Red Pole Vital Battery Range - General Install Guide for all non specifically listed inverters

This manual is intended to be used in conjunction with the product manual supplied by Red Pole Energy. It provides additional and specific information regarding integration with inverters that we have not specifically provided a guide for, and if you are not sure if CAN bus communication is available.

Red Pole Energy Vital 5/10 Lithium batteries' include a Battery Management System (BMS) with communication ports that it uses to communicate with other Vital-5/10 batteries when several units are installed in parallel, as well as with the inverter to set up charging parameters and communicate the battery's state of charge.

But some inverters only support specific battery communication protocols and will not be able to communicate with the Vital-5/10 BMS. This does not mean the Red Pole Energy Vital 5/10 Lithium batteries cannot be used with these inverters, but it does mean that the inverter will only have limited information regarding the battery status and will need to estimate the battery's state of charge. It will also need some settings entered manually,

The following field guide will assist with checking if your battery can communicate with the Vital-5/10 battery, and if not then what the correct battery and inverter settings are.

 Please also ensure that you have read the installation manual of the Vital 5/10 battery.

1. Connect the Red Pole Energy Battery

If you are using multiple Vital-5/10 batteries, then link up all your extra batteries as per the Vital-5/10 user manual and the batteries will set the addresses between themselves automatically. The first or master battery is the one that will connect to and communicate with the inverter.

If you have a Deye, Sunsynk or Victron inverter, please check those guides specifically.

If not, then you need to look up the communication port pinout of your specific inverter.

This is usually included in the user manual of the inverter. An example is shown below.

This custom-made RJ45 communication cable delivers information and signal between lithium battery and the inverter. These information are listed below:
- Re-configure charging voltage, charging current and battery discharge cut-off voltage according to the lithium battery parameters.
- Have the inverter start or stop charging according to the status of lithium battery.

2. Pin Assignment for BMS Communication Port

	Definition
PIN 1	RS232TX
PIN 2	RS232RX
PIN 3	RS485B
PIN 4	NC
PIN 5	RS485A
PIN 6	CANH
PIN 7	CANL
PIN 8	GND

12345678
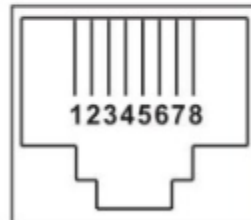
Example of the appendix information for the inverter communication port

The inverter in the example above, requires pin 6 to be CANH, and ping 7 to be CANL.
Our RP-Vital5/10 battery requires pin 4 to be CANH, and ping 5 to be CANL.

Having this information at hand, then a communication cable would need to be made up using CAT5 network cable and RJ45 connectors. IT shops, or any networking technicians have the tools required. This cable can then be crimped so it connects pin 6 to pin 4, and pin 7 to pin 5.

Label each end of the cable and ensure the cable is used the right way around.

2. Test the Communication Cable

On the inverter, navigate to the BMS communication screen or battery type screen. This will be different for each inverter, and the options are different. Some models include specific battery brands like Pylontech, etc, or "other".

Ensure your cable is made correctly, the battery is turned on, and the cable is plugged into the correct port on both the battery and inverter.

Then cycle through all the available options to see if the communication works on one of them. If the communication fails for every option available, then the inverter is not able to communicate with the battery directly.

This means that the inverter will have to use the voltage levels to estimate the state of charge and the battery settings will have to be entered manually. See the section below for guidance, alternatively see Section 4 if you do have communication.

3. No Communication : Enter Settings Manually

On the inverter, set the battery type to user defined. Then navigate to the appropriate menu options on the inverter to set the charging and discharging voltages.

3.1 Charge and Discharge Settings

The max current that the inverter can charge and discharge at, is dependent on the number of batteries used in parallel:

Max A Charge :   #batteries x 1 x 100A (Max is 0.5C)
                          (Recommended continuous <= 0.5C)
                          100A Max, <= 50A should be average if a single Vital battery is used

Max A Discharge :   #batteries x 1 x 100A (Max is 1C)
                          (Recommended continuous <= 0.5C)
                          100A Max, <= 50A should be average if a single Vital battery is used

The charging voltages for the Red Pole Vital batteries are:
Bulk / Absorption Voltage :   55.6v
Float Voltage :   55.6v
Equalization Voltage :   55.6v

3.2 Low Battery Settings

The exact voltages chosen here are a matter of preference but have a direct impact on the longevity of the battery hence we make some recommendations, but first want to expand on what the different low battery settings are.

Shutdown :   The battery voltage at which the inverter should switch off at.
Set this to 48v so the battery does not drain more than about 80-90%.

Low Battery :   The battery voltage at which the inverter should trigger a low battery alarm to indicate that the inverter is close to switching off. Recommended as 50v.

Restart :   In the event that the inverter did switch off, but the battery has since been charged from solar or the grid, then this is the battery voltage that the inverter should switch back on and function normally again.
Recommended as 50 to 52v.

3.3 Summary of Settings

Bulk / Absorption Voltage :   56.1v or 55.6v
Float Voltage :   55.6v
Equalization Voltage :   55.6v
Shutdown :   48v
Low Battery :   50v
Restart :   50 - 52v

4. Communication Works : Check the Settings

If the inverter does have communication with the inverter, then please cycle though and check the following settings. Some might be set automatically, and some might need to be set manually with only the state of charge being communicated.

4.1 Charge and Discharge Settings

Batt Capacity :   #batteries x 100Ah
Max A Charge :   #batteries x 1 x 100A (Max is 0.5C)
    (Recommended continuous <= 0.5C)
Max A Discharge :   #batteries x 1 x 100A (Max is 1C)
    (Recommended normal <= 0.5C)

The charging voltages for the Red Pole Vital batteries are:

Bulk / Absorption Voltage :   56.1v or 55.6v
Float Voltage :   56.1v or 55.6v

4.2 Low Battery Settings

These settings determine how the inverter should act once the battery is at a low state of charge.

Shutdown :   The state of charge % that the inverter should switch off at.

Low Battery :   The state of charge % that the inverter should trigger a low battery alarm to indicate that the inverter is close to switching off.

Restart :   In the event that the inverter did switch off, but the battery has since been charged from solar or the grid, this is the state of charge % that the inverter should switch on and function normally again.

The exact % chosen here is a matter of preference.

Recommended is to have shutdown set to 20% so the battery does not drain more than 80%.

Recommended low battery alarm level should be 10-15% above the shutdown state of charge.

The recommended state of charge % at which the inverter switches on again should be set 5% to 15% above the low battery alarm level.