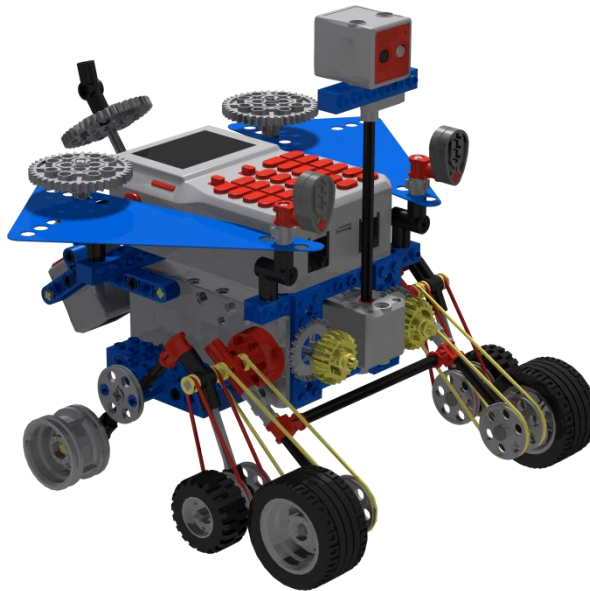


# MPBOT

Micro-brain programming robot, it can directly program and control the robot, which is convenient and efficient, and what you see is what you get.

## User manual

(Robot kit: MPBOT S1)



Micro-brain  
programming



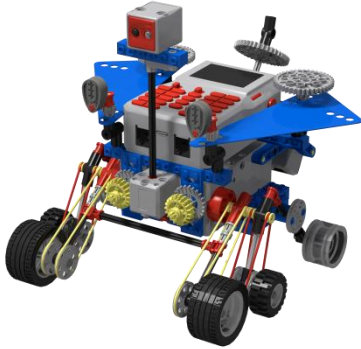
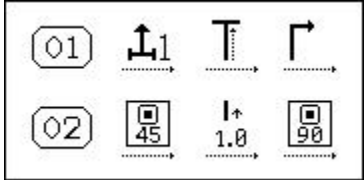
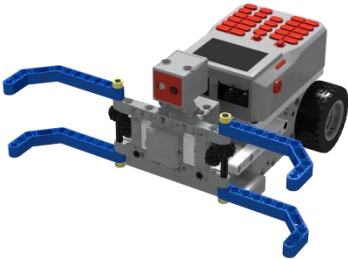
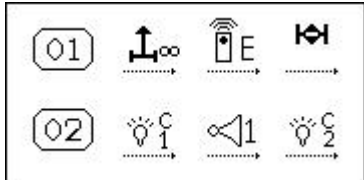

Key-screen  
interaction



MPC slug

1. This product is suitable for children aged 8 years and above;

2. This product recommends 2 experimental items:

Project name	Project diagram	Program example
Mars rover		
Multifunctional robot		
<div style="text-align: center;">  <p>More teaching projects from Nashenbot official website</p> </div>		

Note: operate on open and flat ground to avoid collision or falling. More experimental items are being updated, please refer to the programming tool "Help"

### **3. Technical information on possible hazards and how to operate correctly during the experiment:**

- 1) The functions of the sensor interface and the motor interface are different, so the corresponding connecting line should be used to access the matching interface.
- 2) The motor will produce a little torque during operation, and direct contact with its power output part by fingers may cause skin abrasion or discomfort. Keep non-contact with the model during operation; To stop operation, press the switch first.

### **Warning!**

- 1) The battery specified in this product has the functions of overcharge, over-discharge and overheat protection. It is not allowed to use other types of batteries and chargers that are not the specifications specified by this company, otherwise it may cause the dangerous situation of heating, bursting and fire of the battery;
- 2) The motor and steering engine specified in this product have overload protection function, and other types of motor and steering engine that are not specified by this company are not allowed to be used, otherwise it may cause damage to the model structure and scratch the fingers.

### **Dangerous!**

1. When charging, please do not put the product and flammable goods together, so as not to cause a fire in very accidental circumstances.
2. Plastic bags are dangerous. Please keep them away from babies and children to avoid choking hazard.
3. Keep the equipment and all accessories out of reach of children and pets. Ingestion of the product or its accessories may result in suffocation and other hazards.
4. Do not use the indicator light near the eyes of children or animals.

### **Warning!**

1. Please do not wash or immerse the product in water to avoid damage.
2. Do not disassemble the unit accessories by yourself to avoid damage and warranty invalidation.
3. Do not make the product subject to strong impact or vibration to avoid damage.
4. Do not use chemical solvents or cleaning agents to clean the product.
5. Violent operation is strictly prohibited during product assembly and disassembly.

### **Note:**

1. If the product is not used for a long time, the equipment should be completely shut down after being fully charged.
2. After charging, please pull out the charging cable to avoid damage and possible danger of overcharged battery.
3. Regularly check whether the wires, plugs, housings and other parts are damaged. If any damage is found, please stop using them until they are repaired.
4. The charger can directly charge the battery by connecting the battery charging port.

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### **Announcement**

Before installing and using the product, please read this instruction carefully and keep it properly for future reference.

Some components, functions and features mentioned in this document are for illustrative purposes only, and may only be applicable to certain models of products. Unless otherwise specified, nothing in this document is a description of specific product specifications and configurations. If you need to know the product specification and configuration, please refer to the relevant specification documents of this product or consult the product seller.

The pictures and legends in this document are for example and illustration purposes only, and may differ from the actual situation of the product. Please refer to the actual situation of the product.

The unofficial Internet sites mentioned in this document are only provided for the convenience of users. The information on these websites is not part of the official product data. We do not make any guarantee for these websites and information.

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The software provided with the product may be different from the retail software, and may not include the user manual or all program functions. If you use the software, external equipment or options provided with this product on other products, or use the software, external equipment or options not recommended or permitted by this product specification document on this product, you shall be responsible for its compatibility, reliability and legality.

Nothing in this document constitutes a modification of the official product warranty policy.

The product performance data mentioned in this document are measured in a specific environment, and the data obtained in other operating environments may be different. In addition, some data may be estimated by calculation, and the actual results may vary. Users of this document should check the data applicable to their specific operating environment.

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The 5th Generation Educational Robot

questions and ideas, please call us or log in to the official website for inquiry.

**Shanghai Nashenbot Co., Ltd**


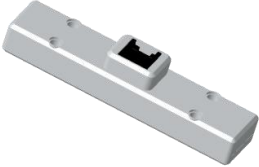



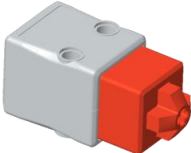
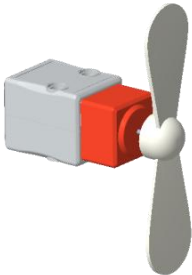
Address: Floor 4, No. 5, Lane 600, Yunling West Road, Putuo District, Shanghai, China



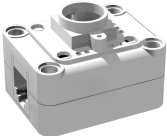
Website: [www.nashenbot.com](http://www.nashenbot.com)

Service e-mail: [info@nashenbot.com](mailto:info@nashenbot.com)

**1. Core module parameter:**

	<p><b>MPC controller</b></p> <p>Control the operation of each module by issuing instructions from the master control.</p> <p>It supports three modes: real-time control, key-screen programming and advanced functions.</p> <p>1 display screen, 128 * 64 pixels, supporting page turning display;</p> <p>1 speaker, supporting voice playback and 7 kinds of audio;</p> <p>1 recording button, supporting recording function;</p> <p>1 switch button, supporting the switch function;</p> <p>1 mode switch, supporting 3 modes switching;</p> <p>1 speed switch, supporting 3 kinds of motor speed exchange;</p> <p>26 programmable control keys, supporting motor speed regulation and commutation, sensor judgment and actuator on-off, and cycle logic;</p> <p>Built-in Bluetooth module;</p> <p>6-way RJ11 interface, supporting 2-way motor (A, B), 4-way sensor input and output (C, D, E, F);;</p> <p>1-way Type-C charging interface, supporting 5V1A charging;</p> <p>2-way status light;</p> <p>The shell is compatible with LASY and LEGO building systems.</p>
	<p><b>Motor</b></p> <p>It supports forward and reverse control and provides the power output of the robot.</p> <p>The maximum rated speed is 50RPM <math>\pm</math> 10% (full power), and the reduction ratio is 1:120.</p>
	<p><b>Servo motor</b></p> <p>Control rotation angle</p> <p>The working voltage is 5v, and the angle is - 90 °~90 °.</p>
	<p><b>Infrared sensor</b></p> <p>Detect whether there are obstacles in front</p> <p>The working voltage is 5v, and the detection range is effective within 10cm (white surface reflection).</p>

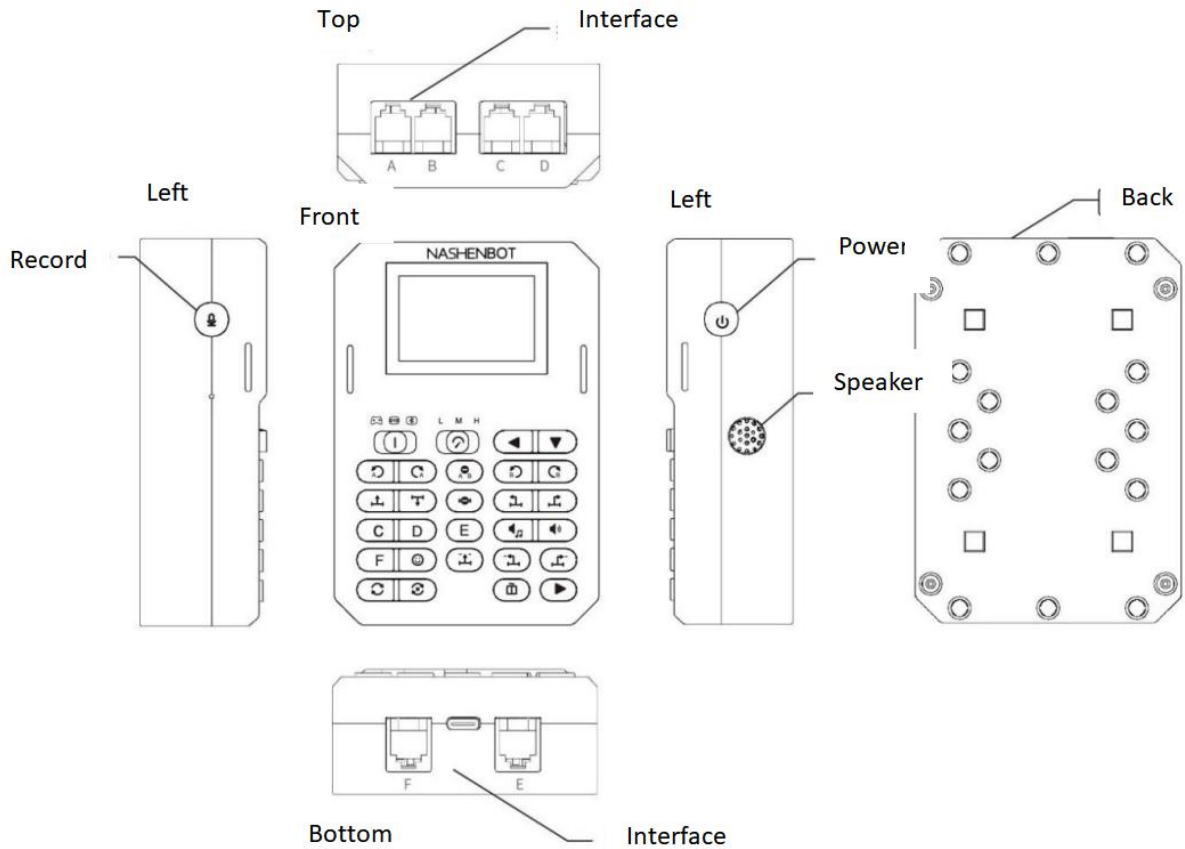
	<p><b>Sound sensor</b>  Detect whether there is sound in front  The working voltage is 5v, and the detection range is 20~90dB.</p>
	<p><b>Integrated 5-Grayscale Sensor</b>  Detect whether there is trace under  The working voltage is 5v and the detection height is 1.6cm.</p>
	<p><b>Magnetic Sensor</b>  Detect whether there is magnet in front  The working voltage is 5v, and the detection distance is 0.5cm.</p>
	<p><b>Ultrasonic sensor</b>  Detect the distance between the obstacle ahead and the robot  The working voltage is 5v, and the detection range is valid within 30cm.</p>
	<p><b>Light Sensor</b>  Check whether the light on the left or right is stronger  Working voltage 5v, detection range 0-600LUX, 45 °.</p>
	<p><b>Touch Sensor</b>  Detect whether there is collision with obstacles  The working voltage is 5v.</p>
	<p><b>Fan Module</b>  Provide two modes of turning and stopping  The working voltage is 5v, the no-load current is 45mA, and the blade is soft and anti-scratch.</p>

	<p><b>Full Color Light</b> It provides five color schemes of red light, green light, white light, blue light and yellow light, and supports two modes of lighting and off. The working voltage is 5v.</p>
	<p><b>Open-loop motor</b> Three modes are provided: forward rotation, reverse rotation and stop. The working voltage is 5v.</p>
	<p><b>Color Sensor</b> Can recognize 5 colors: black, red, green, blue, and yellow</p>

\*The specific product configuration is subject to the product model actually released.

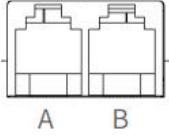
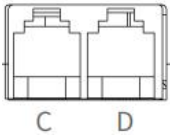
## 2. Function description of MPC controller

The palm-sized MPC controller uses the interactive programming mode of combination of keys and screens to control the keyboard. The program can be run one by one with just a touch of programming, so that the execution of the MPBOT robot program can be seen step by step.

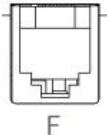
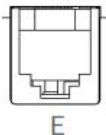



Schematic plan



**2.1 Top**

Icon		
Name	Motor interface	Sensor interface
Parameter	RJ11, 6P6C Support control motor	RJ11. 6P6C Support Infrared obstacle avoidance sensor、 Acoustic intensity detection, Magnetic sensitivity detection, Impact switch, Ultrasonic testing, Photosensitive detection、 Five-Grayscale sensor and other sensor input control; Support Illumination, Electric fan, Steering engine and other output control



**2.2 Bottom**

Icon			
Name	Sensor interface (common for input and output)	Sensor interface (common for input and output)	Charging interface
Parameter	RJ11, 6P6C; Support Infrared obstacle avoidance sensor, Acoustic intensity detection, Magnetic sensitivity detection, Impact switch, Ultrasonic testing, Photosensitive detection, Five-Grayscale sensor and other sensor input control; Support Illumination, Electric fan, Steering engine and other output control	RJ11, 6P6C; Support Infrared obstacle avoidance sensor, Acoustic intensity detection, Magnetic sensitivity detection, Impact switch, Ultrasonic testing, Photosensitive detection, Five-Grayscale sensor and other sensor input control; Support Illumination, Electric fan, Steering engine and other output control	USB Type C interface; Support 5V 1A charging

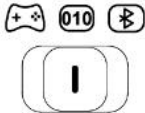
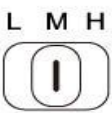





### 2.3 Left




Icon		
Name	Sound recording	
Parameter	Short press to start recording, Only valid in  real-time control mode	










### 2.4 Right









Icon		
Name	Power switch	Trumpet
Parameter	Press 1 second long to turn on or off	Play Sound



### 2.5 Front




Icon				
Name	Mode switch	Power switch	Insert character/Return	Flip/Move
Parameter	Three modes are supported: 1.  Real-time control	Three types of power are supported: 1. High speed 2. Medium speed	Support the insertion of program module in  key-screen programming mode	Support page down in  key-screen programming mode





	<p>2.  Key-screen programming</p> <p>3.  Advanced Function</p>	<p>3. Low speed</p> <p>All three modes are valid</p>	<p>Support return</p> <p>in  advanced function mode</p>	<p>Mobile support</p> <p>in  advanced function mode</p>
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Icon					
Name	A Motor reverse	A motor forward rotation	A or B motor stop	B Motor reverse	B motor forward rotation
Parameter	Control the reverse rotation of motor A	Control the forward rotation of motor A	Control A or B motor to stop rotating	Control the reverse rotation of motor B	Control the forward rotation of motor B
	<p> In normal mode of key-screen programming, short press can set 1~9 seconds and unlimited time, and long press can set 0.1~9.9 seconds in advanced mode</p>	<p> Key-screen programming Normal mode short press to switch A or B motor,</p>	<p> In normal mode of key-screen programming, short press can set 1~9 seconds and unlimited time, and long press can set 0.1~9.9 seconds in advanced mode</p>	<p>advanced mode long press to set the stop time</p>	<p> In real-time control mode, long press will continue to execute</p>








Icon					
Name	Robot forward	Robot back	Robot stop	Robot turns left	Robot turns right
Parameter	At the same time, control the reverse rotation of motor A and the forward rotation of motor B	At the same time, control forward rotation of motor A and reverse rotation of motor B	At the same time, control A and B motors to stop	At the same time, control the forward rotation of motor A and motor B	At the same time, control the reverse rotation of motor A and motor B
	<p> In normal mode of key-screen programming, short press can set 1~9</p>	<p> Key-screen programming</p>	<p> In normal mode of key-screen programming, short press can set</p>		

	seconds and unlimited time, and long press can set 0.1~9.9 seconds in advanced mode	Normal mode short press to switch A or B motor, advanced mode long press to set the stop time	1~9 seconds and unlimited time, and long press can set 0.1~9.9 seconds in advanced mode
	In real-time control mode, long press will continue to execute		

Icon	<b>C</b>	<b>D</b>	<b>E</b>		
Name	C interface sensor detection	D interface sensor detection	E interface sensor detection	sound playback	Turn on the buzzer
Parameter	Automatically identify 9 sensors such as infrared obstacle avoidance or sound intensity detection for logic judgment; Only valid in <b>010</b> key screen programming mode			<b>010</b> In normal mode of key-screen programming: short press can play 8 audio and 1 recording; in advanced mode, long press can play 19 audio and 9 recording	<b>010</b> In key-screen programming mode: press briefly to set 1~7 syllables;  In real-time control mode, press once to play sound

Icon	<b>F</b>				
Name	F interface sensor detection	Expression	Line inspection	Turn left at the intersection	Turn right at the intersection
Parameter	Automatically identify 9 sensors such as infrared obstacle avoidance or sound intensity detection for logic judgment;	<b>010</b> When programming the normal mode of the key screen: short press can switch	<b>010</b> In normal mode of key screen programming: short press to select	Turn left at the intersection in a short time	Turn right at the intersection in a short time

	Only valid in  key screen programming mode	5 expressions, while long press can set the switch of 5 expressions and set the display time of the expressions for 0.1~9.9 seconds	intersection line patrol and time line patrol; in advanced mode, long press to set the time of line patrol for 0.1~9.9 seconds	Only valid in  key screen programming mode	Only valid in  key screen programming mode
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Icon				
Name	Start cycle	End cycle	Remove program	Run program/Define
Parameter	Short press to set infinite and 2-9 cycles	-	Short press to delete the currently selected program	Short press to run or stop the program in the  key-screen programming mode
	Only valid in  key screen programming mode			In advanced function mode,  the function is determined

### 3. MPC micro-brain system

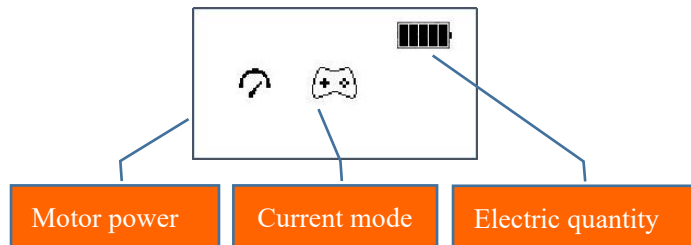
MPC is equipped with the original micro-brain programming instruction system created by Nashen Robot and the micro-brain system integrating robot programming and control, which makes MPBOT robot light and handy, free from dependence on computers and tablets, and make programming more convenient.

#### 3.1 Starting up







It is currently inoperable. It will automatically enter the first level interface after one second of startup.


#### 3.2 Interactive interface




The motor power is a global command, which is divided into three types:  high speed,  medium

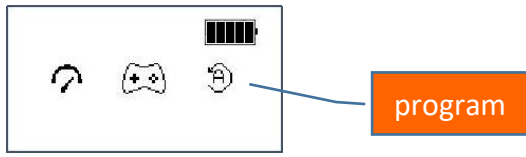
speed and  low speed. This can be used to control the rotation power of A and B motors. At the beginning of debugging, low speed is usually used to facilitate the observation of running conditions.

Mode is single choice:   




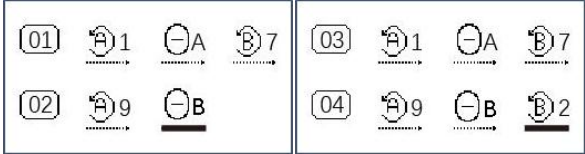





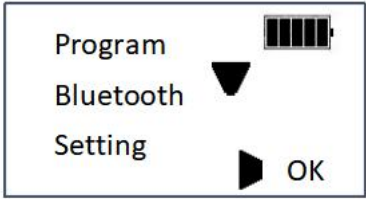

  
 Real-time control



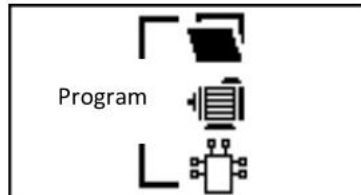
The above keys can take effect;



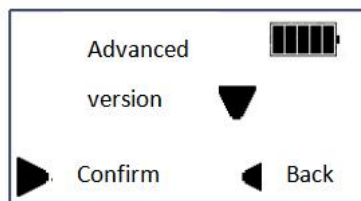
Displays the currently pressed key in the program area.

<p style="text-align: center;">                   Key-screen programming             </p>	<div style="text-align: center;">  </div> <p>The first level interface of this mode will automatically enter the second level interface (i.e. key screen programming status) after one second of display;</p> <p style="text-align: center;">All buttons on the front can take effect;</p> <p style="text-align: center;">Examples of procedures are as follows:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="border: 1px solid black; padding: 5px; margin: 5px;">  </div> <div style="border: 1px solid black; padding: 5px; margin: 5px;">  </div> </div> <p> The number here represents the number of program lines, and the program capacity of different lines is supported according to the robot model;</p> <p> The number here represents the program's parameters (in seconds or times);</p> <p> The letters here represent the program's parameters (ports);</p> <p> The horizontal bar here indicates that the program is selected (you can delete it or insert a new program backward).</p>
<p style="text-align: center;">                   Advanced Function             </p>	<div style="text-align: center;">  </div> <p style="text-align: center;">This is the homepage of advanced functions, which is divided into three modes: program, Bluetooth connection and settings.</p> <p style="text-align: center;">This is the Bluetooth connection mode, which supports the interconnection of two MPC controllers (pay attention to the official account of Nashen Robot at the end of the article for detailed usage).</p> <div style="text-align: center;">  </div>

This is the program mode. This mode is divided into three functions: program, motor and port. The program function can directly execute the program downloaded from the computer. The motor function can view the speed and code values of the two motor ports. The port can view the sensors connected to each sensor port and control the sensor execution commands.



This is the setting mode. There is advanced mode and version information in this mode. Advanced mode can be turned on or not. The version displays the current firmware version information.



**Electric quantity** is relative value: 0~100% corresponding voltage is 3.5~4.2V±0.2V.


When the battery is low, the buzzer will give a "tick tick" low power alarm prompt, and will automatically stop the action of the motor and other program modules, and will automatically shut down after 5 seconds. At this time, it is necessary to use the standard charging line of the product for compliance charging (5V1A).


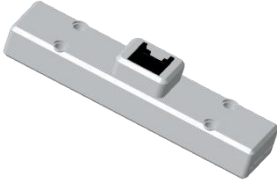



During charging, the charging status is red.

**4. Product list**
















The pictures are for reference only, and the details are subject to the actual delivery.

**4.1 Electronic module configuration list**
















Serial number	Part	MPBOTS1
1	 <p>MPC controller (including rechargeable battery)</p>	1
2	 <p>Motor</p>	2
3	 <p>Servo motor</p>	1
4	 <p>Infrared Sensor</p>	1













5	 Sound Sensor	1
6	 Integrated 5-Grayscale Sensor	1
7	 Full Color Light	2
8	 Open-loop motor	1
9	 Color sensor	1
10	Line patrol map card	1
11	Sensor cable (20cm)	4
12	Sensor cable (40cm)	2
13	Charging cable (Type-C)	1

















#### 4.2 Building block configuration list















Serial number	Name	Part	MPBOTS1
1	1x2 with 1 hole brick beam		6
2	1x4 with 3-holes brick beam		6
3	1x6 with 5-holes brick beam		6
4	1x8 with 7-holes brick beam		6
5	1x12 with 11 holes brick beam		6
6	1x16 with 15 holes brick beam		6
7	1x4 thin sheet glossy		4
8	1x2 flakes		14
9	1x4 flakes		6
10	2x4 flakes		8
11	2x6 flakes		12
12	2x8 flakes		4
13	2x2 cylindrical tiles		2
14	1x2 Beveled brick 45° Architectural wall tiles		8
15	1x2 projecting beam with cross-holes brick		6

16	2x4 brick		4
17	Cams		8
18	33299 1x3 rocker arm with hole		6
19	Medium Pulley 24mm		10
20	1x3 with perforated arms (thick)		4
21	1x5 with perforated arm		4
22	1x7 with perforated arm		4
23	1x9 with perforated arms (thick)		6
24	1x15 with perforated arms (thick)		14
25	2X4L type with perforated arm (thick)		12
26	4x6 curved beam		6
27	11.5 Bent arm with hole		6
28	Reels		2
29	32069 Steering arm		3



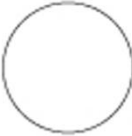

30	3x5 triangular thin beam		4
31	32068 Small grain adapters		4
32	1/2 cross bush		24
33	Bushing		24
34	Standard pins	 Slippage	12
35	Standard bolt friction pins	 Tight fit	50
36	Long pins with cross shaft holes		20
37	Long friction pins Two-headed bolt	 Tight fit	12
38	Long two-sided bolts	 Slippage	12
39	3/4 peg		12
40	Half cross shaft half bolt (sliding)		18
41	2#cross shaft connection		6
42	1x2 Cross Shaft	 2#	22
43	1X3 cross shaft	 3#	12
44	1X4 cross shaft	 4#	12
45	1X5 cross shaft	 5#	4

46	1X6 cross shaft	 6#	4
47	1X8 cross shaft	 8#	4
48	1X10 cross shaft	 10#	4
49	1X12 cross shaft	 12#	8
50	No. 3.5 stop shaft		6
51	4x4 leather strap		4
52	2x2 leather strap		4
53	3x3 leather strap		4
54	1x8 rack and pinion		2
55	1x4 rack and pinion		2
56	1x3 universal joint		2
57	28-tooth differential		2
58	Double-ended coupling pins		4
59	Cross-axis cross-connectors		16
60	Cross shaft connection		14

61	12-tooth bevel gear		10
62	20-tooth bevel gear		4
63	20 tooth bevel spur gear		4
64	Turbo		3
65	12-tooth bevel spur gear		4
66	8-tooth gear		10
67	24-tooth gear		6
68	16-tooth gear		4
69	24 Crown Gear		7
70	40 tooth gear		4
71	Shaft and bolt connection		8
72	Double-ended cross-hair joint		14
73	3# cross shaft connection		6
74	Rope with bumps		3
75	Rope		2
76	Counterweight block		1

77	30.5x3mm thin wheel skin		4
78	Lego wheels		4
79	Wheel size 4		4
80	LEGO tyres		4
81	Tyre size 4		4
82	Curved piece		1
83	Small discs		2
84	Large discs		1
85	Small fan blade		4
86	Medium fan blade		1
87	Large fan blade		1
88	49.5 x 20mm tyres		2
89	Bolt connectors		8
90	Right-angle peg connector		6

91	3X3T with perforated arm		6
92	1X4 Single Side Cut-Off Cross Shaft	 4#	12
93	Large eyes		2
94	Corner plate		4
95	Curved tiles		2
96	Crossed Mouth Balls		4
97	Long curved tiles		6
98	Curved brick		8
99	Beveled brick		8
100	Long bevelled brick		8
101	Biochemical teeth		8
102	5X7 hole arm circle beam		4
103	3X5 L-shaped perforated arm		2

104	5X11 Rim beam with perforated arm		4
105	Universal Wheel		1
106	Ball		1
107	Pliers		1
		Total	734