

EchoPod®

Ultrasonic Level Switch, Controller & Transmitter



DL10, DL14, DL24, DS14 & DX10 Series Quick Start



DL14-00 Shown

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WELCOME TO THE ECHOPOD® DL10, DL14, DL24, DS14 & DX10 SERIES QUICK START

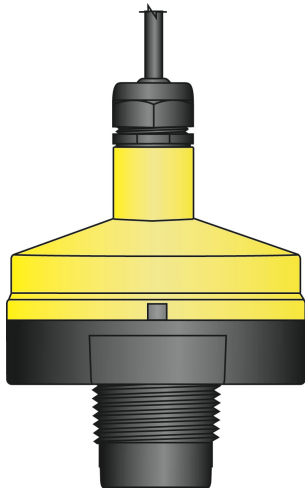
The EchoPod® Quick Start provides basic setup and mounting instructions for getting EchoPod® up and running quickly. If you have a non-standard installation or setup requirement that is not addressed here, please refer to the EchoPod® Manual or support documentation at flowline.com.

WE DO YOUR LEVEL BEST™

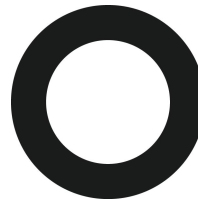
Thank you for purchasing EchoPod®. Depending upon the series, the general purpose ultrasonic level sensor provides non-contact level measurement, switching and/or control. This Quick Start includes everything you'll need to get the sensor up and running.

COMPONENTS

EchoPod® comes with a Viton® gasket for installation and the Quick Start. Some models have the USB® Fob (LI99-1001) included with EchoPod® and other's do not. Fob's can be purchased separately. A Fob is required to interface to the WebCal® configuration software.



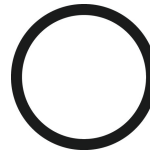
EchoPod®
DL24 Series



Viton® gasket (1")
P/N: 200128 or



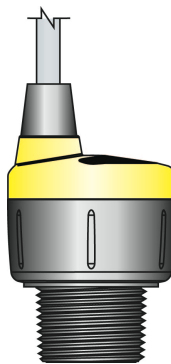
USB® Key Fob
P/N: LI99-1001



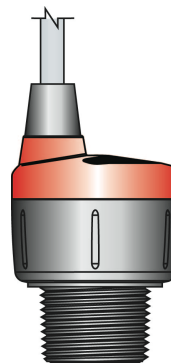
Viton® gasket (1")
P/N: 204038



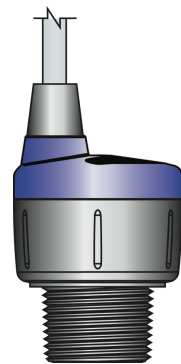
EchoPod®
DL10 Series



EchoPod®
DS14 Series



EchoPod®
DS14 Series



EchoPod®
DX10 Series

CONFIGURING ECHOPOD®

EchoPod® is configured through WebCal®, a PC software program. Configuration of your sensor should be performed prior to mounting, since it requires connection to your PC.

Step 1: Download and Install WebCal®

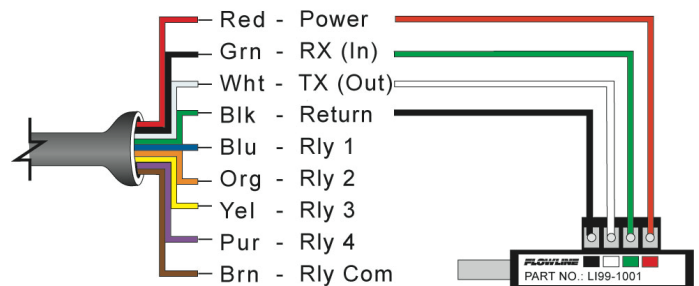
1. Download WebCal® software from flowline.com onto a PC with the following minimum specifications:
 - a. Windows® 2000/XP/Vista/7/8/10, 10 MB storage space, 256 MB RAM, 1 USB® 2.0 port
2. Double-click the WebCal® icon to install before proceeding to Step 2. You must have an active Internet connection to install WebCal®, as it will automatically install any required drivers.

Step 2: Connect the USB® Fob

Note: Do not connect the Fob until after you've installed WebCal®.

The sensor communicates to WebCal® through the USB® Fob. Prior to plugging the Fob into your computer's USB® port, ensure that all external power is disconnected from EchoPod®. The maximum distance between the computer and EchoPod® is 15'.

1. Connect the Red, Green, white, and Black wires from the EchoPod® to the corresponding colored terminals on the Fob.
2. Tighten the terminal screws with a slotted screwdriver.
3. Plug the Fob into your PC's USB® port.



Note: Wiring is identical for all EchoPod series. Only use the Red, Black, Green and White wires.

Step 3: Configure EchoPod® with WebCal®

With EchoPod® connected to your computer, open the WebCal® software by clicking on the WebCal® icon. Follow the below steps to configure the sensor. Click Help in the lower right corner and open the Help menu for support. **For complete information on WebCal®, please refer to the WebCal® manual located at flowline.com/webcal-software, or contact a Flowline applications engineer at (562) 598-3015.**

1. Output Configuration
 - a. Defines the relay pump, valve or alarm and/or output operational settings.
 - b. Defines the relay and output (current, voltage or frequency) fail-safe settings.

2. Volumetric Configuration

- a. To configure in volume versus distance (factory default), defines the tank shape and dimensional information with respect to the sensor's location on the tank.

3. Tank Level Configuration

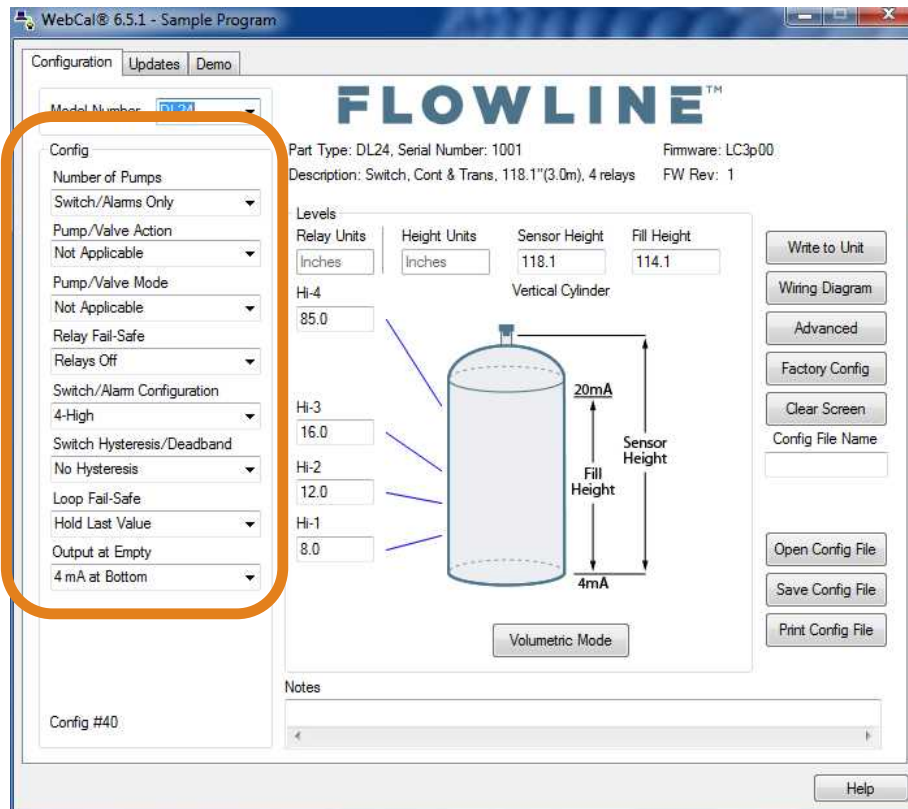
- a. Defines the relay activation and output operational set points.

4. Write to Unit

- Uploads the configuration into the sensor.
- Prints a custom PDF wiring schematic.
- Saves the configuration file for future use.

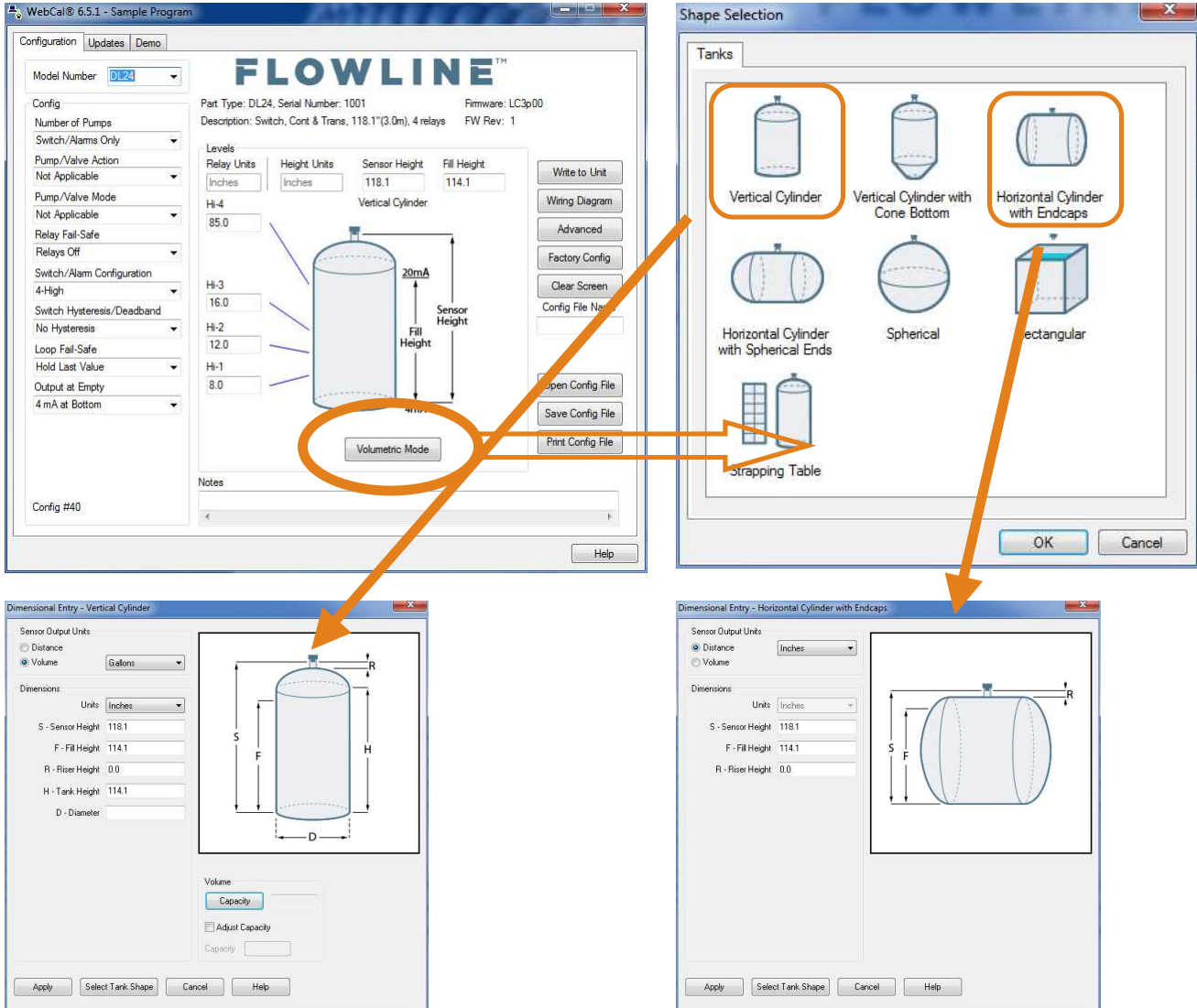
Output Configuration

Configures the relays in terms of pump/valve operations and level alarms as well as the setting fail-safe for relays and signal output.



Volumetric Configuration

Defines the shape of the tank as well as the dimensional information for the tank with respect to the sensor's location on the tank. **Note:** This section is only used when changing the sensor configuration units from the factory default of distance (liquid height in inch, cm, feet or meter) to volume (liquid in gallons or liters). If you wish to configure in distance, skip this section. If you wish to configure in volume, click the **Volumetric Mode** button, select the tank shape, units and input the required dimensional information.



Tank Level Configuration

Enter the settings for the relay activation points and operational range.

Levels

Relay Units	Height Units	Sensor Height	Fill Height
Inches	Inches	118.1	114.1

Vertical Cylinder

Hi-4

85.0

Hi-3

16.0

Hi-2

12.0

Hi-1

8.0

20mA

Sensor Height

Fill Height

4mA

Volumetric Mode

Levels

Relay Units	Height Units	Sensor Height	Fill Height
Gallons	Inches	118.1	114.1

Vertical Cylinder

Hi-4

900

Hi-3

800

Hi-2

700

Hi-1

600

20mA

Sensor Height

Fill Height

4mA

Capacity: 1000.0

Volumetric Mode

Complete the Configuration

Use the buttons on the right side of the WebCal® screen to complete the configuration.

WebCal® 6.5.1 - Sample Program

Configuration Updates Demo

Model Number DL24

Config

Number of Pumps

Switch/Alarms Only

Pump/Valve Action

Not Applicable

Pump/Valve Mode

Not Applicable

Relay Fail-Safe

Relays Off

Switch/Alarm Configuration

4-High

Switch Hysteresis/Deadband

No Hysteresis

Loop Fail-Safe

Hold Last Value

Output at Empty

4 mA at Bottom

Part Type: DL24, Serial Number: 1001

Firmware: LC3p00

Description: Switch, Cont & Trans, 118.1"(3.0m), 4 relays

FW Rev: 1

Levels

Relay Units	Height Units	Sensor Height	Fill Height
Inches	Inches	118.1	114.1

Vertical Cylinder

Hi-4

85.0

Hi-3

16.0

Hi-2

12.0

Hi-1

8.0

20mA

Sensor Height

Fill Height

4mA

Volumetric Mode

Write to Unit

Wiring Diagram

Advanced

Factory Config

Clear Screen

Config File Name

Open Config File

Save Config File

Print Config File

Notes

Config #40

Help

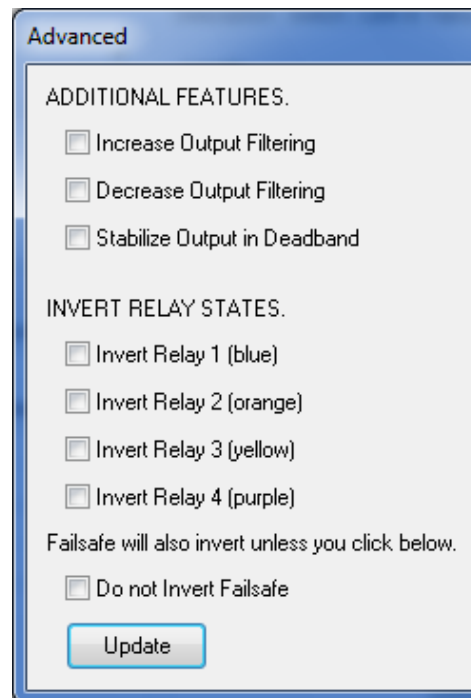
Complete the Configuration

- Click **Write to Unit** to save the configuration to the sensor.
- Click **Wiring Diagram** to open a PDF wiring schematic of the configuration.
- Enter the configuration name and click **Save Config File** for future use.
- Disconnect the USB® Fob and continue to the next section - **Mounting EchoPod®**.

Configuration is Now Complete

The **Advanced** settings are designed to help solve performance or operational issues for specific applications. Changing these setting will alter the factory default performance and operation of your sensor. Please read the Help file to assist you in making adjustments, or if you are unclear about a specific issue, please contact a Flowline applications engineer at (562) 598-3015.

- **Increase Output Filtering:** Placing a check mark in the box will add more output filtering to the 4-20 mA output.
- **Decrease Output Filtering:** Placing a check mark in the box will remove all output filtering from the 4-20 mA output.
- **Stabilize Output in Deadband:** Placing a check mark in the box will hold the signal output at full until the level safely falls back within the span.
- **Invert Relays:** Placing a check mark in any of the four boxes will invert the relay state from normally open to normally closed.
- **Do Not Invert Failsafe:** Placing a check mark in the box will NOT invert the fail-safe when a relay is inverted.

The image shows a software window titled "Advanced". Inside, there are two sections: "ADDITIONAL FEATURES." and "INVERT RELAY STATES.". Under "ADDITIONAL FEATURES.", there are three checkboxes: "Increase Output Filtering", "Decrease Output Filtering", and "Stabilize Output in Deadband". Under "INVERT RELAY STATES.", there are four checkboxes: "Invert Relay 1 (blue)", "Invert Relay 2 (orange)", "Invert Relay 3 (yellow)", and "Invert Relay 4 (purple)". Below these sections, there is a line of text: "Failsafe will also invert unless you click below." followed by a checkbox labeled "Do not Invert Failsafe". At the bottom of the window is a button labeled "Update".

Advanced Settings

MOUNTING ECHOPOD®

The sensor should always be mounted perpendicular to the liquid surface using the provided Viton® mounting gasket. Make sure that there are no restrictions or obstacles in the path of the acoustic signal. For further mounting information, please refer to the EchoPod® Manual at flowline.com.

EchoPod® has 1" NPT or G threads and requires care in fitting selection and mounting to reduce any coupling of the ultrasonic signal to the mounting structure. The below fittings are recommended.

- **Installation in Existing 2" Fittings:** Use a LM52-1400 2" thread x 1" thread adapter or a LM52-1410 2" slip x 1" thread adapter. **Note:** Adapters with air gaps around the 1-inch threads are recommended.
- **Installation in Plastic Tanks:** Use the LM52-1890 1" bulkhead fitting; or a larger bulkhead fitting such as the LM52-2890 with a reducer bushing such as the LM52-1400; or weld a plastic 1" half coupling to the tank top.
- **Installation in Metal Tanks:** Use the LM52-1890 bulkhead fitting; or a flange with a 1" riser such as the LM52-1850 (where the threads are above the plane of the flange); or a larger flange and add a reducer bushing such as the LM52-1400. **Note:** Do not use a blind flange with a tapped 1" thread. While installations directly into a 1" metal fitting are not recommended, acceptable results may be obtained if the fitting is a half coupling and the outer diameter of the coupling is tightly wrapped with vinyl tape.
- **Installation in Open Tanks or Sumps:** Use Flowline's LM50-1001-1 side mount bracket. **Note:** The bracket is not designed for use with stand-pipes.



LM52-1400



LM52-1410



LM52-2890



LM52-1850



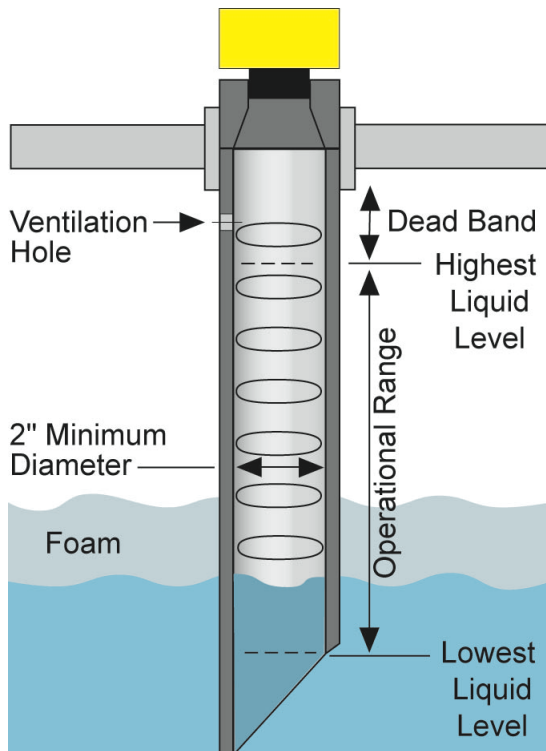
LM50-1001

Mounting Guidelines

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

Stand-Pipe Installation

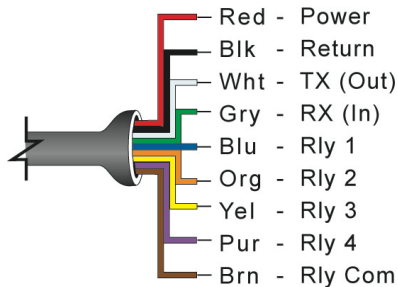
A stand-pipe may be used to dampen turbulence, separate surface foam from the point of measurement or increase performance in heavy vapor. When mounting the sensor in a stand-pipe, the minimum diameter of the pipe is 2". Larger diameter pipes can be used. The pipe should be attached with a coupling and 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 sensor's dead band. Locate the stand-pipe away from pump outlets and/or other sources of substantial turbulence which might cause the liquid in the pipe to oscillate.



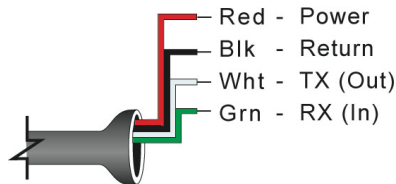
WIRING ECHOPOD®

After mounting the sensor, make the necessary electrical connections. A wiring diagram with specific recommendations for the sensor's configuration can be printed from the WebCal® program. A typical wiring diagram is shown on the next page.

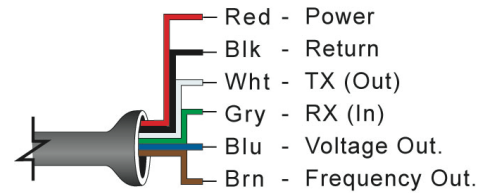
DL14, DL24 & DS14 Series



DL10 Series



DX10 Series



Red & Black: Red (Power) and Black (Return) leads are for connection to a 24 VDC power supply or to a 4-20 mA loop power source (DL10, DL14 & DL24 series only). The Red and Black wires can be extended up to 1,000' using a 22-gauge or larger wire; however do not extend the Green and White wires beyond 15'.

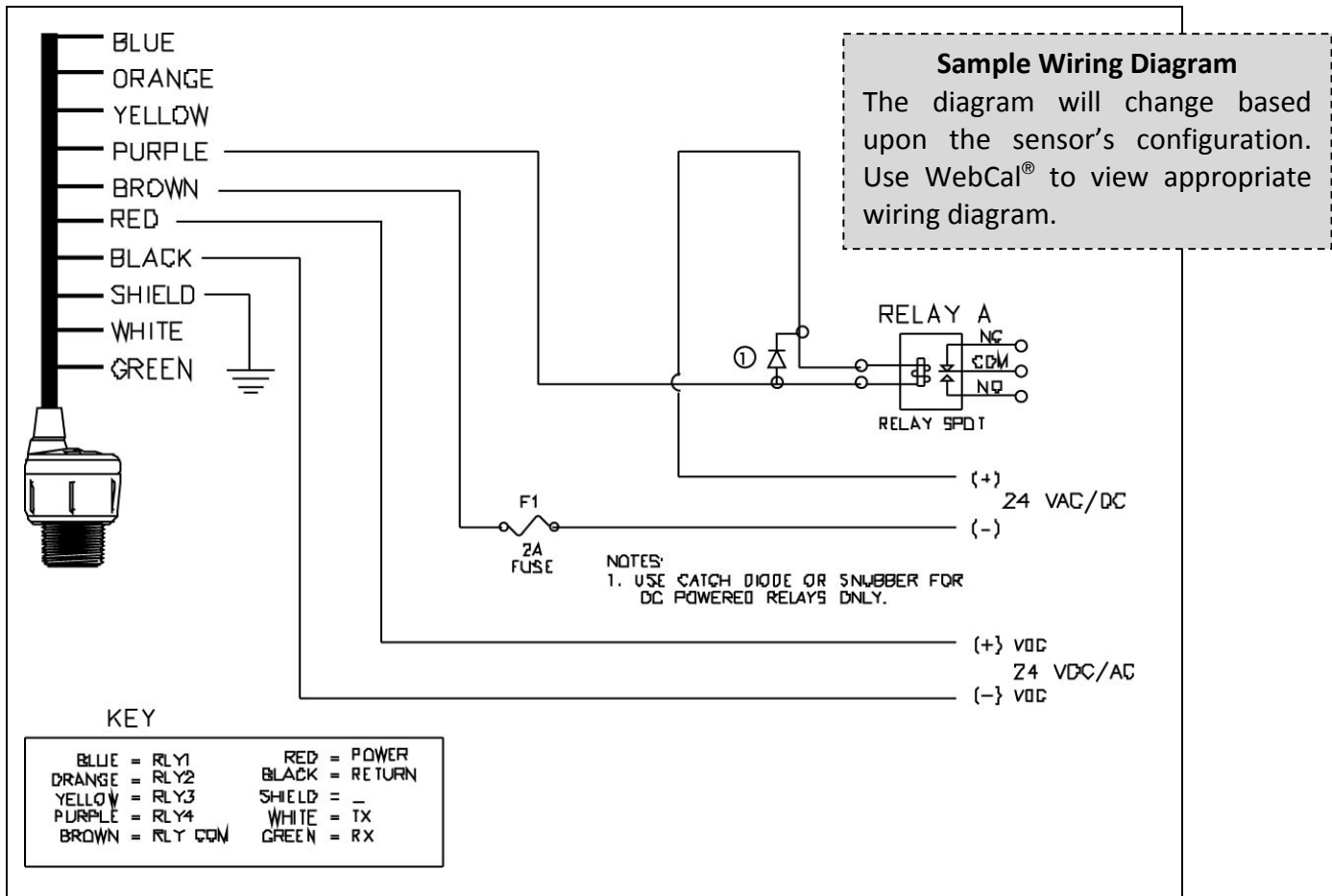
White & Green: White (TX) and Green (RX) leads are reserved for use with WebCal® and PodView® communication and should not be connected during usage in the application. These wires should not be connected to WebCal® while power is supplied from any source other than the USB® Fob. The maximum cable distance between the computer and EchoPod® is 15'. **Note:** Never allow the White or Green wires to touch any power supply.

Blue, Orange, Yellow, Purple & Brown (DL14, DL24 & DS14 Series only): Blue (Rly1), Orange (Rly2), Yellow (Rly3) & Purple (Rly) wires are the relay contacts (normally open) from each of the relays respectively. The Brown wire (Rly Com) is the common for all the relays. Relay selection is determined by the configuration in WebCal®.

Note: EchoPod® uses latching relays. When power is removed to the sensor, the relays will remain in their last state. Example: If the relay is energized, when power is removed, the relay will remain in an energized state.

Blue & Brown (DX10 Series only): Use the Brown wire for the Frequency output. Use the Blue wire for the Voltage output.

Typical Wiring Diagram



Electrical Connections, Usage and Safety

- Where personal safety or significant property damage can occur due to a spill, the installation must have a redundant backup safety system.
- Wiring should always be completed by a licensed electrician.
- The sensor supply voltage should never exceed 28 VDC.
- Do not exceed 28 VDC (28 VDC/VAC for DS14 series only) power on the sensor relays.
- Always use stepper relays between the sensor and external loads. For DC circuits use a catch diode such as 1N4148 shown above.
- Protect the sensor from electrical spikes by isolating the power.
- 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 environments classified as hazardous.

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 of 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 under this warranty will be warranted only for the remainder of the original warranty period. Any product provided as a replacement under this warranty will be warranted for the full two years from the date of manufacture.

RETURNS

Products cannot be returned to Flowline without Flowline's prior authorization. To return a product that is thought to be defective, go to 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.

For complete product documentation and technical support, go to flowline.com. For phone support, call 562-598-3015 from 8am to 5pm PST, Monday-Friday. Please have the Part and Serial number available.