MPPT 30 A & 40 A SOLAR CONTROLLER

User Manual

SC-DB-MPPT-30-12
SC-DB-MPPT-40-12

DOMETIC

*Product may not appear exactly as shown

Manual_SC-DB-MPPT_RevC

CONTENTS

ABOUT THIS MANUAL

Thank you for choosing this Dometic Solar Controller. This manual will provide you with all the information you need to properly install and use your solar controller. This manual contains important information about the safe installation and operation of the solar controller. Please keep this manual for future reference.

GENERAL SAFETY INFORMATION

Read this manual carefully and look at the solar controller equipment to become familiar with the device before trying to install, operate, or maintain it. The following signal words may appear throughout this documentation or on the equipment to warn of potential hazards or call to attention to information that clarifies or simplifies procedure. Make sure that you thoroughly understand the meaning of each signal word and comply with the manual instruction. Always refer to the manual.

	**WARNING!** Hazard to Human Life	This type of notation indicates that the hazard could be harmful to human life.
	**WARNING!** Shock Hazard	Danger of shock or electrocution.
	**WARNING!** Burn/Fire Hazard	Danger of hot surface and/or fire.
	**CAUTION!** Hazard to Equipment	This type of notation indicates that the hazard may cause damage to the equipment.
	**IMPORTANT**	This type of notation indicates that the information provided is important to the installation, operation, and/or maintenance of the equipment. Failure to follow the recommendations in such a notation could result in annulment of the equipment warranty.

SAFETY PRECAUTIONS

	**WARNING!** Disconnect all power sources	Electricity can be very dangerous. Installation must be performed only by licensed electrician or qualified personnel.
	**WARNING!** Battery and wiring safety	Observe all safety precautions of the battery manufacturer when handling or working around batteries. When charging, some batteries may produce hydrogen gas, which is highly explosive.
	**WARNING!** Wiring Connection	Ensure all connections are tight and secure. Loose connections may generate sparks and heat. Be sure to check connections one week after installation to ensure they are still tight.

	**WARNING!** Work Safely	Wear protective eye wear and appropriate clothing during installation. Use extreme caution when working with electricity and when handling and working around batteries. Use properly insulated tools only.
	**WARNING!** Observe correct polarity at all times	Reverse polarity of the battery terminals and/or solar array will cause the controller to display a warning. The controller will not function unless battery terminals are connected to a battery with proper polarity. Failure to correct this fault could damage the controller.
	**WARNING!** Do not exceed the SC-DB-MPPT max voltage ratings	The maximum voltage of the array is the sum of the solar panel–rated open-circuit voltage of the series connected panels multiplied by 1.25 (or by a value from NEC 690.7 provided in Table 690.7 A). The resulting voltage is not to exceed 96V. If your solar system exceeds this value, contact your dealer for a suitable controller alternative. Always refer to the manual.
	**WARNING!** Always use a fuse or breaker	There must be overcurrent protection installed between the controller and battery on the positive wire. An overcurrent protection device is not provided with this equipment and must be purchased separately.
	**IMPORTANT** Mounted Indoor	Ensure that the controller is mounted indoors and protected from exposure to the elements and water.

1. PRODUCT OVERVIEW

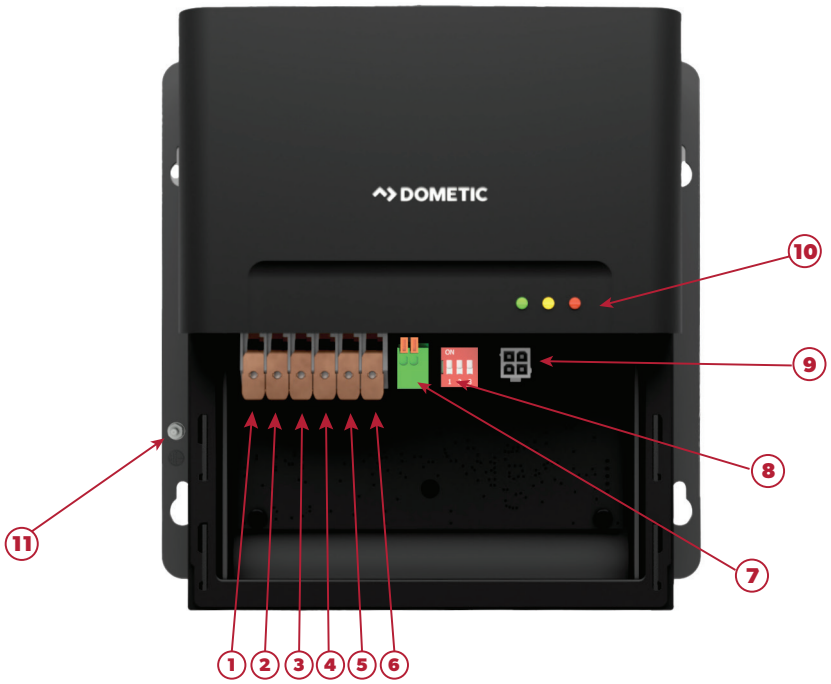
1.1 GENERAL DESCRIPTION

A solar controller, also known as a charge controller or regulator, is an essential component of your photovoltaic solar system. The controller maintains the life of the battery by protecting it from overcharging and maximizes the power usage from your solar panel. When your battery has reached a 100% state of charge, the controller prevents overcharging by limiting the current flowing into the batteries from your solar array.

The SC-DB-MPPT uses maximum power point tracking (MPPT) technology and a unique four stage charging system that includes an optional equalization setting to charge and protect your battery bank. In addition, the SC-DB-MPPT has the ability to trickle charge a secondary battery. The intended use of this feature is to maintain the RV starter battery while it is parked for long periods of time.

The 30 A and 40 A MPPT controllers are intended for use at 12 or 24 VDC nominal system voltage, and are rated for a maximum continuous DC charge current of 30 A and 40 A respectively. The SC-DB-MPPT is suitable for use with lead acid batteries (flooded, GEL, or AGM), as well as lithium iron phosphate (LiFePO4) batteries that are supplied with a battery management system (BMS).

1.2 FEATURES



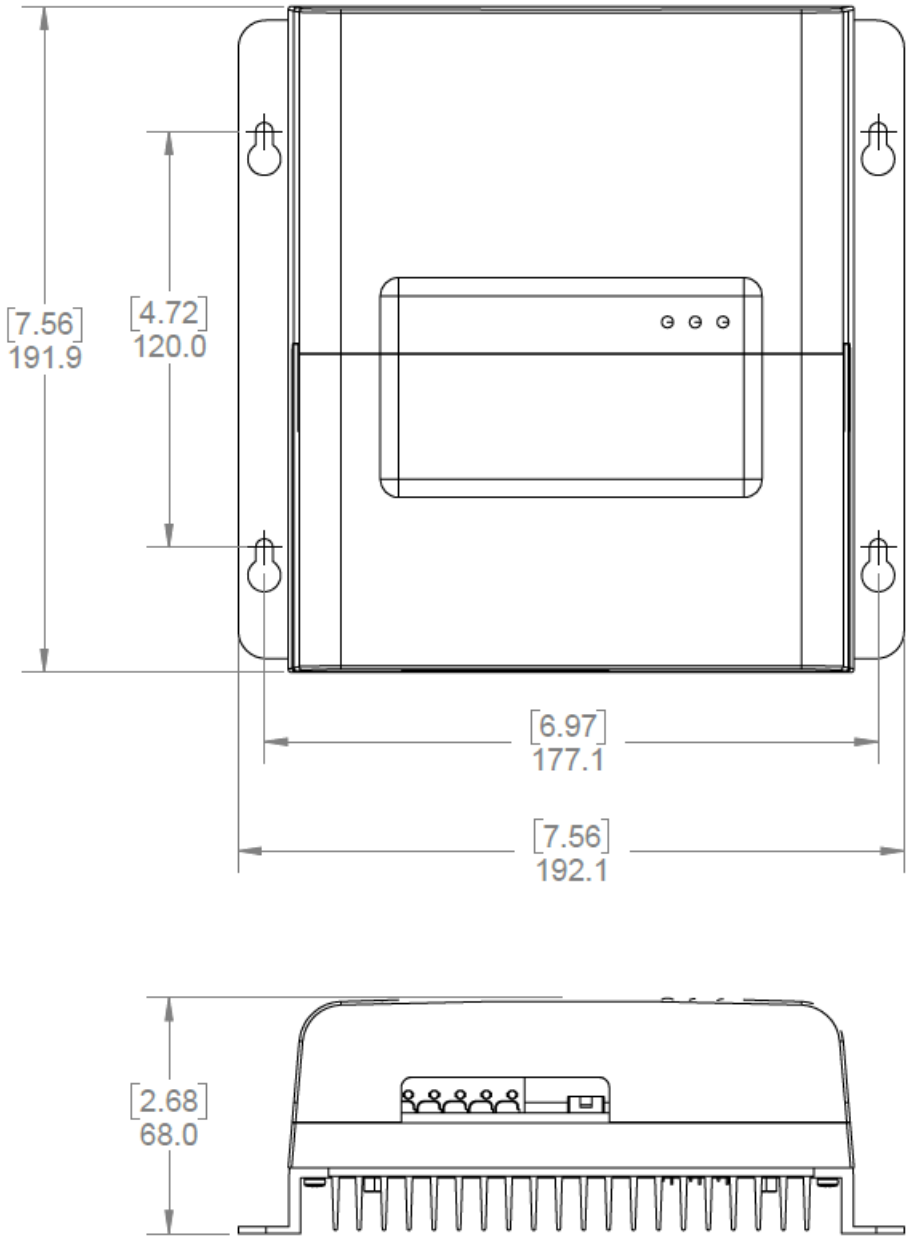
NO.	DESCRIPTION	NO.	DESCRIPTION
1	Solar +	7	External Temperature Sensor Port
2	Solar -	8	DIP Switches
3	Battery 1 +	9	RV-C Communication Port
4	Battery 1 -	10	LED Indicators (Green, Yellow, Red)
5	Battery 2 +		
6	Battery 2 -	11	Grounding Stud

1.3 WHAT'S INCLUDED

ITEM	QUANTITY
SC-DB-MPPT	1
Mounting Screws (#8 x 1")	4
Quick Start Guide	1

1.4 DIMENSIONS

Note The dimensioned drawing is not to scale. Refer to the appendix for the mounting template.



1.5 REGULATORY INFORMATION

UL Std. 1741

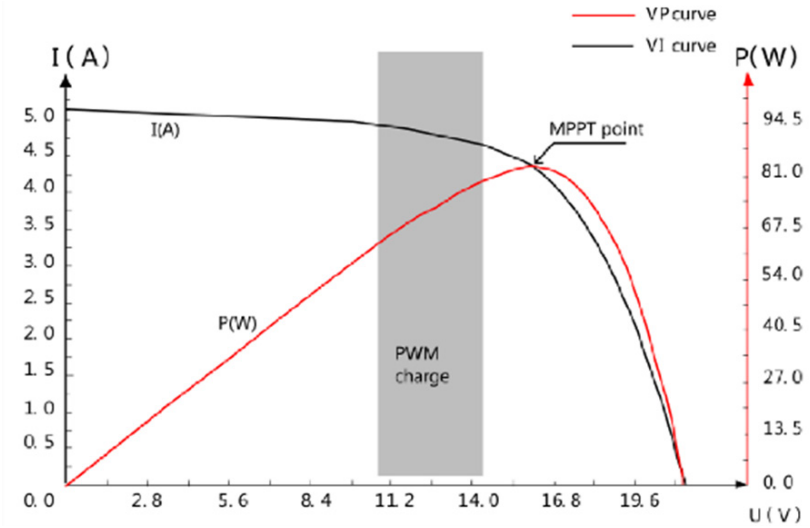
FCC Part 15 Class B

1.6 SPECIFICATIONS

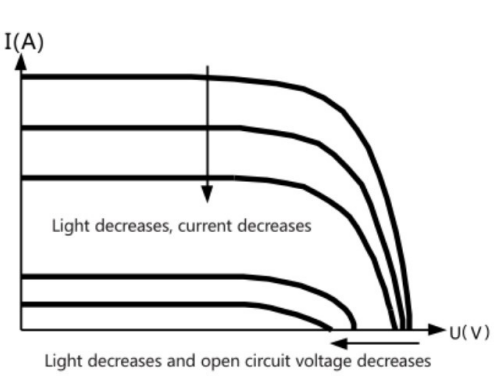
DESCRIPTION	SC-DB-MPPT-30-12	SC-DB-MPPT-40-12
Nominal System Voltage	12/24 V	
Temperature Compensation	-24 mv/°C (configurable), none for Lithium batteries	
Battery Voltage Range	8 – 32 V	
Maximum Total Charge Current	30 A	40 A
Maximum Secondary Charge Current	2.5 A	
Conversion Efficiency	Up to 98 %	
MPPT Tracking Efficiency	Up to 99.9 %	
Max Panel Input Voltage	96 Voc	
Max PV Power Input	600 W @ 12 V / 1200 W @ 24 V	900 W @ 12 V / 1800 W @ 24 V
Idle Current	36.5 mA @ 12.5 V	
Grounding	Common Negative	
Operating Temperature (Without Derating)	-40 to 55 °C	-40 to 40 °C
Storage Temperature	-40 to 60 °C	
Humidity	95 % non-condensing	
Battery Type	Gel, AGM, Flooded, Lithium, Custom	
Number of Battery Outputs	2	
Max Wire Gauge B1 and B2	8 AWG	
RV-C Network Power Supply Nominal Voltage	10.6 V	
RV-C Network Power Supply Max Current	250 mA	
Water Ingress Protection	IP32	
Altitude	< 4000 m	
Standards	UL 1741, FCC Part 15 Class B, RoHS	
Protection	Battery reverse polarity, over temperature, internal overvoltage, PV overcurrent, reverse current (battery to PV)	

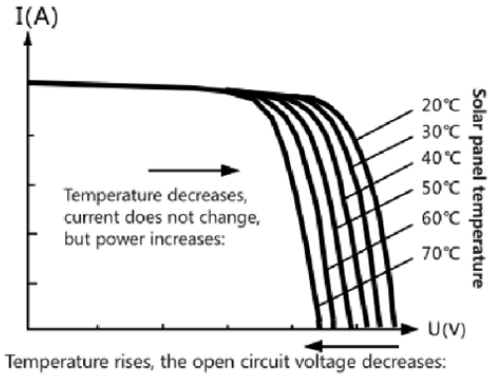
1.7 MAXIMUM POWER POINT TRACKING (MPPT) TECHNOLOGY

Maximum power point tracking (MPPT) is an advanced charging technology that efficiently harvests power from solar panels in all conditions. This is achieved by continuously tracking the I-V curve of the solar array and modifying operating conditions to maximize output power. The graph below shows the MPPT point compared to a traditional PWM charger, which always runs the solar array at a voltage close to the battery voltage.

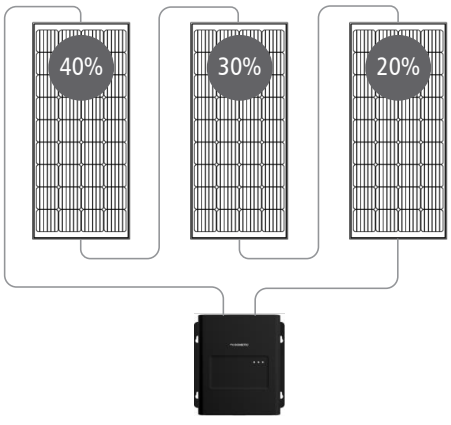


Due to differences in ambient temperature and light conditions, the maximum power point often changes. The MPPT controller can adjust parameters according to quickly changing conditions to keep the system near to its maximum working point. The whole process is fully automatic and does not require any adjustments or interference by users. The graphs below show how the IV curve changes with varying sunlight conditions, and varying temperatures.

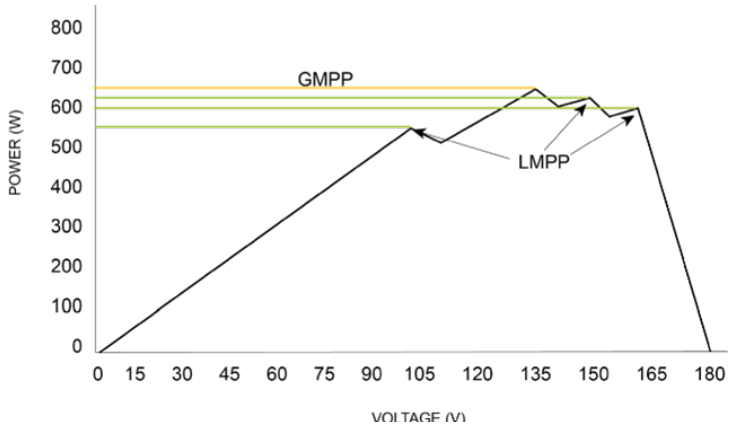




In partially shaded conditions there can also be multiple peaks in the P-V curve that can confuse an MPPT algorithm. Shown in the diagram below is a series string of solar panels.



The corresponding graph below shows local maximum power points (LMPP) and the global maximum power point (GMPP) that will result in maximum energy transfer. The SC-DB-MPPT controllers have a smart algorithm that will always choose the correct peak.



The SC-DB-MPPT controller has an MPPT efficiency of up to 99.9 %, meaning there is no wasted potential from your solar panels.

1.8 SYSTEM VOLTAGE AND CURRENT

The 30 A and 40 A MPPT controllers are intended for use at 12 or 24 VDC nominal system voltage and are rated for a maximum continuous DC charge current of 30 A and 40 A respectively, and maximum solar input voltage of 96 Voc.

Per the National Electric Code (NEC) article 690.7 and 690.8, solar panel nameplate ratings at Standard Test Conditions (STC) must be multiplied by required values (typically 1.25 for both voltage and current) to obtain the maximum voltage and continuous current available from the panel.

The voltage and current ratings of all equipment connected to solar panels must be capable of accepting the voltage and current levels available from solar panels installed in the field.

1.9 CURRENT DERATING

The SC-DB-MPPT constantly monitors the internal temperature to ensure it does not exceed temperature limits. In applications that require full output current in high ambient temperatures, the solar controller starts limiting the current delivered to the battery to keep the internal temperature within the required specifications.

1.10 TEMPERATURE COMPENSATION

The SC-DB-MPPT has the ability to perform temperature compensation. This feature extends the life of the battery by preventing overcharging in warm temperatures, and undercharging in cold temperatures. Temperature compensation is not required for lithium batteries. The SC-DB-MPPT is delivered with a battery temperature sensor. When the sensor is installed, the charge voltages are automatically adapted for deviating temperatures between -20°C and 50°C. If the temperature of the sensor is below 25 °C, the absorption and float charge voltages increase. If the temperature of the sensor is above 25 °C, the absorption and float charge voltages decrease. The temperature compensation factor is -24 mV/°C by default and can be adjusted on the PowerTrak™ Display (sold separately).

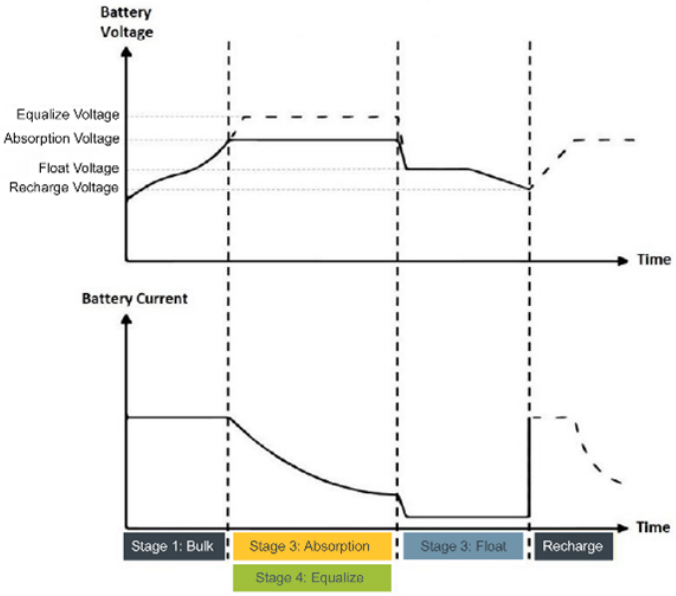
1.11 BATTERY TYPE

The SC-DB-MPPT controller is suitable for use with lead acid batteries (GEL, AGM, Flooded) as well as lithium iron phosphate (LiFePO4) batteries that are supplied with a battery management system (BMS).

A custom profile in the settings allows creating a specific battery profile by programming and adjusting various charging parameters such as the charging voltage set points.

1.12 BATTERY CHARGING STAGES

Maximum power point tracking is used to charge the batteries with the highest current possible, but this is only part of the equation. The multistage battery charger can use up to four different charging stages to help monitor and keep the batteries healthy.



These stages include bulk, absorption, float and, for some types of batteries, equalization.

Note Battery 2 is trickle charged and cannot do equalization.

1.12.1 FIRST STAGE: BULK

In the bulk stage, the battery voltage has not yet reached the set value of full charge voltage (i.e. equalizing/boost charge voltage) and the controller will perform MPPT charging, which will provide maximum solar energy to charge the battery. When the battery voltage reaches the absorption voltage, the second stage will start.

1.12.2 SECOND STAGE: ABSORPTION

When the battery voltage reaches the absorption voltage, the controller will perform constant voltage charging. This is no longer MPPT charging, and the charging current will gradually decrease with time.

1.12.3 THIRD STAGE: FLOAT

After the absorption stage, the controller will reduce the charge current to a small amount in order to reduce sulfates on the battery plates or to allow a lithium battery to balance its cells. If the load exceeds this small current the battery voltage will start to decrease until it reaches the recharge voltage. When the battery voltage falls below the recharge voltage, the controller will switch back to bulk charging.

1.12.4 FOURTH STAGE: EQUALIZATION

WARNING! Risk of explosion! Equalizing vented lead-acid battery may generate explosive gases. So, the battery compartment must be well ventilated.

CAUTION! Damage of device! Equalization can increase the battery voltage to levels that may damage sensitive DC loads. It is necessary to verify that the allowable input voltage of all system loads is greater than the equalizing charge set value.

CAUTION! Damage of device! Over charge and excessive gas evolution may damage the battery plates and cause active substances on the battery plate to come off. Equalizing charge may cause damage if voltage is too high, or time is too long. Please carefully check the specific requirements of battery used in the system.

Certain battery types benefit from equalization charging to stir up stratified electrolyte and to reverse any battery plate sulfation that may have occurred. The equalization charge increases the battery voltage above a standard voltage, causing vaporization of battery electrolyte. By default, this happens every 30 days for flooded batteries.

1.12.5 RECHARGE

After the battery is completely charged the charging cycle completes and the battery is allowed to slowly discharge until it reaches the charge return voltage at which point a new charge cycle is initiated.

1.12.6 CHARGE PARAMETERS FOR VARIOUS BATTERY TYPES

If the manufacturer of your third-party battery recommends charging parameters that differ from the parameters in the table below, select the custom battery option to manually set your charging profile.

PARAMETER	GEL 12V/24V	AGM 12V/24V	FLOODED 12V/24V	LIFEPO4 12V/24V	CUSTOM 12V/24V
High Voltage Disconnect	16.0 / 32.0 V	16.0 / 32.0 V	16.0 / 32.0 V	14.6 / 29.2 V	14.0 V..16.0 V / 28.0 V..32.0 V
Equalization Voltage	-	-	14.9 / 29.8 V	-	<16.0 V / <32.0 V
Bulk-Absorption Voltage	14.1 / 28.2 V	14.4 / 28.8 V	14.4 / 28.8 V	14.4 / 28.8 V	12.0..16.0 V / <32.0 V
Float Voltage	13.7 / 27.4 V	13.7 / 27.4 V	13.7 / 27.4 V	14.0 / 28.0 V	12.0..16.0 V / <32.0 V
Recharge Voltage	13.2 / 26.4 V				<16.0 V / <32.0 V
Under Voltage Return Voltage	12.8 / 25.2 V	12.8 / 25.2 V	12.8 / 25.2 V	12.2 / 24.4 V	11.0 V..22.0 V / 16.0 V..32.0 V
Under Voltage Warning	11.0 V..22.0 V / 14.0 V..28.0 V				
Under Voltage Limit	10.0 V..20.0 V / 13.0 V..26.0 V				
Under Voltage Delay	0..253 seconds				
Equalization Duration	-	-	120 minutes	-	0..65530 minutes
Absorption Duration	120 minutes				0..253 minutes
Equalization Interval	-	-	30 days	-	0..253 days
Temperature Compensation Coefficient	-24 mV/°C	-24 mV/°C	-24 mV/°C	-	0..-99 mV/°C
Over Voltage Limit	14.0 V..16.0 V / 28.0 V..32.0 V				
Over Voltage Return	11.0 V..16.0 V / 22.0 V..32.0 V				

2.1 CHOOSING AN INSTALLATION LOCATION

The SC-DB-MPPT controller is designed to be surface mounted against a wall, out of the way, but easily visible with an unobstructed view of the status LEDs. The SC-DB-MPPT must be installed in a location that meets the following requirements.

- The controller must be mounted as close to the battery as possible.
- The controller must be mounted vertically on a non-flammable surface with power terminals facing downward to optimize cooling of the unit by natural convection.
- The controller must be indoors, protected from the weather.
- The controller must be mounted with at least 150 mm (6 inches) of air gap above and below for the natural convection to be effective.
- Solar connections should connect directly to the controller. Positive and negative battery connections must connect directly from the controller to the batteries. Use of a positive or negative distribution bus is allowed between the controller and battery as long as it is properly sized, electrically safe and an adequate wire size is maintained.

2.2 REQUIRED TOOLS AND MATERIALS

- Phillips screwdriver
- Flat head screwdriver
- Drill
- 7/64" drill bit
- No tools needed for wiring connections (tool-less lever terminals)

3. INSTALLATION INSTRUCTIONS

3.1 MOUNTING THE CONTROLLER

Use the SC-DB-MPPT mounting template located in the appendix to mark out all four mounting holes in the desired mounting location. Drill four pilot holes with a 7/64" drill bit at the marked locations. Insert the screws in the top two mounting holes, without fully tightening them. Align the top two mounting holes of the controller with the pre-fixed screws and hang the controller on the wall. Tighten the top two screws, then insert the bottom two screws and tighten them.

3.2 INSTALLATION OF THE SOLAR PANELS

Install your solar array, and cover panels with opaque material until all wiring is complete. If your SC-DB-MPPT was purchased as part of a solar power kit, follow the installation guide provided. Otherwise, follow manufacturer's instructions for solar panel mounting and wiring.

3.3 WIRE TYPE AND GAUGE

If this SC-DB-MPPT was purchased as part of a solar power kit, appropriate wire type, gauge, and length is provided. If the SC-DB-MPPT was purchased separately, follow the instructions included here.

Wire type is recommended to be a stranded copper. Note, any external wiring should be UV-resistant, outdoor rated wire. Wire gauge should be able to sustain rated current and minimize voltage drop.

3.3.1 WIRE GAUGE & FUSE SIZING

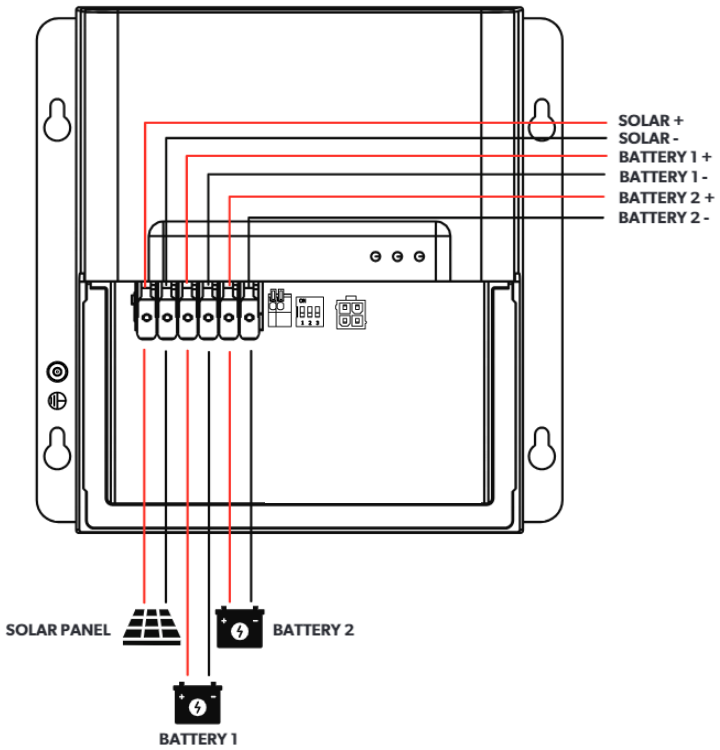
This section outlines the recommended wire gauges and fuse sizes for connecting battery 1 and battery 2 to the solar controller. The following points must be observed for the solar controller wiring.

- The wire length from the solar array to the battery bank should not exceed 7.6 m (25 ft) .
- The wire length between battery 1 and the solar controller should be not exceed 3.0 m (10 ft).
- The wire length between battery 2 and the solar controller should not exceed 6.0 m (20 ft).
- No more than two wires (positive and negative) may be bundled together.
- Wires must have a minimum temperature rating of 105 °C.

PARAMETER	SC-DB-MPPT-30-12		SC-DB-MPPT-40-12	
	Battery 1	Battery 2	Battery 1	Battery 2
Recommended Wire Gauge	10 AWG	16 AWG	8 AWG	16 AWG
Recommended Fuse Size	30 A	10 A	50 A	10 A

CAUTION! Identify the polarity (positive and negative) on the cable used for the battery and solar panel. Use colored wires or mark the wire ends with tags. Although the SC-DB-MPPT is reverse polarity protected, a reverse polarity contact may damage the unit or other connected equipment.

3.4 SOLAR CONTROLLER WIRING



1. Route the wires from the solar array and the batteries to the location of the SC-DB-MPPT controller.

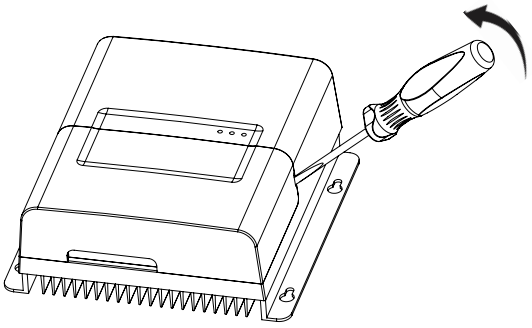
WARNING! If a fuse is being used as circuit protection, do not connect to the batteries at this time. If a breaker is being used as circuit protection, batteries may be connected, but ensure breaker is in the off position.

WARNING! Keep the solar array covered with an opaque material until all wiring is completed.

IMPORTANT All wiring must be in accordance to National Electrical Code, ANSI/NFPA 70. Always use appropriate circuit protection on any conductor attached to a battery.

2. Connect the solar controller chassis to the DC grounding system (also referred to as the earth ground). The DC ground stud accepts M3 (#5) ring terminals, and 8 AWG wire is recommended.

3. Remove the cover from the solar controller by placing a flathead screwdriver into the slot on the side of the controller. Twist the screwdriver to release the cover.



Note The wires will be connected with the push-in cage clamp terminals. To do so, lift the orange lever until it is perpendicular with the terminals and insert the wire into the terminal. Push in the wire as far as the terminal will allow. Press down on the orange lever to lock the wire in place. Ensure the wire is securely inserted by pulling back firmly on the wire.

4. If more than one solar controller is installed in the system, the instances must be set. Refer to section 3.5 for details.

5. For connection details, refer to the wiring diagram above or on the inside of the controller after removing the cover. Connect the main battery to the B1+ and B1- terminals as shown in the terminal diagram. The main battery alone can power on the controller.

6. Connect PV to the PV+ and PV- terminals as shown in the terminal diagram. PV alone can power on the controller.

7. Connect the secondary battery to the B2+ and B2- terminals as shown in the terminal diagram (optional). The secondary battery alone will not power on the controller.

8. Connect the RV-C harness and temperature sensor, if applicable. Refer to sections 3.6 and 3.7 for more details.

9. Place the cover back on the controller.

Note The controller will not work unless there is a battery connected to the battery terminals with at least 8 V or energized solar panels connected.

WARNING! Risk of Electric Shock: When the photovoltaic array is exposed to light, it supplies a DC voltage to this equipment.

CAUTION! Internal Temperature Compensation: Risk of fire, ensure the length of wire between the controller and the batteries is less than 3 m (10 ft).

10. Turn on breakers or connect to batteries in the order of battery 1, battery 2, and PV. The controller will power up and the green LED will start flashing. Remove the opaque material from the solar array.

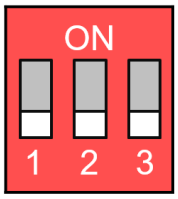
Note The negative solar array and battery wiring must be connected directly to the controller for proper operation. Do not connect the negative solar array or negative battery controller wiring to the chassis of the vehicle.

IMPORTANT This unit is not provided with a GFDI device. This charge controller must be used with an external GFDI device as required by Article 690 of the National Electric Code for the installation location.

3.5 RV-C INSTANCE NUMBERS

The DIP switches on the SC-DB-MPPT are for setting the controller RV-C instance numbers. This is how devices are distinguished on the RV-C bus. Refer to the table below or the RV-C instance number label on the inside of the removable cover to set the instances. If you have multiple solar controllers in your system, make sure they each have a unique RV-C instance number.

INSTANCE ID	DIP 1	DIP 2	DIP 3
Virtual	ON	ON	ON
1	OFF	ON	ON
2	ON	OFF	ON
3	OFF	OFF	ON
4	ON	ON	OFF
5	OFF	ON	OFF
6	ON	OFF	OFF
7	OFF	OFF	OFF



Note Virtual instance will default to 1 unless an RV-C command is sent to virtually configure the instance number. If the instance number is virtually configured, the controller will save this in its memory and use it until it is changed.

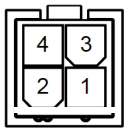
Note If the DIP switches are set to any mode other than virtual, the instance number can still be temporarily changed using an RV-C command, but it will revert back to the DIP switch configured instance number next time the controller is power cycled.

3.6 RV-C COMMUNICATION

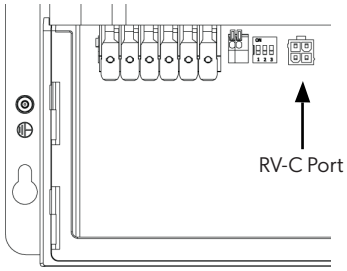
The RV-C connector is a standard RV-C Molex connector with the pinout shown below. Use this to connect the SC-DB-MPPT to the RV-C network and other RV-C devices, like the PowerTrak™ Display.

IMPORTANT The SC-DB-MPPT supplies power to the RV-C network. Dometic recommends using the battery as the power source for the RV-C network, and disabling the power connection to all other power sources, including the SC-DB-MPPT, with the power disconnect cable (84283). Refer to the wiring diagrams in section 3.6.1 for more details.

1	2	3	4
CAN H	CAN L	GND	+10.6 V Supply (250 mA max)



3.6.1 DEVICE CONNECTION



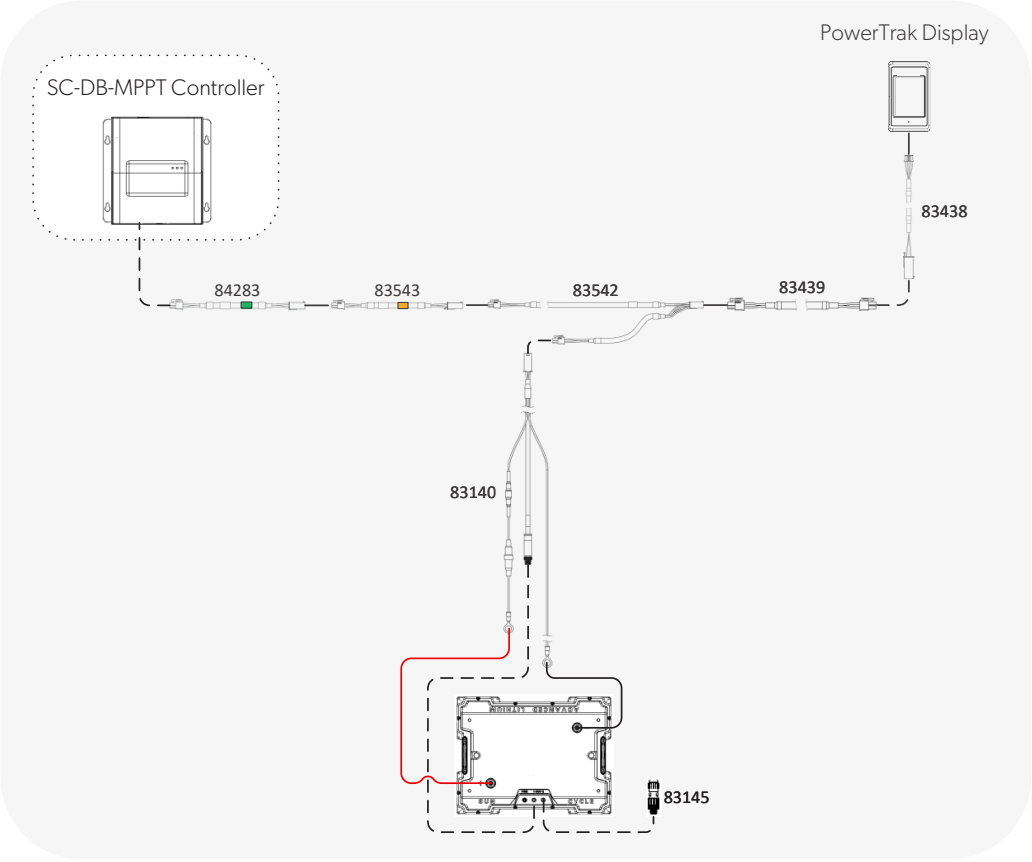
The PowerTrak™ devices are connected via RV-C harnessing (sold separately). The RV-C harnesses are connected to the RV-C port on the SC-DB-MPPT. The following points must be observed for the RV-C harnessing.

- The system must have two terminating resistors, one at each end of the network. The adapter harness (83438) included with the PowerTrak™ Display has a terminating resistor built in. The second terminating resistor must be added to the opposing end of the network, using the terminating resistor harness (83543). This harness can be easily identified by the orange "TERMINATING RESISTOR" label.

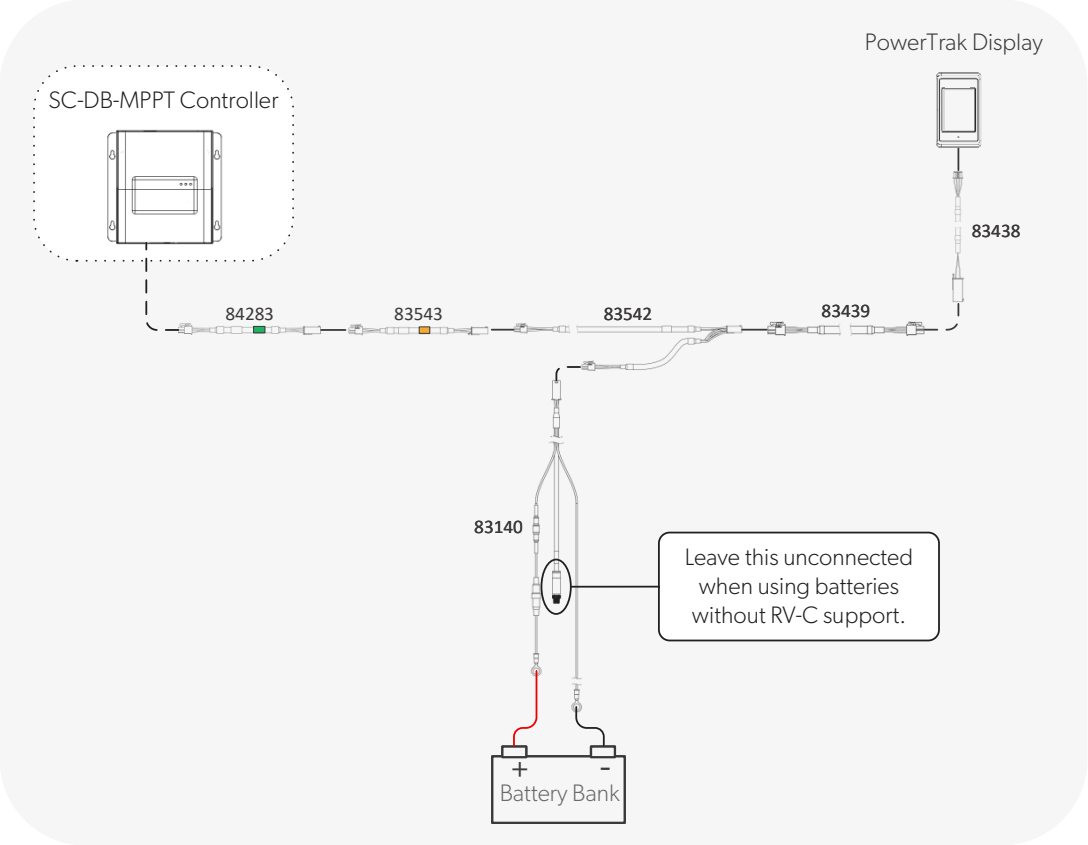
- Dometic recommends using the battery as the power source for the RV-C network, and disabling the power connection from all other power sources. The power disconnect harness (84283) must be connected to any component that supplies power to the RV-C network, excluding the battery. This harness can be easily identified by the green "POWER DISCONNECT" label.

The following wiring diagram shows the recommended RV-C harness connections for systems with a SC-DB-MPPT paired with a PowerTrak™ Display and an Advanced Lithium Battery.

Note The adapter harness (83438) is included with the PowerTrak™ Display. All other RV-C harnesses must be purchased separately from Dometic.

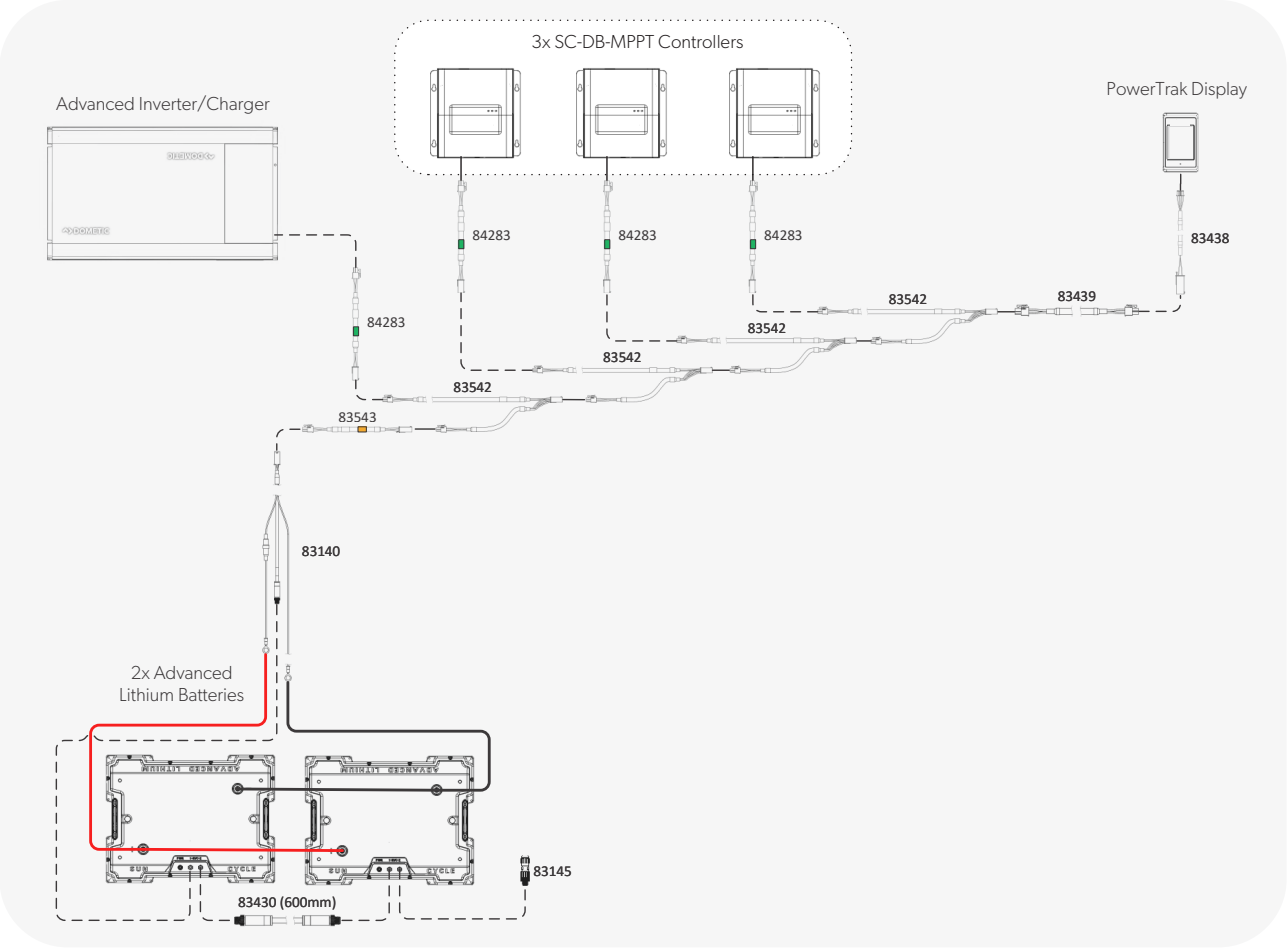


The following wiring diagram shows the recommended RV-C harness connections for systems with a SC-DB-MPPT paired with a PowerTrak™ Display and a battery without RV-C support. In this system, the M8 connector on the battery connection harness (83140) can remain unconnected.



Other examples of PowerTrak™ compatible devices include the Advanced Inverter/Charger, and the Advanced Lithium Batteries. A wiring diagram for an example system including these devices is shown below.

Note 5ft extension harnesses (83636) are available for purchase if required between components.

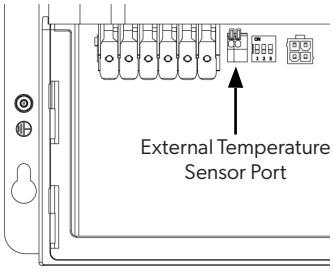


If your power system contains other RV-C compatible devices, you may require a different combination of RV-C harnesses. Please refer to our RV-C configurator through the QR code below to determine which cables are required for your system. Contact technical support if you are unsure about the RV-C requirements for your system.

Scan the QR code to access the PowerTrak™ Part Configurator.

3.7 TEMPERATURE SENSOR

The temperature sensor can be installed in the external temperature sensor port to enable the temperature compensation feature, for non-lithium batteries. The port features push-in cage clamps. Install the temperature sensor wires with the following steps.



1. Insert a small flat head screwdriver into the orange button at the top of the terminal.
2. Push the orange button down with the screwdriver to open the cage clamp, and insert the wires.
3. Release the orange button to close the cage clamp on the wire. Ensure the wire is securely inserted by firmly pulling back on it.

Note Lithium batteries do not require temperature compensation, so the BTS does not need to be installed when using a lithium battery bank.

4. OPERATION

4.1 POWER ON

The SC-DB-MPPT controller will automatically power on when it is connected to the battery or energized solar panels.

IMPORTANT You must set the battery type on the SC-DB-MPPT before you begin to use the controller. The default battery setting is for AGM batteries.

4.2 LED INDICATORS

The SC-DB-MPPT controller has three LED indicators that display the status of the controller.

LED	STATUS	FUNCTION
Green	On	Charging enabled and sufficient PV Voltage
	Slow blink (750 ms)	Charging disabled or battery not detected
	Fast blink (100 ms)	Charging enabled and insufficient PV voltage
Yellow	Off	Warnings clear
	On	Warnings active
Red	Off	Faults clear
	On	Faults active

4.3 POWERTRAK™ DISPLAY

The PowerTrak™ Display is the remote required for controlling the settings on the SC-DB-MPPT and viewing system details. The SC-DB-MPPT and the PowerTrak™ Display (sold separately) are compatible with the Dometic PowerTrak™ system. The PowerTrak™ system technology ensures compatible devices work together to optimize power flow and efficiency. Please use the QR code below to access the user manual for the PowerTrak™ Display.

Scan the QR code to access the PowerTrak™ Display user manual.

4.4 STATUS PARAMETERS

The following parameters are reported over the RV-C network, and can be monitored using the PowerTrak™ Display (sold separately).

PARAMETER	DESCRIPTION
Solar Detected Symbol	Displays if solar is detected.
Solar Power	The total amount of solar power generated from the solar controller.
Solar Voltage	The voltage measured at the solar input terminals.
Solar Current	The current measured from the solar panels to the solar controller.
Charge State	The charging status of the solar controller to the batteries.
Battery 1 Voltage	The voltage measured at the battery 1 terminals.
Battery 2 Voltage	The voltage measured at the battery 2 terminals.
Battery Charge Current	The total charge current being delivered to the battery bank(s).
Battery Temperature	The temperature of the battery.
Device Temperature	The temperature of the solar controller.
Run Time	The total operation time of the solar controller while powered.
Total Watt-Hours	The total power generated in Watt-Hours
Total Ampere-Hours	The total power generated in Ampere-Hours.
Ampere-Hours Today	The total power generated in one day in Ampere-Hours.
Ampere-Hours 1 Day Ago	The total power generated yesterday in Ampere-Hours.
Ampere-Hours 2 Days Ago	The total power generated in the past two days in Ampere-Hours.
Solar Rated Voltage	The specified input solar voltage that the solar controller operates within.
Battery Rated Voltage	The specified battery input voltage the solar controller can operate within.
Battery Rated Current	The specified battery input current the solar controller can operate within.
Firmware Version	Firmware version of the solar controller.
Fault Code	Fault condition reported from the solar controller.

4.5 CONFIGURABLE SETTINGS

The following settings can be configured using the PowerTrak™ Display (sold separately).

Note Value ranges with voltages will show different ranges for the 12 V or 24 V system voltages: Minimum - Maximum 12V (Maximum 24V). Some of these values may only be changed on a custom battery profile.

PARAMETER	DESCRIPTION	DEFAULT	RANGE
Bulk/Absorption Voltage	Transition voltage between bulk and absorption states.	14.4 V	12.0 V - 16.0 V (32.0 V)
Float Voltage	Voltage maintained during float stage.	13.7 V	12.0 V - 16.0 V (32.0 V)
Recharge Voltage	If the voltage at the battery terminals falls below this voltage the controller will re-enter the bulk charging state.	13.2 V	0.0 V - 16.0 V (32.0 V)
Equalization Duration	How long to equalize for in minutes.	120 min	0 - 65533
Equalization Interval	How often to equalize in days.	30 days	0 - 253
Absorption Duration	How long to do absorption for in minutes.	120 min	0 - 253
Temperature Compensation Coefficient	How much voltage to adjust output based on temperature of battery.	-24 mv/°C	-99 - 0 mV/°C
Maximum Charge Current (Battery 1)	Maximum current that can be applied while charging battery 1.	Maximum (30/40 A)	0 - 30/40 A
Battery Capacity	Capacity of the battery being charged.	100 Ah	0 - 65533 Ah
Battery Type	Chemistry of battery.	AGM	Flooded, AGM, Gel, LiFePO4, Custom 1, Custom 2
Under Voltage Warning	Device will warn of under voltage below this threshold. Yellow LED and warning shown on display.	12.0 V	0 - Under Voltage Return
Under Voltage Limit	Device will trigger an under voltage fault if voltage falls below this threshold for more than the amount of time defined by under voltage delay.	11.0 V	8.0V - Under Voltage Return
Over Voltage Limit	Above this voltage the solar controller will trigger an over voltage fault.	15.5 V	Over voltage return - 16.0V (32.0V)
Under Voltage Return Voltage	Device will recover from an under voltage fault once the voltage has returned to this value.	12.0 V	Highest of Under Voltage Warning/Limit - Over Voltage Limit
Over Voltage Return Voltage	The device will recover from an over voltage fault once the voltage has returned below this voltage.	14.0 V	Under Voltage Warning - Over Voltage Limit
Under Voltage Delay	The delay which counts down before triggering an under voltage.	5 s	0 s - 253 s

Note Equalization will be disabled if any of the equalization interval, time, or voltage is set to zero.

4.6 USING THE GO POWER! CONNECT APP

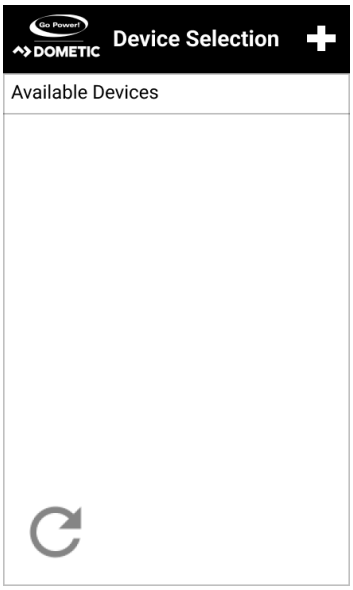
Scan the QR code to access the download page for the Go Power! Connect app.

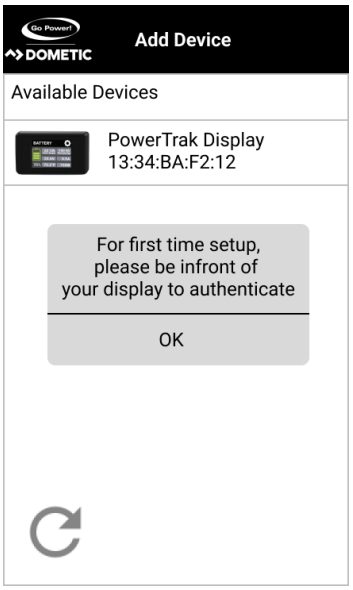
4.6.1 CONNECTING THE POWERTRAK™ DISPLAY TO THE APP

1. Use the + button to pair the PowerTrak™ Display with the app.

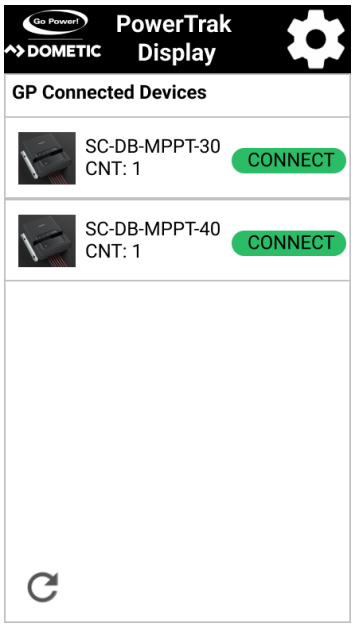
Note Ensure that the BLE function is enabled in the PowerTrak™ Display settings, and that location and BLE are enabled on your device.

2. A message will be displayed asking to place the devices to be paired close to each other for first time set up. Press the **OK** button.



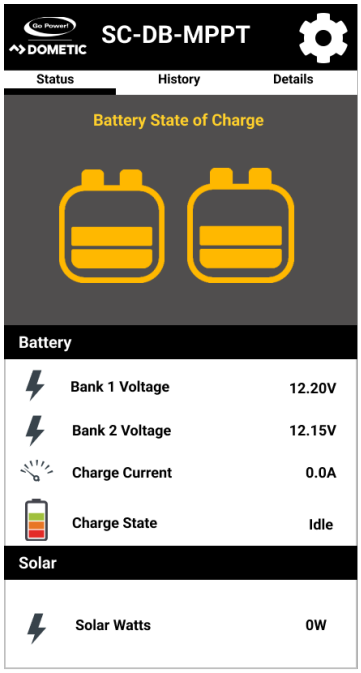


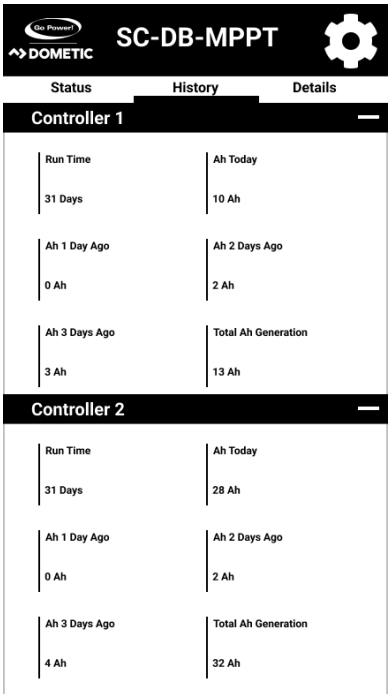
3. After pairing the connected devices are listed. If the PowerTrak™ Display is connected to the SC-DB-MPPT and has been paired with the app correctly, the SC-DB-MPPT should be listed as a connected device. If necessary, press the refresh button in the bottom left corner to reload the list.

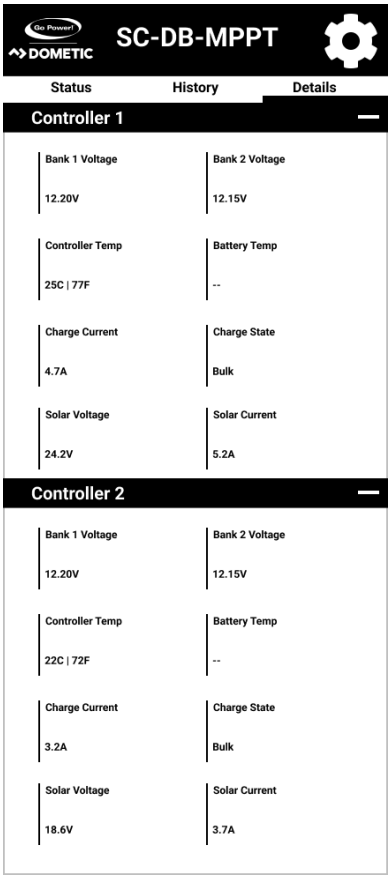


3.6.1 ACCESSING THE SOLAR SETTINGS

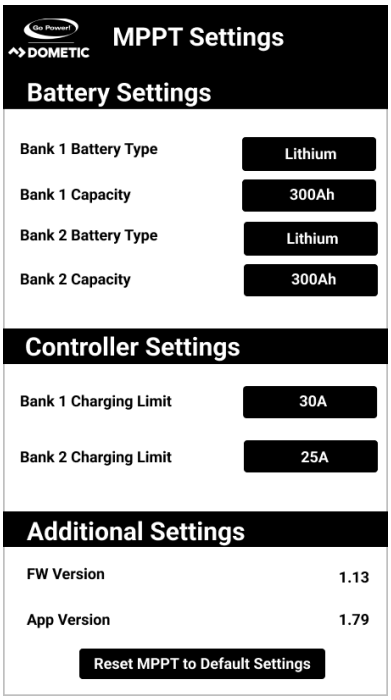
1. Press the **CONNECT** button that corresponds to the SC-DB-MPPT.
2. The main status screen for the SC-DB-MPPT will be displayed. The history and details tabs can be pressed to display more details about the controller.



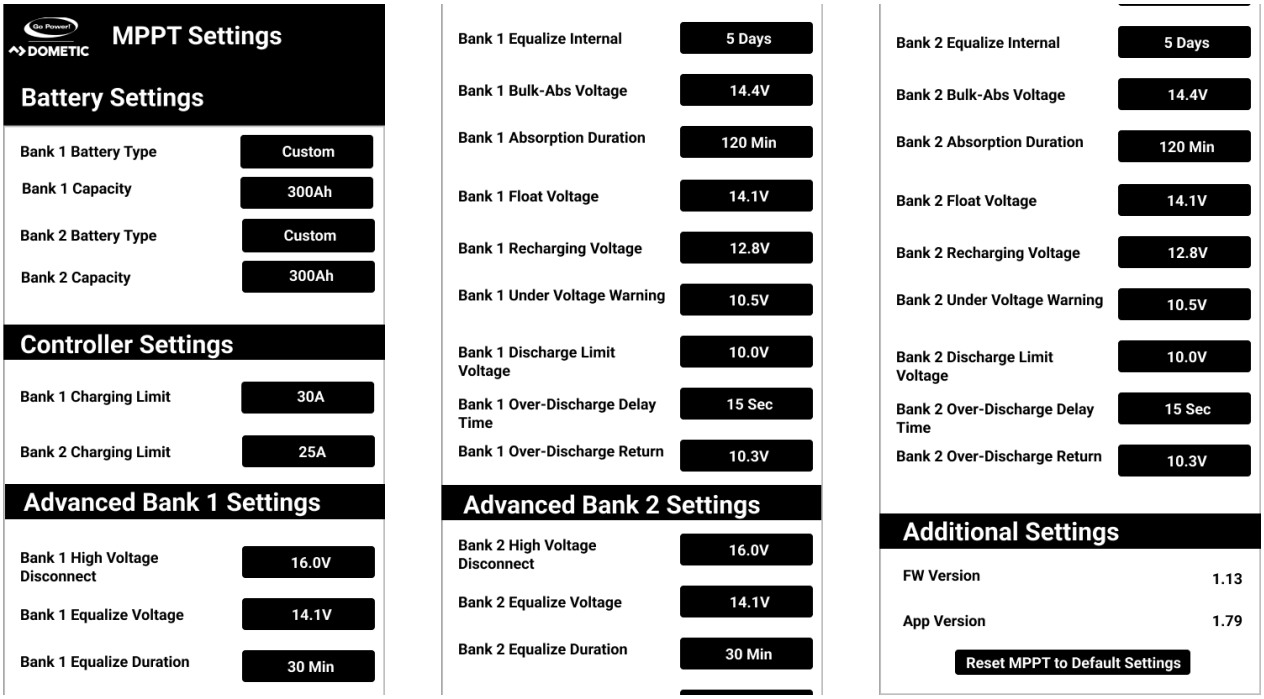




3. Press the ⚙ button to access the solar settings. Press the setting you would like to change, and follow the app instructions.



4. If a custom battery type is selected, the following settings will be available.



5. MAINTENANCE

Maintaining your solar charge controller is essential to ensure it operates efficiently and effectively. We recommend following these maintenance protocols **once every six (6) months:**

- Inspecting the controller: Check the charge controller regularly to see if it's in good condition. Inspect the wires, terminals, and other parts for damage or wear.
- Inspect the solar panels: Check the solar panels for damage or debris that can reduce their efficiency. Keep them clean and clear of obstructions.
- Check the wiring: Inspect the wiring and connections regularly to ensure they're in good condition and not loose or damaged.
- Keep the battery clean: Clean the battery terminals and connections regularly to prevent corrosion, which can affect the battery's performance. Refer to battery manufacturers instructions for proper cleaning and maintenance procedures.

6. TROUBLESHOOTING

6.1 FAULT AND WARNING CONDITIONS

6.1.1 WARNING CONDITIONS

Warning conditions are intended to warn the user of conditions which, if not addressed, may trigger a fault to occur. These conditions may or may not require user intervention.

FAULT	DESCRIPTION	CONDITION	INDICATION
Over Temperature Warning	The solar controller is getting too hot. If sufficient cooling is not provided, the controller will begin de-rating it's maximum output current.	An internal temperature sensor has measured greater than 82 °C (180 °F).	Yellow LED is solid on.
Under Voltage Warning	The solar controller has detected a voltage at the battery terminals below the under voltage warning set point.	Measured voltage at battery terminals was below the under voltage warning set point. Default is 12.0V.	Yellow LED is solid on.

6.1.2 FAULT CONDITIONS

Fault conditions are triggered when the solar controller detects conditions that prevent the controller from operating, indicate damage has occurred to the controller, or may be at risk of causing damage to the controller, equipment, or person(s).

FAULT	DESCRIPTION	CONDITION	INDICATION
Hardware Fault	The hardware internal to the solar controller has detected a failure or abnormal conditions.	An internal fault has been detected, and damage may have occurred.	Red LED is solid on.
Memory Fault	The internal memory of the solar controller has experienced an error in reading or writing.	This fault should not occur in regular operation.	Red LED is solid on.
Over Temperature Fault	The internal temperature of the controller has reached critically high levels.	Internal temperature measured to be greater than 85 °C (185 °F).	Red LED is solid on. Controller is limiting charge current or preventing charging altogether.
Photovoltaic Over Voltage Fault	The solar input has detected a voltage higher than the hardware can support.	Photovoltaic voltage is detected to be greater than 96V.	Red LED is solid on.
Battery 1 Over Voltage Fault	Battery 1 voltage has been measured at an abnormally high value.	The voltage at the battery 1 terminal has exceeded the over voltage limit setting. Default is 15.5 V (31 V in 24 V system).	Red LED is solid on.

Battery 1 Under Voltage Fault	Battery 1 voltage has been measured at a critically low value.	The voltage at battery 1 terminal has gone below the under voltage limit setting. Default is 11.0 V (22.0 V in a 24 V system).	Red LED is solid on.
Battery 2 Over Voltage Fault	Battery 2 voltage has been measured at an abnormally high value.	The voltage at the battery 2 terminal has exceeded the over voltage limit setting. Default is 15.5 V (31 V in 24 V system).	Red LED is solid on.
Battery 2 Under Voltage Fault	Battery 2 voltage has been measured at a critically low value.	The voltage at battery 2 terminal has gone below the under voltage limit setting. Default is 11.0 V (22.0 V in a 24 V system).	Red LED is solid on.

6.2 TROUBLESHOOTING STEPS

Problem:

The solar controller's LEDs are all off, and the device is not being detected on the PowerTrak™ Display or other RV-C multiplexing system, despite receiving power.

Solution:

WARNING! Electrocution Hazard. High voltages may be present on the solar controller terminals which can cause injury or death if not handled appropriately. Only qualified technicians should attempt to service the electrical connections. All systems should be de-energized before attempting to service the device.

To recover the device from this condition, please do the following:

1. Ensure that your batteries are sufficiently charged and/or your solar panels are in full sun light to provide stable power to the solar controller.
2. Cover the solar array with an opaque material. Disconnect all power sources from the solar controller inputs. This may be done using disconnect switches, breakers, or by disconnecting the wires from the input terminals.
3. Wait 10 seconds for the device to fully power down.
4. Reconnect your power sources. Ensure the most stable source is connected first, this would be a charged battery if available. Remove the opaque material from the solar array.
5. Confirm green LED turns on. This may be blinking or solid. If the green LED appears you are done and may resume using your solar controller.
6. If no LED is seen, please check your power sources with a multimeter. Afterwards, begin again from step 2, but increase the waiting period in step 3, and try again.

Problem:

The red LED on the solar controller is blinking and the PowerTrak™ Display is showing incorrect data.

Solution:

A blinking red LED indicates an internal communication error on the solar controller. This issue may be caused by the device not receiving enough power to fully turn on when connected only to solar. To resolve this issue, please ensure a battery is also connected to the device or move the solar panel to a location where it is in full sun light. If the issue does not resolve when provided adequate power, the device may be damaged.

Problem:

The solar controller shows a solid green LED indicating there is enough solar power to charge the battery, but nothing is happening.

Solution:

This may be caused by several conditions. Possible conditions and their solutions are listed below.

- The PowerTrak™ Display or multiplexing remote has stopped receiving data. Please ensure that the solar controller is still connected to the PowerTrak™ Display or multiplexing remote.
- The maximum power point tracking algorithm is in the process of determining where the maximum power point is. Please wait a few minutes until this process is complete. If the controller is still not charging after a few minutes, please try the other solutions in this section.
- The battery is disconnected, or a connection is loose. Please double check fuses and battery connections to ensure the solar controller is connected to the battery. If a multimeter is available, you may directly measure the solar controller terminals, as well as the battery voltage terminals and verify that they have the same voltage.

Problem:

Solar controller yellow LED is on. PowerTrak™ Display (if connected) is displaying a warning.

Solution:

WARNING! Burn hazard. This warning may be displayed due to high temperatures, please avoid direct contact with the solar controller unless you have confirmed it is at a safe temperature.

1. If you have a PowerTrak™ Display connected, please check the warning being displayed. Once confirming what the warning being displayed is, refer to the fault and warning condition tables in section 6.1.
2. If you do not have a PowerTrak™ Display connected, you can determine the warning being issued via electrical and thermal measurements. Refer to the fault and warning condition tables in section 6.1 to see what conditions might trigger a warning.

Under Voltage Warning:

This warning will occur when the voltage detected at one or both battery terminals has gone below the threshold set by the user. The default threshold for this is 12.0V. This warning is used solely to indicate to the user that the battery state of charge is beginning to get low and that they should charge the battery is possible.

To resolve this warning, please ensure there is sufficient sunlight on your solar panels to charge your batteries, or reduce the electrical load being applied to the batteries. Using an external AC-DC or DC-DC charger will also help to resolve the warning if available.

Over Temperature Warning:

This warning is used to indicate to a user that the solar controller is beginning to experience high internal temperatures. This may be due to charging in high ambient temperatures or improper cooling/orientation of the heat sink.

To resolve this warning, please double check that the controller is in the suggested orientation and that the ambient temperature of its environment is not excessive. Alternatively, lowering the charge current should allow the temperature to return to a nominal temperature.

Problem:

Solar controller red LED is on. PowerTrak™ Display (if connected) is displaying a fault.

Solution:

WARNING! Burn hazard. This fault may be displayed due to high temperatures, please avoid direct contact with the solar controller unless you have confirmed it is at a safe temperature.

WARNING! Electrocution Hazard. High voltages may be present on the solar controller terminals which can cause injury or death if not handled appropriately. Only qualified technicians should attempt to service the electrical connections. All systems should be de-energized before attempting to service the device.

1. If you have a PowerTrak™ Display connected, please check the fault being displayed. Once confirming which fault is being displayed, refer to the fault and warning condition tables in section 6.1.

2. If you do not have a PowerTrak™ Display connected, you may determine the fault being issued via electrical and thermal measurements. Refer to the fault and warning condition tables in section 6.1 to see what conditions might trigger a fault. Note that internal hardware or memory faults may not be detected through measurements, only by eliminating all other faults.

Hardware Fault / Memory Fault:

Please try restarting your device. Disconnect all power sources from the input terminals. Wait at least 30 seconds, then reconnect power sources. If the fault persists the device may be damaged. Please contact technical support.

Over Temperature Fault:

WARNING! Burn hazard. This fault may be displayed due to high temperatures, please avoid direct contact with the solar controller unless you have confirmed it is at a safe temperature.

An over temperature fault may be caused by several factors. Please verify that the solar controller is mounted in the suggested orientation and that adequate airflow is available to allow the solar controller to cool. Charging at the maximum rated current in ambient temperatures beyond the rated specifications can increase the temperature of the controller beyond safe limits. If your controller is consistently producing over temperature faults, please consider moving the controller to a cooler area or reducing the maximum charge current to prevent overheating. Regularly cleaning and removing dust and debris from the solar controller and it's heat sink can help ensure efficient cooling.

In rare situations, an over temperature fault may indicate that the controller is experiencing a failure. If all above conditions have been resolved but you are still experiencing over-temperature faults, please contact technical support.

Photovoltaic Over Voltage Fault:

WARNING! Electrocution hazard. Photovoltaic systems may exceed 60 V DC and pose a high risk of electrocution. Please use extreme caution. Only qualified technicians should attempt to service the electrical connections.

To resolve this fault please check that the voltage being supplied to the input of the solar controller does not and can not exceed 96 V. If you are receiving this fault while in direct sunlight you may need to configure your solar system to operate at a lower voltage. Exceeding 96 V on the solar input may result in irreversible damage to the solar controller.

Battery 1 / Battery 2 Over Voltage Fault:

WARNING! Electrocution hazard. An over voltage fault may indicate a short circuit to a high voltage which might result in electrocution. Please use extreme caution. Only qualified technicians should attempt to service the electrical connections.

The most common reason for this fault is due to overcharging of a battery that is connected to the solar controller. If this fault occurs, please verify if the voltage has gone above the over voltage limit (as set by the user, default of 15.5 V DC). It is recommended in this case to disconnect or disable all charging sources to the battery (solar controllers, DC-DC chargers, AC/DC chargers, and inverter chargers) until the battery has settled to its nominal voltage. Please double check all charging source settings to ensure no source is configured to exceed this over voltage limit. Applying high voltages to batteries may result in irreversible damage to the battery.

In rare situations, this fault may be indicated via an electrical short connecting a higher voltage to the battery input terminal. Exceeding 32 V on the battery input may result in irreversible damage to the solar controller.

Battery 1 / Battery 2 Under Voltage Fault:

WARNING! Electrocution hazard. Electrical connections may be near high voltages. Please use extreme caution. Only qualified technicians should attempt to service the electrical connections.

A battery under voltage fault is most often caused by a battery that has been deeply discharged. Please ensure the battery receives a charge before further use.

If you are receiving this fault, but the solar controller is not indicating that it is charging, please verify there is adequate sunlight available. If adequate sunlight is available but the solar controller is still not charging, please verify the settings on the controller are correct and that the solar controller is enabled. If the fault persists, please verify the connections to the solar controller are correct. Please also verify that no fuses or circuit breakers between your solar system and the controller, or battery and the controller, are blown or missing. A quick method to check your system is by measuring the

voltage at the terminals of the solar controller and ensuring they are within an expected range dependent on the solar and battery system nominal voltages.

If the solar controller is charging the battery, but the voltage remains below the under voltage limit, please disconnect or reduce the load connected to the battery. Large loads can cause the battery's voltage to drop and trigger this fault. Additionally, large loads exceeding the charge current being provided to the battery will not allow the battery to be charged. Please reduce your loads if you are getting this fault or consider enabling additional charging sources.

In rare cases an under voltage fault may be indicative of a damaged battery or short-circuit condition. In this case, please consult your battery's manual on troubleshooting steps and verify that there are no electrical shorts to other circuits in the vicinity.

7. LIMITED WARRANTY

The Dometic warranty is valid against defects in materials and workmanship for the specific product warranty period. It is not valid against defects resulting from, but not limited to:

- Misuse and/or abuse, neglect, or accident.
- Exceeding the unit's design limits.
- Improper installation, including, but not limited to, improper environmental protection and improper hook-up.
- Acts of God, including lightning, floods, earthquakes, fire, and high winds.
- Damage in handling, including damage encountered during shipment.

A warranty shall be considered void if the warranted product is in any way opened or altered. The warranty will be void if any fasteners used to seal the unit are removed or altered, or if the unit's serial number is in any way removed, altered, replaced, defaced, or rendered illegible.

Warranty Return Procedure

Before contacting the customer service department, please read the "frequently asked questions" section of our website to troubleshoot the problem. If trouble persists:

Call the Technical Support team (1-866-247-6527) or return defective product to place of purchase.

Unless approved by Dometic Management, all product shipped collect to Dometic will be refused. Test items or items that are not under warranty, or units that are not defective, will be charged a minimum bench charge of $50.00 US plus taxes and shipping. A 15% restocking charge will be applied on goods returned and accepted as "new" stock.

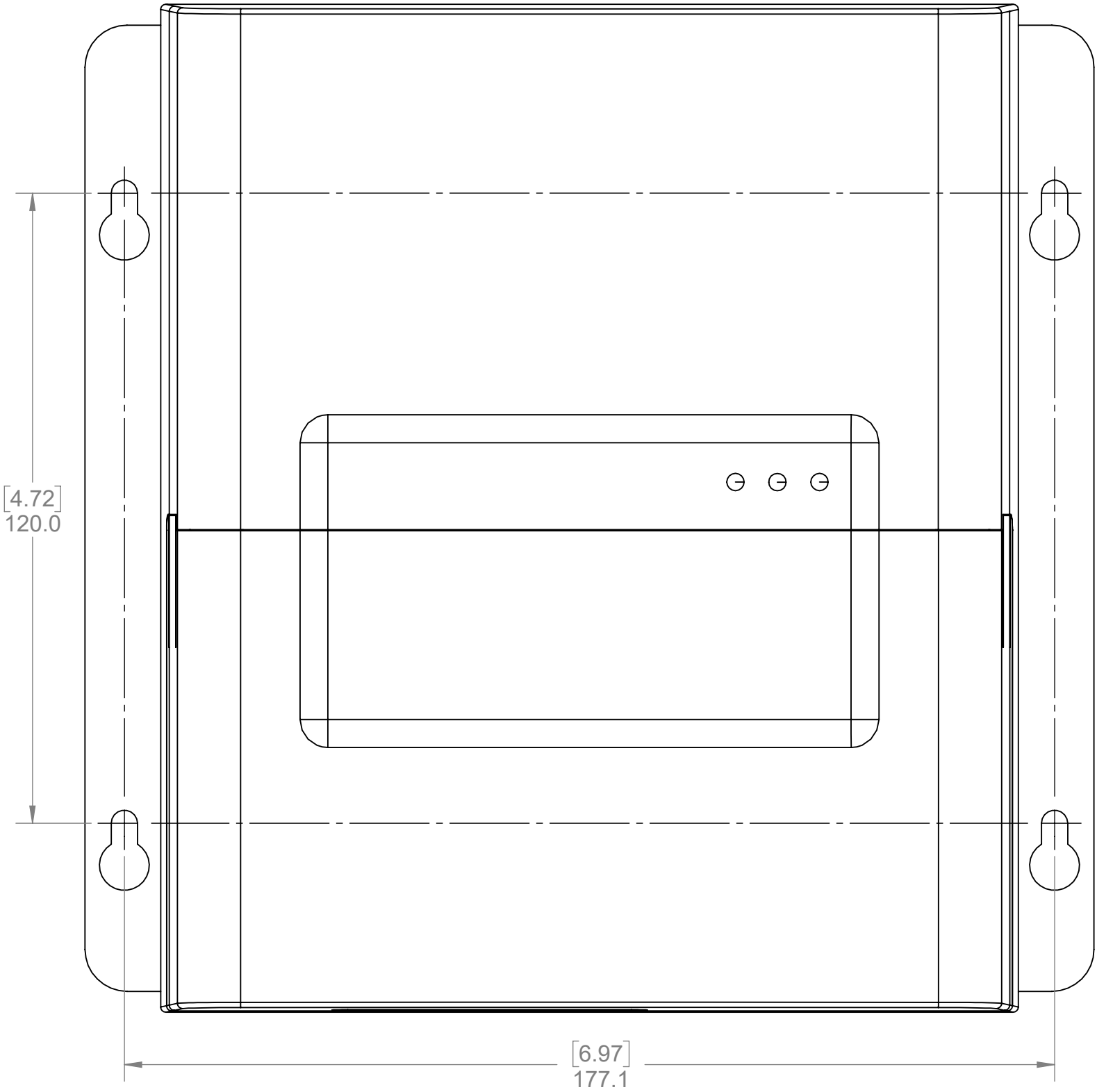
An RMA (return materials authorization) number from Dometic Customer Service is required prior to returning any Dometic products. Dometic reserves the right to refuse any items sent to Dometic without an associated RMA number. To obtain an RMA number, please contact customersupport.gopower@ or Telephone 1-866-247-6527.

Out of Warranty

Dometic electronic products are non-repairable. Dometic does not perform repairs on its products nor does it contract out those repairs to a third party. Dometic does not supply schematics or replacement parts for any of its electronic products.

8.1 MOUNTING TEMPLATE

Note This page must be printed at 100% scale. Confirm the mounting template was printed at 100% scale by placing the controller on the template. The size and holes on the template should match the controller.



Manual_SC-DB-MPPT_RevC