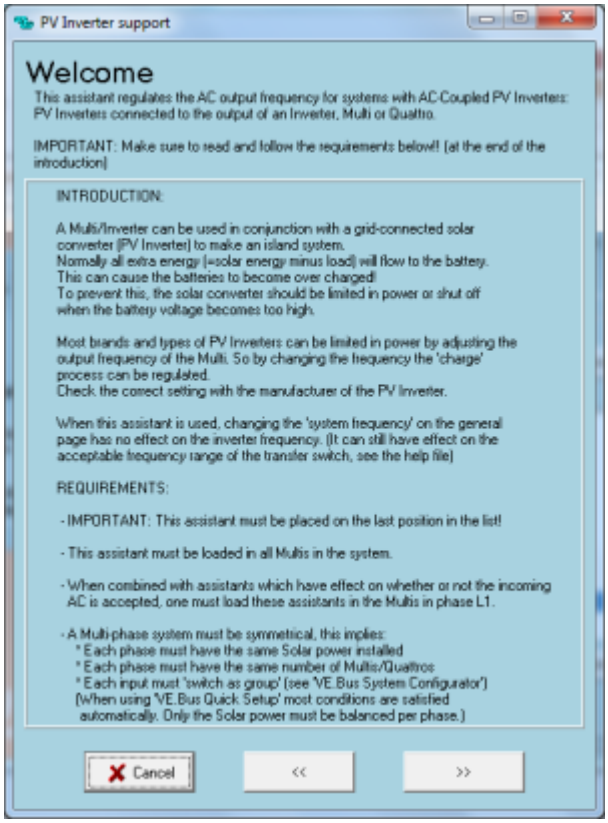
PV Inverter Support Assistant



(click for a readable version)

1. When to use

Use this Assistant in Off-grid systems that have AC-Coupled solar power: a grid-tie PV inverter connected to the AC out of an inverter inverter/charger.

Compatible with Multis, Quattros as well as Phoenix Inverters that have a VE.Bus connection.

Also use this Assistant for systems connected to the grid, that for a particular reason are not setup as ESS and therefor not using the ESS Assistant. Usually all mains-connected systems do need the ESS Assistant, and in that case do not also install the PV Inverter Assistant as well.

2. Summary of functionality

When the system is in inverter mode, this Assistant controls the output power of the grid-tie inverter by changing the AC output frequency of the system. A mechanism commonly refered to as Frequency Shifting. It does so to regulate the charge process: limiting the output power of the Grid-tie inverter to proper manage the charge and also prevent overcharge of the batteries.

This Assistant will be idle when the Multi or Quattro is connected to mains.

3. Frequency control details

The Assistant will use the AC-output frequency to keep both the charge current and the charge voltage within limits.

To prevent DC and AC voltage overshoots because of varying solar irradiance and/or load fluctuations, it will limit the charge current already before battery voltage has rised up to the absorption voltage. It will derate the maximum charge current from 100% at 13.5 / 27 / 54V to 10% at 14.4 / 28.8 / 57.6V. These thresholds are **not** related to the configured absorption voltage.

4. Related documentation

- AC-coupling and the Factor 1.0 rule
- AC-coupled PV with Fronius PV Inverters
- CCGX & Fronius PV Inverters
- Step by step guide for setting up PV Inverter Support on a three-phase 2xx installation

5. FAQ

Q1 - The system is locked to 53 Hz and does not resume

Its locked to the upper limit because of a battery over voltage.

The frequency will reset itself automatically, in case one of the following conditions is met:

1. the battery voltage drops below the re-bulk voltage threshold: the voltage that makes the system restart the charge cycle. For lithium batteries this threshold is defined as the float voltage minus 0.8V. Note that when float is configured to 54.8 volts or higher, then the battery voltage needs to drop below 54V. For lead batteries, the re-bulk voltage is defined as 5.2V below the configured float voltage. Unless that is configured to 56.8V or higher: then the battery voltage needs to drop below 51.6V.
2. the system is connected to mains or generator power. As soon as it sees a voltage on AC-in, it will sync the AC frequency to 50Hz and then connect.

Alternatively, power cycle the system with the rocker switch on the front panel on the inverter/charger.

To prevent this from happening again, check your configured absorption voltage: setting it lower will prevent the overvoltage condition from happening again.

Notes:

- all mentioned voltages are for 48V systems. For 24V divide all values by 2, and for 12V divide by four.
- the mentioned 53 Hz is the PV Inverter disconnect frequency as configured in the Assistant, default 53 Hz.

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