

## Operating Principles

The Solinst Model 107 TLC Meter measures temperature, level and conductivity. Temperature and conductivity readings are displayed on the LCD screen and water level is read from the tape as with a conventional Water Level Meter. When the probe is immersed in a conductive fluid, a circuit is completed and the water level is indicated by a tone and light that lasts about 1 second.

Conductivity measurements are read from 0-80,000  $\mu\text{S}/\text{cm}$  with readings giving accuracy of 5% of reading or 100  $\mu\text{S}$  (whichever is greater). The 'smart probe' displays conductivity which has been standardized to 25°C, i.e. Specific Conductance (displayed as EC). Temperature Coefficient is 2.0%. Temperature measurements are read from -15°C to +50°C.

## Equipment Check

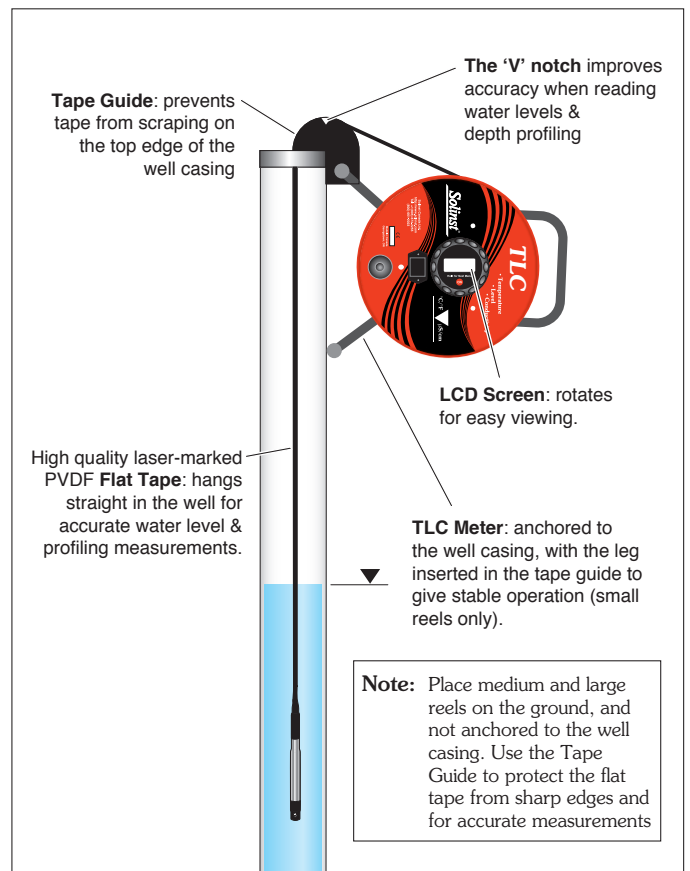
Upon receipt of your Solinst Model 107 TLC Meter, and always before heading out to the field, the following checks are recommended:

1. Turn the meter on. The display should show "EC 0000 $\mu$ " and air temperature (e.g. 21.1°C). If the battery is low, a 'LOW BATT' warning appears and the 9 volt alkaline battery should be replaced. If "No Comm" appears, check the Probe connection to the tape (call Solinst if message persists). If the display is blank, install a new 9V battery.
2. Ensure the probe tip and shroud are clean.
3. Test probe in fresh calibration solution close to the range you expect to measure in the field. Allow suitable time for equilibration. If readings are not within an acceptable range, conduct a user calibration. (See Calibration Instructions).

## Taking Measurements

### Notes:

1. The zero measurement point of the TLC Meter is the tip of the shorter sensor pin visible within the shroud at the bottom of the probe.
  2. If the display indicates 'LOW BATT' there is still some life left in the battery, but it is recommended that you change the batteries as soon as possible.
1. Turn the meter on and lower the probe into water. A tone and light indicate that water has been reached and the depth can be read off the tape and recorded. The LCD screen is blacked out for about one second as the probe enters water. A weaker tone sounds with a quick red light as the probe is removed from water. Lower and raise the probe slowly a few times to verify the depth.
  2. Once in water, the screen displays specific conductance (EC) and temperature of the water at the zero point. Lower the probe to the desired depth. Record the depth and the associated conductivity and temperature readings when stabilized. Allow at least 30 seconds/°C of temperature change for stabilization.  
**To conserve battery power, the display has an auto off after 8 minutes of use.** If the display is blank when you wish to take a measurement, click the ON button to display temperature and conductivity readings.
  3. Repeat at each desired depth allowing 30 seconds/°C temperature change for stabilization.
  4. After each use remove the probe shroud and clean the sensor pins with a soft cloth, then rinse thoroughly with de-ionized water (see cleaning section for more details).
  5. To turn the TLC Meter off, press and hold the ON button to display "Press 2X for OFF", then press the ON button 2 times quickly.



## Tape Guide Instructions

1. Fit the Tape Guide over the top of the well, small end in.
2. Insert the leg of the TLC Meter into the hole on the Tape Guide and rest the TLC Meter on the side of the well casing (small reels only, see diagram).
3. Take all measurements at the 'V' notch on the Tape Guide, and adjust readings according to the offset stamped on the Tape Guide (i.e. subtract 6 cm or 2/10 ft).
4. When finished, store the Tape Guide by clipping it onto the support bracket on the back of the TLC Meter.

## Cleaning

1. Pull the plastic shroud straight off the probe (do not twist).
2. Clean probe and sensors with a cloth or paper towel.
3. To remove hard deposits or stains on the probe and sensor pins, use either pure white vinegar (acetic acid) or CLR diluted by 50%. Try a 30 minute soak followed by gently rubbing with Q-tip, or soft cloth.
4. Rinse thoroughly with de-ionized water.
5. If about to calibrate rather than storing the TLC, rinse in the calibration solution you are using according to the instructions overleaf.
6. Replace the shroud by rotating it until it seats, then push to lock in place. This is important as it can affect conductivity readings.

## Conductivity Sensor

User calibration allows for adjustment of a TLC Meter accurately when the probe has been degraded slightly due to mechanical, biological or chemical affects. If readings of calibration solutions are outside the 5% accuracy range, the user can conduct a recalibration at 1, 2, 3, or 4 separate conductivity levels, using standard solutions (1413, 5000, 12,880, or 80,000  $\mu\text{S}/\text{cm}$ ). User calibrations are required regularly; the frequency will depend on usage and monitoring environment. As a precaution, calibration can be done before every usage.

### Calibration Instructions



#### Calibration Video

2-Point using  
1413 & 5000  $\mu\text{S}/\text{cm}$

[www.solinst.com/Prod/107/107ins/107insd3.html](http://www.solinst.com/Prod/107/107ins/107insd3.html)



#### Notes:

- For highest accuracy, it is recommended to use a 2-point calibration with solutions closest to your expected conductivity range in the field - starting with one solution below that range, and one above.
- The de-ionized water, calibration solutions and the probe should all be at room temperature when conducting the calibration.
- Calibrate only with 1413, 5000, 12,880 and 80,000  $\mu\text{S}/\text{cm}$  solutions. Calibrating with other solutions will cause errors.
- Clean probe **thoroughly** before each calibration step by rinsing in de-ionized water until the conductivity reading reaches  $\sim 20 \mu\text{S}$  or less.
- Do not let the probe rest on the bottom of the cylinder.
- Always ensure that no bubbles are trapped inside the probe shroud. Air bubbles will result in inaccurate calibrations.

- Select fresh calibration solution of the range(s) closest to what you expect to measure in the field.
- Starting with the lowest conductivity calibration solution, clean and rinse the probe with DI water, then rinse with the calibration solution.
- Insert the probe into the calibration solution, stir to remove any bubbles from the sensor, and wait until the sensor has reached equilibrium.
- Press and hold the ON button repeatedly to scroll through the menu until you see the appropriate calibration point i.e: "Cal. @ 1413 $\mu\text{S}$ ".
- Press and hold the ON button once more until it says, for example, "Press 2x for 1413". Press the ON button 2 times quickly to calibrate the probe at the specified point.
- After "Cal Now Wait..." appears, the value of the conductivity calibration point will be shown on the main EC/T display.
- Repeat Steps 2-5 for each calibration solution you are using.
- Turn off the TLC Meter. The TLC Meter is now ready for field use.

### Restore Default Factory Settings (Firmware 2.01 and up)

See the Troubleshooting section below for a description of circumstances where a default factory settings restore may be required.

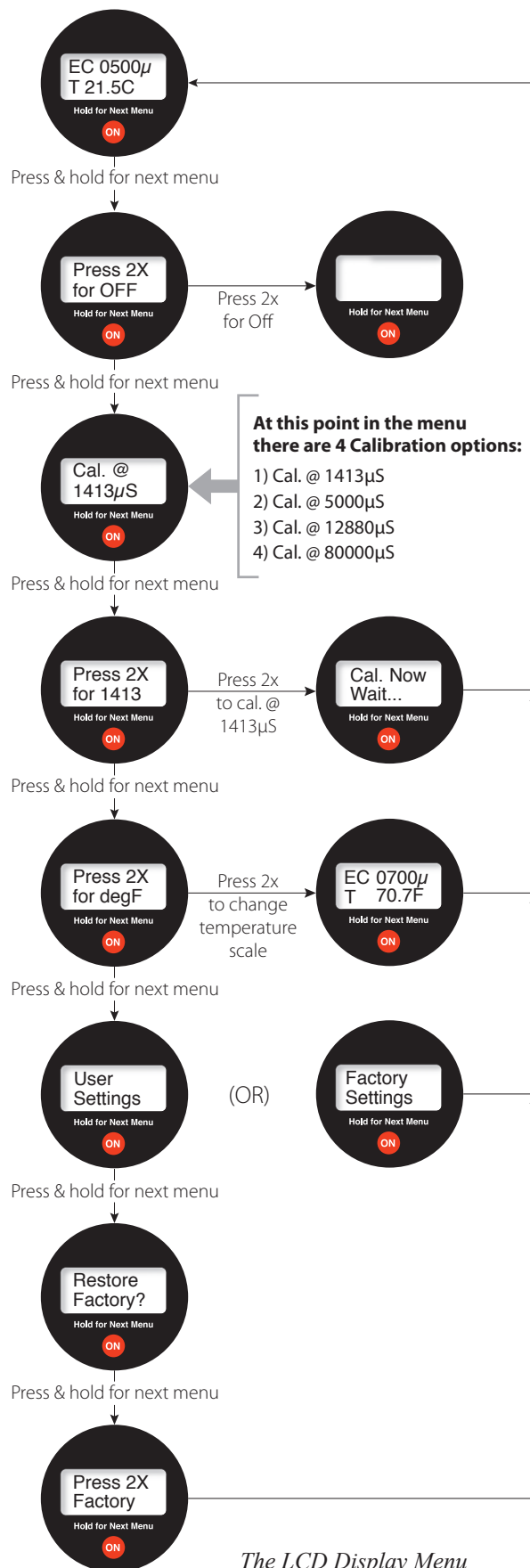
**Note:** To determine if you are using default factory settings or user calibrated settings, press and hold the ON button repeatedly to scroll through the menu until you see "Factory Settings" or "User Settings". If in "User Settings", the next menu will allow you to restore the factory default settings.

Follow these steps to restore the TLC probe back to factory default settings:

- Turn the TLC Meter ON. Press and hold the ON button repeatedly to scroll through the menu until you see "Restore Factory?".
- Press and hold the ON button until "Press 2X Factory" appears.
- Press two times quickly to restore the unit to the default factory settings. The screen will return to the main EC/T display.

### Troubleshooting

SYMPTOM	CAUSE	REMEDY
No sound when probe in water.	Reading conductivity too high.	Restore default factory settings following the instructions above.
No display, blank screen.	Dead battery.	Replace 9V alkaline battery.
	Wire disconnected on faceplate.	Check all connections inside reel for loose/disconnected wires - solder or reconnect.
Conductivity and temperature readings are inaccurate/bouncing.	Probe is dirty.	See cleaning instructions on Page 1.
	Reading conductivity inaccurately.	Restore default factory settings following the instructions above.
	Calibration needed.	Calibrate the probe following the instructions above.
"No Comm" always displayed.	Probe connection.	Ensure probe is properly connected to tape seal plug and that there are no leaks.
	Broken wire in tape.	Locate break in tape - splice and seal. (Contact Solinst)
	Wire disconnected on faceplate.	Check all connections inside reel for loose/disconnected wires - solder or reconnect.
TLC 2.01 (2.02) will not disappear.	No communication at probe.	Ensure the wiring to the probe is correct. Green and white wires properly connected.



**Note:** To change the temperature scale between  $^{\circ}\text{C}$  and  $^{\circ}\text{F}$ , press and hold the ON button repeatedly until "Press 2X for degF" displays. Press the ON button 2 times quickly to change the scale.

# Solinst® Connecting PVDF Laser Replacement Tape to Reel

Model 101 P7/107/122

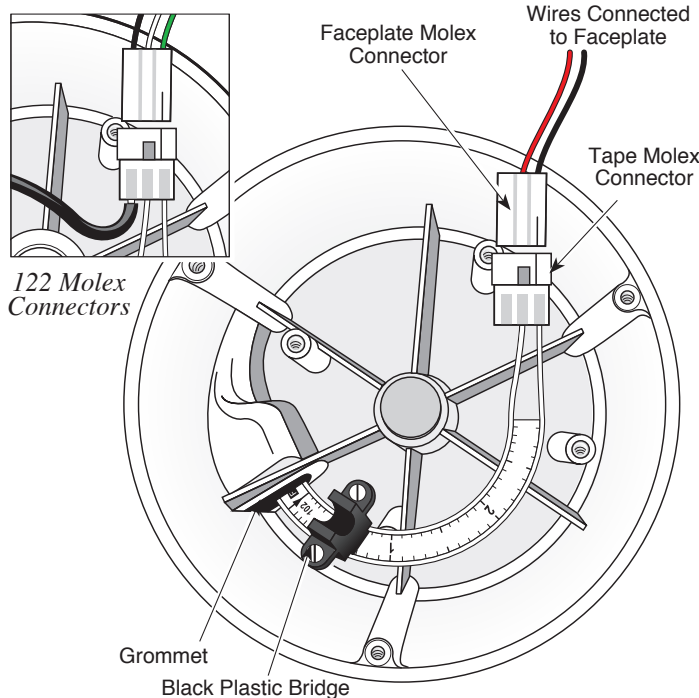
## Tools and Materials Needed

- Model 101 P7/107/122 Replacement Laser Tape Assembly, Includes:
  - Jumper Cable (New Tape - 3 Pin to 2 Pin) (#110508)
  - 3 Pin Molex Connector Housing
  - Grommet
- Phillips or Robertson Screwdriver
- Wire Cutters

**Note:** The Jumper Cable is only required if you are connecting the new Laser Tape to a Model 101 Water Level Meter that previously used polyethylene tape (with red ft/m markings). The Molex Connector from the faceplate electronics will have a 2 pin connection.

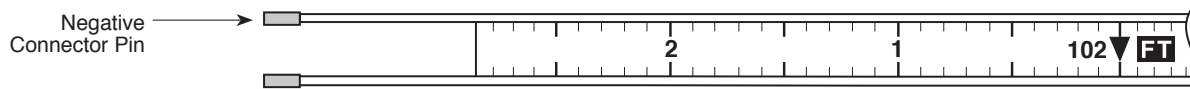
## Instructions

- Place the reel on a flat workbench with the faceplate up. Undo the three screws from the faceplate, and slowly remove it from the reel.
- Disconnect the old Tape Molex Connector from the Faceplate Molex Connector.



Inside View of 101 P7/107 Reel Hub

- Undo the two screws from the black plastic bridge holding the tape inside the reel hub, and remove the top piece of the bridge.

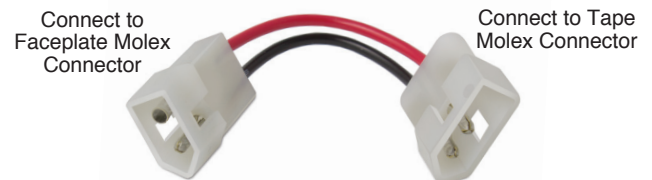


- Use the wire cutters to cut the old Tape Molex Connector from the old tape. Remove the ground wire from the 122 Tape Molex connector by pushing out the pin. Pull the old tape through the grommet and remove it from the reel.
- Feed the new Laser Tape through the grommet into the reel hub.

**Note:** The replacement tape comes with a new grommet. The old grommet may be replaced with the new one, or left in if not damaged.

- By hand, insert the connector pins into the new Tape Molex Connector housing. The negative connector pin is inserted into the terminal on the pointed side of the Tape Molex Connector, housing and the positive pin into the middle terminal. The negative pin is above the numbers on the tape (see diagram at the bottom of the page). The third terminal is left open for the 107 and 101 P7, the ground wire is inserted for the 122.
- Position the tape inside the reel hub with black plastic bridge over top and refasten the two screws to secure the tape to the reel.
- Connect the Tape Molex Connector to the Faceplate Molex Connector.

**Note:** If you are connecting the Laser Tape to a Model 101 that previously used polyethylene tape, you will need to use the Jumper Cable. Attach the 3 pin connection to the Tape Molex Connector, and the 2 pin connection to the Faceplate Molex Connector.



Jumper Cable (New Tape - 3 Pin to 2 Pin) (#110508)

- Attach the probe to the tape seal (existing or replacement probe). **See separate probe replacement instructions.**

**Notes:** The Model 107 probe comes factory calibrated, so there is no need to conduct a user calibration. If with time, recalibration is required, please refer to the Model 107 TLC Meter Operating Instructions.

- 101 P7/107:** With the probe in a glass of tap water, turn the Meter 'ON'. If the buzzer or light do not activate, or the Model 107 LCD does not show temperature or conductivity, check the probe and tape connections.

**122:** With the Probe in a glass of tap water and product, turn the Interface Meter to the 'ON' position. A steady tone and light indicates a product, while an intermittent tone indicates water. If the buzzer or light do not activate, check the probe and tape connections

- Replace the faceplate on the reel and re-secure the three screws.
- Slowly wind the tape onto the reel, holding to ensure no slack.

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Printed in Canada  
January 2, 2014  
(#110225)

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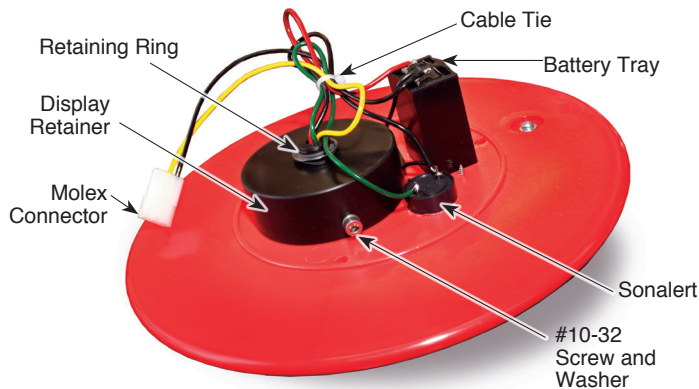
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### Tools and Materials Needed

1. 107 SC1000 Faceplate Assembly (spare) for the TLC Meter (#107719)
2. Phillips or Robertson Screwdriver
3. Soldering Wire and Iron
4. Small Flat Screwdriver
5. Socket Screwdriver (or 10-32 Hex Key)
6. External C-Ring Pliers
7. Any Available Plastic Adhesive/Sealant (e.g. silicone)



Front of the Model 107 TLC Meter Replacement Faceplate

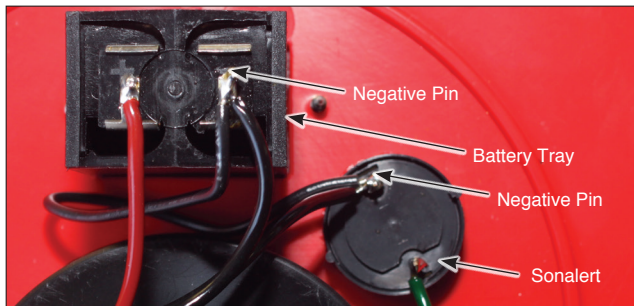


Back of the Model 107 TLC Meter Faceplate

### Instructions

1. Place the reel on a flat workbench with the faceplate up. Make sure the TLC Meter is turned off. Remove the battery.
2. Undo the three screws from the faceplate, and slowly remove it from the reel.
3. Disconnect the white Molex connector inside the reel hub.
4. Cut the cable tie that is wrapped around the wires in the reel hub.
5. Using the soldering iron, unsolder the wires from the connections on the battery tray and Sonalert.
6. Pull to remove the Sonalert from the faceplate, noting the position of the positive and negative pins (negative pin beside the battery tray).

**Note:** Removing the Sonalert will require a small amount of force, as the Sonalert is attached to the faceplate with sealant.



Unsolder the Wire Connections and Note the Pin Positions

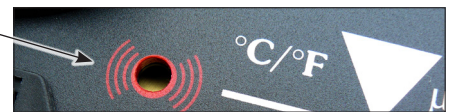
7. Undo the two screws holding the battery compartment and remove it from the faceplate.
8. Push the two pins (on black and yellow wires) out of the Molex connector.
9. Using the socket screwdriver, unscrew the #10-32 screw and washer from the display retainer.
10. Using the external C-ring pliers, remove the washer and retaining ring from the display retainer.
11. Push the display assembly and attached wires through the front of the faceplate.



Display Assembly

12. From the front of the **new** faceplate assembly, feed the wires of the display assembly through the opening in the display retainer. Position the display assembly in the display retainer until the base of the display assembly (rotating part of the assembly) becomes flush with the front of the new faceplate.
13. Refasten the #10-32 screw and washer to the display retainer.
14. Position and refasten the washer and retaining ring using the external 'C' ring pliers.
15. Insert the battery tray into the opening in the new faceplate (ensure it is facing the right way). Secure it to the faceplate using the two screws.
16. Apply a thin layer of plastic adhesive to the flat end of Sonalert. Avoid getting any adhesive in the hole.
17. Line up the hole in the Sonalert with the hole in the new faceplate and apply the Sonalert to the back of the faceplate (negative pin beside the battery tray).

Clear away any excess adhesive from the hole in the front of the TLC Meter faceplate.

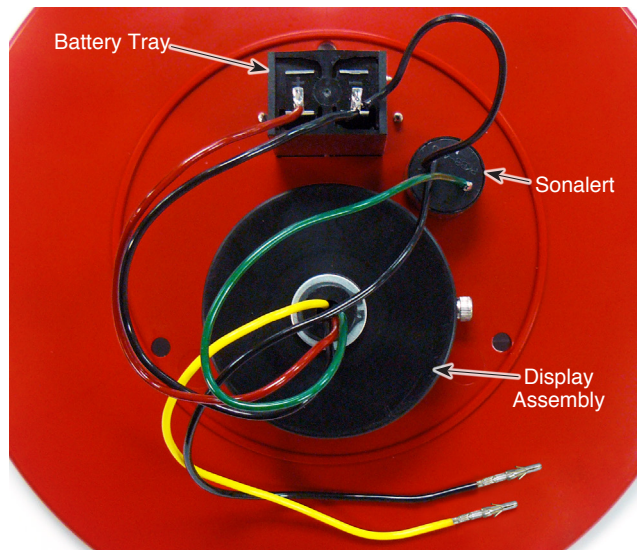


18. From the front of the faceplate, clear away any excess adhesive from the hole. Allow sufficient time for the adhesive to set.

Continued overleaf...

19. Looking at the photo below, resolder the wires to the appropriate pins:

- i) Solder the **shorter black wire** to the negative pin on the Sonalert and the other end to the negative pin on the battery tray.
- ii) Solder the **black wire from the display assembly** to the negative pin on the battery tray.
- iii) Solder the **red wire** from the display assembly to the positive pin on the battery tray.
- iv) Solder the **green wire** from the display assembly to the positive pin on the Sonalert.
- v) Solder the **longer black wire** to the negative pin on the Sonalert (opposite end will still have a Molex pin connected).



*Back of the TLC Meter Faceplate Showing Soldered Connections*

20. Insert the yellow wire with the Molex pin back into the Molex connector. The pin is inserted into the middle terminal of the connector.

21. Insert the black wire with the Molex pin into the terminal on the pointed side of the Molex connector (the third terminal is left unused).

22. Reconnect the Molex connector to the connector on the tape inside the reel hub.

23. Tie all the wires together with the new cable tie.

24. Replace the battery in the TLC Meter.

25. With the Probe in a glass of tap water, turn the TLC Meter 'ON'. If the buzzer or light do not activate, or the LCD does not show temperature or conductivity, check the soldered and Molex connections.

26. Secure the new faceplate to the reel with the three screws.

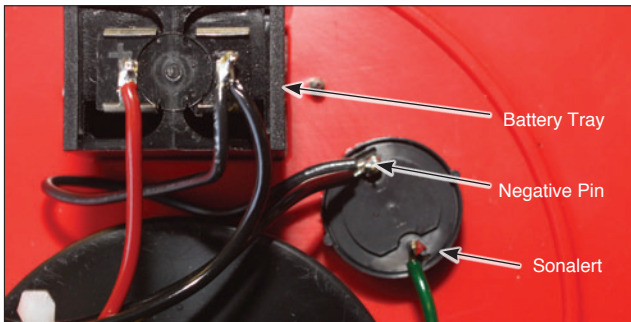
**Note:** Conductivity calibration is not required, but is an option. See the TLC Meter Operating Instructions for the calibration procedure.

### Tools and Materials Needed

1. Model 107 TLC Meter Replacement Sonalert Assembly (#108898), Includes:
  - Sonalert (#109967)
2. Phillips or Robertson Screwdriver
3. Wire Cutters and Strippers
4. Soldering Wire and Iron
5. Any Available Plastic Adhesive

### Instructions

1. Place the reel on a flat workbench with the faceplate up. Remove the battery. Undo the three screws from the faceplate, and slowly remove it from the reel.
2. Disconnect the Molex connector.
3. Cut the three wires connected to the Sonalert close to the two pins.

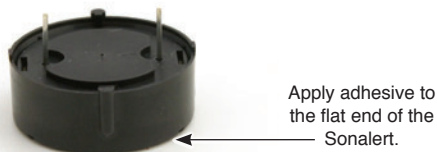


*Sonalert Position and Wire Connections*

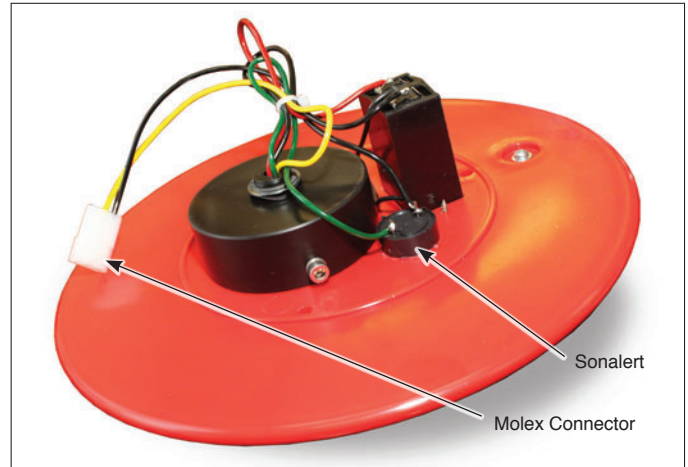
4. Remove the Sonalert from the faceplate, noting the position of the positive and negative pins (negative pin beside the battery tray).

**Note:** Removing the Sonalert will require a small amount of force, as the Sonalert is attached to the faceplate with sealant.

5. Apply a thin layer of plastic adhesive to the flat end of the new Sonalert. Avoid getting any adhesive in the hole.



*Sonalert (#109967)*



*Back of the Model 107 TLC Meter Faceplate*

6. Line up the hole in the Sonalert with the hole in the faceplate and apply the Sonalert to the back of the faceplate (negative pin beside the battery tray).

Clear away any excess adhesive from the hole in the front of the TLC Meter Faceplate.



*Front of the TLC Meter Faceplate*

7. From the front of the faceplate, clear away any excess adhesive from the hole.
8. Allow sufficient time for the adhesive to set.
9. Strip and solder the three wires to the two pins on the Sonalert. Green wire to the positive pin, and two black wires to the negative pin.
10. Reconnect the Molex connector, re-secure the faceplate with the three screws, and reinstall the battery.
11. With the Probe in a glass of tap water, turn the TLC Meter 'ON'. If the buzzer or light do not activate, or the LCD does not show temperature or conductivity, check the soldered connections on the Sonalert.