

# SmartSolar Charge Controllers with screw- or MC4 PV connection

## MPPT 250/60 up to MPPT 250/100



SmartSolar Charge Controller  
MPPT 250/100-Tr  
with optional pluggable display



SmartSolar Charge Controller  
MPPT 250/100-MC4  
without display



Bluetooth sensing:  
Smart Battery Sense



Bluetooth sensing:  
BMV-712 Smart Battery Monitor

### Bluetooth Smart built-in

The wireless solution to set-up, monitor, update and synchronise SmartSolar Charge Controllers.

### Ultra-fast Maximum Power Point Tracking (MPPT)

Especially in case of a cloudy sky, when light intensity is changing continuously, an ultra-fast MPPT controller will improve energy harvest by up to 30% compared to PWM charge controllers and by up to 10% compared to slower MPPT controllers.

### Advanced Maximum Power Point Detection in case of partial shading conditions

If partial shading occurs, two or more maximum power points (MPP) may be present on the power-voltage curve.

Conventional MPPTs tend to lock to a local MPP, which may not be the optimum MPP.

The innovative SmartSolar algorithm will always maximize energy harvest by locking to the optimum MPP.

### Outstanding conversion efficiency

No cooling fan. Maximum efficiency exceeds 99%.

### Flexible charge algorithm

Fully programmable charge algorithm (see the software page on our website), and eight pre-programmed algorithms, selectable with a rotary switch (see manual for details).

### Extensive electronic protection

Over-temperature protection and power derating when temperature is high.

PV short circuit and PV reverse polarity protection.

PV reverse current protection.

### Internal temperature sensor

Compensates absorption and float charge voltage for temperature.

### Optional external battery voltage and temperature sensing via Bluetooth

A Smart Battery Sense or a BMV-712 Smart Battery Monitor can be used to communicate battery voltage and temperature to one or more SmartSolar Charge Controllers.

### Fully discharged battery recovery function

Will initiate charging even if the battery has been discharged to zero volts.

Will reconnect to a fully discharged Li-ion battery with integrated disconnect function.

### VE.Direct

For a wired data connection to a Color Control GX, other GX products, PC or other devices

### Remote on-off

To connect for example to a VE.BUS BMS.

### Programmable relay

Can be programmed (a.o. with a smartphone) to trip on an alarm, or other events.

### Optional: SmartSolar pluggable LCD display

Simply remove the rubber seal that protects the plug on the front of the controller, and plug-in the display.



SmartSolar pluggable display



SmartSolar Charge Controller	250/60	250/70	250/85	250/100
Battery voltage	12 / 24 / 48V Auto Select (software tool needed to select 36V)			
Rated charge current	60A	70A	85A	100A
Nominal PV power, 12V 1a,b)	860W	1000W	1200W	1450W
Nominal PV power, 24V 1a,b)	1720W	2000W	2400W	2900W
Nominal PV power, 36V 1a,b)	2580W	3000W	3600W	4350W
Nominal PV power, 48V 1a,b)	3440W	4000W	4900W	5800W
Max. PV short circuit current 2)	35A (max 30A per MC4 conn.)		70A (max 30A per MC4 conn.)	
Maximum PV open circuit voltage	250V absolute maximum coldest conditions 245V start-up and operating maximum			
Maximum efficiency	99%			
Self-consumption	Less than 35mA @ 12V / 20mA @ 48V			
Charge voltage 'absorption'	Default setting: 14,4 / 28,8 / 43,2 / 57,6V (adjustable with: rotary switch, display, VE.Direct or Bluetooth)			
Charge voltage 'float'	Default setting: 13,8 / 27,6 / 41,4 / 55,2V (adjustable: rotary switch, display, VE.Direct or Bluetooth)			
Charge voltage 'equalization'	Default setting: 16,2V / 32,4V / 48,6V / 64,8V (adjustable)			
Charge algorithm	multi-stage adaptive (eight preprogrammed algorithms) or user defined algorithm			
Temperature compensation	-16 mV / -32 mV / -64 mV / °C			
Protection	PV reverse polarity / Output short circuit / Over temperature			
Operating temperature	-30 to +60°C (full rated output up to 40°C)			
Humidity	95%, non-condensing			
Maximum altitude	5000m (full rated output up to 2000m)			
Environmental condition	Indoor, unconditioned			
Pollution degree	PD3			
Data communication port	VE.Direct or Bluetooth			
Remote on/off	Yes (2 pole connector)			
Programmable relay	DPST AC rating: 240VAC / 4A DC rating: 4A up to 35VDC, 1A up to 60VDC			
Parallel operation	Yes			
<b>ENCLOSURE</b>				
Colour	Blue (RAL 5012)			
PV terminals 3)	35 mm <sup>2</sup> / AWG2 (Tr models) Two pairs of MC4 connectors (MC4 models)		35 mm <sup>2</sup> / AWG2 (Tr models) Three pairs of MC4 connectors (MC4 models)	
Battery terminals	35mm <sup>2</sup> / AWG2			
Protection category	IP43 (electronic components), IP22 (connection area)			
Weight	3 kg		4,5 kg	
Dimensions (h x w x d) in mm	Tr models: 185 x 250 x 95 mm MC4 models: 215 x 250 x 95 mm		Tr models: 216 x 295 x 103 MC4 models: 246 x 295 x 103	
<b>STANDARDS</b>				
Safety	EN/IEC 62109-1, UL 1741, CSA C22.2			
<p>1a) If more PV power is connected, the controller will limit input power.</p> <p>1b) The PV voltage must exceed Vbat + 5V for the controller to start. Thereafter the minimum PV voltage is Vbat + 1V.</p> <p>2) A PV array with a higher short circuit current may damage the controller.</p> <p>3) MC4 models: several splitter pairs may be needed to parallel the strings of solar panels Maximum current per MC4 connector: 30A (the MC4 connectors are parallel connected to one MPPT tracker)</p>				