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ToolkitRC MC8 32 Bit Battery Multi-Checker User Manual

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Contents

Foreword

Thank you for purchasing the MC8multi-checker.Please read through this manual carefully prior to operating the device.

Manual icons

- 🔆 Tip
- ⚠️ Important
- 📋 Nomenclature

Additional information

For more information pertaining to the operation and maintenance of your device, please visit the following link: **www.toolkitrc.com/mc8**

Safety precautions

1. The operational voltage of the MC8is betweenDC7.0V and 35.0V. Ensure the polarity of the power source is not reversed prior to use.
2. Do not operate under extreme heat, humidity, flammable and explosive environments.

3. Never leave unattended when in operation.

4. Disconnect power source when not in use

Product overview

The MC8 is a compact multi-checker designed for every hobbyist. Featuring a bright, color IPS display, it is accurate to 5mV.

- Measures and balances LiPo, LiHV, LiFe and Lion batteries.
- Wide voltage input DC 7.0-35.0V.
- Supports Main/Balance/Signal port power inputs.
- Measures and outputs PWM, PPM, SBUS signals
- USB-A, USB-C dual-port output.
- USB-C 20W PD fast charge output.
- Battery over-discharge protection. Automatically disables USB output when battery reaches critical levels.
- Measurement and balance accuracy: <0.005V.
- Balance current: 60mA.
- 2.0 inch, IPS full viewing angle display.
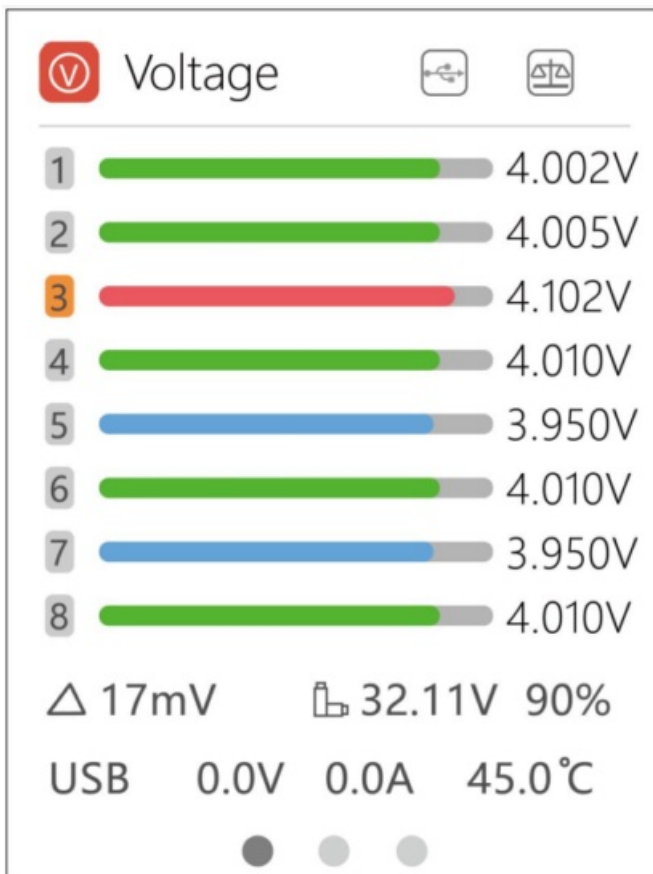- High resolution 320*240 pixels.

Layout

Front

Rear

Output slider Metal roller USB-C port USB-A port

First use

1. Connect the battery to the MC8's balance port, or connect 7.0-35.0V voltage to the XT60 input port oftheMC8.
2. The screen shows the boot logo for 0.5seconds
3. After the boot is completed, the screen enters the main interface and displays as follows:

4. Turn the roller to scroll between menus and options.
5. Short or long press the roller to enter item
6. Use the output slider to adjust channel output.

💡 The scroller functions differently for different menu items, please refer to the following instructions.

Voltage test

Voltage display and balance(individual cells)

Connect the balance port of the batterytotheMC8.After the device powers on, the main pages hows the voltage of each individual cell- as shown below:

The colored bars show the voltage of the battery graphically. The cell with the highest voltage is displayed in red, while the cell with the lowest voltage is displayed in blue. The total voltage and the voltage difference(highest voltage-lowest voltage) is shown below.

On the main menu, press the [wheel] to start the balance function. The MC8 uses internal resistors to discharge the cell(s) until the pack reaches a uniform voltage between cells (<0.005V difference).

1. 💡 The bars are calibrated for LiPOs, it is not accurate for batteries with other chemistries.
2. After balancing the battery pack, remove the battery from the MC8 to prevent over-discharging.

Battery pack total voltage

Connect the battery lead to the mainXT60portonthe MC8 to display the total voltage of the battery pack, as shown below.
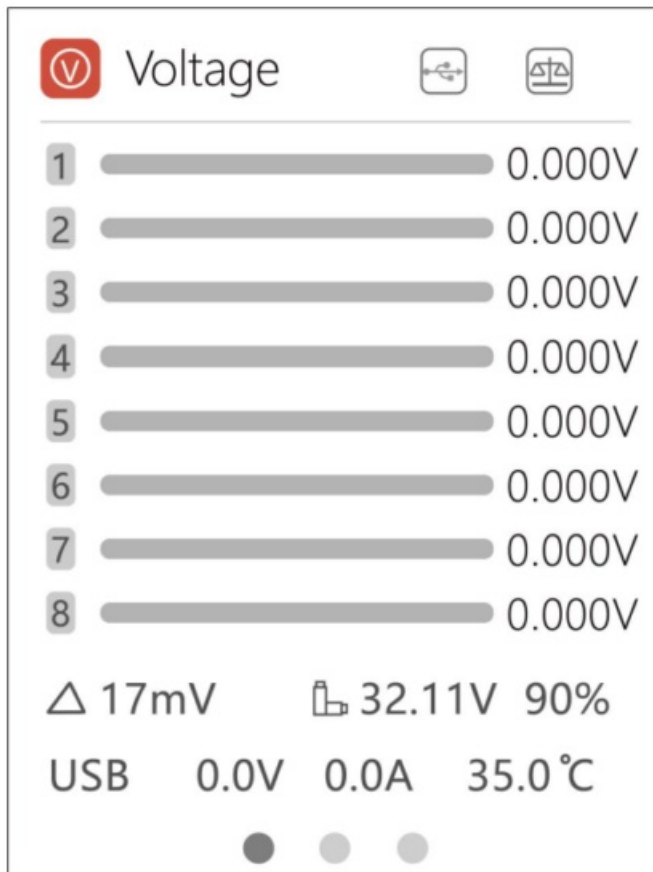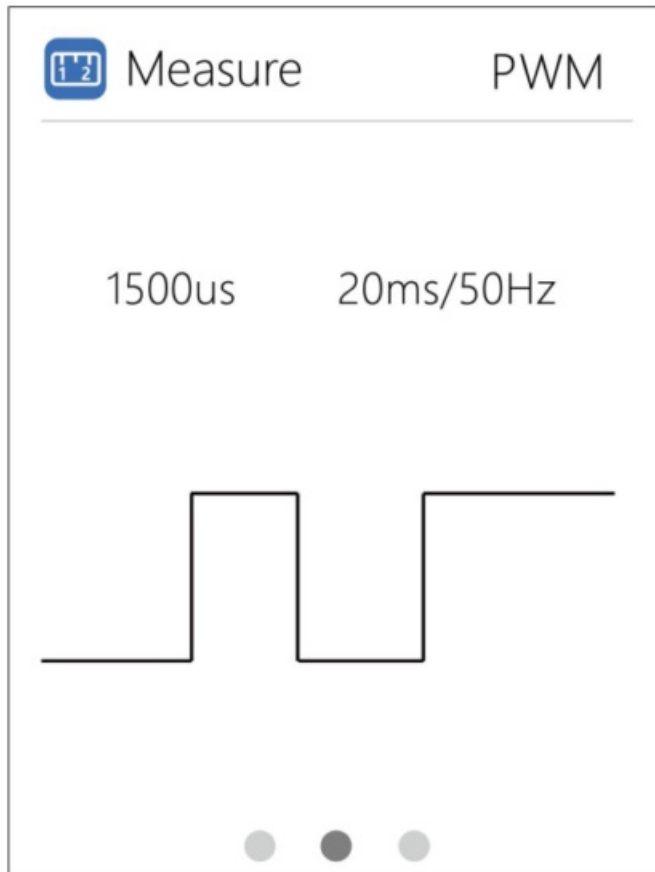

💡 The MC8 displays the total voltage of all battery chemistries operating with in the input limits .

Signal measurement

PWM Signal measurement

After the device powers on, scroll right once on the metal roller to enter Measure mode. The page is displayed as

follows.

UI description
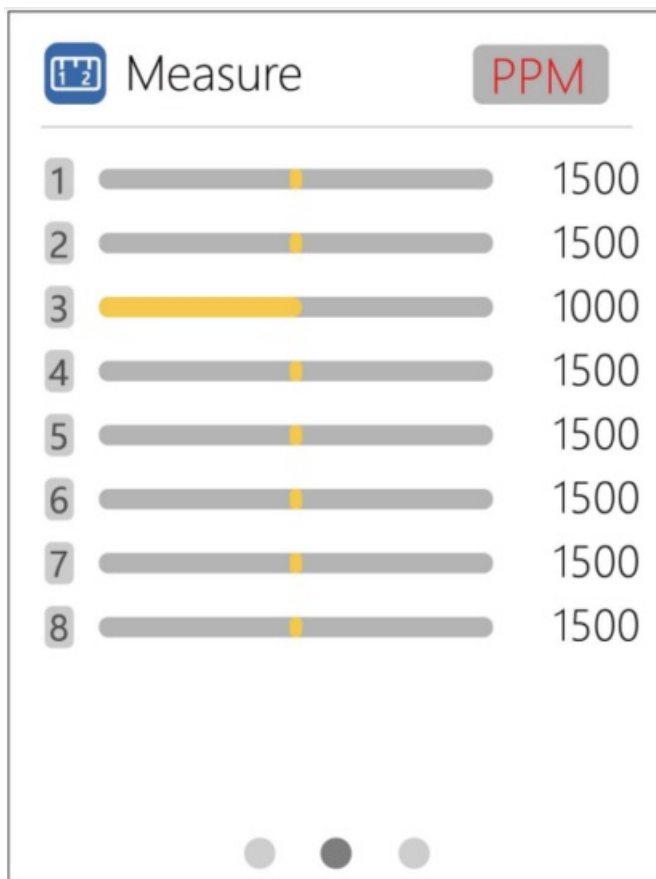**PWM:** Signal type
1500 Current PWM pulse width
20ms/5Hz   Current cycle and frequency of PWM signal.

When using the signal measurement function. The signal port, balance port, and main input port can all supply power to the MC8.
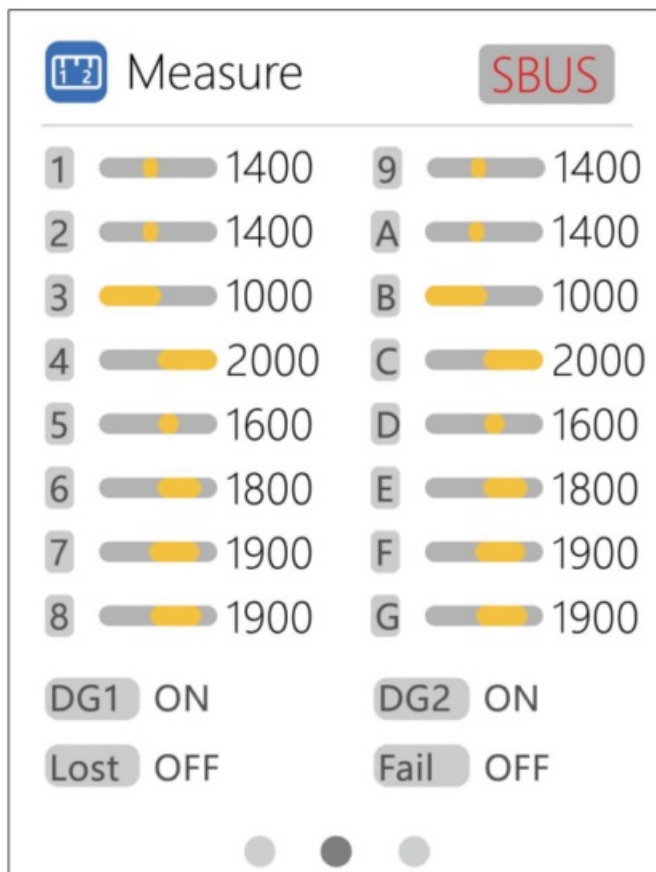

PPM signal measurement

Under PWM signal measurement mode, press down on the scroller and scroll right until PPM is shown. Then the PPM signal can be measured, as shown below.

SBUS Signal measurement

Under PWM signal measurement mode, press down on the scroller and scroll right until SBUS is shown. Then the SBUS signal can be measured, as shown below.

Signal output

PWM Signal output

With the MC8 powered on, scroll right twice on the roller to enter Output mode. Press down onthescrollerfor2seconds to enter the signal output mode, as shown below. UI Description
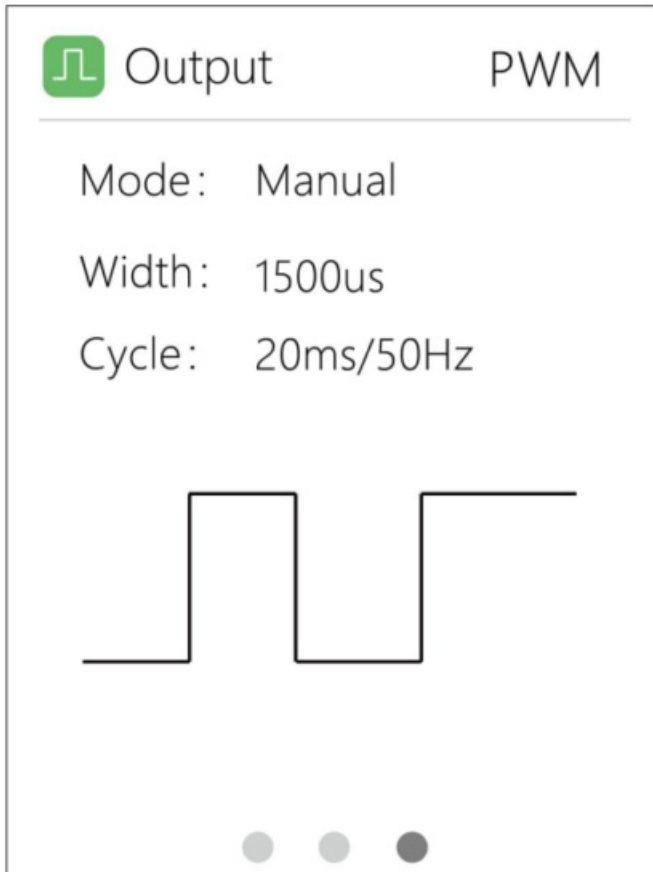
Mode Signal output mode- can be changed between manual and 3 automatic modes of varying speeds.
Width PWM signal output pulse width, rangelimit1000us-2000us. When set to manual, push the channel output slider to change the output signal width. When set to automatic, the signal width will automatically increase or decrease.
**Cycle** PWM signal output cycle. Range adjustable between 1ms-50ms.

1. When the cycle is set to less than2ms, the maximum width will not exceed the cycle value.

2. The channel output slider is safety protected. There will be no signal output until the slider is returned to its minimum position first.

PPM Signal output

From the PWM output page, short press on PWM to change the output type; scroll right until PPM is displayed. Short press to confirm the PPM selection, as shown below:
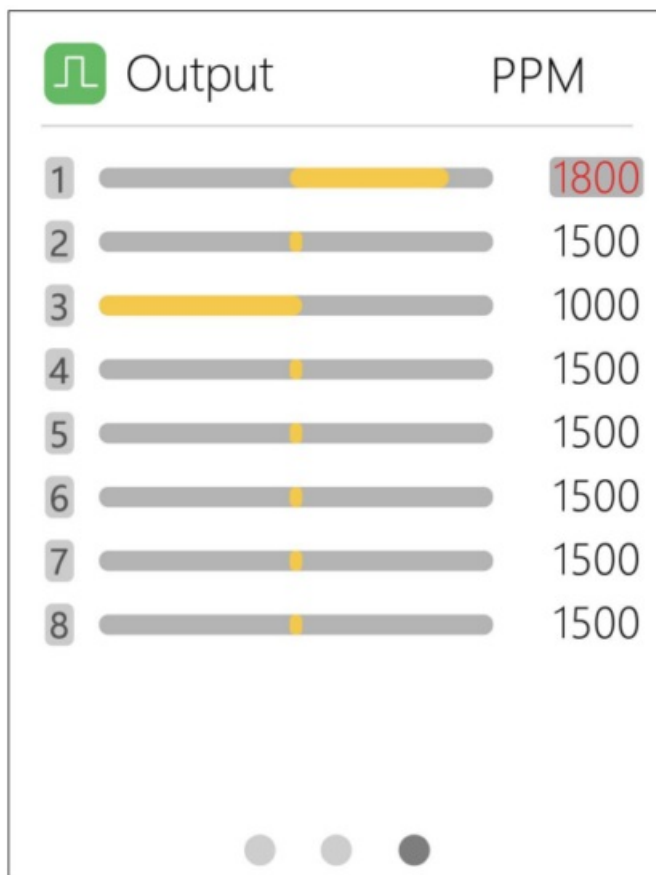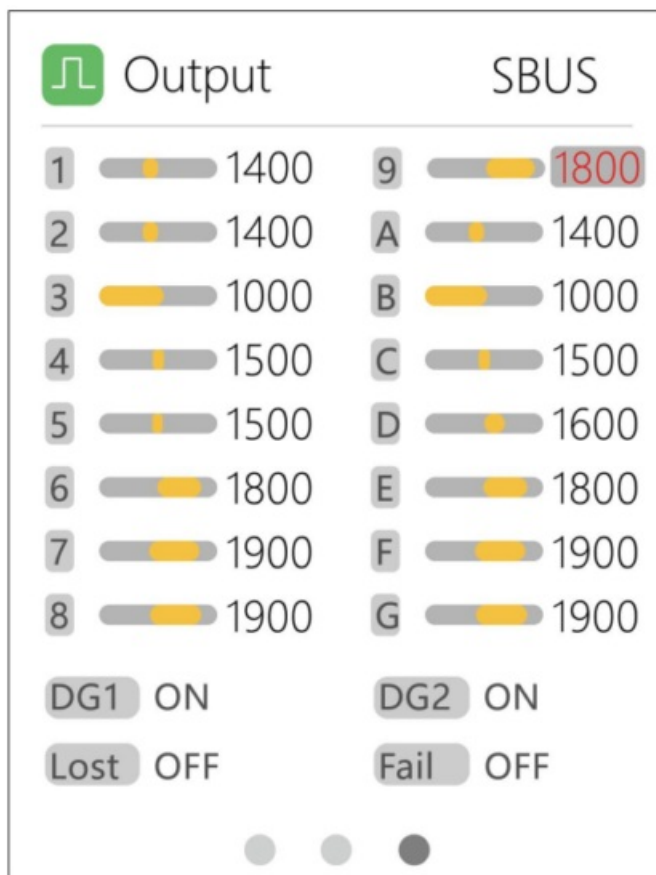
In the PPM output page, press down ontherollerfor2seconds to set the output value of each channel.

1. 💡 The throttle channel can only be controlled using the signal from the output slider; the value cannot be changed using the roller for safety reasons.
2. Ensure the output slider is at its lowest point prior to performing any tests.

SBUS signal output

From the PWM output page, short press on PWM to change the output type; scroll right until SBUS is displayed. Short press to confirm the SBUS selection, as shown below:

⊓ Output		SBUS	
1	1400	9	1800
2	1400	A	1400
3	1000	B	1000
4	1500	C	1500
5	1500	D	1600
6	1800	E	1800
7	1900	F	1900
8	1900	G	1900
DG1 ON		DG2 ON	
Lost OFF		Fail OFF	

In the SBUS output page, press down ontherollerfor2seconds to set the output value of each channel.

1. 💡 When the cycle is set to less than2ms, the maximum width will not exceed the cycle value.
2. The channel output slider is safety protected. There will be no signal output until the slider is returned to its minimum position first.

USB charging

Built-in USB ports allow the user to charge mobile devices on the go. The USB-A port supplies 5V1Awhilethe USB-C port supplies 20Wfast charging, using the following protocols: PD3.0,QC3.0,AFC,SCP,FCPetc.

Press and hold [Wheel] 2 seconds to enter the setting menu, you can set the USB cutoff voltage. When the battery discharges past the set value, theMC8willdisable both USB-A and USB-C output; the buzzer will also give an extended tone, indicating the protection voltage has been reached.
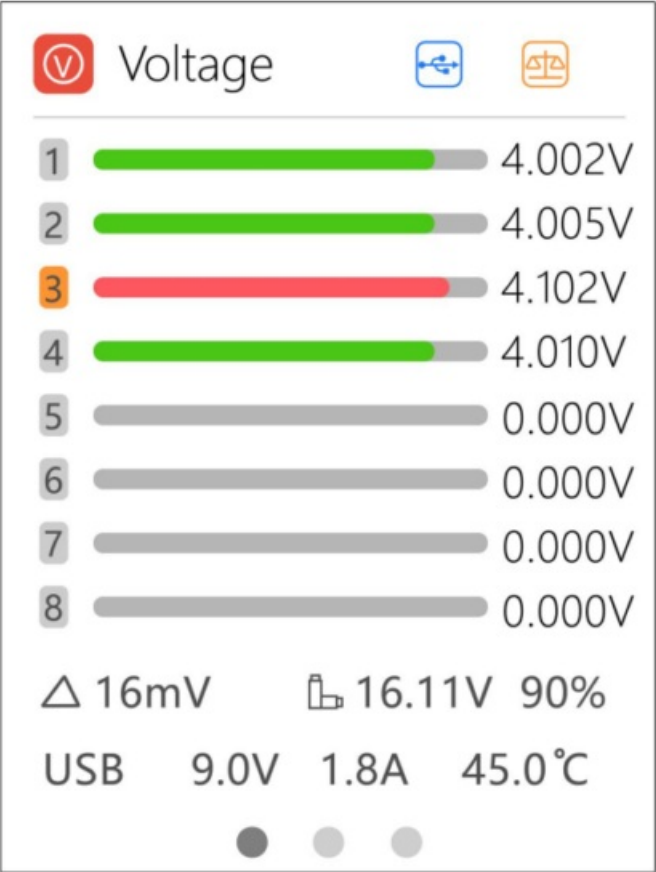
Setup

On the voltage interface, press and hold[wheel] to enter the system settings, as shown in the figure below

Description

Safety voltage: When the battery voltage is lower than this value, the USB output will be turned off. Backlight: display brightness setting, you can set 1-10.

Buzzer: Operation prompt sound, 7 tones can beset or turned off.

Language: System language, 10 display languages can be selected. Theme style: display style, you can set bright and dark themes.

Default: Restore to factory setting.

Back: Return to the voltage test interface.

ID: The unique ID number of the machine.

Calibration

Press and hold the roller while poweringontheMC8to enter calibration mode, as shown below:

Input	16.384V
1	4.096V
2	4.095V
3	4.096V
4	4.096V
5	4.093V
6	4.098V
7	4.096V
8	4.096V
ADC	44850

Exit	Save	Defau.

Measure the voltage of a fully-charged battery pack using a multi-meter. Use the roller to select Input, then scroll until the value matches what was measured on the multimeter. Scroll down to save and press down on the roller to save. Repeat this process for each individual cell if needed. When finished, scroll to the exit option and press down on the roller to finish the calibration.

Input: Voltage measured at the main

XT60port. 1-8: Voltage of each individual cell.

ADC: Original value of the selected option prior to calib

Exit: Exit calibration mode

Save: Save calibration data

Defau.: Return to default settings

💡 Only use multimeters with 0.001Vaccuracytoperform calibrations. If the multimeter is not accurate enough, do not perform calibration.

Specifications

General	Main input port	XT60 7.0V-35.0V
	Balance input	0.5V-5.0V Lixx 2-8S
	Signal port input	<6.0V
	Balance current	MAX 60mA @2-8S
	Balance accuracy	<0.005V @ 4.2V
	USB-A output	**5.0V@1.0A** firmware upgrade
	USB-C output	5.0V-12.0V @MAX 20W
	USB-C protocol	PD3.0 QC3.0 AFC SCP FCP
Measurement	PWM	500-2500us @20-400Hz
	PPM	880-2200us*8CH @20-50Hz
	SBUS	880-2200us *16CH @20-100Hz
Output	PWM	1000-2000us @20-1000Hz
	PPM	880-2200us*8CH @50Hz
	SBUS	880-2200us *16CH @74Hz
Product	Size	68mm*50mm*15mm

	Weight	50g
Package	Size	76mm*60mm*30mm
	Weight	100g
LCD		IPS 2.0 inch 240*240 resolution

Documents / Resources

	ToolkitRC MC8 32 Bit Battery Multi-Checker [pdf] User Manual MC8 32 Bit Battery Multi-Checker, MC8, 32 Bit Battery Multi-Checker

References

- **ToolkitRC.The future of possible**
- **MC8-ToolkitRC co., ltd.**