Victron & MG Energy Systems battery solutions

Introduction

MG Energy Systems (MG) develops and produces advanced battery systems for Marine, Solar/off-grid, industrial and mobile applications. The roots of the cooperation with Victron Energy goes back to 2011 when we developed our first Lithium-Ion battery systems and these were added to Victron's product range. A development cooperation was setup to achieve maximum compatibility, performance, functionality and safety between our battery systems and Victron's inverter/chargers. This close development is still an ongoing process. From Master BMS firmware development with new functions to GX products scripts and GUI to extend functionality and compatibility.



Products

MG has developed a complete range of products with all the same philosophy to provide modular and scalable solutions from 12 VDC to 800 VDC. Each battery system consists out of the following:

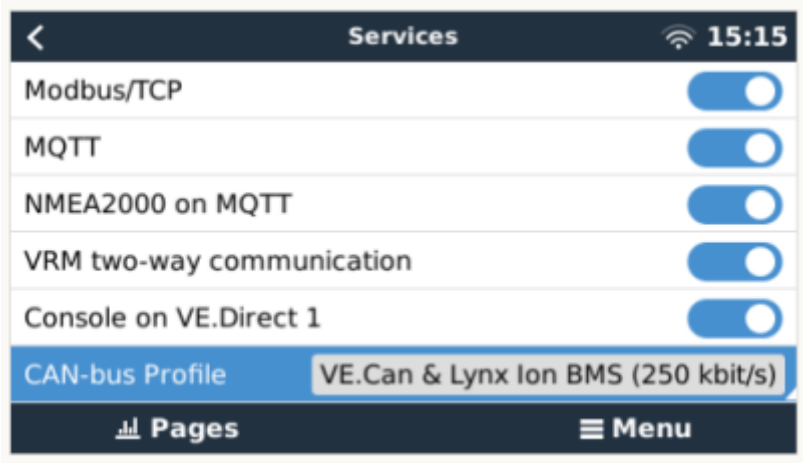
- One or multiple Master BMS's (MG Master LV (Lynx Ion BMS) or MG Master HV).
- One or multiple battery modules (HE Series, HP Series, LFP Series, UHE Series, RS Series, E-Rack Series).

Different setups can be created at different voltages and capacities. The most common to connect to Victron equipment is a Master LV in combination with one of the battery module series from 12 VDC to 48 VDC. For support information you can contact support@mgenergysystems.eu.



Product compatibility

MG is the only battery system provider that has VE.CAN implemented in the Master BMS. This has the advantage to directly control VE.CAN equipment on this communication bus like VE.CAN MPPT's and skylla-I's. Another advantage is that the VE.CAN bus can be connected to the existing NMEA2000 CAN-Bus networks. The default selected mode for the VE.CAN on the GX products (Cerbo GX, Octo GX, Venus GX and CANvu GX) is used.



GX products requirement

One of the GX products needs to be connected in between the Master BMS and inverter/chargers with VE.Bus or VE.Direct to provide charge and discharge control by DVCC. The GX products work like an advanced gateway.

Compatible Victron Energy products

Device	Control type	Connection
MultiPlus 500VA - 1200VA	DVCC	VE.BUS to GX product
MultiPlus 800VA - 5kVA	DVCC	VE.BUS to GX product
MultiPlus-II 3 kVA and 5 kVA	DVCC	VE.BUS to GX product
MultiGrid 3kVA	DVCC	VE.BUS to GX product

Device	Control type	Connection
Quattro – complete range	DVCC	VE.BUS to GX product
EasySolar – complete range	DVCC	VE.BUS to GX product
Phoenix inverter – all with VE.Bus	DVCC	VE.BUS to GX product
Skylla-I and Skylla-IP44[1]	Current control	VE.CAN directly
Skylla-TG	Allow-to-charge contact	Remote on/off (inverted)
Phoenix Smart IP43 Charger	Allow-to-charge contact	Remote on/off (inverted)
	DVCC	VE.Direct to GX product
SmartSolar MPPT 75/10, 75/15, 100/15 & 100/20	DVCC	VE.Direct to GX product
SmartSolar MPPT 100/30 & 100/50	Allow-to-charge contact	Remote on/off VE.Direct [2]
	DVCC	VE.Direct to GX product
SmartSolar MPPT 150/35	Allow-to-charge contact	Remote on/off
	DVCC	VE.Direct to GX product
SmartSolar MPPT 150/45 to 150/100	Allow-to-charge contact	Remote on/off input
	DVCC	VE.Direct to GX product
SmartSolar MPPT 250/60 to 250/100	Allow-to-charge contact	Remote on/off input
	DVCC	VE.Direct to GX product
BlueSolar MPPT 75/10, 75/15 & 100/15	Allow-to-charge contact	Remote on/off VE.Direct [2]
	DVCC	VE.Direct to GX product
BlueSolar MPPT 100/30 & 100/50	Allow-to-charge contact	Remote on/off VE.Direct [2]
	DVCC	VE.Direct to GX product
BlueSolar MPPT 150/35 to 150/100	Allow-to-charge contact	Remote on/off VE.Direct [2]
	DVCC	VE.Direct to GX product
BlueSolar MPPT 150/70 & 150/85	Current control	VE.CAN directly

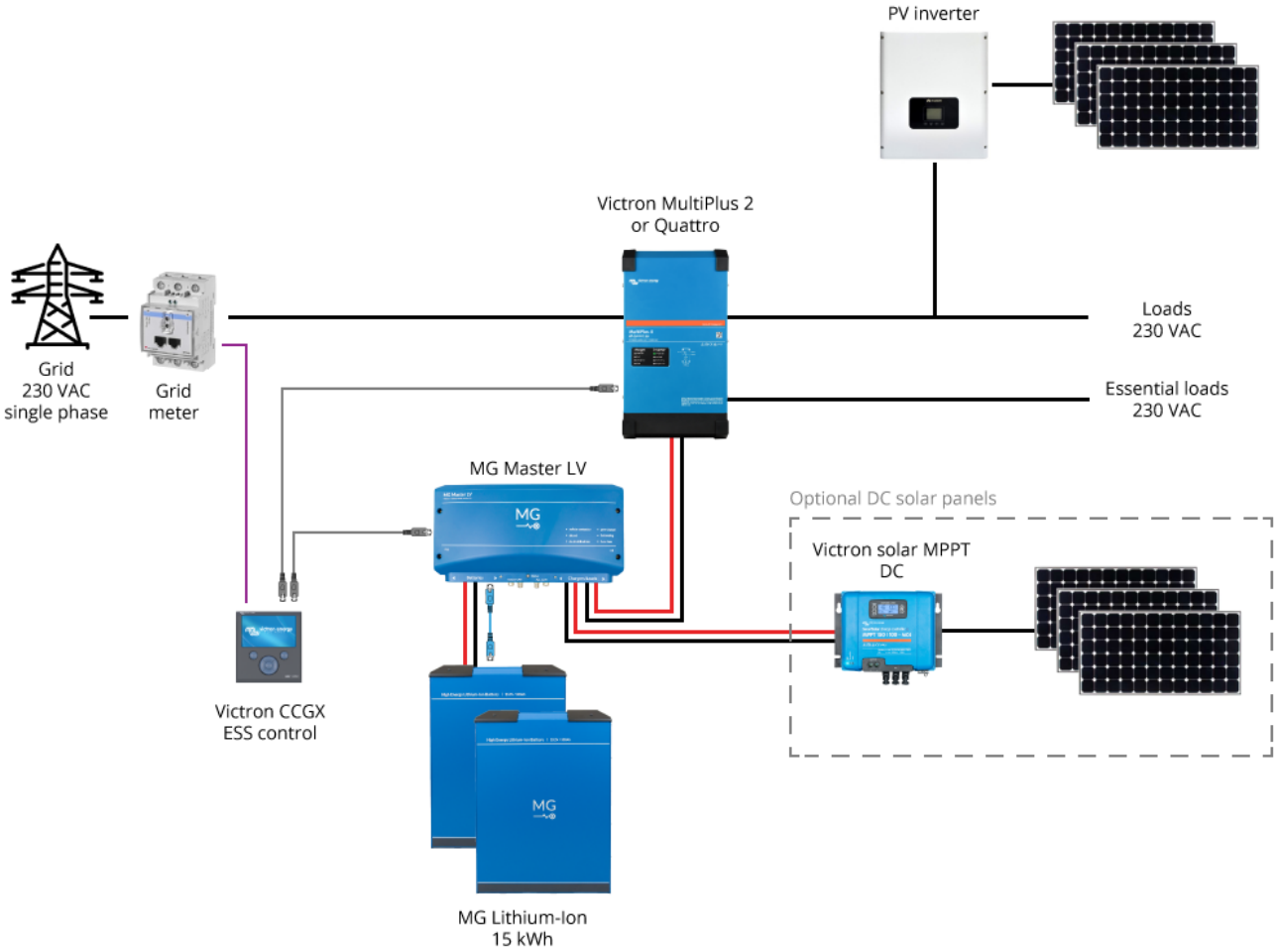
1. Current control requires to set the correct voltage in the charger before use.
2. Requires VE.Direct remote on-off cable non-inverting

Firmware

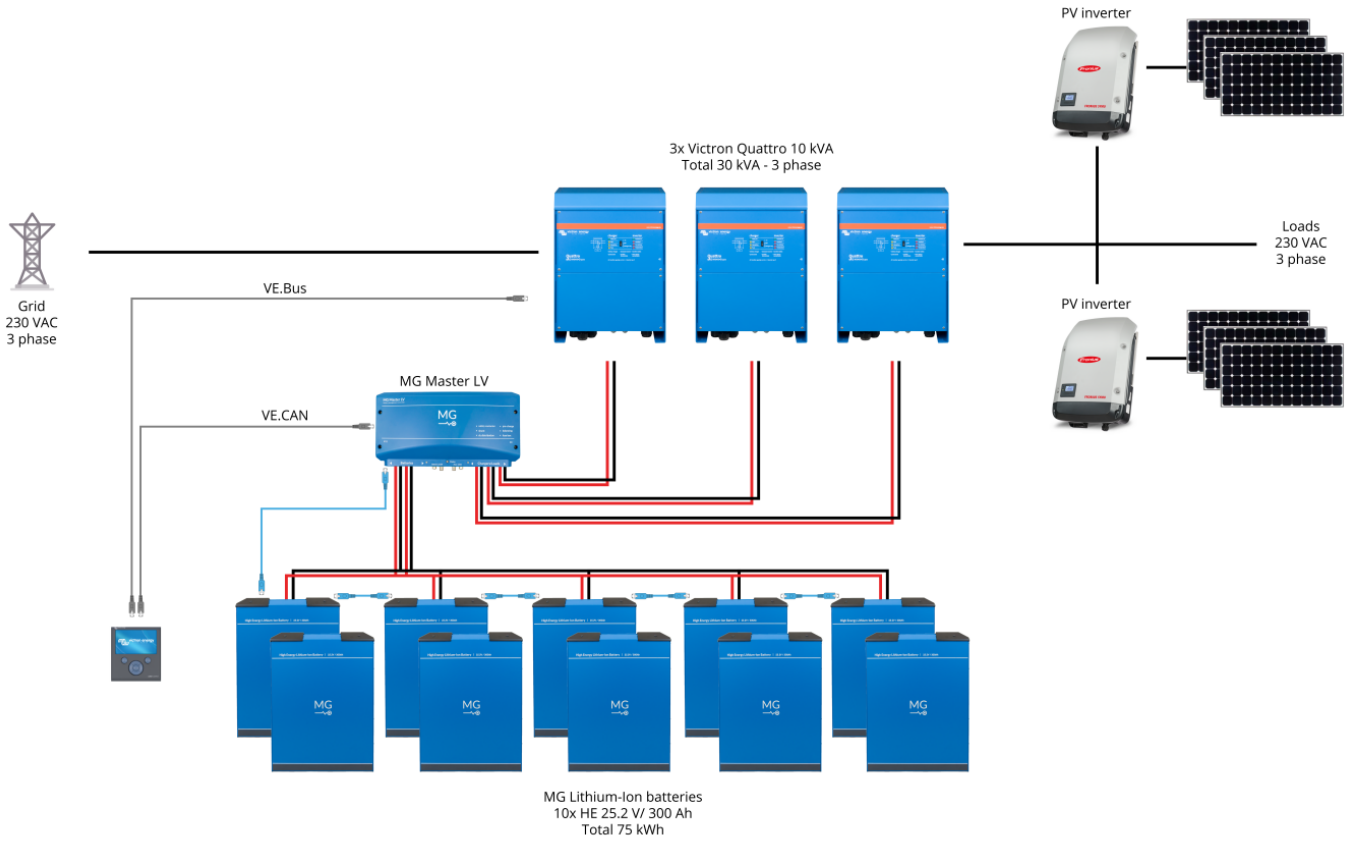
To have the best functionality it is recommended to update all firmware of the devices used in a system to the latest release version. The firmware of the MG Master LV (Lynx BMS) can be update by CAN-Bus locally with the “Diagnostic Tool” (Lynx BMS Tool) or by a GX product remotely on the VRM portal. Updating the Master LV (Lynx BMS) will also update the battery module connected to it automatically if necessary. This will have the advantage that the battery modules are always compatible with the connected Master LV.

System setup examples

Basic 1 phase setup

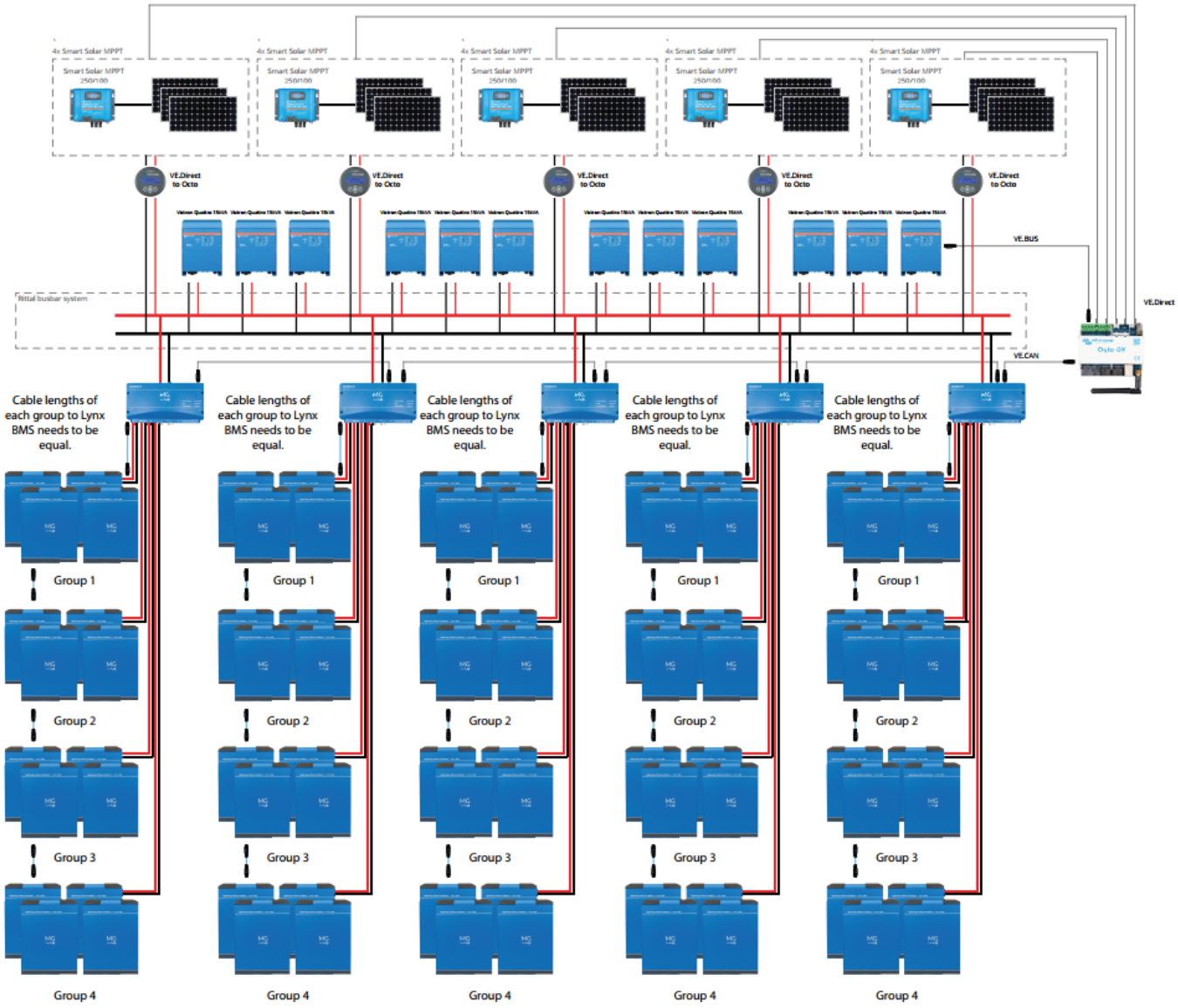


Basic 3 phase setup



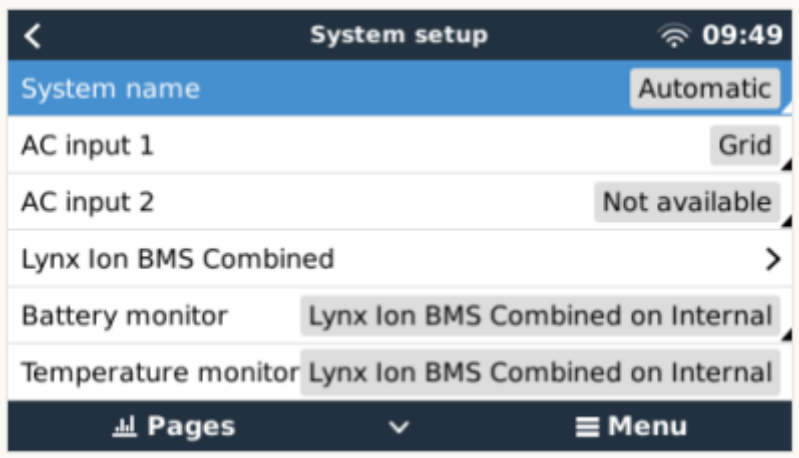
Redundant system setup

Below an example of a 600 kWh redundant battery system setup with solar connected to the DC.

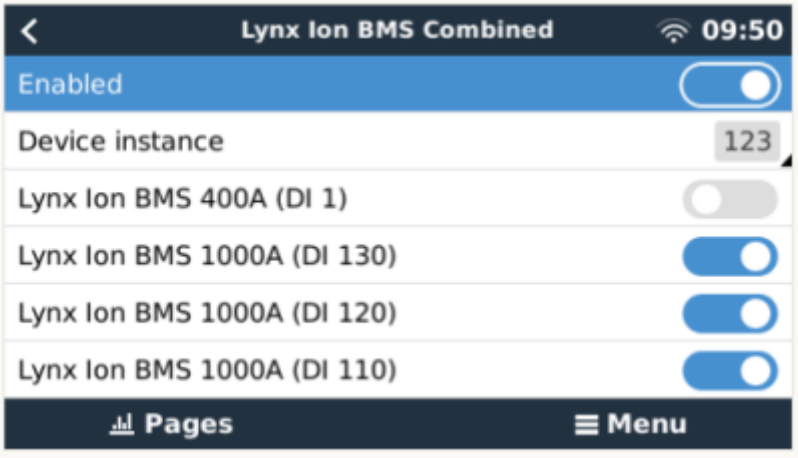


The GX products redundant/combined battery support

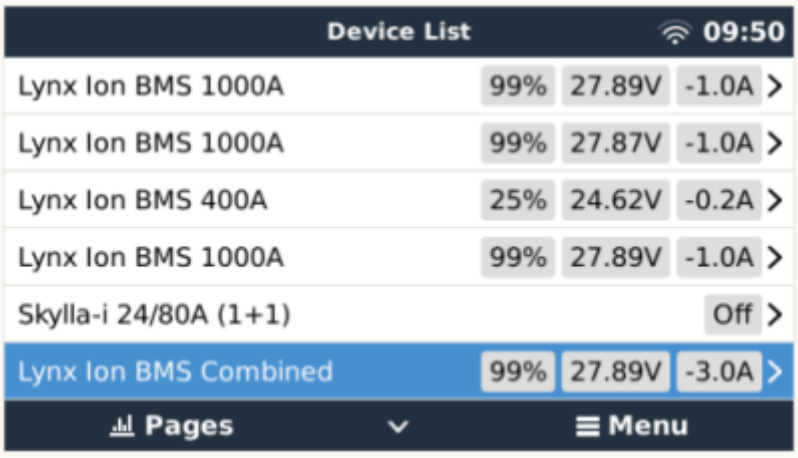
Different Master LV’s in one system can be combined in the GX products to see it as one battery.



The combiner can be enabled in the System Setup menu. The Master LV's (Lynx Ion BMS) which need to be combined can be selected. The new combined battery can be given a new device instance. This will make it also available and can be easily identified on the VRM portal.



The new combined battery will be created in the device list and can be selected as the battery monitor to have parameter control by DVCC. If one the Master LV's (Lynx BMS) fails, the system will stay active and keeps operating.



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