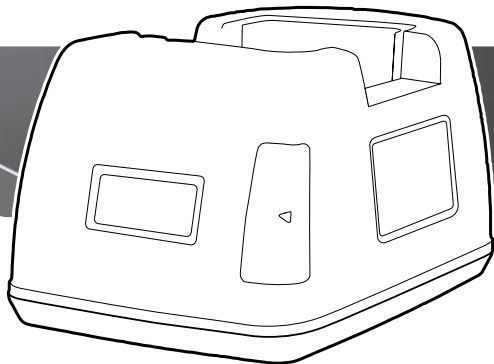




Single Unit Rapid Charger

FOR RECHARGEABLE TWO-WAY RADIO BATTERIES



User Manual

Desktop Models: EC1 / EC1-V2

In-Vehicle Models: EC1M / EC1M-V2

ENDURA EC1 / EC1M CHARGERS

Table of Contents

Topic	Page
Introduction	1
Important (read before use)	2
Caution (read before use)	3
Replacing A Charging Pod	5
EC1 Features	6
Accessories For In-Vehicle Installation	7
In-Vehicle Installation (EC1M)	9
Charging A Battery	11
Fault Conditions & Advisements	13
Warranty And Service	17
Specifications	18
Accessories (EC1 / EC1M)	19

Introduction – EC Chargers

Thank you for purchasing an Endura™ EC charger. There are four EC charger models covered in this User Manual: EC1 / EC1M and EC1-V2 / EC1M-V2. Model EC1 is for desktop use and includes an AC to DC power supply. Model EC1M is for in-vehicle use and includes the accessories needed for installation in a vehicle. The charger base used with EC1 and EC1M is the same and it's compatible with nearly all Endura TWP charging pods. Similar to EC1 and EC1M, model EC1-V2 is for desktop use and model EC1M-V2 is for in-vehicle use. The "V2" models are required for a few Endura TWP charging pods that are not compatible with EC1 /EC1M. Feature differences for the V2 models are noted in this manual where appropriate.

All EC models are designed for charging two-way radio batteries whether on or off a radio. Based on the charging pod installed, EC models can rapid charge these battery chemistries: lithium ion (Li-Ion), lithium polymer (LiPo), nickel-metal hydride (NiMH), or nickel cadmium (NiCd).

If you wish to replace the charging pod in the future, check the model number on the product label (EC1 or EC1-V2) to ensure the replacement pod selected is compatible with your model. For a complete list of charging pods available or to confirm pod compatibility, contact a Power Products dealer, visit www.powerproducts.com, or call customer service at 800-529-1618.

Important

1. Read all Caution statements below and this User Manual before attempting to charge a battery.
2. Check to make sure a charging pod compatible with your battery is properly installed before charging a battery or installing the charger in a vehicle.
3. Always charge new batteries completely before initial use. Recycle batteries when they can no longer be used. Do not discard unwanted batteries in the trash or incinerate. Batteries exposed to fire or excessive heat may explode.
4. For best battery performance, charge NiCd and NiMH batteries when they are fully discharged.

Caution

1. Based on the pod selected, EC models can charge Li-Ion / LiPo and / or NiMH / NiCd batteries. If the pod is designed for Li-Ion / LiPo only, do not attempt to charge NiMH / NiCd batteries. If the pod is designed for NiMH / NiCd only, do not attempt to charge Li-Ion / LiPo batteries. Do not use EC models to charge batteries with other chemistries or batteries that do not have overcharge protection.
2. Use charger in areas protected from the weather. Do not expose the charger to rain, any liquids, or excessive moisture.
3. Do not attempt to charge a battery without first installing the appropriate charging pod. Use only charging pods designed for your EC model. Disconnect charger from the power source before installing, adjusting, or removing the charging pod.
4. Make sure contacts in charging pod and on the battery are clean. Do not allow wire or metal objects to touch contacts in charging pod or any internal part of the charger.
5. Do not remove the charger's housing or make any modification to the charger.

Caution (continued)

6. Use only the power supply or vehicle power adapter provided with the EC model. If a replacement is required, see section **Accessories**. Use of other power supplies may damage the charger or batteries you may be attempting to charge.

Replacing A Charging Pod

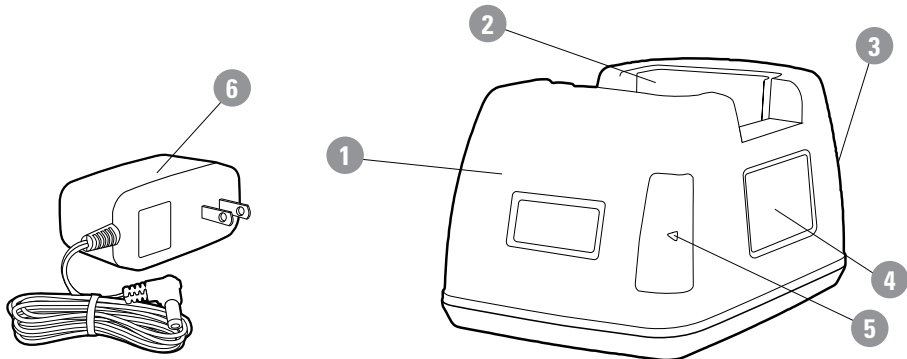
The charging pod is made from quality materials and designed to provide years of service when properly used. In most cases, the charging pod will only be replaced when you want to use the charger with a different battery.

Follow these steps to change the charging pod:

1. Obtain a charging pod made specifically for EC1 or EC1-V2. Confirm that the charging pod is compatible with the battery you want to charge.
2. Unplug the charger from its power source.
3. The charging pod is secured to the base with a single screw. To remove, turn the locking screw on the bottom of the charging pod counter-clockwise until it no longer holds the pod. Lift the charging pod from the charging base.
4. Insert the replacement charging pod into the charger base and secure with the locking screw. Do not over tighten the screw.
5. Inspect the charging contacts to ensure they are clean and unobstructed.
6. Connect the power supply or vehicle power adapter to the charger. You are now ready to charge a battery compatible with the charging pod.

EC1 Features

1. Charger base.
2. Removable charging pod.
3. DC power connection – back of charger.
4. Status LED information – also see bottom label.
5. Charge status LED – illuminates green, red, or orange.
6. AC to DC power supply (EC1 / EC1-V2 only).

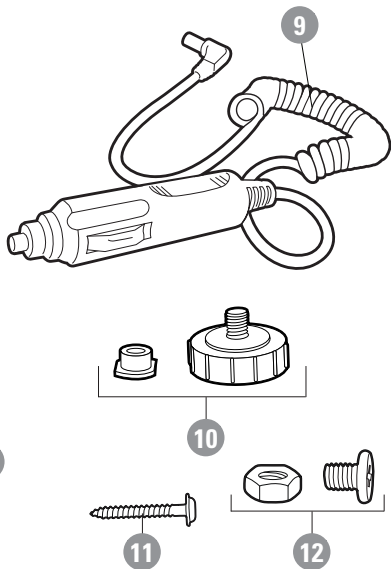
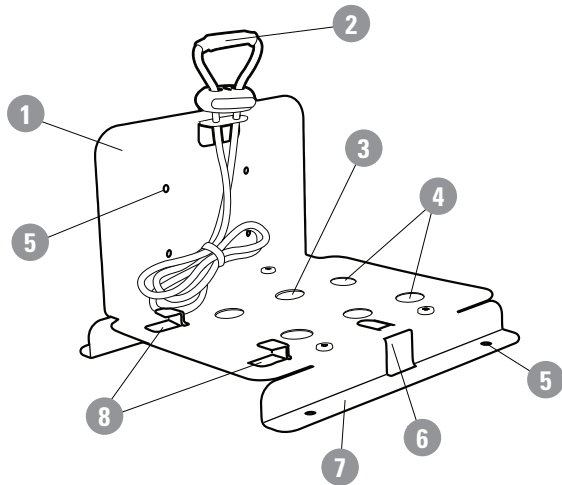


Accessories For In-Vehicle Installation

The items below are included with EC1M and allow the charger to be used in a vehicle.

1. Main mounting bracket.
2. Adjustable tie-down strap – secures battery or radio in charger.
3. Holes for securing main bracket to optional 4-hole AMPS bracket.
4. Holes (2) for securing charger on main bracket with thumb screws (see #10).
5. Holes (4) for securing bracket to wall or floor.
6. Connection point for securing tie-down strap.
7. Side flanges (2) – attach to main bracket for floor mounting.
8. Connection points (2) for attaching charger to main bracket.
9. Vehicle power adapter – supplies power from a vehicle's 12V or 24V outlet.
10. Thumb screws and insert nuts (2 each) for locking charger to main bracket.
11. Screw (24 mm) for fastening bracket to wall or floor (quantity 4).
12. Machine screw and locking nut for attaching flanges to main bracket (quantity 4).

Accessories For In-Vehicle Installation

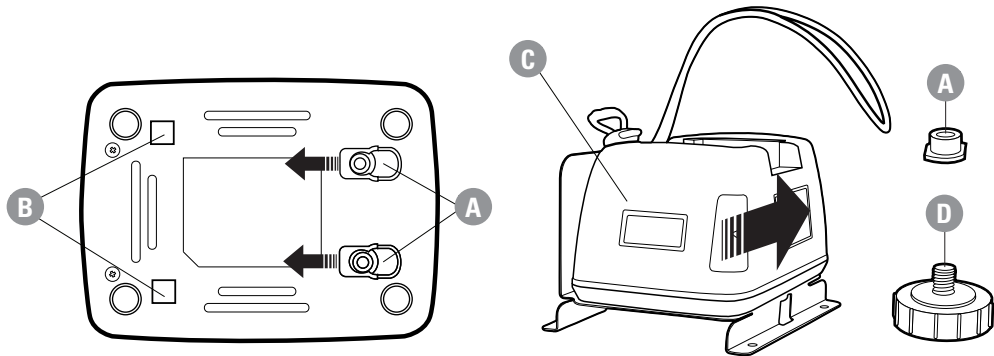


In-Vehicle Installation (EC1M)

1. Install the charger in an area of the vehicle that is close to a 12V or 24V outlet. The location selected should allow the vehicle power adapter to be connected without excessive stretching of the cable. For a hardwire installation, TWC6M-HW is available.
2. Review the section **Accessories For In-Vehicle Installation** to become familiar with the bracket parts and fasteners.
3. If the charger will be floor mounted, attach the two side flanges to the main bracket using the machine screws (4) and locking nuts (4) provided. Attach the side flanges before securing the charger to the main bracket, then fasten the main bracket to the floor with the 24 mm screws (4) provided.
4. If the charger will be dash or wall mounted, the flanges are not required. With the 24 mm screws provided (4), attach the main bracket to the vehicle before securing the charger to the main bracket.

In-Vehicle Installation (EC1M) (continued)

- Attach the charger to the main bracket as follows: (A) slide the insert nuts into the openings on the base of the charger, (B) place the charger on the main bracket so that the two connection points seat into the openings in the charger base, (C) slide the charger to the right until it is centered, (D) fasten the two thumb screws to the insert nuts to lock the charger to the bracket.



In-Vehicle Installation (EC1M) (continued)

6. If required, install the charging pod in the charger before attaching the charger to the mounting bracket. See section **Replacing A Charging Pod**.
7. An elastic type tie-down strap is incorporated into the main bracket. The strap is adjustable to hold radios (or batteries) of different heights securely in the charger.
8. To adjust the tiedown strap, place the radio in the charger, bring the strap over the top of the radio, and attached the looped end to the retaining hook at the front of the bracket. At the back of the bracket, compress the black retaining clip and pull the end of the tie-down strap through the retaining clip until it is snug over the radio. Always use the tie-down strap to secure the radio or battery when your vehicle is in motion.

Charging A Battery

1. Confirm that the charging pod and battery are compatible.
2. Connect the charger to power with the power supply (model EC1) or the vehicle power adapter (model EC1M).

Charging A Battery (continued)

3. Place the battery to be charged in the charging pod. The battery may also be charged while attached to the radio.
4. When a battery is placed in the charging pod and while charging, the status LED will illuminate RED with no flashing to indicate normal charging.
5. If the status LED is red and flashes, a fault has been detected. The flash pattern represents a specific fault condition. If the status LED is orange (solid or flashing), an advisement is being provided. See section **Fault Conditions & Advisements** for details.
6. When the battery is charged to 80% of capacity, the status LED will change to GREEN and begin to flash. It is recommended that the battery be charged to at least 80% capacity before use.
7. The charge status LED will illuminate GREEN with no flashing when the battery is fully charged.
8. After removing a fully charged battery, the charge status LED will illuminate ORANGE for a few seconds. Allow the charge status LED to go off before placing another battery in the charging pod.

Charging A Battery (continued)

9. The EC1 is designed to charge batteries with a temperature monitoring circuit when the battery temperature is between 0°C and 45°C (32° F – 113° F); batteries outside this temperature will not be charged. EC1-V2 is designed to charge batteries without a temperature monitoring circuit or with a temperature monitoring circuit that is not compatible with EC1 and therefore cannot provide cold and hot battery monitoring. For both EC1 and EC1-V2, the ambient temperature should be 5°C - 40°C (41° F - 104° F) while charging a battery.
10. To prevent battery damage, use EC1-V2 to charge your battery: (A) when the battery is above freezing (0°C / 32° F) or (B) when the battery is not excessively warm to the touch (below 45°C / 113° F).

Fault Conditions & Advisements

When the charge status LED flashes RED, a fault condition exists. A fault condition requires immediate attention. When the status LED is solid or flashes ORANGE, you are receiving an advisement about the battery.

Fault Conditions & Advisements (continued)

The flash patterns for fault conditions are as follows:

LED Pattern	Fault Description	EC1 / EC1M	EC1-V2 / EC1M-V2
Flashes RED 1 Time	Indicates (A) low voltage battery failure or (B) battery has a short circuit. If (A), the battery's voltage is below the minimum level required and cannot be charged. If (B), the battery is defective and should be recycled. This warning is provided after the pre-charge stage is completed.	●	●
Flashes RED 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 charging pod to confirm compatibility with battery.	●	●
Flashes RED 3 Times	Battery temperature is 45°C (113° F) or above. Charging has terminated, remove battery from charger. Have battery checked by a qualified technician.	●	

Fault Conditions & Advisements (continued)

The flash patterns for advisements are as follows:

LED Pattern	Advisement	EC1 / EC1M	EC1-V2 / EC1M-V2
Solid ORANGE (Battery removed.)	Brief reset period for charger after battery is removed. Allow the LED to go off before inserting another battery.	●	●
Solid ORANGE (Battery inserted.)	Indicates (A) battery is too cold or (B) charger is performing a temperature diagnostic when the battery is inserted. If (A), the battery temperature is 0°C (32° F) or below and charging is delayed for up to two hours. Battery is monitored and charging resumes once it is above freezing. Monitoring terminates if the battery temperature remains below freezing for two hours. Remove battery and reinsert once battery reaches room temperature. If (B), battery type requires additional time to determine its temperature. This is generally completed within a few minutes after insertion.	●	

Fault Conditions & Advisements (continued)

LED Pattern	Advisement	EC1 / EC1M	EC1-V2 / EC1M-V2
Flashes ORANGE 1 Time	Battery temperature remains at 0°C (32° F) or below after two hours of monitoring. Remove battery from charger and allow it to warm.	●	
Flashes ORANGE 2 Times	Indicates charging complete, but battery is under charged. Battery voltage is below minimum level required. This warning is provided after the rapid charging stage is complete.	●	●

Warranty And Service During Warranty

Endura EC chargers are 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 one-year 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 retailer 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, and return address (street address only; return shipments cannot be made to a P.O.Box).
- All items sent become the property of Power Products and will not be returned.

Specifications (EC1 / EC1-V2)

Dimensions (W x L x H)	96 x 131 x 77 mm / 3.8 x 5.2 x 3.0 inches
Weight	0.25 kg / 0.55 lbs. (charger only)
Compatible Chemistries	Li-Ion / LiPo / NiMH / NiCd (based on pod selected)
Ambient Operating Temperature	5° C - 40° C / 41° F - 104° F
Power Supply (TWC1M-PS)	Input 100V – 240V AC / 50 Hz – 60 Hz / 0.5A
Charger Input	12V-24V DC / 1.0A (minimum)
Charge Rate ^A	900 mA (10.6V-13.5V)
Approvals	FCC ^B / BC ^C / DOE ^D / CE

Specifications subject to change without notice.

(A) Applies to EC1. Charge rate for EC1-V2 is 700 mA. (B) Complies with FCC Rules, Part 15, Subpart B, Class B 2016, ANSI C63.4:2014. (C) Complies with California Energy Commission CEC-400-2011-005. (D) Complies with U.S. Department of Energy 10 CFR, Part 430, PC3 and 4.

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Accessories (EC1 / EC1M)

Part Number	Description	Information
TWC1-PS	Power supply. (Included with EC1 / EC1-V2.)	UL listed. Input: 100-240V, 50-60Hz, 0.5A. Output: 15.0V, 1.0A.
TWC1M-VPA	Vehicle power adapter. (Included with EC1M / EC1M-V2.)	Length: 20.0" (cord relaxed). Replaceable fuse, 2A.
TWC6M-VPA	Heavy duty vehicle power adapter.	Length: 24.0" / 6A. (cord relaxed). Replaceable fuse, 6A.
TWC6M-HW	Hardwire kit for in-vehicle installation.	Length: 13.0'. Components and cable rated to 15A.
EC1M-MB	Mounting bracket. (Included with EC1M / EC1M-V2.)	Dimensions: 4.6" x 3.9" x 2.8" (L x W x H).
EC1M-MBF	Thumb screw and insert nut kit. (Included with EC1M / EC1M-V2.)	Quantity two each.



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