Operating Manual

PRODIGY680
TOUCH SCREEN AC/DC

Prodigy 680 Touch Screen AC/DC
Operating Manual

TABLE OF CONTENTS

1 Specifications

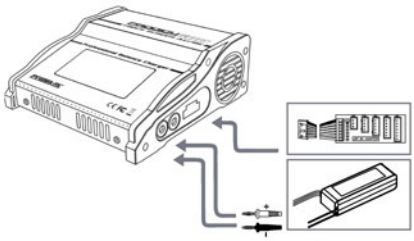
AC Input Voltage: 100V – 240V
DC Input Voltage: 11.0V – 18.0V
Charge Current Range: 0.1 – 8.0A
Discharge Current Range: 0.1 – 5.0A
Charge Power: Max. 80W
Discharge Power Limit: Max. 12W
Balance Tolerance: ±0.01V
Balance Current: Max. 300mA
NiCd/NiMH Battery Cell Count: 1 – 15 Cells
LiPo/LiFe/Li-Ion Cell Count: 1 - 6 Cells
Pb Battery Voltage: 2 – 20V
LiPo/LiFe/Li-Ion Discharge: 2.0 - 4.2V/Cell
Weight: 647g
Dimensions: 134x142x36mm

2 Connection

Connection Diagram in the Balance Charging/Storage/Discharge Mode

WARNING: Read the ENTIRE instruction manual to become familiar with the features of the product before operating.

WARNING: Never leave the charger unattended, exceed maximum charge rate, charge with non-approved batteries or charge batteries in the wrong mode. Failure to comply may result in excessive heat, fire and serious injury.

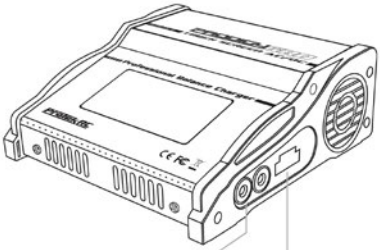


CAUTION: Always ensure the battery you are charging meets the specifications of this charger and that the charger settings are correct. Not doing so can result in excessive heat and other related product malfunctions, which can lead to user injury or property damage.

3 Exterior

DC Input Voltage; range: 11-18.0V

Temperature Sensor (optional): Connect the optional temperature probe to measure battery temperature.



USB Connection: Connect the charger and PC together via the USB cable; FOR FIRMWARE UPDATES AND PC MONITORING ONLY!

Output Port: Connect the battery to be charged to the 4.0mm ports using the supplied charge wires. Caution: be careful with the polarity!

Balancer Connector: High-performance integrated LiXX balancer for 2S to 6S packs using an XHS balancing connector.

CAUTION: Each time you power on the charger make sure there are no batteries connected; if a battery is connected when the charger is powered on, damage to the charger and the battery can result!

1 Connect the charger to a power source.

2 Make program selections in the charger for battery charging.

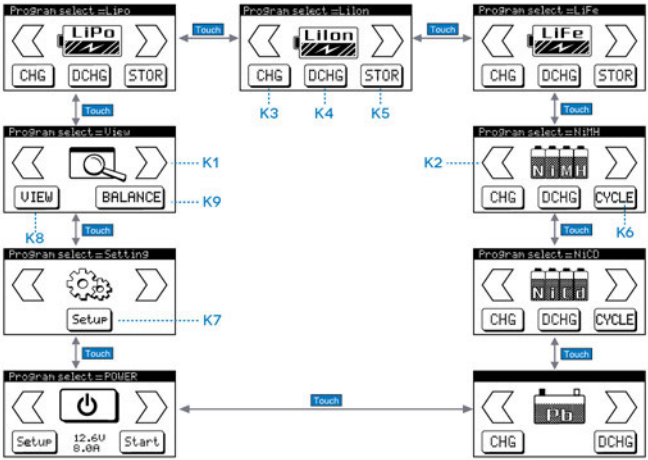
3 Connect balance adapters to charger.

4 Connect battery to charger connectors (connect charging connectors before balancing connectors, when used).

5 Start battery charging.

4 Main Screen

After powering on the charger the main menu will be displayed. Use the arrow keys to scroll through the LiPo, Li-Ion, LiFe, NiMH, NiCd, Pb, Digital Power, Setup and Data View functions.



K1: Select the battery type or program

K2: Select the battery type or program

K3: Enter into the charging setup menu

K4: Enter into the discharging setup menu

K5: Enter into the storage setup menu

K6: Enter into the cycle mode

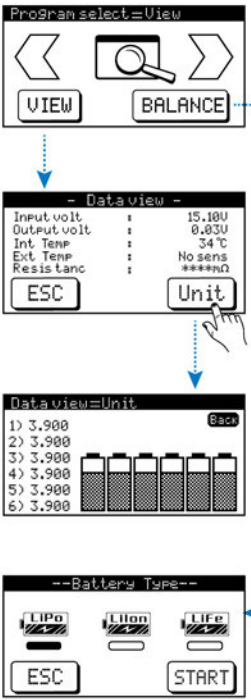
K7: Enter into the advanced setup mode

K8: Enter into the data view mode

K9: Enter into the balance mode

5 Data View

With the Data View feature you can check input and output voltage, individual cell voltage, internal resistance of the battery pack and the internal and external temperature of the charger.



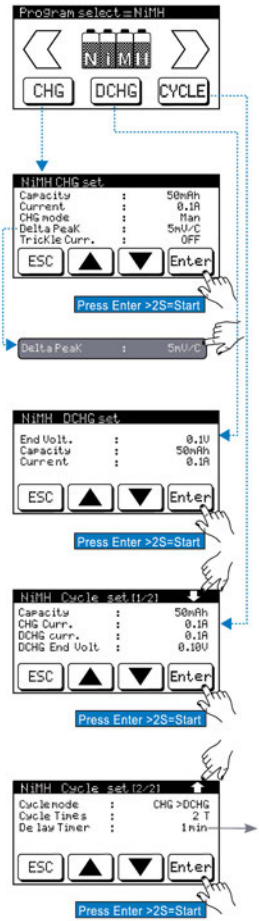
Tips: When you press the "VIEW" button the charger will perform a resistance measurement only once. Please make sure you've connected the battery to the output port of the charger.

You can use the balance function to balance the individual cells of a Lithium battery pack.

Press "Balance," then choose the correct battery type. Press the "START" button to start the balancing function.

Please be sure to carefully check the battery type you wish to balance and setup the charger accordingly. Failure to do so may damage the battery!

6 NiMH/NiCd Battery Programming



Tip: If the voltage of the charging battery is lower than 2.5V, ΔV (delta-peak) may not be perceived, this will cause a danger of discharging the battery. You can connect a temperature sensor or use a charge current above 1C to avoid it.

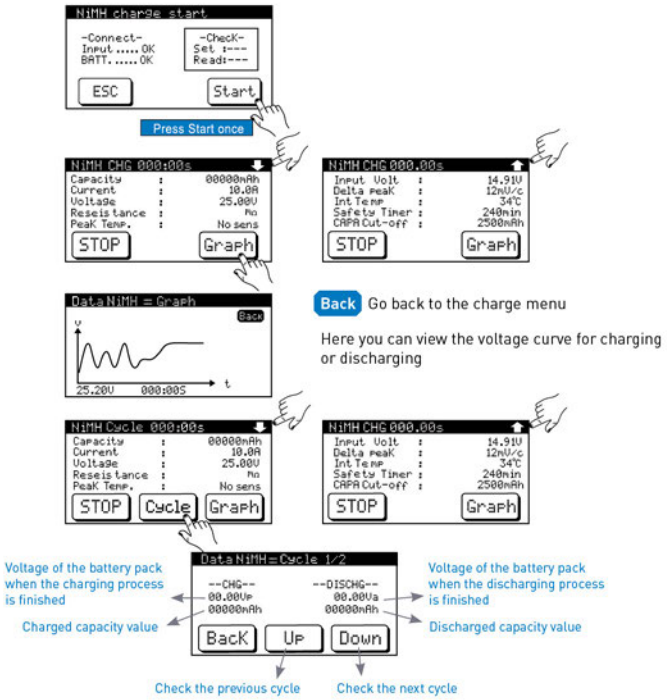
Charge Modes (Automatic & Manual): The default mode is "Man" (Manual). In "Man" mode, the charger will deliver only the programmed amperage (charge current) to the battery. In "Aut" (automatic) mode the charger will choose the best amperage for the battery throughout the charge process. Important: Because some batteries of low impedance and low capacity can cause the processor to "over charge" the battery, you need to set the maximum charge current the charger will charge up to; charging at too high of an amp rate may damage the battery!

The trigger voltage for automatic charge termination of NiMH and NiCd batteries (Δ V) has an effective value range from 5 to 20mV per cell. If ΔV is set too high there is a danger of overcharging the battery; if it is set too low, there is a possibility of premature termination. Please refer to the technical specifications of the battery (NiCd: 12mV, NiMH: 7mV).

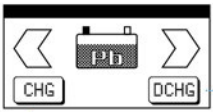
Discharge Mode. The discharge current ranges from 0.1A to 5.0A and the final voltage ranges from 0.1 to 24.0V (the operating method is similar to the Lithium process). The final voltage of a NiMH battery is 1.0V/cell, and the NiCd is 0.85V/cell. Please refer to what is recommended by the battery manufacturer.

Cycle Mode. The Prodigy 680 can perform 1-5 cycles of DCHG→CHG or CHG→DCHG continually. You can select this mode to cycle a brand new NiXX battery, to perform battery maintenance or for long-term storage. Please be careful and set up the parameters correctly or battery damage can occur!

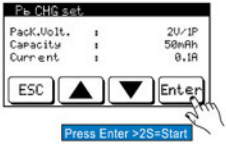
When NiMH or NiCd batteries are run through a cycle process, they can become warm. To counter this, the Prodigy 680 can be programmed with a time delay allowing the battery to cool down before the next cycle begins. The value ranges from 1 to 60 minutes. If you are unsure of an adequate time, start with 10 minutes and adjust from there.


NiMH charge start
-Connect-
Input ..... OK
BATT. ..... OK
-Check-
Set :---
Read:---
ESC
Start
Press Start once
NiMH CHG 000:00s
Capacity : 00000mAh
Current : 10.0A
Voltage : 25.00V
Reseistance : No
PeaK Temp. : No sens
STOP
Graph
NiMH CHG 000.00s
Input Volt : 14.91V
Delta peaK : 12mV/c
Int Temp : 34°C
Safety Timer : 240min
CAPA Cut-off : 2500mAh
STOP
Graph
Data NiMH = Graph
Back
V
t
25.20V
000:00S
Back
Go back to the charge menu
Here you can view the voltage curve for charging or discharging
NiMH Cycle 000:00s
Capacity : 00000mAh
Current : 10.0A
Voltage : 25.00V
Reseistance : No
PeaK Temp. : No sens
STOP
Cycle
Graph
NiMH CHG 000.00s
Input Volt : 14.91V
Delta peaK : 12mV/c
Int Temp : 34°C
Safety Timer : 240min
CAPA Cut-off : 2500mAh
STOP
Graph
Data NiMH=Cycle 1/2
--CHG--
00.00Vp
00000mAh
--DISCHG--
00.00Va
00000mAh
BacK
Up
Down
Voltage of the battery pack when the charging process is finished
Charged capacity value
Voltage of the battery pack when the discharging process is finished
Discharged capacity value
Check the previous cycle
Check the next cycle

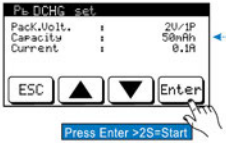
7 Pb Battery Programming



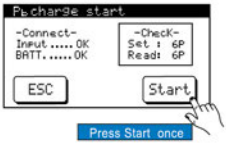
This is the program for charging a Pb (Lead Acid) battery with a nominal voltage from 2 to 20V. Pb batteries cannot be charged rapidly. They can only receive relatively lower current compared to their capacity; the optimal charge current will be 1/10th of their capacity. Please always follow the instructions supplied by the manufacturer of the battery.



Charging Mode. Set up the charge current, voltage and capacity in the settings interface. The charge current ranges from 0.1-8.0A and the voltage should be matched with the battery being charged. Start the charge process by pressing the "ENTER" key for more than 2 seconds.

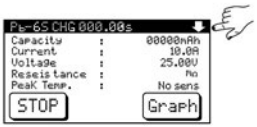


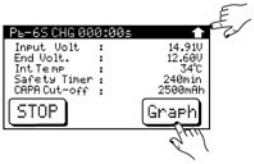
Discharging Mode. Set up the discharge current, voltage and capacity in the settings interface. The discharge current ranges from 0.1-5.0A and the voltage should be matched with the battery being discharged. Start the discharge process by pressing the "ENTER" key for more than 2 seconds.

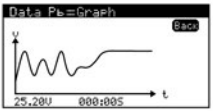


This screen shows the state of the charging/ discharging process. To stop the process press the "ESC" key once.

7 Pb Battery Programming (cont...)

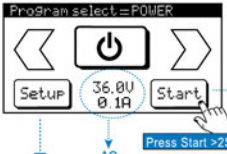




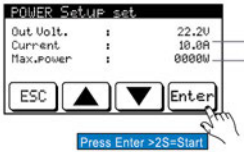


8 Digital Power Programming

In this mode the charger can provide an output power of 3.0V-24V DC for other electronic equipment.

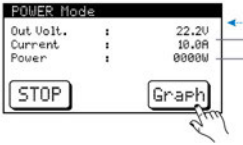


AO: The Digital Power menu displays the parameters which were set during the last usage. If you do not need to modify the settings, press the START button for more than two seconds, otherwise hit the "Setup" button.



Set the maximum output current

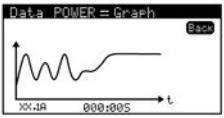
Set the maximum output power



This displays the real-time output current

This displays the real-time output power

Press the "GRAPH" key to view the current curve

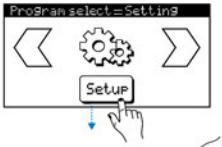


To stop the program, press "BACK" to go to the previous interface and press the "Stop" button.

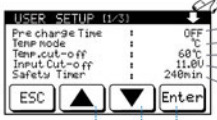
9 Initial Parameter Setup

Tip: Please program the "User Setup" menu before operating the charger for the first time.

This charger can recognize the cell count of a Lithium battery automatically. But if the battery voltage is lower than the lowest safety voltage, the charger will not start the charge process. Luckily, the charger has a precharge function to restore the battery. You can set the restore time (normally off) in the menu. The precharge program will then start up in the low voltage battery scenario. A higher capacity battery will need more time than a lower capacity battery.



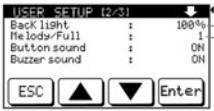
Attention: In the normal charge mode, you need to turn off the precharge process. DO NOT use this function unless you know the battery status very well. If the battery voltage increase very little, please stop the precharge process immediately or it can cause damage!



OFF: 10min
°C/F
20°C~80°C (68°F~176°F)
11.0V~15.0V
1~720 min

S1: Dec./Up **S2:** Inc./Down **S3:** Select/Enter

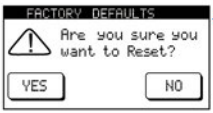
Press here to check other settings



0~100% (LCD brightness adjustment)
1-5 (different melodies)

DEL

You can program a user name and other information here. Once the charger is powered on, the name will be displayed for a few seconds.



You can restore all the settings to the factory default here.

Please **DO NOT** use this function unless you are sure that you need the factory reset.

10 Warning & Error Messages

The Prodigy 680 is protected against faults and operator errors by the Multi-Protection-System. Faults and errors are displayed on the LCD screen and they interrupt the active process to protect the unit and the battery.

The output is connected to a battery with incorrect polarity

Not connected or connection interruption

Output short circuits

Input voltage error, below or over the limit 11-18V

Charger failure

Total voltage too low

Total voltage too high

Individual cell voltage too low

Individual cell voltage too high

Balance port connection error

Charger overheating

Power exceeds the limit in the digital power mode

Current exceeds the setting in the digital power mode

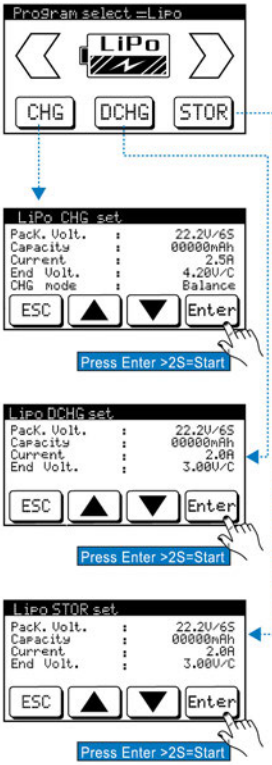
Exceed the maximum safe time limit

Exceed the maximum capacity limit

External temperature too high

11 Lithium Battery Programming

The Prodigy 680 Touch Screen Charger can accept three types of Lithium batteries: LiPo, Li-Ion and LiFe. Be sure to check your type of battery carefully for proper parameter setup; failure to do so may damage the battery and possibly cause it to explode!



Notice: The charger will set the charge current according to a rate of 1C automatically when you set the capacity of the battery pack. If you wish to set the current higher you can do so manually (be sure to check the battery manufacturer's specifications to ensure the battery can handle a charge rate higher than 1C!).

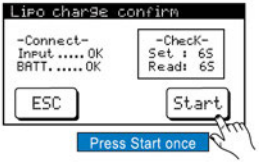
There are 3 modes for Lithium battery charging: Auto mode, Balance mode and Fast mode.

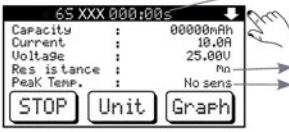
To start a charge/discharge process, press the "ENTER" touch key for more than 2 seconds (be sure all the program parameters are set correctly!).

Discharge Mode. Theoretically, Lithium batteries do not need to discharge, especially a deep-discharge. To ensure the battery discharges evenly - without overly discharging one of the individual cells - connect the balance plug of the battery to the charger; you can set the discharge cut-off voltage to 3.0V-4.0V.

Storage Mode. This mode will put the Lithium battery into a storage state, and is best for when the battery will not be used for the time being. The charger performs this mode by either charging or discharging the battery until the battery contains around 40% of its power; the final voltage vary depending on the battery type: Li-Ion: 3.75V, LiPo: 3.85V and LiFe: 3.3V. The charger software is very sophisticated and will know whether the battery needs to be charged or discharged, and will do so automatically as long as the battery balance plug is plugged into the chargers balance port.

The "LiXX charge confirm" screen shows the number of cells you setup and what the processor detects. "Set" is the number of cells selected by you on the previous menu and "Read" shows the number of cells found by the charger. If both numbers are identical you can start charging by pressing the "START" button. If not, press the "ESC" button to go back to the previous menu, and then carefully check the number of cells of the battery pack to charge again.

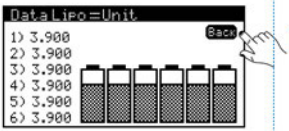




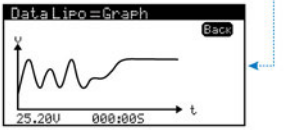
Records the elapsed time of the charging/ discharging process

Internal resistance of the battery pack

Peak temperature measured by the temperature sensor



Back Go back to the charge menu



Here you can view the voltage curve for charging or discharging

12 After-Sale Service & Guarantee

Thank you for purchasing the ProTek R/C "Prodigy 680 AC" Touch Screen AC/DC Battery Charger. We will do our best to provide you with comprehensive after sale service and protect your rights and interests.

ProTek R/C guarantees this item to be free of defects in materials and workmanship for one (1) year after original purchase date. The warranty only applies to material or operational defects that are present at the time of purchase; ProTek R/C reserves the right to repair or replace the item. Warranty will not cover items that have been modified, disassembled, or otherwise misused according to the item's instructions. Proof of purchase is required to submit a warranty claim. ProTek R/C is not responsible for bodily injury and/or property damage that may occur from the use of, or caused by, this item.

13 Safety Messages

IMPORTANT:

1. Do not cover the charger during use.
2. Do not use or store in an environment below 41°F (5°C) or above 122° (50°C).
3. Use the charger carefully and do not operate it in a wet or corrosive environment.
4. Do not drop, strike, or shake the charger, and do not place heavy items on the charger.
5. Never disassemble the charger.
6. Keep the charger away from children and pets at all times.
7. Never leave a battery in your model while charging
8. Never leave power supply, charger or battery unattended during charging
9. Never exceed maximum charge rate
10. Never charge with incompatible batteries
11. Never charge batteries in wrong mode
12. Never over discharge a Lithium battery
13. Never charge a damaged or swollen battery
14. Never charge near or on flammable materials
15. Always ensure proper polarity of plugs
16. Always balance charge a LiPo battery
17. Always use a LiPo charging bag
18. Always use a LiPo specific charger to charge a LiPo (NiMH or NiCd only chargers WILL NOT WORK!)

Warning: This product contains chemicals known to the State of California to cause cancer, birth defects or other reproductive harm.

THIS PRODUCT IS NOT A TOY! NOT FOR CHILDREN UNDER 14 YEARS.
For proper operation and to avoid risk of damage and injury, read and follow all instructions before operating this product. Failure to comply may result in excessive heat, fire, property damage and serious injury.

Compliance Information for the European Union

Declaration of Conformity

CE

Product(s): ProTek R/C "Prodigy 680 AC" Touch Screen AC/DC Battery Charger
Item Number(s): PTK-8513

The object of declaration described above is in conformity with the requirements of the specifications listed below, following the provision of the European EMC Directive 2004/108/EC

EN 55014-1:2006
EN 55014-2:1997+A1:2001
EN 61000-3-2:2006
EN 61000-3-3:2008

Instructions for disposal of WEEE by users in the European Union

This product must not be disposed of with other waste. Instead, it is the user's responsibility to dispose of their waste equipment by handing it over to a designated collections point for the recycling of waste electrical and electronic equipment. The separate collection and recycling of your waste equipment at the time of disposal will help to conserve natural resources and ensure that it is recycled in a manner that protects human health and the environment.