HYPERION HK LTD. Manual Addendum for EOS 0610i NET/DUO Firmware Revision v1.6

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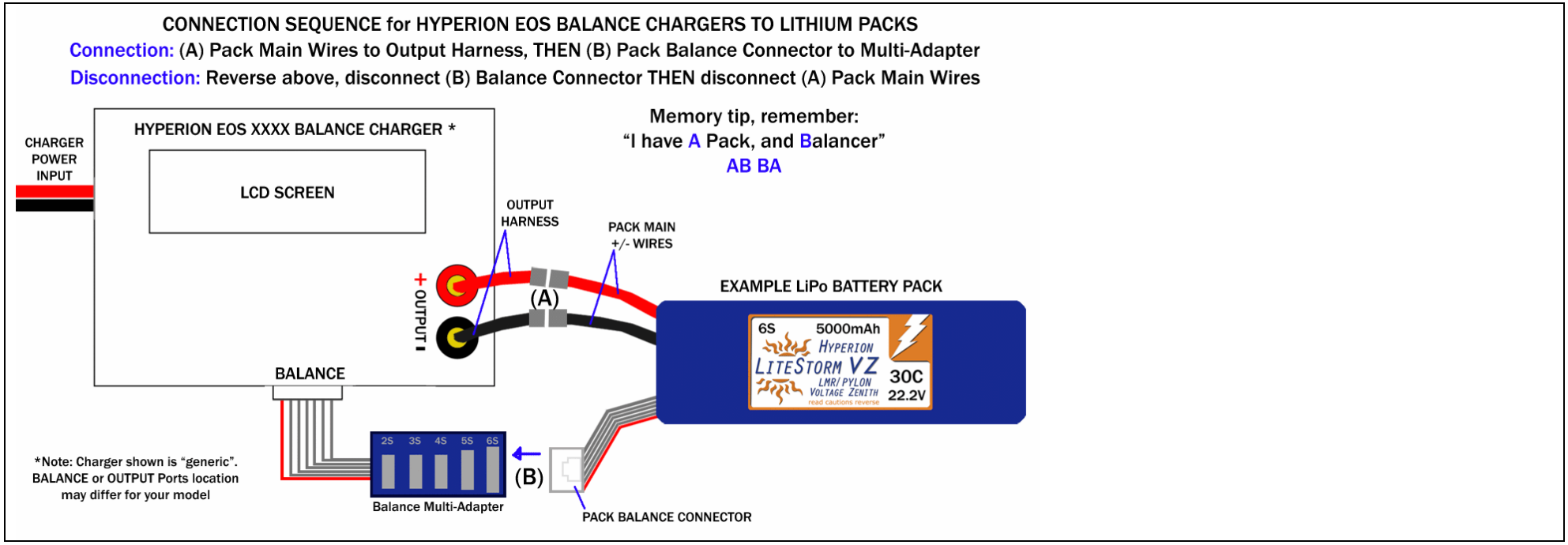
Changes in EOS 0610i NET/DUO from Firmware revision 1.6

(1) CHARGER INTERNAL PROTECTION UPGRADE – The connection sequence of Lithium Packs with Balancer Connector (LiPo, LiFePO4) has an impact on the components inside the charger. The connection sequence shown below reduces surges which occur at pack connection time, greatly reducing possibility of damage to charger components:



In v1.6 NET/DUO firmware, additional protection is provided such that even if correct connection sequence is NOT followed, chances of charger damage are much reduced. Even so, it is always recommended that you follow the connection/disconnection (AB-BA) sequence as shown above.

NOTE: v1.6 firmware also includes a diagnostic routine to identify chargers which have suffered internal damage. If - after updating firmware to v1.6 and attempting to balance charge a Lithium pack - you see an error message "OUTPUT CIRCUIT ERROR" then it means that hardware components have been damaged, and you MUST return your charger for repair/replacement before further use. **NEVER continue to use the charger if you see this message after v1.6 upgrade, nor revert to earlier firmware!**

(2) Buzzer under SYNC MODE Charging – fix bug in which Buzzer sounded when first pack finishes. Now buzzer sounds only when both are ready to disconnect together.

(3) Display after CC/CV END – Shows "BLC" to indicate charger is holding balance and preventing discharge until user disconnects battery

(4) When in BALANCE MODE, main pack wires need not be connected. (With or without main wires is allowed. If connecting main wires, connect them before balancer, as above)

(5) SYNC STORE MODE bug fixed, such that both packs STORE properly and buzzer ends when both are done. (ie: when the "slowest pack finishes)

Changes in EOS 0610i NET/DUO from Firmware revision v1.5 which remain included in v1.6 Firmware

* **BAD PACK SAFETY** – (from v1.5 or higher) Lithium Battery Charge Algorithm has been changed to insure the highest possible safety even in the event that a cell(s) has(have) been damaged before attachment to the charger, or are highly imbalanced (which also indicates damage) and to give earlier warning of poor battery condition in such cases. As such, update to v1.6 is highly recommended for all users.

* **VOLTAGE DISPLAY** during operation will accurately reflect the voltages at cells within Lithium batteries connected to balancer ports. Earlier firmware versions would typically show a voltage used internally by the charger, which was higher than actually existed at the battery cells.

*** STORE MODE** for Li~ Batteries connected to balance port has been added. Experience has shown that storage of fully-charged lithium batteries can lead to premature cell failures. Store Mode allows users to insure that their Lithium batteries are Discharged/Charged to 60% of capacity for storage.

--- If output battery has less than 60% Capacity at start, STORE MODE Balance Charges to 60% capacity

--- If battery has more than 60% Capacity at start, STORE MODE Discharges via the balance port to 60% capacity (0.3A max rate)

NOTES: (and see STORE MODE diagrams in following pages)

- The capacity remaining inside a pack cannot be determined instantaneously. Instead, the charger must monitor cell voltages and measured resistance over a period of time, and with comparisons to the mA setting you have chosen for your pack. As such, if you use STORE MODE and disconnect the pack at end of Store Mode, then re-connect in store mode, you may initially see TCS reported higher or lower than 60% (usually higher). This is normal. Typically the charger will identify the actual capacity in a period of several minutes and stop Store Mode again.
- The higher the charged-in capacity is (TCS), the more accurately the charger can determine the capacity. As such, true Store Mode capacity may vary within approximately 5% as a maximum depending on the condition of your battery. For purposes of storage the difference, if any, is irrelevant.
- Max discharge via the balancer is 300mA. Therefore a large-capacity battery which is fully charged may take some hours to complete under Store mode (for example, a 100% charged 5000mAh battery can be calculated to take approx. 7 hours at fastest to reach 60%)
- “+”currents indicate Store Mode charging, “-“ indicate discharging

* **Confirmation Text** (for #cells in a Li~ pack) has been changed. Now Cell “S” is shown first, then “RIGHT?” (was opposite previously)

* **Auto Start** (10-second countdown) has been added to Li~ Types for Charge and Store Mode (only when pack is **balance connected**), to save a button push

NET/DUO FAQ

*** Why does the charger not give the END buzzer,** even though the pack has been attached for a long time? (I have checked and buzzer is set ON)

- LIPO/LiFePO4: Most likely, you have set a charge rate lower than 1C, and the charger cannot terminate CC/CV as required current at that point is too low. Assuming your battery is of decent quality and condition (if not, do NOT charge it!) there is NO reason to charge at rates below 1C. Charge again at 1C and observe results.
- NiCd/NiMH: Same answer as Lipo/LifePO4 above (for a different reason). Try charging at a higher rate. We have found that many NiMH packs on the market today are poorly made, and do not signal delta-v (indicating end charge) properly when charged at low rates, and sometimes even at higher rates. Try setting delta-v in your charger menu to a lower value. Try charging at a higher rate (check battery for over-temp!). If nothing works, get a pack of cells from a known quality brand (Sanyo, GP, etc) and test your charger.
- Previous DUO firmware had a bug in which the buzzer could be turned off while switching between CH1 and CH2. Upgrade to firmware v1.6

*** Why does the charger continue to show current flowing for Li~ charging after the END buzzer?**

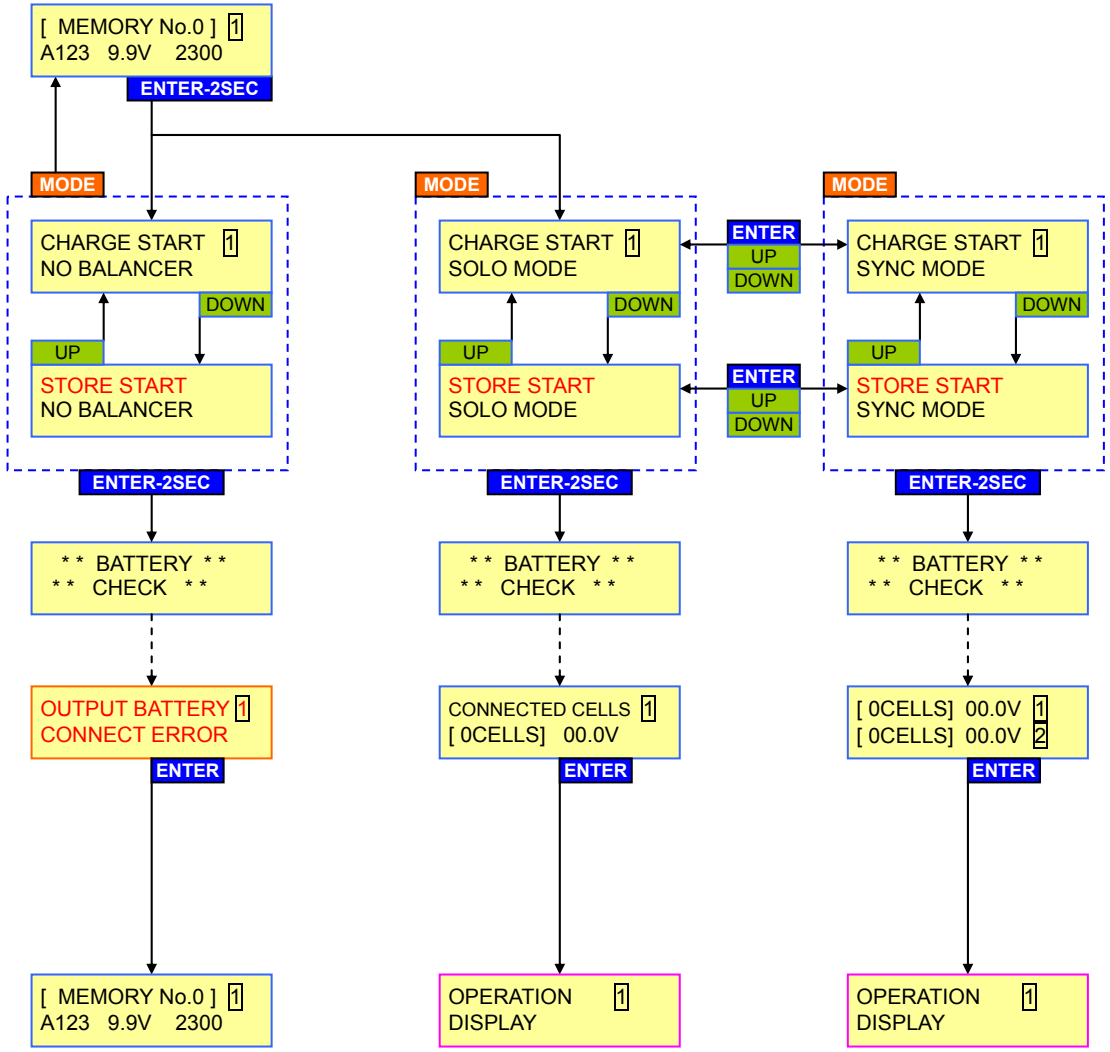
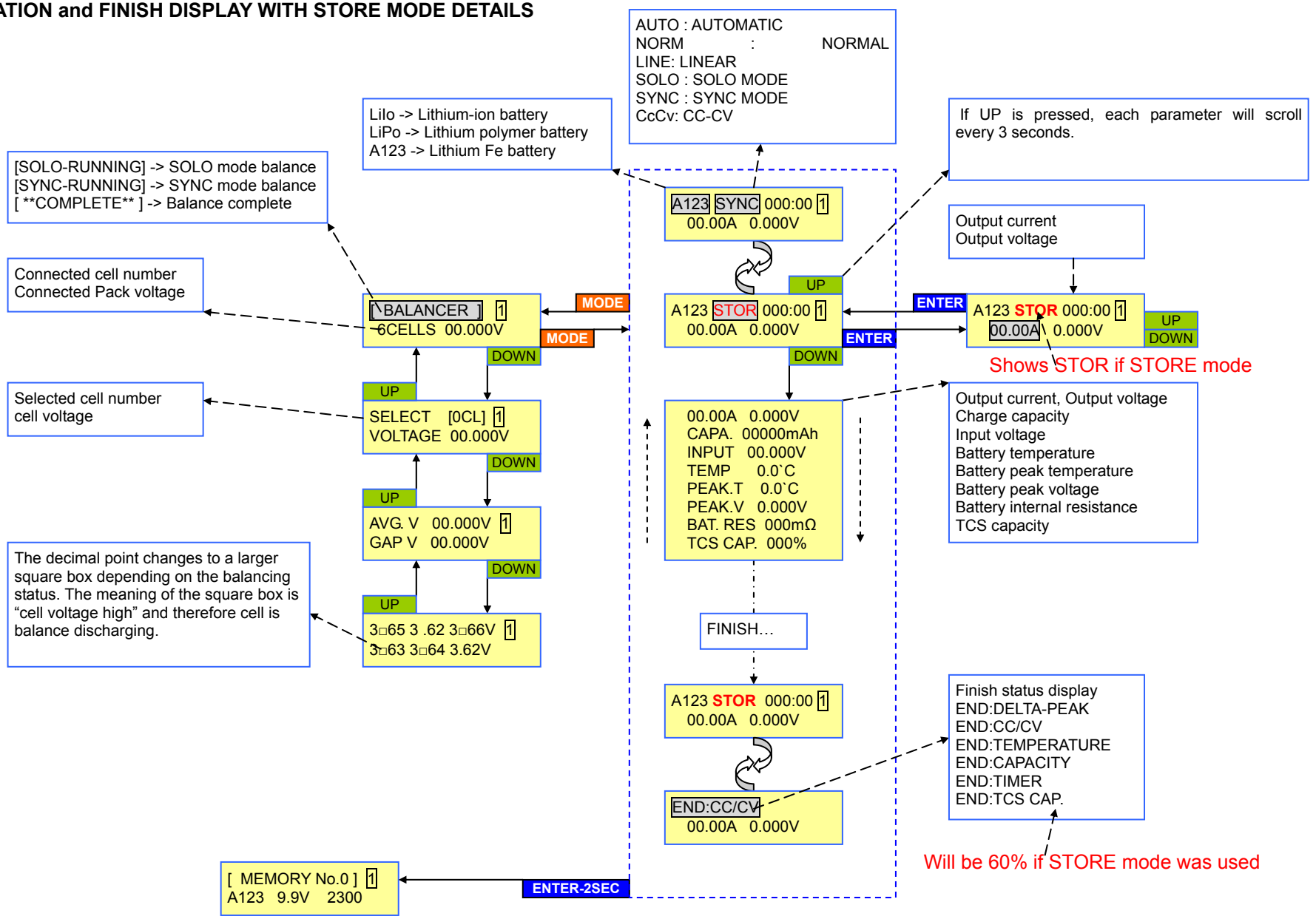
At END of Li~ CC-CV charge, the charger MUST maintain a small current in order to finish the final few % of capacity, maintain cell balance and avoid discharge via the balance circuit until pack is removed from the charger. You may see the mA-in counter rise as a few low cells receive their final charge-in capacity. Due to a programming limitation in previous firmware versions, this was shown with “TRK” in the display (as it is when NiMH “trickle” is in effect at charge end). HOWEVER, THIS IS IN NO WAY a “trickle charge” as commonly defined for NiMh, etc. If you see “TRK” in this case it means your battery is ready to be disconnected, only. Always disconnect as soon as possible after End Buzzer.
Update to v1.6 firmware as soon as possible to further protect and perfect your charger. From v1.6 firmware, “TRK” is replaced and “BLC” is shown instead, to better indicate that any current flowing is mostly holding balance state, rather than charging in a normal sense.

*** Why do I see “0” current flowing during charge at regular intervals**, when watching a log of a battery charge? Is it a “Pulse” charger?

No, the 0610i simply pauses charging at intervals in order to make extremely accurate readings of cell/pack condition.

EOS 0610i NET/DUO Firmware v1.5/v1.6 Addendum

LiPo / LiIo / LiFePO4 (A123) STORE MODE DIAGRAM (note that balancer connection to pack is required for STORE MODE)



OPERATION and FINISH DISPLAY WITH STORE MODE DETAILS