

Changing a Power-One/ABB Solar Inverter into a Wind Inverter

The somewhat older-style Power-One/ABB Aurora inverters in the 3.6 – 12 kW range can be internally switched from a solar to a wind inverter. The firmware that is inside has both options, and how it presents and behaves is a matter of how it is set up. The Aurora CVI software from Power-One can make that switch. This manual explains how to do so.

Please note that results are not guaranteed in any way. If you kill your inverter, or yourself, in an attempt to switch it over, you are on your own! We do not provide any warranty (nor does Power-One/ABB I would imagine), this is entirely at your own risk!

What you will need

- The Aurora CVI 5.0.1 program (<https://www.solacity.com/docs/CVI%205.0.1.zip>)
- The Aurora Installer program (<https://www.solacity.com/docs/AuroraInstaller.zip>)
- A USB-to-RS485 dongle (for example: <https://www.robotshop.com/ca/en/devantech-usb-rs-485-interface.html>)
- A source of **DC Voltage** of at least 150 Volt (up to 550V DC)

If you know what you are doing you could use a PVI-Wind-Interface to create 150V DC from 120V grid AC (or even 330V DC from 240V grid AC). The emphasis is on *if you know what you are doing*, as this is of course potentially dangerous. Then again, so is working with wind turbines that can generate hundreds of Volts AC and DC with considerable current. Caveat emptor!

Be sure to disconnect the grid AC side of the inverter before proceeding in this manual! The inverter is entirely powered from the DC side, no AC is needed, nor should it be connected to AC!

Let's get started!

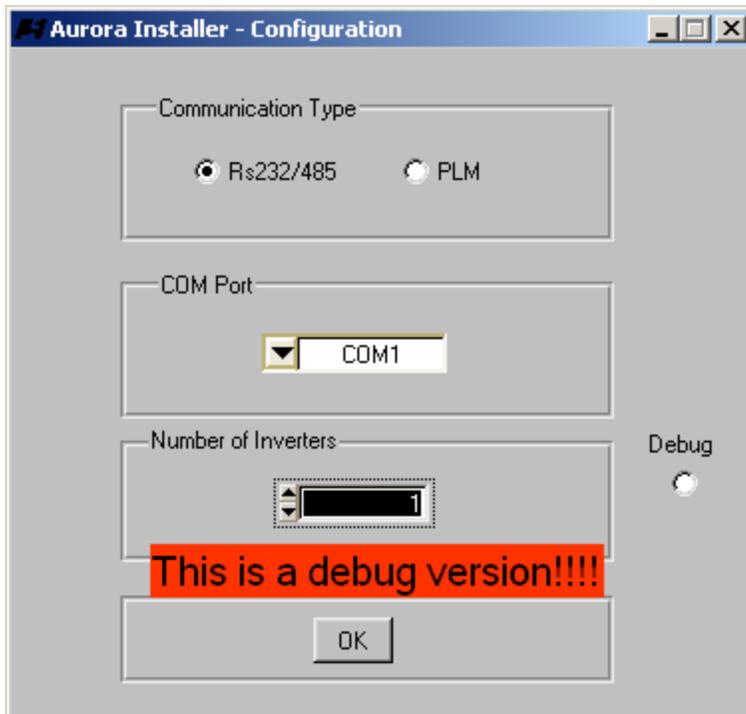
Connect the USB-to-RS485 dongle to your PC and make sure the correct drivers are installed. Set the baud-rate to 19,200 – 8 databits – 1 stopbit. Take note of what (virtual) COM-port your new RS485 interface created on your computer, this could be COM1, but on some PCs the number will be different.

Assuming your RS485 interface ends in a connector for regular (loose) wires, run the TX+, TX-, and Ground (GND) wires to the inverter. On the inverter side the RS-485 input connector with the corresponding labels +T/R, -T/R, and RTN.

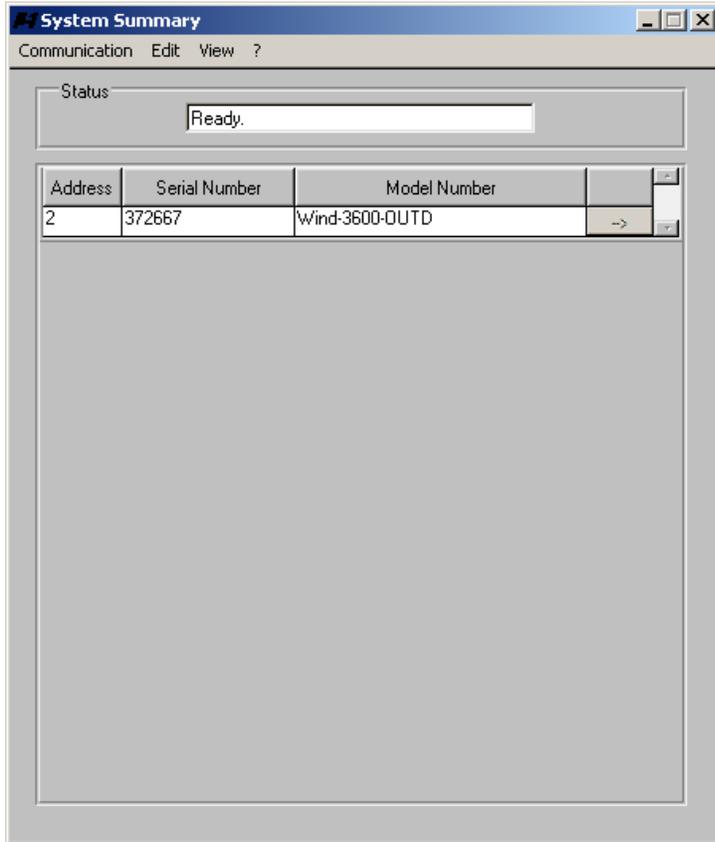
Now connect a DC source of at least 150V to PV input number 1, be sure to get the positive and negative wired up correctly. By default, from the factory, the solar inverters are set for 200V DC for startup. So it may take 200V DC to get the inverter started. However, the startup Voltage can be changed through the menus from 50 Volt DC to (nearly) 600V DC, and your inverter may be set differently. If the inverter starts successfully you will see the display light up and text appear.

PC connection

Start up the Aurora Installer software. Select "RS232/485" and the correct COM port number. Press "OK".

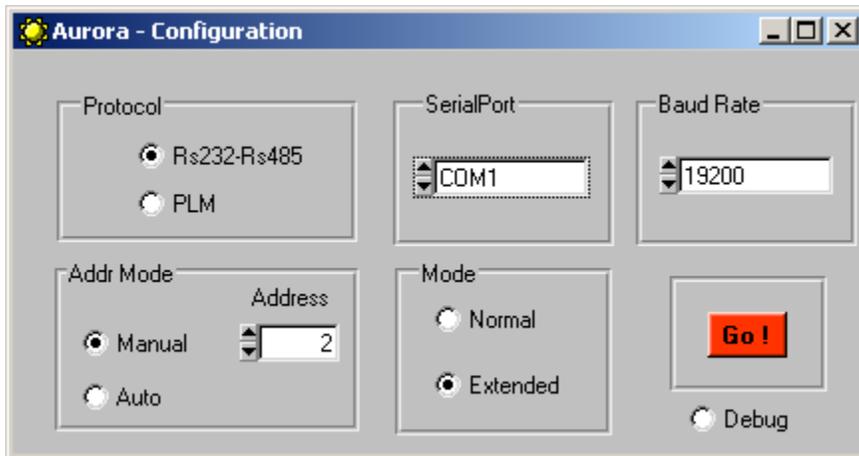


If the inverter is communicating with your computer you will see the “Ready” screen. Take note of the “Address” number, you will need this in a moment.

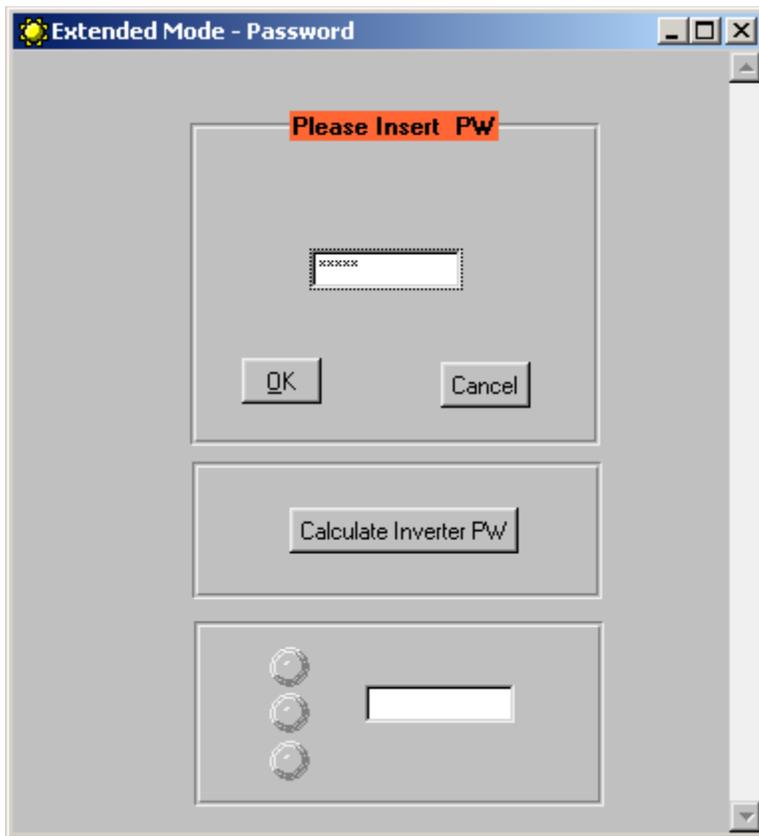


Making the ‘wind’ switch

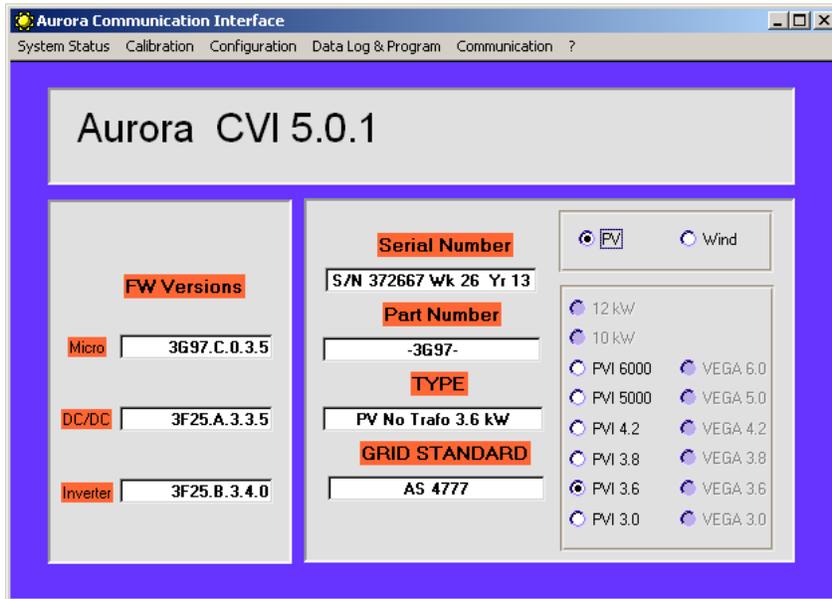
Exit AuroraInstaller, and start up CVI 5.0.1. Select the same serial port number and baud rate as before, set the address to the same as was seen from AuroraInstaller, and make sure RS232/485 is selected. Select “Extended” mode. Press the “Go!” button.



In the "Insert PW" field enter "05591" and click "OK".



You should now see the screen below. The “PV” radiobutton will be selected (since we started out with a PV inverter), change this to “Wind”. This takes immediate effect, no need to save.



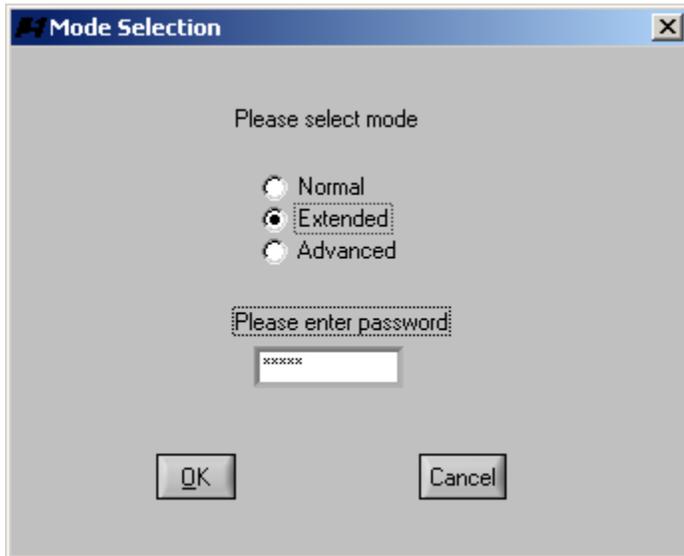
Stay in this screen and switch off the DC source to the PV input of the inverter. Wait until the inverter LCD display goes blank, count to 15, and re-apply the DC Voltage to start up the inverter again.

The inverter should now show the message “empty table W009”, indicating the switch to a wind inverter was successful! You can now go out of the CVI program. The message means there is no MPPT table in the (wind) inverter yet, and you need to enter one using the AuroraInstaller software.

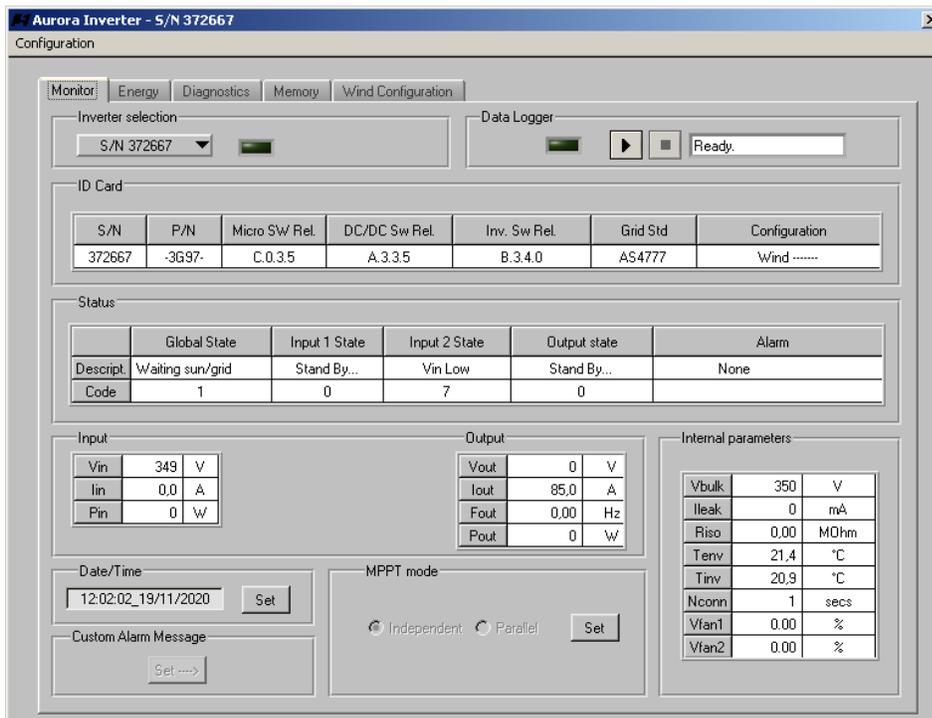
Setting the MPPT wind table

Start AuroraInstaller again, using the same configuration as described earlier. Select the inverter that is listed and click on the little arrow to the right of the serial number and inverter type.

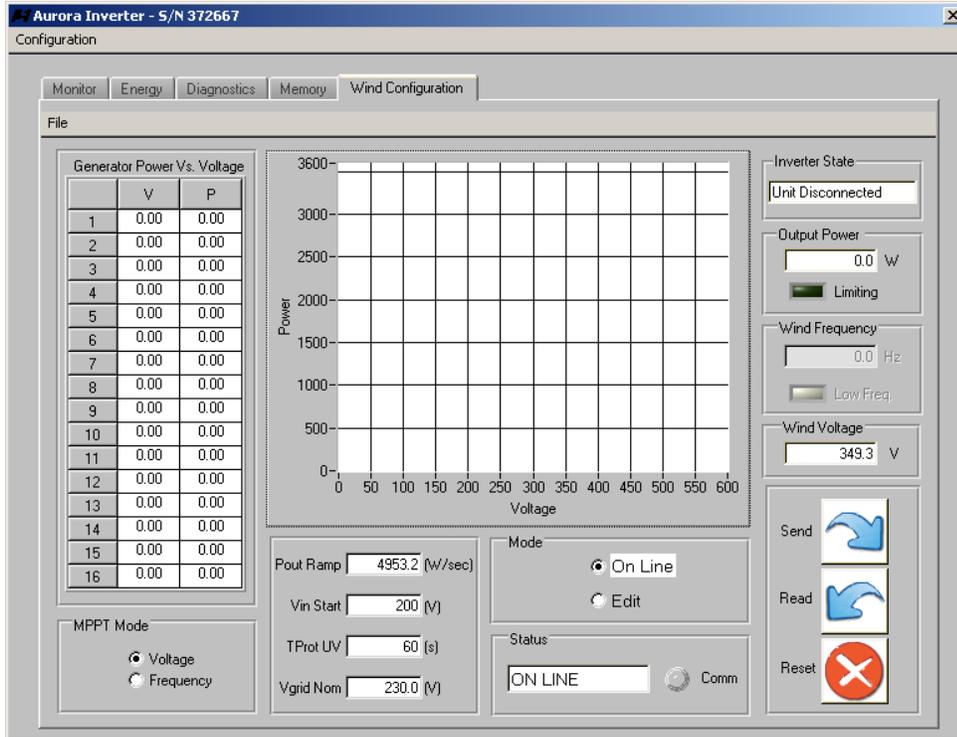
This will get you to the “Mode Selection” screen. Select “Extended” and enter the same passcode as before: 05591. Press “OK”.



You should now see the screen below. Select the “Wind Configuration” tab.



The software will take a few seconds to read out the configuration of the inverter, including the (empty) wind table, wait for this to complete. Once that completes, press “Edit” in the “Mode” section. This enables changing of the wind table values.



The AuroraInstaller manual (<https://www.solacity.com/docs/AuroraInstaller%20Manual.pdf>) has the details for this screen. The “Send” button will upload/save the new wind table to the inverter. Checking the “On Line” option for “Mode” will also send it over to the inverter. Both will complain that the “File has not been saved”, this is OK, it is about saving your settings to a file on your PC (which can be a good idea). You can do the same through the “File” menu at the top of the tab.

Now exit the AuroraInstaller software, remove the DC source to the inverter input, wait for the screen to go blank, plus another 15 seconds. Now reapply the DC to start the inverter, and restart AuroraInstaller. When you go to the Wind Configuration tab you should see the wind table you just stored (after a few seconds), indicating all went well!

Final bits to wrap it all up

Your solar inverter is now a wind inverter, and the two input trackers of the inverter need to be connected in parallel. Run a 10 AWG or thicker wire from the ‘+’ of input 1 to the ‘+’ of input 2, and a

wire from the ‘-’ of input 1 to the ‘-’ of input 2. Also make sure that the little switch to the right of the inputs is set to “PAR” (for parallel).

You now have an Aurora Wind inverter!