

# M4Q

## Manual V1.0

2020.08



ToolkitRC

[www.toolkitrc.com](http://www.toolkitrc.com)

ToolkitRC Technology (Shenzhen) Co., Ltd

# Introduction

Thank you for purchasing the M4Q balance 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. Or visit [www.toolkitrc.com](http://www.toolkitrc.com).



WeChat QR Code

Applications

Video teaching

Product purchase



## Safety

1. M4Q allows the input voltage AC 100V-240V, DC 10-18V, to ensure that the power supply voltage is consistent, pay attention to the positive and negative polarity of the power supply when connecting.
2. Do not use this product in the environment of heat, humidity, flammable liquids or explosive gas.
3. Please do not use this charger without supervision. Never leave charging batteries unattended.
4. When not using this product, please unplug the input power.
5. When using the charging function, please set a current that matches the battery. Do not set an excessive current for charging to avoid damage to the battery. Check the guidelines of your battery's manufacturer for correct charging instructions.

# Contents

Introduction.....	1
Key Points.....	2
Further information.....	2
Safety.....	3
Contents.....	4
M4Q Layout.....	7
Quick start.....	8
Charging settings.....	9
1, Battery type.....	9
2, Number of cells.....	11
3, Work mode.....	13
4, End voltage (TVC) .....	13
5, Charging current.....	14
6, NiMH setting (PeakV) .....	15
Charging work.....	17
System settings.....	22
Other functions.....	24
Specification.....	26

# Product description

The M4Q is a four-channel balanced charger with IPS display and wheel menu navigation, which is easy and convenient to operate.

- Charge, discharge and balance management of LiPo, LiHV, LiFe, Lion 1-4S, NiMh 1-10S, PB 1-8S batteries.
- AC and DC power supply modes: AC 100-240V max 100W; DC 10-18V max 200W.
- Charging current: Max 5A @MAX50W.
- Charging accuracy <0.005V.
- Balancing current 240mA.
- Lithium battery cut-off voltage can be set (TVC ).
- Automatically allocate input power.
- Multi-language system, can upgrade any language you need.
- The device connects to a PC like a USB drive, simply copy and paste new firmware files for easy updates.
- Can record 5 commonly used batteries.
- Can record 3 groups of commonly used power sources, convenient and fast translation.

# M4Q Layout

Scroll wheel  
(Turn: Left or Right  
Press: OK)

Display

CH/ Exit



Output main port \*4

Balance port\*4

**Front**

Micro USB port



DC Input port

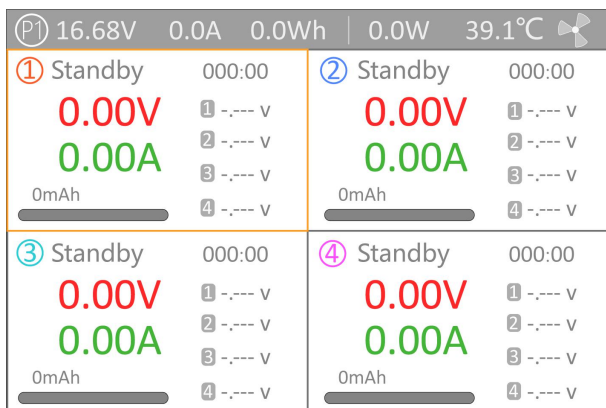
Cooling fan

AC Input port

**Back**

# Quick start

- 1, Connect the AC100-240V or DC10-18V power supply to the corresponding input port on the back of the M4Q.
- 2, The screen shows the boot logo for 2 seconds.
- 3, At the same time, accompanied by the sound of di-di startup.
- 4, After booting up, the screen enters the main interface as shown below:



- 5, short press [CH/Exit], the cursor will switch among the four channels in sequence.
- 6, Scroll [Scroll Wheel] to switch to display the voltage and internal resistance of the corresponding channel.
- 7, Short press [OK] to select the charging task when the channel is idle. You can adjust and end the charge when the channel is in progress.
- 8, Long press [OK] to enter the system setting interface when all four channels are free.

9, Press [CH/Exit] to end the modification or return to the previous interface.

=====



1. Short press [Scroll Wheel] once to confirm the function.

2. Long press [Scroll Wheel] for 2 seconds, it is the delete key function.

3. If any key is successfully operated, there will be a didi sound.

=====



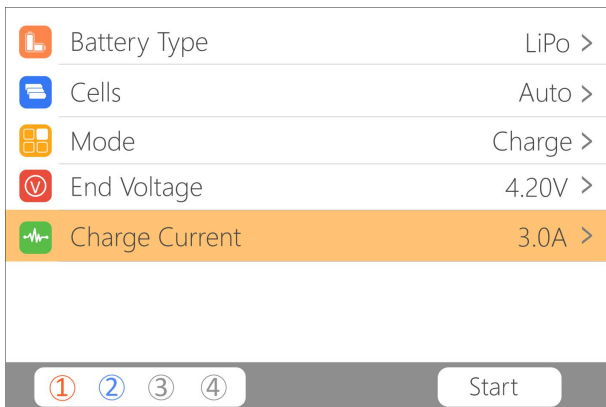
# Charging settings

In the main interface, select and short press [OK] to enter the charging function. If the battery selection is turned on in the main setting interface, 5 battery records can be saved, and the following interface is displayed. Otherwise, it will default to the first battery record, skip this step.

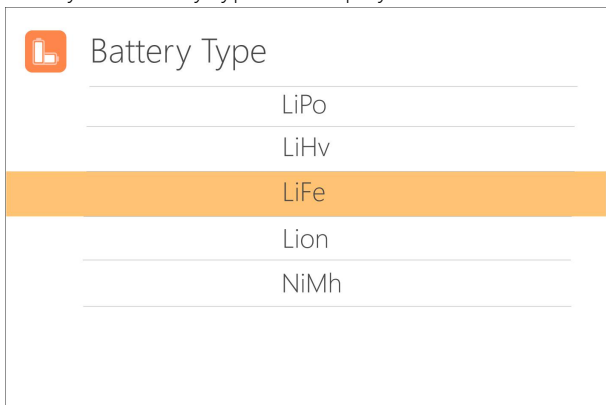
Battery selection			
LiPoAT	2.0A	Charge	>
NiMh6S	1.0A	Charge	>
New			>
New			>
New			>

## 1, Battery type

Scroll [Scroll Wheel], move the cursor, select the battery that has been set, or create a new battery, press [OK] to enter the battery setting interface of this group, the display is as follows:



Move the cursor to “Battery Type” and press [OK] to modify the battery type, the display is as follows:



The charger supports Lipo, LiHV, LiFe, Lion, NiMh, PB, 6 kinds of batteries, after choosing the battery that matches the actual battery. Short press [OK] and [CH/Exit] to take effect, and return to the previous interface.



## Important

1. Choosing the wrong battery type to charge may damage the battery, the charger, and cause fire and other dangers. Please choose carefully.
  2. Please do not use this product to charge the battery that is not marked with the battery type. Always follow the charging guidelines of your battery manufacturer
- 



## Vocabulary explanation

- 1, **LiPo**: Often called a lithium polymer battery, a battery with a nominal voltage of 3.70V and 4.20V when fully charged.
  - 2, **LiHV**: Often referred to as a high-voltage lithium battery, a battery with a nominal voltage of 3.85V and 4.35V when fully charged.
  - 3, **LiFe**: Often referred to as a lithium iron battery, a battery with a nominal voltage of 3.30V and 3.60V when fully charged.
  - 4, **Lion**: Often referred to as a lithium-ion battery, a battery with a nominal voltage of 3.60V and 4.10V when fully charged.
  - 5, **NiMh**: often referred to as nickel-hydrogen battery, nominal voltage 1.20V.
  - 6, **PB**: often called lead-acid battery, nominal voltage 2.00V.
- 

## 2, Number of cells

Move the cursor to the position of “Cells”, press [OK] to modify the number of battery cells. The display is as follows:



## Cells

Auto

1 S

2 S

3 S

4 S

Scroll [Scroll Wheel] to adjust the value. When set to "Auto", the charger will automatically identify the number of cells connected to the battery according to the battery voltage connected to the output port. Short press [OK] and [CH/Exit] to take effect and return to the previous interface.

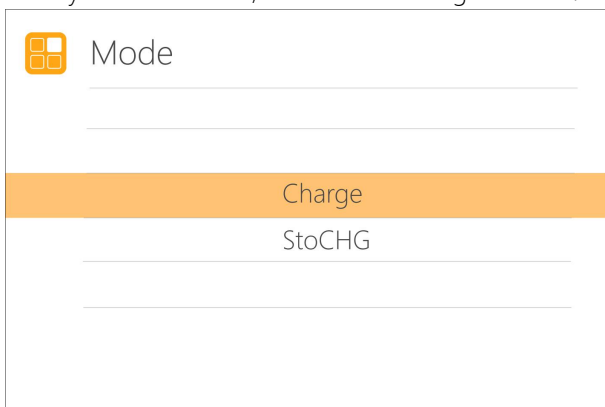


### Tips

- 1, Over discharge or overcharge of the connected battery may cause battery cell identification errors.
- 2, If the cell number is set incorrectly, it may be insufficient to charge, or overcharge may damage the battery, please set it carefully.
- 3, After Lixx batteries are connected to the balance port, the number of battery strings can be more accurately identified.

### 3, Mode

Move the cursor to "Mode" and press [OK] to modify the work mode, as shown in the figure below.



**Lipo**, **LiHV**, **LiFe**, and **Lion** batteries can be charged and stored. **NiMh**, battery and **PB** battery can choose to charge. Short press [OK] and [CH/Exit] to take effect, and return to the previous interface.

### 4, End voltage (TVC)

Move the cursor to "End Voltage" and press [OK] to modify the end voltage of the single-cell battery. When the working mode is charging, it is the charging cut-off voltage, and the range is plus or minus 50mV of the full voltage. When the working mode is discharge, it is the discharge cut-off voltage. Scroll [Scroll Wheel] to adjust the value, step 0.01V.



## End Voltage

3.58V

3.59V

3.60V

3.61V

3.62V



1, Only LiPo, LiHV, LiFe batteries can set the cut-off voltage.

2, Do not modify the cut-off voltage when you are not familiar with the battery characteristics.

3, The charging cut-off voltage can be set to a range of plus or minus 50mV of full voltage.

4, **TVC**: English abbreviation for terminal voltage control.

## 5, Charging current

Move the cursor to the "Charging Current" position and press [OK] to modify the current. Scroll [Scroll Wheel] to adjust the value, step by 0.1A. Scroll [Scroll Wheel] quickly to increase or decrease quickly. The charger supports up to 5.0A.



## Charge Current

1.8 A

1.9 A

2.0 A

2.1 A

2.2 A



### Tips:

6. Please set the charging rate of 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. Check the guidelines of your battery's manufacturer for correct charging instructions.

## 6, NiMh setting (PeakV)

When the battery type is NiMh, the negative pressure value when the battery is fully charged can be set, and the setting range is 5mV-15mV, as shown below:



## Nixx Peak

5 mV

6 mV

7 mV

8 mV

9 mV



### Tips

1, Only NiMh battery can set the battery negative pressure value.

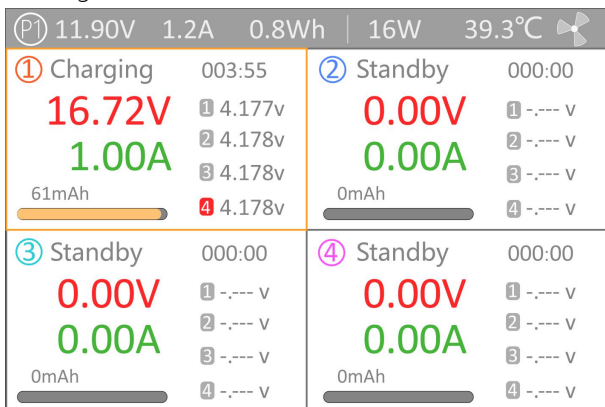
2, Vocabulary explanation:

PeakV: When the NiMH battery is fully charged, the peak voltage of each cell drops.

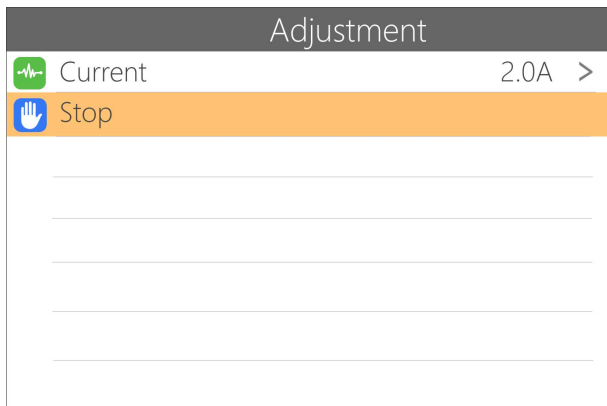


# Charging work

When charging starts, the charger enters the working interface as shown below:



Scroll [Scroll Wheel] on this interface to switch the display of the internal resistance voltage value of the corresponding channel. Short press [OK] to dynamically set the working current or stop working. As shown below:



To end the charging and discharging work, short press [OK], move the cursor to [Stop], short press [OK], stop working and return to the main interface.

When charging is complete or charging error occurs. A prompt box will pop up with a prompt sound.

Display content description:

**11.90V**: Input power supply voltage.

**1.2A**: Input power current.

**0.8Wh**: The accumulated power consumption of the input power.

**39.3°C**: The internal temperature of the charger.

**16.72V**: The main port voltage of the first channel.

**1.00A**: The main port current of the first channel.

003:55: Working time of the first channel.

61mAh: The cumulative capacity of the first channel.

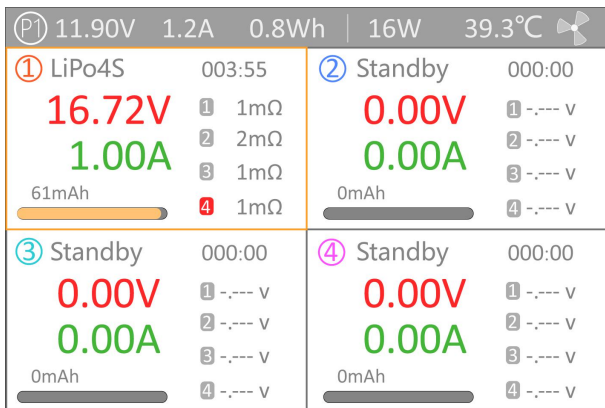
**1 4.177V**: The first battery voltage

4

.....  
4.178V: The fourth battery voltage (this battery is under balance management)

-.--V: No battery connected.

Use Scroll [Scroll Wheel] to switch to the second column of the second channel, which is the internal resistance information. As shown below:



1

1mΩ: Internal resistance of the first battery

=====



**Tips:**

1. When charging, please ensure someone is supervising the charge throughout the process to deal with abnormalities safely.
2. When charging a lithium battery, only connecting to the main port will not perform balance management. Please pay attention to the balance of the battery. After connecting to the balance port, it will automatically begin balance management.
3. After charging is completed, unplug the battery and insert a new battery, it will automatically continue to charge and discharge according to the set mode. When set to a fixed number of cells, batteries with the same number of cells need to be connected. When setting to automatically detect the battery string number, please pay attention to whether the detected cell number matches the actual number.





=====

# System settings

Long press [OK] on the main interface you will enter the system setting interface only when all channels are not in use, as shown in the figure below:

设置		
	Input settings	∨
	Security Settings	∨
	Continuous work	OFF
	Work completed	Trickle
	Battery selection	ON
	Backlight	6
	Buzer	6
	Language	English

**Input settings:** Input power related settings, short press to expand the settings. As shown below.

Setup		
	Input settings	∧
	Power selection	Ⓟ
	Max power	230W
	Max current	20.0A
	Lowest voltage	10.0V
	Security Settings	∨
	Continuous work	OFF
	Work completed	Trickle

**Power selection:** When the AC power supply is






connected, the power selection will be fixed to PI, power, current, and voltage are also fixed values. P1 and P2 can be selected when the input is DC. Users can set power, current, voltage by themselves.

**Max power:** the maximum power absorbed from the input port when charging.

**Max current:** the maximum current drawn from the input port during charging.

**Lowest voltage:** is the lowest allowable input voltage.

Charging safety settings: Short press to expand the settings. As shown below.

设置	
 Security Settings	^
Safe Inter. Temp.	80°C
Safe time	200Min
Safe capacity	30Ah
 Continuous work	OFF
 Work completed	Trickle
 Battery selection	ON
 Backlight	6









**Safe Inter. Temp.:** above this temperature value, the device will stop the main port output.

**Safe time:** the maximum time of continuous charging, it will stop charging if it exceeds this.

**Safe capacity:** the maximum capacity for continuous charging, and it will stop working if exceeded.

**Continuous work:** after charging, whether to continue

charging after replacing the battery. Ensure the next connected battery requires the same settings as the previous battery that was being charged

Setup		
	Work completed	Trickle
	Battery selection	ON
	Backlight	6
	Buzzer	6
	Language	English
	Theme style	Light
	Default	
	ID: FF3705D8-SW1.00-HW1.2	

**Work completed:** whether to stop or trickle charge after the charge is over.

**Battery selection:** whether to skip the battery selection interface when selecting charging.

**Backlight:** the backlight brightness level of the display can be set from 1 to 10 level.

**Buzzer:** the tone of the buzzer, which can be set to off.

**Language:** system display language. You can choose English, Chinese, etc.

**Theme style:** two styles of Light and Dark can be selected.

**Default:** restore all settings to factory values.

**ID:** the unique ID of the device factory settings.

# Other functions

## 1. Firmware upgrade

After connecting the M4Q to the computer with the USB data cable in the box, the computer will recognize a USB drive named Toolkit. Download the upgrade file app.upga on the official website. To update copy and past the new file and overwrite the files in the USB to upgrade the firmware.

## 2. Automatically continue charging

When a battery is fully charged, after unplugging the battery for 2 seconds, connect to the next battery, the device will automatically continue to charge, you can start and stop this function in the settings menu.

## 3. Fan level

When the internal temperature of the device exceeds 42°C, the fan turns on half-speed air volume to reduce noise. When the internal temperature exceeds 50°C, the fan turns on full-speed air volume to enhance heat dissipation.

## 6. Manually calibrate the voltage

In the shutdown state, press and hold the [Scroll Wheel] without releasing, connect the power supply, and the system will enter the manual voltage calibration function. Use a voltmeter to measure the actual voltage of each battery, move the cursor to the corresponding voltage value, modify the voltage value to be consistent with the voltmeter value, and achieve calibration. After the calibration is completed, move the cursor to save, short press once, the buzzer will beep for a long time, and the save is successful. Just exit or shut down.



## 7, Fully charged

When the lithium battery is fully charged, it will prompt "Fast charging has ended". If the battery is not removed, the constant voltage trickle charge will be performed automatically to keep the battery full.

# Specification

Charging	Input	AC100-240V@MAX1.5A DC10-18V@MAX20A
	Battery Type	LiPo LiHV LiFe Lion@1-4S NiMh @1-10S Pb @1-8S
	Bal Cur.	240mA @2-4S
	Accuracy	<0.005V
	Charging Power	0.1-5A@50W*4 DC input
		0.1-5A@50W*2 AC input
		0.1-5A@25W*4 AC input
	USB	upgrade@USB
Battery Voltage	1.0V-5.0V @1-4S	
Battery Internal Resistance	1-100mR @1-4S	
Display	LCD	IPS 3.5 寸 480*320 Pixel
Product	Size	150mm*112mm*36.5mm
	Weight	450g
Individual Packing	Size	160mm*160mm*46mm
	Weight	600g