

### **Changes in EOS 0610i NET/DUO in Firmware revision 2.0**

**(1) LIPO MAX C** – Under USER SETUP menu, you will now find a setting to allow setting of Maximum “C” charge rate for Lithium Polymer (3.7v/cell type) batteries, with options of 1C, 2C, 3C, 4C, and 5C (2C is Default). Note that MAX C **attainable** will depend on the Amps Max and Watt Max rating of your charger, and pack capacity.

**NOTE:** It is entirely YOUR responsibility to determine the SAFE Max C for your LiPo pack. **If you don't know, never exceed 1C rates.**

HYPERION LCL, LCX, LVX, LVZ types **2C** max charge rate.

HYPERION GENERATION II 25C and 35C packs, **5C** max charge rate (GEN2 packs est. release date March 25 2009)

**ALL HYPERION SWIFT CAR PACKS - 5C** max charge rate (note ALL Swift Car packs produced support 5C rate, regardless of 2C cautions on initial packaging)

**(2) Cooling Fan Control** – Cooling Fan will come ON at lower watt/amp point, to avoid point overheating under certain conditions, which could affect LCD display.

### **Changes in EOS 0610i NET/DUO in Firmware revision 1.9**

**(1) CH Button Result(DUO Only)** – Previously, when viewing – for example – Cell Voltages in the Data View on one CHANNEL, pushing the CH Button would take you to the previously used screen position on the other Channel. Now when the CH Button is pressed it will take you to the corresponding MODE, on the other channel, but not usually the exact same screen. It simply saves a few button pushes during setup... This applies only during setup, and not during charge (or discharge, store, etc) operation.

**(2) Lithium IR Value Reporting** – Pack IR values reported are now more accurate

**(3) Allowed Battery Capacity** – Settings increased for Lithium type (50000mAh now) and PB (100Ah now).

### **Changes in EOS 0610i NET/DUO in Firmware revision 1.7** (see flow charts revised for v1.7 at end this document, new points are in **RED** )

**(1) TCS ACTION setting added** to each Memory Position for Lilon, LiPo, and LiFePO4. Values are CONTINUE and STOP. CONTINUE is the default. In this case, when TCS% is reached for settings 50% to 95%, the charger will “beep” 10 times, but continue charging to 100% until stopped. If TCS ACTION is set to STOP, the charger will stop charging at that TCS setting and - if balancing is complete – then give COMPLETE (END) Buzzer according to you buzzer settings. (or continue till balanced, then give End buzzer)

**(2) A “QuickView” Data Screen has been added.** While charging, you can press the MODE button to scroll through CHARGE DATA, BALANCER DATA, and now QUICKVIEW screens. The first two are as before (use arrow keys up/down to see various info) but the QuickView is a single screen which shows key data:

- \* Charged (C) Mah IN (or (D) Discharged OUT if Store Mode discharge)
- \* Voltage OUT to the battery pack
- \* TCS % - Capacity in the pack at that point in time (for Lithium based packs only).
- \* Input (i) Voltage from power supply
- \* Charge Current (A)

**(3) Default CHANNEL at Startup is now CH#1.** As a result, settings for PS Load control (voltage, current, power sharing) are also now under CH#1.

**(4) Balance Circuit resistance tolerance relaxed.** V1.6 firmware – in an attempt to provide strongest possible error checking – reduced the tolerance for the balancer circuit total resistance too much, which resulted in spurious OUTPUT CIRCUIT ERROR messages. V1.7 relaxes that tolerance to a more appropriate balance. If you have Output Circuit Error, see the “troubleshooting section below for advice.

**(5) Charge Completion Screens and Buzzers made more “intuitive” for Lithium Balance charging.** Full END Buzzer now only sounds when TCS setting has been reached AND balance has been made as close as is possible – “COMPLETE” will show on LCD then. If TCS has been reached but balancing still needs to be done, a single beep is heard, and screen indicates “CHG<>BLC” until complete, then full END Buzzer and “COMPLETE” on LCD display.

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

**(1) When in BALANCE MODE,** main pack wires need not be connected. (note: CHARGE Mode always requires main wire connection)

### Changes in EOS 0610i NET/DUO from Firmware revision v1.5

\* **VOLTAGE DISPLAY** during operation will accurately reflect the voltages at cells within Lithium batteries connected to balancer ports.

\* **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 roughly 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. 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%. 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%~10% 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

\* **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

### \* I have an OUTPUT CIRCUIT ERROR after v1.6 Update

There are three possibilities:

- 1) V1.6 firmware has detected damage done to the charger due to "improper" connection sequence with firmware v1.5 or earlier
- 2) In V1.6 firmware, charger tolerance for resistance in balancer connectors was reduced (too much!). As a result, balancer harness and multi-adapter resistance may be seen as "too high" even though the parts are in decent (but not perfect) condition.
- 3) Power Supply is inadequate in power, low-quality, Noisy, unstable

----- Of the two possibilities, #2 and #3 are showing to be much more common than #1...

### **FIRST, update to firmware v1.7 available on about September 5th. AND THEN....**

- 1) Carefully inspect balance wire harness and Multi-Adapter for damage, wear, etc. If OK, then:
- 2) Spray all connectors (including the one in charger) with de-oxide contact spray, then insert-remove connectors several times, then spray one last time and re-connect.
- 3) Use a solid DC PS or fully charged CAR battery for Input power
- 4) Test charger using a battery known to be in good condition.

If after updating to v1.7 and cleaning/testing as above you still have ERROR, pls return the charger to you dealer for repair/replacement.

### \* **Why does the charger not give the END buzzer (or FLAT CHECK error),** 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.

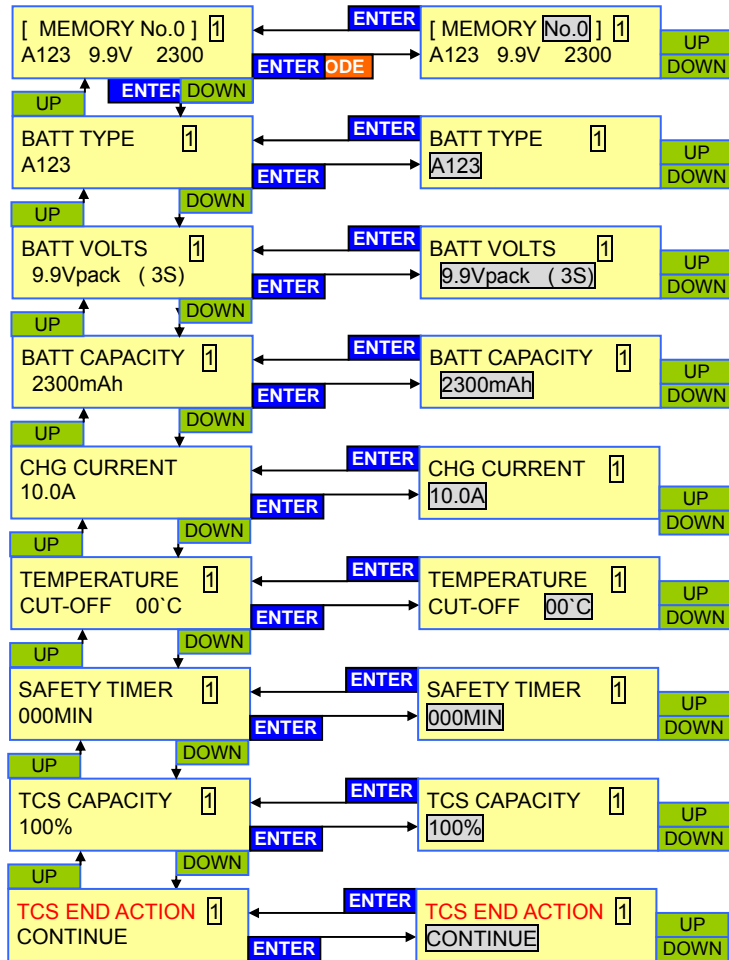
- Previous DUO firmware had a bug in which the buzzer could be turned off while switching between CH1 and CH2. Upgrade to firmware v1.7.

### \* **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.

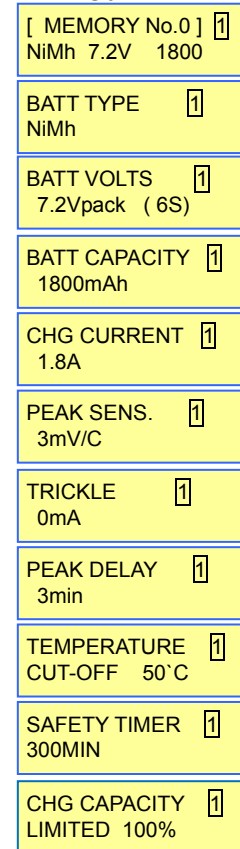
## MEMORY SCREENS / SETTINGS

Lilo/LiPo/LiFePO4 (a123)

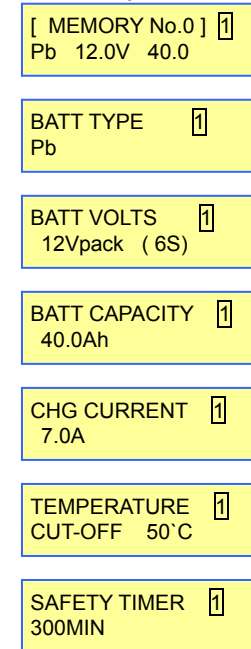


TCS END ACTION added in v1.7. See text description pg. 1 of this document.

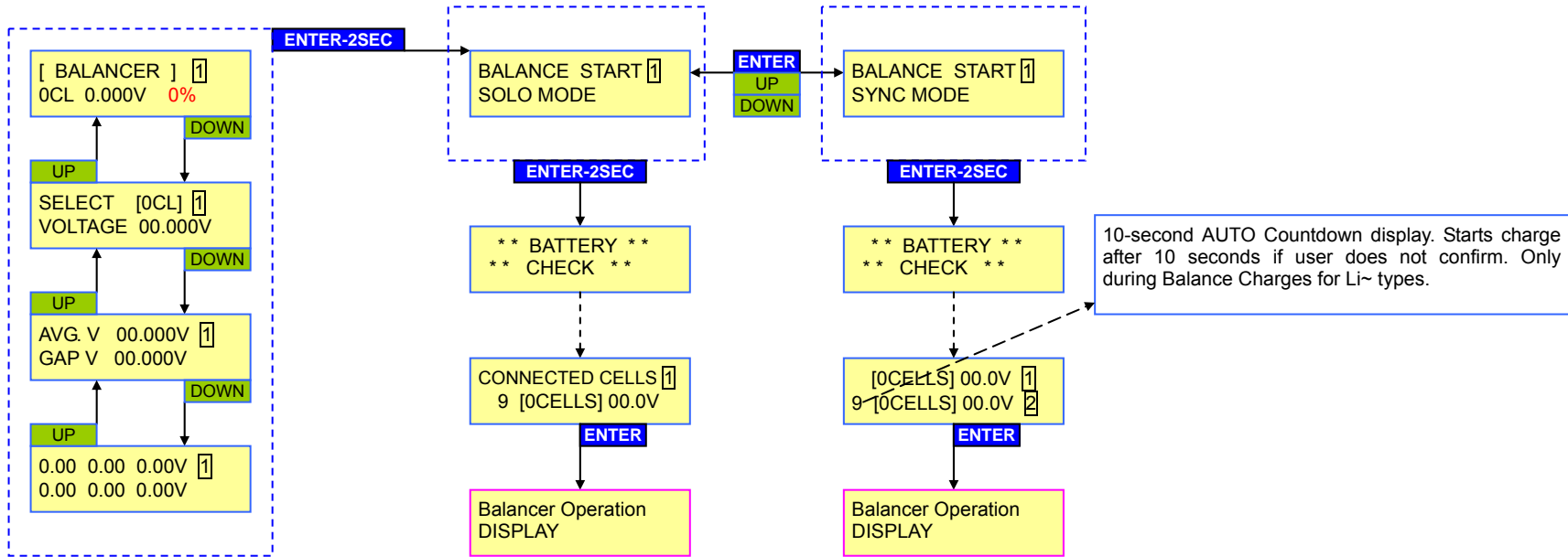
NiCd/NiMH



Pb



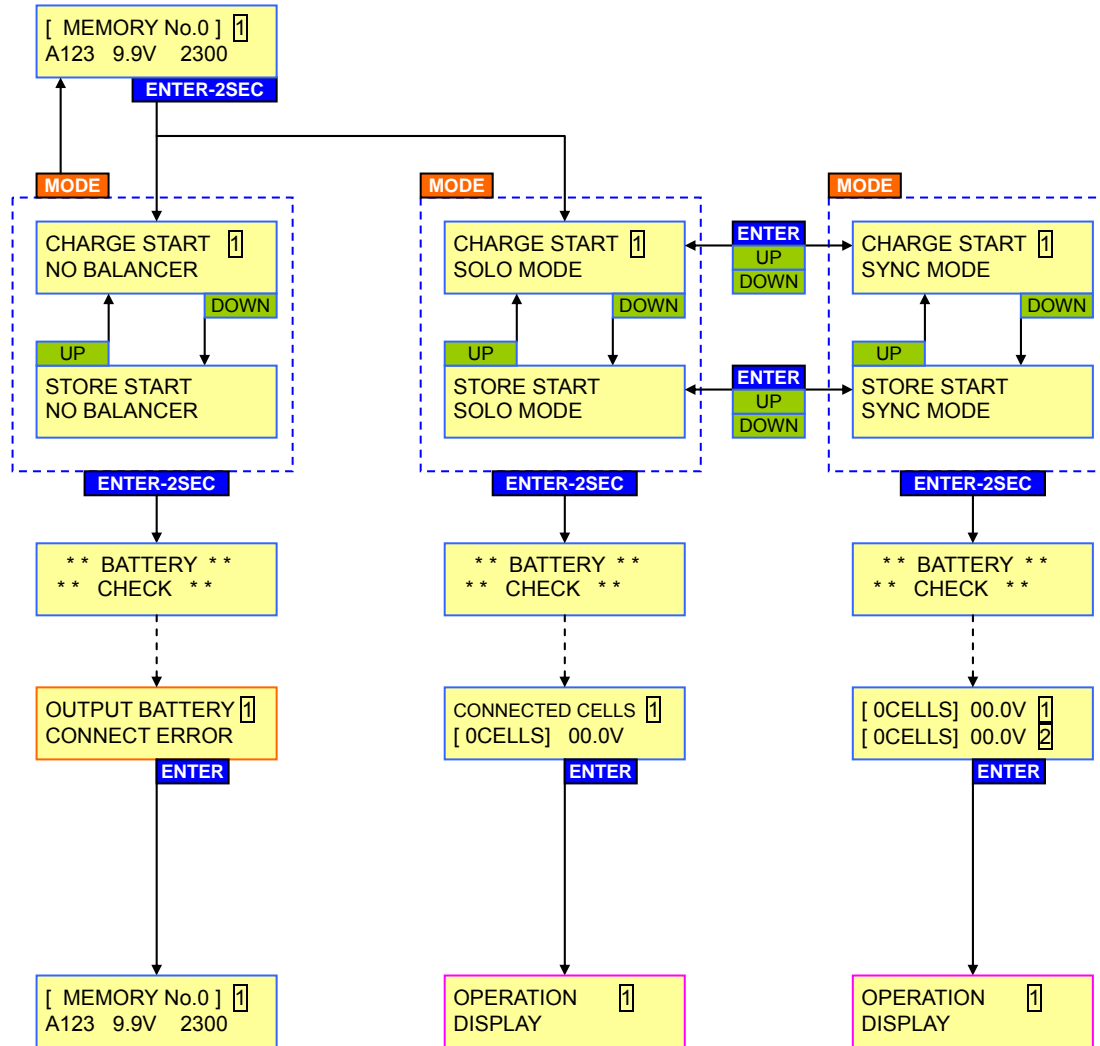
# BALANCE INFORMATION DISPLAY



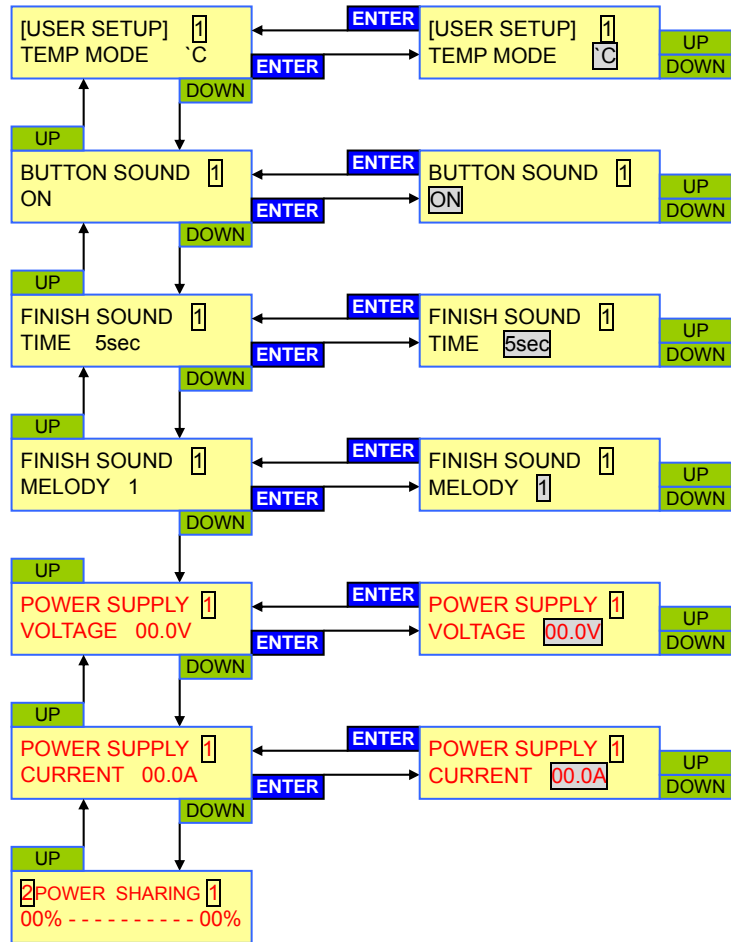
The red 0% in screen above indicates TCS% in that screen (added in v1.7 update)

## STORE MODE DIAGRAM (LiPo / Lilo / LiFePO4-A123 )

STORE Mode only applies to Lilo, LiPo, and LiFePO4(a123) types. Balancer Connection is **required**. If Balancer is NOT connected OUTPUT BATTERY CONNECT ERROR will result.



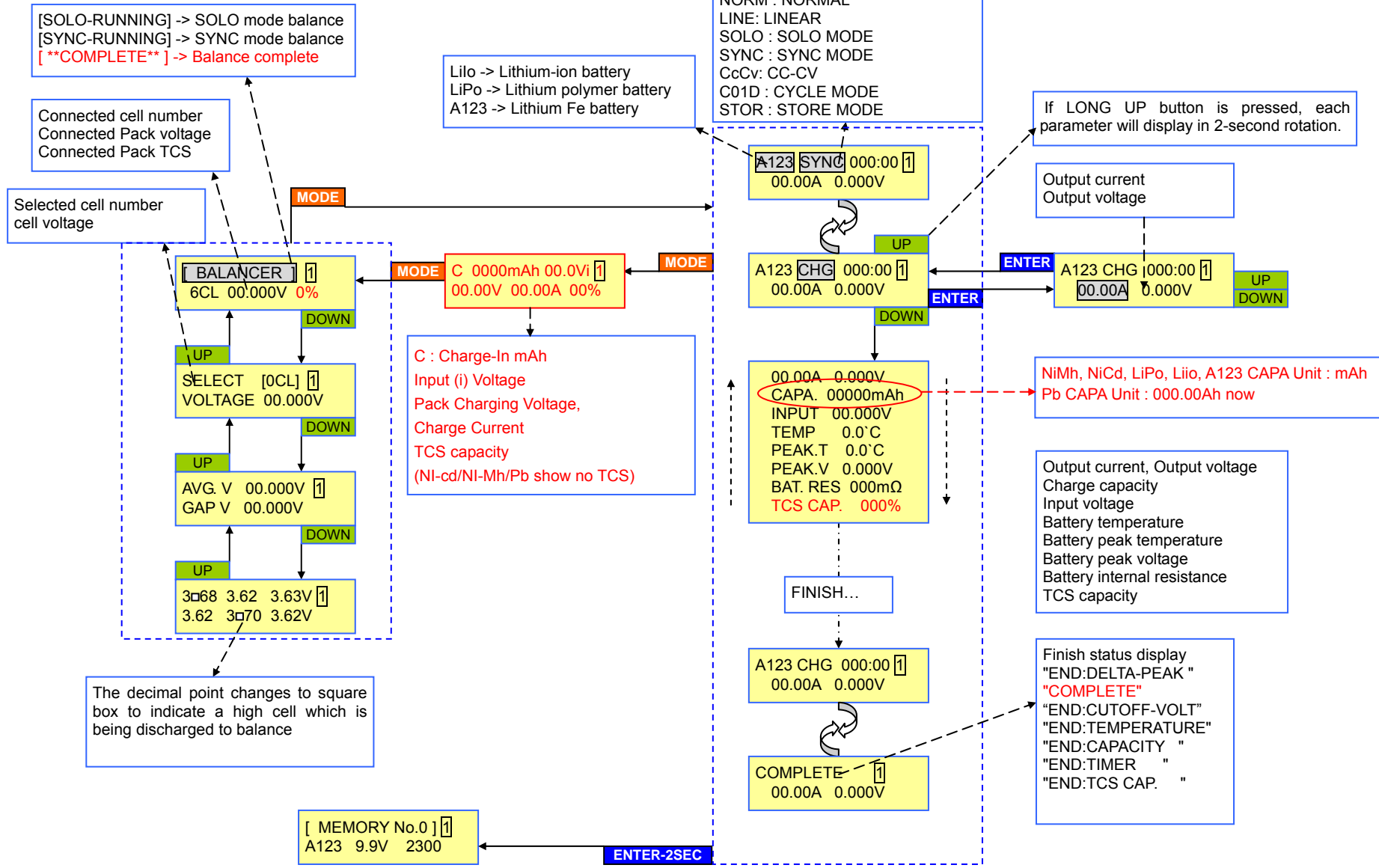
## USER SETUP DISPLAY



The PS Load Control settings above (Power Supply Voltage, Current, Sharing) are now only found under CH#1 menu. (was under CH#2 previous to v1.7 firmware).

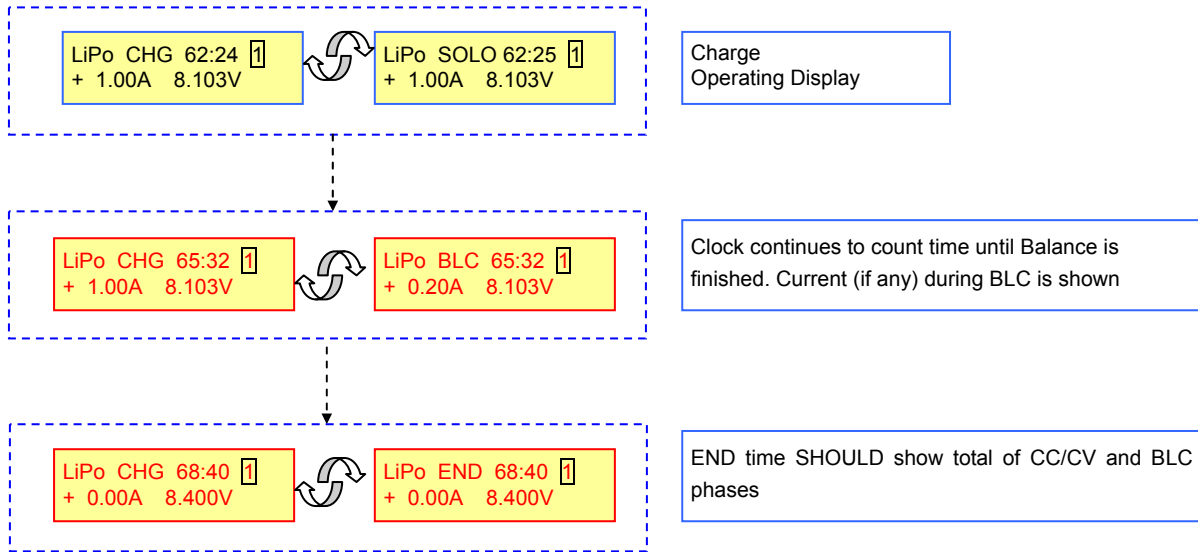
**v2.0 Firmware adds option for LIPO MAX C** (not pictured above), between FINISH SOUND MELODY and PS VOLTAGE settings. See top of pg. 1 for details.

# OPERATION and FINISH DISPLAY





# LiFePO4(a123) / LI-PO / LI-IO BALANCE CHARGE FINISH DISPLAY



## ERROR MESSAGE DISPLAY

INPUT VOLTAGE ERROR 0.00V <sub>i</sub>	When input voltage is below 11.0V or exceeds 28V.
OUTPUT BATTERY CONNECT ERROR	When a battery is not connected to the charger's output
OUTPUT BATTERY REVERSE POLARITY	Output battery is connected to the output in reverse polarity (switch +/-)
OUTPUT BATTERY OPEN CIRCUIT	If the battery becomes disconnected during an operation
OUTPUT CIRCUIT PROBLEM	The output circuit of the charger has a problem. See troubleshooting above.
OUTPUT VOLTAGE TOO LOW 0.00V	Output voltage is lower than the selected cells or voltages (check batt and reset charger correctly)
OUTPUT VOLTAGE TOO HIGH 0.00V	Output voltage is higher than the selected cells or voltages.
TEMPERATURE SENSOR ERROR	The thermal probe is incorrectly connected, or the probe is damaged.
BATTERY TEMP TOO LOW 0.00V	The temperature of the battery is too low ( below -10°C at idle mode and 0°C during operation, requires probe attached!).
BATTERY TEMP TOO HIGH	Battery temp is too high to be charged! (requires probe attached!)
INTERNAL TEMP TOO HIGH	When the temperature of the charger exceeds 125C. Reduce room temp, wait, restart.
BALANCE VOLTAGE CELL(0) TOO HIGH	The balancing cell voltage is too high; Possible pack damage or connection error.
PAUSE... CHARGER TOO HOT	Charger temperature is too high. Charger will Pause until temp drops.
SYNC COMMAND ERROR	Communication is not properly working in SYNC mode. Check to insure no damage, wiring proper, etc...
FLAT CHECK	NiCd, NiMH only. Charger cannot detect DeltaV to terminate charge. See Troubleshooting section.