

APACHE SMART Lithium Polymer Chargers



Compact – Reliable – Intelligent – SAFER!

Newest Charger for 1–cell to 4–cells in Series

Lithium Polymer in RC is a recent advance, and a very promising one. One of the restraints to wider adoption, however, has been the poor reliability of charging systems. But the technology for safe charging of these cells has just taken a major step forward – with the introduction of these new chargers from Apache, in association with E–Tec.

Other charger manufacturers have developed fully automatic detection for cell count to set charge voltage, but none of these systems have proven reliable. The result in many cases has been destroyed batteries, which is both costly and unsafe.

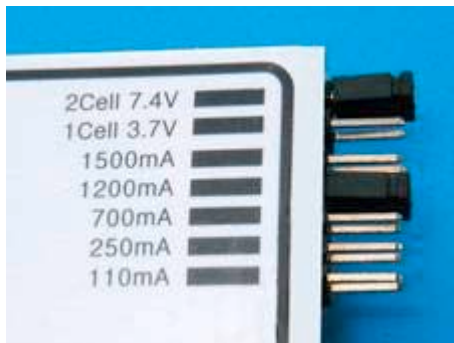
Apache looked at this problem and determined that the best possible system was a combination of manual setting by the user, plus an extremely sophisticated detection routine to check the voltage setting before charging begins. Using jumpers to set voltage and charge rate also insures that settings do not change inadvertently, as they can with chargers using rotary dials or software systems.

We believe that the Apache SMART Charger line are the safest on the market today. In a recent test of the safety detection circuit they contain, more than 1000 improper combinations of battery and jumper settings were connected, and the chargers were 100% accurate in detecting these errors – emitting a warning tone and refusing to charge in each case. Human error is much more likely than charger error, and the Apache oversight circuit is highly recommended insurance for that rare case when your attention might wander for a moment.

Here are the specifications and instructions for use:

- ✧ SMARTCHG–2 1215 – Dedicated Lithium Polymer charger for 1 to 2 cells* (3.7V ~ 7.4V)
80, 110, 250, 700, 1200mA charging rates
- ✧ SMARTCHG–4 2500 – Dedicated Lithium Polymer charger for 1 to 4 cells* (3.7V ~ 14.8V)
250, 700, 1200, 1700, 2000, 2500mA charging rates
- ✧ Charge up to **4 cells in series from 12V power source.** (4–cell charger)
- ✧ **Trouble–free** manual cell count/charging voltage setting
- ✧ Unique, Accurate **Automatic Over–Sight Safety Circuit.**
- ✧ Input and output **Reverse Polarity Protection.**
- ✧ High–Quality silicone cabling
- ✧ **Female JST connector** to match E–Tec 250–700mAh Packs
- ✧ Safely charge any Lithium Polymer battery to 100% capacity.

*Charge voltage = 4.2V per cell in series



Previous 2–cell charger pictured.
Current model has settings for
80mA–1200mA

Charging

You must set the charger to match the number of cells connected in SERIES in your battery pack. E–Tec battery packs come in 2–cell and 3–cell series configurations, for example. BEFORE you attach your battery pack to the charger, be sure to set the number of cells (voltage) and charging rate to match your battery pack. This is accomplished with the jumper blocks on the side of the charger, as pictured above.

For example, a custom pack of 2 cells in series that is then connected in parallel with another 2 cells in series (a total of 4 cells, designated a "2S2P" pack) would be charged at the 2-cell setting, marked "2 cell 7.4V" (the actual charge voltage would be 8.4V).

Once the voltage has been determined, set the charge rate to match the rated capacity of the pack. The E-Tec 700, for example, should be charged at 700mAh.

Now, connect the charger clips labeled "INPUT" to a DC power source of 12.0 to 13.8 volts. This may be an automobile battery, or an AC/DC power supply of at least 5A output. DO NOT use an automobile battery charger! Make sure the red clip is connected to positive (plus), black clip to negative (minus). Connect the Lithium Polymer battery to the connector provided (marked "Battery").

LED Status Display

- Red LED
 - ON Continuous – Charging properly
 - Flashing – Error
 - 1) Incorrect cell count (voltage) set by jumper
 - 2) Short circuit on output side (battery or charger can be damaged – do not short circuit)
- Green LED
 - Charging completed – The battery is more than 90% charged at green LED ON. Charging will continue at decreasing rate for the next 30–40 minutes, at which time the pack will be fully charged.
- No LED light
 - Battery pack is reverse connected (check connection and change if necessary)
 - Source power is reverse connected (check connection and change if necessary)

Cautions

- ✓ These chargers are for lithium polymer battery charging only – they may NOT be used for NiCd, NiMH, Lead-Acid, or other types of batteries.
- ✓ The MAXIMUM charge rate for Lithium Polymer cells is 1C (ex: 250mA for the ET-0250 cell). Do not charge your lithium polymer cells at any rate higher than 1C.
- ✓ Do not disassemble the charger, remove from case, or attempt repair of any kind.
- ✓ Do not exceed 13.8V on input voltage to charger.
- ✓ Keep the charger dry. Do not use the charger if wet.

Safety

Lithium Polymer cells are a tremendous advance in battery technology for RC flight. However, due to the chemistry of lithium cells, there is a possibility of fire if charging is not properly done. It is unavoidable due to the nature of lithium itself. This is no different from many things we use in daily life – knives, kitchen cleaners, automobiles, for a few examples – which are inherently dangerous, but which can be used very safely by adhering to simple rules and precautions.

Both E-Tec batteries and SMART chargers have been designed and manufactured using great care to provide the highest level of safety possible utilizing current technology. While SMART chargers are the safest on the market today, it remains well to note the simple cautions below to further minimize the chance of accident.

- ✓ Be absolutely sure that both voltage and current settings are correct for the battery pack being charged
- ✓ Care should be taken to charge on a fireproof surface, such as a platform of bricks
- ✓ Do not charge batteries near flammable items or liquids
- ✓ Keep a dry fire extinguisher nearby, or a large bucket of dry sand, which is a cheap and effective extinguisher
- ✓ Do not charge inside an automobile, especially while driving
- ✓ Charge in a well-ventilated room, or outside if possible
- ✓ Batteries should NEVER be left unattended while charging
- ✓ **Keep charger and batteries away from children and pets at all times**

If, after reading this manual, you have any concerns about the safety of lithium polymer batteries and/or Smart Charger, please return the products immediately – without using them – for a full refund.