



ElectriFly POLYCHARGE 4™

FOUR-OUTPUT LITHIUM-POLYMER CHARGER

INSTRUCTIONS

INTRODUCTION

Thank you for purchasing the PolyCharge4 lithium-polymer charger! Capable of charging 4 separate lithium-polymer packs simultaneously, the PolyCharge4 charger is specially designed for today's electric flight modeler. Adjustable capacities from 300 to 3000mAh, tri-color LED indicators and ease of use make this a must-have item! Audio sound cues indicate charge completion and errors, while each individual port's status can be read at a glance by the LED. **Do NOT attempt to use this charger with NiCd, NiMH or Lithium-Ion batteries as they are not compatible! Please read this entire manual to learn about specific functions and features as well as safety information. Damage resulting from misuse or modification of this charger will void your warranty.**

SPECIFICATIONS

Input Voltage: 12.0 - 15.0V DC

Number of Outputs: Four

Specifications for EACH Output:

Battery Types: Lithium-Polymer Only

Number Cells: 1 to 4 Cells (3.7-14.8V)

Charge Control: Pushbutton Start

Fast Charge Termination: Constant Current/
Constant Voltage

Max. Cell Capacity: 300mAh to 3000mAh

Charge Current: 300mA to 3.0A

Safety Timer: 3 Hours Maximum Charge Time

Output Connectors: Banana Jacks

Status Indicators: Tri-Colored LED and
Audible Buzzer

Input Connectors: Alligator Clips

Fuse: 20A Replaceable Spade Fuse
(Auto Type)

Case Size: 8.19"x1.50"x4.96" (208x38x126mm)

Weight: 21.8 oz. (617g)

SPECIAL FEATURES

- Four independent outputs—like having four chargers in one!
- Charge up to four 4-cell LiPo packs simultaneously
- Input voltage boost circuitry to handle 3 and 4-cell packs with ease.
- Set the battery capacity on each output with an adjustment dial, 300mAh to 3000mAh
- Charge current sets automatically, based on battery mAh selection, 300mA to 3.0 amps
- Automatically detects the number of cells on each output—no switch to set
- Pushbutton start for each output
- Uses the constant-current/constant-voltage charge technique for each output

- Each output has a built-in 3 hour safety timer
- Tri-color LED and audible indicators for each output indicates charge status, as well as for improper input voltage, output reverse polarity, open-circuit, and more
- Built-in fan keeps charger cool for efficient operation and extended lifetime
- Rugged metal case for durability.
- Reverse polarity and current overload protection on input (20A spade fuse included)
- 12V DC only input

IMPORTANT PRECAUTIONS

- Charge **ONLY** lithium-polymer rechargeable batteries. Do not attempt to charge other types of rechargeable batteries—including different types of lithium batteries—as permanent damage to the battery, charger and surrounding environment could result!
- **NEVER** leave the charger unattended while in use!!
- **IMMEDIATELY disconnect the battery from the charger if it begins to swell, emits smoke, or is warm to the touch!** Place warm or hot batteries in a fire-safe location, such as a container made of metal (such as an empty ammunition box) or ceramic. Always monitor the area with a smoke or fire alarm, and have an "ABC type" fire extinguisher available at all times.
- **DO NOT** set the battery capacity dial to a value greater than the battery's 1C value as permanent damage could result.
- **DO NOT** allow LiPo cells to overheat at any time! Cells which reach greater than 140 degrees Fahrenheit (60°C) can and **USUALLY WILL** become damaged physically and could possibly catch **FIRE!!** Always inspect a battery which has previously overheated for potential damage, and do not re-use if you suspect it has been damaged in any way.
- **ALWAYS** provide adequate ventilation around Li-Po batteries during charge, discharge, while in use, and during storage. If a battery becomes overheated, remove it from the charger **IMMEDIATELY** and place it in a fire-proof location until it cools.
- Use a charge lead that is directly compatible with the "charge" connector on the Li-Po battery. It is strongly recommended to use pre-assembled charge leads which can be found at most hobby retailers. Great Planes' 2-Pin/Banana Plug Charge Adapter (GPMM3105) is directly compatible with ElectriFly Li-Po battery charge leads, having banana plugs on the opposite end for connection to the charger.
- Do not use automotive type chargers to power charger.
- Do not allow water, moisture or foreign objects to enter the charger.
- Do not block the air intake holes or fan, which could cause the charger to overheat.
- Do not attempt to charge packs containing more than 4 cells wired in series.
- Always disconnect the charger from the input power source when not in use.
- Keep out of reach of children.

IMPORTANT PRECAUTIONS FOR HANDLING LITHIUM-POLYMER BATTERIES

WARNING!! Never attempt to care for lithium-polymer (Li-Po) cells in the same way as other battery types!! It is very important to have a good understanding of the operating characteristics of Li-Po batteries—especially their exact rated voltage and maximum acceptable charge current. Always read the specifications printed on the label of your Li-Po battery prior to use. Great Planes will not be held responsible for any and all incidental damages and bodily harm that may result from improper use of lithium-polymer batteries with this charger. Failure to follow the care and handling instructions can quickly result in severe, permanent damage to the batteries and its surroundings and even start a **FIRE!**

Do not mistaken lithium-polymer cells for other lithium-based cell types (such as lithium-metal, lithium-phosphate, etc.), as other lithium hybrids have different care and handling characteristics as well. All “lithium” based batteries types are NOT the same.

It is strongly recommended to use packs which have been assembled with a built-in charge protection circuit. Such circuits help to regulate the maximum voltage per cell in the pack to ensure that they do not accidentally become overcharged. The PolyCharge4 charger is designed to detect the proper voltages for Li-Po batteries, but it is always a good idea to have a second level of protection on the batteries as well.

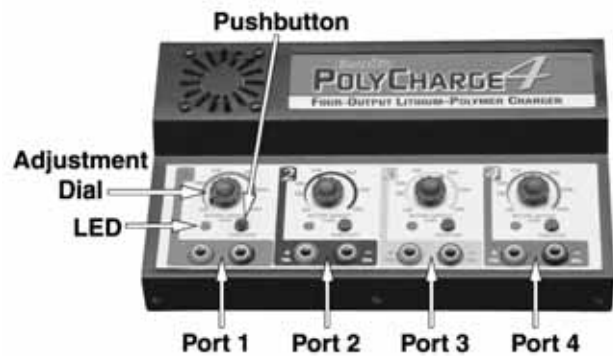
IMMEDIATELY remove a Li-Po battery from a model if it is involved in a crash in any way. Carefully inspect the battery for even the smallest of dents, cracks, splits, punctures or damage to the wiring and connectors. **CAUTION!** Cells may be hot! **DO NOT** allow the battery's internal electrolyte to get in the eyes or on skin - wash affected areas immediately if they come in contact with the electrolyte. A Li-Po battery might not appear to be damaged after a crash, but it could smolder over a short amount of time and suddenly catch fire unexpectedly. If in doubt, place the battery in a fire-proof location indefinitely.

INPUT POWER

The PolyCharge4 charger only accepts 12 to 15V DC input power. The charger will not function properly if the input voltage exceeds this range. Input power could come from a dedicated AC/DC power supply or automotive type battery. Due to the larger potential currents when charging high capacity packs, a 12V hobby field battery may not be suitable for all-day usage. An AC/DC power supply or 12V automotive battery may be needed in these applications. The power supply chosen must be able to supply 14A at 12V DC in order to achieve the maximum potential from the charger. Applying less than 12V may result in errors indicated by audio alerts as well as flashing orange LEDs. It is best to use a clean DC source which has a filtered output to reduce noise, and high quality connections.

WARNING! Never accidentally short together the positive (+) and negative (-) input connections when connected to 12V DC power. Failure to do so could result in permanent damage to the power source and the charger.

CONTROLS AND BATTERY CONNECTIONS



INPUT POWER LEAD: The input power lead is located on top-rear of the charger.

FOUR OUTPUTS: The PolyCharge4 is equipped with four separate outputs, each being totally independent of the others. This means that each output should be handled as one single charger. Each output is rated to deliver a maximum of 30 watts of power. It is possible that for batteries with high cell counts (3 or 4 cells) and high capacity ratings (over 2.0 amps), the maximum current actually delivered to the battery might be limited due to the maximum power rating of the output. This is normal.

There is never a need to be concerned with the setup of one output in respect to another output. For simplicity, each output is color coded. The controls and jacks for output 1 are colored in red, output 2 is black, output 3 is in yellow, and output 4 is in blue.

Each output consists of (a) one set of banana jacks, (b) a dial by which to set the **rated capacity** of the battery to be charged, (c) a pushbutton, and (d) a tri-colored LED.

FUSE: The over-current protection fuse is located on the left side of the charger. This charger requires an “ATO” fuse, sometimes referred to an “auto” or “spade” type fuse. The rating of the fuse is 20A (amps) at 32V (volts). Do NOT replace with a fuse of a higher current rating than 20A, as it could result in damage to the charger if an over-current condition occurs! Using a fuse with a rating of less than 20A might cause the fuse to blow too easily.

FAN: The internal fan is located on the upper-left side of the face of the charger. The fan helps to keep all internal components cool during operation. This will help extend the service life of the charger, as well as allow the charger to function more accurately and efficiently. The fan will turn on anytime a load is present on the charger's output. **Do not block the cooling fan and other vent holes as it could cause an overheating condition to occur, possibly causing permanent damage to the charger!**

CHARGING A BATTERY PACK

- CONNECTING INPUT POWER:** Connect the input power lead to 12V DC input power. Connect the red, positive (+) lead to the power source's positive (+) terminal, and the black, negative (-) lead to the power source's negative (-) terminal. Note that there is no ON/OFF power control switch. Once connected, the charger is always “on”. Always disconnect the charger from input power when not in use.
- CHOOSE AN OUTPUT:** Determine which one of the four outputs which will be used to charge a battery. It is not necessary to use the outputs in any specific order. One battery only can be charged on any output, two batteries can be charged simultaneously on any two outputs, four batteries simultaneously, etc.

3. CONNECTING CHARGE ADAPTER: it will be necessary to use a separate adapter lead to connect the battery to the output.

A. It's highly recommended to use a pre-assembled charge lead to avoid possible erroneous operation which could result from using poor quality hand-made leads. Great Planes' "2 Pin / Banana Plug Charge Adapter" (GPMM3105, available separately) comes pre-assembled with banana plugs on one end, with a 2-pin connector on the opposite end. This adapter is directly compatible with many different commonly available Li-Po battery packs, including all ElectriFly LiPo batteries.

B. If charging an ElectriFly brand Li-Po battery, be sure that only the battery's lead marked "charge" is connected to the charger. Do NOT attempt to charge the battery through the lead marked "discharge".

C. **ALWAYS** connect the charge lead to the charger **FIRST**. Securely connect the charge lead's red, positive (+) connector to the output's red jack, and the charge lead's black, negative (-) lead to the output's black jack.

D. Make sure not to connect a lead to the jacks of two different outputs. For example, do not connect the adapter lead's black plug to the black jack of output 1 and the red plug to the red jack of output 2, as the charger will not recognize that the battery is connected.

4. SET THE BATTERY CAPACITY RATING ON THE ADJUSTMENT DIAL:

A. Look at the label on the Li-Po battery to find it's rated capacity (listed as "mAh"). If the "mAh" rating is not found on the battery itself, do not guess! Refer to your battery's instruction sheet or your supplier for details before proceeding.

B. Adjust the dial for the respective output to match the capacity rating of the battery. For example, if a battery rated at "1500mAh" is connected to output "3" (in yellow), rotate the dial for output "3" so that the triangular indicator points to the "1500" mark. Similarly, if a battery's capacity rating is "700mAh", set the dial to the "700" mark, etc. For values which do not have an actual numerical mark around the dial, it is o.k. to make a close estimate of the necessary location to rotate the dial. It is o.k. to set the dial to a value which is LOWER than the mAh rating of the battery. **It is highly recommended NOT to set the dial to a value which is GREATER than the mAh rating of the battery! Failure to follow this warning could result in the battery becoming dangerously overcharged!**

5. CONNECT BATTERY: Securely connect the battery to the charge lead on the charger's output. Pay special attention to ensure that the polarities on the battery's connector match the polarities on the charge adapter. The battery's red, positive (+) lead connects to the output's red jack, and the battery's black, negative (-) lead connects to the output's black jack. **WARNING! Never allow a battery's positive and negative leads to accidentally touch each other. This will result in a short circuit and cause permanent damage to your battery and or charger and void all warranties.**

6. START CHARGE:

WARNING! It is not normal for Li-Po batteries to become warm during charge. Disconnect batteries from the charger IMMEDIATELY if they become warm, hot or begin to swell at any time! Cells which reach 140 degrees Fahrenheit (60°C) can and USUALLY WILL become damaged physically and could possibly catch FIRE!!

In such case, place the battery in a fireproof location immediately such as a container made of ceramic or metal (like an empty ammunition box), and let it rest for at least 30 minutes. Always provide adequate ventilation around Li-Po batteries while being charged. Always monitor the charging area with a smoke or fire alarm, and have an "ABC type" fire extinguisher available at all times. NEVER leave the battery unattended while being charged!!

A. Press the black START/STOP button for the respective output to start the charge process.

B. The output's LED should turn on solid green to indicate that the battery is properly connected. Here the charger will also be checking the condition of the battery before it actually starts to apply a charge. Very little current will flow at this time. This precheck could last for up to 5 minutes.

C. If the charger has determined that the battery is approved to accept a charge, the LED will begin to flash green to indicate that the normal charge process has begun. Here, the green LED will flash one time for each number of cells that are wired in series in the pack. For example, two green flashes means the charger identified two cells wired in series in the pack (a 7.4V pack), four flashes identifies four cells (14.8V pack), etc. **IMPORTANT: if the number of flashes DOES NOT match the number of cells in the battery pack, re-press the START/STOP button or disconnect the battery to stop the charge process!** Recheck the number of cells in the pack, and try to start charge again. If the charger continuously mis-identifies the number of cells in the pack do not attempt to charge the battery and refer to the Troubleshooting Guide in the rear of this manual.

D. When the above pre-check is finished and the battery is ready to accept charge, the PolyCharge4 will automatically begin the normal charge process. The amount of current being delivered to the battery at this time will gradually increase until it reaches the pre-calculated charge current level (based on the "mAh" setting on the adjustment dial). **It is possible that the charger might NOT deliver the maximum charge current** if the condition of the battery will not allow it. This is a built-in safety feature designed to prevent from damaging the battery pack and causing an unsafe condition. If the battery is NOT in suitable condition to accept a charge, an error indication will show on the LED (refer to the Error Indications section near the end of this manual for further details).

E. When the battery pack has reached full charge at 4.2V per cell, the LED color will change to red and the audible tone will sound. Note that the red LED will still flash the same number of times equal to the number of cells in the pack. This can assist in determining if the charger properly identified the number of cells in the pack at the end of charge. The battery can now be disconnected, and is ready for use.

F. Repeat this process for each output. All four outputs are independent.

G. If for some reason the charger does not detect that the battery has reached full charge after 3 hours, the output will automatically shut down as a safety precaution. The orange LED will flash 4 times to indicate this error condition has occurred. This 3 hour safety feature exists for all four outputs.

LED Legend	Status
No Pack	LED Totally Off
Checking Cells	Solid Green
Charge	Green Flashes 'x' Times
Charge Done	Red LED Flashes 'x' Times
Errors	Orange LED Flashes (See "Error Indications" Section Below)

ABORTING A CHARGE

If for any reason it is desired to stop the charge process (if the pack is too warm, incorrect cell detection or charger becoming excessively hot, etc.), re-press the START/STOP button. The charger will sound a single beep, and the charge process will stop (LED will turn off).

ERROR INDICATIONS

For each output, all error alarms are indicated by flashing the orange LED accompanied by an audio tone. PolyCharge4 can identify 6 different possible errors during charge. Each error type is identified by a certain number of flashes of the orange LED and audible tones. The list of recognizable errors is as follows:

Error	Orange LED Flashes
Input Voltage Exceeds 12-15V Range	1
Battery is Connected in Reverse	2
No Battery Connected	3
3-Hour Safety Timer Expired	4
Battery Voltage Error	5
System Error with Charger	6

If an error occurs, remove the battery from the respective output and re-press the START/STOP button to shut off the alarm. At this point the output will be reset back to idle mode with the LED flashing green. Refer to the Troubleshooting Guide for further information.

SOLID-STATE CURRENT OVERLOAD AND REVERSE POLARITY PROTECTION

The PolyCharge4 charger uses solid-state circuitry to protect against potential damage which could be caused by a short-circuit or reverse polarity conditions.

CURRENT OVERLOAD: if for some reason a short circuit condition exists which will try to draw more than 20 amps through the charger's input lead, the built-in fuse should blow. To check the fuse, make sure the charger is disconnected from the input power source BEFORE attempting to remove the fuse. Inspect the fuse and replace if necessary with another fuse of the same rating (20A, 32V).

REVERSE INPUT POLARITY: if power is connected in reverse to the charger's input lead the charger will be protected from damage. Re-check the input connections and the power source to ensure the proper power and polarities are observed.

TROUBLESHOOTING GUIDE

PROBLEM: Charger doesn't recognize battery.

CAUSES AND CURES:

- 1) Battery may be connected backwards. Connect battery leads properly.
- 2) Faulty connection or wiring. Correct or replace charge lead.
- 3) Defective cell in the pack. Replace battery pack or cell.
- 4) Insufficient input power to charger.

PROBLEM: Charger does not automatically terminate charge after 3 hours.

CAUSE AND CURE: Capacity setting too low for respective port and battery. Reset capacity dial to better match the battery and start charge again.

PROBLEM: Battery voltage low after charge (below 4.2V per cell).

CAUSES AND CURES:

- 1) Battery in poor condition. Replace battery.
- 2) Automatic safety timer activated before battery reached full charge. Reset capacity dial to better match the battery and start again.
- 3) Power supply voltage too low. Adjust DC input voltage to 12.0V DC minimum.
- 4) Battery connected in reverse. Connect battery leads properly.
- 5) Defective battery needs to be replaced.

PROBLEM: LEDs and controls do not function properly.

CAUSE AND CURE: Battery possibly connected backwards. Connect battery leads properly, or contact Hobby Services for further details.

PROBLEM: LEDs do not work when unit is connected.

CAUSES AND CURES:

- 1) Check power supply for improper power.
- 2) Check input connections for proper contact.


1-YEAR LIMITED WARRANTY (USA and Canada Only)

Great Planes warrants this product to be free from defects in materials and workmanship for a period of one (1) years from the date of purchase. During that period, Great Planes will, at its option, repair or replace without service charge any product deemed defective due to those causes. You will be required to provide proof of purchase (invoice or receipt). This warranty does not cover damage caused by abuse, misuse, alteration or accident. If there is damage stemming from these causes within the stated warranty period, Great Planes will, at its option, repair or replace it for a service charge not greater than 50% of its then current retail list price. Be sure to include your daytime telephone number in case we need to contact you about your repair. This warranty gives you specific rights. You may also have other rights, which vary from state to state.

For service on your Great Planes product, warranty or non-warranty, send it post-paid and insured to:

HOBBY SERVICES
3002 N. Apollo Drive Suite 1
Champaign, IL 61822
(217) 398-0007

*For warranty and service information if purchased outside the USA or Canada, see the additional warranty information insert (if applicable) or ask your retailer for more information.

 www.greatplanes.com
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