Advantage Controls — Manual

EchoPod®

Ultrasonic Level Sensor

Installation
Maintenance
Repair
Manual

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Manufacturer's Product Warranty

Advantage Controls warrants units of its manufacture to be free of defects in material or workmanship. Liability under this policy extends for 24 months from date of installation. Liability is limited to repair or replacement of any failed equipment or part proven defective in material or workmanship upon manufacturer's examination. Removal and installation costs are not included under this warranty. Manufacturer's liability shall never exceed the selling price of equipment or part in question. Advantage disclaims all liability for damage caused by its products by improper installation, maintenance, use or attempts to operate products beyond their intended functionality, intentionally or otherwise, or any unauthorized repair. Advantage is not responsible for damages, injuries or expense incurred through the use of its products.

The above warranty is in lieu of other warranties, either expressed or implied. No agent of ours is authorized to provide any warranty other than the above.

30 Day Billing Memo Policy

Advantage Controls maintains a unique factory exchange program to ensure uninterrupted service with minimum downtime. If your unit malfunctions, call 1-800-743-7431, and provide our technician with Model and Serial Number information. If we are unable to diagnose and solve your problem over the phone, a fully warranted replacement unit will be shipped, usually within 48 hours, on a 30 Day Billing Memo.

This service requires a purchase order and the replacement unit is billed to your regular account for payment. The replacement unit will be billed at current list price for that model less any applicable resale discount. Upon return of your old unit, credit will be issued to your account if the unit is in warranty. If the unit is out of warranty or the damage not covered, a partial credit will be applied based upon a prorated replacement price schedule dependent on the age of the unit. Any exchange covers only the controller or pump. Electrodes, liquid end components and other external accessories are not covered.

I. Introduction

Thank you for purchasing the EchoPod (DL10). This general purpose ultrasonic sensor provides non-contact detection powered by the 4-20 mA loop. This Quick Start includes everything you'll need to get the EchoPod up and running.

II. Components

Depending on how the EchoPod was shipped, you may or may not have the components shown below. All three components, including the EchoPod, USB Fob, and Viton gasket are required to configure and install the EchoPod. If you need any additional components, you can order them directly by calling 1-800-743-7431.

EchoPod

Viton Gasket

PSDC-24-Q
Can be used to connect up to 4 EchoPods

USB FOB (Optional)
Is only needed if you want to change the ordered/ programmed lengths

III. Configuring (Only if Changes are Required)

Units come preconfigured. Skip to mounting if there are no changes.
Pre-calibrated units can have calibration fine tuned in MegaTrons if drum sizes are a little different. Configuration of your EchoPod should be performed prior to mounting, since it requires connection to your PC and USB FOB.

Step 1: Install the WebCal Software

Download WebCal from www.flowline.com onto a PC with the following minimum specifications:
Windows 2000/XP/Vista/7, 10 MB storage space, 256 MB RAM, 1 USB 2.0 port

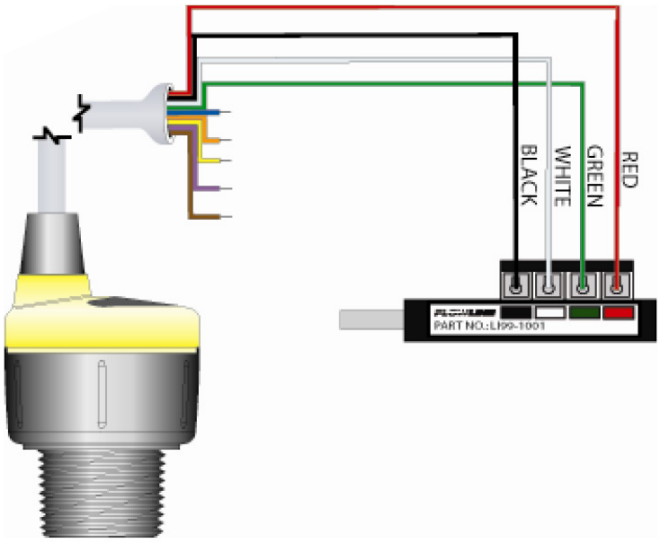
Double-click the WebCal icon to install before proceeding to Step 2. You must have an active Internet connection to install WebCal, as it will automatically verify driver updates.

Step 2: Connect the USB Fob

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

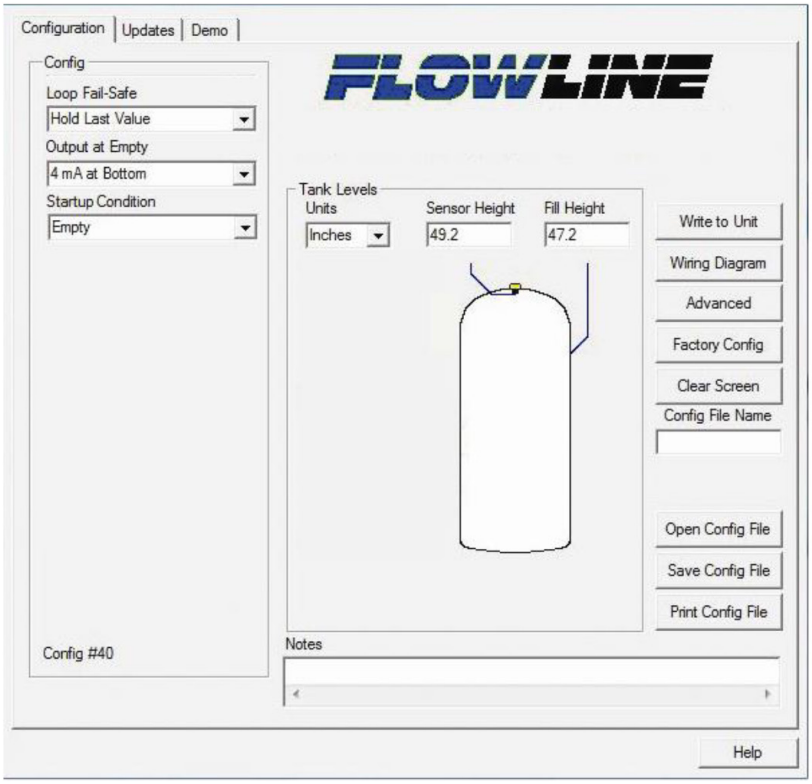
The EchoPod communicates to its configuration software through the USB Fob. Prior to connecting the Fob, ensure that all external power is disconnected from the EchoPod as power is provided through the PC's USB 2.0 port. Do not use a cable connecting the EchoPod to the Fob any longer than 15 feet.

1) Connect the red, green, white, and black wires from the EchoPod® to the corresponding colored terminals on the Fob (as shown in the diagram).
2) Tighten the terminal screws with a slotted screwdriver.
3) Plug the Fob into your PC's USB port.



Step 3: Configure through WebCal

These instructions will walk you through configuration of the EchoPod® through WebCal. For more information, click the WebCal HELP button in the lower right corner or anywhere on the WebCal screen.



WebCal Configuration Screen

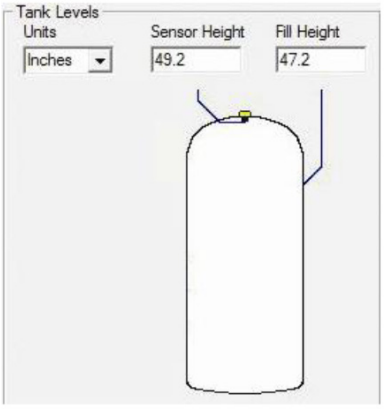
Using the drop-down menus on the left of the WebCal screen, set the configuration for your application requirements. When a selection does not apply to your application, “Not Applicable” will appear in the drop-down. Make sure all drop-downs are set appropriately for your application before moving to the Tank Level section.

Note: If you would like to start over, click the **Clear Screen** button on the right.

Configuration Settings

Enter the appropriate tank level set points for your application.

- Units. Display measurements in inches or centimeters.
- Sensor Height. Distance measured from the bottom of the empty tank to the bottom of the transducer. Under factory configuration, this becomes the 4 mA set point. See Quick Steps.
- Fill Height. Distance measured from the bottom of the empty tank to the maximum fill height within the tank. Under factory configuration, this become the 20 mA set point. See Quick Steps.



Tank Level Settings

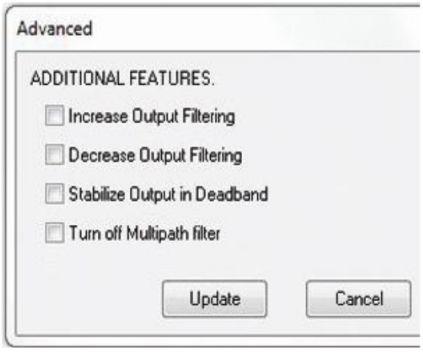
The options on the right of the WebCal screen to finalize the configuration.

- Write to Unit. Send your configuration into EchoPod.
- Advanced. Configure advanced settings. Read the section below on advanced setting options
- Factory Config. Return EchoPod® to the original factory configuration.
- Clear Screen. Clears the screen of configuration settings.
- Config File. Name, save, open or print your configuration for later use.

The **Advanced** button is used for options available when setting up the sensor with special, non-standard features. Many of these features are available for specific applications that may change from time to time. Consult WebCal's HELP file for the latest information on the use of any of these features.

The more commonly used Advanced features are the Invert Relay and Increase Output Filtering described below.

- **Increase Output Filtering.** Select this radio button to add additional filtering to the 4-20 mA output.
- **Decrease Output Filtering.** Select this radio button to remove all output filtering on the 4-20 mA output.



Advanced Settings

Before configuration can be completed:

- You must click the **Write to Unit** button to save the settings to the unit.
- Then, click **Wiring Diagram** for a hard copy of the EchoPod's settings.
- Finally, enter the file name under which you wish to save the configuration file and click **Save Config File.**

Configuration is now complete.

Disconnect the USB Fob before continuing to the next step: Mounting the EchoPod.
For updates to WebCal, or to make sure you're using the most up-to-date version available, click the **Update** tab on the top of the WebCal screen.

IV. Mounting the EchoPod

The EchoPod should always be mounted perpendicular to the liquid surface and installed using the provided Viton mounting gasket. Always use fittings, with thin wall mounting structures that isolate the transducer. This will provide the best performance over the lifetime of the product.

The preferred mounting fitting for the EchoPod is the reducer bushing (2" thread x 1" thread). For further mounting products and solutions call 1-800-743-7431.

For installations in existing 2" fittings:

1) Use the 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 1" inch Bulkhead fitting,

2) Use a Bulkhead fitting 2" thread adaptor 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 1” Flange. The flange fitting must have a riser for the threaded section. Drilling and tapping a blind flange is not recommended.

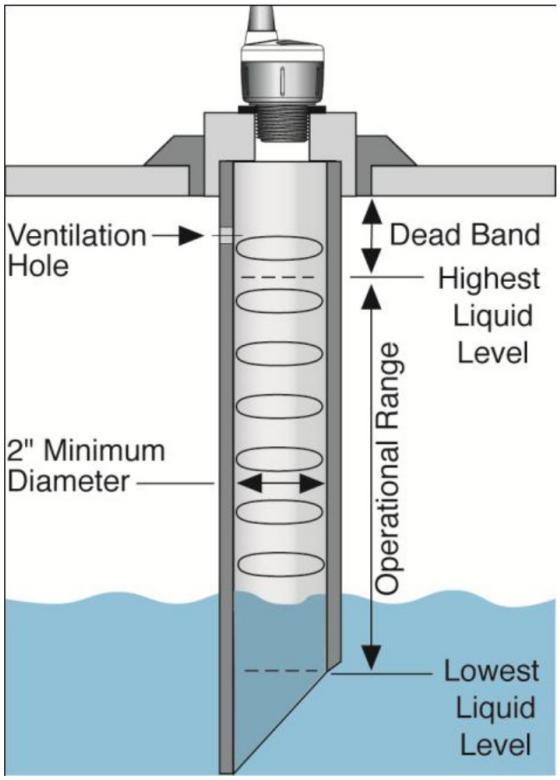
2) While installations directly into a 1” metal fitting are not recommended, acceptable results may be obtained if the 1” fitting is a half coupling in form and the outer diameter of the coupler is tightly wrapped in vinyl tape to dampen vibrations.

For installations in open tanks and sumps:

1) Use a side mount bracket, which includes a 2” x 1” thread reducer bushing.

V. Using a Standpipe (Optional)

A standpipe may be used to dampen turbulence, separate surface foam from the point of measurement or increase performance in heavy vapor. Select a 3” pipe (a 2” pipe is usable, but the minimum) and attach the EchoPod 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 become turbulent.



Mounting with a Standpipe

VI. Electrical Connection

After mounting the EchoPod, make the necessary electrical connections.

General notes for 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 installed
- Wiring should always be completed by a licensed electrician
- Supply voltage should never exceed 28 VDC
- Protect the sensor from excessive electrical spikes by isolating the power whenever possible
- The sensor materials must be chemically compatible with the liquids to be measured
- Design a fail-safe system for possible sensor and/or power failure
- Never use the sensor in environments classified as Hazardous

A general wiring diagram is shown on the following page.

White and **Green** leads are reserved for use with WebCal 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 EchoPod USB.

⚠ ***Never allow the white or green wires to touch any power supply.***

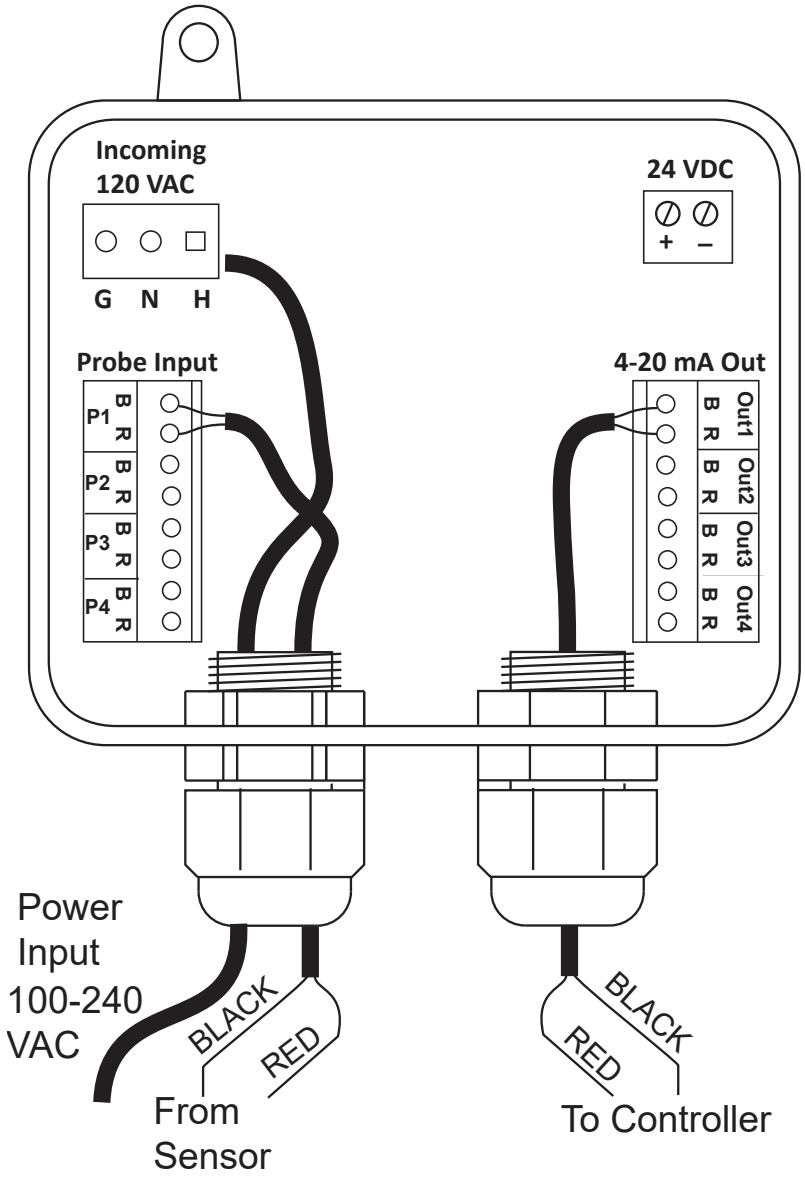
Red and **Black** leads are for connection to a 24 VDC power supply or to a 4-20 mA loop power source. The red and black wires can be extended more than 1000 feet using 22 gauge or larger wire, however do not extend the green and white wires during configuration.

⚠ CAUTION ⚠
1. There are live circuits inside the controller even when the power switch on the front panel is in the OFF position. Never open the front panel without first disconnecting power from the outlet. Prewired controllers are supplied with an 8 foot, 18 AWG power cord with USA style plug. A #1 Phillips driver is required to open the front panel.
2. Low voltage signal wires (probes, flow switch, water meter, etc.) should never be run in conduit with high voltage (like 115VAC) wires.
3. Never attempt to land connections to the controller without first disconnecting power from the outlet.
4. Do not block access to disconnect power during mounting and installation.
5. The controller should be connected to its own isolated circuit breaker, and for best results, the ground should be a true earth ground, not shared. Any attempt to bypass the grounding will compromise the safety of users and property.
6. The electrical installation of the controller must be performed by trained personnel only and conform to all applicable National, State and Local codes.
7. Operation of this product in a manner not specified by the manufacturer may result in damage to equipment or persons.
8. Avoid mounting in locations that expose the controller to direct sunlight, vapors, vibration, liquid spills or extreme temperatures; less than 0°F (-17.8°C) or greater than 120°F (50°C). EMI(electromagnetic interference) from radio transmissions and electric motors can also cause damage or interference and should be avoided.

Echopod Set-Up with a MegaTron

Step 1:
The Echopod needs to be connected to a 24 VDC to power the sensor and the 4-20mA output to the Megatron's mA input. An Advantage Controls PSDC-24-Q can supply the power for 1-4 model DL10's. The PSDC-24-Q is sold separately.

PSDC-24-Q Wiring



Echopod Set-Up with a MegaTron

Step 2:
Program the 4-20mA input by first getting the units of measure and number range set.

CUSTOMIZE MENU

Step 3:
Push the **SET UP RUN** button to get this screen. From here push **CUSTOMIZE** (Button 4) to go to the next screen.

```
>HOME SETUP<

SETPOINTS                DATE/TIME
CALIBRATION              CONFIGURE
TIMERS                     HISTORY
CUSTOMIZE               TOTALIZERS
ALARMS                      RELAYS
```

Step 4:
This is the Customize Screen. From here push **mA IN** (Button 9) on a MegaTron SS or select the appropriate **SYSTEM** number on a multi-system MegaTron.

```
>CUSTOMIZE<

UNIT NAME                FLOW METERS
RELAY NAMES                 NOTEPAD
SYS NAME
INPUT NAMES                   mA IN
                          RUN SCREEN
```

Step 5:
This is the Customize mA Screen. From here push **INPUT 1** (Button 1) to go to the next screen.

```
>CUSTOMIZE mA INPUTS<

INPUT 1
```

Step 6:
This is the Customize mA Input 1 Screen. From here you can set a **NAME** (Button 1), **UNITS** (Button 2) and **NUMBER** range (Button 3). Press desired button to go to the next screen.

```
>CUSTOMIZE mA INPUT 1<

NAME        mAIN1
UNITS           %
NUMBER      xxxxx
```

Step 7:
Set the value of **mA INPUT 1 NAME** by using the arrow keys. Then press **ENTER** to confirm and go to the previous screen.

```
mA INPUT 1 NAME

            [mAIN1      ]

USE UP/DOWN KEYS TO CHANGE
PRESS ENTER TO ACCEPT
```

Step 8:
Set the value of **TYPE OF UNITS** by using the arrow keys. Then press **ENTER** to confirm and go to the previous screen.

```
TYPE OF UNITS

                -->  %

USE UP/DOWN KEYS TO CHANGE
PRESS ENTER TO ACCEPT
```

Step 9:
Set the value of **NUMBER FORMAT** by using the arrow keys. Then press **ENTER** to confirm and go to the previous screen.

```
NUMBER FORMAT

              -->  xxxxx

USE UP/DOWN KEYS TO CHANGE
PRESS ENTER TO ACCEPT
```

Echopod Set-Up with a MegaTron

Step 10:
With the Echopod powered and connected to the MegaTron's 4-20mA input card suspend the Echopod so that it will be sensing an empty tank. After giving it a full minute to average to this empty level leave it sensing your empty drum.

Step 11:
Follow this by going to the Calibration menu and setting the MAX to your full drum amount (example: 30 gallons) and the MIN to 0 gallons.

Go into the MegaTron's mA Input Calibration menu with the Echopod sensing an empty drum. Select the appropriate input and note the A/D value beside the 4mA calibration key. Go into the 4mA calibration pop-up screen and see what the A/D is now showing. It should be within 15% of the original calibrated A/D value. If it is press Enter to recalibrate the input to the signal the Echopod is sending for an empty tank.

CALIBRATION MENU

Step 12:
Push the **SET UP RUN** button to get this screen. From here push **CALIBRATION** (Button 2) to go to the next screen.

```
>HOME SETUP<

SETPOINTS                DATE/TIME
CALIBRATION              CONFIGURE
TIMERS                     HISTORY
CUSTOMIZE              TOTALIZERS
ALARMS                      RELAYS
```

Step 13:
Select the mA Inputs (Button 7) to go to mA Input calibration. Then select the mA input to calibrate.

```
>CURRENT LOOP CALIBRATION<

INPUT 1
INPUT 2
INPUT 3
```

Step 14:
This will be the **mA INPUT CALIBRATION** screen. From here select **MAX** (Button 3) to set what the controller needs to display when it is receiving a 20mA signal. Use number keys to select and **ENTER** to set value.

```
>mA INPUT 1 CALIBRATION<

20mA          14500
4mA            2900
MAX            200 PPM
MIN              0 PPM
OFFSET                   DISABLED
```

Step 15:
From the **mA INPUT CALIBRATION** screen select **MIN** (Button 4) to set what the controller needs to display when receiving a 4mA signal. Use number keys to select and **ENTER** to set value.

```
>mA INPUT 1 CALIBRATION<

20mA          14500
4mA            2900
MAX            200 PPM
MIN              0 PPM
OFFSET                   DISABLED
```

WARNING:
The 20mA and 4mA calibration selections (Buttons 1 & 2) should only be selected if a 4-20mA signal generator is connected to the input.

```
>mA INPUT 1 CALIBRATION<

20mA          14500
4mA            2900
MAX            200 PPM
MIN              0 PPM
OFFSET                   DISABLED
```

Echopod Set-Up with a MegaTron

If these are improperly set by entering an A/D value for the settings while the input is not seeing the correct signal a signal generator will be required to reset the calibration.

These selections are for calibrating the raw analog to digital (A/D) reading when a 4mA and/or 20mA signal is being sent into the input from an external device to match the controller's A/D reading to the signal value.

Units supplied with 4-20mA inputs from the factory come with the 4 and 20mA positions calibrated in the A/D with the A/D value seen at the time of the calibration displayed to the right of the position in the Input Calibration menu.

```
      >mA INPUT 1 CALIBRATION<

20mA          14500
4mA            2900
MAX          200 PPM
MIN            0 PPM
OFFSET                      DISABLED
```

These A/D values will vary based on your unit type and the individual input circuit. Typically, an XS and MT will have around 5800 for 20mA, and 1100 for 4mA. If these are improperly set by entering an A/D value for either setting without the actual 4 or 20 signal being sent a signal generator (HT-SIM-MOP) will be required to reset the raw calibration of the input.

Step 16:
Set your desired low alarm for the mA input in the Set Points menu of the MegaTron.

SET POINTS MENU

Step 17:
Push the **HOME** button to leave Calibration and go back to the HOME menu screen. From here push **SETPOINTS** (Button 1) to go to the next screen.

```
            >HOME SETUP<

SETPOINTS                   DATE/TIME
CALIBRATION                 CONFIGURE
TIMERS                        HISTORY
CUSTOMIZE                  TOTALIZERS
ALARMS                        RELAYS
```

Step 18:
This is the Setpoints Setup Screen. From here push **mA IN** (Button 7) to go to the next screen

```
          >SETPOINTS SETUP<
SENSORS
                                mA IN
```

Step 19:
This is the mA Inputs Screen. From here push **INPUT 1** (Button 1) to go to the next screen.

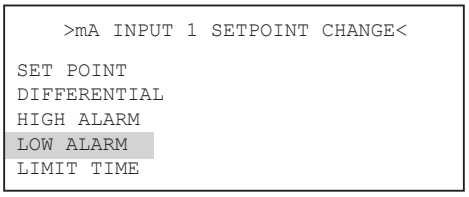
```
             >mA INPUTS<
INPUT 1
```

Step 20:
This is the mA Input 1 Setpoint Review Screen. From here push **SETPOINTS** (Button 5) to go to the next screen.

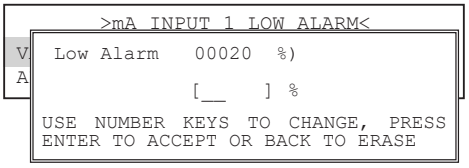
```
        >mA INPUT 1 SETPOINT<
             mAIN1
      SET POINT:   500%
                   RISING CONTROL
    DIFFERENTIAL:  20
   HIGH ALARM AT:  1000(OFF  )
    LOW ALARM AT:  0(OFF  )
      LIMIT TIME:  00:01 HH:MM
SETPOINTS
```

Echopod Set-Up with a MegaTron

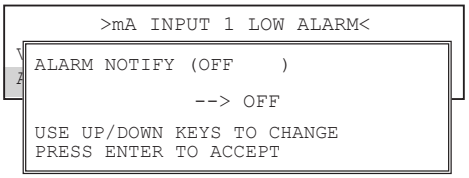
Step 21:
This is the mA Input 1 Setpoint Change Screen. From here you can set **LOW ALARM** (Button 4) and other settings. Press the desired button to go to the next screen



Step 22:
Set the **LOW ALARM** settings for **VALUE** (the reading that will give a Low Alarm) and **NOTIFICATION**. Press **ENTER** to confirm and go to the previous page.



Step 23:
Set the value of the **ALARM NOTIFY** by using the arrow keys. Then press **ENTER** to confirm and go to the previous screen.
Note: Display - will appear on controller display only, Remote - appears through email if controller is online, or both Dis/Remote



Press **BACK** to return the mA Input 1 Set Point.

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- Feed Timers
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- Glycol Feed Systems
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