

UltraCell

Dashboard Software Operator's Manual

**For use with:
XX25 (25W Portable Power System)**

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Dashboard Software

Introduction

Dashboard Software:

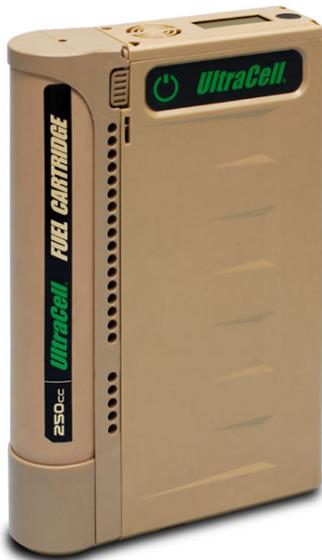
UltraCell Dashboard is a software application available for use with the XX25 fuel cell system. The software provides real-time monitoring of XX25 system *Voltage* and *Power* output as well as information about its status including error logging, which enables the user to monitor the XX25 while in operation and optionally .

In addition, the user has the ability to configure the XX25 system parameters for use with their specific application.

The data files generated within the Dashboard software can be emailed to sales@ultracellpower.com in case of any errors, for further analysis and support.

XX25 System:

The UltraCell XX25 is a 25 Watt micro fuel cell that provides power to mobile electronic devices such as satellite communications, rugged computers, military radios, sensor equipment etc.



Specifications:

Continuous Maximum power	25 Watts
Voltage (factory set)	12V to 24V
Startup	12 minutes*
Dimensions	5.9" x 9.1" x 1.7"
Weight	2.7 lbs (1.24 kg)
Fuel Cartridge Capacity	250cc
Energy Capacity	≈ 180 W-hr
Duration	≈ 9 hrs @ 20 W

** up to 20 min. for cooler ambient temp. or if internal battery is not completely charged*

Additional information on the XX25 system is available on the UltraCell webpage: www.ultracellpower.com

Installation

Windows OS (compatible with 98, 2000, XP)

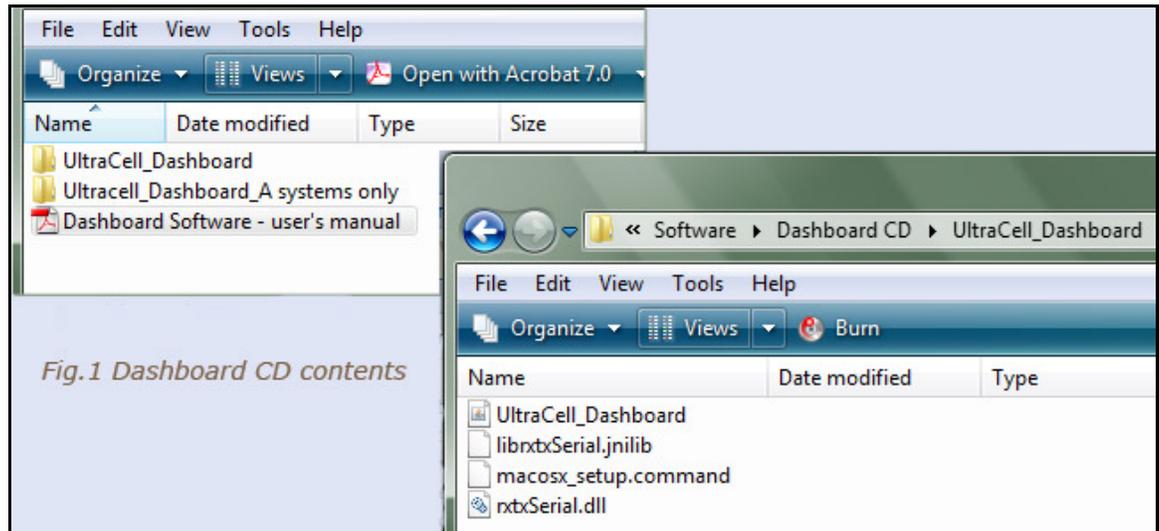
Follow outlined steps below to install UltraCell Dashboard software on your PC. A view of the files included on the *Dashboard CD* is shown in *Figure 1* below.

Step 1: Confirm Java installation

- Run the following link to verify if Java is installed on your PC.
<http://www.java.com/en/download/installed.jsp>
- If Java is not installed on the PC, run the following install link on the Sun website
<http://www.java.com/en/download/index.jsp>

Step 2: Run UltraCell dashboard

- Copy the 'UltraCell_Dashboard' folder to a writable location on your computer.
- Double-click on **UltraCell_Dashboard.jar** to start program



MAC OS

Step 1: Copy the Dashboard files

- Copy the *UltraCell_Dashboard* folder to a writable location on your computer.

Step 2: Run MACOS_SETUP.COMMAND

- Run the *macos_setup.command* (double click it) and follow the instructions in the Terminal window. This file needs to be run only during the initial set up.

Note: All files in the Dashboard folder must be in the same folder or directory in order for the Dashboard to work, and must be on a writable disk. Flash drives are OK, network drives are OK, as long as the drive has write access

Connecting the XX25

The Dashboard software communicates with the XX25 over a serial interface. The default tether supplied with the XX25 includes a serial (DB-9) connector integrated with the power connectors.

Serial connection

Connect the serial port on your PC to the DB-9 port on the tether. In case your PC is not equipped with a serial DB-9 interface (some newer PCs), follow instructions below to connect the XX25 to the PC via a USB connection.

USB connection

In case your PC is not equipped with a serial port, connect the supplied Serial-to-USB adapter cable to the standard tether supplied with the system, after installing the appropriate drivers. Then connect the USB end to the USB port on your PC.

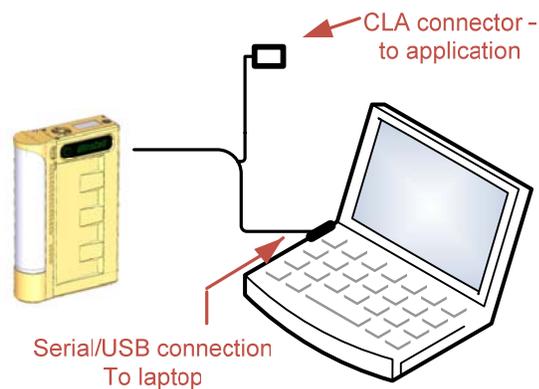


Figure 2: XX25 PC connection

Monitoring the XX25

Power & Fuel Monitoring

The Dashboard software allows the user to continuously monitor the output power and remaining fuel level on the XX25 when the system is connected to the PC.

The gauges under the *STATUS* tab give accurate readings to monitor the load profile of the user's device as well as an estimated run time of the attached cartridge. The dashboard software continually records this load profile as well as fuel readings onto a file which can be sent to UltraCell for analysis in case of any failures.

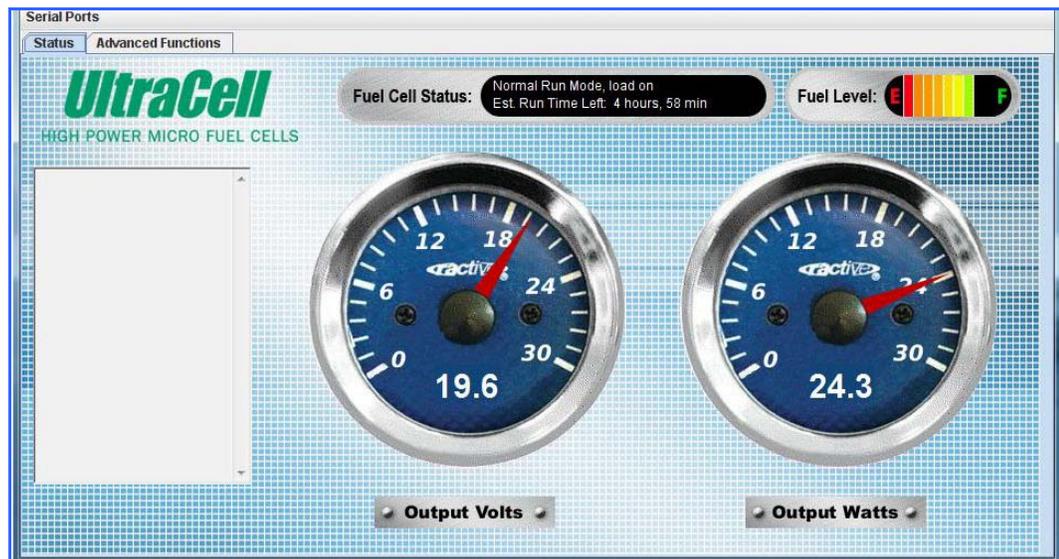


Figure 3: Dashboard software – XX25 monitoring

Configuring the XX25

The XX25 can be configured for different application scenarios, both for independent as well as hybridized operation (connected to external battery). The available parameters are accessible through the *ADVANCED FUNCTIONS* tab in Dashboard Software.

Note: Please contact your UltraCell sales representative at (925) 455-9400 or e-mail support@ultracellpower.com and request a login password.

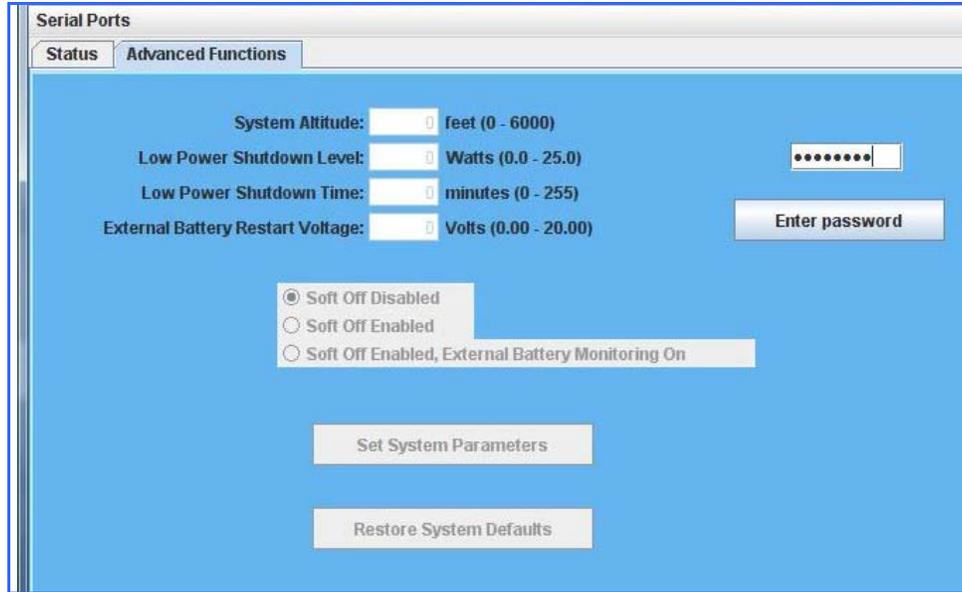


Figure 4: XX25 Configuration tab on Dashboard software – Enter password to enable features

Altitude

The system operates and meets its expected operational specifications unalterably to 3000 ft. For higher elevations, the altitude setting must be programmed via the dashboard software to allow efficient operation without any power drop outs.

The available altitude settings are in 1000 ft. increments and acceptable values are 4000, 5000 and 6000 ft. For elevations above 6000 ft, the system output level will degrade and the system will eventually shutdown.

Note: It is not recommended to operate the system at elevations above 6000 ft.

Automatic Shutdown and Restart features:

- The XX25's internal software is designed to monitor the output current and voltage of the XX25 and that of an external battery pack.

Automatic Shutdown:

- **Soft Off Disabled:** If the *LOW POWER SHUTDOWN LEVEL* is greater than zero (0), the system will monitor the output power level. If the power level falls below the *LOW POWER SHUTDOWN LEVEL* and the time exceeds the value set for *LOW POWER SHUTDOWN TIME*, the system will shut down.

- Soft Off Enabled: If the *LOW POWER SHUTDOWN LEVEL* is greater than Zero (0), the system will monitor the output power level. If the power level falls below the *LOW POWER SHUTDOWN LEVEL* and the time exceeds that set in *LOW POWER SHUTDOWN TIME*, the system will go into a sleep mode. The system microprocessor is then awaiting a startup command from an external computer.

Automatic Restart:

- Soft Off Enabled External Battery Monitoring On: If the *LOW POWER SHUTDOWN LEVEL* is greater than Zero, the system will monitor the output power level. If the power level falls below the *LOW POWER SHUTDOWN LEVEL* and the time exceeds that set in *LOW POWER SHUTDOWN TIME*, the system will go into a sleep mode.
- If the XX25 is connected to an external battery, the XX25 will continue to monitor the output voltage. If the output voltage drops below the set point in *EXTERNAL BATTERY RESTART VOLTAGE*, the XX25 will automatically restart and recharge the external battery.
- During this sleep period, the XX25 also monitors its internal battery, and will restart to recharge the internal battery if required. At the same time the external battery connected will be recharged.

The XX25 system has three OFF states (modes) that can be set as described above.

- **Standby mode**
During *Standby* mode, the power output on the XX25 is turned OFF but the internal system temperature is maintained such that the system is ready to deliver power without going through the start up sequence of *12 minutes*.
- **Low power (Sleep) mode**
During *Sleep* mode, the power output on the XX25 is turned OFF and the system goes through a cool down cycle. The internal flash retains the settings enabled from the dashboard software.

If the *Auto Restart* feature on the system is enabled, the system will automatically recover from Sleep mode when the external voltage goes below the set value for longer than 2 minutes.

- **Shutdown mode**
The *Shutdown* mode refers to the system OFF state during which the system can be only be restarted by physically pressing the ON/OFF button on the XX25.

The unit will go through a cool down and then check whether the *Sleep Mode* has been enabled via the dashboard software. If this is Enabled, then the system goes into *Sleep mode* described above, otherwise the system shuts down.

Voltage

System voltage is currently set at the factory per the user's application and cannot be modified through the dashboard software.

System Reset (Default setting)

The XX25 system can be reset to factory settings via the dashboard software by selecting RESTORE SYSTEM DEFAULTS on the dashboard configuration page (shown in Fig.4).

Default settings:

Auto Shutdown	OFF
Altitude	0 ft. (operational to 3000 ft.)
Shutdown mode	Enabled
Sleep mode	Disabled