t TIP
Technical Information Page

What You Need to Know About Using and Maintaining Your TDC1 Datalogger Batteries

Summary: If you are using a TDC1 datalogger with a GPS Pathfinder™ Pro XL or a GPS Pathfinder™ Pro XR, you need to know how to maintain and replace the batteries, and how to troubleshoot possible problems that may be associated with the batteries. The TDC1 has two sets of batteries inside the unit and a set that it uses externally. Inside the TDC1, the first set of batteries are the internal batteries. These can be either two 9-volt batteries (standard) or a Nickel Cadmium (NiCad) battery pack (available only through a private vendor). The second set of batteries are the internal back-up batteries. The back-up batteries are two 3-volt lithium batteries. The external batteries are a set of two 12-volt camcorder batteries. This TIP includes instructions for maintaining and replacing these batteries and for troubleshooting some of the battery problems that may occur.

1 How to Replace or Recharge Your TDC1 Batteries

The internal 9-volt batteries cannot be recharged by the Office Support Module (OSM). If , however, you purchased the NiCad battery pack, then the OSM can recharge the battery pack. The lithium back-up batteries are not rechargeable.

Once the 9-volt and the lithium batteries are dead, they need to be replaced. The NiCad battery pack will need to be replaced after approximately 2000 recharge cycles.

2 How to Check the Battery Power Levels

The battery life can be checked in the TDC1 under the *Configure / Hardware* option. Once *Hardware* is selected, scroll down to the second screen to see the following information:

- Where the TDC1 is drawing power from
- The status of the internal, internal back-up, and the external batteries.

The screen will look like the following; see the appropriate section for further information on each line:

```
TDC1 Batteries:
Power:      Internal (or External)   (see section 2.1, below)
Internal:   Good (or Bad)            (see section 2.2, below)
Back-up:    Good (or Dead)           (see section 2.3, below)
External:   12.3V (or N/A)           (see section 2.4, below)
```

2.1 What the *Power* Status Line Means

The *Power Status* line tells you where you are drawing your power from. If you have the TDC1 hooked up to the external 12-volt camcorder batteries or the OSM, then this power line should say *external*.

Note: Make sure you have actually made a connection between your TDC1 and the receiver, by pressing the lower-left [GPS] key. If you do not have the TDC1 hooked up to any power source, then the power line will tell you that the power source is internal.

Product: GPS Pathfinder™ Pro XL with TDC1 Datalogger, GPS Pathfinder™ Pro XR with TDC1 Datalogger
Short title: TDC1BATX
Document no.: 1074 Rev. 1.00
Last modified: 9/19/97

2.2 What the *Internal* Battery Status Line Means

The *Internal*, i.e., the NiCad, battery status line will display *Good* if there is enough voltage in the batteries to operate the TDC1, or if you have it hooked up to the OSM. This line may display *internal batteries are low* if you frequently have the TDC1 turned on and not connected to an external source.

Note: If your internal batteries are too low to turn on the TDC1, it will *never* make a connection to the receiver's external 12-volt camcorder batteries.

2.3 What the *Back-up* Battery Status Line Means

If the *Back-up* line displays *Good*, then your lithium batteries have enough voltage in them to maintain any data files and the datum/coordinate file in your TDC1 when the internal batteries fail.

If, however, the lithium batteries are unable to save the data, then the TDC1 will warn you that your internal batteries are low or dead, and the status line will display *Dead*. You can continue to use your TDC1 in this condition, but you will periodically receive an error message, and if your internal batteries become low, you may lose your data files.

2.4 What the *External* Battery Status Line Means

If your TDC1 is not hooked up to an external power source, then the *External* line will display *N/A*. When your TDC1 is hooked up to the 12-volt camcorder batteries, the line may display anywhere from 10.5 (meaning the 12-volt batteries are low) to 12.3 (meaning the batteries are fully charged).

2.5 How to Store Your TDC1

Removing the batteries for long-term storage will prolong the life of the batteries. To properly store your TDC1, first make sure you have downloaded all the data files on your TDC1 and then delete any data files from the TDC1. Then remove the batteries. Tape the lithium batteries to the TDC1.

3 What Are Some Possible Problems and Their Solutions

The following are possible problems associated with the TDC1 batteries:

- While using the TDC1, it suddenly displays: *Internal batteries are dead* (see section 3.1, below).
- While using the TDC1, it suddenly displays: *Internal back-up batteries are dead* (see section 3.2, below).
- The TDC1 is Hooked Up to the Pro XL or Pro XR with Fully Charged 12-volt Batteries and the TDC1 Will Not Turn On
- The TDC1 displays messages indicating low or dead batteries, even after you replaced them (see section 3.4, below).
- The TDC1 either appears to not be drawing power from the external batteries or you are replacing the 9-volt batteries frequently (see section 3.5, below).

3.1 While You Are Using the TDC1, It Displays: *Internal Batteries Are Dead*

This means the 9-volt batteries are low/dead and need to be replaced. If you are using the Nicad battery pack, the pack needs to be recharged.

3.2 While You Are Using the TDC1, It Displays: *Internal Back-up Batteries Are Dead*

This means the lithium batteries are dead and need to be replaced. You can replace the lithiums with either the two 3-volt batteries or with four 1.5-volt batteries (type V76PX).

3.3 The TDC1 is Hooked Up to the ProXL or Pro XR with Fully Charged 12-volt Batteries and theTDC1 Will Not Turn On

When the TDC1 is turned on, it requires the internal batteries (9-volt batteries or the NiCad battery pack) to do so. If these batteries are good, the TDC1 will turn on and *then* switch over to the Pro XL or Pro XR to use the 12-volt camcorder batteries. If the batteries are dead, it will not turn on or switch over to the 12-volt batteries. The internal back-up batteries are not enough to turn on the TDC1 and switch over the power. Replace the old 9-volt batteries with new 9-volt batteries and then try turning on the TDC1.

3.4 Messages Are Displayed Indicating Low or Dead Batteries, Even After You Have Replaced Them

In this case, the first thing to check is whether or not the internal batteries and the internal back-up batteries are properly in place.

First check the 9-volt batteries to make sure they are lined up according to the +/- symbols.

The lithium batteries can be checked to see if they are properly installed by removing them. If you can remove the batteries with great ease and without hearing an audible *click*, then chances are they were not pushed all the way into the black casing. These batteries are difficult to install and remove. Try removing (listening for a *click*) and replacing the lithium batteries (listening for a *click*). Also, make sure the +/- symbols match the diagram inside the yellow plastic case to the left of the lithium batteries.

The second thing to check is the charge of the batteries, which can be done under the *Configure / Hardware* option as described in section 2, above. If they are new and, in the *Hardware* option, a message is displayed stating they are dead, then it is possible that the batteries were dead when you installed them. In this case, we recommend using a volt meter to test the voltage of the batteries.

If the volt meter reads less than 2.6 for the lithium batteries, they are dead. Some lithium batteries remain on the shelf in the store too long. These batteries will have a lower voltage to begin with when you install them.

The same thing can happen to the 9-volt batteries. The voltage should not read any lower than 7.0 volts. If either set of batteries reads a lower voltage, replace the batteries with new ones that have been tested with a volt meter to confirm the appropriate voltage needed to run the TDC1.

3.5 The TDC1 Appears to Either Not Be Drawing Power from the External Batteries or You Are Replacing the 9-Volt Batteries Frequently

The first thing to check is whether or not the internal batteries and the internal back-up batteries are properly in place. Check the 9-volt batteries to make sure they are lined up according to the +/- symbols.

The lithium batteries can be checked to see whether they are properly installed by removing them. If you can remove the batteries with great ease and without hearing an audible *click*, then they were probably not pushed all the way into the black casing. These batteries are difficult to install and remove. Try removing (listening for a *click*) and replacing the lithium batteries (again listening for a *click*). Also, make sure the +/- symbols match the diagram to the left of the lithium batteries.

The second thing to check is the charge of the batteries, which can be done under the *Configure / Hardware* option as described in section 2, above. Make sure the external power line displays *External* when the 12-volt camcorder batteries are hooked up. To make sure your TDC1 is connected to the receiver, press the lower left [GPS] key.

If the 12-volt camcorder batteries are hooked up and the display indicates the power is being drawn from the internal batteries, then you *may* have a defective multiport cable or dual battery cable. First, make sure that both the internal and back-up batteries have a *Good* status. If they do, see the Trimble TIP*: What to Do if You Get an Error Message on Your GPS Pathfinder Pro XL Datalogger* for instructions on troubleshooting the problem of a defective cable.

Product: GPS Pathfinder™ Pro XL with TDC1 Datalogger, GPS Pathfinder™ Pro XR with TDC1 Datalogger
Short title: TDC1BATX
Document no.: 1074 Rev. 1.00
Last modified: 9/19/97