



# EchoPod/EchoTouch® Reflective Technology™ Ultrasonic Liquid Level Sensors



## Overview

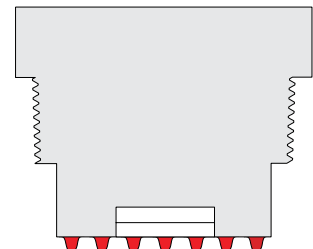
The innovative EchoPod/EchoTouch Reflective Technology ultrasonic liquid level sensors replace other ultrasonic level sensors in condensation applications, as well as float, conductance and pressure sensors that fail due to contact with dirty, sticky and scaling media in small, medium and large capacity tanks. Applied in chemical, water and wastewater applications, these general purpose or intrinsically safe non-contact sensors are available with single and multi-function capabilities, including continuous level measurement, switching and control. The standard 4-20 mA output is easily monitored by a PLC or other controller. Models with four relays can be configured for level alarms and/or stand-alone level control such as automatic fill or empty functions using the embedded level controller. PC configuration of all models is simple with **WEBCAL™** software, while the UG06, UG12 and US06 models also offer limited configuration via their pushbuttons and integral display.

## What is Reflective Technology™?

Condensation is the most commonly encountered variable in liquid level applications. Condensation attenuates the acoustic signal of ultrasonic sensors that have a flat horizontal transducer face, weakening their signal strength and signal-to-noise ratio by up to 50%, and substantially reducing their measurement reliability. At the core of Reflective Technology™ is a simple fact: unlike flat horizontal surfaces, significant water droplets cannot adhere to smooth vertical surfaces. By orienting the internal ultrasonic transducer vertically, condensation runs off the transducer face and does not affect sensor performance. The unimpeded transmit and receive signals are redirected to and from the liquid off a 45° reflector, delivering reliable level measurement. Thanks gravity!

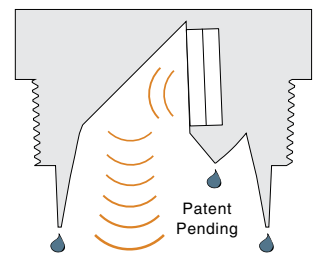
## Reflective Technology

Horizontal Transducer



Signal Attenuation

Reflective Transducer



Reliable Measurement

## WebCal Software

**WEBCAL** PC software is a utility program that enables users to easily configure their EchoSonic II, EchoTouch and EchoPod level transmitters, switches, and controllers. Download your free copy of WebCal at [www.AutomationDirect.com](http://www.AutomationDirect.com), and connect your sensor through our Fob USB adapter (LI99-2001). Develop your configuration using pre-programmed function menus as the tank graphic and set point fields automatically change to match your configuration. Then, input your level set point values and click the Write to Unit button. Your configuration will be downloaded into the sensor and verified in less than a second. Last, click the Wiring Diagram button to open a wiring schematic of your configuration in PDF format. Print the document, disconnect the sensor and wire it per the schematic. As new software or firmware becomes available, it can be downloaded and updated through WebCal.



**WEBCAL**



**LI99-2001**



# EchoPod/EchoTouch<sup>®</sup> Reflective Technology<sup>™</sup> Ultrasonic Liquid Level Sensors

| EchoPod/EchoTouch Reflective Technology Ultrasonic Liquid Level Sensors General Specifications |                                                                                                             |                                     |                                                                                                                                 |                                        |                                                                                                             |                                     |                                                                                                                                 |
|------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|----------------------------------------|-------------------------------------------------------------------------------------------------------------|-------------------------------------|---------------------------------------------------------------------------------------------------------------------------------|
| Model                                                                                          | <a href="#"><u>UG01-0001-40</u></a>                                                                         | <a href="#"><u>UG03-0001-40</u></a> | <a href="#"><u>UG06-0001-00</u></a>                                                                                             | <a href="#"><u>UG12-0001-00</u></a>    | <a href="#"><u>US01-0001-00</u></a>                                                                         | <a href="#"><u>US03-0001-00</u></a> | <a href="#"><u>US06-0001-00</u></a>                                                                                             |
| Price                                                                                          | \$525.00                                                                                                    | \$600.00                            | \$800.00                                                                                                                        | \$1,050.00                             | \$645.00                                                                                                    | \$715.00                            | \$1,000.00                                                                                                                      |
| Type                                                                                           | EchoPod/EchoTouch Reflective Technology (works in condensing environments)                                  |                                     |                                                                                                                                 |                                        |                                                                                                             |                                     |                                                                                                                                 |
| Classification                                                                                 | General purpose (non-hazardous)                                                                             |                                     |                                                                                                                                 |                                        | Intrinsically safe                                                                                          |                                     |                                                                                                                                 |
| Media                                                                                          | Liquids                                                                                                     |                                     |                                                                                                                                 |                                        |                                                                                                             |                                     |                                                                                                                                 |
| Range                                                                                          | 1.5 in to 4.9 ft<br>(3.8 cm to 1.5 m)                                                                       | 4in to 9.8 ft<br>(10.1 cm to 3m)    | 8in to 19.6 ft<br>(20cm to 6m)                                                                                                  | 18in to 39.3 ft<br>(45.7 cm to 12m)    | 1.5 in to 4.9 ft<br>(3.8 cm to 1.5 m)                                                                       | 4in to 9.8 ft<br>(10.1 cm to 3m)    | 8in to 19.6 ft<br>(20cm to 6m)                                                                                                  |
| Output                                                                                         | 4-20 mA and (4) SPST relays                                                                                 |                                     | 4-20 mA (No Relays)                                                                                                             |                                        |                                                                                                             |                                     |                                                                                                                                 |
| Mounting                                                                                       | Vertical, top of tank, 2in NPT male                                                                         |                                     |                                                                                                                                 | Vertical, top of tank,<br>3in NPT male | Vertical, top of tank, 2in NPT male                                                                         |                                     |                                                                                                                                 |
| Electrical Termination                                                                         | Integral 48in, 9-conductor, shielded cable                                                                  |                                     | Screwless terminals, 1/2in female NPT                                                                                           |                                        | Integral 48in, 4-conductor, shielded cable                                                                  |                                     | Screwless terminals, 1/2in female NPT                                                                                           |
| Configuration                                                                                  | <a href="#"><u>WEBCAL</u></a> Software (free download) and LI99-2001 Fob USB Adapter (purchased separately) |                                     | <a href="#"><u>WEBCAL</u></a> Software (free download) and LI99-2001 Fob USB Adapter (purchased separately) or Pushbutton / LCD |                                        | <a href="#"><u>WEBCAL</u></a> Software (free download) and LI99-2001 Fob USB Adapter (purchased separately) |                                     | <a href="#"><u>WEBCAL</u></a> Software (free download) and LI99-2001 Fob USB Adapter (purchased separately) or Pushbutton / LCD |
| Ambient Temperature                                                                            | -31° to 140°F (-35° to 60°C)                                                                                |                                     |                                                                                                                                 |                                        |                                                                                                             |                                     | -40° to 176°F (-40° to 80°C)                                                                                                    |
| Process Temperature                                                                            | -40° to 176°F (-40° to 80°C)                                                                                |                                     |                                                                                                                                 |                                        |                                                                                                             |                                     |                                                                                                                                 |
| Pressure                                                                                       | 30 PSI (2 bar) max.                                                                                         |                                     |                                                                                                                                 |                                        |                                                                                                             |                                     |                                                                                                                                 |

Part No. **US06-0001-00** Shown

# EchoTouch® US06 Series

## Ultrasonic Liquid Level Sensors

### Overview

The EchoTouch US06 intrinsically safe reflective ultrasonic level transmitters provide continuous level measurement up to 19.6' (6m) with a 4-20 mA analog signal output, and are configured via [WEBCAL](#) software with limited configuration also available via the integral pushbutton display module. The non-contact liquid level sensor features Flowline's proprietary Reflective Technology™ that delivers reliable level measurement in condensing environments. Select this sensor for intrinsically safe environments and bulk tanks with non-foaming and mildly vaporous media such as chemicals, water, wastewater and oil. Typical applications include bulk storage, neutralization tank, clarifier and waste sumps.

### Features

- Intrinsically safe approvals for hazardous locations
- 6m (19.6') measurement range
- Reflective Technology™ measures reliably with condensation
- Corrosion resistant PVDF transducer with aluminum IP66 enclosure
- Fail-safe diagnostics with selectable signal fail-safe outputs
- LCD display indicates level in inches, feet, or meters
- Narrow 3" (7.6cm) beam width for applications with limited space
- Configuration via [WEBCAL](#) software with limited configuration via the integral pushbutton and display
- Short 8" (20.3 cm) dead band maximizes tank filling capacity
- Type 4X (IP66) compact enclosure for small tank applications
- Automatic temperature compensation from -40° to 176°F (-40° to 80°C)
- 2-year warranty

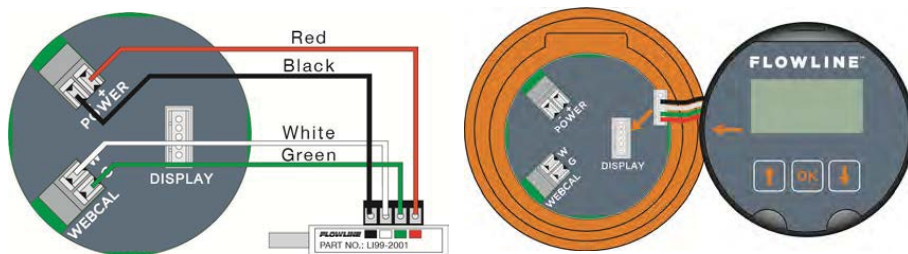
### Agency Approvals

- CSA, CE



### Configuration

The settings for the US06 are configured with free [WEBCAL](#) software (downloadable from AutomationDirect Web site), and an [LI99-2001](#) Fob USB adapter (purchased separately).



**Note:** Remove the display from the housing and disconnect the cable from the connector before wiring the Fob.

**LI99-2001**

See the end of the Ultrasonic Level Sensor Section for further details and Accessories

| US06 Technical Specifications |                                                                                                                                                                                         |
|-------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Model</b>                  | <b>US06-0001-00</b>                                                                                                                                                                     |
| <b>Price</b>                  | \$1,000.00                                                                                                                                                                              |
| <b>Weight (lbs)</b>           | 1.9                                                                                                                                                                                     |
| <b>Range</b>                  | 8in to 19.6 ft<br>(20cm to 6m)                                                                                                                                                          |
| <b>Accuracy</b>               | ±0.2% of range                                                                                                                                                                          |
| <b>Resolution</b>             | 0.079 in (2mm)                                                                                                                                                                          |
| <b>Sensing Dead Band*</b>     | 8in (20.3 cm)                                                                                                                                                                           |
| <b>Beam Width</b>             | 3in (7.6 cm)                                                                                                                                                                            |
| <b>Configuration</b>          | Pushbutton or <a href="#">WEBCAL</a> ® PC Windows® USB® 2.0                                                                                                                             |
| <b>Memory</b>                 | Non-volatile                                                                                                                                                                            |
| <b>Display Type</b>           | LCD, 6-digit                                                                                                                                                                            |
| <b>Display Units</b>          | Inch, cm or percent                                                                                                                                                                     |
| <b>Supply Voltage</b>         | 14-28 VDC                                                                                                                                                                               |
| <b>Loop Resistance</b>        | 500Ω @ 24VDC                                                                                                                                                                            |
| <b>Signal Output</b>          | 4-20 mA, two-wire                                                                                                                                                                       |
| <b>Signal Invert</b>          | 4-20 mA or 20-4 mA                                                                                                                                                                      |
| <b>Signal Fail-Safe</b>       | 4mA, 20mA, 21mA, 22mA, hold last                                                                                                                                                        |
| <b>Process Temperature</b>    | -40° to 176°F (-40° to 80°C)                                                                                                                                                            |
| <b>Temp. Compensation</b>     | Automatic                                                                                                                                                                               |
| <b>Ambient Temperature</b>    | -40° to 176°F (-40° to 80°C)                                                                                                                                                            |
| <b>Pressure</b>               | 30 PSI (2 bar)                                                                                                                                                                          |
| <b>Enclosure Rating</b>       | Type 4X (IP66)                                                                                                                                                                          |
| <b>Enclosure Material</b>     | Aluminum                                                                                                                                                                                |
| <b>Enclosure Vent</b>         | Water tight membrane                                                                                                                                                                    |
| <b>Transducer Type</b>        | Reflective                                                                                                                                                                              |
| <b>Transducer Material</b>    | Polyvinylidene Fluoride (PVDF)                                                                                                                                                          |
| <b>Conduit Entrance</b>       | 1/2in NPT                                                                                                                                                                               |
| <b>Process Mount</b>          | 2in Male NPT                                                                                                                                                                            |
| <b>Classification</b>         | Intrinsically safe                                                                                                                                                                      |
| <b>Approvals (for USA)</b>    | CSA: Class I, Div 1, Groups A,B, C & D T4;<br>Class II, Div 1 Groups E, F & G T4;<br>Class III T135C;<br>Class I, Zone 0, IIC AEx ia T4 Ga;<br>Class II, Zone 20, IIC AEx ia, T135C, Da |
| <b>Approvals (for Canada)</b> | CSA: Class I, Div 1, Groups A,B, C & D T4;<br>Class II, Div 1 Groups E, F & G T4;<br>Class III T135C                                                                                    |
| <b>Approvals (for IECEx)</b>  | Ex ia IIC T4 Ga; Ex ia IIC, T135C Da;<br>Tamb: -40 to 80C                                                                                                                               |
| <b>Compliance</b>             | CE                                                                                                                                                                                      |

\* Dead band is the minimum distance the sensor must be mounted above the max liquid level.



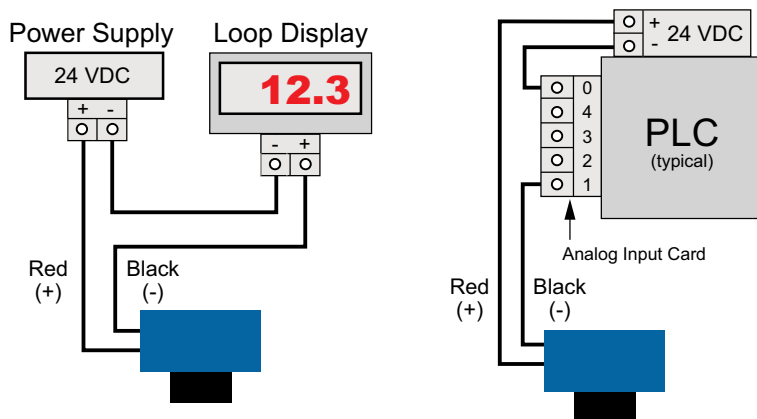
**FLOWLINE™**  
LEVEL BEST

# EchoTouch® US06 Series

## Ultrasonic Liquid Level Sensors

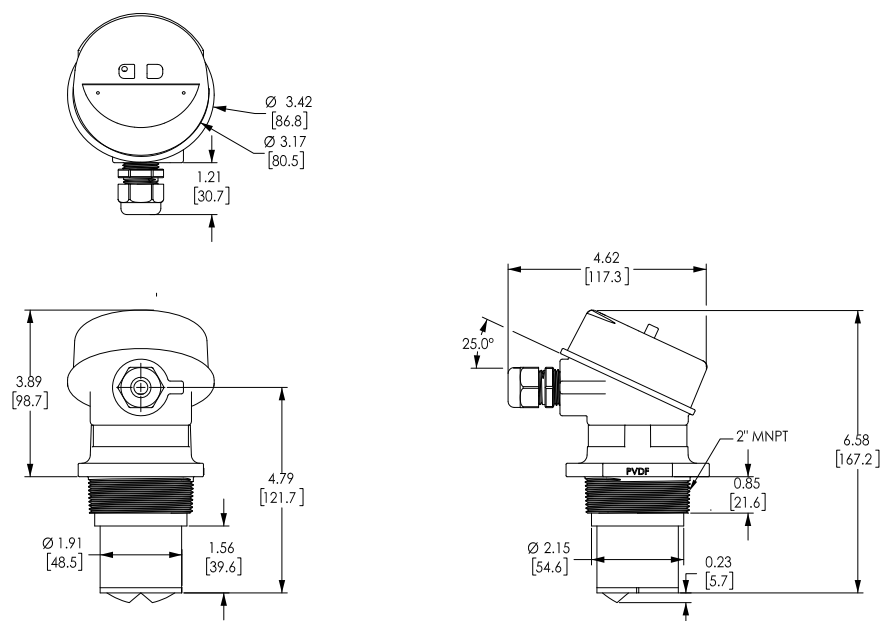
### Wiring

Common wiring to display, controllers and PLC examples



### Dimensions

inches [mm]



Part No. US06-0001-00



# Ultrasonic Liquid Level Sensor Accessories

| Ultrasonic Liquid Level Sensor Accessories |            |                                                                                                                                                                                                                                                                                                                                                                                                                  |          |        |          |
|--------------------------------------------|------------|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------|----------|
| Part No.                                   | Item Photo | Description                                                                                                                                                                                                                                                                                                                                                                                                      | Quantity | Weight | Price    |
| <a href="#"><u>LI40-1001</u></a>           |            | Flowline PodView general purpose digital indicator, displays tank level or volume and sensor relay status, 6-digit LCD display with four relay status indicators, 3-button user interface, polycarbonate panel mount enclosure with NEMA 4 (IP65) faceplate, 6-foot (1.8-meter) 22AWG 4-conductor cable, for use with Flowline EchoPod DL, DS and DX series ultrasonic level sensor with firmware V50.0 or later | 1        | 0.6    | \$275.00 |
| <a href="#"><u>LM50-1001</u></a>           |            | Flowline side mount bracket, 2 inch NPT female threads, polypropylene (PP), for use with Flowline DL34, LU23, LU28, LU29, LU74, LU78, LU81, LU83, LU84, UG01, UG03, UG06, US01, US03 and US06 series ultrasonic level sensors                                                                                                                                                                                    | 1        | 0.4    | \$48.00  |
| <a href="#"><u>LM50-1001-1</u></a>         |            | Flowline side mount bracket, 2 inch NPT female threads, polypropylene (PP), and 2 inch NPT male x 1 inch NPT female reducer bushing (PVC), for use with Flowline DL14, DL24, DS14, DL10, DX10, LU27, LU77 and LU80 series ultrasonic level sensors                                                                                                                                                               | 1        | 0.6    | \$64.00  |
| <a href="#"><u>LM52-1400</u></a>           |            | Flowline reducer bushing, 2 inch NPT male x 1 inch NPT female threads, PVC, for use with Flowline DL14, DL24, DS14, DL10, DX10, LU27, LU77 and LU80 series ultrasonic level sensors                                                                                                                                                                                                                              | 1        | 0.2    | \$18.00  |
| <a href="#"><u>LM52-2400</u></a>           |            | Flowline reducer bushing, 3 inch NPT male x 2 inch NPT female threads, PVC, for use with Flowline DL34, LU23, LU28, LU29, LU74, LU78, LU81, LU83, LU84, UG01, UG03, UG06, US01, US03 and US06 series ultrasonic level sensors                                                                                                                                                                                    | 1        | 0.6    | \$46.00  |
| <a href="#"><u>LM52-3800</u></a>           |            | Flowline reducer bushing, PVC, 4in male NPT to 2in female NPT. For use with Flowline DL34, LU23, LU28, LU29, LU74, LU78, LU81, LU83, LU84, UG01, UG03, UG06, US01, US03 and US06 series ultrasonic level sensors                                                                                                                                                                                                 | 1        | 2.0    | \$156.00 |
| <a href="#"><u>LM52-1890</u></a>           |            | Flowline low-profile bulkhead fitting, 1 inch NPT female x slip socket, with mounting nut, PVC, for use with Flowline DL14, DL24, DS14, DL10, DX10, LU27, LU77 and LU80 series ultrasonic level sensors                                                                                                                                                                                                          | 1        | 0.5    | \$60.00  |
| <a href="#"><u>LM52-2890</u></a>           |            | Flowline low-profile bulkhead fitting, 2 inch NPT female x slip socket, with mounting nut, PVC, for use with Flowline DL34, LU23, LU28, LU29, LU74, LU78, LU81, LU83, LU84, UG01, UG03, UG06, US01, US03 and US06 series ultrasonic level sensors                                                                                                                                                                | 1        | 1.2    | \$114.00 |
| <a href="#"><u>LM52-3890</u></a>           |            | Flowline low-profile bulkhead fitting, PVC, 3in female NPT to slip socket. For use with Flowline UG12 series ultrasonic level sensors. Mounting hardware included.                                                                                                                                                                                                                                               | 1        | 2.1    | \$194.00 |
| <a href="#"><u>LM52-1850</u></a>           |            | Flowline mounting flange, 1 inch NPT female threads, CPVC, for use with Flowline DL14, DL24, DS14, DL10, DX10, LU27, LU77 and LU80 series ultrasonic level sensors                                                                                                                                                                                                                                               | 1        | 0.5    | \$92.00  |
| <a href="#"><u>LM52-2850</u></a>           |            | Flowline mounting flange, 2 inch NPT female threads, CPVC, for use with Flowline DL34, LU23, LU28, LU29, LU74, LU78, LU81, LU83, LU84, UG01, UG03, UG06, US01, US03 and US06 series ultrasonic level sensors                                                                                                                                                                                                     | 1        | 1.0    | \$140.00 |
| <a href="#"><u>LM52-3850</u></a>           |            | Flowline mounting flange, CPVC, 3in female NPT. For use with Flowline UG12 series ultrasonic level sensors.                                                                                                                                                                                                                                                                                                      | 1        | 1.9    | \$280.00 |
| <a href="#"><u>204038</u></a>              |            | Replacement mounting gasket, for use with Flowline DL14, DL10, DX10 and DS14 series ultrasonic level sensors                                                                                                                                                                                                                                                                                                     | 1        | 0.1    | \$8.00   |
| <a href="#"><u>200128</u></a>              |            | Replacement mounting gasket, for use with Flowline DL24, LU27, LU77 and LU80 series ultrasonic level sensors                                                                                                                                                                                                                                                                                                     | 1        | 0.1    | \$12.00  |
| <a href="#"><u>200129</u></a>              |            | Replacement mounting gasket, for use with Flowline DL34, LU23, LU28, LU29, LU74, LU78, LU81, LU83 and LU84 series ultrasonic level sensors                                                                                                                                                                                                                                                                       | 1        | 0.1    | \$18.00  |

When installing the 1" NPT level sensors care should be used to mechanically isolate the sensor housing from the tank. This can easily be done by using any of the Flowline mounting accessories which are designed to provide the isolation needed.

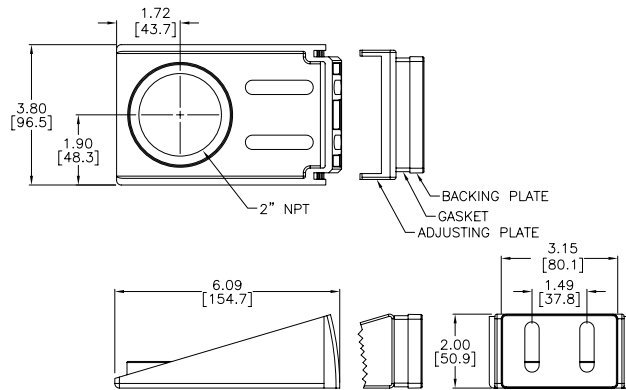


# Ultrasonic Liquid Level Sensor Accessories

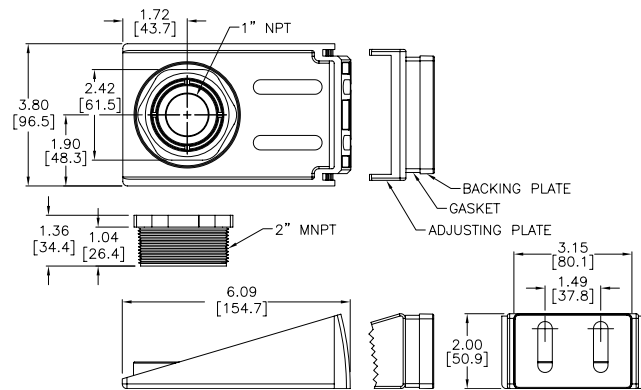
## Dimensions

inches [mm]

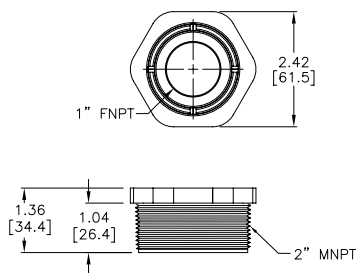
### LM50-1001



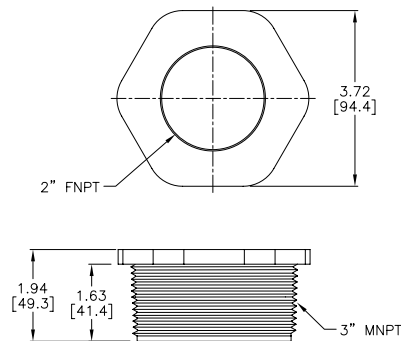
### LM50-1001-1



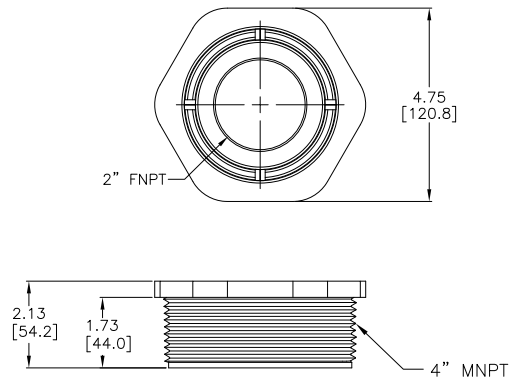
### LM52-1400



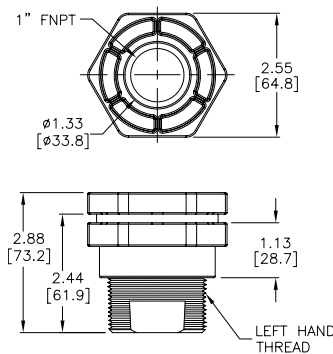
### LM52-2400



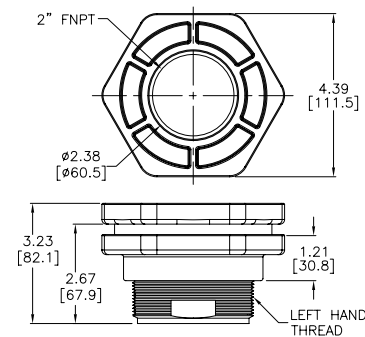
### LM52-3800



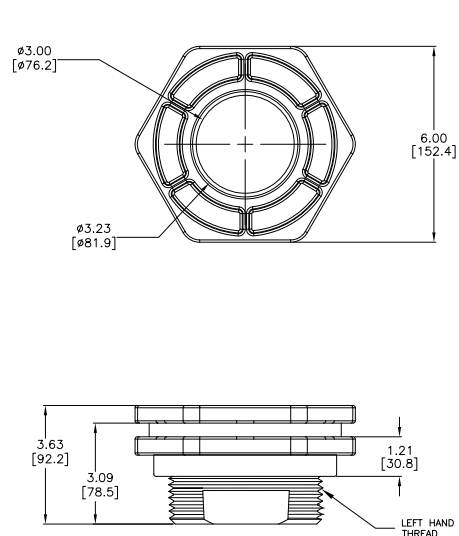
### LM52-1890



### LM52-2890



### LM52-3890



See our website [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete Engineering drawings.

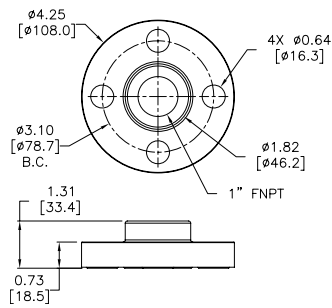


# Ultrasonic Liquid Level Sensor Accessories

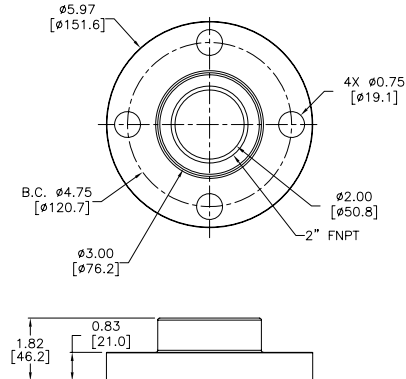
## Dimensions

inches [mm]

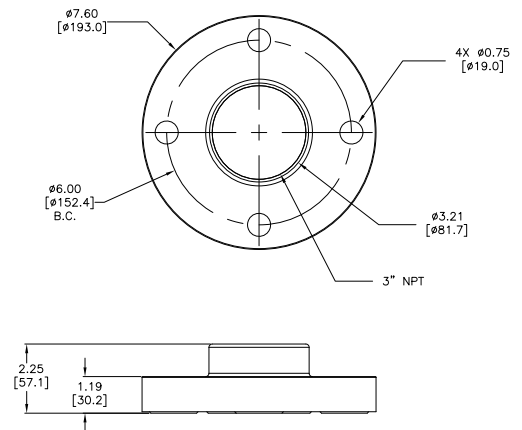
### LM52-1850



### LM52-2850



### LM52-3850



See our website [www.AutomationDirect.com](http://www.AutomationDirect.com) for complete Engineering drawings.





# WebCal Ultrasonic Level Sensor Software and USB Fob Adapter

## Overview

**WEBCAL** PC software is a utility program that allows users to easily configure their EchoPod, EchoTouch and EchoSonic II level transmitters, switches, and controllers. Download your free copy of **WEBCAL** at [www.AutomationDirect.com](http://www.AutomationDirect.com), and connect your sensor through the Fob USB adapter (LI99-2001). Develop your configuration using pre-programmed function menus as the tank graphic and set point fields automatically change to match your configuration. Then, input your level set point values and click the Write to Unit button. Your configuration will be downloaded into the sensor and verified in less than a second. Last, click the Wiring Diagram button to open a wiring schematic of your configuration in PDF format. Print the document, disconnect the sensor and wire it per the schematic. It's that simple.

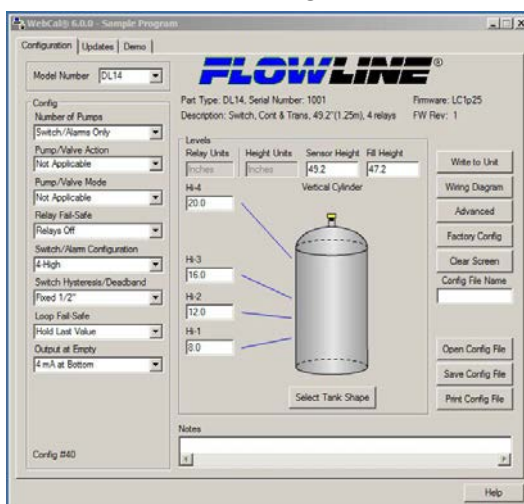
Configuration files can be named, saved, emailed, printed, opened and used again under revision control. The advanced feature page enables you to change the measurement signal, output filtering and invert relay states from N.O. to N.C. As new software or firmware becomes available, they can be downloaded and updated through **WEBCAL**.

## Features

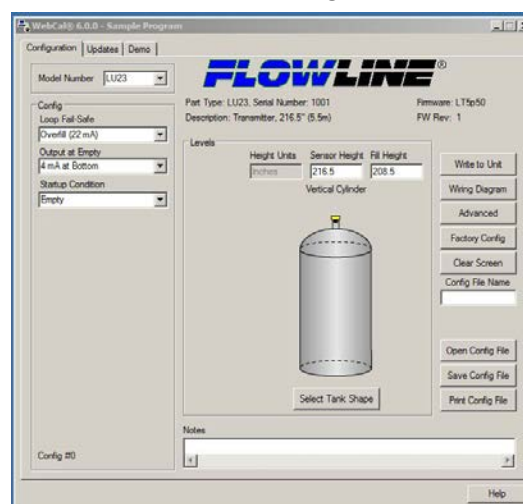
- 169 configurations with pull-down menu selections
- Graphical interface lets you visualize your configuration
- Applicable level set point fields appear automatically
- Installs and tests configuration in less than a second
- Available PDF wiring diagram for each configuration
- Technical help menu with FAQs, tips and glossary
- Rapidly program sensors to the same configuration
- Save configuration files for future use or reference
- Print wiring diagrams and configuration text files
- Email configuration files to other remote users
- Please check [www.automationdirect.com](http://www.automationdirect.com) for the most recent system requirements.

| WebCal Ultrasonic Level Sensor Software and USB Adapter |                                                                                     |                                                                                                                                                                 |          |              |               |
|---------------------------------------------------------|-------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|--------------|---------------|
| Part No.                                                | Item Photo                                                                          | Description                                                                                                                                                     | Quantity | Weight (lbs) | Price         |
| <b>LI99-2001</b>                                        |  | Flowline Fob USB adapter, required for use with WebCal software to configure Flowline EchoPod, EchoTouch and EchoSonic II ultrasonic level sensors.             | 1        | 0.1          | \$65.00       |
| <b>WEBCAL</b>                                           |  | Configuration software for Flowline EchoPod, EchoTouch and EchoSonic II ultrasonic level sensors. Requires an LI99-2001 Fob USB adapter (purchased separately). | 1        | 0.1          | Free Download |

## EchoPod Configuration



## EchoSonic II Configuration



Click on the thumbnail or go to <https://www.automationdirect.com/VID-LE-0004> for Part 1 of our How To video on the use of the Flowline Ultrasonic Level Sensors



Click on the thumbnail or go to <https://www.automationdirect.com/VID-LE-0005> for Part 2 of our How To video on the use of the Flowline Ultrasonic Level Sensors