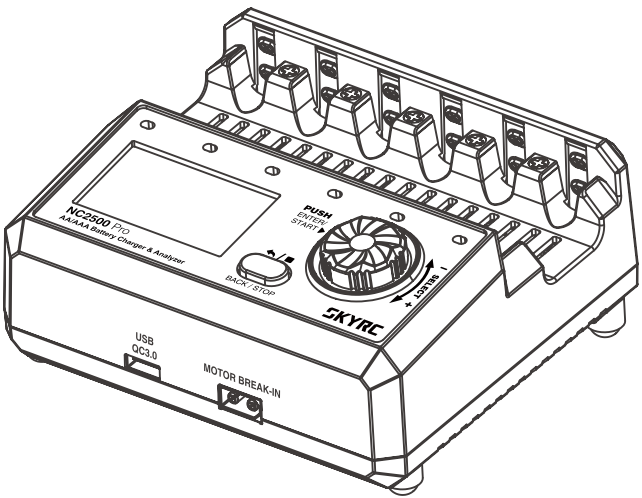
NC2500 Pro

AA/AAA NiMH/NiCD Charger & Analyzer

Instruction Manual



SKYRC

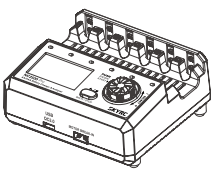
INSTRUCTION MANUAL

Congratulations on your choice of SkyRC NC2500 Pro Charger!

NC2500 Pro is a six-channel charger for AA/AAA NiMH/NiCD Batteries with four working modes of Charge, Discharge, Refresh and Break-in. You can set the proper working current based on different battery capacities, and the current is adjustable, ranging from 0.1A to 2.5A.

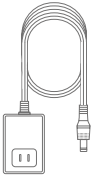
With the wide-viewing LCD screen, NC2500 Pro displays current, capacity, voltage, elapsed time, and working mode at a glance. NC2500 Pro features battery internal resistance detection, QC3.0, motor run-in, and the firmware is upgradable.

IN THE BOX



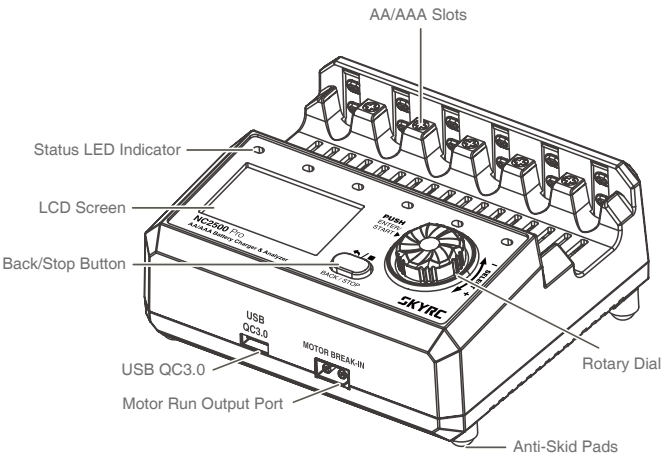
NC2500 Pro Charger *1

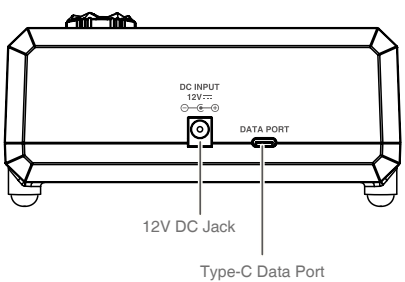
Manual *1



12V/ 3A Adapter *1

MEET SKYRC NC2500 PRO





PRECAUTIONS

- Never charge batteries other than NiMH or NiCD. Please read the battery's manual to ensure it can accept the programmed charge/discharge rates.
- Never expose the unit to rain or moisture to avoid fire.
- Never use the charger if it appears damaged.
- Do place the battery with a positive terminal facing the top. Wrong polarity may cause fire or explosion.
- Do not allow the unit to expose to direct sunlight. Operate in a well-ventilated area. Do not place the charger on the carpet.
- Never allow the battery terminals to become shorted.
- Please use the standard AC adaptor included in the package.
- The batteries may become hot during charging/discharging(especially at a high chosen current).
- Please use caution while removing batteries after charging/discharging.
- Remove all the batteries while not in use.

FEATURES

- Four working modes of Charge, Discharge, Refresh and Break-In.
- Step charge mode to set the proper current for each charging step.
- Adjust current automatically based on the detected battery resistance
- Six independent slots to charge six cells simultaneously.
- Six LED indicators make working status intuitive.
- Set up once, applied to all of the six ports.
- Intuitive interface with independent display for each slot.
- Information at a glance: Current, Voltage, Capacity, Elapsed time, and Working mode.

- Motor run-in.
- Experience a faster charge with USB QC3.0.
- Easy operation with the rotary dial.
- Reverse polarity prevention
- Firmware upgradable.

SPECIFICATION

CHARGE

- Input Power: DC 12V ⎓ 3A
- Battery Type: NiMH/NiCD
- Battery Size: AA/AAA
- Charge Rate: 0.1-2.5A
- Discharge Rate: 0.1-1.5A
- Discharge Cut-off Voltage: 0.8-1.0V Adjustable
- USB Output: QC3.0 5V ⎓ 3A, 9V ⎓ 2A,18W Max
- -△V: 1-8mV Adjustable
- Trickle Current: 30-99mA/OFF
- Over Temperature Protection: 55-65°F/131-149°F Adjustable
- Net Weight: 600g
- Size: 148x135x65mm

MOTOR RUN-IN

- Voltage: 0.5-6V
- Current Limiting: 0.1-2A
- Motor Run-in Direction: Auto/ Forward/ Reverse
- Time: 1-60Min Adjustable

CHARGING CURRENT AUTOMATIC ADJUSTED

The internal resistance of the battery usually increases as it is used. When the battery is used for a long time, its internal resistance will increase. The internal resistance consumes part of the electric energy during charging and causes the battery to heat up simultaneously.

We deploy an innovative FlexiPulse algorithm for internal resistance detection. Once a high internal resistance is detected, the charge current will automatically decrease to reduce the overall heating to protect the battery.

Note:

Please use the Refresh mode when determining the battery capacity.

Battery IR(Internal Resistance)	Charge Rate
30mΩ<IR≤60mΩ	Limited to 1.5A
60mΩ<IR≤90mΩ	Limited to 800mA
90mΩ<IR	Limited to 400mA

BATTERY KNOWLEDGE

What is the Meaning of “mAh” on Rechargeable Batteries?

mAh means milliamp Hour and is a unit that measures (electric) power over time. It is commonly used to measure the energy capacity of a battery. In general, the more **mAh** and the longer the battery capacity or battery life.

Battery Capacity **mAh** (milliampere/hour) = discharge (milliampere) x discharging time (hour)

For example, if you insert a 2400mAh battery into an appliance that consumes 50 milliampere current continuously, the operating time will be around 48 hours.

What is the "C" of a Battery?

“C” stands for the battery capacity, and the number preceding it is the fraction of the battery capacity. For example, 0.3C means 0.3 times the capacity for the battery. For a 2400mAh battery, 0.3C would be 0.3 x 2400mAh = 720mA.

Choose the Right Charge & Discharge Rate.

Charge at a rate lower than 0.3C and higher than 1.0C is not recommended. Charging too slow may affect the charger termination properly. Charging too fast may cause the battery to overheat and shorten its lifespan.

Generally speaking, a lower charging rate can prolong the battery lifespan while charging time will be longer. A higher charging rate makes charging fast but with the battery heat-up, which will shorten its lifespan.

Discharge at a rate above 1.0C is not recommended.

Charge/Discharge Rate Reference

AAA Batteries

Battery Capacity(mAh)	Charge Rate(mA)	Discharge Rate(mA)
700	700	350
800	800	400
900	900	450
1000	1000	500
1100	1100	550
1200	1200	600

AA Batteries

Battery Capacity(mAh)	Charge Rate(mA)	Discharge Rate(mA)
1800	1800	900
2200	2200	1100
2400	2400	1200
2600	2500	1250
2700	2500	1300

Battery Matching

Most electronic devices usually require two or more batteries to be used together. In this circumstance, the worst battery will limit the device's overall performance.

Battery matching means grouping batteries by a similar capacity to maximize efficiency. Detect the battery capacity with the Refresh mode to group batteries easily.

■ **Battery Formatting**

New batteries and those stored for more than three months become chemically deactivated. With BREAK-IN mode, NC2500 Pro will charge & discharge the battery with a small charge and discharge rate in a charge-discharge-charge sequence. This process may need to repeat two or three times for complete formatting.

FOUR WORKING MODES

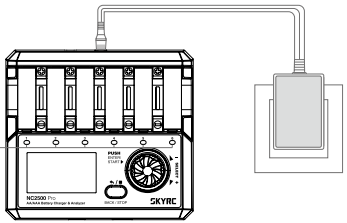
This charger comes with four working modes, each of which will be used under the different situations as below.

Mode	Scenario
CHARGE	Charge the battery with a programmable charge rate.
DISCHARGE	Discharge the battery with a programmable discharge rate.
REFRESH	Determine the battery's performance based on the actual capacity it can hold. It's applicable for batteries stored for more than two weeks and less than three months or for batteries that are not performing well.
BREAK-IN	Applicable for new batteries and those stored for more than three months. The BREAK-IN mode is to activate the battery with a small charge and discharge rate in a charge-discharge-charge sequence.

POWER ON

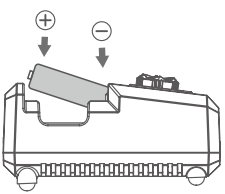
Ensure there are no batteries inside the slots before powering. Plug the DC jack into the charger and plug the adaptor into the wall socket. The LED indicators light up in red-green sequentially and then turn off.

* light up in red-green sequentially and then turn off.

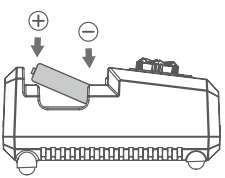


INSERT AA/AAA BATTERIES

Note: When inserting the battery, insert the negative terminal first, as shown in the picture below. The LED indicator will light in solid orange. Please check the battery connection if the LED indicator does not light up.



Inserting AA Batteries



Inserting AAA Batteries

WORKING MODES

CHARGE MODE

- Please refer to the BATTERY KNOWLEDGE to select an appropriate rate to charge the battery.
- Suitable for batteries that need to be recharged without determining the capacity. Applicable for charging the batteries in a good performance and continuous use.

1. Insert the batteries into the slots. The LED indicator light solid orange means the battery is in good contact with the charger. Otherwise, recheck the battery connection.
2. Rotate the knob, move the cursor to CHARGE, short-press the ENTER key to set the charging parameters.
3. Rotate the knob, move the cursor to CURRENT, short-press the ENTER key, rotate the knob to set the proper charge current when the CURRENT value is blinking. Then short-press the ENTER key again to confirm.
4. Rotate the knob, move the cursor to DELTA PEAK, short-press the ENTER key, rotate the knob to set the proper delta peak value when the DELTA PEAK value is blinking. Then short-press the ENTER key again to confirm.

   **When NC2500 Pro detects the DELTA PEAK value reaches the set value, the charger will determine that the battery is fully charged.*

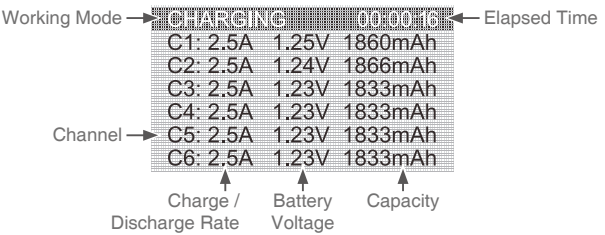
5. Rotate the knob, move the cursor to TIMER, short-press the ENTER key, rotate the knob to set the proper TIMER value when the TIMER value is blinking. Then short-press the ENTER key again to confirm.

   **To prevent the battery from being overcharged due to the failure of the charger, the charger will stop when the charging time exceeds the set TIMER value.*

6. Rotate the knob, move the cursor to TRICKLE CHARGE, short-press the ENTER key, rotate the knob to set the proper trickle charge current when the TRICKLE CHARGE value is blinking. Then short-press the ENTER key again to confirm.
7. Rotate the knob, move the cursor to STEP CHARGE, short press the ENTER key, rotate the knob to turn on Step Charge when OFF is blinking. Then short-press the ENTER key again to confirm.

   **SETP CHARGE mode default to be OFF. It supports up to three stages of charging. Users can set each stage of charging according to the battery capacity, which helps to prolong battery life. This mode requires users to have more professional battery knowledge, use it with caution.*

8. When all parameters are set, rotate the knob, move the cursor to START, and short press the ENTER key to start charging.



9. The LED indicator will be pulsing in GREEN during the charging process.
10. The LED indicator will be solid GREEN once the charging process is completed.

DISCHARGE MODE

- Please refer to BATTERY KNOWLEDGE to select an appropriate rate to discharge the batteries.

To start the DISCHARGE mode.

1. Insert the batteries into the slots. The LED light is in solid orange, indicating the battery is in good contact with the charger. Otherwise, recheck the battery connection.
2. Rotate the knob, move the cursor to DISCHARGE, short-press the ENTER key to set the discharging parameters.
3. Rotate the knob, move the cursor to CURRENT, short-press the ENTER key, rotate the knob to set the proper discharge current when the CURRENT value is blinking. Then short-press the ENTER key again to confirm.
4. Rotate the knob, move the cursor to CUT OFF, short-press the ENTER key, rotate the knob to set the proper cut-off voltage when the CUT OFF value is blinking. Then short-press the ENTER key again to confirm.
5. Rotate the knob, move the cursor to START, short press the ENTER key to start discharging.
6. The LED indicator will be pulsing in RED during discharging.
7. The LED indicator will be solid GREEN once discharging is completed.

REFRESH MODE

- To determine the battery performance based on the capacity it can hold after a charge, discharge, and charge cycle, please refer to the BATTERY KNOWLEDGE to select an appropriate rate.
- View the actual amount charged in the final cycle on the charger.

- Applicable for charging batteries in poor performance. Also suitable for batteries that need to determine the capacity.

To start the REFRESH mode.

1. Insert the batteries into the slots. The LEDs are solid orange indicating the battery is in good contact with the charger. Otherwise, recheck the battery connection.
2. Rotate the knob, move the cursor to REFRESH, short-press the ENTER key to set the parameters.
3. Rotate the knob, move the cursor to CHARGE, short-press the ENTER key, rotate the knob to select the proper charge current when the CHARGE value is blinking. Then short-press the ENTER key again to confirm.
4. Rotate the knob, move the cursor to DISCHARGE, short-press the ENTER key, rotate the knob to select the proper discharge rate when the DISCHARGE value is blinking. Then short-press the ENTER key again to confirm.
5. Rotate the knob, move the cursor to REST TIME, short-press the ENTER key, rotate the knob to set the proper rest time when the REST TIME value is blinking. Then short-press the ENTER key again to confirm.
6. Rotate the knob, move the cursor to CYCLE, short-press the ENTER key, rotate the knob to select the proper cycle times when the CYCLE value is blinking. Then short-press the ENTER key again to confirm.
7. Rotate the knob, move the cursor to START, short press the ENTER key to start refreshing.
8. The LED indicator will be pulsing in GREEN during the charging process and pulsing in RED during discharging.
9. The LED indicator will be solid green when the process is completed.

BREAK-IN MODE

- Charge the batteries at 0.1C(0.1*battery capacity) for 16 hours and rest for 1 hour. Then, fully discharge the batteries at 0.2C and rest for 1 hour again. Finally, charge the batteries at 0.1C for 16 hours again.
- BREAK-IN applies to the batteries which the REFRESH mode cannot rescue.
- The process takes 39-45 hours to complete.

To start the BREAK-IN mode.

1. Insert the batteries into the slots. The LED lights in solid orange, indicating the battery is in good contact with the charger. Otherwise, recheck the battery connection.
2. Rotate the knob, move the cursor to BREAK-IN, short-press the ENTER key to set the parameters.
3. Rotate the knob, move the cursor to CAPACITY, short-press theENTER key, rotate the knob to select the proper battery capacity when the CAPACITY value is blinking. Then short-press the ENTER key again to confirm. Then set the left five ports battery capacity one by one.
4. When all parameters are set, rotate the knob, move the cursor to START, and short press the ENTER key to start charging.
5. The LED indicator will be pulsing in GREEN during the charging process and pulsing in RED during discharging.
6. The LED indicator will be solid green when the process is completed.

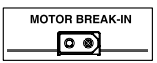
BATTERY METER

Insert the batteries into the slots. The LED lights in solid orange, indicating the battery is in good contact with the charger. Otherwise, recheck the battery connection.

Rotate the knob, move the cursor to BATTERY METER, short-press the ENTER key to check the battery voltage and internal resistance.

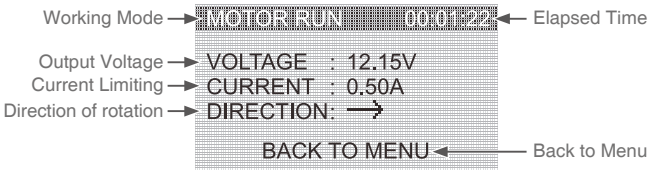
MOTOR RUN-IN MODE

1. Connect the motor to the MOTOR RUN-IN output port.



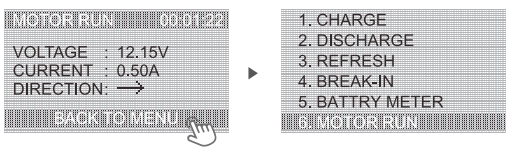
2. Rotate the knob, move the cursor to MOTOR RUN, short-press the ENTER key to set the parameter setting.
3. Rotate the knob, move the cursor to VOLTAGE, short-press the ENTER key, rotate the knob to select the proper output voltage when the VOLTAGE value is blinking. Then short-press the ENTER key again to confirm.
4. Rotate the knob, move the cursor to CURRENT LIMITING, short-press the ENTER key, rotate the knob to set the proper current limiting value when the CURRENT LIMITING value is blinking. Then short-press the ENTER key again to confirm.
5. Rotate the knob, move the cursor to DIRECTION, short-press the ENTER key, rotate the knob to select the motor rotation's direction when DIRECTION is blinking. Then short-press the ENTER key again to confirm.
6. Rotate the knob, move the cursor to TIME, short-press the ENTER key, rotate the knob to select the proper break run-in time when the TIME value is blinking. Then short-press the ENTER key again to confirm.

7. Rotate the knob, move the cursor to START, short press the ENTER key to start MOTOR RUN-IN.



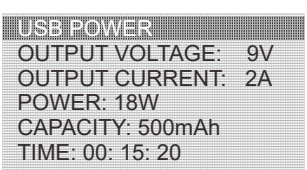
Note:

To keep the MOTOR RUN-IN working simultaneously with the main ports, you have to start MOTOR RUN first, then go back to the menu, start the charging or discharging process of the main ports.



USB POWER

NC2500 Pro charger supports QC3.0, and the maximum output power is 18W. It will start charging once connecting your device to the USB POWER port, and you can view the output voltage/current/power, charging capacity, and charging time through the USB POWER interface.



Note:

1. If the USB output cannot reach the maximum charge power, check whether your device supports the QC3.0 protocol.

2. This function is unusable during the NC2500 Pro charging process and available to use while discharging.

LED INDICATOR EXPLAINED

LED Indicator	Explanation
Orange	Stand by
Pulsing in GREEN	Charging
Pulsing in RED	Discharging
Solid Green	Complete
Blinking Red	Error

ERROR MESSAGES

Error Messages	Explanation
DC INPUT ERROR	Input Voltage too High or too Low
OVERLOAD	Motor Run-In Overload
OVERHEATING	Internal Temperature Too High
BATTERY ERROR	Battery Error

SYSTEM SETTING

Setting	Choice	Description
BACKLIGHT	ON/1-30Min	Sets the display backlight time.
KEY SOUND	ON/OFF	he beep or melody sounded at various times during operation.
TEMP. UNIT	°C/°F	You can choose the temperature displayed by Celsius or Fahrenheit as you like.
Temp.	55-65°C /131-149°F	When the charger temperature exceeds the set value, the working current will decrease automatically to reduce heat generation. If the temperature continues to rise, the process will terminate.
FIRMWARE UPDATE	/	Firmware update.
DEFAULT SETTING	/	Press and hold the ENTER key to load the factory setting.
SYSTEM INFO.	/	It shows the hardware version and firmware version.
LANGUSAGE	ENGLISH /JAPANESE	You can choose the intented language displayed in English or Japanese.

RESCUE BATTERIES

If the batteries are still not performing well after trying all the modes as in the manual, refer to the battery rescue steps below:

1. Use the REFRESH mode one to three times.
2. Change to BREAK-IN mode if the capacity is still low.
3. If step 2 can improve the battery capacity by more than 10%, please try BREAK-IN mode for another cycle as in step If there are no significant improvements and the actual battery capacity is less than 60% of its rated capacity. The battery would probably be at the end of its life and needs to be replaced.

LIABILITY EXCLUSION

This charger is designed and approved exclusively for use with the types of the battery stated in this Instruction Manual. SkyRC accepts no liability of any kind if the charger is used for any purpose other than that stated. We are unable to ensure that you follow the instructions supplied with the charger, and we have no control over the methods you employ for using, operating and maintaining the device. For this reason we are obliged to deny all liability for loss, damage or costs which are incurred due to the incompetent or incorrect use and operation of our products, or which are connected with such operation in any way. Unless otherwise prescribed by law, our obligation to pay compensation, regardless of the legal argument employed, is limited to the invoice value of those SkyRC products that were immediately and directly involved in the event in which the damage occurred.

WARRANTY AND SERVICE

We guarantee this product to be free of manufacturing and assembly defects for one year from the time of purchase. The warranty only applies to material or operational defects, which are present at the time of purchase. During that period, we will repair or replace free of service charge for products deemed defective due to those causes. This warranty is not valid for any damage or subsequent damage arising as a result of misuse, modification, or as a result of failure to observe the procedures outlined in this manual.

Note:

The warranty service is valid in China only.

If you need warranty service overseas, please contact your dealer in the first instance, who is responsible for processing guarantee claims overseas. Due to high shipping cost, complicated custom clearance procedures to send back to China. Please understand SkyRC can't provide warranty service to overseas end users directly. If you have any questions which are not mentioned in the manual, please feel free to send email to info@skyrc.com

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Latest version can be downloadedfrom www.skyrc.com

If you have any question about this document,please contact SkyRC by sending a message to info@skyrc.com

SKYRC

Manufactured by
SKYRC TECHNOLOGY CO., LTD.
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[Version 1.0]

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