

Quick Field Charger MkII™

PRO SERIES



IMPORTANT!! READ ALL INSTRUCTIONS PRIOR TO USE. FAILURE TO DO SO COULD RESULT IN DAMAGE TO PERSONS AND PROPERTY.

INTRODUCTION

Thank you for purchasing Hobbico's® Quick Field Charger MkII™. Capable of charging nickel-cadmium (NiCd), nickel-metal hydride (NiMH), lithium-polymer (LiPo) and lithium-ion (Li-Ion) batteries, Quick Field Charger MkII is specifically designed for convenience and flexibility for charging radio batteries at the flight line. It can even charge park flyer type aircraft batteries! Two independent charge circuits can each charge transmitter **or** receiver batteries – even single cells! Adjustable current ranging from 200mA to 2.0A for each charge circuit is great for custom matching the charger to your battery's needs. Three-color LEDs, sound cues and built-in voltmeter monitoring jacks aid in setting up and monitoring charge progress. **Damage resulting from misuse or modification of this charger will void your warranty.**

SPECIFICATIONS

Input Voltage:	10-15V DC
Battery Types (each port):	Nickel-Cadmium (NiCd) Nickel-Metal Hydride (NiMH) Lithium-Polymer (LiPo) Lithium-Ion (Li-Ion)
Number Cells (each port):	1-8 NiCd or NiMH, 1-3 LiPo or Li-Ion
Fast Charge Current (each port):	0.2A-2.0A linear (1A max for LiPo)
Fast Charge Termination (each port):	Peak Detection (NiCd & NiMH) CC/CV (LiPo/Li-Ion)
Trickle charge current (each port):	0, 50mA, 85mA & 100mA (NiCd & NiMH only)
Output connectors:	Banana Jacks
Fuse:	7.5A spade (auto)
Case size:	6.25 x 4.0 x 1.5 in [159 x 102 x 38mm]
Weight:	12.0 oz. [342g]
Safety Timer:	120 minutes - NiCd/NiMH 180 minutes - LiPo/Li-Ion

SPECIAL FEATURES

- Perfect for Tx and Rx batteries. Also good for single cell glow ignitors, even park flyer batteries!
- EACH port handles 1-8 NiCd or NiMH cells and 1-3 LiPo/Li-Ion cells.
- EACH port offers 0.2A-2.0A of adjustable, linear charge current (1A max for LiPo/Li-Ion).
- EACH port offers 0, 50mA, 85mA and 100mA trickle charge currents (NiCd and NiMH only).
- EACH port includes tri-color LEDs and sound cues, for ease of setup and operation.
- EACH PORT includes built-in jacks for monitoring battery voltage externally with a voltmeter.
- Peak detection charge method for NiCd and NiMH batteries.
- CC/CV charge method for LiPo/Li-Ion batteries.

- Visual and audible error messages reverse polarity on input or output and poor output connections.
- Other safety features include time-out charge termination, fused current overload and reverse polarity protection.
- Same size as regular power panels, for easy mounting in field boxes.
- Rear enclosure included for use as a stand-alone charger.

IMPORTANT PRECAUTIONS

- Charge only nickel-cadmium, nickel-metal hydride, lithium-polymer or lithium-ion rechargeable batteries. Do NOT attempt to charge other types of rechargeable batteries as permanent damage to the battery and charger could result.
- Do not use automotive type battery chargers to power the charger.
- Do not allow water, moisture or foreign objects into the charger.
- Do not attempt to use batteries with more cells or total voltage than listed in the specifications.
- **DO NOT LEAVE THE CHARGER UNATTENDED WHILE CHARGING. DISCONNECT THE BATTERY AND REMOVE INPUT POWER FROM CHARGER IMMEDIATELY IF THE CHARGER BECOMES HOT!! ALLOW THE CHARGER OR BATTERY TO COOL DOWN BEFORE RECONNECTING.**
- Do not place the charger or battery on a flammable surface or near a flammable object while in use. Keep away from carpets, cluttered workbenches, etc.
- Always turn off the power switch when not in use.
- Do not overcharge batteries as permanent damage could result. Do not use a charge or discharge current rate which exceeds the safe level of the battery. Do not attempt to charge or discharge a battery if it is hot.
- Keep out of reach of children.

CARE & HANDLING INSTRUCTIONS FOR NiMH BATTERIES

While similar in appearance to NiCd batteries and having the same 1.2V rating per cell, NiMH cells contain a different chemical makeup which requires different care and handling.

- **Do not allow NiMH batteries to overheat at any time.** Heat can adversely affect the performance of NiMH batteries. If overheating is observed, disconnect the battery from the charger immediately and allow to cool! Reduce charge current rate for future charges.
- Do not attempt to use the NiCd or LiPo/Li-Ion charge function with NiMH batteries.
- Store NiMH packs with some voltage remaining on the cells.
- Use a NiMH battery pack no more than three cycles per day, with a two to three hour break in-between for cooling. More frequent use is likely to overheat the pack.
- NiMH cells have a self-discharge range of approximately 20-25% (compared to 15% for NiCd batteries). Thus, if NiMH batteries have been inactive for more than a few days it is important to recharge them immediately prior to use.

CARE & HANDLING INSTRUCTIONS FOR LITHIUM-POLYMER AND LITHIUM-ION BATTERIES

Never attempt to care for lithium-polymer (LiPo) or lithium-ion (Li-Ion) cells in the same way as other battery types! LiPo/Li-Ion cells have design and operational characteristics which greatly differ from NiCd and NiMH batteries and thus have different care and handling requirements. In addition, do not mistake LiPo or Li-Ion cells for other lithium-based cell types (such as lithium-metal, etc.), as other lithium hybrids have different care and handling characteristics as well. All "lithium" based batteries types are NOT the same.

- **DO NOT ATTEMPT TO USE THE NiCd OR NiMH CHARGE FUNCTIONS WITH LIPO OR LI-ION BATTERIES!**
- **THE LIPO/LI-ION CHEMISTRY IS A VERY VOLATILE MIXTURE. MISUSE CAN QUICKLY RESULT IN CELLS GETTING HOT, EXPLODING, OR IGNITING WHICH COULD LEAD TO SERIOUS DAMAGE OR PERSONAL INJURY.**
- LiPo/Li-Ion cells have an 8% self discharge rate, meaning they can hold charge very well. Thus, there is no need to trickle charge LiPo/Li-Ion cells.

- Do NOT continue to charge LiPo/Li-Ion cells if they do not recharge within the specified charging time. Failure to follow this guideline could cause the battery to become hot, explode, or ignite.
- LiPo/Li-Ion cells should be charged about once per year at a minimum to prevent over-discharge.
- LiPo/Li-Ion batteries should be stored with about 30%-50% of capacity.

IMPORTANT WARNINGS CONCERNING USE OF LITHIUM-POLYMER AND LITHIUM-ION BATTERIES

It is strongly recommended to only use LiPo/Li-Ion cells which have obtained UL1642 approval to ensure they have been produced in accordance with specific safety criteria. It is also strongly recommended to use UL approved cells which have been assembled with a charge protection circuit built into the pack. Such circuits help to regulate cell operation to make sure they operate within specified current and voltage limits. Batteries not containing a built-in regulative circuit can accidentally be overcharged, thus posing significant risk of fire and/or explosion. **Consult your battery supplier if you are unsure if your LiPo/Li-Ion battery has UL1642 approval or includes a built-in protection circuit.**

It is strongly recommended to set the charge current at a LOW value for LiPo/Li-Ion batteries for safety purposes. Set the charge current to NO GREATER than the battery's 1C rating. For example, charge a 600mAh battery at 0.6A, a 900mAh battery at 0.9A, etc. Closely monitor the temperature of the cells during charge. If cells become excessively warm to the touch or begin to swell during charge remove them from the charger immediately, and reduce the level of charge current for future charges to prevent cells from overheating.

MOUNTING

If desired to use as a stand-alone charger, a rear enclosure is included with Quick Field Charger MkII to protect all internal circuitry from possible damage from external forces. The physical shape and size of Quick Field Charger MkII's faceplate match that of a regular power panel. This makes it very easy for mounting the charger directly into a field box. Before removing the rear enclosure for field box mounting, please remove the fuse from the rear enclosure. Next simply remove the rear enclosure from Quick Field Charger MkII, then mount the face panel directly into the pre-cut power panel hole on the field box (minor adjustments to field box may be necessary). Remember to insert the fuse back into the face panel once the Quick Field Charger MkII has been properly mounted in the field box. Failure to replace the fuse will cause the Quick Field Charger MkII to be inoperable.

INPUT POWER

Quick Field Charger MkII only accepts DC input power which could come from a power supply or 12V automotive battery. Do not attempt to apply more than 15V to the input, as permanent damage to the charger could result and void the warranty. Applying less than 11V to the inputs will not be sufficient power to allow the charger to work properly. Securely connect the charger's red alligator clip to the positive (+) terminal on the power source and the black alligator clip to the negative (-) terminal. It's best to use a clean DC power source whose output is filtered to remove unwanted electrical noise. To achieve maximum potential, the power source must be capable of delivering at least 3 amps of current while maintaining 12 volts DC. Turn off the power switch when not in use.

WARNING! Make sure the charger's positive (+) and negative (-) input connections are never accidentally shorted together when connected to 12V DC power. Failure to do so could result in permanent damage to the power source and the charger.

BATTERY CONNECTION AND CHARGER CONTROLS

Power: The main on/off POWER button is located on the far left. The red LED will illuminate when the switch is turned to the "ON" position.

Two Charge Ports: Each of Quick Field Charger MkII's charge circuits or "ports" contain two sets of banana jacks. One set of jacks is marked "BATT" for connection of the battery to be charged. The second set of jacks marked "METER" is for connecting an external voltmeter for monitoring battery voltage during charge if so desired.

Controls: Each charge port includes one red current adjustment dial and one yellow pushbutton. Each red dial adjusts the charge current for its respective charge port. Each pushbutton is used to initiate the charge process for its respective port and can be used to manually halt a charge process that is currently under way (if desired).

CHARGING BATTERIES

Two totally independent charge circuits are built into this charger, noted as "CHARGER 1" and "CHARGER 2." Each port is capable of charging batteries containing from 1 to 8 NiCd or NiMH cells in series, or 1-3 LiPo or Li-Ion cells in series. Therefore, both ports can charge 4 or 5 cell receiver batteries, 8 cell transmitter batteries, single cell glow ignitor batteries – even 6 or 7 cell batteries for park flyer aircraft. This convenient feature means that no one port is dedicated strictly for transmitter or receiver batteries.

Each port has adjustable current ranging from 200mA (great for charging small cells) up to 2.0 amps (for charging larger size cells). Low charge currents are more gentle on batteries and tend to result in more accurate, full charges but take longer to fully charge batteries. Smaller cells, such as "AAA" size cells and smaller can easily overheat when charged with excessive charge currents and therefore should only be charged at low rates. High charge currents result in much quicker charge times, but are more stressful on batteries which can shorten their overall lifespan. Larger cells, such as "AA" and "A" size can handle higher charge currents, but battery temperature should be monitored during the charge process to make sure the battery does not overheat.

NiCd and NiMH Batteries: Nickel-cadmium and nickel-metal hydride batteries are charged using the peak detection method. This method is more reliable than the "peak prediction" technique used by some chargers and can result in a battery safely receiving approximately 95-98% full charge, after which time the charger will automatically switch to a gentle trickle charge current. Trickle charge will help the battery safely reach its 100% full charge potential.

LiPo and Li-Ion Batteries: The "constant current/constant voltage" method is used for charging LiPo and Li-Ion batteries. As the battery approaches full charge the charger will recognize a reduction in charge current – which is how LiPo/Li-Ion batteries naturally react when fully charged – and will halt the fast charge process. Battery manufacturers do not recommend applying a trickle charge to LiPo/Li-Ion batteries, thus no trickle charge is available. See the "*Important Warnings Concerning Use Of Lithium-Polymer And Lithium-Ion Batteries*" section on this page before charging LiPo/Li-Ion packs.

TO CHARGE A BATTERY:

It is highly recommended to use pre-assembled charge leads to avoid possible erroneous operation as a result of using poor quality connections. Always connect the charge lead to the charger first. Then connect the battery to the charge lead.

WARNING! Do not short the battery connections, as permanent damage to the battery and/or the charger could result and void your warranty. Do not attempt to charge a battery through the meter jacks.

Select a charge port. Securely connect the battery to be charged to the "BATT" jacks, with the positive (+) battery lead connected to the red jack and the negative (-) battery lead to the charger's black jack. Set

that port's red current adjustment dial to the appropriate charge current setting to match the battery (consult your battery supplier if there is any question as to what is the appropriate setting). If charging a battery inside a Tx, or one which is inside a model connected to a switch harness, make sure the power switch is in the "off" position. The LED will NOT do anything at this time – this is normal.

Push this port's yellow pushbutton in the sequence listed below to initiate the quick charge process:

NiCd BATTERIES: Press the yellow pushbutton ONCE to charge NiCd batteries. The LED above the charge jacks will flash RED 3 times, then change to a constant red glow to indicate the peak detection quick charge of NiCd batteries is in progress.

NiMH BATTERIES: Press the yellow pushbutton TWICE to charge NiMH batteries. The LED above the charge jacks will flash AMBER 3 times, then change to a constant AMBER glow to indicate the peak detection quick charge of NiMH batteries is in progress.

LiPo/Li-Ion BATTERIES: Press the yellow pushbutton THREE TIMES to charge LiPo/Li-Ion batteries. The LED above the charge jacks will flash GREEN 3 times, then change to a constant green glow to indicate the "cc/cv" quick charge of LiPo/Li-Ion batteries is in progress. **Note:** The maximum charge current for LiPo/Li-Ion batteries on each port is 1 amp. When charging LiPo/Li-Ion cells, turning the current adjustment past "1.0" will NOT increase the charge current more than 1.0 amp.

WARNING! Lithium-polymer and Lithium-ion cells are VERY sensitive and volatile. Do NOT attempt to charge LiPo/Li-Ion cells at excessive currents or temperatures. Failure to do so could result in bodily harm and/or permanent damage to the cells as the LiPo/Li-Ion chemistry can be very explosive. Make sure the GREEN LED is lit when charging LiPo/Li-Ion batteries. Disconnect LiPo/Li-Ion batteries from the charger IMMEDIATELY if they begin to swell or become very warm to the touch. It is strongly recommended to ONLY use packs consisting of LiPo/Li-Ion cells which also contain a built-in protective circuitry which will protect the pack in the event of excessive conditions. Do Not charge LiPo/Li-Ion cells at greater than their 1C rating.

If it is necessary or desirable to stop the charge process after it has already begun, simply re-press the respective yellow button which will cause the LED to completely dim indicating the quick charge process has been halted.

WARNING! It is normal for batteries to become warm during charge. Disconnect batteries IMMEDIATELY if they become hot at any time! Extra caution must be observed with NiMH and LiPo/Li-Ion batteries as any heating will reduce the lifespan of the battery. In such case, it may be necessary to reduce the fast charge current to lower the possibility of heating. Never attempt to charge batteries at excessive rates, as permanent damage could result.

To charge another battery on Quick Field Charger MkII's second charge circuit while another is being charged on the first circuit, simply follow the above directions for the second circuit. In effect, Quick Field Charger MkII is two completely independent chargers in one. It is not necessary to start both charge circuits simultaneously. One charge circuit does not effect the other charge circuit in any way.

TRICKLE CHARGE

Quick Field Charger MkII will automatically supply trickle charge current to NiCd and NiMH batteries immediately after quick charge has ended. No trickle charge feature exists for LiPo/Li-Ion batteries.

The trickle charge current is determined by the setting of the fast charge current dial. The trickle charge rates are as follows:

Fast Charge Setting	Trickle Charge Rate
Less than 500mA	0mA (no trickle)
500mA - 1.0A	50mA
1.0A - 1.5A	85mA
1.5 - 2.0A	100mA

Quick Field Charger MkII will indicate that fast charge has ended and trickle charge has begun by emitting an audible tone seven times and the LED will flash four times. The charger will remain in the trickle charge state until the battery is removed from the charger, or another input command is given to the charger.

CONNECTING A VOLTMETER



It may be desirable to monitor a battery's voltage with a voltmeter while it is being charged. Quick Field Charger MkII offers one set of voltmeter jacks for each charge port. To monitor a battery with a voltmeter during charge:

1. Select a voltmeter which has a selectable load, such as the Hobbico Digital Voltmeter MkIII (HCAP0356) or a standard digital voltmeter.
2. Set the voltmeter to the proper scale, making sure the meter's internal load is turned off (if possible). Do NOT use an expanded scale voltmeter (ESV) because it's on-board load will steal current from the battery being charged.
3. Connect the voltmeter to the appropriate METER jacks, following proper polarity.

Do NOT attempt to charge batteries through Quick Field Charger MkII's METER jacks.

SAFETY FEATURES

Quick Field Charger MkII utilizes a unique and handy safety feature to warn if problems exist when attempting to quick charge a battery. If a charge port's LED alternately flashes red and green and is accompanied by an audible warning tone, it is an indication that one of three potential problems exists, as follows:

- A. The battery was not properly connected to the output before the charge button was pressed.
- B. The battery somehow becomes disconnected from the charger while it was in the charge process.
- C. If the battery was accidentally connected to the output jacks in reverse polarity.

In any case, re-check to make sure the battery is connected to the output jacks properly as explained above. Check to make sure the charge lead is making good contact with the charger's output jacks and with the battery to be charged and that proper polarity is being observed.

Quick Field Charger MkII uses solid-state and fused overload circuitries to protect against potential damage which could be caused by short-circuit or reverse polarity conditions and provides a backup safety timer.

Reverse Input Polarity: If input power to the charger is connected in reverse polarity, the charger will be protected from damage but will not function. Re-check all input connections and the power source to ensure the proper power and polarities are observed.

Battery Condition Pre-Check: Any time a command is given to begin charging a battery, the charger will check the condition of the battery and determine if it is suitable for charging. If an error exists on either output, the respective LED will flash red and green alternately, accompanied by audible tones to note the error. This can occur when a battery is connected to the output in reverse polarity, or if the charger does not recognize a solid electrical connection to the battery on the output. The charger will be protected from damage in either case. Make sure the battery is solidly connected to the output in proper polarity.

Current Overload: If for some reason a short circuit condition exists on the input or output, the 7.5A spade (auto) fuse located on the left side of the charger might blow. In this case, make sure the charger's power switch is in the "off" position. Remove and inspect the fuse. If the fuse is blown, replace with another fuse of the exact same rating.

Backup Safety Timer: If for some reason the charger does not recognize that the battery has reached full charge, a backup safety timer will automatically stop charge to prevent damage from occurring to the pack. The safety time is 2 hours for NiCd and NiMH batteries, and 3 hours for LiPo/Li-Ion batteries.

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.

PROBLEM: Does not automatically terminate peak charge of NiCd or NiMH batteries after 2 hours, or terminate quick charge of LiPo/Li-Ion batteries after 3 hours.

CAUSE AND CURE: Internal problem with charger. Disconnect battery immediately and contact **Hobby Services** for further details.

PROBLEM: Battery voltage low after charge (below 1.2V per cell for NiCd and NiMH batteries, or below 3.6V for LiPo/Li-Ion batteries).

CAUSES AND CURES:

- 1) Charge rate setting too low. See "**Charging Batteries.**"
- 2) Battery connected in reverse. Connect battery leads properly.
- 3) Defective battery, needs to be replaced.

PROBLEM: LEDs and controls do not function properly.

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

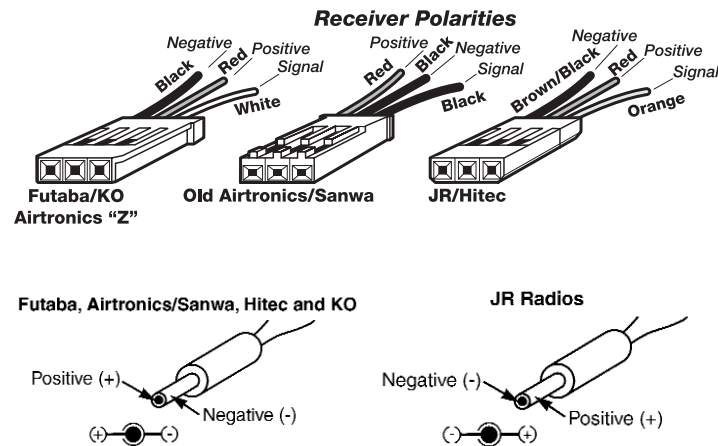
CHARGE LEADS

Hobbico offers a variety of charge leads to match any radio system you may have. These items may be purchased through your local hobby shop.

Part #	Item Description
HCAP0101	Futaba J Tx and Rx charge leads, except 9VAP
HCAP0102	Futaba J Tx and Rx charge leads, 9VAP only
HCAP0104	Airtronics/Sanwa Tx and Rx charge leads
HCAP0105	JR Tx and Rx charge leads
HCAP0106	Hitec Tx and Rx charge leads

HCAP0108
HCAP0110
HCAP0310
HCAP0320

Charge leads, banana plugs to alligator clips
9V-style Tx connector, Futaba-J Rx charge lead
Banana Plugs (3 pair)
Heavy Duty Banana Plugs (2 pair)



2-YEAR LIMITED WARRANTY (U.S.A. & CANADA ONLY*)

Hobbico warrants this product to be free from defects in materials and workmanship for a period of two (2) years from the date of purchase. During that period, Hobbico 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, Hobbico 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 Hobbico product, warranty or non-warranty, send it post-paid and insured to:

HOBBY SERVICES

3002 N. Apollo Dr., Suite #1
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*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.



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