

**Larson Electronic Mfg.**  
**System 102**  
**Technical Help Manual**

**Introduction**

The 102 tank level monitoring system is a capacitance type continuous level detector used to measure the contents of the fresh water and holding tanks. It uses two metallic pads consisting of aluminum foil tape strips that are cemented to the outside vertical surface the tank wall. These two pads are mounted approximately two inches apart and extend from the empty water line of the tank to the full water line. Each of the two pads should have at least 15 square inches of area and at most 50 square inches of area.

In between the two pads is mounted an electronic module which does the sensing. It is connected to each of the two aluminum foil pads with two 2" square copper foil pads. The purpose of the copper pads is simply to allow a reliable solder connection to be made to the wires (never attempt to solder wires directly to aluminum foil as the solder joint will corrode and the wires will fall off in about one week). The copper pads do not have to make a direct electrical connection to the aluminum foil, they make a *capacitive* connection instead.

The two aluminum foil pads on the tank walls, effectively form the plates of a capacitor. An electronic signal is transmitted across the pads and as the water level rises in the tank, the electronic signal increases. This signal is converted to a DC voltage and is sent to the monitor panel where lights are turned on to indicate the level of water in the tank.

**Tank Measurement**

To measure the level of a tank, simply push the button on the display panel corresponding to the tank you wish to measure. The lights on the panel will turn on in sequence, indicating the level in the tank.

**Calibration**

The first thing to check in this system is the calibration of the tanks. First fill the suspected tank with water. If the reading goes to full before the tank is full or the tank fills completely and the reading never reaches full, the calibration is off. The procedure for re-calibration is simple, first fill the tank. Second, using an adjustment tool (this is supplied with the vehicle attached to the warranty/operating instruction card), simultaneously push the button for that tank and rotate the adjustment located above the button and behind the face plate counter-clockwise until some (but not all) of the lights turn off in sequence. Then slowly rotate the adjustment clockwise until the full light is completely on. Repeat this procedure as necessary for the remaining tanks. The system is now calibrated properly.

## Trouble Shooting a Malfunctioning System

If after calibration the system is still found to be malfunctioning, the following list of common symptoms and causes can be helpful in finding the problem. They are listed so that the most probable cause is listed first:

### FULL TANK

#### Panel reads empty.

Possible causes:

1. Red or blue wire on module not connected to panel.
2. Blue wire on module shorted to ground.
3. Aluminum foil pads shorted to ground.
4. Bad module.
5. Bad panel.

#### Will not adjust up to full.

Possible causes:

1. Foil pads not large enough (minimum 15 sq. in. per pad, two pads per tank).
2. Red or blue wire on module not connected to panel.
3. Foil pads too far apart (maximum 4 in. apart).
4. Bad module.
5. Bad panel.

#### Will not adjust down from full.

Possible causes:

1. Black wire on module not connected to battery ground.
2. Aluminum foil pads shorted together.
3. Blue wire on module shorted to +12V.
4. Red and blue wires on module reversed.
5. Bad module.
6. Bad panel.
7. Foil pads too large (maximum 50 sq. in.).

#### Some of the lights stay off out of sequence.

Possible causes:

1. Bad Panel.

## EMPTY TANK

### All of the lights stay on.

Possible causes:

1. Red and blue wires on module reversed.
2. Black wire on module not connected to battery ground
2. Blue wire on module shorted to +12V.
3. Foil sensors touching or too close together (minimum 2" separation).
4. Bad module.
5. Bad Panel.

### Some of the lights stay on.

Possible causes:

1. Red and Blue wires on modules reversed
2. Tank not empty.
3. Foil sensors too close together.
4. Bad module.
5. Bad panel.

### Some of the lights stay on out of sequence.

Possible causes:

1. Bad Panel.

## FULL OR EMPTY TANK

### Lights do not turn on when button is pushed.

Possible cause:

1. No power to panel.
2. Power and ground wires on panel reversed.
3. Bad panel.

### Lights stay on when buttons are not pushed.

Possible causes:

1. Panel face plate warped due to incorrect mounting.
2. Bad panel.

**Panel won't track water and lights won't adjust down from full.**

Possible causes:

1. Black and Blue tank module wires are reversed.
2. Red and Blue wires that hook to the tank module are shorted.
3. Aluminum foil sensor pads are shorted together.
4. Defective tank module (Black box on tank).

**Panel won't track water but lights will adjust down from full.**

Possible causes:

1. Red and blue wires that hook to the tank module are reversed.

The causes listed above constitute the vast majority of problems occurring with our system. However, should any problems occur that cannot be solved using this manual, you may call our service department for additional help. Our toll free number is **1-800-456-4498**.