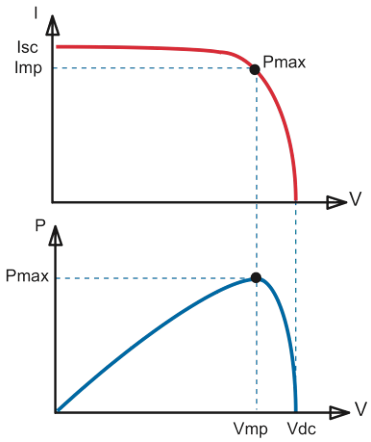
BlueSolar and SmartSolar MPPT Charge Controllers Overview

www.victronenergy.com



Maximum Power Point Tracking (MPPT)

Upper curve:
Output current (I) of a solar panel as function of output voltage (V).
The Maximum Power Point (MPP) is the point Pmax along the curve where the product I x V reaches its peak.

Lower curve:
Output power P = I x V as function of output voltage.
When using a PWM (not MPPT) controller the output voltage of the solar panel will be nearly equal to the voltage of the battery, and will be lower than Vmp.



MPPT Control



SmartSolar Control



VictronConnect Application

Feature highlights common to all models

- Ultra-fast Maximum Power Point Tracking (MPPT).
- Advanced Maximum Power Point Detection in case of partial shading conditions.
- Outstanding conversion efficiency.
- Natural convection cooling.
- Automatic battery voltage recognition.
- Flexible charge algorithm.
- Over temperature protection and power derating when temperature is high.

Sizing options:

- Suitable for a variety of battery voltages. Most models connect to 12, 24, and 48V batteries, some only connect to 12 and 24V batteries, or only to 48V batteries.
- Charge currents rating from 10A all the way up to 100A.
- Maximum PV array Voc voltages ranging from 75V up to 250V.
- Multiple chargers can be used in parallel, for large systems we recommend to use the models with a VE.Can communication port.

PV terminal options:

- TR - one positive and one negative screw terminal.
- MC4 - 3 pairs of paralleled MC4 connectors.

Bluetooth options:

- SmartSolar models have Bluetooth.
- BlueSolar models do not have Bluetooth. They can be retrofitted to have Bluetooth by connecting the VE.Direct Bluetooth Smart dongle. Advantage: the product is not Bluetooth accessible when the dongle is not connected. Note that on the SmartSolar models, Bluetooth can be disabled.

Display options:

- VictronConnect Application. Connects via Bluetooth or via the VE.Direct - USB interface
- MPPT Control. Connects to all models via a VE.Direct cable
- SmartSolar Control Display. Plugs directly into the housing of the larger models
- GX device
- VRM website (GX monitoring device needed)

Communication ports:

- VE.Direct - all models
- VE.Direct and VE.Can - limited models. VE.Can is especially suitable for systems with multiple solar chargers. All units are simply “daisy chained” to each other with a single RJ45 cable between each unit and also between the las unit in the chain and the a GX monitoring device.

Temperature sensor options:

- Internally (all models).
- Externally via the Smart Battery Sense (only SmartSolar models).

Load output options:

- Physical output - On the 10, 15 and 20A models.
- Virtual output - via VE.Direct TX digital output cable and the BatteryProtect or a solid-state relay.

Remotely enabling and disabling the charger:

- All larger units feature the Victron standard remote on/off terminals. All models that don’t feature an onboard Remote on/off terminal can be remotely controlled by using the VE.Direct non inverting remote on/off cable – ASS030550310. Note that this prohibits using the VE.Direct port for anything else.

Firmware update options:

- Local updates via the VictronConnect Application (via Bluetooth or USB-VE.Direct interface)
- Remote updates via VRM website and a GX device

Optional accessories:

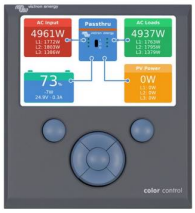
- VictronConnect Application (free download)
- Wire boxes, to cover and protect the terminals. See table on page 2 for wire box types
- Control and display panels: MPPT control or SmartSolar control)
- GX monitoring device (CCGX Venus GX or Octo GX)
- Data cables: VE.Direct cable, RJ45 Cable (CanBus models only) USB-VE.Direct interface
- External control cables: TX cable, non-inverting cable
- Bluetooth dongle (for non-smart models)

More information:

- To access the above-mentioned documents or information: press the search button on our website and enter the appropriate search word.
- For connection to a Color Control GX or other GX device see: https://www.victronenergy.com/live/venus-os:start.

BlueSolar Charge Controller	Load output	Battery voltage	Optional display	Bluetooth	Com. port	Remote on-off	Programmable relay	Wire Box
75/10	15A	12/24	MPPT control	Optional dongle	VE.Direct	No	No	S 75-10/15
75/15	15A	12/24	MPPT control	Optional dongle	VE.Direct	No	No	S 75-10/15
100/15	15A	12/24	MPPT control	Optional dongle	VE.Direct	No	No	S 100-15
100/30	No	12/24	MPPT control	Optional dongle	VE.Direct	No	No	M
100/50	No	12/24	MPPT control	Optional dongle	VE.Direct	No	No	M
150/35	No	12/24/36/48	MPPT control	Optional dongle	VE.Direct	No	No	M
150/45-Tr	No	12/24/36/48	MPPT control	Optional dongle	VE.Direct	No	No	L
150/45-MC4	No	12/24/36/48	MPPT control	Optional dongle	VE.Direct	No	No	L
150/60-Tr	No	12/24/36/48	MPPT control	Optional dongle	VE.Direct	No	No	L
150/60-MC4	No	12/24/36/48	MPPT control	Optional dongle	VE.Direct	No	No	L
150/70-Tr	No	12/24/36/48	MPPT control	Optional dongle	VE.Direct	No	No	L
150/70-MC4	No	12/24/36/48	MPPT control	Optional dongle	VE.Direct	No	No	L

SmartSolar Charge Controller	Load output	Battery voltage	Optional display	Bluetooth	Com. port	Remote on-off	Programmable relay	Wire Box
75/10	15A	12/24	MPPT control	Built-in	VE.Direct	No	No	S 75-10/15
75/15	15A	12/24	MPPT control	Built-in	VE.Direct	No	No	S 75-10/15
100/15	15A	12/24	MPPT control	Built-in	VE.Direct	No	No	S 100-15
100/20	20A	12/24	MPPT control	Built-in	VE.Direct	No	No	S 100-20
100/20-48V	1A	48	MPPT control	Built-in	VE.Direct	No	No	S 100-20
100/30	No	12/24	MPPT control	Built-in	VE.Direct	No	No	M
100/50	No	12/24	MPPT control	Built-in	VE.Direct	No	No	M
150/35	No	12/24/36/48	MPPT control	Built-in	VE.Direct	No	No	M
150/45-Tr	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	L
150/45-MC4	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	L
150/60-Tr	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	L
150/60-MC4	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	L
150/70-Tr	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	L
150/70-MC4	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	L
150/70-Tr-CAN	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct & VE.Can	Yes	Yes	L
150/85-Tr	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	XL
150/85-MC4	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	XL
150/85-Tr-CAN	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct & VE.Can	Yes	Yes	XL
150/100-Tr	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	XL
150/100-MC4	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	XL
150/100-Tr-CAN	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct & VE.Can	Yes	Yes	XL
250/60-Tr	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	L
250/60-MC4	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	L
250/70-Tr	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	L
250/70-MC4	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	L
250/85-Tr	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	XL
250/85-MC4	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	XL
250/100-Tr	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	XL
250/100-MC4	No	12/24/36/48	MPPT ctrl & SmartSolar ctrl	Built-in	VE.Direct	Yes	Yes	XL



Color Control GX



Venus GX



Octo GX


Smart Battery Sense


VE.Direct Bluetooth Smart Dongle


VE.Direct to USB interface

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