

Even more tips

- The LIPO-402 and LIPO-102/202 chargers, available from Kokam/USA, are ideal for charging LiPo battery packs.
- The Versatile Adapter, part number 501MC, is a great companion for any charger. It provides Futaba, JR, Airtronics, Deans and Molex connectors, plus 2.1mm and 2.5mm power jacks, enabling you to easily connect your cells and packs to the charger. The chargers plug right into the 2.5mm power jacks.
- To determine the LiPo 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).



Sport VRLI specifications

Model	VRLI1-LIPO	VRLI1-NCD
For battery types	Lithium Polymer (LiPo)	NiCd/NiMH
Nominal input voltage	7.4VDC (2 LiPo cells in series)	4.8 or 6.0VDC (4 or 5 NiCd/NiMH cells in series)
Nominal output voltage	5.0V	4.8 or 5.0V
LEDs versus input voltage		
Green LED	on at >7.3V	on at >4.75V
Yellow LED	on between 7.3V and 6.0V	on between 4.5V and 4.75V
Red LED	on at <6.0V	on at <4.5V
Nominal output voltage	Regulated 5.0VDC at 2A continuous for inputs greater than 5.0V, maximum 0.5V output drop for inputs less than 5.0V (regardless of input voltage)	
Maximum output current	2.0A continuous	
Dimensions	1.3 in. (33mm) L x 0.75 in. (19mm) W x 0.23 in. (5.8mm) H (not including LEDs and connectors)	

FMA limited warranty for electronic speed controls

FMA, Inc. warrants this product to be free of manufacturing defects for the term of 1 year from the date of purchase. Should any defects covered by this warranty occur, the product shall be repaired or replaced with a unit of equal performance by FMA or an authorized FMA 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 an FMA 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 FMA.

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 FMA technician.
- Installation or removal charges, or damage caused by improper installation or removal.

Call (301) 668-7614 for more information about service and warranty repairs.



Sport VRLI

voltage regulator / LED indicator for powering radio control receivers and standard servos

Model VRLI1-LIPO: for 7.4V Lithium Polymer battery packs

Model VRLI1-NCD: for 4.8 and 6.0V NiCd and NiMH battery packs

Features

- Designed specifically for powering flight electronics (receiver and servos) in engine-powered radio controlled aircraft.
- VRLI1-LIPO regulates 7.4VDC (from two Lithium Polymer cells in series) to 5.0VDC. VRLI1-NCD regulates 6.0VDC (from five NiCd/NiMH cells in series) to 5.0VDC. Low drop-out regulator maintains maximum 0.5V drop, even if battery voltage decreases under full load (e.g., if battery outputs 4.8V, the VRLI outputs 4.3V minimum).
- Supplies 2A continuous current, sufficient for driving up to five standard (moderate torque) sport servos, as well as micro and mini servos. This unit is not recommended for use with digital servos.
- LEDs show two battery voltage check points—helpful for stopping radio use before battery packs fall below 2.5V/cell (LiPo); 1.13V/cell (4-cell NiCd/NiMH); 0.90V/cell (5-cell NiCd/NiMH).
- Easy to install: connects between radio switch and receiver using universal plug and jack.

Note: When using LiPo batteries in electric-powered models, use an FMA LiPo Electronic Speed Control instead of the Sport VRLI. FMA LiPo ESCs work with LiPo, NiCd and NiMH batteries, and have a Battery Eliminator Circuit (BEC) to power the radio system.

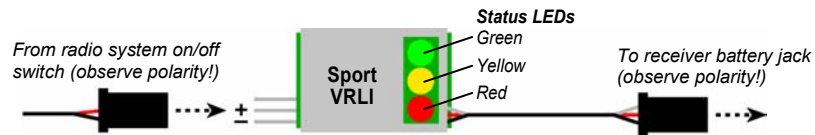
Kokam/USA Lithium Polymer cells are the next-generation replacement for NiCd, NiMH and Lithium Ion cells. This unique power technology offers high energy density, low weight, long life, safe operation and environmentally-friendly chemistry. Order Kokam/USA cells and packs through the Kokam/USA Web site,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

Precautions

- Follow all instructions in this manual to assure safe operation.
- Observe frequency control. If someone else is operating a radio controlled model on the same channel as your transmitter, **do not turn on your transmitter—even for a short time.** Your transmitter has a channel number marked somewhere on its case. When a model receives signals from two transmitters on the same channel at the same time, it cannot be controlled and will crash—possibly causing personal injury or property damage. **For safety, most RC flying fields have formal frequency control rules. Follow them carefully.**
- Do not operate your radio control transmitter within 3 miles of a flying field. Even at a distance, your transmitter can cause interference.
- Do not use the Sport VRLI with high current, high torque or digital servos.
- 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 not provided by chargers made for other battery technologies. The LIPO-402 and LIPOCH202 chargers, available from Kokam/USA, are ideal for charging LiPo battery packs.
- Follow all guidelines for charging, discharging, handling and storing LiPo cells.*
*For details, see the Kokam/USA Lithium Polymer Cell application manual, AN000001, available in the Support section of the Web site.

Installing the Sport VRLI

1. Attach connector from radio system on/off switch to VRLI input jack (observe polarity!).
2. Attach VRLI output connector to receiver battery jack (observe polarity!).



Tip: Mount the VRLI so you can see the LEDs from outside the aircraft.

CAUTION: Failure to observe correct servo/battery polarity voids warranty. Damage may result to both receiver and servos.

Note: You cannot use "old style" (pre-"Z-type") Airtronics servo connectors with the Failsafe Receiver. Use an adapter (FMA Part Number 217AJ) or convert "old style" Airtronics connectors to industry standard configuration using FMA Part Number SEASSYJ.

Using the Sport VRLI

1. Turn on your transmitter, then turn on your receiver.
2. Check battery condition with no load (don't move transmitter sticks):
 - If the green LED is on and the yellow and red LEDs are off, battery is charged. Go to step 3.
 - If all LEDs are off, power is not reaching the VRLI. Turn off your receiver and transmitter, then correct the problem. The battery may be completely dead.
 - **CAUTION:** If the yellow LED is on, battery capacity is low. Charge battery before flying.
 - **CAUTION:** If the red LED is on, battery capacity is very low. Charge battery before flying.

Note: Do not fly if yellow or red LED is on with no load.

3. Check battery condition with load:
 - a. Move all transmitter sticks at the same time (to create a load on the battery) for several seconds. Depending on the load, all three VRLI LEDs may turn on; this is normal.
 - b. Stop moving the transmitter sticks, and see how long it takes until just the green LED is on (and yellow and red LEDs are off).
 - Fast recovery to green LED only: battery is charged.
 - Slow recovery to green LED only: battery capacity is low. **Charge battery before flying.**
 - Very slow recovery to green LED only: battery capacity is very low. **Charge battery before flying.**

Note: Recovery time depends on several factors, including battery capacity, actual load and loading time. Test your system under various conditions to see how recovery time relates to battery capacity.

More tips

- The Sport VRLI can help you identify problems with the airborne part of your radio system. Since it works similar to an expanded scale voltmeter (ESV) when you move the servos, it can reveal problems such as sticky linkages or insufficient aircraft battery capacity.
- If you experience erratic servo behavior while using the VRLI, it may indicate:
 - The battery pack installed in the aircraft has insufficient capacity, or
 - The receiver and servos are exceeding the VRLI's 2A maximum current capacity.
 Try removing servos or changing servo types to see if the problem goes away. Do not attempt to fly if servos are erratic. If the VRLI is operating beyond its rated current, it could fail.