WeeeFight Robot Competition Introduction

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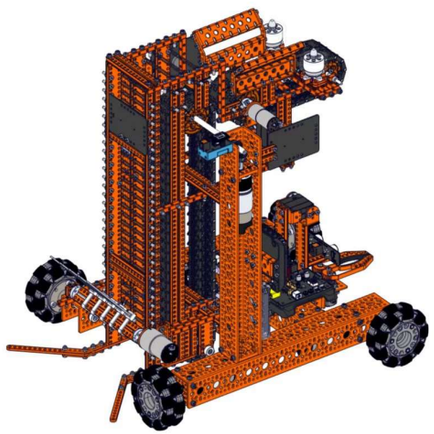
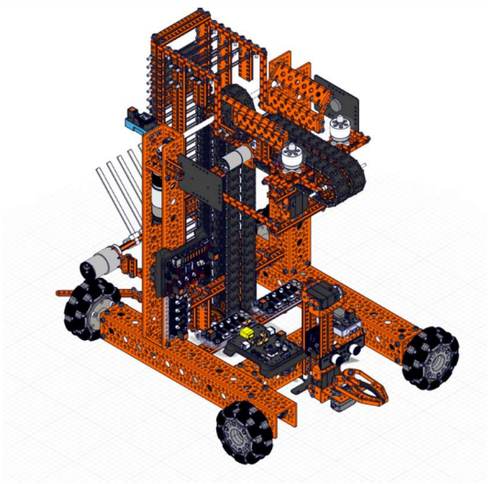
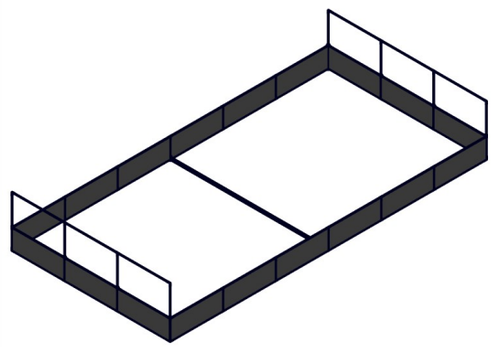
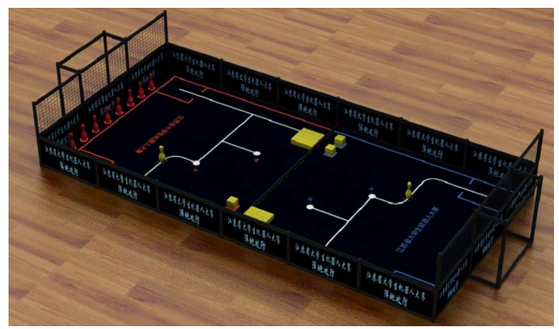
WeeeFight Competition Kit

WeeeFight is a robot competition for college and university. It applied offline artificial intelligence battlefield offensive and defensive settings. WeeeFight can be used to simulate the scenes of future battlefield offensive and defensive. This set of products allow students to comprehensively learn robot technology, mechanical structure, mathematical knowledge, AI technology, programming technology (software support graphic programming and Python text programming), and improve team collaboration capabilities, on -site response capabilities, etc. Comprehensively cultivate students 'hands -on practical ability, programming and algorithm applications, comprehensive application of electromechanical integration, and improving students' comprehensive scientific literacy and engineering literacy.



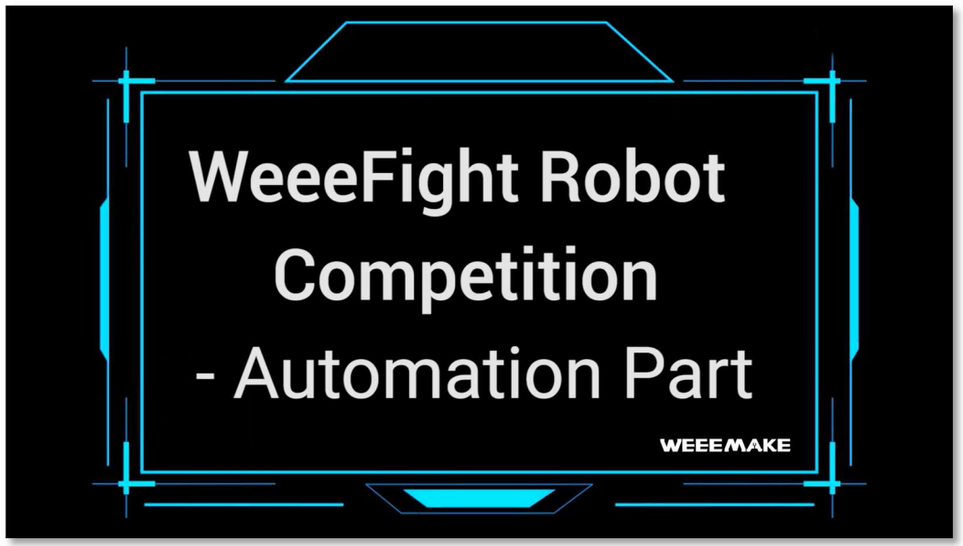




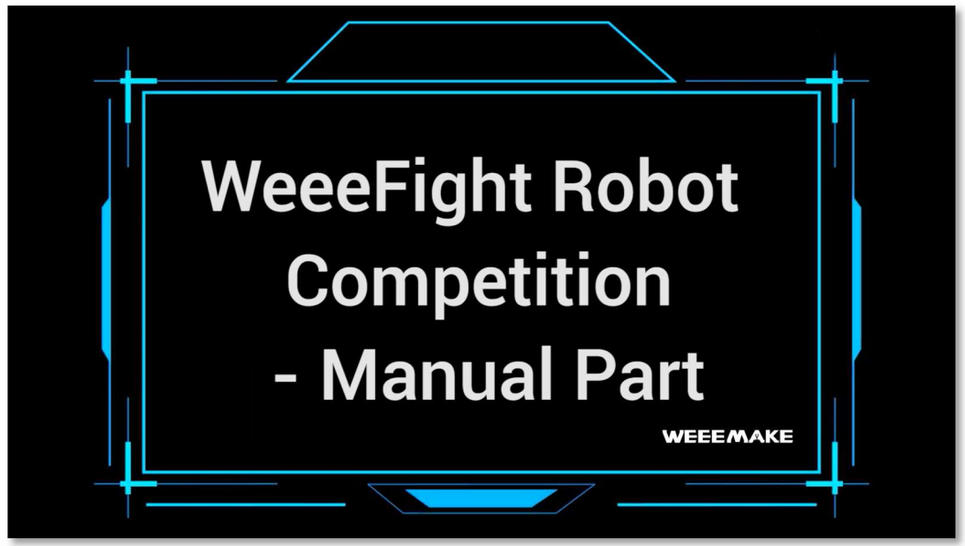


WeeeFight – Video Demo

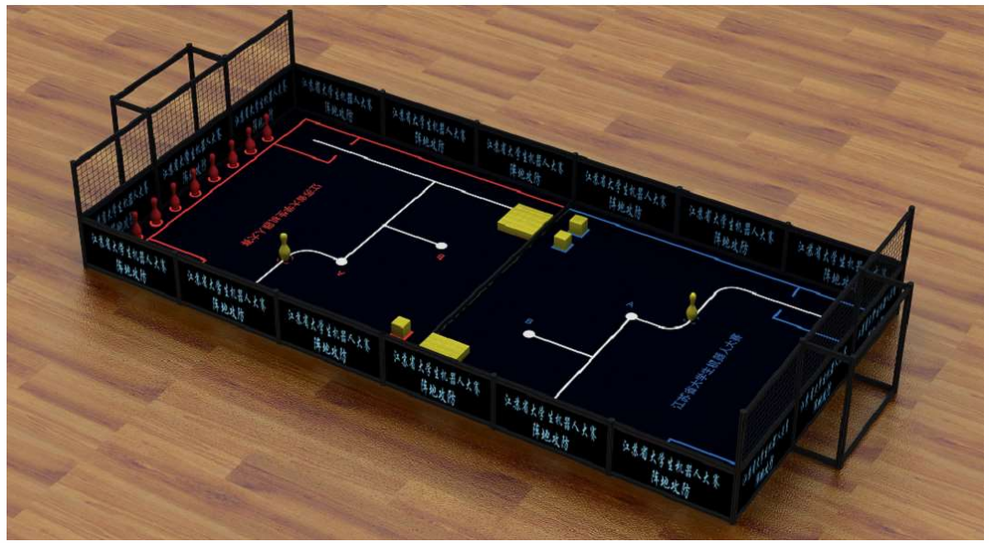
Automatic Part Demo



Manual Part Demo

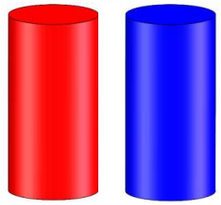


WeeeFight – Field Instruction



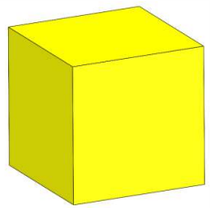
Field:

The attack and defense field of the competition map is **3*6 meters**, and the middle barrier of the field is divided into two positions: red and blue. Both side robots can only complete their tasks in their respective positions.

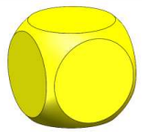


Score props: the scoring props in the field of battlefield attack and defense events are called "soldiers", which are 8 red soldiers and 8 blue soldiers. The scoring items are cylindrical objects of EVA material, 16cm hight, 8cm width.

Special soldiers: Special “soldier” props on the patrol line, 16cm hight, 8cm width.



Stacking Cube: The yellow EVA cube will have QR code on it to be identified and be stacked by robot. The size is 10x10x10 cm.



Bullet: bullet is a yellow EVA rectangular cube, there are 50 bullets on the field, 25 placed on each square array. The bullet is allowed to be ejected by robots. Size is 6x6x6 cm.

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Product Value

Cultivation of teamwork ability, organization ability and reaction ability

Assessment of the comprehensive technical capability of mechanical, electronic and software

Learning and application of artificial intelligence image recognition

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10110
11110

According to the competition scene, the software algorithm is constantly improved

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Selling Point

Robot competition for the university and college student

All-metal structure, with strong structural strength. High-power drive, strong power. High-performance master control, you can complete the complex multitasking competition.

Empowered by artificial intelligence image recognition module

The image recognition module based on K210 can be used for icon recognition, icon positioning, line patrol, etc.

Easy programming, graphical and text language advanced learning

Also support graphics and Python programming, one-key translation, second-level upload

Strong extensibility

500 + Standard size design mechanical parts, RJ11 system 100 + electronic support

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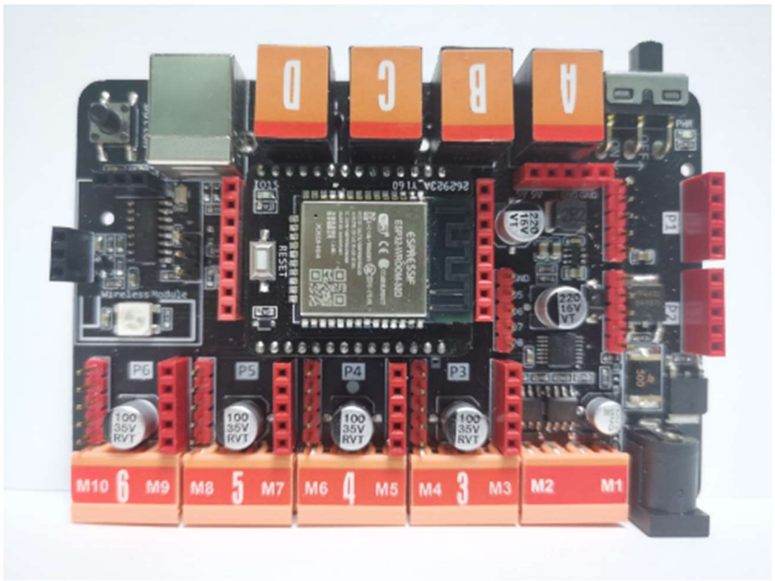
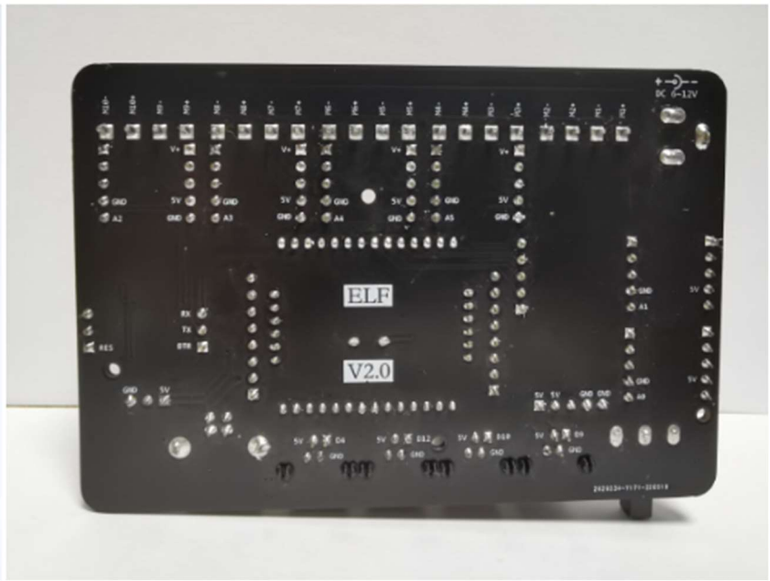
Controller – ELF ESP32 Pro

The core board of ELF ESP32 Pro master control board is composed of ESP32-WROOM-32D module, used on ELF V2.0 board, which can be directly programmed, download firmware and other operations. The core board has a total of 21 functional pins, onboard reset button and a controllable LED light. The master board supports graphical programming and python, programming, and supports arduino programming



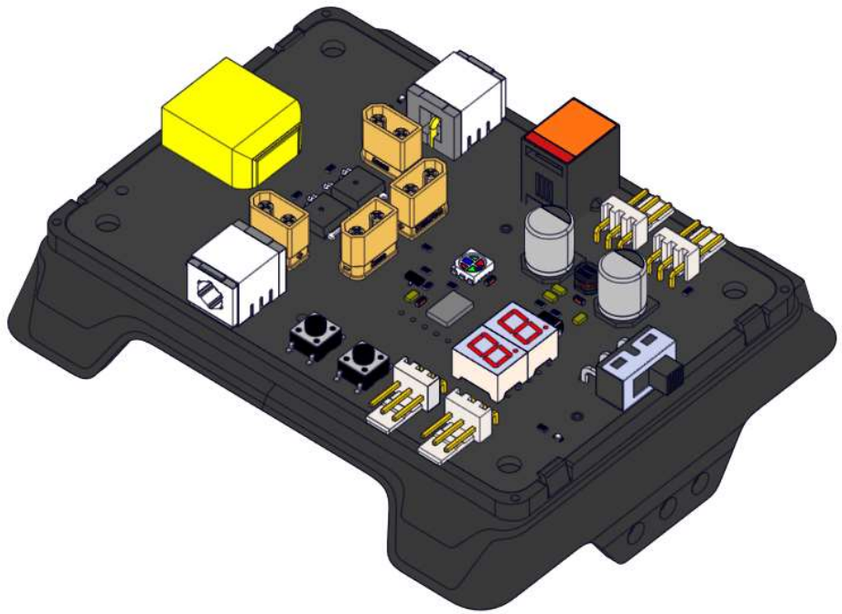


Bluetooth Controller

Based on the Bluetooth protocol connection, the transmission data is stable and reliable, and it is not easy to disconnect. With the gamepad design, it is easier to use and better to experience. The controller is a master-in-one design that can connect to the Weeemake Bluetooth module, control the car robot movement, or to the Weeemake Bluetooth dongle to communicate with the computer for scratch programming and learning. Built-in lithium battery pack, no need to frequently change the dry battery, battery indicator light and Bluetooth indicator light, convenient for users to check the power situation and connection situation.

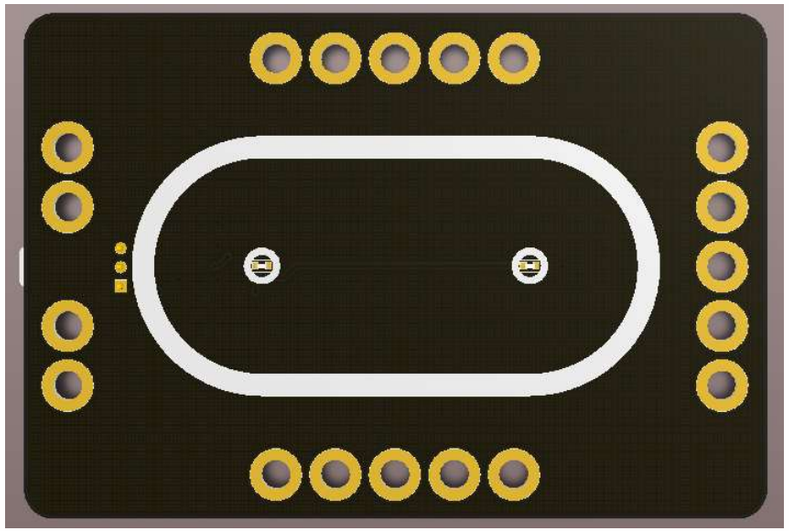
Power Management Module

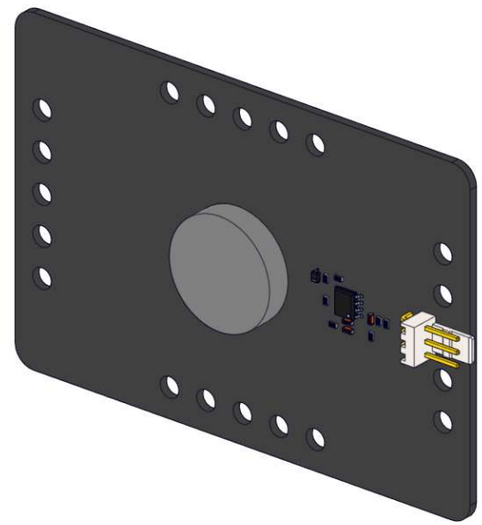
This module is designed for competition and is used for power control. The module divides the power of the lithium battery into several parts and is used to power the circuit boards such as the main control and the motor drive module. In addition, the module integrates MCU on the module to timing and detect the hit situation. When the module is hit or the race time ends, the power supply to the main control and motor is automatically turned off to realize the automatic stop of the race.



Hit Sensor

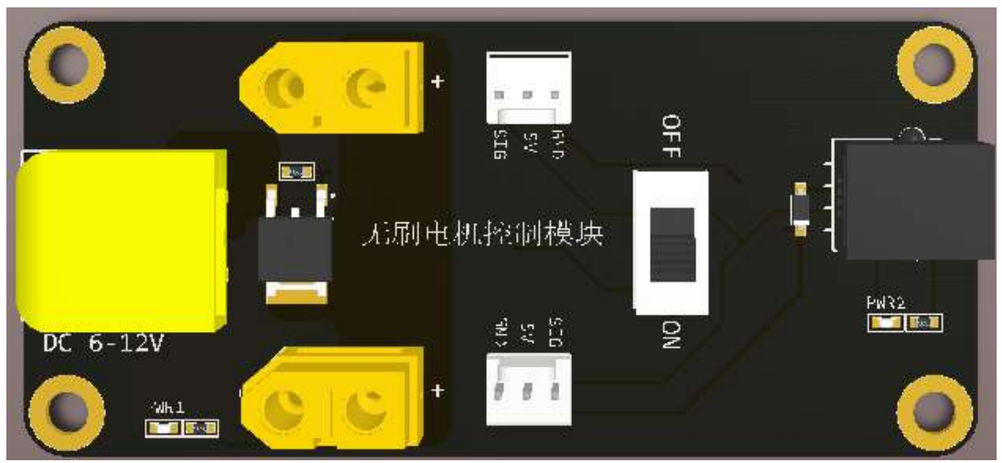
This module is designed for competition and is used to detect enemy "bullets" strikes. The module is detected by the vibration sensor on the back. When a "bullet" hits the module, the output state will be changed immediately away, thus triggering the corresponding action of the power management module. After power-on, two LED lights will appear on the front side for indication. There are 19 mounting holes around the module, which are convenient for installation in any position of the car.(Note: It may be necessary to isolate the vibration of the fuselage sponge during installation.

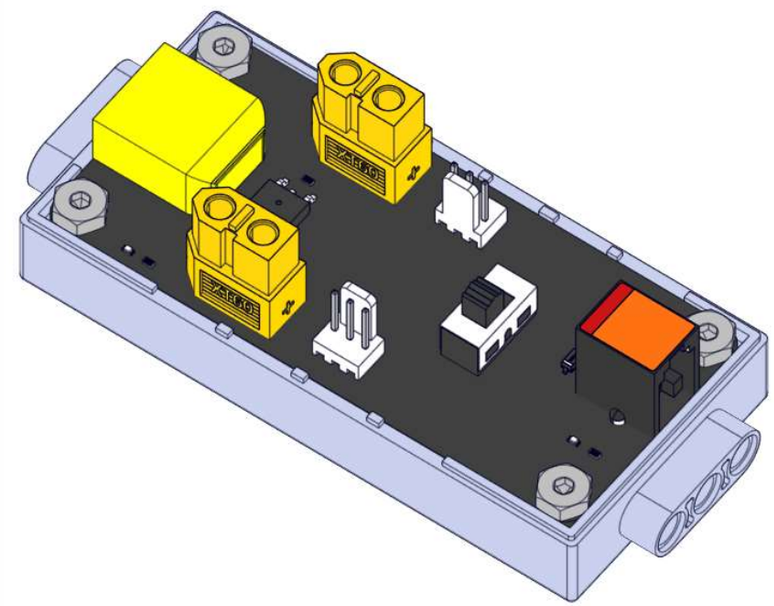




Brushless Motor Driver

This module is a competition-specific module designed to drive two strike modules consisting of brushless motors. It consists of one power input port, two power output ports and two brushless motor signal ports. The control signal of two brushless motor is input by RJ11 port. The module power supply is controlled by the dial switch, and the user can not plug the power port frequently for convenient debugging.





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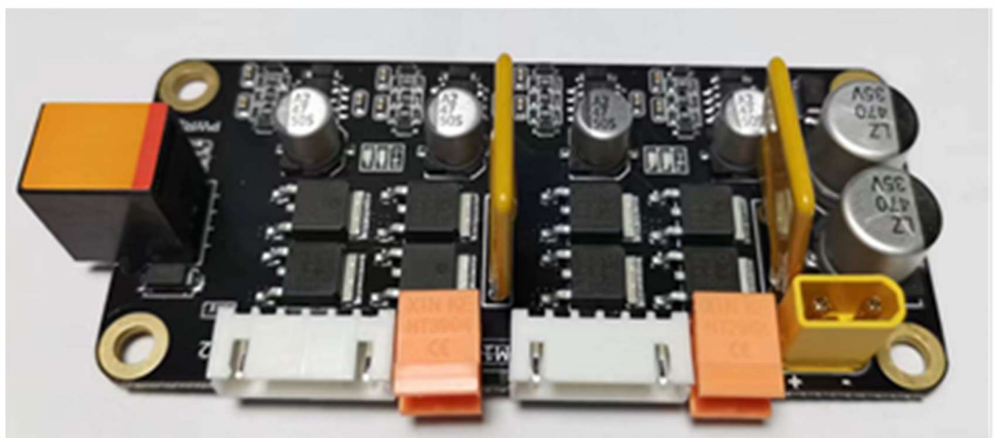
Brushless Motor

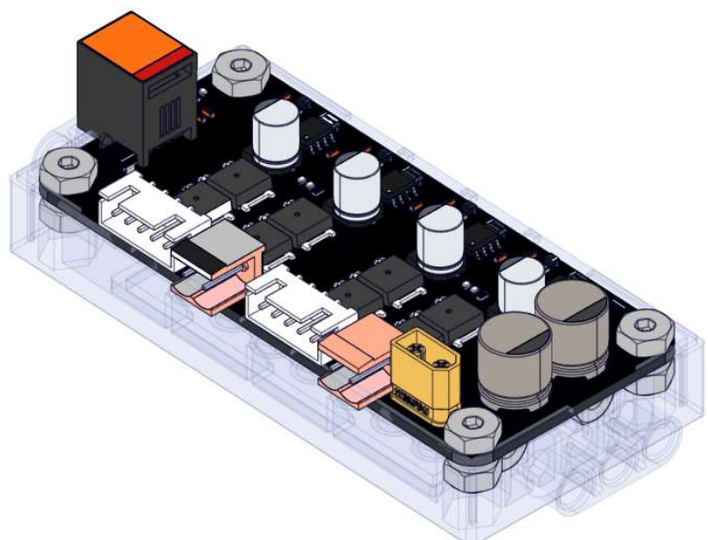
2312 Brushless motor, 960KV, rotate in clockwise and counterclockwise. Pure copper enameled wire, long-life bearing, hollow design, is conducive to heat dissipation. Start safely, the throttle position is not prohibited to start; Temperature protection, automatically shutdown at 110 degrees of surface temperature; Out of control protection, no signal after 1 second shutdown. 8KHz PWM control, using the speed control curve.

Maximum current: 30A
Dimensions: 34 * 24 * 7mm
Voltage range: 4-16V
Number of batteries: 4-12NIMH
BEC Output: continuous 2A

Encoder Motor Driver (H)

This module adopts the motor drive circuit composed of large power MOS pipe, which can drive the 2-way DC motor and the encoding motor simultaneously, supporting the positive and reverse and speed regulation. The module adopts WM single bus control, built-in MCU control, requires external power supply, support a single motor for 5A, instantaneous 10A power, with overcurrent protection, motor rotation indicator lamp. The encoding motor supports AB two-phase detection, can accurately control the speed, direction and displacement of the positive rotation, reversal, built-in PID algorithm, can be more stable movement to the specified position. The PCB plate is gilded to make the module more beautiful and durable.





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36 Planetary Geared Encoder Motor

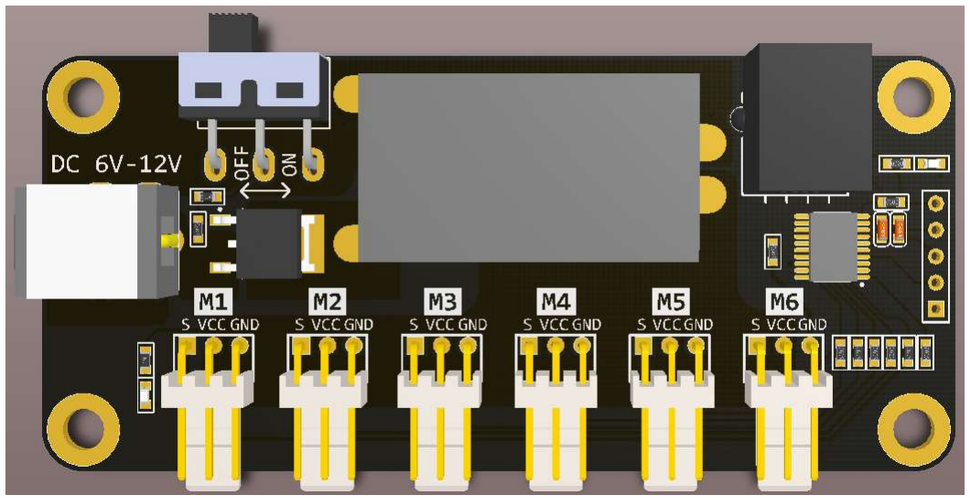
This motor is a 36 planetary geared deceleration encoder DC motor, with large power, convenient control and other characteristics, especially suitable for large sites, and the need for heavy load motor place. There are 2 types of this motor, one of speed is 320rpm and 64rpm.

	320 RPM	**64 RPM**
Reduction gear ratio	25	125
Rating torque	10000g.cm	20000g.cm
Block the torque	25000g.cm	60000g.cm
Rated voltage	DC12V	DC12V
No-load current	500mA	480mA
Locked rotor current	13.8A	12.7A
Encoding voltage	DC5V	DC5V
Hall sensor	2 Road	2 Road
Magnet ring	13 Extreme	13 Extreme
Work environment	-10℃+50℃3080%RH	-10℃+50℃3080%RH
Motor size	38*137mm	38*145mm

6-way Servo Motor Driver

The 6-way servo motor driver module has a built-in high-power DCDC step-down module, which can achieve 10A current output, and can drive 6 PWM steering gear (servo motor) at the same time, or a few more powerful PWM servo motor. Built-in MCU, can be controlled through 1 port, but also can control the WS2812RGB light strip, to achieve up to 6 strips x 30 LED lit together, but also can light any number of LED assigned.

The module can also control the mixture of RGB LED strip and servo motor, and the module needs to be powered separately to drive.



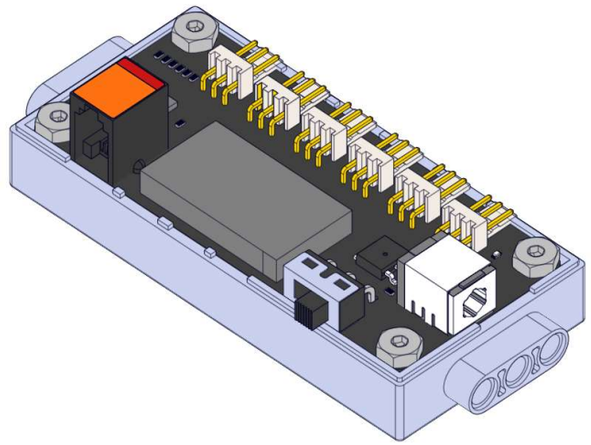
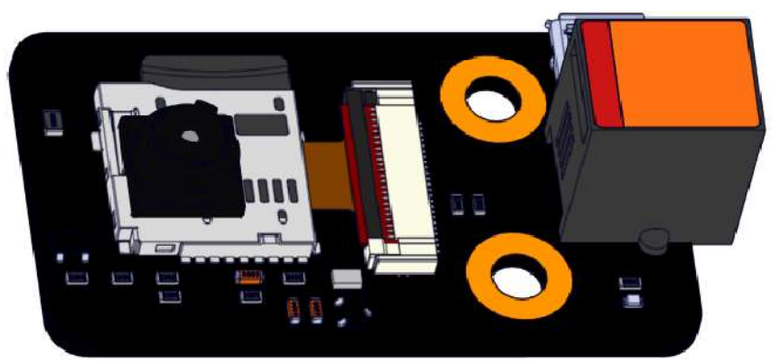


Image Recognition Sensor V2

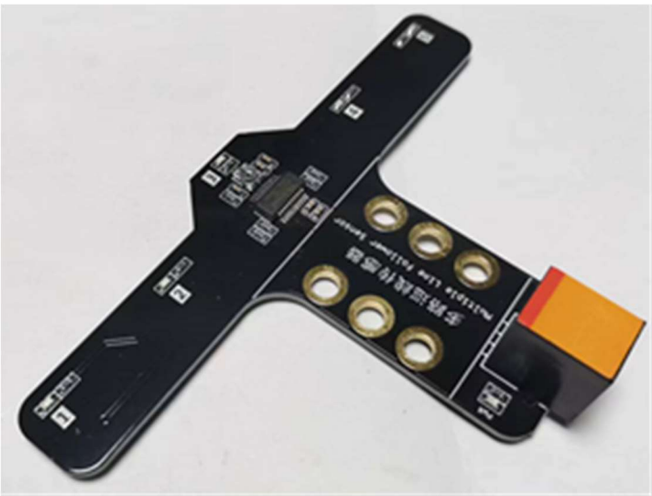
Compared to the previous image recognition sensor, the image recognition sensor module V2.0 uses the K210 module with faster operation speed and stronger image processing power. The module has a built-in 64-bit dual-core high-performance processor, with FPU units, 2 accelerator KPU and FFT, and supports a variety of AI programming frameworks. In addition to the functions of the image recognition sensor module 1.0, it supports user secondary development and learning, and can perform face recognition, object classification, machine learning and other functions. The module has a USB port, which can see the video image directly after connecting the software for convenient development.

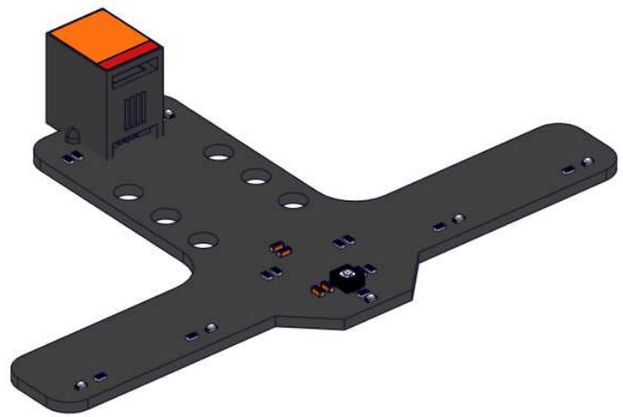


Processor: K210 AI chip
Kernel: RISC-V Dual Core64bit
Main frequency: 400MHz~600MHz
SRAM: 8M
Camera: 200W (OV2640,60°) / 30W (GC0328,160°)
TF card slot: 1 slot
Light-fill LED lamp: 1
microUSB: 1 out of them
Operating voltage: DC 5V
Communication mode: WM single-bus
Module size: 4.8CM2.8CM (width)
3 The Use Guide & Programming

Multiple Line Tracking Sensor

This module uses 5 anti-interference infrared cutoff illumination sensors, with high sensitivity, good linearity, good temperature stability, and a built-in optical filter, which can effectively filter out the infrared light interference. Compared to the infrared tube patrol sensor, this module can be used for outdoor or indoor places close to the sun, but also can be better patrol. Built-in 5 white LED lights for lighting, built-in mcu for rapid detection, built-in 5 blue LED lights for prompt black and white line, built-in an adjustable resistance, convenient for users to directly debug the threshold. This module uses WM single bus communication, which can feedback 5 simulated values or 5 high and low values.





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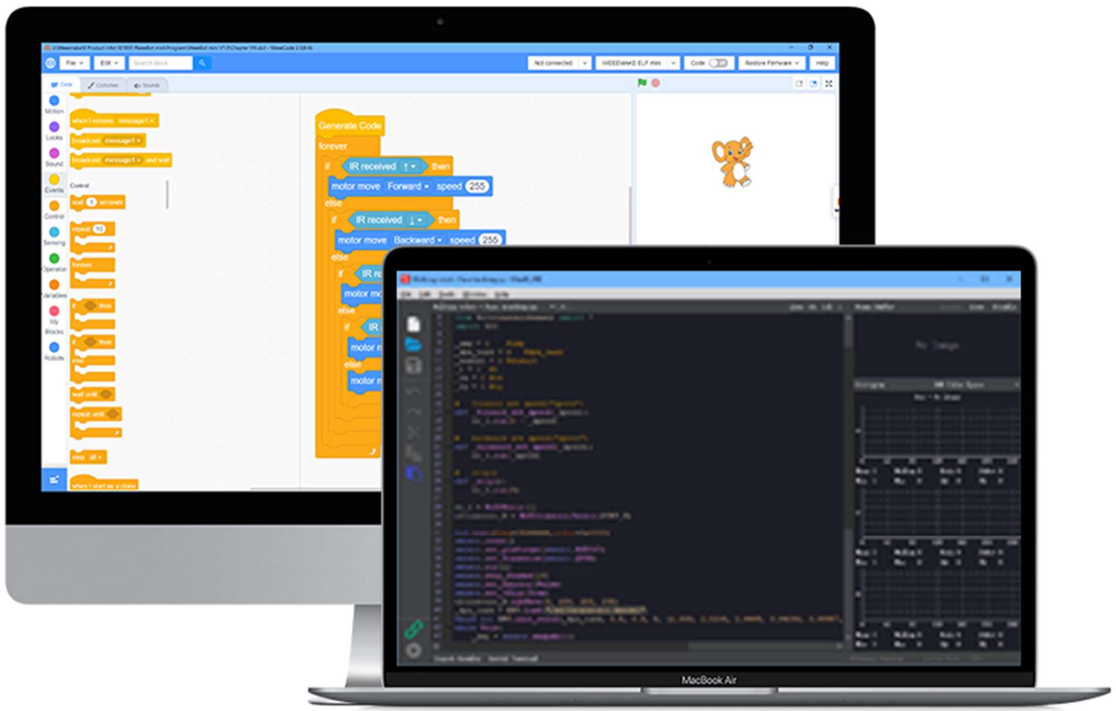
Software



WeeeCode

Graphical programming + Python programming.

Python Editor

Pure text Python editor.

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Specifications

Product name	**WeeeFight Competition Robot Kit**	**Applicable age group**	Over 15 years old
Electronic module	**ELF** ESP32 Pro, the main control board The Image Recognition Sensor module V2.0 Bluetooth controller Bluetooth module Power management module Beat the module Brushless motor drive module High-power encoding motor drive module, 6-way rudder machine drive module Brush-free electric adjustment 36 Encoding motor Brush motor Steering gear, 37 motor, image recognition sensor Multipatrol sensor ultrasonic sensor	**ESP32 core module basic parameters**	Input voltage: DC 5V; operating voltage: 3.3V
			Master control chip: ESP32-WROOM-32D module 8M
			Reset button: 1; programmable LED lamp: 1 (blue) (IO15); row driver: 28 pins (anti-reverse design)
			Module size: 33mm * 28mm (length * width)
		ELF ESP32 Pro	Operating voltage: 5V
			1x Onboard button; 1xonboard RGB LED; 1 x buzzer; 4x RJ11 port A, B, C, D, Can be very easily connected to the WM RJ11 series of electronic modules; Pin port 1,2, The pin-type sensor can be directly connected and converted to the RJ11 port; The pin port 3,4,5, and 6 can be converted to the RJ11 port; DC motor port M1, M2; The DC motor port M3~M10 shall be connected with the DC / coding complex motor drive module or the stepper motor to drive at the corresponding port; Plug-in to either MEGA-328P or MEGA-2560 or ESP32; Wireless communication port: connect to bluetooth module port; Wired communication port: USB-B
			Dimensions (LxWxH): 88x75x20mm
			Power supply voltage: DC 6-12V
structure	The 100mm omnidirectional wheels, couplings, tracks, shaft, bearings, gears, keys, aluminum construction parts, etc		
Programming environment	WeeeCode; MaixPy IDE	**Programming language**	Graphical Programming, and by MicroPython