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Foshan Biowin Robot Automation Technology Co., Ltd

ModMi Intelligent Modular Robot

ModMi Modular Robot

Usage suggestions

You can learn about the guick use of ModMi from the Quick Use Guide, and know the different robot configurations of ModMi. This book details the product information of ModMi, including module specifications, splicing use, connection settings, battery charging, security and privacy, and FAQs.

ModMi APP installation



OR code

For Android



OR code For IOS

Matters needing attention

1. It contains small parts and is not suitable for children under 3 years old; 2. The toy contains precision parts, please avoid falling from high places; 3. Toys are not fireproof and waterproof. Do not get close to the fire source and keep them dry. Avoid getting wet or putting them into water; 4. Do not directly or indirectly splice multiple control modules together; 5. The built-in battery cannot be disassembled or replaced. If it is damaged, contact the after-sales service for maintenance;

6. Only the recommended charger can be used for toys (recommended specification: output DC 8.4V/1.5A);

7. Do not force the toy to rotate when it is locked; 8. Do not touch toys with your hands during the movement; 9. Discard this toy at will, which may affect the environment. Please recycle it properly;



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ModMi modular intelligent robot is an intelligent robot with both entertainment and education functions. ModMi adopts a modular design that is easy to assemble and disassemble, allowing you to create various interesting robots like building blocks, such as manipulator robots, bionic spider robots, bionic snake robots, biped robots, etc. Each robot can bring you different game playing methods and experiences. Combined with the graphical programming function of the "Mimi Robot" APP, the robot intelligent programming application can be completed by dragging the graphical program modules in the order of instructions. With the help of motion posture records in APP, you can achieve smooth robot actions by simply dragging the robot with your hands. You can also control robot movement, dancing, greeting, doing sports and other actions through the APP. In addition, the App also provides a way to play with customized robot shapes, which brings fun and satisfies all your imagination of robots. ModMi also nested a series of STEAM courses, including preliminary, intermediate and high-level full stage courses, to guide children to learn robot control, programming and AI application, greatly stimulate their learning interest, and enhance their creativity and imagination.

Introduction

Module **Specifications**

F control module



F Control Module Parameters			
size	138*30*68 mm	output voltage	DC 7.4V
weight	446g	Battery	1.5mAH
communication mode	WI-FI	processor	ARM cortex-M0
IO port	2 (including one serial port)	Splicing clip	Upper and lower underside
Module interface	2		

The F control module is the control and power supply center of the ModMi bionic snake, robot arm, humanoid biped and biped robot. The module adopts ARM cortex-M0 architecture processor, with 1.5Ah rechargeable lithium polymer battery built in. The front includes a power indicator, a program burning port, a sensor interface and a reset button. There is a control module switch on the left side, a charging interface on the right side, a splice buckle module interface on the upper and lower sides, and the F control module also integrates a Wi Fi module function unit.

Pcontrol module

surface



Module **Specifications**

The P control module is the control and power supply center of the ModMi bionic spider, X-wheel and mechanical arm modeling robot. The P control module adopts ARM cortex-M4 architecture processor, with 2.5Ah rechargeable lithium polymer battery built in. The control module has six splicing clips and one splicing clip module interface in the circumferential direction and on the upper and lower surfaces respectively. The power indicator is also on the upper and lower surfaces. The front includes the sensor interface, the host program burning interface, and the slave program burning interface. The back has the control module switch, the charging interface, and the reset button. The P control module also integrates the Wi Fi module function unit.

T-joint module



T joi	nt module par	ameters	
size	: 48*36*81 mm	output voltage	DC 7.4V
weight	: 100g	stall torque	: 16 kg/cm
communication mode	: Serial port	freedom	: 1
Maximum speed	299.2°/s	Splicing clip	Upper and lower underside
Opening and closing range	-90°~ 90°	Rated power	4.44W

Module Specifications

The T-joint module is the swinging "joint" of the ModMi robot, which is used to drive the swinging motion of the robot. It is a high-precision servo system with built-in DC reduction motor and angular position sensor. The T-joint module has two splicing clips, one on the upper and one on the lower bottom. Each clip is designed with an anti slip button. The T-joint module can be spliced and disassembled with other modules by pressing the button and rotating the clip. In addition, an indicator light is set at the upper end of the T-joint module. After power on, the status of the indicator light can be used to judge whether the module is spliced normally.

l-joint module



I joint module parameters				
size	57*40*72 mm	output voltage	DC 7.4V	
weight	105g	stall torque	16 kg/cm	
communication mode	Serial port	freedom	1	
Maximum speed	299.2°/s	Splicing clip	Upper and lower underside	
Opening and closing range	-180°- 180°	Rated power	4.44W	

Module Specifications

The I-joint module is the rotary "joint" of the ModMi robot, which is used to drive the rotary motion of the robot. It is a high-precision servo system with built-in DC reduction motor and angular position sensor. The I joint module has two splicing clips, one on the upper and one on the lower bottom. The buckle on the lower bottom is designed with an anti slip button. The I joint module can be spliced and disassembled from other modules by pressing the button and rotating the clip. The upper and lower surfaces are equipped with pins to locate the initial position of the I joint module. In addition, the upper end of the I joint module is equipped with an indicator light, which can be used to judge whether the module is spliced normally after power on.

G terminal module



G terminal module parameters			
size	58*57*79 mm	output voltage	DC 7.4V
weight	123g	stall torque	16 kg/cm
communication mode	Serial port	freedom	1
Maximum speed	299.2°/s	Splicing clip	Bottom surface
Opening and closing range	0°~ 90°	Rated power	4.44W

The G terminal module is the end "tool" of the ModMi robot, which is installed at the end of the robot to hold objects. It is a high-precision servo system with built-in DC reduction motor and angular position sensor. The G end module has one splicing buckle in total, and an anti slip button is designed beside the buckle. The splicing and disassembly of the G joint module and other modules can be realized by pressing the button and rotating the buckle. In addition, an indicator light is set at the upper end of the G end module, and after power on, the module can be judged whether the splicing is normal by the indicator light status.

Module

Specifications

Auxiliary mobile wheel

Latch

Auxiliary mobile wheel parameters size 38*17mm weight 3.6g

The auxiliary mobile wheel is the auxiliary function module of the ModMi robot, which is used to build the bionic snake robot. It consists of two small wheels and two latches, which are installed on the T joint module and the F control module to assist the movement of the bionic snake robot.

Module Specifications

F Control module holder



F Control module holder parameters		
size	85*76*51mm	
weight	44g	

The fixed base of the F control module is used to drive the base suction cup of the ModMi operating arm configuration to be firmly fixed on the desktop by pressing the key. The upper end of the fixed base is also provided with a splicing clip for splicing the base of the mechanical arm with the F control module.

Module Specifications

Quadrature module



Bionic foot

Bionic foot parameters size 39*77 mm weight 56g

The bionic foot is the auxiliary function module of the ModMi robot, which is used to build the bionic spider robot and the operating arm. It is installed at the end of each leg of the bionic spider robot to assist the motion of the bionic spider robot. In addition, it can be used as a support for the base of the P module when building the operating arm of the P module.



Quadrature module is the auxiliary function module of the ModMi robot, which is used for the splicing of various joint modules, auxiliary modules and executive modules to achieve the axial 90 $^{\circ}$ relative rotation between modules.

1. Align (+) with (+), (-) with (-)

After aligning the arrows, The stop button _____ can only be pressed.



2. Inserting cohesion

Press 3. Rotary fastening

Assembly method

Module Splicing



Anti tripping button

Stop button



Disassembly method

Power And Charging

The number of lit cells of the power supply indicator light of the F and P control modules represents the power state of the ModMi robot. To ensure the normal operation of the robot and maintain the battery life, when only one cell of the power supply indicator light is left, please charge it in time. The indicator light of the charging charger will display green when fully charged, otherwise it will display red.



The following are the four steps of equipment connection (taking the P module as an example):



1. Find the robot id on the silver label paper of the control module. The id starts with "biowin", and the last bit is the corresponding control module type. For example, P module is "biowinP"+others.





2. Turn on the switch button of the control module, and if the power indicator is on, it means that the switch is successfully turned on.

Device Connection





3. Open the mobile phone "Network Settings" to find the corresponding WiFi name, and click Connect; If the phone is connected to other WiFi, you can disconnect it first until you find the WiFi hotspot of the robot. The WiFi module starts for about 5s. Note that if the pop-up window "The current WiFi is unavailable, do you want to continue using this WiFi?", you need to select "Use".

4. Click the ModMi icon, enter the interface, select "DIY setup", select the corresponding WiFi, and click "Confirm connection".

Biowin Robot provides robot peripherals package ModMi-Ex, which allows users to expand the use of commonly used external sensors and devices and enrich the application of ModMi. ModMi-Ex includes a peripheral control board and up to 30 kinds of external sensors and equipment. It has a communication serial port connected to the control module. The interface connected to the sensor includes three digital signal interfaces, one analog signal interface, one IIC communication interface, one serial port communication interface, one program burning interface, and one power supply interface.



Peripheral

Peripheral

Ultrasonic ranging module



The non-contact distance test function of 2cm-400cm is provided, and the test accuracy can be up to 3mm 2cm blind area. The module includes ultrasonic transmitter, receiver and control circuit. It can be added to projects with multiple test distances. Connect the main control board interface: D3

Lattice display module



Using special driver chip TM1637 to drive 5×7 dot matrix. The dot matrix display module is added to the project. By controlling each pixel to turn on or off, various DIY patterns are displayed to achieve creative display.

Connect the main control board interface: D4

Tracking module



It is designed and manufactured by using two channels of infrared photoelectric sensor ST188. The detection distance is about 2cm. When triggered, the high level is output; Otherwise, low level is output. Connect the main control board interface: D3/D7.

Peripheral

Full color LED module



It is designed and manufactured with one WS2812. WS2812 is an intelligent external control LED light source integrating control circuit and light-emitting circuit. Through serial cascade interface, data can be received and decoded through a signal line. It can perfectly display all kinds of colors, and can be used for project signal lights, decorative lights, etc. Connect the main control board interface: D2

Peripheral

Color sensor





It is designed and manufactured by using TCS34,725FN color optical digital converter core. Through I2C interface communication, it can provide detection and digital output of red, green, blue (RGB) and light sensing value, and can detect red, green and blue colors.

Sound sensor module



A sensor module based on electret microphone for sound detection can be used to detect the sound intensity in the surrounding environment. There is a sound output high level, and no sound output low level. Connect the main control board interface: D3

Remote control receiving module



The integrated infrared remote control receiver IRM:+H638T is adopted for design and manufacture. The carrier frequency is 38.0kHz and the period is 26us, which can resist the reflection interference of natural light. Connect the main control board interface: D3

Peripheral

Gesture sensor



The built-in ultraviolet and infrared barrier filters can detect light intensity and temperature in complex environments, and accurately sense "up, down, left, right" and more complex actions; The detection distance is 10-20cm. Connect the main control board interface: IIC/A5

Exploratory Map



Advanced Map



The Exploratory version is divided into sensor fixing area, square placing area and F module mechanical arm fixing area, which can be used together with square, sensor, mechanical arm and Lego parts.





The advanced version is divided into sensor fixing area, square placing area and P-module mechanical arm fixing area, which can be used together with square, sensor, mechanical arm and Lego parts. Security And Privacy& After-sale Service

Security and privacy

We are fully aware of the importance of personal information security and will do our best to protect the personal information security of all users.

We will take all reasonable and feasible measures to ensure that irrelevant personal information is not collected. If the user is required to provide some personal information during the use of the product, we will first obtain the user's authorization and save the personal information provided by the user only in the local area of the device with security protection measures that meet the industry standards. In the case that the function uses unnecessary connection to the network, we will also use the personal information provided by users with limited local computing processing technology to prevent unauthorized access, public disclosure, use, modification, damage or loss of data on the Internet.

After-sale service

We promise that the material and process problems of ModMi modular robot products and accessories in the process of using according to the product instructions will be confirmed by the technical inspectors of Foshan Biowin Robot Automation Technology Co., Ltd. to meet the product warranty scope, and will provide 1 year of free maintenance service for electronic components and 6 months of free maintenance service for materials and motors from the date of purchase.

How does ModMi power on and off?

F control module: Push the switch on the left side upward to start the machine, and push the switch downward to shut down the machine.

P control module: press the switch on the back to start the machine, and press the switch again to reset the pressed switch when the machine is started.

How long does it take to fully charge ModMi? How long can I use it when fully charged?

F control module: use a DC 8.4V/1.5A charger, and it takes 2 hours to fully charge. P control module: The charger with DC 8.4V/1.5A will take 4.5 hours to fully charge. The usage duration of the ModMi when fully charged depends on the number of joint modules connected. The indicator light of the charger will be green when fully charged, and the maximum usage duration can last for 4 hours.

Does ModMi need to connect to the network?

ModMi does not need to connect to the network, just connect the WiFi of the computer or mobile phone to the hotspot sent by the control module.



Common Problem

What is the farthest control distance between APP and robot?

The farthest control distance between APP and robot is about 6m.

What is the rotation range of each module of ModMi?

The T joint module can be rotated 90 $^{\circ}$ to the left or right at most, the I joint module can be rotated 150 $^{\circ}$ to the left or right at the center of the zero position at most, and the maximum angle that the end of the G end can be opened is 90°. Each motion module can be controlled to a specific position in the APP customized configuration.

What programming languages does ModMi support?

ModMi currently supports graphical programming, Python, and C++programming.

What are the programmable modules ModMi supports?

At present, ModMi has more than 30 programmable controllable components, including F/P/M control module, T/I joint module, G terminal module, ultrasonic sensor, infrared sensor, digital tube, lattice sensor, RGB sensor, buzzer, etc.

How does the module reset?

1. According to the chapter "Device Connection", connect ModMi, open the computer software Bw StudioSuite, and click the icon "Reset Module":

detected", and "zero correction" is displayed at the bottom right; state of the holder.

3. After the user adjusts the joint/end module to zero position, click "zero position correction"; 4. After setting, exit "Reset Module" and enter "Module Setting". The interface displays "A Module Detected" and check the "Position". If the display is 0, the zero setting is successful. In addition, in the "Module Setting" interface, you can also reset the specified ID of the module by entering the module ID and pressing the "Setting Button".

What is the function of the indicator light of the module?

cates that the module is being turned on during power on, and can be connected after the power indicator is always on. The red indicator light of joint module and end module is used to display whether the module is successfully spliced.



- 2. Enter the reset module interface, the user accesses the joint module requiring zero correction, displays "a module is
- Note: Since ModMi has no encoder, it is necessary to manually swing the joint position of the module to zero. The zero position mark of I module is the triangle mark of the motor housing aligned with the triangle mark of the module housing, the zero position of T module is in the vertical middle, and the zero position of G module is in the tightly closed
- The power indicator of the control module is used to display the power condition; The flashing wifi signal 🛜 indi-