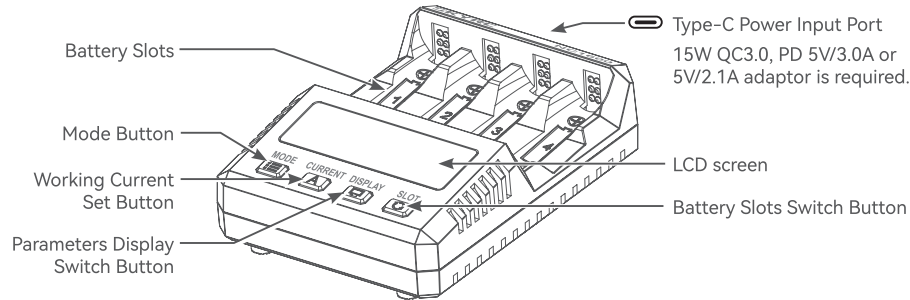# INSTRUCTION MANUAL

SKYRC

NC1600
AA/AAA NiMH/NiCD
Battery Charger & Analyzer

SK-100191
V1.0

INTRODUCTION

Thank you for purchasing SkyRC NC1600 AA/AAA NiMH/NiCD Battery Charger & Analyzer!

SkyRC NC1600 is specially designed for AA/AAA NiMH/NiCD batteries. It has four independent slots that can charge 4 batteries simultaneously. With the three working modes of CHARGE, DISCHARGE and REFRESH, it is capable of charging, discharging, and analyzing the batteries fastly. The charger is not only compatible with the ordinary 5V/2.1A adaptors but also with QC3.0 and PD 5V/3.0A adaptors. The charge rate can reach up to 1600mA at max. Equipped with the LCD screen, various battery parameters and real-time datas are all at a glance!

Battery Slots

Mode Button

Working Current
Set Button

Parameters Display
Switch Button

Type-C Power Input Port

15W QC3.0, PD 5V/3.0A or
5V/2.1A adaptor is required.

LCD screen

Battery Slots Switch Button

mA	Charge/Discharge Rate
V	Battery Voltage
mAh	Battery Capacity
h	Elapsed Time
mΩ	Battery Internal Resistance*

Value Display

Unit
(mA,V,mAh,h,mΩ)

Working Modes

REFRESHT CHARGE DISCHARGE (×4)

*At the start of a program, the device always performs a quick standard test first to determine the internal battery resistance. Aged or poor condition batteries have a higher IR and therefore heat up more during charge or discharge. The values are estimates and will vary depending on the state of the batteries and the operation environment.

FEATURES

- Four independent slots allow charging four cells simultaneously.
- Easy operation with four buttons.
- Intuitive interface with independent display for each slot.
- Working with both 15W QC3.0, PD 5V/3.0A, or 5V/2.1A adaptor.
- Battery parameters and real-time datas are all at a glance w/ LCD screen.
- Auto-measure internal resistance once the battery is inserted.

- Three working modes of CHARGE, DISCHARGE & REFRESH.
- Auto-start if no operation within eight seconds after the battery is inserted.
- Adjust current automatically based on the battery internal resistance detected.
- Trickle current ensure the battery is truely fully charged.
- Multiple protections: Over-temperature Protection, Reverse Polarity Protection, Over-current Protection, Capacity Protection, Over-voltage Protection, and Short-circuit Protection

CHOOSE THE RIGHT CHARGE & DISCHARGE RATE

It is not recommended to charge at a rate lower than 0.3C and higher than 1.0C. 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 smaller charging rate can prolong the battery lifespan while charging time will be longer. A larger charging rate makes charging fast but with the battery heat-up, which will shorten its lifespan.

It is not recommended to use a discharge rate above 1.0C.

THREE WORKING MODES

The charger has three working modes, each of which will be used under the different situations below.

Mode	Scenario
CHARGE	Charge the battery with a programmable charge rate of 100-1600mA
DISCHARGE	Discharge the battery with a programmable discharge rate of 100-700mA
REFRESH	Refresh and analyze mode is used to determine the battery's performance based on the actual discharged capacity. It's applicable for batteries stored for more than two weeks and less than three months, or for batteries that are not performing well.

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 when charging and causes the battery to heat up at the same time.

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

Note: Please use the Refresh mode when determining the battery capacity.

Battery Internal Resistance	Charge Rate
Great than 30mΩ	Limit to 1200mA
Great than 50mΩ	Limit to 800mA
Great than 80mΩ	Limit to 400mA
Great than 120mΩ	ERR

MANUALLY VIEW THE DISPLAYED INFO

When multiple slots are working, the charger allows switching between slots by pressing the SLOT button. Click the DISPLAY button to switch and view the specific slot's info.
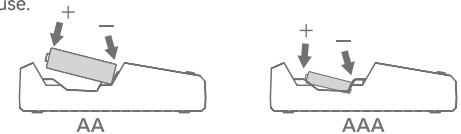
OPERATION

CHARGE Mode

- Charge the battery according to the selected charge rate.
- Useful when the battery needs to be recharged without determining the capacity. Applicable for charging the batteries in a good performance and continuous use.

To start the CHARGE mode:

1) Power the charger with the required adaptor.

2) Insert the batteries into the slots.

Note: Always insert the Negative(-) terminal FIRST as shown in the diagram. The setting interface will pop up for each slot based on the inserting sequence if more than one battery is inserted at a time.
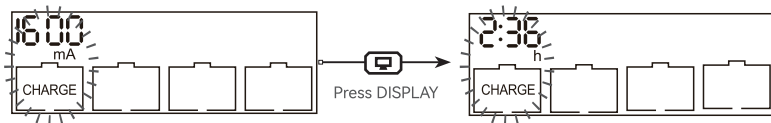
AA   AAA

3) Short-press to select the CHARGE mode.

800 mA REFRESH → Press MODE → 800 mA CHARGE
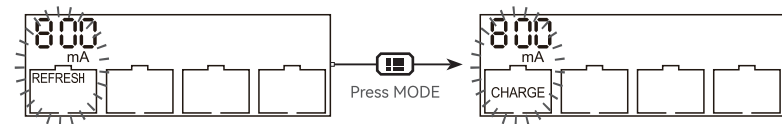
4) Short-press A to select the appropriate charge rate and the charger will start charging automatically in eight seconds.

800 mA CHARGE → Press CURRENT → 1600 mA CHARGE
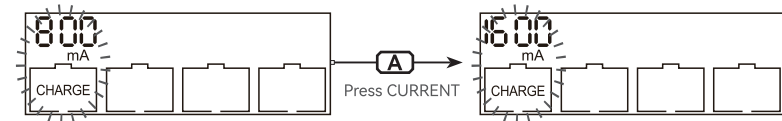
5) The real-time datas of charge rate, battery voltage, charged capacity, battery IR, and elapsed time can be viewed by pressing 🖥 once the charging process started.

6) The charger will display Full after charging is completed, the charge rate, battery voltage, charged capacity, battery IR, and elapsed time can be viewed by pressing 🖥 .

```
1600
  mA
CHARGE
```
Press DISPLAY →
```
2:38
   h
CHARGE
```

DISCHARGE Mode

- Discharge the battery according to the selected discharge rate.

To start the DISCHARGE mode:

1) Insert the batteries into the slots.

2) Short-press ▦ to select the DISCHARGE mode.

3) Short-press Ⓐ to select the appropriate discharge rate and the charger will start discharging automatically in eight seconds.

4) The real-time datas of discharge rate, battery voltage, discharged capacity, battery IR, and elapsed time can be viewed by pressing 🖥 once the discharging process started.

5) The charger will display End after discharging is completed, the discharge rate, battery voltage, discharged capacity, battery IR, and elapsed time can be viewed by pressing 🖥 .

```
End
DISCHARGE
```

REFRESH Mode

- To determine the battery performance based on the actual discharged capacity after a charge, discharge, and charge cycle with the selected working rate.
- Applicable to those batteries not performing well and determine the actual capacity of the battery.

The process of the REFRESH mode is as follows

- Charge and then rest for 1 hour.
- Discharge and then rest for 1 hour
- Charge until fully charged

To start the REFRESH mode:

1) Insert the batteries into the slots.

2) Short-press ▦ to select the REFRESH mode.

3) Short-press Ⓐ to select the appropriate charge rate and the charger will start working automatically in eight seconds. The discharge rate will be set to a half of the charge rate then.

4) The real-time datas of working rate, battery voltage, charged/discharged capacity, battery IR, and elapsed time can be viewed by pressing 🖥 once the working process is started.

When the CHARGE process finishes, the slot will rest for an hour and displays as shown on the right:
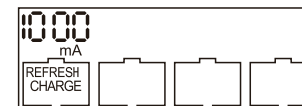```
0:36
   h
REST
```
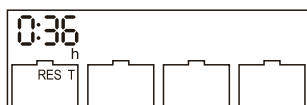
Starts DISCHARGE routine after resting for 1 hour. Displays as shown on the right:
```
500
  mA
REFRESH
DISCHARGE
```
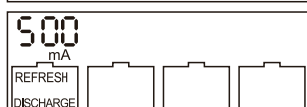
Rests for another hour after the DISCHARGE process has finished. Displays as shown on the right:
```
0:36
   h
REST
```

Recharges the battery to Full after resting for 1 hour. Displays as shown on the right:
```
1000
   mA
REFRESH
CHARGE
```

5) Displays Full when the REFRESH process has finished, working rate, battery voltage, discharged capacity, battery IR and elapsed time can be viewed by pressing 🖥 .
```
Full
REFRESH
```
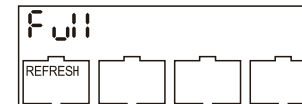
BATTERY IR MEASUREMENT

To ensure safety, the charger performs a battery internal resistance check at the beginning of the program. If the internal resistance detected is great than 120mΩ, ERR would be displayed and program will be terminated. Usually, the aged or poor batteries will fail this test.

SPECIFICATIONS

Input Power: 15W QC3.0, PD 5V/3.0A or 5V/2.1A

Battery Type: NiMH/NiCD

Battery Size: AA/AAA

Charge Rate: When powered by 15W QC3.0, PD 5V/3.0A adaptor: 1600mA/slot for 3 batteries; 1500mA/slot for 4 batteries.

When powered by 5V/2.1A adaptor: 1600mA/slot for 2 batteries; 1000mA/slot for 4 batteries.

Discharge Rate: 100-700mA

Trickle Charge Rate: 30-70mA

Working Modes: Charge, Discharge and Refresh mode

-ΔV: 7mV

Discharge Cut-off Voltage: 0.9V

Capacity Protection: 3000mAh

Working Temperature: 0-40℃

Working Humidity: 10-90%RH

Storage Temperature: -10-70℃

Storage Humidty: 20-70%RH

Net Weight: 114g

Size: 108x79x32.9mm

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.
- 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.

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

1. The warranty service is valid in China only.

2. 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.

3. If you have any questions which are not mentioned in the manual, please feel free to send email to info@skyrc.com