

1500W Solar Battery Charger Booster Maximum Power Point Tracker

Operating Instructions
Please read these instructions before use



This revolutionary maximum power point tracker solar charger was designed using the technology that won GSL Electronics the prestigious “2008 EDN Innovation Award” and the “2009 Greentech Consensus Award”. A simple, efficient and low cost alternative to charge sealed or vented batteries from low voltage or parallel panels. With built in low voltage disconnect. Compatible with our MCM module and PC Based GUI.

The BMPPT1500 is designed to automatically charge 24V and 48V sealed and vented lead acid batteries from silicon based PV panels such as monocrystalline, polycrystalline and thin film.



PATENT APPLIED FOR - 2010901565

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BMPPT1500 Specifications	
Efficiency typical	96%
Input voltage	14V to 54V
Output voltage	Float 27V / 54V Absorption - Vented LA Batteries 29V / 58V Sealed - LA Batteries 28.4V / 56.8V
Output Current	26A @ $V_{out} / V_{in} \approx 2$, 13A @ $V_{out} / V_{in} \approx 4$
Quiescent current	0.04A (0.08A with MCM)
Thermal protection	Multilevel Type
Dimensions (mm)	220 X 145 X 67mm
Indications	LED display – OUTPUT STATUS

Important notes:

- The panel open circuit voltage MUST be below 27V on battery systems or below 54V on 48V battery systems.
- Use only sealed or vented 24V or 48V lead acid batteries and confirm the BMPPT settings, charge voltages and currents are correct for your battery system – if in any doubt seek qualified advice!
- This equipment must be installed by qualified personnel only and incorrect wiring can cause fire, injury or death – GSL will accept no responsibility for BMPPT misconnection or misuse.
- Use wires suitable for at least 40A, but if wire runs are over 3m then larger wires are recommended to limit voltage drop and losses.
- Install the unit in a dry place out of direct sunlight and away from flammable liquids or gases.
- Battery fuse (BF) is always required and must be located as close to the battery as possible, its sizing depends on the wire size and load ratings. Typically a 40A 60VDC fuse would do.
- The lowest Maximum Power Point required for proper operation is 14V.

BMPPT1500 General Information:

- Green LED On – Battery Ok.
- Green LED Flashing – Battery Low.
- This MPPT is designed to auto detect 24V or 48V battery systems and select a suitable charge regime.
- The BMPPT1500 is shipped in a sealed battery setting which is the safest setting but if your batteries are vented then, **BEFORE** wiring the BMPPT in, follow the **CHANGING BATTERY TYPE SETTING PROCEDURE**.
- The absorption phase is entered following a low battery condition or dawn and is maintained until the battery demand falls below 1.5A.
- Custom float and absorption voltages and thresholds are possible but minimum orders apply.
- This BMPPT has a built in multilevel over temperature protection to improve product reliability while maximising output power availability.

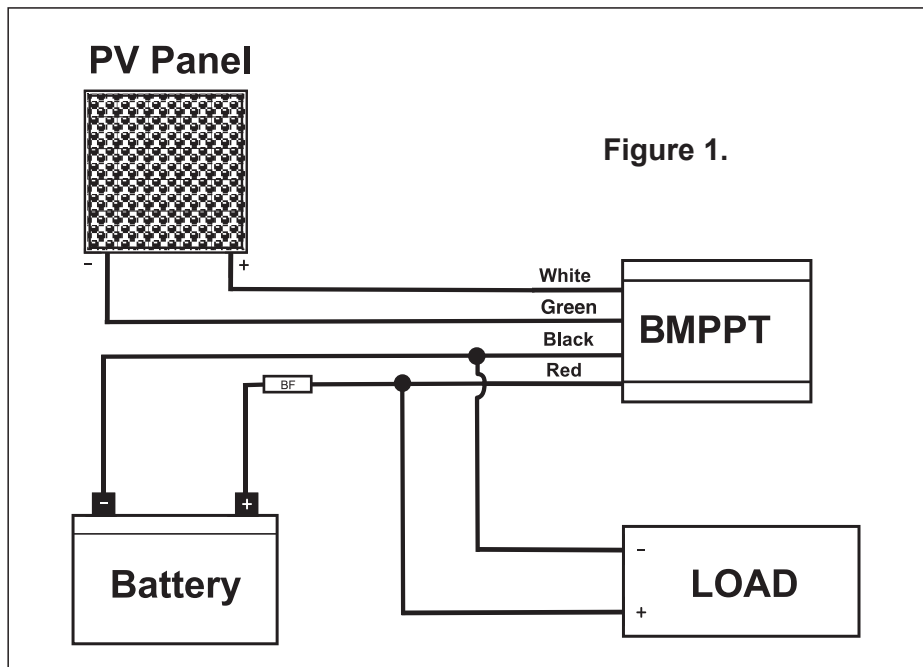


BASIC WIRING OPTIONS:

Permanent Load Connection

(Figure 1):

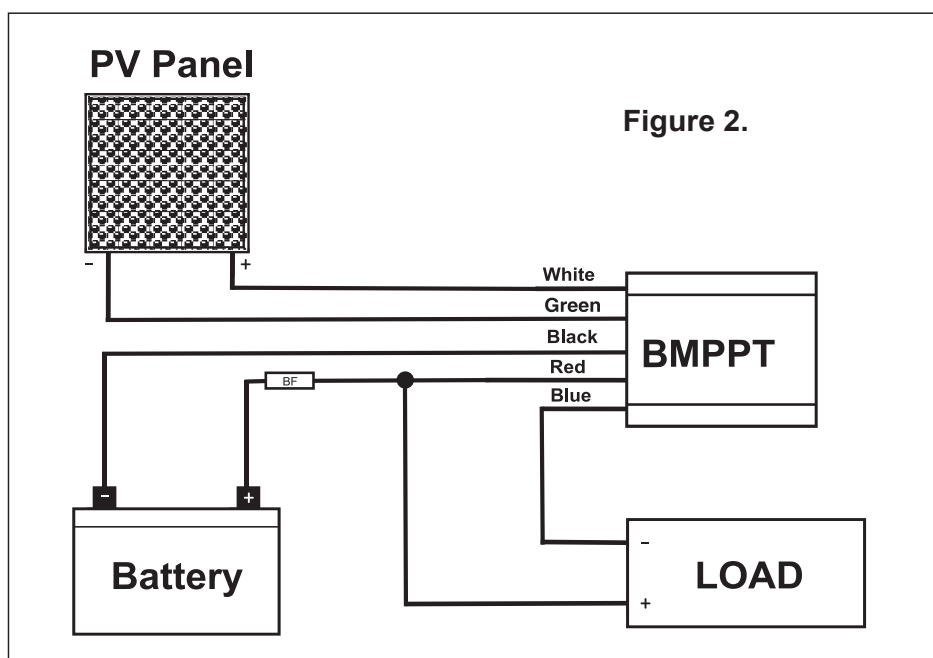
Simplest wiring option where the load is permanently connected and the batteries are not protected from overdischarge.



Wiring With Low Voltage

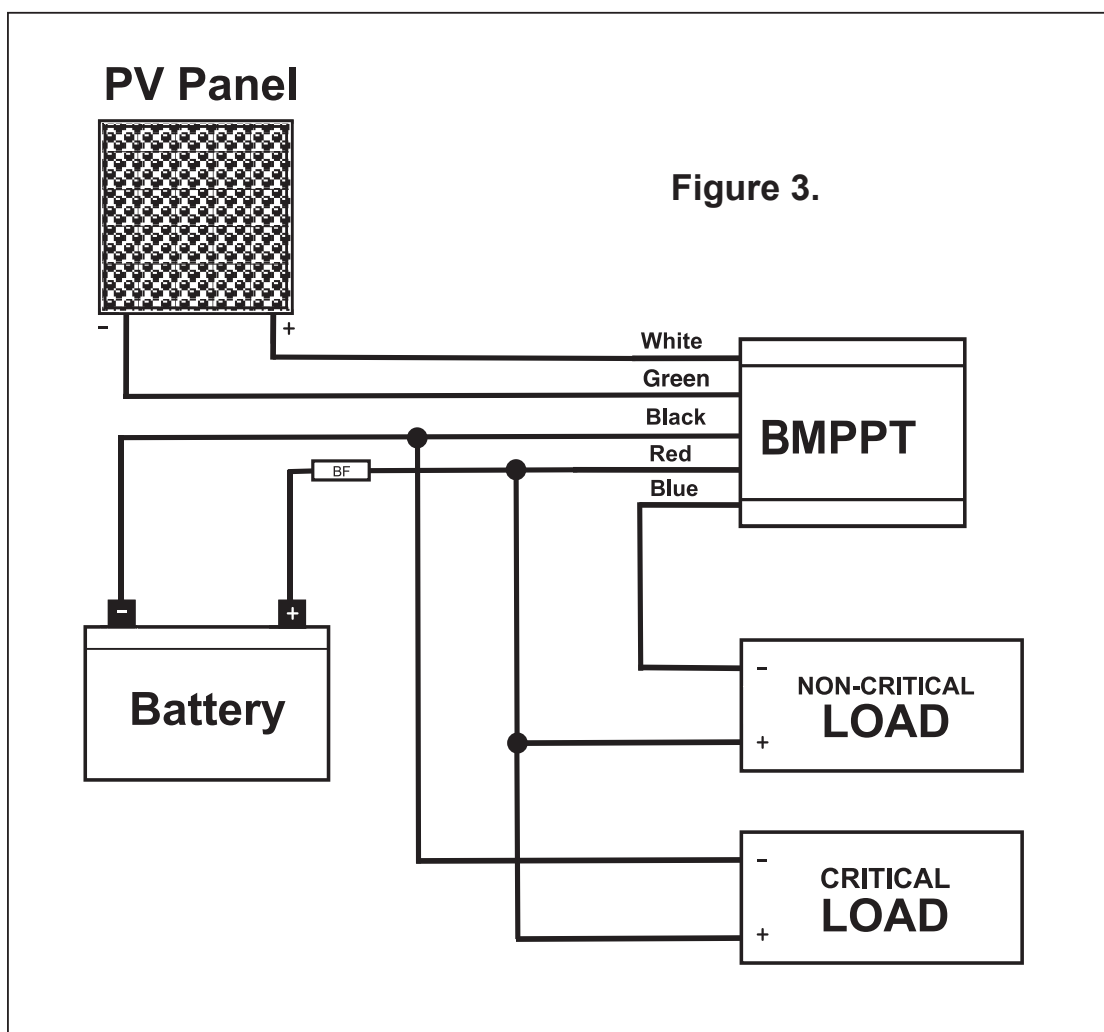
Disconnect (Figure 2) :

This option protects the battery from overdischarge by disconnecting the load. The LVD option disconnects the load when the battery voltage drops below 0.85 of nominal voltage to protect the battery from damage. The load reconnects when the battery voltage exceeds 0.95 of nominal voltage. This feature will not trigger during short transients. LVD load is 40A continuous or 60A transient.



Wiring With Critical And Non Critical Loads (Figure 3):

Critical loads are generally light loads which are powered under any condition. Non critical loads are loads which can be disconnected to ensure maximum on time for critical loads as well as to extend the life expectancy and reliability of the system. The non critical load can be set up as LVD or Dawn to Dusk loads.



Wiring with MCM option:

Connecting the optional MCM to the BMPPT will allow various system parameter display, output voltage and alarm settings and enable the programmable dawn to dusk or remote load control options. **For more details please refer to MCM Manual.**

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For optimal performance from panel and BMPPT please use the following table to determine the best setup for your situation.

Panel Configuration	V _{OC}	V _{MP}	24V Charging	48V Charging
"Battery Panel"				
1x12V Battery Panel	21	16	✓	✓
2x12V Battery Panel	42	32		✓
3x12V Battery Panel	63	48		
4x12V Battery Panel	84	64		
1x24V Battery Panel	42	32		✓
2x24V Battery Panel	84	64		
Grid Connect Panel (size per cells in grid)				
1x18 Cell Grid	10	8	✓	✓
1x48 Cell Grid	28	23		✓
2x48 Cell Grid	56	46		
3x48 Cell Grid	84	69		
1x52 Cell Grid	31	25		✓
2x52 Cell Grid	62	50		
3x52 Cell Grid	93	75		
1x54 Cell Grid	32	26		✓
2x54 Cell Grid	64	52		
3x54 Cell Grid	96	78		
1x60 Cell Grid	36	29		✓
2x60 Cell Grid	72	58		
1x72 Cell Grid	44	36		✓
2x72 Cell Grid	88	72		
1x96cgsp	65	55		

Changing Battery Type Setting Procedure

- 1.Ensure all the BMPPT wires are disconnected.
 - 2.Remove 7 front panel screws and the front panel and slide out cover – **see Figure 4.**
 - 3.Locate connector J4 – **see Figure 4.**
 - 4.Shift link on J4 to vented position – **see Figure 5.**
 - 5.Slide back cover and fit in front panel carefully, insuring led fits properly into housing, and screw back the 7 mounting screws.
- The above procedure can be repeated to turn back to sealed mode – **see Figure 6.**

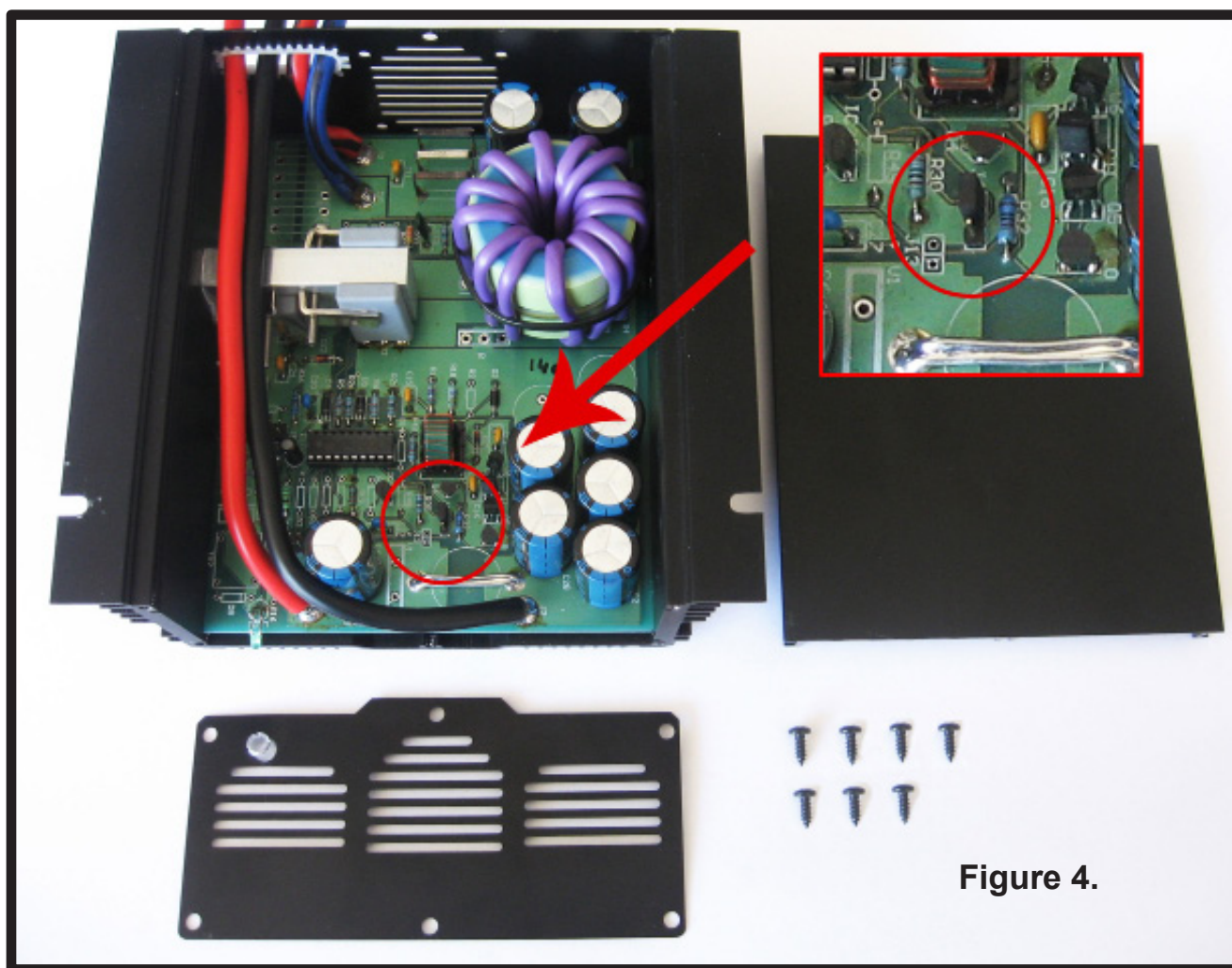


Figure 4.

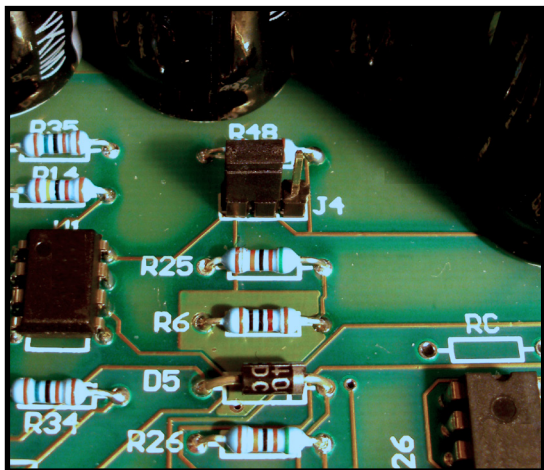


Figure 5 (Above): Vented Battery Setting

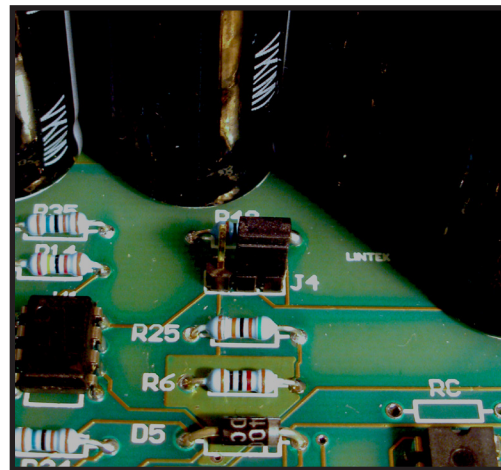


Figure 6 (Above): Sealed Battery Setting

BMPPT FAQs

Q: What is an BMPPT?

BMPPT stands for Booster Maximum Power Point Tracker and is a specialised converter designed to maintain the PV voltage at the level in which it delivers maximum power to the load or battery while at the same time boosting the output voltage above the input. The nominal panel output power can only be ensured with the use of an MPPT

Q: When is a BMPPT Required?

The BMPPT is required when the panel voltage is below the battery voltage such as when a 12V panel needs to charge a 24V battery.

The BMPPT enables the parallel connection of panels which can make the system more tolerant to partial shading when compared to series panel connection.

Q: What sort of batteries should I use?

1. A deep cycle battery is a must due to the cyclical nature of the solar system with a recommended battery capacity of at least 180AH.
2. A larger battery will not only give longer run time during low light but also will be able to avoid available PV power being unstored such as when battery reaches the float stage.

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Q: How do PV temperatures affects charge current?

Temperature increase brings down the PVs maximum power point voltage reducing the BMPPTs current gain available. In principle at 25C it is possible to achieve 30% gain but at 40C, a more realistic average temperature, about 20% is still available.

Q: What sorts of loads can I power with the BMPPT1500?

1. The maximum bulk charge current with the BMPPT1500 on a 24V battery and a 12V 750W panel is approximately 26A, so you can expect about 100AH per day which means a 240W load for about 10 hours daily.
2. Following the same reasoning with a 48V Battery and 24V 1500W panel the BMPPT1500 will supply a daily load of 480W for about 10 hours.

Q: Is interference possible? and If so what do I do?

GSL's BMPPTs produce far less interference than conventional solar regulator during the absorption and float stages, that is during most of its operating time, and its designed to comply with local and international EMI standards however some interference is still possible. If interference occurs first try and reorient the aerial or move the sensitive equipment away from the BMPPT wires. Ensure the BMPPT chassis is grounded. Grounding a battery terminal may also help and finally you can try adding ferrite clamps.

Warranty Conditions: The product is warranted to be free from defects in materials and workmanship under normal use and service for a period of 24 months from the date of sale. This warranty covers defective parts and workmanship provided that the product is shipped prepaid to the seller within 24 months of purchase of goods. This warranty is limited to the repair or replacement (at the manufacturers' discretion) of parts and shipping prepaid to the original despatch destination. We regret that no liability can be accepted for consequential or special damages of any kind howsoever arising in connection with products supplied by the seller. This warranty is in lieu of all other warranties expressed or implied. No representative is authorised to assume for the seller any other liability in connection with the seller's products.

