



# Flush Mount Solar Charger

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## User Manual



Model: GM3024N



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## Important Safety Instructions

This manual contains all instructions for the safety, installation, and operation of the GoMate series controller ("the controller" is referred to in this manual).

- Read all the instructions and warnings carefully before installation.
- No user-serviceable component exists inside the controller. DO NOT disassemble or attempt to repair the controller.
- Avoid direct sunlight and high temperatures, and DO NOT install the controller at locations where water can get in.
- Install the controller at well-ventilated places; the controller's heat sink will be very hot during the system operation.
- Appropriate external fast-acting fuses or breakers are suggested.
- Please cut off all connections of the PV array, fast-acting fuses, or breakers which close to the battery before the controller installation and adjustment.
- Power connections must remain tight to avoid excessive overheating from the loose connection.



**WARNING**

Do not install the controller in humid, salt spray, corrosion, greasy, flammable, explosive, dust accumulative, or other severe environments.

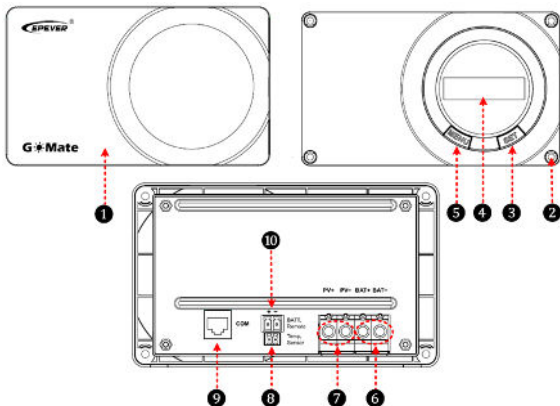
# 1 Overview

The GoMate, a negative-ground and flush mount solar charge controller, is designed for an aesthetically clean and integrated look on RV and Vessel. Also, it includes a surface mount cover to suit personal preference. The GoMate adopts a highly efficient PWM charging mode and comes equipped with a special LCD to show the real-time operating status. This charge controller is fully controlled automatically, providing users with a simple usage pattern.

## **Features:**

- Flush-mounted and embedded installation design
- High quality and low failure rate components (ST/IR) to ensure the product's lifetime
- 3-Stage intelligent PWM charging: Bulk, Boost/Equalize, and Float
- Battery type: Sealed, Gel, Flooded, and User
- Real-time energy statistics feature
- Battery temperature compensation feature
- Digital LCD monitor for informative display of operational parameters and faults
- Voltage drop and temperature compensation sampling design
- RS485 communication port of Modbus protocol and short-circuit protection for 5V/200mA power supply
- Multiple communication peripherals
- Rated charging current at working temperature without de-rating
- Extensive electronic protections
- Monitor and set the parameters via PC software or APP

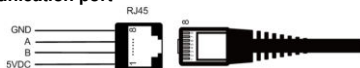
## 2 Appearance



①	Controller case	⑥	Battery terminals
②	Mounting hole size $\phi$ 4.5mm	⑦	PV terminals
③	SET button	⑧	Remote temperature sensor port <sup>(1)</sup>
④	LCD	⑨	RS485 communication port (5VDC/200mA) <sup>(2)</sup>
⑤	MENU button	⑩	Remote battery voltage sensor port <sup>(1)</sup>

(1)The controller will charge the battery at 25°C as default and has no temperature compensation when the temperature sensor is damaged.

(2) RS485 communication port

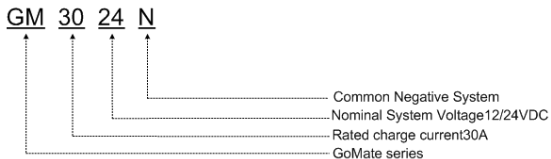


### RJ45 pin definition:

Pin	Definition	Instruction	Pin	Definition	Instruction
1	+5VDC	5V/200mA	5	RS485-A	RS485-A
2	+5VDC		6	RS485-A	
3	RS485-B	RS485-B	7	GND	Power ground
4	RS485-B		8	GND	

(3) The port can detect accurate battery voltage through an insulation-protected 2P/1.5mm<sup>2</sup> wire (Red+, black-). One end connects the 5.08-2P terminal to insert **10** port, the other connects the battery, and make sure the "+" and "-" poles are connected correctly.

## 2.1 Naming rules



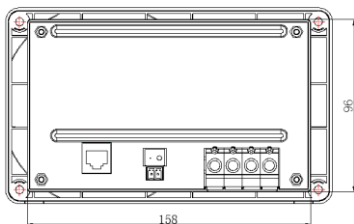
## 3 Installation and wiring

### 3.1 Install the controller

#### 1) Determine the installation location and heat-dissipation space

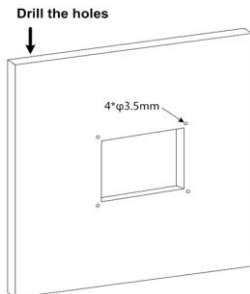
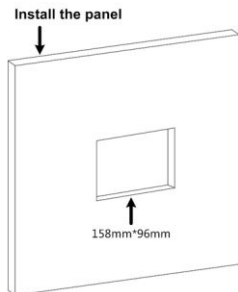
The controller shall be installed in a place with sufficient airflow through the radiators of the controller and a minimum clearance of 150 mm from the upper and lower edges to ensure natural thermal convection.

#### 2) Determine the size of the installation location (158\*96mm)



#### 3) Cut out the section (158\*96mm)

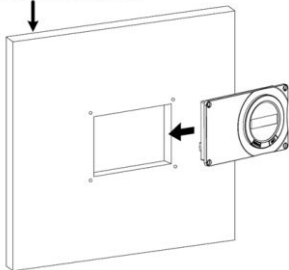
#### 4) Mark holes and drill holes $\phi 3.5\text{mm}^4$



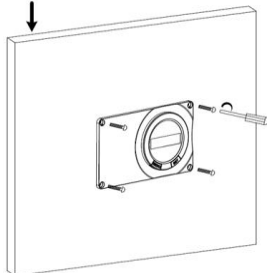


### 5) Secure the controller

Install the controller

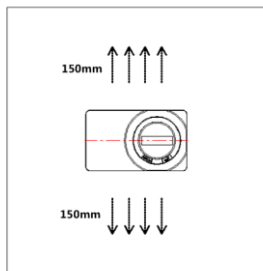
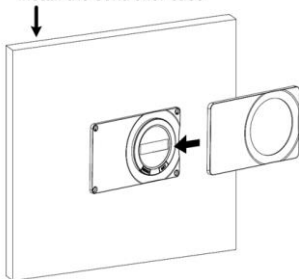


Turn the screw



### 6) Install the control case

Install the controller case



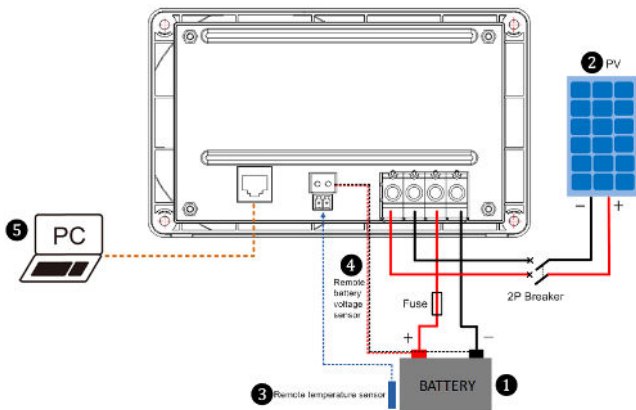
## 3.2 Wiring

### Step1: connect the battery ❶



**CAUTION**

A fast-acting fuse whose current is 1.25 to 2 times the rated current of the controller must be installed on the battery side with a distance from the battery not greater than 150 mm.



### **Step2: Connect the PV ②**



#### **CAUTION**

- While wiring the controller, do not connect the breaker or fast-acting fuse. Ensure that the leads of the "+" and "-" poles are connected correctly.
- Install a reasonable arrester if the controller is used in an unguarded or frequent lightning area.

### **Step3: Connect the Remote temperature sensor cable ③**



#### **CAUTION**

The controller will charge or discharge the battery at 25°C as default, and no temperature compensation when the temperature sensor is damaged.

**Step4: Connect the Remote battery voltage sensor 4**



**CAUTION**

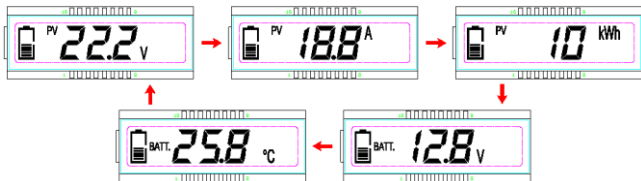
Ensure that the battery voltage sensor cable of the "+" and "-" poles are connected correctly when wiring.

**Step5: Connect the PC via the RS485 communication port 5**

Refer to chapter 4, "Remote set battery type."

## 4 LCD

### 1) Automatic cycle interface



**Cycling display:** PV voltage → PV current → PV power → Battery voltage → Battery temperature → PV voltage.....

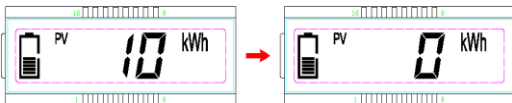
**Note:** The display screen can be viewed clearly when the angle between the end-users horizontal sight and the display screen is within 90°. If the angle exceeds 90°, the information on the display screen cannot be viewed clearly.

### 2) Clear the generated energy

**Operation:**

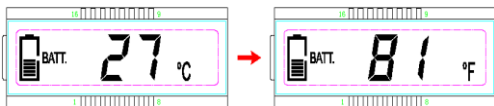
**Step 1:** In the PV power interface, press and hold the "SET" button until the value is flashing.

**Step 2:** Press the "SET" button to clear the generated energy



### 3) Switch the battery temperature unit

Press and hold the "SET" button in the battery temperature interface to switch the battery temperature unit directly.



#### 4) Battery type

##### + Battery type

Sealed; Gel; Flooded; User<sup>Ⓞ</sup>

##### + Set battery type by LCD<sup>Ⓞ</sup>

##### Operation:

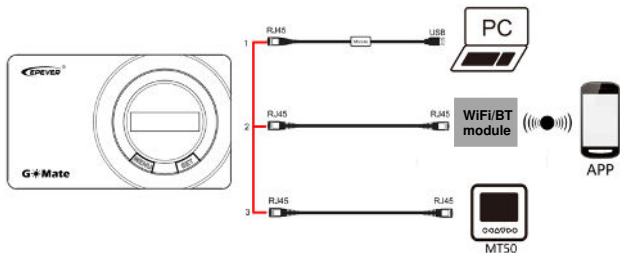
**Step1:** In the battery voltage interface, press and hold the "SET" button to enter the battery type interface.

**Step2:** Press the "MENU" button to select a battery type.

**Step3:** Press the "SET" button to confirm the battery type.



##### + Set battery type by PC<sup>Ⓞ</sup>






## Download software

[www.epever.com](http://www.epever.com)——Solar Station Monitor

[www.epever.com](http://www.epever.com)——ChargeController(Sealed)

(1) Only Sealed, Gel, and Flooded battery types can be set via the LCD. The "User" battery type can be set via the PC software, APP software, or MT50.

## 5) System status icon

Icon	Phenomenon	Instruction
	Solid	The system is normal but not charging
	Energy bars are Flashing	Charging
	Solid	Full
	Flashing	Battery Overvoltage
	Flashing	Battery Over Discharge



## 5 Protection

Protection	Instruction
PV Overcurrent	When the PV charging current exceeds the controller's rated current, it will charge the battery at the controller's rated current.
PV Overvoltage	When the PV voltage exceeds 50V, the controller will stop charging. It resumes work when the PV voltage is lower than 45V.
PV short circuit	The controller will stop charging when the PV voltage is lower than 50V and is short-circuited. It resumes work when the fault is cleared and won't be damaged.
PV Reverse Polarity	When the PV polarity is reversed, the controller may not be damaged and can operate normally after the connection is corrected.
Night Reverse Charging	It prevents the battery from discharging to the PV module at night.
Battery Reverse Polarity	Fully protected against reverse battery polarity; no damage will occur to the battery. Correct the wiring error to resume normal operation.
Battery Overvoltage	When the battery voltage reaches the overvoltage disconnect voltage, it will automatically stop charging the battery to avoid over-charging.
Battery Overheating	The controller can detect the battery temperature through an external temperature sensor. The controller stops working when its temperature exceeds 65°C and resumes

	work when its temperature is below 55°C.
Controller Overheating	The controller can detect the temperature inside the battery. The controller stops working when its temperature exceeds 85°C and resumes work when its temperature is below 75°C.
TVS High Voltage Transients	The internal circuitry of the controller is designed with Transient Voltage Suppressors (TVS), which can only protect against high-voltage surge pulses with less energy. Suppose the controller is to be used in an area with frequent lightning strikes. In that case, it is recommended to install an external surge arrester.



## 6 Troubleshooting

Faults	Possible reasons	Troubleshooting
The PV parameters on LCD are 0 when the sunshine falls on PV modules properly	PV array disconnection	Confirm that PV wire connections are correct and tight
LCD is no display	Min.8V will start up the controller.	Measure battery voltage with a multi-meter. Min.8V can start up the controller.
 Flashing	Battery Overvoltage	Disconnect the solar array and measure the battery voltage to determine whether it is too high;
 Flashing	Battery Over Discharge	Charge the battery

## 7 Technical Specifications

### Electrical Parameters

Item	GM3024N
Nominal System Voltage	12/24VDC or Auto
Battery Input Voltage Range	8V~32V
Rated Charge Current	30A
Max. PV Short-circuit Current	30A
Max. PV Open-circuit Voltage	50V
Battery Type	Sealed(default)/Gel/Flooded/User★
Self-consumption	≤4.2mA/12V; ≤2.6mA/24V
Temperature Compensate Coefficient	-3mV/°C/2V(Default)
Charge Circuit Voltage Drop	0.21V

★The "User" battery type can be set via the PC software, APP software, and MT50. Refer to table 1(Page 15).

### Environmental Parameters

Storage Temperature	-30°C~+80°C
Work Temperature	-20°C~+55°C(100% input and output)
Relative Humidity	≤95%, N.C.
Enclosure	IP30
Grounding	Common negative
Altitude	5000m
Pollution Degree	PD2

## Mechanical Parameters

Dimension (L×W×H)	178.5×105.5×48.3mm
Mounting size (L x W)	166.5×93.5mm
Mounting hole size	Φ5mm
Terminal	16mm <sup>2</sup> /6AWG
Recommended cable	10mm <sup>2</sup> /8AWG
Net Weight	0.31kg

## Lead-acid Battery Voltage Parameters

Table1

Parameters are in the 12V system at 25°C, x2 in 24V.

Item	Sealed	Gel	Flooded	User
Over Voltage Disconnect Voltage	16.0V	16.0V	16.0V	9~17V
Charging Limit Voltage	15.0V	15.0V	15.0V	9~17V
Over Voltage Reconnect Voltage	15.0V	15.0V	15.0V	9~17V
Equalize Charging Voltage	14.6V	—	14.8V	9~17V
Boost Charging Voltage	14.4V	14.2V	14.6V	9~17V
Float Charging Voltage	13.8V	13.8V	13.8V	9~17V
Boost Reconnect Charging Voltage	13.2V	13.2V	13.2V	9~17V
Low Voltage Reconnect Voltage	12.6V	12.6V	12.6V	9~17V
Under Voltage Warning Reconnect Voltage	12.2V	12.2V	12.2V	9~17V

Under Volt. Warning Volt.	12.0V	12.0V	12.0V	9~17V
Low Volt. Disconnect Volt.	11.1V	11.1V	11.1V	9~17V
Discharging Limit Voltage	10.6V	10.6V	10.6V	9~17V
Equalize Duration	120min.	—	120min.	0~180min.
Boost Duration	120min.	120min.	120min.	10~180min.

(1) When the battery type is sealed, gel, or flooded, the adjusting range of equalizing duration is 0 to 180 minutes, and the boost duration is 10 to 180 minutes.

(2) The battery voltage control parameters should follow the rules below when setting the battery type as "User" (the factory default value is the same as the sealed type):

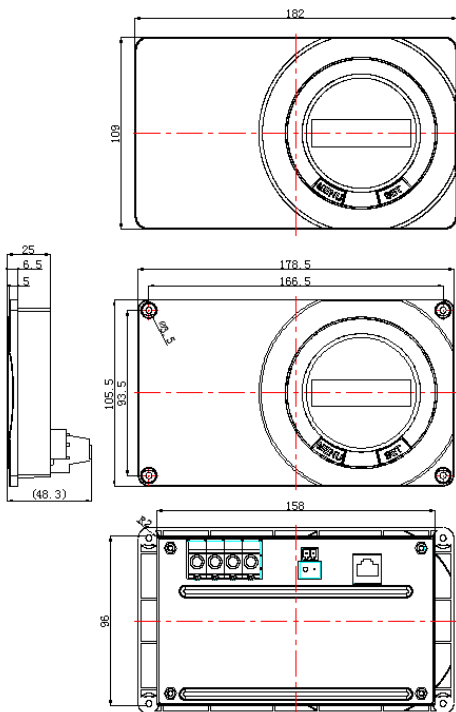
- A. Over Voltage Disconnect Voltage > Charging Limit Voltage ≥ Equalize Charging Voltage ≥ Boost Charging Voltage ≥ Float Charging Voltage > Boost Reconnect Charging Voltage.
- B. Over Voltage Disconnect Voltage > Over Voltage Reconnect Voltage
- C. Low Voltage Reconnect Voltage > Low Voltage Disconnect Voltage ≥ Discharging Limit Voltage.
- D. Under Voltage Warning Reconnect Voltage > Under Voltage Warning Voltage ≥ Discharging Limit Voltage.
- E. Boost Reconnect Charging voltage > Low Voltage Disconnect Voltage.

## 8 Disclaimer

The company policy of warranty does not cover the following situations:

- Damage from improper use or use in an unsuitable environment.
- PV or load current, voltage, or power exceeds the controller's rated value.
- The controller's working temperature exceeds the required temperature range.
- The user disassembles and attempts to repair the controller without permission.
- The controller is damaged due to natural causes such as lightning.
- The controller is damaged during transportation and shipment.

## 9 Dimensions



Any changes without prior notice! V2.1



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