Manuals+ — User Manuals Simplified.

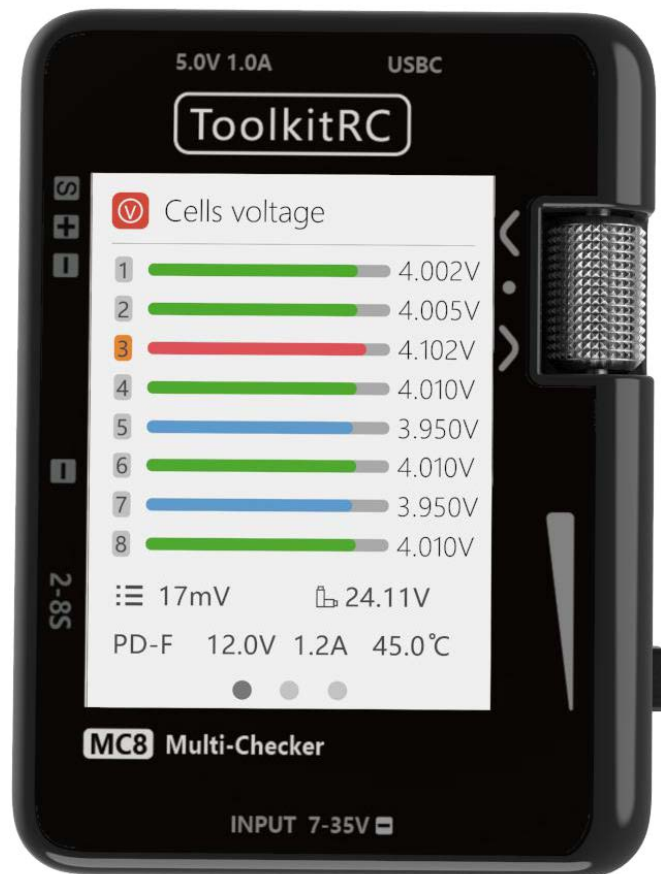# ToolkitRC MC8 Cell Checker and Multi Tool with USB-C Fast Charging User Manual

Contents

ToolkitRC

ToolkitRC MC8 Cell Checker and Multi Tool with USB-C Fast Charging

Foreword

Thank you for purchasing the MC8 multi-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 MC8 is between DC 7.0V 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 the battery reaches critical levels.
- Measurement and balance accuracy: <0.005V.
- Balance current: 60mA.
- 2.0 inch, IPS full viewing angle display.
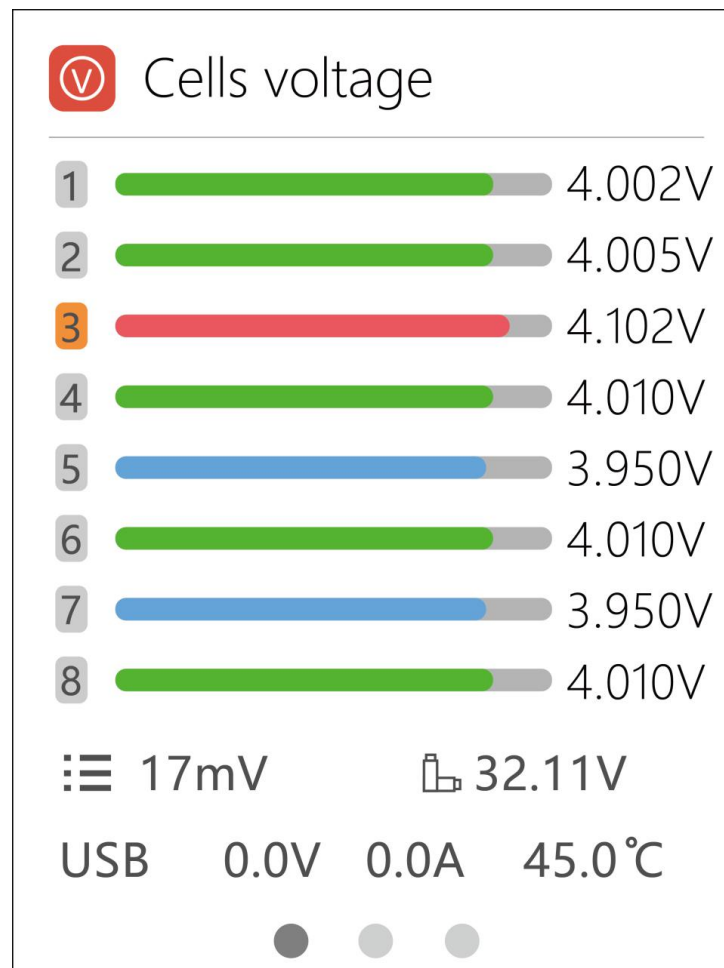- High resolution 320*240 pixels.

Layout

Front

First use

1. Connect the battery to the MC8's balance port, or connect 5.0-35.0V voltage to the XT60 input port of the MC8.
2. The screen shows the boot logo for 0.5 seconds
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

    1. 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 battery to the MC8. After the device powers on, the main page shows 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 roller in excess of 2 seconds 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 main XT60 port on the MC8 to display the total voltage of the battery pack, as shown below.
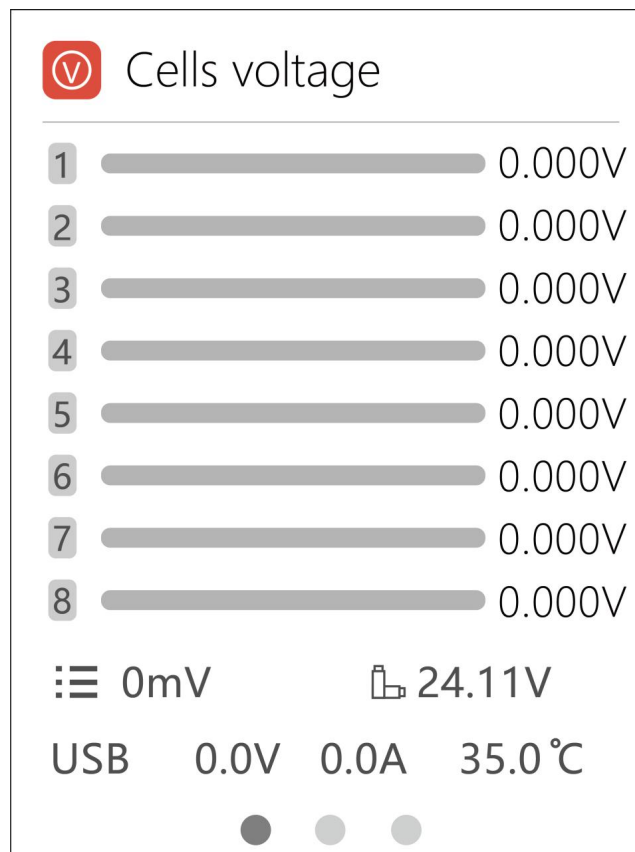
1. The MC8 displays the total voltage of all battery chemistries operating within the input limits .

Signal measurement

1. **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.
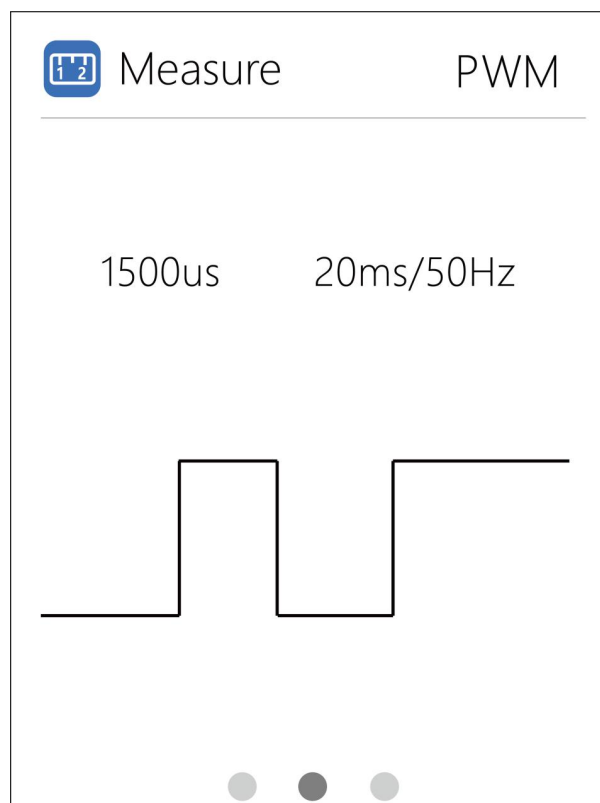

UI description

- **PWM:** Signal type

  1500 Current PWM pulse width

  20ms/5Hz Current cycle and frequency of PWM
- When using the signal measurement function. The signal port, balance port, and main input port can all supply power to the MC8.

2. **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.
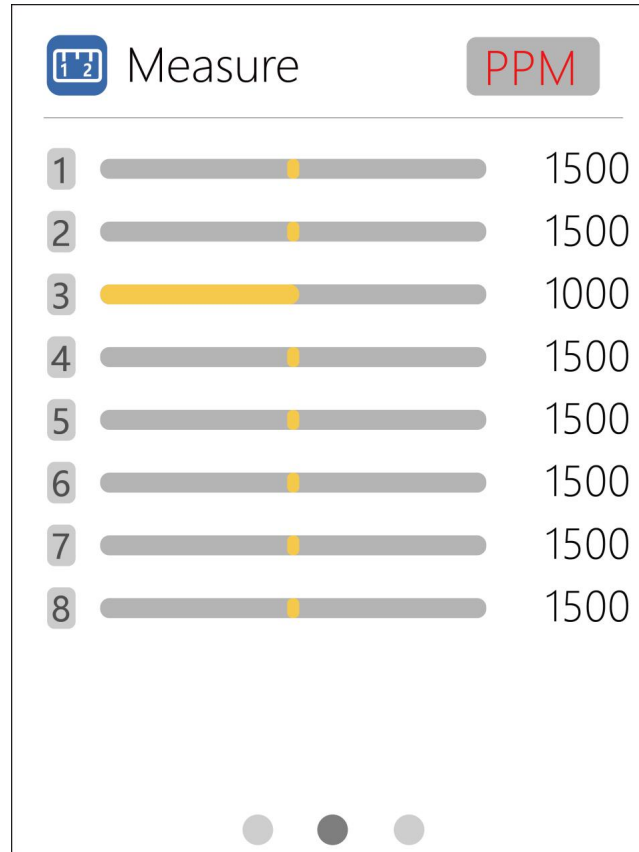

3. **SBUS Signal measurement** Under PWM signal measurement mode, press down on the scroller and scroll right until SBUS is shown. Then the SBUS signal can be measured, as shown below.
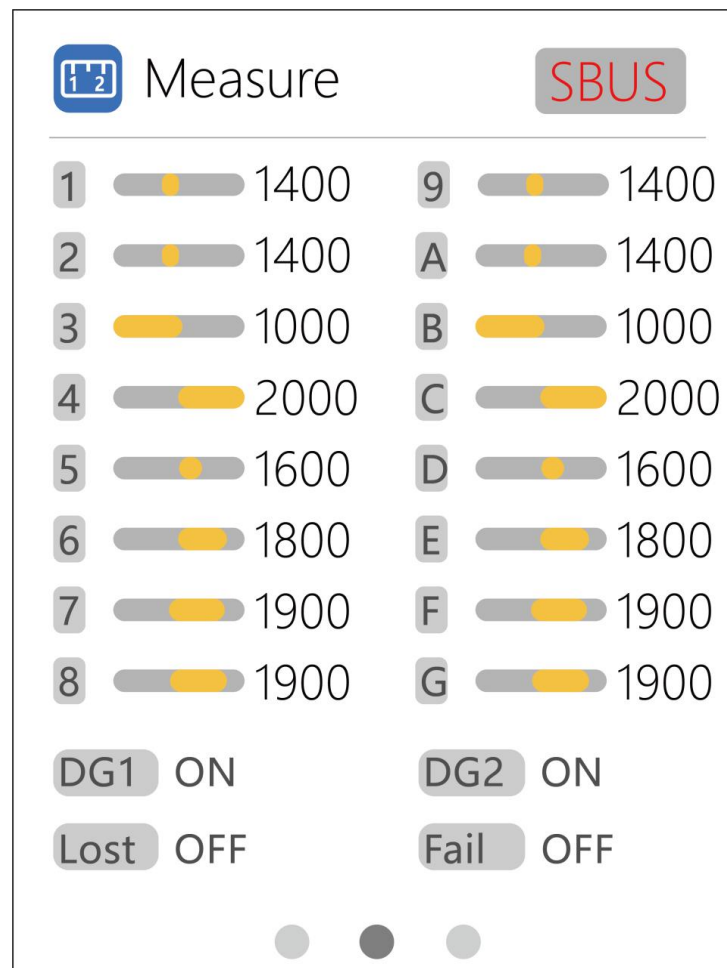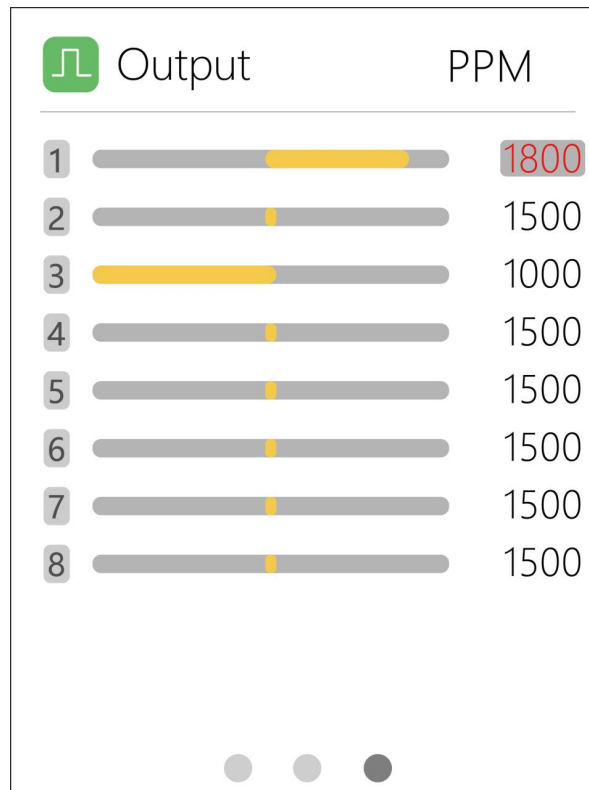
Signal output

1. **PWM Signal output** With the MC8 powered on, scroll right twice on the roller to enter Output mode. Press down on the scroller for 2 seconds to enter the signal output mode, as shown below. UI Description
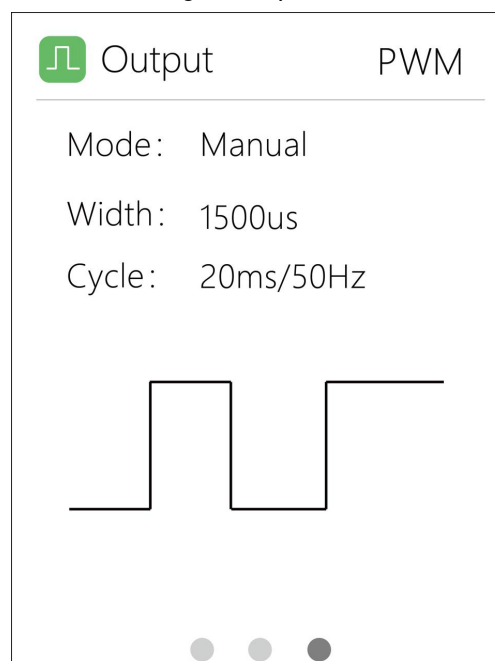
- **Mode** Signal output mode- can be changed between manual and 3 automatic modes of varying speeds.
- **Width** PWM signal output pulse width, range limit 1000us-2000us. When set to manual, push the channel output slider to change the output signal width. When set to automatic, the signal width will automatically increase or decrease.
- **Cycle** PWM signal output cycle. Range adjustable between 1ms-50ms.

- When the cycle is set to less than 2ms, the maximum width will not exceed the cycle value.
- The channel output slider is safety protected. There will be no signal output until the slider is returned to its minimum position first.
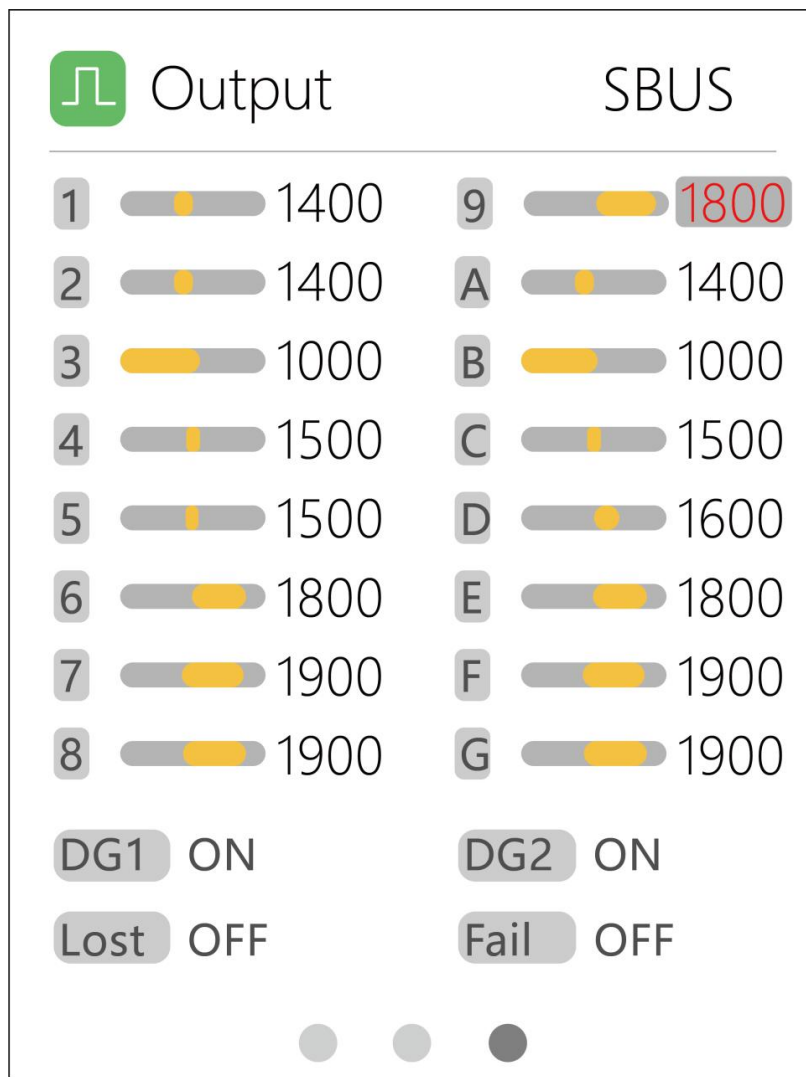
2. **PPM Signal output** From the PWM output page, short press on PWM to change the output type; scroll right until PPM is displayed. Short press to confirm the PPM selection, as shown below:

On the PPM output page, press down on the roller for 2 seconds 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.

3. **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 on the roller for 2 seconds to set the output value of each channel.

1. When the cycle is set to less than 2ms, 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 5V 1A while the USB-C port supplies 20W fast charging, using the following protocols: PD3.0, QC3.0, AFC, SCP, FCP, etc.
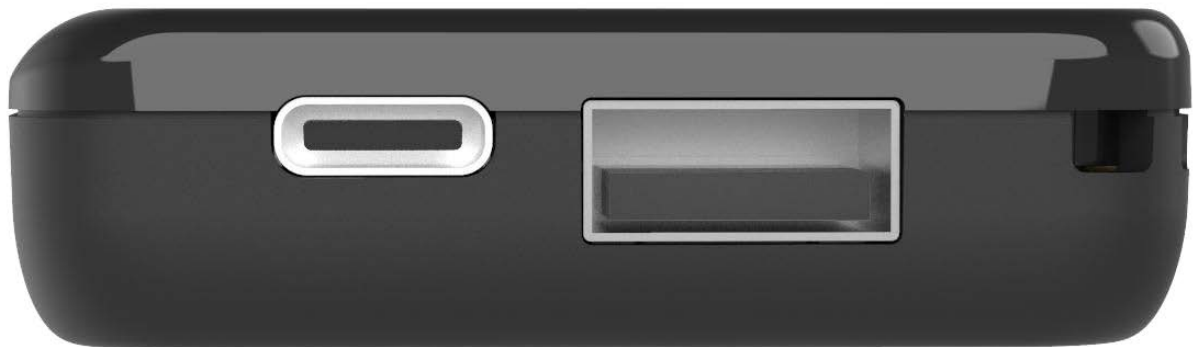
When charging USB devices, always connect the balance port. When any individual cell reaches 3.0V or below, the USB output will stoppreventing battery damage.

Calibration

Press and hold the roller while powering on the MC8 to 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 multimeter. 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 XT60 port.
- **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
- **Default.:** Return to default settings

Only use multimeters with 0.001V accuracy to perform 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
Measure ment	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 Cell Checker and Multi Tool with USB-C Fast Charging** [pdf] User Manual
MC8, Cell Checker and Multi Tool with USB-C Fast Charging |

References

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