PRO-LOGIX

Manual
Battery Maintainer Model No. PL2112
No. 141-112-000

⚠WARNING	
	Failure to follow instructions may cause damage or explosion, always shield eyes. **Read entire instruction manual before use.**

⚠WARNING
This product can expose you to chemicals, including Vinyl-Chloride, Styrene and Acrylonitrile, which are known to the State of California to cause cancer.

A IMPORTANT SAFETY INSTRUCTIONS - READ THESE FIRST

⚠WARNING	
	Read these instructions completely before using the Battery Charger and save them for future reference. Before using the Battery Charger to charge a battery, read these instructions and the instruction manual/safety information provided by the car, truck, boat or equipment manufacturer. Following all manufacturers' instructions and safety procedures will reduce the risk of accident.
	Working around lead-acid batteries may be dangerous. Lead-acid batteries release explosive gases during normal operation, charging and jump starting. Carefully read and follow these instructions for safe use. Always follow the specific instructions in this manual and on the Battery Charger each time you use the Battery Charger. All lead-acid batteries (car, truck and boat) produce hydrogen gas which may violently explode in the presence of fire or sparks. **Do not smoke, use matches or a cigarette lighter while near batteries.** Do not handle the battery while wearing vinyl clothing because static electricity sparks are generated when vinyl clothing is rubbed. Review all cautionary material on the Battery Charger and in the engine compartment.
	This battery charger is equipped with a setting for charging a specific type of lithium battery chemistry, Lithium Iron Phosphate (LiFePO4). The charger's lithium charging function is optimized for this type of lithium battery only, as noted on the control panel. There exist many different lithium battery types, each using a different specific lithium battery chemistry. Do not charge any other lithium battery types using this charger – doing so could result in personal injury and/or property damage.
	Always wear eye protection, appropriate protective clothing and other safety equipment when working near lead-acid batteries. Do not touch eyes while working on or around lead-acid batteries.
	Always store clamps away from each other or common conductors. Improper storage of clamps may cause the clamps to come in contact with each other, or a common conductor, which would be hazardous if the Battery Charger was plugged into an AC outlet.
	Use extreme care while working within the engine compartment, because moving parts may cause severe injury. Read and follow all safety instructions published in the vehicle's Owner's Manual.
	Batteries being charged with the Battery Charger unit likely contain liquid acids which are hazardous if spilled.

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiver antenna.
- Increase the separation between remote and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio TV technician for help.

This Class B digital apparatus complies with Canadian ICES-003.

1. SAVE THESE INSTRUCTIONS – This manual contains important safety and operating instructions for Model No. PL2112.
2. Do not expose charger to rain or snow.
3. Use of an attachment not recommended or sold by the manufacturer may result in a risk of fire, electric shock, or injury to persons.
4. To reduce risk of damage to electric plug and cord, pull by plug rather than cord when disconnecting charger.
5. An extension cord should not be used unless absolutely necessary. Use of an improper extension cord could result in a risk of fire and electric shock. If extension cord must be used, make sure:
   a. That pins on plug of extension cord are the same number, size, and shape as those of plug on charger,
   b. That extension cord is properly wired and in good electrical condition; and
   c. That the wire size is large enough for the length of cord as specified below.

Cord Length: ft.(m)	25(8)	50(16)	100(31)	150(46)
AWG size of cord:	18	16	14	12

6. DANGER – FIRE HAZARD
   When you connect the positive clamp to the battery positive terminal, take care to avoid it coming into accidental contact with the engine, frame or any other grounded component. This will cause a short circuit from the battery positive through the vehicle's ground to the battery negative, potentially causing a fire risk, engine component damage, and / or physical harm to the user.
7. To prevent electric shock - Dispose of battery charger if cord becomes defective.
8. Do not operate charger if it has received a sharp blow, been dropped, or otherwise damaged in any way; take it to a qualified service center.
9. Do not disassemble charger; take it to a qualified service center when service or repair is required. Incorrect reassembly may result in a risk of electric shock or fire.
10. To reduce risk of electric shock, unplug the charger from outlet before attempting any maintenance or cleaning. Turning off controls will not reduce this risk.
11. Monitor battery charger daily when using it to maintain battery for extended periods.
12. WARNING – RISK OF EXPLOSIVE GASES.
    a. Working in vicinity of a lead-acid battery is dangerous. Batteries generate explosive gases during normal battery operation. For this reason, it is of utmost importance that each time before using your charger, you read this manual and follow the instructions exactly.
    b. To reduce risk of battery explosion, follow these instructions and those published by the battery manufacturer and the manufacturer of any equipment you intend to use in the vicinity of the battery. Review cautionary markings on these products and in the engine compartment.

B PERSONAL PRECAUTIONS

1. Someone should be within range of your voice or close enough to come to your aid when you work near a lead-acid battery.
2. Have plenty of fresh water and soap nearby in case battery acid contacts skin, clothing, or eyes.
3. Wear complete eye protection and clothing protection. Avoid touching eyes while working near battery.
4. If battery acid contacts skin or clothing, wash immediately with soap and water. If acid enters eye, immediately flood eye with cold running water for at least 10 minutes and get medical attention immediately.
5. NEVER smoke or allow a spark or flame in vicinity of battery or engine.
6. Be extra cautious to reduce risk of dropping a metal tool onto battery. It might spark or short-circuit battery or other electrical part that may cause explosion.
7. Remove personal metal items such as rings, bracelets, necklaces, and watches when working with a lead-acid battery. A lead-acid battery can produce a short-circuit current high enough to weld a ring or other jewelry to metal, causing a severe burn.
8. Use charger for charging LEAD-ACID and LiFePO4 batteries only. It is not intended to supply power to a low voltage electrical system other than in a starter-motor application. Do not use battery charger for charging dry-cell batteries that are commonly used with home appliances. These batteries may burst and cause injury to persons and damage to property.
9. NEVER charge a frozen battery.

C PREPARATION

PREPARING TO CHARGE BATTERY:

1. If it is necessary to remove battery from vehicle to charge, always remove grounded terminal from battery first. Make sure all accessories in the vehicle are off, so as not to cause an arc.
2. Be sure area around battery is well ventilated while battery is being charged. Gas can be forcefully blown away by using a piece of cardboard or other non-metallic material as a fan.
3. Clean battery terminals with a mixture of baking soda and hot water. Be careful to keep corrosion from coming in contact with eyes.
4. Add distilled water in each cell until battery acid reaches level specified by battery manufacturer. This helps purge excessive gas from cells. Do not overfill. For Maintenance Free Batteries - carefully follow manufacturer's recharging instructions.
5. Study all battery manufacturer's specific precautions such as removing or not removing cell caps while charging and recommended rates of charge.
6. Determine voltage of battery by referring to vehicle owner's manual and make sure that charger output voltage matches vehicle voltage.

D LOCATING THE CHARGER

1. Locate the charger as far away from the battery as DC cables permit.
2. Never place the charger directly above the battery being charged; gases from the battery will corrode and damage the charger.
3. Never allow battery acid to drip on the charger when reading specific gravity or filling the battery.
4. Do not operate the charger in a closed area or restrict ventilation in any way.
5. Do not set a battery on top of the charger.
6. Locate the charger at least 18" above the floor.
7. Do not place the charger where rain, snow, or other moisture could drip on it.

E BATTERY CHARGER CONNECTION PRECAUTIONS

1. CAUTION: Connect and disconnect DC output clips only after ensuring the unit is in IDLE mode and removing AC power cord from electric outlet. Never allow clips to touch each other.
2. When hooking up charger, attach one clip to battery and the other to a point away from battery (see sections F & G). Do not hook up charger until reading sections A–J.
3. Always make battery connections prior to plugging charger into AC outlet.

To reduce explosion risk, never connect both clips directly to the battery. When making each connection, twist or rock clip back and forth several times to make a good connection and to reduce the risk of a clip slipping off and creating a spark. Do not twist or rock clip on the battery after the second clip connection is made.

F CHARGING A BATTERY THAT IS INSTALLED IN A VEHICLE

CAUTION: A MARINE (BOAT) BATTERY MUST BE REMOVED AND CHARGED ON SHORE. TO CHARGE IT ON BOARD REQUIRES EQUIPMENT SPECIALLY DESIGNED FOR MARINE USE.

CAUTION: A SPARK NEAR BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF A SPARK NEAR BATTERY:

1. Position AC and DC cords to reduce risk of damage by hood, door, or moving engine part.
2. Stay clear of fan blades, belts, pulleys, and other parts that can cause injury to persons.
3. Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has larger diameter than NEGATIVE (NEG, N, –) post.
4. Determine which post of battery is grounded (connected) to the chassis. If the negative post is grounded to the chassis (as in most vehicles), see Figure 1 and instruction 5a. If the positive post is grounded to the chassis, see instruction 5b.
5. a) For NEGATIVE GROUNDED vehicle, connect POSITIVE (Red) clip from the battery charger to the POSITIVE (POS, P, +) ungrounded post of the battery.

   b) For POSITIVE GROUNDED vehicle, connect the NEGATIVE (Black) clip from the battery charger to the NEGATIVE (NEG, N, –) ungrounded post of the battery. (This arrangement is usually found in pre-1970 foreign vehicles or pre-1970 farm tractors. This is a rare occurrence.)
6. Connect the remaining battery charger clip to the vehicle chassis or engine block, as far away from the battery as possible. Do not connect the clip to carburetor, fuel lines, or sheet metal body parts. Connect to a heavy gauge metal part of the frame or engine block.
7. When disconnecting charger, turn charging sequence OFF by depressing the “CHARGE” button, disconnect AC cord, remove clip from vehicle chassis, and then remove clip from battery terminal.
8. Refer to the Operating Instructions for information on setting selector switches.

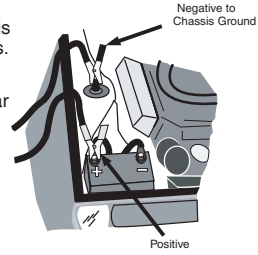


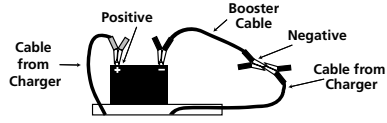
Figure 1

G CHARGING A BATTERY OUTSIDE OF THE VEHICLE

CAUTION: A MARINE (BOAT) BATTERY MUST BE REMOVED AND CHARGED ON SHORE. TO CHARGE IT ON BOARD REQUIRES EQUIPMENT SPECIALLY DESIGNED FOR MARINE USE.

CAUTION: A SPARK NEAR BATTERY MAY CAUSE BATTERY EXPLOSION. TO REDUCE RISK OF A SPARK NEAR BATTERY:

1. Check polarity of battery posts. POSITIVE (POS, P, +) battery post usually has a larger diameter than NEGATIVE (NEG, N, –) post.
2. Attach at least a 24” long, #6 gauge (AWG) insulated battery cable to NEGATIVE (Neg, N, –) battery post.
3. Connect POSITIVE (RED) charger clip to POSITIVE (POS, P, +) post of battery.
4. Position yourself and the free end of the cable (installed in step #2) as FAR away from the battery as possible. FACING AWAY FROM THE BATTERY, connect the NEGATIVE (Black) charger clip to the free end of the cable.
5. When charging is complete, turn charging sequence off by depressing the “CHARGE” button. Then disconnect charger, always in reverse sequence of connecting procedure and break first connection while as far away from battery as practical.



H OPERATING INSTRUCTIONS

BATTERY CHARGING SETTINGS

Upon making a proper battery connection (see Section F or G as applicable), plug AC power cord into an AC receptacle. All unit LEDs will light momentarily, then only the LEDs corresponding to charging settings should stay lit. The charger is now in Standby Mode.

If an ERROR Indicator LED lights, disconnect from AC power supply immediately and determine the cause of the alarm. A flashing ERROR light indicates reverse polarity, while a solid ERROR light indicates the detection of a battery fault, such as a shorted connection.

To charge a battery:

1. Choose a battery type setting. To charge Standard and Maintenance Free Flooded Acid batteries, push the Battery Type button until the “STD” LED is lit. To charge AGM and Spiral Wound batteries, push the Battery Type button until the “AGM” LED is lit. To charge Lithium Iron Phosphate starting batteries, push the Battery Type button until the “LiFeP04” LED is lit.

   Note: When charging lithium batteries, please note that there are many different lithium battery chemistries. The Lithium charging setting on this charger is specifically for Lithium Iron Phosphate (LiFePO4) batteries and only these lithium batteries. The charger should never be used for charging any other lithium battery type.

   Note: Ambient temperature must be between 0C and 50C in order to charge a LiFePO4 battery. If ambient temperature is outside this range, ERROR is solid and LiFePO4 is flashing, and charging will not start.

2. Press the “CHARGE” button and the charging indicator LED will light. The charger will automatically commence and complete the charging process. If you press the “CHARGE” button at any point during the charging sequence, the charger will stop charging and return to Standby Mode.

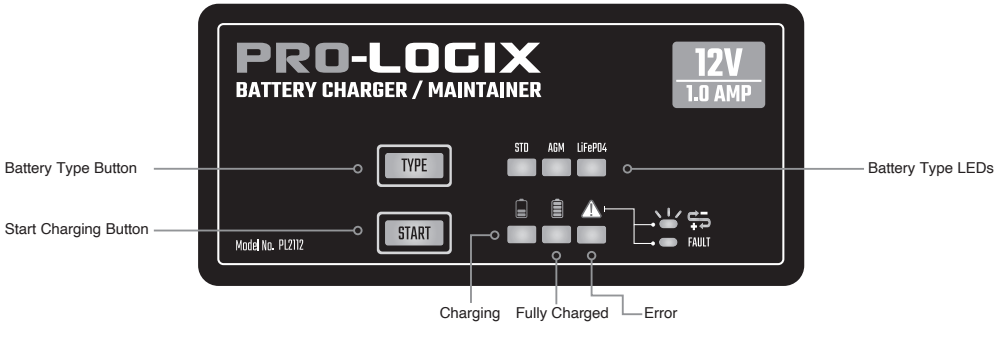
   Note: If the ERROR LED lights, disconnect from AC power immediately and determine the cause of the alarm. See Additional Features for a list of conditions that might cause this warning.

   Note: The charger is designed to protect against faults and shorts (see Battery Charger Features). If the battery to be charged has an open circuit voltage of less than 1V, the charger will indicate a fault. If, after unplugging unit, checking connections and verifying all settings, you determine the problem causing the “fault” condition is battery voltage below 1V, you can override the charger’s protection by holding down the “CHARGE” button for 3 seconds. The charger will commence the charging sequence and, assuming there are no other hindrances that caused the fault indication, will complete the charging process and automatically turn off when the battery has reached full charge.

3. When the battery approaches full charge and enters the Completion Phase, the green CHARGING COMPLETE indicator will light and the CHARGING IN PROGRESS indicator will flash. At this point, if time is critical, the battery can be put into service if it will be used in a charging situation, such as in a vehicle that that will be used immediately. To reach a true 100% state of charge, the charger should stay connected until the charger reaches the Rest Phase, when only the green CHARGING COMPLETE is lit.

4. When you are finished with the charging process, disconnect AC power cord from AC outlet, then disconnect DC leads from vehicle ground (if charging with battery in vehicle) and battery in the reverse sequence of the connection procedure.

   Low Energy Consumption Mode
   Note: The charger is designed to minimize energy consumption as much as possible. If the unit is in standby mode for 10+ minutes without a key pressed, the TYPE LED will flash. If the unit is in charge mode and has reached the rest phase, the CHARGED LED will flash slowly. At any time, you can wake the display by pressing any button.



CHARGING PROGRESS AND DISPLAY FEEDBACK

The charger uses a proprietary Multi-Stage charging process designed to optimally charge and maintain batteries. Assuming normal battery health, the standard charging sequence has four stages: 1.) energizing, 2.) fast charge, 3.) absorption, 4.) completion. Additionally, the charger has dedicated modes to address battery issues, as noted below. Finally your charger is an ideal tool for battery maintenance, the steps for which are addressed below as phases 5-7.

ENERGIZING PHASE

The charging process includes an initial energizing mode in which the charger determines the best charging path for the connected battery. From there, the charger can enter the Fast Charge stage (most cases), Soft Start Mode, Battery Recondition Mode or stop the charging routine because unsafe battery conditions (short, etc.) are detected.

SOFT START MODE

Soft Start Mode is activated when the charger is connected to a deeply discharged battery. This mode protects the battery during the initial charge period, as the battery's voltage rises to a more normal level, and is beneficial for the long-term health of the battery.

BATTERY RECONDITION MODE

During the Energizing Phase, if the charger detects the presence of battery sulfation, it will activate this mode. If this occurs, the CHARGING LED will flash. This indicates the charge time will be extended while the charger attempts to recondition the battery.

PRO-LOGIX PHASES 5-7: IDEAL BATTERY MAINTENANCE

A key feature of this charger is how it manages a battery that remains on the charger after a complete charge has been achieved, such as during the storage of a seasonal use vehicle. Once the charger reaches the Resting Phase, its output is virtually turned off, except to occasionally monitor battery condition. This is beneficial for the connected battery, as it reduces chemical reaction within the battery compared to traditional charger maintenance modes. This greatly reduces the chance of damaging a battery in long-term storage. In the resting phase, the charger will enter a low power mode, when only the green "Complete" LED flashes slowly. To resume normal operation, press any key to reactivate the display.

In addition, in Phase 6 Exercising, we introduce a load on the battery, simulating active use, and then recharge the battery to full charge. This Exercising feature keeps the battery in optimal condition during periods of storage and non-use.

ADDITIONAL FEATURES

MULTIPLE BATTERY COMPATIBILITY

The charger will properly charge a wide variety of battery types, including Conventional, Maintenance Free, AGM, LiFe, Spiral Wound and Deep Cycle batteries.

SMART CLAMP TECHNOLOGY

The charger will send power to the output leads only when a proper battery connection is made.

REVERSE POLARITY PROTECTION

Guards against reverse connections. The ERROR LED will flash on the control panel and power will not be sent to output cables if a reverse connection is sensed.

TEMPERATURE COMPENSATION

The charger is equipped with temperature compensation technology, which alters the charging parameters based on ambient temperature. This is beneficial for battery health, as it is critical in achieving an optimal charge, as the battery's needs change based on temperature.

BATTERY FAULT PROTECTION

Guards against excessively charging compromised batteries. ERROR and CHARGING LED will flash indicating charging has stopped and the charger has detected a compromised battery. Conditions that cause this error include: if the battery voltage does not rise appropriately during the charging process (indicating a shorted cell) or if the maximum charge time has been exceeded.

SHORT CIRCUIT PROTECTION

Guards against shorted connections. ERROR LED will light solid on control panel and power will not be sent to output cables. This condition is triggered if the charger detects less than 1V across the clamps. See Operating Instructions Step 2 Note 2 for details regarding this feature.

OVER-VOLTAGE PROTECTION
Guards against charging errors where the charger is programmed to charge in a different voltage than the detected voltage of the battery. When this safeguard is engaged, the ERROR LED will slowly flash (2.0s-ON/2.0s-OFF). To reset the charger, disconnect from AC outlet, reset the vehicle connections and reconnect to the AC outlet.

I CHOOSING THE BATTERY TYPE

For Conventional and Maintenance Free flooded (wet) batteries, the ideal Battery Type selection is “STD”.

For batteries identified as AGM construction, the ideal Battery Type selection is “AGM”.

For batteries identified as LiFe construction, the ideal Battery Type selection is “LiFeP04”.

For most Spiral Wound batteries, the best Battery Type selection is “AGM”.

For batteries identified as Deep Cycle, determine the construction of the battery. Is it a wet cell battery or another type of construction? This will determine the proper Battery Type selection.

For batteries identified as Marine, determine the construction of the battery. Is it a wet cell battery or another type of construction? This will determine the proper Battery Type selection.

J CHARGER CARE & MAINTENANCE

CAUTION – Make sure charger is unplugged from electrical outlet before performing any maintenance.

A minimum amount of care can keep your battery charger working and looking good for years.

1. Clean the clamps after each use. Wipe off any battery fluid that may have come in contact with the clamps to prevent corrosion. Battery fluid may be neutralized with a solution of water and baking soda.
2. If needed, the case may be wiped clean with a soft cloth.

There are no user-serviceable parts inside.