

EasySolar-II GX - Produkthandbuch

1. # Einleitung

Das Victron EasySolar-II GX integriert die folgenden Elemente:

- Ein leistungsstarker MultiPlus-II-Wechselrichter/Ladegerät
- Ein SmartSolar MPPT Solarladeregler
- Ein GX-Gerät mit einer 2x 16-stelligen Anzeige

Diese Elemente sind vorverdrahtet und in einer einzigen Einheit vorkonfiguriert. Dies vereinfacht die meisten Installationen erheblich und spart Zeit und Geld.

Dieses Dokument erklärt, wie alle Komponenten zusammenpassen, wie das Produkt installiert wird und welche Dokumentation für die Konfiguration und andere Details der einzelnen Teile verwendet werden muss.



Dieses Dokument erklärt:

- Eigenschaften
- Verhaltensweisen
- Spezifikationen
- Einschränkungen
- Installationsanleitung
- Schritte zur Fehlerbehebung

Sie müssen es lesen, um zu verstehen, wie Sie Ihr Produkt sicher und zuverlässig einsetzen können.

Dieses Handbuch gilt für:

- EasySolar-II GX 48/3000/35-32

2. # Aktuellste Dokumentation

Sie können schnell auf die neueste Version dieses Handbuchs online zugreifen, indem Sie den folgenden Link besuchen: <https://docs.victronenergy.com/easysolar-ii-gx.html>

3. # Sichere Installation

Please read the documentation supplied with this product first, so that you are familiar with the safety signs and directions before using the product. This product is designed and tested in accordance with international standards. The product should be used for the designated application only.

WARNING

DANGER OF ELECTRICAL SHOCK

The product is used in combination with a permanent energy source (battery). Even if the product is switched off, a dangerous electrical voltage can occur at the input and/or output terminals. Always switch the AC power off and

disconnect the battery before performing maintenance.

The product contains no internal user-serviceable parts. Do not remove the front panel and do not put the product into operation unless all panels are fitted. All maintenance should be performed by qualified personnel.

Never use the product at sites where gas or dust explosions could occur. Refer to the specifications provided by the manufacturer of the battery to ensure that the battery is suitable for use with this product. The battery manufacturer's safety instructions should always be observed.

This product is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the product by a person responsible for their safety. Children should be supervised to ensure that they do not play with the product.

WARNING

Do not lift heavy objects unassisted

3.1. <#> Transport and storage

On storage or transport of the product, ensure that the mains supply and battery leads are disconnected.

No liability can be accepted for damage in transit if the equipment is not transported in its original packaging.

Store the product in a dry environment; the storage temperature should range from -20°C to 60°C .

Refer to the battery manufacturer's manual for information on transport, storage, charging, recharging and disposal of the battery.

Schützen Sie die Solarmodule während der Installation vor einfallendem Licht, z. B. decken Sie sie ab.

Berühren Sie niemals unisolierte Kabelenden.

Verwenden Sie nur isolierte Werkzeuge.

3.2. <#> Erdung

Batterieerdung: Dieses Gerät kann in einem positiven oder negativen Erdungssystem installiert werden.

Hinweis: Legen Sie eine einzige Erdung an (vorzugsweise in der Nähe der Batterie), um Fehlfunktionen des Systems zu vermeiden.

- Erdung des Chassis: Ein separater Erdungspfad für die Erdung des Chassis ist zulässig, da er von der positiven und negativen Klemme getrennt ist.
- Der Nationale Elektrische Code (NEC) der USA verlangt die Verwendung einer externen Erdschlussschutzeinrichtung (GFPD). Diese MPPT-Ladegeräte verfügen nicht über einen internen Erdschlussschutz. Das elektrische Negativ des Systems sollte durch ein GFPD mit der Erdung an einer (und nur einer) Stelle verbunden werden.
- Das Ladegerät darf nicht mit geerdeten PV-Arrays verbunden werden. (nur ein Erdungsanschluss)
- Das Plus und Minus der PV-Anlage sollte nicht geerdet werden. Erden Sie den Rahmen der PV-Module, um die Auswirkungen von Blitzschlag zu reduzieren.

****WENN EIN ERDUNGSFEHLER ANGEZEIGT WIRD, KÖNNEN BATTERIEANSCHLÜSSE UND ANGESCHLOSSENE SCHALTUNGEN NICHT GEERDET UND GEFÄHRLICH SEIN.**

4. # Produktbeschreibung

The basis of the product is an extremely powerful sine inverter, battery charger and transfer switch in a compact casing. It is suited for use in Marine, Automotive, as well as stationary land-based applications.

4.1. # Features applying to all applications

4.1.1. # GX LCD display

A backlit 2 x 16 character display screen shows system parameters.

4.1.2. # BMS-Can Connections

A BMS-Can connection allows connecting of compatible CAN-bus BMS batteries. VE.Can products as for example Victron MPPT Solar Chargers, or a Lynx Shunt VE.Can are NOT supported.

4.1.3. # Ethernet and Wifi

Ethernet and Wifi connections allow for local and remote system monitoring, as well as connection to Victron's free VRM portal for long term system performance information.

4.1.4. # Automatic and uninterruptible switching

In the event of a supply failure or when the generating set is switched off, the product will switch over to inverter operation and take over the supply of the connected devices. This is done so quickly that operation of computers and other electronic devices is not disturbed (Uninterruptible Power Supply or UPS functionality). This makes the product highly suitable as an emergency power system in industrial and telecommunication applications.

4.1.5. # Two AC outputs

Besides the usual uninterruptible output (AC-out-1), an auxiliary output (AC-out-2) is available that disconnects its load in the event of battery operation. Example: an electric boiler that is allowed to operate only if the genset is running or shore power is available. There are several applications for AC-out-2.

4.1.6. # Three phase capability

The unit can be connected with others and configured for three-phase output. Up to 6 sets of three can be parallel connected to provide 45 kW / 54 kVA inverter power and more than 600A charging capacity.

4.1.7. # PowerControl – maximum use of limited AC power

The product can supply a huge charging current. This implies heavy loading of the AC mains or generator. Therefore a maximum current can be set. The product then takes other power users into account, and only uses 'surplus' current for charging purposes.

4.1.8. # PowerAssist – Extended use of generator or shore current

This feature takes the principle of PowerControl to a further dimension allowing the product to supplement the capacity of the alternative source. Where peak power is often required only for a limited period, the product will make sure that insufficient AC mains or generator power is immediately compensated for by power from the battery. When the load reduces, the spare power is used to recharge the battery.

4.1.9. <#> Programmable

All settings can be changed with a PC and free of charge software, downloadable from our website www.victronenergy.com. See this manual for more information - <https://docs.victronenergy.com/veconfigure.html>

4.1.10. <#> Programmable relay

The product is equipped with a programmable relay. The relay can be programmed for different applications, for example as a [starter relay for a generator](#).

4.1.11. <#> External current transformer (optional)

External current transformer option to implement PowerControl and PowerAssist with external current sensing.

4.1.12. <#> Programmable analog/digital input/output ports (Aux in 1 and Aux in 2, see appendix)

The product is equipped with 2 analog/digital input/output ports.

These ports can be used for several purposes. One application is communication with the BMS of a lithium-ion battery.

4.2. <#> Features specific on-grid and off-grid systems combined with PV

4.2.1. <#> External current transformer (optional)

When used in a grid-parallel topology the internal current transformer cannot measure the current to or from the mains. In this case an external current transformer has to be used. See appendix A. Contact your Victron Distributor for further information about this installation type.

4.2.2. <#> Frequency shift

When solar inverters are connected to the AC-output of the product, excess solar energy is used to recharge the batteries. Once the absorption voltage is reached, charge current will reduce and excess energy will be fed back into the mains. If the mains is not available, the product will slightly increase the AC frequency to reduce the output of the solar inverter.

4.2.3. <#> Built-in Battery Monitor

The ideal solution when the product is part of a hybrid system (diesel generator, inverter/chargers, storage battery, and alternative energy). The built-in battery monitor can be set to start and stop the generator:

- Start at a preset % discharge level, and/or
- start (with a preset delay) at a preset battery voltage, and/or
- start (with a preset delay) at a preset load level.
- Stop at a preset battery voltage, or
- stop (with a preset delay) after the bulk charge phase has been completed, and/or
- stop (with a preset delay) at a preset load level.

4.2.4. <#> Autonomous operation when the grid fails

Houses or buildings with solar panels or a combined micro-scale heating and power plant or other sustainable energy sources have a potential autonomous energy supply which can be used for powering essential equipment (central heating pumps, refrigerators, deep freeze units, Internet connections, etc.) during a power failure. A problem is however that grid connected sustainable energy sources drop out as soon as the grid fails. With the product and batteries, this problem can be solved: **the product can replace the grid during a power failure**. When the sustainable

energy sources produce more power than needed, the product will use the surplus to charge the batteries; in the event of a shortfall, the product will supply additional power from the battery.

4.3. [# Battery charger](#)

4.3.1. [# Lead-acid batteries](#)

Adaptive 4-stage charge algorithm: bulk – absorption – float – storage

The microprocessor-driven adaptive battery management system can be adjusted for various types of batteries. The adaptive function automatically adapts the charging process to battery use.

The right amount of charge: variable absorption time

In the event of slight battery discharge, absorption is kept short to prevent overcharging and excessive gas formation. After deep discharging, the absorption time is automatically extended in order to fully charge the battery.

Preventing damage due to excessive gassing: the BatterySafe mode

If, in order to quickly charge a battery, a high charge current in combination with a high absorption voltage has been chosen, damage due to excessive gassing will be prevented by automatically limiting the rate of voltage increase once the gassing voltage has been reached.

Less maintenance and aging when the battery is not in use: the Storage mode

The Storage mode kicks in whenever the battery has not been subjected to discharge during 24 hours. In the Storage mode float voltage is reduced to 2,2V/cell (13,2V for 12V battery) to minimise gassing and corrosion of the positive plates. Once a week the voltage is raised back to the absorption level to 'equalize' the battery. This feature prevents stratification of the electrolyte and sulphation, a major cause of early battery failure.

Battery voltage sense: the correct charge voltage

Voltage loss due to cable resistance can be compensated by using the voltage sense facility to measure voltage directly on the DC bus or on the battery terminals.

Battery voltage and temperature compensation

The temperature sensor (supplied with the product) serves to reduce charging voltage when battery temperature rises. This is particularly important for maintenance-free batteries, which could otherwise dry out by overcharging.

4.3.2. [# Li-ion batteries](#)

Victron LiFePO4 Smart batteries

Use the VE.Bus BMS

4.3.3. [# Other Li-ion batteries](#)

Please see https://www.victronenergy.com/live/battery_compatibility:start

4.3.4. [# More on batteries and battery charging](#)

Our book 'Energy Unlimited' offers further information on batteries and battery charging, and is available free of charge on our website: www.victronenergy.com/support-and-downloads/whitepapers
For more information on adaptive charging, please also refer to the General Technical Information on our website.

4.4. # ESS – Energy Storage Systems: feeding energy back into the grid

When the product is used in a configuration in which it will feed back energy into the grid it is required to enable grid code compliance by selecting the appropriate grid code country setting with the VEConfigure tool.

Once set, a password will be required to disable grid code compliance or change grid code related parameters. Contact your Victron Distributor if you require this password.

If the local grid code is not supported by the product an external certified interface device should be used to connect the product to the grid.

The product can also be used as a bidirectional inverter operating parallel to the grid, integrated into a customer designed system (PLC or other) that takes care of the control-loop and grid measurement,

Special note regarding NRS-097 (South Africa)

1. The maximum allowed impedance of the network is $0.28\Omega + j0.18\Omega$
2. The inverter is fulfilling the unbalance requirement in case of multiple single phase units only when the Color Control GX is part of the installation.

Special notes regarding AS 4777.2 (Australia/New Zealand)

1. Certification and CEC approval for off-grid use does NOT imply approval for grid-interactive installations. Additional certification to IEC 62109.2 and AS 4777.2.2015 are required before grid-interactive systems can be implemented. Please check the Clean Energy Council website for current approvals.
2. DRM – Demand Response Mode When the AS4777.2 grid code has been selected in VEConfigure, DRM 0 functionality is available on port AUX1 (see appendix A. To enable grid connection, a resistance of between $5k\Omega$ and $16k\Omega$ must be present between the terminals of port AUX1 (marked + and -). The product will disconnect from the grid in case of an open circuit or a short circuit between the terminals of port AUX1. The maximum voltage that may be present between the terminals of port AUX1 is 5V. Alternatively, if DRM 0 is not required, this functionality can be disabled with VEConfigure.

5. # Betrieb

5.1. # On/Off/Charger Only Switch

The switch is located on the underside to the bottom right of the product.

The switch has three positions. The centre position 0 is Off. The I position is On, and the II position is Charger Only.

When switched to 'I / On' (rocked towards the front of the unit), the product will come into operation and the inverter is fully functional.

If an AC voltage is connected to the 'AC in' terminal, it will be switched through to the 'AC out' terminal, if within specifications. The inverter will switch off, and the charger commences charging. 'Bulk', 'Absorption' or 'Float' will display, depending on the charger mode.

If the voltage at the 'AC-in' terminal is rejected, the inverter will switch on.

When the switch is switched to 'II / Charger Only', only the battery charger of the Multi will operate (if mains voltage is present). In this mode input voltage also is switched through to the 'AC out' terminal.

NOTE: When only the charger function is required, ensure that the switch is switched to 'II / Charger Only'. This prevents the inverter from being switched on if the mains voltage is lost, thus preventing your batteries from running flat.

6. # GX LCD-Schnittstelle

The display screen will present useful information about your system.

6.1. # On/off behaviour

When the product is switched off with the physical switch on the device or with the Remote On/Off terminals, then the GX card is off as well. If you switch the product remotely, using a Digital Multi Control, then the GX card will remain powered. Also when switching the inverter/charger off from within the GX menus, the GX card will remain powered.

Lastly, when the inverter/charger switches itself off due to an alarm, such as low battery or overtemperature, then the GX card will remain powered and functional as well.

6.2. # Push button behaviour

When the GX Card is on, pushing the button beside the screen will increase the brightness of the backlight. The backlight will dim itself again after 5 minutes.

Once the backlight has been activated, pushing the button again will cycle through the available display options. Some options will be displayed automatically, and others require a button push to display.

6.3. # Information displayed

- Solar Power, Voltage and Charge state (if connected)
- ESS/DVCC reason codes (if active)
- Solar Daily Yield
- Inverter/charger charge state (eg Bulk, ESS)
- Battery State of Charge, Power and Voltage
- Network IP Address and Connection Type (if connected).
- AC input and output Power

In a system with more than one phase, there will be additional AC input and output information available, eg

- Phase 1 AC input Voltage and Power.
- Phase 1 AC output Voltage and Power.
- Phase 2 AC input Voltage and Power.
- Phase 2 AC output Voltage and Power.
- Phase 3 AC input Voltage and Power.
- Phase 3 AC output Voltage and Power.

6.4. # Error Code Display

If there is an error with the system, the error code will be displayed on the screen. The screen will display VE.Bus error code numbers, and MPPT error codes (if connected).

Basic information about the VE.Bus Error codes are in the Error Indications section.

For further details about the error codes please see:

[VE.Bus Error Codes](#)

[MPPT Error Codes](#)

The error will display until it is cleared.

7. # Anschluss des PV-Arrays

7.1. # Größe des Arrays anpassen

Wir empfehlen die Verwendung des [MPPT Sizing Calculator auf unserer Website] (<https://www.victronenergy.com/solar-charge-controllers>).

- Der Solarladeregler wird nur dann betrieben, wenn die PV-Spannung die Batteriespannung (Vbat) überschreitet.
- Die PV-Spannung muss Vbat +5 V überschreiten, damit die Steuerung starten kann. Danach beträgt die minimale PV-Spannung Vbat +1 V.
- Die maximale Leerlaufspannung des PV-Arrays beträgt 250 V.
- Der maximale Kurzschlussstrom des PV-Arrays beträgt 35 A.

Zum Beispiel:

- Minimale Anzahl von Zellen in Serie: 144 (4x 12V Panel oder 2x 24V Panel in Serie).
- Maximum: 360 Zellen (10x 12V oder 5x 24 Panel in Serie).

Anmerkung: Bei niedrigen Temperaturen kann die Leerlaufspannung einer 360-Zellenanordnung je nach örtlichen Bedingungen und Zellspezifikationen 250 V überschreiten. In diesem Fall muss die Anzahl der Zellen in Serie reduziert werden.

Die MPPT-Komponente des EasySolar-II GX ist auf 48 V vorprogrammiert, um den Anforderungen des mitgelieferten Wechselrichters/Laders gerecht zu werden.

7.2. # Verbindung

1. Schließen Sie die Batterie an.
2. Verbinden Sie die Solaranlage mit den M6-Solarschrauben. Hinweis: Wenn die Steuerung mit umgekehrter Polarität verbunden ist, erwärmt sie sich, lädt aber die Batterie nicht auf.

Beachten Sie, dass die 100-A-Sicherung nicht vom Endverbraucher ausgetauscht werden kann. Falls durchgebrannt, muss das Gerät zur Reparatur an eine Servicestelle zurückgeschickt werden. Sie brennt erst durch, wenn andere Komponenten im Gerät ausgefallen sind.

8. # Zugriff auf Anschlusspunkte



9. # Installation

This product contains potentially dangerous voltages. It should only be installed under the supervision of a suitable qualified installer with the appropriate training, and subject to local requirements. Please contact Victron Energy for further information or necessary training.

9.1. # Location

The product must be installed in a dry and well-ventilated area, as close as possible to the batteries. There should be a clear space of at least 10 cm around the product for cooling.

WARNING

Excessively high ambient temperature will result in the following:

- Reduced service life.
- Reduced charging current.
- Reduced peak capacity, or shutdown of the inverter. Never position the appliance directly above the batteries.

This product is suitable for wall mounting. For mounting purposes, a hook and two holes are provided at the back of the casing (see appendix G). The device can be fitted either horizontally or vertically. For optimal cooling, vertical fitting is preferred.

WARNING

The interior of the product must remain accessible after installation.

Try and keep the distance between the product and the battery to a minimum in order to minimize cable voltage losses.

For safety purposes, this product should be installed in a heat-resistant environment. You should prevent the presence of e.g. chemicals, synthetic components, curtains or other textiles, etc., in the immediate vicinity.

9.2. # Connection of battery cables

In order to utilize the full capacity of the product, batteries with sufficient capacity and battery cables with sufficient cross section should be used. See table.

	48/3000/35
Recommended battery capacity (Ah)	100–400
Recommended DC fuse	125 A
Recommended cross section (mm ²) per + and - connection terminal	
0 – 5 m	35 mm ²
5 – 10 m	70 mm ²

Remark: Internal resistance is the important factor when working with low capacity batteries. Please consult your supplier or the relevant sections of our book 'Energy Unlimited', downloadable from our website.

9.3. # Battery Connection Procedure

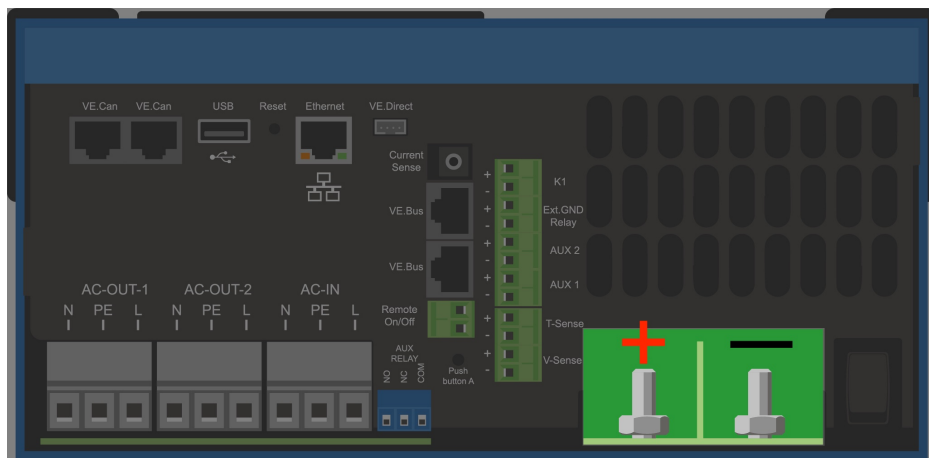
Proceed as follows to connect the battery cables:

WARNING

Use a torque wrench with insulated box spanner in order to avoid shorting the battery. **Maximum torque: 14 Nm**
 Avoid shorting the battery cables.

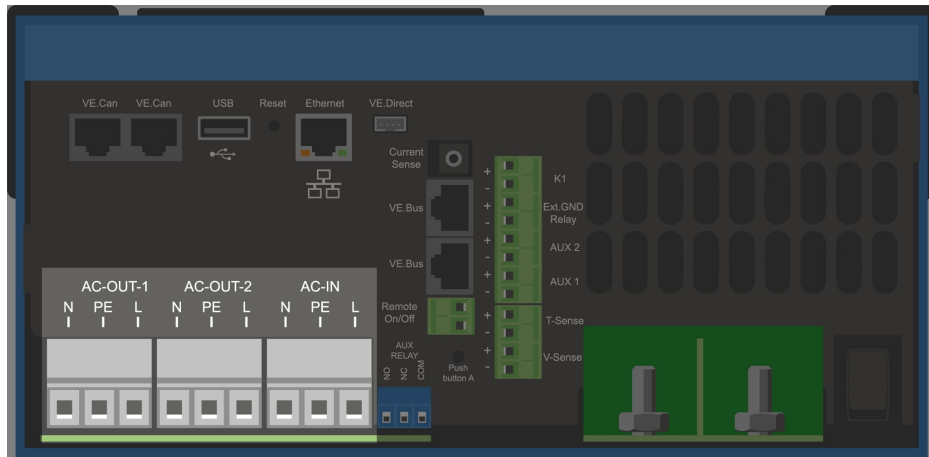
WARNING

Specific care and attention must be taken when making the battery connections. Correct polarity must be confirmed with a multimeter before connection. Connecting a battery with incorrect polarity will destroy the device and is not covered by warranty.



- Undo the two screws at the bottom of the enclosure and remove the service panel.
- Connect the battery cables. First the - cable then the +. Be aware that there may be a spark when making the battery connections.
- Tighten the nuts to the prescribed torques for minimal contact resistance.

9.4. # Connection of the AC cabling



WARNING

This is a safety class I product (supplied with a ground terminal for safety purposes). **Its AC input and/or output terminals and/or grounding point on the inside of the product must be provided with an uninterruptible grounding point for safety purposes.** see Appendix A.

In a fixed installation, an uninterruptible grounding can be secured by means of the grounding wire of the AC input. Otherwise the casing must be grounded.

This product is provided with a ground relay (relay H, see Appendix B) that **automatically connects the Neutral output to the chassis if no external AC supply is available.** If an external AC supply is provided, the ground relay H will open before the input safety relay closes. This ensures the correct operation of an earth leakage circuit breaker that is connected to the output.

In a mobile installation (for example, with a shore current plug), interrupting the shore connection will simultaneously disconnect the grounding connection. In that case, the casing must be connected to the chassis (of the vehicle) or to the hull or grounding plate (of the boat). In case of a boat, direct connection to the shore ground is not recommended because of potential galvanic corrosion. The solution to this is using an isolation transformer. **Torque: 2 Nm**

The terminal blocks can be found on the printed circuit board, see Appendix A.

Do not invert neutral and phase when connecting the AC.

- **AC-in** The AC input cable can be connected to the terminal block 'AC-in'. From left to right: "N" (neutral), "PE" (earth) and "L" (phase) **The AC input must be protected by a fuse or magnetic circuit breaker rated at 32A or less, and cable cross-section must be sized accordingly.** If the input AC supply is rated at a lower value, the fuse or magnetic circuit breaker should be down sized accordingly.
- **AC-out-1** The AC output cable can be connected directly to the terminal block 'AC-out'. From left to right: "N" (neutral), "PE" (earth) and "L" (phase) With its PowerAssist feature the Multi can add up to 3kVA (that is 3000 / 230 = 13A) to the output during periods of peak power requirement. Together with a maximum input current of 32A this means that the output can supply up to 32 + 13 = 45 A. An earth leakage circuit breaker and a fuse or circuit breaker rated to support the expected load must be included in series with the output, and cable cross-section must be sized accordingly.
- **AC-out-2** A second output is available that disconnects its load in the event of battery operation. On these terminals, equipment is connected that may only operate if AC voltage is available on AC-in-1, e.g. an electric

boiler or an air conditioner. The load on AC-out-2 is disconnected immediately when the inverter/charger switches to battery operation. After AC power becomes available on AC-in-1, the load on AC-out-2 will be reconnected with a delay of approximately 2 minutes. This to allow a genset to stabilise.

9.5. <#> Optional Connections

A number of optional connections are possible:

9.5.1. <#> Remote Control

The product can be remotely controlled in two ways.

- With an external switch (connection terminal M, see Appendix A). Operates only if the switch on the device is set to "on".
- With a Digital Multi Control panel (connected to one of the two RJ45 sockets L, see Appendix A). Operates only if the switch on the device is set to "on"

The Digital Multi Control panel has a rotary knob with which the maximum current of the AC input can be set: see PowerControl and PowerAssist.

9.5.2. <#> Programmable relay

The product is equipped with a programmable relay.

The relay can be programmed for all kinds of other applications, for example as a starter relay for a generator.

9.5.3. <#> Programmable analog/digital input/output ports

The product is equipped with 2 analog/digital input/output ports.

These ports can be used for several purposes. One application is communication with the BMS of a lithium-ion battery.

9.5.4. <#> Voltage sense (connection terminal J, see Appendix A)

For compensating possible cable losses during charging, two sense wires can be connected with which the voltage directly on the battery or on the positive and negative distribution points can be measured. Use wire with a cross-section of 0,75mm².

During battery charging, the inverter/charger will compensate the voltage drop over the DC cables up to a maximum of 1 Volt (i.e. 1V over the positive connection and 1V over the negative connection). If the voltage drop threatens to become larger than 1V, the charging current is limited in such a way that the voltage drop remains limited to 1V.

9.5.5. <#> Temperature sensor (connection terminal J, see Appendix A)

For temperature-compensated charging, the temperature sensor (supplied with the inverter/charger) can be connected. The sensor is isolated and must be fitted to the negative terminal of the battery.

9.5.6. <#> Parallel Connection

It is required to use identical units for three phase and parallel systems. In this case, as only one GX device is allowed per system, if you wish to parallel and/or three phase with this product, you must find the same model MultiPlus-II to pair.

To assist with finding identical units, consider instead using MultiPlus-II for parallel and three phase systems, and an external GX device.

Up to six units can be connected in parallel. When connecting this product with MultiPlus-II in a parallel system, the following requirements must be met:

WARNING

- It is essential the negative battery terminal between the units is always connected. A fuse or circuit breaker is not allowed on the negative.
- All units must be connected to the same battery.
- A maximum of six units connected in parallel.
- The devices must be identical (aside from GX part) and have the same firmware.
- The DC connection cables to the devices must be of equal length and cross-section.
- If a positive and a negative DC distribution point is used, the cross-section of the connection between the batteries and the DC distribution point must at least equal the sum of the required cross-sections of the connections between the distribution point and the units.
- Always interconnect the negative battery cables before placing the UTP cables.
- Place the units close to each other, but allow at least 10cm for ventilation purposes under, above and beside the units.
- UTP cables must be connected directly from one unit to the other (and to the remote panel). Connection or splitter boxes are not permitted.
- Only one remote control means (panel or switch) can be connected to the **system**. That means only one GX.

9.5.7. # Three-phase operation

The product can also be used in 3-phase wye (Y) configuration. To this end, a connection between the devices is made by means of standard RJ45 UTP cables (the same as for parallel operation). The **system** will require subsequent configuration.

Pre-requisites: see Section Voltage Sense

1. Note: the product is not suitable for 3-phase delta (Δ) configuration.
2. When the AS4777.2 grid code has been selected in VEConfigure, only 2 units in parallel per phase are allowed in a three phase system.

For full details on parallel and three-phase configuration always discuss with your Victron distributor first and please see this specific manual: https://www.victronenergy.com/live/ve.bus:manual_parallel_and_three_phase_systems

9.5.8. # Connection to the VRM Portal

Connection of the product to VRM requires an internet connection. This can be made via wifi, or preferably a hardwired ethernet cable to an internet connected router.

The VRM site id is located on a sticker inside the cable connections area of the device.

For more information to set up VRM, refer to the [VRM Getting Started Manual](#).

10. # Konfiguration

This section is intended mainly for stand-alone applications

For grid connected Energy Storage Systems (ESS) please see <https://www.victronenergy.com/live/ess:start>

- Settings may only be changed by a suitable qualified installer with the appropriate training, and subject to local requirements. Please contact Victron for further information or necessary training.
- Read the instructions thoroughly before implementing changes.
- During setting of the charger, the AC input must be removed.

10.1. # Standard settings: ready for use

On delivery, the product is set to standard factory values. In general, these settings are suitable for single-unit operation.

WARNING

Possibly, the standard battery charging voltage is not suitable for your batteries! Refer to the manufacturer's documentation, or to your battery supplier!

Standard factory settings

Setting	Value
Inverter frequency	50 Hz
Input frequency range	45 – 65 Hz
Input voltage range	180 – 265 VAC
Inverter voltage	230 VAC
Stand-alone / parallel / 3-phase	stand-alone
AES (Automatic Economy Switch)	off
Ground relay	on
Charger on / off	on
Battery charge curve	four-stage adaptive with BatterySafe mode
Charging current	100% of the maximum charging current
Battery type	Victron Gel Deep Discharge (also suitable for Victron AGM Deep Discharge)
Automatic equalisation charging	off
Absorption voltage	57.6V
Absorption time	up to 8 hours (depending on bulk time)
Float voltage	55.2V
Storage voltage	52.8V (not adjustable)
Repeated absorption time	1 hour
Absorption repeat interval	7 days
Bulk protection	on
AC input current limit	32A (= adjustable current limit for PowerControl and PowerAssist functions)

UPS feature	on
Dynamic current limiter	off
WeakAC	off
BoostFactor	2
Programmable relay	alarm function
PowerAssist	on

10.2. <#> Explanation of settings

Settings that are not self-explanatory are described briefly below. For further information, please refer to the help files in the software configuration programs.

Inverter frequency

Output frequency if no AC is present at the input.

Adjustability: 50 Hz; 60 Hz

Input frequency range

Input frequency range accepted. The product synchronises within this range with the AC input frequency. The output frequency is then equal to the input frequency.

Adjustability: 45 – 65 Hz; 45 – 55 Hz; 55 – 65 Hz

Input voltage range

Voltage range accepted. The product synchronises within this range with the AC input. The output voltage is then equal to the input voltage.

Adjustability:

Lower limit: 180 – 230V

Upper limit: 230 – 270V

Note : the standard lower limit setting of 180V is intended for connection to a weak mains supply, or to a generator with unstable AC output. This setting may result in a system shut down when connected to a 'brushless, self excited, externally voltage regulated, synchronous AC generator' (synchronous AVR generator). Most generators rated at 10kVA or more are synchronous AVR generators. The shut down is initiated when the generator is stopped and revs down while the AVR simultaneously 'tries' to keep the output voltage of the generator at 230V.

The solution is to increase the lower limit setting to 210VAC (the output of AVR generators is generally very stable), or to disconnect the product from the generator when a generator stop signal is given (with help of an AC contactor installed in series with the generator).

Inverter voltage

Output voltage in battery operation.

Adjustability: 210 – 245V

Stand-alone / parallel operation / 2-3 phase setting

Using multiple devices, it is possible to:

- increase total inverter power (several devices in parallel)
- create a split-phase system with a separate autotransformer: see VE autotransformer datasheet and manual
- create a 3-phase system.

The standard product settings are for a single device in stand alone operation.

AES (Automatic Economy Switch)

If this setting is turned 'on', the power consumption in no-load operation and with low loads is decreased by approx. 20%, by slightly 'narrowing' the sinusoidal voltage. Applicable in stand-alone configuration only.

Search Mode

Instead of the AES mode, the **search mode** can also be chosen. If search mode is 'on', the power consumption in no-load operation is decreased by approx. 70%. In this mode the product, when operating in inverter mode, is switched off in case of no load or very low load, and switches on every two seconds for a short period. If the output current exceeds a set level, the inverter will continue to operate. If not, the inverter will shut down again.

The Search Mode 'shut down' and 'remain on' load levels can be set with VEConfigure.

The default settings are:

Action	Threshold
Shut down	40 Watt (linear load)
Turn on	100 Watt (linear load)

Ground relay (see appendix B)

With this relay, the neutral conductor of the AC output is grounded to the chassis when the back feed safety relays are open. This ensures the correct operation of earth leakage circuit breakers in the output. If required an external ground relay can be connected (for a split-phase system with a separate autotransformer). See appendix A.

Battery charge algorithm

The standard setting is 'Four-stage adaptive with BatterySafe mode'.

This is the recommended charge algorithm for lead acid batteries. See the help files in the software configuration programs for other features.

Battery type

The standard setting is the most suitable for Victron Gel Deep Discharge, Gel Exide A200, and tubular plate stationary batteries (OPzS). This setting can also be used for many other batteries: e.g. Victron AGM Deep Discharge and other AGM batteries, and many types of flat-plate flooded batteries.

With VEConfigure the charge algorithm can be adjusted to charge any battery type (Nickel Cadmium batteries, Lithium-ion batteries)

Absorption time

In case of the standard setting 'Four-stage adaptive with BatterySafe mode' the absorption time depends on the bulk time (adaptive charge curve), so that the battery is optimally charged.

10.2.1. # Equalisation

Traction batteries require regular additional charging. In the equalisation mode, the product will charge with increased voltage for one hour (4V for a 48V battery). The charging current is then limited to 1/4 of the set value.

Equalisation mode supplies a higher charging voltage than most DC consuming devices can cope with. These devices must be disconnected before additional charging takes place.

Automatic equalisation charging

This setting is intended for flooded tubular plate traction or OPzS batteries. During absorption the voltage limit increases to 2,83V/cell (68V for a 48V battery) once the charge current has tapered down to less than 10% of the set maximum current.

See 'tubular plate traction battery charge curve' in VEConfigure.

Storage voltage, Repeated Absorption Time, Absorption Repeat Interval

See Appendix E.

Bulk Protection

When this setting is 'on', the bulk charging time is limited to 10 hours. A longer charging time could indicate a system error (e.g. a battery cell short-circuit).

AC input current limit

These are the current limit settings for which PowerControl and PowerAssist come into operation.

PowerAssist setting range: from 5,3 A to 32 A.

Factory setting: the maximum value (32 A).

UPS feature

If this setting is 'on' and AC on the input fails, the product switches to inverter operation practically without interruption.

The output voltage of some small generator sets is too unstable and distorted for using this setting – the product would continually switch to inverter operation. For this reason, the setting can be turned off. The product will then respond less quickly to AC input voltage deviations. The switchover time to inverter operation is consequently slightly longer, but most equipment (most computers, clocks or household equipment) is not adversely impacted.

Recommendation: Turn the UPS feature off if the product fails to synchronise, or continually switches back to inverter operation.

Dynamic current limiter

Intended for generators, the AC voltage being generated by means of a static inverter (so-called 'inverter' generators). In these generators, engine rpm is reduced in case of low load: this reduces noise, fuel consumption and pollution. A disadvantage is that the output voltage will drop severely or even completely fail in the event of a sudden load increase. More load can only be supplied after the engine is up to speed.

If this setting is 'on', the device will start supplying extra power at a low generator output level and gradually allow the generator to supply more, until the set current limit is reached. This allows the generator engine to get up to speed.

This setting is also often used for 'classical' generators that respond slowly to sudden load variation.

Weak AC

Strong distortion of the input voltage can result in the charger hardly operating or not operating at all. If WeakAC is set, the charger will also accept a strongly distorted voltage, at the cost of greater distortion of the input current.

Recommendation : Turn WeakAC on if the charger is hardly charging or not charging at all (which is quite rare!). Also turn on the dynamic current limiter simultaneously, and reduce the maximum charging current to prevent overloading the generator if necessary.

Note: when WeakAC is on, the maximum charge current is reduced by approximately 20%.

BoostFactor This value adjusts the PowerAssist behaviour. If you are experiencing issues with PowerAssist (e.g. overload), please consult with a specialist trained by Victron Energy before attempting to modify.

Programmable relay

The device is equipped with multiple programmable relays. These relays can be programmed for all kinds of other applications, for example as a starter relay for a generator.

Auxiliary AC output (AC-out-2)

Intended for non-critical loads and directly connected to the AC input. With current measurement circuit to enable PowerAssist.

10.3. [# Wechselrichter/Ladegerät](#)

Weitere Informationen zur Konfiguration der Wechselrichter-/Ladekomponente des EasySolar-II GX finden Sie in den [MultiPlus-II-Handbüchern] (<https://www.victronenergy.com/inverters-chargers/multiplus-ii#manuals>).

Die volle Programmierfunktionalität des Wechselrichters / Ladegeräts erfordert die Verwendung eines Laptops mit [VEConfigure](#). Eine eingeschränkte Konfiguration ist möglich mit [VictronConnect](#)

10.4. [# SmartSolar MPPT 250/70 Laderegler](#)

Das Solarladegerät wird über VictronConnect konfiguriert. Die einfachste Methode, sich mit dem Solarladegerät zu verbinden, ist über Bluetooth. Dies funktioniert mit Android, iOS und macOS. Es funktioniert nicht mit Windows.

Wenn Sie Windows verwenden möchten, trennen Sie das VE.Direct-Kabel vom Solarladegerät und verwenden Sie ein [VE.Direct USB-Schnittstellenkabel] (<https://www.victronenergy.com/accessories/ve-direct-to-usb-interface>) an Ihrem Windows-Laptop. Nach Fertigstellung schließen Sie das VE.Direct-Kabel, das zwischen dem internen GX-Gerät und dem Solarladegerät verläuft, wieder an.

Die vollständige Dokumentation für das im EasySolar-II GX enthaltene MPPT finden Sie in diesen Dokumenten:

- [SmartSolar MPPT 250/70 Dokumentation](#)
- [VictronConnect MPPT Solarladegeräte](#)
- [VictronConnect Handbuch](#)

11. # Wartung

The product does not require specific maintenance. It will suffice to check all connections once a year. Avoid moisture and oil/soot/vapours, and keep the device clean.

12. # Fehleranzeigen

Mit den folgenden Verfahren können die meisten Fehler schnell identifiziert werden. Wenn ein Fehler nicht behoben werden kann, wenden Sie sich bitte an Ihren Victron Energy Versorger.

12.1. # Allgemeine Fehleranzeigen

Problem	Ursache	Lösung
Keine Ausgangsspannung am AC-Ausgang 2.	EasySolar-II GX im Wechselrichtermodus	
Die Einheit schaltet nicht auf Generator- oder Netzbetrieb um.	Der Leistungsschalter oder die Sicherung im AC-Eingang ist aufgrund von Überlastung geöffnet.	Überlast oder Kurzschluss am AC-Ausgang 1 oder AC-Ausgang 2 beseitigen und Sicherung/Schalter zurücksetzen.
Der Wechselrichterbetrieb wurde beim Einschalten nicht eingeleitet.	Die Batteriespannung ist übermäßig hoch oder zu niedrig. Keine Spannung am DC-Anschluss.	Stellen Sie sicher, dass die Batteriespannung im richtigen Bereich liegt.
'Schwache Batterie'	Die Batteriespannung ist niedrig.	Laden Sie die Batterie auf oder überprüfen Sie die Batterieanschlüsse.
'Schwache Batterie' (Herunterfahren)	Der Umrichter schaltet sich aus, weil die Batteriespannung zu niedrig ist.	Laden Sie die Batterie auf oder überprüfen Sie die Batterieanschlüsse.
'Überlastung'	Die Umrichterlast ist höher als die Nennlast.	Reduzieren Sie die Last.
'Überlastung' (Herunterfahren)	Der Umrichter wird aufgrund zu hoher Last abgeschaltet.	Reduzieren Sie die Last.

'Übertemperatur'	Die Umgebungstemperatur ist hoch oder die Last ist zu hoch.	Installieren Sie den Umrichter in einer kühlen und gut belüfteten Umgebung oder reduzieren Sie die Last.
'Schwache Bat V Überlastung' (Herunterfahren)	Niedrige Batteriespannung und übermäßig hohe Last.	Laden Sie die Batterien auf, trennen oder reduzieren Sie die Last oder installieren Sie Batterien mit höherer Kapazität. Setzen Sie kürzere bzw. dickere Batteriekabel ein.
'Hohe DC-Restwelligkeit'	Die Brummspannung am DC-Anschluss übersteigt 1,5Vrms.	Überprüfen Sie die Batteriekabel und Batterieanschlüsse. Überprüfen Sie, ob die Batteriekapazität ausreichend hoch ist, und erhöhen Sie diese bei Bedarf.
'DC-Restwelligkeit Herunterfahren'	Der Wechselrichter wird aufgrund einer übermäßig hohen Brummspannung am Eingang abgeschaltet.	Installieren Sie Batterien mit einer größeren Kapazität. Setzen Sie kürzere bzw. dickere Batteriekabel ein und setzen Sie den Wechselrichter zurück (aus- und wieder einschalten).
Das Ladegerät ist außer Betrieb.	Die AC-Eingangsspannung oder -frequenz liegt nicht innerhalb des eingestellten Bereichs.	Stellen Sie sicher, dass der AC-Eingang zwischen 185VAC und 265VAC liegt und dass die Frequenz innerhalb des eingestellten Bereichs liegt (Standardeinstellung 45-65 Hz).
	Der Leistungsschalter oder die Sicherung im AC-Eingang ist aufgrund von Überlastung geöffnet.	Überlast oder Kurzschluss am AC-Ausgang 1 oder AC-Ausgang 2 beseitigen und Sicherung/Schalter zurücksetzen.
	Die Batteriesicherung ist durchgebrannt.	Ersetzen Sie die Batteriesicherung.
	Die Verzerrung oder die AC-Eingangsspannung ist zu groß (in der Regel Generatorversorgung).	Schalten Sie die Einstellungen WeakAC und Dynamic Current Limiter (dynamischen Strombegrenzer) ein.
Das Ladegerät ist außer Betrieb. 'Schüttgutschutz' dargestellt.	EasySolar-II GX befindet sich im Modus 'Schüttgutschutz'-Modus, wodurch die maximale Schüttgut-Ladezeit von 10 Stunden überschritten wird. Eine so lange Ladezeit kann auf einen Systemfehler (z.B. Kurzschluss der Batteriezelle) hinweisen.	Überprüfen Sie Ihre Batterien. HINWEIS: Sie können den Fehlermodus zurücksetzen, indem Sie das EasySolar-II GX aus- und wieder einschalten. Die werkseitige Standardeinstellung des EasySolar-II GX im Modus 'Schüttgutschutz' ist eingeschaltet. Der 'Schüttgutschutz'-Modus kann nur mit Hilfe von VEConfigure ausgeschaltet werden.
Die Batterie ist nicht vollständig geladen.	Der Ladestrom ist übermäßig hoch, was zu einer vorzeitigen Absorptionsphase führt.	Stellen Sie den Ladestrom auf ein Niveau zwischen dem 0,1- und 0,2-fachen der Batteriekapazität ein.
	Schlechte Batterieverbinding.	Überprüfen Sie die Batterieanschlüsse.
	Die Absorptionsspannung wurde auf einen falschen Level (zu niedrig) eingestellt.	Stellen Sie die Absorptionsspannung auf den richtigen Level ein.
	Die Erhaltungsspannung wurde auf einen falschen Level (zu niedrig)	Stellen Sie die Erhaltungsspannung auf den richtigen Level ein.



	eingestellt.	
	Die verfügbare Ladezeit ist zu kurz, um die Batterie vollständig aufzuladen.	Wählen Sie eine längere Ladezeit oder einen höheren Ladestrom.
	Die Absorptionszeit ist zu kurz. Beim adaptiven Laden kann dies durch einen extrem hohen Ladestrom in Bezug auf die Batteriekapazität verursacht werden, so dass die Schüttgut-Zeit unzureichend ist.	Reduzieren Sie den Ladestrom oder wählen Sie die 'festen' Ladecharakteristiken.
Die Batterie ist überladen.	Die Absorptionsspannung ist auf einen falschen Level (zu hoch) eingestellt.	Stellen Sie die Absorptionsspannung auf den richtigen Level ein.
	Die Erhaltungsspannung ist auf einen falschen Level (zu hoch) eingestellt.	Stellen Sie die Erhaltungsspannung auf den richtigen Level ein.
	Schlechter Batteriezustand.	Ersetzen Sie die Batterie.
	Die Batterietemperatur ist zu hoch (aufgrund schlechter Belüftung, zu hoher Umgebungstemperatur oder übermäßig hohem Ladestrom).	Verbessern Sie die Belüftung, installieren Sie die Batterien in einer kühleren Umgebung, reduzieren Sie den Ladestrom, und schließen Sie den Temperatursensor an.
Der Ladestrom sinkt auf 0, sobald die Absorptionsphase beginnt.	Defekter Batterietemperatursensor	Trennen Sie den Stecker des Temperatursensors am EasySolar-II GX. Wenn das Laden nach ca. 1 Minute korrekt funktioniert, sollte der Temperatursensor ausgetauscht werden.
	Die Batterie ist überhitzt (+50 °C)	Installieren Sie die Batterie in einer kühleren Umgebung
		Reduzieren Sie den Ladestrom
		Überprüfen Sie, ob eine der Batteriezellen einen internen Kurzschluss hat

12.2. # VE.Bus-Fehlercodes

A VE.Bus system can display various error codes. These codes are displayed on the front GX display screen.

To interpret a VE.Bus error code correctly, you should refer to the VE.Bus error codes documentation -

https://www.victronenergy.com/live/ve.bus:ve.bus_error_codes.

Code	Meaning:	Cause/solution:
1	Device is switched off because one of the other phases in the system has switched off.	Check the failing phase.
3	Not all, or more than, the expected devices were found in the system.	The system is not properly configured. Reconfigure the system. If the error persists, possible communication cable error. Check the

		cables and switch all equipment off, and then on again.
4	No other device whatsoever detected.	Check the communication cables.
5	Overvoltage on AC-out.	Check the AC cables.
10	System time synchronisation problem occurred.	Should not occur in correctly installed equipment. Check the communication cables.
14	Device cannot transmit data.	Check the communication cables (there may be a short circuit).
17	One of the devices has assumed 'master' status because the original master failed.	Check the failing unit. Check the communication cables.
18	Overvoltage has occurred.	Check AC cables.
22	This device cannot function as 'slave'.	This device is an obsolete and unsuitable model. It should be replaced.
24	Switch-over system protection initiated.	Should not occur in correctly installed equipment. Switch all equipment off, and then on again. If the problem recurs, check the installation. Possible solution: increase lower limit of AC input voltage to 210 VAC (factory setting is 180 VAC)
25	Firmware incompatibility. The firmware of one of the connected devices is not sufficiently up to date to operate in conjunction with this device.	1) Switch all equipment off. 2) Switch the device returning this error message on. 3) Switch on all other devices one by one until the error message reoccurs. 4) Update the firmware in the last device that was switched on.
26	Internal error.	Should not occur. Switch all equipment off, and then on again. Contact Victron Energy if the problem persists.

13. # Spezifikationen

13.1. # Wechselrichter/Ladegerät

Spezifikationen	
PowerControl & PowerAssist	ja
Transferschalter	32A
Maximaler AC-Eingangstrom	32 A
Hilfsausgang	32 A
Wechselrichter	
Eingangsspannungsbereich	38 - 66 V
Ausgang	Ausgangsspannung: 230 VAC $\pm$ 2% Frequenz: 50 Hz $\pm$ 0,1% (1)
Kontinuierliche Ausgangsleistung bei 25°C (3)	3000 VA / 2400 W
Kontinuierliche Ausgangsleistung bei 40°C / 65°C	2200 W / 1700 W
Maximale Scheineinspeiseleistung	2500 VA
Spitzenleistung	5500 W

Maximale Effizienz	95%
Nulllastleistung	11 W
Nulllastleistung im AES-Modus	7 W
Nulllastleistung im Suchmodus	2 W
Ladegerät	
AC-Eingang	Eingangsspannungsbereich: 187-265 VAC Eingangsfrequenz: 45 – 65 Hz
Ladespannung 'Absorption'	57,6 V
Ladespannung 'Erhaltung'	55,2 V
Speichermodus	52,8 V
Maximaler Batterieladestrom (4)	35 A
Batterietemperatursensor	ja
Programmierbares Relais (5)	ja
Schutz (2)	a-g
VE.Bus-Kommunikationsanschluss	Für Parallel- und Dreiphasenbetrieb, Fernüberwachung und Systemintegration
Universal-Com-Port	Ja, 2x

13.2. # Solar-Laderegler MPPT

Spezifikationen	
Modell	SmartSolar MPPT 250/70-Tr
Maximaler Ausgangsstrom	70 A
Maximale PV-Leistung	4000 W
Maximale PV Leerlaufspannung	250 V
Maximale Effizienz	98%
Eigenverbrauch	20 mA
Ladespannung 'Absorption', Standard	57,6 V
Ladespannung 'Erhaltung', Standardeinstellung	55,2 V
Schutz (2)	a-e

13.3. # Allgemein

Spezifikationen	
Schnittstellen	BMS-Can Port (VE.Can nicht unterstützt), USB, Ethernet, VE.Direct, Wi-Fi
Remote Ein/Aus	ja
Betriebstemperaturbereich	-40 bis +65 °C (lüftergestützte Kühlung)

Luftfeuchtigkeit (nicht kondensierend):	max 95%
Gehäuse	
Material & Farbe	Aluminium (blau RAL 5012)
Schutzart	IP21
Batterieanschluss	M8-Schrauben
PV-Anschluss	M6-Schrauben
230 V AC-Anschluss	Schraubklemmen 13 mm ² (6 AWG)
Gewicht	26 kg
Abmessungen (HxBxT)	506 x 275 x 237 mm
Normen	
Sicherheit	EN-IEC 60335-1, EN-IEC 60335-2-29 EN-IEC 62109-1, EN-IEC 62109-2
Emission / Immunität	EN 55014-1, EN 55014-2, EN-IEC 61000-3-2, EN-IEC 61000-3-3, IEC 61000-6-1, IEC 61000-6-2, IEC 61000-6-3
Anti-Islanding (Einrichtung zur Netzüberwachung mit zugeordneten Schaltorganen)	Siehe Produktseite

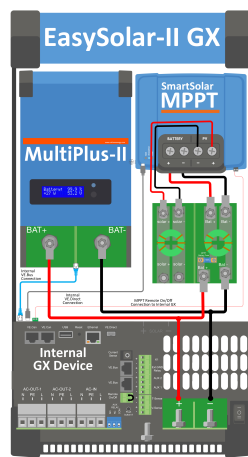
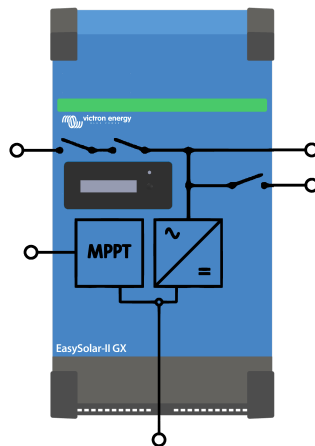
1. Kann auf 60 Hz eingestellt werden
2. Schutzschlüssel:
 - i. Ausgangskurzschluss
 - ii. Überlastung
 - iii. Batteriespannung zu hoch
 - iv. Batteriespannung zu niedrig
 - v. Temperatur zu hoch
 - vi. 230 VAC am Wechselrichterausgang
 - vii. Eingangsspannungswelligkeit zu hoch
3. Nichtlineare Last, Scheitelfaktor 3:1
4. Bei 25°C Umgebung
5. Programmierbares Relais, das für Sammelalarm, Gleichstrom unter Spannung oder Start/Stopp-Funktion des Aggregats eingestellt werden kann. AC-Nennwert: 230 V/4 A, DC-Nennwert: 4 A bis zu 35 VDC und 1 A bis zu 60 VDC

13.4. <#> GX-Gerät

GX-Karte Spezifikationen	
Benutzeroberfläche	
Anzeige	2x16-stellige Anzeige
Remote-Konsole	ja
Summer	ja
Victron comm. Ports	
VE.Direct Ports (immer isoliert)	1

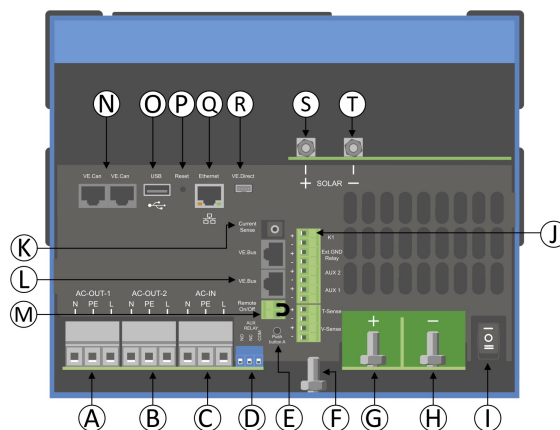
Dedizierter BMS-Can-Port (VE.Can nicht unterstützt)	2 parallele RJ45-Buchsen - isoliert
VE.Bus	2 parallele RJ45-Buchsen - isoliert
Nicht-Victron-Produkte	
Canbus-BMS-Batterien	Viele Batteriemarken. Details finden Sie hier
Fronius PV-Wechselrichter	Details finden Sie hier
SMA PV-Wechselrichter	Details finden Sie hier
ABB PV-Wechselrichter	Details finden Sie hier
SolarEdge PV-Wechselrichter	Details finden Sie hier
Kommunikation	
USB	1 USB-Host-Anschluss - nicht isoliert
Ethernet	10/100 RJ45 Buchse
WiFi	eingebaut
Bluetooth Smart	nein
Micro-SDcard-Slot	nein
Zweiter CAN-Bus-Port	nein
VE.Can-Port	nein
Eingebauter RS485	nein
IO	
Programmierbares Relais ⁽⁷⁾	n/v
Resistive Tankpegeleingänge	nein
Temperaturfühler-Eingänge	nein
Digitale Eingänge	nein
Leistung	
CPU	Quad-Core
RAM	512MB
Max. VE.Direct Geräte ⁽¹⁾	25
Sonstige	
Versorgungsspannung	intern versorgt, keine externe Versorgung
Montage	Eingebaut
Betriebstemperatur	-20 bis +50°C
Batterie-Backup-Uhr	ja

14. # Interne Topographie



15. # Fehlerbehebung

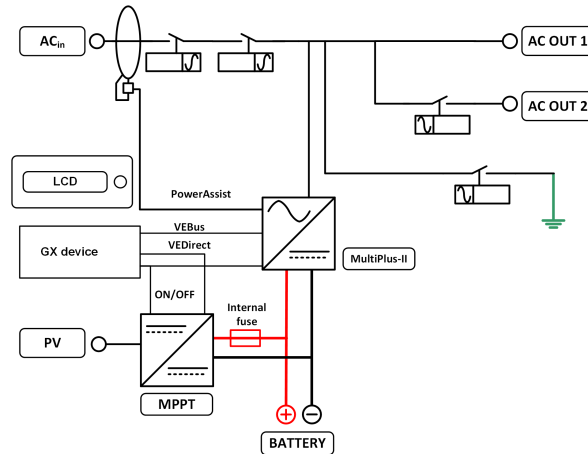
16. # Anhang A: Verbindungsübersicht



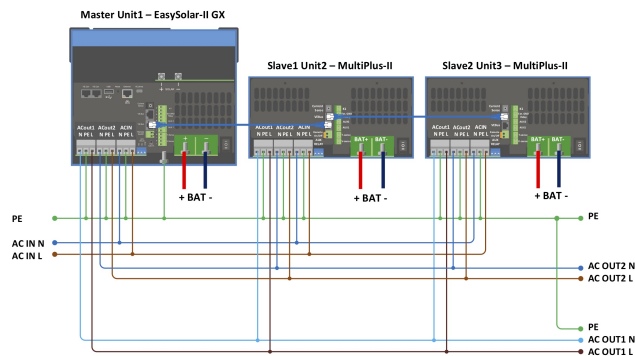
Referenz	Beschreibung	Anschluss
A	Lastanschluss. AC-AUSGANG-1 Von links nach rechts:	N (neutral), PE (Erde/Masse), L (Phase)
B	Lastanschluss. AC-AUSGANG-2 Von links nach rechts:	N (neutral), PE (Erde/Masse), L (Phase)

C	AC-Eingang. AC-EINGANG Von links nach rechts:	N (neutral), PE (Erde/Masse), L (Phase)
D	Alarmkontakt: von links nach rechts	NO, NC, COM.
E	Start ohne Assistenten	Drücken und halten Sie diese Taste beim Start
F	Primärer Erdungsanschluss	M6 (PE)
G	Batterie-Plusanschluss.	M8
H	Batterie Minusanschluss.	M8
I	Schalter	-:On, 0:Off, =:Nur Ladegerät
J	Klemmen von oben nach unten:	
		12 V 100 mA
		Programmierbarer Kontakt K1 offener Kollektor 70 V 100 mA
		Externes Erdungsrelais +
		Externes Erdungsrelais –
		Aux-Eingang 1 +
		Aux-Eingang 1 –
		Aux-Eingang 2 +
		Aux-Eingang 2 –
		Temperaturfühler +
		Temperaturfühler –
		Batterie-Spannungsfühler +
		Batterie-Spannungsfühler –
K	Externer Stromsensor	
L	2x RJ45 VE-BUS-Anschluss	für Fernbedienung bzw. Parallel- / Dreiphasenbetrieb
M	Anschluss für Fernschalter	Kurze Verbindung zum Schalter "An".
N	Dedizierter BMS-Can-Port (VE.Can nicht unterstützt)	
O	USB	
P	Rückstellknopf	Wofür wird der Rückstellknopf verwendet? MCO
Q	Ethernet-Port	
R	VE.Direct Port	
S	Solar-Positive M6-Schraube	
T	Solar-Negative M6-Schraube	

17. # Anhang B : Blockschaltbild

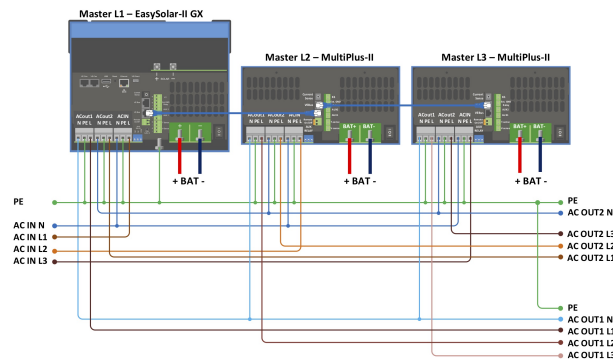


18. # Anhang C: Parallele Verbindungen



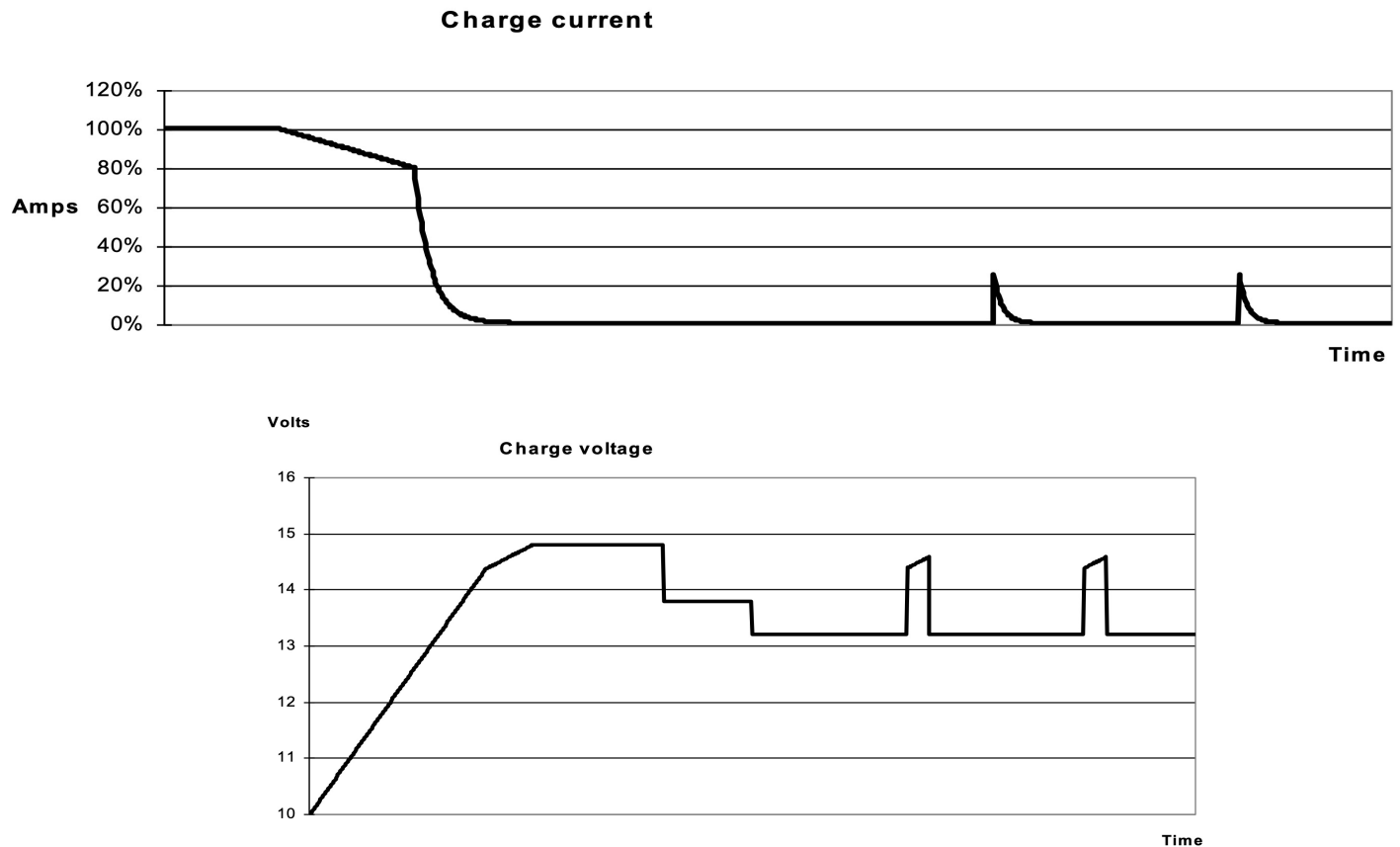
Zusätzliche Bedingungen sind für parallele Systeme erforderlich - bitte lesen Sie weitere spezifische Dokumentation hier - https://www.victronenergy.com/live/ve.bus:manual_parallel_and_three_phase_systems

19. # Anhang D: Dreiphasenanschlüsse



Zusätzliche Bedingungen sind für Dreiphasensysteme erforderlich - bitte lesen Sie weitere spezifische Dokumentationen hier - https://www.victronenergy.com/live/ve.bus:manual_parallel_and_three_phase_systems

20. # Anhang E: Ladungscharakteristik



20.1. # 4-stufige Aufladung:

Schütt Wird eingegeben, wenn das Ladegerät gestartet wird. Der Konstantstrom wird bis zum Erreichen der Batterienennspannung in Abhängigkeit von Temperatur und Eingangsspannung angelegt, danach wird konstante Leistung bis zum Beginn einer übermäßigen Begasung (28,8 V bzw. 57,6 V, temperaturkompensiert) angelegt.

20.1.1. # Batterieschutz

Die an die Batterie angelegte Spannung wird schrittweise angehoben, bis die eingestellte Absorptionsspannung erreicht ist. Der abgesicherter Modus der Batterie ist Teil der berechneten Absorptionszeit.

20.1.2. # Absorption

Der Absorptionszeitraum ist abhängig vom Schüttgutzeitraum. Die maximale Absorptionszeit ist die eingestellte maximale Absorptionszeit.

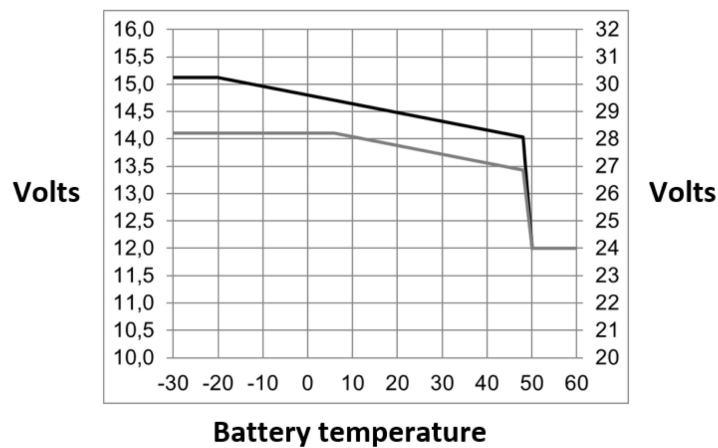
20.1.3. # Erhaltung

Es wird eine Erhaltungsspannung angelegt, um die Batterie voll aufgeladen zu halten

20.1.4. # Lagerung

Nach einem Tag Erhaltungsladung wird die Ausgangsspannung auf Speicherniveau reduziert. Dies sind 26,4 V bzw. 52,8 V (bei 24 V und 48 V Ladegerät). Dadurch wird der Wasserverlust auf ein Minimum reduziert, wenn die Batterie für die Wintersaison gelagert wird. Nach einer einstellbaren Zeit (Standard = 7 Tage) wechselt das Ladegerät für eine einstellbare Zeit (Standard = eine Stunde) in den wiederholten Absorptionsmodus, um den Akku zu 'aktualisieren'.

21. # Anhang F: Temperaturkompensation



Die Standardausgangsspannungen für Erhaltung und Absorption liegen bei 25 °C. Die reduzierte Erhaltungsspannung folgt der Erhaltungsspannung und die erhöhte Absorptionsspannung folgt der Absorptionsspannung. Im Einstellmodus erfolgt keine Temperaturkompensation.

22. # Anhang G: Abmessungen

