



PPMS Service Note 1099-412

In Response to a Planned Power Outage:

PPMS[®] EverCool II Shut Down and Re-start Procedure

Introduction:

Loss of electricity to the PPMS[®] EverCool II should not cause damage to the equipment. In the event of a power loss, the EverCool II system will recover automatically as soon as power to the compressor and EverCool II controller come back.

If the system does not appear to be operating normally after a power loss, it could be due to associated events, such as tripping of a local breaker, fuses or power surges. Contact your Quantum Design service representative if you believe the system has not returned to normal operation after a power outage.

If the system will be set to idle and not completely turned off, helium can be conserved by putting it in **Shutdown** (standby) mode. **Important: Shutdown** mode *does not* turn off the system; it reduces the use of helium while allowing the Model 6000 to monitor the status of the system. The procedures for Shutdown mode can be found in section 4.2.3 of the *PPMS[®] Hardware manual*.

I. Power Loss

When there is a power loss, the software will automatically place the PPMS[®] in **Shutdown** (standby) mode. During the power loss or when you power off the system, leave the magnet leads connected—the leads will allow any current in the magnet to safely drain away. Also, leave the blue lemo connected to the system.



WARNING!!

Do not disconnect the blue lemo or the magnet leads while the power is off.

In the event there is a power loss to the PPMS[®] EverCool II compressor, turn off the main power switch located on the back of the compressor in order to prevent a power surge occurring when power is regained. Depending on the valve position at the time of the power loss, the compressor can make loud popping sounds when power is

restored. If the compressor does not seem to be operating properly after the power is back on, cycle the power back off and then on from the indoor unit.

II. Shutting Down the PPMS EverCool II System: Power Off Sequence

We recommend that you use the sequence below to turn off the PPMS[®], and that you always place the PPMS[®] in **Shutdown** mode before you turn it off—these procedures will help bring the system to a stable, helium-conserving state. If there was an unplanned power outage, go directly to step 7 of the Power Off Sequence.



WARNING!!

Before following this procedure, verify that the room is well ventilated. The helium that escapes from the EverCool II dewar will displace air in an enclosed space and might cause asphyxiation.

1. Remove any sample or option probe from the sample chamber, clamp the blank flange on the chamber, and purge and seal the chamber.
2. If the magnetic field is not in **Persistent** mode and at zero (0) Oe, reset it according to the sequence below:
 - a. Select **Instrument >> Field** (Figure 1).
 - b. In the **Field** dialog box, set the **Mode** to **Persistent** and the **Set Point** to zero (0) Oe.
 - c. Click on the **Set** button.
 - d. Leave the dialog box open so that you can monitor the field until it is within 1000 Oe of zero (do not continue until the field is within 1000 Oe of zero).
 - e. In the **Field** dialog box, click on the **Close** button.
3. Bring the system to a stable state by putting it in **Shutdown** mode:
 - To use the Model 6000, select **CTRL >> Interactive Control >> 8. Shutdown Mode**.
 - To use MultiVu, select **Instrument >> Shutdown** from the dropdown menus at the top of the MultiVu window.
4. Deactivate any active option (**Utilities >> Activate Option**).
5. Exit the MultiVu program and turn off the power to the computer.

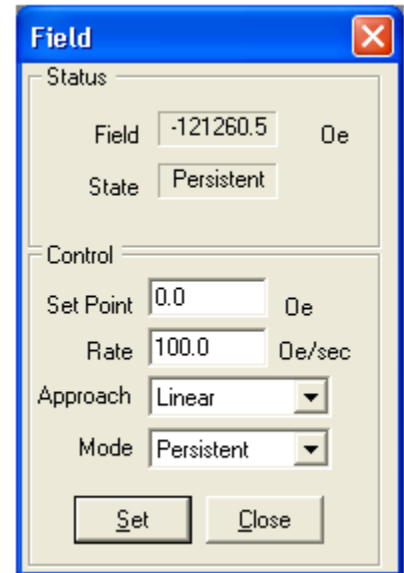


Figure 1 PPMS[®]
Field dialog

6. Close the small knob on the regulator of the Helium supply bottle.
7. Disconnect the annulus line (the large pumping line) at the probe head. Open the annulus connection enough to stop the flow, but leave it seated in the connector.



WARNING!!

*Before you turn off the power to the Model 6000, verify that the system is in **Shutdown** mode with the magnet in **Persistent** mode and the **Field** at zero (0) Oe.*

8. Shut Down the helium compressor:

Air Cooled Compressors (HAC 4500):

- Set Indoor Compressor Control Unit to “OFF” state by depressing once the “RUN” button in the front control panel. The front panel will then display: “OFF by REMOTE CTRL”. Note that it might take a few minutes for the Cold Head to stop. Once the Cold Head is completely stopped proceed to the next step.
- Power down the indoor compressor by toggling the switch in the back of the indoor compressor control unit. This will shut down any 200-230 V power delivered to the Outdoor Compressor Unit.
- Disconnect the high voltage power by turning off the high voltage breaker.
- Disconnect the 200-230 V power by turning off the Low Voltage breaker.
- Unplug the compressor power cords from the power source if needed.

Water Cooled Compressors (HLC 4500):

- Set the Compressor to the “OFF” state by depressing once the “RUN” button in the front control panel. The front panel will then display “OFF by REMOTE CTRL”. Note that it might take a few minutes for the Cold Head to stop. Once the Cold Head is completely stopped proceed to the next step.
- Power down the compressor by turning off the breakers in the “OFF” position in the back of the compressor.
- Disconnect the high voltage power by turning off the high voltage breaker.
- Disconnect the 200-230 V power by turning off the Low Voltage breaker.
- Shut off the flow of cooling water to the compressor.
- Unplug the compressor power cord from the power source if needed.

9. Turn off the power to the individual PPMS[®] components.

10. Remove power to any other PPMS[®] pumps or electronics that have plugs to an outlet.
11. Turn off the main breakers on the back of the PPMS[®] cabinet.
12. Unplug the PPMS[®] cabinet plug from the power source.

III. Restarting the PPMS EverCool II system: Power On Sequence

1. Plug in the PPMS[®] cabinet power cord to the power source.
2. Turn on the main breaker on the back of the PPMS[®] cabinet.
3. Turn on the power to the computer.
4. Restart the helium compressor:

Air Cooled Compressors (HAC 4500):

- Turn the High Voltage Power back on by switching on the High Voltage Power Breaker and wait 5 minutes.
- Power on the indoor compressor unit by toggling the switch on the back of the indoor compressor unit. Wait 2 minutes for the Indoor Compressor Control Unit to initialize.
- Set the Indoor Compressor Control Unit to “RUN” by depressing the “RUN” button in the front control panel once. The front panel will then display “RUNNING REMOTE CTRL”.

Water Cooled Compressors (HLC 4500):

- Turn on the flow of water.
 - Plug in the compressor power cord to the power source.
 - Power on the indoor compressor unit by toggling the switch on the back of the indoor
5. Re-start MultiVu by double clicking the MultiVu icon.
 6. Verify that you do not have any communication error messages when starting MultiVu. To do this open the windows explorer application and navigate to C:\QDCAN\CANDATALOGGER.EXE and open the program.

PPMS EverCool II Shut Down and Re-Start Procedure

- Press the “Initialize CanOpen Master” button to initialize the CAN Bus communications.
- Click on File and open the EvercoolII.cdl file in the C:\Evercool\Tools directory.
- Click the SDO Read tab and press the “Read ALL (Once)” button.
- Click the Alarms tabs and select node 4, and press “Upload and Parse” button to check if any messages appear. Typically you might see the following three messages shown in Figure 2.

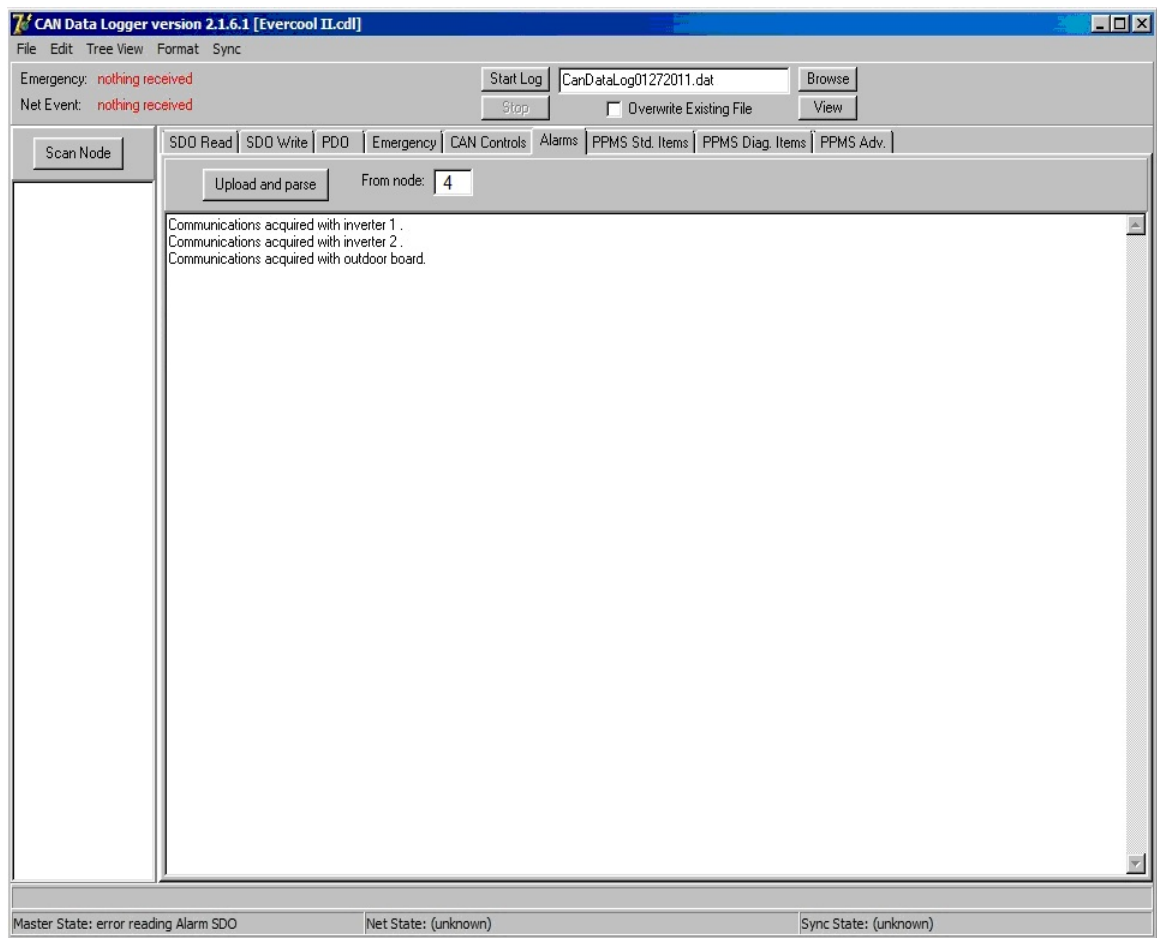


Figure 2. Typical CAN Data Logger Alarms Tab upon power up

In particular the messages can be interpreted as follow:

“Communication acquired with inverter 1” informs the user know that successful communications with the Cold Head inverter has been established.

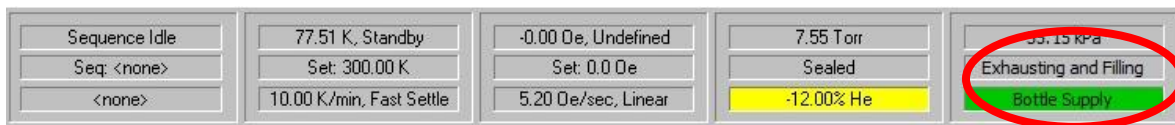
“Communication acquired with inverter 2” informs the user know that successful communications with the Scroll Capsule inverter has been established.

“Communication acquired with outdoor unit” informs the user that all communications are established with the outdoor unit.

Depending on the specific version of the Compressor Firmware you are running you might also see one more message:

“Capsule temperature at 999.00 C” is a default value it is displayed every time the power is lost - again all normal here.

7. If everything is communicating at this point, verify that the compressor and helium level control are enabled from within MultiVu by clicking on the EverCool II status box located on the bottom of MultiVu application. Once the Evercool II Instrument window appears check the status of both “Compressor Control” and “Helium Level”. These should be reading “Automatic” and “Enabled” respectively.
8. If you have lost too much Liquid Helium (below 60%), wait for the system to refill to above 60% before using the magnet and temperature control. The status should be in “Recirc. & Filling” if is below that level. Contact a qualified Quantum Design representative for assistance if need be.
9. Open the small knob on the regulator of the Helium supply bottle.
10. Before reconnecting the large annulus, verify in Multivu that the status is in an “Exhausting & Filling” state to prevent air from entering the system.



11. Set the temperature to 5 K (**Instrument >> Temperature**). When you set the temperature to 5K, the equipment automatically opens the valves and starts pumping out the lines.
12. Verify a vacuum is present by slightly pulling back on the pumping line at the probe head. Once the vacuum has been established, reconnect the annulus line to the probe head.
13. Wait five minutes for the system to stabilize and evacuate any air in the pumping lines.
14. Change the status of the Evercool II back into the “Recirc. & Filling” state. Click on Instrument>Evercool II... then select “Recirculate Pump Output”.
15. Set a new temperature and activate an option.