

## Technical Support

Tel: 562.598.3015

8:00 am and 5:00 PM PST Mon-Fri

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



## EchoSwitch II®

Model: LU7\_-50\_5

Quickstart

QS300650 REV: B  
© 2008 Flowline, Inc.  
All Rights Reserved  
Made In USA



## We Do Your Level Best!

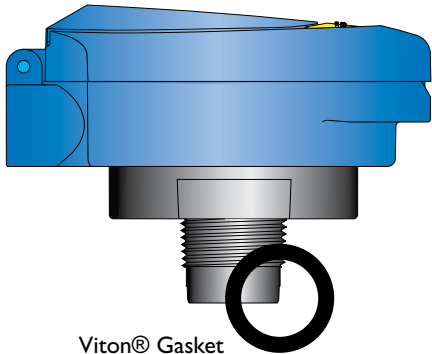
Thank you for purchasing Flowline's next generation EchoSwitch II. The switch has (3) relay channels. Each is a SPDT (single pole, double throw) type rated at 60 VA, 1A max. Normally open (NO) or normally closed (NC) operation is user selected based on the desired system control and fail-safe logic. Flowline would like to thank you for your business and continue to do your level best!

## Components

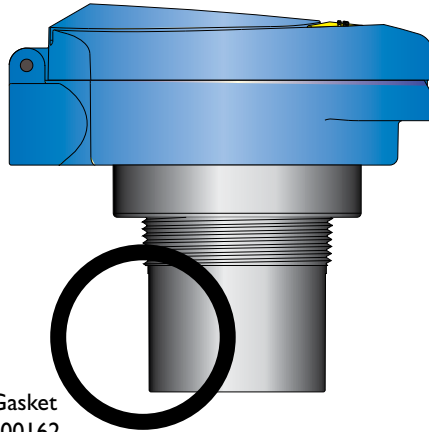
EchoSwitch II is offered in two different models. Your EchoSwitch II ships with a 1" or 2" Viton® gasket. If you did not receive the gasket, please contact your supplier before installing the sensor, as EchoSwitch II should always be installed with a gasket.

LU77-5005

LU78-5005



Viton® Gasket  
1" P/N: 200125



Viton® Gasket  
2" P/N: 200162

## Configuration

EchoSwitch II can be configured before installation. The switch features non-volatile memory, all set points configured before installation will not be lost when the switch is powered down. To start, you will need the following information:

### Basic Tank Information

- HEIGHT - Distance from the transducer face to the bottom of the tank.
- FILL H - Maximum fill height of the liquid from the bottom of the tank.

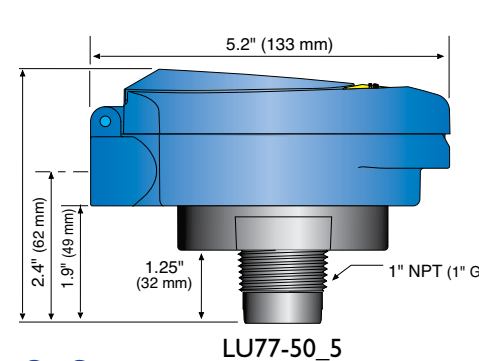
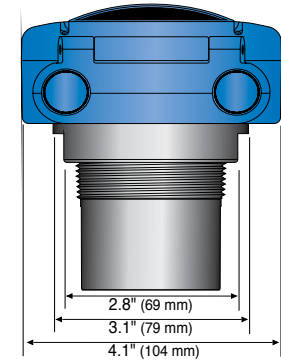
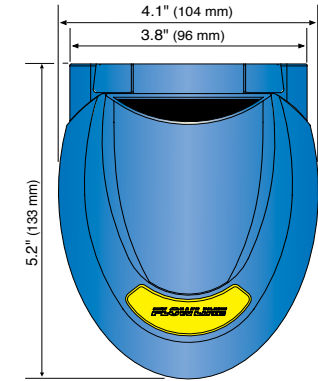
### Set Points

- You will need the measured distance from the bottom of the tank to each set point. These values will all be in the same distance values (inch, centimeters, feet or meters).

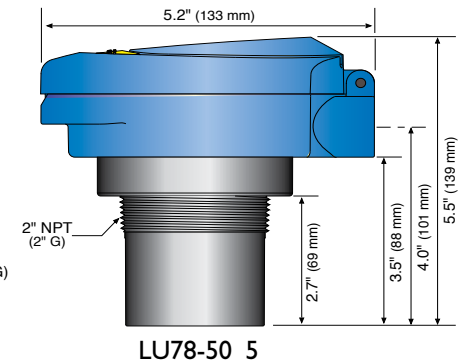
## Specifications

Range:	LU77: 4" to 8.2" (10 cm to 2.5m) LU78: 8" to 24.6" (20 cm to 7.5m)
Repeatability:	0.25" (6.35 mm)
Beam width:	LU77: 2" (5 cm) dia. LU78: 3" (7.6 cm) dia.
Dead band:	LU77: 4" (10 cm) LU78: 8" (20 cm)
LCD indication:	Level and relay status
Configuration:	Push button
Supply voltage:	95-250 VAC
Contact type:	(3) SPDT relays
Contact rating:	60 VA, 1A max
Contact fail-safety:	Programmable / selectable
Temp. comp.:	Automatic
Electronics temp.:	F: -7° to 140° C: -20° to 60°
Pressure:	MWP = 30 PSI
Enclosure rating:	NEMA 4X (IP65)
Enclosure vent:	Water tight membrane
Encl. material:	Polycarbonate, UV
Encl. hardware:	Brass and stainless
Trans. material:	PVDF
Process mount:	LU77: 1" NPT (1" G) LU78: 2" NPT (2" G)
Mount. gasket:	Viton®
Conduit entrance:	Dual, 1/2" NPT
Classification:	General purpose
Compliance:	RoHS
Approvals:	CE

## Dimensions



LU77-50\_5



LU78-50\_5

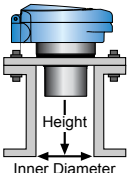
## Safety

1. Installation should be done by properly trained staff
2. Supply voltage should never exceed a maximum of 250 VAC
3. Always use stepper relays between the sensor and external loads
4. Make sure the sensor is chemically compatible with your application
5. Design a fail-safe system that accommodates the possibility of sensor and/or power failure.
6. **This sensor should not be used in classified hazardous environments**

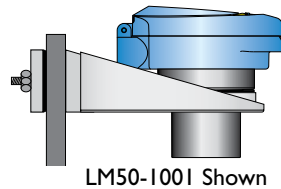
## Mounting EchoSwitch II

1. Do not mount at an angle
2. Liquid should never enter the sensor's dead band
3. Mount at least 2" from the side wall
4. Do not mount where obstacles will intrude on beam column
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 fitting with minimal height, ensuring that the installed transducer will not be substantially elevated into the fitting. Flowline recommends the LM54-1001, a 3"x2" tank adapter. For the LU77 transducer, Flowline recommends a 2"x1" reducer busing, Flowline part number: LM52-1001.

	Riser Specifications	
	Inner Diameter	Maximum Height
	2" (5 cm)	3f (7.6 cm)
	4" (10 cm)	8f (20 cm)
	6" (15 cm)	12f (30 cm)

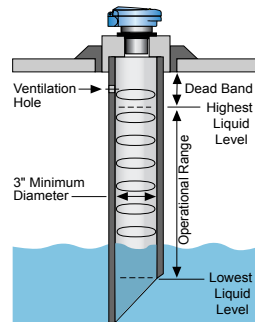
**Riser:** Installations with tall, narrow risers can impede the acoustic signal. Use the above Riser Specification chart to select a riser.



**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" or 3" thread and use a thread by thread reducer bushing.

**Side Mount Bracket:** Use Flowline's LM50-1001 side mount bracket.

**Stand Pipe:** Use a stand pipe when surface foam or turbulence are present. Use a 2" diameter pipe (for LU77) or 3" diameter pipe (for LU78) 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.



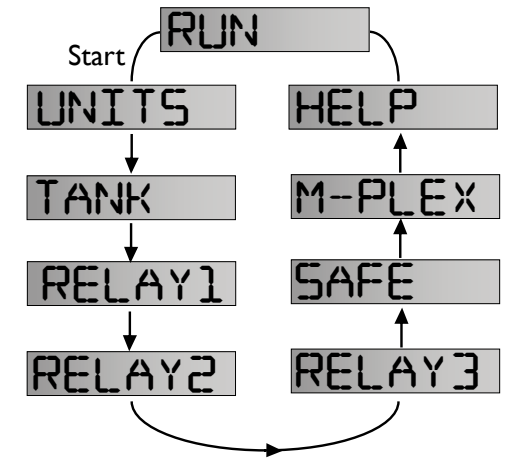
## Wiring EchoSwitch II

After you have finished positioning and mounting EchoSwitch II, have a licensed electrician wire the sensor and components it will be controlling. Remember to *always install a stepper relay* between your EchoSwitch II and the components it will be controlling.

\* For additional instruction, please download the full manual at [www.flowline.com](http://www.flowline.com)

## Configuration Menu

EchoSwitch II is configured by using the 3 push buttons (**UP**, **DOWN** and **SELECT**) and an LCD display. To access the configuration menu mode, hold down the select button for 5 seconds. The display will begin to scroll through the top level of the configuration menu.



\* M-PLEX will only be available when you have two or more relays configured as pumps.

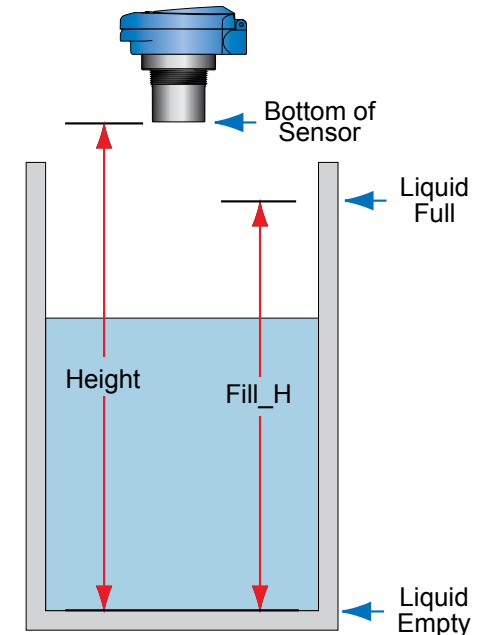
## Set The Tank and Fill Height

### Program UNITS:

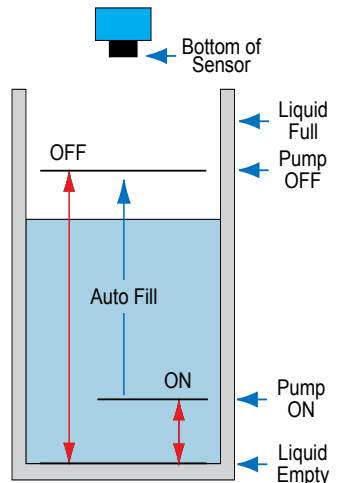
1. Enter configuration menu mode (see above).
2. Select UNITS when displayed.
3. Press SELECT when your preferred unit of measurement is displayed.
4. Select EXIT to return to the configuration menu.

### Program Tank / Fill Height:

1. In the configuration menu mode press SELECT when TANK is displayed.
2. Select HEIGHT and use the UP and DOWN buttons to set the height of your tank. Hold down the SELECT button to save.
3. Select FILL H and use the UP and DOWN buttons to set the fill height of your tank. Hold down the SELECT button to save.
4. Select EXIT to return to the configuration menu.



## Easy PUMP Configuration

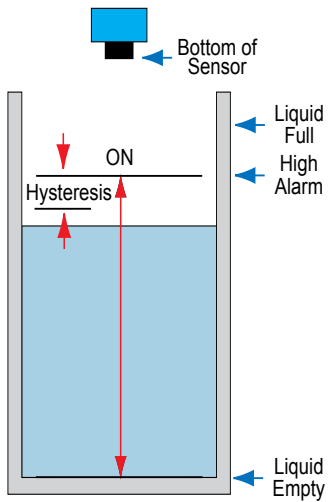


\* All measurements are made from liquid empty.

1. Hold down the **SELECT** button for 5 seconds to enter the configuration menu mode.
2. Press the **SELECT** button when the relay you would like to program is displayed.
3. Select **PUMP**.
4. Now select the pumps operation, **FILL** or **EMPTY** option.
5. Now enter the **ON** and **OFF** values, measured from the bottom of the tank.
6. You can enter a **DELAY**, which will delay the pump start (used in batch applications).
7. Once you have entered your selection, press **SELECT** when **EXIT** is displayed
8. To switch into operational mode, press **SELECT** when **RUN** appears.

\* For additional instruction, please download the full manual at [www.flowline.com](http://www.flowline.com)

## Easy ALARM Configuration



\* All measurements are made from liquid empty.

1. Hold down the **SELECT** button for 5 seconds to enter the configuration menu mode.
2. Press the **SELECT** button when the relay you would like to program is displayed.
3. Select **ALARM**.
4. Now select the alarms operation, **HIGH** or **LOW** option.
5. Now enter the **ON** value, measured from the bottom of the tank.
6. Now set your hysteresis (**HYSTER**) value. The hysteresis is the differential for when the relay will de-energize.
7. Once you have entered your selection, press **SELECT** when **EXIT** is displayed
8. To switch into operational mode, press **SELECT** when **RUN** appears.

\* For additional instruction, please download the full manual at [www.flowline.com](http://www.flowline.com)

## Easy PUMP M-PLEX Configuration

The **M-PLEX** option will only be available when you have two or more relays configured as pumps.

1. Hold down the **SELECT** button for 5 seconds to enter the configuration menu mode.
2. Press the **SELECT** button when **M-PLEX** is displayed.
3. You have 3 options: **NO ALT** (no alteration), **DUPLEX** (two pumps) or **TRIPLEX** (three pumps). Press **SELECT** when your option is displayed.
4. Now select the 2 or 3 relays you would like multiplexed *Note: You can only M-PLEX relays that you have configured to control pumps.*
5. Once you have entered your selection, press **SELECT** when **EXIT** is displayed
6. To switch into operational mode, press **SELECT** when **RUN** appears.

\* For additional instruction, please download the full manual at [www.flowline.com](http://www.flowline.com)

## Easy Time Based PUMP Alternation Configuration

1. Hold down the **SELECT** button for 5 seconds to enter the configuration menu mode.
2. Press the **SELECT** button when **M-PLEX** is displayed.
3. Select either **DUPLEX** (two pumps) or **TRIPLEX** (three pumps).
4. Now select **A-TIME**. Change the value (in hours) to the time you wish the pumps to alternate. *Note: The cycle by cycle alternation will be disabled and the time based will take over.*
5. Once you have entered your selection, press **SELECT** when **EXIT** is displayed
6. To switch into operational mode, press **SELECT** when **RUN** appears.

\* For additional instruction, please download the full manual at [www.flowline.com](http://www.flowline.com)