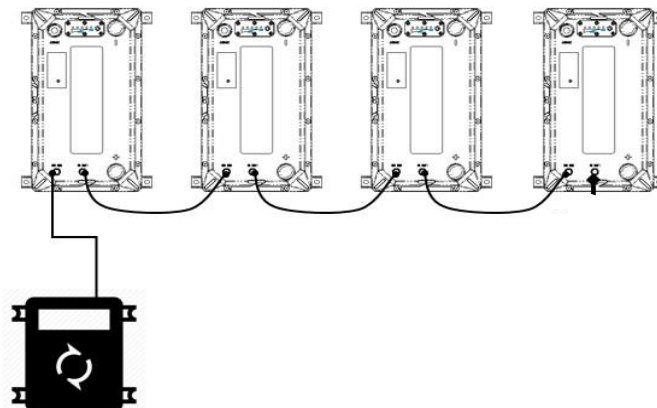# Invicta SNLX To Victron Integration Manual

Invicta Xero (SNLX) Closed Loop Communication Manual

Battery Model: SNLX12V120BT/200BT/300BT

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1. System check list

Items	Specification		Qty.	Remarks
SNLX Xero Batteries	12.8V100Ah	12.8V120Ah	1-16 pcs	Max. 4 in series and 4 in parallel or 16 in parallel no series.
	12.8V200Ah	12.8V300Ah		
Battery to battery power cables	3 B&S (26.5mm²) cable to be used minimum		1 pair per battery	Cable thickness and length should be determined by a qualified person.
Battery to inverter power cables	Cables should be selected by a qualified professional depending on current requirements and length of cable		1 pair per system	Please choose cable sizes and thicknesses according to load/current requirements and local electrical connection standards
Battery to battery communication cable	6 pin round to 6 pin round 500mm (0.5M)		1 pcs	Provided with each battery in the box
Battery to battery communication cable (Sold separately)	6 pin round to 6 pin round 2000mm (2M) = SNLXCBB2M		1 pc	If required contact SPB to order. 1 piece required per battery in system
	6 pin round to 6 pin round 3000mm (3M) = SNLXCBB3M			
Battery to Inverter communication cable (Sold separately)	6 pin round to RJ45 3000mm (3M) = SNLXCBI3M		1 pcs	If required contact SPB to order. 1 piece required per system
	6 pin round to RJ45 5000mm (5M) = SNLXCBI5M			
	Customized cable according to inverter brand			If required please contact SPB
Battery system protection DC breaker/fuse/isolator	150A rated or higher		1 pcs	According to local electrical connection requirements.

2. Preconditions

Before connecting the battery with an inverter, make sure the following rules are followed.

1. The battery system discharge power/current can meet the inverter's power requirements. We recommend configuring batteries in 1:2 proportion, for example, if you have a 5KW rated inverter, connect (10KWh) or more batteries.

2. If your system is an off-grid system, make sure your configuration can cover the worst situation to avoid batteries being over-discharged, we recommend installation of a smart generator and/or an MPPT solar regulator (on the DC side). Systems that have an inverter to battery ratio sized less than 1:1, we may refuse to give support.

3. Make sure that your installation environment is correct, follow settings and sequences using the user manual.

4. Only qualified people are allowed to install and commission the system.

5. Before the battery communicates with Victron devices, the battery needs to be networked by following the SNLX user manual or Invicta Legion Application instructions. For detailed network operation, refer to the User Manual, link or QR code below >

SNLX-Manual-Dec.pdf (mymedia.delivery)

Invicta Legion application link below >

Invicta-Legion-App-Manual.pdf (mymedia.delivery)

3. Connection and Commissioning

3.1 Victron

Victron devices and SNLX (Xero) batteries can be used for the following system types:

☐ Energy Storage Systems (ESS) - Self Consumption

☐ Grid Backup (DVCC or ESS)

☐   Off-grid (DVCC)

A GX device is required to establish communication with other Victron devices. It is essential to use the CAN-bus connection of the GX device (e.g. Cerbo GX) - this communicates the live system signal, charge and discharge limits, error codes, warnings, alarms and state of charge (SOC %) between the batteries and the system.

The minimum required firmware version for the GX Device is v2.40, It is highly recommended to use the latest firmware version on all connected devices, including the GX device Inverter/Charger and MPPTs.

CAN-bus baud rate **500 Kbps** is supported, 250Kbps may be added in the future.

If you use a VE.Can MPPT, it must also be connected via a GX device that has more than one CAN-bus interface, e.g. the Cerbo GX.

Compatible Victron devices:

1. Multi, MultiPlus, MultiGrid, EasySolar & EasySolar-II, Inverter RS & Multi RS and Quattro.
2. VE.Direct/VE.CAN BlueSolar and SmartSolar MPPT Chargers.
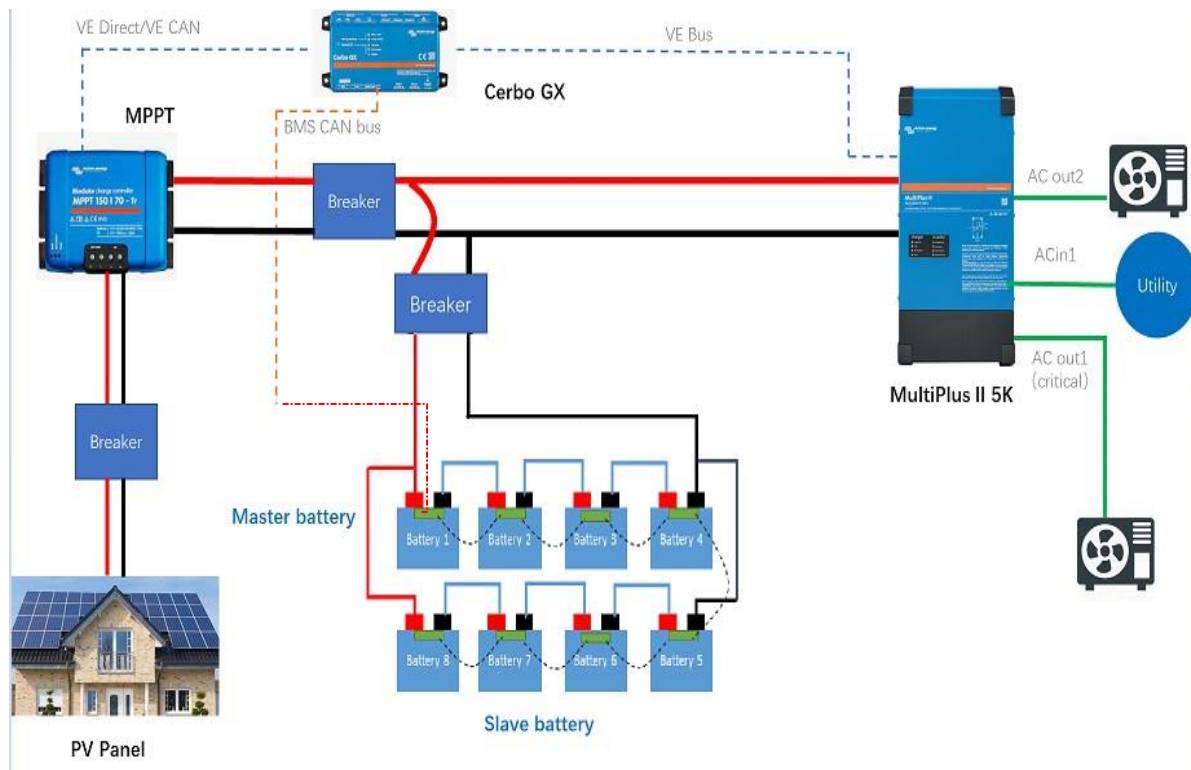
3.1.1 Cable connection

3.1.1.1 Keep both inverter and battery completely switched off.

3.1.1.2 Make the communication cable and connect the system according to the following schematic.

Battery BMS CAN port		Victron GX device (VE.CAN Port / BMS CAN Port)	
Pin1	H	Pin7	H
Pin2	L	Pin8	L

Cable suggested:

1.Invicta official cables are available （optional）.

Diagram showing: MPPT, VE Direct/VE CAN, Cerbo GX, VE Bus, BMS CAN bus, Breaker, AC out2, ACin1, Utility, MultiPlus II 5K, AC out1 (critical), Master battery (Battery 1, Battery 2, Battery 3, Battery 4), Slave battery (Battery 8, Battery 7, Battery 6, Battery 5), PV Panel

⚠ CAUTION

This electrical connection in this diagram is only for illustration, please follow the Manual suggestions of related devices and operate in accordance with locally applicable connection requirements, standards, and directives.

3.1.2 Start system

3.1.2.1 Connect the wiring according to the User Manual

3.1.2.2 Press the Power/isolation on button to switch on all the batteries and then close the battery breaker if there is one present.

3.1.2.3 Close inverter soft switch, then turn on/close DC breaker to start MPPT.

3.1.2.4 Finish inverter setup procedures as section

3.1.2.5 3.1.3, close the AC and PV input.

3.1.3 Inverter setup

3.1.3.1 Confirm the Venus OS version, the minimum version should be higher than 2.40.
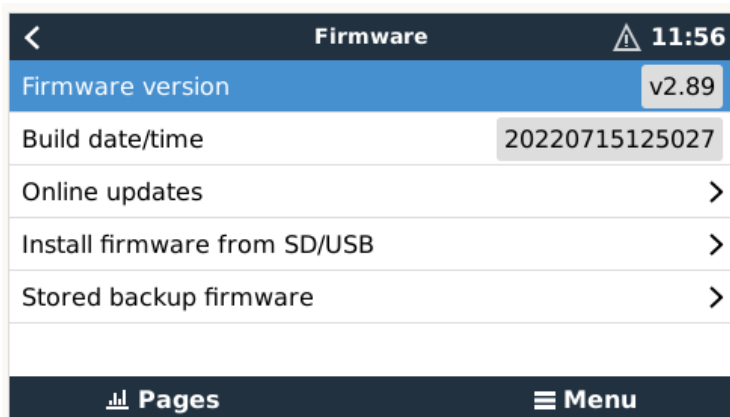
3.1.3.2 Select the baud rate: setting–services–VE.CAN / Can-bus BMS, select the **500 kbps**.
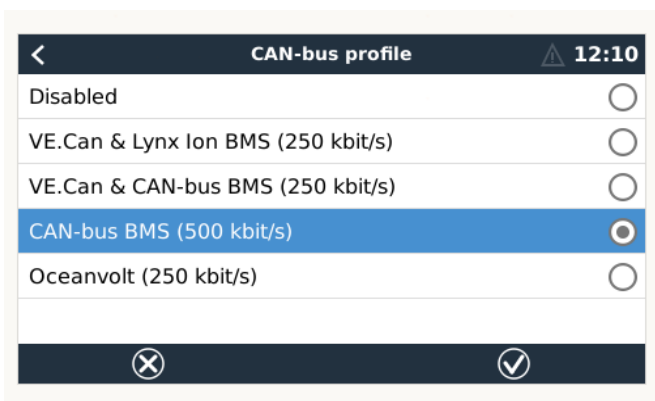
3.1.3.3 Find the battery in the Home Page of the GX device, check the amount of **Online batteries** or installed capacity **(= rated capacity/capacity/number of parallel batteries)** information with actual battery amount/capacity.
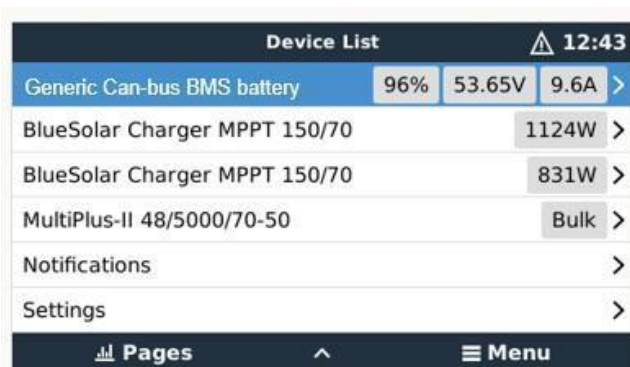
3.1.3.4 Enable DVCC. Set DVCC as in the picture below, if you've configured ESS mode, please enable 'Optimized with Battery life' and Minimum SOC should be ＞10%.

3.1.3.5 Configure MPPT via Victron connect app.

MPPT Parameter	Setting
Battery voltage.	48V
Absorption voltage	56.0V
Float voltage	54.6V
Auto equalization	Off
Others	Keep default or follow Victron manual

3.1.4 VE Configure Settings

3.1.4.1 General tab

☐ Check the "Enable battery monitor" function

☐ Set the battery capacity to the total capacity of the battery bank.

☐ The other parameters ("State of charge when bulk finished" and "Charge efficiency") can be left to their default setting.

3.1.4.2 Charge tab

VEConfigure Charge Parameter	Setting
Battery type	Lithium
Charge curve	Fixed
Absorption voltage	56.0 V
Float voltage	54.6 V
Absorption time	1 Hr

1.1.1.1 Inverter tab

VEConfigure Inverter Parameter	Setting
DC input low shut-down	47V
DC input low restart	52V
DC input low pre-alarm*	51.2V

3.1.4.3 ESS assistant setting (if you are using your battery in a grid connected system)
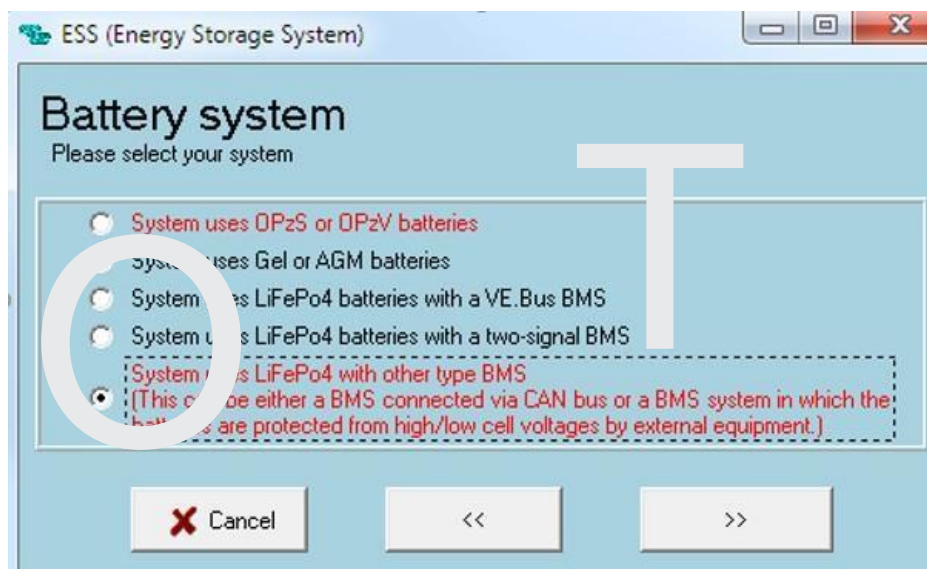
ESS Parameter	Settings
Dynamic cut-off	47V

Sustain voltage.	50V
Restart offset:	1.2V (Default)

Send all the settings to the inverter/charger, it will take effect after restart, then the system is running.

Frequently asked questions:

1. ***The maximum charge and discharge current/voltage is always changing, the system derating at high or low temperature.***
   Yes, the BMS has a dynamic target current and voltage according to different parameters to ensure the battery is working in the optimal status.

2. ***Battery maximum SOC is 98~99% and never goes to 100%SOC during daily cycle use.***
   This is normal and has no influence on capacity, usually the BMS will calibrate the SOC to 100% when it has reached cut-off current or trigger HVP, however, to avoid batteries from being overcharged and to extend the cycle life as longer as possible, we set the charging profile to let battery not be charged at high voltage near full, please float the battery about 30 minutes/1 hour to calibrate the SOC.

3. ***GX device triggers 'High voltage' and 'cell unbalance' warning or alarm in rare cases.***
   This happens with new batteries that are not yet balanced, please lower the Maximum charge voltage at DVCC tab and Float (keep battery charged) the battery via grid or generator. If not solved,.

4. ***When having multiple batteries in parallel connection, the battery on the end can't be fully charged.***
   Pay attention to your wiring diagram, please always follow the manual wiring advice and ensure proper cable size selection and pairing.

INVICTA LITHIUM BATTERIES

5. **When multiple batteries are connected and a battery triggers an alarm, the charge/discharge current limit will be Zero, while multiple batteries charge or discharge' in GX devices the battery details tab is showing only 1 or 2 batteries, *is this wrong?***

   No, that's normal. Because there are batteries that may trigger a major Alarm that requires the system to STOP charging or discharging or both.

6. **The current is reading 0A when connecting to a very small load in a system consisting of multiple batteries in parallel, how to solve it?**

   Each BMS has a threshold current of 0.5A (~25W) before it begins to report, this can lead to inaccurate display of the current over long periods. To correct this the battery bank needs to be fully discharged and recharged.

7. **SOC is not accurate or suddenly jumps to 100% during charging.**

   This mostly happens in off-grid applications on batteries that have not been SOC calibrated for a long time or situations that are similar to Q6 with an inverter in Idle mode or a small DC load connected like GX devices, we suggest fully charging the batteries at least once per month.

8. **The system is still running when the GX shows 'internal failure' Warning.**

   This is our logic and this warning flag indicates there is 1 or more batteries in communication offline from the system, the system will derate until communication is recovered for safety.

9. **When using a Cerbo GX, which port should I connect to the master battery?**

   The BMS RJ45 Can port is recommended; it is not required to insert the termination resistor for this system. This cable will connect to the link in port of the master battery

*If you require any further assistance, please contact the please contact your supplier or the Sealed Performance Batteries customer service team.

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