

Technical Support

For complete product documentation, video training, and technical support, go to www.flowline.com.

For phone support, call 562-598-3015 from 8am to 5pm PST, Mon - Fri.
(Please make sure you have the Part and Serial number available.)

Flowline Inc. 10500 Humbolt St, Los Alamitos, CA 90720



Warranty

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 in accordance with instructions furnished by Flowline 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. 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, which Flowline's examination determines to its satisfaction to be defective in material or workmanship within the warranty period. Flowline must be notified pursuant to the instructions below of any claim under this warranty within thirty (30) days of any claimed lack of conformity of the product. Any product repaired or replaced under this warranty will be warranted only for the remainder of the original warranty period.

Returns

Products cannot be returned to Flowline without Flowline's prior authorization. To return a product that is thought to be defective, go to www.flowline.com, and submit a customer return (MRA) request form and follow the instructions therein. All warranty and non-warranty product returns to Flowline must be shipped prepaid and insured. Flowline will not be responsible for any products lost or damaged in shipment.

Limitations

This warranty does not apply to products which: 1) are beyond the warranty period or are products for which the original purchaser does not follow the warranty procedures outlined above; 2) have been subjected to electrical, mechanical or chemical damage due to improper, accidental or negligent use; 3) have been modified or altered; 4) anyone other than service personnel authorized by Flowline have attempted to repair; 5) have been involved in accidents or natural disasters; or 6) are damaged during return shipment to Flowline. Flowline reserves the right to unilaterally waive this warranty and dispose of any product returned to Flowline where: 1) there is evidence of a potentially hazardous material present with the product; or 2) the product has remained unclaimed at Flowline for more than 30 days after Flowline has dutifully requested disposition. This warranty contains the sole express warranty made by Flowline in connection with its products. ALL IMPLIED WARRANTIES, INCLUDING WITHOUT LIMITATION, THE WARRANTIES OF MERCHANTABILITY AND FITNESS FOR A PARTICULAR PURPOSE, ARE EXPRESSLY DISCLAIMED. The remedies of repair or replacement as stated above are the exclusive remedies for the breach of this warranty. IN NO EVENT SHALL FLOWLINE BE LIABLE FOR ANY INCIDENTAL OR CONSEQUENTIAL DAMAGES OF ANY KIND INCLUDING PERSONAL OR REAL PROPERTY OR FOR INJURY TO ANY PERSON. THIS WARRANTY CONSTITUTES THE FINAL, COMPLETE AND EXCLUSIVE STATEMENT OF WARRANTY TERMS AND NO PERSON IS AUTHORIZED TO MAKE ANY OTHER WARRANTIES OR REPRESENTATIONS ON BEHALF OF FLOWLINE. This warranty will be interpreted pursuant to the laws of the State of California. If any portion of this warranty is held to be invalid or unenforceable for any reason, such finding will not invalidate any other provision of this warranty.



Model: LU77
EchoSwitch® II
Quick Start

Welcome to the EchoSwitch® II Quick Start

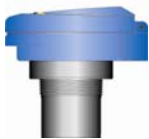
The EchoSwitch® II Quick Start is meant to show some of the more common setup solutions to getting the EchoSwitch® II up and running quickly. If you run into an issue that is not addressed here or wish to install or set up with a non-standard configuration, please address the EchoSwitch® II Manual or refer to the Flowline website at www.flowline.com.

We Do Your Level Best

Thank you for purchasing Flowline's EchoSwitch® II. EchoSwitch® II provides integrated LCD and three push-button configuration. This Quick Start includes everything you'll need to get the sensor up and running. For complete information, please refer to EchoSwitch® II documentation located at www.flowline.com.

Components

You should have the EchoSwitch® II and Viton® gasket, which is required to install the EchoSwitch® II.



EchoSwitch® II
LU77



Viton® gasket
Part # 200128 (1")

Select Fail Safety Output

In the event the sensor does not receive an echo, the Select Fail Safety Output setting can be set to turn each relay ON, OFF, or HOLD last state to achieve the desired fail-safe condition. During fail-safe, the display will read LOST.

- 1) Enter the Configuration menu (as shown previously).
- 2) Select **SAFE** from the menu and press SELECT to choose the relay you want to configure.
- 3) Select an output option, such as **ON**, **OFF**, or **HOLD**.
- 4) Select **EXIT** to return to the Configuration menu.

Troubleshooting

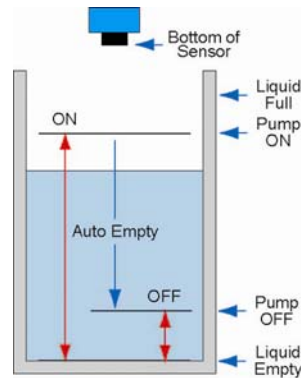
If you face any issues not addressed in this quick start, please refer to the EchoSwitch® II Manual located on Flowline website at www.flowline.com.

Information on how to set a LOW or HIGH alarm, as well as how to FILL or EMPTY a tank with a pump, can also be found in the EchoSwitch® II Manual located on Flowline website at www.flowline.com.

Empty a Tank with a Pump or Valve

The relays can also be used to empty a tank when the level inside gets too high. To set the sensor to automatically fill a tank:

- 1) Enter the Configuration menu (as shown previously), and press **SELECT** when the relay being set appears.
- 2) Select **PUMP** from the Menu,
- 3) Select **EMPTY** from the Menu,
- 4) Select **ON** from the Menu,
- 5) Using the UP and DOWN buttons, set the ON set point for the relay. The ON set point is the level at which the relay begin emptying the tank. This is the higher of the two set points. Enter this value by pressing and holding the **SELECT** button down for approximately two seconds, until the display reads **SAVED**,
- 6) Select **OFF** from the Menu,
- 7) Using the UP and DOWN buttons, set the OFF set point for the relay. The OFF set point is the level at which the relay will cease emptying the tank. This is the lower of the two set points. Enter this value by pressing and holding the **SELECT** button down for approximately two seconds.



If you wish to add a delay when the pump starts, continue to step 8. Otherwise, select **EXIT** to return to the Configuration Menu.

- 8) Select **DELAY** from the Menu,
- 9) Using the UP and DOWN buttons, set the DELAY time in seconds. This pump delay can range from 0 to 600 seconds. Enter this value by pressing and holding the **SELECT** button down for approximately two seconds, and
- 10) Select **EXIT** to return to the Configuration Menu.

Mounting the Sensor

The sensor should always be mounted perpendicular to the liquid surface using the provided Viton® mounting gasket. Insure that there are no restrictions or obstacles in the path of the ultrasonic signal. Further mounting information can be found on the Flowline website at www.flowline.com. An instructional video on is also available on the website.

The LU77 has a 1" NPT or G fitting and requires more care in mounting to reduce any coupling of the ultrasonic signal to the mounting structure. The below listed fittings are recommended.

For installations in existing 2" fittings:

- 1) Use LM52-1400 2" thread x 1" thread adapter.
(An adapter with an air gap around the 1 inch threads as shown is recommended)



For installations in plastic tanks:

- 1) Use a Bulkhead fitting LM52-1890 1" Bulkhead fitting,
- 2) Use a Bulkhead fitting LM52-2890 in combination with LM52-1400 or,
- 3) Weld a plastic 1" half coupler to tank top.



For installations in metal tanks:

- 1) Use the recommended bulkhead fittings as shown above or a LM52-1850 1" Flange. The flange fitting must have a riser for the threaded section. Drilling and tapping a blind flange is not recommended.
- 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 coupler is tightly wrapped in vinyl tape to dampen vibrations.



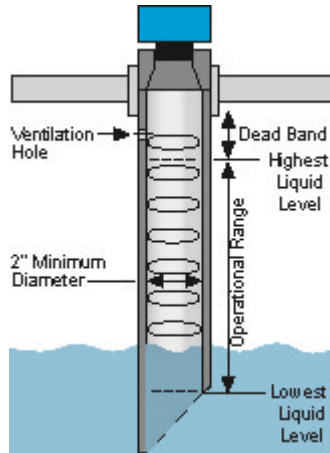
For installations in open tanks and sumps:

- 1) Use Flowline's LM50-1001-1 side mount bracket,



Mounting with a Stand Pipe:

A standpipe may be used to dampen turbulence, separate surface foam from the point of measurement or increase performance in heavy vapor. When mounting an LU77, select a pipe no larger than 2". This should be attached with a coupling and reducer bushing. 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. Cut the bottom end of the pipe at 45° and drill a 1/4" pressure equalization hole high in the dead band. The pumps should not drive liquid past the open end of the standpipe which causes the liquid in the pipe to oscillate.



Stand Pipe Mounting

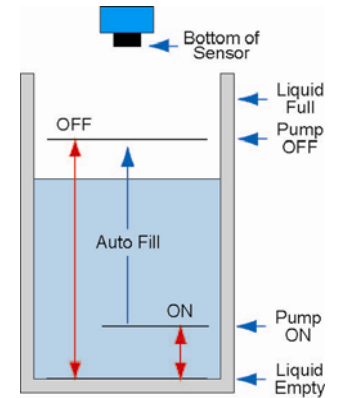
IMPORTANT MOUNTING GUIDELINES:

- 1) Never mount the sensor at an angle.
- 2) Liquid should never enter the dead band.
- 3) Mount at least 3" from the side wall.
- 4) Never mount in a vacuum.
- 5) Do not obstruct the sensor's beam width.

Fill a Tank with a Pump or Valve

The relays can also be used to fill a tank vessel when the level inside drops too low. To set the sensor to automatically fill a tank:

- 1) Enter the Configuration menu (as discussed previously) and select relay,
- 2) Select **PUMP** from the Menu,
- 3) Select **FILL** from the Menu,
- 4) Select **ON** from the Menu,
- 5) Using the UP and DOWN buttons, set the ON set point for the relay. The ON set point is the level at which the relay will trigger the refill of the tank. This is the lower of the two set points. Enter this value by pressing and holding the SELECT button down for approximately two seconds, until the display reads **SAVED**,
- 6) Select **OFF** from the Menu,
- 7) Using the UP and DOWN buttons, set the OFF set point for the relay. The OFF set point is the level at which the relay will cease the refill of the tank. This is the higher of the two set points. Enter this value by pressing and holding the SELECT button down for approximately two seconds.



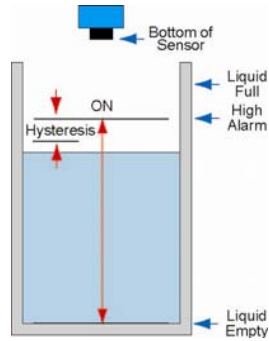
If you wish to add a delay when the pump starts, continue to step 8. Otherwise, select EXIT to return to the Configuration Menu.

- 8) Select **DELAY** from the Menu,
- 9) Using the UP and DOWN buttons, set the DELAY time in seconds. This pump delay can range from 0 to 600 seconds. Enter this value by pressing and holding the SELECT button down for approximately two seconds, and
- 10) Select **EXIT** to return to the Configuration Menu.

Set a High Alarm Relay

A high alarm relay will notify you when the tank level gets too high. To set a high alarm relay:

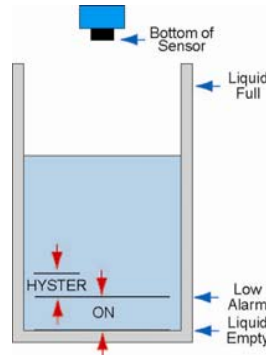
- 1) Enter the configuration menu (as discussed previously) select relay, and press SELECT when the relay being set appears.
- 2) Select **ALARM** from the Menu,
- 3) Select **HIGH** from the Menu,
- 4) Using the UP and DOWN buttons, set the HIGH (ON) set point for the relay. This is the high point where the alarm will sound. Enter this value by pressing and holding the SELECT button down for approximately two seconds, until the display reads **SAVED**,
- 5) Select **HYSTER** from the Menu. HYSTER (or hysteresis) is the distance below the HIGH (ON) set point that turns off the high alarm relay.
- 6) Using the UP and DOWN buttons, set the HYSTER (OFF) point, Enter this value by pressing and holding the SELECT button down for approximately two seconds, and
- 7) Select **EXIT** to return to the Configuration Menu.



Set a Low Alarm Relay

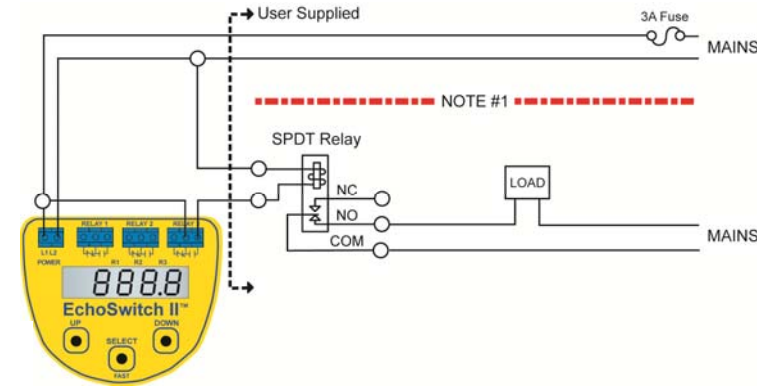
A low alarm relay will notify you when the tank level gets too low. To set a low alarm relay:

- 1) Enter the configuration menu (as discussed previously) and select relay, and press SELECT when the relay being set appears.
- 2) Select **ALARM** from the Menu,
- 3) Select **LOW** from the Menu,
- 4) Using the UP and DOWN buttons, set the LOW (ON) set point for the relay. This is the low point where the alarm will sound. Enter this value by pressing and holding the SELECT button down for approximately two seconds, until the display reads **SAVED**,
- 5) Select **HYSTER** from the Menu. HYSTER (or hysteresis) is the distance above the LOW (ON) set point that turns off the low alarm relay,
- 6) Using the UP and DOWN buttons, set the HYSTER (OFF) point,
- 7) Enter this value by pressing and holding the SELECT button down for approximately two seconds, and
- 8) Select **EXIT** to return to the Configuration Menu.



Wiring the EchoSwitch® II

The following wiring diagrams can be used when wiring the EchoSwitch® II.



Some notes on safety:

- Where personal safety or significant property damage can occur due to a spill, the installation must have a redundant backup safety system installed.
- Wiring should always be completed by a licensed electrician.
- The sensor must be chemically compatible with the application.
- Design a fail-safe system for possible sensor and/or power failure.
- Never use the sensor in classified hazardous environments.

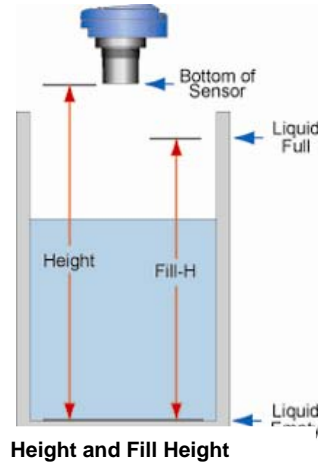
Configuring the Sensor

The sensor features non-volatile memory, and can be configured prior to installation. Your configuration will not be lost when the sensor is powered down.

Before configuring, be sure to have the following information:

Height. This is the distance from the transducer face to the bottom of the tank.

Fill Height (Fill-H). This is the distance from the highest level of liquid to the bottom of the tank



Configuration Menu

The sensor is configured with the three button's on the sensor's face (**UP**, **DOWN** and **SELECT**) and the sensor's LCD. To access the sensor's configuration menu, simply hold down the SELECT button for five seconds or until the menu is displayed. The display menu will automatically begin to scroll through the uppermost level of the Configuration menu.



When the menu scrolls to an item you wish to configure, simply press the SELECT button again when that item appears. Once you've made your configuration changes, press SELECT again to scroll through the options and once more while RUN appears in the display. This will return the sensor to its operational mode.

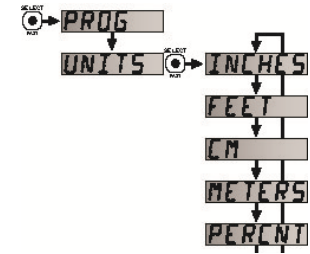
To go up one level, press SELECT when EXIT appears.

Set Units

The sensor displays information in either inches, feet, centimeters, meters or percentages.

Follow these instructions to set how units are displayed:

- 1) Enter the Configuration menu (as discussed previously),
- 2) Select **UNITS** from the menu,
- 3) Select the type of unit or the type of DISPLAY you desire, and
- 4) Select **EXIT** to return to the Configuration menu.



Setting Units

Set Height and Fill Height

This setting customizes the reading for your installation. Follow these instructions to set the height and fill height for your tank:

- 1) Enter the configuration menu (as discussed previously), and press SELECT when TANK appears.
- 2) Select **HEIGHT**. Use the UP and DOWN buttons to set the height of your tank. Then, hold down the SELECT button to save this setting.
- 3) Select **FILL-H** for the fill height. Use the UP and DOWN buttons to set the fill height of your tank. Then, hold down the SELECT button to save this setting.
- 4) Select **EXIT** to return to the Configuration menu.