Opti*SMART CHARGE*

SC-10   Manual

Opti*POWER*™
...your passion

www.Optiglobal.co

Opti**GLOBAL**

Contents

*Opti*GLOBAL

Introduction

Thank you for purchasing the *OptiSMARTCHARGE* SC-10 model tool chain product, please read this manual carefully before using it.

1. The SC-10 allows an input voltage of 7-28V, to ensure that the power supply voltage is consistent, pay attention to the positive and negative polarity of the power supply when connecting.

2. Do not use this product in the environment of extreme heat, humidity, or in the vicinity of flammable and explosive gas.

3. Never leave the charger unattended while in use

4. If the charger is to be left inactive always disconnect the input power

5. For best life and to minimize damage to the battery

OptiGLOBAL

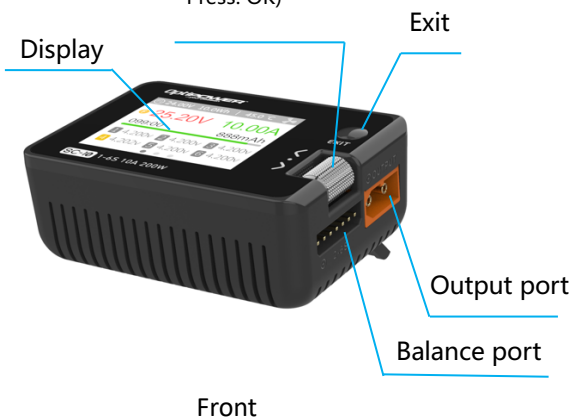always set an appropriate charge current or 1-2C.

Product description

The SC-10 is a Smart charger which includes a balance charger and discharger, a signal measuring device, and a signal source for testing.
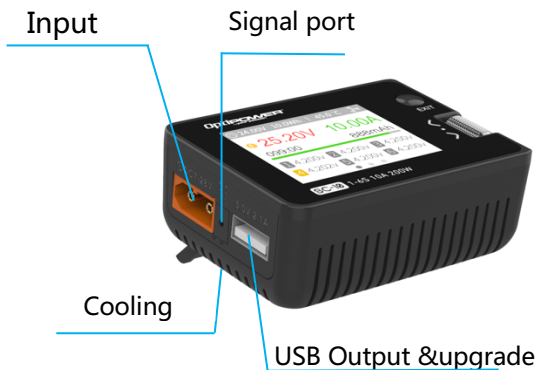
- The SC-10 charge and discharge and balance LiPo, LiHV, LiFe Lion 1-6S, NiMh 1-16S, PB 1-10S batteries
- Charge current：Max 10A/200W
- Discharge current：Recycle mode Max 10A/200W External mode Max 10A @200W Internal discharge Max 3A @10W
- Lithium battery cut-off voltage can be set (TVC function)
- SC-10 can measure battery voltage, battery internal resistance, lithium battery balance management
- SC-10 can measure the signal value of PWM/PPM/SBUS, with an accuracy of 1 microsecond

OptiGLOBAL

- SC-10 can output PWM/PPM/SBUS standard signals with an accuracy of 1 microsecond
- Constant current and constant voltage source output, customizable 1-28V constant voltage, 1-10A constant current
- SC-10 has the battery charge option for mainstream drone batteries, automatically activated and charged
- Multi-language system
- SC-10 includes a USB 2.1A@5.0V output which is able to recharge mobile devices

OptiGLOBAL

SC10 Layout

Scroll wheel
(Turn: left or right
Press: OK)

Exit

Display

Output port

Balance port

Front

OptiGLOBAL

Input Signal port

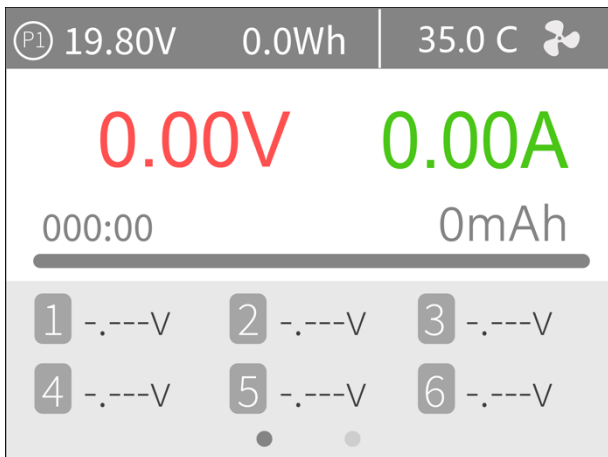Cooling

USB Output &upgrade

=Back

Quick start

1. Connect the 7-28V power supply to the input port on the back of the SC-10.
2. The display shows the boot logo and stays for 2 seconds.
3. After the boot is completed, the screen enters the main interface and displays as follows:

OptiGLOBAL

4. Long press [Exit] to enter the auxiliary function interface.

5. Scroll [Scroll Wheel] to switch the page below.

6. Short press [OK] to select the charging task when the charger is idle. You can adjust and finish the work when the charger is working.

7. Long press [OK] to enter the system setting interface when the charger is idle.

8. Short press [Exit] to end the modification or return to the previous interface.

Tips;

1. Short press [Scroll Wheel] once to confirm the function
2. Long press [Scroll Wheel] for 2 seconds, it is the delete key function
3. If any key is successfully operated, there will be a DI-DI sound

*Opti*GLOBAL

Charge and discharge settings

In the main interface, select and short press [OK] to enter the charging function, open the battery selection option in the system settings, and the following interface will be displayed.

🔲 Battery selection			
LipoAT	10.0A	Charge	>
LiHv 3S	5.0A	Charge	>
New			>
			>
			>
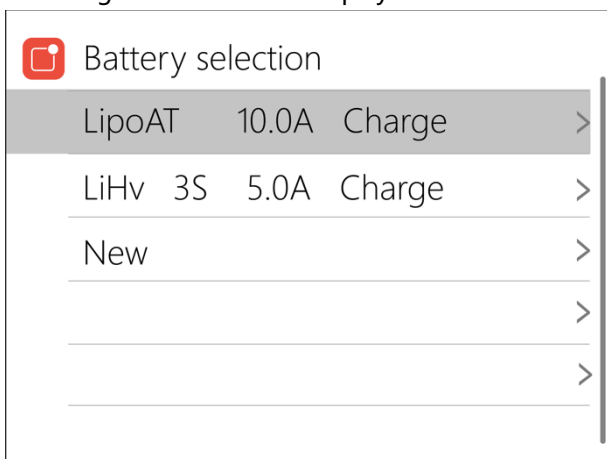
1. Battery Selection setting

The SC-10 can store up to 32 battery charge profiles. Scroll [Scroll Wheel], move the cursor, select a battery profile that has been set, or create a new battery profile. Press [Enter] to enter the battery setting interface of this group, the display is as follows:

OptiGLOBAL

LiPoAT Charge

🔋	Battery Type	LiPo >
🔖	Cells	Auto >
🔳	Mode	Charge >
Ⓥ	End Voltage	4.2V >
〰	Charge Current	2.0A >
▶	Start	

Move the cursor to [Battery Type] and press [OK] to modify the battery type, the display is as follows:

🔋 Battery Type

Lipo

LiHv

LiFe

Lion

NiMh

The charger supports charging and discharging of 6 types of batteries: Lipo, LiHV, LiFe, Lion, NiMh, and PB. There is also a smart battery mode to choose

OptiGLOBAL

from. After selecting the battery that matches the actual battery. Short press [OK] and [Exit] to take effect and return to the previous interface.

Warning:

1. Ensure the correct battery chemistry is selected, selecting the wrong battery chemistry to charge may damage the battery and the charger.

2. Please do not use this product to charge any battery types not listed in the options.

Glossary of battery terms explanation:

- **Lipo**: Lithium polymer battery with a nominal voltage of 3.70V and a fully charged battery of 4.20V.
- **LiHV**: High-voltage lithium battery with a nominal voltage of 3.85V and a fully charged battery of 4.35V.
- **LiFe**: Lithium-iron battery, with a nominal voltage of 3.30V and a fully charged battery of 3.60V.
- **Lion**: Lithium-ion battery with a nominal voltage of 3.60V and a fully charged battery of 4.10V.
- **NiMh**: Nickel Metal Hydride battery, nominal voltage 1.20V.
- **PB**: Lead-acid battery, nominal voltage 2.00V.

OptiGLOBAL

2. The Cell Count

Move the cursor to [Battery Section], press [OK] to modify the cell count of the battery.

📄 Cells
1 S
2 S
3 S
4 S
5 S
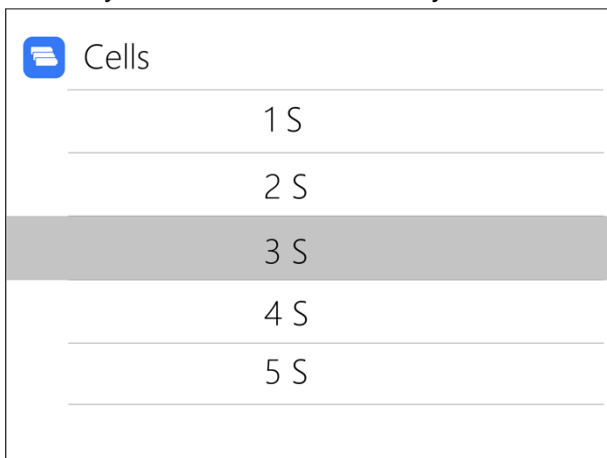
Rotate the [Scroll wheel] to adjust the cell count. When set to [Auto], the charger will automatically scan the voltage and detect the cell count of the battery. Simply a short press [OK] and [Exit] to take effect and return to the previous interface.

Tips;

1. If the connected battery is over-discharged or over-charged this will cause incorrect identification of the battery cell count, in this situation you need to manually set the correct cells.
2. If the Cell count is incorrect, it will overcharge mand damage the battery, please take care to set correctly.

OptiGLOBAL

3. Once the batterie is connected to the balance port, the battery cells can be more accurately identified.

3. Charge Mode

Move the cursor to [Mode] and press [OK] to change the charge mode, as shown in the figure below:
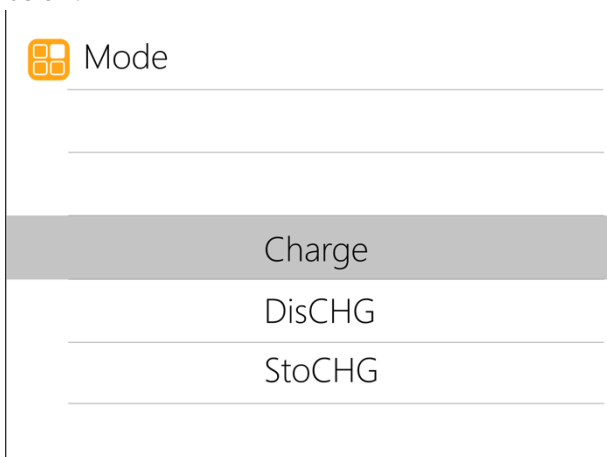

Lipo, LiHV, LiFe, Lion batteries can be charged, discharged, and stored. **NiMh** battery can choose to charge, discharge, cycle. **PB** battery can choose to charge and discharge. Short press [OK] and [Exit] to select and return to the previous interface.

4. Discharge mode

When selecting discharge, storage, and cycle mode, the battery setting interface will allow a

OptiGLOBAL

number if discharge modes.

Move the cursor to [Discharge Mode] and press [OK] to alter the discharge mode, as shown below:
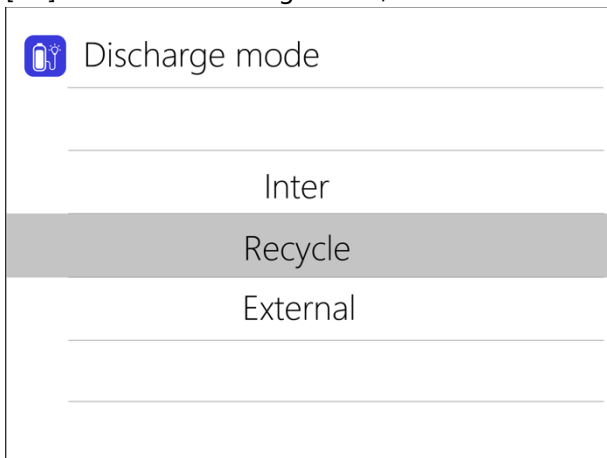
The charger supports three discharge modes.

1. **Normal mode**: discharge through internal heat consumption, maximum support 3.0A/10W discharge.

2. **Recycle mode**: when the main power input is via a large capacity battery, the power is recovered back to the input battery through this function, and the maximum support is 10.0A/200W discharge.

3. **External mode**: when the input port is connected to the discharge load and the output port is connected to the battery, it can be discharged

*Opti*GLOBAL

through this function, and the maximum support 10.0A/200W discharge.

5. Input MaxVoltage

When the discharge mode is selected to recycle, the battery setting interface will require the input Max Voltage setting. Move the cursor to [Input MaxVol] and press [OK] to adjust the input Max voltage. If the input voltage reaches this voltage value during discharge, the discharge will stop. As shown below:

🔋 Input MaxVol
27.8V
27.9V
28.0V
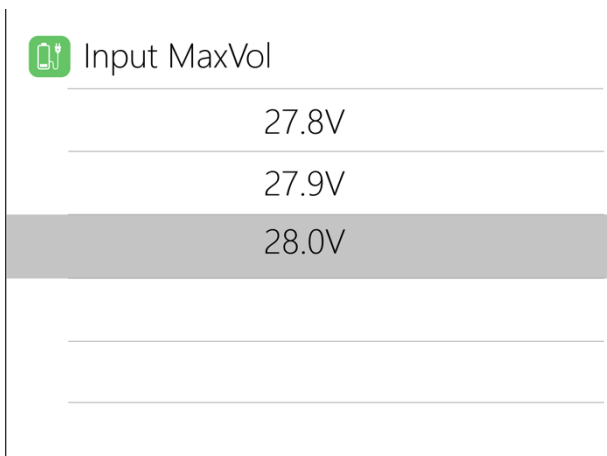
This allows the charger to ensure it does not over charge the large capacity battery source.

OptiGLOBAL

6. End voltage setting

Move the cursor to [End Voltage] and press [OK] to modify the end voltage per cell of the battery.

When the charge mode is selected, this is the charge cut-off voltage, the adjustment is +/- 50mV of the full voltage. When the discharge mode is selected, the end voltage is the discharge cut-off voltage. Scroll [Scroll wheel] to adjust the value, step 0.01V.

Ⓥ End Voltage
4.18V
4.19V
4.20V
4.21V
4.22V

Tips;

1. Only LiPo, LiHV, LiFe batteries can set the cut-off voltage.

2. Do not modify the cut-off voltage when you are not familiar with the battery characteristics.

3. The charging cut-off voltage can be set to a range of plus or minus 50mV of full voltage.

OptiGLOBAL

7. Current setting

Move the cursor to the [Charge Current] or [DisCHG Current] position, and press [OK] to modify the current. Rotate [Scroll Wheel] to adjust the value, step by 0.1A. Scroll [Scroll Wheel] quickly to increase or decrease. The charger supports up to 10.0A.

⋀ DisCHG Current
1.8A
1.9A
2.0A
2.1A
2.2A
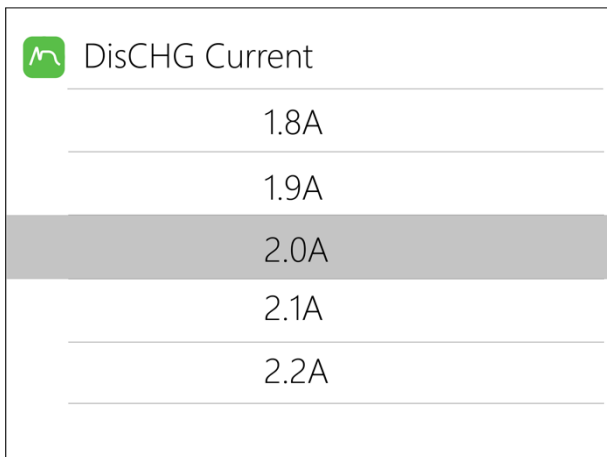
Tips:

1. Please set the charging rate of 1-2C according to the battery capacity. For example, if the battery capacity is 2000mAh, please set the charge current to 2.0-4.0A.

OptiGLOBAL

8. NiMh setting (PeakV)

When the battery type is **NiMh**, the peak detect value when the battery is fully charged can be set, the range of which can be set is 5mV-15mV, as shown below:

Ⓥ Nixx Peak
5mv
6mv
7mv
8mv
9mv

Tips:

1. Only NiMh battery can set negative battery voltage.

2. **PeakV**: When the nickel-metal hydride battery is fully charged, the voltage drops off at the peak of charge.

OptiGLOBAL

9. Cycle setting

When the battery type is **NiMh**, and the charge mode is cycle, the battery setting interface will increase Cycle times and Rest time setting. As shown below:

NiMhAT Cycle	
Nixx Peak	5mV >
Charge Current	2.0A >
DisCHG Current	2.0A >
Cycle times	2 >
Rest time	2Min >
Start	
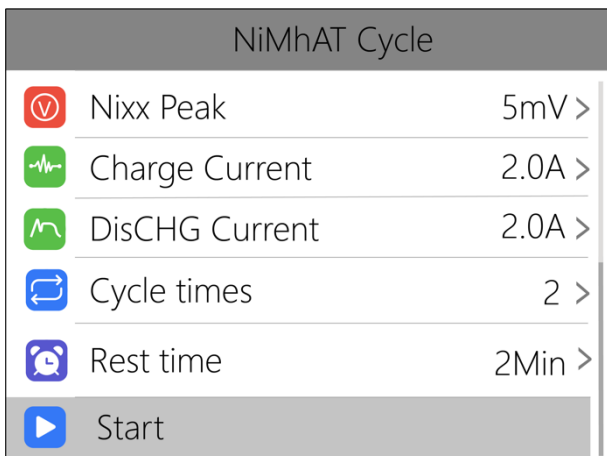
Move the cursor to [Cycle times] and press [OK] to set the range of cycle times to 2-12.

The charger will follow the pattern cycle of discharge->charge->discharge->charge....

"Discharge -> charge" is 2 times.

OptiGLOBAL

Cycle times
2
3
4
5
6

Move the cursor to [Rest time] and press [OK] to set the rest time of cycle charge. The range is 2 minutes to 10 minutes. As shown below:

Rest time
2Min
3Min
4Min
5Min
6Min

*Opti*GLOBAL

10. External load setting

When external discharge is selected as the discharge mode, the external load setting will be increased. Set the wattage according to the external load used. As shown below:

External Load
30W
31W
32W

*Opti*GLOBAL

11. Smart battery setting

When UAV battery is selected for battery type, there are only two options for battery setting: drone type and Max current. As shown below:

UAVbat		
🔋 Battery Type	UAVbat	>
Ⓥ Drone model	Mavic2	>
〰 Max Current	3.8A	>
▶ Start		
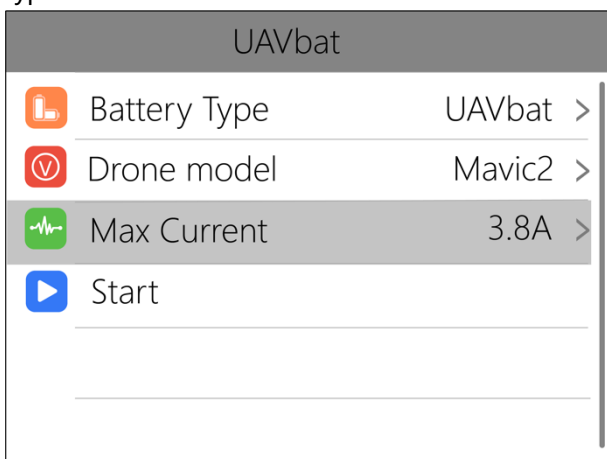
Move the cursor to [Drone model] and press [OK] to select different drone models. As shown below:

*Opti*GLOBAL

Ⓥ Drone model
Mavic2 17.6V
MavicS 13.05V
Phantom 17.4V
Inspire 26.1V

Move the cursor to [Max Current] and press [OK] to set the charge current. The range is 0.5A to 10A.

OptiGLOBAL

Charge and discharge Display

When charging and discharging starts, the charger enters the working interface as shown below:
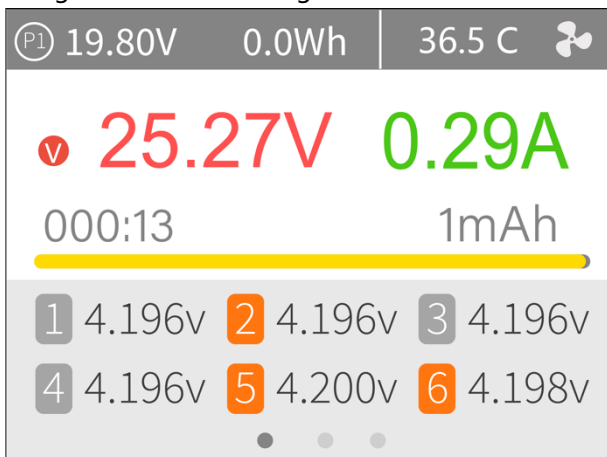
Rotate [Scroll Wheel] on this interface to switch the bottom status information from cell voltage and balance spread to internal resistance.

Short press [OK] to dynamically set the working current or stop working. As shown below:

OptiGLOBAL

Adjustment	
〰️ Current	2.0A >
✋ Stop	

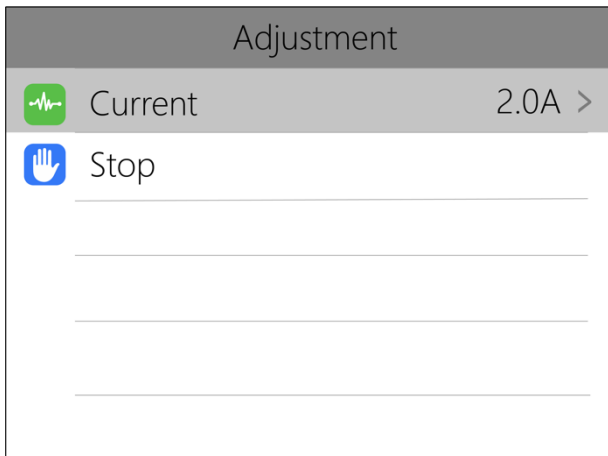To end the charge or discharge, short press [OK], move the cursor to [Stop], short press [OK], stop charging and return to the main interface.

When charge is complete, or charge error occurs. A prompt box will pop up with a sound.

Display content description:

P1: Power selection in system settings

19.80V: Input power supply voltage

0.0Wh: The accumulated power consumption of the input power

36.5℃: The internal temperature of the charger

V : Constant voltage   C: Constant current

25.27V: Main port voltage

*Opti*GLOBAL

0.29A: Main port current

000:13: Working hours

1mAh: Cumulative capacity

1　4.196V: The first battery voltage

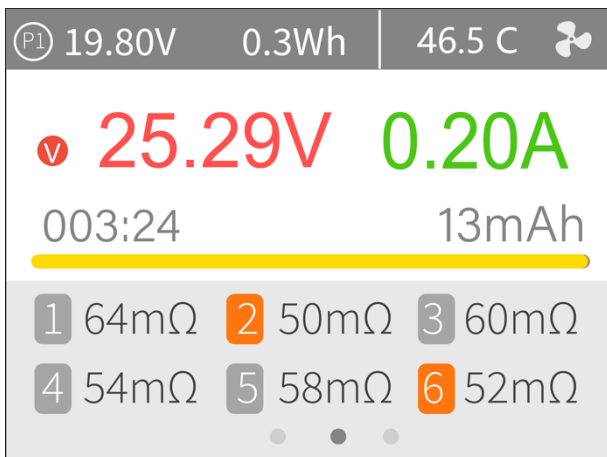.......

6　4.198V: The voltage of the sixth battery (this battery is under balance management)

-.---v : No battery connected

Scroll [Scroll Wheel] to switch to the second column, which is the internal resistance information. As shown below:
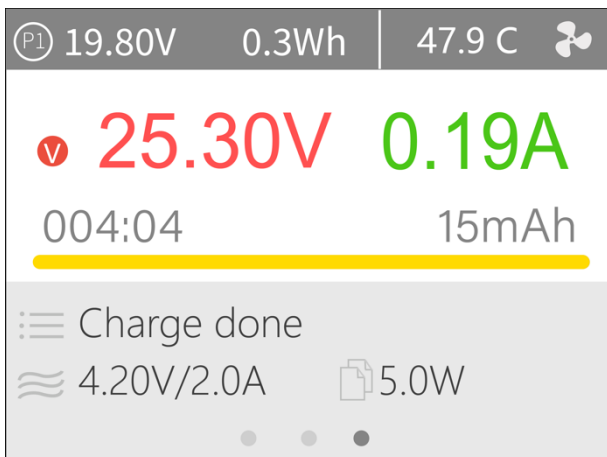

1　64mΩ: Internal resistance of the first battery

......

Scroll [Scroll Wheel] to switch to the third column, which is the information column. As shown

below:

    Charge done: Indicates the current charging status

    5.0W: The current charging power

    4.20V/2.00A: end voltage/charge current

Tips:

1. When charging and discharging, please ensure the charger is not left unattended.
2. When charging and discharging lithium batteries, ensure both the main power wires and the balance lead is connected to allow the charger to perform balance charge/discharge.
3. After charging is completed, it will automatically retian the previous charge settings. When using the automatic detection mode, the charger will automatically assess the next connected battery.

*Opti*GLOBAL

Accessibility

After long pressing [Exit] in the main interface, you can enter the auxiliary function interface when the charger is idle, as shown below:

⚙️ Accessibility	
Measure resistance	>
Measure signal	>
Signal output	>
ESC test	>
Power	>
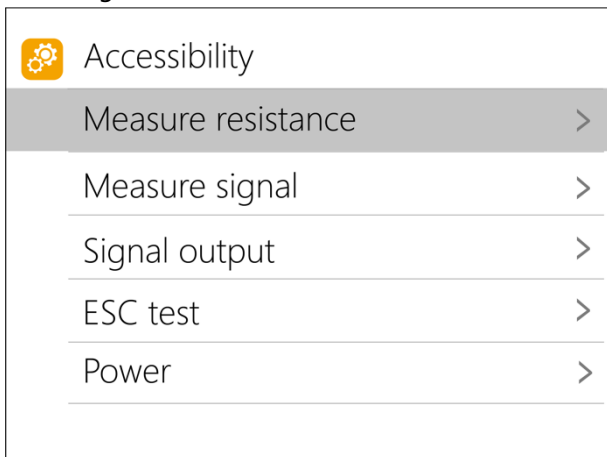
1. Measure resistance

Short press [OK] to test the internal resistance of the connected battery and return to the main interface display.

2. Measure signal

The cursor selects the measure signal, short press [OK] to enter the signal test interface.

Scroll [Scroll wheel] to select the type of signal

OptiGLOBAL

to be tested. Select PWM, as shown below:

| 🔢 Measure signal | PWM |
| 1500us | 20.0ms/50Hz |
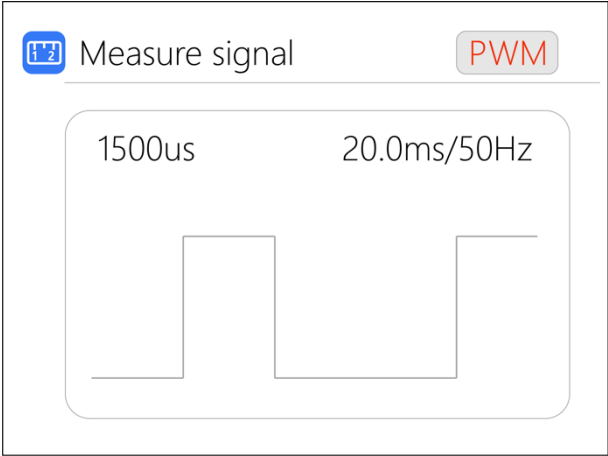
Select PPM, as shown below:

🔢 Measure signal	PPM
1	1500
2	1500
3	1000
4	1500
5	1500
6	1500
7	1500
8	1500

OptiGLOBAL
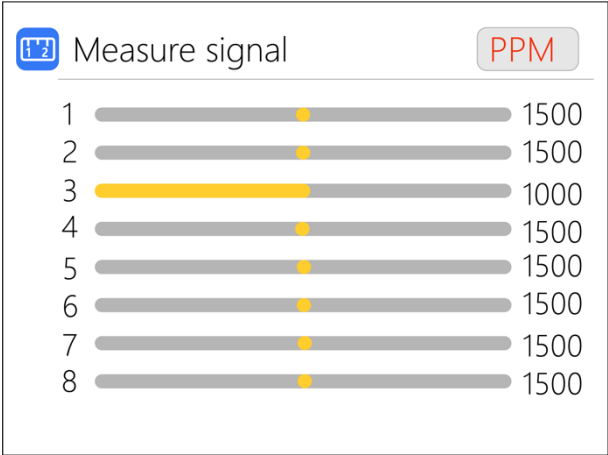
Select SBUS, scroll [Scroll wheel], can switch to display [1-8 channels], [9-16 channels], status bits. As shown below:

📱 Measure signal	SBUS
1	992
2	992
3	192
4	992
5	992
6	992
7	992
8	992

📱 Measure signal	SBUS
9	992
10	992
11	992
12	992
13	992
14	992
15	992
16	992

OptiGLOBAL

```
┌─────────────────────────────────────────────┐
│ 🔢 Measure signal              SBUS          │
│ ─────────────────────────────────────────── │
│  Channel DG1:                   OFF          │
│  Channel DG2:                   OFF          │
│  Frame lost:                    OFF          │
│  Failsafe:                      OFF          │
│  Endbyte:                        00          │
│                                              │
│              ●    ○    ●                     │
└─────────────────────────────────────────────┘
```

3. Signal output

The cursor selects signal output, short press [OK], you can enter the signal test interface.
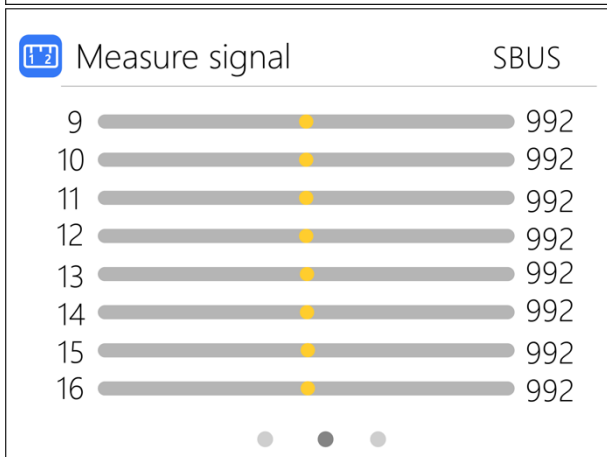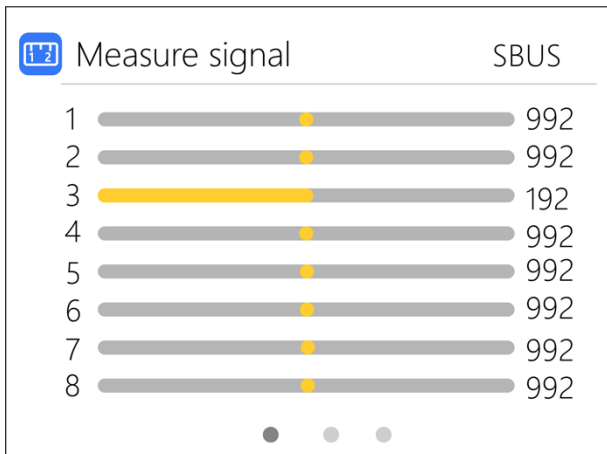
Scroll [Scroll wheel] to select the type of signal to be tested. Choose PWM.

Scroll the [Scroll Wheel], move the cursor to the [Manual] option, press [OK] to set the output mode, which can be set to manual, auto 1, auto 2, and auto 3.
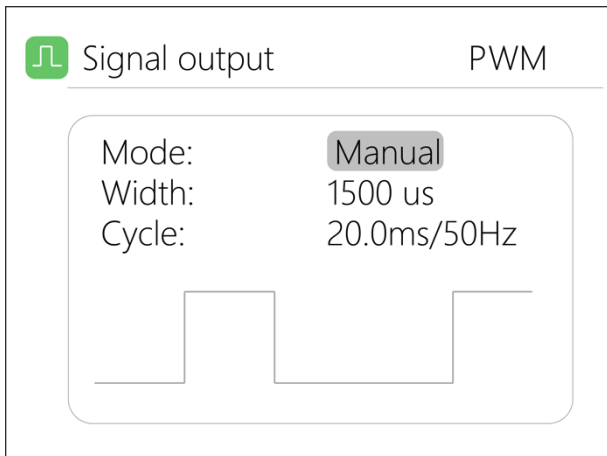
When the mode is manual, you can move the cursor to the pulse width and cycle items to set the signal value to be output.

When set to auto 1, 2, 3, the pulse width value of output PWM will automatically change at 3
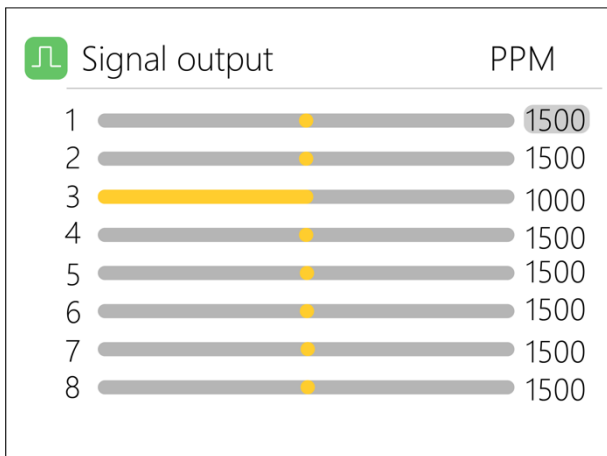
*Opti*GLOBAL

different speeds.

The width can be set from 800 to 2200us.

The cycle can be set in the range: 2.5ms (400hz) to 50.0ms (20hz). As shown below:

Select PPM, scroll [Scroll wheel] to move the cursor to the value of the channel to be modified. Press [OK] to modify the output pulse width value of this channel. As shown below:

Signal output		PPM
1		1500
2		1500
3		1000
4		1500
5		1500
6		1500
7		1500
8		1500

Select SBUS, scroll [Scroll wheel] to move the cursor to the value of the channel to be modified. Press [OK] to modify the output pulse width value of this channel. As shown the following 3 pictures:

Signal output		SBUS
1		992
2		992
3		192
4		992
5		992
6		992
7		992
8		992

OptiGLOBAL
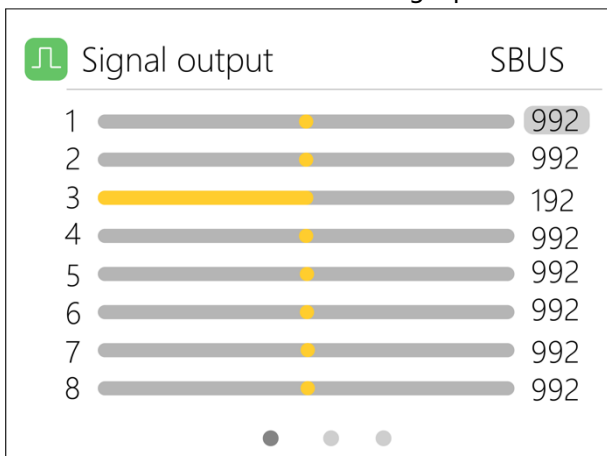
Signal output   SBUS

9	━━━━━●━━━━━	992
10	━━━━━●━━━━━	992
11	━━━━━●━━━━━	992
12	━━━━━●━━━━━	992
13	━━━━━●━━━━━	992
14	━━━━━●━━━━━	992
15	━━━━━●━━━━━	992
16	━━━━━●━━━━━	992

Signal output   SBUS

Channel DG1:	OFF
Channel DG2:	OFF
Frame lost:	OFF
Failsafe:	OFF
Endbyte:	00

OptiGLOBAL

4. ESC test

Select ESC test with the cursor, short press [OK] to enter the ESC test, , move the cursor [Scroll wheel] to the pulse width and cycle, press [OK] to change the corresponding value. As shown below:
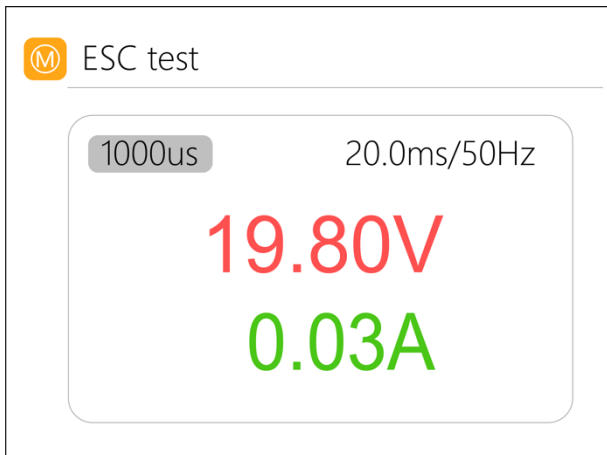
5. Power

Select the adjustable power supply with the cursor, and short press [OK] to enter the power.

The voltage and current of the output power supply can be set. Move the cursor to the beginning, short press [OK] to start power output and return to the main interface. As shown below:

OptiGLOBAL

Power

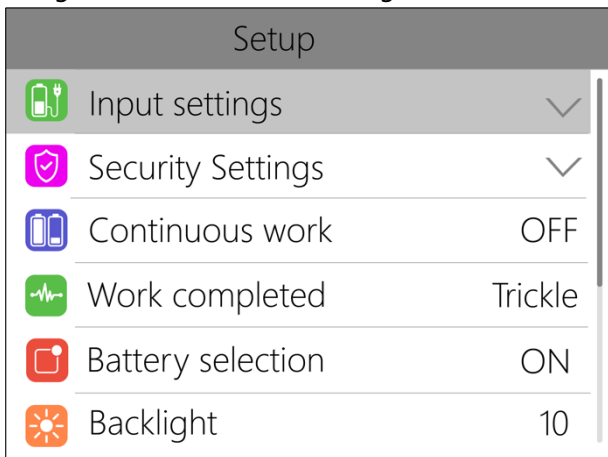|		
Ⓥ	Output Voltage	20.1V ›
∿	Max Current	2.0A ›
▶	Start	

OptiGLOBAL

System settings

After long pressing [OK] in the main interface, you can enter the system setting interface when the charger is idle, as shown in the figure below

Setup	
🔋 Input settings	⌄
🛡 Security Settings	⌄
📱 Continuous work	OFF
〰 Work completed	Trickle
🔋 Battery selection	ON
☀ Backlight	10

Input settings: Input power related settings, short press to expand the settings. As shown below:

OptiGLOBAL

Setup	
🔋 Input settings	∧
Power selection	Ⓟ1
Power type	Battery
Max power	350W
Max current	12.0A
Voltage range	7.0-28.0V

Power selection: Can choose power 1, power 2, power 3 profiles.

Power type: Can choose battery pack and adapter (power supply). The battery pack can choose to recycle discharge during discharge, but the adapter will remove the recycle option.

Max power: When charging, the maximum power drawn from the input port

Max current: When charging, the maximum current drawn from the input port

Voltage range: Allowable input voltage range

Security Settings: Short press to expand settings. As shown below:

*Opti*GLOBAL

Setup	
🔋 Input settings	⌄
🛡 Security Settings	⌃
Safe Inter. Temp.	80℃
Safe Exter. Temp.	60℃
Safe time	200Min
Safe capacity	30Ah

Safe Inter. Temp.: Above this temperature value, the device will stop the main port output

Safe Exter. Temp.: If the external sensor detects a temperature higher than this value, the device will stop the main port output

Safe time: The maximum time of continuous charging and discharging will stop working if exceeded

Safe capacity: The maximum capacity of continuous charging and discharging will stop working if exceeded

Continuous work: After charge and discharge, whether to continue charge and discharge after battery replacement

OptiGLOBAL

Work completed: Whether to stop or trickle charge after charge done

Battery selection: Option to open and close the battery selection interface

Backlight: The backlight brightness level of the display can be set from 1-10

Setup	
☀ Backlight	10
🔊 Buzzer	6
🌐 Language	English
AA Theme style	Light
🏠 Default	
SN ID:FF3005D3-V1.00	

Buzzer: The tone of the buzzer, can be set to off.

Language: System display language can be selected

Theme style: Can be set to light and dark themes

Default : Restore all setting items to factory value

ID : Independent ID for each device

*Opti*GLOBAL

Other functions

1. USB 5.0V output

   The USB interface can output 2.0A current to charge mobile devices.

2. Automatically continue charging and discharging

   When a battery is fully charged, after unplugging the battery for 2 seconds, connect to the next battery, the device will automatically continue to charge and discharge, you can start and stop this function in the settings menu

4. Fan level

   When the internal temperature of the device exceeds 45°C, the fan turns on half-speed air volume to reduce noise. When the internal temperature exceeds 53°C, the fan turns on full-speed air volume to enhance heat dissipation.

6. Manually calibrate the voltage

   In the shutdown state, press and hold the [roller] without releasing, connect the power supply, and the system will enter the manual voltage calibration function. Use a voltmeter to measure the actual voltage of each battery, move the cursor to the corresponding voltage value, modify the voltage value to be consistent with the voltmeter value, and achieve calibration. After the calibration is completed, move the cursor to save, short press once, the buzzer

*Opti*GLOBAL

will beep once, the save is successful. Just exit or shut down

7, fully charged

When the lithium battery is fully charged, it will prompt "Fast charge is done". If the battery is not removed, the constant voltage trickle charge will be performed automatically to ensure the battery maintains a full charge.

OptiGLOBAL

Specifications

Charging	Input	7-28V@MAX12A
	Battery type	LiPo LiHV LiFe Lion@1-6S NiMh @1-16S Pb @1-10S
	Balance	400mA @2-6S
	Accuracy	<0.005V
	Power	0.1-10A@200W
	Discharge power	0.1-10A@250W Recycle Mode 0.1-3A@12W Internal Mode
	USB	2.1A@5V upgrade@USB3.0
	Voltage	1.0V-5.0V @1-6S
	Internal resistance	1-100mR @1-6S
Measuring	PWM	880us-2200us@20-400hz
	PPM	880us-2200us*8 CH@20-50hz
	SBUS	880us-2200us*16 CH@20-100hz
Output	PWM	500us-2500us@20-1000hz
	PPM	880us-2200us*8 CH@50hz
	SBUS	880us-2200us*16 CH@74hz
	Power	1-10A@1-28V Mode: CC+CV
Display	LCD	IPS 2.0 inch 320*240 resolution
Product	Size	73mm*51mm*27mm
	Weight	90g

OptiGLOBAL

Individual packing	Size	84mm*79mm*39mm
	Weight	150g

OptiGLOBAL