Multi and Quattro - Assistant programming

Online training

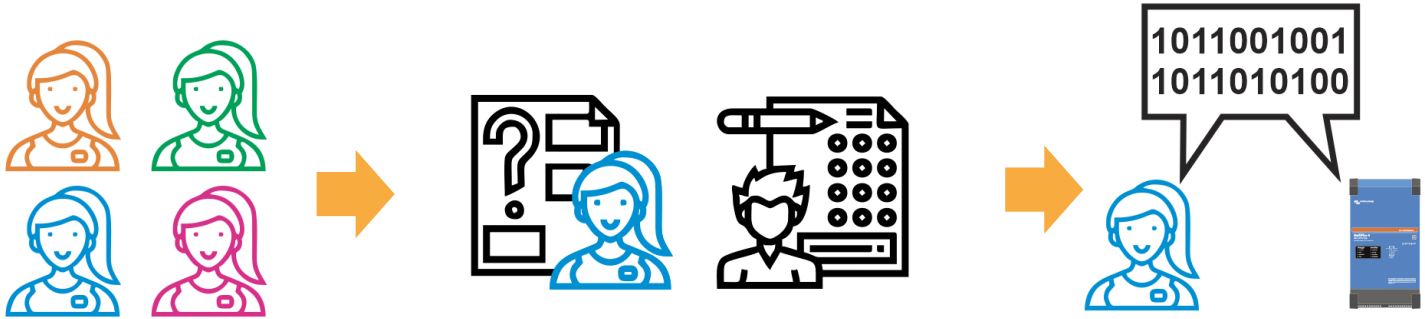
08/04/2020

What are assistants?

An assistant is a part of VEConfigure.

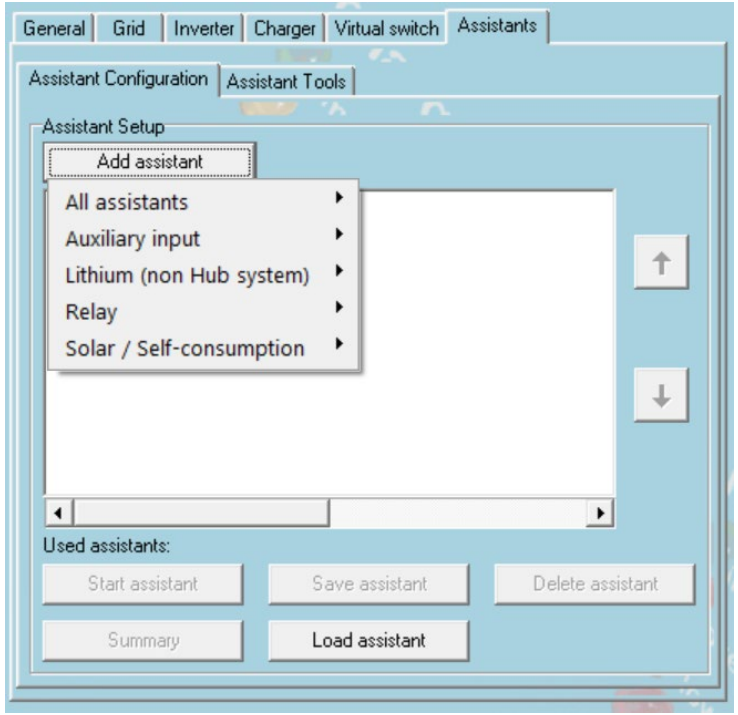
It assists you in programming a Multi or Quattro for a specific task, this is how:

- You chose the appropriate assistant
- The assistant asks some questions
- You answer these questions
- The assistant will program the Multi accordingly



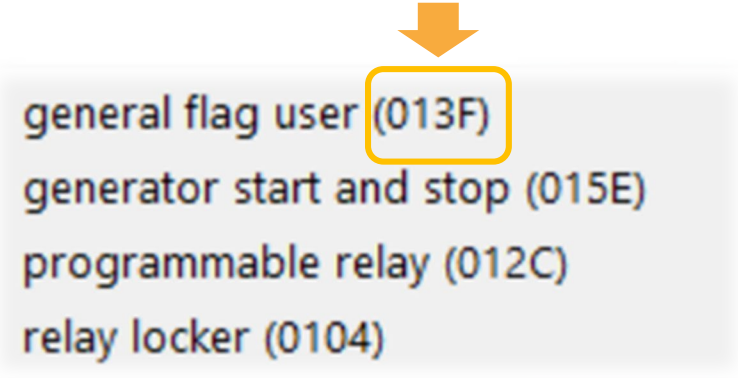
What can assistants do?

- Program an auxiliary input
- Program for lithium batteries
- Program a relay
- Program for AC PV solar or ESS



Some notes

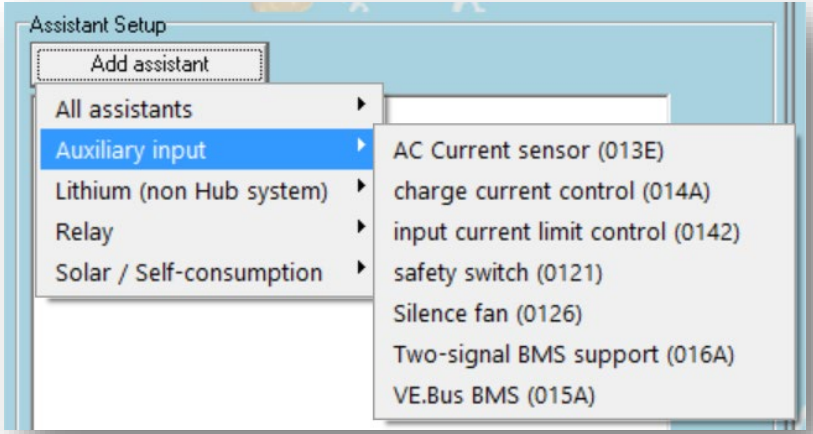
- When using assistants, the virtual switch cannot be used
- Assistants get updated or features are added every now and then, This is why they have a version number
- Each assistant has an intro text with an explanation, and sometimes a link to more information
- For assistant manuals also see: https://www.victronenergy.com/live/assistants:start



Auxiliary and Lithium assistants

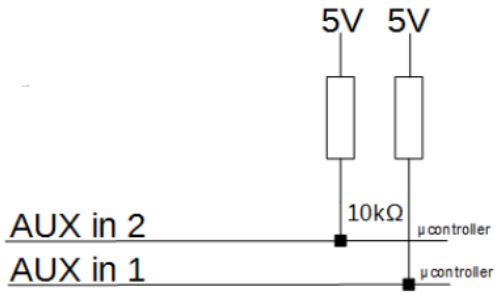
Auxiliary and Lithium assistants

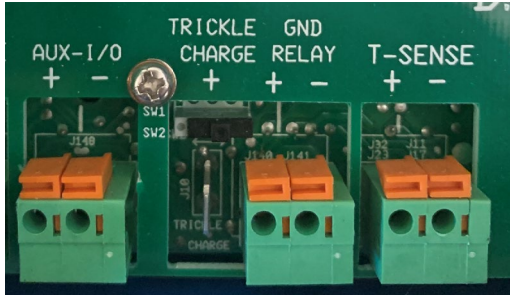
- AC current sensor
- Safety switch
- Charge current control
- Input limit control
- Silence fan
- Lithium VE.Bus BMS support
- Lithium Two-signal BMS support

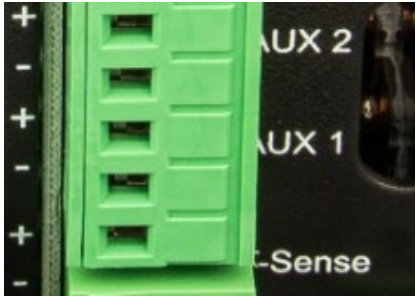


Aux port and Temperature port

- These are both ports that receive and read a input signal
- The input can be a voltage (0-5V), a resistance or an open or closed contact
- If the temperature sensor is not used (like is the case with lithium batteries) it too can be used as AUX port
- Small Multis only have a T-sense port, larger units have a T-sense and 1 or more Aux ports

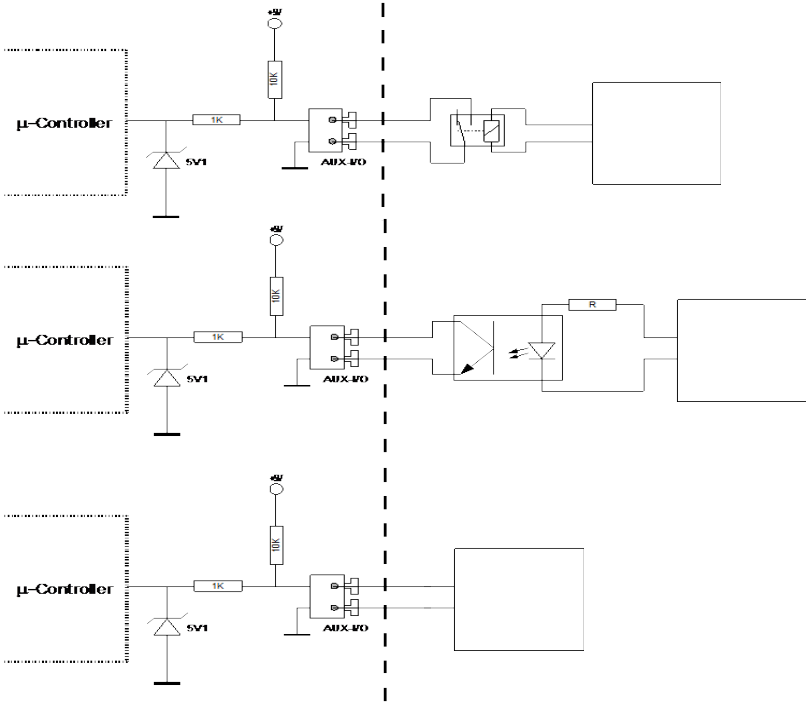






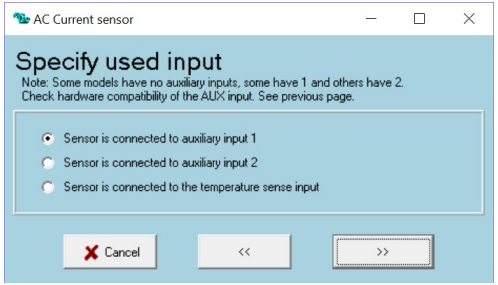
Usage examples Aux port

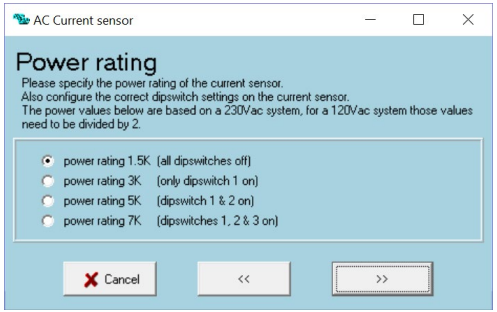
- With a relay
- With an optocoupler
- With a voltage signal (max 5V)
- Or with a resistance signal

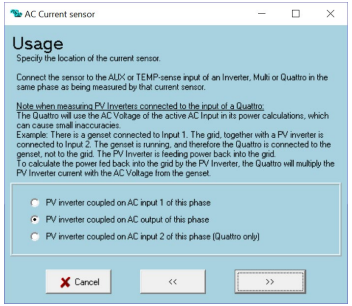


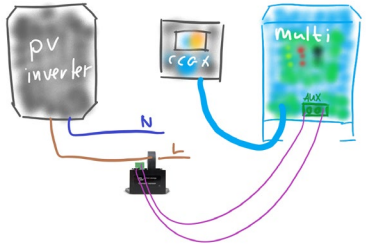
AC Current sensor Assistant

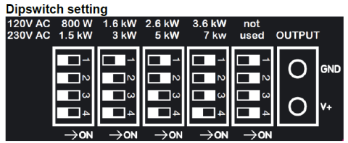
Use to display the current from a PV inverter on a GX device







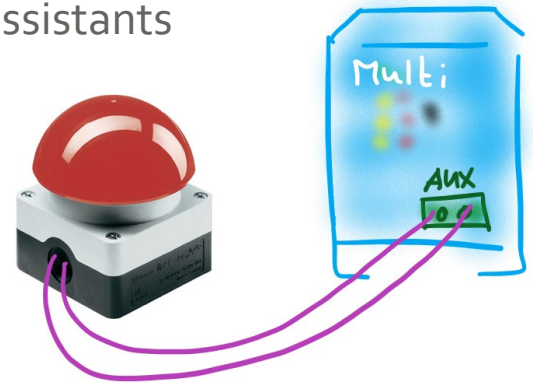


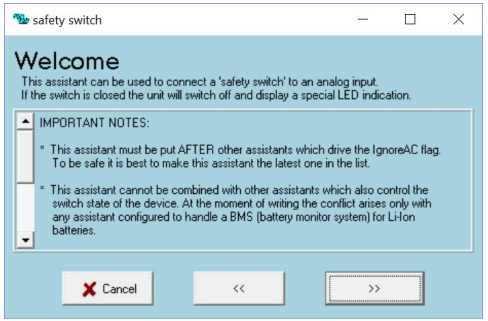


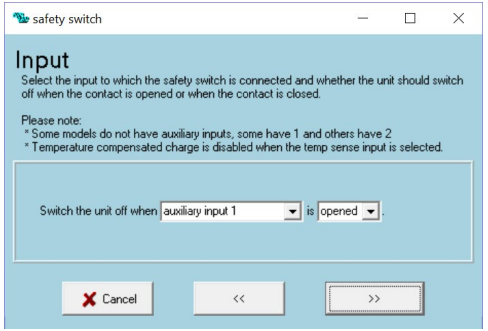
Safety switch Assistant

Use to switch off the AC output when an external switch is pressed

- Note that this assistant might conflict with lithium assistants



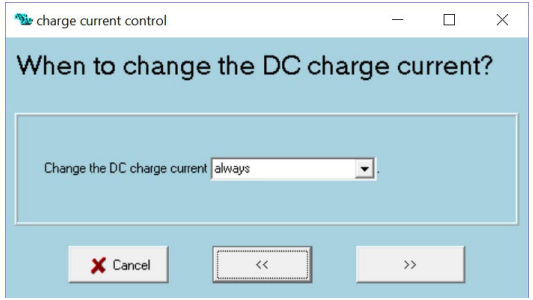


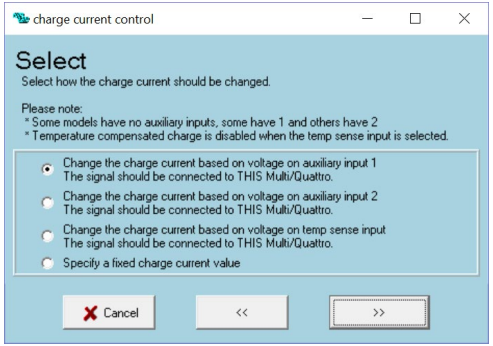


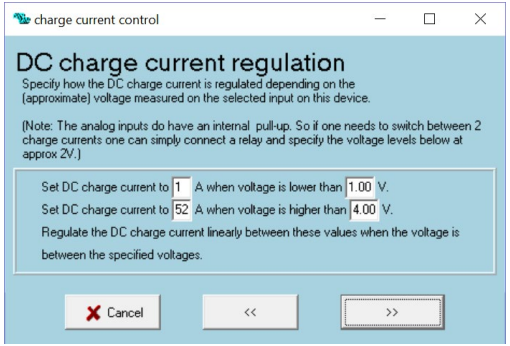
Charge current control Assistant

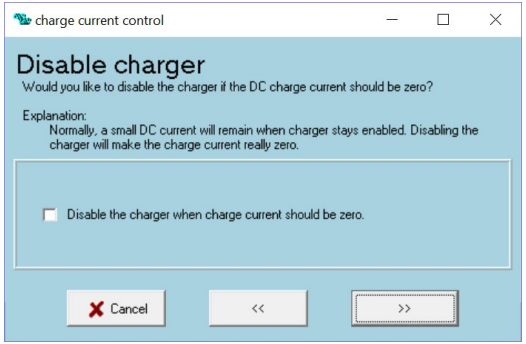
Use to change the charge current depending on:

- Which AC input is used
- Or status of AUX port





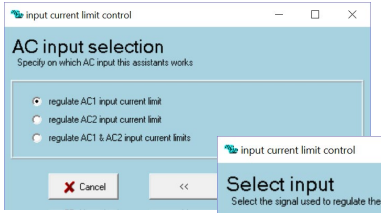


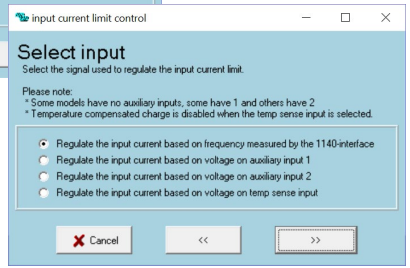


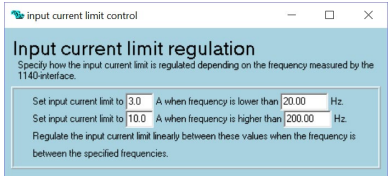
Input current limit control Assistant

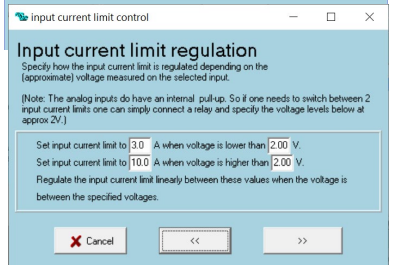
Use to limit the AC input current limit under these circumstances:

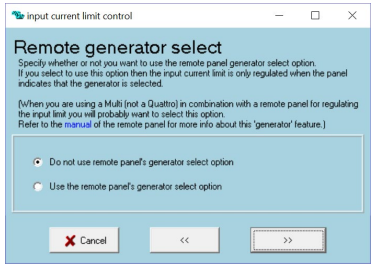
- The frequency of the 1140 interface: The available AC power depends on the rpm in variable speed generator, flywheel generator or water turbine.
- The voltage of the AUX port: for example below 3Vdc 10Aac input and above 3Vdc is 16Aac





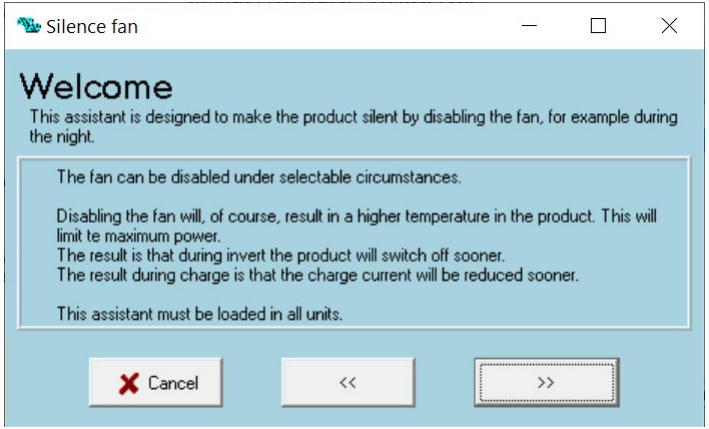


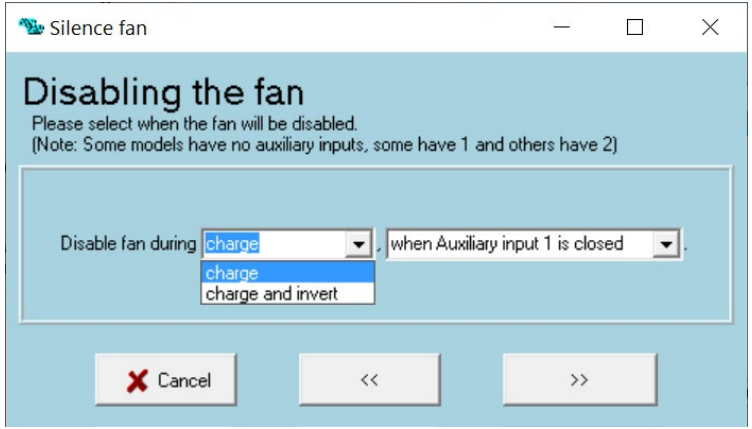




Silence Fan

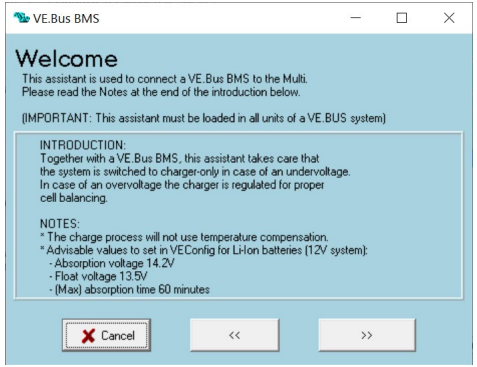
Use to silence the fan in the Multi under selectable circumstances

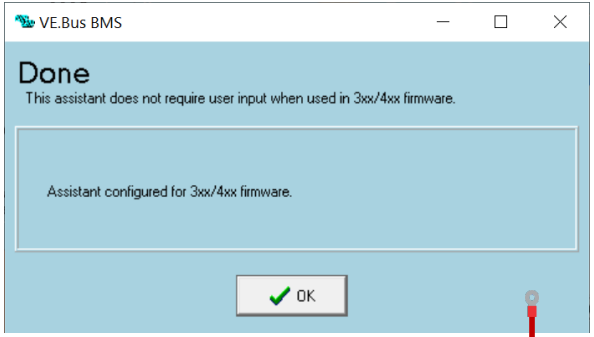


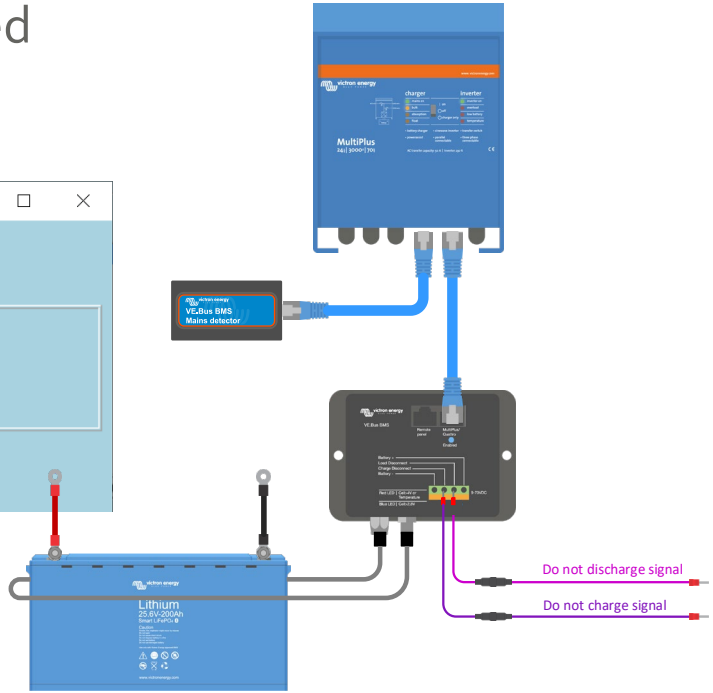


VE.Bus BMS Assistant

Use to tell Multi that a VE.Bus BMS is connected



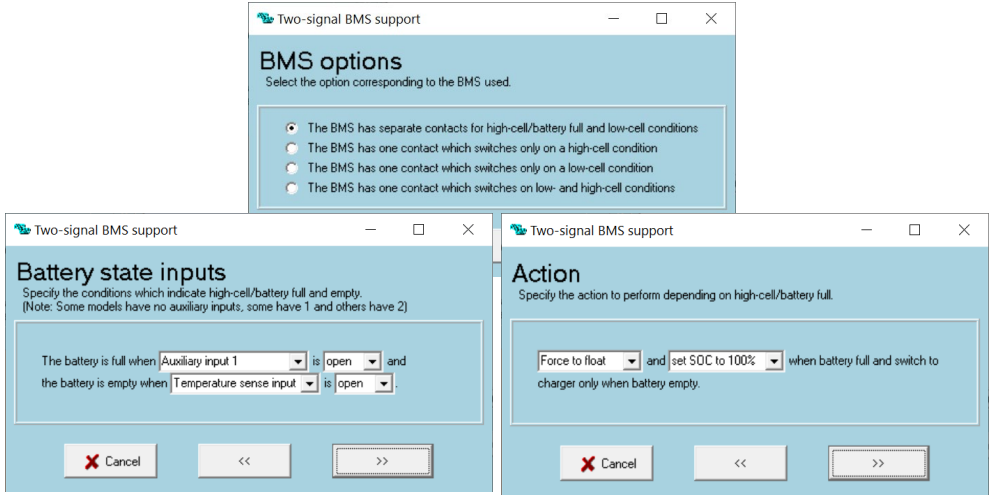


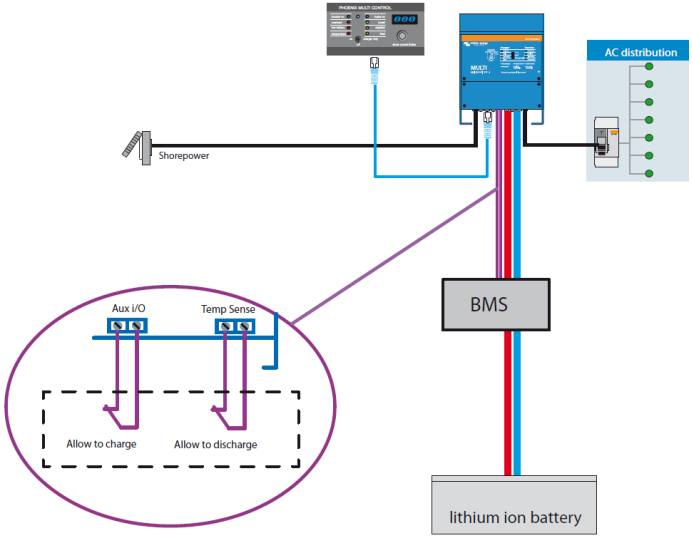


Two wire BMS support

Use to for two signal lithium BMS

- The AUX or Temp sense ports are used to communicate with the BMS

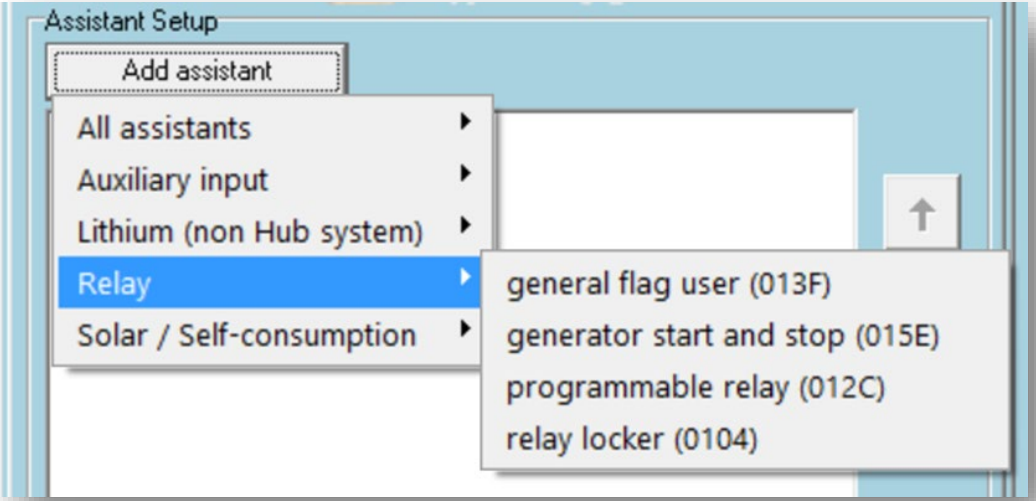




Relay Assistants

Relay assistants

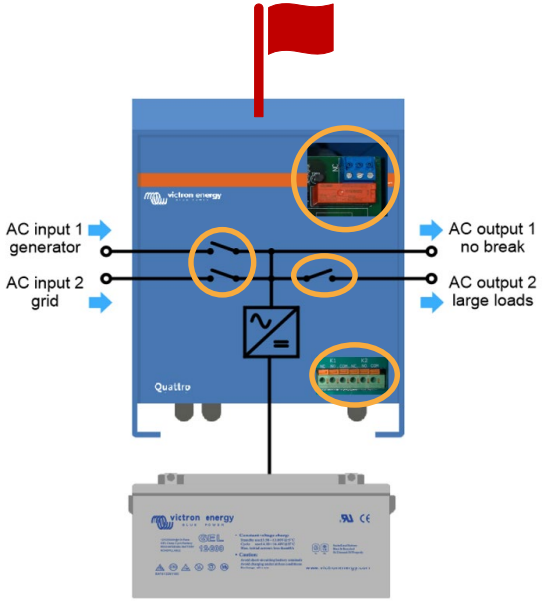
- Programable relay
- Relay locker
- General flag user
- Generator start and stop



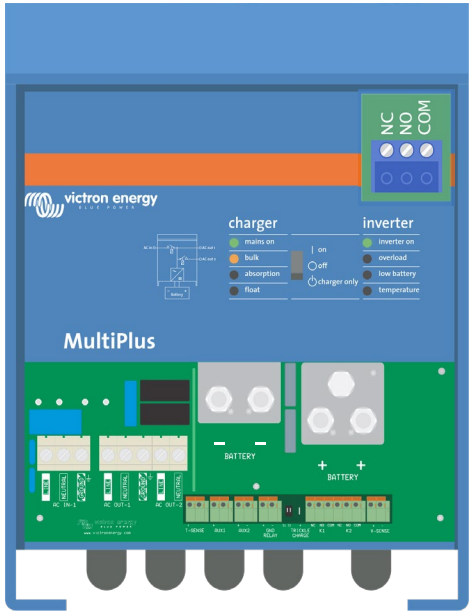
Relay assistants

These assistants drive a relay, an open colelctor or a software flag:

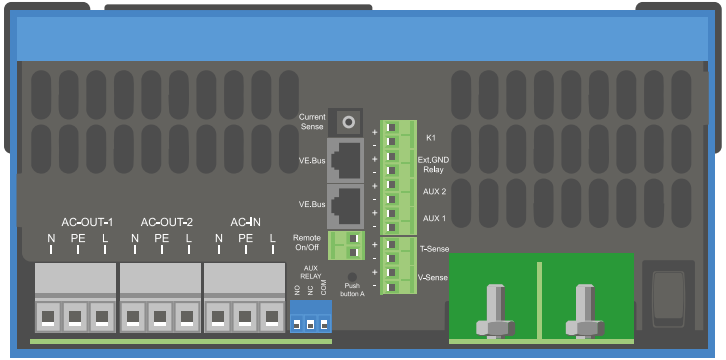
- Programmable relay
- K relays or open collector
- AC2 output relay
- AC input relays via the Flag



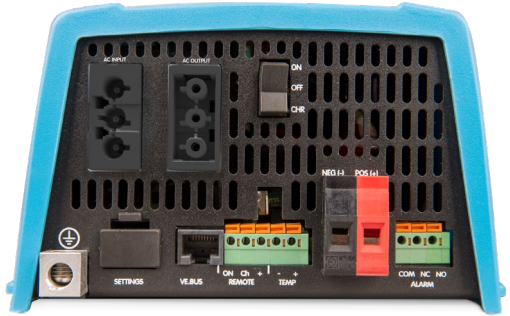
Location of relays and ports



MultiPlus and Quattro



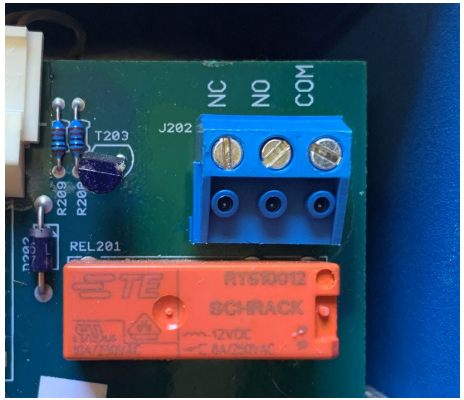
MultiPlus II



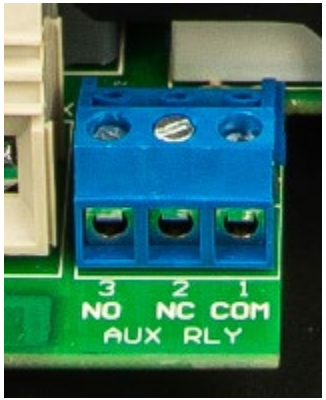
Small MultiPlus

Programable relay

- A relay acts as a switch, It makes and breaks a contact
- It is activated by a signal from the Multi

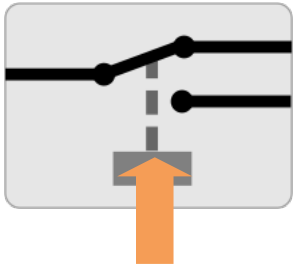


MultiPlus + Quattro



MultiPlus II

C=Common

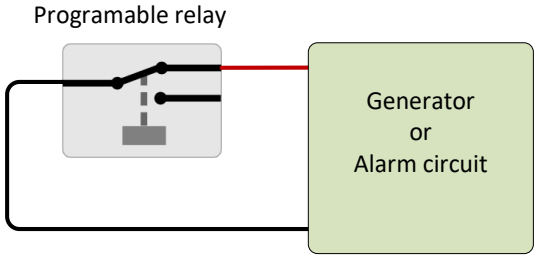


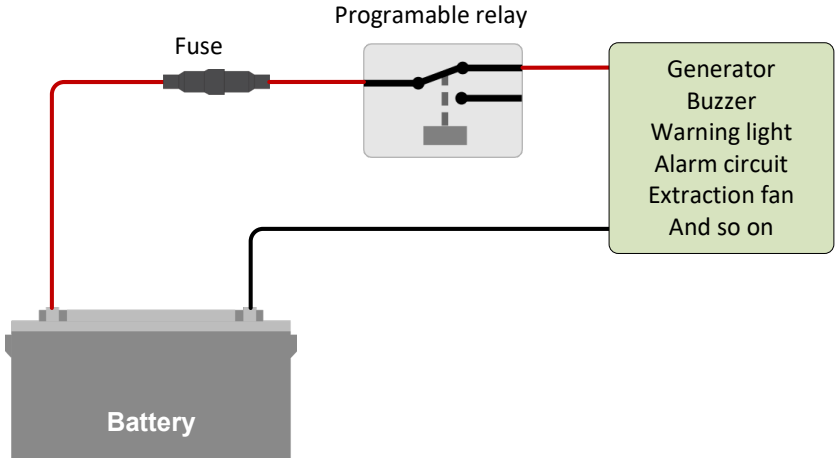
NC = Normally Closed

NO = Normally Open

Relay is driven by logic from Multi CPU

Usage examples

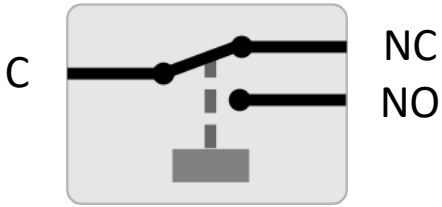


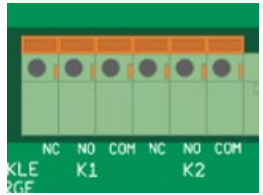


Secondary K relays

MultiPlus en Quattro:

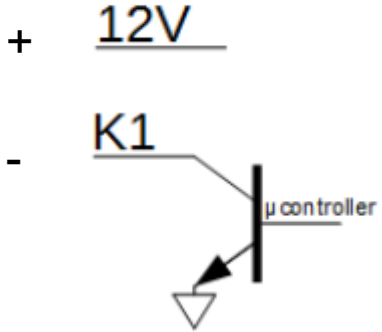
- Relay: Like the programable relay



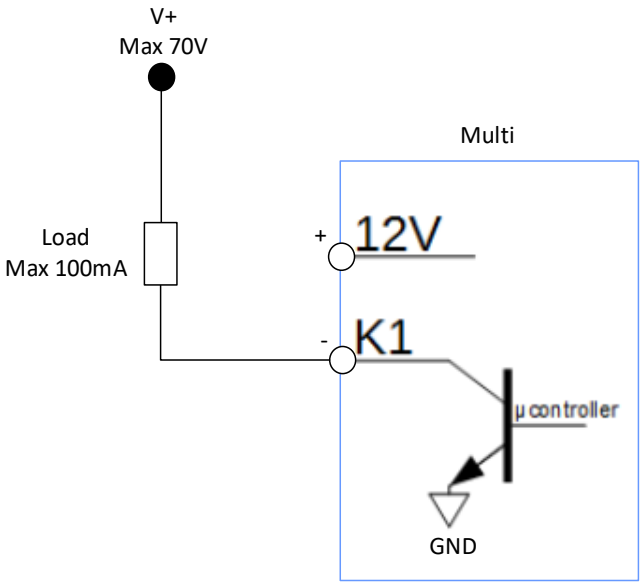


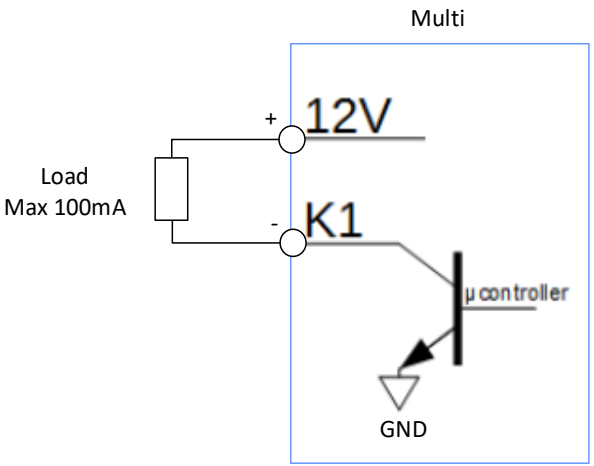
MultiPlusII

- Open collector
- + 12V 100mA supply
- - open collector 70V 100mA



Usage example open collector



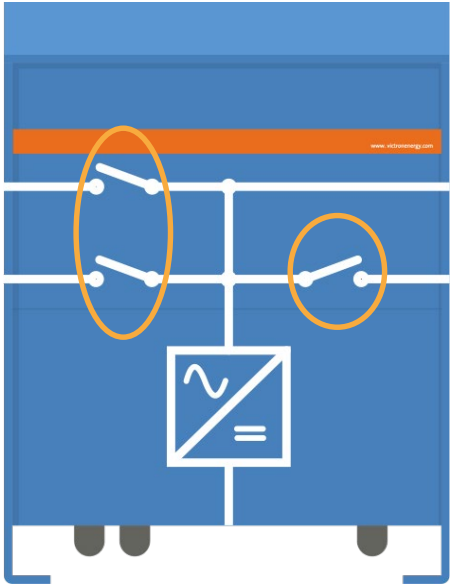


AC input and AC output

AC input 1

AC input 2

Via the general flag



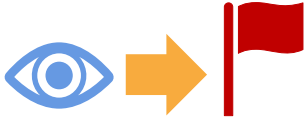
AC output 2

Via the relay assistant

General flag

- This is a software marker
- It is used to relay a message from one location to another location

- One process raises the flag
- And the other process performs an action when it sees that the flag is up

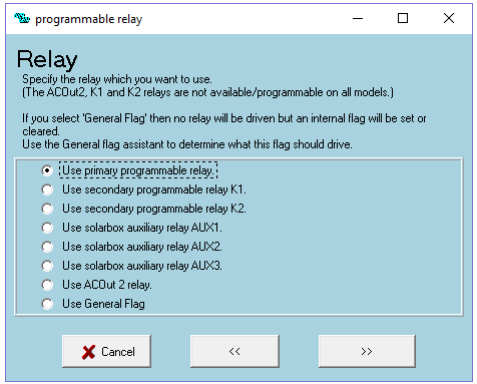


- We use the flag for driving the AC inputs or AES mode
- The relay assistant drives the status of the AC inputs or AES mode via the general flag.

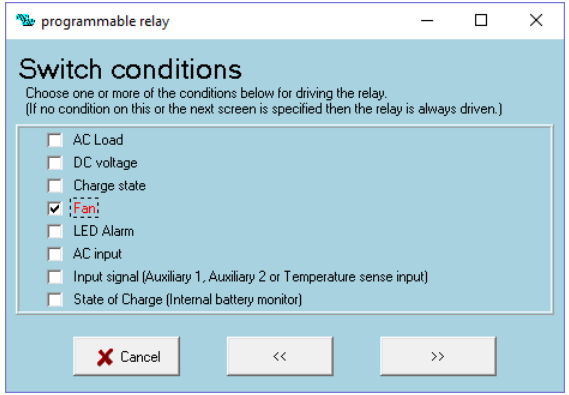
Programmable relay Assistant

Use to drive to drive these relays:

- Programable relay
- K relays
- ACout2 relay
- General flag



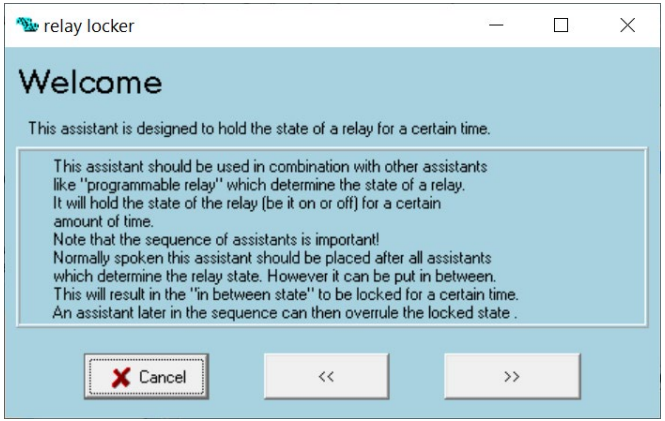
Using these parameters:

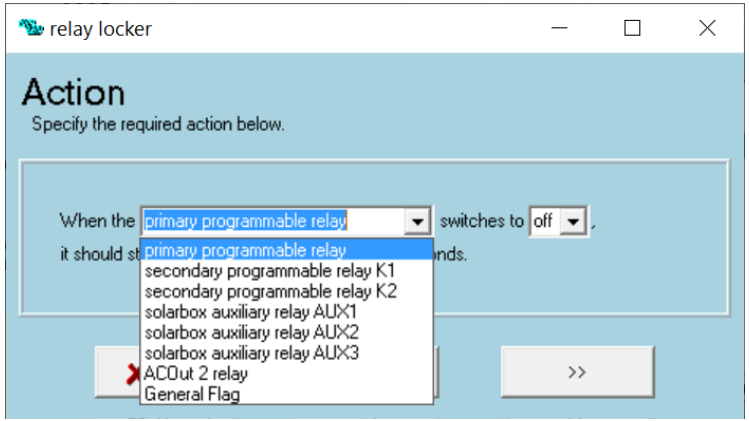


Note: two assistants are needed, one to turn relay on and another to turn relay off

Relay locker Assistant

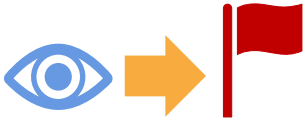
Use to hold the state of a relay for a certain time

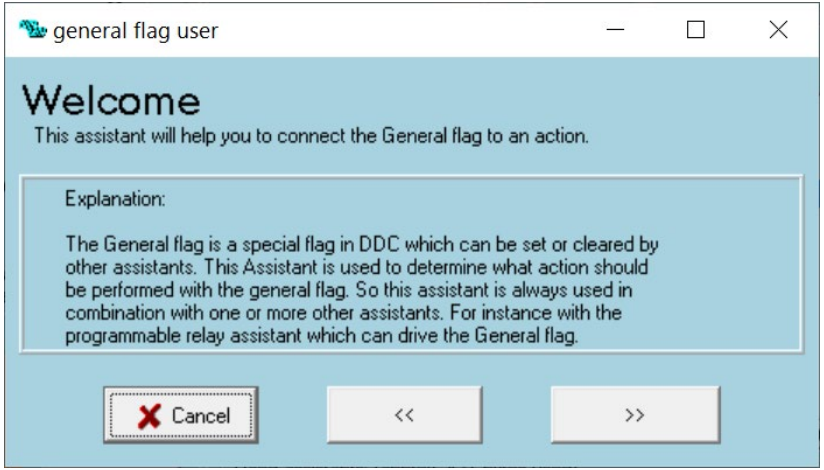


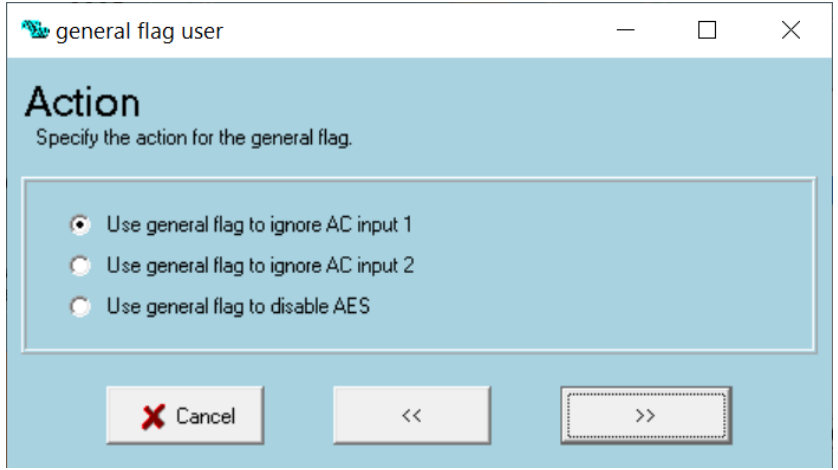


General flag user

Is needed to connect one or more assistant(s) to a flagged action







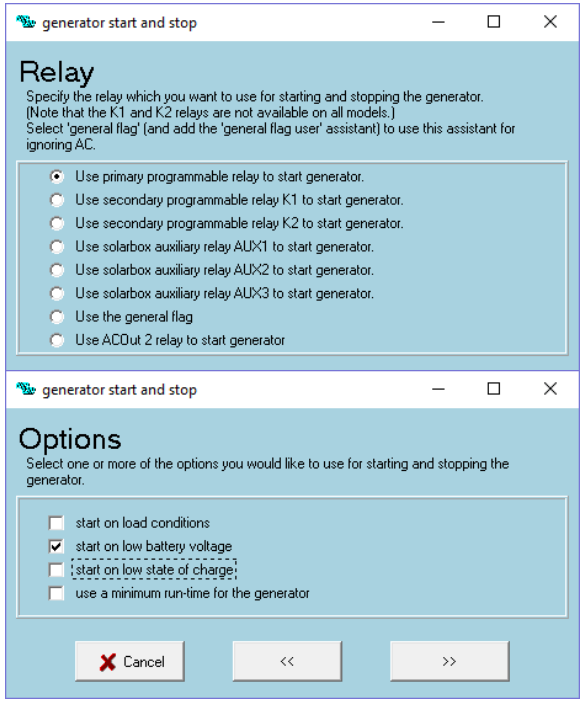
Generator start and stop Assistant

This assistant is used for starting a generator

Note: if the system has an GX device consider using its generator relay instead

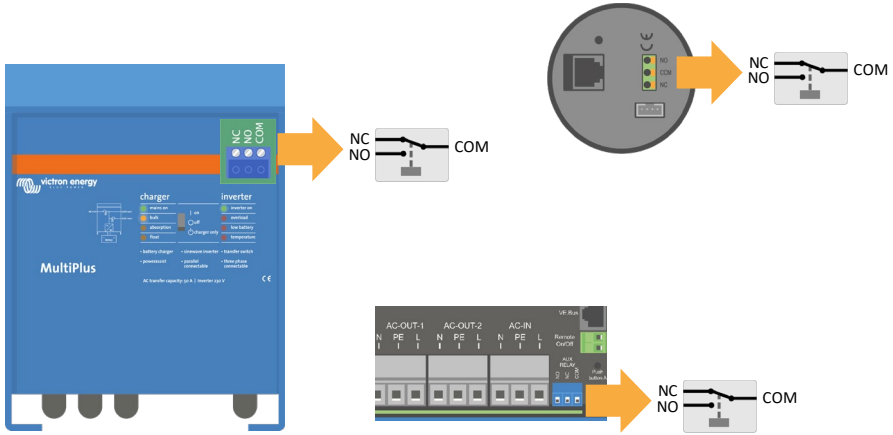
Generator assistant can also be used for:

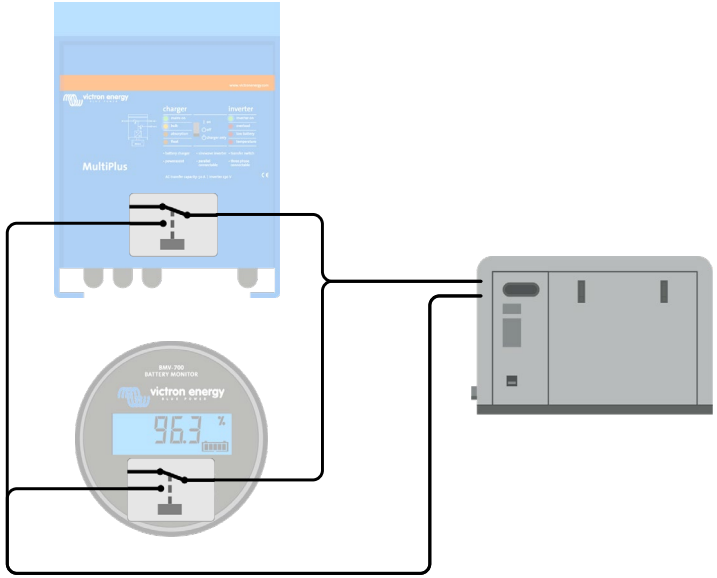
- Selectively letting grid in.
- To turn on a dump load once the batteries are full
- To turn of a grid feed inverter connected to output 2 of a Quattro
- To drive a contactor to turn a grid feed inverter off



Generator start stop using both BMV and Multi

- The inverter/charger and BMV relays can be used together to start/stop a generator
- Wire the open contacts (NO) in parallel to each other

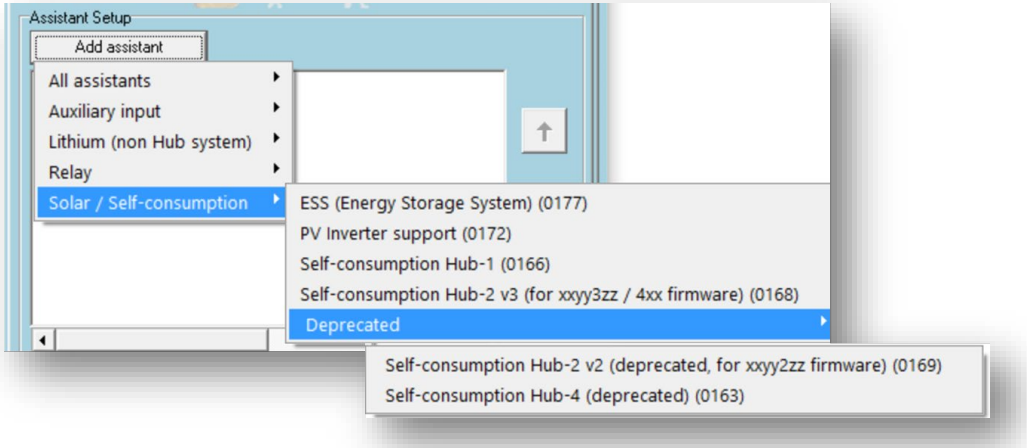




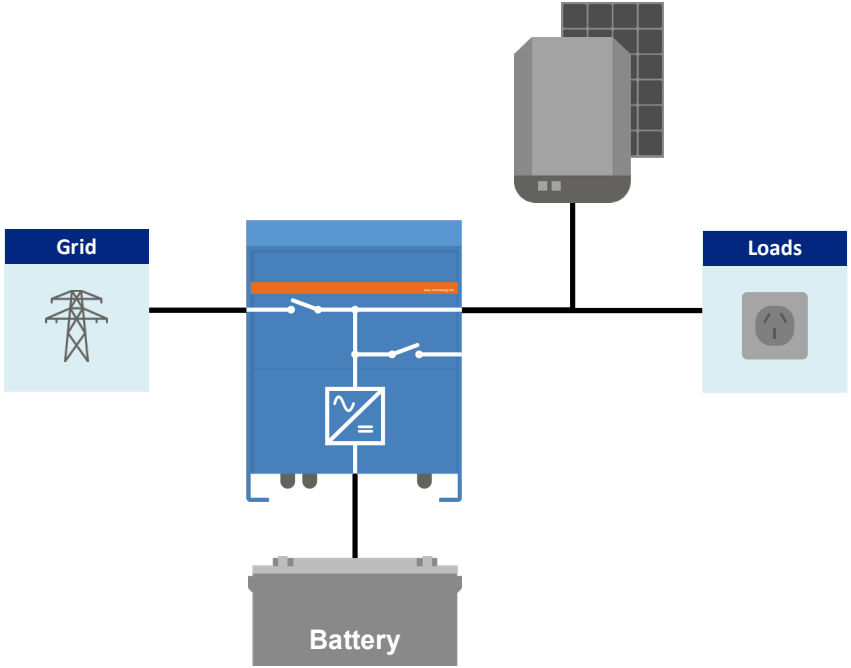
Solar assistants

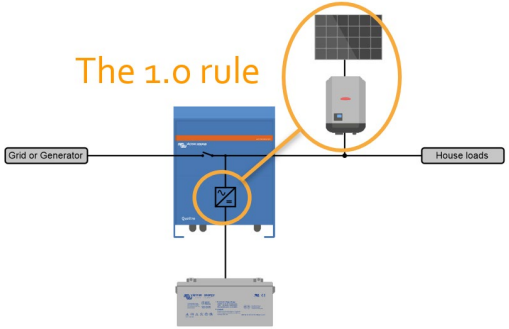
Solar assistants

- PV inverter support
- ESS (Energy Storage System)
- Hubs for older units



AC coupled PV inverter

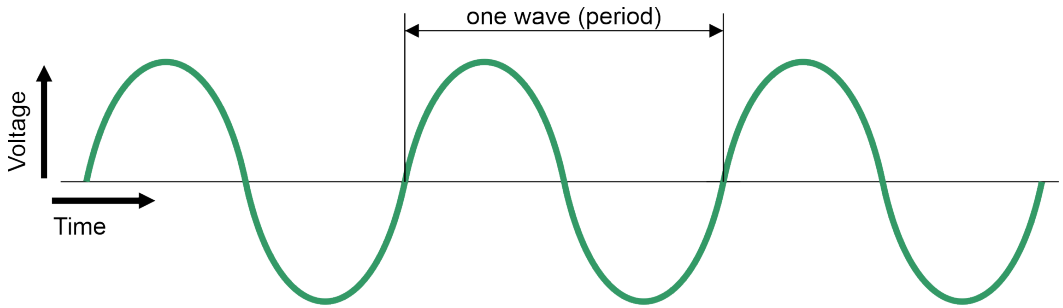




The power rating of the PV inverter (or array) must not be more than the power rating of the Multi or Quattro

What is frequency?

Frequency (Hz) is the number of waves (periods) per second

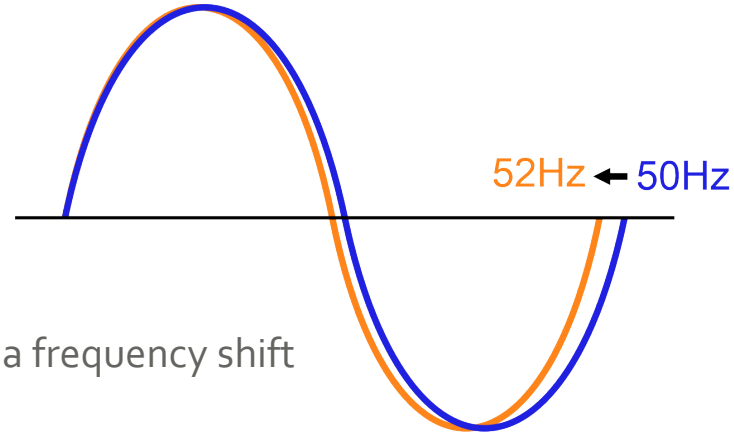


50Hz is 50 periods per second - One period is 1/50 = 20ms

52 Hz is 52 periods per second - One period is 1/52 = 19.2308 ms

What is frequency shift

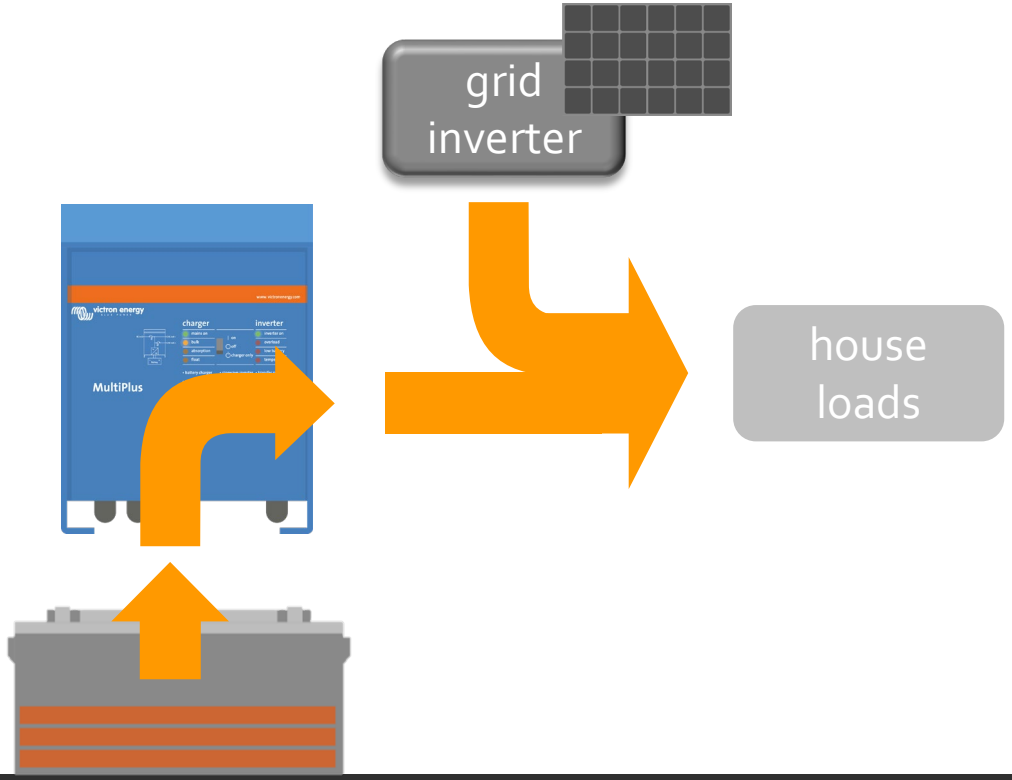
- Frequency shift is a change in frequency, going from a lower to a higher or back from high to low. For example from 50Hz to 52Hz and back to 50 Hz
- This is used to communicate with PV inverters



- The PV inverter needs to be able to listen and act on a frequency shift
- All 4777 rated PV inverters have it build in
- Older style PV inverters might not

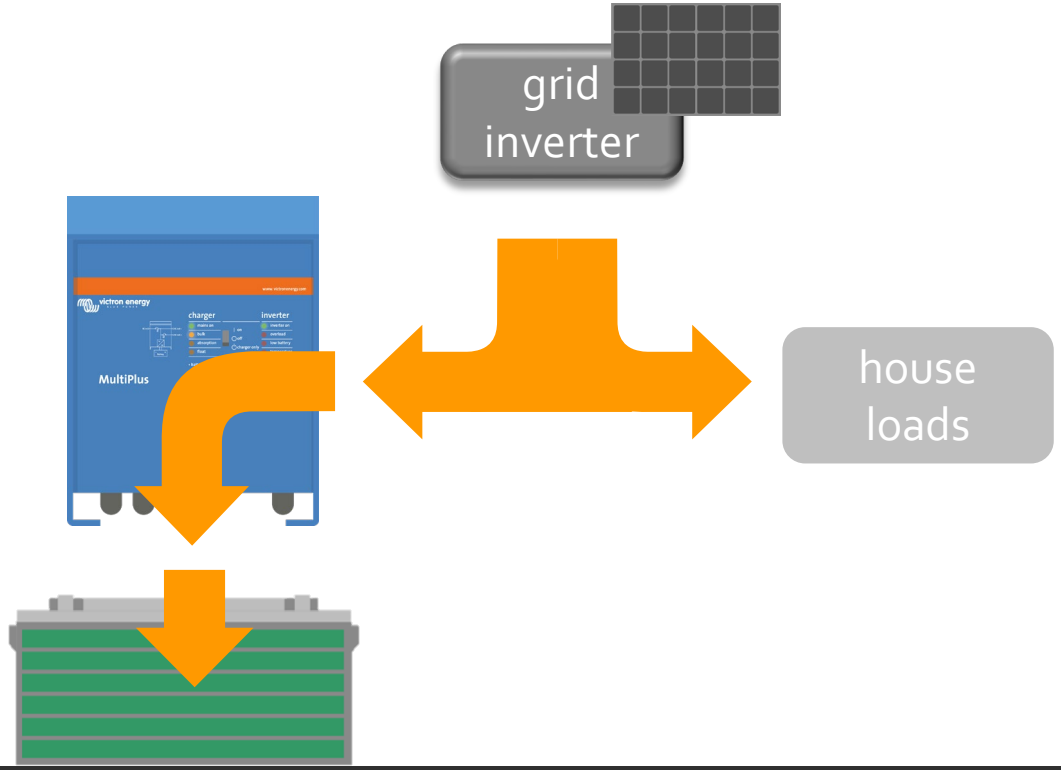
Frequency shift explained

- The grid inverter and the Multi are both supplying the house loads



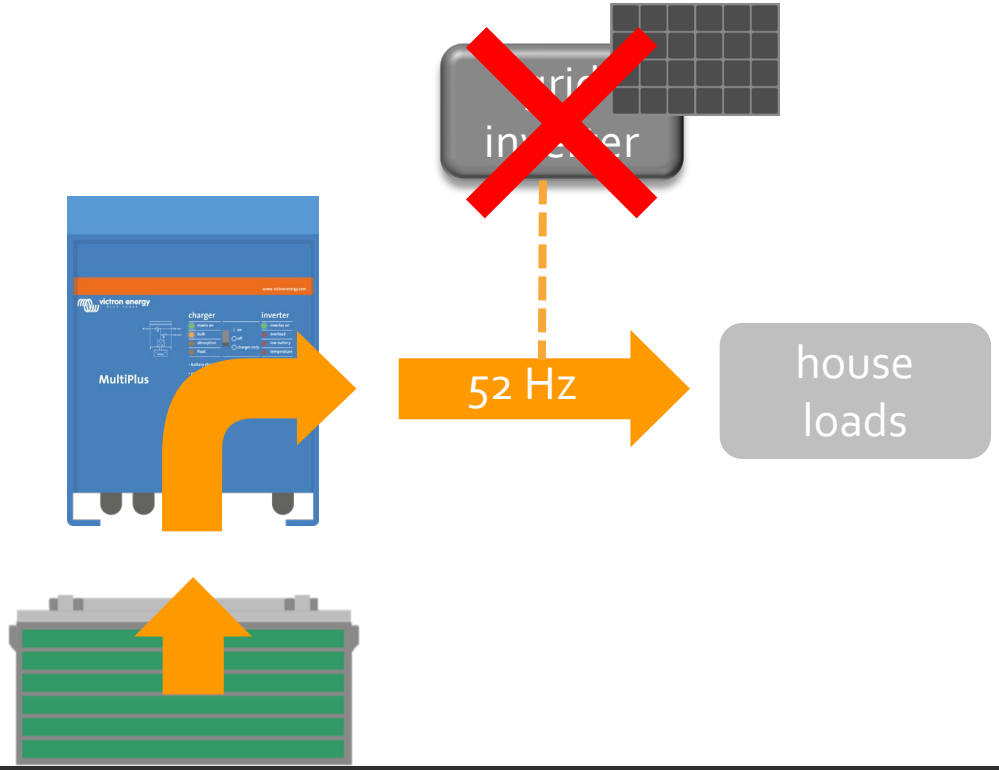
Frequency shift explained

- When the grid inverter supply exceeds the house loads the batteries will be charged



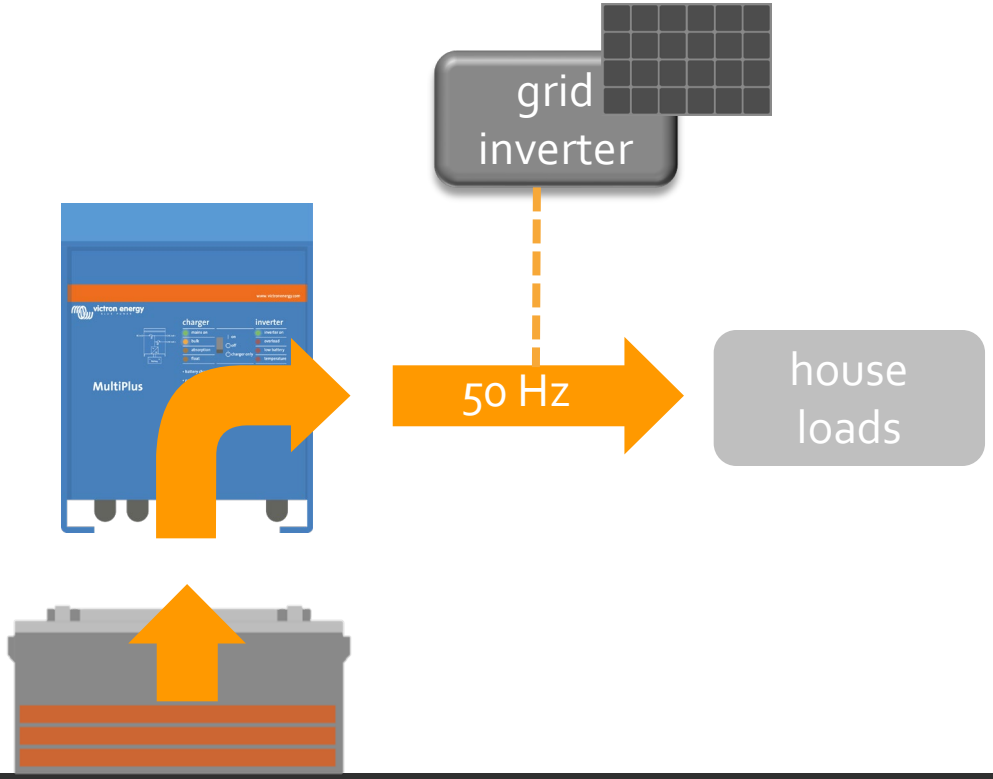
Frequency shift explained

- When the battery is full the Multi changes its output frequency
- The grid feed inverter turns off when it detects a frequency change



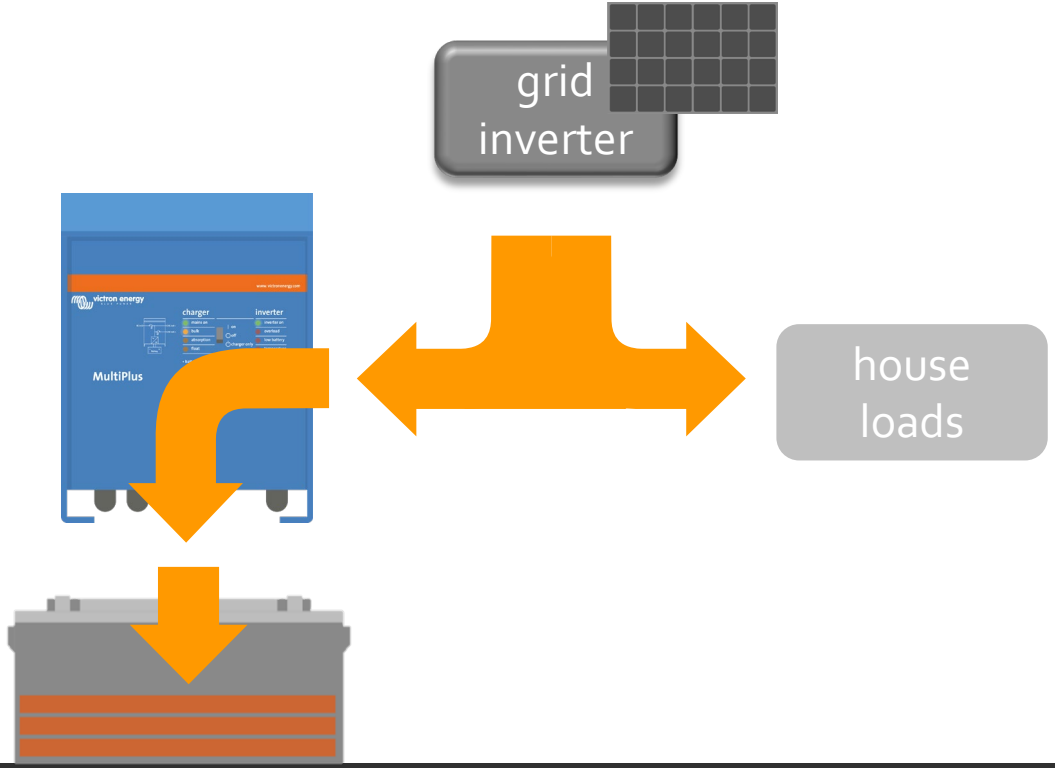
Frequency shift explained

- Once the batteries empty again the Multi changes its output frequency back to 50Hz
- The grid feed inverter turns back on



Frequency shift explained

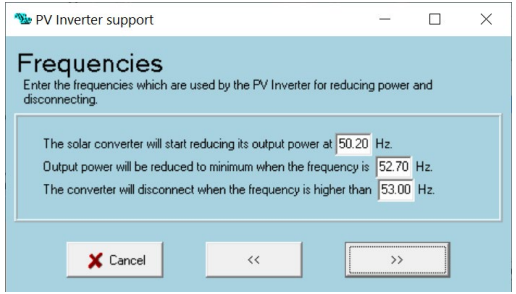
- Once the grid feed inverter has turned back on the house loads will be fed from solar power
- Now the batteries will be charged again

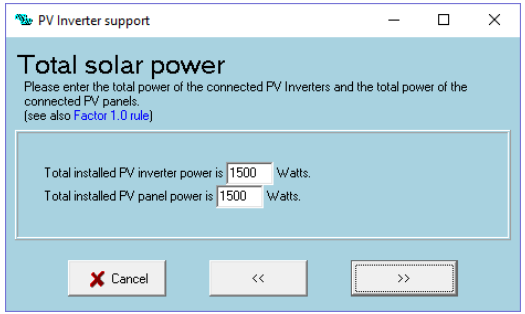


PV inverter Assistant

Use to turn the PV inverter off and on via a frequency shift depending on battery voltage

- Always check if the PV inverter can switch on or off based on a frequency shift
- Battery overcharge will occur if this system is set up incorrectly
- The Factor 1:0 rule: Do not install more KW solar than the KW rating of the Multi or Quattro

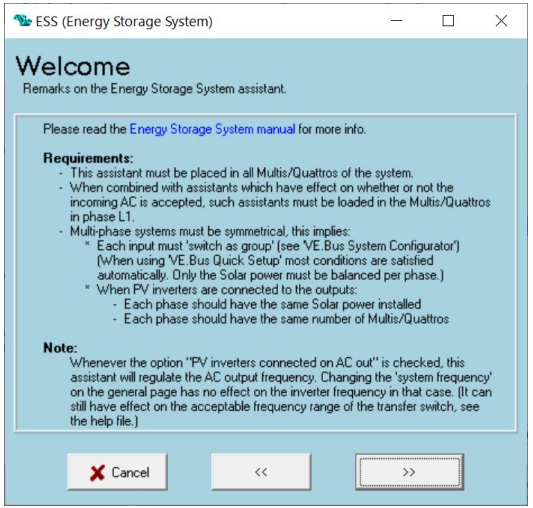


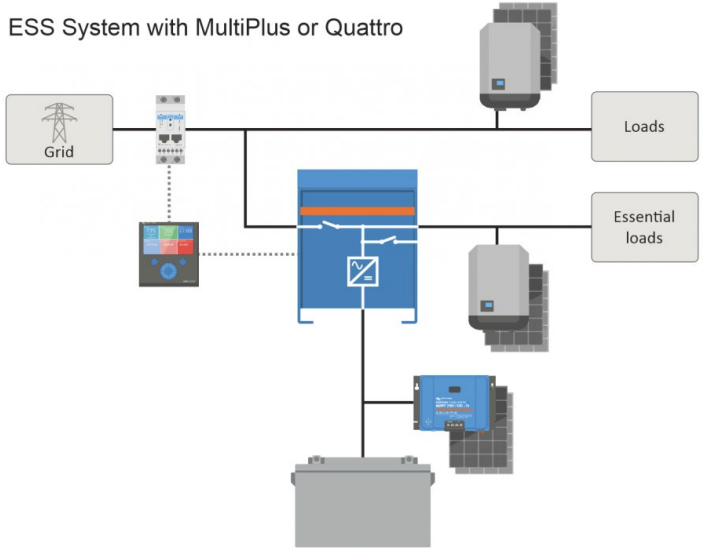


ESS (Energy Storage System) assistant

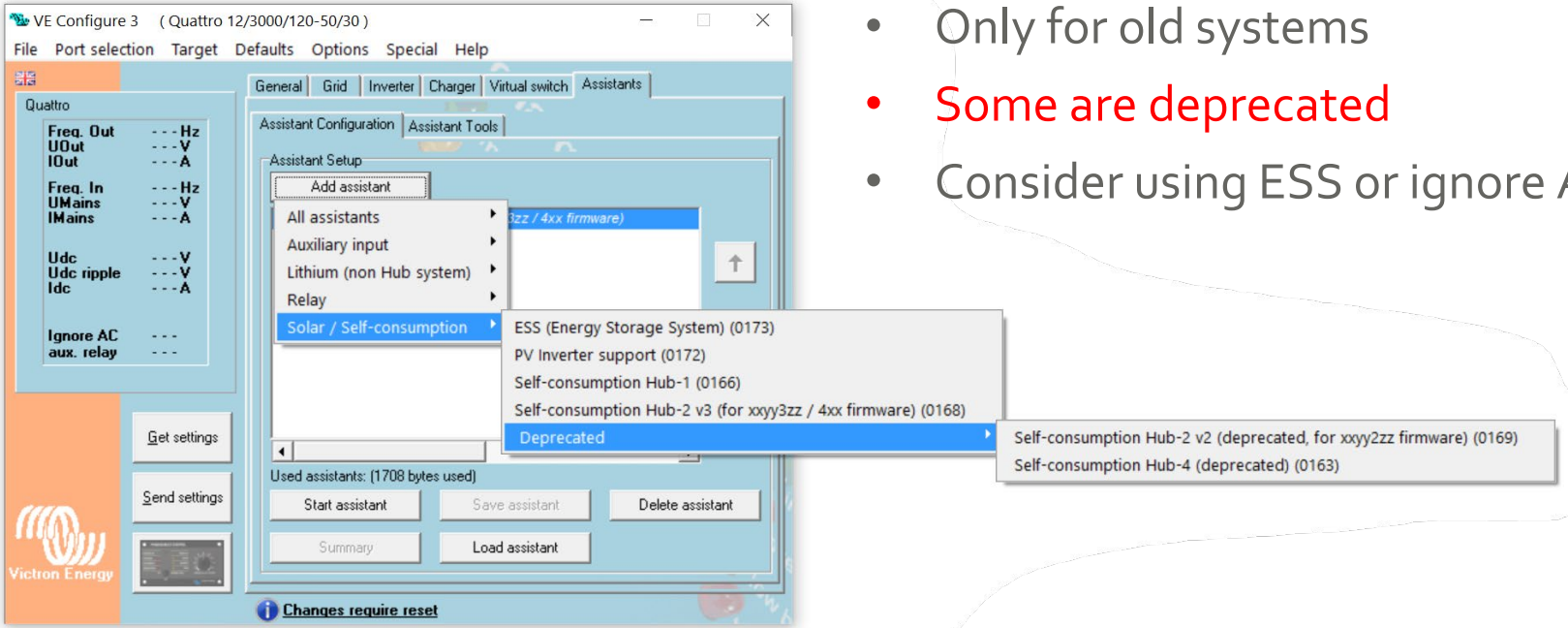
Assistant and GX device programming needed and grid feed needs to be enabled

See [ESS quick start guide](#) on our website. If you can't find the link just "google" it.





Self consumption Hub assistants



- Only for old systems
- Some are deprecated
- Consider using ESS or ignore AC

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