

**Instruction Manual
Of
Solar / DC Charge Controller (60A Rate) for 12V/24V SLA / LFP Battery with
LCD Display**



AA Portable Power Corp (<http://www.batteryspace.com>)

Address: 860 S, 19th St, Unit A, Richmond, CA, 94804

Tel: 510-525-2328

Fax: 510-439-2808

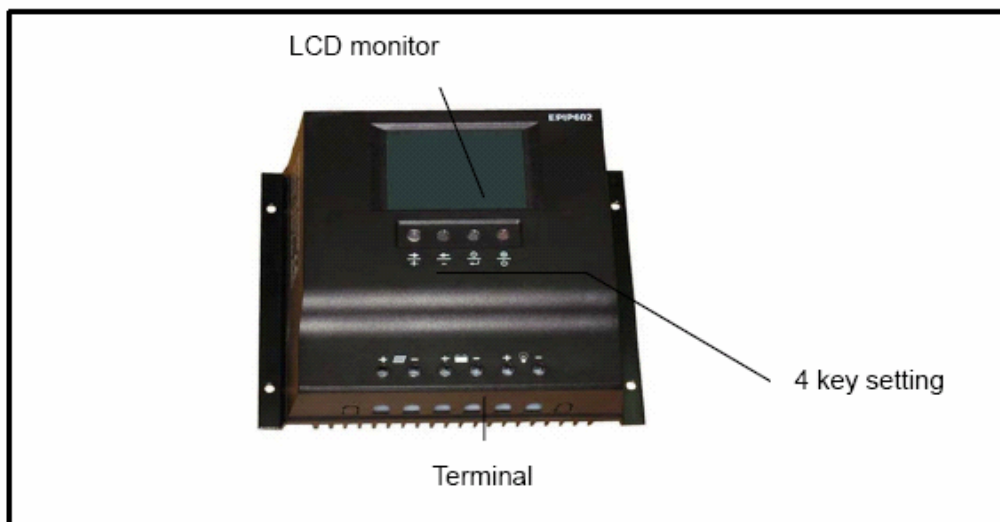
Email: Sales@batteryspace.com

Prepared & Approved by Louis (01/10/08)

1 Characteristics

- PWM or ON/OFF series battery charging
- Over-load, short circuit, polarity reverse protection
- State of charge(SOC) battery regulation
- Battery Ah setting, boost charging, equalizing charging, float charging
- Automatic load reconnection, manual load switch
- Automatic selection of voltage (12/24V)
- Temperature compensation
- Accurate clock show
- Lighting control, timer setting options during night time(for type-T)
- Field adjustable parameters by four buttons
- Full circuit protection, electronic fuse
- LCD display: SOC as a fuel gauge, all system parameters in digital value, system status as symbols

2 Controller panel instructions



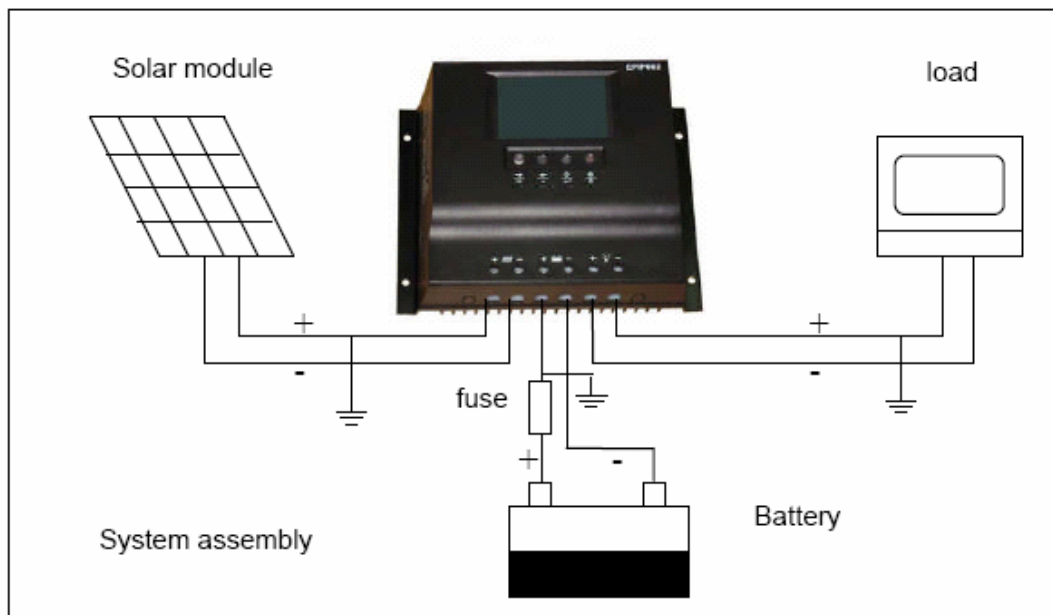
3 Installation:

Connect the individual components to the symbols provided, they are

solar panel, battery and loads in order. Only install the regulator near the battery on a suitable surface. This surface should be solid, stable, even, dry and nonflammable. The battery cable should be as short as possible (1-2m) and have a suitable cable diameter size to minimize loss, e.g. use 8mm² at 40A; use 10mm² at 50A; use 16mm² at 60A.

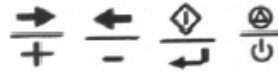
Observe the following connection sequence during commissioning:

- 1) Mount the controller to a vertical surface. Allow space above and below the controller for air flow. Note: the mounted ambient temperature should not be over the working temperature of controller (-10°C~60°C);



2. Connect the polarity + of battery to the fuse, and then connect the battery to the controller. The current of fuse should be chosen 2-3 times of rated current. Note the plus and minus.
 3. Connect the photovoltaic module to the charge regulator - plus and minus
 4. Connect the consumer to the charge regulator -plus and minus
- Please observe that the automatic adjustment to 12V/24V systems does not function properly, if this sequence order is not followed. An improper sequence order can damage the battery!
5. The parameters can be set depending on the user's need.
 6. The negative ground(battery)

4. Operation & instructions:



1 Keys & instructions(from left to right):

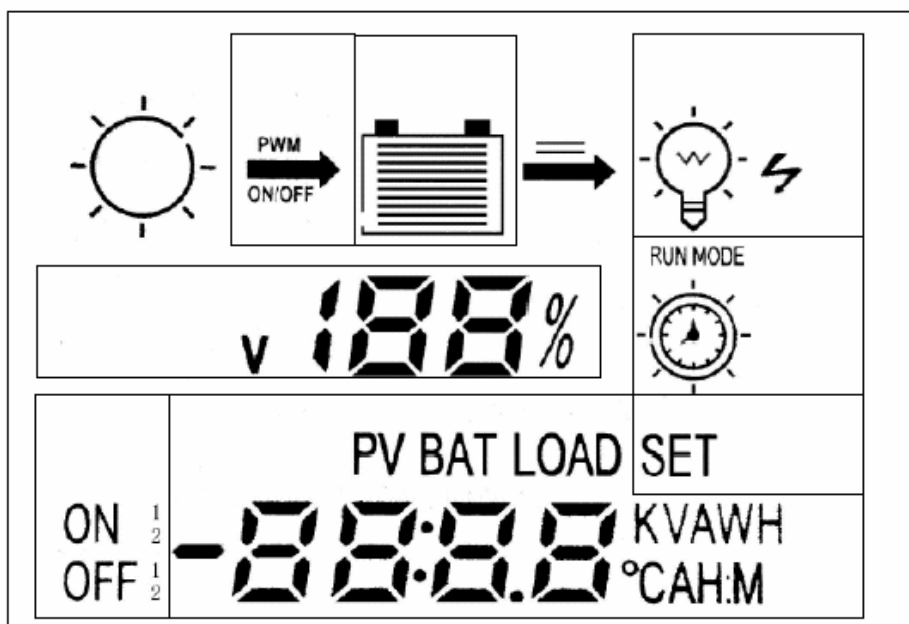
K1: reading status, switch to next figure; Setting status, switch to next function or increase the setting data.

K2: Reading status, switch to the previous figure; setting status, switch to the previous function or decrease the setting data.

K3: On reading status, press K3, then on setting status; on setting status, press K3, and save the data, back to reading status.

K4: cancel/power switch, on setting status, no saving with K4. On reading status, K4 is power switch while loads are working. Recovery key while it's short-circuited or over load.

2 Display instructions: LCD display as the setting mark:











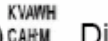


1) ☀ sun, daytime ☀ and night ○ ; flashing shows the over load status.

2) Charging mode  . PWM charging or ON/OFF switch; users can

choose any method.

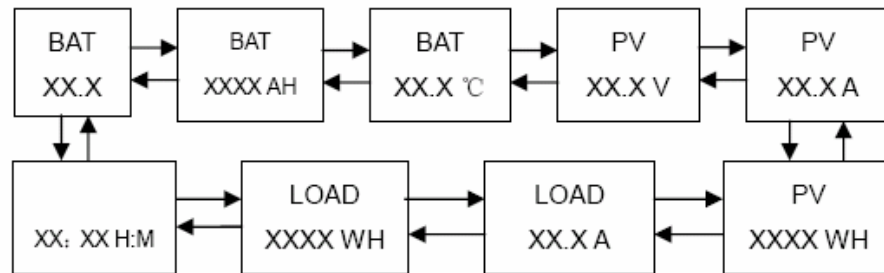
Note: For telecom or radio, suggest customers choose ON/OFF mode. PWM regulation causes noise interference with such load.

- 3)  battery. The strips inside show the status of charging or discharging and present capacity.
 - If discharging, the strips will reduce.
 - If charging, the strips will increase.
 - Without charging or discharging, the strips inside will remain the status.
 - Every strips equals 10% of battery capacity.
 -  the outsider shows status of battery.  flashes when over discharging. It stops flashing when goes back to normal charging.
- 4)  DC output.
- 5)  load, shows load and trouble status.
 -  is on when the load is in normal,  symbol display when output is on.
 - Load symbol  is flashing when over loading, then press K4.
 - While short circuit protection, load and light  flashes, then return to normal automatically after 10 minutes. If there are 2 short circuit protection in concession in 11 minutes, users need check loads and connects, then press K4.
- 6) LCD displays "PV", "BAT", "Load" for solar module, battery or load separately.
- 7) "SET" on goes to selection status, "SET" flashing is on setting status
- 8) ON $\frac{1}{2}$, OFF $\frac{1}{2}$ loads on/off status.
- 9)  at bottom of LCD display shows parameters.
- 10)  Displays in lower right: V-Voltage, A-ampere, AH-Battery Capacity, °C-Temperature, H:M-Time, WH-Capacity of charging and discharging in one day.
- 11) $XX\%$ the percent of available voltage of battery.

3 Operation instructions:

- 3.1 System is on reading status after its assembly. The LCD display: $XX.X$ v;
- 3.2 Reading specifications: On reading status, press K1, K2, LCD

will repeating the following specifications.



3.3 Battery capacity modify:

While display battery capacity XXXX AH, press K3 into setting mode, battery unit "AH" & "SET" is flashing, modify the data through K1/K2, press one time, battery capacity will be up/down 10Ah, the maximum is 5000, the minimum is 50; Press K3 for saving or K4 for back to the reading status.

The default value is 500AH.

3.4 Charging mode modify:

- 1) While on displaying voltage of solar module, press K3 into setting mode, "SET" is on, and "➡" is flashing, press K1/K2 to select PWM-^{PWM} "➡" or ON/OFF-^{ON/OFF} "➡" mode;
- 2) Press K1/K2 into setting start voltage mode,
- 3) While "SET" and "➡" flashing, press k3, choose the charging mode.
- 4) K1/K2 switch on PWM or ON/OFF mode
- 5) K3 for saving, K4 back to original status.

Note: Go ahead with following procedure while need to set the start voltage

- 6) while "SET" and "⊙" flashing, press K3, and set the start voltage.
- 7) Press K4 for saving and back to selection.


The default mode is ON/OFF mode, start voltage is: 5.0V.

3.5 Load control setting:

Four control mode: ON/OFF, lighting control, lighting + hours on control, ON/OFF on setting time. When LCD displays load current, press K3 and "SET" flashes. Operate K1, K2 to meet user's need and press K3 to return reading status.

- 1) ⊙, light control. The loads will be connected or disconnected automatically when the controller detects the light.
- 2) ⊙ + ⊕, lighting + time on control. The loads can disconnect

automatically depending on selecting working time.

3) , time control. Load on or off on setting time.

3.6 No  or , its ON/OFF mode.

Time setting operation:

- ON/OFF mode, lighting control mode, the LCD only shows real time.
- Lighting + hours on mode, User can adjust real time and working hours.
- ON/OFF on setting time mode, user can adjust the exact time for load ON or OFF.
- The default time data is 0.

The controller will follow the last data setting.

When LCD displays time to be adjusted:

- 1) Press K3, "SET" and H of H:M flashes, user can modify hours
- 2) User can adjust data 0~23 by K1/K2
- 3) Press K3 again, save data of hours and then turn to modify minute, "SET" and M of H:M flashes.
- 4) User can adjust data 0~59 by K1/K2.
- 5) Press K3 and save the modified data, if not saved, then press K4 to return select status-"SET" not flash.

Note: while its on LIGHTING + HOURS ON MODE, adjust happens after it started work, the controller will follow the instruction on the next day.

5 Safety and Protection

The controller is with intelligent protection against over voltage, over current, short circuit, polarity reverse and lightning. The LCD displays have warning indicates of over voltage, over current and short circuit.

Note: TVS lighting protection is the last necessary protection. User need choose professional TVS system in the areas with frequent lightning weather. If the controller without TVS system is damaged by lightning, it will not be guaranteed.

6 Guarantee & Customer service

One year warranty, or contact your authorized distributor. After one year, we can provide customer service and ask for service fees. Used improperly and damaged by people, the controllers are not guaranteed.

7 Specifications

Rated charging current		60A(max69A)
Rated load current (Ie)		60A
Over load, short circuit protection	1.25 times of Ie for 60secs, 1.5 times of Ie by for 5secs overload protection; ≥2 time of Ie short circuit protection	
Self consumption	Control mode: <15 mA; LED & LCD display (MAX) <15mA; Total (Max) < 30A	
System voltage	12/24V AUTOWORK, 48V	
Work temperature	industrial (I series): -20°C to +70°C	
Battery capacity	Battery in parallel from 50AH to 5000ah	
Boost charging	14.8V; ×2/24V; ×4/48V	
equalizing charging	14.4V; ×2/24V; ×4/48V	
Float charging	13.4V; ×2/24V; ×4/48V	
Temperature	5mv/°C/2v;	
Over discharge voltage	11.4V; ×2/24V; ×4/48V	
Control mode	PWM charging mode & ON/OFF mode for options, control point voltage is the intelligent compensation modify of the battery.	

8 Problems & Troubleshooting:

Problems	Troubleshooting
Sun sign flashing without setting	Battery over voltage. Open circuit of battery. Check if the battery cable connect properly.
The load sign flashing	Overload occurs, remove some loads and then press K4.
Load sign and short circuit sign flashes	Short circuit protection, check if the loads connect properly, remove some loads with trouble and then press K4.

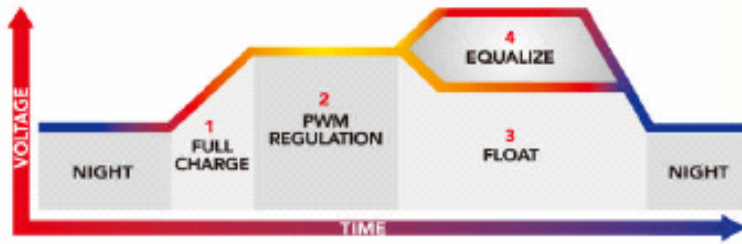
Operation temperature: -25 to +55

Compliance: CE world Bank

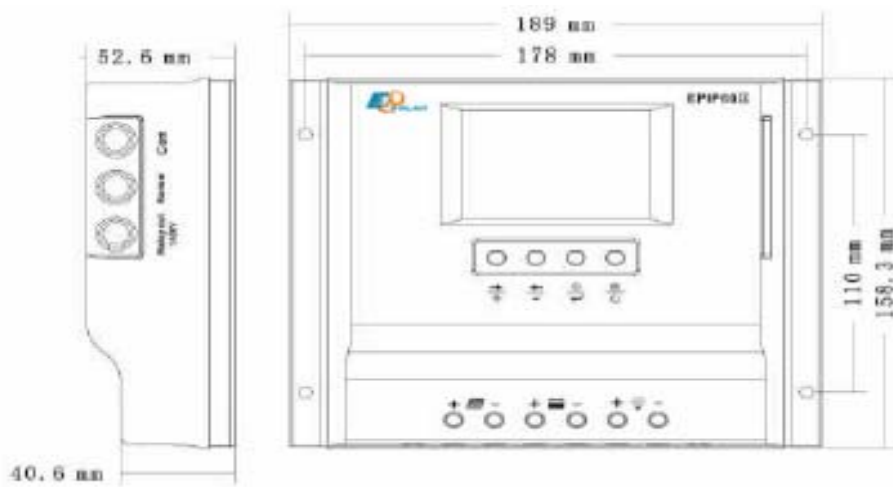
Note: values are for 12V. Use 2X for 24V,

9. Optimized Battery Charging Curve

4 Stage of charging to increase battery capacity and life



10. Mechanical Drawing



11. System Assembling

