

# SmartSolar Charge Controllers with VE.Can interface

## MPPT 150/70 VE.Can up to MPPT 150/100 VE.Can



**SmartSolar Charge Controller  
MPPT 150/100-Tr VE.Can  
with optional pluggable display**



**SmartSolar Charge Controller  
MPPT 150/100-Tr VE.Can  
without display**



**Bluetooth sensing:  
Smart Battery Sense**



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



**Bluetooth sensing: SmartShunt**

### 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, 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.

### Bluetooth Smart built-in

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

### Internal temperature sensor and 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.

### VE.Direct or VE.Can

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

### 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.Can: the multiple controller solution

Up to 25 units can be synchronised with VE.Can, and up to 10 units with Bluetooth

### Remote on-off

To connect for example to a VE.BUS BMS.

### Programmable relay

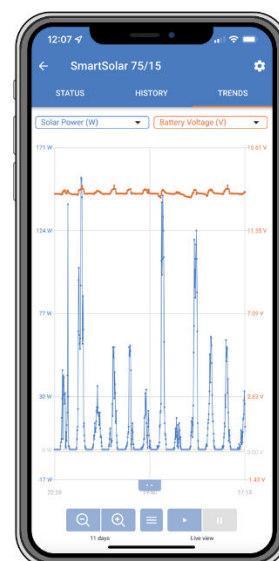
Can be programmed to trip on an alarm, or other events.

### 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 with VE.Can interface                                                                                                                                                                                                                                                                                                                                                                                                                                             | 150/70 VE.Can                                                                                                     | 150/85 VE.Can                                                                       | 150/100 VE.Can<br>(also available without Bluetooth) |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------------------------------------|-------------------------------------------------------------------------------------|------------------------------------------------------|
| Battery voltage                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 12/24/48 V Auto Select (36 V: manual)                                                                             |                                                                                     |                                                      |
| Rated charge current                                                                                                                                                                                                                                                                                                                                                                                                                                                                           | 70 A                                                                                                              | 85 A                                                                                | 100 A                                                |
| Nominal PV power, 12 V 1a,b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 1000 W                                                                                                            | 1200 W                                                                              | 1450 W                                               |
| Nominal PV power, 24 V 1a,b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 2000 W                                                                                                            | 2400 W                                                                              | 2900 W                                               |
| Nominal PV power, 36 V 1a,b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 3000 W                                                                                                            | 3600 W                                                                              | 4350 W                                               |
| Nominal PV power, 48 V 1a,b)                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | 4000 W                                                                                                            | 4900 W                                                                              | 5800 W                                               |
| Max. PV short circuit current 2)                                                                                                                                                                                                                                                                                                                                                                                                                                                               | 50 A (max 30 A per MC4 conn.)                                                                                     | 70 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 35 mA @ 12 V / 20 mA @ 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 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                                                                                                                                                                                                                                                                                                                                                                                                                                                                             | VE.Can, VE.Direct and 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, parallel synchronised operation with VE.Can (max. 25 units) or Bluetooth (max. 10 units)                     |                                                                                     |                                                      |
| ENCLOSURE                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                   |                                                                                     |                                                      |
| Colour                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | Blue (RAL 5012)                                                                                                   |                                                                                     |                                                      |
| PV terminals 3)                                                                                                                                                                                                                                                                                                                                                                                                                                                                                | 35 mm <sup>2</sup> / AWG2 (Tr models)<br>Two pairs of MC4 connectors (MC4 models)                                 | 35 mm <sup>2</sup> / AWG2 (Tr models)<br>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                                                                                                              | 4,5kg                                                                               |                                                      |
| Dimensions (h x w x d) in mm                                                                                                                                                                                                                                                                                                                                                                                                                                                                   | Tr models: 185 x 250 x 95 mm<br>MC4 models: 215x 250 x 95 mm                                                      | Tr models: 216 x 295 x 103<br>MC4 models: 246 x 295 x 103                           |                                                      |
| STANDARDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      |                                                                                                                   |                                                                                     |                                                      |
| Safety                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         | EN/IEC 62109-1, UL 1741, CSA C22.2                                                                                |                                                                                     |                                                      |
| STORED TRENDS                                                                                                                                                                                                                                                                                                                                                                                                                                                                                  |                                                                                                                   |                                                                                     |                                                      |
| 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                                                                                                                |                                                                                     |                                                      |
| 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) |                                                                                                                   |                                                                                     |                                                      |



With VE.Can or Bluetooth up to 25 respectively up to 10 Charge Controllers can be daisy-chained for synchronous charging and connected to a Color Control GX or other GX device.  
Each Controller can be monitored individually, for example on a Color Control GX and on the VRM website (VE.Can) or on a smartphone or iPad (Bluetooth)