More tips

- The Kokam LIPO-403 charger can also charge Lithium Ion cells and packs.
- Kokam/USA's Versatile Adapter, part number 501MC, is a great companion for the charger. It provides Futaba, JR, Airtronics, Deans and Molex connectors, plus 2.1mm and 2.5mm power connectors, enabling you to easily connect your cells and packs to the charger. Be sure to get the 201BCB cable at the same time—it directly connects the Versatile Adapter to the charger.

- To determine the LiPoly pack configuration that will work best in your application, use the LiPo Calc design tool on the Kokam/USA Web site, www.kokamusa.com (or www.fmadirect.com).

LIPO-403 Lithium Polymer Battery Charger specifications

For battery types	Lithium Polymer (LiPoly) and Lithium Ion (LiIon) only
Nominal output voltage	User-settable to: 3.7VDC for single cells (4.21VDC at end of charge cycle) 7.4VDC for two cells in series (8.42VDC at end of charge cycle) 11.1VDC for three cells in series (12.63VDC at end of charge cycle) 14.8VDC for four cells in series (16.84VDC at end of charge cycle) Auto: charger detects number of cells in series and sets output voltage
Output current	User-settable to 0.1A, 0.25A, 0.5A, 0.75A, 1.0A or 1.5A
Maximum output power	25W
Input voltage	11 to 15VDC
Dimensions	4-3/16in (106mm) wide, 1.6in (41mm) high, 0.5in (12mm) deep, 4-11/16in (119mm) wide including connectors and jumpers

Kokam/USA limited warranty for chargers

Kokam/USA warrants this product to be free of manufacturing defects for the term of one year from the date of purchase. Should any defects covered by this warranty occur, the charger shall be repaired or replaced with a unit of equal performance by Kokam/USA or an authorized Kokam/USA service station.

Limits and exclusions

This warranty may be enforced only by the original purchaser, who uses this product in its original condition as purchased, in strict accordance with the product's instructions. Units returned for warranty service to a Kokam/USA service center will be accepted for service when shipped postpaid, with a copy of the original sales receipt or warranty registration form, to the service station designated by Kokam/USA.

This warranty does not apply to:

- Consequential or incidental losses resulting from the use of this product.
- Damage resulting from accident, misuse, abuse, neglect, electrical surges, reversed polarity on connectors, lightning or other acts of God.
- Damage from failure to follow instructions supplied with the product.
- Damage occurring during shipment of the product either to the customer or from the customer for service (claims must be presented to the carrier).
- Damage resulting from repair, adjustment, or any alteration of the product by anyone other than an authorized Kokam/USA technician.
- Installation or removal charges, or damage caused by improper installation or removal.

Call (301) 668-4280 for more information about service and warranty repairs.

LIPO-403 Charger

for

Kokam/USA Lithium Polymer cells and packs

About the charger

The Kokam LIPO-403 charger is designed to charge Kokam/USA Lithium Polymer (LiPo) cells and battery packs. It charges up to four LiPo cells connected in series. Six current settings handle a wide range of cell and pack capacities. Output voltage can be set manually for one to four LiPo cells connected in series. Alternatively, the charger can automatically set the output voltage after it senses the number of cells connected in series. The charger can be powered by a 12V lead acid or gel cell battery, a DC power supply or any source that can provide 11 to 15VDC.

LiPo cells are best charged using a special sequence: constant current at the beginning of the charge cycle, followed by constant voltage at the end of the charge cycle. The LIPO-403 charger automatically follows this sequence. Two LEDs on the charger's panel show charging status, and a third LED lights when auto voltage detection is activated.

Built-in circuitry prevents damage to the charger if cells, packs or power source are incorrectly connected to the input or output terminals; or if the output terminals are shorted. An internal timer stops operation after 12 hours of continuous charging.

Kokam/USA Lithium Polymer cells are the next-generation replacement for NiCd, NiMH and Lithium Ion cells. This unique power technology offers high energy density, low weight, long life, safe operation and environmentally-friendly chemistry. Order Kokam/USA cells and packs through the Kokam/USA Web site, www.kokamusa.com (or www.fmadirect.com). LiPo technical and application information is available in the Support section of the Web site.

Precautions

- The LIPO-403 charger is designed specifically for charging Lithium Polymer (LiPo) and Lithium Ion cells and packs. **Do not** use the LIPO-403 charger to charge NiCd, NiMH or any other type of battery.
- Never charge LiPo batteries with a charger designed for NiCd, NiMH or any other type of battery chemistry. LiPo cells require a special charging sequence (described above) not provided by chargers made for other battery technologies.
- For best results, use a 1C charge rate* (where C = cell/pack capacity). Charging at a 1C rate takes about 1 hour to reach 90% capacity (for a fully discharged cell/pack). Charge rates greater than 1C may reduce cell capacity.* Extreme charge rates **will** damage cells.
- Follow all guidelines for charging, discharging, handling and storing LiPo cells.*
- See additional warnings sheet provided with this charger.

*For details, see the *Kokam/USA Lithium Polymer Cell application manual*, AN000001, available in the Support section of the Web site.

Kokam USA a division of FMA Inc.

FMA Direct

Kokam/USA • 5716A Industry Lane • Frederick, MD 21704
Sales: (800) 343-2934 • Technical: (301) 668-4280 • www.kokamusa.com • www.fmadirect.com

Parts list

- Charger
- 2 jumpers (plus 2 spares)
- 2 banana plugs for output cable

Prepare the output cable

If you aren't using the 201BCB cable and 501MC Versatile Adapter (available separately), then make a cable to connect your cell/pack to the charger:

1. Solder the supplied banana plugs to one end of the cable.
2. Solder a connector to match your cell/pack to the other end of the cable (observe polarity!)

Charging a cell or pack

You'll need a power source that delivers clean 11–15VDC, such as a12V lead-acid battery/gel cell or a good quality regulated 12VDC power supply. The power source must deliver at least 1.3 times the current applied to the cell/pack. For example, if you are charging at 1.5A, the power source must supply 1.3 x 1.5A = 2A or more. (Many 12V wall plug-in power supplies are unsuitable for powering the charger because they have excessive AC voltage on the DC output. Wall plug-in chargers for lead acid batteries, for example, may cause the charger to malfunction.)

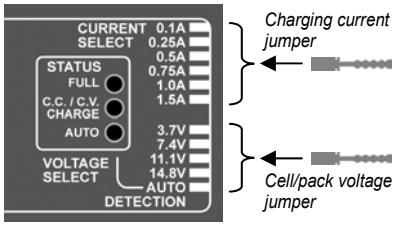
1. Determine cell/pack voltage and capacity.

- Voltage is 3.7, 7.4, 11.1 or 14.7 volts.
- For a series-connected pack, the pack's capacity (mAh or Ah) is the same as the capacity of a single cell.
- For a parallel-connected pack, the pack's capacity (mAh or Ah) is equal to the number of cells times the capacity of a single cell.
- Each Kokam/USA pack is marked with its voltage and capacity.

2. Set charger's output current and voltage.

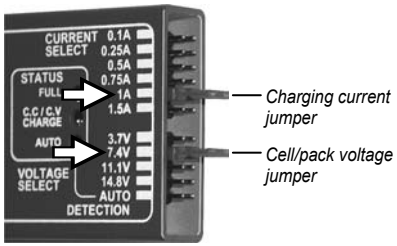
a. Carefully place one jumper on the two pins corresponding to the desired output current.

Note: Do not set the output current to a value larger than the pack's capacity. Maximum charge rate for Kokam USA cells and packs is 1C, where C is the cell/pack capacity. Charge rates >1C may damage cells.

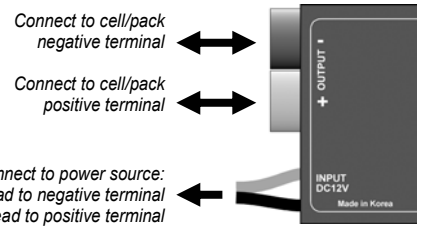


b. Carefully place the other jumper on the two pins corresponding to the cell/pack voltage.
or
Place the other jumper on the Auto pins to have the charger automatically set output voltage (cell/pack must be discharged for auto detection to operate correctly).

Example: *Jumpers in this example are set for 1A output current and 7.4V cell/pack voltage.*

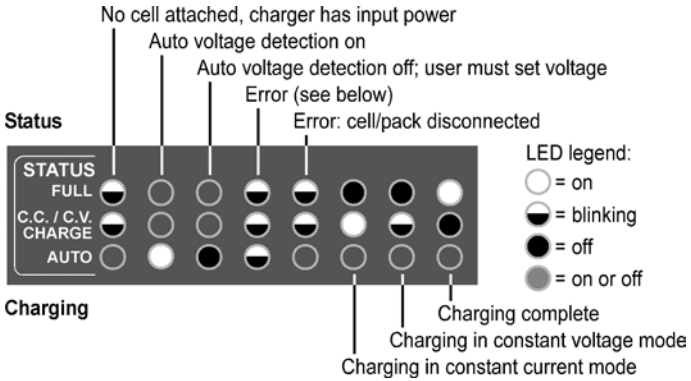


3. Connect charger to LiPoly cell/pack as shown at right.



4. Connect charger to power source as shown at right.

5. Monitor charger.



Error conditions:
- Charger input voltage is <11 volts or >15 volts.
- Poor or no connection between charger and cell/pack.
- Defective cell/pack.

Note: Sometimes, when auto voltage detection is on, the charger will set the output to 11.1 volts when a fully discharged pack of four series-connected cells (14.8 volts) is attached. The "Full" LED will turn on and the pack will not be charged. If this happens, disconnect the power source and the pack, then start over at step 3.

6. Cell/pack will reach about 90% capacity in one hour, and this may be sufficient for your purposes. It will take an additional two to three hours for the cell/pack to reach 100% capacity. When charging is complete:

a. Disconnect charger from power source.

b. Disconnect cell/pack from charger.

Tip: Continue charging for a while after reaching the "Charging complete" state. This assures the cell/pack is 100% charged.

Tip: Cell/pack may be left connected indefinitely without harm. When the cell/pack is fully charged, charger output drops to almost 0mA. After 12 hours, charging is automatically stopped.