

Quick reference and setup guide for TP-610C w/V5.4+ software

Specifications:

Capable of charging (and discharging) 1 to 6 Lithium Polymer cells at up to 10A (1A).

Capable of charging (and discharging) 1 to 14 NiCd or NiMH cells at up to 10A (1A)

Capable of charging (and discharging) 6V, 12V or 24V lead acid batteries at up to 10A (1A).

Capable of charging (and discharging) 1 to 6 LiFe/A123 cells at up to 10A (1A).

Note: The TP610C is capable of 80 watts charge output which limits the max current a pack can be charged at. For example, a 2S LiPo pack can be charged at 10 amps (~8.0V average x 10 amps = 80 watts) whereas a 6S pack can only be charged at approximately 3.3 amps maximum (~24.0V average x 4 amps = 79 watts).

Also, the TP610C is capable of discharging at up to 1 amp max current with a total power limit of 8 watts.

Warnings: Keep the unit out of direct sunlight and in a cool place while in use. Remove the plastic protection film from the display before placing into operation. In use at or near the maximum power capabilities of the charger, the 610C can run quite warm. Operating temps of 130 degrees F are not uncommon, and hot days (100+ degrees F) could elevate the operating temp of the unit. Be sure to provide adequate cooling and to handle the charger with care under these and other similar conditions.

Navigating the software:

There are two basic sets of information that will be displayed on the screen, operational screen data, e.g. data that pertains to charging/discharging and setup screen data for the various kinds of charging/discharging that can be done with the unit.

There are 4 buttons on the front panel of the TP610C. The buttons can be used in two ways, short presses (less than 1 second) and long presses (greater than 2 seconds). Generally, long presses are used to enter/exit setup menus and to commence charge/discharge. Short presses are used to change menu selections within the setup menus, change cell counts and currents and also to stop charging/discharging on the operational screen.

When first powered on, the charger will immediately display its manufacturer (Thunder Power), model number (TP-610C) and software revision (e.g. v5.4). Following that it will display the operational screen it was last used for.

If you want to use the currently displayed battery type, all you need to do from this point is to select, using short presses, either charge or discharge using the “SEL/MOD” button, and then use the “CHARGE/ENT” button to select the cell count (displayed as “XsPACK”) or current (displayed as “C or D =X.XXA”). From here the “-/DEC” and “+/INC” buttons are used to alter the numerical value (the X’s) of these two parameters.

To enter the setup menus, long press the SEL/MOD button. The display will show “Battery type” and a chemistry, most likely “LiPo”. To change the type of battery, push either the “-/DEC” or “+/INC” buttons to scroll through the 5 available chemistries. Once the proper type has been chosen, short pressing the “SEL/MOD” button will take you through the various parameters that can be changed for that type of battery. The following tables show these parameters along with a description of each and a range of adjustment.

NiCd/NiMH

<u>Function</u>	<u>Purpose</u>	<u>Adjustment range</u>
Delta -V setting	Sets the -V trip point at which the charger stops charging	5-30mV (NiCd) 2-15mV (NiMH)
Beeper option	Lets you turn off the beeping when buttons are pressed	On/Off
Input PWR option LVC	Sets the threshold for minimum input voltage (Keeps you from having to ask your buddy for a jump start)	10-12V
System timeout Max time	Sets the maximum time for a charge cycle	2 to 10 hours
Cycle data Cy#:1-9	Shows the charge and discharge capacities for up to 9 cycles.	Can view any of 9 previously run cycles

PB (lead acid)

<u>Function</u>	<u>Purpose</u>	<u>Adjustment range</u>
PB charge topeff	Adjusts the per cell final voltage at charge termination	2.2- 2.5V/cell
Beeper option	Lets you turn off the beeping when buttons are pressed	On/Off
Input PWR option	Sets the threshold for minimum input voltage (Keeps you from having to ask your buddy for a jump start)	10-12V
System timeout Max time	Sets the maximum time for a charge cycle	2 to 10 hours

LiFe

<u>Function</u>	<u>Purpose</u>	<u>Adjustment range</u>
A123 charge option	Allows adjustment of the amount of charge put into the battery	100% 95% 50% (storage) FAST charge (almost a 100% charge but not taking as long)
A123 Dchg option cut off	Sets the per cell cutoff voltage when discharging	2.5-3.6V/cell
Li/A1 InitCharge timeout	Sets the maximum time the charger will take to initialize a charge procedure	5 to 15 minutes
Key tone option	Lets you turn off the beeping when buttons are pressed	On/Off
Input PWR option LVC	Sets the threshold for minimum input voltage (Keeps you from having to ask your buddy for a jump start)	10-12V
System timeout Max time	Sets the maximum time for a charge cycle	2 to 10 hours

LiPo

<u>Function</u>	<u>Purpose</u>	<u>Adjustment range</u>
LiPo CHG option	Allows adjustment of the amount of charge put into the battery	100% 95% 50% (storage) FAST charge (almost a 100% charge but not taking as long)
LiPo Dchg option cut off	Sets the per cell cutoff voltage when discharging	3 to 3.9V/cell
Li/A1 InitCharge timeout	Sets the maximum time the charger will take to initialize a charge procedure	5 to 15 minutes
Key tone option	Lets you turn off the beeping when buttons are pressed	On/Off
Input PWR option LVC	Sets the threshold for minimum input voltage (Keeps you from having to ask your buddy for a jump start)	10-12V
System timeout Max time	Sets the maximum time for a charge cycle	2 to 10 hours

Once you have dialed in all the specifics for the battery you want to charge or discharge, long press the “SEL/MOD” button again and you will be taken back to the operational screen.

From the operational screen, to select charging, discharging or cycling, you short press the “SEL/MOD” button. To change the number of cells or charge/discharge current, you short press the “CHARGE/ENT” button which will initiate blinking of either the Pack size or charge/discharge current. From here you use the “-/DEC” or “+/INC” buttons to alter the numbers. Once the proper numbers have been set, long press the red “CHARGE/ENT” button to initiate charging, discharging or cycling. Note that short pressing the red “CHARGE/ENT” button also halts the current charging, discharging or cycling process.

As a battery charges or discharges, information is given on the main screen. In the upper left of the screen you will see two letters that change every two seconds, these are the battery type and function being performed. Just to the right of that you will see the current voltage across the pack. To the right of that you will see the charge current. Just to the right of that you will notice that there is another character that changes back and forth, this will show either A for amps, CC for constant current or CV for constant voltage depending on what kind of charging you are doing. The second row of the display shows the amount of charge placed back into the pack in mAh and overall charge time.

If using the built in balancer in closed loop mode, you can at any time during a charge or discharge cycle (LiPo and A123 only) check to see any of the individual cell voltages along with what the balancer is doing. Long press the “SEL/MOD” button. You will now have displayed a screen that says “(X) CELL#:123 456” on the top line and “B.STATUS: OOO OOO” directly underneath. This is the balancer status screen. It shows which cells in the pack are being drawn down to the level of the others. From here you can use the “-/DEC” and “+/INC” buttons to scroll through the cells, two per screen. To the far right on these screens you will also be shown the maximum deviation voltage between cells. Leaving the unit alone for about 60 seconds will return it to the charge screen. The unit comes furnished with an adaptor board. This board is only needed when using T.P. 6S (2 connector) packs and certain brands of Chinese made batteries. If using T.P. Packs in 1 to 5 series cell configurations, you can simply plug the balance connector straight into the connector on the charger itself. Simply make sure to slide the edge of the connector with the black wire all the way over to the left of the connector on the charger (towards the + banana jack). Alternately, you can use the adaptor board for all T.P. batteries (up to 6S) and the Chinese made packs.

Using memories:

From the main charging screen, the one that you initiate charging from, there are three parameters that you can alter, the cell count, charge/discharge current and memory position. At the far upper, right end of the display you see [M 1-10], this is the memory location. To access it short press the red “CHARGE/ENT” button quickly and the number in the brackets will begin to flash. You can use the “-/DEC” and “+/INC” buttons to change the location. Note that each location will keep the cell count and charge current stored. There are 25 memories per battery type for a total of 125 memories. Note that the memories cannot be named other than 1, 2, 3 etc. but you could number your packs accordingly, NiCd pack 1, Lipo pack 1 etc.

Updateability:

From time to time, new firmware updates will become available for the 610. These will be made available through the Thunder Power website: www.thunderpowerrc.com. To install new firmware, you will need to purchase a special programming cable (P/N PGM-V2) from either your local hobby shop or Thunder Power RC directly. This cable plugs into the charger via a connector located under the “Factory use only do not remove” sticker.

Expected performance of the 610C when charging Lithium Polymer battery packs

Cell count (voltage)	Max current range
1 (3.3-4.2V)	10A
2 (6.6-8.4V)	9.5-10A
3 (9.9-12.6V)	6.3-8.1A
4 (13.2-16.8V)	4.7-6.1A
5 (16.5-21V)	3.8-4.8A
6 (19.8-25.2V)	3.2-4A

Note: This is the maximum current that the charger can deliver, NOT the current that should be used to charge a given battery. Charge current should always be 1C unless otherwise specified by the manufacturer.

Expected performance of the 610C when charging LiFe battery packs

Cell count (peak voltage)	Max current range
1 (2-3.65V)	10A
2 (4-7.3V)	10A
3 (6-10.95V)	7.3-10A
4 (8-14.6V)	5.5-10A
5 (10-18.25V)	4.4-8A
6 (12-21.9V)	3.7-6.7A

Note: This is the maximum current that the charger can deliver, NOT the current that should be used to charge a given battery. You should always use the charge current recommended by the manufacturer of the battery.

Expected performance of the 610C when charging Pb batteries

Cell count (voltage)	Max charge current
3 (6V)	10A
6 (12V)	6.7A
12 (24V)	3.3A

Expected performance of the 610C when charging Nicd/NiMH battery packs will vary similarly. However, the charge termination voltage across a Nicd/NiMH cell will vary greatly dependant upon charge current. For this reason, it is difficult to construct a similar table as it would be quite large.