



Battery Communications Integration Guide

5/11/21

| Revision | Changelog | Author | Date |
|----------|-------------------------------------|-----------------|---------|
| 1.0 | Initial creation | William Hopkins | 1/13/21 |
| 1.1 | Updated Storz & eFlex information | William Hopkins | 2/9/21 |
| 1.2 | Updated CAN Pinout for Indoor units | William Hopkins | 2/10/21 |
| 1.3 | | William Hopkins | 2/11/21 |
| 1.4 | Updated Pinouts | William Hopkins | 3/4/21 |
| 1.5 | Added NuEnergy and PowerSync | William Hopkins | 4/29/21 |
| 1.6 | Added Fortress eVault | William Hopkins | 5/11/21 |
| 1.7 | Corrections to StorzPower Pinout | William Hopkins | 7/28/21 |
| 1.8 | Added KiloVault HAB | William Hopkins | 8/2/21 |

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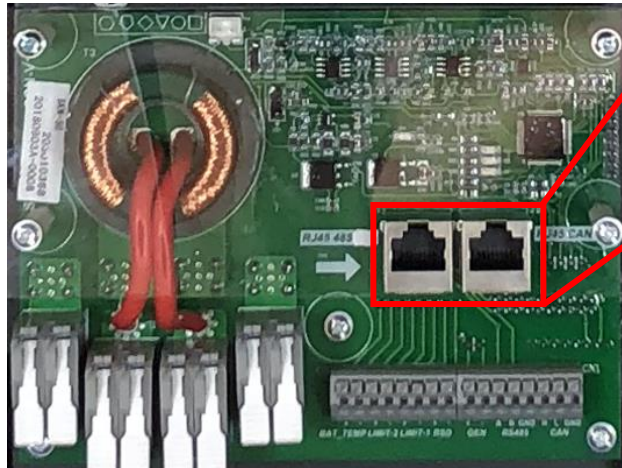
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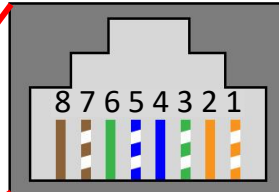
General Hardware Configurations

Sol-Ark 8K:

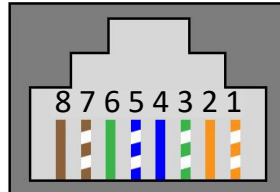
Communications on the Sol-Ark 8K are achieved through either of the 2 RJ-45 ports labeled “RJ45_485” and “RJ45_CAN” or the terminal connectors for RS-485 and CAN.

The ports are shown below alongside pin diagrams and detailed pin configurations for each port.





| Pin | Function |
|-----|-----------|
| 1 | RS-485 B- |
| 2 | RS-485 A+ |
| 3 | GND |
| 4 | |
| 5 | |
| 6 | GND |
| 7 | RS-485 A+ |
| 8 | RS-485 B- |

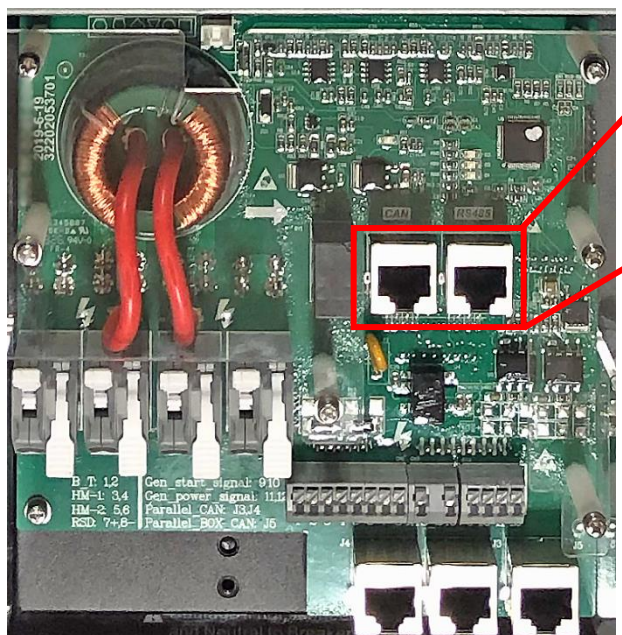


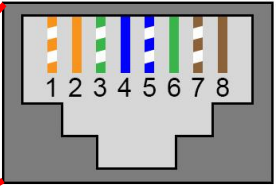
| Pin | Function |
|-----|----------|
| 1 | |
| 2 | GND |
| 3 | |
| 4 | CAN Hi |
| 5 | CAN Lo |
| 6 | |
| 7 | |
| 8 | |

Sol-Ark 12K:

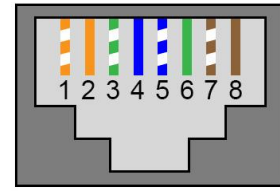
Communications on the Sol-Ark 12K are achieved through the RJ-45 ports labeled “RS-485” and “CAN”.

The ports are shown below alongside pin diagrams and detailed pin configurations for each port.





| Pin | Function |
|-----|----------|
| 1 | |
| 2 | GND |
| 3 | |
| 4 | CAN Hi |
| 5 | CAN Lo |
| 6 | |
| 7 | |
| 8 | |

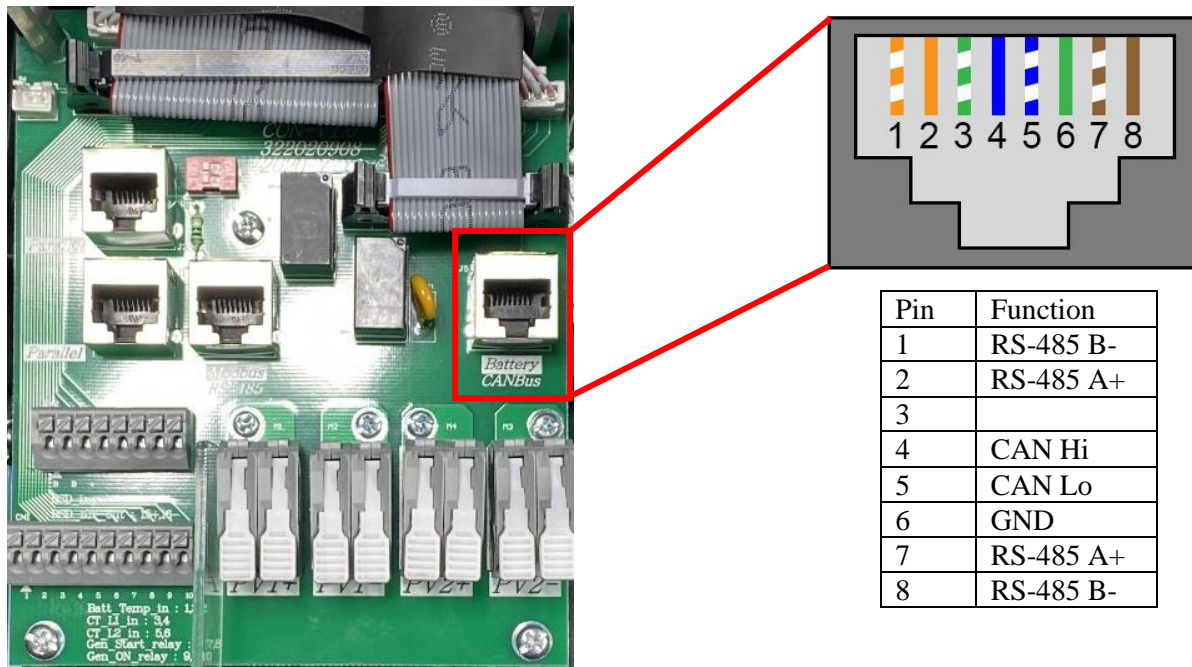


| Pin | Function |
|-----|-----------|
| 1 | RS-485 B- |
| 2 | RS-485 A+ |
| 3 | GND |
| 4 | |
| 5 | |
| 6 | GND |
| 7 | RS-485 A+ |
| 8 | RS-485 B- |

Outdoor Sol-Ark 5/8/12K:

Communications on the Outdoor rated units are achieved through a single RJ-45 port labeled “Battery CAN Bus”. This port combines the pin configurations of the RS-485 and CAN ports on the indoor rated 12K.

The port is shown below alongside a pin diagram and detailed pin configuration.



Note: The “Modbus RS-485” port on the outdoor rated systems is not for battery communications and is currently not implemented.

Common Battery Compatibility Chart

| Name | Comms |
|----------------------------------|-------------|
| PCC-230 (or any Lead Acid cells) | No |
| Blue Ion/eGauge | Yes |
| Fortress eVault 18.5 | Yes |
| Fortress eFlex 5.4 | Yes |
| Discover (using Discover Lynk) | Yes |
| SimpliPhi AmpliPhi | Yes |
| StorzPower | Yes |
| Dyness | Yes |
| Polarium/Incell | Yes |
| KiloVault HAB | |
| Batrium | In Progress |
| Orion Jr. 2 | In Progress |

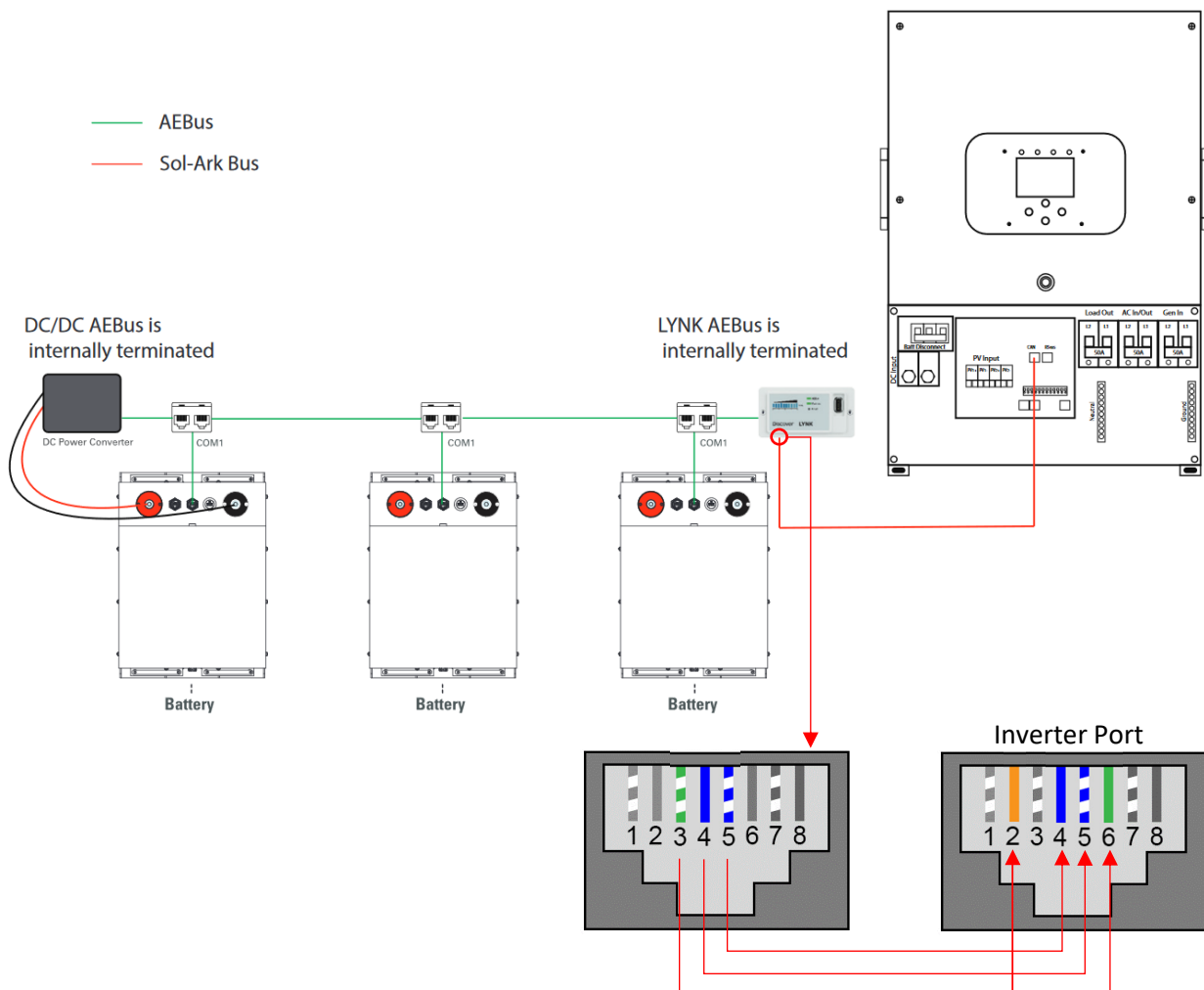
Compatible Battery Installation Guide

Discover

You will need the Discover Lynk device to adapt the battery's AEBus to CAN Bus for use with the Sol-Ark. The Lynk will need the proper adapter for the Sol-Ark's pin configuration (Part number 950-0016-XNBS for Schneider Electric devices). A custom cable is required.

Communications Installation and Setup instructions are included below:

1. Insert the included RJ45 splitters into the AEBus port of each Discover Battery.
2. Connect each battery to one another, linking each battery to the next in a chain using RJ45.
3. Connect one of the batteries on either end of the chain to the AEBus RJ45 port on the Lynk
4. Connect the 12V power supply to one of the batteries and plug it into the other end of the chain using RJ45 cable.
5. Create a custom RJ45 cable that swaps the positions of pins 4 (solid blue) and 5 (white blue), and connects pin 3 (white green) on the LYNK side to pin 2 (Indoor units only) or pin 6 (outdoor units only).
6. Connect the CAN Bus port of the Lynk to the CAN Bus port of the Sol-Ark.
7. Enable “BMS Lithium Batt” and set its value to “00”.

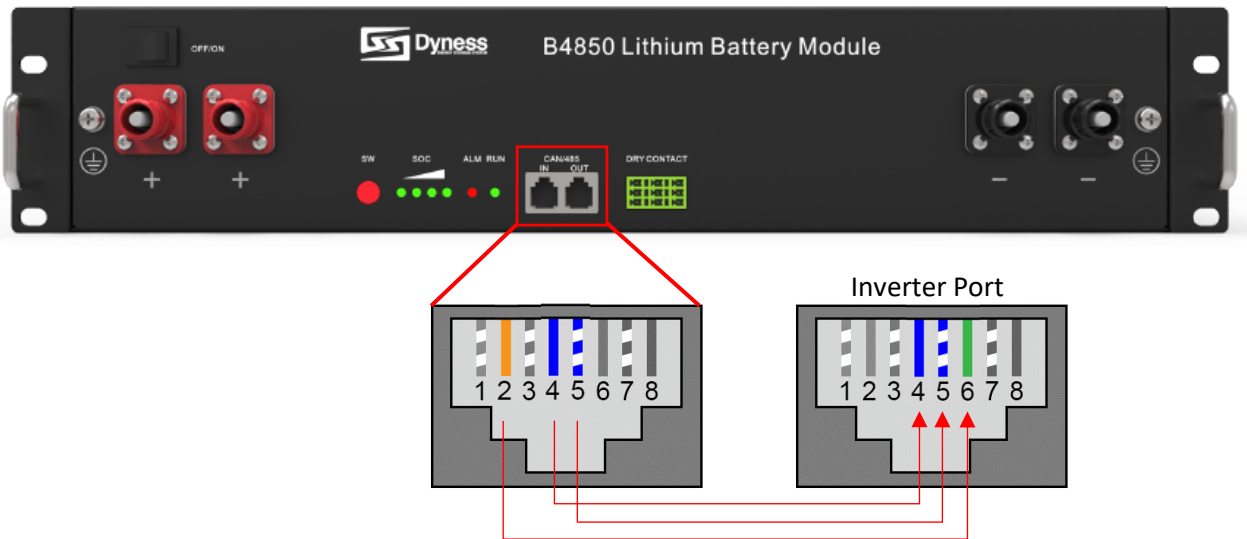


Dyness

No additional hardware is required to establish communication with Dyness batteries. No custom cable is required for indoor inverters, but one is required for outdoor inverters.

Communications Installation and Setup instructions are included below:

1. Connect the batteries to one another and the inverter as specified in their user manual.
2. For outdoor systems only, create a custom RJ45 cable that connects pin 2 on the battery to pin 6 on the inverter. Leave pins 4 and 5 as they were.
 - a. No pins except 2, 4, and 5 on the battery need to be connected to the inverter.
3. Connect one of the batteries to the inverter via the CAN Bus port.
4. For the battery connected to the inverter, set the switch in position 3 of the DIP selection switches to the “ON” position.
5. Enable “BMS Lithium Batt” and set its value to “00”.



Blue Ion/eGauge

In order to establish communications with the Blue Ion battery you will need an eGauge monitoring device, an eGauge USB-485 converter, and a wired internet connection. You will need a custom RJ45 cable for this setup.

Communications Installation and Setup instructions are included below:

1. Connect the Blue Ion to your wired internet connection using the RJ45 port on the back of the unit.
2. Connect the eGauge to a power source.
3. Connect the eGauge to your wired internet connection using the RJ45 port on the unit.
4. Follow instructions from eGauge to set up the device with your Blue Ion battery.
5. Connect the USB-485 to the eGauge.
6. Set up the USB-485 using eGauge's online instructions.
7. Enable Modbus RTU on the eGauge.
8. Connect "D+" on the USB-485 to either pin 2 or pin 7 (2nd from the rightmost or leftmost pin), "D-" to either pin 1 or pin 8 (rightmost or leftmost pin) and GND to either pin 3 (indoor units only) or pin 6 (outdoor units only).
 - a. Note that eGauge needs to configure your device specifically for use with the Sol-Ark. If this has not been done yet, please contact eGauge support.
9. Plug in the RJ45 cable to the "RS-485" (indoor models) or "Battery CAN Bus" (outdoor models) port on the inverter.
10. Enable "BMS Lithium Batt" and set its value to "03".

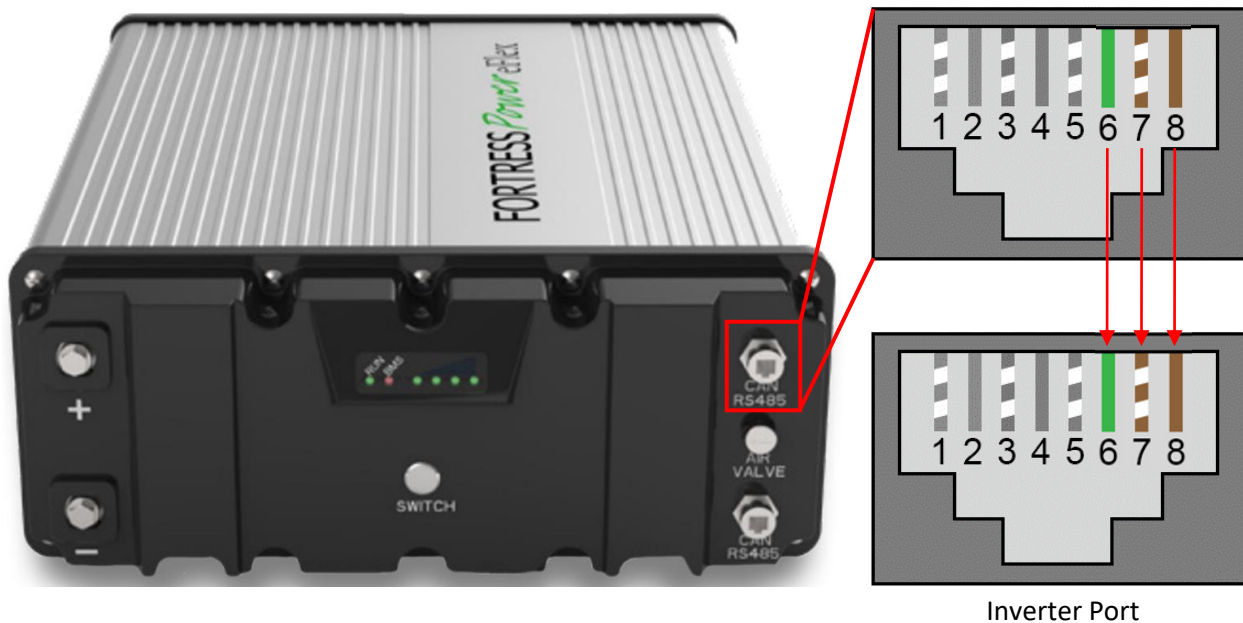


Fortress eFlex 5.4

No additional hardware is required to establish communication with the eFlex 5.4. You will need to make a custom cable for this setup.

Communications Installation and Setup instructions are included below:

1. Connect the batteries to one another using the included RJ45 cables.
2. Use the included 120 Ohm termination resistor on either end of the resulting chain.
3. Create a custom RJ45 cable where only pins 6 (solid green), 7 (white brown) and 8 (solid brown) remain connected in their original positions as shown in the picture below.
 - a. **It is easier and less prone to error that a known working ethernet cable be cut open and that the unneeded wires are cut in the middle of the cable.**
 - b. Note: If you are crimping new connectors to create a custom cable, be careful not to over-tighten the crimping tool as this can recess the connectors and lead to poor or intermittent connection.
4. Plug one end of the cable into the CAN/RS485 port on the battery and the other into either the “RS-485” (indoor models) or “Battery CAN Bus” (outdoor models) port on the inverter.
5. Enable “BMS Lithium Batt” and set its value to “04”.



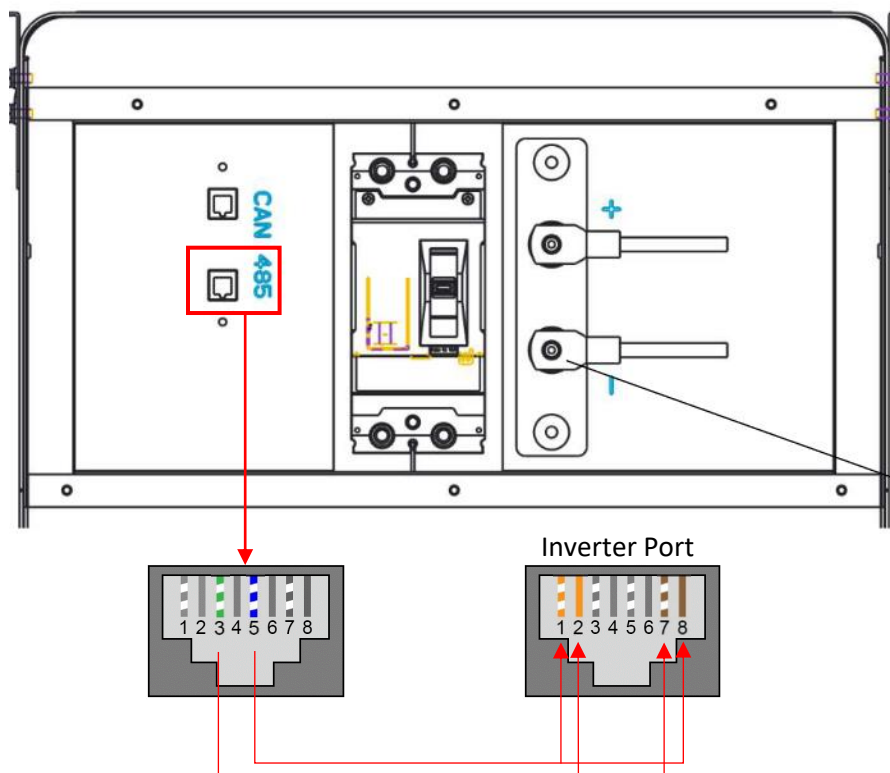
Fortress eVault 18.5

No additional hardware is required to establish communication with the Fortress eVault 18.5 battery. You will need to make a custom cable for this setup.

NOTE: The Fortress eVault is only able to communicate with the Sol-Ark after a firmware update to the eVault. New eVault units ship with this update, but those with older units may have to install the new firmware themselves. To find out whether you need to as well as how to perform this update, please contact Fortress Power.

Communications Installation and Setup instructions are included below:

1. If using multiple batteries, designate one as master and the others as slaves in accordance with Fortress' setup instructions. If using a single battery, skip to step 3
2. Connect the multiple batteries using ethernet cable (RJ45 cable) as directed in Fortress' setup instructions.
3. Create a custom cable such that only pins 3 and 5 (white green and white blue) are connected to the battery. Pin 3 (white green) can be connected either to pin 2 or pin 7 on the inverter, and Pin 5 (white blue) can be connected to either pin 1 or pin 8 on the inverter.
 - a. **Since the eVault has no ground pin for communications, it is recommended that "BMS_err_stop" (under battery setup > discharge tab) be unchecked so that noise on the communications cable does not cause the inverter to fault.**
4. Connect this cable between the Fortress eVault's RS485 port and the "Battery CANBus" port (Outdoor units) or the "RS-485" port (Indoor units).
5. Enable "BMS Lithium Batt" and set its value to "04"

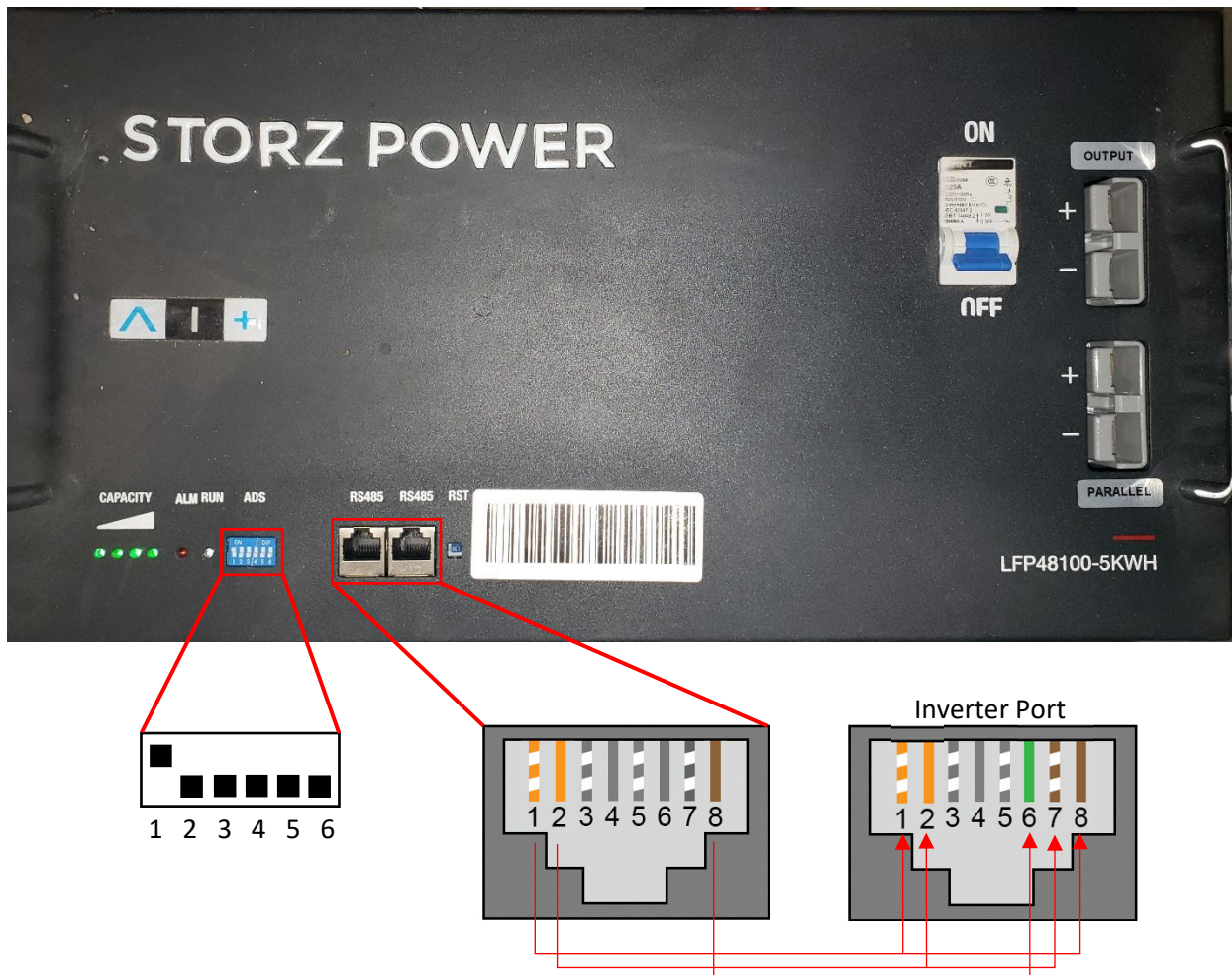


StorzPower

No additional hardware is required to establish communication with StorzPower Resi+ 48V units. You will need to make a custom cable for this setup.

Communications Installation and Setup instructions are included below:

1. Set the DIP switches on the batteries such that the first battery in the chain (to be connected to the inverter) is set as slave 1 and each unit behind it increases the slave ID it has.
 - a. Each DIP switch (1-4) represents a bit in the slave ID value. i.e. [1: ON 2: OFF 3: ON 4: ON] = 1101 (binary) = 13 (decimal).
2. Connect the batteries to one another with RJ45 cable such that they are all in parallel.
3. Create a custom cable such that only pins 1, 2, and 3 (white orange, solid orange, and white green) are connected to the battery. Pin 1 (white orange) can be connected to pin 1 or pin 8 on the inverter, pin 2 (solid orange) can be connected to pin 2 or pin 7 on the inverter, and pin 3 (white green) can be connected to pin 3 (indoor units only) or pin 6 (outdoor units only).
4. Connect this cable between the battery set as slave 1 and the inverter's "Battery CANBus" (Outdoor models) or "RS-485" (Indoor models) port.
5. Enable "BMS Lithium Batt" and set its value to "01".

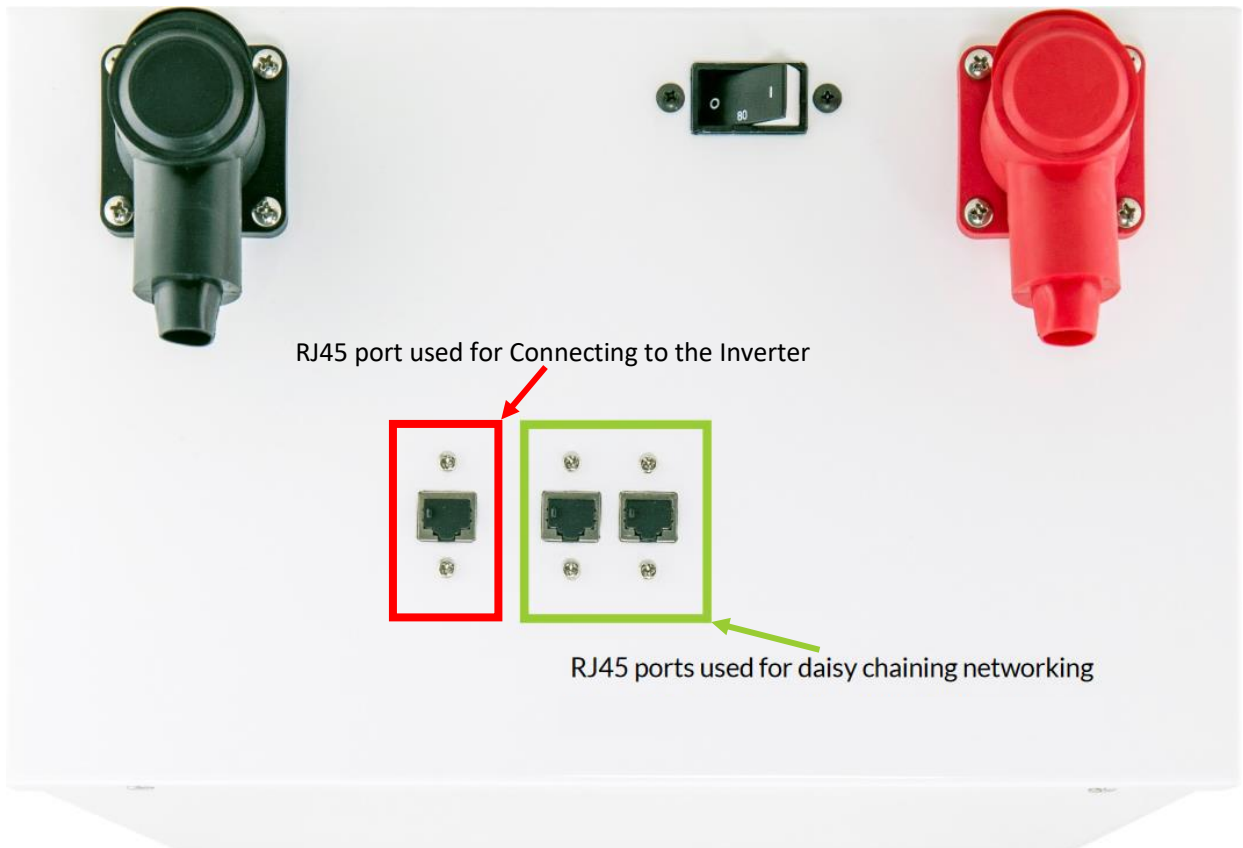


SimpliPhi AmpliPhi

No additional hardware is required to establish communication with SimpliPhi AmpliPhi units. You will not need to make a custom cable for this setup.

Communications Installation and Setup instructions are included below:

1. Connect the batteries to one another using the included RJ45 cables, using the two ports nearest each other on the battery to bridge the batteries together.
2. Use the included 120 Ohm terminators on both ends of the resulting chain.
3. Connect an RJ45 cable from the separate RJ45 port on one of the batteries either at the beginning or end of the chain (not in the middle) to the “CAN” or “Battery CAN Bus” port on the inverter.
4. Enable “BMS Lithium Batt” and set its value to “00”.

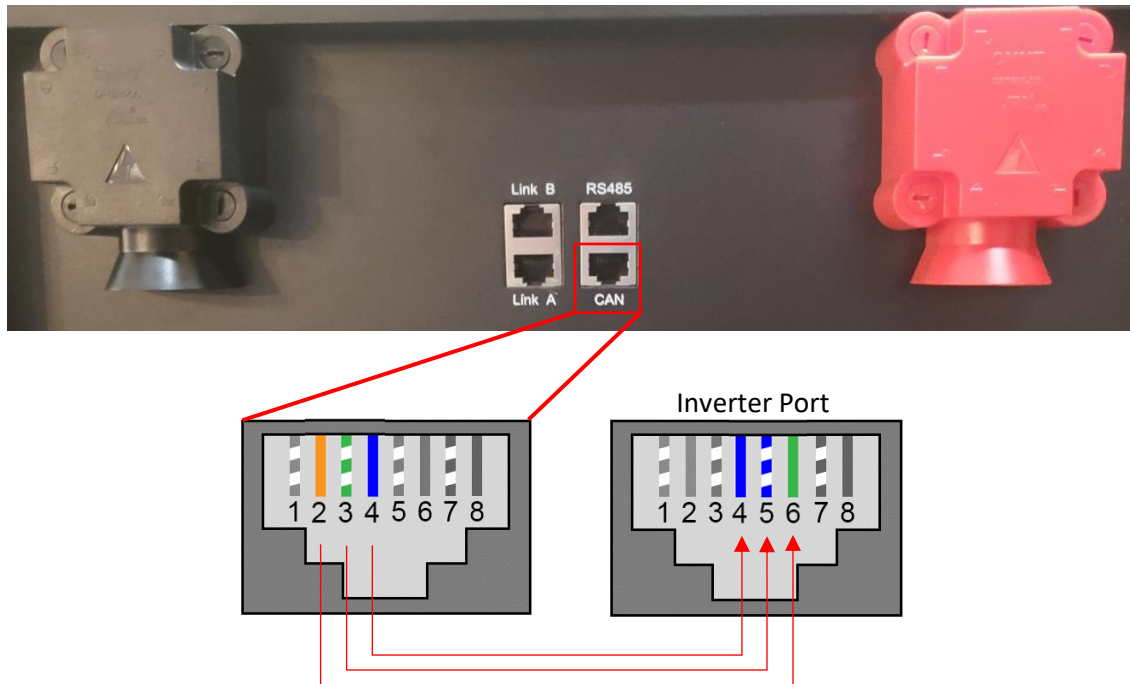


NuEnergy Lithium

No additional hardware is needed to establish communications with NuEnergy Lithium batteries. A custom cable is required to establish communications with the NuEnergy Lithium battery.

Communications Installation and Setup instructions are included below:

1. Create a custom cable such that only pins 2, 3, and 4 (solid orange, white green, and solid blue) are connected to the battery. Pin 2 (solid orange) should connect to pin 6 on the inverter. Pin 3 (white green) should connect to pin 5 on the inverter. Pin 4 (solid blue) should connect to pin 4 on the inverter.
 - a. On indoor units, leave pin 2 (solid orange) connected to pin 2 on the inverter instead of pin 6.
2. Connect the cable to the “CAN” port on the NuEnergy cabinet and the “Battery CAN Bus” port (or the “CAN” port for indoor-only units) on the Sol-Ark.
 - a. Keep track of which end of the cable is terminated for the battery and which is terminated for the Sol-Ark as the cable is not reversible.
3. Turn on the battery by flipping the “on” switch for each individual battery then pressing the circular button at the top of the inside of the unit.
4. Enable “BMS Lithium Batt” and set its value to “00”.

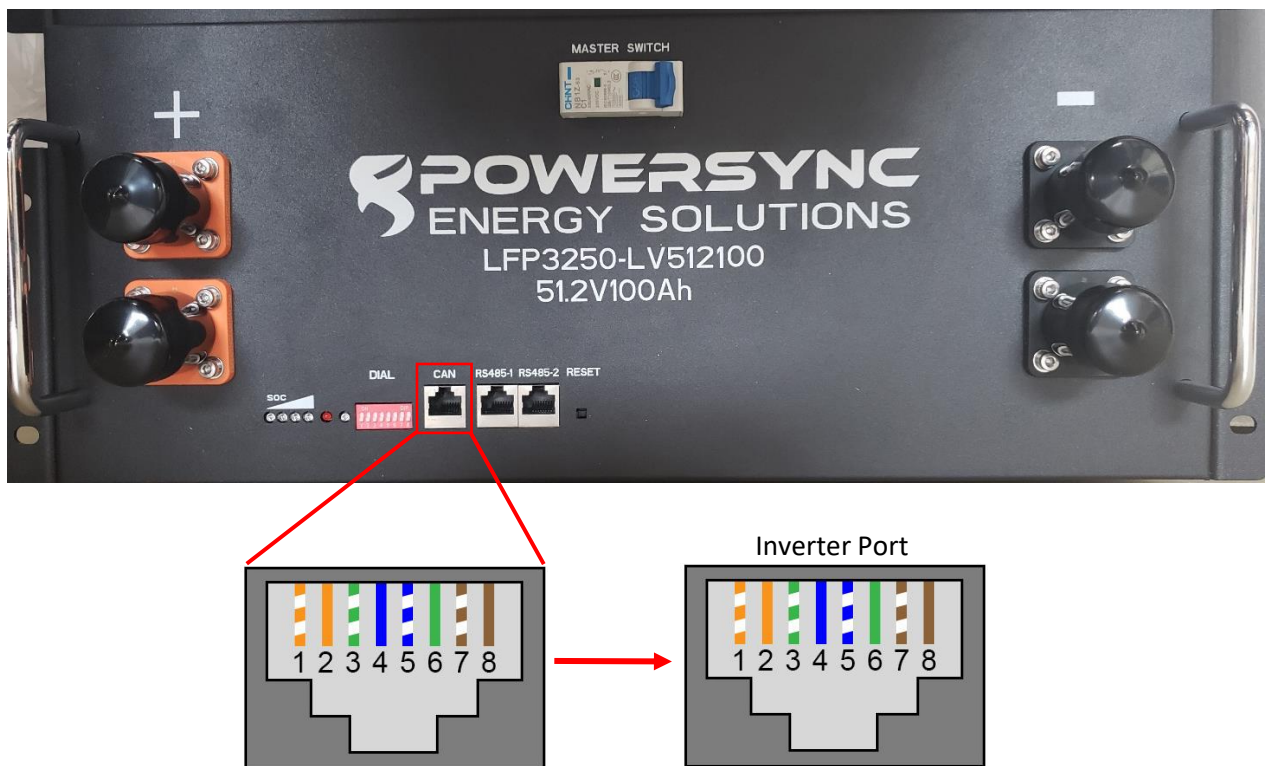


PowerSync 51.2V Lithium

No additional hardware is required to establish communication with PowerSync 51.2V Lithium batteries. You will not need to make a custom cable for this setup.

Communications Installation and Setup instructions are included below:

1. Set the DIP switches on the battery in accordance with the manual and your battery configuration.
2. Connect each battery to one another using the included short RJ45 cables, connecting each battery via their RS485 ports.
3. Connect the master battery's "CAN" port to the inverter's "Battery CAN Bus" port (or to the inverter's "CAN" port for indoor-only units) using a standard RJ45 ethernet cable.
4. Turn on the batteries using the breaker labeled "Master Switch".
5. Enable "BMS Lithium Batt" and set its value to "00".



KiloVault HAB

No additional hardware is required to establish communications with KiloVault HAB batteries. You will need to make a custom cable for this setup.

Communications Installation and Setup instructions are included below:

1. Ensure that the batteries are running the latest firmware from KiloVault, and that the Sol-Ark communication profile is selected.
 - a. If unsure, contact KiloVault to verify.
2. Set the DIP switches in accordance with the KiloVault manual.
 - a. If only using a single battery, all DIP switches should be “OFF”
 - b. If using more than one battery, the battery which is connected to the inverter should have only DIP switch 1 turned “ON”. All subsequent batteries should have their DIP switches set in accordance with what number they are in the chain (the DIP switches represent the binary number of the battery).
 - c. A theoretical maximum of 15 batteries can be communicating in parallel at the same time. More than one unit still untested but should work.
3. Create a custom cable such that the “Inverter RS485B” wire connects to pin 1 (white orange) and “Inverter RS485A” connects to pin 2 (solid orange).
4. Connect the custom 6-pin connector to the KiloVault’s custom port and connect the custom RJ45 cable to the “Battery CAN Bus” (outdoor units) or “RS-485” (indoor units) port on the inverter.
 - a. **As of 8/2/2021 the KiloVault HAB does not feature a ground connection for their communication port. It is recommended to first enter all battery settings into the system manually and to disable “BMS_err_stop” under “Battery Setup -> Discharge” to avoid errors when communications are lost.**
5. Enable “BMS Lithium Batt” and set its value to “05”.

