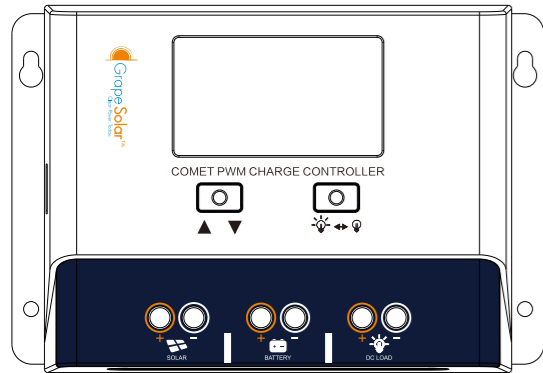


Grape Solar

PWM Charge Controller

User Manual

GS-COMET-PWM-40BT

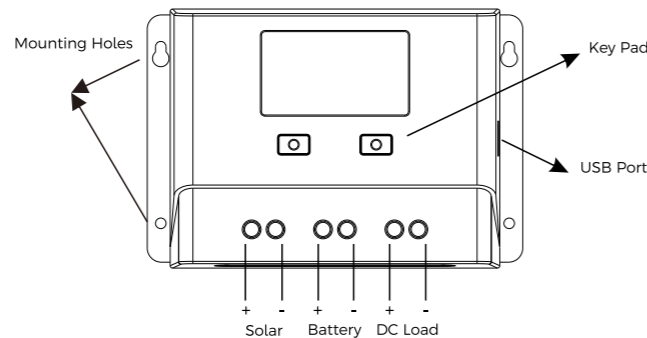


Please review this manual thoroughly before installation.

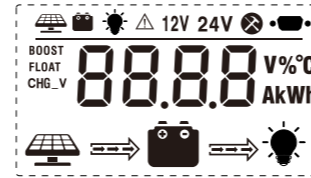
Product Features

- 12V and 24V battery auto-recognition.
- Pre-set charging modes for sealed, gel, flooded lead-acid deep cycle batteries and a customizable mode for lithium-ion batteries users.
- Three-stage charging with periodic equalization cycle prevents battery sulfation and enhances battery service life.
- Wide range of DC load control modes provide maximum flexibility in running DC loads.
- Built-in protection from common errors such as battery overcharge, battery over-discharge, overload, short-circuit and reverse polarity.
- TVS lightning protection for grounded circuits.

Device Diagram



LCD Display Interface Overview



Icon	Status	Description
	On	Daylight Detected
	Off	Daylight Not Detected
	Slow Blink	Solar Charging Battery
	On	Battery Connected & Functional
	Off	No Battery Connection
	Fast Blink	Battery Over-Discharged
	Flowing	Charging or Dis-charging
	Off	Not Charging or No Load

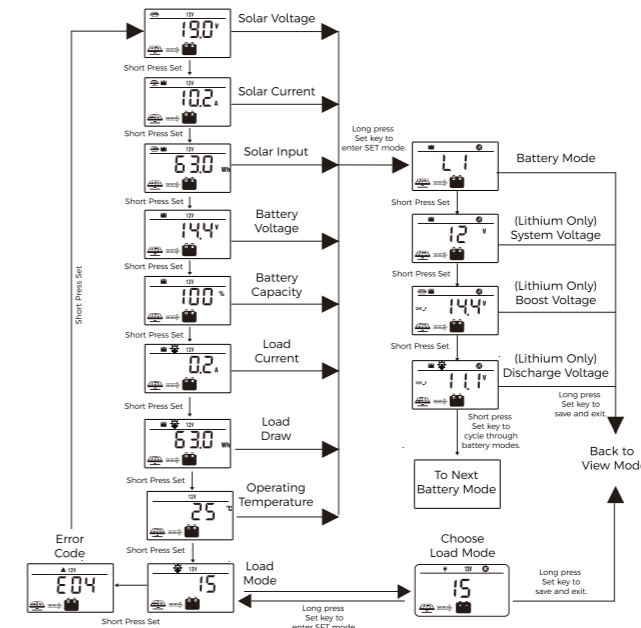
Entering SET Mode

Use the keys located underneath the LCD screen to enter/exit SET mode.

Interface	Function Key	Input	Input Function
View Mode (Default)		Long Press	Enter Set Mode
		Short Press	Cycle Through View
		Long Press	No Function
		Short Press	No Function
Set Mode		Long Press	Save and Exit
		Short Press	Cycle Through Settings
		Long Press	No Function
		Short Press	Adjust Parameter

LCD Display Cycles

- **View Mode**
Browse through different views of system status by short pressing the Set key.
- **Battery Type SET Mode**
On any view page (except Load Mode view page), long press the Set key to enter SET mode. Flooded, sealed and GEL batteries have pre-set programs, while lithium battery mode allows for more in-depth user customization.
- **DC Load Management SET Mode**
On the Load Mode view page, long press the Set key to enter SET mode. Choose from 18 pre-set load programs.



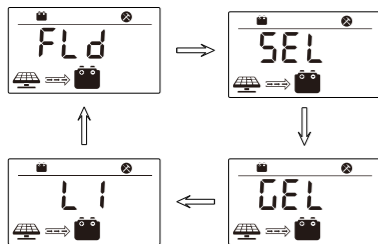
After 12 seconds of inactivity, the controller will resume to display battery voltage.

DC Load Modes

- **Dusk to Dawn (Mode 0)**
Load turns on 10 minutes after daylight not detected.
- **Timed Load (Mode 1-14)**
Load turns on 10 minutes after daylight not detected, stays on for X hours.
- **Manual Load (Mode 15)**
Press the light control key on the controller to turn load on/off.
- **Turn Off Load (Mode 16)**
Load will stay off in this mode.
- **Always On (Mode 17)**
Load will stay on as long as connected battery is above 11V.
- **USB Ports**
The 1A@5V USB ports will always stay on in all modes.

Mode	Description	Mode	Description
0	Dusk to Dawn	9	Dusk to Dawn + 9
1	Dusk to Dawn + 1	10	Dusk to Dawn + 10
2	Dusk to Dawn + 2	11	Dusk to Dawn + 11
3	Dusk to Dawn + 3	12	Dusk to Dawn + 12
4	Dusk to Dawn + 4	13	Dusk to Dawn + 13
5	Dusk to Dawn + 5	14	Dusk to Dawn + 14
6	Dusk to Dawn + 6	15	Manual (Default)
7	Dusk to Dawn + 7	16	Off
8	Dusk to Dawn + 8	17	Always On

Battery Type & Parameter Settings



Short press Set to cycle through modes.

Abbreviation	Battery Type	Description
FLD	Floored	Default programs with pre-set parameters and auto system voltage detection.
SEL	Sealed	
GEL	Gel	
LI	Lithium	System voltage, charge and discharge adjustable.

Error Code Chart

Code	Error	Description
E00	No Error	No action needed.
E01	Battery Over-discharged	Battery voltage is too low. DC load will be turned off until battery re-charges.
E02	Battery Over-voltage	Battery voltage has exceeded controller limit.
E04	Load Short Circuit	DC load wiring short circuit.
E05	Load Overload	DC load power draw exceeds controller maximum.
E06	Overheating	Controller overheated.
E08	Solar Over-amperage	Solar array amperage exceeds controller input limit.
E10	Solar Over-voltage	Solar array voltage exceeds controller input limit.
E13	Solar Reverse Polarity	Solar array input wires connected with reverse polarity.
E14	Battery Reverse Polarity	Battery input wires connected with reverse polarity.

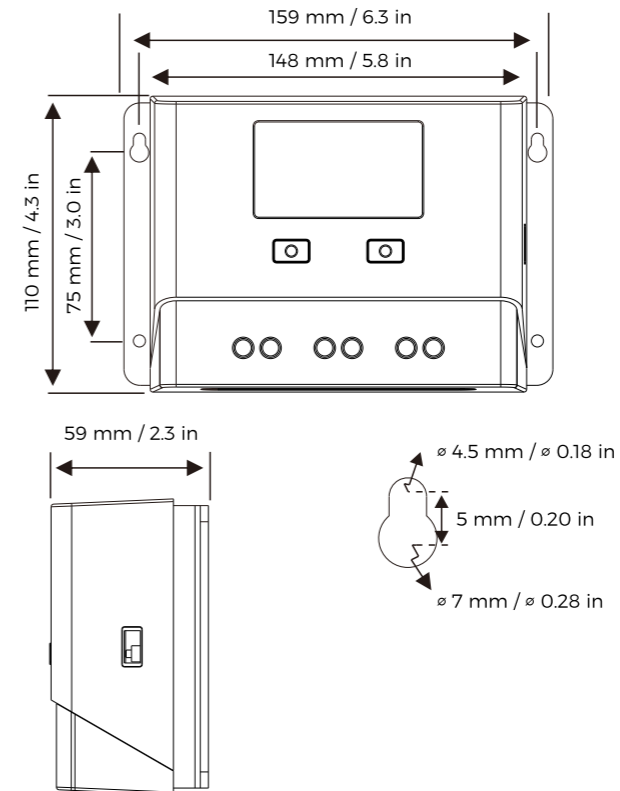
*Contact Grape Solar for live technical support on additional troubleshooting.

Controller Specification

*The variable "fln" is adopted as a multiplying factor when calculating parameter voltages, the rule for "fln" is listed as: if battery voltage is 12V, n=1; 24V, n=2.

Parameter	Value			
Model No.	GS-PWM-COMET-40BT			
Battery System Voltage	12V / 24V			
No load Loss	8mA (12V) / 12mA (24V)			
Max Solar Input Voltage	< 55 Voc			
Solar Charge Current	40 A			
Max Solar Input Power	600W*n			
Battery Types	FLD	SEL	GEL	LI
Equalize Charge Voltage	14.8 V*n	14.6 V*n	--	--
Boost Charge Voltage	14.6 V*n	14.4 V*n	14.2 V*n	Default: 14.2 V*n
Float Charge Voltage	13.8 V*n			--
Boost Charge Recovery	13.2 V*n			--
Over-discharge Recovery	12.6 V*n			Default: 12.6 V*n
Over-discharge Voltage	11.1 V*n			Default: 11.1 V*n
Daylight Detection	5V*n			
USB Outlet Rating	5V 1A			
Operating Temperature	-25°C to + 45°C / -13°F to + 113°F			
IP Waterproof Rating	IP 32			
Dimension	159*118*59 mm / 6.3*4.6*2.3 in			
Weight	0.62 kg / 1.37 lbs			

Product Dimension



Product Dimension: 159*118*59 mm / 6.3*4.6*2.3 in
 Installation Area Dimension: 148*75 mm / 5.8*3.0 in
 Installation Hole Size: \varnothing 4.5 and \varnothing 7 mm / \varnothing 0.18 and \varnothing 0.28 in