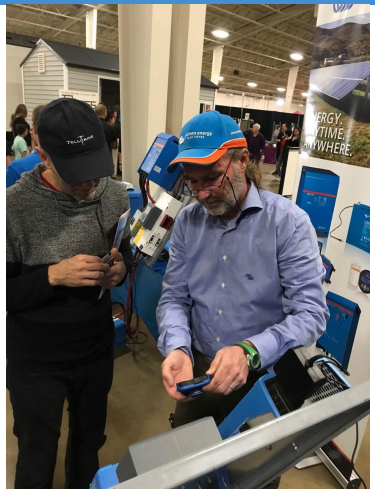

victron energy
Quattro
48|5000|70
charger
inverter
IP20
Octo GX
INVERTER/BATTERY→
←BYPASS/GEN

Closed Loop Battery Management Solutions

Marc Stevens Ambassador/Trainer

Who's Marc?



Wind

Off-Grid Solar

Doctors Without Borders

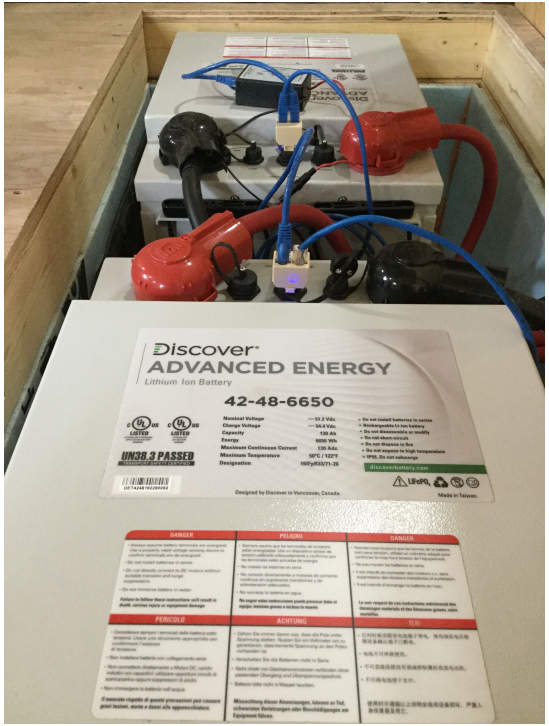
Victron Energy

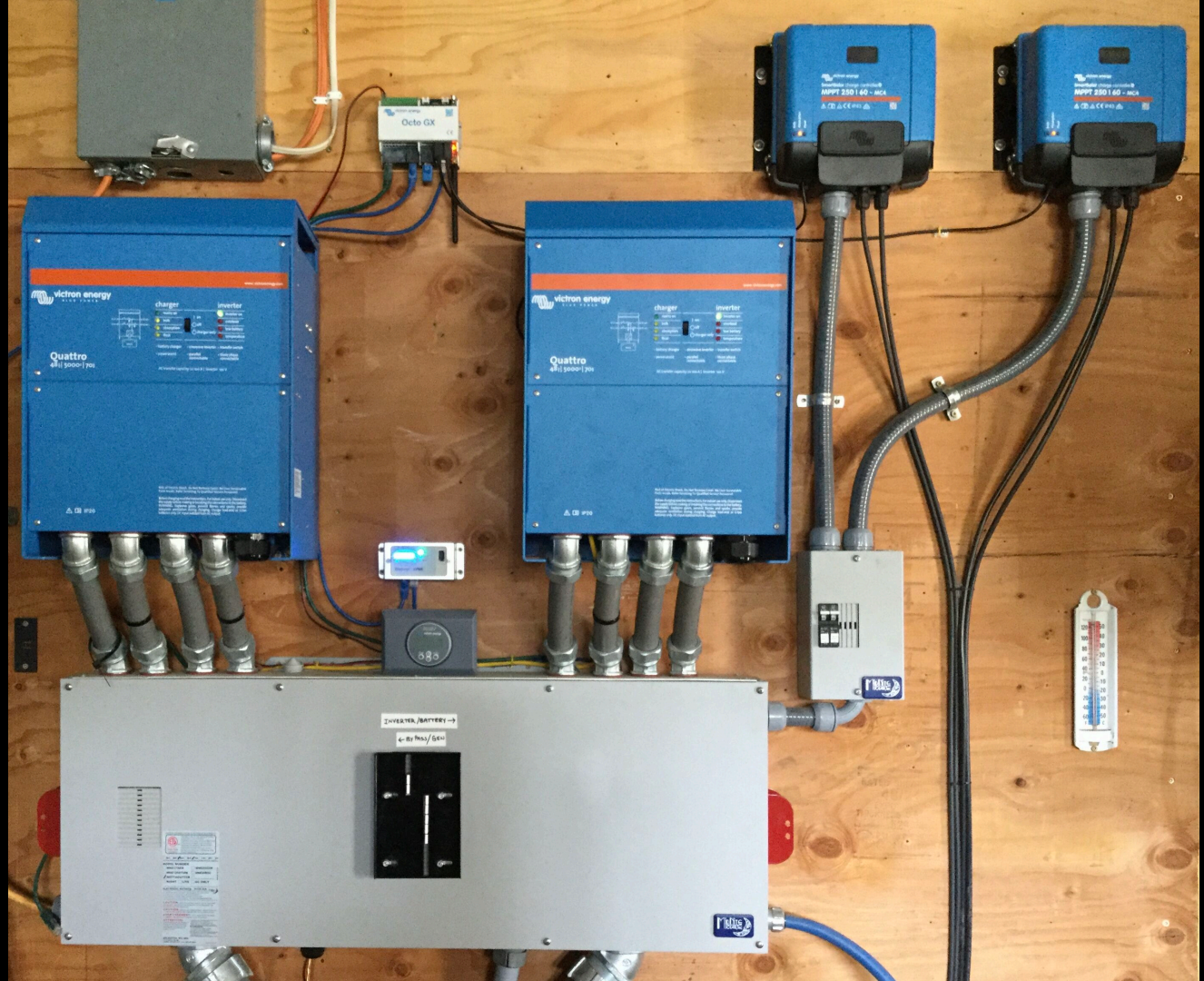
Covered in this Webinar

- Explanation and setup procedures to integrate Discover AES batteries with Victron Energy's equipment in a closed loop communication configuration.

- An overview of other battery manufactures that are also compatible in this arrangement using Victron Energy's gear.

Off-Grid-n-Groovin’

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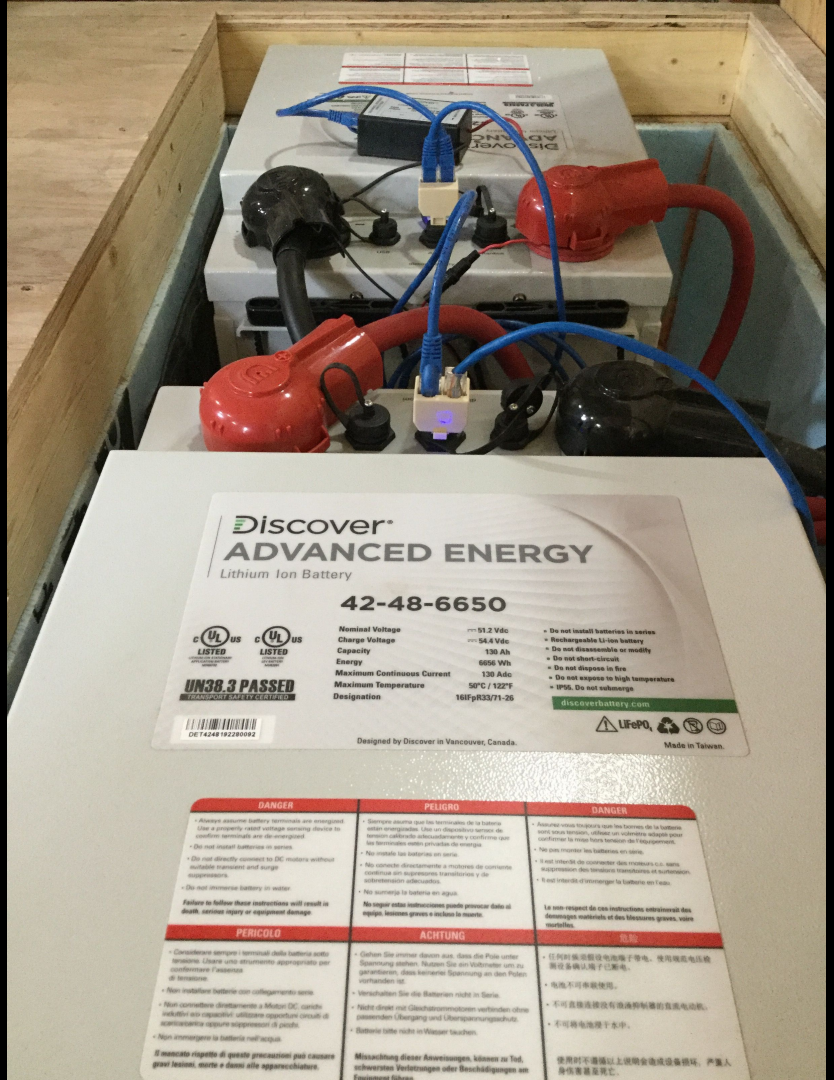
Discover
ADVANCED ENERGY
Lithium Ion Battery
42-48-6650
UN38.3 PASSED
Nominal Voltage 51.2 Vdc
Charge Voltage 54.4 Vdc
Capacity 130 Ah
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discoverbattery.com
LiFePO4
Designed by Discover in Vancouver, Canada.
Made in Taiwan.
DANGER
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What is Closed Loop?

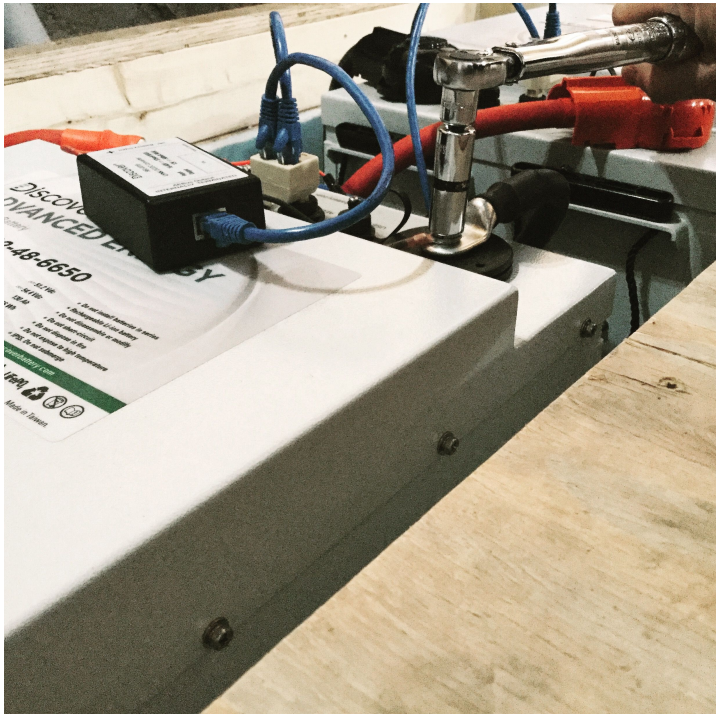
In a Closed Loop configuration the battery charge and discharge rates and settings are dynamically controlled by the BMS of the Discover AES LiFePO4 battery.

During normal operation the charge characteristics are governed automatically by the GX device via Distributed Voltage and Current Control (DVCC), with instructions from the connected AES battery

What is Open Loop

Open Loop configuration are set up manually through the controller for the Power Conversion device at the time of installation. This is commonly referred to as a ‘lead acid drop-in replacement’ configuration.

Let’s Get Started



System Sizing: **Minimum Battery Capacity**

Model	Inverter Peak (92% Efficiency at 48V)	Charger	Single Phase Minimum 42-48-6650	Three Phase Minimum 42-48-6650
MultiPlus 48/3000/35	136 Adc	35 Adc	1	2
MultiPlus / Quattro 48/5000/70	226 Adc	70 Adc	1	3
Quattro 48/8000/110	362 Adc	110 Adc	2	4
Quattro 48/10000/140	452 Adc	140 Adc	2	5
Quattro 48/15000/200	566 Adc	200 Adc	2	6

Model	Inverter Peak (92% Efficiency at 24V)	Charger	Single Phase Minimum 44-24-2800
MultiPlus / Quattro 24/3000/70	271 Adc	70 Adc	1
MultiPlus / Quattro 24/5000/120	452 Adc	120 Adc	2
MultiPlus / Quattro 24/8000/200	724 Adc	200 Adc	3

Discover AES Battery System Sizing

Minimum Battery Configuration for Off-grid Inverter Application
Design To Support: Autonomy, Peak AC Surge, Continuous AC and Full DC Charge Amps

1. **AUTONOMY:** Calculate Load Energy in kWh and Divide by 6.65 kWh (90% useful) = Number of Batteries (at 100% DoD)
2. **PEAK AC SURGE:** Convert Inverter AC Surge to DC Amp and Divide by 300 A = Number of Batteries
3. **CONTINUOUS AC:** Convert Inverter AC Continuous to DC Amp and Divide by 130 A = Number of Batteries
4. **FULL CHARGING:** Divide Inverter Continuous Charge DC Amp by 130 A = Number of Batteries

Use Highest Rounded Up Number of (1 – 4 above) batteries to support full capabilities of selected inverter system

Multiply by number of inverters in parallel.

For 3 phase system multiply by 3 and then multiply by number of clusters in parallel.

AC to DC conversion: AC Watts divided by inverter efficiency, divided by 48V = Amp DC

AES 42-48-6650
Capacity 7.4 kWh
Useful 90 % DOD (6.65 kWh)
Peak Power 300 A
Discharge / Charge 130 A

System Setup

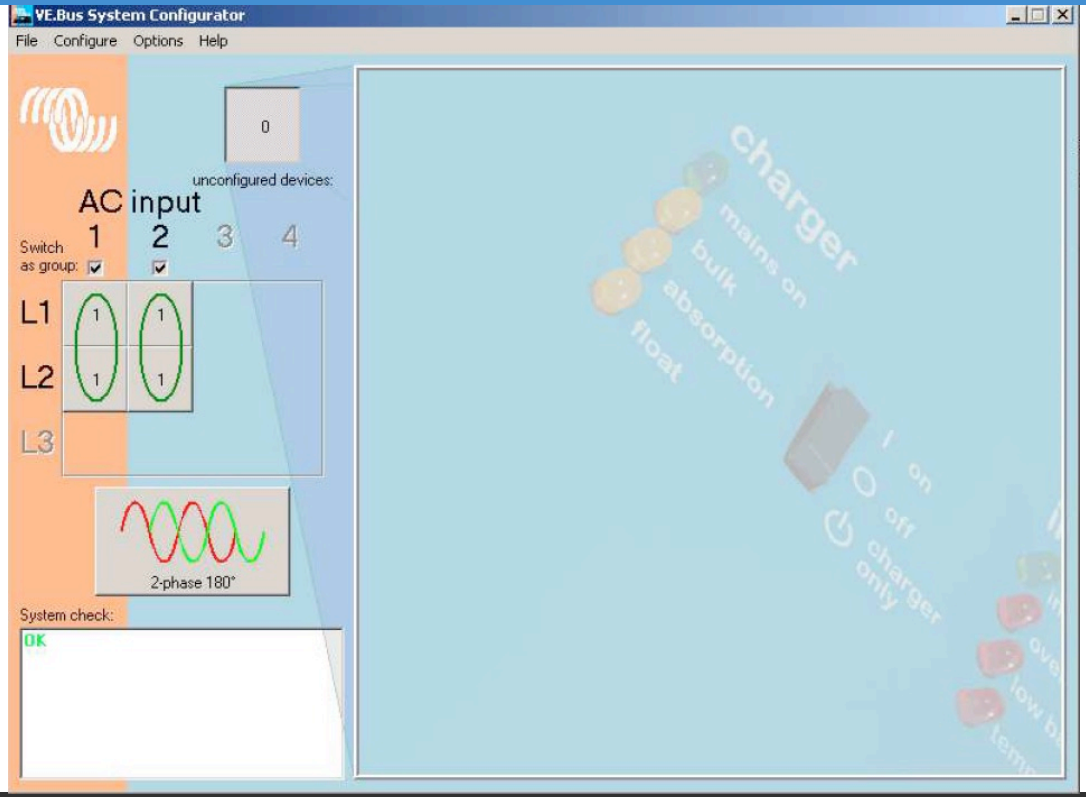
- Make sure none of the Discover communication or CAN bus cables are installed at this time.

- Turn on battery/batteries and all Victron equipment

Update Firmware to all Devices

- MultiPlus / Quattro - v459 or later.
- GX device to include Color Control/ Venus/Octo/Cerbo- v2.40 or later.
- VE.Direct MPPT - v1.42 or later.

Configure VE Bus



VE Config Settings

These parameters once set will become the default values used if comm with the AES battery is interrupted for some reason.

VE Config>General Tab

General Tab	44-24-2800	42-48-6650
Overruled by remote [1]	Enable	Enable
Enable battery monitor	Enable	Enable
SoC when Bulk finished [2]	95%	95%
Total battery capacity (per battery installed)	installed x 110 Ah	installed x 130 Ah
Charge efficiency [2]	95%	95%

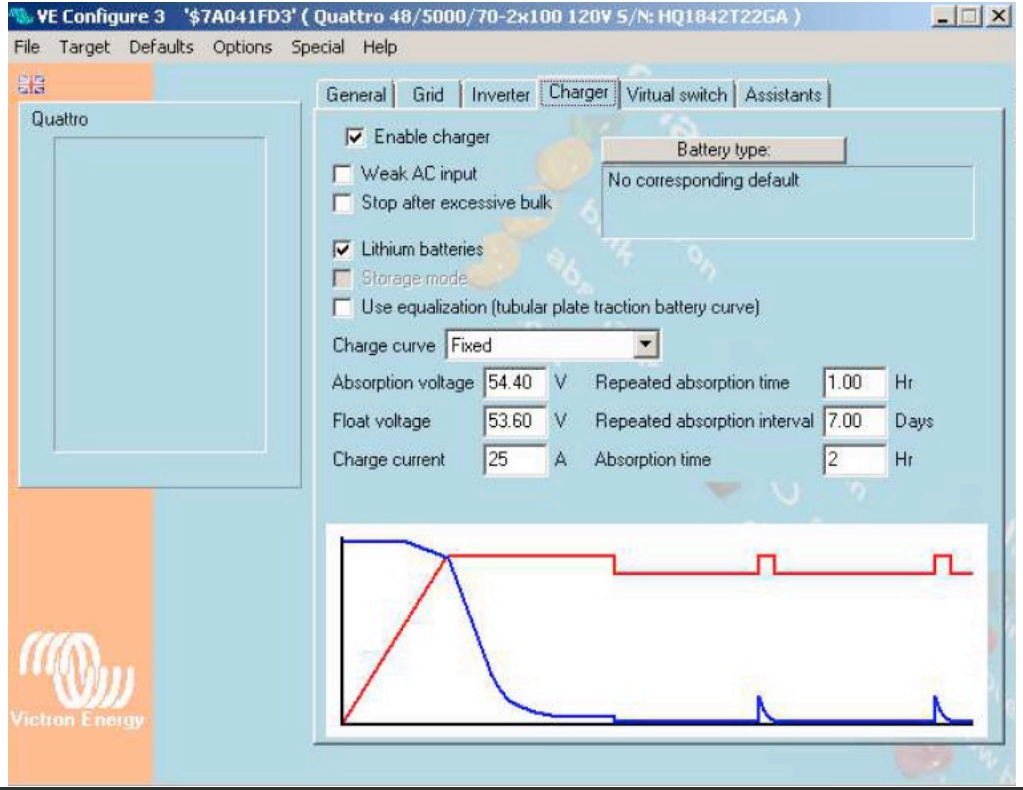
VE Config>Inverter Tab

Inverter Tab	44-24-2800	42-48-6650
DC input low shut-down [3]	24.0 V	48.0 V
DC Input low restart [4]	26.0 V	52.0 V
DC input low pre-alarm [5]	25.5 V	51.0 V
Enable AES [6]	Disable	Disable

VE Config>Charger Tab

Charger Tab	44-24-2800	42-48-6650
Enable charger	Enable	Enable
Battery Type [2]	Blank	Blank
Lithium batteries [2]	Enable	Enable
Charge curve [2]	Select: Fixed	Select: Fixed
Absorption voltage [2]	27.2 V	54.4 V
Float voltage [2]	26.8 V	53.6 V
Charge current per battery installed (Recommended < Maximum)	installed x (78 A < 110 A)	installed x (92 A < 130 A)
Repeated absorption time [2] [7]	1.0 < 3.0 Hr	1.0 < 3.0 Hr
Repeated absorption interval [2]	7.0 Days	7.0 Days
Absorption time [2] [7]	1.0 < 3.0 Hr	1.0 < 3.0 Hr

VE Config>Charger Tab



MPPT-Victron Connect

MPPT Charge Controller Settings	44-24-2800	42-48-6650
Battery voltage	24 V	48 V
Max current per battery installed (Recommended < Maximum) [9]	installed x (78 A < 110 A)	installed x (92 A < 130 A)
Charger enabled	Enabled	Enabled
Battery preset	User Defined	User Defined
Absorption voltage	27.2 V	54.8 V
Maximum absorption time [10]	1.0 < 3.0 Hr	1.0 < 3.0 Hr
Float voltage	26.8 V	54.0 V
Equalization voltage	26.8 V	54.0 V
Auto equalization	Disabled	Disabled
Temperature compensation	Disabled	Disabled
Low temperature cut off	5° C	5° C

Setting Up Battery Comm

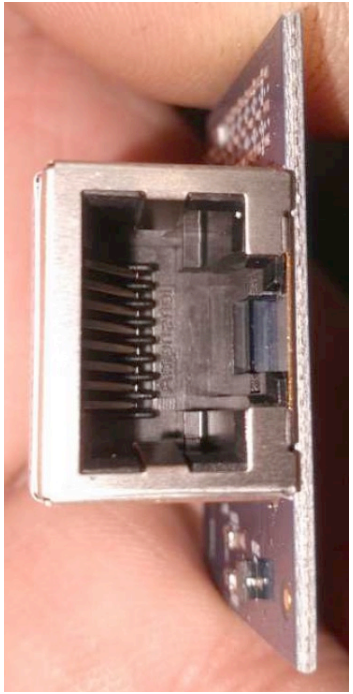
Turn Victron Equipment and Discover AES Battery “OFF”.

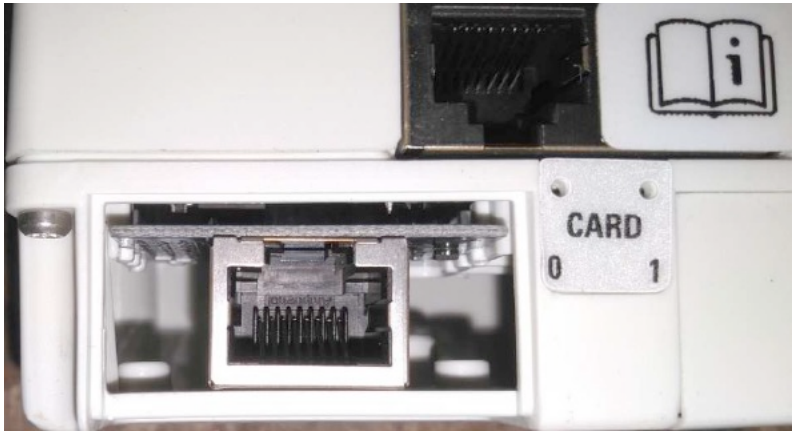
Lynk Gateway

Part # 950-0015

Slot 0 Type

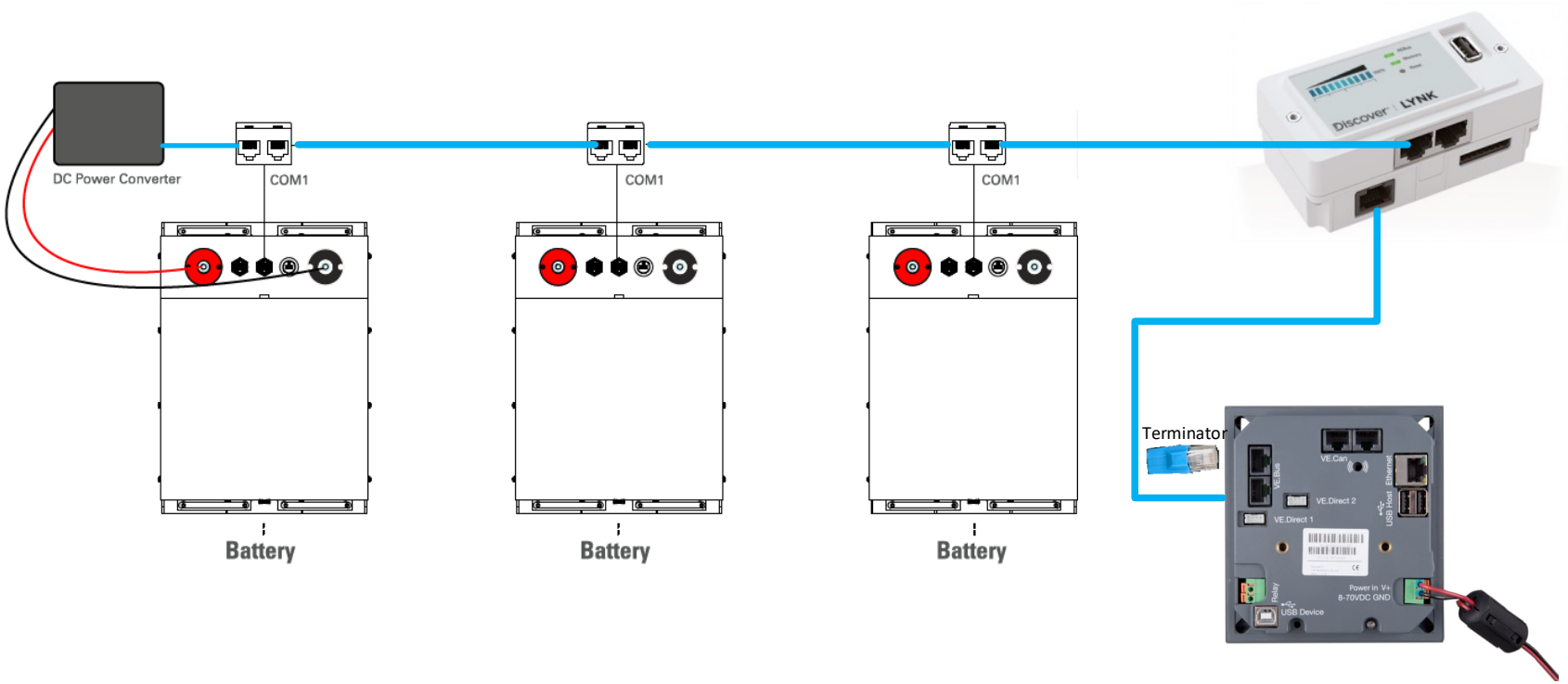
Insert Victron Edge Card

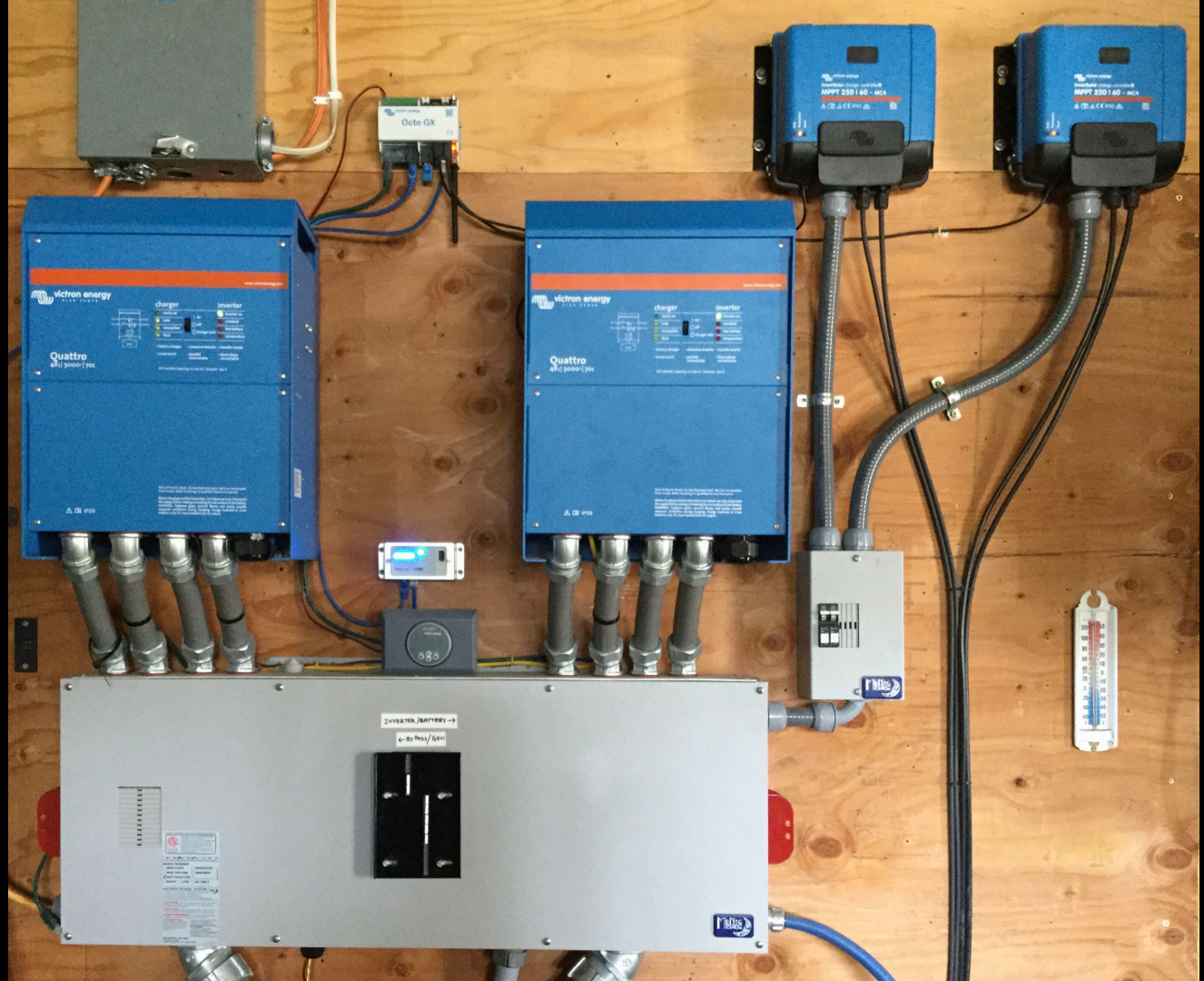




Victron Edge Card
Part # 950-0016-VICTRON

Connect Cat5 Cables

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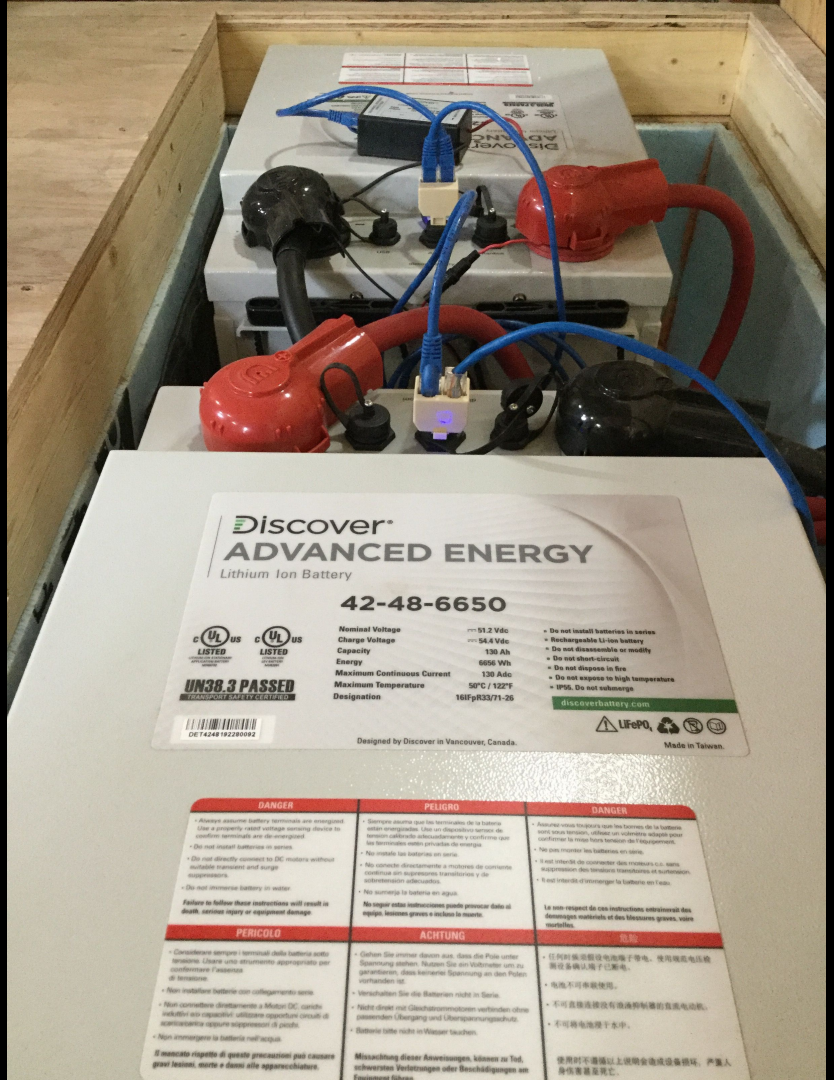
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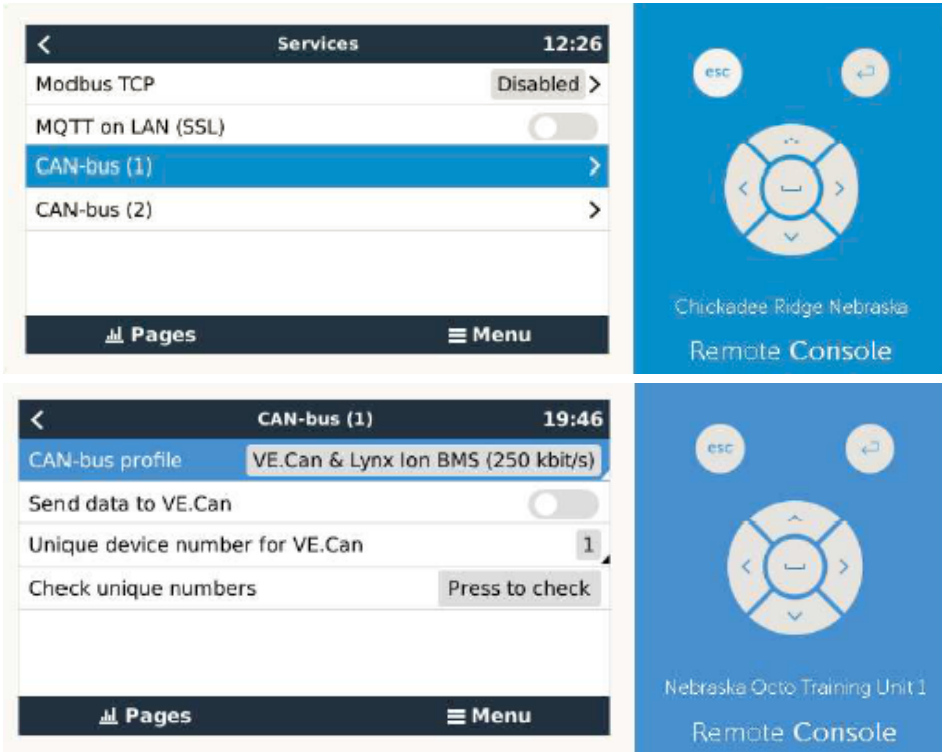
Terminate Can Bus on GX Device

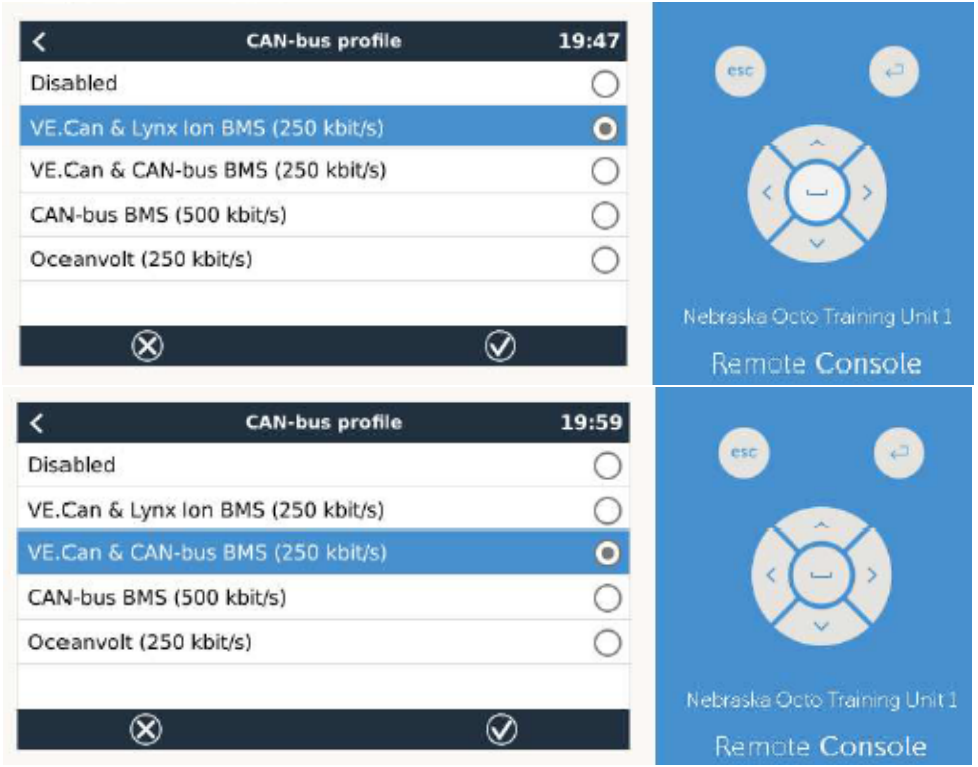
Turn System ON

Turn Discover AES Battery and Victron Equipment “ON”.

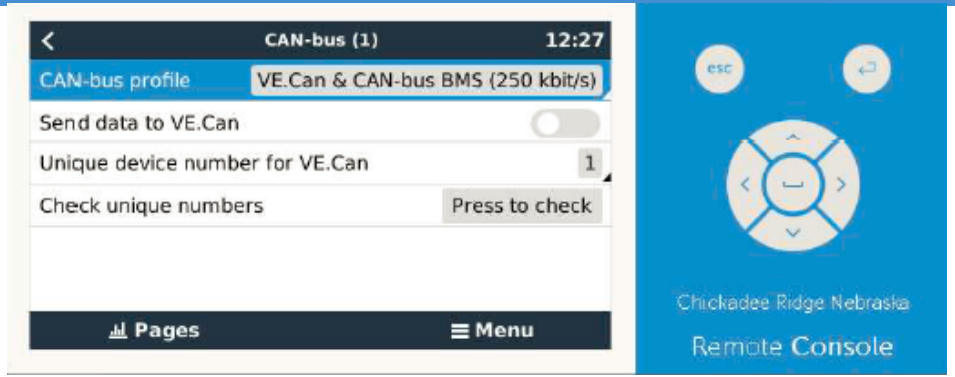
Device List > Settings > Services > Can-bus (1)



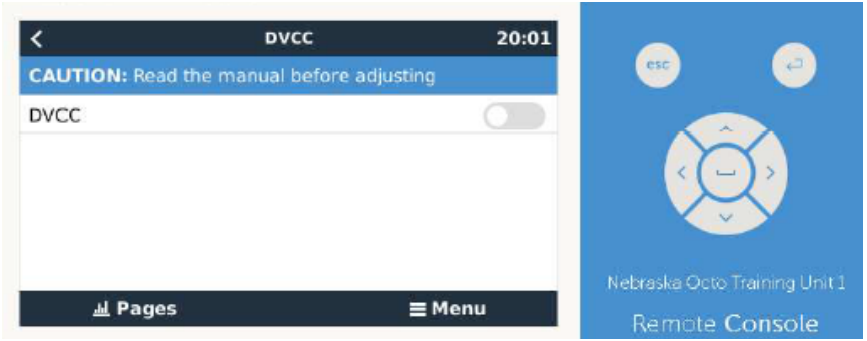
Device List > Settings > Services > Can-bus >Can-bus (1) >Can-bus Profile



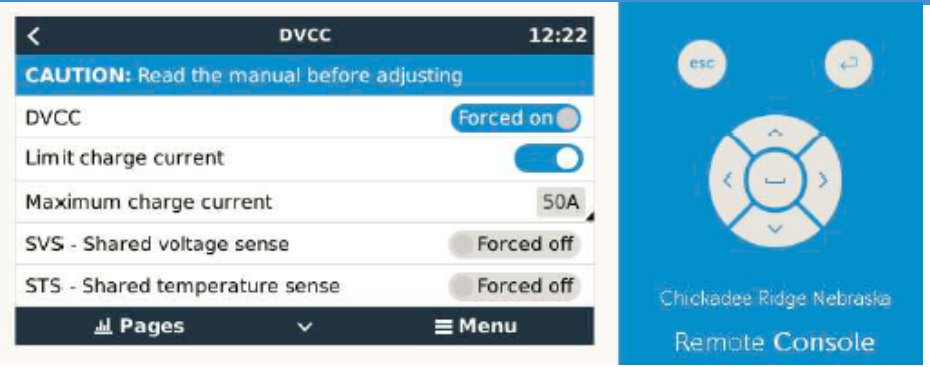
Device List > Settings > Services > Can-bus >Can-bus (1)

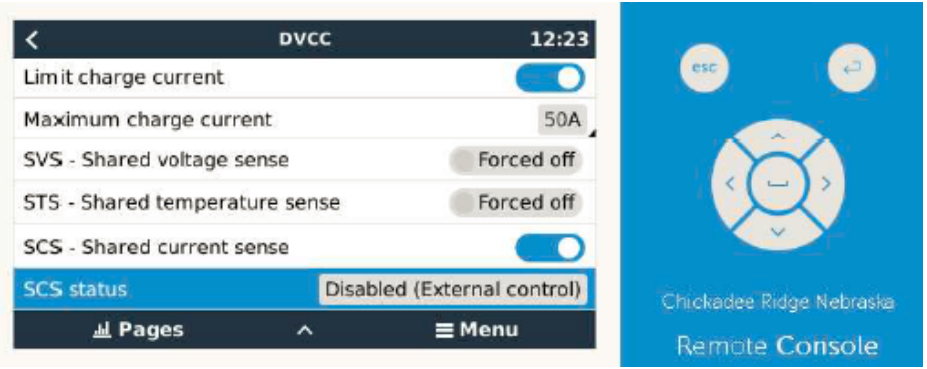


Distributed Voltage and Current Control (DVCC)

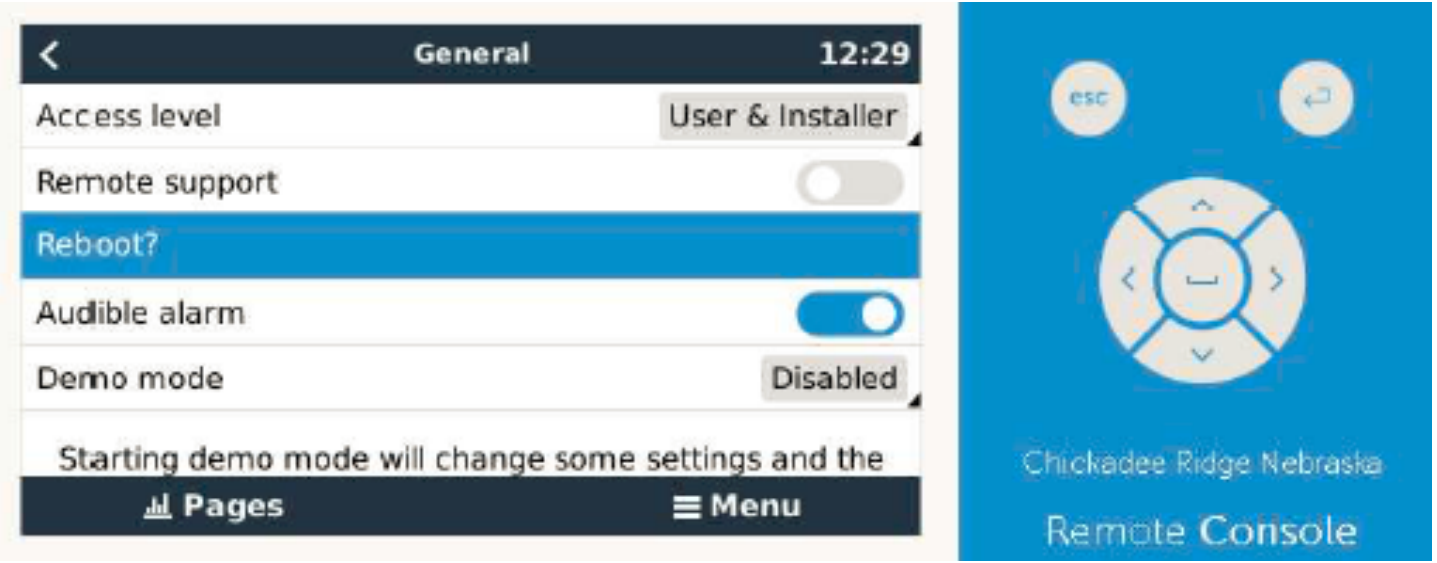


Device List > Settings > DVCC

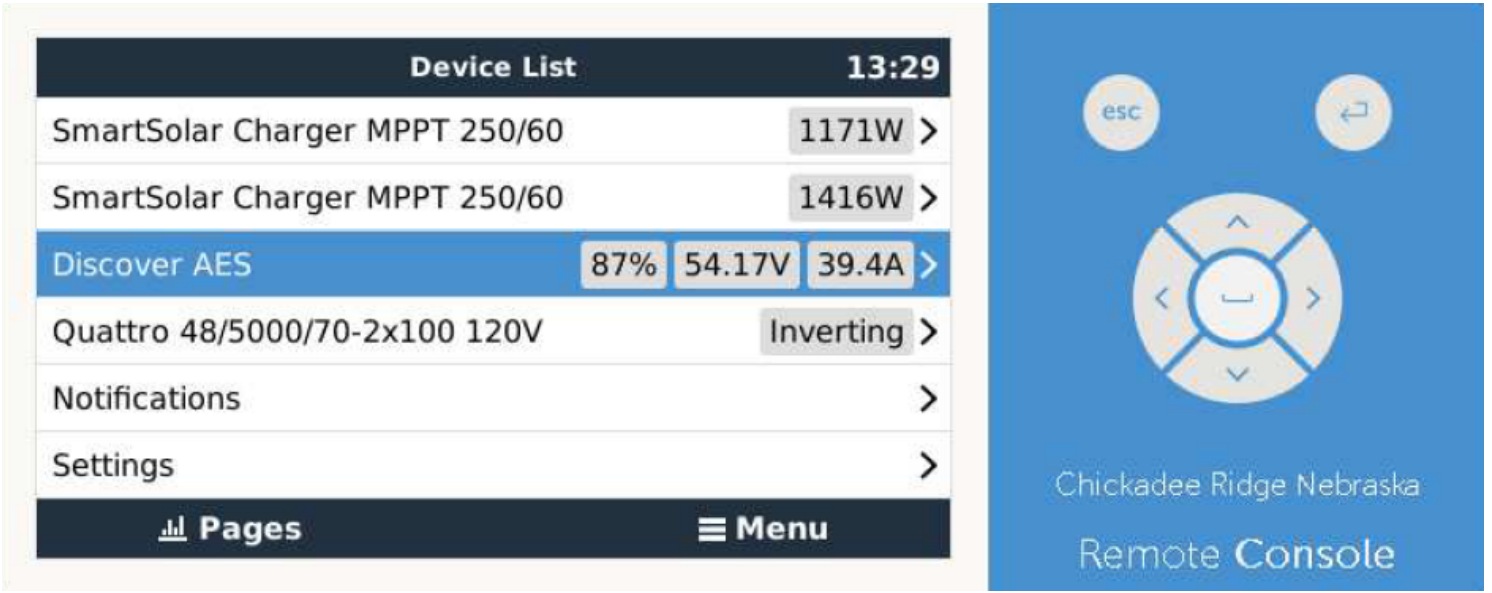




Device List > Settings >



Device List


Device List 13:29
SmartSolar Charger MPPT 250/60 1171W
SmartSolar Charger MPPT 250/60 1416W
Discover AES 87% 54.17V 39.4A
Quattro 48/5000/70-2x100 120V Inverting
Notifications
Settings
Pages
Menu
esc
Chickadee Ridge Nebraska
Remote Console

MPPT External Control

Other Victron Compatible Closed Loop Battery Manufacturers

BYD

Pylontech

Freedomwon

Redflow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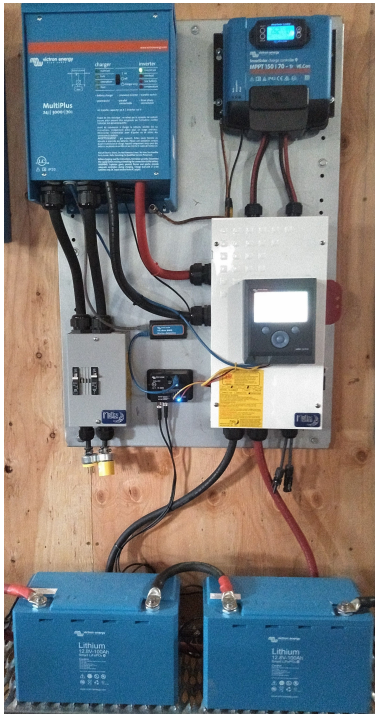
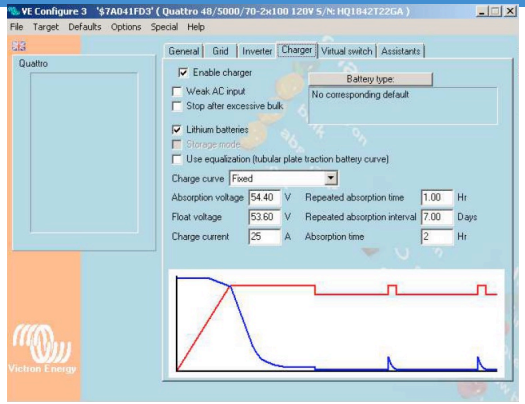
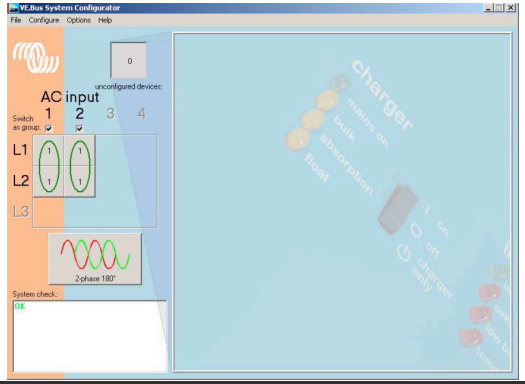
Future Webinars



Victron's Smart Lithium Batteries
VE Bus BMS setup

NA Dual/Split Phase
VE Bus and VE Config Setup





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