

TCM-4 Data Logger Battery Replacement Instructions

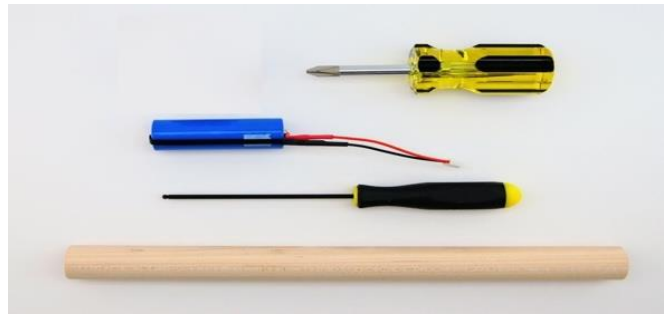
These instructions apply to the following product:

- TCM-4 Shallow Water Current Meter

These instructions assume that the user has purchased a TCM-4 Battery Replacement Tool Kit.

Materials:

- 3/32" Hex Driver
- 3/4" x 8" Pusher Dowel
- #2 Phillips Screwdriver (grip color may vary)
- Replacement "A" size lithium battery
- 2 replacement desiccant packs (optional)



Caution: This logger is sensitive to static electricity when removed from the logger housing. Avoid working on indoor carpet or in other static prone environments.

Important: The lithium metal batteries should be tested and conditioned (as necessary) prior to the first deployment. Conditioning is necessary to ensure that the battery has not become passivated during storage. (Passivation is a temporary build-up of resistance in the battery that prolongs its storage life, but reduces peak currents.) Conditioning is performed by running the battery briefly prior to field deployment. See Steps 26-29.

Instructions

1. Remove the nose cone of the meter, connect a USB cable and use MAT Logger Commander to stop the logger. Failure to stop a running logger will result in data loss.
2. Use the #2 Phillips screw driver to loosen the screw in the top end cap. Do not remove the screw.



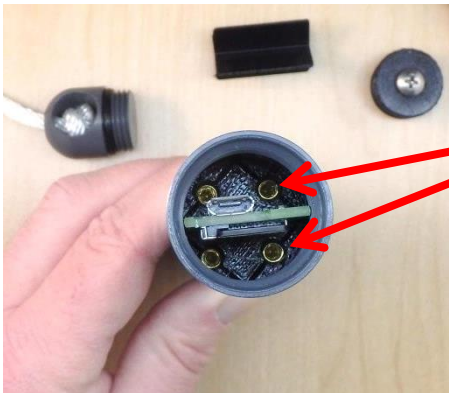
3. Gently pull the end cap up and out of the top of the carbon fiber housing.



4. Remove the "X" spacer from the housing.

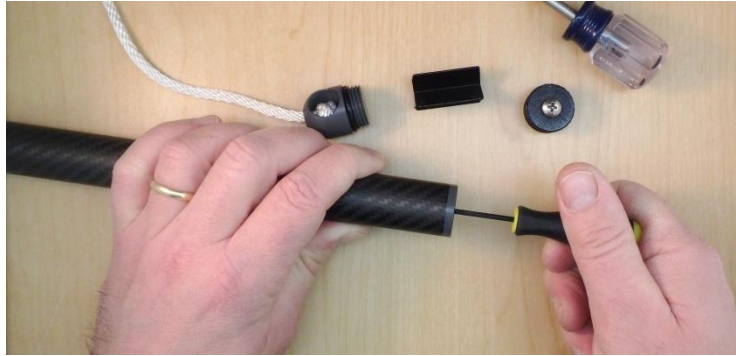


5. Look inside the USB end of the logger and locate the 4 brass setscrews within.

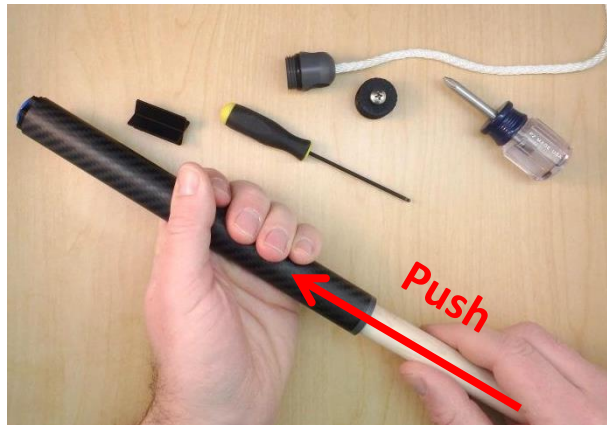


Set Screws (2 of 4)

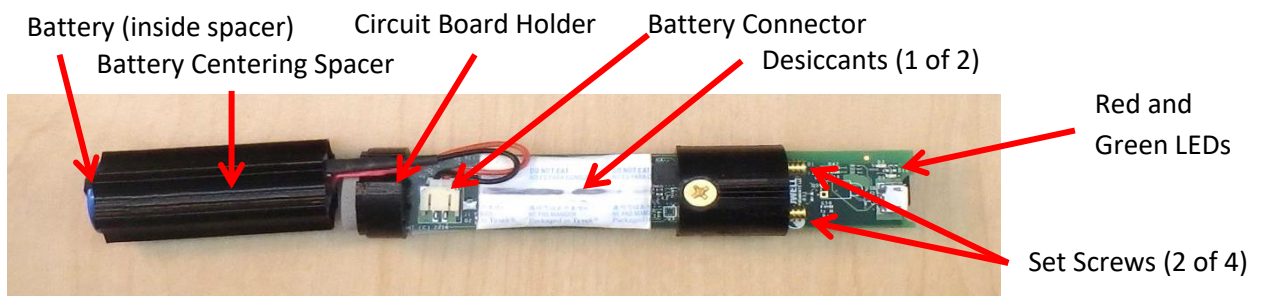
6. Use the 3/32" hex driver to loosen the 4 set screws. It is not necessary to remove the screws completely.



7. The board should now be loose within the housing. Use the 3/4" dowel to gently push the circuit board and logger assembly out of the housing.



8. The battery and circuit board will look like this:



9. Slide off the battery centering spacer and circuit board holder and set aside.
10. Disconnect the old battery by gently pulling on the battery leads. You may need to use a pair of pliers to gently rock the plug back and forth. Set the old battery aside and dispose of it according to your local regulations.



11. Inspect the desiccant. Replace or refresh the desiccant if not bright blue. To refresh desiccant, warm it with a toaster oven or hot plate at 100 C (210 F) for 10-20 minutes. Alternatively microwave it for 10-15 seconds at a time until it is bright blue.
12. The logger must completely power down for a clean restart. Wait at least 3 minutes between disconnecting the old battery and reconnecting the new battery for the on-board capacitors to discharge.



13. Connect the new battery by gently pushing the polarized connector into the battery socket. Verify that the green and red LED's flash three times. If they do not flash, disconnect the battery, wait 3 minutes and repeat.
14. Slide the battery centering spacer over the new battery.
15. Carefully slide the battery, circuit board holder, desiccant and circuit board partially back into the logger housing.



16. Add the two desiccant packs and push the circuit board and battery all the way into the housing. It may take a couple of attempts. Do not use excessive force.



17. Temporarily install the nose cone. (The end cap will provide a stop for the circuit board assembly when inserted into the housing in the next step.)
18. Use the 3/4" dowel to push the assembly all the way into the bottom of the housing towards the nose cone until it stops. The circuit board should now be in contact with the inside of the nose cone.

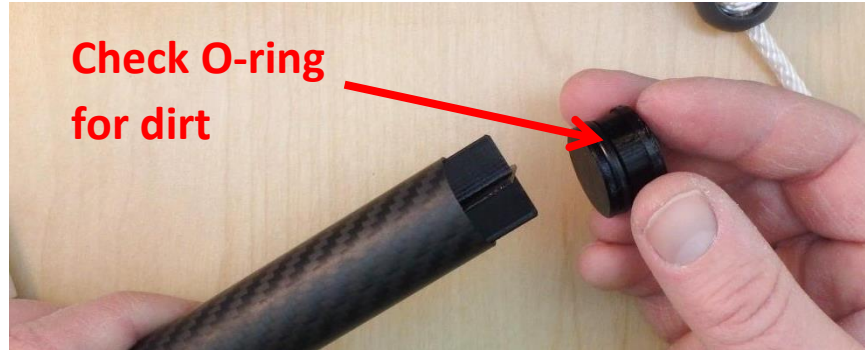


19. Remove the nose cone again and check that the circuit board overlaps the internal threads ~2 threads as shown. If not, reinsert circuit board and push slightly to one side until it overlaps.



Check that circuit board overlaps with threads.

20. Inspect the top end cap assembly and check that there is no dirt/lint/sand on the O-ring. Disassemble, clean and reassemble as required.
21. Put the "X" spacer back into the housing and then insert the top end cap assembly into the top of the meter.



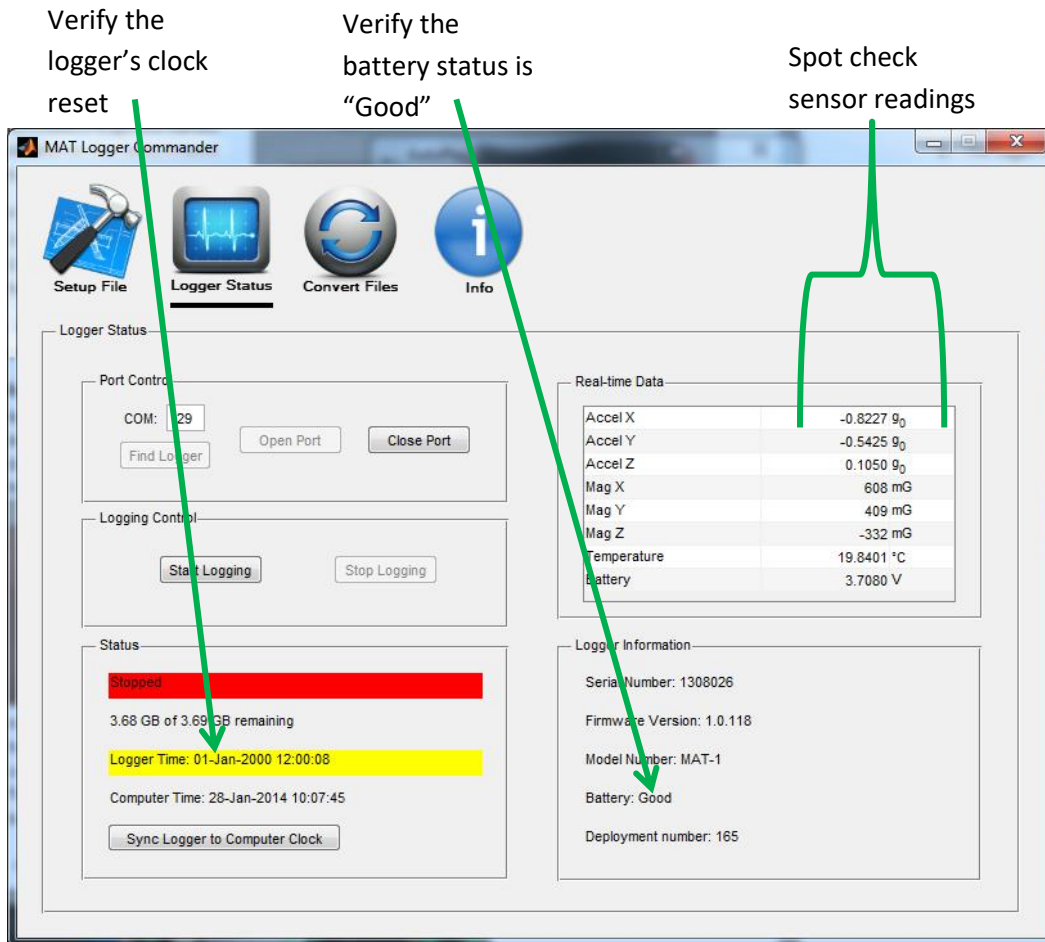
22. Use the screwdriver to tighten the Phillips screw until it is snug.



23. Flip back to the USB end of the housing and use the 3/32" hex driver to tighten the four hex screws taking turns to tighten them evenly by alternating screws. Once again, do not over torque.

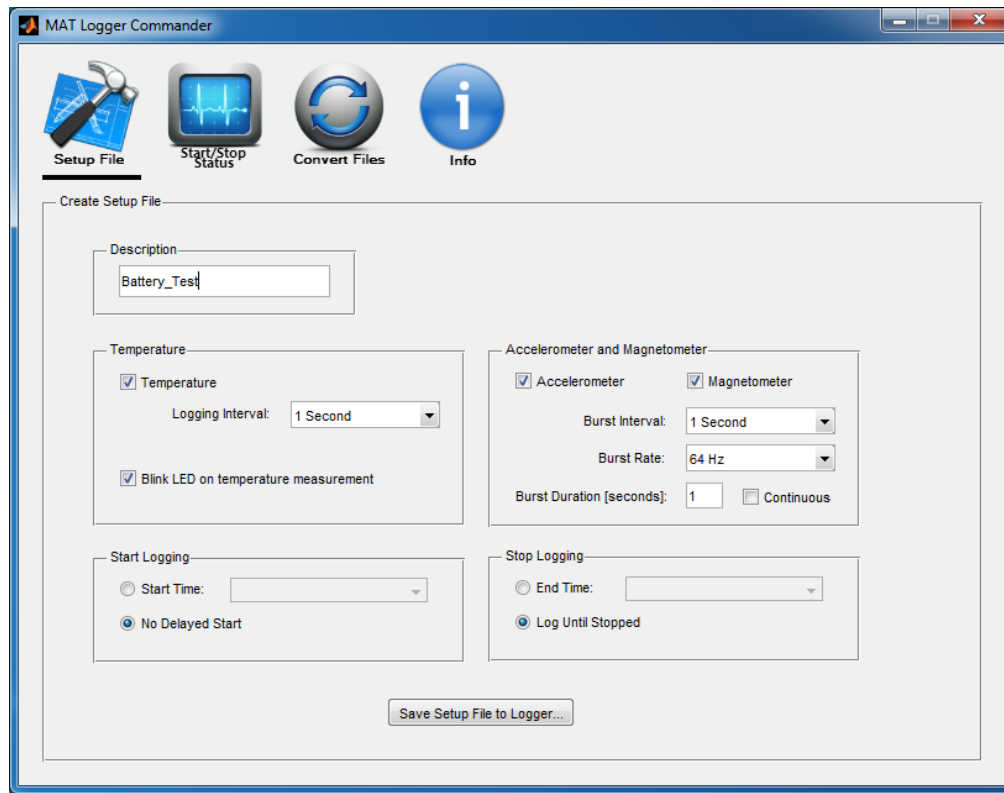


24. Reconnect the USB cable, open the Logger Status window in MAT Logger Commander and open the COM port.
25. Verify that the “Logger Time” has reset to the year 2000, that the battery status is “Good” and that the “Real-time Data” is updating. If not, then the logger was not completely reset and the logger must be power-cycled again. Go back to step 2 and increase the time between disconnecting and reconnecting the battery.



IMPORTANT: You are not done yet. Perform a battery test run to test for, and to remove, passivation of the lithium metal battery before starting a field deployment (see below).

26. Perform a test run of the battery. A meaningful test will record at least 128Kbytes of data with the USB cable disconnected. To perform this test quickly, set the logger to run at 64Hz as shown below:



27. Start the logger, disconnect the USB cable, wait 2.5 minutes and check to see if the red LED of the meter is blinking.
28. If the red error LED is indicating, reconnect the USB cable, stop the logger, disconnect the USB cable and wait 5 minutes. Then repeat steps 25-27.
29. If only the green LED is blinking, reconnect the USB cable, stop the meter and reload your setup file (MAT.cfg).
30. If, after two attempts, the red LED continues to indicate a problem, then something else is wrong. Contact technical support for advice.

Support

Additional information is available on the Lowell Instruments web site. Please see:

<http://www.lowellinstruments.com/support> for the most up-to-date support information.

Warning: Do not cut open, incinerate, heat above 85°C (185°F), or recharge the lithium batteries. The battery may explode if the logger is exposed to extreme heat or conditions that could damage or destroy the battery case. Do not dispose of loggers or batteries in fire. Do not expose the contents of the batteries to water. Dispose of the batteries according to local regulations for lithium batteries.

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