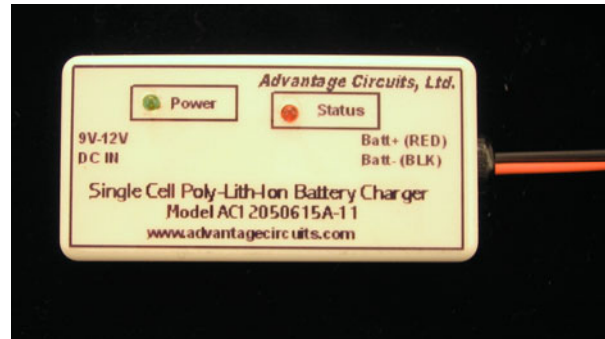


Polymer-Lithium-Ion Cell Charger

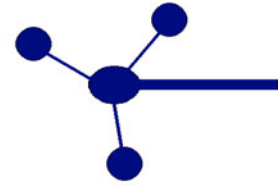
Features:

- 1000mA Fast Charge Capability
- Low Cost, Highly Reliable
- Deep-Discharge Battery Preconditioning
- Intelligent Dual Mode Charging:
 - Constant Current
 - Constant Voltage
- LED Status Indicators
- Dedicated Polymer-Lithium-Ion design for maximum battery capacity charging
- Alligator clip output termination
- One and two cell configurations.



The AC12050615A battery charger is designed exclusively for charging 4.2V polymer-lithium-ion battery technologies. The charger is available in a single cell (4.2V) or two cell (8.4V) configuration. The use of specific polymer-lithium-ion charge algorithms enables the maximum possible capacity safe charging of these batteries.

The charger is available as a populated PCB for OEM integration or enclosed and labeled.



Theory of Operation:

The AC12050615A charger is designed to be a full featured, highly reliable, low cost single cell, polymer-lithium-ion charger for cell capacities 1000 mAh and greater. The charger requires a 5.0V DC input voltage.

The AC12050615A initiates charging in one of two ways: battery insertion or charger power-up.

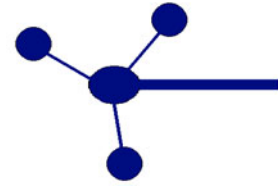
Lithium polymer cells are best charged with a constant current for the first 90% of capacity, then using a constant voltage for the last 10%. The AC12050615A charger automatically follows this sequence*.

For deeply discharged cells, the charger has a battery preconditioning feature which enables battery preconditioning with 10% (100mA) of the programmed current at the beginning of a charge cycle, until the battery voltage is verified to be above the minimum fast charge voltage (2.8 volts, typically). This low-current preconditioning charge mode is named 'trickle mode'. Once the minimum fast charge voltage is reached, the charger assumes the constant current, fast charge portion of the cycle. This preconditioning phase is important to prevent damage to cells that have been deep-discharged.

** Note: The constant current portion of the battery charge cycle is fixed at a maximum of 1000mA. The charger must only be used with cells that can handle these charge rates. Typical Polymer-Lithium-Ion batteries are rated not to exceed 2C fast charge rates.*

Precautions:

- The AC12050615A charger is designed specifically for charging Lithium Polymer (LiPoly) and Lithium Ion cells. Do not use the AC12050615A charger to charge NiCd, NiMH or any other type of battery.
- NEVER charge a Polymer Lithium-ion (LiPoly) or Lithium Ion cell with a charger designed for NiCd, NiMH, or any other type of battery chemistry.
- For best results, only use the 1000mA charger version with cells greater than 1000mAh capacity. Use of this charger with cells of less than 1000mAh capacity can reduce cell capacity (by charging at rates greater than 1C, where C = cell capacity). Extreme charge rates **will** damage cells.



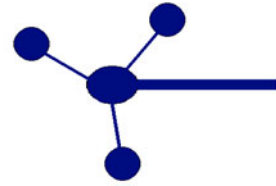
Operating Instructions

- There are two LED indicators on the charger: Power and Status. Their functions are as follows:
 - Power – indicates the charger has power.
 - Status – see table below:

Charge Cycle State	Status LED
Qualification	OFF
Preconditioning	ON
Constant-Current Fast Charge	ON
Constant Voltage	ON
Charge Complete	OFF
Safety Timer Fault	FLASHING
Disabled – Sleep Mode	OFF
Battery Disconnected	OFF

- The charger initiates charging in one of two ways: battery insertion or charger power-up.
- Connect the cell to the output wires, carefully matching the polarity of the cell and wires.
- Plug charger into power supply.
- Upon connecting a single cell polymer-lithium-ion cell, the charge cycle will begin as indicated by the Charging LED.
- The charger can charge multiple cells that are placed in parallel. However, if the combined capacity is too large the three-hour time limit may be exceeded. This will not affect the battery pack but the operator will have to reset the charger by cycling charger wall power or plugging and unplugging the battery pack.





Part Numbering: AC12050615A -XX

-XX Options:

- 01 Single cell** version for single batteries or batteries in parallel (4.2V max voltage). Maximum charge rate of **1000mA**. Requires regulated 5V DC input.

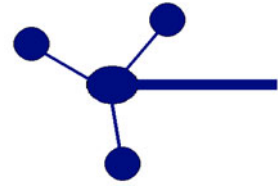
- 02 Two cell** version for series batteries or series / parallel configurations (8.4V max voltage). Maximum charge rate of **1000mA**. Requires regulated 9V-10V DC input.

Example 5V power sources:

1. Jameco pn: 252719CG, SO8AB050100 AC/DC 5VDC, 1.0A regulated

Example 9V power sources:

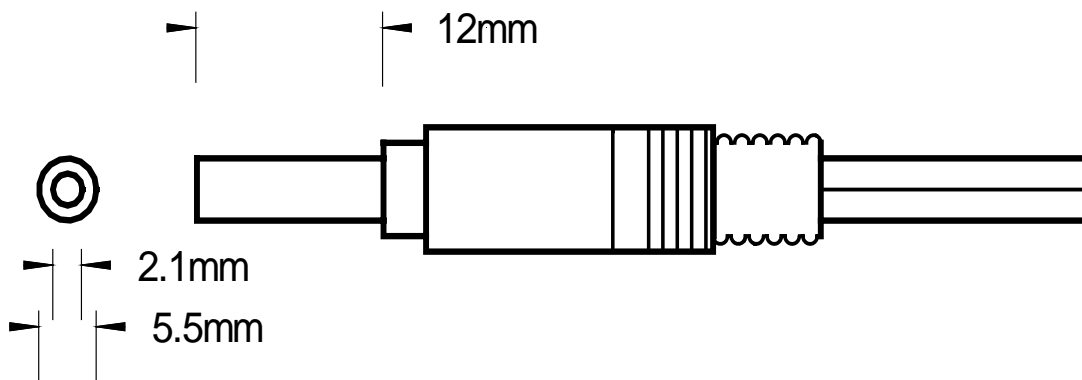
1. CUI Inc. pn: DMS090170-P5P-SZ AC/DC 9VDC, 1.7A regulated
2. Pihong. pn: PSC15A-90S AC/DC 9VDC, 1.7A regulated



Voltage Input Specification:

Power Jack – Center Positive, 2.1mm x 5.5mm x 12.0mm

Power the AC12050615A charger with the following type of charge jack:



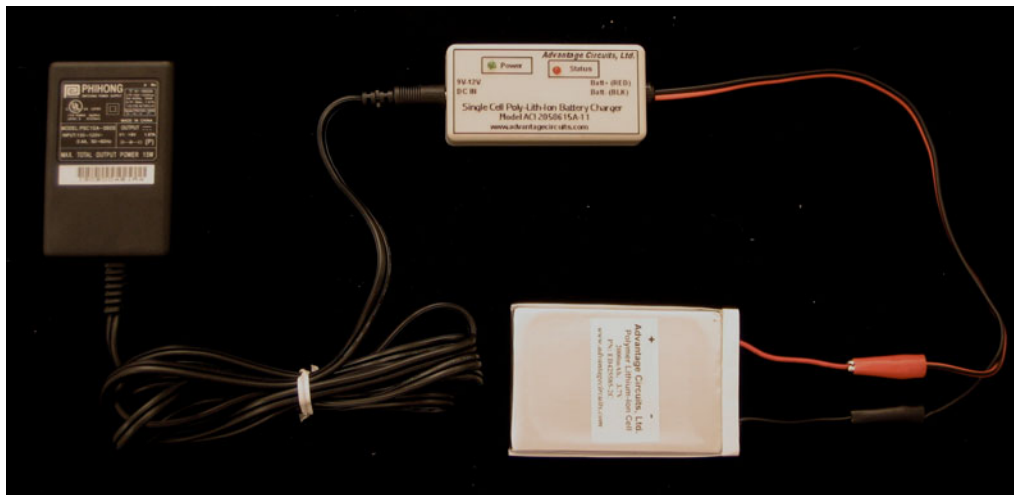
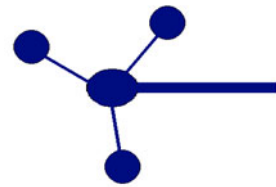


Figure 1. AC12050615A-01 shown with 5VDC, 1.0A voltage supply charging a 2000mAh Advantage Circuits polymer-lithium-ion battery.



Figure 2. AC12050615A-01 shown with no enclosure and a 5VDC, 1.0A voltage supply charging a 1000mAh Advantage Circuits polymer-lithium-ion battery.

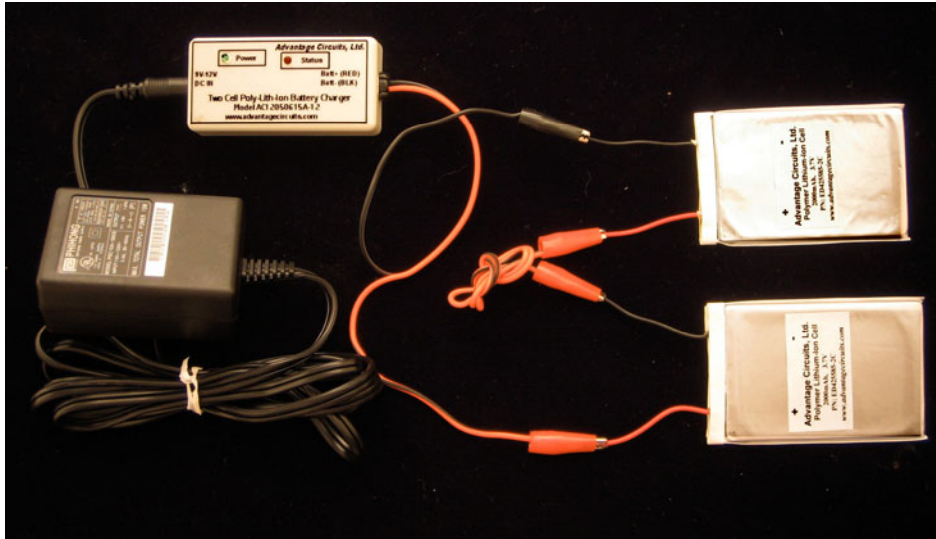
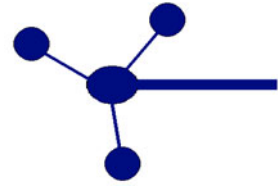


Figure 3. AC12050615A-02 shown with 9VDC, 1.7A voltage supply charging two 2000mAh Advantage Circuits polymer-lithium-ion batteries in series.