Hub-1 - Policy 'Connected to mains, no feedback'

This policy is intended of backup systems, with DC-coupled solar installed. Use it to make use of excess solar power: as soon as the batteries are full, AC loads will be co-powered with solar power.

To keep the text short, 'Multi' is used to describe the VE.Bus system. It can also be a Quattro, or multiple Multis or Quattros in a parallel-, split- or three-phase system. 'MPPT' is used to reference one or more BlueSolar MPPT charge controllers installed in the system.

Installation & configuration

- Safety: it is required to have either internal or external anti islanding detection. Internal detection is enabled a compliant grid code standard is selected, see the Grid tab in VEConfigure3.
- VE.Bus to VE.Can interface cable is supported but not required. When installed:
  - the Assistant will reduce output power of the MPPT in case of an Li-Ion high cell signal/balance.
  - the MPPT will not follow its own charge algorithm. The Assistant will actively control the output voltage of the MPPT instead.
  - there will never be a state mismatch (ie Multi in ‘absorption’ and MPPT in ‘float’)
- When the VE.Bus to VE.Can interface cable is not used one must make sure that:
  - the MPPT voltage during float for Li-Ion must be 13.6V (For Lead it must be anything > 13.5)
  - for optimal use of solar power make sure that the absorption time of the MPPT is exceeds the absorption time of the Multi.
- Lithium systems: as always, also connect the BMS to the MPPT solar chargers, to stop charging the batteries on a high cell condition.
- Install a BMV-700 Battery Monitor to get proper state of charge. The internal battery monitor of the Multi will not work correctly for dc-coupled systems.
- Install a Color Control GX to get full local and remote system monitoring.

How it works

- The system will always be connected to the grid, unless there is a power outage.
- During a power outage, the Multi will power the loads from the battery, until the Low DC voltage disconnect set-point has been reached. This set-point is configured on the Inverter tab in VEConfigure3.
- Grid and solar will be used to charge the batteries:
  - Charge current from solar needs to be configured in the MPPT(s)
  - Charge current from Multi can be configured with VEConfigure. Note: do not disable the internal charger of the Multi.
- After a power outage, the battery will first be fully recharged, using both all available grid and solar power
- Once batteries are full (Multi switches to float), excess solar will be used to power loads > 50 W
- Input current limiter:

    - Setting an input current limit, works as usual, and can be used to do peak shaving.
    - When necessary, the charge current will be reduced to prevent going over the limit (Power Control)
    - When reducing the charge current is not enough, the Multi will use power from the batteries to partially power the loads (Power Assist)
- No energy will be fed back to the grid
- Absorption phase is not skipped during charge, in contrast to the other polices in Hub-1. Because of this, and also because the grid will be used to charge the battery, there is no automatic maintenance charge needed. To do an equalization charge, trigger it manually by toggling the front switch on the Multi. Note that enabling (automatic) equalization on the MPPT might not always work: when there are AC loads, the Multi will take the extra power from the MPPT and use it to power AC loads, instead of letting the MPPT perform its equalization phase.
- This policy can be used in single-, split and three phase configurations. The Hub-1 Assistant must be loaded in all phase masters or, in case of using a VE.Bus BMS, in in all devices. The easy way is just to load it in all devices. If it is not needed in a device, you will get a notification about that.
- This policy can be combined with the 'Charge current control' Assistant to get operational control over the power used to charge the battery with power from the grid. Wire a simple on/off switch to one of the Aux inputs of the Multi, and you can then configure two charge currents, one which will be used when the switch is open, and one which will be used when the switch is closed. Remember that it is not allowed to disable the charger: do not enable the option 'Disable the charger when charge current should be zero'.

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