Installation of Advanced communications card and LG Chem RESU

Introduction

This technical note shows how to set up an SP PRO for use with an LG Chem RESU lithium battery (LG RESU battery).
It explains how to update the firmware in the SP PRO, install the Advanced Communications card, install the LG RESU battery and configure the SP PRO inverter to suit.

IMPORTANT:

1. ***You must update the SP PRO firmware with the Green card first.***
2. ***Then install the blue Advanced Communications Card (ACC).***
3. ***When connecting SP LINK via the USB port on the blue ACC, you must select connection type "Serial" NOT "USB" (see page 7).***
4. ***Configure the LG RESU so you get 10min run time (see page 4 or 5).***

Summary of steps

The following is a summary of the steps needed to complete the installation. Once the installation is completed come back to this page and use this as a check list.

- ☐ Install SP LINK version 9.7 on your computer
- ☐ Connect to the SP PRO via the OLD **green** communication card using SP LINK 9.7
- ☐ Update SP PRO Firmware with 9.70.6 (ABB and Fronius) or 9.70.1 (KACO)
- ☐ Install the **blue** Advanced Communications Card (ACC) in the SP PRO
- ☐ Connect LG RESU batteries to the ACC in the SP PRO
- ☐ Create the configuration for SP PRO using the Site Configuration Wizard in SP LINK
- ☐ Connect to the SP PRO via the ACC (connection type "**Serial**") and save the configuration to the SP PRO
- ☐ Power cycle the SP PRO
- ☐ Test the system

SP PRO Interactive Inverter Charger

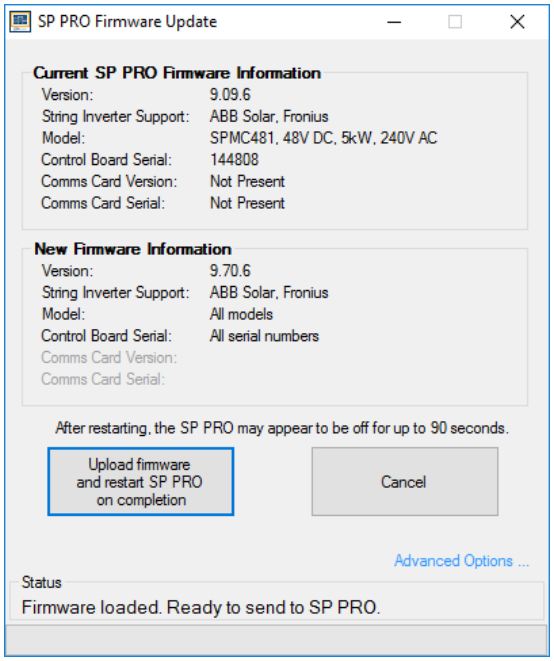
Technical Note

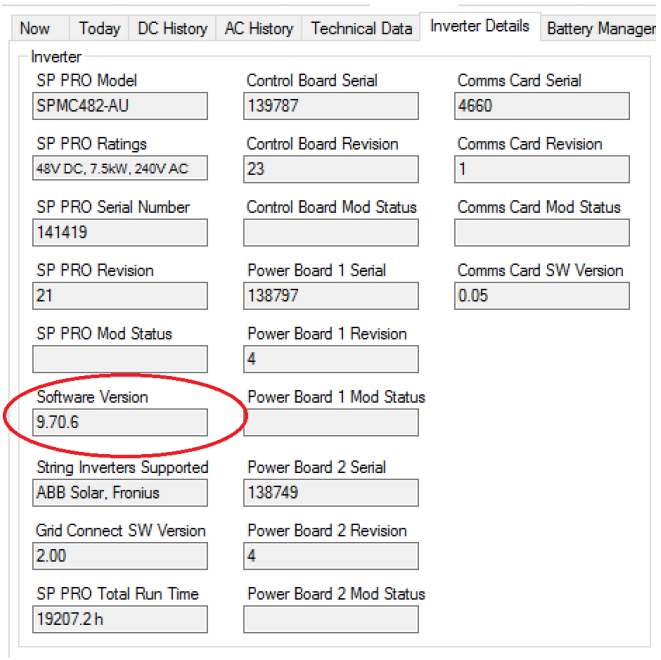
Installing SP LINK and updating firmware in the SP PRO

The SP PRO firmware **must** be 9.70 or higher to function with the Advanced Communications card. So you **must** first install SP LINK 9.7 on a computer, connect to the SP PRO and update its firmware. This is done by following the steps below:

1. Leave the old **green** communications card in the SP PRO until the firmware is updated.
2. Download SPLINK program from the Selectronic Web site and install it on a Windows PC. Windows XP, Vista, 7 and 10 are supported.
   http://www.selectronic.com.au/sppro/splink.htm
3. Connect the DC power to the SP PRO. Wait until the front panel LEDs are stable.

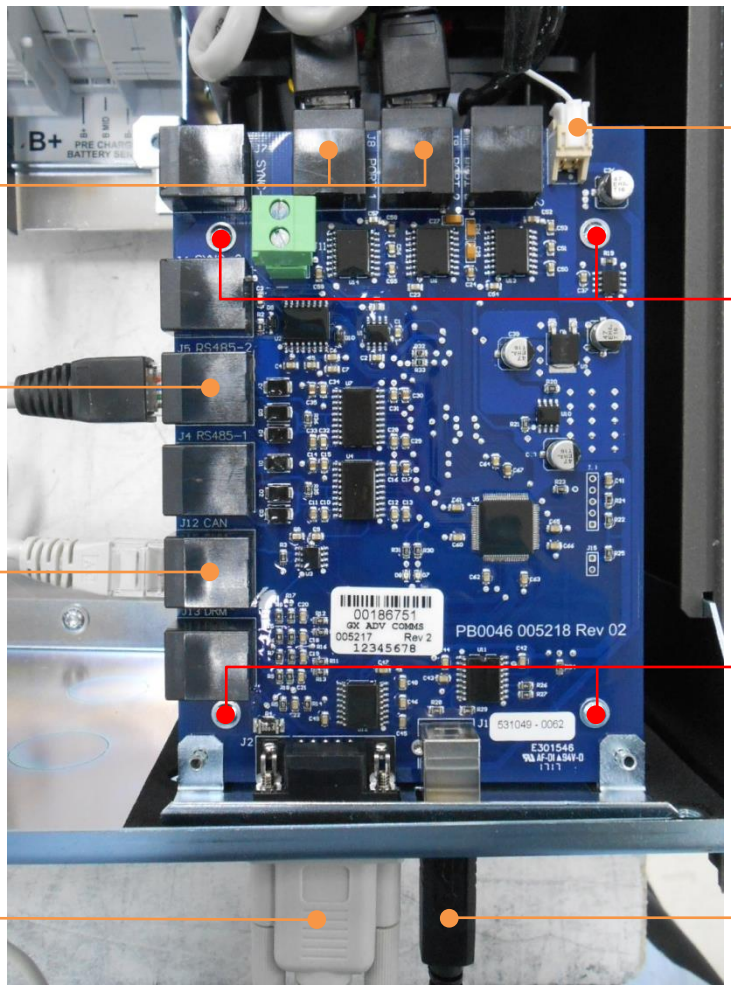
   NOTE: Perform the following tasks quickly as the RESU battery will shutdown in 10 minutes without the CANbus connected. If this happens, turn the RESU back on and restart the process.
4. Connect the PC to the SP PRO via the USB cable.
5. Menu "File > Firmware Update"
6. In the SP PRO Firmware update screen click on the **Update firmware and restart SP PRO on completion**.
7. After the update is completed the SP PRO will automatically restart. You will need to wait about 90s for the inverter to restart. AC output Power from the SP PRO will be lost during this time.
8. Once the SP PRO has restarted, wait another 20 seconds then click the Connect button to reconnect SP LINK to the inverter.
9. Go to "Data View > Inverter Details" and check the Software Version is correct.





Installing the Advanced Communications card (blue)

1. Power down the SP PRO inverter. All Lights on the front panel will be off. The three blue lights across the top will still be lit if there is AC source power (grid or generator). This is OK.
2. Remove the 4 Torx screws holding the original **green** communications card in the SP PRO**. Do not through away the Torx screws**, the screws will be used to remount the Advanced Communications card.
3. Remove the 2 short grey RJ45 connectors from the Control Board in the SP PRO (Internal Communications Ports 1 and 2)
4. Remove the white, 2 pin plug on the top right corner of the **green** communications card (Power)
5. Remove the original **green** communications card
6. Connect the white, 2 pin plug to the top, right corner of the **blue** Advanced Comm card (Power)
7. Connect the two, small grey RJ45 leads to the **blue** Advanced Comm card and into the Control board in the SP PRO (Internal Communications Ports 1 and 2)
8. Screw down the **blue** Advanced Comm card into the SP PRO using the 4 Torx screws. (mounting screw)

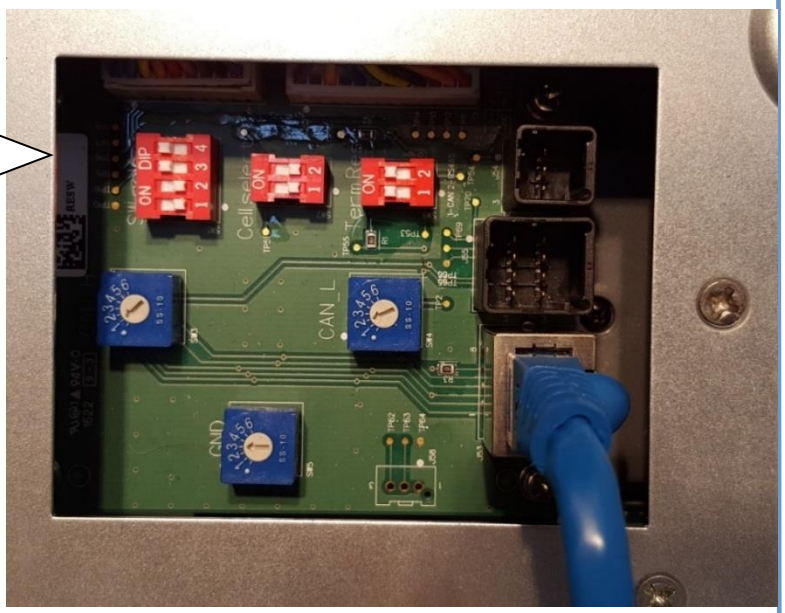


NOTE: For Rev 02 boards, connector labels are printed on the board either above or to the right of the connector.

Connect the RESU comms to SP PRO (Single battery)

1. The SP PRO battery temperature sensor remains connected to the SP PRO. Roll it up and place it inside the SP PRO.
2. Do not connect any wires to the pre-charge/battery sense terminals. The battery sense voltage is read from the RESU BMS.
3. Configure the RESU dip switches and rotary switches as shown below:

RESU BATTERY



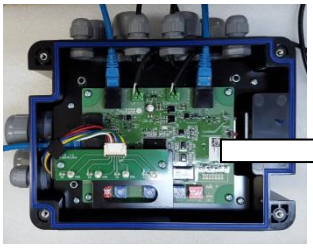
CAN H = 1
CAN L = 2
GND = 3
TermRes = both ON
CellSelect = Both OFF
SW Select - 1,2=OFF 3,4=ON

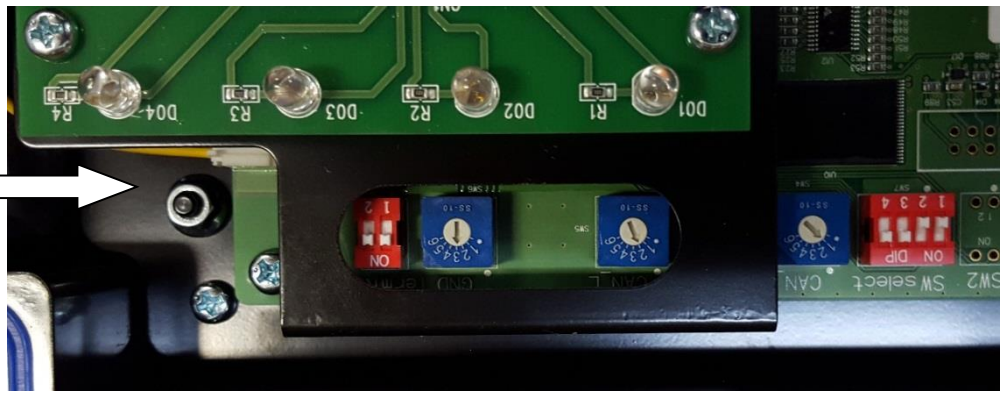
4. Connect a RJ45 patch lead from the CAN on the **blue** Advanced Comm card to the RESU battery.
5. Power up the SP PRO by turning on the LG battery and any DC breakers.
6. After the SP PRO has powered up and the front panel LEDs are stable, check the green LEDs on the **blue** Advanced Comm card.
    a. The LH LED should alternatively turn off and on every second.
    b. The RH led should be steadily on.
7. If there is a problem then disconnect the power from the SP PRO and go back to point 4.

Connect the RESU comms to SP PRO (Dual battery with RESU Plus)

1. The SP PRO battery temperature sensor remains connected to the SP PRO. Roll it up and place it inside the SP PRO.
2. Do not connect any wires to the pre-charge/battery sense terminals. The battery sense voltage is read from the RESU BMS.
3. Follow the RESU instructions to install the RESU plus and the RESU battery banks.
4. Configure the RESU Plus rotary switches and RESU Battery settings shown below:

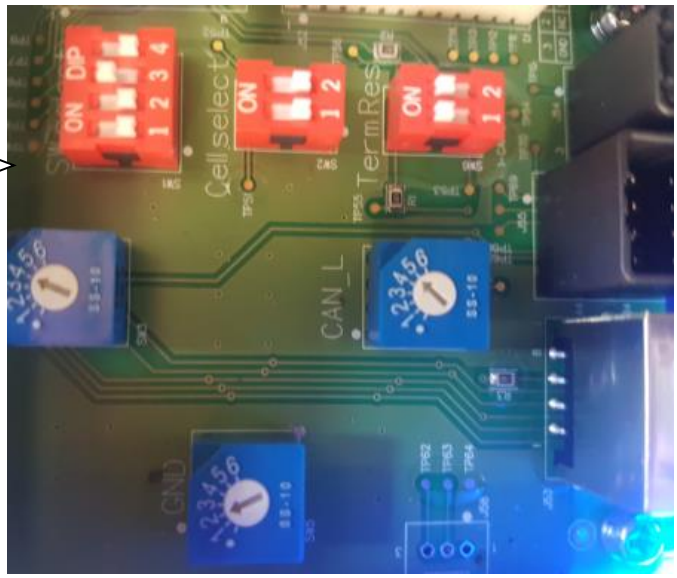
RESU PLUS





CAN H = 1
CAN L = 2
GND = 3

RESU BATTERY

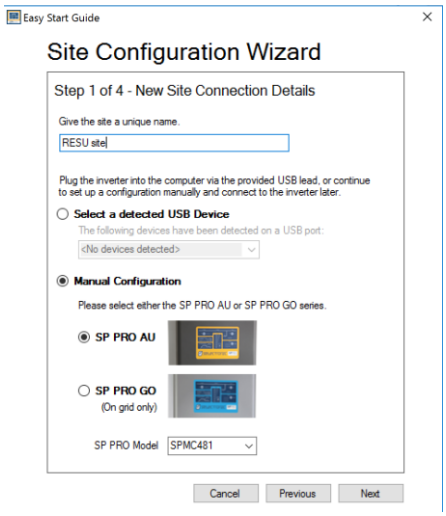


CAN H = 4
CAN L = 5
GND = 2
TermRes = both ON
CellSelect = Both OFF
SW Select - 1,2,4=OFF 3=ON

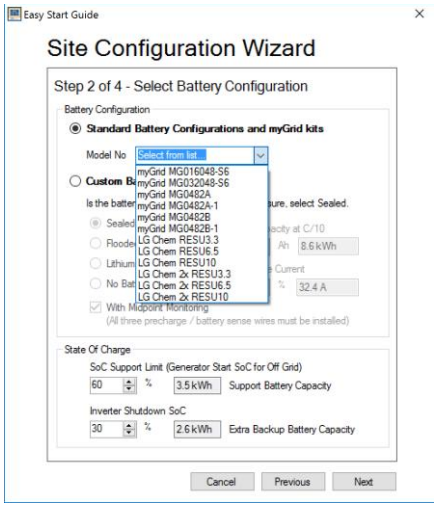
5. Connect a RJ45 patch lead from the CAN on the SP PRO **blue** Advanced Comm card to the RESU Plus.
6. Power up the SP PRO by turning on the LG batteries, the RESU plus and any DC breakers.
7. After the SP PRO has powered up and the front panel LEDs are stable, check the green LEDs on the **blue** Advanced Comm card.
    a. The LH LED should alternatively turn off and on every second.
    b. The RH led should be steadily on.
8. If there is a problem then disconnect the power from the SP PRO and go back to point 5.

Configuring the SP PRO for LG Chem RESU.

1. Run Selectronic SP LINK
2. Select "Site Configuration Wizard"
3. Enter the site name
4. Select "Manual Configuration" (The **Blue** Adv Comm Card is not detected automatically as yet)
5. Select "SP PRO AU"
6. Selected SP PRO model which will be either "SPMC481" or "SPMC482"
7. NEXT



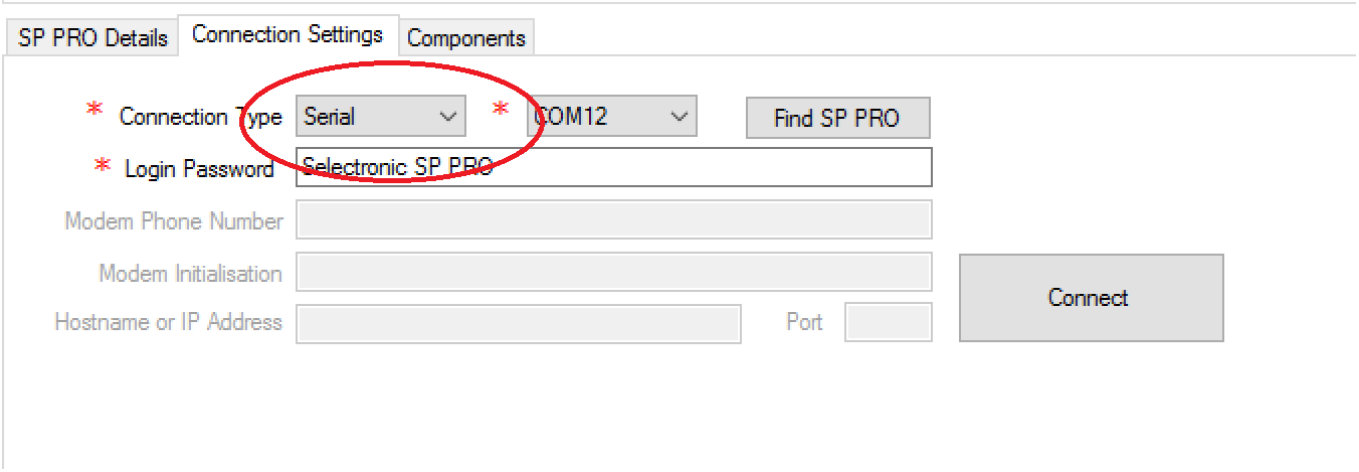
8. Select "Standard Configuration and myGrid Kits"
9. Select the RESU model including number installed.
   NOTE: The 2x RESUxxx selections are used when there are 2 RESU batteries installed with a RESU Plus. If the 2 batteries are of different sizes, then select the largest Model. Eg. If a RESU6.5 is combined with a RESU10 then select 2x RESU10.
10. NEXT



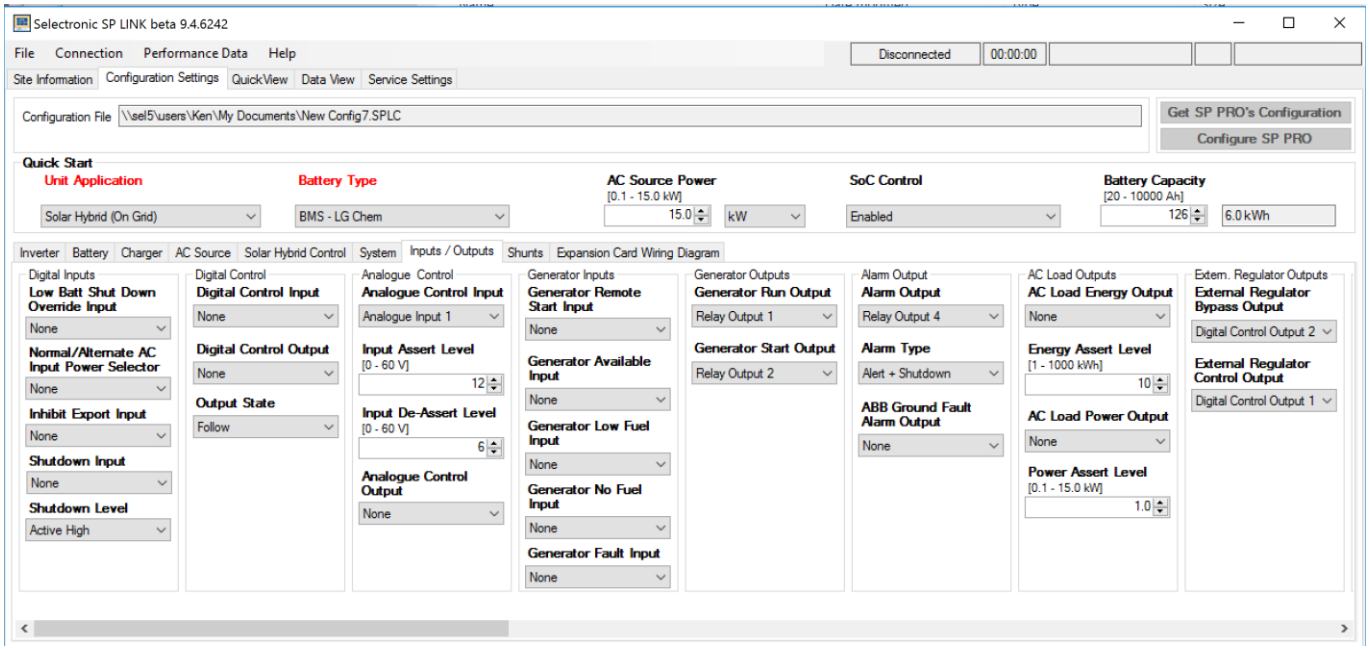
11. Continue through the wizard to enter other system parameters.
12. When completed, from the menu bar select File > Site Configuration > Save to save the site just created.

Saving the Configuration to the SP PRO.

1. Connect the USB lead between the SP PRO and the PC.
2. **At the Connection Settings tab, select Connection Type = Serial**
3. Select the COM port associated with the SP PRO. If unsure then unplug the USB lead from the PC, and see which COM port number disappears. Plug the USB lead back in and the COM port number will reappear.

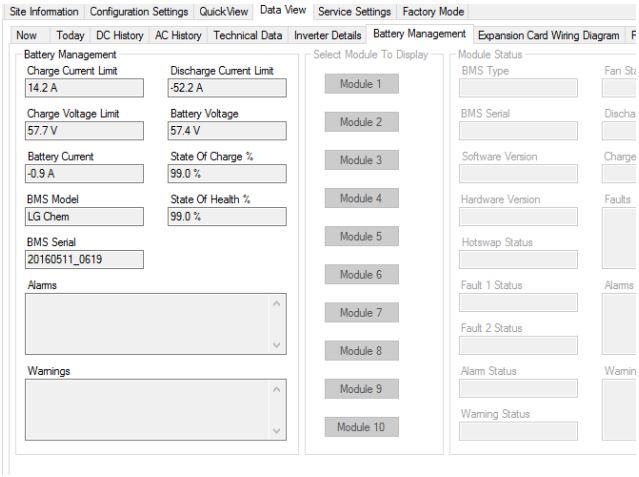


4. Click the "Connect" button to connect to the SP PRO.
5. At the Configuration Settings tab, click the "Configure SP PRO" button. The default passcode is 74.



Testing the RESU battery.

1. Power cycle the SP PRO by turning off the DC breaker, wait 20 seconds and turning back on.
2. Navigate to "Data view > Battery Management". If the system is working correctly the values on this screen will be valid for the LG Chem RESU.
3. The Module Status readings are greyed out as they are not used with the RESU batteries. These readings are only used when the LG Stand Alone (19" rack mount) battery modules are installed.
4. The values displayed under Battery Management are those read from the RESU battery.
   The SP PRO uses these values to adjust the charge current and limit the discharge current in the battery.



Note: The SP PRO will be beeping and the RESU battery will turn off (its breaker will trip) after 10 minutes if there is a problem with the communications between the SP PRO and the RESU battery.

Operation of the SP PRO with the RESU battery.

The SP PRO reads all the data out of the RESU battery bank and automatically adjusts the battery current to suit. This means the operation is a little different than with other battery banks.

When connected to the grid the operation of the SP PRO is as follows:

1. When the SP PRO is charging the charge current will be limited to the "Charge Current Limit" as displayed in Battery Management (see diagram above) and the charge voltage limited to "Charge Voltage Limit".
2. When the SP PRO is supporting the load then the current taken from the battery bank will not exceed the "Discharge Current Limit". The SP PRO will adjust its maximum support power to ensure the discharge current is not exceeded.

When the grid fails then the operation of the SP PRO in stand alone is:

1. When the SP PRO is charging from the PV, the charge current will be limited to the "Charge Current Limit" as displayed in Battery Management (see diagram above) and the charge voltage limited to "Charge Voltage Limit".
2. When the SP PRO is running the load and the current drawn from the battery exceeds the "Discharge Current Limit", the SP PRO will go into current limit and reduce its output voltage. If the load so high that the AC voltage drops below 200V for 10 seconds, the SP PRO will shut down as the RESU battery can no longer support the load. The customer then needs to reduce the load so that when the SP PRO retries, it can continue to provide backup power.