Fugit Tempus.

Everyone knows this phrase in its normal format ("tempus fugit" – time flies) but the thought occurred to me that reversing it should translate as "flying time". At the time of writing we should add the adjective "nullus" as the month of January has been the most horrendous period of rain and wind that I can remember, at least in the northeast, and indoor activities are the only possibility. At least I have a couple of new models waiting for test flights, and for once my building schedule is approximately up-to-date.

Latest from West London Models.

WLM are the main UK source for Thunder Power products, and like all of the major battery/charger/controller suppliers, this U.S. firm spend a lot of time and effort keeping their range at the forefront of developments in this area. Rod Holmes recently sent me some of the most recent TP products to hit the UK and they are certainly up to the usual high TP standards. The units involved are a new charger, and a new controller/programmer.

The Thunder Power TP610C Charger/Balancer.

This unit is part of the recent trend with chargers to produce a unit aimed specifically at the needs of the club flyer. It is not the top of the TP range of chargers, (that is the TP1010C which I covered in QEFI 58) but it has all of the features that the club flyer needs without being too technical, and it has some particularly useful extras. It is a compact unit (see specification) and is contained within a sturdy aluminium case. The input supply is via a cable and a pair of bulldog clips suitable for connection to a 12 volt leisure battery, although the TP610 will operate on the workbench with a suitable (11-16 volt DC) power supply unit. Connections for data (not yet available), single output, and balancing are on the ends of the case with the LCD screen and programming buttons on the top face.

The specification for the TP610 is as follows

a) Input Power: 11-16V DC 10Amp at maximum charge rate
b) Memory profile: 25 Memory for each Battery type
c) Charge battery type: Lipo/NiMh/NiCd/PB/A123
d) Charge voltage and cells:
    LiPo battery: 1-6 cell, CC to CV change voltage: 4.18V/cell, full charge voltage 4.2V/Cell
    NiMh, NiCd Battery: 1- 14 cells
    Pb Battery: 6V/12V/24V
    A123 Battery: 1-6 cell, CC to CV change voltage: 3.6V/cell, full charge voltage 3.65V/Cell
e) Charge Current: 0.25A---10A
f) Charge control type LiPo/A123: CC/CV
g) Charge NiCd/NiMh: constant current -delta peak
h) Charge/discharge cycles: 9 cycles.
i) Discharge rate: 50 mA- 1 Amp
j) Discharge capacity: 7 Watt (Max 1A)
k) Capacity display: 0-9999 mAh
1) Timeout limit: 2-10 hour (User selectable)
m) Display Tolerance: 0.5%
n) Display Type: Backlit 2 x 16 dot LCD
o) Charge maximum output: 80 Watt
p) Output Charge Terminal: 4 mm standard banana Jack
q) Input wire: 16 AWG silicon Wire.
r) Size: 118 x 85 x 28 (mm)/4.65"x3.4"xl.l"
s) Weight: 265g/ 9.4 oz

This unit is ideal for flyers who want their charger to operate in basic mode for most of the time. The operation with Nickel based packs is straightforward, but it is great for LiPos and A123s. The charging limitation is 80 watts and for 1C charging, a 3S LiPo can be charged at up to 6 amps (equivalent to 6000 mAh capacity), and a 4S pack at up to 4.7 amps (4700 mAh capacity). The figures for A123 packs are slightly different but in the same field.

Where this charger is particularly helpful is in terms of balancing. It has an internal balancer and is supplied with a universal balancing lead with fitments for both Thunder Power and other makes of pack. It is a semi-automatic system in that the initial start of charging with Lithium packs involves a sequence of assessment screens where the charger suggests the series cell count based on the initial voltage reading, but this has to be accepted or adjusted by the operator. This, of course, is the area of operation needing the safest possible approach, and the recommendation is that the operator should consciously check each stage to minimize any possibility of error.

The charger does not have a PC interface for downloading and displaying real-time data. This is generally not possible when used in the field, but even in the workshop such a facility can be counter-productive, especially if you already struggle to program your VCR/DVD reorder. It does, however, have very good internal programming so that all of the necessary data is displayed on its own LCD screen. This includes the balancing data at any stage of the charge as well as all of the normal voltage, current, capacity, and time data. The memories available also mean that data can be stored for future recall and assessment. It does have two data ports, one on the right side to allow the software to be upgraded, and one on the left side for some future (unspecified) use. The discharge ability of the TP 610C is, like all such units, very limited. A maximum current of 1 amp at a maximum of 7 watts means that discharge from full can be a very long process (a 3500 mAh 3S pack would take 6 hours) and is only really relevant to long term cycling. The data resulting from such a test is obviously far removed from the performance of the pack under normal in-flight loads (at 30 amps the same 3S pack is operating at 350 watts which is 50 times the TP610 discharge load of 7 watts) but there are situations where such data can still be useful.

I have used the charger now for a couple of weeks and have deliberately tried to operate it in the widest possible way. I have covered perhaps 60% of the available features and have not had a single glitch. It takes a while to become familiar with the procedures (as it does with all new and unfamiliar units), but it has a friendly feel to it which I appreciate. I think it is a useful addition to the marketplace and should grow to be popular mid-range charger.

Thunder Power TPE 40SGB4 Smartguide/LiPo Saver controller.

Thunder Power currently produce two ranges of sensorless brushless controllers for electric flight, the High Grade series and the Smartguide/LiPo saver series. The High Grade units are standard controllers aimed at the full range of electric flight applications with what we have come to consider to be a typical range of features. The Smart Guide/LiPo Saver units are slightly more expensive but are targeted specifically at LiPo applications. In this respect they are the first controllers to include a voltage monitoring system for individual LiPo cells during discharge.

You will notice in the photograph that the controller has the usual two power input wires, the standard three power output wires, the normal throttle connector to the Rx, and an additional multi-pin connector for the BDMP (Balanced Discharge Monitoring and Protection) system into which the balancing lead of the battery plugs. During use then, this system checks the individual cell voltages throughout the discharge. As I understand it from their description, this feature does not provide "active balancing" (where the power taken from individual cells would be adjusted to maintain the cells at the same voltage level throughout the discharge), but it does provide a safety cut-off so that if any cell drops below a user-set voltage floor (2.75, 3.0, 3.25 volts) the controller output to the motor is cut allowing only the BEC output to continue. This is a very useful safety feature and will certainly help to maintain a healthy pack, but I still look forward to some manufacturer producing a controller with full active discharge balancing. This is what we have in the better chargers and balancers so combining two such units together would give an ideal combination.

All of the TP controllers have a range of user-set features, utilizing either a Tx throttle sequence and audio tones, or the TP eZ programmer (see later description). This allows the user to set battery type, cut-off type, governor mode (for helis), cut-off voltage, start mode, brake, motor timing, and controller frequency. All but the very highest power units have BEC, linear for the bottom end and switch mode for the mid-range units. In the 40SGB4 this is a switch mode system able to deliver 3 amps at 5 volts.

The 40SGB4 controller in the photographs is a typical mid-range controller which will operate with 2 to 4 Lithium and 5 to 12 Nickel cell packs, up to 40 amps continuous and 55 amps in burst, and with a weight of 40 gms and dimensions of 55 x 28 x 15 mm. In use it has worked without fault, but, as is the case with all controllers, assessing the performance of a controller, in use or on the bench, is very difficult. If it works up to the maximum performance specified and over the range of output from minimum to maximum throttle without overheating, then it is satisfying the designers (and the advertisers) specification. It is likely to be comparable in efficiency with all similar units (95% plus usually), and will continue to do so, subject to abuse in use. What more could you ask?

The Thunder Power EZP-V1.10 programmer.

Several of the major controller manufacturers now provide this facility with their programmable controllers and I find it to be very useful. Even in situations where the controller is to be used in a default (plug and fly?) mode there are often circumstances where a controller may decide, for reasons of its own, to change its own program (often when the owner uses an incorrect switch-off/unplug sequence) and the ability to get back to the intended program with a simple procedure is vital, especially on the field. All of the Tx/audio tone systems are important since they are available when the programmer is unavailable, but I know which system I find simplest to use.

Unplug the controller from the power pack, plug the controller Rx lead into the programmer, and plug the power pack back into the controller. A sequence of red leds lights up, use the buttons on the base to move these into the required pattern and the job is done. All you have to do is to remember to carry the programmer with you whenever you go flying which is dead easy isn't it? That's from a man who has gone to the flying field with everything except a transmitter, mind you, but no one's perfect, are we?

Schulze New Generation.

Reference to the TP610C above reminds me that I have another unit on the test bench at the moment but one that is a very different from the Thunder Power charger. This is the Schulze 6.30-5 plus New Generation, loaned to me by Alan Fry of Importeknik, and this unit is so impressive that I have agreed with Editor Mike that I will present my assessment as a stand-alone review. This will be in a future edition of the magazine but at least you have advance notice of its appearance in the photograph.

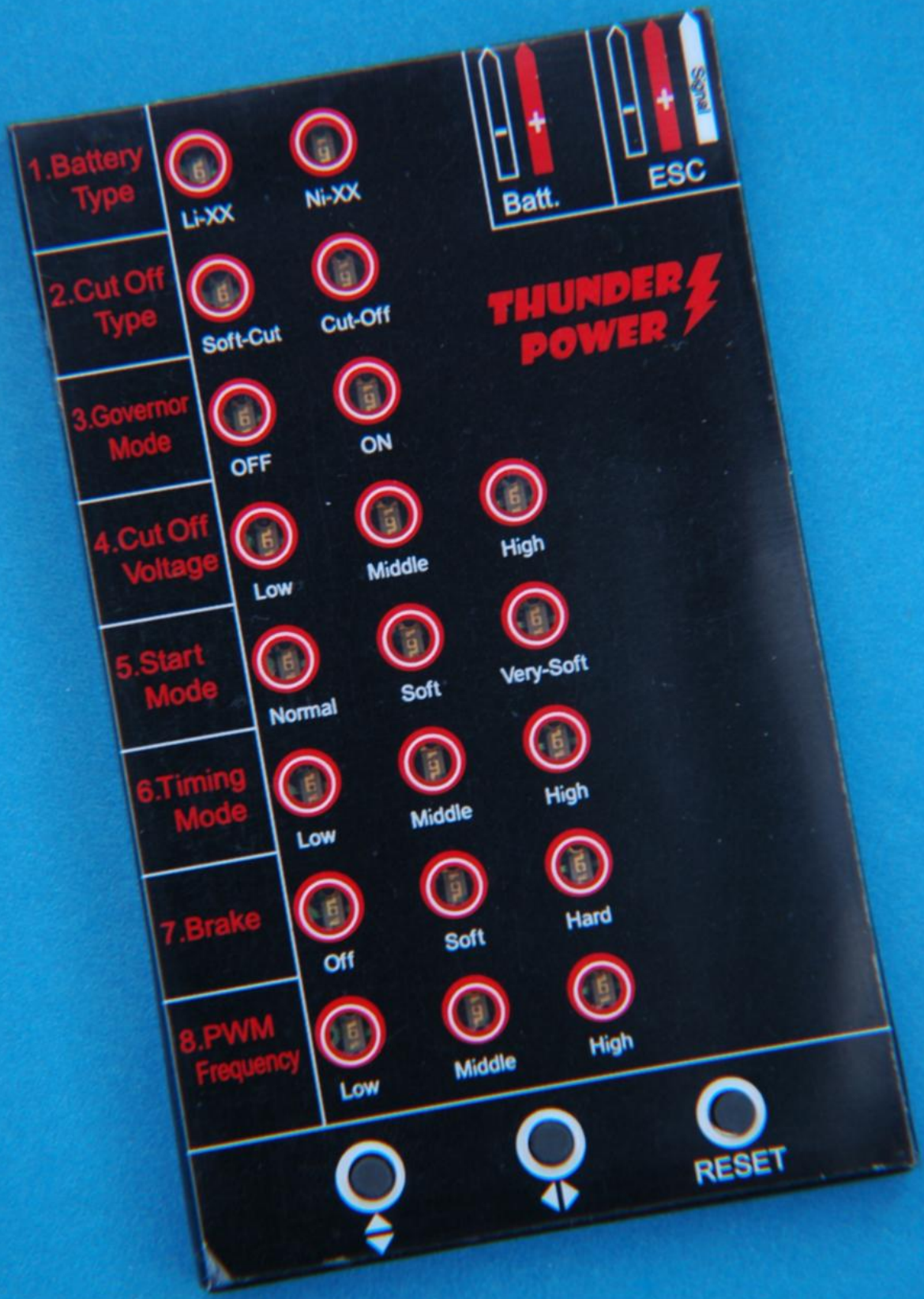
Contacts.

West London Models, 214 High St, Harlington, Middlesex, UB3 5DS – Tel 020 8897 2326
Website www.westlondonmodels.com

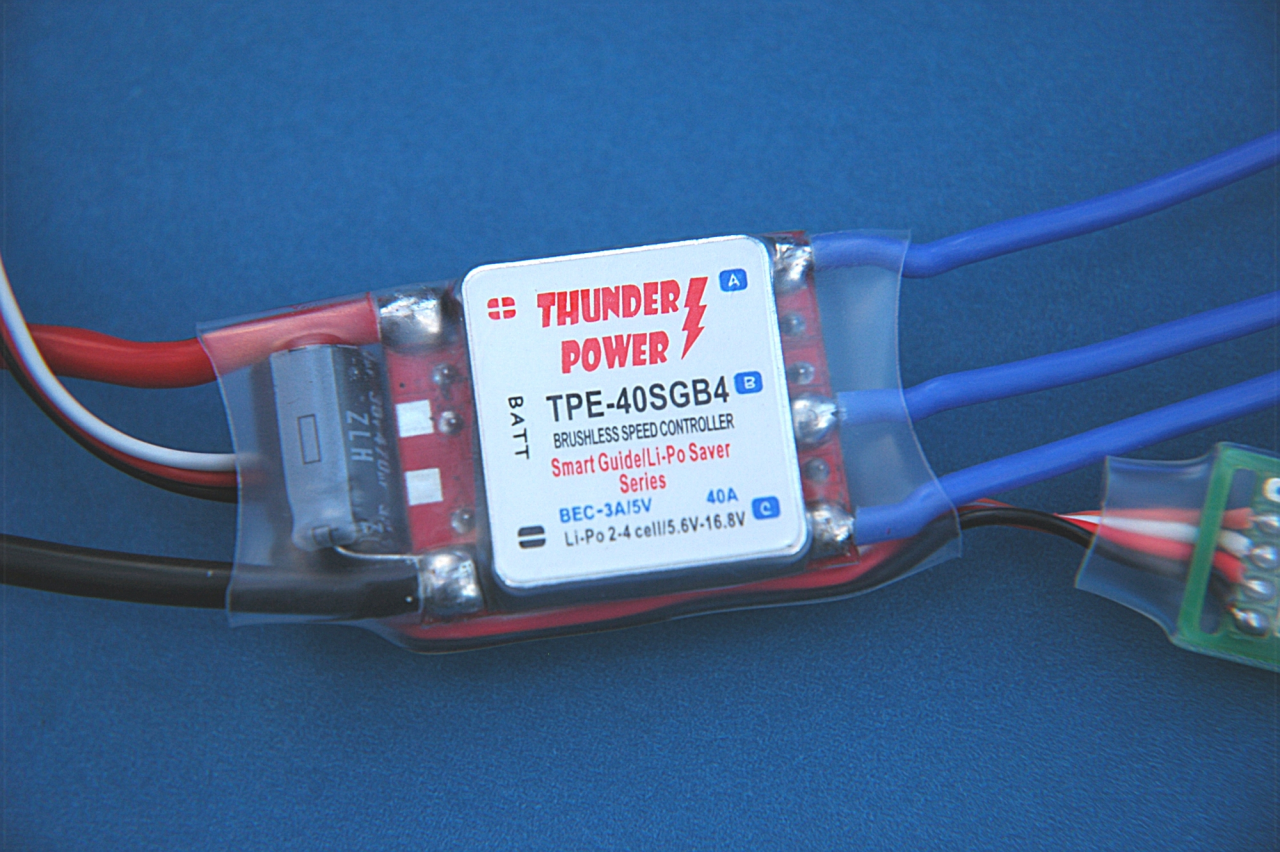
ImporTeknik, Alan Fry, 29 Braiswick, Colchester, Essex, CO4 5AU - Tel 01206 852209

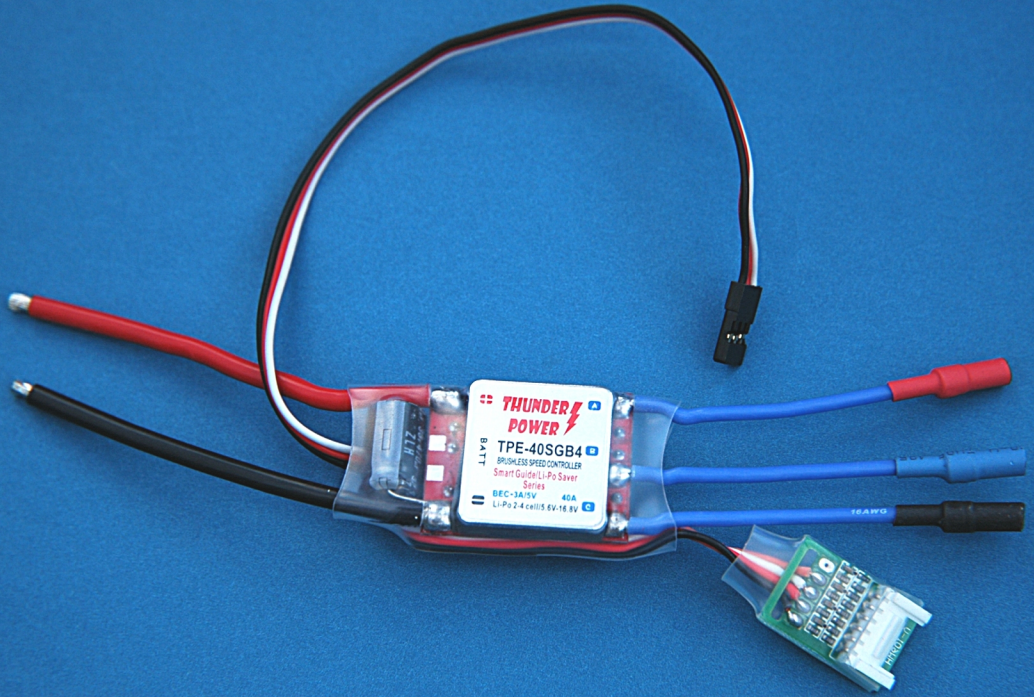
Photographs.

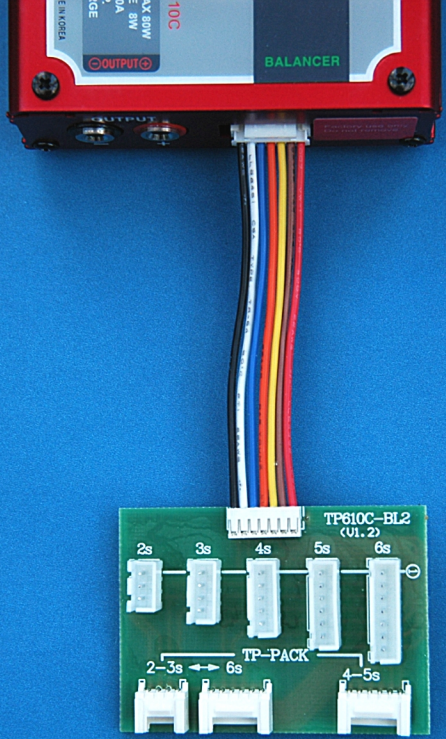
QEFI74-1	**The Thunder Power 610C charger/balancer.**
QEFI74-2	**The LCD screen and programming buttons of the TP610C.**
QEFI74-3	**The balancing lead/connector fitted to the TP610C.**
QEFI74-4	**Thunder Power TPE 40SGB4 Smartguide/LiPo Saver controller with BDMP connector**
QEFI74-5	**The labelled front face of the 40SGB4.**
QEFI74-6	**The Thunder Power eZ Programmer with connection pins (battery connector for OPT controllers.**
QEFI74-7	**The front face of the EZP-V1.10 with leds.**
QEFI74-8	**The Schulz Next Generation 6.30-5 Charger.**


1.Battery Type
Li-XX
Ni-XX
2.Cut Off Type
Soft-Cut
Cut-Off
3.Governor Mode
OFF
ON
4.Cut Off Voltage
Low
Middle
High
5.Start Mode
Normal
Soft
Very-Soft
6.Timing Mode
Low
Middle
High
7.Brake
Off
Soft
Hard
8.PWM Frequency
Low
Middle
High
Batt.
ESC
THUNDER POWER
RESET


THUNDER POWER
eZ Programmer
Model:EZP-V1.10

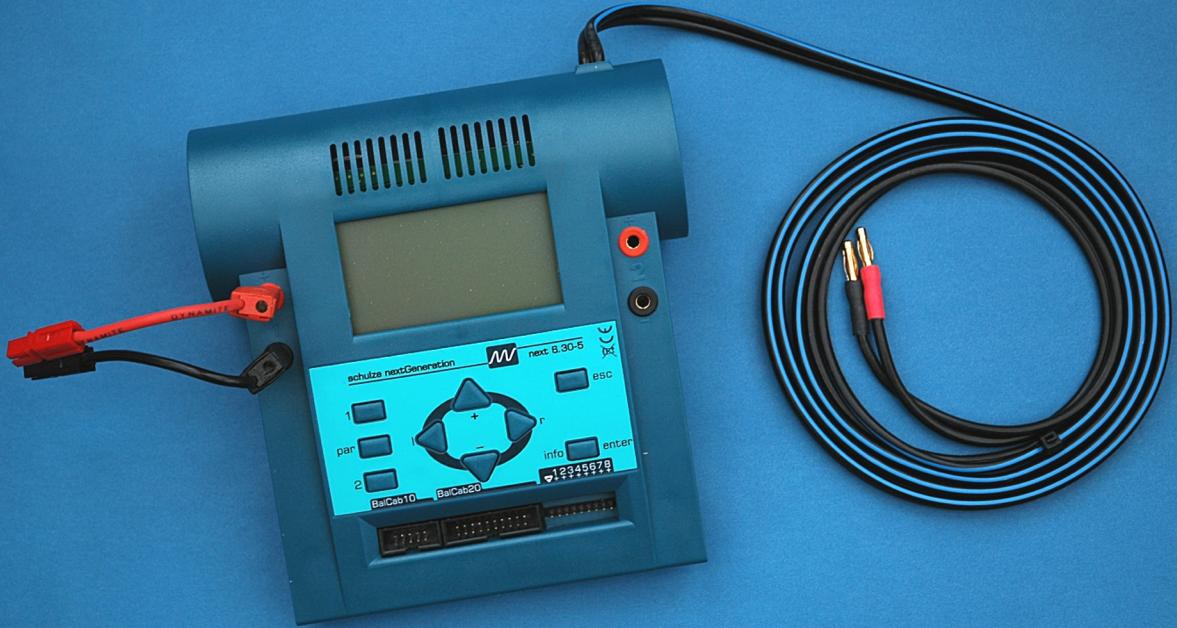

THUNDER POWER
A
TPE-40SGB4
B
BRUSHLESS SPEED CONTROLLER
Smart Guide/Li-Po Saver Series
BATT
BEC-3A/5V
40A
C
Li-Po 2-4 cell/5.6V-16.8V


THUNDER POWER
TPE-40SGB4
BRUSHLESS SPEED CONTROLLER
Smart Guide/Li-Po Saver Series
BEC-3A/5V
40A
Li-Po 2-4 cell/5.6V-16.8V
BATT
16AWG


BALANCER
OUTPUT
TP610C-BL2
(V1.2)
2s
3s
4s
5s
6s
TP-PACK
2-3s ↔ 6s
4-5s


Digital Balancer
Charger & Discharger
INPUT
11-18V DC
BALANCER
Digital Multi Function Display
THUNDER POWER RC
TP-610C
DATA
A123: 1-6CELL
LIPO: 1-6CELL
NiMh:1-14CELL
NiCd:1-14CELL
PB(SLA):6-24V
SEL
MODE
INC
DEC
ENT/
STOP
CHARGE MAX 80W
DISCHARGE 8W
MAX CHG 10A
AUTO TEMP.
SAFE CHARGE
OUTPUT
DIGITAL TECHNOLOGY POWER SYSTEM
MADE IN KOREA


Digital Balancer
Charger & Discharger
INPUT
11.1V/DC
BALANCER
Digital Multi-Function Display
TIJUNDER POWER RC
DATA
A123: 1-6CELL
LIPO: 1-6CELL
NiMh:1-14CELL
NiCd:1-14CELL
PB(SLA):6-24V
SEL MODE
INC
DEC
ENT/ STOP
TP-610C
CHARGE MAX 80W
DISCHARGE 8W
MAX CHG 10A
AUTO TEMP.
SAFE CHARGE
OUTPUT
DIGITAL TECHNOLOGY POWER SYSTEM
MADE IN KOREA


schulze nextGeneration
next 8.30-5
esc
1
par
2
info
enter
BalCab10
BalCab20