



ToolkitRC M6AC

Multifunctional AC/DC balance charger
User manual



Please read this manual carefully before first use, in particular the safety instructions in chapter 1. Never leave charging batteries unattended.

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

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1. Safety

Thank you for purchasing the ToolkitRC M6AC balance charger. Please read this entire manual carefully before first use, in particular the safety instructions, and keep it for future reference.

This product may only be used by persons aged 14 and over.

1.1 Power supply and environment

- The charger accepts an input voltage of **AC 100-240 V** (mains cable included) or **DC 7-28 V** (power supply, battery or power bank). Ensure the charger is only connected to a suitable power source and with correct polarity.
- Do not use this product in hot, humid, flammable or explosive environments. The charger is intended for use in dry indoor areas; do not expose it to rain or moisture.
- Do not cover the cooling fan on the back or the ventilation openings, and place the charger on a firm, non-flammable surface.
- When not using this product, please unplug the input power.
- Do not use the charger if its housing, mains cable or connectors are damaged.

1.2 Charging batteries

- **Never leave charging or discharging batteries unattended.** Do not use this charger without supervision.
- When using the charging function, set a current that matches the battery. Do not set an excessive current to avoid damage to the battery. Check the guidelines of your battery's manufacturer for correct charging instructions.
- Before charging, always check that the **correct battery type** and the **correct cell count** are selected. An incorrect setting may damage the battery and cause a fire.
- Only charge rechargeable batteries of the supported types (chapter 4.1). **Do not charge non-rechargeable (primary) batteries** or non-compatible battery chemistries.
- Charge lithium batteries on a non-flammable surface, ideally in a LiPo safety bag, away from flammable objects.
- Do not charge damaged, swollen, deformed or overheated batteries. Let the battery cool down to ambient temperature after a flight.
- Charge lead-acid (Pb) batteries in a well-ventilated area.
- In the event of abnormal behaviour (heating, odour, swelling, smoke), stop charging immediately, disconnect the power and move the battery to a safe place.

2. Product description

2.1 Main features

The M6AC is a multifunctional tool that integrates a balance charger with discharge function, a signal measuring device and a signal source.

- Supports AC or DC dual input.
- Charges, discharges and balances (where applicable) LiPo, LiHV, LiFe, Lilon, LTO 1-6S, NiMH 1-16S and Pb 1-10S batteries.
- Charge current: max. 15 A, power max. 300 W.
- Discharge current: Recycle mode max. 15 A / 300 W, internal mode max. 3 A / 15 W.
- Lithium battery cut-off voltage can be adjusted (TVC function).
- Measures battery voltage and internal resistance, and balances lithium packs automatically.
- Measures / outputs PWM, PPM and SBUS standard signals with an accuracy of 1 μ s.
- Constant current and constant voltage source output: adjustable voltage 1-28 V, current 0.5-15 A.
- Can be adapted for charging consumer-grade drone batteries.
- Multi-language user interface, easily upgradable via USB.

Manufacturer	ToolkitRC Technology (Shenzhen) Co., Ltd
Website	www.toolkitrc.com

2.2 M6AC layout



Front



Back

①	Display	⑥	Buttons ■ ▲ ▼ ●
②	USB output (USB-A)	⑦	DC input
③	Signal port	⑧	Cooling fan
④	Balance port	⑨	AC input
⑤	Output (charging) port		

2.3 Buttons

Button	Function
■	Short press: return to the previous interface. Press and hold in the main interface: auxiliary functions (chapter 6).
▲ ▼	Switch between pages, move the cursor and change values.
●	Short press: enter the charge settings, confirm a selection; during charging adjust the current or stop. Press and hold when idle: system settings (chapter 7).

2.4 Package contents

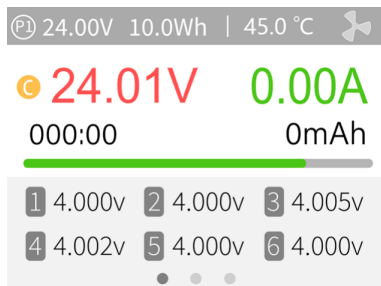
- 1× M6AC charger
- 1× mains power cable
- 1× USB cable

2.5 Specifications

Area	Parameter	Value
Charge	Input	AC 100-240 V, max. 100 W
		DC 7-28 V, max. 30 A
	Battery type	LiPo, LiHV, LiFe, Lilon, LTO: 1-6S
		NiMH: 1-16S; Pb: 1-10S
	Balance	1000 mA @ 4.2 V
	Accuracy	< 0.005 V
	Charge	0.1-15 A, max. 300 W
	Discharge	0.1-15 A, max. 300 W (Recycle mode)
		0.1-3 A, max. 15 W (internal mode)
	USB-A	5.0 V / 1.0 A; firmware upgrade
Measure	Cell voltage	1.0-5.0 V (1-6S)
	Internal resistance	0.1-99 mΩ (1-6S)
	PWM	880-2200 μs, 20-400 Hz
	PPM	880-2200 μs × 8 CH, 20-50 Hz
	SBUS	880-2200 μs × 16 CH, 20-100 Hz
Output	PWM	500-2500 μs, 20-1000 Hz
	PPM	880-2200 μs × 8 CH, 50 Hz
	SBUS	880-2200 μs × 16 CH, 74 Hz
	Power	0.5-15 A, 1-28 V, mode CC + CV
Display	LCD	IPS 2.0", 320 × 240 px
Product	Size	108 × 106 × 60 mm
	Weight	350 g
Packing	Size	144 × 158 × 63 mm
	Weight	510 g

3. Quick start

- ① Connect an AC 100–240 V or DC 7–28 V power supply (power supply unit, battery or power bank) to the input port on the back of the M6AC.
- ② The display shows the boot logo for 2 seconds.
- ③ A welcome sound (voice pack dependent) is played simultaneously.
- ④ After booting up, the screen enters the main interface as shown below:

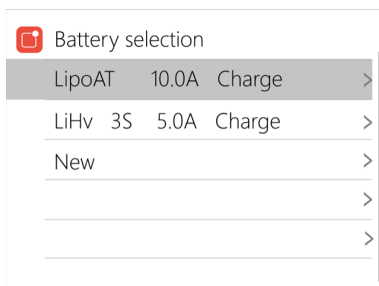


Main interface

- ⑤ Press and hold the  button to enter the multi-function (auxiliary) interface.
- ⑥ Press the   buttons to switch between pages.
- ⑦ When the charger is idle, short press the  button to set the charging parameters. During the charging process, press the  button to adjust the current or stop the charge process.
- ⑧ When the charger is idle, press and hold the  button to enter the system settings.
- ⑨ Short press the  button to return to the previous interface.

4. Charge and discharge settings

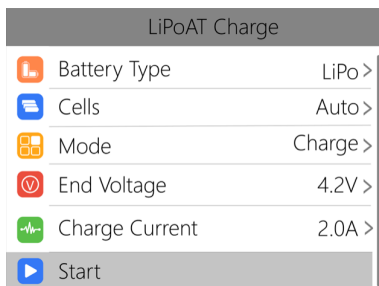
In the main interface, short press the ● button to enter the charging function. If the *Battery selection* option is enabled in the system settings (not enabled by default), the list of saved batteries is displayed first:



Battery selection

4.1 Battery type setting

Press the ▲ ▼ buttons and select one of the presets, or create a new battery (*New*). Up to 32 battery profiles can be created. Press the ● button to enter the settings of the selected battery:



Battery settings

Move the cursor to *Battery Type* and press the ● button to modify the battery type:

 Battery Type

Lipo

LiHv

LiFe

Lion

NiMh

Battery type selection

The charger supports charging and discharging of 7 types of batteries: LiPo, LiHV, LiFe, Lilon, LTO, NiMH and Pb. There is also a smart drone battery mode (UAVbat) to choose from. Battery destruction (discharge for disposal) is supported for LiPo, LiHV, LiFe, Lilon and LTO.

After selecting the battery type that matches the battery on charge, short press the ● button and then the ■ button to save and return to the previous interface.

Warning: Ensure the correct battery type has been selected prior to charging. An incorrect choice may damage the battery and/or become a fire hazard. Do not use this product to charge non-compatible battery chemistries.

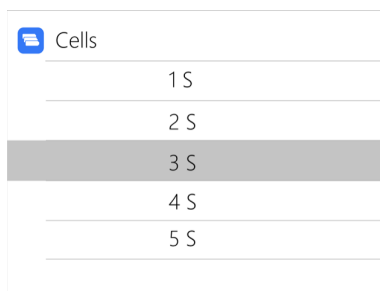
► Glossary of battery types

Type	Description	Nominal voltage	Fully charged
LiPo	lithium polymer battery	3.70 V	4.20 V
LiHV	high-voltage lithium polymer battery	3.85 V	4.35 V
LiFe	lithium iron phosphate battery	3.30 V	3.60 V
Lilon	lithium-ion battery	3.60 V	4.10 V
LTO	lithium titanate battery	2.40 V	2.70 V
NiMH	nickel-metal hydride battery	1.20 V	-
Pb	lead-acid battery	2.00 V	-

Voltages are given per cell.

4.2 Cell setting

Move the cursor to *Cells* and press the ● button to modify the number of cells:



Cell count setting

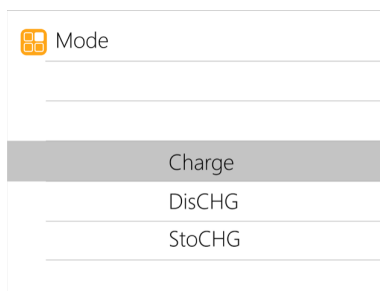
Press the ▲ ▼ buttons to adjust the value. When set to *Auto*, the charger automatically identifies the number of cells by checking the total voltage against the balance port data. Short press the ● button and the ■ button to take effect and return to the previous interface.

Tips:

- If the connected battery is over-discharged or over-charged, the cell count may be detected incorrectly; in that case, set the number of cells manually.
- If the cell count is set incorrectly, it may lead to overcharging, which presents a fire risk.
- The cell count can be determined more accurately if the balance port is connected.

4.3 Work mode

Move the cursor to *Mode* and press the ● button to modify the work mode:



Work mode selection

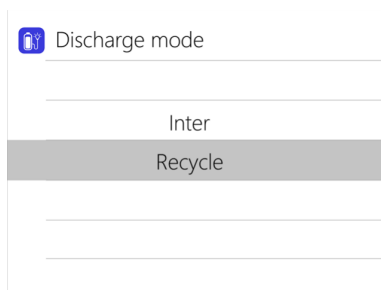
- **LiPo, LiHV, LiFe, Lilon, LTO** — charge (*Charge*), discharge (*DisCHG*), storage (*StoCHG*) and destruction.
- **NiMH** — charge, discharge and cycle.
- **Pb** — charge and discharge.

Short press the ● button and the ■ button to take effect and return to the previous interface.

※ Storage mode brings a lithium battery to storage voltage. For LiPo and LiHV batteries the storage voltage is 3.8 V/cell.

4.4 Discharge mode

In discharge, storage and cycle modes, the discharge mode option appears. Move the cursor to *Discharge mode* and press the ● button to modify it:



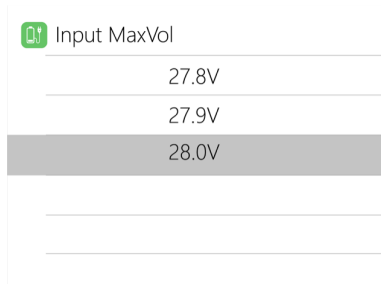
Discharge mode selection

The charger supports 2 discharge modes:

- ① **Normal mode (Inter)** — discharge using internal heat dissipation, max. 3.0 A / 15 W.
- ② **Recycle mode (Recycle)** — when a battery is used as the input, the energy is recovered to the input-side battery, max. 15.0 A / 300 W.

4.5 Max input voltage

When the discharge mode is set to Recycle, the *Input MaxVol* option appears (first set *Power type* to battery in the input settings, see chapter 7.1). Move the cursor to this item and press the ● button to adjust it. If the input voltage reaches this value during discharge, the discharge stops.

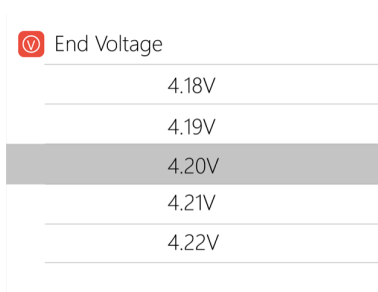


Max input voltage setting

Tip: Set the max input voltage to the highest protection voltage of the power source connected to the input. After this voltage is reached, the charger automatically stops recycle discharging. Setting too high a value may damage the input power source.

4.6 End voltage setting (TVC)

Move the cursor to *End Voltage* and press the ● button to modify the end voltage for the individual cells. When charging, it is the charge cut-off voltage, adjustable within ± 50 mV of the full voltage. When discharging, it is the discharge cut-off voltage. Press the ▲ ▼ buttons to adjust the value, step 0.01 V.



End voltage setting

Tips:

- Only LiPo, LiHV and LiFe batteries allow the cut-off voltage to be set.
- Do not modify the cut-off voltage if you are not familiar with the battery characteristics.
- The charge cut-off voltage can be set within ± 50 mV of the full voltage.
- TVC is the abbreviation for *terminal voltage control*.

4.7 Current setting

Move the cursor to *Charge Current* or *DisCHG Current* and press the ● button to modify the current. Press the ▲ ▼ buttons to adjust the value in steps of 0.1 A; press the buttons quickly to increase or decrease faster. The charger supports up to 15.0 A.

 DisCHG Current

1.8A
1.9A
2.0A
2.1A
2.2A

Discharge current setting

Tips:

- Set a charging rate of 1–2C according to the battery capacity. For example, for a 2000 mAh battery, set the charge current to 2.0–4.0 A.
- The charge / discharge current is only valid in the corresponding work mode.
- For the discharge mode setting (power supply / battery), refer to chapter 7.1.

4.8 NiMH setting (PeakV)

When the battery type is NiMH, the peak voltage value used to detect a fully charged battery can be set. The adjustable range is 5–15 mV:

 Nixx Peak

5mv
6mv
7mv
8mv
9mv

PeakV sensitivity setting

Tips:

- This function is only available for NiMH cells.
- PeakV is the maximum voltage drop per cell when the NiMH battery is fully charged.

4.9 Cycle setting

When the battery type is NiMH and cycle mode is selected, the *Cycle times* and *Rest time* options appear:

NiMhAT Cycle		
	Nixx Peak	5mV >
	Charge Current	2.0A >
	DisCHG Current	2.0A >
	Cycle times	2 >
	Rest time	2Min >
	Start	

NiMH cycle settings

Move the cursor to *Cycle times* and press the ● button to set the number of cycles within the range 2-12. The charger follows the pattern discharge → charge → discharge → charge...; one “discharge → charge” counts as 2 times.

	Cycle times
	2
	3
	4
	5
	6

Cycle times

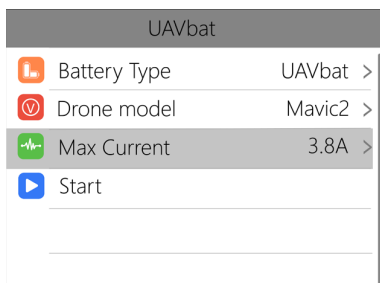
Move the cursor to *Rest time* and press the ● button to set the rest time between cycles. The range is 2 to 10 minutes:

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

Rest time

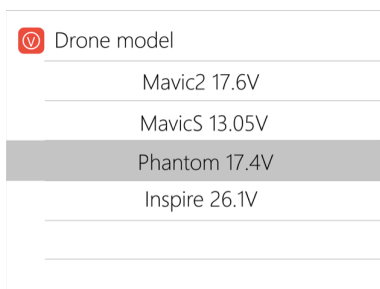
4.10 Smart battery setting

When the smart drone battery (*UAVbat*) is selected as the battery type, there are only two options: drone model and max current.



Smart drone battery settings

Move the cursor to *Drone model* and press the ● button to select the drone model:

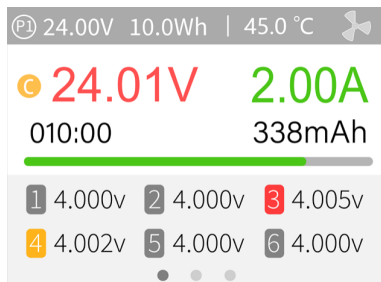


Drone model selection

Move the cursor to *Max Current* and press the ● button to set the charge current. The range is 0.5 A to 15 A.

5. Charge and discharge work

When charging or discharging starts, the charger enters the following interface:

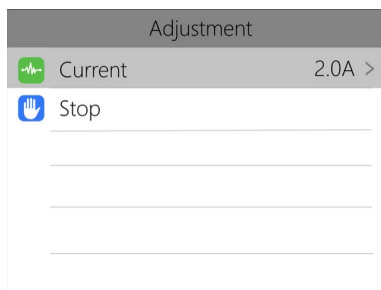


Working interface – page 1

Press the ▲ ▼ buttons on this interface to toggle between 3 different displays.

Item	Meaning
P1	power profile selected in the system settings
24.00V	input voltage
10.0Wh	accumulated energy
45.0 °C	internal temperature of the charger
V / C	constant voltage / constant current sign
24.01V	main (output) port voltage
2.00A	main port current
010:00	working time
338mAh	charged capacity
1 4.000v	voltage of the first cell (and so on)
-.---V	no battery connected

Short press the ● button to change the charge current on the fly or to stop charging:

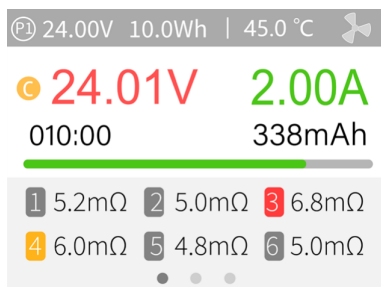


Adjustment of current and stop

To end the charge or discharge process, short press the ● button, move the cursor to *Stop* and short press the ● button again. Charging stops and the main interface is displayed.

When charging is complete or a charge error occurs, a popup appears along with an audible tone.

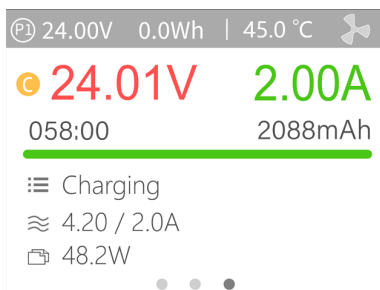
Press the ▲ ▼ buttons to switch to the second page, which shows the internal resistance information:



Cell internal resistance – page 2

- **1 5.2mΩ** — internal resistance of the first cell (and so on).
- **T: 32mΩ** — total internal resistance.

Press the ▲ ▼ buttons to switch to the third page, which shows general information:



General information – page 3

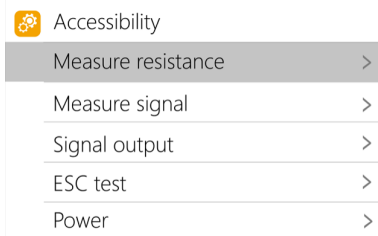
- **Charging** — current status (charging).
- **4.20 / 2.0A** — end voltage / charge current.
- **48.2W** — current charging power.

Tips:

- When charging and discharging, never leave the batteries unattended.
- When charging and discharging lithium batteries, balancing only occurs if the balance plug is connected. The charger automatically balances each cell once a balance plug is detected.
- If the first battery is disconnected after being fully charged, charging automatically starts for the next connected battery. If a fixed cell count is set, ensure that the next battery has the same cell count. If set to automatic, make sure that the detected cell count is correct.

6. Auxiliary functions

Press and hold the  button in the main interface to enter the auxiliary functions menu (*Accessibility*):



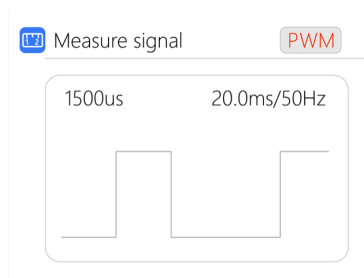
Auxiliary functions menu

6.1 Measure resistance

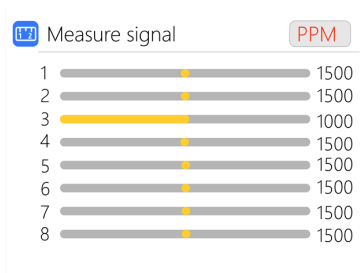
Short press the  button on *Measure resistance* to test the internal resistance of the connected battery; the result is displayed and the charger returns to the main interface.

6.2 Measure signal

Move the cursor to *Measure signal* and short press the  button to enter the signal test interface. Press the   buttons to select the signal type.

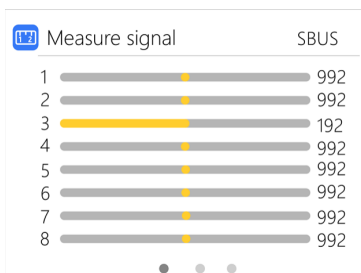


PWM signal measurement

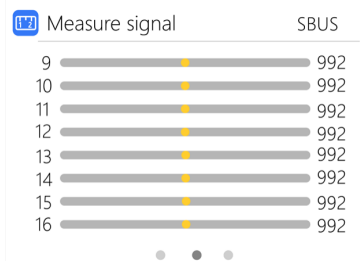


PPM signal measurement

For SBUS, press the ▲ ▼ buttons to display channels 1-8, channels 9-16 and the overall status:



SBUS – channels 1-8



SBUS – channels 9-16

Measure signal	SBUS
Channel DG1:	OFF
Channel DG2:	OFF
Frame lost:	OFF
Failsafe:	OFF
Endbyte:	00

SBUS – overall status

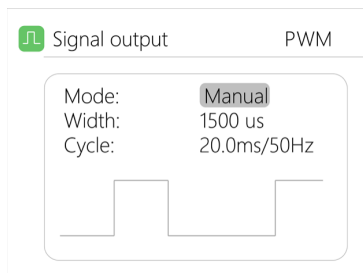
6.3 Signal output

Move the cursor to *Signal output* and short press the ● button to enter the signal output interface. Press the ▲ ▼ buttons to select the type of signal to be output.

► PWM

Press the ▲ ▼ buttons, move the cursor to *Manual* and press the ● button to set the output mode: *Manual*, *Auto 1*, *Auto 2* or *Auto 3*. In manual mode, you can change the pulse width and cycle values with the cursor. In Auto 1, 2 and 3, the pulse width of the output PWM changes automatically at 3 different speeds.

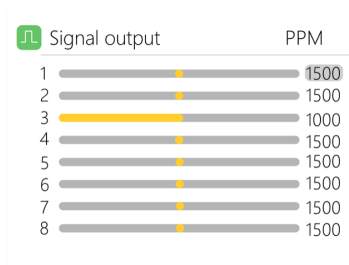
The width can be set from 800 to 2200 μ s. The cycle can be set from 2.5 ms (400 Hz) to 50.0 ms (20 Hz).



PWM signal output

► PPM

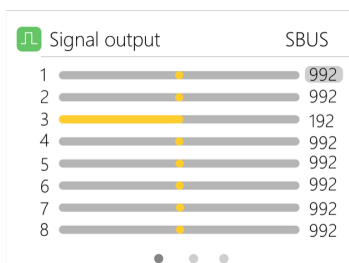
Press the ▲ ▼ buttons to move the cursor to the value of the channel to be modified. Press the ● button to modify the output pulse width of this channel.



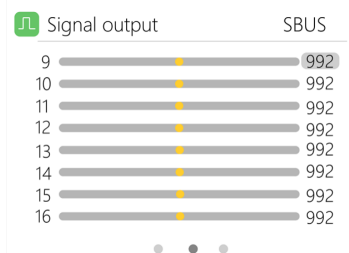
PPM signal output

► SBUS

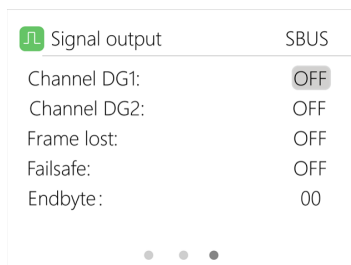
Press the ▲ ▼ buttons to move the cursor to the value of the channel to be modified. Press the ● button to modify the output value of this channel. The settings are spread over 3 pages:



SBUS output – channels 1-8



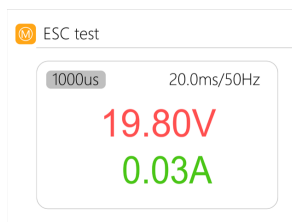
SBUS output – channels 9-16



SBUS output – status flags

6.4 ESC test

Select *ESC test* with the cursor and press the ● button to enter the ESC test mode. Press the ▲▼ buttons to move the cursor to pulse width or cycle and press the ● button to change the corresponding value.

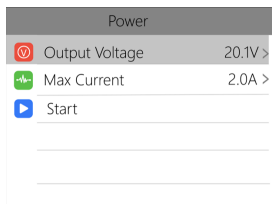


ESC test

When testing an ESC with a motor connected, always remove the propeller first.

6.5 Power

Select *Power* (adjustable power supply) with the cursor and short press the ● button to enter. The output voltage (*Output Voltage*) and current (*Max Current*) can be set freely within the ranges given in chapter 2.5. Move the cursor to *Start* and short press the ● button to start the power output; the charger returns to the main interface.



*Adjustable power supply
(Power)*

7. System settings and other functions

7.1 System settings

Press and hold the  button in the main interface to enter the system settings page (*Setup*). Short press to expand the individual groups.

Setup		
	Input settings	▼
	Security settings	▼
	Personalization	▼
	Battery selection	OFF
	Continuous	OFF
	Work completed	Trickle

System settings

Setup		
	Input settings	▼
	Power select.	Auto 
	Power type	Adapter
	Max power	90W
	Max current	12.0A
	Voltage range	7.0 - 24.0V

Input settings

► Input settings

- *Power select.* — preset power profile 1, 2 or 3.
- *Power type* — choose between battery pack and adapter. For battery packs, recycle mode is enabled; for adapters, recycle mode is disabled.
- *Max power* — maximum power allowed via the input port during charging.
- *Max current* — maximum current allowed via the input port during charging.
- *Voltage range* — input voltage range.

Setup	
 Input settings	▼
 Security settings	▼
Safe inter Temp.	70°C
Safe Exter Temp.	50°C
Safe time	200Min
Safe capacity	20Ah

Security settings

► Security settings

- *Safe inter Temp.* — charging stops when the temperature of the device exceeds this value.
- *Safe Exter Temp.* — charging stops when the ambient temperature exceeds this value.
- *Safe time* — maximum time limit for continuous charging/discharging operation.
- *Safe capacity* — maximum accumulated capacity for one charging/discharging session.

Setup	
 Personalization	▼
Backlight	10
Operation volume	Low
Announce volume	Medium
Warning volume	High
Language	English
Theme style	Light

Personalization

► Personalization

- *Backlight* — backlight brightness level of the display, 1-10.
- *Operation volume* — volume of the buttons: off, low, medium, high.
- *Language* — system display language (English, Chinese, etc.).
- *Theme style* — light or dark theme.

Setup		
	Personalization	▼
	Backlight	10
	Operation volume	Low
	Language	English
	Theme style	Light
	Battery selection	OFF

Further system settings

► Further items

- *Battery selection* — show/hide the list of saved batteries. Not enabled by default.
- *Continuous* — enables/disables continuous charging/discharging after battery replacement.
- *Work completed* — whether to stop or trickle charge after charging is complete (*Trickle*). The default is no trickle charge.
- *Balance start Vol* — balance cells prior to full current charge.
- *Default* — restore factory settings.
- *ID* — independent ID of each device.

7.2 Firmware upgrade

Connect the M6AC to a computer with the USB cable included in the box. The computer recognises a USB drive named *Toolkit*. Download the upgrade file *app.upg* from the official ToolkitRC website (www.toolkitrc.com) and copy it to the drive, overwriting the existing file.

7.3 USB output

The USB-A port supports 5.0 V / 1.0 A output to charge mobile devices.

7.4 Automatic continuation of charging/discharging

When a battery is fully charged, connect the next battery – the device automatically continues to charge and discharge. You can enable or disable this function in the system settings (*Continuous*).

7.5 Fan

The fan starts when the internal temperature of the device reaches 40 °C; its speed then increases linearly with temperature. With AC input and an input power higher than 55 W, the fan runs at full speed.

7.6 Manual voltage calibration

With the M6AC powered off, press and hold the ● button and, without releasing it, connect the power supply – the system enters the manual voltage calibration mode. Use a voltmeter to measure the actual voltage of each cell, move the cursor to the corresponding value and modify it to match the voltmeter reading. When calibration is complete, move the cursor to save and short press once; the buzzer beeps once and the settings are saved. Then exit or switch off the device.

Only calibrate with an accurate voltmeter. Incorrect calibration may lead to overcharging.

7.7 Full charge mode

When a lithium battery is fully charged, the message *Fast charge complete* is displayed. If the battery is not removed, the charger continues to trickle charge until the battery is disconnected.

8. Information for the EU and Czech Market

The information in this chapter describes the situation in the Czech Republic. If you use the product in another country, you must follow the regulations of the country in which you operate it – in particular with regard to the take-back and disposal of electrical equipment.

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@rotorاما.cz
Phone	+420 252 252 098
Website	www.rotorاما.cz

8.2 Product conformity



- 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@rotorاما.cz.
- **Product identification:** the type designation (M6AC) is shown on the front of the device; the unique device ID can be found in the system settings (item *ID*).

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.