION FOR CONSEQUENTIAL DAMAGES TO PERSONAL OR REAL PROPERTY, OR FOR INJURY TO ANY PERSON.

This warranty does not apply to products which have been subject to electrical or chemical damage due to improper use, accident, negligence, abuse, or misuse. Abuse shall be assumed then indicated by electrical damage to relays, reed switches or other components. The warranty does not apply to products which are damaged during shipment back to Flowline's factory or designated service center or are returned without the original casing on the products. Moreover, this warranty becomes immediately null and void if anyone other than service personnel authorized by Flowline attempts to repair the defective products.

Products which are thought to be defective must be shipped prepaid and insured to Flowline's factory or designated service center (the identity and address of which will be provided upon request) within 30 days of the discovery of the defect. Such defective products must be accompanied by proof of the date of purchase.

Flowline further reserves the right to unilaterally waive this warranty and to dispose of any product returned to Flowline where:

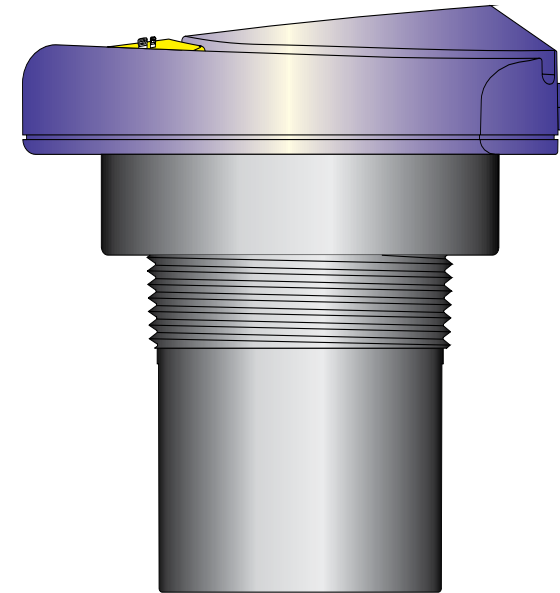
- a. There is evidence of a potentially hazardous material present with product
- b. The product has remained unclaimed at Flowline for longer than 30 days after dutifully requesting disposition of the product.

THERE ARE NO WARRANTIES WHICH EXTEND BEYOND THE DESCRIPTION ON THE FACE OF THIS WARRANTY. This warranty and the obligations and liabilities of Flowline under it are exclusive and instead of, and the original purchaser hereby waives all other remedies, warranties, guarantees or liabilities, express or implied. EXCLUDED FROM THIS WARRANTY IS THE IMPLIED WARRANTY OF FITNESS OF THE PRODUCTS FOR A PARTICULAR PURPOSE OR USE AND THE IMPLIED WARRANTY OF MERCHANT ABILITY OF THE PRODUCTS.

This warranty may not be extended, altered or varied except by a written instrument signed by a duly-authorized officer of Flowline, Inc.

Flowline and the Flowline logo are trademarks of Flowline Inc. All other trademarks or registered trademarks of their respective companies.

U.S. Patent #: 7,098,669



Model: LU2X-(XX)

## EchoSonic® II

Manual

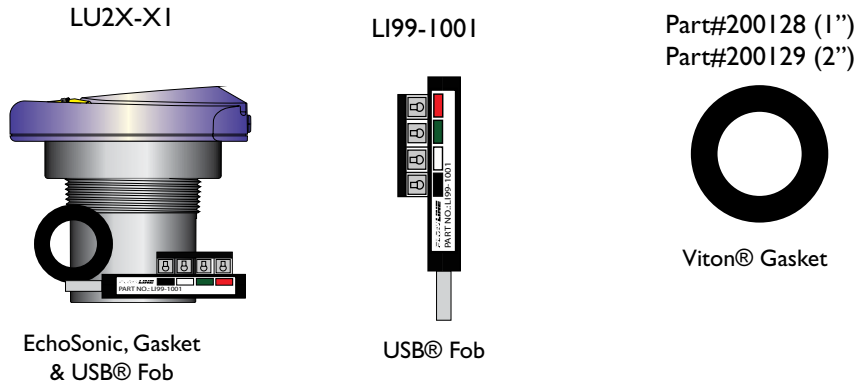
MN300610 REV: A  
© 2008 Flowline, Inc.  
All Rights Reserved  
Made In USA

## We Do Your Level Best!

Thank you for purchasing Flowline's new innovative tank level solution. EchoSonic II LU2X series are general purpose sensors that provides non-contact ultrasonic level measurement for tanks 32.8' (10 m) or less. Flowline would like to thank you for your business and continue to do your level best!

## Components

EchoSonic II is offered in three different measuring lengths. Depending on the model purchased, you may or may not have been shipped all the components shown below. You do however, need an EchoSonic II, USB® Fob and Viton® gasket to configure, install and operate EchoSonic.



## Configuration

EchoSonic II is configured through WebCal, a PC software program. WebCal is a free download from Flowline's website. You must download and install WebCal prior to plugging in the USB® Fob. Please go to <http://www.flowline.com/webcal> and select download.

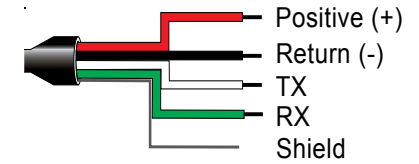
## WebCal System Requirements

Windows® XP or 2000  
10 mB hard drive space  
256 mB RAM  
1 USB® 2.0 port  
Internet connection

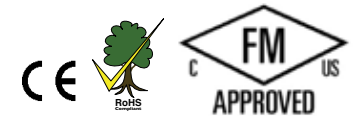
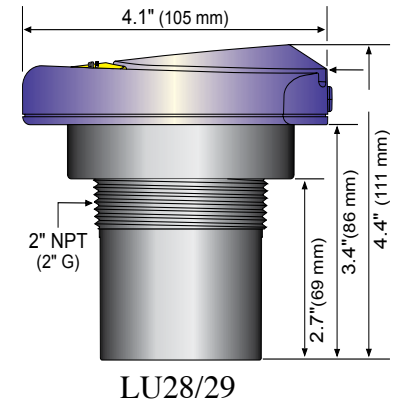
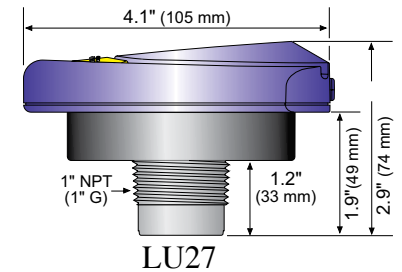
## Specifications

<b>Range:</b>	LU27: 4" to 8.2' (10 cm to 2.5 m) LU28: 8" to 24.6' (20 cm to 7.5 m) LU29: 8" to 32.8' (20 cm to 10 m)
<b>Accuracy:</b>	± 0.2% Range
<b>Resolution:</b>	LU27: 0.019" (0.5 mm) LU28/29: 0.079" (2 mm)
<b>Beam width:</b>	LU27: 2" (5 cm) dia. LU28/29: 3" (7.6 cm) dia.
<b>Dead band:</b>	LU27: 4" (10 cm) LU28/29: 8" (20 cm)
<b>Memory:</b>	Non-volatile
<b>Supply voltage:</b>	24 VDC
<b>Consumption:</b>	0.5W
<b>Loop resist.:</b>	500Ω Ohms @ 24 VDC
<b>Signal output:</b>	4-20 mA, two-wire
<b>Signal invert:</b>	4-20 mA or 20-4 mA
<b>Configuration:</b>	WebCal® PC Windows® USB 2.0
<b>Fail-safety:</b>	4 mA, 20 mA, 21 mA, 22 mA or hold last
<b>Process temp.:</b>	F: -4° to 140° C: -20° to 60°
<b>Temp. comp.:</b>	Automatic
<b>Ambient temp.:</b>	F: -31° to 140° C: -35° to 60°
<b>Pressure:</b>	MWP = 30 PSI
<b>Enclosure rating:</b>	Type 6P encapsulated, corrosion resistant & submersible
<b>Encl. material:</b>	Polycarbonate
<b>Trans. material:</b>	PVDF
<b>Cable jacket mat.:</b>	Polyurethane
<b>Cable type:</b>	4-cond., shielded
<b>Cable length:</b>	10' (3m)
<b>Process mount:</b>	LU27: 1" NPT (1" G) LU28/29: 2" NPT (2" G)
<b>Mount. gasket:</b>	Viton®
<b>Classification:</b>	General purpose
<b>Compliance:</b>	RoHS
<b>Approvals:</b>	CE, cFMus

## Wiring



## Dimensions



## Safety

1. Installation should be done by properly trained staff
2. Supply voltage should never exceed a maximum of 28 VDC
3. Make sure the sensor is chemically compatible with your application
4. Design a fail-safe system that accommodates the possibility of sensor and/or power failure.
5. This sensor should not be used in classified hazardous environments

## Wiring EchoSonic

After you have finished positioning and mounting EchoSonic II, follow WebCal's wiring diagram to then wire EchoSonic II. Flowline recommends using a licensed electrician to wire all of the application components.

*Note: Do not extend the white & green wires beyond 15'.*

## Mounting Guide

1. Do not mount at an angle
2. Liquid should never enter the dead band
3. Mount at least 3" from the side wall
4. Do not mount where obstacles will intrude on 3" beam width
5. Do not mount in a vacuum
6. Never screw directly into tank, always use a *non-metallic* fitting
7. Always use a tank adapter with the minimal height possible

**Tank Adapter:** Select a tank adapter with minimum height to ensure that EchoSonic's transducer will not be substantially elevated inside the fitting. For LU27 sensors, Flowline recommends using a Spears 2" x 1", thread by thread, reducer bushing (LM52-1001).

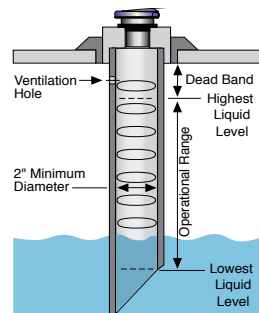
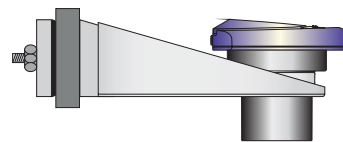
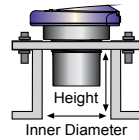
**Riser:** Use the riser specifications guide and match your riser's inner diameter with the height.

**Flange:** Select a flange with a thread that is above the plane of the flange. If your installation requires the use of a blind flange, tap a 2" thread. For LU27 sensors use a thread by thread reducer bushing (see tank adapter).

**Side Mount Bracket:** Use Flowline's LM50-1001 side mount bracket. The LM50-1001-1 includes a 2" x 1" reducer bushing for LU27 sensors.

**Stand Pipe:** Use a stand pipe when surface foam or turbulence are present. Use a 3" diameter pipe with a length that runs the distance of the span. Cut a 45° notch at the bottom and a 1/4" hole within 2" from bottom of the transducer face.

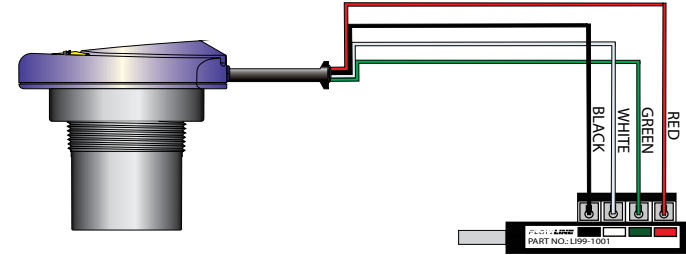
Riser Specifications	
Inner Dia.	Max. Height
2" (5 cm)	4" (10 cm)
3" (7.6 cm)	6" (15 cm)
4" (10 cm)	8" (20 cm)
6" (15 cm)	12" (30 cm)



## USB® Fob Interface

EchoSonic II communicates with WebCal through a USB® interface called a Fob. Before plugging your Fob into your computer's USB® port, be sure that you have installed WebCal on your computer.

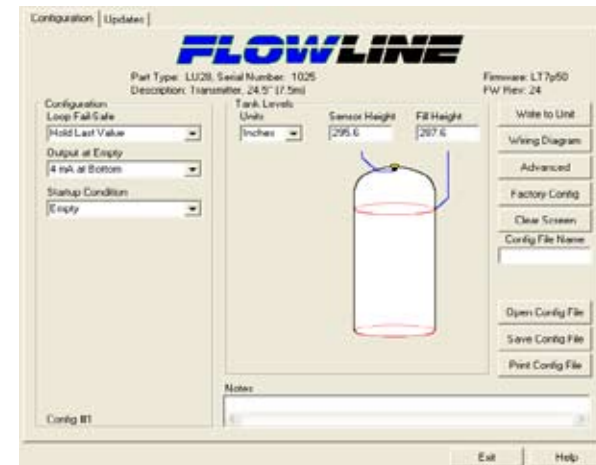
Connect the red, green, white and black wires from EchoSonic II into the correct terminals on the Fob. Tighten the screws on the terminals and plug your Fob into the USB® port of your computer.



\* Once EchoSonic II is configured, isolate the white and green wires from active power to prevent a short of the configuration circuit

## WebCal

With EchoSonic II connected to your computer, open the WebCal software. Follow steps 1-3 (pg. 4-5) to configure EchoSonic II. Click "Help" in the lower right hand corner and open the help menu of WebCal for additional instructions on WebCal. If you need additional assistance using WebCal, please contact a Flowline Applications engineer at (562) 598-3015.



## WebCal Step 1: Configuration

Configuration

Loop Fail-Safe

Output at Empty

Startup Condition

Config #1

This section of WebCal is where you select the application's configuration settings. Start from the top and work to the bottom, choosing the selections that are applicable to your configuration. "Not Applicable" will automatically show when a selection doesn't apply to your configuration settings, and you may move on. All configuration settings must be selected or have "Not Applicable" before you can continue to step 2.

Right click on any menu that you may have questions on to open the help menu.

## WebCal Step 2: Tank Levels

This section of WebCal is where you enter application measurement values. All values must be filled in before moving to step 3.

Tank Levels

Units

Sensor Height

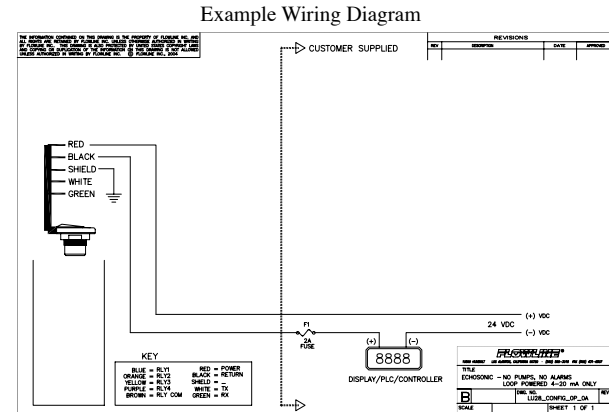
Fill Height

**Sensor Height:** Distance from the bottom of the tank to the bottom of the transducer.

**Fill Height:** Distance from the bottom of the tank to the maximum liquid height.

## WebCal Step 3: Write to Unit

After you have entered configurations and tank values, click "Write to Unit" and send the configuration to your EchoSonic II. Now use WebCal's file management features to save your configuration by clicking "Save Config File" and print your wiring diagram by clicking "Wiring Diagram."



## Position and Mount

Positioning and mounting EchoSonic II is critical to the sensor performing correctly. EchoSonic II should always be mounted perpendicular to the liquid in the tank, clear of any obstructions in the beam path. Not doing so will result in poor performance. Refer to Flowline's mounting guide on pg. 6 for further instruction, or [www.flowline.com](http://www.flowline.com).

