M8S

Manual V1.2

2019.11



ToolkitRC

www.ToolkitRC.com

ToolkitRC Technology (Shenzhen) Co.. Ltd.

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Introduction

Thank you for purchasing the M8S Toolkit Charger. Please read this manual carefully before use.

Key Points

Tips Important Information

Further information

To ensure you have the best experience with this product please scan the QR code below to stay up to date with news. information and firmware updates for your charger.

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Safety

1. The M8Scharger allows input from 7-30V. For best operation ensure the power supply is stable and pay attention to connection polarity.
2. Do not use this product in excessively hot, wet or moist conditions or near flammable objects, liquids or gas.
3. Only use this product while under supervision, do not leave charging batteries unattended.
4. Disconnect batteries or power supply when not in use.
5. When charging please select the charge voltage and current suitable to your battery. Check the battery manufacturers specifications for further details. Do not charge batteries above their rated voltage and amperage specifications.

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Product description

M8Sis a multi-function charger and discharger that integrates receiver and servo test functions along with power supply functions.

• Lipo. LiHV. LiFe Lion1-8S. NiMh 1-20s. PB 1-12s battery charging and discharging and balance management

•Charging current: Maximum 18A @400W

•Discharge Current: Recovery MAX 18A@400W
normal mode MAX 5A @20W

•Lithium battery full voltage can be set (TVC)

• can measure battery voltage. battery internal resistance. lithium battery balance management

•ESC power meter 400W@18A, simultaneous output voltage and throttle signal.

•Measurement of signal values such as PWM/PPM/SBUS with accuracy of up to 1us

• can output PWM/PPM/SBUS standard signal. accuracy up to 1 microseconds

• constant current constant voltage source output. can customize 1-30V constant voltage. 1-18A constant current

• can be adapted to the mainstream UAV battery. automatically activated and charged.

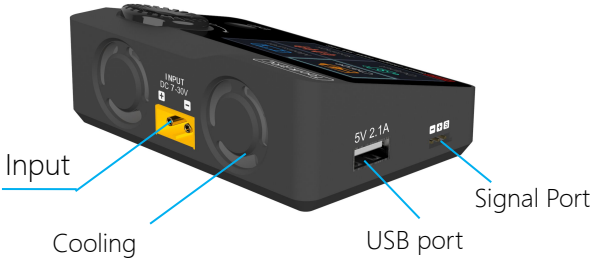
•USB 2.1A@5.0V output. rechargeable mobile device.

•Device simulation for USB flash drive. copy upgrade file to achieve product firmware upgrade

M8SLayout



Front

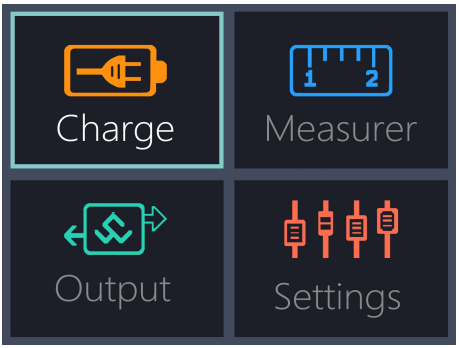


Back

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Quick start

1. The 7-30V power supply is connected to the input port on the back of the M8S
2. The display shows the bootup logo and stays for 2 seconds
3. Accompanied with do-re-mi bootup sound
4. the bootup is completed. the display enters into the main interface as shown below



5. Rotate the [knob]. move the cursor to select function. press the [OK] button to enter the selected function and enter the corresponding interface
6. After entering the related function interface. Rotate the [knob] to move the cursor to select the setting item or value. press the [OK]

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and modify the option or value. After the modification is completed. press the [OK] to confirm.

7. Press the [Exit] key to end the modification or return to the previous screen.

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1. Short press the [OK] once to determine the key function.

2. Press and hold the [OK] for 2 seconds as the delete key function.

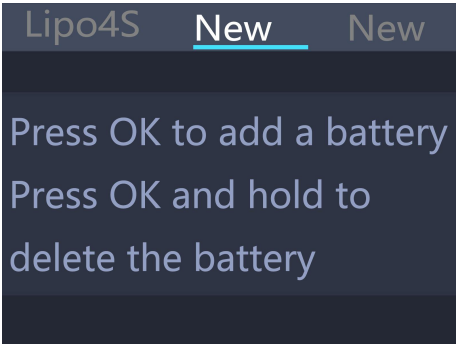
3.Pressing any button will give a sound prompt.

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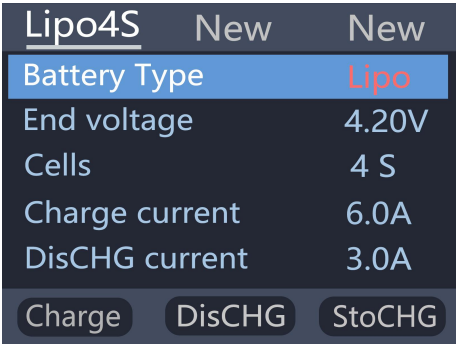
Charge and discharge

After selecting the [Charge] function on the main interface press [OK] to enter the charging function. The following interface is displayed.



1. Battery type setting

Rotate the [knob] to move the cursor. Select the battery type to be set. Press [OK] to enter the battery setting interface as shown below.



Move the cursor to [Lipo] and press [OK] to modify

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the battery type. The charger supports charging and discharging five types of batteries: Lipo. LiHV. LiFe. Lion.NiMh. PB. After selecting the correct battery that matches the actual battery Short press [OK] and [Exit] Effective.

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Important:

1. Incorrect battery type charging may damage the battery. charger. and may lead risk of burning. etc.. please be double careful.

2. battery that cannot be indicated the battery type. pls do not use this product to charge

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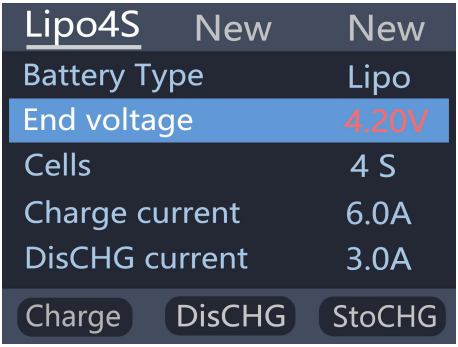
Information:

1. Lipo: often referred to as lithium polymer battery. nominal voltage 3.70V. fully charged 4.20V battery
2. LiHV: often referred to as high-voltage lithium battery. nominal voltage 3.85V. 4.35V battery after full
3. LiFe: often referred to as lithium-iron Phosphate battery. nominal voltage 3.30V. fully charged 3.60V battery
4. Li-ion: often referred to as lithium-ion battery. nominal voltage 3.60V. fully charged 4.10V battery

5. NiMh: Often called nickel-metal hydride battery. nominal voltage 1.20V
6. PB: often referred to as lead-acid battery. nominal voltage 2.00V

2. Cutoff voltage setting（TVC）

Move the cursor to [End Voltage] and press [OK] to modify the battery charge cut-off voltage. Rotate the [knob] to adjust the value and step 10mV.



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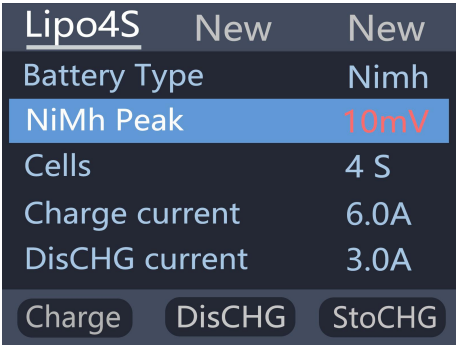
1. only LiPo. LiHV. LiFe.Lion battery can set the cutoff voltage
2. Do not modify the cutoff voltage when you are unfamiliar with battery characteristics.
3. the cutoff voltage can be set to the range of positive and negative 50mV of full voltage
4. vocabulary explanation: TVC: terminal voltage control

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3. NiMH Setting (PeakV)

When the battery type is NiMh. you can set the negative voltage value when the battery is full. and the range can be set from 5mV to 20mV. as shown below.



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Tips:

1. Only NiMh battery can set the battery negative voltage value

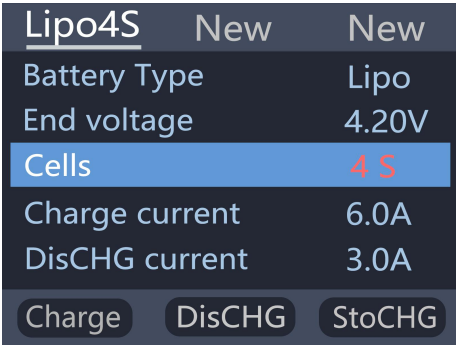
2. vocabulary explanation:PeakV: Peak voltage drop per piece when NiMH battery is full

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4. Battery Setting

Move the cursor to the [Cells] and press the [OK] button to change the number of battery cells. Rotate the [knob] to adjust the value. When set to [Auto].

the charger will automatically recognize the number of cells on the connected batteries according to the voltage of battery which connected with output port



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Tip:1. the battery which was over- discharged or over-charged. may cause the number of cells to be recognize falsely. you need to manually set the correct number of cells.

2. If the number of cells was set incorrectly. The battery cannot be full charged. or be overcharged and damaged. please set it carefully.

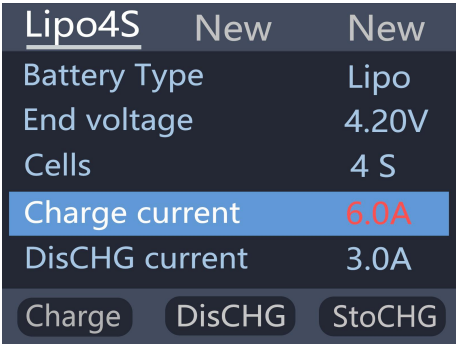
After the Lixx battery is connected to the balance port. the number of battery cells can be more accurately identified.

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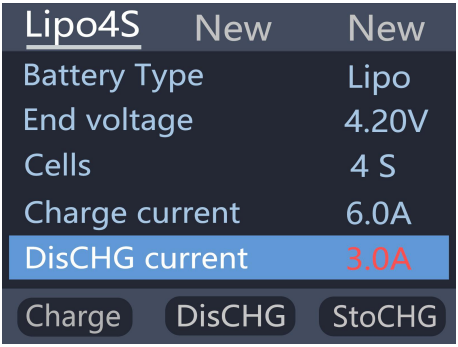
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5. Current setting

Move the cursor to the charging current [Charge Current] position and press [OK] to modify the charging current. Rotate the [knob] to adjust the value and step 0.1A. Press and hold [knob] to add or subtract quickly. The charger supports up to 18.0A.



Move the cursor to the [Discharge current] position and press [OK] to modify the discharge current. Press up or down to adjust the value and step 0.1A. Press and hold up or down can be quickly reduced. The charger supports two discharge modes. 1. ordinary discharge mode. through internal heat dissipation discharge. maximum support 2.0A@8W. 2. Recovery discharge mode. When the input power source is a battery this function can recycle electrical energy to the input battery, the maximum support 10.0A current.



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Tip:

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

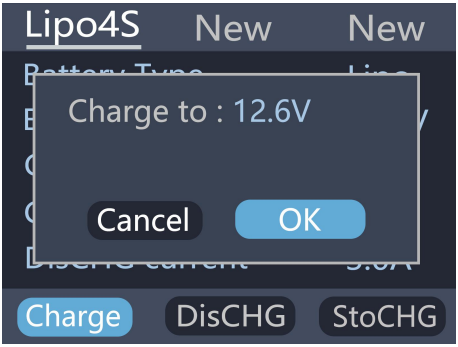
2. charging and discharging current is only valid in the corresponding working mode.

3. For the discharge mode setting. refer to the <System Settings> chapter of this manual.

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6. Working mode

Move the cursor to [Charge] [DisCHG] [StoCHG] position. press [OK]. the charger will work in the mode of the selected function. When selected as [Charge]. it will indicate the target voltage that will charge the battery. As shown below

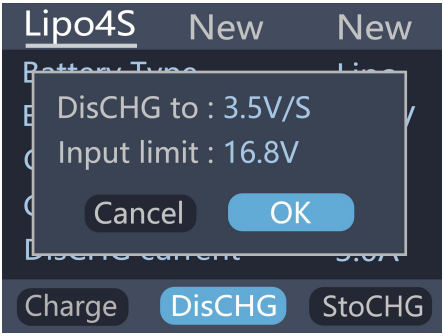


When selected as [DisCHG]. it will prompt the target voltage to discharge the battery to. If the discharge mode is to recycle the discharge. it is also necessary to set the cutoff voltage of the battery being used as the power source. As shown

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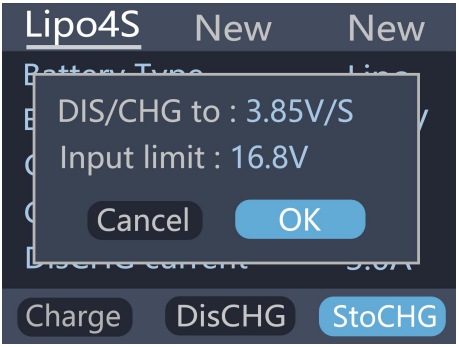
Tip: 1,To use energy recovery discharge mode (recycle) please read the details on setting discharge mode on page 37 of this manual.

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When selected as [StoCHG]. it will prompt the target voltage to charge and discharge the battery. If the discharge mode is to recycle the discharge to the power source batter. it is also necessary to set the cutoff voltage of the battery. As shown below



The high limit voltage of recovered. The default is 0.5V higher than the input voltage. Please set according to the maximum limit voltage of the input power supply. To cancel the operation. move the cursor [Cancel] or press [Exit]. Move the cursor to [OK]. short press [OK] to start charging. and display the charging and discharging work interface.

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Tip:The discharge cutoff voltage should be set.

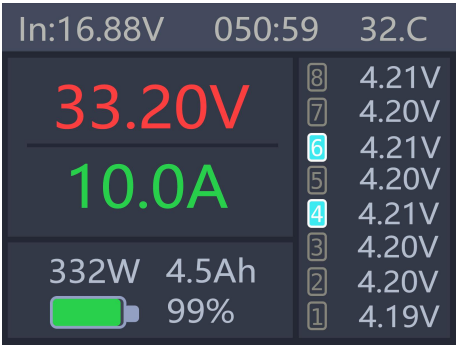
1. According to the discharge characteristics of the battery.
2. After the recovery limit voltage is set to the highest protection voltage of the power supply.

the charger will automatically stop the recovery discharge. Setting a high overvoltage may damage the input power. Do not set the input limit higher than the capacity of the power source battery.

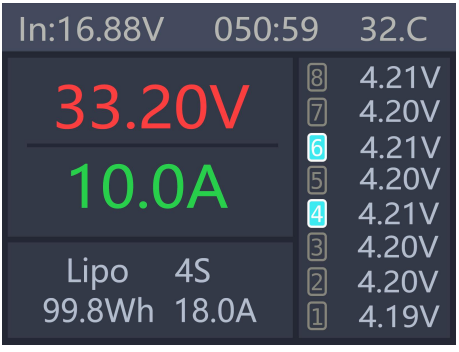
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Charge and discharge

When charging and discharging starts the charger enters the working interface as shown below.



Rotate the [knob] key on this screen to switch the bottom status display information or press and hold [OK] for 2 seconds to dynamically set the working current. As shown below



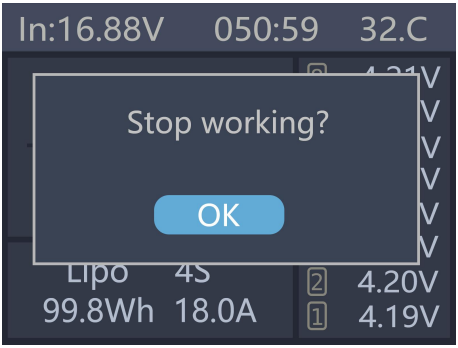
33.20V: The battery voltage of the output port.

10.0A: Charging or discharging current

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Current limit flag. **P:** power. **C:** maximum current
I: input over current or Power **A:** activate charging
F: The main port is full voltage or a single cell is full
332W: Charge or discharge power of the charger
32'C: internal temperature of the charger
050:59: The time when the work has started. Unit: minute: second
4.5Ah: the capacity that has been charged and discharged this time
Lipo 4S: currently set battery type and number of cells
18.0A: Current operating current set. Long press to modify.
IN 16.88V: Input supply voltage
99.8Wh: Input power that has been discharged from the power supply.
1 4.19V: 1st battery voltage
2 4.20V: 2nd battery voltage
3 4.20V: 3rd battery voltage
4 4.21V: 4th battery voltage (balancing)
5 4.20V: 5th battery voltage
6 4.21V: 6th battery voltage (balancing)
7 4.20V: 7th battery voltage
8 4.21V: 8th battery voltage
-.--V : no battery connected
To end the charge and discharge work. short press [Exit]. in the pop-up prompt box. select [OK] to exit.

When charging is complete or charging is wrong A pop-up windows display and a tone sounds.



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Tip:1. Only charge or discharge batteries under supervision do not leave them unattended.

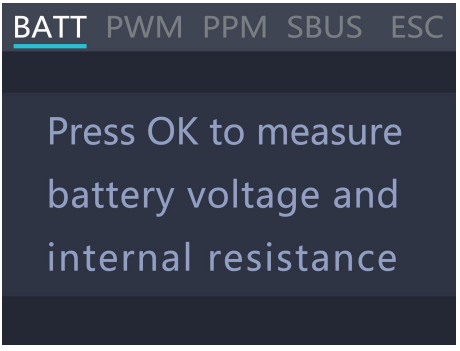
2. When charging and discharging the lithium battery if only connect with the main port of battery it will not be balanced. Please pay attention to the balance of the battery. Connect the battery with balance port so the balance management is automatically performed.

3. When charging is completed unplug the battery. After accessing the new battery. it will automatically continue to charge and discharge according to the setting mode. When set to a fixed number of cells. you need to access the same number of batteries. When setting to automatically detect the number of battery cells. please pay attention to whether the number of detected cells matches the actual ones.

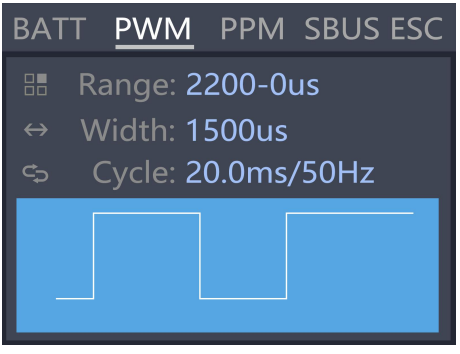
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Signal measurement

After selecting the [Measurer] function on the main interface. press [OK] to enter the function and display the following interface. Press up or down to select the type of signal to be tested.



Move the cursor to the [PWM] item. press [OK] to enter the PWM test interface as shown below.



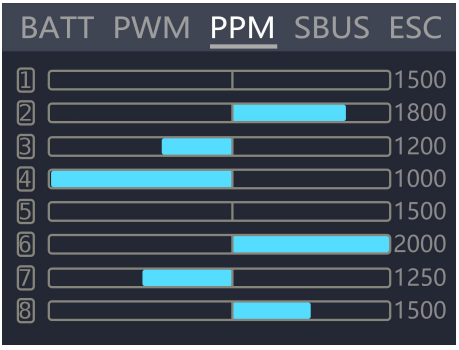
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Tip:

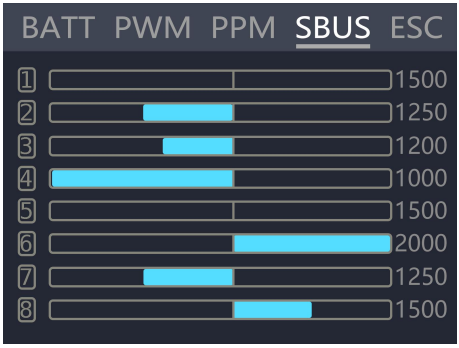
1. PWM and PPM signals can automatically

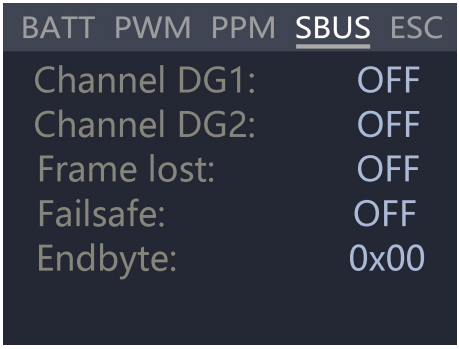
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identify and switch to the corresponding interface.
2. sBus is an inverted signal. baud rate 100kbps 8-bit data bit 2-bit stop bit even parity
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Press up or down switch on the measurement main interface to move the cursor to the [PPM] item. press [OK] to enter the PPM test interface as shown below.



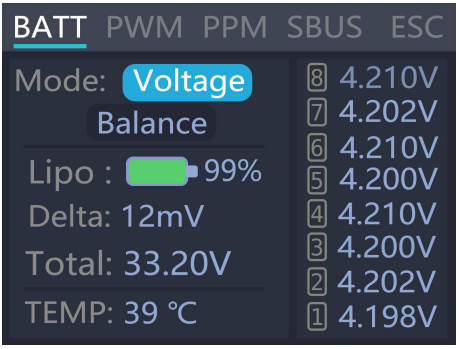
Move the cursor to the [SBUS] item and press [OK] to enter the compatible signal test of SBus. Dbus. etc.. Press up or down and switch the 16 channel value and status bit. The display interface is as follows 2 (9-16 channel display is omitted)


BATT PWM PPM SBUS ESC
1 1500
2 1250
3 1200
4 1000
5 1500
6 2000
7 1250
8 1500

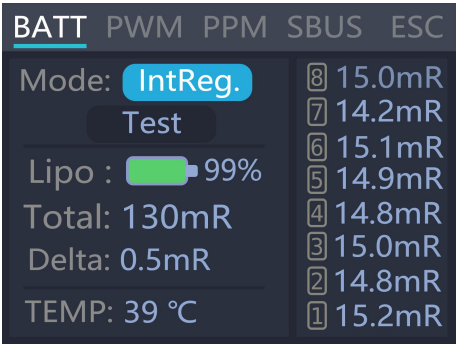

BATT PWM PPM SBUS ESC
Channel DG1: OFF
Channel DG2: OFF
Frame lost: OFF
Failsafe: OFF
Endbyte: 0x00

Battery Measurement

After selecting [Measurer] function in the main interface of measurement press [OK] to enter the function and display the following interface.



This interface displays the current battery voltage value and range Move the cursor select [Balance] and press [OK] to start balancing management of the batteries. Move the cursor to the [Voltage] position press [OK] to switch to internal resistance mode and display the following figure.



Move the cursor to [Test] press [OK] once to start testing the internal resistance. The testing is finished after about 5 seconds and shows the internal resistance of the battery

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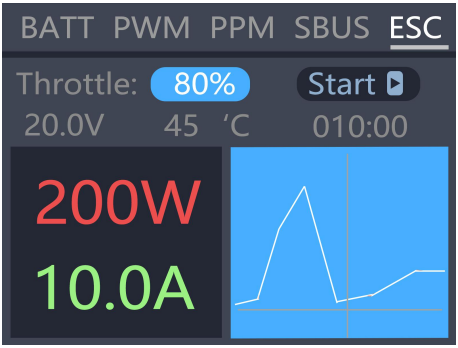
Tips:

1. This testing needs to charge the battery for 5A current for a short time. please ensure that the input power is sufficient and the battery is not overcharged.

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ESC Wattmeter

After selecting [ESC] function in the main interface of measurement, press [OK] to enter the function and display the following interface.



Display instructions:

Throttle signal 80% : PWM signal value to be output from the signal

Output 20.0V: Input voltage value, straight output from the main port

Start: After pressing the OK button, the output signal and the main port voltage are started.

200W: The power being output

10.0A: Current being output

010:00: Working time

45°C: current internal temperature of the device

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Tips:

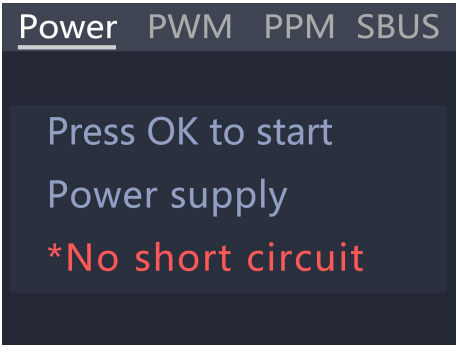
1, please do not connect the battery in this mode, otherwise it may damage the device

2. Please adjust the throttle value slowly during the test to prevent the current from being too large.

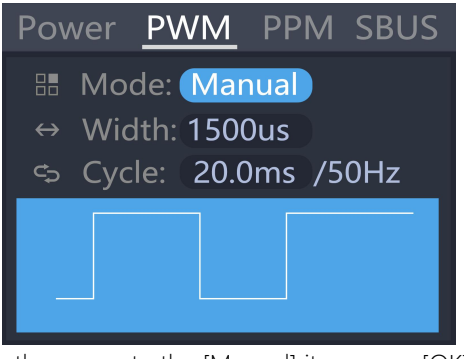
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Signal output

After selecting the [Output] function on the main interface press [OK] to enter the function. and the following interface is displayed.



Rotate the [knob] to move the cursor to the [PWM] item press [OK] to enter the PWM test interface as shown below.



Move the cursor to the [Manual] item press [OK] to set the output mode. which can be set to Manual.

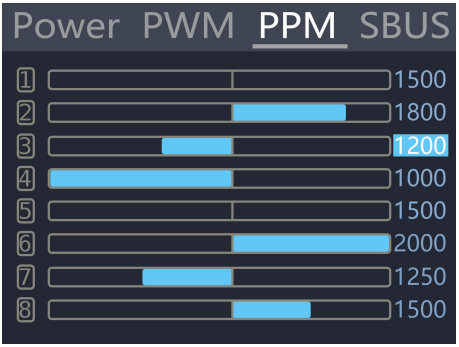
Auto 1. Auto 2. Auto 3.

When the mode is set to manual. you can move the cursor to the pulse width and period items to set the signal value to be output.

When set to Auto 1. 2. 3. the pulse width value of the output PWM will automatically change at 3 different speeds.

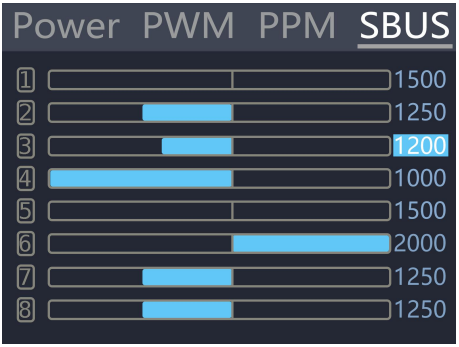
Pulse width can be set from 800 to 2200us The cycle can be set from 2.5ms (400Hz) to 50.0ms (20Hz).

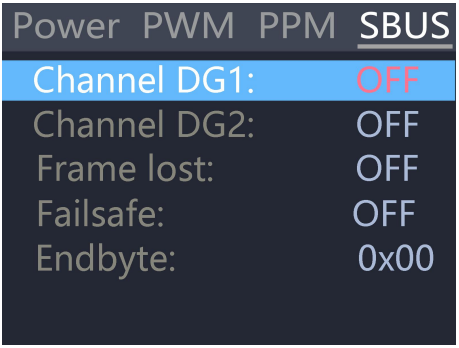
Rotate the [knob] on the output main interface to move the cursor to the [PPM] item. press [OK] to enter the PPM output interface as shown below.



Rotate the [knob] to move the cursor to the value that needs to be modified. Press [OK] to modify the output pulse width value of this channel. Press up or down under the output main interface to move the cursor to the [SBUS] item. press [OK] to enter the compatible signal output of SBus. Dbus.

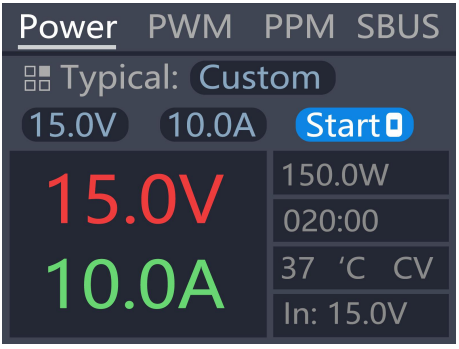
etc.. Press up or down. and switch the 16 channel value and status bit. The display interface is as shown below (9-16 channel and status display interface diagram omitted) Rotate the [knob] to move the cursor to the value of the channel to be modified. Press [OK] to modify the output pulse width value of this channel.





Power output

Rotate the [knob] on the [Output] main interface to move the cursor to the [Power] item. press [OK] to enter the power output function. This product will output the input power according to the setting voltage and current. constant voltage and constant current. The display interface is as shown below



Typical value**:** It is a common typical output mode. which can be set into the following 3 modes.

1. Input pass-through: Do not achieve constant current and constant voltage. and output the input voltage directly from the output main port.
2. custom: users can manually set the value of voltage and current limit according to demand
3. commonly used drone battery charging: select

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the corresponding battery. automatically configure the relevant output voltage and current.

Configure the relevant output voltage and current
12.0V: The voltage output from the output main port can be set to 5-30V.
10.0V: Maximum current limit output from the main port. the range of 1-15A can be set.
Start: Start output. stop output button
0.0V 0.0A 0.0W: Current output current and power of the main port.
33 ° C: current internal temperature of the device.
00:00: output time
CV CC: current working mode. CV: constant voltage CC: constant current

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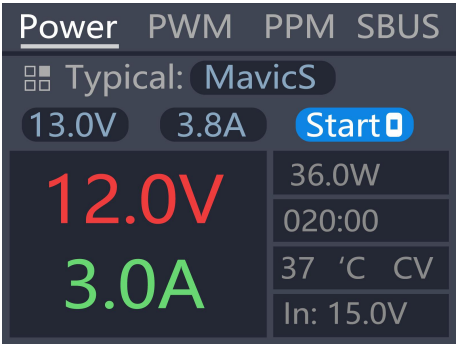


Important:
1. Do not charge the normal battery when the power output is turned on. Otherwise. the battery may be damaged or the device may be damaged.

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Drone charging

Rotate the [knob] on the [Output] main interface to move the cursor to the [Power] item. press [OK] to enter. then move the cursor to the typical value and change the output mode to the model of the drone that needs to be charged. Move the cursor to [Start] and press the enter key. The charger will output the set voltage. The display interface is as shown below



Typical: For common drone models. it can be set to the following four types of drones. Mavic2. Mavic. Phantom. Inspire.

13.0V: The voltage value when the current battery is full cannot be changed.

3.8AV: Maximum current for charging. adjustable current.

Start: Start output. stop output button

12.0V 3.0A 36.0W: Voltage. current and power

output from the main port.

20:00 Working hours

In: 15.0V: Input voltage.

37 °C: Current internal temperature of the device.

CV CC: Working mode. CV: constant voltage CC: constant current

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Tip:

1. There is no need to open the battery before charging. Automatic activation and charging

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Important:

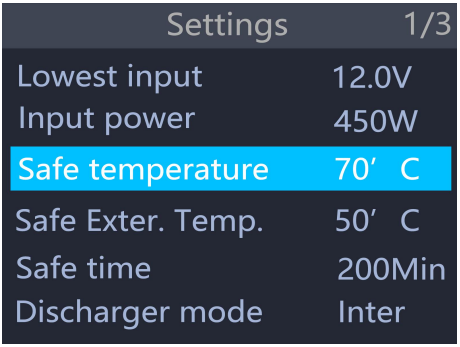
1. Do not charge the normal battery in this working mode. otherwise the battery may be damaged or the device may be damaged.

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System settings

After selecting the [Settings] function on the main interface. press the [OK] key to enter the function display the following interface. Rotate the [knob] to switch to the second interface. as shown below

Function Description:



Minimum input voltage: Below this voltage. the device will stop the main port output.

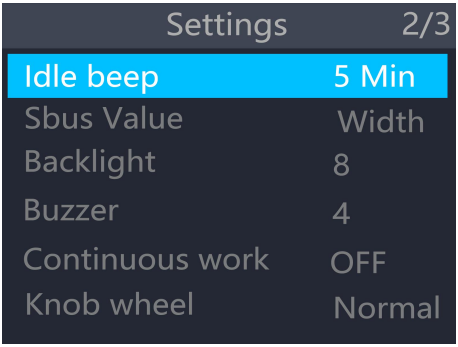
Maximum input power: The maximum power obtained from the input port during charging.

Safe operating temperature: above this temperature value. the device will stop the main port output

Safe Exter. Temp.: External temperature sensor above this temperature value. the device will stop the main port output

Safe charging time: The maximum time for continuous charging and discharging. will stop working if it exceeds

Discharge mode: Can be set to normal discharge. discharged by internal heat dissipation. Or recycle the discharge and recycle the energy to the input power source (the input must be rechargeable battery power) , Or external mode(need connect load into the input port)



Idle beep: If the device is not operated during this time, the sound and light will be disconnected from the power supply.

SBUS value: The display mode of sBus when measuring or outputting. can be set to pulse width value (1000-2000). or original value (0-2047).

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

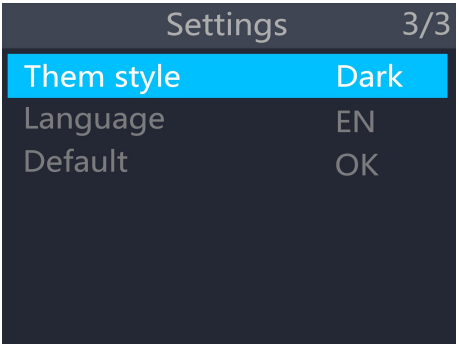
Buzzer: The tone of the buzzer can be set to off.

Energy saving tips: The sound and light are not disconnected from the power supply during this time.

Continuous work: After charging and discharging. whether to continue charging and discharging after replacing the battery

Work completed: When the charging is completed, you can set the end or charge with a small current.

Knob wheel: Adjust the sensitivity of the knob wheel



Them style: The color style displayed by the system interface.

Language: The system displays the language. Choose from English, German, French, Italian, Portuguese, Chinese, and more.

Default : Restore all settings to their default values.

Other functions

1. Firmware upgrade

After connecting the M8S to the computer via the USB cable in the box. the computer will recognize the USB flash drive named Toolkit. Download the upgrade file app.upg on the official website to overwrite the files in the USB flash drive to upgrade the firmware.

2. USB 5.0V output

In addition to the above upgrade functions. the USB interface can also output 2.1A current to charge mobile devices.

3. energy saving reminder

When the M8S is idle for 5 minutes. the backlight will automatically decrease.

4. Automatically continue to charge and discharge after the next one .

unplug the battery for 2 seconds. then access the next battery. the device will automatically continue to charge and discharge.

5. Fan rating

When the internal temperature of the device reaches 40 ° C. the fan work at the half-speed air volume to reduce noise. When the internal temperature reaches 50 ° C. the fan turns on the full speed air volume to enhance heat dissipation.

6. Manually calibrate the voltage.

Press and hold the Jog Wheel while powering up th e charger. The system will enter the manual calibration voltage function. Use a voltmeter to measure the actual voltage of each battery. move the cursor to the corresponding voltage value. and modify the voltage value to match the voltmeter value for calibration. After the calibration is completed. move the cursor to save. short press once. the buzzer sounds once and the save is successful. Exit or Turn off device

7. Supplement

When the lithium battery is fully charged. the prompt "fast charging has ended" .If the battery is not removed. constant voltage trickle charging will be performed automatically to bring the battery to the even more full state.

8. Extern discharge

Connect the battery to the output and the load resistor to the input. Set the discharge mode to external discharge in the setup menu. Set the cutoff voltage and load power, the device will use an external resistor to discharge the battery, and balance management.

Specification

Charging	Input	7-30V@MAX18A
	Battery Type	LiPo LiHV LiFe Lion@1-8S NiMh @1-20S Pb @1-12S
	Bal Cur.	800mA @2-8S
	Accuracy	±0.01V
	Charging Power	0.1-18A@400W
	Discharging Power	0.1-18A@400W Recycle Mode 0.1-5A@20W Normal Mode
	USB	2.1A@5.0V upgrade
Measuring	PWM	880us-2200us @20-400Hz
	PPM	880us-2200us*8Ch @20-50hz
	SBUS	880us-2200us*16ch @20-100Hz
	Voltage	1.0V-5.0V @1-8S
	IR	1-100mR @1-8S
Output	PWM	500us-2500us @20-1000Hz
	PPM	880us-2200us*8ch @50hz
	SBUS	880us-2200us*16ch @74Hz
	Power	1-18A@1-30V Mode: CC+CV
Display	LCD	TFT 2.4 inch 320*240 resolution
Product	Size	98mm*68mm*35mm
	Weight	170g
Individual packing	Size	108.5mm*80.5mm*46mm
	Weight	255g

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