ROLLS LFP ESS INTEGRATION WITH VICTRON ENERGY

USER MANUAL

Rolls

BATTERY ENGINEERING

Installation, connection, and closed-loop configuration of Rolls LFP ESS batteries with Victron Energy devices.

Contents

OVERVIEW

This document provides information on the integration of Rolls LFP ESS batteries with Victron Energy systems via CAN-BUS communication. The integration covers the following components:

• Cerbo communication centers
• MultiPlus inverter chargers
• Quattro inverter chargers
• MPPT Charge Controllers
• BMV 700 Series Battery Monitor
• Venus GX / Color Control GX
• VE Configure Software
• VictronConnect Bluetooth application

Victron Energy Reference Documents:

• Quattro Inverter Charge Manual
• Multi Inverter Charge Manual
• SmartSolar Charge Controller Manual
• Venus GS (VGX) / Color Control GX (CCGX) Manual
• BMV 700 Series Battery Monitor Manual

Rolls LFP ESS Reference Documents:

• ROLLS S48-100LFP ESS DATA SHEET
• ROLLS S48-100LFP ESS BATTERY OPERATING MANUAL

Visit the links above, or rollsbattery.com for the most recent version of published documents.

Certain configurations, installations, services, and operating tasks should only be performed by qualified personnel in consultation with local utilities and/or authorized dealers. Qualified personnel should have training, knowledge, and experience in:
• Installing electrical equipment
• Applying applicable installation codes
• Analyzing and reducing hazards involved in performing electrical work
• Installing and configuring batteries

No responsibility is assumed by Rolls Battery for any consequences arising out of the use of this material.

Read Rolls LFP ESS Battery Operating Manual and safety instructions before installing the battery.
Read Victron Energy manuals for guidance on product features, functions, parameters and how to use the product safely.

BATTERY OPERATING LIMITS

Maximum Battery Operating Limits

The battery should not be operated outside these operating limits. The BMS will open its internal relay and disconnect the battery if any of these limits are exceeded.

Maximum Operating Limits	S48-100LFP ESS
Continuous Charge Current*	63 Adc
Continuous Discharge Current*	50 Adc
Peak Current (300 milliseconds)	500 Adc
Operating Voltage (Min / Max)	41.6 V / 58.4 V
Charge Temperature (Min / Max)	0°C / 55°C (32°F / 131°F)
Discharge Temperature (Min / Max)	-20°C / 60°C (-4°F / 140°F)
Storage Temperature (Min / Max)	-5°C / 45°C (23°F / 113°F)

 *Effects of AC Ripple must be taken into consideration when sizing and configuring a system

Note: Intentional bypassing of a BMS to operate a battery outside its maximum and minimum limits voids warranty and may lead to safety concerns.

Minimum Battery Capacity

Using large solar arrays with battery banks that are too small can exceed the operating limits of the battery, potentially triggering over-current protection in the Battery Management System (BMS). Battery capacity must be sized to accommodate the maximum charge current of the system, or the charging devices must be adjusted to charge below the operating limit of the installed batteries. This value is determined by summing the charge capacities of all inverter/chargers and solar charge controllers in the system. Additionally, the battery peak capacity must be sized to support the surge requirements demanded by the load connected to the inverter. Ensure that the sum of all inverter peak power values matches the sum of all battery peak current values.

| Model	Inverter Peak (92% Efficiency at 48V)	Charger	Single Phase Minimum
MultiPlus 48/3000/35	125 Adc	35 Adc	2
MultiPlus 48/5000/70	208 Adc	70 Adc	4
Quattro 48/5000/70	208 Adc	70 Adc	4
Quattro 48/8000/110	333 Adc	110 Adc	6
Quattro 48/10000/140	416 Adc	140 Adc	8
Quattro 48/15000/200	520 Adc	200 Adc	9

ROLLS LFP DESKTOP SETUP

Physical Setup

Steps to setup are:

1. Connect Rolls battery terminals (+ and -) to Victron MultiPlus (+ and -) [Red and Black cable]
2. Connect Victron components to the VE.Bus and VE.Can networks as applicable. To use with a Rolls S48-100LFP ESS battery, or other Rolls products after 2023, you will need a Cerbo-S GX, or other VE>Can enabled product, capable of 500k Can communication.
3. Connect Cerbo-S GX (VE.Can) to Rolls S48-100LFP ESS battery (CAN-BUS) [RJ45]
   a. Use **Victron Cable A** to properly connect the CAN-bus signals.
4. Connect HMI, or PC to Victron network to monitor entire system.
5. Connect Battery (RS485) to Computer via RS485 to USB adapter (not supplied with battery, available with cabinet). [This step is required for **setup only**, or can be used to monitor batteries individually]
6. Launch Rolls LFP Desktop App on your PC to configure CAN-bus mode.

Software Setup – Rolls LFP Desktop

Within the computer software Rolls LFP Desktop, after connecting to the battery:

1. Select a baud rate of 19200
2. Select the appropriate COM port on your computer.
3. Select "Connect" and wait for connection to be established (1-3 seconds).
4. The battery information will be displayed, including cell parameters, and software information.
5. Configure the unit to communicate with Victron devices.
   a. Click CAN on the top ribbon.
   b. Double click "VCTR" to configure for Victron.
   c. Wait for pop-up confirming updated software.
6. Ensure that the "BMS Information" Section at the bottom of the screen has updated to reflect the Victron CAN-bus Protocol.
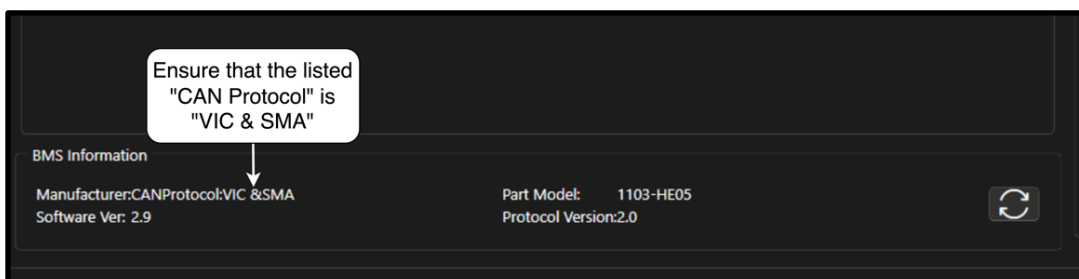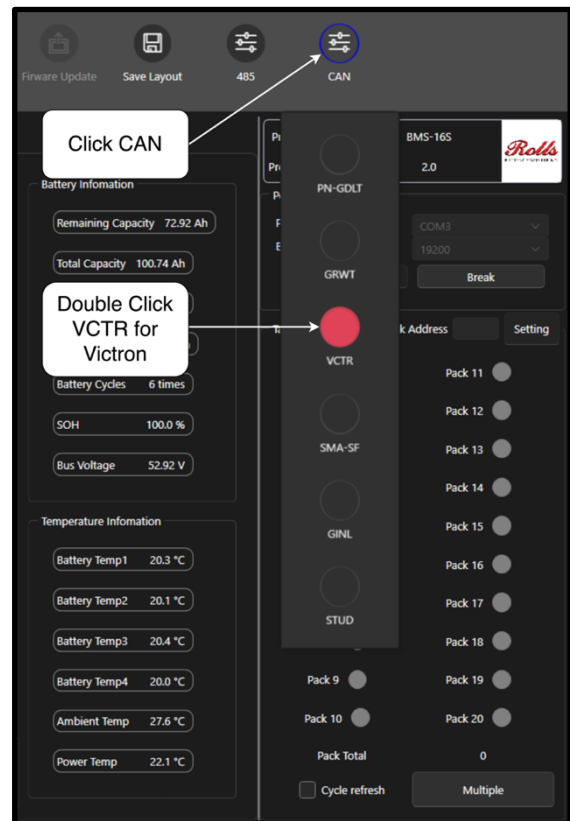
ROLLS LFP ESS CLOSED LOOP INTEGRATION WITH VICTRON ENERGY EQUIPMENT

Victron communication device capable of BMS-Can operation at 500k (this may prevent you from using VE.Can if your device only has one CANbus interface, VE.Direct will be unaffected), and a Compatible Rolls Battery device, like the S48-100LFP ESS.

In case of confusion, refer to the manual for the Victron energy device you are using, which may have specific ports, or setup requirements. Typical setup is as follows for devices like the Cerbo GX.
Ensure the physical connection steps have been followed, and all connected S48-100LFP ESS Devices are also connected over RS485 and properly addressed.

- Set CERBO to proper speed and communication type:
  - Settings → Services → VE.Can port → CANbus Profile → CANBus BMS (500 kbit/s)

- Ensure connection is correct / proper cable in use:
  - Network status → no active errors/all packets coming through.

- Rename Storage Device:
  - Device list → See battery listed above inverter → click on battery → Device → Name → Rename to match system.

- Ensure parameters were properly set:
  - Battery → parameters → check the following parameters (current is per battery):

Charge Voltage Limit	Charge Current Limit	Discharge Current Limit
57.6 V	50 A	63 A

Note: If the system is idle, the battery may not report discharge directly if discharge is below 1A.

Note: VE.Can and BMS-Can cannot be combined on the same bus. If you wish to use both, they require a GX device with two separate buses, each with 2 RJ45 ports - 4 CANbus ports in total.

ROLLS LFP ESS OPEN LOOP INTEGRATION WITH VICTRON ENERGY EQUIPMENT

Device Settings

The settings in this document are for an off-grid application with Open Loop configuration using Victron Energy equipment.

VE.Configure Device Settings [Open Loop]

The charge and discharge settings for Rolls LFP ESS batteries in an Open Loop configuration are set up manually using Victron's VE.Configure software for Quattro/Multiplus inverter chargers using the following recommended parameters. After setting the parameters, 'send' all parameters to the inverter and CCGX. Restart the CCGX after completion. Refer to Victron product manuals for the safe and correct operation of Victron products.

General Tab	
Overruled by remote [1]	Enable
Enable battery monitor [2]	Enable
SOC when Bulk finished	95%
Total battery capacity *(per battery installed)*	installed x 130 Ah
Charge efficiency	95%

Inverter Tab	
DC input low shut-down [3]	48.0 V
DC Input low restart [4]	52.0 V
DC input low pre-alarm [5]	51.0 V

Charger Tab	
Enable charger	Enable
Battery Type	Blank
Lithium batteries	Enable
Charge curve	Select: Fixed
Absorption voltage	54.4 V
Float voltage	53.6 V
Charge current per battery installed	installed x (50 A)
Repeated absorption time [6]	1.0 < 3.0 Hr
Repeated absorption interval [7]	7.0 Days
Absorption time [8]	1.0 < 3.0 Hr

[1]   Enabled is recommended.

[2]   Used to enable and define the general display of voltage based SC. However, voltage based SOC accuracy is low with Rolls LFP battery and generator start stop control is not recommended using this feature as the SOC trigger. A Victron BMV Battery Meter is recommended for triggering generator start stop control with Rolls LFP Battery based on measured SOC.

[3]   The lowest operating voltage allowed, increase voltage as required.

[4]   Restart voltage after DC input low shut-down, recommended to be set to the minimum value (minimum varies according to the DC Input low shut-down value).

[5]   51.0 V value (approximately 15% SOC) will trigger low battery warning, increase or decrease as preferred.

(6)   The recommended minimum is 1.0 hour. A longer period of time may be required to compensate for multiple batteries to achieve a smooth completion of charge.

(7)   Duration of maximum Float period or Interval between a repeated absorption cycle.

Note: Confirm the Float Voltage after completing the installation of any Victron 'Assistants'. If necessary, reset the Float Voltage to 26.8 V / 53.6 V

VE.Direct Device Settings [Open Loop]

The settings for Rolls LFP ESS batteries in an Open Loop configuration with Victron VE.Direct MPPT are as follows below. This section presumes familiarity with VictronConnect (Bluetooth App) used to configure, monitor and diagnose Victron MPPT products which feature Bluetooth, or are equipped with a VE.Direct Port.

Refer to Victron product manuals for the safe and correct operation of Victron products.

MPPT Charge Controller Settings	S48-100LFP ESS
Battery voltage	48 V
Max current per battery installed [9]	installed x (63 A)
Charger enabled	Enabled
Battery preset	User Defined
Absorption voltage	54.8 V
Maximum absorption time [10]	1.0 < 3.0 Hr
Float voltage	54.0 V
Equalization voltage	54.0 V
Auto equalization	Disabled
Temperature compensation	Disabled
Low temperature cut off	0ºC

(8)   May be set to lower value if necessitated by charger controller size.

(9)   Duration of absorption period after the bulk charge interval. The recommended minimum is 1.0 hour. A longer period of time may be required to compensate for multiple batteries to achieve a smooth completion of charge.

Victron BMV 700 Battery Monitor Settings [Open Loop]

The settings for Rolls LFP ESS batteries in an Open Loop configuration with a Victron BMV 700 Series Battery monitor are as follows below. Set up is established using the +/- and 'Select' buttons on the face of the BMV 700 Series Battery Monitor.

Refer to Victron product manuals for the safe and correct operation of Victron products.

BMV 700 Battery Monitor Settings	S48-100LFP ESS
Battery capacity (per battery installed)	installed x 100 Ah
Charged voltage	54.4 V
Tail current	4%
Charge detection time	1 min
Peukert exponent	1.05
Charge efficiency factor	95%
Current threshold	0.1 A
Time to go averaging period	3 min

Victron CCGX Set Up

To optimize performance of a Victron system the following items need to be manually set using the CCGX, Ekrano, or other Victron Communication Centre product.

Navigate from the Device List screen > Settings > System Setup.

From the System Setup menu, scroll down to select each item and then set as indicated.

Battery Monitor	Automatic
DVCC - Distributed Voltage and Current Control	ON
SVS – Shared voltage sense	ON
STS – Shared temperature sense	OFF
Limit charge current	ON
Max charge current	installed x (50A)