

Aurora Communicator

Monitor tool for Aurora Inverters

User Manual

Date	version	author	note
22/11/10	2.4	Nocentini Lorenzo	Note for Windows Seven

This is an unpublished work the copyright in which vest in Power-One S.p.A. All rights reserved.
This document and its information is supplied without liability for errors or omissions and no party may be reproduced, used or disclosed except as authorized by contract or other written permission.

Important!

This manual has been written considering "English" as the default language: since "Aurora Communicator" is a multi-language application you may find that the definitions used here are different from the ones in the real application (unless you set the language to "English").

(i.e. the "Configuration" menu is called like this only if the selected language is "English", but it changes to "Configurazione" if the language is "Italiano" and "Konfiguration" in "Deutsch")

Index

Index	1
1 - Setup	3
1.1 - Requirements	3
1.2 - Installation	3
2 - Starting up	4
2.1 - Language Selection	4
2.2 – Communication Setup	5
2.3 – Preferences	6
2.3.1 – Sampling	6
2.3.2 – Date / Time Synchronization	6
2.4 – Inverters Configuration	7
3 – Using Aurora Communicator	10
3.1 – Inverters List	11
3.1.1 – Energy Harvesting	13
4 - Charts	14
4.1 – Charts Interaction	14
4.2 – Charts Options	15
4.2.1 – Export Chart	15
4.2.2 – Show Measurements	16
4.2.3 – Edit Y Range	16
4.2.4 – Set visualization to current day	17
4.2.5 – View All	17
4.2.6 – Y Axys Scale Mode	17
4.2.7 – Printer Setup / Print	18
5 - Statistitcs	19
5.1 – Alarms / Warnings	19
5.2 – Recent Power Statistics	21
5.3 – System Statistics	22
5.3.1 – Statistics Results	22
5.4 – Inverter Statistics	23
5.5 – Store Statistics	26
5.6 – Opening Chart Files	26
6 – E-Mail	27
6.1 – Configure E-Mail	27
7 – Data Logger	29
7.1 – Configure Data Logger	29

8 – Synoptic	31
9 – Aurora PVI Desktop	32
9.1 – Firmware Upgrade	33
9.1.1 – Web Update	34
9.1.2 – Update.....	35
9.1.3 – Change Revision	35
9.2 – Data Logging.....	36
9.3 – Start Screen Calibration	38

1 - Setup

1.1 - Requirements

This application can run on any PC with Windows based operating systems, but for better performances we suggest a 2GHz processor and at least 512 MB of RAM.

Microsoft .NET Framework (v2.0) is installed automatically during the setup.

Aurora Communicator has been successfully tested with the following operating systems:

- Windows 2000
- Windows XP (32 bit / 64 bit)
- Windows Vista (32 bit / 64 bit)
- Windows Seven (32 bit / 64 bit)

1.2 - Installation

Just run the **setup.exe** file provided and follow the instructions until the installation is completed.

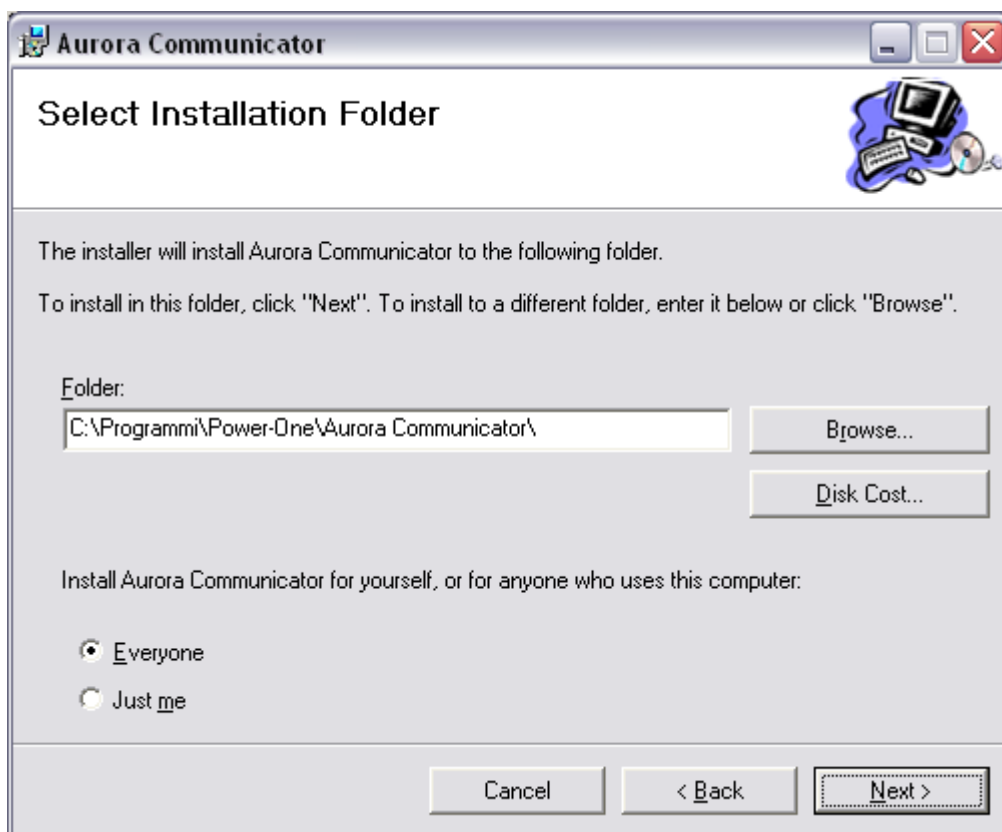


Fig. 1.1 – Installation window

During the setup, your PC may need to be restarted.

Once the program is successfully installed, it will create a launch icon in the desktop and in the start menu.

2 - Starting up

Important: if you are using Windows Vista or Windows Seven with restricted access, be sure to run Aurora Communicator with administration privileges, otherwise it will report errors due to the impossibility to write configuration and statistics files.

To do this, right click on the application link and select "Run as administrator", or edit the advanced properties of the link and choose to always run it in administration mode.

Configuring Aurora Communicator

When you run the program for the first time, these are the settings that you may need to configure:

- **Language**
- **Serial port**
- **Preferences**
- **Inverters**

2.1 - Language Selection

Aurora Communicator automatically configures the language according to the system language.

Nevertheless it is possible to change it in any moment: from the menu (on the top), select "**Language**" then pick the one you desire.

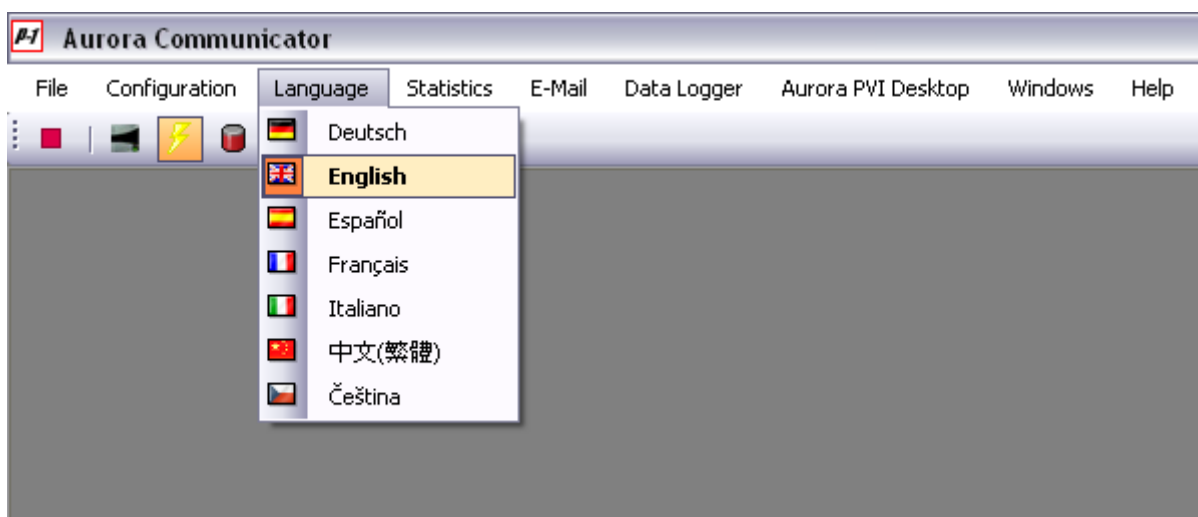


Fig. 2.1 – Language Selection

2.2 – Communication Setup

This application uses a serial connection to communicate with the inverters. It is also possible, using a TCP/IP – RS232 bridge adapter, to connect using a remote TCP/IP connection.

To change these settings, from the menu on the top select “**Configuration**” then “**Communication Setup**”.

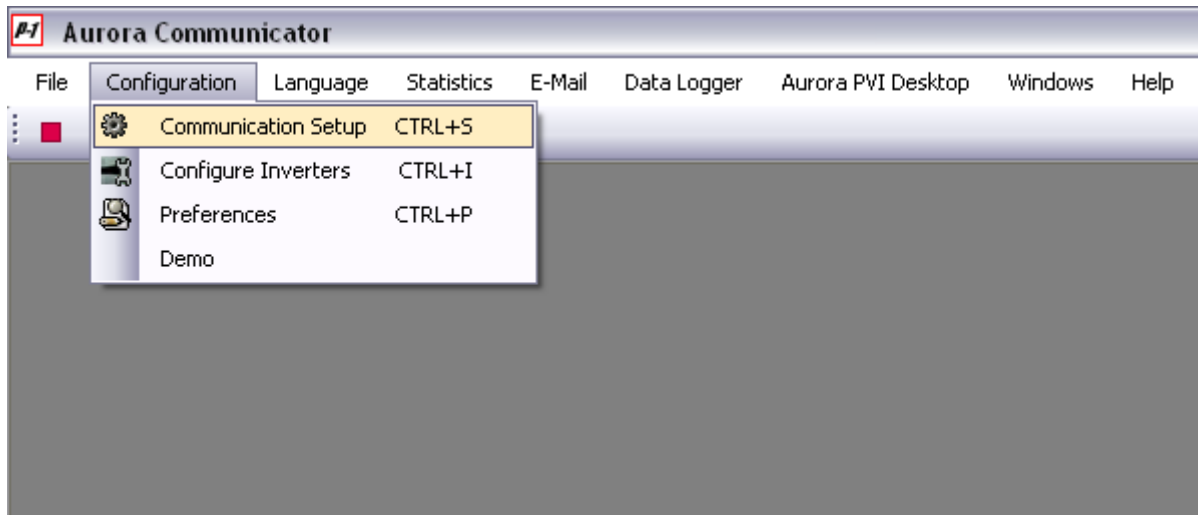


Fig. 2.2.1 – Serial port selection

This will open the configuration window:

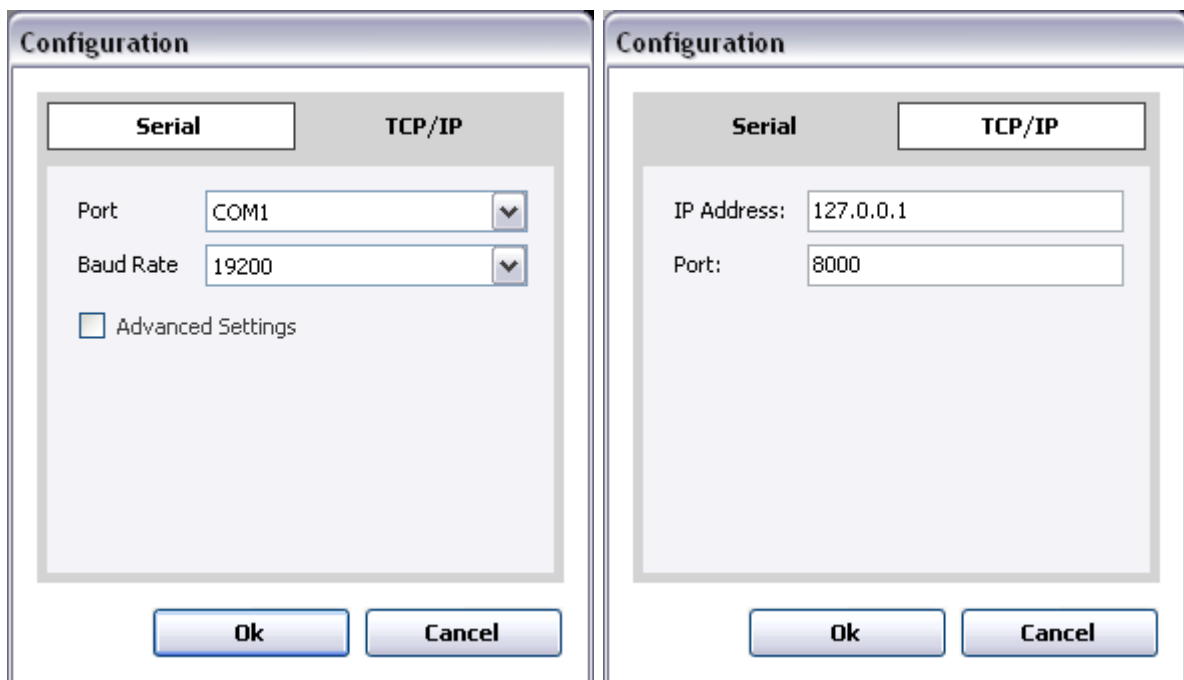


Fig. 2.2.2 – Serial port configuration window

Just select from the “**Port**” combo box the appropriate port. It is recommended to leave the other settings unchanged.

In case you are using a TCP/IP – RS232 bridge, select the TCP/IP section on the top and enter the remote IP address and port.

2.3 – Preferences

These are general settings. To modify them, from the menu on the top select “**Configuration**” then “**Preferences**”.

This will open the preferences window:

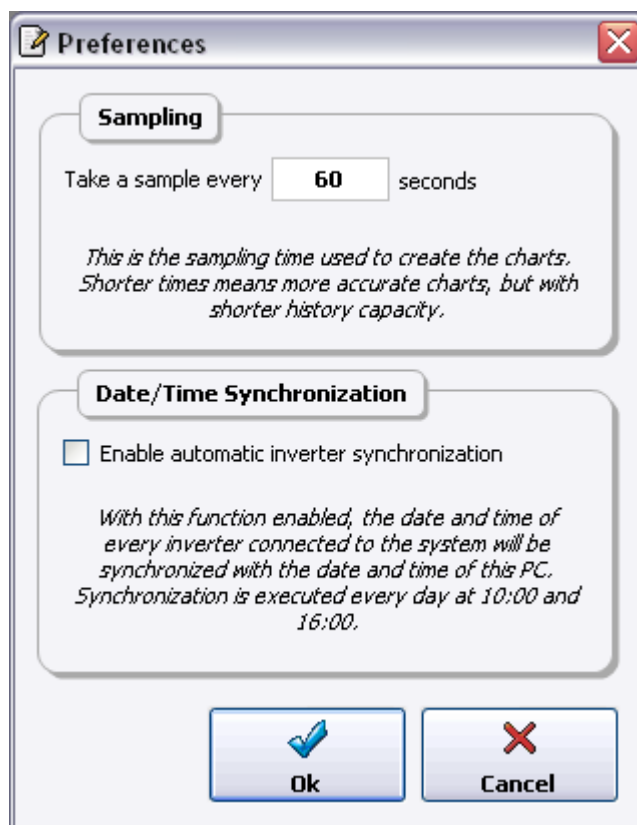


Fig. 2.3.1 – Preferences

2.3.1 – Sampling

This parameter defines the interval (in seconds) from one sample and the next.


It is recommended to enter a value of at least 300 seconds.

Using shorter times will result in more accurate charts, but more memory will be used, both in RAM and in the hard disk (to store the statistics).

2.3.2 – Date / Time Synchronization

If you enable this option, this application will update the date and time of each inverter with the system time two times in a day (at 10 AM and at 4 PM). This is to ensure that there is no time discrepancy between the PC where Aurora Communicator is running and the inverters.

2.4 – Inverters Configuration

Before using this application for the first time, you must configure the inverters you have connected to the system; to do so, open the inverter configuration window by clicking on this button  in the upper toolbar, or, from the menu on the top select "**Configuration**" then "**Configure Inverters**".

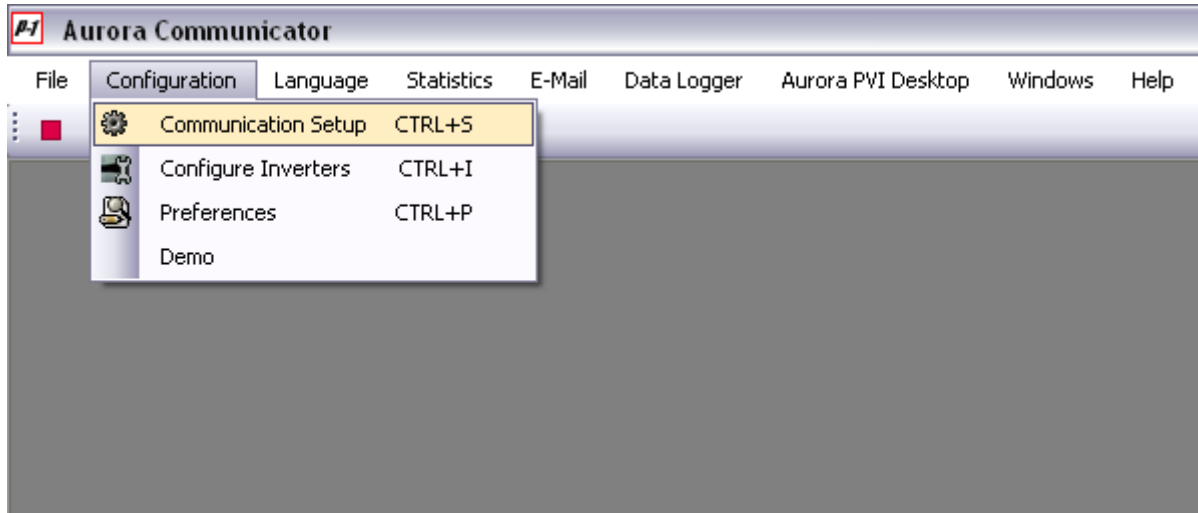


Fig. 2.4.1 – Configuring inverters

This will open the inverters configuration window:

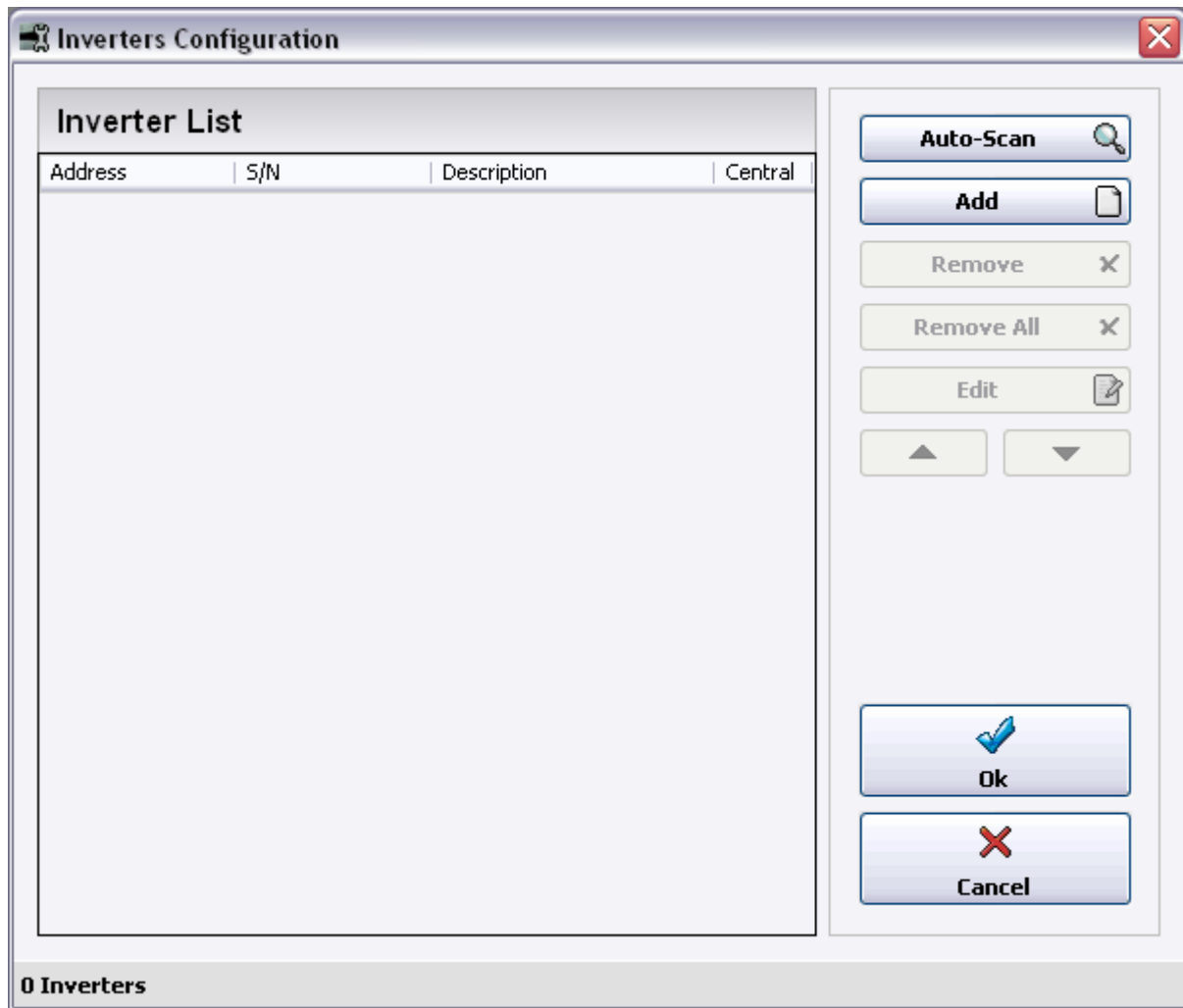


Fig. 2.4.2 – The Inverters Configuration window

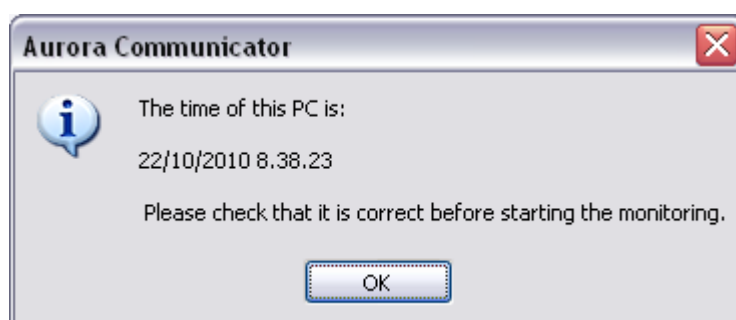
To configure the inverters, you can either add each one by entering their addresses or you can scan the system to check which inverters are currently connected.

To manually add an inverters, click on the **"Add"** button.

To search for inverters, click on the **"Auto-Scan"** button (this operation may take a few minutes).

You can modify the list with the **"Remove"** and **"Edit"** buttons, and also change the position of an inverter in the list with the up/down buttons.

Once you are done with the configuration, press **"Ok"** to exit.



A message will inform you of the time of your PC (Aurora Communicator uses the PC clock to generate local charts and statistics), then you will be able to start the communication.

3 – Using Aurora Communicator

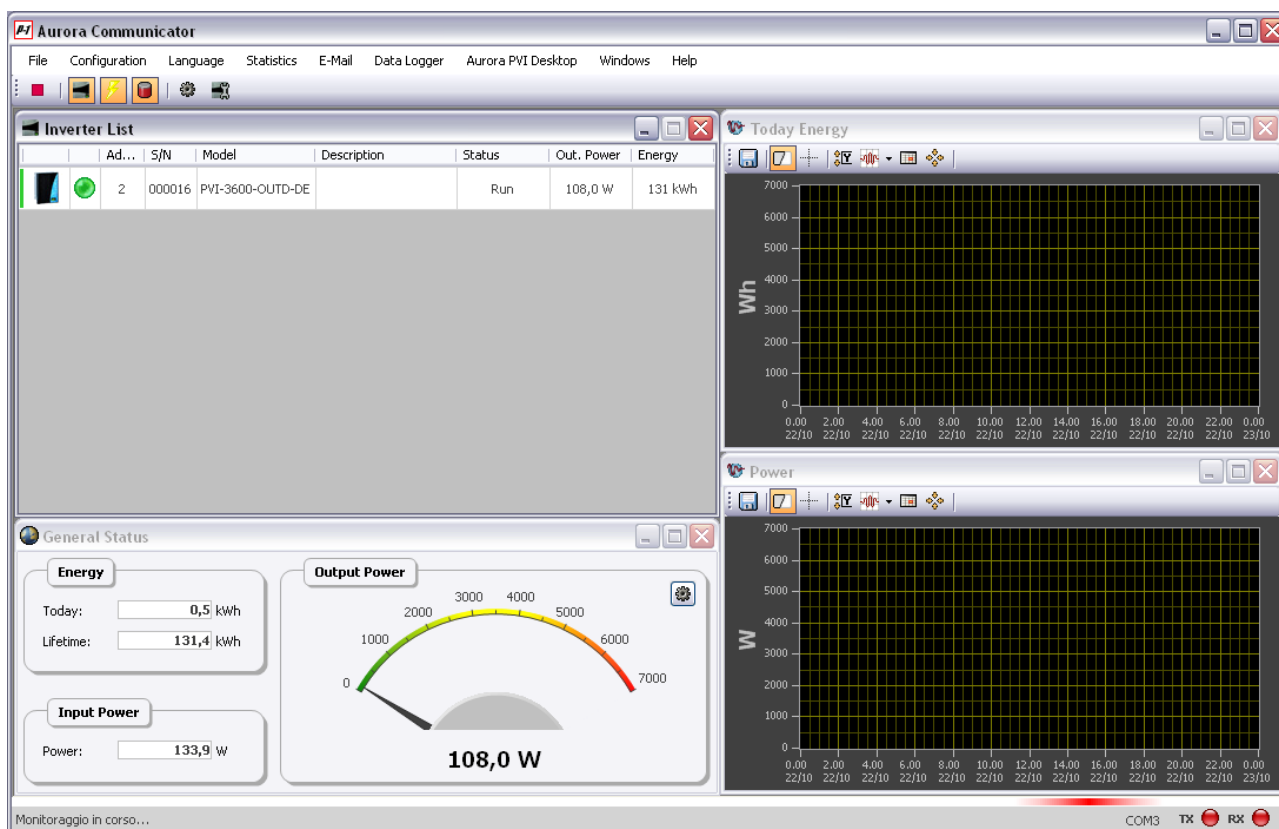


Fig. 3.1 – Aurora Communicator

Once you have configured the system you can start monitoring the inverters.

Press the "Start" button on the toolbar to begin.



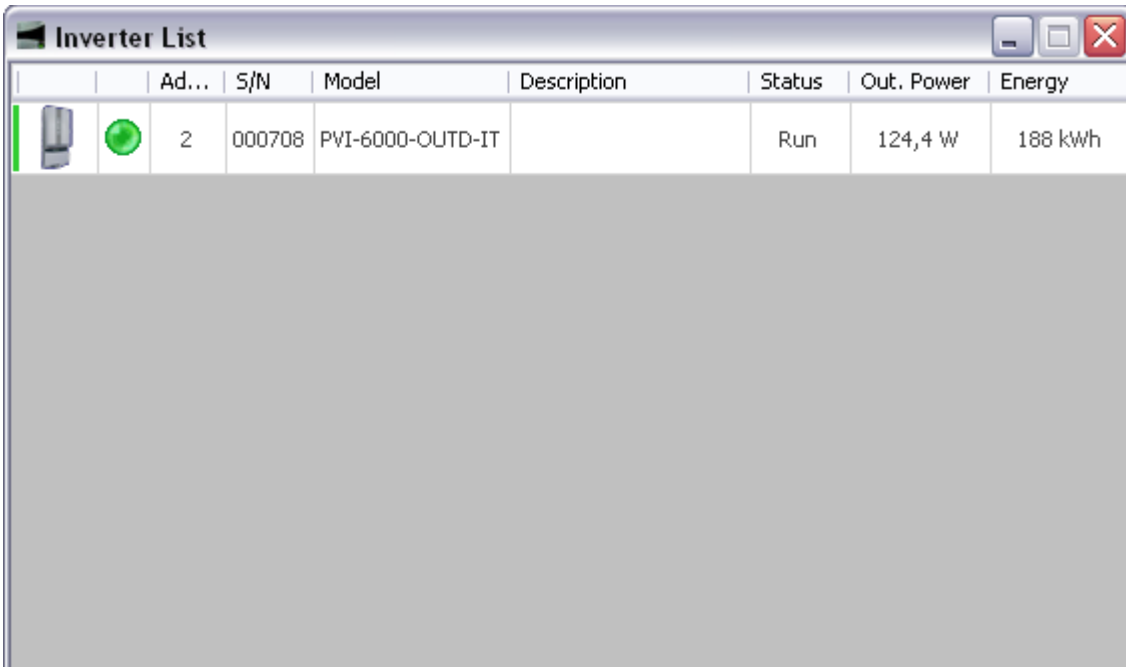
Press it again when you want to stop (the start button is replaced by the stop button when the monitoring is enabled).

The windows you see by default are:

- **Inverters List**
- **General Status**
- **Today Energy**
- **Power**

3.1 – Inverters List

This window shows the status of the inverters connected to the system. See section 2.4 to learn how to configure this list.



The screenshot shows a window titled "Inverter List" with a table containing the following data:



	Ad...	S/N	Model	Description	Status	Out. Power	Energy
		2	000708	PVI-6000-OUTD-IT	Run	124,4 W	188 kWh

Fig. 3.1.1 – Inverters List

You can manually change the date and time of each inverter by right clicking on it, then selecting **"Edit Date/Time"**.

If you double click on a row, the control panel for the selected inverter will show up:

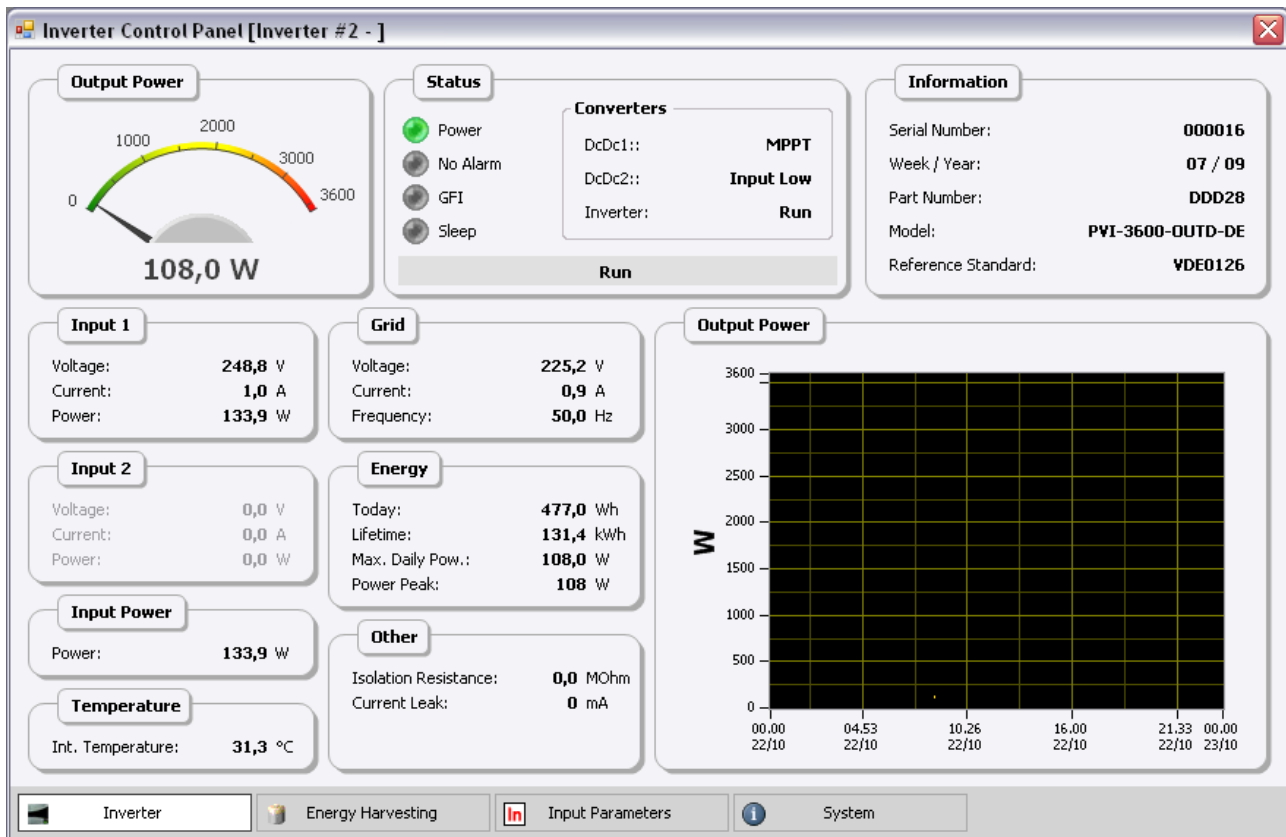


Fig. 3.1.2 – Inverter Control Panel

This panel shows the details of a single inverter.

Information are divided in four sections:

- **Inverter** Shows the general details of the inverter
- **Energy Harvesting** Statistics of the energy collected by the inverter (see section 3.1.1)
- **Input Parameters** Status of the photovoltaic array or eolic generator
- **System** A summary of the system status

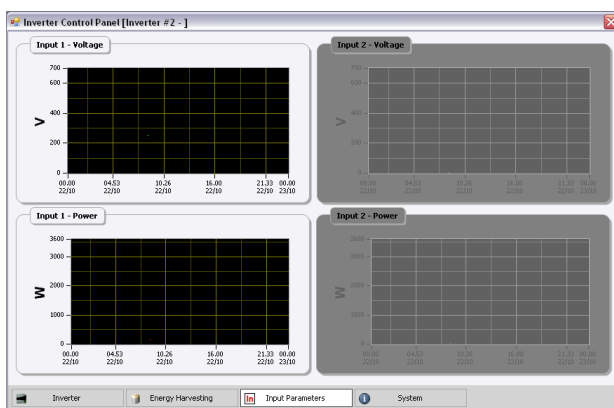


Fig. 3.1.3 – Input Parameters

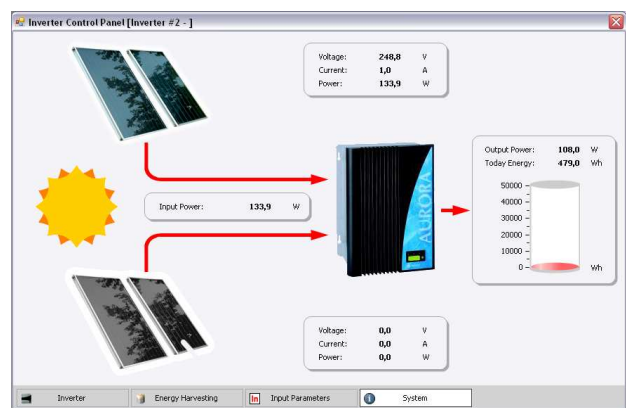


Fig. 3.1.4 – System Status

3.1.1 – Energy Harvesting

In this section of the control panel you can see how much energy has been harvested by the inverter in different time spans.

The first time you enter here, Aurora Communicator will load data from the inverter to generate the statistics; this operation may take a few moments.

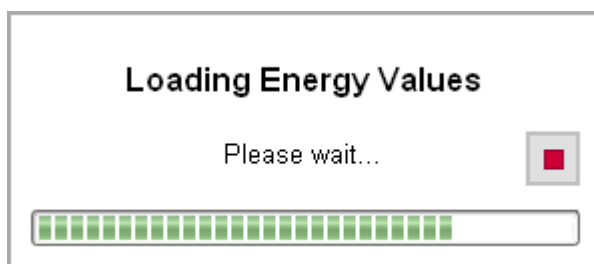


Fig. 3.1.1.1 – Loading inverter statistics

If you want to update the statistics, press the **"Reload"** button in this section.

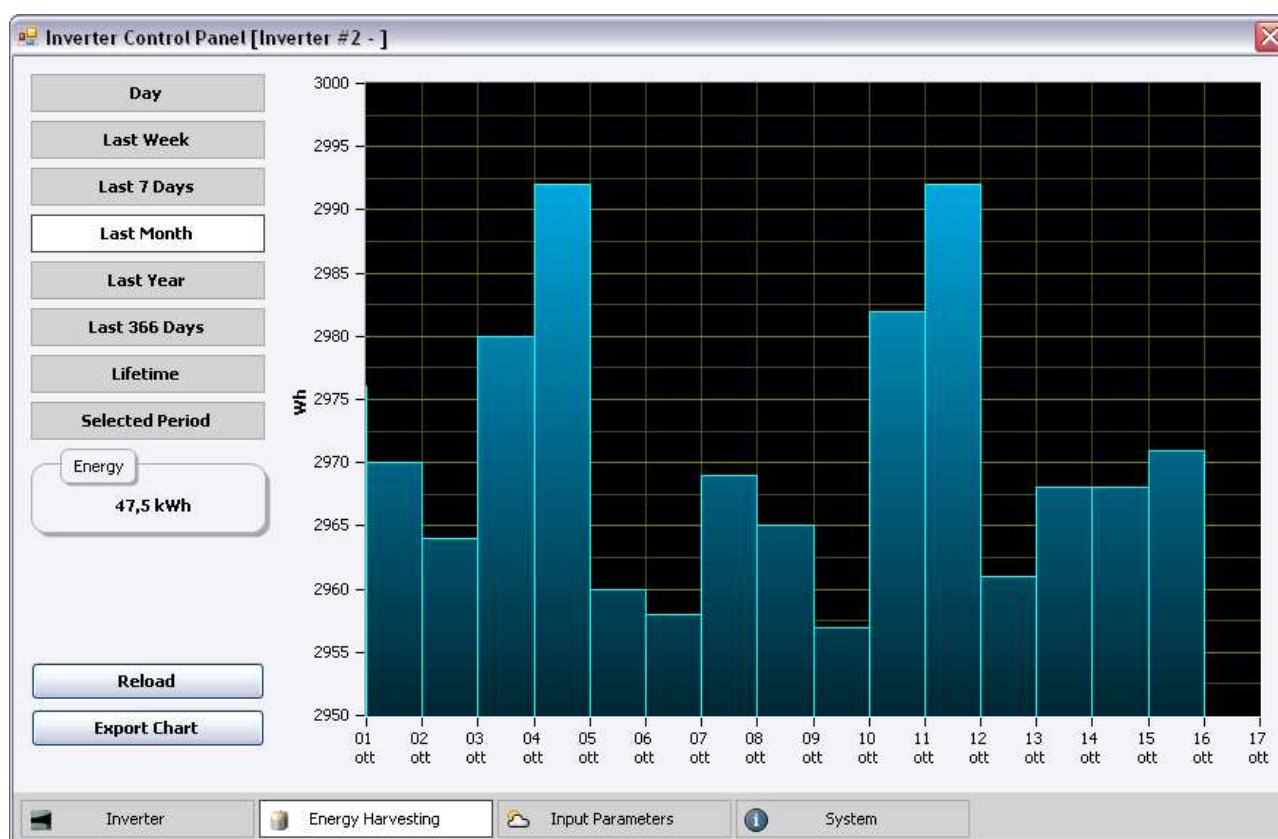


Fig. 3.1.1.2 – Energy Harvesting

On the left side of this section you can choose which time period you want to see.

By using the **"Export Chart"** function you can also save a copy of the statistics in **xls** or **csv** format.

4 - Charts

Aurora Communicator generates several charts while monitoring the system, in order to collect data for the statistics.

By default, you can see in the main application window the charts of the daily energy ("Today Energy") and power. These two are updated automatically from time to time (see section 2.3.1, "**Sampling Time**").

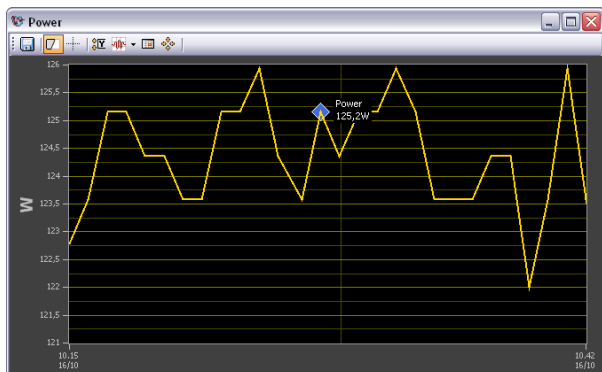


Fig. 4.1 – Power

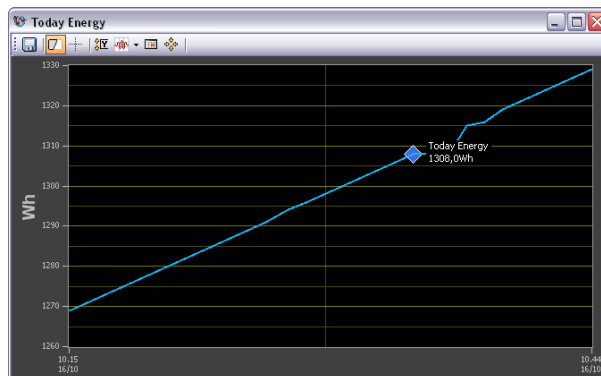


Fig. 4.2 – Daily Energy

4.1 – Charts Interaction

It is possible to interact with the charts by using a combination of keyboard and mouse.

There is an help inside Aurora Communicator that can show you how to operate: to open it, from the menu on the top, select "**Help**" then "**Charts Information**".



Fig. 4.1.1 – Charts Help

In any case, here is a summary of the most important operations:

Zoom In Shift + Left Mouse Click

Zoom Area	Shift + Drag Mouse with the Left Button Pressed
Reset Zoom	Shift + Backspace
Undo Zoom	Shift + Right Mouse Click
Zoom In / Out	Shift + Mouse Wheel
Move Chart	Ctrl + Drag Mouse with the Left Button Pressed
Move Left	Ctrl + Left Arrow
Move Right	Ctrl + Right Arrow
Move Up	Ctrl + Up Arrow
Move Down	Ctrl + Down Arrow
Reset Move	Ctrl + Backspace
Undo Move	Ctrl + Mouse Right Click

4.2 – Charts Options

Right click on a chart to open this contextual menu:

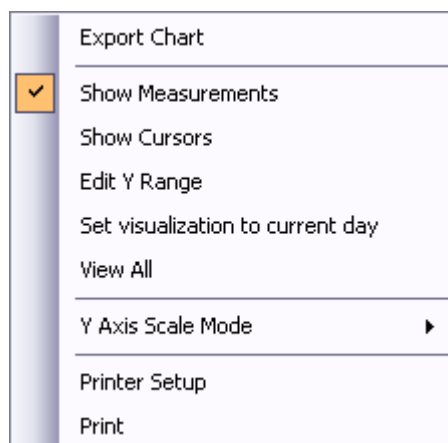


Fig. 4.2.1 – Chart Menu

4.2.1 – Export Chart

With this feature you can export a chart in different formats:

- **.cht** This is the default format used in this application: you can only open these files inside Aurora Communicator.
- **.xls** These are TAB separated files that can be opened with any version of Excel.
- **.csv** These files contain data of each point in the chart; they can be opened with various applications.
NOTE: you can save these files in 2 ways: european or american. The first one uses the character “,” as separator for decimal digits, while the second one uses the character “.”.

4.2.2 – Show Measurements

This option shows/hides the toolbar in the chart window which contains various commands and measurements (values, times and intervals).

Drag the two cursors (those dotted lines you see in the chart) to change their position.

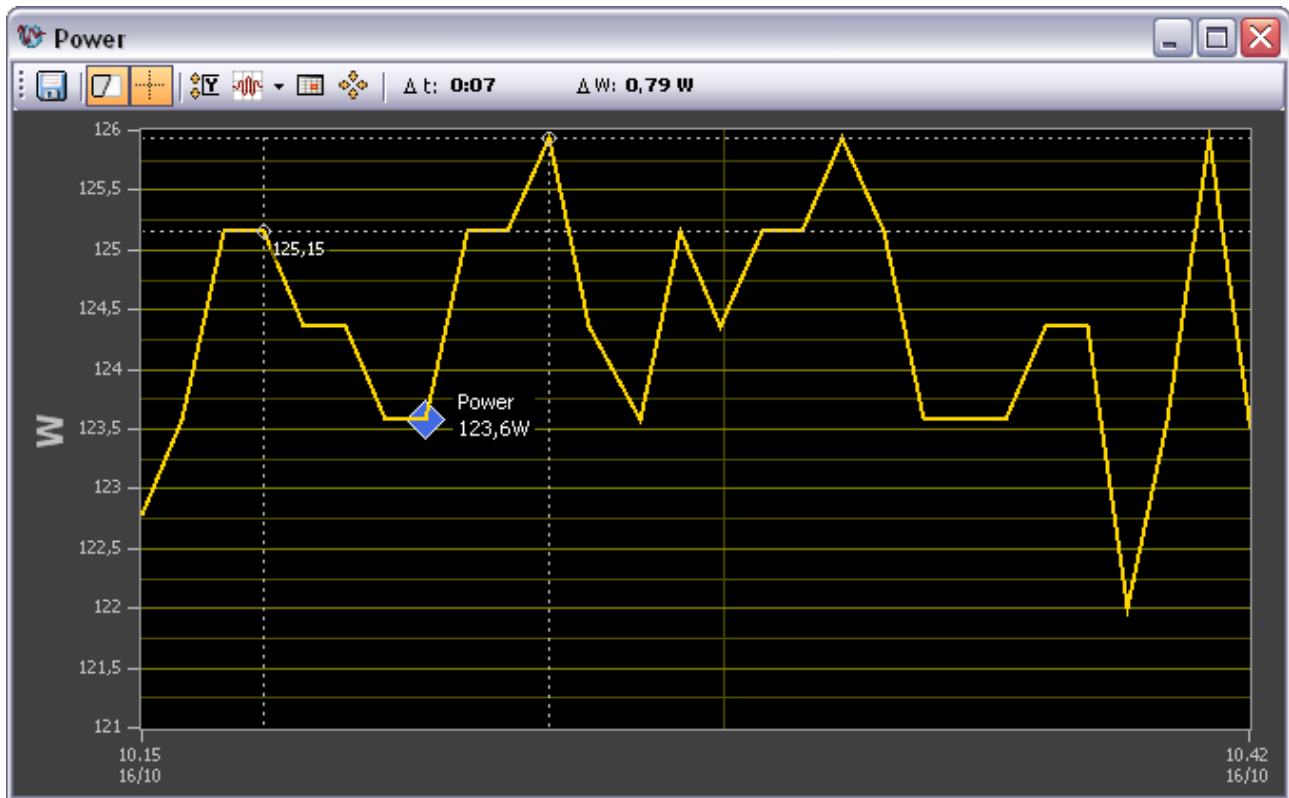


Fig. 4.2.2.1 – A chart with measurements shown

4.2.3 – Edit Y Range

Select this option to change the chart's default Y range in order to better adjust it (if needed).

You will be asked for a new interval:

Fig. 4.2.3.1 – Edit Y Range

4.2.4 – Set visualization to current day

This function shows the current day in the X axis of the chart (from 6:00 AM to 8:00 PM).

Use it to quickly reset the visualization to the default one if you manually scrolled/zoomed into the chart.

4.2.5 – View All

This function automatically changes the X and Y axis of the chart in order to perfectly fit the waveform on it.

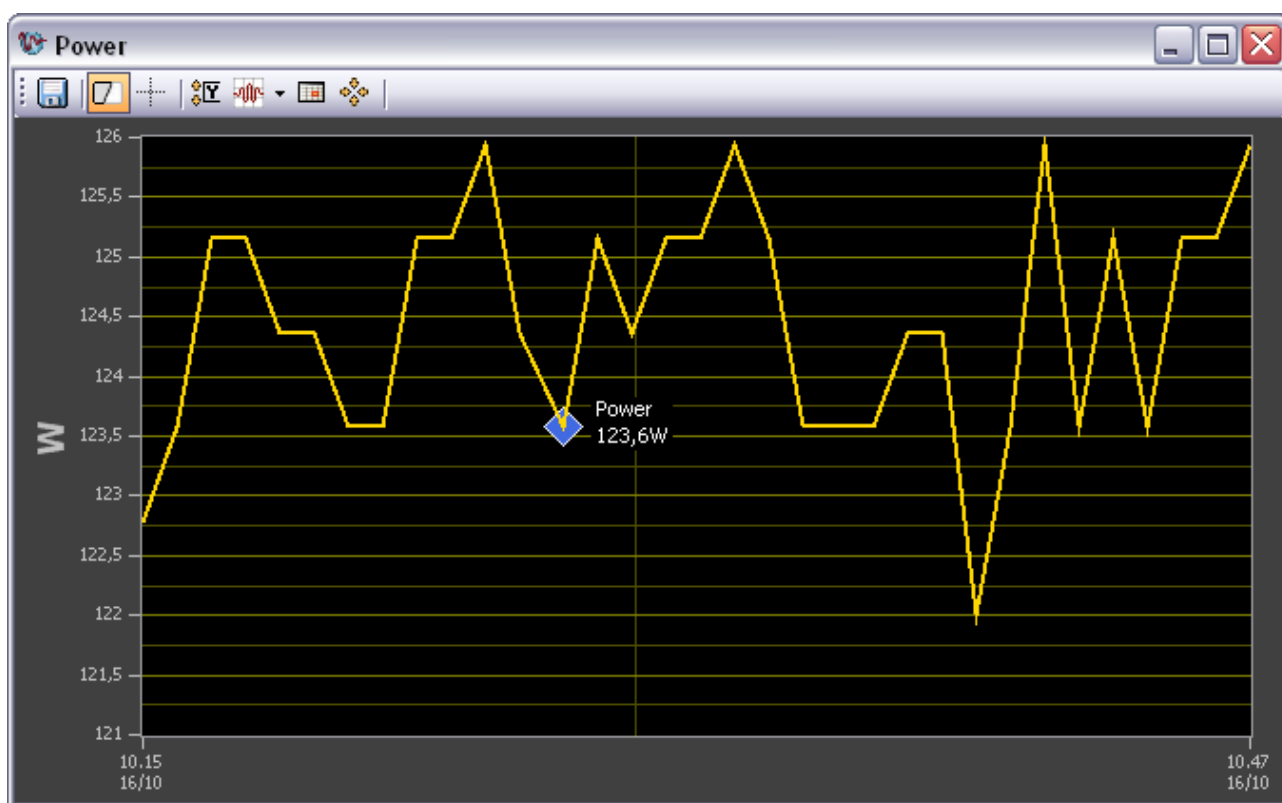


Fig. 4.2.5.1 – Example of "View All" function

4.2.6 – Y Axis Scale Mode

Here you can choose how the Y axis works:

- **Fixed** The Y axis range is fixed, and depends by the one you defined yourself (see section 4.2.3)
- **Auto-Scale Loose** The Y axis range is determined by the minimum and maximum values, with a small gap on top and bottom.
- **Auto-Scale Exact** The Y axis range is determined by the minimum and maximum values, with no gap on top and bottom.
- **Scope Chart** The Y axis range follows the waveform. A small gap is left on top or bottom.

- **Strip Chart** The Y axis range follows the waveform. No gap is left on top or bottom.

4.2.7 – Printer Setup / Print

These are standard dialog boxes that allow to set up a printer and print the selected chart.

5 - Statistics

From the menu on the top, select **"Statistics"** to open this section:

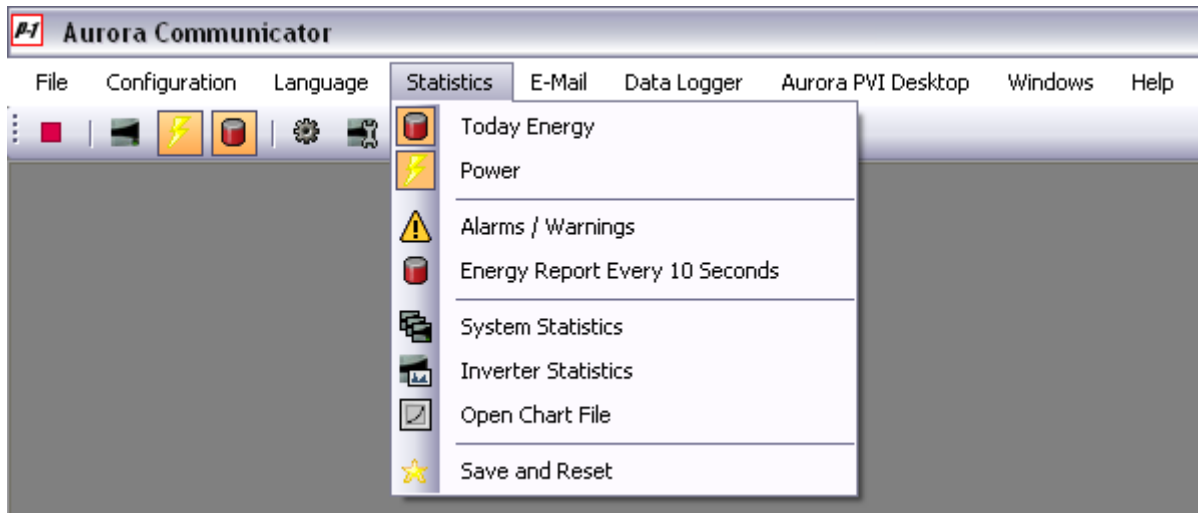


Fig. 5.1 – Statistics Menu

"Today Energy" and **"Power"** are the charts that you can see in the main application window (see section 4); if you close them, you can open them again by clicking on these entries.

5.1 – Alarms / Warnings

This is a list of past alarms and warnings reported by a single inverter.

From the combo box on the bottom, select the inverter you want to analyze and the program will start loading data from it:



Fig. 5.1.1 – Loading alarms and warnings

This operation may take a few seconds, according to the total number of events stored in the inverter.

Once this operation is completed (you can abort it any time you want by pressing the **"Stop"** button), you will be shown the list of alarms and warnings:

Alarms / Warnings						
Alarms						
Code	Description	Date/Time	Startup No.	Progressive No.	Value	
E005	Comm.Error	29/09/2009 9.42.28	308	1	-----	
E005	Comm.Error	29/09/2009 9.36.30	307	1	-----	
E005	Comm.Error	29/09/2009 9.29.50	306	1	-----	
E005	Comm.Error	04/08/2009 14.58.33	279	1	-----	
E005	Comm.Error	03/08/2009 14.06.47	278	1	-----	
E005	Comm.Error	03/08/2009 14.03.08	277	1	-----	
E005	Comm.Error	03/08/2009 13.58.31	276	1	-----	
E005	Comm.Error	03/08/2009 13.57.25	276	1	-----	
E005	Comm.Error	03/08/2009 13.55.46	276	1	-----	
E013	Wrong Mode	25/06/2009 19.13.25	256	2	-----	
E005	Comm.Error	20/01/2009 11.45.41	207	1	-----	
E005	Comm.Error	20/01/2009 11.41.58	206	1	-----	
E005	Comm.Error	20/01/2009 11.40.34	206	1	-----	
E005	Comm.Error	20/01/2009 11.32.34	205	1	-----	
E023	DC inj error	20/01/2009 11.05.23	205	3	-----	
E023	DC inj error	20/01/2009 10.58.38	205	2	-----	
E013	Wrong Mode	12/01/2009 17.24.15	197	1	-----	
E013	Wrong Mode	12/01/2009 17.23.36	197	1	-----	
E013	Wrong Mode	21/05/2008 8.29.52	106	5	-----	

Inverter
000708

Alarms

Warnings

Export

Close

Loading Completed

Fig. 5.1.2 – Alarms / Warnings

Use the “**Alarms**” and “**Warnings**” buttons (located on the bottom) to switch between the two tables. You can sort these lists by clicking on the column titles in the table’s header.

By using the “**Export**” button you can also save these lists in different formats:

- **.txt** A simple text file that can be opened with any editor.
 - **.xls** A TAB separated file that can be opened with any version of Excel.
 - **.csv** Another type of file that can be opened with various applications (Excel included).
- NOTE:** you can save these files in 2 ways: european or american. The first one uses the character “,” as separator for decimal digits, while the second one uses the character “.”.

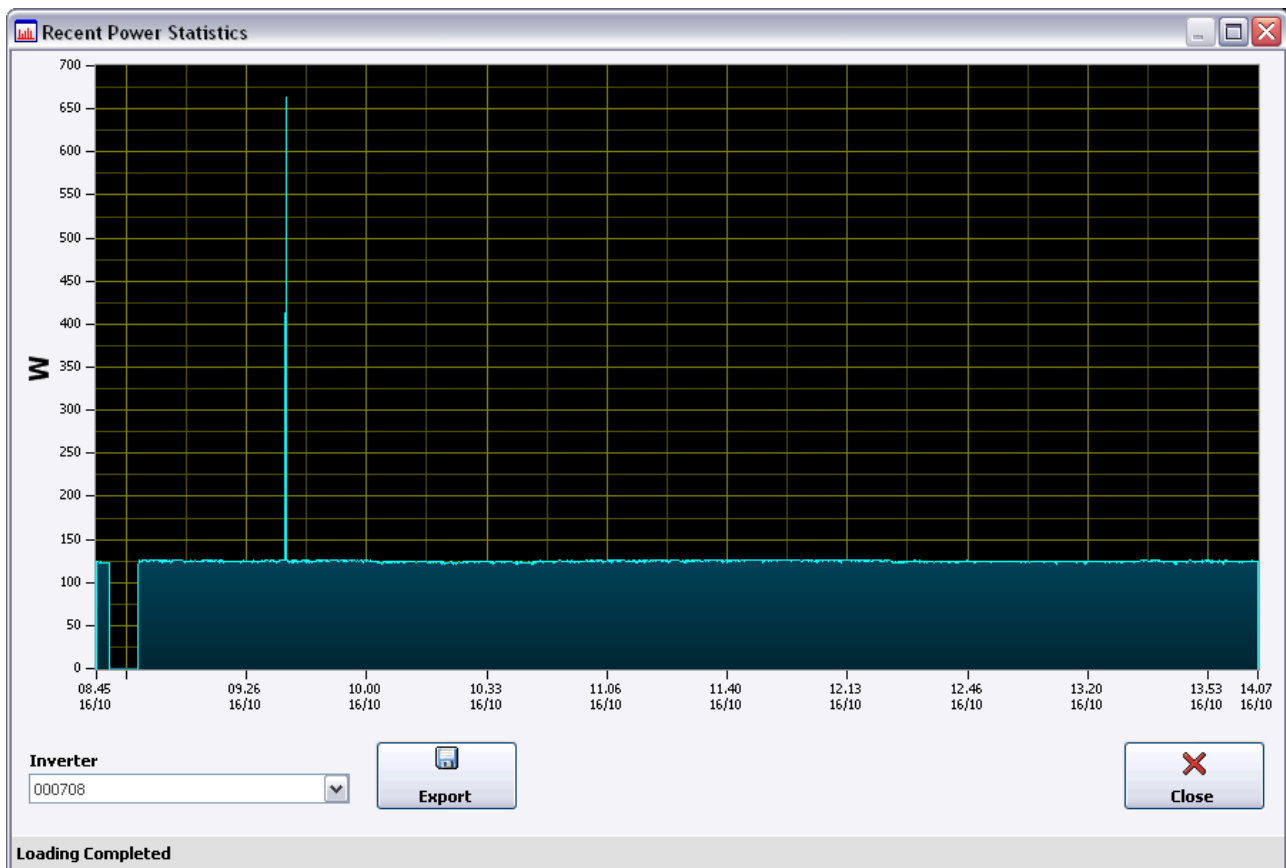
5.2 – Recent Power Statistics

Inverters store a sample of output power once every 10 seconds. This allows around 2 days of detailed analysis.

By using the “Recent Power Statistics” function, you can download this information on your PC.

Be aware that this operation will take around 6 minutes to complete, since there are many values to download.

Once completed, you can export the values to csv or excel files.



5.3 – System Statistics

This function generates a chart with the system statistics.

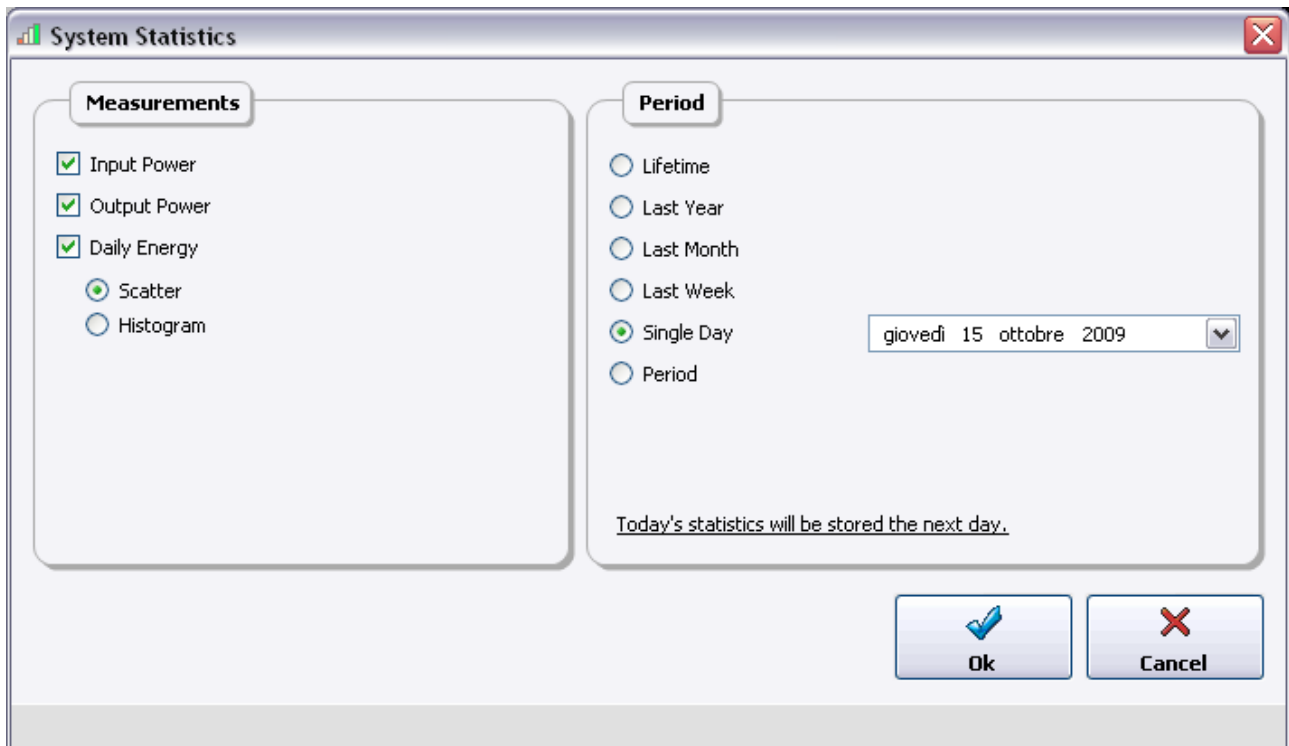


Fig. 5.2.1 – System Statistics

Select, on the left side, the measurements you want to appear on the chart; daily energy can be shown either with a scatter or an histogram chart.

Then, select the time period on the right: either select a single day or look for a particular interval. Press "Ok", and the program will search for the required information, then a chart will be shown.

5.3.1 – Statistics Results

The chart generated by the statistics functions can contain more waveform:

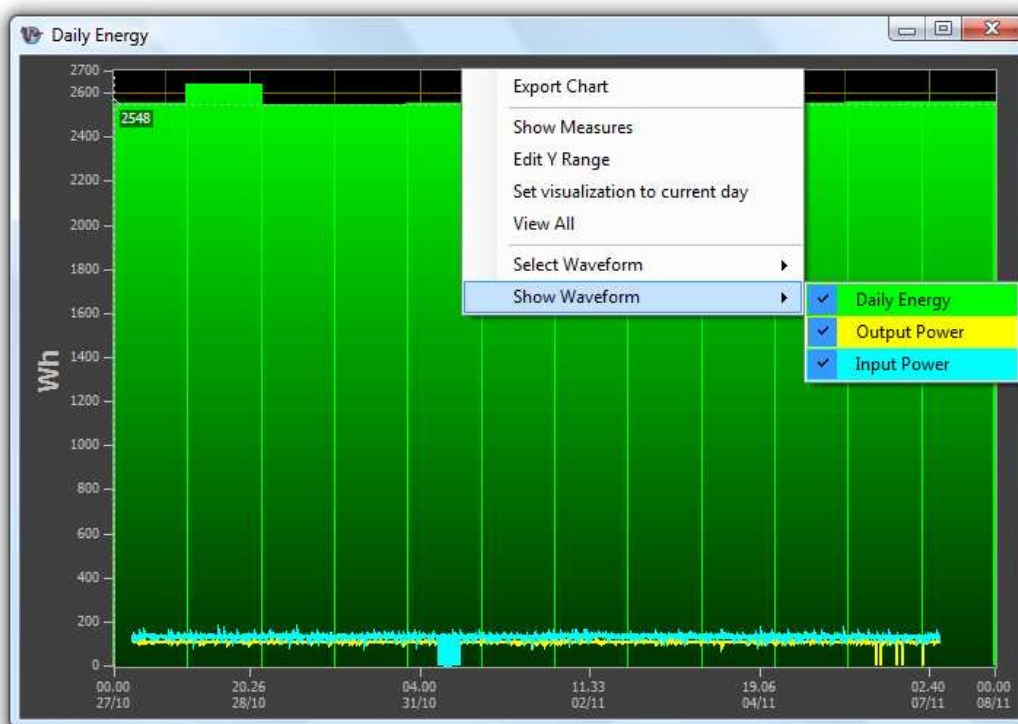


Fig. 5.2.1.1 – Example of System Statistics

If you right click on the chart, you will see two new menus: **"Select Waveform"** and **"Show Waveform"**.

"Select Waveform" let you choose which one of the waveforms is currently selected. It is necessary to select a waveform to make measurements (using the cursors, see section 4.2.2), change the units in the Y axis and the title of the chart, and finally to export it (only the selected waveform can be exported when you choose the "Export Chart" function, see section 4.2.1).

"Show Waveform" let you hide and show the single waveforms shown in the chart.

NOTE: you will not find any data from the current day in these statistics because they are stored the next day.

5.4 – Inverter Statistics

This feature is similar to "System Statistics" (section 5.2), but only shows data of a single inverter.

Inverter Statistics

Measurements

- ☐ Input 1 Voltage
- ☐ Input 1 Current
- ☐ Input 1 Power
- ☐ Input 2 Voltage
- ☐ Input 2 Current
- ☐ Input 2 Power
- ☒ Output Voltage
- ☒ Output Current
- ☒ Output Power
- ☐ Inverter Temperature
- ☐ Internal Temperature
- ☒ Daily Energy
 - ☒ Scatter
 - ☐ Histogram

Inverter

Serial Number:

Period

- ☐ Lifetime
- ☐ Last Year
- ☐ Last Month
- ☐ Last Week
- ☒ Single Day
- ☐ Period

giovedì 15 ottobre 2009

Today's statistics will be stored the next day.

Ok **Cancel**

Fig. 5.3.1 – Inverter Statistics

First, select an inverter from the combo box on the top.

Then, select on the left side the measurements you want to appear on the chart; daily energy can be shown either with a scatter or an histogram chart.

Finally, select the time period on the right: either select a single day or look for a particular interval. Press **"Ok"**, and the program will search for the required information, then a chart will be shown:

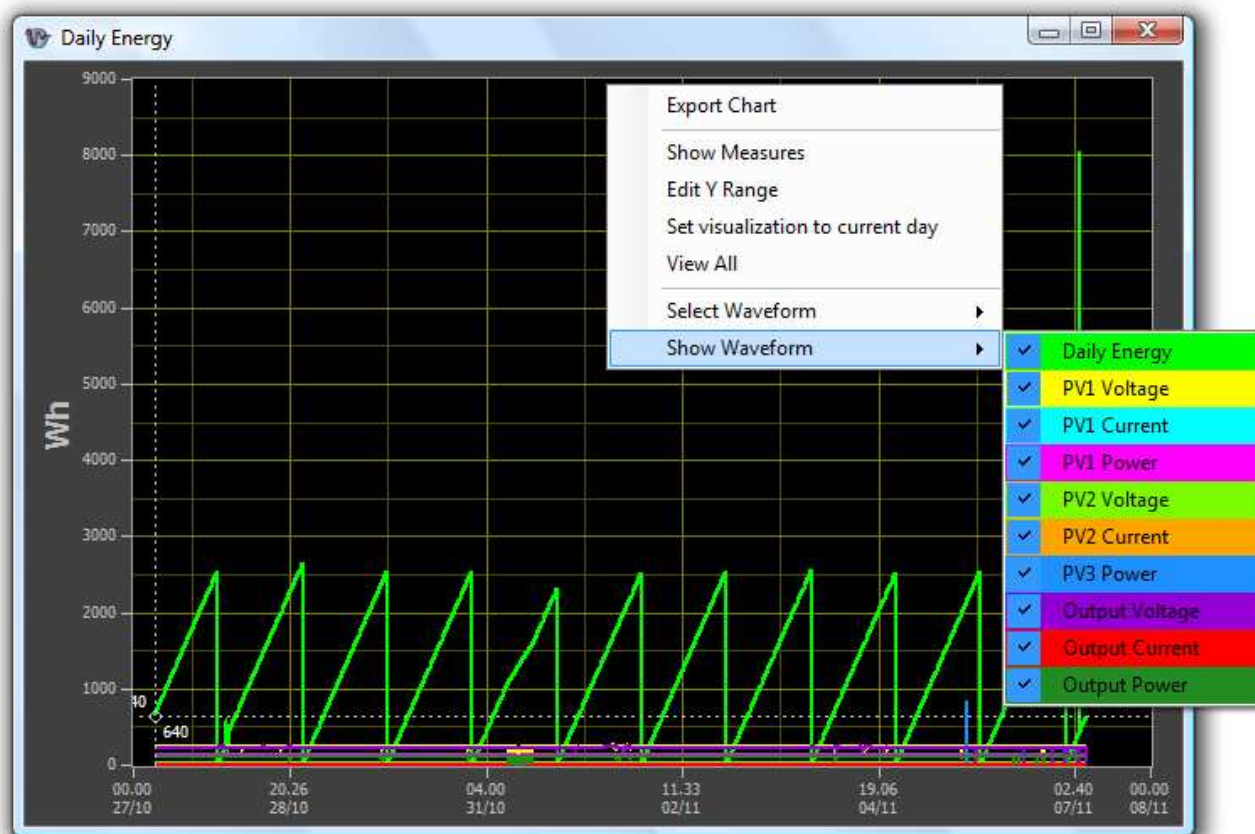


Fig. 5.3.2 – Example of Inverter Statistics

This chart works exactly like the one generated by "System Statistics": see section 5.2.1 ("**Statistics Results**") for more information.

5.5 – Store Statistics

Aurora Communicator automatically stores daily statistics to files each day at midnight, then clears the charts.

This is done to save memory (only information for the current day is shown) and to organize data for the statistics.

You can also manually store these files by using **"Save and Reset"** in the **"Statistics"** menu.

"Save and Reset" saves the current charts to files, then clears all of them (it's the same thing that is automatically done each day at midnight).

5.6 – Opening Chart Files

It is possible to load chart files that you previously exported by using the **"Open Chart File"** function.

You can load charts in these formats:

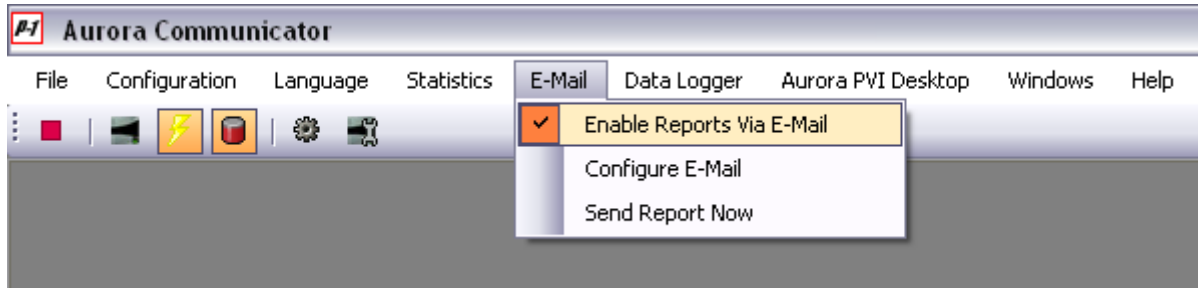
- **.cht**
- **.xls**
- **.csv**

Please note that if you have modified charts files with other applications (for example, you opened an .xls file with Excel and saved it again) you most likely will not be able to open them again with Aurora Communicator!

6 – E-Mail

It is possible to configure Aurora Communicator in order to send via mail faults or daily reports.

To enable this function, check the option under the “**E-Mail**” menu:



6.1 – Configure E-Mail

Select this option to set up email addresses and SMTP server.

In the section on the left, set up the mail server, using authentication if required.

Some SMTP servers also require you to set proper sender name and address.

The other two sections refer to daily reports and fault reports.

Daily reports are sent each day either at a specified time or when inverters are switching off (at the end of the day, due to missing sun).

Set up the mailing list by adding each address using the "**Add E-Mail**" link.

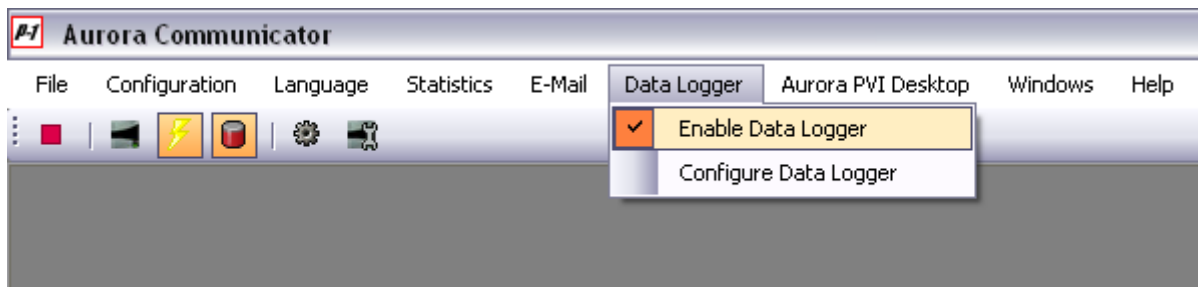
Data logs are attached to each daily report, if enabled (see section 7 for more info on Data Logger).

Fault reports, on the other hand, are sent immediately when a fault is recognized. Set up the mailing list as for the daily reports. You can also choose to ignore warnings and receive reports only for real faults.

7 – Data Logger

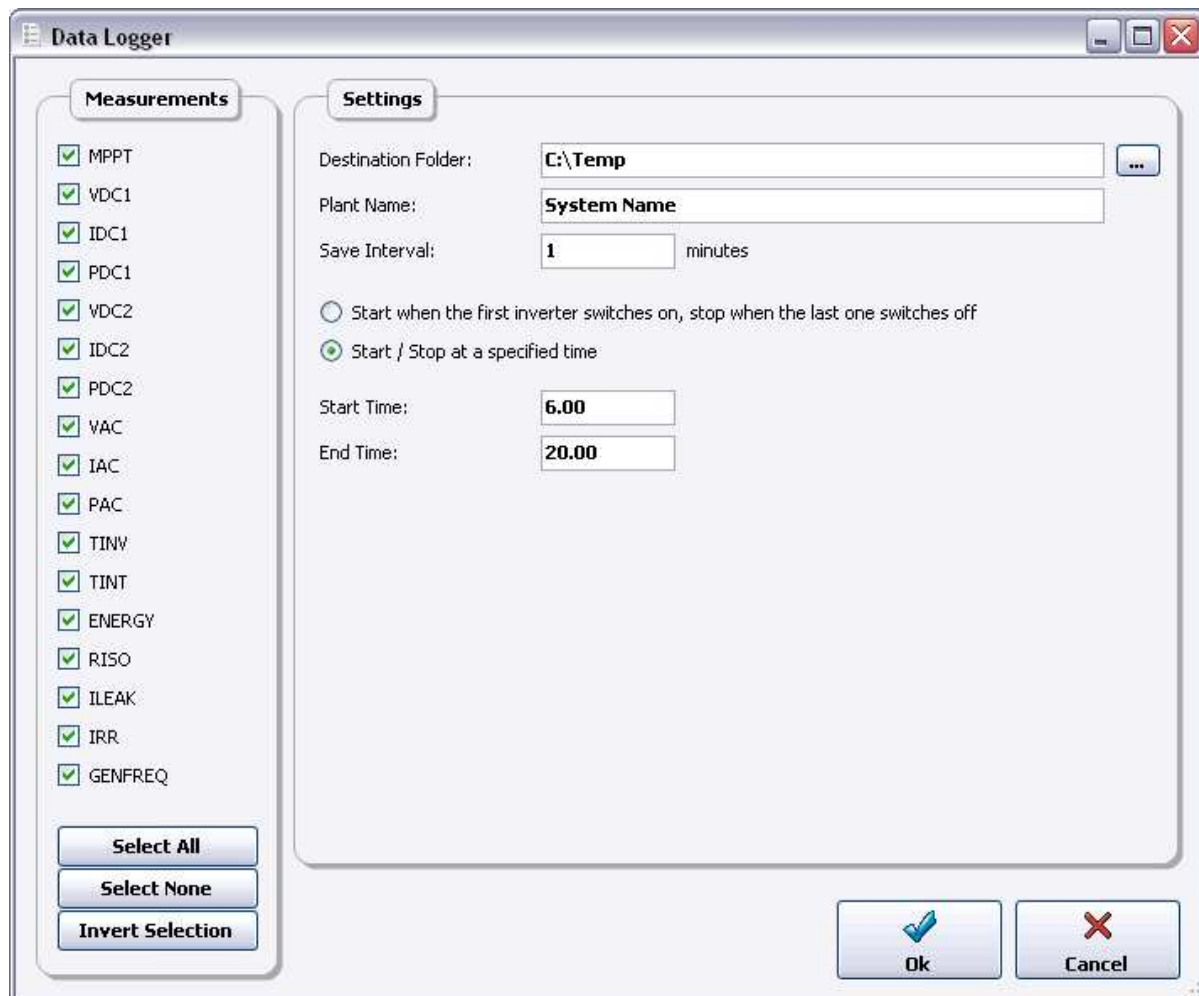
Data logs are files created daily by Aurora Communicator that store various measurements taken at specified intervals.

To enable this function, check the option under the **"Data Logger"** menu:



7.1 – Configure Data Logger

Select this option to set up measures, folder and interval time for data logger.



Mark the measures that you want to appear in the log from the list on the left.

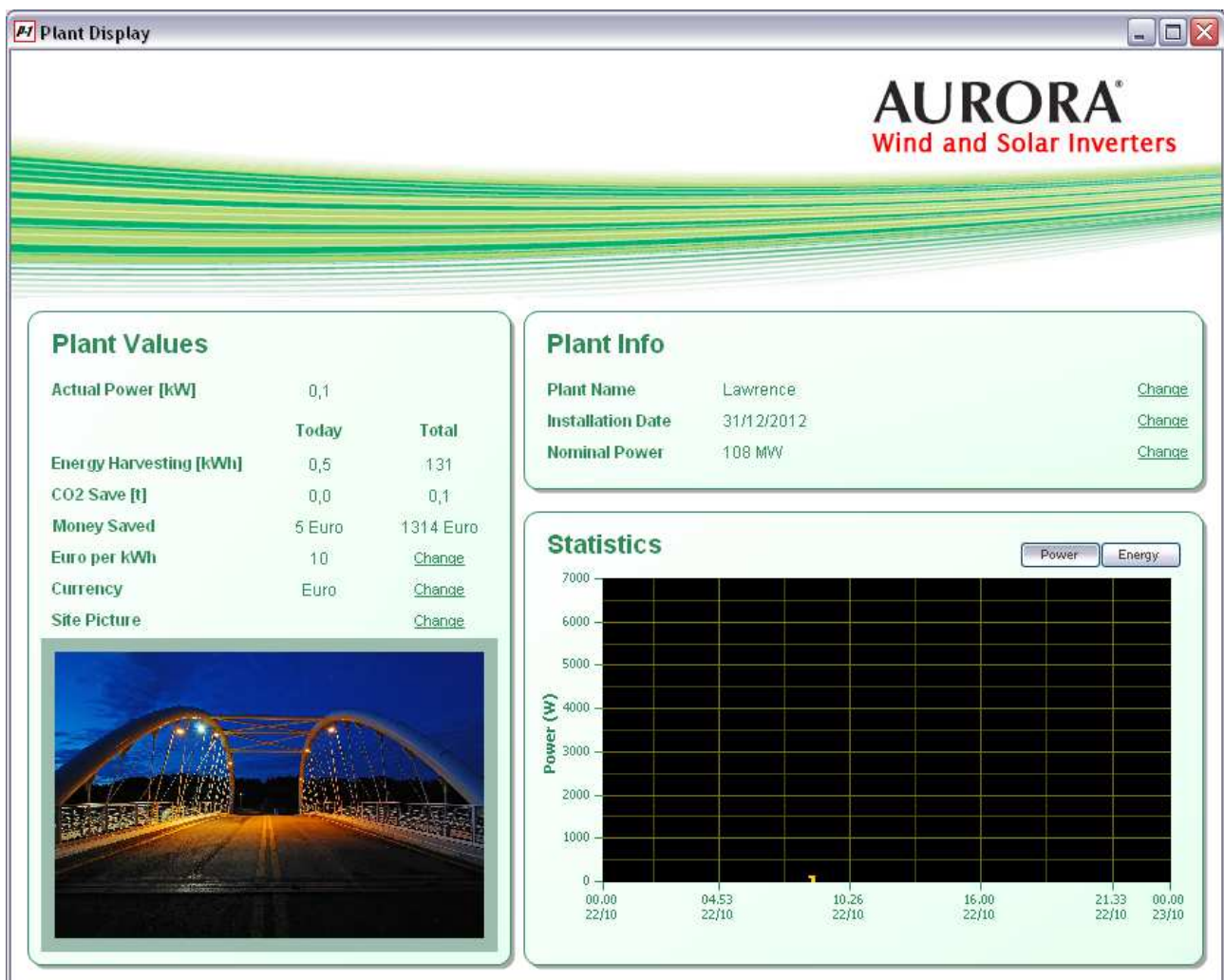
Then, you can select the folder where to save the data logger files: for each day, a different file is created.

You can also set up the system name that will be reported in the log, the interval between each measurement and the start / end time.

8 – Synoptic

The synoptic is a simple window that just shows the main system parameters and statistics without any detailed information.

This window, called “**Plant Display**”, can be found under the “**Help**” menu:

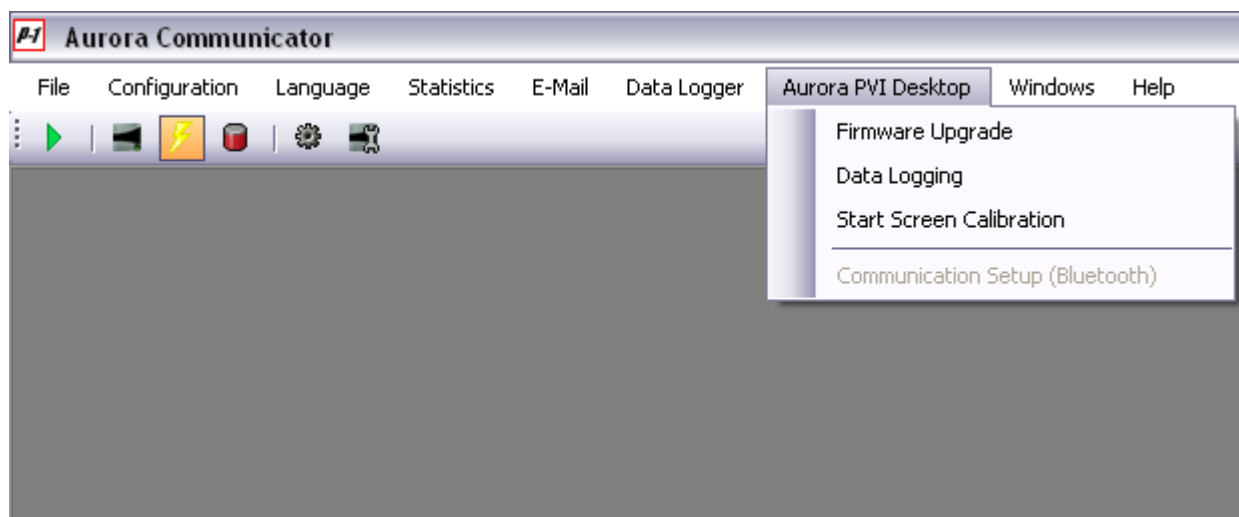


9 – Aurora PVI Desktop

Power-One's Desktop product allows inverter owners to monitor performance from anywhere within 300 metres of the units. Ideal for residential and small commercial PV applications, the Desktop features touch screen colour TFT display and can be either wireless or connected.



By connecting your Aurora PVI Desktop to a PC via USB cable or Bluetooth it is possible to use Aurora Communicator to perform various tasks from the specific menu:



The option "**Communication Setup (Bluetooth)**" is only enabled if PVI Desktop is not detected via USB: when the device is connected directly via USB and you click on "**Aurora PVI Desktop**" menu this option will be automatically disabled.

9.1 – Firmware Upgrade

Use this option to check for new firmware updates and to download them into your PVI Desktop.



If your device is properly detected, you will see on the left panel some information about it.

If no device is detected, you will see this message:

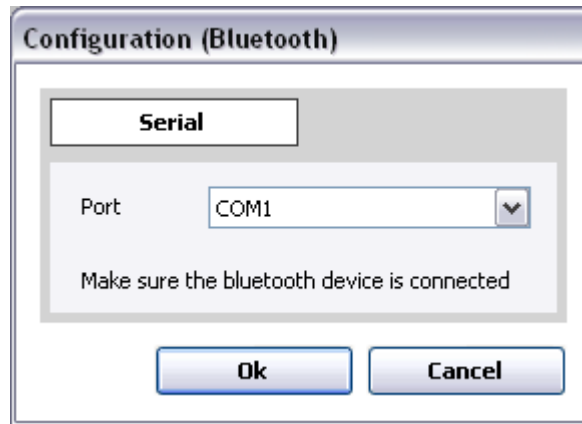


Proceeding in offline mode allows you to download new firmwares from the web.

In this case you can:

- Check that the USB cable is properly connected and that the PVI Desktop is switched on (if you have just switched it on, wait for the starting sequence to end)
- Close Aurora Communicator, disconnect and reconnect the USB cable, then run again Aurora Communicator

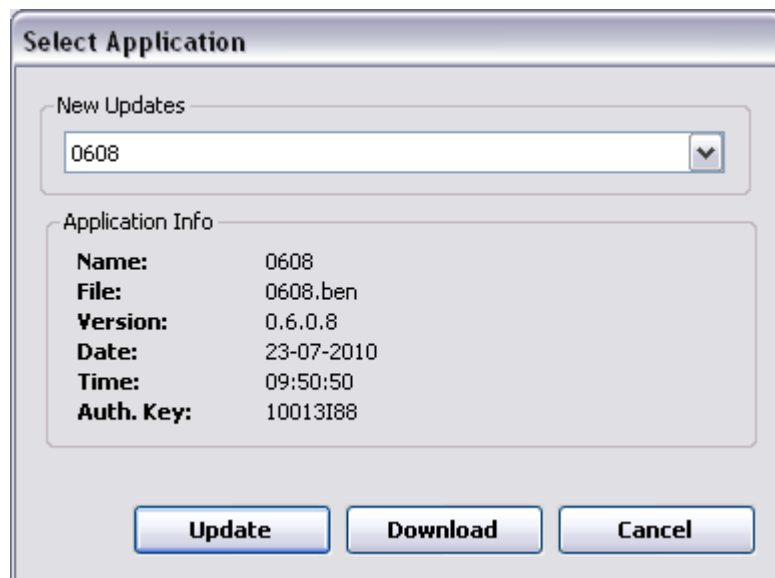
- If you are using a Bluetooth connection, check the communication settings in the specific menu (be sure to select the correct communication port):



9.1.1 – Web Update

With this option you can check for new firmwares on the web or download previous releases.

Make sure that your internet connection is active and press the **"Web Update"** button in the **"Aurora PVI Desktop Firmware Upgrade"** window.



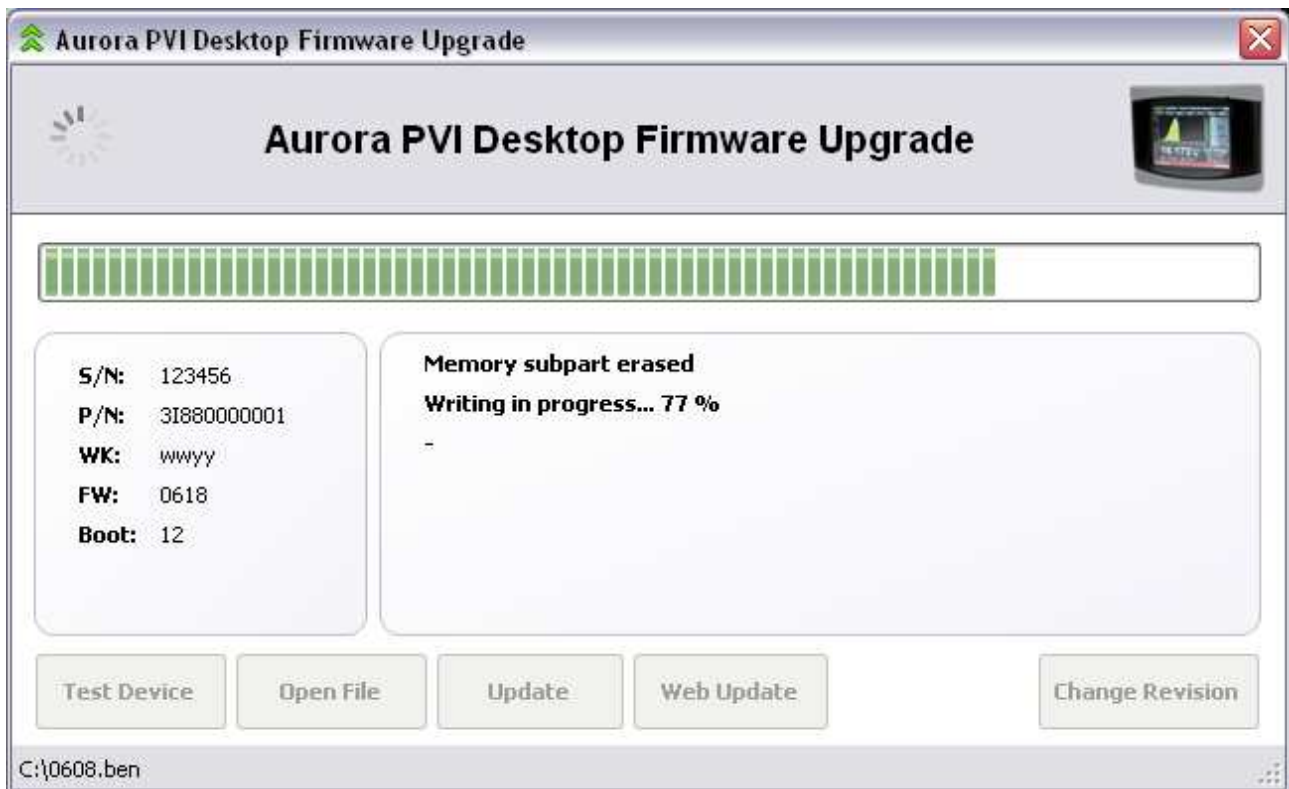
The combo box will show the list of firmware revisions which have been officially released: the latest one should be automatically selected.

Press the **"Update"** button to download the selected firmware and automatically send it to the PVI Desktop.

Instead, use the **"Download"** button if you just want to download it to a folder in your PC and upgrade later.

9.1.2 – Update

Once you have loaded a file, press the **"Update"** button to upgrade the PVI Desktop. You do not need this operation if you are using the **"Web Update"** function (it will start automatically).

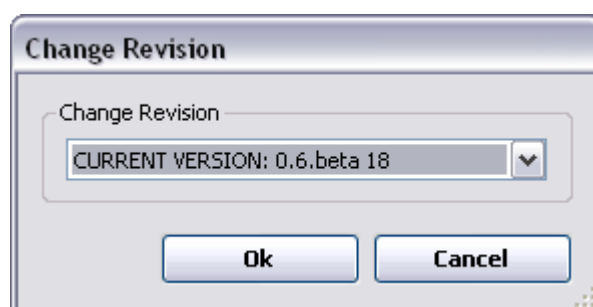


The whole operation could take several minutes to complete.

9.1.3 – Change Revision

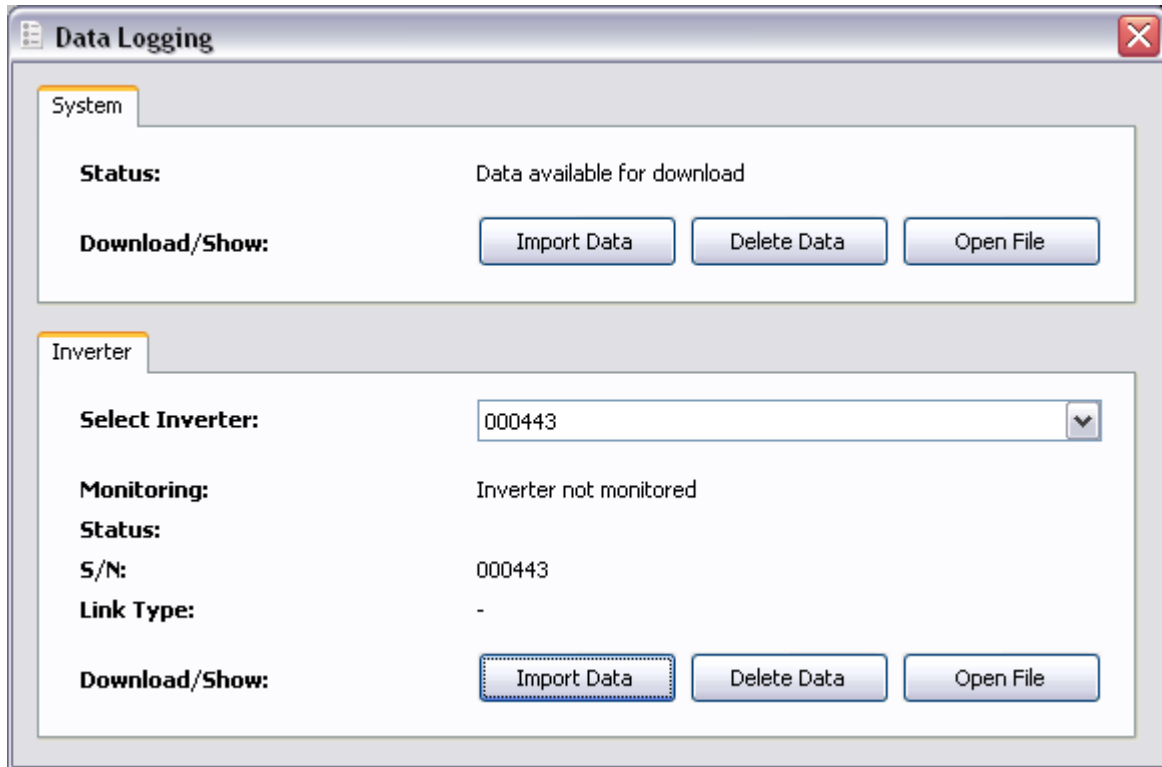
With this option you can activate a newly downloaded firmware or restore a previous version.

Press the **"Change Revision"** button to open a list of available firmwares, select one and then press **"Ok"** to start the procedure.



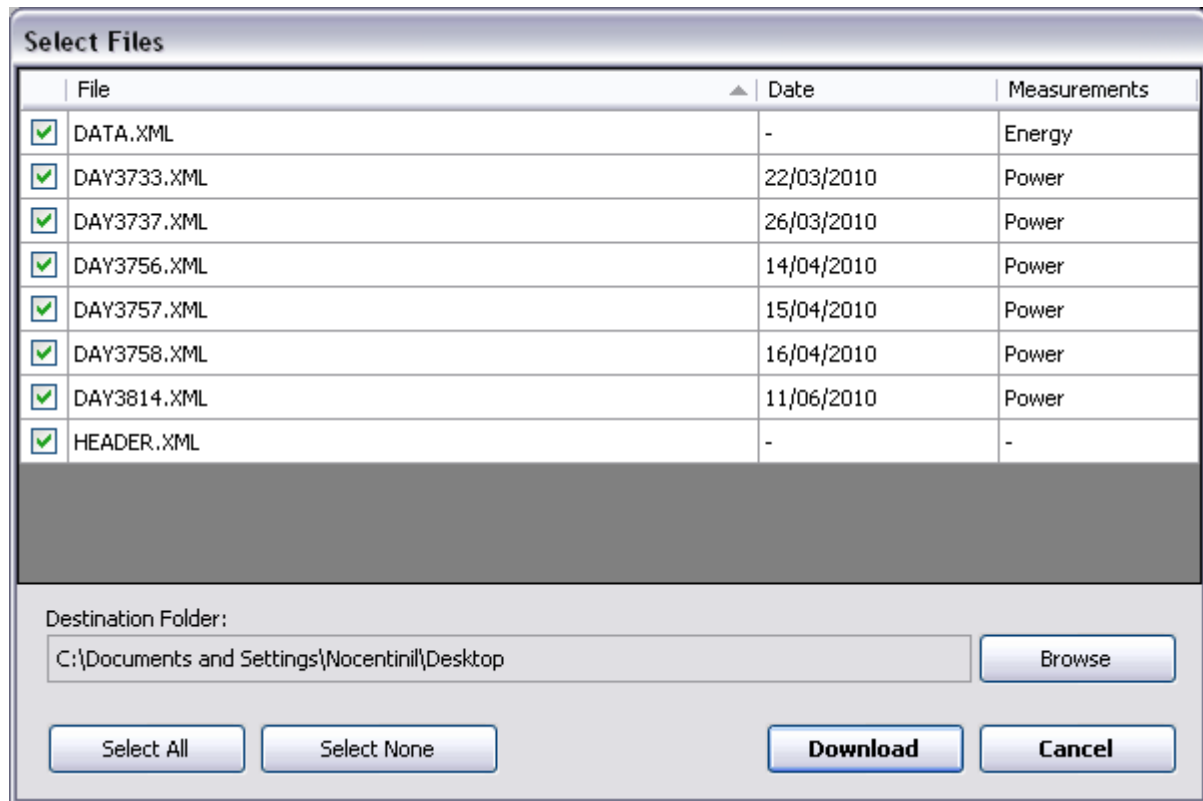
9.2 – Data Logging

PVI Desktop acquires, for each monitored inverter, statistics about daily energy and power. With this function you can download them to your PC and either view or export them to a file.

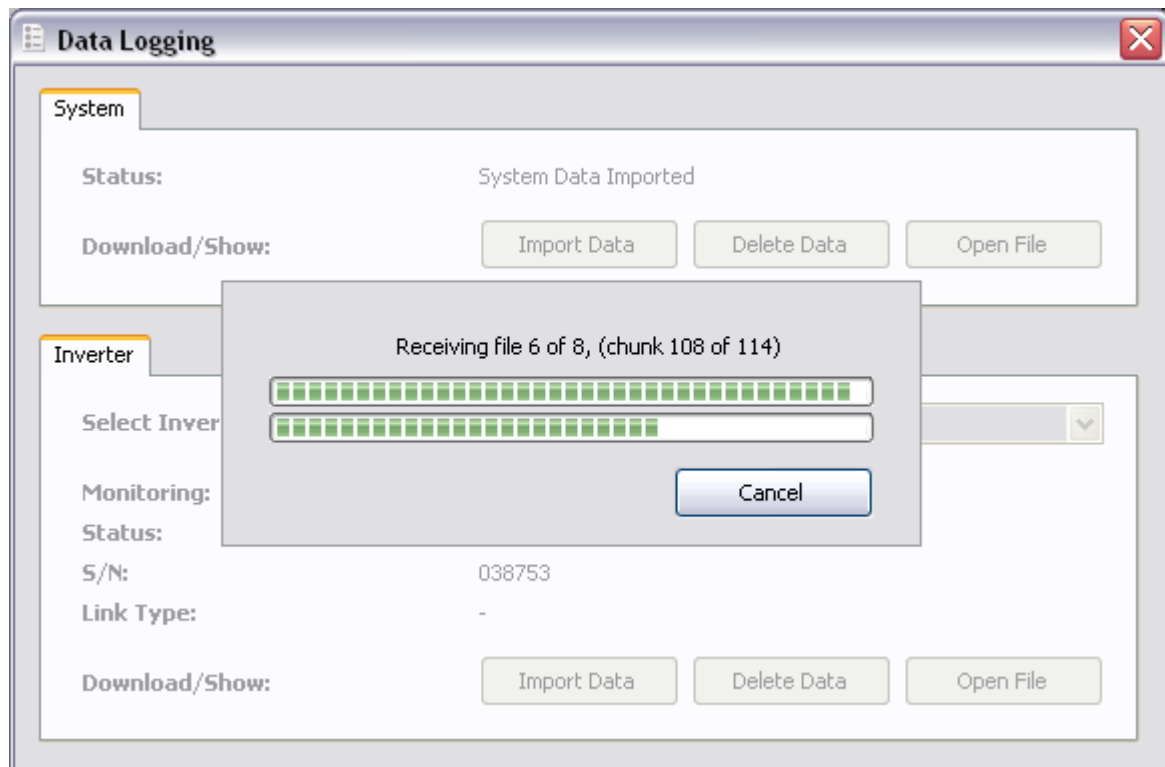


In the top panel, "**System**" you can download data about the whole plant, while in the bottom one you can find data about single Inverters.

Use the "**Import Data**" buttons (either for the system or a selected inverter from the list) to show the files available:



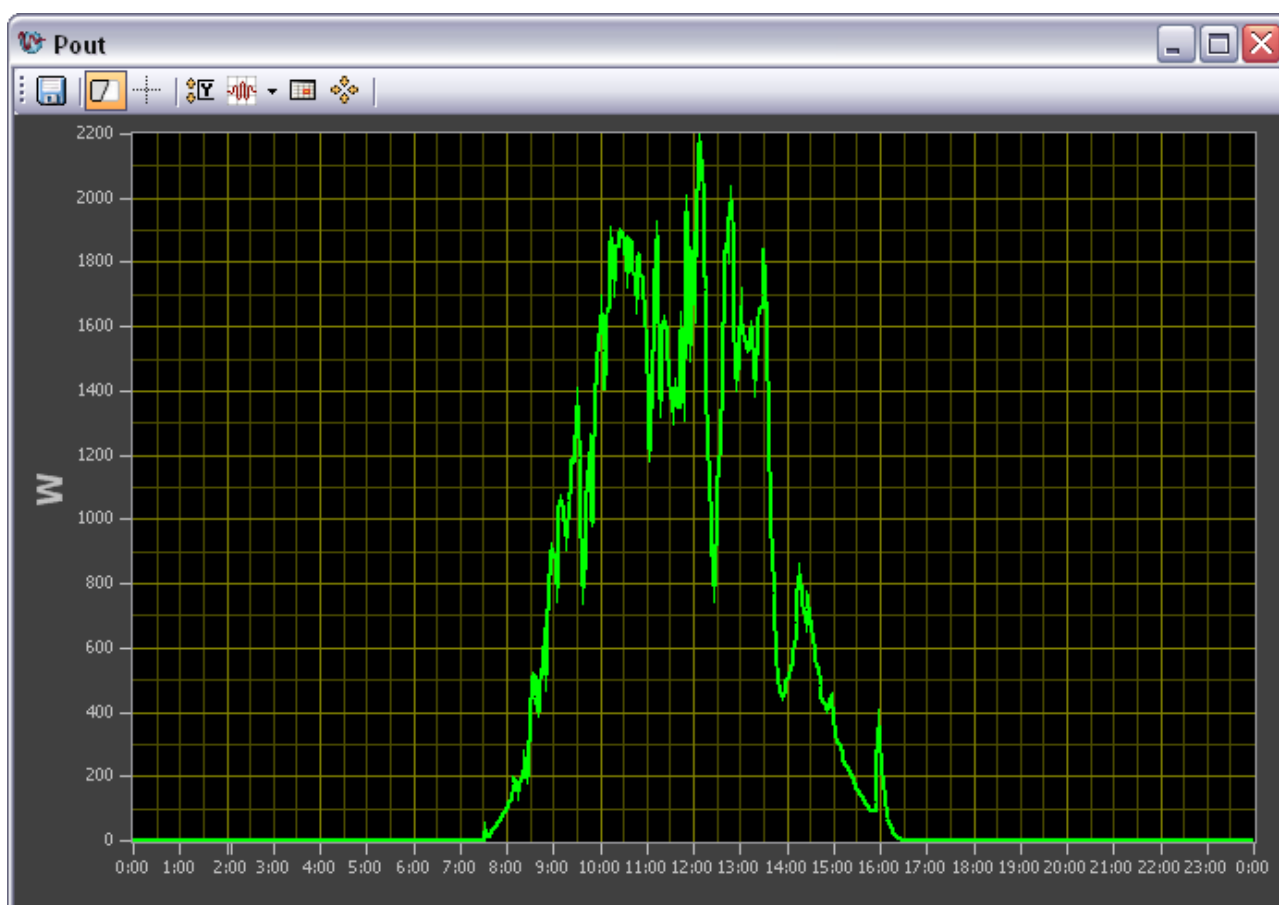
Just select the files you want from the list, browse the destination folder where you want to store them and press "**Download**". The download window will appear:



To delete files follow the same procedure: just press the **"Delete Data"** button and select the files you want to remove from the list, then press **"Delete"**.

NOTE: To use the **"Delete Data"** buttons you need to upgrade the PVI Desktop to at least version 6.18.

Once you have downloaded the files on your PC, you can view them in Communicator: press the **"Open File"** button and select a file. Files which contain daily power curves are renamed with the date of when they have been acquired by the PVI Desktop, while the one containing the produced energy (day by day) is called SYSTEM_DATA.XML (or SNXXXXXX_DATA.XML for single inverters).



The one above is a typical Communicator chart, which can be exported using the top left button (Save). See section 4 for more information about these charts.

9.3 – Start Screen Calibration

Should your PVI Desktop become unusable due to wrong screen calibrations, you can run the calibration procedure by using this option from the Aurora PVI Desktop menu.