

# SmartSolar Charge Controllers with screw- or MC4 PV connection

## MPPT 150/45 up to MPPT 150/70



**SmartSolar Charge Controller  
MPPT 150/70-Tr  
without optional display**



**SmartSolar Charge Controller  
MPPT 150/70-Tr  
with optional display**



**Bluetooth sensing:  
Smart Battery Sense**



**Bluetooth sensing:  
BMV-712 Smart Battery Monitor**



**Bluetooth sensing: SmartShunt**

### 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 98 %.

### 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, temperature and current sensing via Bluetooth

A Smart Battery Sense, a BMV-712 Smart Battery Monitor or a SmartShunt can be used to communicate battery voltage and temperature (and current, in case of a BMV-712 or a SmartShunt) to one or more SmartSolar Charge Controllers.

### Synchronized parallel charging with Bluetooth

Up to 10 units can be synchronized with Bluetooth.

### 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 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  | 150/45  | 150/60 | 150/70 |
|---|---|--------|--------|
| Battery voltage   | 12 / 24 / 48 V Auto Select (software tool needed to select 36 V)  |        |        |
| Rated charge current  | 45 A  | 60 A   | 70 A   |
| Nominal PV power, 12 V 1a,b)  | 650 W   | 860 W  | 1000 W |
| Nominal PV power, 24 V 1a,b)  | 1300 W  | 1720 W | 2000 W |
| Nominal PV power, 36 V 1a,b)  | 1950 W  | 2580 W | 3000 W |
| Nominal PV power, 48 V 1a,b)  | 2600 W  | 3440 W | 4000 W |
| Max. PV short circuit current 2)  | 50 A (max 30 A per MC4 conn.)   |        |        |
| Maximum PV open circuit voltage   | 150 V absolute maximum coldest conditions<br>145 V start-up and operating maximum                                 |        |        |
| Maximum efficiency  | 98 %  |        |        |
| Self-consumption  | Less than 35mA @ 12 V / 20mA @ 48 V   |        |        |
| Charge voltage 'absorption'   | Default setting: 14,4 / 28,8 / 43,2 / 57,6 V<br>(adjustable with: rotary switch, display, VE.Direct or Bluetooth) |        |        |
| Charge voltage 'float'  | Default setting: 13,8 / 27,6 / 41,4 / 55,2 V<br>(adjustable: rotary switch, display, VE.Direct or Bluetooth)      |        |        |
| Charge voltage 'equalization'   | Default setting: 16,2 V / 32,4 V / 48,6 V / 64,8 V (adjustable)   |        |        |
| Charge algorithm  | multi-stage adaptive (eight pre-programmed 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: 240 VAC / 4 A DC rating: 4 A up to 35 VDC, 1 A up to 60 VDC                                       |        |        |
| Parallel operation  | Yes: up to 10 units can be synchronized with Bluetooth  |        |        |
| <b>ENCLOSURE</b>  |   |        |        |
| Colour  | Blue (RAL 5012)   |        |        |
| PV terminals 3)   | 35 mm <sup>2</sup> / AWG2 (Tr models)<br>Two pairs of MC4 connectors (MC4 models)                                 |        |        |
| Battery terminals   | 35 mm <sup>2</sup> / AWG2   |        |        |
| Protection category   | IP43 (electronic components), IP22 (connection area)  |        |        |
| Weight  | 3 kg  |        |        |
| Dimensions (h x w x d)  | Tr models: 185 x 250 x 95 mm<br>MC4 models: 215 x 250 x 95 mm   |        |        |
| <b>STANDARDS</b>  |   |        |        |
| Safety  | EN/IEC 62109-1, UL 1741, CSA C22.2  |        |        |
| <b>STORED TRENDS</b>  |   |        |        |
| Data stored   | Battery voltage, current and temperature, as well as load output current, PV voltage and PV current.              |        |        |
| Number of days trends data is stored  | 46  |        |        |
| <p>1a) If more PV power is connected, the controller will limit input power.<br/> 1b) The PV voltage must exceed Vbat + 5 V for the controller to start. Thereafter the minimum PV voltage is Vbat + 1 V.<br/> 2) A PV array with a higher short circuit current may damage the controller.<br/> 3) MC4 models: several splitter pairs may be needed to parallel the strings of solar panels<br/> Maximum current per MC4 connector: 30 A (the MC4 connectors are parallel connected to one MPPT tracker)</p> |   |        |        |

