



SP PRO Series 2i Managed Batteries

Installation Note

SP PRO Series 2i Managed Batteries Installation

Introduction

This instruction will show how to setup and install a managed Lithium battery with a Selectronic SP PRO Series 2i in either a single phase system or Advanced Multiphase system (Three phase or Split phase).

NOTES:

- When installing an Advanced Multiphase system, also refer to installation guide: IN0052_xx Installation of an Advanced Multiphase system.
- In an Advance Multiphase system the CAN bus cable is ONLY connected from the battery bank to the L1 SP PRO. There is no connection to the CAN on either the L2 or L3 SP PRO.

Refer to the table below to understand which installation kit is the right choice for your application. Note that the table below is equally applicable to both on-grid and off-grid systems.

Applicable Batteries	Installation Kit Order code for each System Application			PV Type		
	Single Phase	Split (Two) Phase	Three Phase	Generic AC Coupled	SCERT AC Coupled	DC Coupled
BYD B-Plus 2.5 modules (in B-Box RES or PRO), B-Plus L 3.5 modules, Battery-Box Pro 13.8, Battery-Box Pro 16.5	✓	✓ P	✓ P	✓	✓	✗
Sonnenschein@home Lithium 6.8 or 9.0 Needs 200A HRC fuses, not supplied with battery.	✓	✓	✓	✓	✓	✗
Pylontech US2000, US3000	✓	✓	✓	✓	✓	✗
LG Chem RESU 3.3, 6.5, 10, 13	✓	✓	✗	✓	✓	✗
LG Chem Stand-Alone modules (Rack Mount) Needs optional cable "CAN RJ45-DB9 LM CS1022_01" stock code 005289	✓ S	✓ S	✓ S	✓	✓	✗

P – The pre-charge/Battery sense wiring must be installed when using a BYD battery in an Advance Multiphase (**AMP**) system. See Installation note *IN0052_xx 005303 Installation of an Advanced Multiphase system.*

S – The battery fuse or circuit breaker must be turned **ON** before the battery bank is started (button press on the master battery) when using the LG Chem Standalone modules.



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Preparation

- If installing Sonnenschein@home Lithium batteries: Make sure there are 2x 200A NH fuses (ABB OFAF1H200 or equivalent) for SPMC482, OR 2 x 160A NH fuses (ABB OFAF1H160 or equivalent) for SPMC481 and SPMC480 installed in each battery box. Battery fuses are not supplied with battery.
- If installing LG Chem Stand-Alone modules (LG Chem Rack Mount) you must also purchase the option Lead CAN RJ45-DB9 LM CS1022 stock code 005289.

NOTE: The battery fuse size for the SPMC482 when used with a Sonnenschein@home Lithium must be 200A. In this application ONLY, do not use 250A fuses as specified in the SP PRO installation manual as this may damage the Sonnenschein@home Lithium. A 200A fuse is suitable in this application as the battery voltage for the Sonnenschein@home Lithium is higher (54 VDC) than nominal (48 VDC).

Summary of steps

The following is a summary of the steps needed to complete the installation.
Once the installation is completed, use the below points as a check list:

- Install batteries according to the manufacturer's installation manual.
- Install the latest version of SP LINK on your computer from <http://www.selectronic.com.au>
- If the system is Advanced Multiphase with BYD batteries, wire in the Pre-charge.
- Connect Communication cable from battery to the SP PRO.
- Create the configuration for SP PRO using the Site Configuration Wizard in SP LINK.
- Connect to the SP PRO via SP LINK and save the configuration to the SP PRO.
- Turn battery power OFF and back ON again to the SP PRO.
- Test and commission the system.



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Communications Connection to SP PRO

The following communication connections must be completed for the appropriate battery type in order for the system to operate with the SP PRO.

Section 1 for BYD B-Plus, B-Plus 13.8 and B-Plus 15.5 ONLY: Go to page 4

Section 2 for Sonnenschein@home Lithium ONLY: Go to page 5

Note: Requires 200A HRC fuses. Not supplies with battery.

Section 3 for LG Chem RESU (Single battery) ONLY: Go to page 6

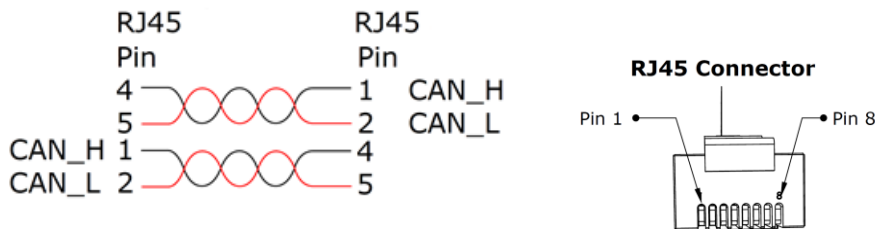
Section 4 for LG Chem RESU Plus (Dual battery) ONLY: Go to page 7

Section 5 for LG Rack mount modules ONLY: Go to page 8

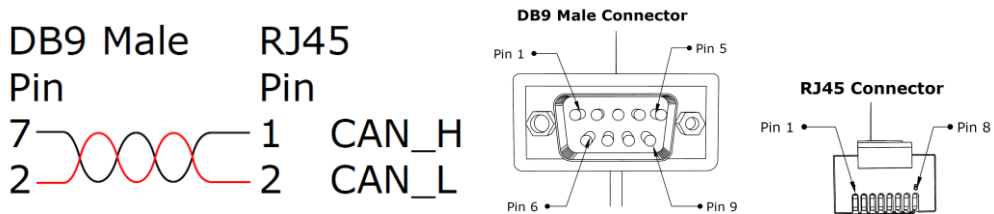
Note: Requires optional cable "CAN RJ45-DB9 LM CS1022_01" stock code 005289

Section 6 for Pylontech US2000 or US3000 modules: Go to page 9

Pinout for the BMS to SP PRO CAN Bus cable



Pinout for BMS to SP PRO cable for the LG Standalone modules (Rack mount).





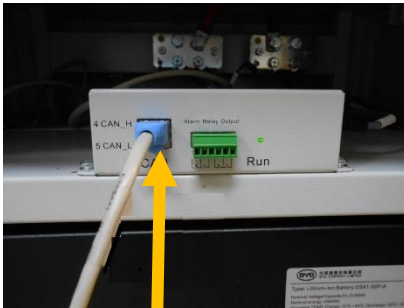
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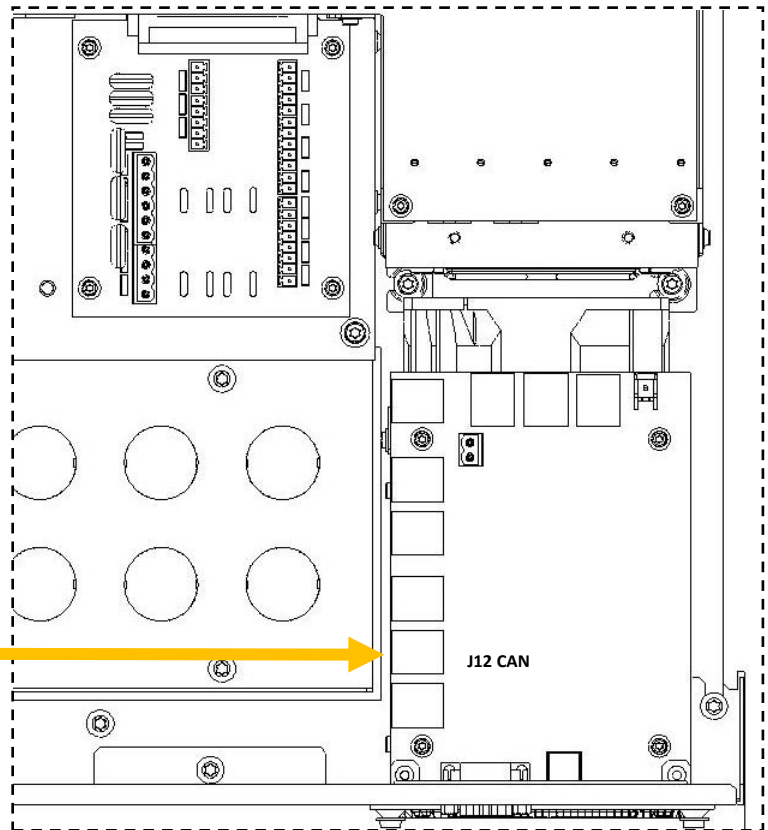
Section 1 for BYD B-Plus batteries in a BYD B-Box

1. When installing a Split phase or Three phase system you must connect the pre-charge / battery sense terminals. The BYD uses the pre-charge function in the SP PRO. (see "IN0052_xx Installation of an Advanced Multiphase system" for wiring details.)
2. Leave the battery temperature sensor connected and rolled up inside the SP PRO. This is not used in a managed battery system.
3. Follow the BYD B-Box instructions to install the BYD B-Box.
4. Connect the Grey "BMS to SP PRO CAN bus" RJ45 Connector cable from the SP PRO Comms Card to the BYD B-Box. Cable can be connected in either direction.

BYD B-Box



SP PRO Inverter (L1 only in a multiphase system)



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Installation Note

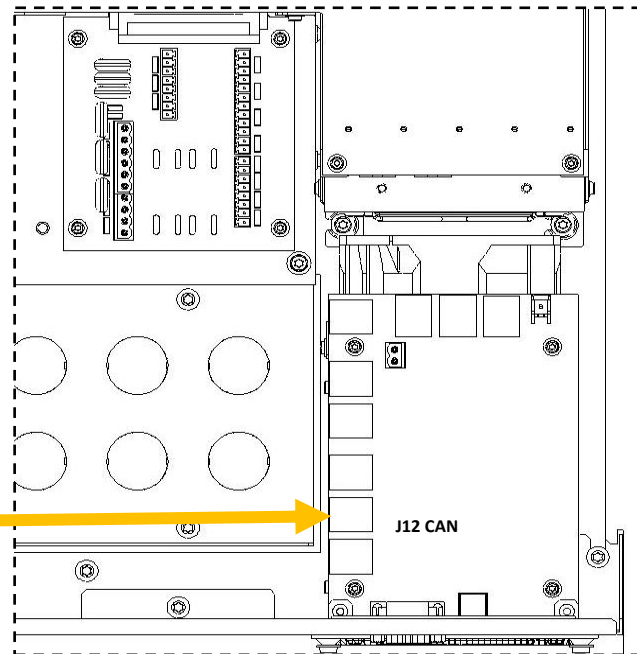
Section 2 for Sonnenschein@home Lithium

1. Do not connect any wires to the pre-charge / battery sense terminals. The battery sense voltage is read from the Sonnenschein@home Lithium battery BMS.
2. Leave the battery temperature sensor connected and rolled up inside the SP PRO. This is not used in a managed battery system.
3. Follow the Sonnenschein@home Lithium instructions to install the Sonnenschein@home Lithium.
4. Connect the Grey "BMS to SP PRO CAN bus" RJ45 Connector cable from the SP PRO Comms Card to the Sonnenschein@home Lithium. Cable can be connected in either direction.

Sonnenschein@home Lithium



SP PRO Inverter (L1 only in a multiphase system)



4. Fit two 200A NH fuses (ABB OFAF1H200 or equivalent) for SPMC482 or two 160A NH fuses (ABB OFAF1H200 or equivalent) for SPMC481 into the fuse housing inside the Sonnenschein@home Lithium.



Fuses inside

Go to "Check Communications Card Firmware" page 10

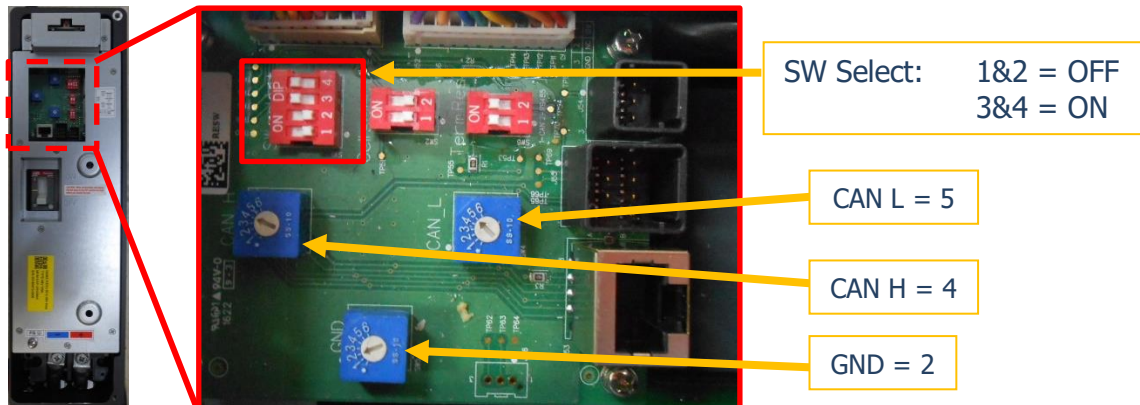


SP PRO Series 2i Managed Batteries

Installation Note

Section 3 for LG RESU (Single battery)

1. Do not connect any wires to the pre-charge / battery sense terminals. The battery sense voltage is read from the RESU battery BMS.
2. Leave the battery temperature sensor connected and rolled up inside the SP PRO. This is not used in a managed battery system.
3. Follow the RESU instructions to install the RESU battery.
4. Configure the LG Chem RESU dip switch, set "SW Select": 1&2 = OFF and 3&4 = ON.
5. Configure blue rotary switches, CAN H = 4, CAN L = 5 and GND = 2

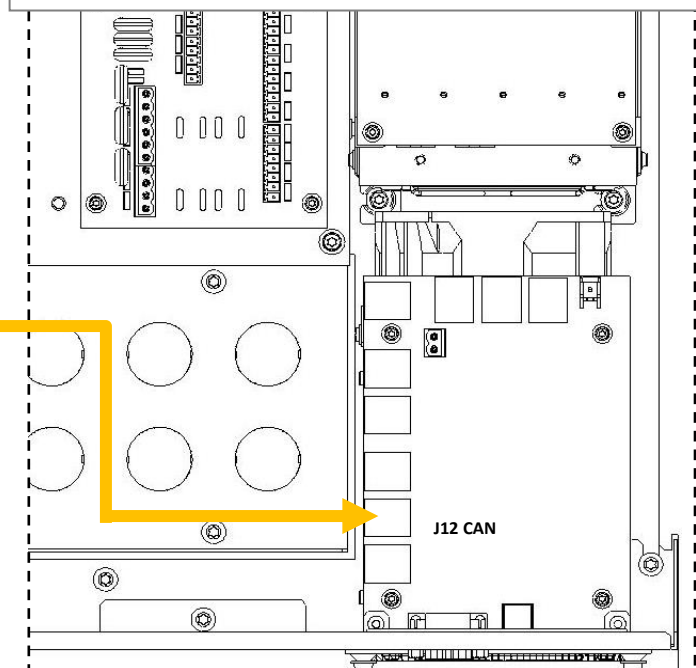


6. Connect the Grey "BMS to SP PRO CAN bus" RJ45 Connector cable from the SP PRO comm Card to the RESU. Cable can be connected in either direction.

LG Chem RESU



SP PRO Inverter (L1 only in a multiphase system)



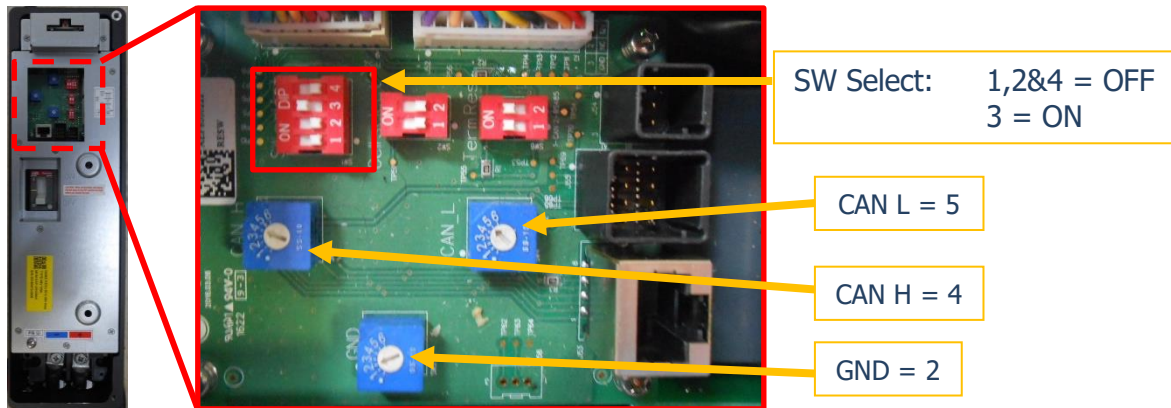
Go to section "Check Communications Card Firmware" page 10



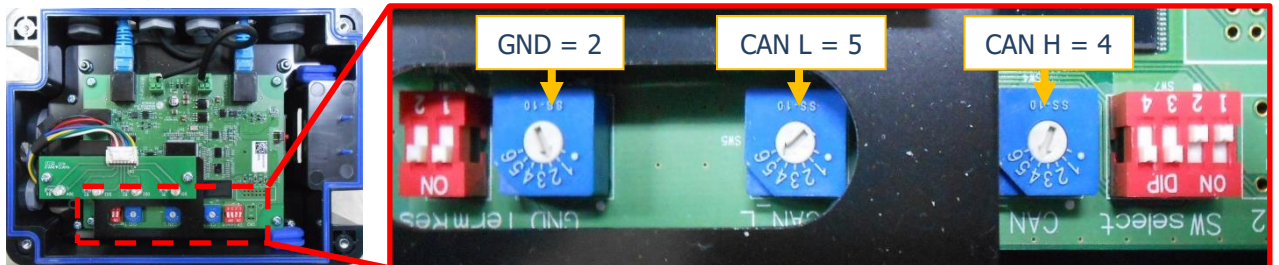
SP PRO Series 2i Managed Batteries Installation Note

Section 4 for LG Chem RESU Plus (Dual battery)

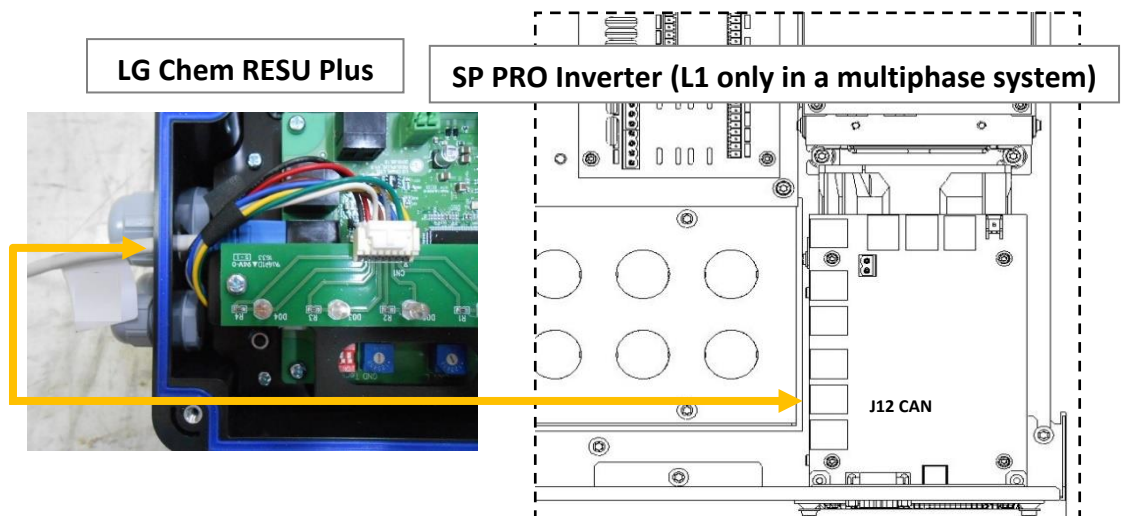
1. Do not connect any wires to the pre-charge / battery sense terminals. The battery sense voltage is read from the RESU battery BMS.
2. Leave the battery temperature sensor connected and rolled up inside the SP PRO. This is not used in a managed battery system.
3. Follow the RESU instructions to install the RESU battery.
4. Configure the LG Chem RESU dip switch, set "SW Select": 1,2&4 = OFF and 3 = ON.



7. Configure the LG Chem batteries and the LG Chem RESU Plus blue rotary switches: CAN H = 4, CAN L = 5 and GND = 2.



5. Connect the Grey "BMS to SP PRO CAN bus" RJ45 Connector cable from the SP PRO comm Card to the RESU Plus. Cable can be connected in either direction.



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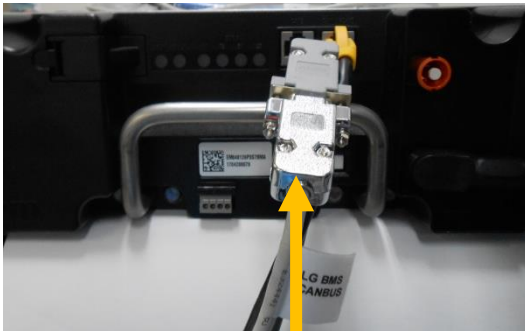
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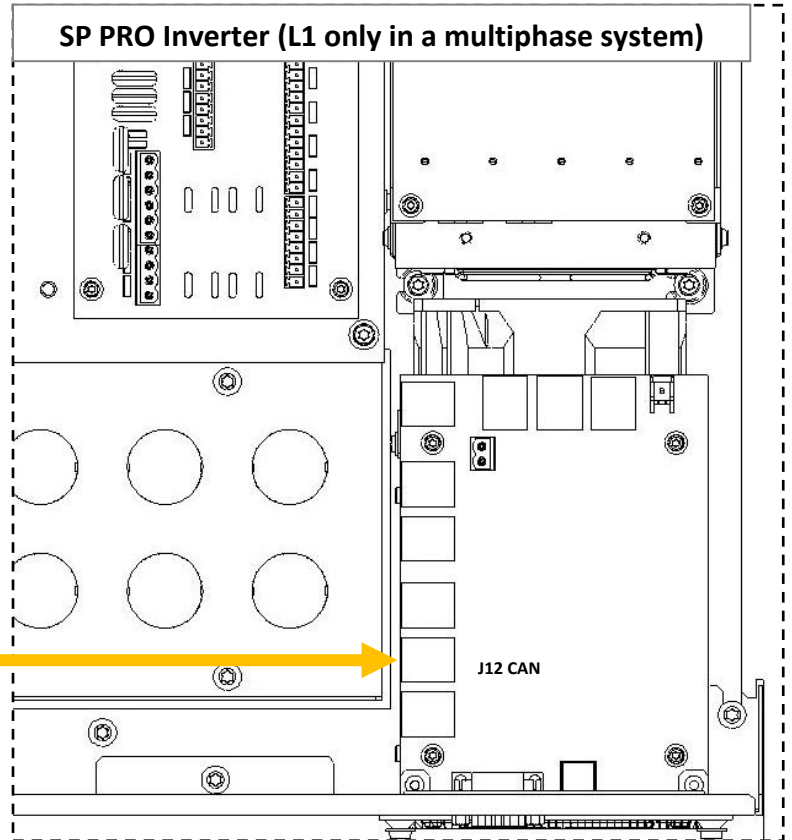
Section 5 for LG Chem Rack Mount Modules

1. Do not connect any wires to the pre-charge or battery sense terminals. The battery sense voltage is read from the LG Chem Rack Mount BMS.
2. Leave the battery temperature sensor connected and rolled up inside the SP PRO. This is not used in a managed battery system.
3. Follow the LG Chem Rack Mount instructions to install the LG Rack Mount.
4. Using the optional cable "CAN RJ45-DB9 LM CS1022_01" stock code 005289, connect the RJ45 end of the cable to the SP PRO comm card "**SP PRO CANBUS**" and connect the DB9 end to the LG Chem Rack Mount battery DB9 cable "**BMS CANBUS**".

LG Chem Rack Mount



SP PRO Inverter (L1 only in a multiphase system)



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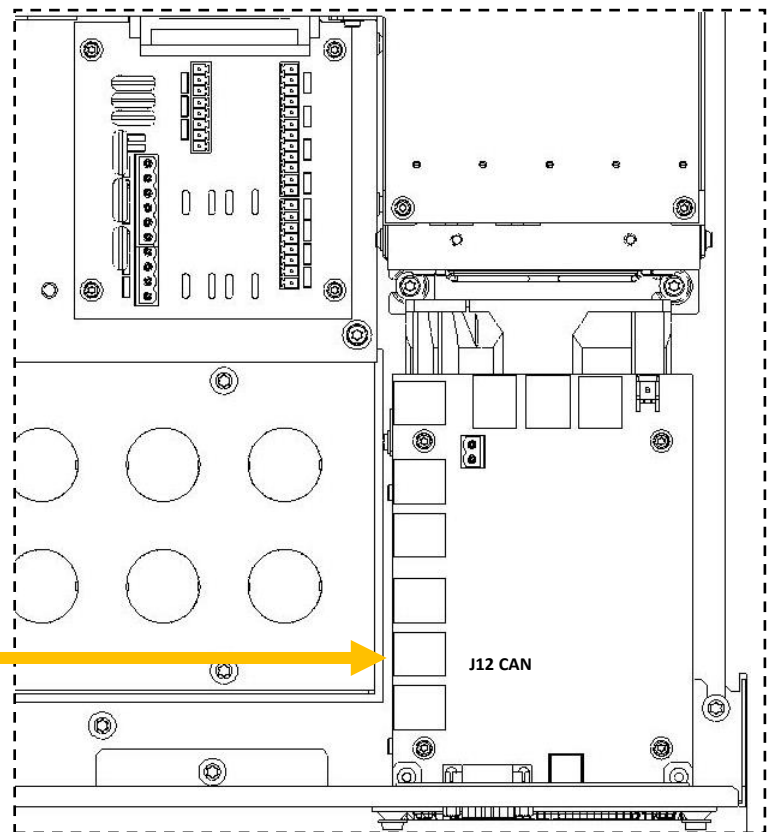
Section 6 for Pylontech US2000 and US3000 modules

1. Do not connect any wires to the pre-charge or battery sense terminals. The battery sense voltage is read from the LG Chem Rack Mount BMS.
2. Leave the battery temperature sensor connected and rolled up inside the SP PRO. This is not used in a managed battery system.
3. Follow the Pylontech instructions to install the modules.
4. Connect the Grey "BMS to SP PRO CAN bus" RJ45 Connector cable from the SP PRO comm Card to the Pylontech. Cable can be connected in either direction.

**Pylontech US2000 or
US3000**



SP PRO



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Turn on the Battery DC to the SP PRO

Each battery type has a different power ON procedure. If the correct procedure for a given battery type is not followed, the battery may not turn ON and run.

1. Connect the DC power to the SP PRO. This is done as follows:
 - For Sonnenschein@home Lithium – Leave the system DC circuit breaker or fuses OFF and turn the battery ON by pressing the ON button (adjacent to the fuse holder). When the relay inside the battery clicks, indicating the batteries have come ON, turn ON the system DC breaker or fuses.
 - For LG Chem RESU – Turn ON the system DC breaker or fuses to the SP PRO then turn ON the battery bank circuit breaker(s).
 - For Pylontech US2000 and US3000 – Turn ON the battery by switching the On/Off switch to the ON position.
 - For BYD B-Plus 2.5 modules, BYD B-Plus 13.8 BYD B-Plus 15.5, turn ON the battery bank by pressing the ON button. Turn on the Pre-charge / Battery Sense (If the system is AMP) and wait until the SP PRO comes on, then turn on the Battery Breaker or switch.
 - For LG Chem Rack Mount – Turn ON the system DC breaker or fuses to the SP PRO then turn ON the battery bank by pressing the ON button.

Wait until the SP PRO front panel LEDs are stable.

NOTE:

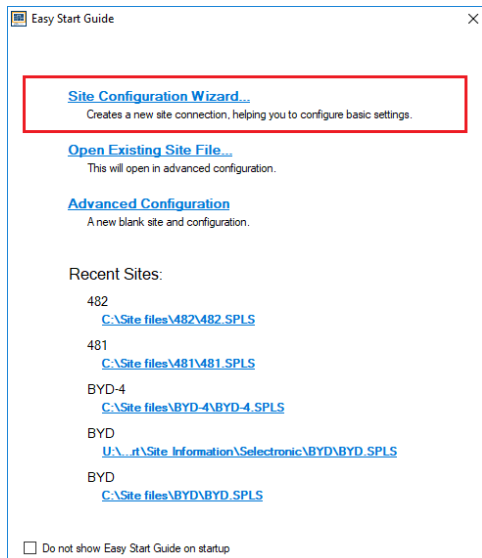
- a. During the SP PRO power up, the front panel display cycles through three stages; first, all LEDs turn green from bottom up, second, all LEDs turn red from bottom up and third, some LED's will be flashing while the battery LEDs are ON solid green. The third stage is what is referred to as stable.
- b. Perform the following tasks quickly as the batteries might shutdown in 5-10 minutes without the CANBUS communications. If this happens, turn the batteries ON and restart the process.



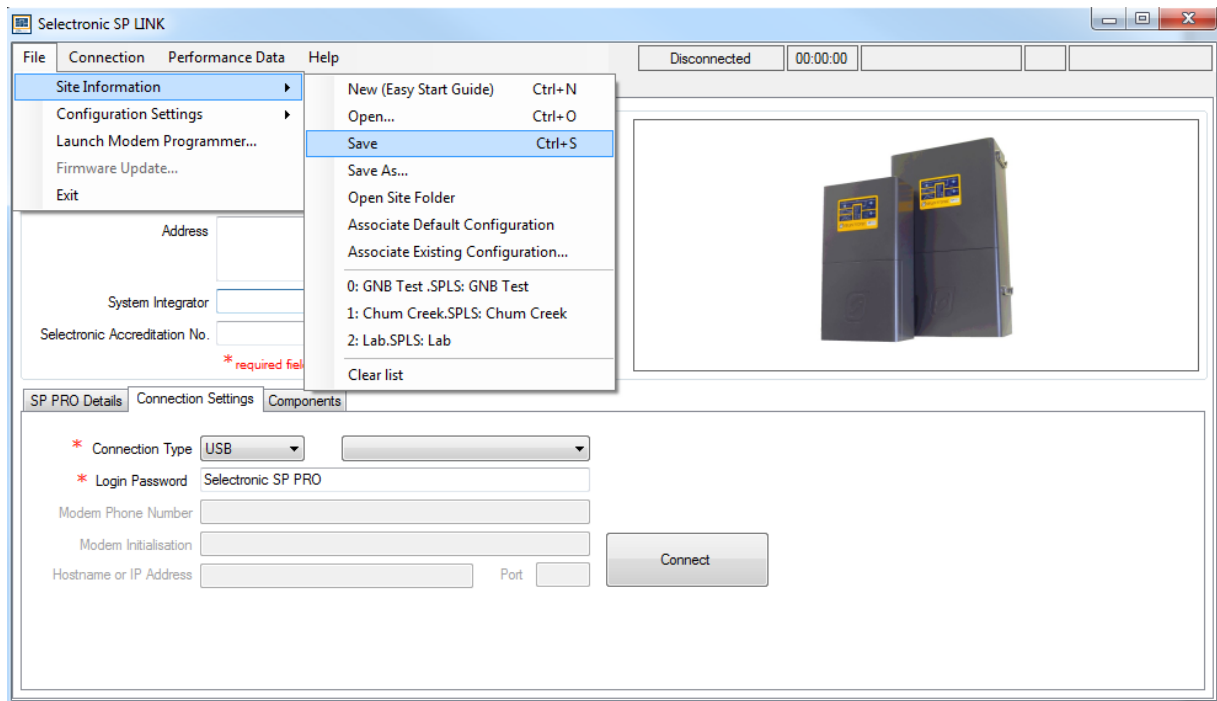
SP PRO Series 2i Managed Batteries Installation Note

SP PRO Configuration

1. Start Selectronic SP LINK.
2. Select "Site Configuration Wizard"



3. Follow the wizard to create a configuration for the SP PRO.
4. When the wizard is complete, select File > Site Information > Save to save the created site.





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5. SP LINK will automatically detect when the SP PRO is ON and the USB cable is connected. Click "Connect" to connect to the SP PRO.

The screenshot shows the 'Connection Settings' tab of the SP PRO configuration interface. It includes fields for 'Connection Type' (set to USB), 'Login Password' (Setelectronic SP PRO), 'Modem Phone Number', 'Modem Initialisation', and 'Hostname or IP Address'. A 'Connect' button is visible on the right.

6. At the Configuration Settings tab, click the "Configure SP PRO" button. The default settings passcode is 74.

The screenshot shows the 'Configuration Settings' tab of the SP PRO configuration interface. The 'Configure SP PRO' button is highlighted with a red box. The interface displays various settings such as 'Unit Application' (Solar Hybrid), 'Battery Type' (BMS - BYD), 'AC Source Power' (15.0 kW), and 'Battery Capacity' (625 Ah, 16.2 kWh). Other settings include 'String Inverter' (Fronius), 'Islanding Power Limit' (15.0 kW), and 'Trip Time' (5 s).

7. NOTE: If you have changed the AC coupled string inverter to one not supported by the firmware currently in the SP PRO, you may be prompted to replace the firmware after you have uploaded the configuration. If so, follow the prompts to upload firmware and restart on completion.



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Testing the Batteries

1. Turn OFF the main DC breaker, waiting 20 seconds and turn back ON.
2. After the SP PRO has powered up and the front panel LEDs are stable, check the green LEDs on the comm card.

Note: During the SP PRO power up, the front panel display cycles through three stages.

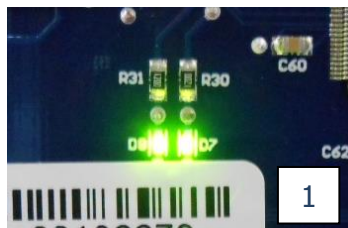
- First, all LEDs turn green from bottom up,
- second, all LEDs turn red from bottom up,
- third, some LED's will be flashing while the battery LEDs are ON solid green.

The third stage is what is referred to as stable.

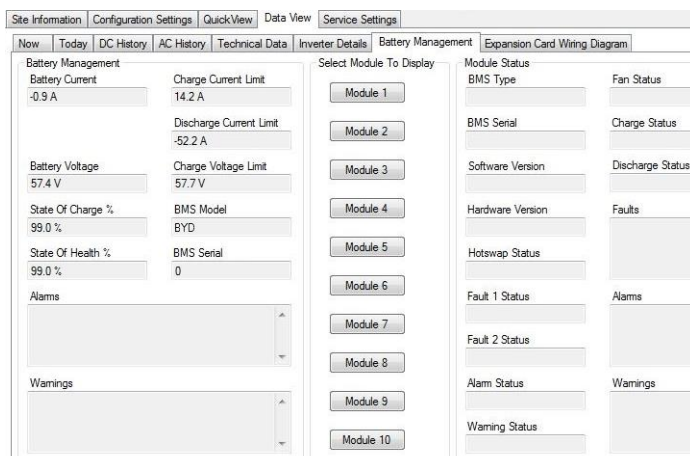
The right LED should be steadily ON.

The left LED should flash approximately once per second.

NOTE: There may be a delay of up to 60 seconds after power on before the left LED starts flashing.



3. Navigate to "Data view > Battery Management". If the system is working correctly, the values on this screen will be valid for the batteries.
4. The values displayed under Battery Management are those read from the batteries. The SP PRO uses these values to adjust the charge current and to limit the discharge current in the battery.



Note: The SP PRO will be beeping and the batteries will turn off after 5-10 minutes if there is a problem with the communications between the SP PRO and the batteries.

Note: If Module Status readings are greyed out they are not applicable for your battery type.



SP PRO Series 2i Managed Batteries

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Operation of the SP PRO

The SP PRO reads all the data out of the batteries 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, 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, the operation of the SP PRO in standalone mode 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 supporting the load, but 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 is so high that the AC voltage drops below 200V for 10 seconds, the SP PRO will shut down as the 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.

ADDITIONAL INFORMATION

Selectronic web site – <http://www.selectronic.com.au> or contact the Selectronic Sales Team.