logic™ ENERGY

IN-VEHICLE CHARGER

Advanced Modular Charging System For Two-Way Radio Batteries

Thank you for purchasing a Logic Energy In-Vehicle Charger (LEVC). This ultra-rugged product is designed for rapid charging two-way radio batteries in a vehicle, trailer, or train. LEVC models are "radio specific," but can charge batteries with: lithium ion (Li-Ion), lithium polymer (LiPo), nickel-metal hydride (NiMH), or nickel cadmium (NiCd) chemistry. Please review this manual before installing or using the LEVC.

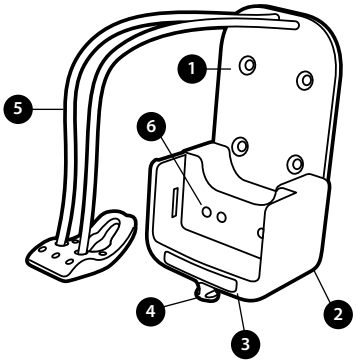
Important

1. Read the Caution section below and this User Manual before attempting to install the LEVC or charge a battery.
2. Check to make sure the LEVC model is compatible with your radio and battery before installing.
3. Always charge new batteries completely before initial use. For best battery performance, recharge NiCd and NiMH batteries when they are fully discharged. Recycle batteries when they can no longer be used.

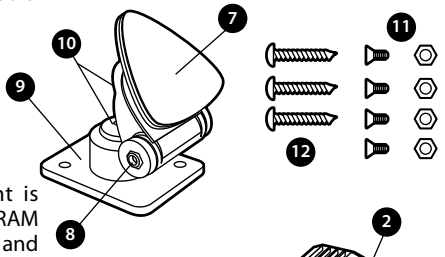
Caution

1. Never attempt charging alkaline or dry cell batteries with this charger. They may burst and cause damage or personal injury.
2. Do not charge Li-Ion, LiPo, NiMH, or NiCd batteries unless they are designed with overcharge and overheat protection.
3. Do not discard unwanted batteries in the trash or incinerate. Batteries exposed to fire or excessive heat may explode.
4. Install the LEVC inside a vehicle or protected area. Do not expose any components to rain, liquids, or excessive moisture.
5. Make sure contacts on the radio holder and battery are clean. Do not allow wire or metal objects to touch the contacts in the radio holder or any internal part of the charge controller.
6. Do not open the radio holder or remove the charge controller housing or make any modification to the LEVC.
7. Use only the DC power cable supplied with the LEVC.
8. Always secure the radio (or battery) in the radio holder with the tie-down strap before the vehicle, trailer, or train goes in motion.
9. When replacing or adjusting the length of the tie-down strap, make sure that it will securely hold the radio or battery, but that it is not too tight. If over-tensioned, the strap could cause injury when released.

Radio Holder And Mount

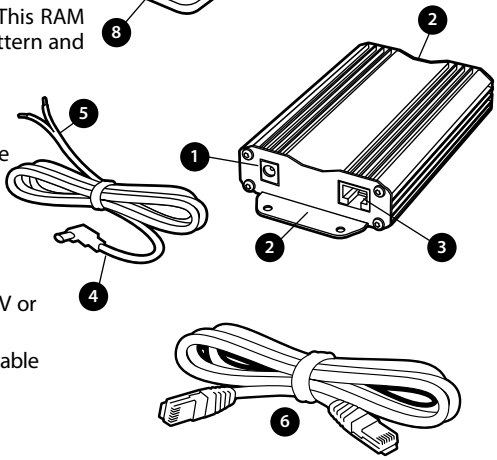


1. Holes for fastening to multi-directional mounting bracket
2. Connection point for interface cable
3. Status LED (illuminates orange, red, or green)
4. Hook for connecting tie-down strap
5. Tie-down strap
6. Charge contacts (number varies based on LEVC model)
7. Mounting plate (with adhesive) for attaching bracket to vehicle
8. Hinge adjustment bolt
9. Mounting plate for attaching bracket to radio holder (universal AMPS 4-hole pattern)
10. Plate adjustment bolts
11. Bolts and locknuts for fastening radio holder to mounting bracket
12. Screws for fastening mounting bracket to vehicle



Note: If a heavy duty flat surface mount is required, consider using RAM-B-101U. This RAM mount has the universal AMPS hole pattern and is compatible with the LEVC.

Charge Controller And Cables



1. Connection point for DC power cable
2. Integrated mounting brackets
3. Connection point for interface cable
4. DC power cable – plug this end into charge controller
5. DC power cable – connect red to 12V or 24V source, black to ground
6. Controller to radio holder interface cable with RJ45 connectors

Installing LEVC

1. Before installing the LEVC, confirm that the radio holder is compatible with the radio and battery you want to charge.
2. Select an area in the vehicle to mount the radio holder. The slim profile of the LEVC allows it to be installed in areas where traditional in-vehicle chargers will not fit. Depending on the location selected, you may be able to install the radio holder without using the multi-directional mount.
3. Select an area for mounting the charge controller. When choosing the location, keep in mind that the length of the DC power cable is 9.8' (3.0 m) and the length of the interface cable is 6.6' (2.0 m). If a longer interface cable is required, use a standard Ethernet cable with RJ45 connectors up to 13.1' (4 m) in length.
4. If using the multi-directional mount, first determine what adjustments to the mount are needed. The "hinge adjustment" allows the vertical position of radio holder to be changed. Loosen slightly the bolt that passes through the hinge to adjust the angle of the radio holder as needed; firmly tightened this bolt only after the mount and radio holder are installed.
5. The two "plate adjustment" bolts allow the radio holder to swivel left or right. Loosen these

bolts slightly and adjust the mounting plates as needed. Firmly tighten these bolts before attaching the mount to the vehicle; these bolts are not easily accessible once the mount is secured to the vehicle.

6. Fasten the triangular mounting plate to the vehicle before attaching the radio holder to the rectangular mounting plate. The paper backing on the triangular plate should be removed before securing it to the vehicle. Three screws are provided to fasten the triangular mounting plate to the vehicle. Four bolts with locking nuts are provided to fasten the radio holder to the rectangular mount plate.
7. Run the DC power cable from the area selected for the charge controller and connect it to the vehicle's 12V or 24V source. Run the interface cable from the charge controller and connect either end to the radio holder (RJ45 connectors are on both ends). Make sure the DC power cable has an in-line fuse (16 AWG / 5A) and then connect the DC power cable to the charge controller. Connect the interface cable to the charge controller.
8. Place the appropriate battery in the radio holder to confirm it will properly charge. Once you confirm there are no issues, fasten the charge controller and secure all cables.
9. Tie-Down Strap Adjustment – If it is necessary to shorten the strap to better secure the radio, follow these steps: (1) On the back of the radio holder, pull one of the knots so that a short length of the strap is exposed, then tie a second knot to shorten the strap. (2) Test the shorter length to confirm it is the desired length. (3) Once the desired length is achieved, tighten the knot, trim the excess length of strap, and melt the end of the strap to seal the cut fibers and prevent the knot from unraveling.
10. Tie-Down Strap Replacement – Should the strap become damaged and require replacement, follow these steps: (1) Remove the old strap. (2) Firmly tie a knot on one end of the new strap and feed it through either of the two holes near the upper edge of the back plate. Be sure to feed the strap through the hole so that the knot is on the back side of the plate. (3) Loop the strap through the plastic clasp and then feed the end of the strap through the opening of the second hole. (4) On the back side of the plate, tie a knot in the strap and adjust as described above.

Charging A Battery

A battery may be charged while on or off the radio. Always use the tie-down strap to secure the radio or battery before your vehicle is driven.

1. After the LEVC system is installed and the radio holder is securely positioned, switch vehicle power on.
2. Place the battery to be charged in the radio holder; the charge status LED will illuminate ORANGE for a short period while the charge controller performs a battery diagnostic. If the LED does not illuminate, check to make sure the LEVC is receiving power. The charge status LED will change from ORANGE to RED once the battery diagnostic is complete.
3. While the battery is charging, the charge status LED will illuminate RED continuously. If the charge status LED is red and flashes, a fault has been detected. The flash pattern represents a specific fault condition. See Fault Conditions section for details.
4. When the battery is charged to 80% of capacity, the charge status LED will change to GREEN and flash. It is recommended that the battery be charged to at least 80% capacity before use. The charge status LED will illuminate GREEN with no flashing when the battery is fully charged.
5. After removing a fully charged battery, the charge status LED may remain illuminated for a few seconds. Allow the charge status LED to go off before placing another battery in the radio holder.
6. The LEVC is designed to operate best when temperatures are between 15°C and 30°C. Charging a battery at temperatures outside this range may result in under charging of the battery.
7. If charging a battery while off the radio and a tighter fit of the tie down strap is desired, slide the plastic clip up slightly and pull the looped end of the elastic strap over the retaining hook.

LEVC Specifications

Compatible battery chemistries	NiCd / NiMH / Li-Ion / LiPo
Recommended operating temperature	15° C – 30° C / 59° F – 86° F
Storage temperature	0° C – 65° C / 32° F – 149° F
Power supply input	12V – 24V DC @ 1.0A (minimum)
Charge rate	700 mA
DC power cable	16 AWG / 5A in-line fuse / 3.0 m (9.8')
Controller to radio holder interface cable	2.0 m (6.6') / RJ45 connectors

Fault Conditions

When the charge status LED flashes RED, a fault condition exists. The LED flash patterns and fault conditions are as follows:

Flash Pattern	Fault Type
Flashes 1 Time	Indicates charging complete, but battery is under charged. Battery voltage is below the minimum level required. This warning is provided after the rapid charging stage is complete.
Flashes 2 Times	Indicates battery contact is "open" and current is not passing through the (+) and (-) contacts on the battery. This warning is provided after the initial diagnostic stage is complete. Check radio holder to confirm compatibility with battery.
Flashes 3 Times	Indicates over-current condition caused by battery short circuit. Have the battery checked by a qualified technician. Do not attempt charging the battery if a short circuit exists.

Warranty And Service During Warranty

The Logic Energy In-Vehicle Charger is made from high quality materials and designed to provide years of reliable service. The following warranty applies:

Power Products Unlimited, Inc. (PPU) warrants this product to be free from defects in workmanship and materials for two-years from date of purchase by the end user. This warranty applies to the original purchaser and is void if the product has been altered, misused, damaged, neglected, or if repair is required because of normal wear and tear. This is the only warranty made by PPU. In no event will PPU, its affiliates, subsidiaries, related entities, or their respective directors, officers, or employees, be liable for any damages beyond repair or replacement as described above, including without limitation, indirect, incidental, or consequential damages. For service under warranty, return the product along with dated proof of purchase to the dealer where purchased or to Power Products. If returning directly to Power Products, follow these instructions:

Send to Power Products – Warranty Service Department, 2170 Brandon Trail, Alpharetta, GA 30004. For your protection, we recommend you obtain proof of delivery for your shipment.

Include with your product, dated proof of purchase, your name and daytime telephone number, email address, and return address (a U.S. street address only; return shipments cannot be made to a P.O. Box or locations outside the U.S.).

All items sent become the property of Power Products and will not be returned.

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