

## Application Note:

### ICC Raspberry Pi initial setup and Setup with Axpert and Pylon

#### 1) Introduction:

The ICC (Inverter Control Centre) is the ideal solution for Pylon when used with Axpert in an on-grid solution. The main purpose of the ICC is to provide accurate monitoring and the ability to remotely monitor when used with an Axpert or InfiniSolar inverter. Alternatively, the ICC offers the ability to connect to the Pylontech BMS and by doing so the inverter can be controlled by the ICC based on the SoC reported by the BMS.

Adding the ICC greatly improves the cycling efficiency of the Axpert with Pylontech, as the ICC will use the SoC reported by the BMS of the Pylontech battery to control when the Axpert will use grid or battery, rather than relying on the Axpert measuring the very narrow battery voltage range. By using SOC based control, the system will be able to use the full rated capacity of the Pylontech battery if set to do so. This is especially useful for Axpert inverters because they can't supply loads from mixed power sources. Maximising the energy available from the battery means the inverter will delay switching to the grid for as long as possible.



The ICC will therefore increase the overall value of the system as the full 80% DoD of the Pylontech can be used in a self-consumption battery cycling setup.

This short guide demonstrates how to setup and access the ICC as part of your storage installation.

#### 2) Options, capabilities and limitations:

Two components will be required when using ICC with a Pylon battery:

- [Inverter Control Centre Module](#) (Raspberry Pi 3 b+)
- [Pylon Communication Cable for ICC](#)

The ICC offers the following features:

- Real-time monitoring of all the different power sources in use in a solar system (solar panels, batteries, grid power, etc).
- All data is captured, stored and can be exported for a specific time period.
- Specific monitoring of the batteries in use.
- Can monitor up to 9 Axpert inverters in parallel.

- Support for a host of different Voltronic inverters, including the new InfiniSolar 4 Super inverter.
- Can monitor grid tie as well as hybrid inverters.
- Support for Pylontech batteries with true SoC and voltage monitoring.
- Hourly trend analysis of the load, the solar panels, the batteries as well as the utility consumption and/or production.
- Easy setup with integrated hotspot and configuration wizard.

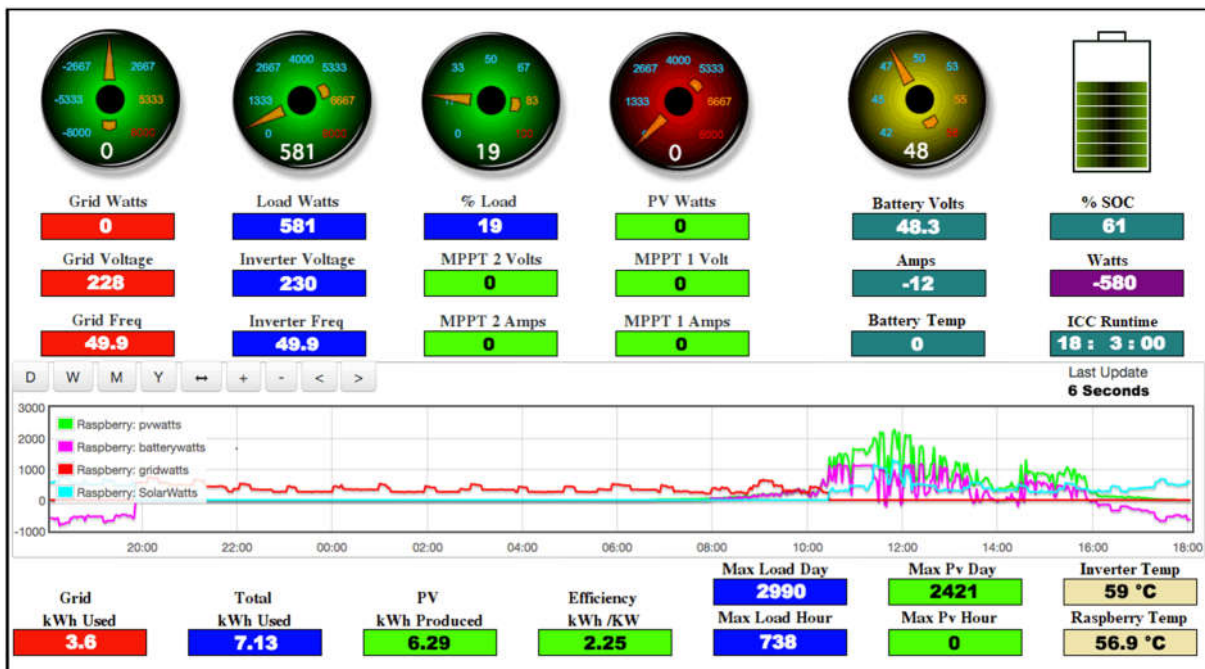


Figure 1: ICC Dashboard

When using ICC and Pylon with the intention to implement battery control, a few things must be taken into consideration.

The ICC Pylon battery control function can only be used in an on-grid application, while in off-grid the ICC can only be used for monitoring.

The on-grid control only comprises the battery cycling. The ICC will take over the cycling control logic and will not rely on the inverter logic. The parameters "to Battery" and "to Grid" will be controlled by the ICC based on the SOC reported by the battery BMS.

Please note: When using the ICC and Pylon for Grid connected self-consumption applications, the system will run the risk of the batteries shutting down in the event of a power failure. If the battery shuts down due to the low-voltage cutout protection, the battery will have to be manually turned on once a charging source is available. This can be done by simply pressing the RED button on the master battery. During grid connected cycling, the battery will be limited to 80% DoD and during a grid outage the DoD will be limited to 90%.



Figure 2: Power SW

ICC offers mobile monitoring and can be used on Android platforms. IOS platforms will be supported soon. The information displayed can be customized to the user's needs.

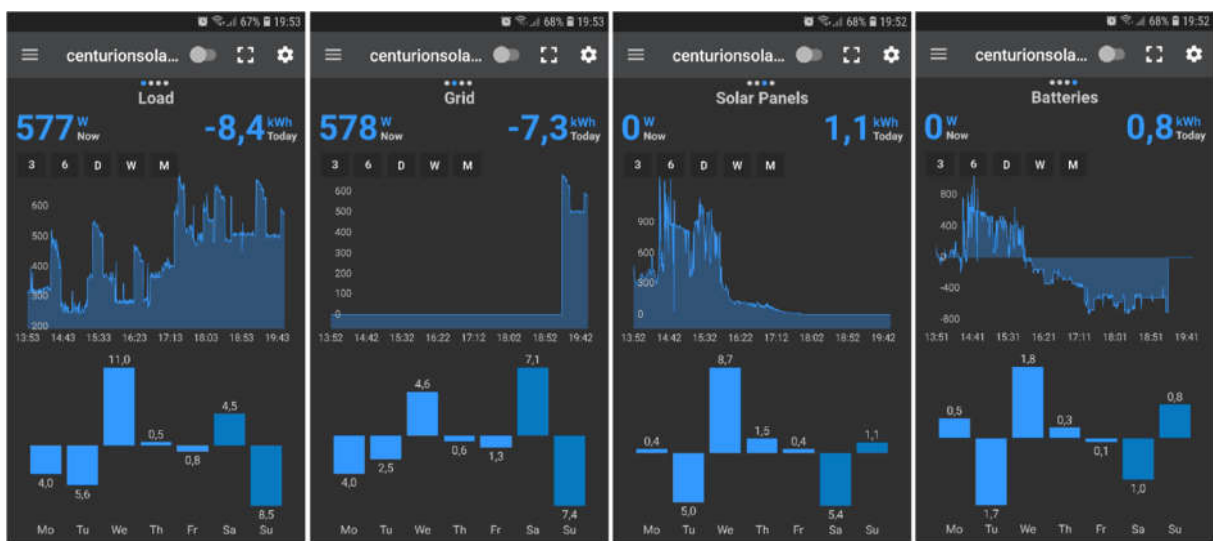


Figure 3: Android Monitoring

### 3) ICC Initial Setup

The ICC Module plugs in using a normal AC adaptor and the adaptor must be plugged into a circuit connected to the backup of the inverter. In other words, the ICC module must be powered by the inverter. The process is as follows:

- Make sure everything is powered down. The inverter, battery and ICC module must be off when connecting the communication cables.
- Connect the USB cable to the ICC and to the inverter. The USB cable is included in the box with the inverter.
- Now connect the Pylon communication cable to the ICC module and to Pylon battery - it plugs into the 'Console' port on the battery.

Everything is now ready to be powered on.



Figure 4: Communication Plugs

Please ensure that the settings on the inverter are set to the Pylon Specified settings. Refer to the [Installation Manual Pylontech Voltronic Settings](#) for the inverter settings. When using the system for cycling, then Program 12 & 29 will be set to 46V (or 45.5V if 46V does not work). This will bypass the inverter control and will allow the ICC to control the cycling.

The next step will be to connect the ICC module to a network. This can be done by using a laptop or a mobile phone. It is recommended to use a mobile as the setup is very easy.

Step 1: Go to WiFi networks and connect to **ICC-Hotspot**, the password is **raspberry**

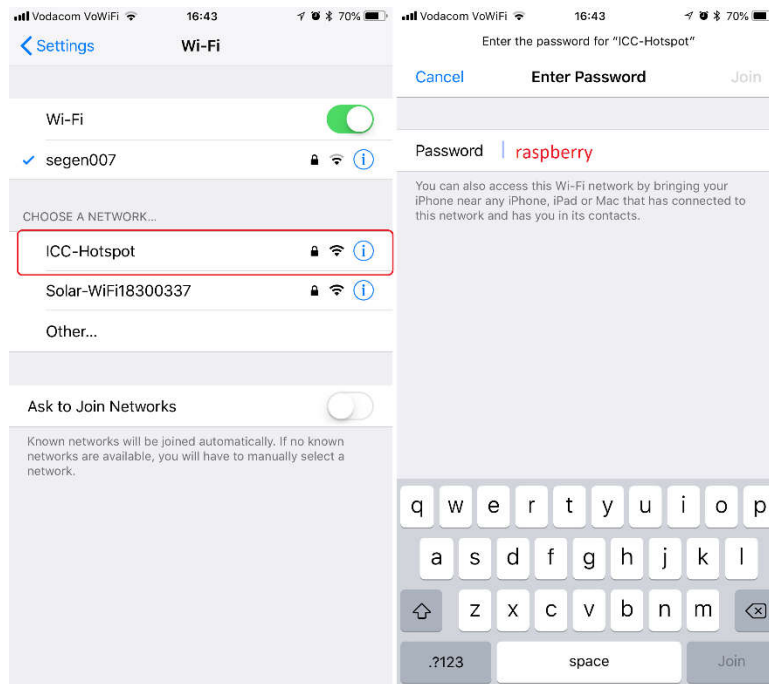


Figure 5: WiFi connection

Step 2: Open Web browser (Safari, Google Chrome or any browser app) and enter **10.3.141.1** and this will prompt for a username and password. The username is **pi** and the password is **raspberry**. This will open an ICC dashboard. Click on **Join WiFi Network**

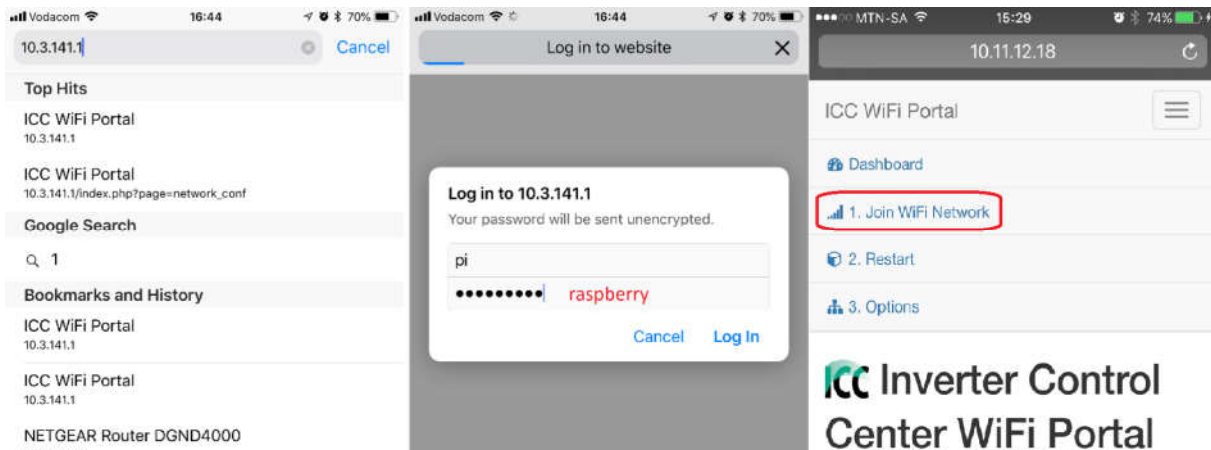


Figure 6: Connecting to the browser configuration

Step 3: All available WiFi networks will show up on the screen after clicking on **1. Join WiFi Network**. Select the desired network, enter the WiFi network password and click on add. After completing this step, the unit should be connected to the WiFi network. click on **2. Restart** and select **Reboot** to complete the setup process.

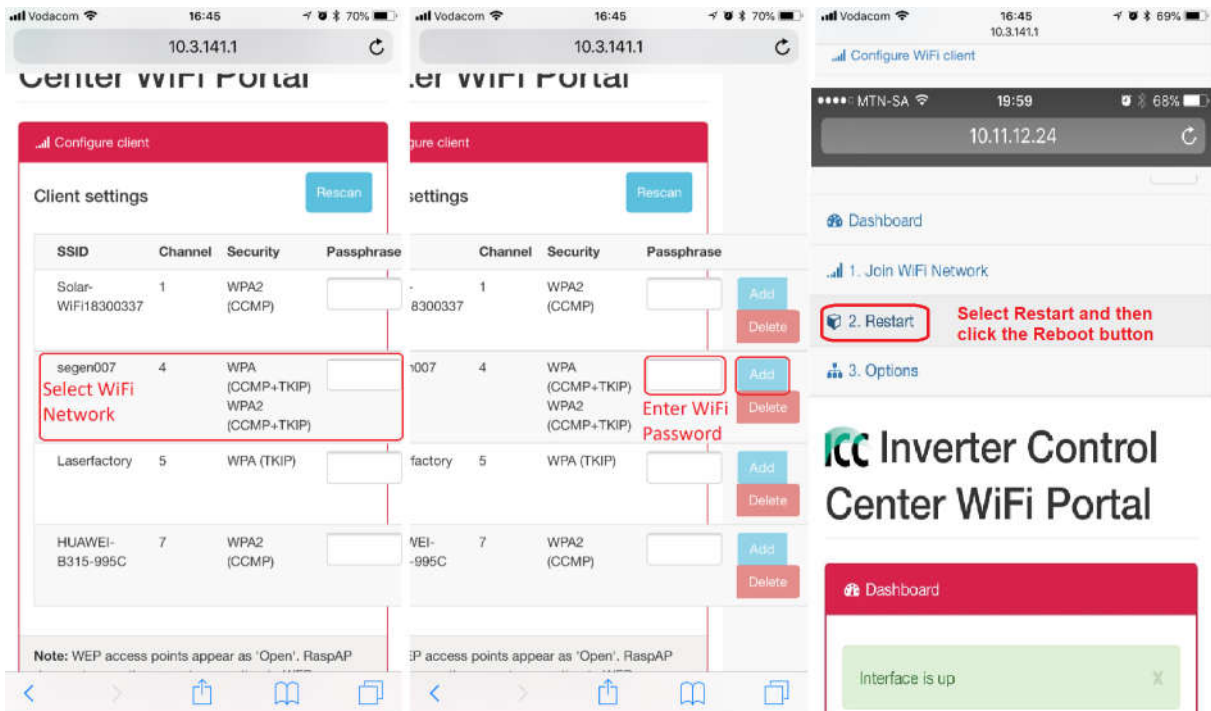


Figure 7: Connect to WiFi network example.

Now that the unit is connected to the internet, the remote monitoring can be used. The ICC account is pre-registered and the login details can be found inside the ICC module packaging. The username and password can be changed by the user. It is strongly recommended to change the password after registration.

The registration link is also found inside the packaging. Please make sure to read this properly, as your account may be connected to a different instance.

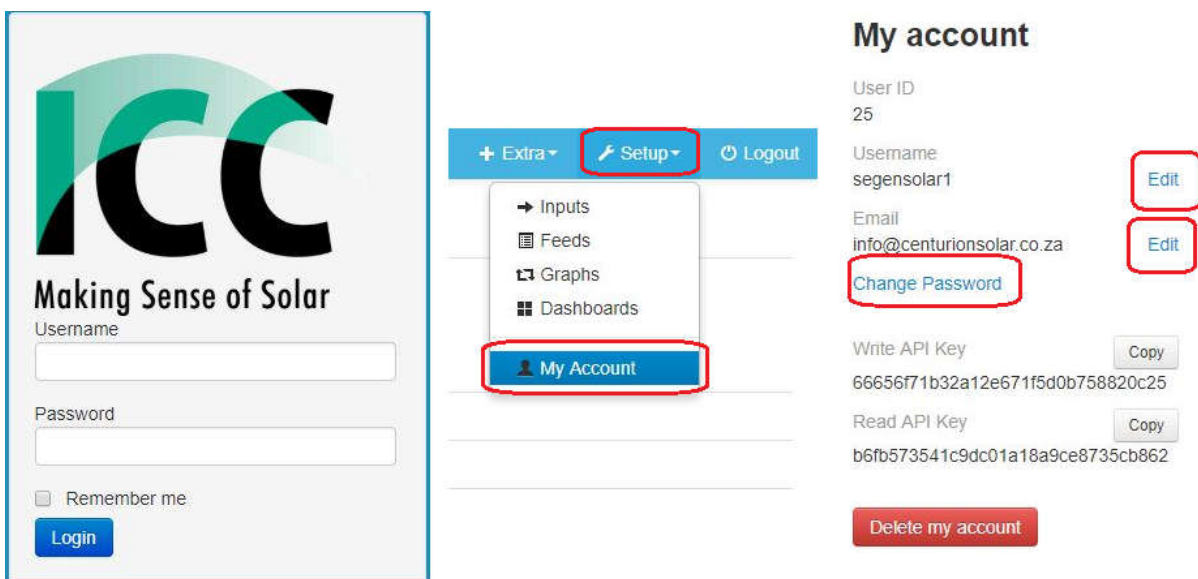


Figure 8: ICC Monitoring Account

The Mobile app setup is done from the ICC portal and all that's needed is an app to be downloaded and then to scan a QR code with the app, after which the mobile monitoring will work. The Emoncms APP can be downloaded on the Google Playstore. IOS support is coming soon.

Android APP direct link: <https://play.google.com/store/apps/details?id=org.emoncms.myapps>

The image shows a screenshot of a web interface for mobile app registration. On the left, a navigation menu is visible with a blue header containing '+ Extra', 'Setup', and 'Logout'. The 'Setup' option is highlighted with a red box. Below the header, a dropdown menu lists 'Inputs', 'Feeds', 'Graphs', and 'Dashboards'. At the bottom of this menu, 'My Account' is highlighted with a red box. On the right, the heading 'Mobile app' is displayed. Below it, the text reads 'Scan QR code from the iOS or Android app to connect:'. A large QR code is shown, also enclosed in a red box. To the right of the QR code are two buttons: 'Download on the App Store' and 'GET IT ON Google Play'. Below the QR code, the text says 'Or using a barcode scanner scan to view MyElectric graph'.

Figure 9: Mobile App Registration



#### 4) Packages:

SegenSolar includes the ICC in several Axpert storage packages. We think the increased control and usable energy offered by adding it to your project is well worth it.

Inverter Control Centre Module recommended packages:

[Mecer MKSII 5kW / Pylontech US2000B PLUS 4.8kWh](#)

[Mecer MKSII 5kW / Pylontech US2000B PLUS 7.2kWh](#)

[Mecer MKSII 5kW / Pylontech US2000B PLUS 9.6kWh](#)

[Mecer MKSII 5kW / Pylontech US2000B PLUS 12.0kWh](#)

All the above-mentioned packages include the mentioned [Mecer Axpert](#) inverter, mentioned [Pylontech battery pack](#), [Interactive IT Battery Cabinet](#), [Inverter Control Centre Module](#), and [Pylon Communication Cable for ICC](#).

#### 5) Technical Advice

Most of what is needed to know on how to setup the ICC is shown above in this document. If there is a need to access the ICC dashboard to make changes, please refer to the Centurion Solar YouTube guides. Go to <https://centurionsolar.co.za> and click on support for a list of YouTube guides.

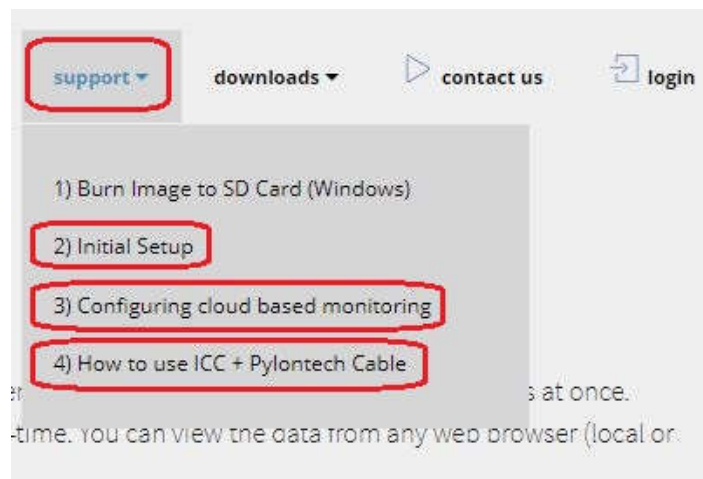


Figure 11: YouTube Guides

YouTube Video: [Initial Setup](#) assist with connecting to the ICC using VNC and how to change basic settings.

YouTube Video: [Configuring cloud-based monitoring](#) is a guide on everything regarding monitoring.

YouTube Video: [How to use ICC + Pylontech Cable](#) assists with the setup with ICC and Pylontech.

All documents involving Axpert, Pylon and ICC can be found on the documents tab on all Axpert, Pylon and ICC packages.




Home Products Place Orders News Documentation Events My Account Configuration Tools

You are here: Home » Photovoltaic » Pylon Tech

### Mecer MKSII 5kW / Pylontech US2000B PLUS 12.0kWh

Part No: VOLMKSI-5K-US2000B-PLUS-12.0 Storage Systems - Offgrid Packages



**SPECIAL OFFER** This part is a special offer made up of the following items:

Part	Description	Discount
5 x US2000B-PLUS	Pylon US2000B Plus 2.4kWh Li-Ion Battery ( excl. brackets )	5%
1 x VOL_AXP101 MKS.5K.0	Mecer 5kW-48V Off-Grid inverter II	5%
1 x DCB_E1A-2-600V_USA_0.10	600V Combiner Box 2 Inputs 1 Output 32A Isolator Type II SPD	5%
1 x BATT_CAB_12U	Battery Cabinet 12U ( 5 x Pylon )	5%
1 x KESTO-00	Fuse-switch-disconnector KESTO size 60 body (battery isolator)	5%
1 x K&N_T203_63A2P4	K&N Single Phase AC Switch Disconnector 25A	5%
1 x CAB_PK_PYLON	Cable Pack for US2000B / Phantom-0 Batteries	5%
2 x B001607-100A	NF Fuse-link 100A for KESTO-00	5%
1 x BATT_CAB_25_1M	25mm <sup>2</sup> Battery Cable (401N2-D) 1m - Black	5%
1 x BATT_CAB_25_1M-RED	25mm <sup>2</sup> Battery Cable (401N2-D) 1m - Red	5%
4 x US205-B	25mm <sup>2</sup> Cable Terminal Lug 40 - Single	5%
1 x CEN_ICC_03	Inverter Control Centrel Module	5%
1 x CEN_ICC-PYLON-CABLE	Pylon Communication Cable for ICC	5%

Domestic scale off-grid hybrid storage system

The 5kW rated power of the Mecer PF1, when matched with five economic Pylon modules of 2.4kWh each, delivers up to 5kW of continuous discharge power, based on Max discharge of 1.2kWh per Pylon battery.

That's perfect for supplying some of the higher powered electrical loads in the evening.

The Mecer PF1 hybrid is a pure sine wave inverter that boasts a power factor of 1. It has Selectable input voltage range for home appliances and personal computers and a selectable charging current based on the application.

Its max DC input voltage for 145V makes it ideal for 8 strings of 2 X 72 cell modules (320W - 360W) or 5 strings of 3 X 66 cell modules (260W - 300W).

The package also includes a high spec 7 input DC combiner box that incorporates Type 2 surge protection, DC isolation and DC fuses, all in a neat enclosure.

The included 12U wall-mount battery cabinet is perfect storage solution for housing 5 PylonTech US2000B Lithium-Ion batteries.

Specification Other Parts Availability **Documents** Diagnostics

- Application Note Pylon & AscertInverterSolar
- Data Sheet Mecer
- Data Sheet Mecer MKS
- Data Sheet Pylontech US2000B Plus and Phantom 0
- Installation Manual ESS US2000 Plus
- Installation Manual MKS
- Installation Manual Pylontech Volttronic Settings
- Product Compatibility Pylon II and II Plus and Phantom
- Warranty U.S. US2000 Plus Terms and Conditions SA
- Warranty Pylontech Volttronic Validation form

Figure 12: Axpert, Pylon and ICC Package Document page

PLEASE NOTE: ICC remote monitoring is currently free; Centurion Solar reserves the right to provide the service for free and may charge for the service in the future. Centurion Solar will notify its users in advance if any changes are planned.

## 6) SegenSolar portal services

The SegenSolar portal has a System Designer tool which allows installers to create their own battery packages:

<http://portal.segensolar.co.za/Reseller/PVDesigner>

Please speak to your account manager or technical support representative if you require training on how to use the System Design tool. The design tool will allow the user to create a quote quickly and easily with all the necessary components. All the available stock levels are shown as well as any incoming deliveries.

## 7) Further notes

### **About ICC:**

ICC is proudly brought to you by a trio of friends, with Johan doing the cloud and mobile portal together with sales and marketing, Manie coding the client side software and Riaan developing all the cool hardware that ICC supports (like the Pylontech battery cable).

Inverter Control Center (ICC) came about after a long search for monitoring software that could gather and store information about Voltronics inverters. There simply wasn't a product that could record everything happening in the inverter, present it in real time, and allow the end user to make sense of their solar systems in an easy to understand fashion. This is where Inverter Control Center was born.

Initially the software supported only the Axpert 5kVA inverter, but over time a wide variety of Voltronics inverters have been added, including the Axpert 5kVA in parallel (up to 9 inverters), the new InfiniSolar 4Super, etc.

The dashboards can be accessed remotely, allowing the user to see exactly what's going on in the solar system. A copy of the data can even be sent to the installer to remotely monitor all the systems he/she installed, and can be drilled down if any problems arise.

<https://centurionsolar.co.za>

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