POWERLINE®

USER MANUAL
PL-C010P
12V 10A
AUTOMATIC CHARGER

OPERATING INSTRUCTIONS
PL-C010P 10A
Intelligent Battery Charger

INTENDED USE
The product is designed to charge and maintain 12-V lead-acid batteries with a capacity of 20 - 300 Ah and 12-V calcium batteries with a capacity of 25 - 100 Ah.

It can also be used as a mains adapter (13.8 V/8.0 A).

Any use other than that described above will damage this product and involves the risk of short circuits, fire, electric shock, etc.

DELIVERY CONTENTS
- Battery charger
- Cable with battery clamps
- User Manual

SAFETY INSTRUCTIONS
Please read through the operating instructions completely before operating the device. They contain important information for correct operation. The warranty/guarantee will be void if damage is incurred resulting from non-compliance with these operating instructions! We assume no liability for any consequential damage! We do not assume any liability for damage to property or personal injury caused by improper use or the failure to observe the safety instructions!

General
- Any unauthorized conversion and/or modification of this product is not admissible for safety and approval reasons (CE).
- This product may only be operated with a voltage supply 220-240 Vac ~ 50/60 Hz.
- Always keep the product away from children. The product should be set up, used and stored in places that are not accessible to children.
- This product is only designed to charge 12 V lead acid and calcium battery. DO NOT use it to recharge non-rechargeable batteries or other type of rechargeable batteries (e.g. NiCd, NiMH, LiPo) due to risk of fire and explosion.
- Any maintenance, adjustment, and repair work may only be carried out by specialist or specialised workshop.
- During maintenance, adjustment, and repair work, only use original spare parts to replace faulty components in the product.
- If any damage is noticed on the product, DO NOT use the product anymore and return it to a specialised workshop or disposed it in an environmentally friendly manner.

Operation

DO:
- Ensured there is sufficient ventilation during operation.

DO NOT:
- Use the product if ambient temperature is above 40 ^{o}C.
- Use the product under the present of flammable gases, solvents, vapours, and relative humidity (RH) above 80%.
- Use the product in the vicinity of flammable or combustible substances or gases.
- Use the battery charger inside a vehicle.
- Cover the battery charger or the connected battery.
- Smoke while handling the battery charger or the battery.
- Operate the device immediately after it has been taken from a cold to warm room to avoid malfunctioning of the product due to condensation vapour.

Notes on Lead Acid & Calcium Battery
- Please read through all safety and charging instructions from the battery manufacturer user manual.
- Make sure all loads are disconnected before connecting the battery to the battery charger.
- Make sure battery is disconnected before connecting any loads to the battery charger.
- When connecting the battery, observe the polarity. Red charger terminal is positive (+) and black charger terminal is negative (-).
- Lead acid battery contains hazardous and corrosive acids. Please avoid any skin or eye contact with the battery fluids.
- On skin contact, clean the affected area with clean water and soap. On eye contact, rinse the affected eye with clean water. Consult the doctor immediately.
- Do not try to tamper or dismantle lead acid battery.
- Do not short-circuit the lead acid battery.
- Do not throw the battery into fire.

DISPOSAL

 At the end of its useful life, this product must not be disposed of together with normal household waste, but has to be dropped off at a collection centre for the recycling of electrical and electronic devices. This is indicated by the symbol on the product, on the instruction manual or on the packaging.

The materials of which this product is made are recyclable pursuant to their labelling. With the reuse, the recycling of the materials or other forms of scrap usage you are making an important contribution to the protection of the environment.

Please ask your local administration office for the appropriate disposal centre.

Product features:

1. Charge multiple type of Batteries
The charger is programmed to charge Lead-Acid, Gel, AGM & Calcium Batteries.

2. Fully Automatic multi-stages charging system
Microprocessor constantly monitors battery voltage and automatically deliver the appropriate currents to allows the batteries to be used over a prolonged period, which means that it is ideal for the maintenance of seasonally used motor / vehicle / boat / yachts so that the batteries are always ready to go and in perfect condition without damaging the batteries.

3. Auto-Memory
The charger will return to last selected mode automatically after power re-started.

4. Battery Recovery capability and dead battery detection
Capable to recover slightly sulfated batteries and automatically identifies in case of dead battery.

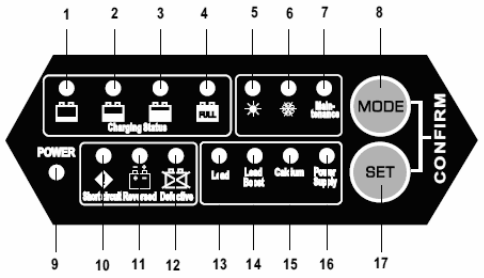
5. Switch-Mode technology
Switch mode charger has high efficiency in terms of less heat lost, much faster response during charging, compact Size, and Light Weight.

6. Low Power Saving
Charger is programmed to reduce amount of charging current once the battery is fully charged.

Protection features:

1. Spark resistant short circuit protection. Spark resistant Reverse battery protection - Prevents charger damage if battery leads are accidentally reversed.
2. Over Voltage Protection – Prevents high voltage spikes from damaging sensitive electronic components in the charger.
3. Electronic Current Limiting – Prevents overheating and damage caused by shorts or excessive loads.
4. Automatic Over-temperature Protection – Prevents damage of the charger in the event of abnormal ambient temperature or malfunction of components.
5. IP65 - Dust and Splash approval.

Description of LEDs/functions



1		LED 1 - Charging indicator (0 - 25 %)
2		LED 2 - Charging indicator (25 – 50 %)
3		LED 3 - Charging indicator (50% or above)
4	FULL	LED 4 - Charge indicator (fully charged)
5	☀	MODE 5 - Summer mode (14.4 V / 10 A for Lead or 16 V / 5A for Calcium battery) in normal temperature - For Lead-acid battery, select SET 13 (**Lead**) and ***MODE*** 5 ☀ for this function - For Calcium battery, select ***SET*** 15 (**Calcium**), press ***SET+MODE*** to confirm, then choose ***MODE*** 5 ☀ for this function
6	❄	MODE 6 - Winter mode (14.7 V / 10 A for Lead or 16.2 V / 5A for Calcium battery) in low ambient temperature - For Lead-acid battery, select ***SET*** 13 (**Lead**) and ***MODE*** 6 ❄ for this function. This mode is also recommended for AGM batteries. - For Calcium battery, select ***SET*** 15 (**Calcium**), press SET+MODE to confirm, then choose ***MODE*** 6 ❄ for this function
7	**Maintenance**	MODE 7 - Maintenance mode (13.8 V/ 8 A constant charging) for the application where max. capacity of the battery required - Select ***SET*** 13 (**Lead**) and ***MODE*** 7 **(Maintenance)** for this function
8	MODE	MODE selection
9	**POWER**	Power/stand-by indicator
10		LED 10 - Short Circuit indicator
11		LED 11 - Cables connected with reversed polarity indicator
12		LED 12 - Battery Defective indicator
13	**Lead**	SET 13 - This mode is suitable for 12V Lead Acid and GEL batteries. - Select ***SET*** 13 (**Lead**) and ***MODE*** 5 ☀ / ***MODE*** 6 ❄ / ***MODE*** 7 **(Maintenance)** to activate the function
14	**Lead Boost**	SET 14 - High voltage 16V boost mode (16V / max. 1.5A) will be applied for deep discharge battery due to stratified acid for max. 4 hours. - Select ***SET*** 14 (**Lead Boost**), then press ***SET*** + ***MODE*** together to activate this function - A fully charged battery gives better result. - Caution! High voltage may cause some water loss.
15	**Calcium**	SET 15 - This mode is suitable for 12V Calcium batteries. - Select ***SET*** 15 (**Calcium**), then press ***SET*** + ***MODE*** together. Choose ***MODE*** 5 ☀ or ***MODE*** 6 ❄ to activate the function
16	**Power Supply**	SET 16 - Power Supply set (13.8 V/8 A) - Make sure there is no load connected from the charger before the mode is activated - Select ***SET*** 16 (**Power Supply**), then press ***SET*** + ***MODE*** together to activate this function
17	SET	SET selection

CHARGING A LEAD-ACID & CALCIUM BATTERY

1. First make sure your lead-acid or calcium battery is a 12 V battery. Do not charge batteries with different operating voltages!
2. Disconnect all loads from the battery.
3. If the battery is installed in a vehicle, turn off the ignition and any other loads.

   Observe the instructions and safety information of the vehicle to find out how the vehicle battery should be charged. Modern vehicles are equipped with sensitive electronic parts and controls that can be damaged if you do not proceed properly.
4. First connect the battery charger to the power supply (220-240 V~/50/60 Hz).
5. Then, connect the battery charger to the battery with the correct polarity. If the polarity is not correct, LED 11 lights up.

   a) Charging a battery installed in a vehicle:

   a) For negative ground systems, connect the positive (red) alligator clip to the positive battery post. Then connect the negative(black) alligator clip to the vehicle chassis.

   b). For positive ground systems, connect the negative (black) alligator clip to the negative battery post. Then connect the positive (red) alligator clip to the vehicle chassis

   b) Charging a battery not connected to a vehicle:
   Connect the positive (red) alligator clip to the positive battery post. Then connect the negative(black) alligator clip to negative post of the battery.
6. Connect the AC power plug to the electrical outlet.
7. If the Charging loop is in short circuit, LED 10 lights up.
8. This battery charger is equipped with an automatic memory function, i.e. whenever AC supply is connected, it returns to last selected mode automatically.
9. Now you can select a function using the ***SET*** button (17) and ***MODE*** button (8) for selection. See the next chapter for a description of the individual operating modes.
10. After the charging process, disconnect the battery charger from the mains supply.
11. Then, disconnecting charger in reverse sequence of connecting procedure.

OPERATING MODES

1. Lead and Summer☀ mode (14.4 V +/- 0.25 V, Max. 10A)

- This mode is suitable for all lead-acid batteries (also SLA, gel, and AGM) with a capacity above 20 Ah at normal ambient temperature.
- To select this mode, select the ***SET*** button until LED 13 **Lead** lights up, then press ***MODE*** button until LED 5 ☀ lights up.
- When the battery is fully charged (14.4V +/- 0.25V), LED 4 FULL lights up. The device automatically switches to maintenance charging stage.

2. Lead and Winter ❄ mode (14.7 V +/- 0.25V, Max. 10A)

- This mode is suitable for all lead-acid batteries (also SLA, gel, and AGM) with a capacity above 20 Ah at low ambient temperature.
- To select this mode, select the **SET** button until LED 13 **Lead** lights up, then press **MODE** button until LED 6 ❄lights up.
- When the battery is fully charged (14.7V +/- 0.25V), LED 4 FULL lights up. The device automatically switches to maintenance charging stage.

3. Lead Maintenance mode (13.8 V +/-0.25V, Max. 8 A)

- This mode is suitable to maintain batteries above 20 Ah.
- The charger is operated at a constant voltage of 13.8V, this is maintenance mode for applications where maximum capacity from the battery is needed, such as golf cart, floor sweeper, back up UPS etc.
- The maintenance program is designed to maintain any 12-V lead-acid batteries (SLA, gel, AGM).
- The charging current is 8 A +/- 10 % to the battery until a voltage of 13.8 V +/- 0.25 V is reached. As the battery voltage increases, the charger reduces the charging current accordingly.
- To select this mode, select the ***SET*** button until LED 13 ***Lead*** lights up, then press ***MODE*** button until LED 7 ***Maintenance*** lights up.

4. Lead Boost mode (16 V +/-0.25 V, Max. 1.5 A)

- This mode is mainly used to regenerate deep-discharged or sulphated Lead Acid batteries from 20 Ah upwards.
- A fully charged battery gives better result.
- **→ Use this mode with care, high voltage may cause some water loss.**
- To select this mode, select the ***SET*** button until LED 14 **Lead Boost** lights up, then Press the ***SET*** and ***MODE*** button together to activate this function.
- At a battery voltage of 4.5V – 10.5V, the charger pulse-charges the battery. Maximum pulse-charging time is 7 hours. (If the battery voltage is not reached 10.5V within 7 hours, the charger output cut off, defective LED will be flashed).
- When the battery voltage reaches 10.5V, the charger switches to 16-V boost mode for 4 hrs.
- Then, the charger automatically switches to normal charge. LED 14 goes out. LED 5 ☀ & LED 13 **Lead** for normal charging lights up.

→ You can also use this mode with batteries specified by the manufacturer to be suitable for a higher charge end voltage. Please observe the charging instructions of the battery manufacturer.

Calcium and Summer ☀ mode (16 V +/-0.25 V, Max. 5A)

- This mode is suitable for calcium batteries from 25 Ah upwards at normal ambient temperature.
- The maximum charging current is 5 A +/- 10 % until 16 V +/- 0.25 V is reached.
- To select this mode, select the ***SET*** button until LED 15 **Calcium** lights up. Press the ***SET*** and ***MODE*** button together to activate this function and then, press ***MODE*** button until LED 5 ☀lights up.
- When the battery is fully charged (16 V +/- 0.25 V), LED 4 FULL lights up. The device automatically switches to maintenance charging stage.

Calcium and Winter ❄ mode (16.2 V +/- 0.25 V, , Max. 5A)

- This mode is suitable for calcium batteries from 25 Ah upwards at low ambient temperature.
- The maximum charging current is 5 A +/- 10 % until 16.2 V +/- 0.25 V is reached.
- To select this mode, select the ***SET*** button until LED 15 **Calcium** lights up. Press the ***SET*** and ***MODE*** button together to activate this function and then, press the ***MODE*** button until LED 6 ❄lights up.
- When the battery is fully charged (16.2 V +/- 0.25 V), LED 4 FULL lights up. The device automatically switches to maintenance charging stage.

Power Supply mode (13.8 V +/-0.25V, max. 8 A)

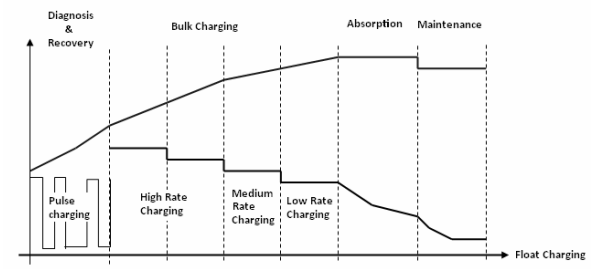
- The charger can also be used as a power adapter (13.8 V, max. 8 A)

  It is only permissible to connect loads with a maximum power consumption of 8.0 A.

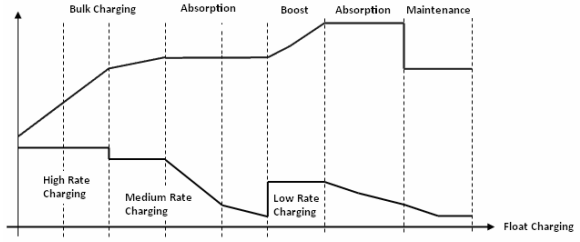
  Do not power any products that require a stabilised operating voltage of 12 V (e.g. computers).
- The device is protected against short-circuits electronically. Make sure that the connection is correct anyway.
- Make sure there is no load connected from the charger before the mode is activated. To select this mode, press the *SET* button until LED 16 Power Supply lights up, then Press the *SET* and *MODE* button together to activate this function.
- Press the ***SET*** and ***MODE*** button together to switch off the function after use.

CHARGING PHASES

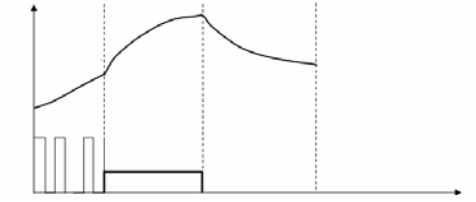
Charging Profile for Lead Acid Battery summer & winter mode



Charging Profile for Calcium Battery summer & winter mode



Charging Profile for Boost mode



MODE SELECT

Press the **SET** button to select Lead / Lead Boost / Calcium / Power Supply mode.

Press the **MODE** button to select Summer / Winter/ Maintenance mode.

Press **SET** + **MODE** button together to activate the Lead Boost / Calcium / Power Supply functions.

CLEANING

Disconnect the battery charger from the battery and the mains voltage before cleaning it.
Clean the outside of the product with a clean, dry, and soft cloth.
Do not use aggressive cleaning agents to avoid discolouration.

SPECIFICATIONS

Operating voltage:	220-240 V~/50/60 Hz
Charge end voltage:	14.4 V +/- 0.25 V or 14.7 V +/- 0.25 V (lead-acid batteries)
	16.0V +/- 0.25 V or 16.2 V +/- 0.25V (calcium batteries)
	13.8 V +/- 0.25 V (maintenance program)
Charging current:	10.0 A +/- 10 % or 5 A +/- 10 % (or +/- 0.5A)
Rechargeable battery type:	Any 12-V lead-acid batteries (SLA, AGM, gel) or 12-V calcium batteries
Battery capacity:	20 - 300 Ah (lead-acid batteries)
	25 - 100 Ah (calcium batteries)
Protection type:	IP65 (casing)