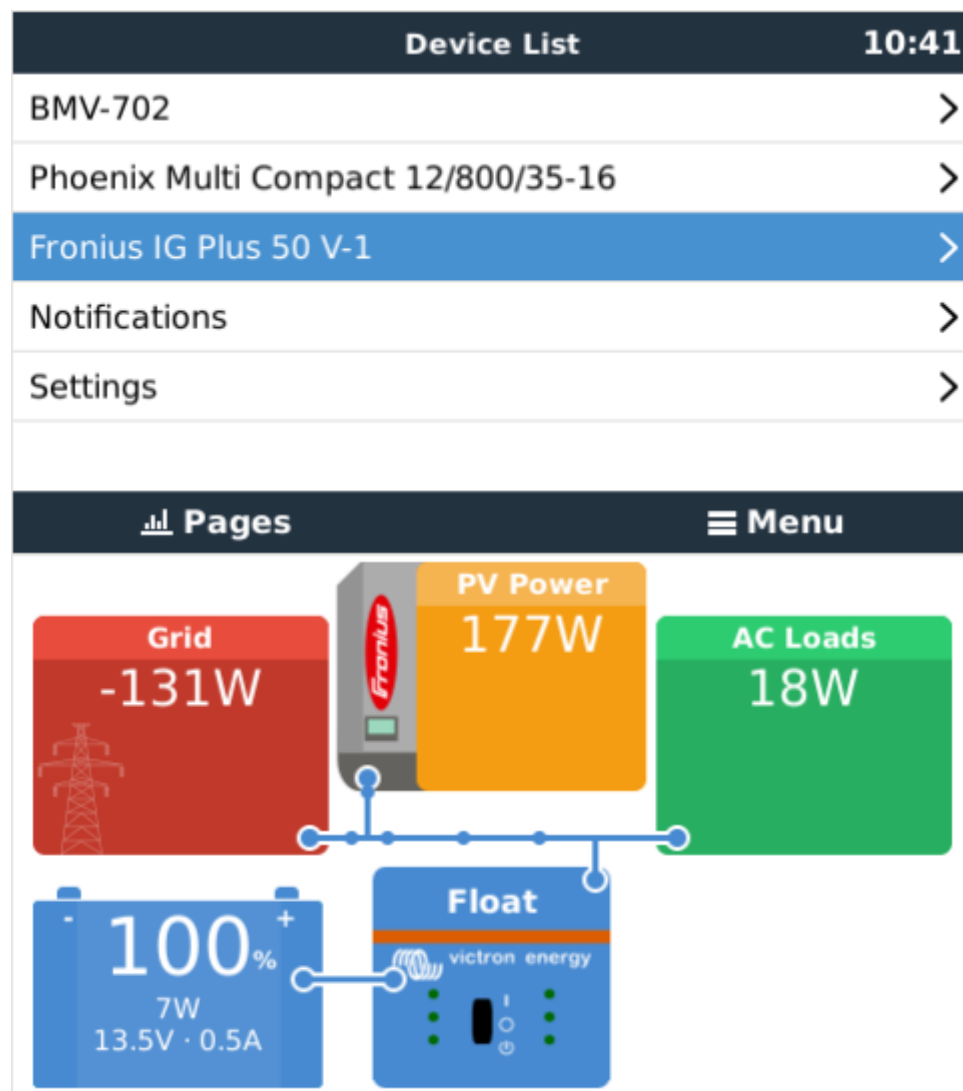# AC-coupled PV with Fronius PV Inverters

This document describes how to setup Energy-storage, Off-grid/Micro-grid and Backup systems with AC-coupled PV, using Fronius PV Inverters. For Fronius information on the same subject, see their MicroGrid flyer.

The Victron system monitor, the Color Control GX includes built-in Fronius monitoring.

Frequency shifting

To make sure that the Fronius PV inverter works well with Victron inverter/chargers, both must be configured with the right 'frequency shift settings':

- The Fronius PV Inverter must be set to Setup MG, short for Micro-Grid.
- For off-grid systems, load the Multi or Quattro with the PV Inverter support Assistant
- For on-grid / energy-storage systems, load the Multi or Quattro with the ESS Assistant. Read information about ESS in the design-installation-manual.

And the 1:1 rule must be adhered to.

Fronius / Victron specifics

This is a very easy setup. The Fronius Setup Microgrid has been developed in close cooperation with Victron. During commissioning, set the PV Inverter to Setup MG50 (or Setup MG60 for 60 Hz systems). Everything is then pre-configured. The Setup MG settings match the default Victron Assistant settings.

Compatible inverters are:

- Fronius Symo (3~, 3 kW up to 20 kW) → Software *fro27140.upd* or higher
- Fronius Eco (3~, 25 kW or 27 kW) → Software *fro27140.upd* or higher
- Fronius Primo (1~, 3 kW up to 8.2 kW) → Software *fro27140.upd* or higher
- Fronius Agilo (3~, 75 kW up to 100 kW) → Software *update19.tl* or higher
- Fronius IG Plus V (1~, 2~, 3~, 2.5 kW up to 12 kW) → from *IGF 5.0.66* on with settings according to the Victron recommendations

For new systems the Symo and Eco inverters are recommended for 3~ applications. The Primo inverters are recommended for 1~ applications. Please note that all these inverters are transformerless and therefore PV-Modules that require pole-grounding (on the Plus or Minus pole) cannot be connected.

The use of Fronius Galvo inverters is not recommended anymore for new applications - the Fronius Primo is the best substitute and offers higher efficiency, wider DC voltage range, two MPP trackers and many other features.

When setting up a system, always update both the Fronius and the Victron devices to their latest firmware versions. For the latest Fronius firmware and information how to update use this link: Fronius firmware update

Setting up the Fronius with Setup MG50/MG60

When not pre-ordered with a MicroGrid setup, follow these steps:

1. Make sure that the Fronius PV inverter is updated to at least the firmware version mentioned above. See Inverter list above.
2. After making the inverter operational according to the manual, select the language and after this the country specific setup.
3. Here choose MG50 or MG60 depending on the system frequency.
4. Ready to start up.

Setting up the Victron Multi or Quattro

1. After connecting the MultiPlus or Quattro with the battery, you can now connect a computer through the VE.Bus (in combination with the Victron interface MK2USB) to configure the system with the latest version of the software VE.Configure.
2. Go to the tab Assistants:
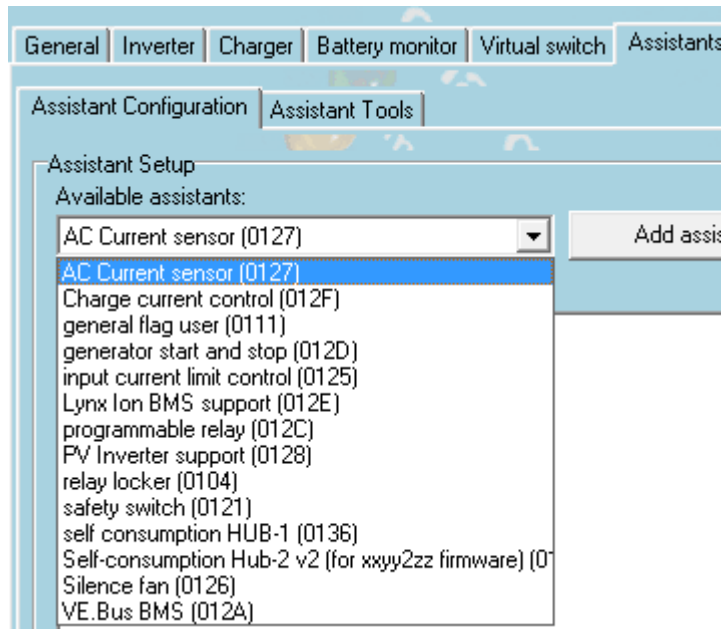
3. Add one of the Assistants that regulate output frequency:
   1. ESS Assistant
   2. PV Inverter support
4. Note that it is not necessary to change the default settings in the Assistant.
   ❌
5. Complete the rest of the Assistant and write the new settings to the MultiPlus or Quattro.

Table for settings for 50Hz and 60Hz frequency

State	50Hz	60Hz	.
Start	50.2	60.2	Hz
Minimum	52.7	62.7	Hz
Disconnect	53.0	63.0	Hz

More information on adding Assistants is here.

Remote system monitoring

The Victron system can be monitored through Victron VRM Portal if a Color Control GX is present at the site. The Fronius PV inverter data can be integrated into the Color Control GX and therefore also in the VRM portal. So the VRM portal is the recommended monitoring platform also for AC-coupled installations.

However, also Fronius offers an equivalent monitoring solution. The Fronius portal is called Fronius Solar.web. The PV system data can be transfered to the portal if the inverter is equipped with a Datamanager 1.0 or Datamanager 2.0.

The usage of both portals in parallel is possible.

A video instruction how to set up the Datamanager 2.0 + Solar.web can be found here.

Frequently asked questions

Why doesn't the frequency settings in the Multi and the Fronius need to be the same?

The first two frequencies do not need to be the same since the Multi actively regulates.

I have an Fronius IG inverter (not Plus), can that work?

No, the IG inverters cannot be made to work in a MicroGrid system. The appropriate substitute for an IG 30 is the GALVO 2.5-1 or an IG Plus 25V-1 (depending on the desired DC voltage range).

The system is locked to 53Hz and does not drop down

Its locked to the upper limit because of a battery overvoltage.

The frequency will reset itself once the system switches back to bulk. For this to happen, the battery voltage needs to drop 0.8V below the configured float voltage. Unless float is configured to 54.8 volts or higher, then the battery voltage needs to drop below 54 volts for the system to switch back to bulk.

Above voltages are for a lithium battery. When configured for other battery types, the voltage needs to drop 5.2V below the configured float voltage. Unless that is configure to 56,8V or higher, then the battery voltage needs to drop below 51.6V for the system to switch back to bulk.

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 float voltage: setting it lower will prevent the overvoltage condition from happening again.

Note that all voltages are for 48V systems. For 24V divide all values by 2, and for 12V divide by four.

~~DISQUS~~

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