

# SOLAR CHARGE MASTER

## SCM20 PWM / SCM40 PWM

PWM CONTROLLED PV BATTERY CHARGER

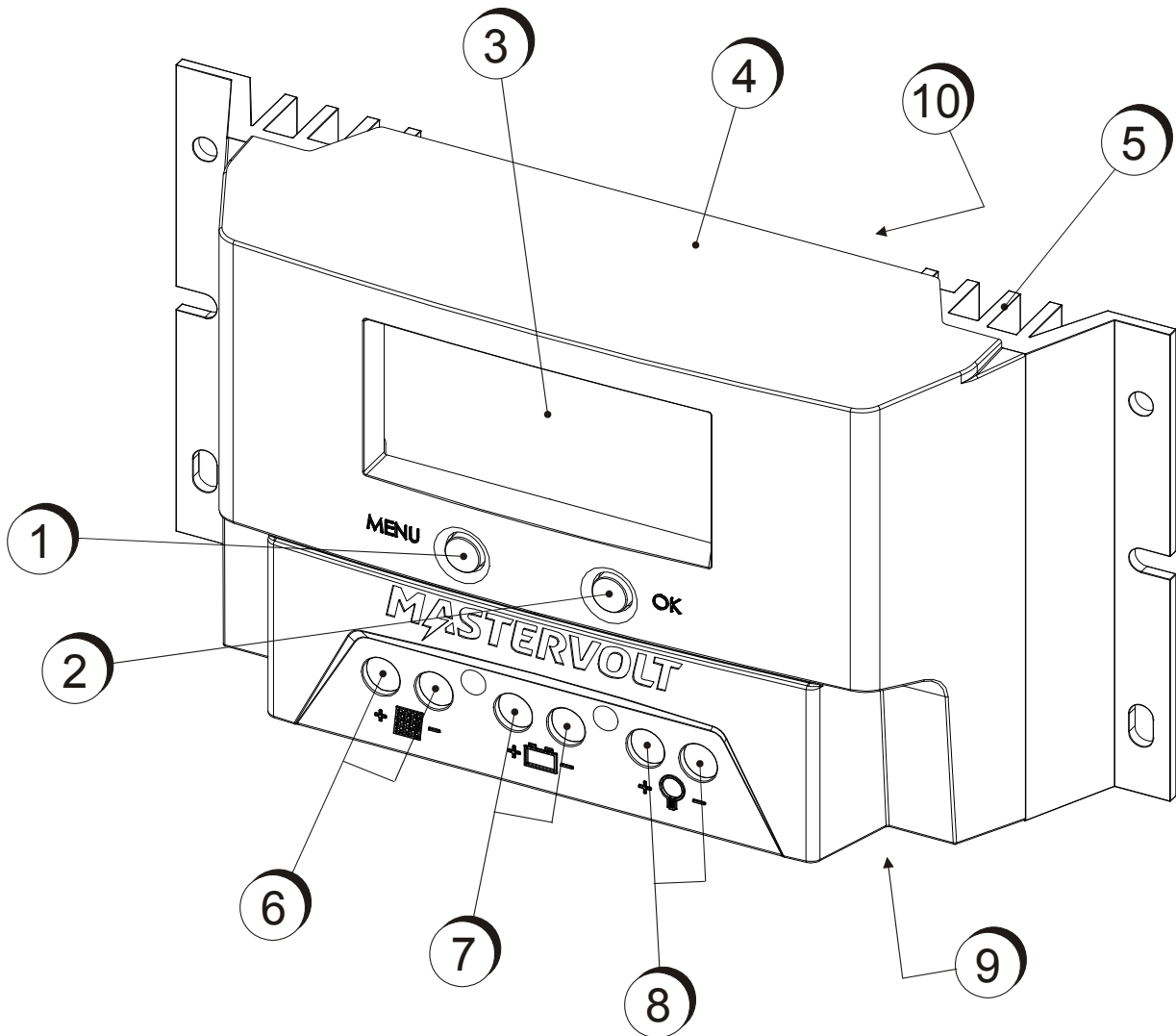


EN  
NL, DE, FR, ES

USER'S AND INSTALLATION MANUAL  
<https://www.mastervolt.com/products/solar-charge-controllers>

1000014327/02

## OVERVIEW



1. MENU button
2. OK button
3. LCD-display
4. Casing
5. Heatsink
6. PV input
7. Battery connection
8. Load output
9. Temperature sensor jack
10. Identification label (rear side)

Figure 1: Overview

**TABLE OF CONTENTS:**

<b>1</b>	<b>GENERAL INFORMATION.....</b>	<b>4</b>
1.1	Use of this manual.....	4
1.2	Validity of this manual.....	4
1.3	Use of pictograms.....	4
1.4	Identification label.....	4
1.5	Liability .....	4
<b>2</b>	<b>OPERATION .....</b>	<b>5</b>
2.1	General.....	5
2.2	Maintenance.....	5
2.3	Three step charge algorithm.....	5
2.4	LCD Display .....	6
2.5	Monitoring.....	6
2.6	Configuration.....	7
2.6.1	Low voltage disconnect function.....	8
2.6.2	Battery type .....	8
2.6.3	Load mode.....	8
<b>3</b>	<b>INSTALLATION .....</b>	<b>9</b>
3.1	Unpacking .....	9
3.2	Environment .....	9
3.3	Wiring and fuses.....	9
3.4	Specifications of the PV array .....	10
3.5	Connection of loads.....	10
3.5.1	Load connected to the Load output .....	10
3.5.2	Load connected to the battery .....	10
3.6	Things you need .....	10
3.7	Connection .....	12
3.7.1	General.....	12
3.7.2	Installation step by step .....	12
3.8	Commissioning after installation.....	13
3.9	Decommissioning .....	13
3.10	Storage and transportation .....	13
3.11	Re-installation.....	13
3.12	Correct disposal of this product.....	13
<b>4</b>	<b>TROUBLE SHOOTING .....</b>	<b>14</b>
<b>5</b>	<b>TECHNICAL DATA.....</b>	<b>15</b>
5.1	Specifications .....	15
5.2	Dimensions.....	16
5.3	Ordering information.....	16

## 1 GENERAL INFORMATION

### 1.1 USE OF THIS MANUAL

This manual serves as a guideline for the safe and effective operation, maintenance and possible correction of minor malfunctions of the "Solar ChargeMaster"

It is therefore obligatory that every person who works on or with the Solar ChargeMaster must be completely familiar with the contents of this manual and the Important Safety Instructions, and that he/she carefully follows the instructions contained herein.

Installation of, and work on the Solar ChargeMaster may be carried out only by qualified, authorised and trained personnel, consistent with the locally applicable standards and taking into consideration the Important Safety Instructions.

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### 1.2 VALIDITY OF THIS MANUAL

All of the specifications, provisions and instructions contained in this manual apply solely to standard versions of the Solar ChargeMaster delivered by Mastervolt.  
This manual is only valid for the following models:

Part number	Model
131822000	ChargeMaster "SCM20 PWM"
131822000	ChargeMaster "SCM40 PWM"

These models are mentioned as "Solar ChargeMaster" further in this manual.

### 1.3 USE OF PICTOGRAMS

Safety instructions and warnings are marked in this manual and on the product by the following pictograms:



A procedure, circumstance, etc which deserves extra attention.



#### CAUTION!

Special information, commands and prohibitions in order to prevent damage.



#### WARNING

A WARNING refers to possible injury to the user or installer or significant material damage to the Soladin if the installer / user does not (carefully) follow the stated procedures.



Read this manual before installation and use



This product has been declared conform the EC directives and standards.



Degree of protection: IP23. The product is protected against touch by fingers and water spray < 60 degrees from vertical.

### 1.4 IDENTIFICATION LABEL

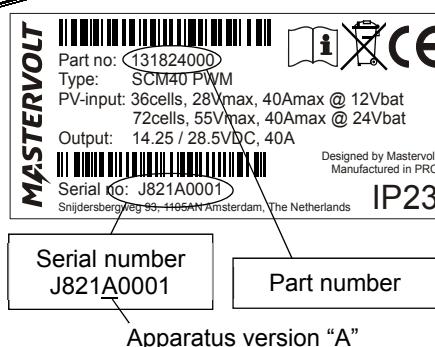
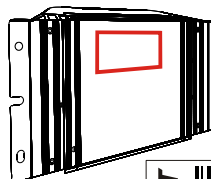


Figure 2: Identification label

The identification label is located at the rear side of the Solar ChargeMaster (see Figure 2). Important technical information required for service, maintenance & secondary delivery of parts can be derived from the identification label.



#### CAUTION!

Never remove the identification label.

### 1.5 LIABILITY

Mastervolt can accept no liability for:

- consequential damage due to use of the Solar ChargeMaster;
- possible errors in the manuals and their results.

## 2 OPERATION

### 2.1 GENERAL

The Mastervolt Solar ChargeMaster is a fully automatic battery charger which converts power from photovoltaic (PV) array to a regulated battery voltage. The Solar ChargeMaster will automatically adjust itself to a 12V or a 24V system. Under normal circumstances the Solar ChargeMaster remains switched on with the PV-array and batteries connected.

If power from the PV array is sufficient, the Solar ChargeMaster will initiate the charging process.



#### WARNING

The Solar ChargeMaster has no on/off switch. Charging will be initiated as soon as power from the PV-array becomes available.

The Load output of the Solar ChargeMaster switches off if one of the following fault conditions occurs: overload, short circuit, overheating or under and over voltage. The Load output switches on again after one minute if the Solar ChargeMaster recovers from these fault conditions.



#### CAUTION!

The Solar ChargeMaster is not protected against:

- Excessive overvoltage on the Solar input
- Surges induced by lightning.

### 2.2 MAINTENANCE

No specific maintenance to the Solar ChargeMaster is required. Examine your electrical installation on a regular base, at least once a year. Defects such as loose connections, burnt wiring etc. must be corrected immediately.

If necessary, use a soft clean cloth to clean the casing of the Solar ChargeMaster. Do not use any liquids or corrosive substances, such as solvents, alcohol, petrol or abrasive components.



In the event of decommissioning, refer to section 3.9

### 2.3 THREE STEP CHARGE ALGORITHM

See Figure 3. Battery charging is accomplished in three automatic stages: BULK, ABSORPTION and FLOAT.

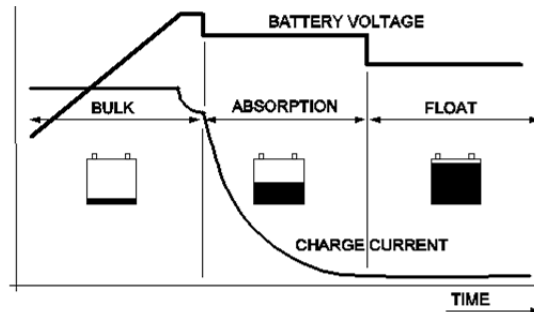


Figure 3: Three step charge system

- **BULK:** At this stage the charger delivers its maximum current for quick charging from 0 to 80%
- **ABSORPTION:** The charger has reached its maximum charge voltage and the charge current will slowly decrease until the battery is charged up to 100%.
- **FLOAT:** This stage begins once the battery is fully charged. The battery remains in fully charged state.

By installing the battery temperature sensor (not included; see section 5.3 for ordering information) the charge voltages are automatically adapted for deviating temperatures.

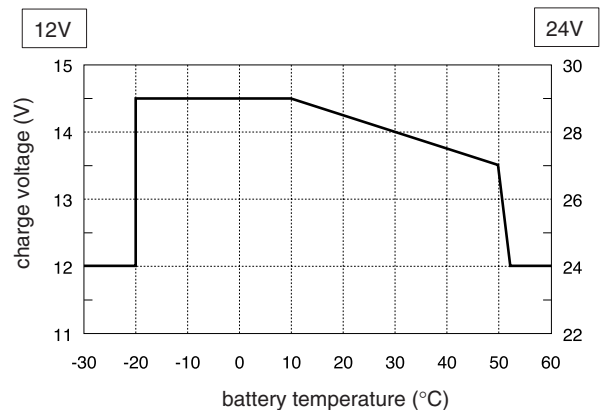


Figure 4: Temperature compensated charging















See Figure 4. When the battery temperature is low, the charge voltage increases. On the other hand, when the battery temperature is high, the charge voltage is decreased. Over charge and gassing are prevented this way. This will extend the life of your batteries

## 2.4 LCD DISPLAY



Use the **MENU** and **OK** button (Figure 1, items 1 and 2) to operate the Solar Chargemaster

Explanation of the symbols used on the screen:

Item	Indication	Meaning
PV Array	 	Daytime, not charging
	 → 	Daytime, charging
		Night
	PV	PV voltage, current and Ah's
	PV T	Total Charged Ah from the PV-array
Battery		Battery capacity
	 BAT	Battery voltage (programmable)
	BAT	Battery current
	BAT SOC	Battery state of charge (in %)
	25 °C	Temperature
	 BAT T CEL	Battery type (programmable)
Load	LOAD	Load voltage, current and Ah (24hrs cycle)
	LOAD T	The total discharge Af of the load
	 LOAD	Load mode (programmable)
	 → 	Load is off
	 	Load is on
Fault		Fault condition, see section 4

## 2.5 MONITORING

There are three monitoring modes:


- **Automatic Scrolling Mode:** the LCD-display is automatically scrolling through a selection of screens.
- **Manual Scrolling Mode:** Press **OK** shortly to scroll through all screens manually.
- **Static Display Mode:** Hold **MENU** and **OK** pressed simultaneously for 1 second to lock the screen. Hold **MENU** and **OK** pressed simultaneously for 1 second again to return to the Automatic Scrolling Mode.



























Below table shows the available screens.

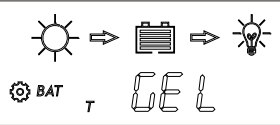
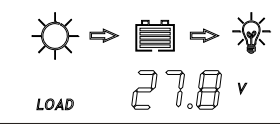
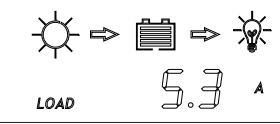
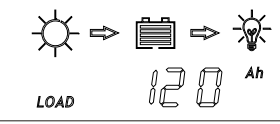
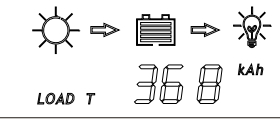
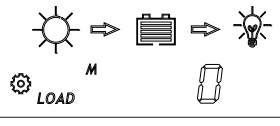


(#) = not shown in Automatic Scrolling Mode

(!) = not relevant if the load is directly connected to the battery; see section 3.5.

 = you can enter the configuration mode from this screen; see section 2.6.

Screen	Meaning
 →  →  PV 35.8 V	Voltage at the PV input.
 →  →  PV 16.2 A	Current of the PV array.
 →  →  PV 28 Ah	(#) Charged Ah.
 →  →  PV T 120 kWh	(#) Total Charged Ah from the PV-array.
 →  →   BAT 27.8 V	Battery voltage  See section 2.6 for configuration of the Low voltage disconnect function.
 →  →  BAT 10.9 A	(!) Battery current. Positive = charging. Negative = discharging.
 →  →  BAT SOC 96 %	(!) State of charge (available energy in %) of the battery.
 →  →  25 °C	Temperature of the battery in °C. Only shown if battery temperature sensor is connected.

Screen	Meaning
	(#) Battery type. ⚙️ See section 2.6 to change the Battery type settings
	(!) Voltage at the Load output.
	(!) Load current.
	(#)(!) Discharged Ah from the battery.
	(#)(!) Total discharged Ah from the battery.
	(#)(!) Status of the load mode. ⚙️ See section 2.6 for explanation and configuration of the Load mode settings

## 2.6 CONFIGURATION



### CAUTION!

Invalid settings of the Solar ChargeMaster can cause serious damage to your batteries and/or the connected load! Adjustments of settings may be undertaken by authorised personnel only.



If your Solar ChargeMaster is not new, you have to take into account that former users may have changed the settings.

When the ⚙️ symbol is shown on the screen (see section 2.5), you can enter the Configuration mode:

- Hold **MENU** pressed for 1 sec. until the ⚙️ symbol starts blinking

Change a setting:

- Shortly press **OK** until the desired setting is shown

Save setting and exit the configuration mode:

- Press **MENU** shortly

Exit the Configuration mode without saving setting:

- Wait for 30 seconds.

### 2.6.1 Low voltage disconnect function

There are two ways to protect the battery from too deep discharges:

- Static: the Load output switches off if the battery voltage drops below the Disconnect threshold voltage.
- Dynamic: the Load output switches off depending on both battery voltage and load current.

The Load output switches on again if the battery voltage rises above the Reconnect threshold value.

The Low voltage disconnect function can only be used if the load is connected to the Load output (see section 3.5)

#### Static Low voltage disconnect function:

Indication	Disconnect threshold	Reconnect threshold
10.8 / 21.6	10.8V / 21.6V	11.6 V / 23.2V
10.9 / 21.8	10.9V / 21.8V	11.7 V / 23.4V
11.0 / 22.0	11.0V / 22.0V	11.8 V / 23.6V
11.1 / 22.2	11.1V / 22.2V	11.9 V / 23.8V
11.2 / 22.4	11.2V / 22.4V	12.0 V / 24.0V
11.3 / 22.6	11.3V / 22.6V	12.1 V / 24.2V
11.4 / 22.8	11.4V / 22.8V	12.2 V / 24.4V
11.5 / 23.0	11.5V / 23.0V	12.3 V / 24.6V
11.6 / 23.2	11.6V / 23.2V	12.4 V / 24.8V
11.7 / 23.4	11.7V / 23.4V	12.5 V / 25.0V
11.8 / 23.6	11.8V / 23.6V	12.6 V / 25.2V

#### Dynamic Low voltage disconnect function:

Indication	Disconnect threshold		Reconnect threshold
	at full load	at no load	
§- 1	11.0V	11.6V	12.4 V
	22.0V	23.2V	24.8V
§- 2	11.1V	11.6V	12.5 V
	22.2V	23.2V	25.0V
§- 3	11.2V	11.6V	12.6 V
	22.4V	23.2V	25.2V
§- 4	11.4V	11.6V	12.7 V
	22.8V	23.2V	25.4V
§- 5	11.6V	11.6V	12.8 V
	23.2V	23.2V	25.6V

### 2.6.2 Battery type

Indication	Battery type
GEL	Gel
L19	Flooded (liquid)
AG-	AGM

### 2.6.3 Load mode

Indication	Load mode
0	Always on Mode: the load output is always switched on
	Dusk to Dawn Mode: the load output is switched on between sunset and sunrise. PV input threshold voltage: 5.0/10.0V
23456789	Evening Mode: The load output will be switched on for 2~9 hours after sunset.
USE	Manual Mode. The load output can be switched on and off manually by pressing <b>MENU</b> shortly.



#### NOTES:

- You can test the operation of the Load output manually by holding **MENU** pressed for 3 seconds. Press **MENU** again to switch off the load again or the load will switch off automatically after 1 minute.
- If the Manual Load Mode is selected ("USE"), you can switch on and off the Load output manually by pressing **MENU** shortly. In this case the protections against fault conditions for overload, short circuit, overheating or under and over voltage will be ignored!



## 3 INSTALLATION

During installation commissioning and maintenance of the Solar ChargeMaster, the Important Safety Instructions are applicable at all times.

### 3.1 UNPACKING

The delivery includes the following items:

- Solar Chagemaster;
- This User's manual
- Important Safety Instructions

After unpacking, check the contents for possible damage. Do not use the product if it is damaged. If in doubt, contact your supplier.

### 3.2 ENVIRONMENT

Obey the following stipulations during installation:

- The Solar Chagemaster is designed for indoor use only.
- Ambient operating temperature: -20°C ... 50°C / -4°F ... 122°F (power de-rating above 40°C / 104°F to decrease the internal temperature).
- Humidity: 5-95%, non-condensing.
- The Solar ChargeMaster must be mounted to a vertical, solid and heat-resistant surface, with the connecting cables downwards.
- Do not expose the Solar Chagemaster to excessive dust, aggressive environments, ammonia or salt.
- Make sure that the hot air that is developed during operation can be discharged. The Solar Chagemaster must be mounted in such a way that obstruction of the airflow along the heatsink on the backside of the casing will be prevented.
- No objects must be located within a distance of 20 cm / 8 inch around the Solar Chagemaster.
- Do not locate the Solar Chagemaster in the same compartment as the batteries.
- Do not install the Solar Chagemaster straight above the batteries because of possible corrosive sulphur fumes.
- Although the Solar Chagemaster fully complies with all applicable EMC limits, it may still cause harmful interference to radio communication equipment. If such interference appears, it is recommended to increase the separation between the Solar Chagemaster and the equipment, to relocate the receiving antenna or to connect the equipment to a circuit different from that to which the Solar Chagemaster is connected.

### 3.3 WIRING AND FUSES



#### WARNING

The wire and fuse sizes stated in this manual are given as example only. Prescribed wire and fuse sizes may be different due to local applicable regulations and standards.

Keep in mind that high current will pass through the DC wiring. Keep the cable length as short as possible, this will keep the system efficiency as high as possible. The recommended minimum cross sections of the wiring are:

Model	Minimum DC Cable cross section	
	<2m / 6ft length	2 - 4m / 6 - 12ft
SCM20 PWM	6mm <sup>2</sup> / 8AWG	10mm <sup>2</sup> / 6AWG
SCM40 PWM	10mm <sup>2</sup> / 6AWG	16mm <sup>2</sup> / 4AWG

Use boot lace ferrules on the wire ends. These ferrules must be crimped with a proper crimping tool.

Use the following wire colours for DC wiring:

Wire colour	Meaning	Connect to:
Red	Positive	+ (POS)
Black	Negative	- (NEG)

Lay the positive and negative cables next to each other to limit the electromagnetic field around the cables. The negative battery cable should be connected directly to the negative post of the battery bank or the ground side of a current shunt. Do not use the chassis frame as the negative conductor. Tighten securely. The positive battery cable must be fused and connected to the positive post of the battery bank.

The recommended DC fuses are:

Model	Battery fuse	Load fuse
SCM20 PWM	20A	20A
SCM40 PWM	40A	40A

See section 5.3 for ordering information

### 3.4 SPECIFICATIONS OF THE PV ARRAY



#### WARNING

When the PV array is exposed to light, it supplies a DC voltage to the Solar Chargemaster which can be dangerous to touch. For this reason, use of an external DC-switch is strongly recommended. Alternatively, before attempting any maintenance or cleaning the PV-array should be protected from light exposure, e.g. by covering the PV modules.



#### CAUTION!

Do not connect Solar Chargemasters in parallel on the side of the PV array.

The Solar ChargeMaster is appropriate for nominal 12V and 24V solar systems. The table shows the number of cells required for the nominal voltages.

#### Battery voltage $U_{NOM} = 12V$

Model	Panel type	Max input voltage	Max input current
SCM20 PWM	36 cells	28V	20A
SCM40 PWM	36 cells	28V	40A

#### Battery voltage $U_{NOM} = 24V$

Model	Panel type	Max input voltage	Max input current
SCM20 PWM	72 cells	55V	20A
SCM40 PWM	72 cells	55V	40A



#### CAUTION!

Never connect voltages higher than specified to the PV-input, as this will cause permanent damage to the Solar Chargemaster.

Configuration examples for PV-arrays consisting of monocrystalline or polycrystalline PV-modules:

### 3.5 CONNECTION OF LOADS

Depending on the energy system in which the Solar Chargemaster is used, there are two options to connect the electrical load to the Solar Chargemaster:

- To the Load output on the Solar Chargemaster, or
- Directly to the battery.

#### 3.5.1 Load connected to the Load output

See Figure 5 for a typical installation diagram. The Load output is provided with a protection circuit that switches off the connected load automatically in case of overload or if the battery voltage is too low. This kind of installation is typically used when the PV-modules are the only source of electrical power to charge the battery.

#### 3.5.2 Load connected to the battery

If the maximum load will exceed 20 Amps (SCM20 PWM), 40 Amps (SCM40 PWM) or if the battery will also be charged by other energy sources, such as a battery charger or an alternator, the electrical load shall be connected to the battery directly. See Figure 6 for a typical installation diagram. In this situation the battery is no longer protected against too low battery voltages. Installation of additional undervoltage protection circuits may be necessary. See section 5.3 for ordering information

### 3.6 THINGS YOU NEED

Make sure you have all the parts you need to install the Solar Chargemaster:

- Solar Chargemaster (included);
- Battery temperature sensor with cable and plug (optional, not included; see section 5.3 for ordering information);
- DC cables to connect the Solar Chargemaster; see section 3.3 for specifications;
- DC-fuse holder with a DC-fuse, to be integrated in the positive DC-cable to the battery; see section 3.3;
- Screws / bolts ( $\varnothing$  4mm max.) (with plugs) to mount the Solar Chargemaster to a surface;
- Batteries;
- Appropriate and reliable cable terminals, strain reliefs, battery terminals and boot lace ferrules.

We recommend as a minimum tool kit:

- Phillips screw driver nr.2 or flat blade screw driver 5 mm to fix the DC-cables;
- Tools to fix the screws / bolts with plugs to mount the Solar Chargemaster to a surface;

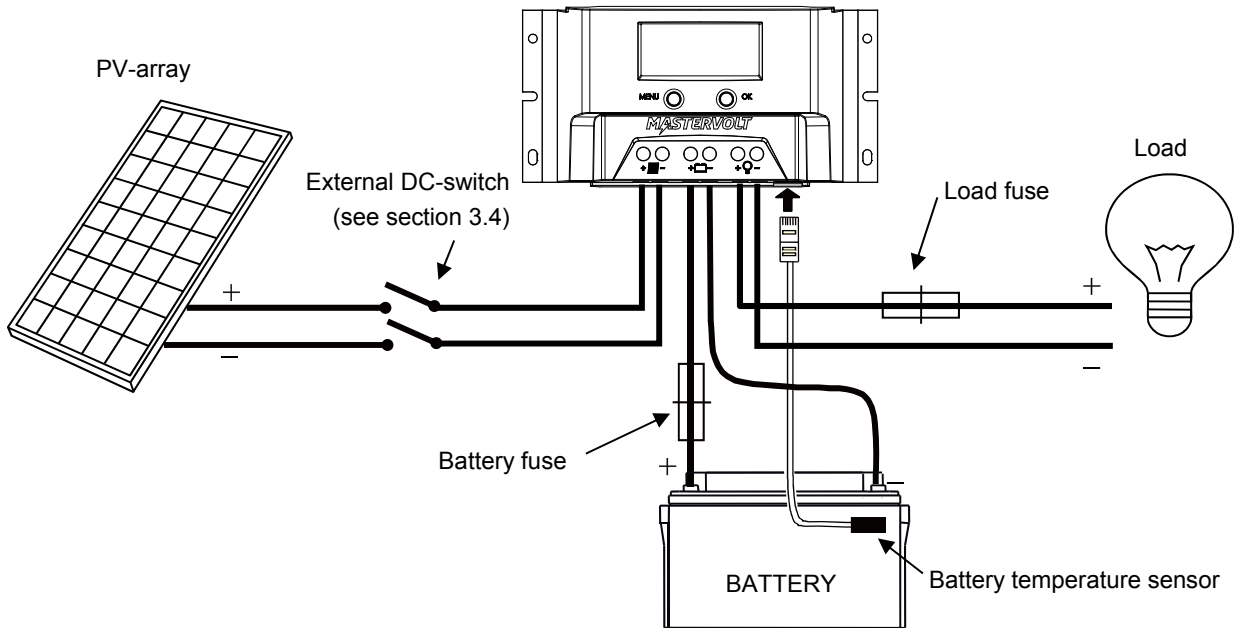


Figure 5: Load connected to the Load output on the Solar Chargemaster

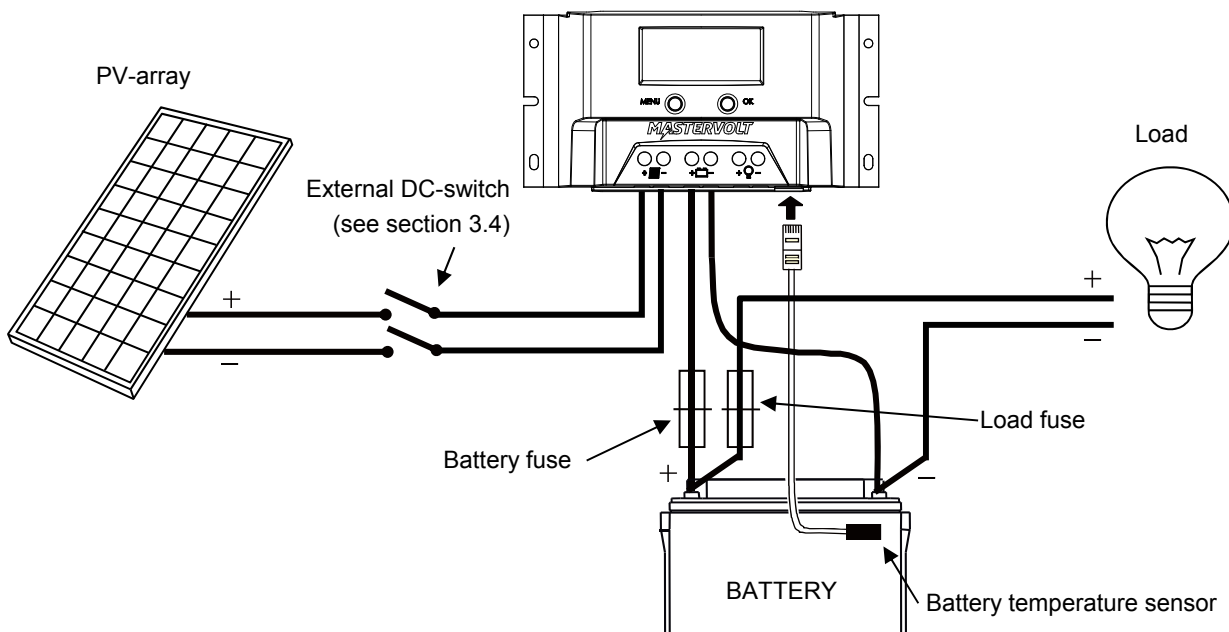


Figure 6: Load connected directly to the battery

Above schematics are to illustrate the general placement of the Solar Chargemaster in a circuit. They are not meant to provide detailed wiring instructions for any particular electrical installation

## 3.7 CONNECTION

### 3.7.1 General



#### WARNING

Let installation work be done by a licensed electrician.

All electrical systems must be disconnected from any power source during the entire installation!



#### CAUTION!

- Short circuiting or reversing DC polarity may lead to damage to the Solar ChargeMaster, the cabling and/or the terminal connections.
- Follow all steps of the installation instructions in order of succession as described.



#### CAUTION!

Too-thin cables and/or loose connections can cause dangerous overheating of the cables and/or terminals. Therefore tighten all connections well, in order to limit transition resistance as far as possible. Use cables of the correct size. Use additional strain reliefs to prevent the transmission of stress to the screw connectors.



#### CAUTION!

The negative connections of the Solar ChargeMaster are common and therefore have the same electrical potential. If grounding is required, always do this on the negative wires. Use one grounding point only.



#### NOTE:

If the battery temperature remains within 15-25°C, connection of the battery temperature sensor is optional

### 3.7.2 Installation step by step

- 1 Mark the position of the mounting spots. Then fix the casing to the wall.
- 2 Fit boot lace ferrules to all DC-cables.
- 3 Integrate a fuse holder in the positive battery wire, but do not place the fuse yet. Connect the wiring from the Battery connection to the battery.
- 4 Optional: Attach the battery temperature sensor to the casing the battery. Plug the temperature sensor cable into the Temperature sensor jack.



#### WARNING

Risk of shock! When the PV array is exposed to light, it supplies a dangerous DC voltage. See section 3.4!

- 5 Connect the PV array to the PV input.
- 6 Connect the wiring of the Load-output (see section 3.5). Integrate a fuse holder in the positive load wire, but do not place the fuse yet.
- 7 Check all wiring: positive to +, negative to -. See also Figures 5 and 6 for wiring examples. If OK, continue with section 3.8 for commissioning of the Solar ChargeMaster.

### 3.8 COMMISSIONING AFTER INSTALLATION



#### CAUTION!

Check the polarity of all wiring before commissioning: positive connected to positive (red cables), negative connected to negative (black cables).

- 1 If all wiring is OK, place the DC-fuse between the Solar Chargemaster and the battery



#### WARNING

When placing this fuse, a spark can occur, caused by the capacitors used in the Solar Chargemaster. This is particularly dangerous in places with insufficient ventilation, due to the gassing of the batteries an explosion can occur. Avoid having flammable materials close by.

- 2 Then, place the DC-fuse between the Solar Chargemaster and the load.
- 3 The Solar Chargemaster will initiate the charging process if the voltage from the PV array is sufficient.



If the Solar Chargemaster does not switch on, press **MENU** shortly.

- 4 Refer to section 2.6 for settings.

### 3.9 DECOMMISSIONING

To put the Solar ChargeMaster out of operation, follow these instructions in order of succession:

- 1 Switch off all loads that are connected to the Solar Chargemaster;
- 2 Disconnect the PV array by switching off the switch between the PV-array and the Solar Chargemaster (or protect the PV-array from light exposure, e.g. by covering the PV modules);
- 3 Remove the DC-fuse between the Solar Chargemaster and the battery;

- 4 Remove the DC-fuse between the Solar Chargemaster and the load;
- 5 Check with a suitable voltage meter whether the Battery connection and the LOAD output of the Solar Chargemaster are voltage free;
- 6 Disconnect the negative cable to the PV array from the terminal block of the Solar Chargemaster. Isolate the core of the wire with insulating tape;
- 7 Do the same for the positive cable to the PV array;
- 8 Disconnect all other remaining wiring.

Now the Solar Chargemaster can be demounted in a safe way.

### 3.10 STORAGE AND TRANSPORTATION

When not installed, store the Solar Chargemaster in the original packing, in a dry and dust free environment.

Always use the original packing for transportation. Contact your local Mastervolt Service Centre for further details if you want to return the apparatus for repair.

### 3.11 RE-INSTALLATION

To reinstall the Solar Chargemaster, follow the instructions as described in this chapter (chapter 3).

### 3.12 CORRECT DISPOSAL OF THIS PRODUCT

#### (Waste Electrical & Electronic Equipment)













This product is designed and manufactured with high quality materials and components, which can be recycled and reused. When this crossed-out wheeled bin symbol is attached to a product, it means the product is covered by the European Directive 2012/19/EU.

Please be informed about the local separate collection system for electrical and electronic products.

Please act according to your local rules and do not dispose of your old products with your normal household waste. The correct disposal of your old product will help prevent potential negative consequences to the environment and human health

## 4 TROUBLE SHOOTING

If you cannot solve a problem with the aid of this chapter, contact your local Mastervolt Service Centre. See [www.mastervolt.com/technical-support](http://www.mastervolt.com/technical-support). Make sure you have the following information present if you have to contact your local Mastervolt Service Center to solve a problem: Article and serial number; see section 1.4

Malfunction	Possible cause	What to do?
No display function	Battery voltage is abnormal	Check battery voltage. Battery voltage must be 10~15V for 12V systems or 20~30V for 24V systems.
	Reversed polarity of the Battery	Check wiring to battery
No voltage at Load output	Fault condition	See below error codes E1 ~E5
	Wrong setting of the Load mode	Check settings of the Load mode (section 2.6)
	Short circuit at Load output	Switch off all loads, remove short circuit. Load output will automatically resume after 1 minute.
  E1		
  E2	Overload at Load output	Reduce the connected load. Load output will automatically resume after 1 minute.
  E3	Battery voltage is too low; see section 2.6 for configuration of the Low voltage disconnect function.	Reduce load connected to the batteries and charge batteries. Load output will automatically resume after 1 minute.
  E4	Overcharge, battery voltage is too high (>15.5/31.0V)	Check batteries. Check other charging systems. Use the battery temperature sensor.
  E5	Over temperature	Check cooling of the Solar Chargemaster
No battery charging during daytime	Batteries are full	Nothing.
	No power from the PV-modules..	Check wiring to PV-modules. Check for loose connections, short circuit or incorrect polarity
	Damaged battery temperature sensor	Check battery temperature sensor (if applied)
Output voltage too low, charger supplies maximum current	Load that is connected to the batteries is larger than charger can supply.	Reduce load taken from the batteries.
	Batteries not 100% charged	Measure battery voltage. After some time this will be higher.
	Wrong battery type setting	Check settings (see section 2.6).
Battery is discharged too fast	Battery capacity reduced due to sulphation or due to plate corrosion	Charge and recharge a few times, this might help. Check battery and replace if necessary.
	Too low charger capacity or battery capacity or too high load	Check balance between charger capacity, battery capacity and load
	Defective battery (short circuit in cell)	Check battery and replace if necessary.
Batteries are too warm, gassing	Battery temperature too high	Use the battery temperature sensor.
	Charge current too high for battery	Check specifications of battery for maximum allowed charge current
	Wrong battery type setting	Check settings (see section 2.6).

## 5 TECHNICAL DATA

### 5.1 SPECIFICATIONS

Model	SCM20 PWM		SCM40 PWM	
Article no.:	131822000		131824000	
Nominal battery voltage ( $U_{NOM}$ ):	12V / 24 V (Auto recognition)		12V / 24 V (Auto recognition)	
<b>PV-INPUT</b>	<b>@ <math>U_{NOM} = 12V</math></b>	<b>@ <math>U_{NOM} = 24V</math></b>	<b>@ <math>U_{NOM} = 12V</math></b>	<b>@ <math>U_{NOM} = 24V</math></b>
Typical number of cells:	36 cells	72 cells	36 cells	72 cells
Absolute maximum PV Voltage:	28V <sub>DC</sub>	55V <sub>DC</sub>	28V <sub>DC</sub>	55V <sub>DC</sub>
Maximum PV input current*:	20A	20A	40A	40A
Control:	PWM			
Dusk to dawn threshold voltage:	5V	10V	5V	10V
<b>BATTERY OUTPUT</b>	<b>@ <math>U_{NOM} = 12V</math></b>	<b>@ <math>U_{NOM} = 24V</math></b>	<b>@ <math>U_{NOM} = 12V</math></b>	<b>@ <math>U_{NOM} = 24V</math></b>
Maximum charge current ( $I_{MAX}$ ):	20A	20A	40A	40A
Charge voltage, Absorption:	14.4V	28.8V	14.4V	28.8V
Charge voltage, Float (flooded):	13.25V	26.5V	13.25V	26.5V
Charge voltage, Float (AGM / gel batteries):	13.8V	27.6V	13.8V	27.6V
Battery temperature compensation:	-30 mV/°C	-60 mV/°C	-30 mV/°C	-60 mV/°C
DC consumption (at night):	7mA	7mA	7mA	7mA
Battery voltage operating window:	10.0-15.0V	20.0-30.0V	10.0-15.0V	20.0-30.0V
Charge algorithm:	Three step (Bulk, Absorption, Float)			
Battery types*:	Flooded, AGM, Gel			
<b>LOAD OUTPUT</b>	<b>@ <math>U_{NOM} = 12V</math></b>	<b>@ <math>U_{NOM} = 24V</math></b>	<b>@ <math>U_{NOM} = 12V</math></b>	<b>@ <math>U_{NOM} = 24V</math></b>
Maximum output current:	20A	20A	40A	40A
Under voltage disconnect (adjustable**):	10.8~11.8V	21.6~23.6V	10.8~11.8V	21.6~23.6V
Under voltage reconnect (adjustable**):	11.6~12.6V	23.2~25.2V	11.6~12.6V	23.2~25.2V
<b>GENERAL</b>				
Galvanic isolation between PV and battery:	No, common negative conductor			
Dimensions in mm [inch] (h x w x d):	96 x 189 x 53 mm [3.8 x 7.4 x 2.0 inch]; see also section 5.2			
Weight:	480g			
Operating Temperature Range:	-20°C ≤ T <sub>AMB</sub> ≤ +50°C [-4°F ≤ T <sub>AMB</sub> ≤ 122°F]			
Full Power Temperature range:	-20°C ≤ T <sub>AMB</sub> ≤ +40°C [-4°F ≤ T <sub>AMB</sub> ≤ 104°F] (no power de-rating)			
Non-operating Temperature range:	-25°C ≤ T <sub>AMB</sub> ≤ +75°C [-13°F ≤ T <sub>AMB</sub> ≤ 167°F] (storage temperature)			
Relative Humidity:	5% to 95% non-condensing			
Protections:	Reversed polarity, output overload, output short circuit, overheating, battery under voltage, battery over voltage			
Protection degree:	IP23			
MasterBus connectivity:	No			
Load modes**:	Always on, Dusk to Dawn, Evening, Manual			
Terminals:	Screw terminals, max. wire size 16mm <sup>2</sup>			

\* Short circuit current of the PV module

\*\* Refer to section 2.6 for configuration

Specifications are subject to change without prior notice.

## 5.2 DIMENSIONS

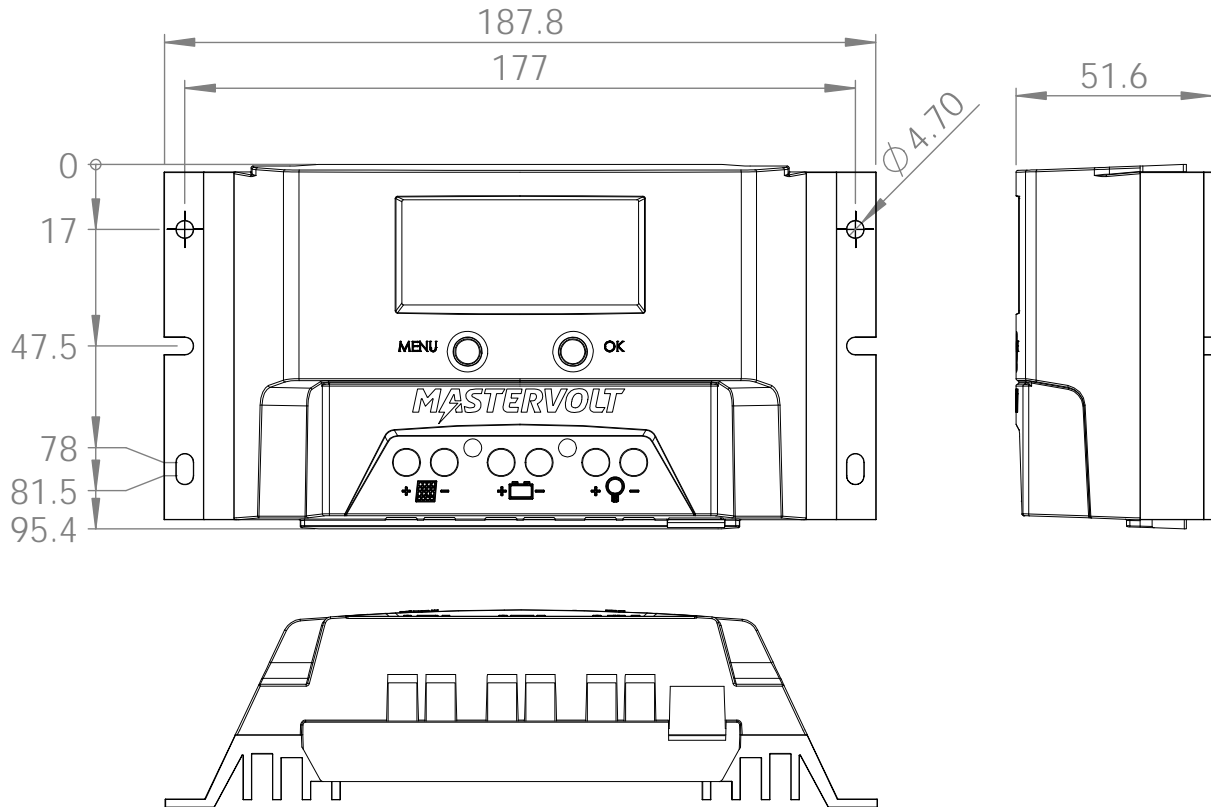


Figure 7: Dimensions of the Solar ChargeMaster in mm [inches]

## 5.3 ORDERING INFORMATION

Part number	Description
77049020	ANL Fuse 20A
77049040	ANL Fuse 40A
607006	ANL Fuse block
701	Battery switch 275A
41500500	Battery temperature sensor, incl. 6 meter / 19 ft cable
83200150	Battery Watch, Battery undervoltage protection circuit, 12V/24V, 100A continuous, 150A peak load
77020200	DC-Distribution 500.
	The Mastervolt DC Distribution offers fused DC connections to install up to four different devices.

Mastervolt can offer a wide range of products for your electrical installation, including battery chargers, DC to AC Sine wave inverters, AGM, gel and Li-ion batteries, DC distribution kits and many more.

See our website [www.mastervolt.com](http://www.mastervolt.com) for an extensive overview of all our products