

ESS Self Consumption System

Use Case:

1. Charge batteries and feed domestic circuit using off-peak hours
2. Discharge batteries and feed domestic circuit during peak hours
3. Limit Inverter to 3600W for GR98 connection requirements
4. Grid assistance to provide top up power above 3600W

Hardware:

Victron Quattro 48/10000

4 x Pylontech US5000

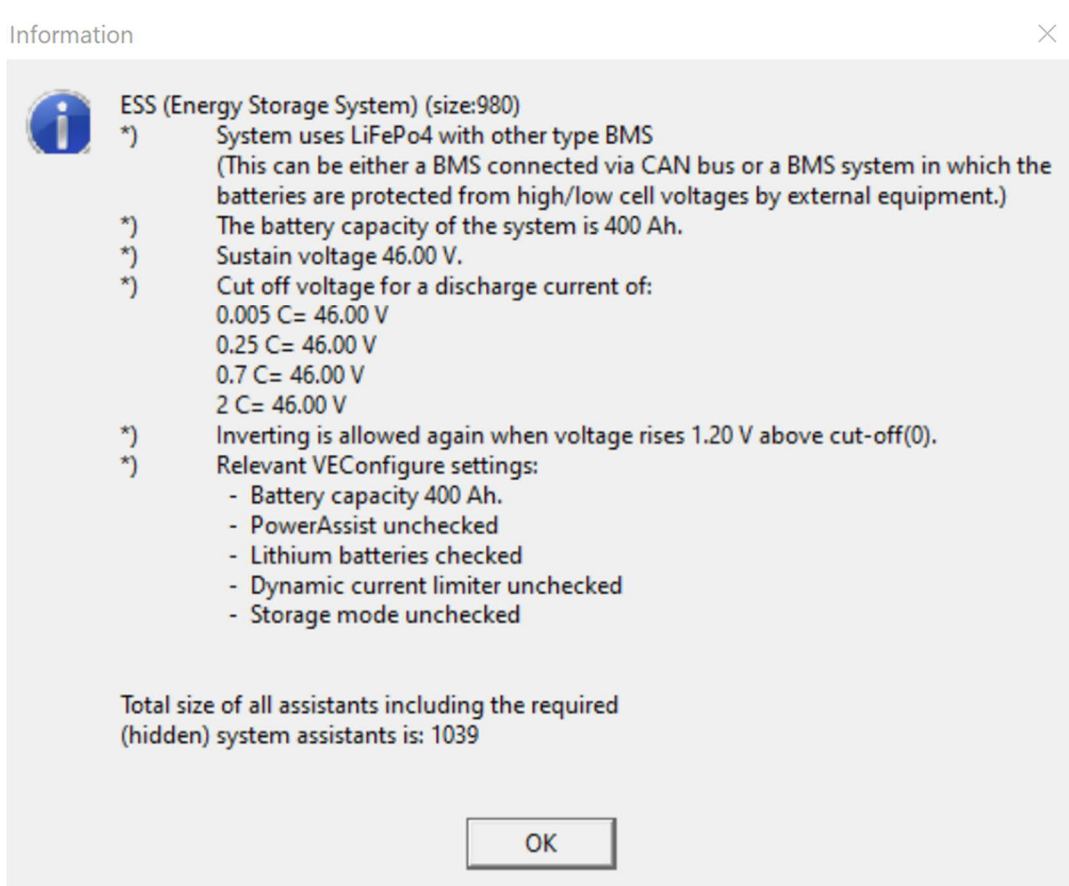
Cerbo GX and Touch 50

Lynx Distribution

Settings and screenshots from VE Configure:

Note that I did not use a MK3 USB adaptor but used VRM devices menu.

1. I used VRM to update the firmware.
2. I then used VRM to download the settings from the Quattro, double clicked the downloaded *.rvsc file. Edited the settings offline as below and saved, and then uploaded the file back to the Quattro using VRM





Cerbo GX

[Hide details](#)

Last updated:
Realtime

Grid

53 W

L1: 245.4 V 4.1 A 53 W



Discharging

AC Loads

1935 W

L1: 50.1 Hz 1935 W

Discharging -2024 W

69.0 %

Voltage: 49.14 V
Current: -41.20 A
Temperature: 13 °C

Quattro	70.0 %
48.92 V -40.50 A -1876 W	Discharging

File Port selection Target Defaults Options Special Help

Quattro

General | **Grid** | Inverter | Charger | Virtual switch | Assistants

System frequency
 50Hz 60Hz

Shore limit

AC1 input current limit A Overruled by remote (priority)

AC2 input current limit A Overruled by remote

Dynamic current limiter

Enable battery monitor

State of charge when Bulk finished %

Battery capacity Ah

Charge efficiency

Quattro


General Grid Inverter Charger Virtual switch Assistants

Grid code selection UK grid code settings

Country / grid code standard
 UK: G98/1 Amendment 6, G99/1 Amendment 8

Loss Off Mains (LOM) detection
 LOM detection AC input 1 Type B (grid code compliant)
 LOM detection AC input 2 Type B (grid code compliant)

Note: Click [here](#) for more info on LOM.



Quattro

General Grid Inverter Charger Virtual switch Assistants

Inverter output voltage 230 V

Ground relay

PowerAssist
 Assist current boost factor 2.0

DC input low shut-down 44.00 V

DC input low restart 48.00 V

DC input low pre-alarm 48.00 V

shut-down on SOC

SOC low shut-down 10.0 %

SOC low restart 20.0 %

Do not restart after short-circuit (VDE 2510-2 safety)

enable AES

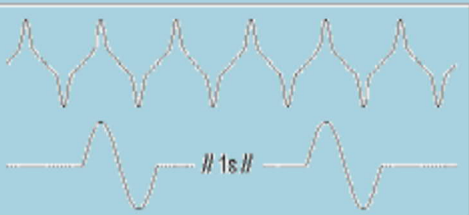

Start AES when load lower than 138 W

Stop AES when load 23 W higher than start level.

AES type

modified sine wave

search mode

Quattro

General Grid Inverter **Charger** Virtual switch Assistants

Enable charger

Weak AC input

Stop after excessive bulk

Lithium batteries

Disable VSense (for diagnostic purposes)

Configured for VE.Bus BMS

Battery type: No corresponding default

Charge curve: Fixed

Absorption voltage: 52.00 V Repeated absorption time: 1.00 Hr

Float voltage: 51.00 V Repeated absorption interval: 7.00 Days

Charge current: 80 A Absorption time: 1 Hr

Stop charger below: -20.5 deg C

Victron Energy

Quattro

General Grid Inverter **Charger** Virtual switch Assistants

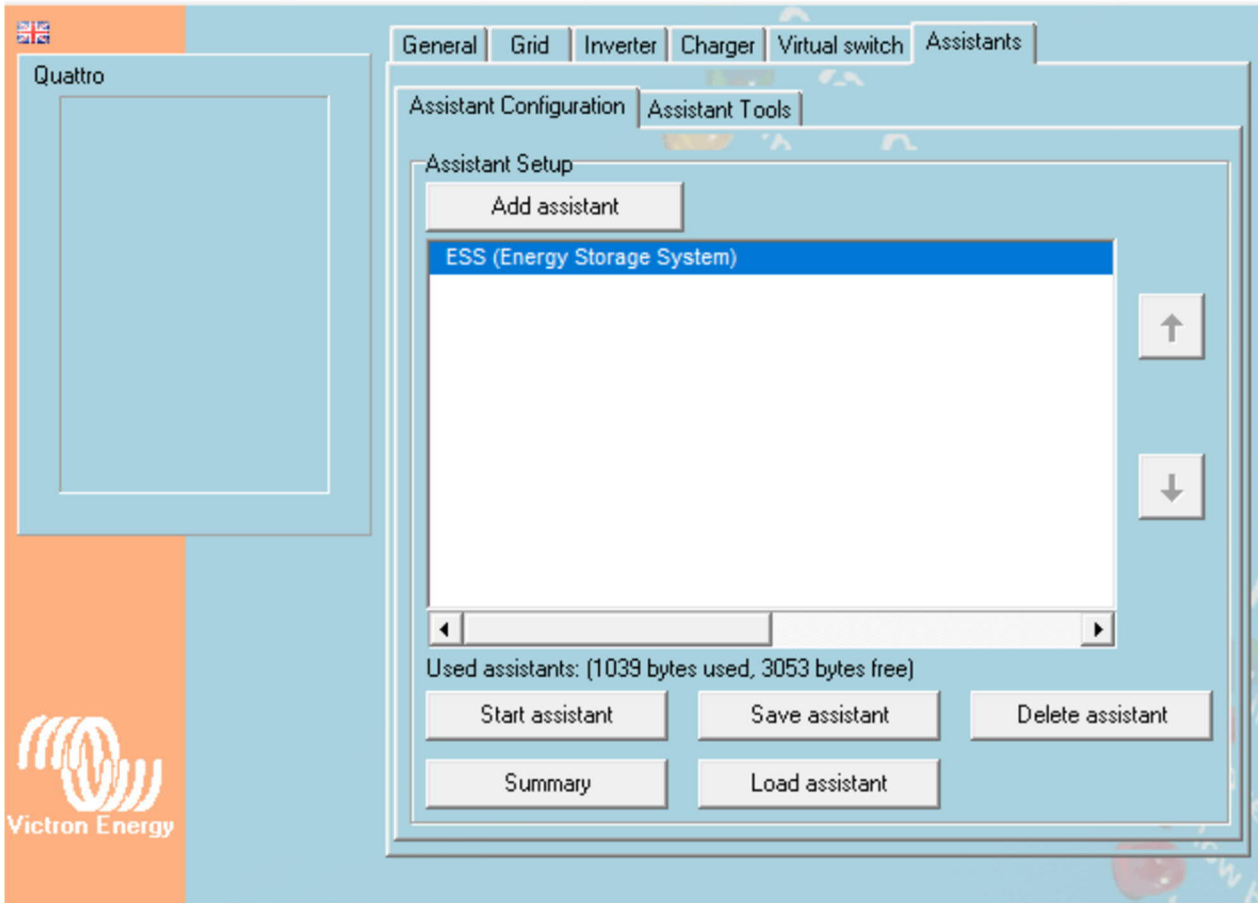
Usage

Specify virtual switch usage: Invert virtual switch usage

- Do not use VS
- drive multifunctional (aux.) relay: VS on=open; VS off=close
- ignore AC input: VS on=ignore; VS off=do not ignore
- dedicated ignore AC input
- dedicated generator control
- drive aux. relay (VS on=open) + dedicated ignore AC input
- ignore AC input (VS on=ignore) + dedicated generator control

? Help

Victron Energy



ESS Assistant Settings

ESS (Energy Storage System)



Battery system

Please select your system

- System uses OPzS or OPzV batteries
- System uses Gel or AGM batteries
- System uses LiFePo4 batteries with a VE.Bus BMS
- System uses LiFePo4 batteries with a two-signal BMS
- System uses LiFePo4 with other type BMS
(This can be either a BMS connected via CAN bus or a BMS system in which the batteries are protected from high/low cell voltages by external equipment.)
- System uses Redflow ZCell batteries

Cancel

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Battery capacity

Please enter the correct battery capacity.

The battery capacity of the system is Ah.

✖ Cancel

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VEConfigure battery type selection

Some VEConfigure settings do not (exactly) correspond with the battery default settings for Li-Ion.

Would you like the assistant to change the default battery type in VEConfigure?

(If you decide to let the assistant change the battery type, a summary of the changed settings will be displayed when the assistant is finished.)

- Do not change battery type
- Change battery type as suggested

✖ Cancel

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Sustain voltage

When batteries are left in a deep discharged state during a prolonged period, there is a severe chance that they will be damaged.

To prevent this, the sustain mechanism will kick in and keep the batteries at a minimum voltage by charging them with a small current whenever necessary.

For more info, refer to the [controlling depth of discharge](#) chapter of the [Energy Storage manual](#).

Sustain voltage V.

✖ Cancel

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Dynamic cut-off

This assistant uses so called dynamic cut-off.
That is, the 'DC input low shut-down' level depends on the battery discharge current.

There will normally be no need to adjust the curve used for this!
Just accept below values which are already optimized for the selected battery type.

In rare cases it might be advantageous to modify the curve. This can be done by changing the values below.

Note:

* Because dynamic cut-off is used, the "DC input low shut-down" related parameters in VEConfigure are ignored.

Cut off voltage for a discharge current of:	
0.005 C	= 46.00 V
0.25 C	= 46.00 V
0.7 C	= 46.00 V
2 C	= 46.00 V

Restart offset

When inverting is stopped due to low battery, the battery voltage must rise above a certain level before inverting is allowed again.

This level is determined as an offset to cut-off(0).

(cut-off(0) is the cut-off voltage corresponding with a DC discharge of 0A.)

Note:

This same value is used as an offset to the cut-off voltage to determine the low bat Pre-Alarm indication)

Inverting is allowed again when voltage rises V above cut-off(0).

PV Inverters

Are there PV inverters connected on the AC out of the Multi/Quattro system?

- No
 Yes

Some Key Screens and their settings from VRM Remote Console

Device List 15:24

Cupboard Temp	12°C	>		
External Temp	17°C	>		
Pylontech battery	66%	49.30V	-8.5A	>
Quattro	Ext. control	>		
Notifications	>			
Settings	>			

Pages **Menu**

General 15:25

Access level	Superuser
Set root password	<input type="checkbox"/>
SSH on LAN	<input type="checkbox"/>
Remote support	<input type="checkbox"/>
Reboot?	
Audible alarm	<input type="checkbox"/>

Pages **Menu**

Remote Console 15:27

Enable password check	<input type="checkbox"/>
Enable on VRM	<input checked="" type="checkbox"/>
Remote Console on VRM - status	Online

Security warning: only enable the console on LAN when the GX device is connected to a trusted network.

Enable on LAN	<input checked="" type="checkbox"/>
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Pages **Menu**

Battery Measurements 15:28

Use this menu to define which battery measurements to see on the VRM Portal and the MFD HTML5 App

Pylontech battery	Visible >
Quattro 48/10000/140-2x100	Visible >

Pages **Menu**

DVCC 15:29

DVCC	Forced on
Limit charge current	<input checked="" type="checkbox"/>
Maximum charge current	80A
Limit managed battery charge voltage	<input type="checkbox"/>
SVS - Shared voltage sense	Forced off
STS - Shared temperature sense	Forced off

Pages **Menu**

VRM online portal 15:29

Logging enabled	Enabled
VRM Portal ID	48e7da887779
Log interval	5 min
Use secure connection (HTTPS)	<input checked="" type="checkbox"/>
Last contact	18s
Connection error	No error

Pages **Menu**

ESS 15:30

Mode: Optimized (without BatteryLife)

Grid metering: Inverter/Charger

Multiphase regulation: Total of all phases

Minimum SOC (unless grid fails): 10%

Limit inverter power:

Maximum inverter power: 3600W

Pages Menu

ESS 15:31

Minimum SOC (unless grid fails): 10%

Limit inverter power:

Maximum inverter power: 3600W

Grid setpoint: 50W

Grid feed-in: >

Scheduled charging: >

Pages Menu

Scheduled charging 15:32

Schedule 1: Every day 00:05 (4h 55m or 85%) >

Schedule 2: Disabled >

Schedule 3: Disabled >

Schedule 4: Disabled >

Schedule 5: Disabled >

Pages Menu



Enabled



Day

Every day

Start time

00:05

Duration (hh:mm)

04:55

Stop on SOC



SOC limit

85%