EchoPulse® + EchoPro®

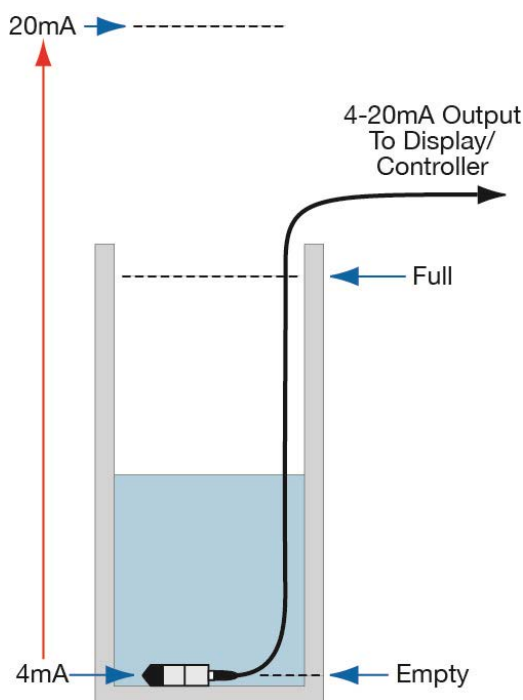**Radar Liquid Level Transmitter**

FLOWLINE™
LEVEL BEST

Addendum for LR30 & LR31 Series

### CONFIGURE LR30 OR LR31 TO A PRESSURE TRANSMITTER RANGE

Pressure Transmitters have a fixed span so the 4-20mA output cannot be changed and the application must accept the span as is. In a typical application where a pressure transmitter is used, the location of 4mA will be at the bottom of the tank (see below). The 20mA will be located well above the top of the tank due to the fixed span of the device (see below).

Radar transmitters have a span that is adjustable to match the shape of the tank. Typically, the 4mA will be located at the bottom of the tank and the 20mA will be located at the Full level of liquid (see below).

4-20mA span w/ Pressure Transmitter   **4-20mA span w/ Radar Transmitter**
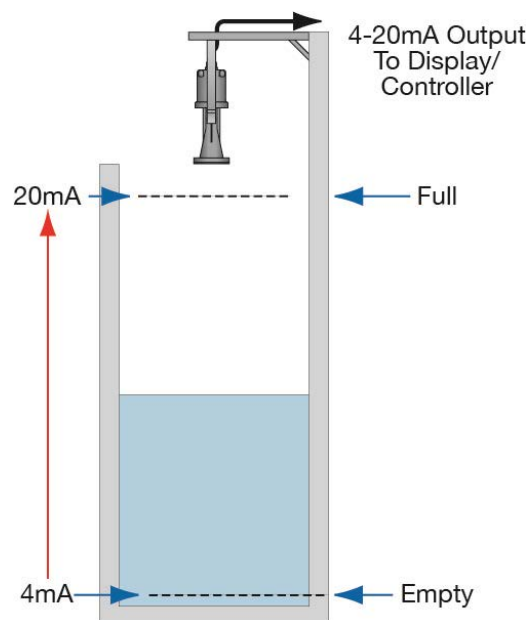
The radar transmitter can be configured to match the fixed span of a pressure transmitter. Follow the instructions below to configure your radar transmitter like a pressure transmitter.

STEP 1 – IDENTIFY THE SPAN OF THE PRESSURE TRANSMITTER

To span DataView™ to the full span of the pressure sensor, you will need the following information:

- Maximum Pressure (**MP**) of the sensor in psi
- Specific Gravity (**SG**) of the liquid
- Units of operation (**Feet** or **Meters**)
- Maximum Liquid Height (**MLH**)
    - o The equivalent height of liquid (in a virtual tank) at the full span of the transmitters (at 20mA)
        - To calculate MLH in Feet ➔ **MLH** = (**MP** x 2.31) / **SG**
        - To calculate MLH in Meters ➔ **MLH** = (**MP** x 0.704) / **SG**

Example in Feet:

- *If **MP** = 15 psi and **SG** = 1.05, then*
- ***MLH** = 15 x 2.31 / 1.05 = 33.00 ft...*
- ***MLH** = 33.00 feet full*

*Example in Meters:*

- *If **MP** = 15 psi and **SG** = 1.05, then*
- ***MLH** = 15 x 0.704 / 1.05 = 10.057 m...*
- ***MLH** = 10.057m full*
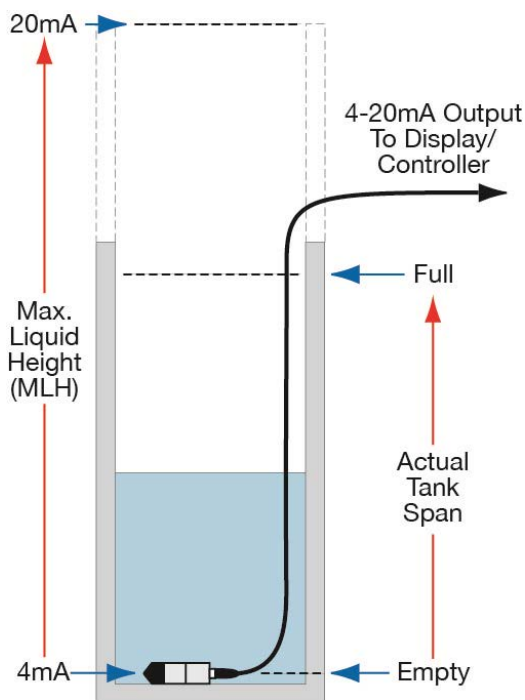
STEP 2 – MEASURE THE SENSOR HEIGHT OF THE RADAR TRANSMITTER

Measure the distance from Empty to the measurement point of the radar transmitter. With the EchoPulse LR30 series, the measurement point is the bottom of the sensor. This measurement is critical so accuracy is of upmost importance.
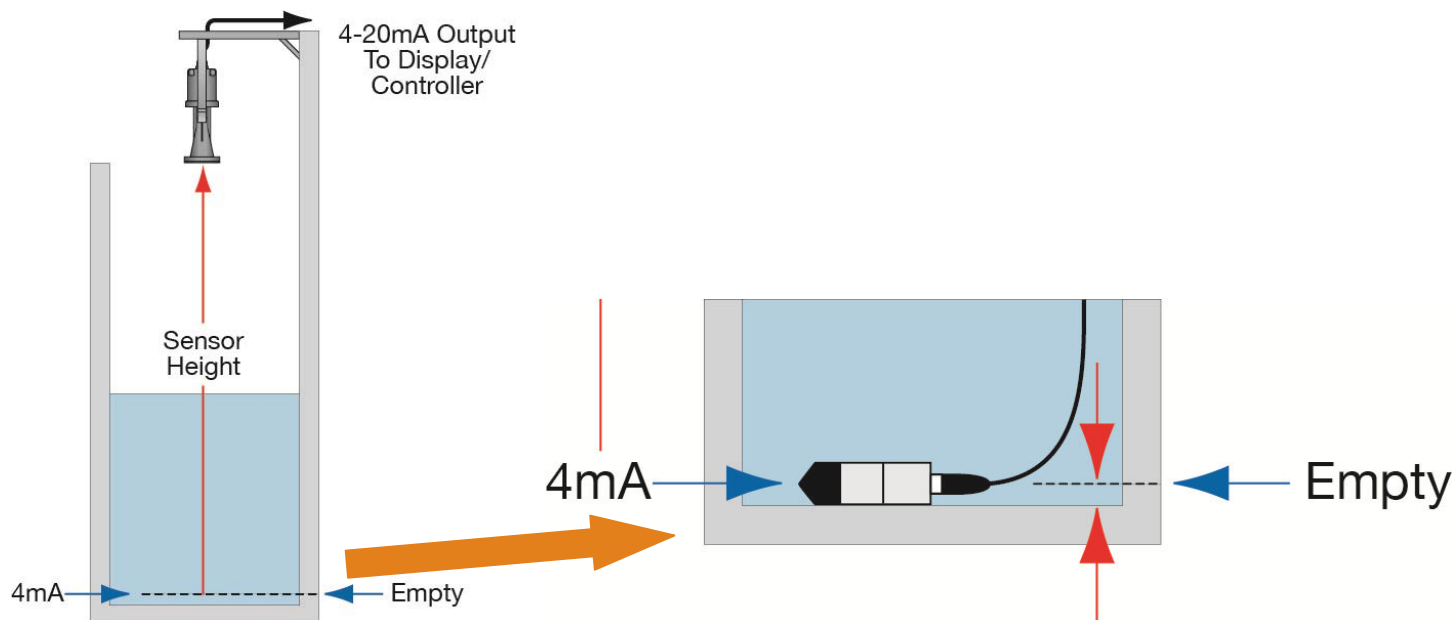
Note: The 4mA location for the pressure transmitter will be slightly off the bottom of the tank. Take this into account when calculating the Sensor Height Setting.

STEP 3 – DETERMINE THE OFFSET DISTANCE

The difference between the operational range of the tank and the actual span of the pressure transmitter is the Offset Distance. Simply subtract the Sensor Height (SH) from the Maximum Liquid Height (MLH) to find the Offset Distance.

Example in Feet:

- **SH** = 20.0 feet
- **MLH** = 33.00 feet full
- **Offset Distance = MLH - SH**
    - o 33.00' – 20.00' = 13.0'
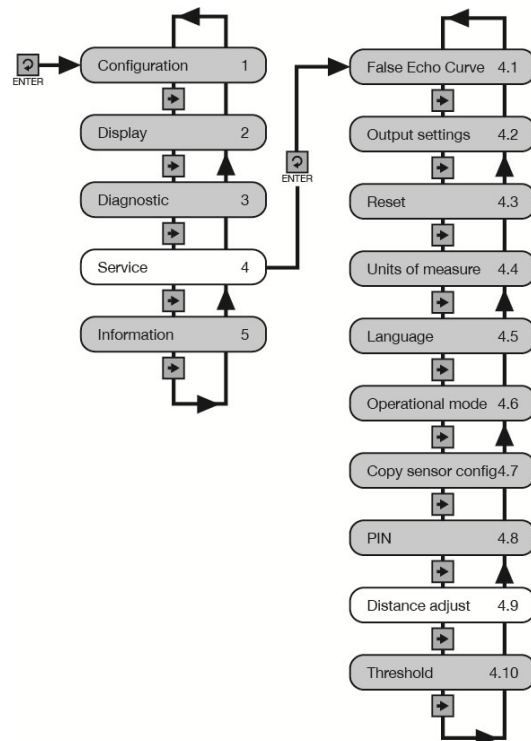   - o Offset Distance = 13.0'

Example in Meters:

- **SH** = 6.100m
- **MLH** = 10.057m full
- **Offset Distance = MLH - SH**
    - o 10.057m – 6.100m = 3.957m
    - o Offset Distance = 3.957m
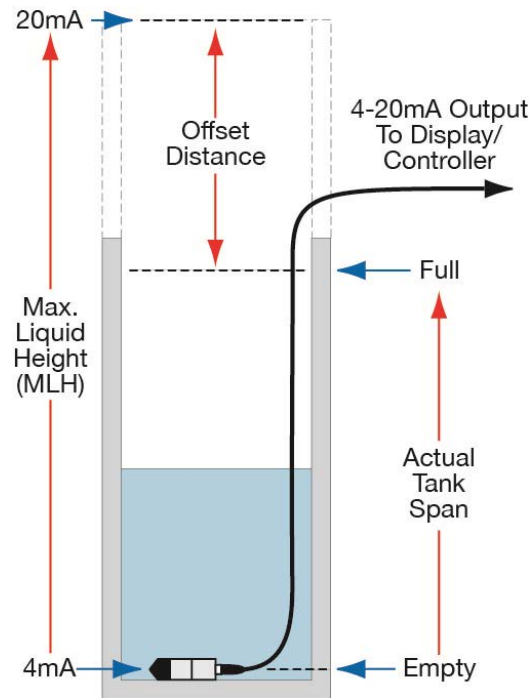
STEP 4 – RECORD THE FACTORY DISTANCE ADJUST VALUE

The radar transmitter has a factory set Distance Adjust value. This is one of the settings you will change in the following steps. Prior to the next steps, it is required to record this setting so that in the future you need to change the setting back to a normal span, you will need this setting.

1. From the Main Screen, press Enter to advance into the Main Menu.

2. Press **Right Arrow** repeatedly until the arrow is next to Service (4).

3. Press **Enter** to advance into the Service Menu.

4. Press **Right Arrow** repeatedly until the menu shows Distance Adjust. (4.9).

5. Record the Distance Adjust. setting.

6. When done, press **ESC** to return to the Main Menu, and press **ESC** a second time to return to the Main Screen.

STEP 5 – CALCULATE THE NEW DISTANCE ADJUST

The New Distance Adjust is when you add the Offset Distance to the Factory Distance Adjust

- New Distance Adjust = Offset Distance + Factory Distance Adjust
    - 13.00' + -0.61' = 12.39'
    - 3.957m + -0.187m = 3.770m

STEP 6 – CONFIGURE THE RADAR TRANSMITTER

The radar transmitter will have 6 settings to configure: Empty, Full, Range, Dead Band, Distance Adjust and Display. Refer to the Radar Trasnmitter's Quick Start and/or Manual for detailed information in setting the actual values.

EchoPulse LR30 Series

- Empty = Max. Liquid Height (MLH) value
- Full = 0.00 feet or 0.000 meters
- Range = Max. Liquid Height (MLH) value
- Dead Band = Leave in Factory Setting
- Distance Adjust = Change to New Distance Adjust
- Display = Set display to Height
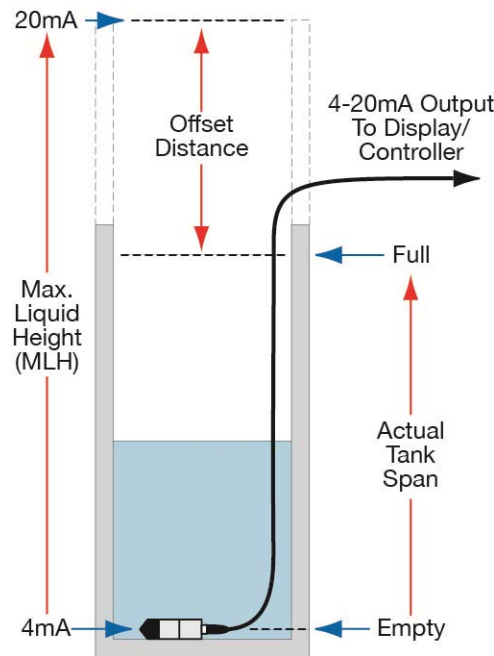
EchoPro LR31 Series

- Sensor Heigth = Max. Liquid Height (MLH) value
- Fill-Height = Max. Liquid Height (MLH) value
- Range = Max. Liquid Height (MLH) value
- Dead Band = Leave in Factory Setting
- Distance Adjust = Change to New Distance Adjust
- Display = Set display to Height

Example in Feet:

- Empty = 33.00'
- Full = 0.00'
- Range = 33.00'
- Dead Band = 1.00'
- **Distance Adjust = 12.39'**

Example in Meters:

- Empty = 10.057m
- Full = 0.000m
- Range = 10.057m
- Dead Band = 0.300m
- **Distance Adjust = 3.770m**

Example in Feet:

- Sensor Height = 33.00'
- Fill-Height = 33.00'
- Range = 33.00'
- Dead Band = 1.00'
- **Distance Adjust = 12.39'**

Example in Meters:

- Sensor Height = 10.057m
- Fill-Height = 10.057m
- Range = 10.057m
- Dead Band = 0.300m
- **Distance Adjust = 3.770m**

Flammable, Explosive or Hazardous Applications:

EchoPulse® LR30 series is available <u>only</u> as a General Purpose transmitter and EchoPro® LR31 series is available as an Intrinsically Safe transmitter only. This addendum is solely designed to show how to configure EchoPulse® and EchoPro® as a pressure transmitter. Refer to the products individual manual for information pertaining to all electrical wiring of the transmitter in accordance with applicable NEC codes and safety requirements.