

# 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**



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**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 clouded 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

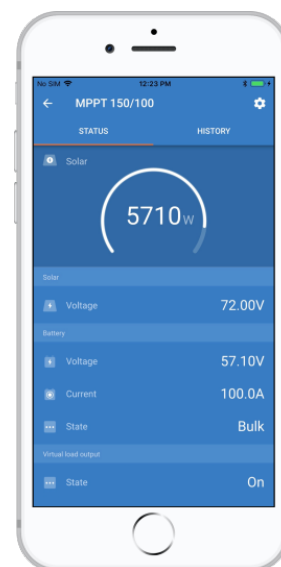
Can be programmed to trip on an alarm, or other events.

### 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 / 48V Auto Select (software tool needed to select 36V)                                                   |        |        |
| Rated charge current                                                                                                                                                                                                                                                                                                                                                                                                                                                                        | 45A                                                                                                              | 60A    | 70A    |
| Nominal PV power, 12V 1a,b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 650W                                                                                                             | 860W   | 1000W  |
| Nominal PV power, 24V 1a,b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1300W                                                                                                            | 1720W  | 2000W  |
| Nominal PV power, 36V 1a,b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 1950W                                                                                                            | 2580W  | 3000W  |
| Nominal PV power, 48V 1a,b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | 2600W                                                                                                            | 3440W  | 4000W  |
| Max. PV short circuit current 2)                                                                                                                                                                                                                                                                                                                                                                                                                                                            | 50A (max 30A per MC4 conn.)                                                                                      |        |        |
| Maximum PV open circuit voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                             | 150V absolute maximum coldest conditions<br>145V start-up and operating maximum                                  |        |        |
| Maximum efficiency                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | 98%                                                                                                              |        |        |
| Self-consumption                                                                                                                                                                                                                                                                                                                                                                                                                                                                            | Less than 35mA @ 12V / 20mA @ 48V                                                                                |        |        |
| Charge voltage 'absorption'                                                                                                                                                                                                                                                                                                                                                                                                                                                                 | Default setting: 14,4 / 28,8 / 43,2 / 57,6V<br>(adjustable with: rotary switch, display, VE.Direct or Bluetooth) |        |        |
| Charge voltage 'float'                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | Default setting: 13,8 / 27,6 / 41,4 / 55,2V<br>(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 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: 240VAC / 4A DC rating: 4A up to 35VDC, 1A up to 60VDC                                            |        |        |
| Parallel operation                                                                                                                                                                                                                                                                                                                                                                                                                                                                          | Yes: up to 10 units can be synchronized with Bluetooth                                                           |        |        |
| ENCLOSURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                  |        |        |
| 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 35mm <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                                                    |        |        |
| STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |                                                                                                                  |        |        |
| Safety                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | EN/IEC 62109-1, UL 1741, CSA C22.2                                                                               |        |        |
| 1a) If more PV power is connected, the controller will limit input power.<br>1b) The PV voltage must exceed Vbat + 5V for the controller to start. Thereafter the minimum PV voltage is Vbat + 1V.<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: 30A (the MC4 connectors are parallel connected to one MPPT tracker) |                                                                                                                  |        |        |