MC8

ToolkitRC · Battery checker and balancer 2–8S
User manual

Please read through this manual carefully prior to first use, especially the safety precautions in Chapter 1.3. Keep this manual.

Importer: Rotorama, s.r.o. · www.rotorama.cz

Contents

1. Introduction and safety

1.1 About the product

The **ToolkitRC MC8** is a compact multi-checker designed for every hobbyist. It measures and balances **LiPo, LiHV, LiFe and Li-ion 2–8S** batteries, measures and outputs **PWM, PPM and SBUS** signals and its built-in USB ports allow mobile devices to be charged from the connected battery. Featuring a bright, colour 2.0" IPS display with a full viewing angle, it is accurate to 5 mV.

- Measures and balances LiPo, LiHV, LiFe and Li-ion batteries.
- Wide voltage input DC 7.0–35.0 V.
- Supports main / balance / signal port power inputs.
- Measures and outputs PWM, PPM and SBUS signals.
- USB-A and USB-C dual-port output, USB-C 20 W PD fast charge output.
- Battery over-discharge protection – USB output is automatically disabled when the battery reaches the set limit.
- Measurement and balance accuracy <0.005 V, balance current 60 mA.
- 2.0" IPS display with a resolution of 320 × 240 pixels.

1.2 Package contents

- 1× MC8 multi-checker
- 1× USB cable
- 1× Quick manual
- 1× Screen protector

1.3 Safety precautions

Please read through this manual carefully prior to operating the device and keep it for future reference.

① The operational voltage of the MC8 is **DC 7.0–35.0 V**. Do not apply a higher voltage to the main input and ensure the **polarity** of the power source is not reversed prior to use.

② Do not operate under extreme heat or humidity, or in flammable and explosive environments.

③ **Never leave the device unattended** when in operation – especially during balancing.

④ Disconnect the power source and the battery when the device is not in use.

⑤ After balancing the battery pack, remove the battery from the MC8 to prevent over-discharging.

⑥ Do not connect or balance batteries that are damaged, swollen or overheated.

⑦ When testing speed controllers (ESC) and motors with the signal output, always **remove the propellers** first.

⑧ The device is not a toy. Keep it out of the reach of children.

Lithium batteries may catch fire if handled improperly. Balance them on a non-flammable surface away from flammable objects.

1.4 Manufacturer

Manufacturer	Toolkit RC Co., LTD
Address	South of 5F, B2 Building, Shanghe Industrial Park, Nanchang Road, Hangcheng Street, Bao'an District, Shenzhen, China
E-mail	sales@toolkitrc.com
Web	www.toolkitrc.com/mc8

The importer and responsible person in the EU is Rotorama, s.r.o. – see Chapter 8.1 for contact details.

2. Device overview

2.1 Controls and ports

Front

Rear

No.	Part	Function
①	IPS display	shows measured values and menus
②	Signal port	PWM, PPM, SBUS signal input / output
③	Balance port	connection of the battery balance lead 2–8S
④	Main input (XT60)	7.0–35.0 V power input, total voltage measurement
⑤	Output slider	manual adjustment of the output signal
⑥	Metal roller	turn = scroll through menus, press = select
⑦	USB-C port	output up to 20 W
⑧	USB-A port	5 V / 1 A output, firmware upgrade

2.2 First use

① Connect the battery to the MC8's balance port, or connect 7.0–35.0 V 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 *Voltage* interface.

④ Turn the roller to scroll between menus and options.

⑤ Short or long press the roller to enter an item.

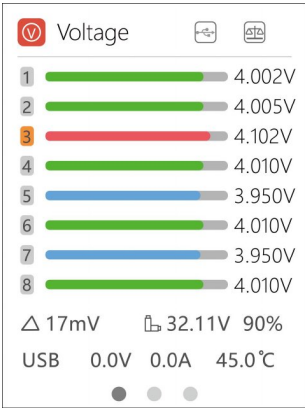
⑥ Use the output slider to adjust the channel output.

※ The roller functions differently for different menu items – please refer to the instructions in the following chapters.

3. Voltage test

3.1 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. The coloured 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) are shown below.



Main page – individual cell voltages

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

※ The bars are calibrated for LiPo batteries; they are not accurate for batteries with other chemistries. After balancing the battery pack, remove the battery from the MC8 to prevent over-discharging.

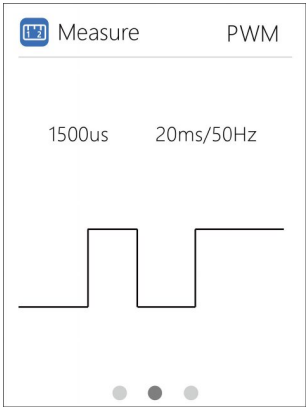
3.2 Battery pack total voltage

Connect the battery lead to the main XT60 port on the MC8 to display the total voltage of the battery pack. The MC8 displays the total voltage of all battery chemistries operating within the input limits (7.0–35.0 V).

4. Signal measurement

4.1 PWM signal measurement

After the device powers on, scroll right once on the metal roller to enter *Measure* mode.



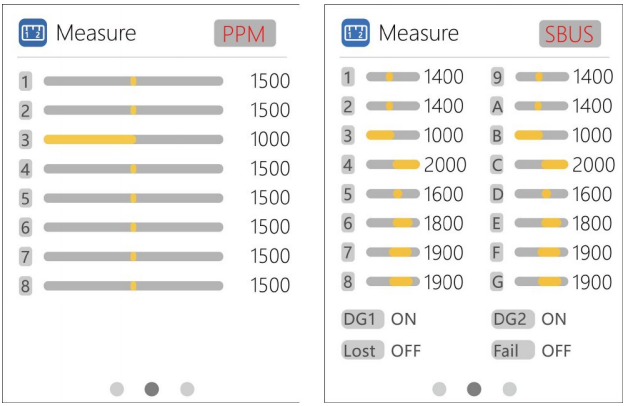
PWM signal measurement

- **PWM** – signal type,
- **1500us** – current PWM pulse width,
- **20ms/50Hz** – current cycle and frequency of the PWM signal.

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

4.2 PPM and SBUS signal measurement

Under PWM signal measurement mode, press down on the roller and scroll right until **PPM** or **SBUS** is shown. The selected signal can then be measured – 8 channels are shown for PPM and 16 channels for SBUS (1–8 and 9–G).



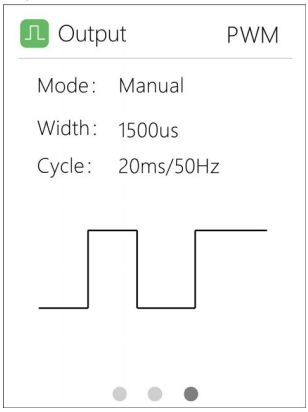
PPM (left) and SBUS (right) signal measurement

※ For SBUS, the status flags of the protocol are also shown: **DG1** and **DG2** (digital channels), **Lost** (frame lost) and **Fail** (failsafe).

5. Signal output

5.1 PWM signal output

With the MC8 powered on, scroll right twice on the roller to enter *Output* mode. Press down on the roller for 2 seconds to enter the signal output settings.



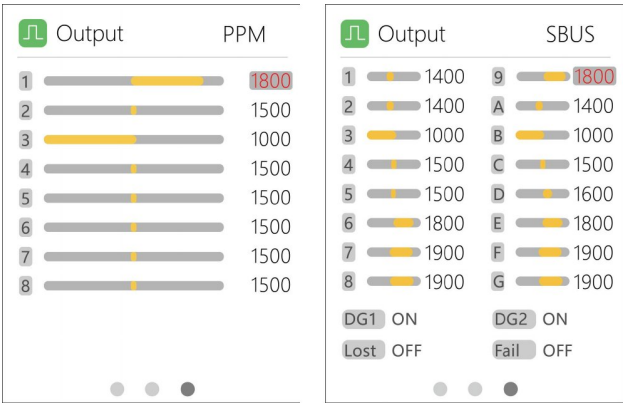
PWM signal output

- **Mode** – signal output mode, can be changed between manual (*Manual*) and 3 automatic modes of varying speeds.
- **Width** – PWM signal output pulse width, range limit 1000–2000 µs. When set to manual, push the 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, adjustable between 1–50 ms.

※ When the cycle is set to less than 2 ms, the maximum width will not exceed the cycle value. The output slider is safety protected – there will be no signal output until the slider is returned to its minimum position first.

5.2 PPM and SBUS signal output

From the PWM output page, short press on **PWM** to change the output type, scroll right until **PPM** or **SBUS** is displayed and short press to confirm the selection. Then press down on the roller for 2 seconds to set the output value of each channel.



PPM (left) and SBUS (right) signal output

※ For safety reasons, the throttle channel can only be controlled using the output slider; its value cannot be changed using the roller. Ensure the output slider is at its lowest point prior to performing any tests.

6. USB charging, setup and calibration

6.1 USB charging

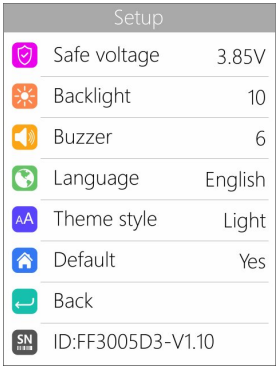
Built-in USB ports allow the user to charge mobile devices on the go from the connected battery. The **USB-A** port supplies 5 V / 1 A, while the **USB-C** port supplies 20 W fast charging using the following protocols: PD3.0, QC3.0, AFC, SCP, FCP etc.

USB-C and USB-A ports

Press and hold the roller for 2 seconds to enter the settings menu, where you can set the USB cutoff voltage (*Safe voltage*). When the battery discharges past the set value, the MC8 will disable both USB-A and USB-C output; the buzzer will also give an extended tone, indicating that the protection voltage has been reached.

6.2 Setup

On the voltage interface, press and hold the roller to enter the system settings (*Setup*).



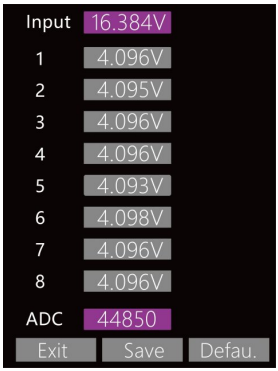
Setup menu

Item	Description
Safe voltage	when the battery voltage is lower than this value, the USB output will be turned off
Backlight	display brightness, adjustable 1–10
Buzzer	operation prompt sound, 7 tones or off
Language	system language, 10 display languages

Item	Description
Theme style	display style – light or dark theme
Default	restore factory settings
Back	return to the voltage test interface
ID	unique ID number of the device

6.3 Calibration

Press and hold the roller while powering on the MC8 to enter calibration mode.



Calibration mode

Measure the voltage of a fully charged battery pack using a multimeter. Use the roller to select **Input**, then scroll until the value matches the one measured on the multimeter. Scroll to **Save** and press down on the roller to save. Repeat this process for each individual cell if needed. When finished, scroll to **Exit** and press down on the roller to finish the calibration.

Item	Description
Input	voltage measured at the main XT60 port
1–8	voltage of each individual cell
ADC	original value of the selected item prior to calibration
Exit	exit calibration mode
Save	save calibration data
Defau.	return to default settings

※ Only use multimeters with 0.001 V accuracy to perform calibrations. If the multimeter is not accurate enough, do not perform calibration.

7. Specifications

Group	Parameter	Value
	Main input port	XT60, 7.0–35.0 V
	Balance input	0.5–5.0 V, Li-xx 2–8S
	Signal port input	<6.0 V
General	Balance current	max. 60 mA (2–8S)
	Balance accuracy	<0.005 V at 4.2 V
	USB-A output	5.0 V / 1.0 A, firmware upgrade
	USB-C output	5.0–12.0 V, max. 20 W
	USB-C protocols	PD3.0, QC3.0, AFC, SCP, FCP
	PWM	500–2500 µs, 20–400 Hz
Measurement	PPM	880–2200 µs × 8 channels, 20–50 Hz
	SBUS	880–2200 µs × 16 channels, 20–100 Hz
	PWM	1000–2000 µs, 20–1000 Hz
Output	PPM	880–2200 µs × 8 channels, 50 Hz
	SBUS	880–2200 µs × 16 channels, 74 Hz
Product	Size	68 × 50 × 15 mm
	Weight	50 g
Package	Size	76 × 60 × 30 mm
	Weight	100 g
Display	IPS 2.0"	320 × 240 pixels

8. Information for the EU and Czech Market

※ The information in Chapters 8 and 9 describes the situation under the law of the Czech Republic. EU regulations apply in all member states, but national regulations differ. If you use the product in another country, you must follow the regulations of the country in which you use it.

8.1 Importer and responsible person in the EU

The product is placed on the European Union market by the importer stated below, who is at the same time the responsible person within the meaning of Article 16 of Regulation (EU) 2023/988 of the European Parliament and of the Council on general product safety (GPSR).

Importer / responsible person in the EU	Rotorama, s.r.o.
Company ID (IČO)	051 57 692
VAT ID (DIČ)	CZ05157692
Registered office	Okrajová 1351, 674 01 Třebíč, Czech Republic
E-mail	info@rotorama.cz
Phone	+420 252 252 098
Website	www.rotorama.cz

8.2 Product conformity

CE

- The product bears the **CE** marking and complies with the requirements of the applicable European Union harmonisation legislation.
- A copy of the **EU Declaration of Conformity** is available from the importer at the address stated above or at the e-mail address info@rotorama.cz.
- **Product identification:** the type designation (MC8) is given on the device and on the packaging; the unique identification number of the device (ID) is shown in the *Setup* menu (Chapter 6.2).

8.3 Disposal of electrical equipment

- The crossed-out wheeled bin symbol on the product, its packaging or in the documentation means that at the end of its service life the product **must not be disposed of together with mixed municipal waste**.
- Hand it over at a take-back point for electrical equipment – at a collection yard, at a take-back point of a collective system, or at the retailer when purchasing a new equivalent product. Take-back is free of charge for the end user.
- The obligations under Act No. 542/2020 Coll., on end-of-life products, are fulfilled by the importer through a collective take-back system.
- Proper disposal helps prevent negative impacts on the environment and human health and contributes to the reuse of secondary raw materials.

Through its contractual partner **ASEKOL a.s.**, the company ensures the take-back of waste electrical equipment from households and the separate collection of waste electrical equipment, batteries and accumulators in accordance with the applicable legislation. The customer is entitled to hand over old electrical equipment or a battery or accumulator at any collection point of the above contractual partner. The addresses of these take-back points are listed at www.asekol.cz, www.ecobat.cz and also https://visoh2.mzp.cz/RegistrMistZO/RegistrMistZOPublic/MapaMistZpetOdberu.

9. Warranty and rights arising from defective performance

The rights and obligations of the contracting parties are governed by Czech law, in particular by Act No. 89/2012 Coll., the Civil Code, and Act No. 634/1992 Coll., on consumer protection.

- The seller is liable to the buyer for the product being free of defects on receipt. If the buyer is a consumer, a defect may be notified **within two years of receipt** of the product (Section 2165 of the Civil Code).
- If a defect appears within **one year** of receipt, the product is deemed to have been defective already at the time of receipt (Section 2161(5) of the Civil Code).
- When purchasing online, a consumer has the right to **withdraw from the contract within 14 days** of receiving the goods without giving a reason (Section 1829 of the Civil Code).
- Claims should be made with the retailer from whom you purchased the product. The importer's contact details are given in Chapter 8.1.
- The competent body for out-of-court settlement of consumer disputes is the **Czech Trade Inspection Authority**, Štěpánská 796/44, 110 00 Prague 1, www.coi.cz.