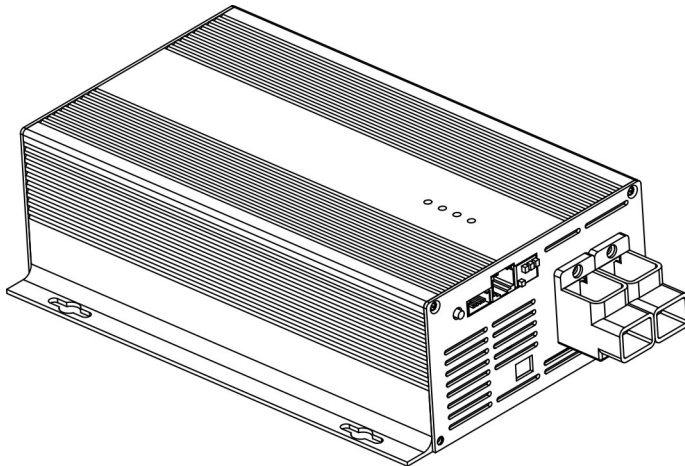


Smart AC-to-DC Battery Charger

*BC1230PRO (12V 30A), BC1260PRO (12V 60A),
BC2415PRO (24V 15A) and
BC4810PRO (48V 10A) series*

INSTRUCTION MANUAL



----- Application: leisure vehicles, commercial and special purpose vehicles, boats,
and other mobile or stationary systems with 12V/24/48V batteries -----

Dear Customer,



Thank you very much for choosing our product. This manual contains important information about the installation and operations of the battery charger. Please read this manual carefully before installing and using the product.

Note: working with electricity and batteries can be dangerous. Make sure that any work follows all appropriate safety standards and precautions.

Overview

This compact Photonic Universe smart battery charger is specifically designed to charge various lead-acid and lithium batteries from mains power. The automatic 4 stage charging algorithm delivers fast and efficient charging. Thanks to its low current mode, this charger can recover deeply discharged batteries and recover some lost capacity from old batteries. The product can also be used as a constant power supply to run accessories that require a stable and constant DC voltage.

The charger is compatible with GEL, AGM, Lead Acid, Lithium-Ion, and a variety of LiFePO4 battery types using the settings available via the DIP switches. It also features advanced temperature protection for lithium batteries when the charger is used with an optional external temperature sensor (purchased separately). In this mode, the charger can switch off charging when it detects 0°C or lower temperature, preventing damage to the battery.

The product features a cooling fan which has dual thermal / charge current control, preventing the charger from overheating. The built-in 'night mode' can reduce the fan speed, allowing the charger to continue to charge more quietly (note during this time charging current will also be reduced).

This charger can be connected to a mobile phone app via an optional Bluetooth dongle (purchased separately) to monitor charging parameters and any fault information, as well as to a remote LCD meter (purchased separately).

Safety Instructions

- Ensure that the area around the battery and charger is well ventilated.
- Do not cover or place anything on the top of the charger.
- Do not place the charger on top of the battery.
- Ensure that there is no spark or ignition source near the battery.
- Do not attempt to charge non rechargeable, frozen or damaged batteries.
- Power connections must comply with local electrical regulations.
- If the AC power cable is damaged, please contact the seller.
- The charger can only be plugged into a grounded AC power outlet.
- Keep out of reach of children.
- If the battery acid comes into contact with the skin, rinse it with water immediately.



Warning Risk of electric shock! Do not open device if it has been connected to an AC power source

Installation

When installing the charger, it must be connected according to the following sequence:

1. Connect the DC output cables to the charger.
2. Connect the DC output cables to the batteries.
3. Insert the fuse or close DC circuit breaker between the charger and the battery.
4. Connect Bluetooth, Remote meter or a temperature sensor as appropriate.
5. Set the DIP switches of the charger as required.
6. Connect the AC power cable to the main power outlet and turn the charger on.

When removing the charger from the installation, it must be disconnected in the reverse sequence to the installation:

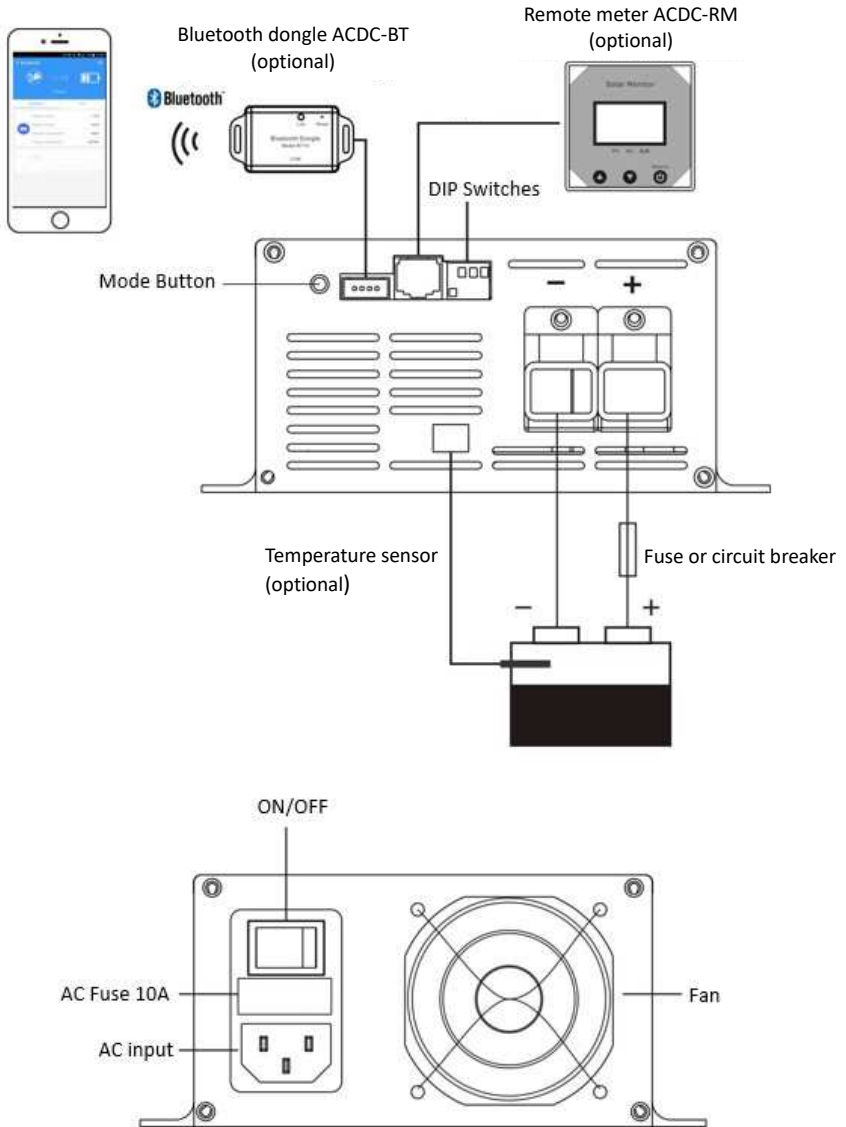
1. Turn off the AC switch and disconnect the AC power cable from the main power outlet.
2. Open DC circuit breaker/fuse if installed.
3. Disconnect the DC output cabled from the batteries.
4. Disconnect the DC output cables from the charger.

Note: *although the mains charger has built-in electronic protection, please install an inline fuse or a circuit breaker between the batteries and the charger. Current rating of the fuse or circuit breaker should be chosen according to the maximum charging current of the charger.*

Optional surface mounted (CB series) and recess mounted (CBR series) DC circuit breakers can be purchased from Photonic Universe. This range includes 30A, 40A, 50A, 60A and 80A circuit breakers suitable for 12V / 24V / 48V voltages (product codes **CB30 – CB80, CBR40**).



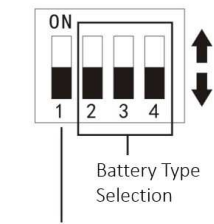
Connection diagram



Settings

The battery type can be selected using DIP switches 2, 3 and 4. Please make sure the correct battery type is selected before charging has begun. If the battery type is changed once the charging has already begun, charging will stop for a few seconds, and then restart according to the new charging parameters.

Please refer to the table below for selecting the battery type:



	2	3	4
GEL (14.3V)	↑	↑	↑
Lead-acid (14.4V)	↑	↑	↓
AGM (14.7V)	↑	↓	↑
LiFePO4 (13.9V)	↑	↓	↓
LiFePO4 (14.2V)	↓	↑	↑
LiFePO4 (14.4V)	↓	↑	↓
LiFePO4 (14.6V)	↓	↓	↑
Lithium Ion (12.6V)	↓	↓	↓

Note: the voltage in the table above is provided as a reference guide for 12V battery chargers. Please multiply all values by 2 for a 24V charger and by 4 for a 48V charger.

1	0°C charging
↑	OFF
↓	ON

The 0°C charging function can be toggled using DIP switch 1. Please note this function will only apply when charging a lithium battery. If a lead acid battery type is selected, the charger will use the default charging parameter.

Note: To use the 0°C charging function, an external temperature sensor is required. If an external temperature sensor is not used, the charger will use the default charging parameters.

Mode setting

The operating mode of the charger can be selected by holding the Mode Button for 1 second. This will cycle through the various modes. The mode indicator will flash quickly to indicate the selected mode. When the desired operating mode has been selected, release the button and it will take effect after 5 seconds.

Working modes

The charger can work in the following modes:

Mode	Operation
Normal	Rated current charging
Night	Low speed and low current charging
Low current	50% rated current charging
DC power supply	Charger produces constant voltage

LED Indicators

The charger will show its working mode using the yellow and green LED indicators. For the battery charging operation, the yellow indicator will be used. For the DC power supply operation, the green LED indicator can be used.

Mode	Yellow / Green LED Indicator
Normal	Yellow LED is ON
Night	Yellow LED is OFF
Low current	Yellow LED is flashing
DC power supply	Green LED is ON

When the charger is in the battery charging mode, the Green LED indicator will be used to display the battery status:

Battery Status	Green LED Indicator
Battery full	ON
Battery not fully charged	OFF

In the same battery charging mode the blue LED will display the charging phase:

Charging phase	Blue LED Indicator
No charging / timeout	OFF
Bulk charge (constant current)	Slow flash once / 2 seconds
Absorption charge (constant voltage)	Fast flash once / 1 second
Float charge (battery full)	ON

Troubleshooting

The red LED will display any errors which may have occurred with the charger. Please use the table below for reference:

Error	Red LED Indicator
No fault	OFF
Hardware overcurrent	ON
No battery connected	Flash once / 3.5 seconds
Software overcurrent	Flash 2 times continuously, pause for 3.5 seconds
Charging timeout	Flash 3 times continuously, pause for 3.5 seconds
Over temperature protection	Flash 4 times continuously, pause for 3.5 seconds
Input overvoltage	Flash 5 times continuously, pause for 3.5 seconds
Input low voltage	Flash 6 times continuously, pause for 3.5 seconds
Output undervoltage	Flash 7 times continuously, pause for 3.5 seconds
Communication error	Flash once / 1 second
Battery specification error	Flash 2 times / 1 second

Charging Parameters

Battery Type	Absorption	Float
GEL	14.3V	13.8V
Lead-acid (14.4V)	14.4V	13.5V
AGM (14.7V)	14.7V	13.5V
LiFePO4 (13.9V)	13.9V	13.8V
LiFePO4 (14.2V)	14.2V	13.8V
LiFePO4 (14.4V)	14.4V	13.8V
LiFePO4 (14.6V)	14.6V	13.8V
Lithium-ion (12.6V)	12.6V	12.5V

Note: the voltage in the table above is provided as a reference guide for 12V battery chargers. Please multiply all values by 2 for a 24V charger and by 4 for a 48V charger.

Specifications

Model	BC1230PRO	BC1260PRO	BC2415PRO	BC4810PRO
Input voltage and frequency range	180V-260VAC 50Hz			
Efficiency	> 90%			
Battery voltage	12V	12V	24V	48V
Max output current-normal mode	30A	60A	15A	10A
Max output current-low current mode	15A	30A	7.5A	5A
Max output current-night mode	10A	20A	6A	3A
Max battery capacity (recommended)	300Ah	600Ah	150Ah	100Ah
Min battery capacity (recommended)	100Ah	100Ah	50Ah	30Ah
DC Power supply voltage/current (default)	12.6V/30A	12.6V/60A	25.2V/15A	50.4V/10A
DC Power supply voltage (app setting range)	12V-13.8V	12V-13.8V	24V-27.6V	48V-55.2V
Temperature compensation (Except lithium battery)	18mV/°C	18mV/°C	36mV/°C	72mV/°C
Charge algorithm	4-stage adaptive			
Protection	Reverse polarity (fuse), output short circuit, over temperature			
Operating temperature	-20 to +50°C			
Material & Colour	Aluminium, iron grey			
Battery connection	M8 screw			
Protection category	IP22 (indoor use)			
Weight	1.4kg	1.9kg	1.4kg	1.4kg
Dimensions (H x W x D)	221×155×70mm	221×190×70mm	221×155×70mm	221×155×70mm

Temperature sensor ACDC-TS (optional)

The optional temperature sensor **ACDC-TS**, if fixed on the battery and connected to the charger, will measure the external temperature of the battery and provide the real time temperature readings to the charger. This is particularly useful for charging lead acid batteries in temperatures that vary substantially from the baseline temperature 25°C. In such case, the charger will apply an adjustment (temperature compensation) to the charging voltage equal to 18mV/°C (12V charger), 36mV/°C (24V charger), 72mV/°C (48V charger). If the temperature sensor is not connected, the charger will charge the battery based on a default temperature of 25°C.



Remote meter ACDC-RM (optional)

An optional remote LCD meter **ACDC-RM** can be connected to the charger to display charging parameters such as real time battery voltage, charging current, charging Ah, charging Wh and any fault information.



Bluetooth dongle ACDC-BT (optional)

Using an optional Bluetooth dongle **ACDC-BT**, the charger can be connected to a mobile phone app to allow the user to monitor charging parameters such as real time battery voltage, charging current, charging Ah, charging Wh and any fault information.

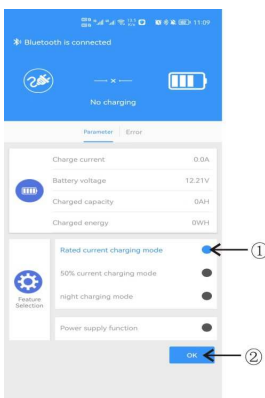


To setup the Bluetooth dongle and connection to the mobile phone, please install the correct and up-to-date version of the app using the name, links or QR codes for the app provided in a separate user manual for the Bluetooth dongle.

Using the Bluetooth dongle, the user can also adjust two settings of the charger:

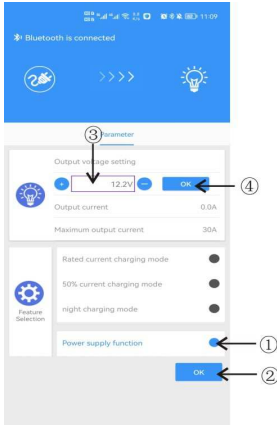
- Changing the working mode of the charger (which can also be changed by pressing and holding the Mode Button);
- Changing the output voltage when the charger works in the power supply mode (default voltage is 12.6V for 12V charger, 25.2V for 24V charger, 50.4V for 48V charger).

To select the working mode of the charger through the app:



1. Select one of the 4 working modes in the app.
2. Press "OK" to confirm.

To change the output voltage for the power supply mode through the app:



1. Select “Power Supply Mode”
2. Press “OK” at the bottom
3. Select the desired voltage of the DC power supply in the “output voltage setting” field.
4. Press “OK” next to this field

If you would like to purchase any of these optional extras, please visit our online shop

www.PhotonicUniverse.com

or call 0203 150 1111 (international +44 203 150 1111) for a phone order.

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