mBuild

Next-generation AI electronic module platform

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Contents

1 What is mBuild?

2 Who/What is mBuild for?

3 What can mBuild do?

4 Powerful mBuild kits

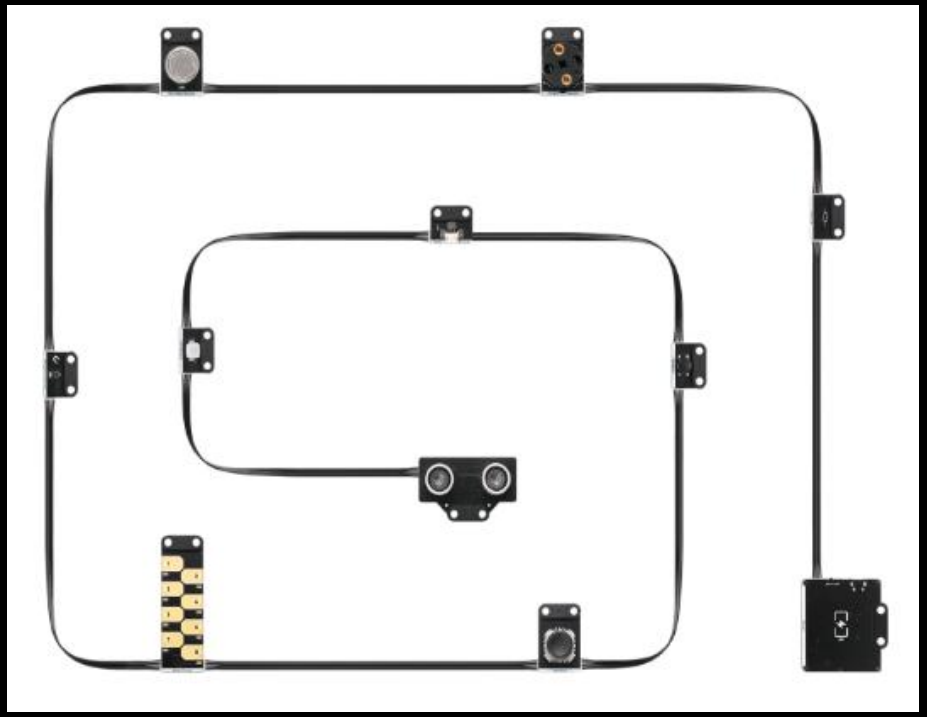
5 Choose your kit

6 Build with mBuild

What is mBuild?

Next-generation AI electronic module platform

mBuild is our new series of electronic moduels that are compact but powerful and easy to use. It includes over 60 types of modules, supports infinite combinations, and can be used offline without further programming. Supported by both mBlock and Mu Python editor, mBuild offers a wide range of opportunities to create interesting projects. The diversity of mBuild means that it can meet the needs of beginners, right through to professionals. It facilitates learning the basics of programming, developing advanced projects, teaching AI & IoT, joining robotics competitions and much more.



Who/What is mBuild for?

Suitable for:

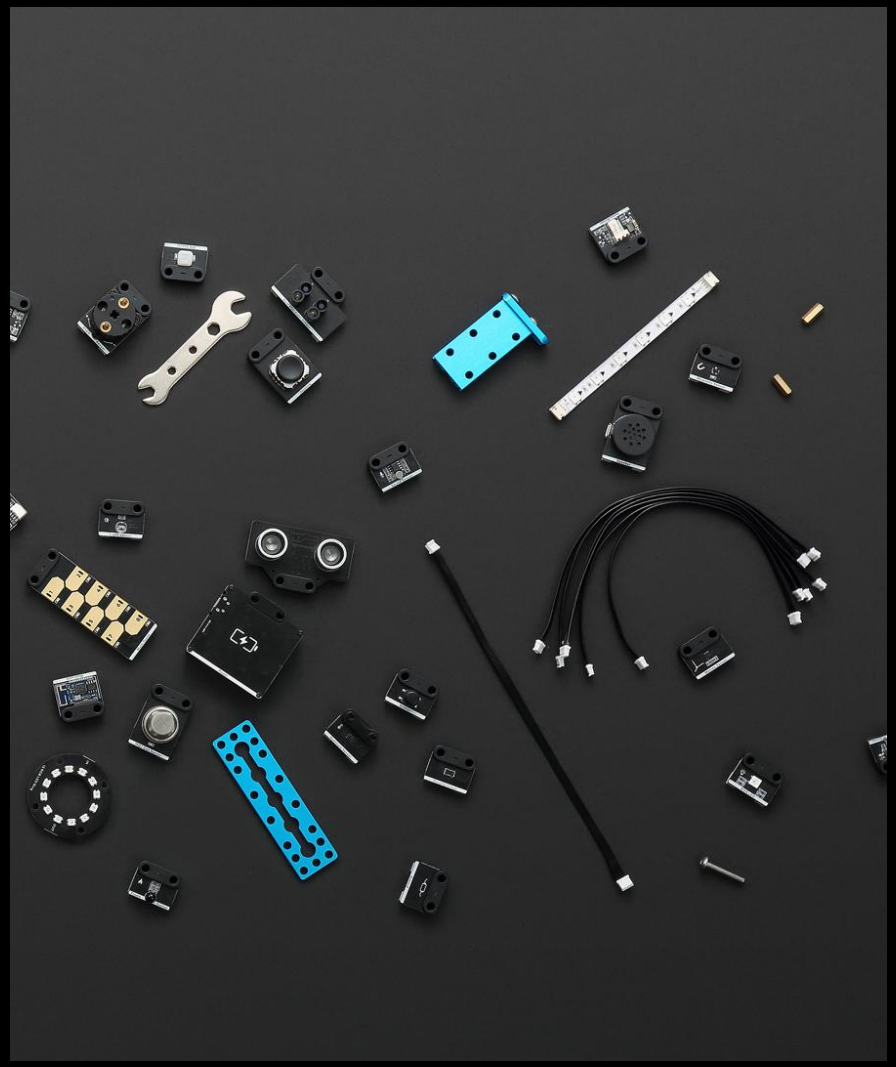
1. **Teaching science, computer science, maker concepts and skills, and more**
2. **Computer science classes, after-school clubs, robotics competitions**

Computer science classes

After-school clubs

Robotics competitions

Who/What is mBuild for?



1. Ingenious design
   For all educational scenarios

2. Built-in MCU
   Easy to teach with, ready to play with

3. 60+ electronic modules
   For but not only for AI & IoT education, and robotics competitions

4. From scratch, beyond Scratch

5. Python learning, basics to masters

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1. Ingenious design

For all educational scenarios

- Compact
- Insulation design
- Stackable
- M4 holes for mechanical parts
- Building bricks compatible
- Works with maker tools

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Ingenious design

For all educational scenarios

- Compact
- Insulation design
- Stackable
- M4 holes for mechanical parts
- Building bricks compatible
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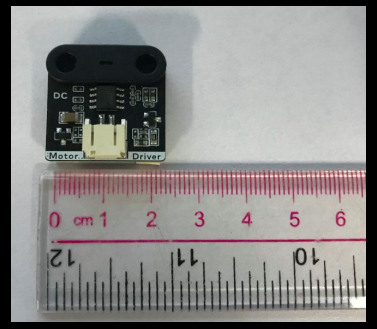
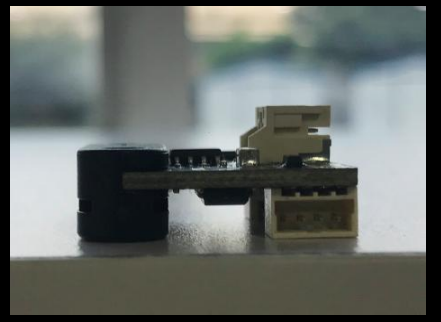
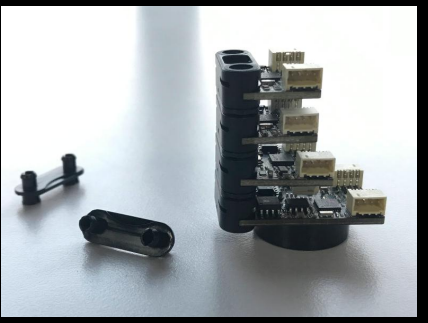


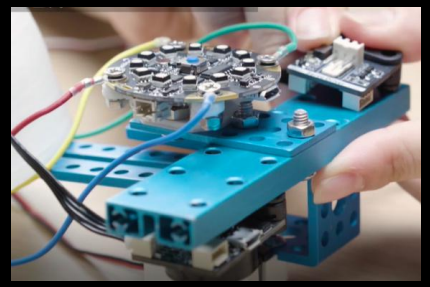
Compact



Insulation design

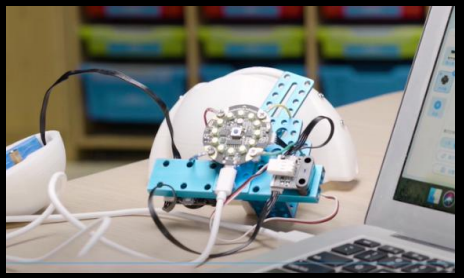


Stackable



M4 holes for mechanical parts

Building bricks compatible



Works with maker tools

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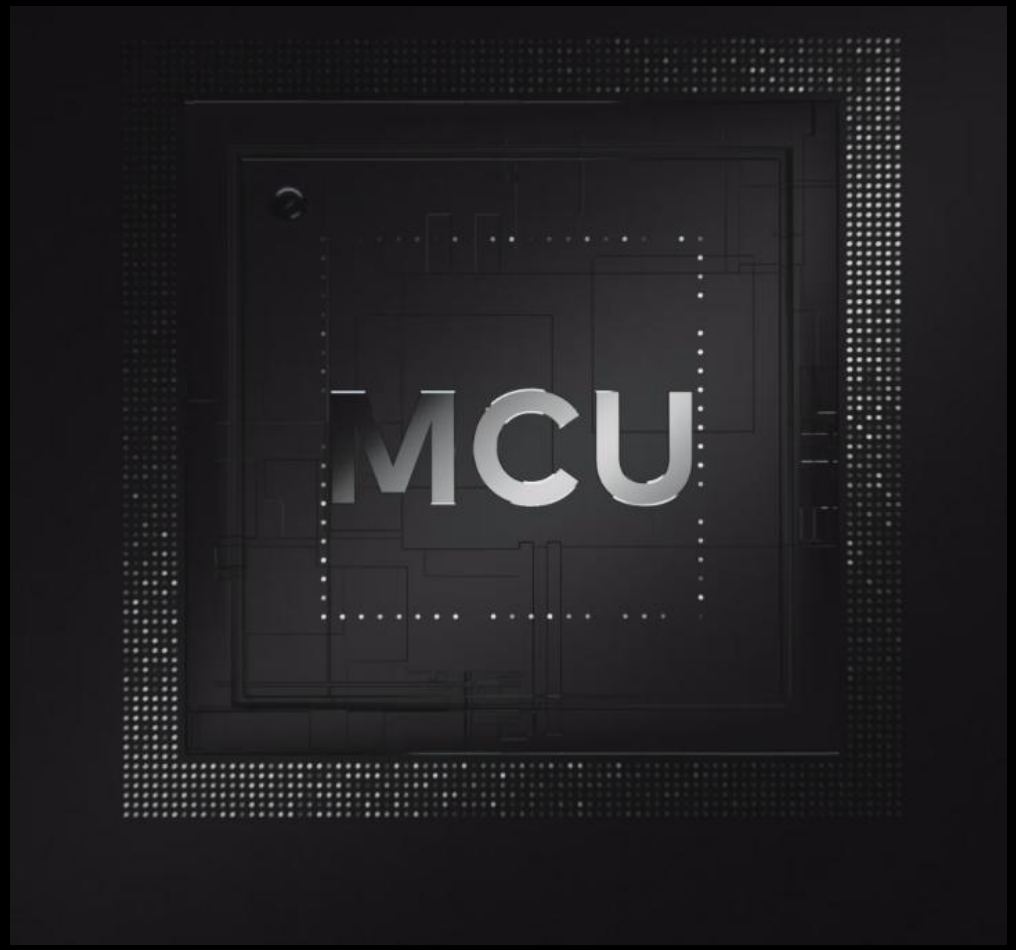

2. Built-in MCU

Easy to teach with, ready to play with

- Infinite combinations, infinite creativity
- Battery in connection, power in hand
- Offline mode, ready to use
- No need to distinguish between input and output interfaces

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Built-in MCU
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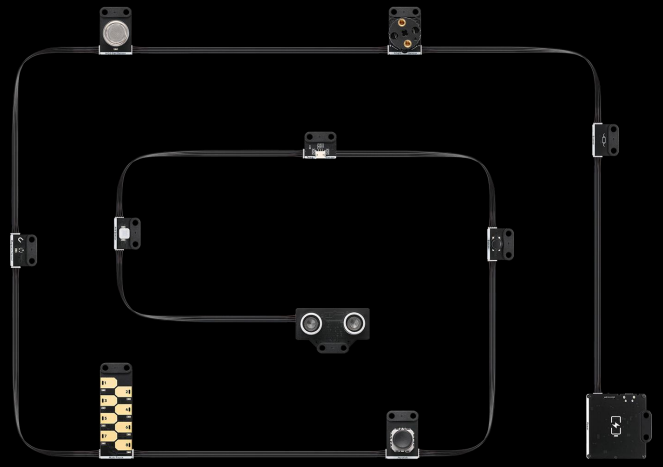

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Built-in MCU
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Built-in MCU

Easy to teach with, ready to play with

- Infinite combinations, infinite creativity
- Battery in connection, power in hand
- Offline mode, ready to use
- No need to distinguish between input and output interfaces

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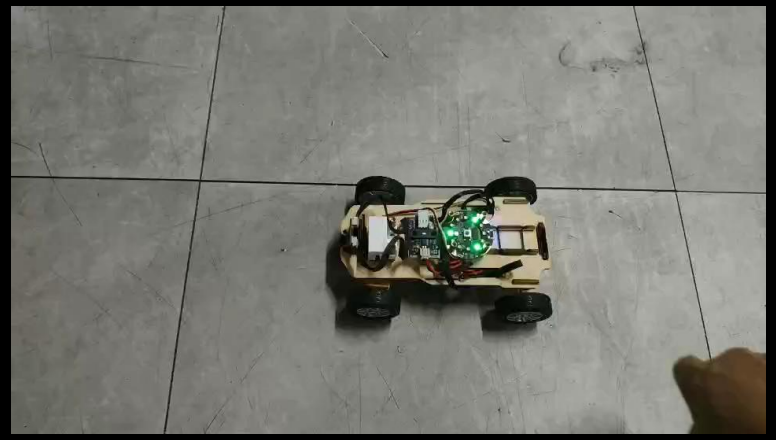
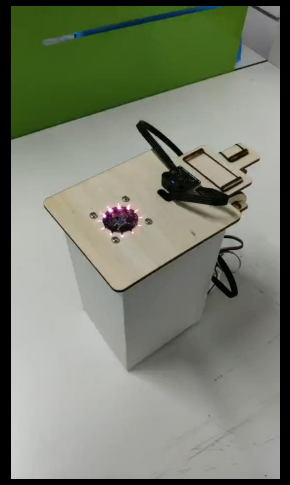
3. 60+ electronic modules
For but not only for AI & IoT education, and robotics competitions



Smart Links



Garbage Sorting

Fire Alarm

Intelligent Farm

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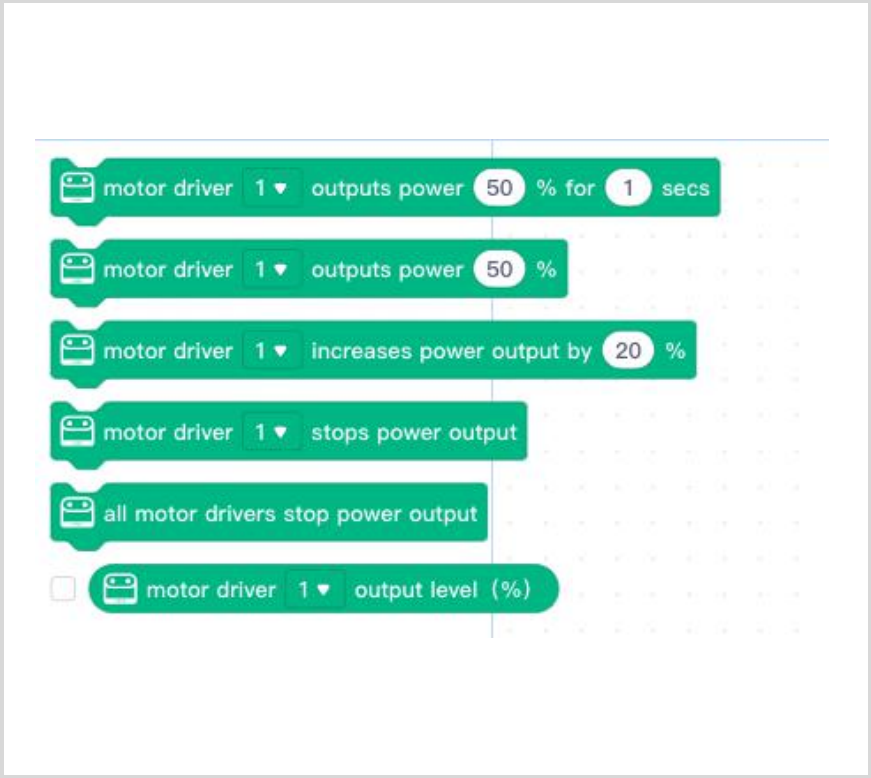
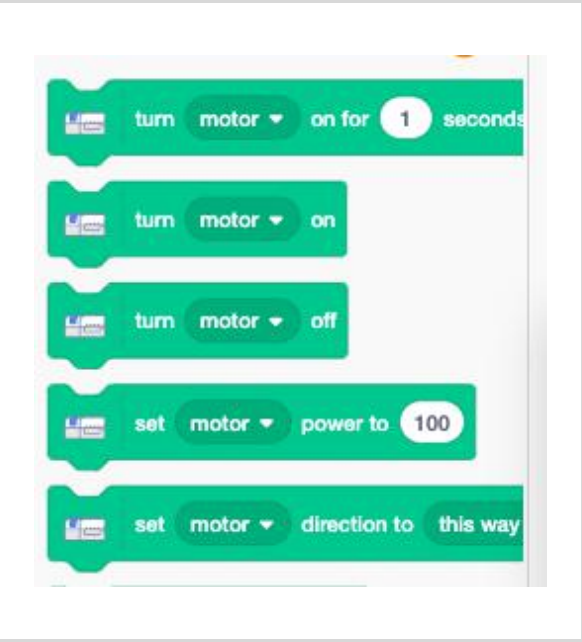
4. From Scratch, beyond Scratch

- More coding blocks, less entry thresholds

- More functional programming blocks
- -AI
- -IoT
- -Data science





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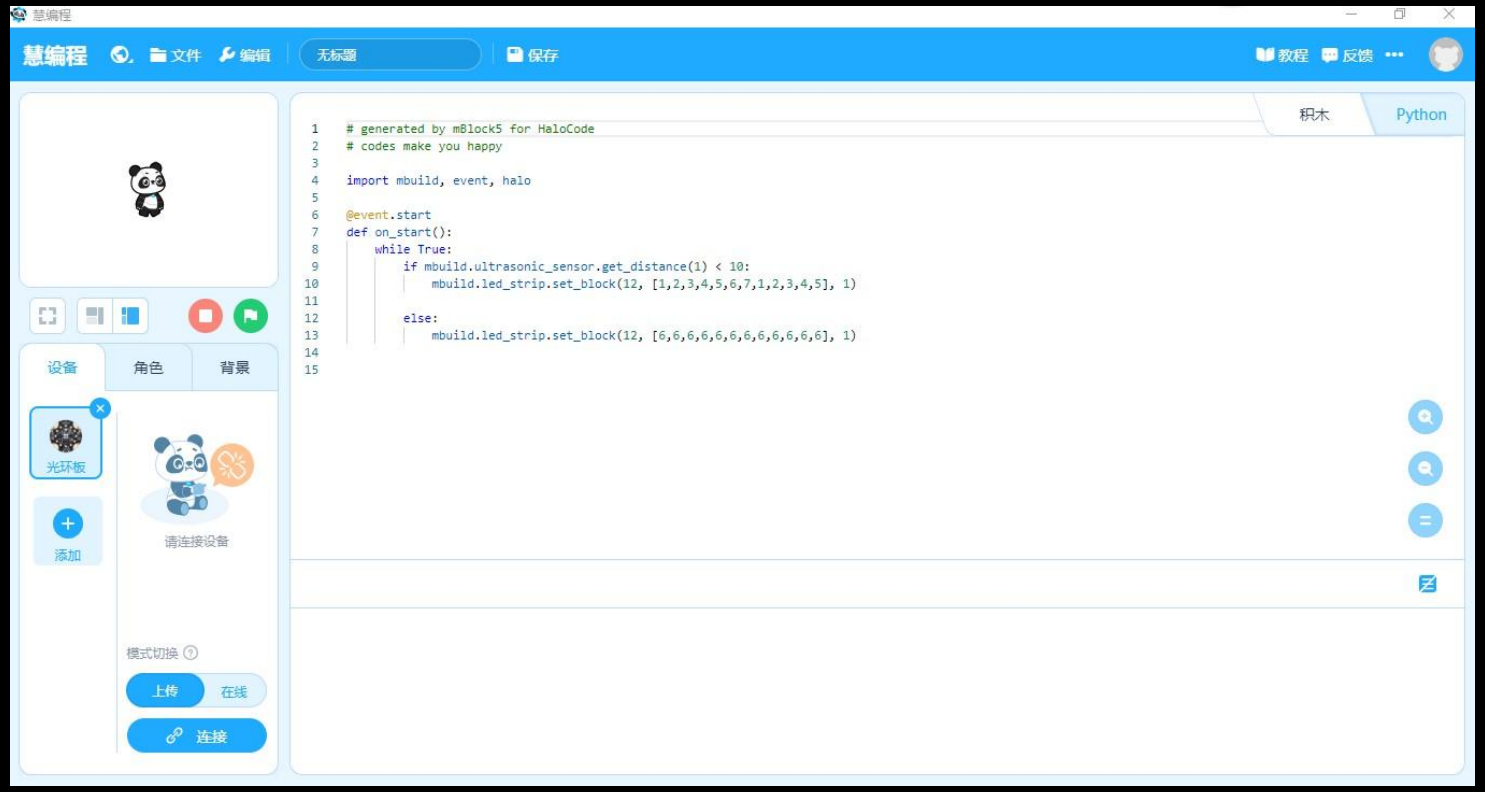
5. Python learning, basics to masters



- Simple and user-friendly interface
- Plentiful built-in general-purpose third-party libraries
- REPL interaction
- Data science

Powerful mBuild kits

Featured

AI & IoT Creator Add-on Pack

Smart Camera incl.: X
mBuild: 13 electronic modules & 9 packs of accessories
Mainboard: Halocode (not incl.)
Price: $199.99

Featured

AI & IoT Scientist Add-on Pack

Smart Camera incl.: X
mBuild: 18 electronic modules & 8 packs of accessories
Mainboard: Halocode (not incl.)
Price: $229.99

Featured

AI & IoT Education Toolkit Add-on Pack

Smart Camera incl.: √
mBuild：30 electronic modules & 8 packs of accessories
Mainboard: Halocode (not incl.)
Price: $419.99

Smart Camera Add-on Pack

Smart Camera incl.: √
Mainboard: NA
Structural parts: metal mechanical parts
Price: $89

AI & IoT Creator Add-on Pack & AI & IoT Scientist Add-on Pack

- SP 1: Offer over 10 different mBuild electronic modules, which can be applied in robot building and programming teaching
- SP 2: Provide different options (3 available solutions) for different scenarios
- SP 3: Programmable in block-based and Python languages, supporting AI education and application (Google Cloud) with mBlock
- SP 4: Include commonly-used electronic modules, accessories and tools used in example projects

Choose your kit–AI & IoT Creator Add-on Pack & AI & IoT Scientist Add-on Pack

	AI & IoT Creator Add-on Pack	AI & IoT Scientist Add-on Pack	AI & IoT Education Toolkit Add-on Pack
Price ($)	199.99	229.99	419.99
Positioning	Suitable for teaching robotics and programming Combined with Halocode to build projects like Line-following Auto Car, Smart Parking Lot	Suitable for teaching robotics, programming and natural science. Combined with Halocode to build projects like Intelligent Farm and Smart Greenhouse	Including Smart Camera module and a complete series of mBuild electronic modules. Suitable for teaching AI, robotics and programming
Ages	**Grade 3 or above**		
Options	• **Solution A: Large-group teaching** • **4 students share a kit, 10 kits for a class of 40 students** • **Solution B: Small-group teaching** • **2 students share a kit**		

AI & IoT Education Toolkit Add-on Pack

- SP1: Includes Smart Camera module (works both offline and online), realizing AI education and application
- SP2: Programmable in block-based and Python languages, supporting AI education and application (Google Cloud) with mBlock
- SP3: Meets the needs of beginners to masters

Smart Camera Add-on Pack

- SP 1: Easy-to-use, fast-learning (10s) AI vision sensor
- SP 2: Able to learn and track objects, read barcode, follow lines, and detect road intersection
- SP 3: Simultaneously recognizes over a hundred colored objects and multiple barcodes
- SP 4: Works with RJ25 electronic modules, mBuild series, mBot and Halocode
- SP 5: Programmable in block-based, Python and Arduino languages

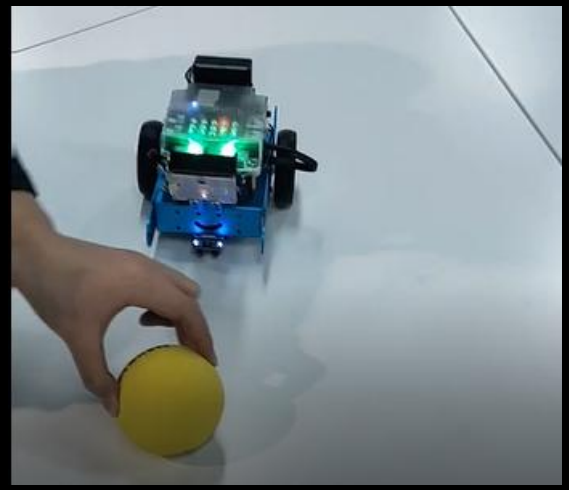
Suitable for:

- Grade 3 or above+
- MakeX Starter players
- Recommended solutions:
  - Solution A: Large-group teaching
  - 4 students share a kit, 10 kits for a classsize of 40 students
  - Solution B: Small-group teaching
  - 2 students share a kit

Smart Camera function

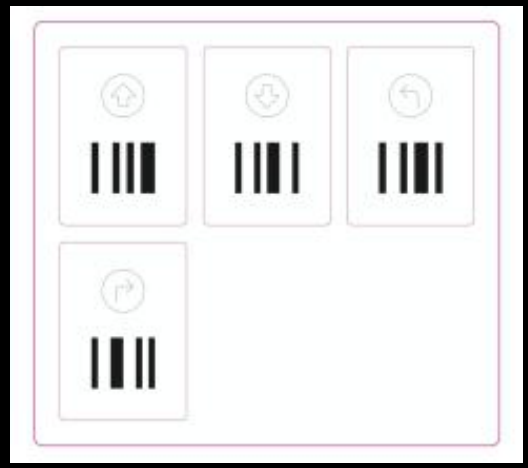
Object learning

Recognizes and learns single-colored objects or those in bright colors. A brighter color often means a higher accuracy. Balls and objects in bright colors are easy to recognize.



Object tracking

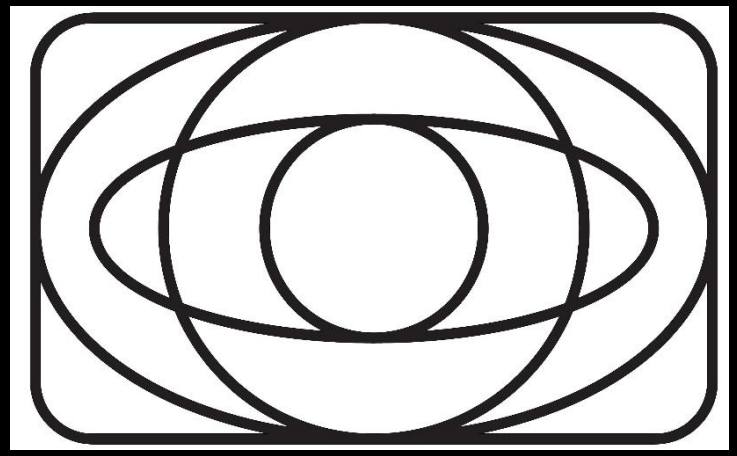
Able to track an object after learning it. Locate the object whenever and wherever it moves.



Barcode recognition

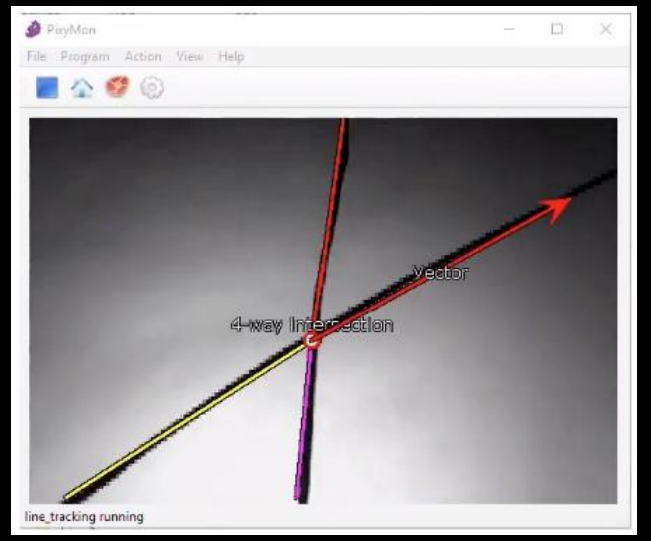
Once the Barcode Recognition mode is on, Smart Camera can read any barcode and return the pre-set coordinate information. Barcodes can also be used to track objects.

Smart Camera function



Line following

Able to track black or white lines. Detects in a high accuracy even on a complex line-following map



Intersection detection

Besides following lines, also able to identify intersections and numbers of side paths, and return necessary information (coordinates, direction, etc.). Automatically identifies pre-set direction, realizing auto-driving.

Comparison & modules list

Kit	AI & IoT Creator Add-on Pack	AI & IoT Scientist Add-on Pack	AI & IoT Education Toolkit Add-on Pack
Positioning	Suitable for teaching robotics and programming. Combined with Halocode to build projects like Line-following Auto Car, Smart Parking Lot	Suitable for teaching robotics, programming and natural science. Combined with Halocode to build projects like Intelligent Farm and Smart Greenhouse ;	Including Smart Camera module and a complete series of mBuild electronic modules. Suitable for teaching AI, robotics and programming
Price ($)	199.99	229.99	419.99

Kit	Smart Camera Add-on Pack
Positioning	Easy to use, fast-learning (10s), entry-level AI vision sensor; Works with mBot for MakeX Starter
Price($)	89

More details at: https://shimo.im/sheets/wKddHjVvPwXYk3wV/l9xwl/

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mBuild specifications

Product Name	mBuild
Positioning	Next-generation AI electronic module platform
Electronic Modules	Energy & Communication Modules: Power, Bluetooth, IR Transceiver
	Input Modules: Smart Camera, Light Sensor, Ranging Sensor, PIR Sensor, Ultrasonic Sensor, Sound Sensor, Temperature Sensor, Dual Color Sensor, Button, Soil Moisture Sensor, Joystick, Multi-touch, Motion Sensor, MQ2 Gas Sensor, Humiture Sensor, Flame Sensor, Magnetic Sensor, Angle Sensor, Slider, Smart Camera
	Output Modules Speaker, Motor Driver, Servo Driver, 8×16 Blue LED Matrix, LED Driver, RGB LED
Connection	4Pin connector
Transmission	Cable/Bluetooth/IR communication
Compatibility	Compatible with Makeblock products and other building bricks
Power	950mAh 3.7V
Battery Life	3 hours (There is a fluctuation of different combinations of modules.)
Charging Time	1.25 hours
Bluetooth Transmission Range	10 meters
Input/Output Voltage	5V
Input/Output Current	Input < 2A, Output: 1.5A
Dimensions	48×48mm，24×24mm，24×20mm，24×36mm，24×72mm

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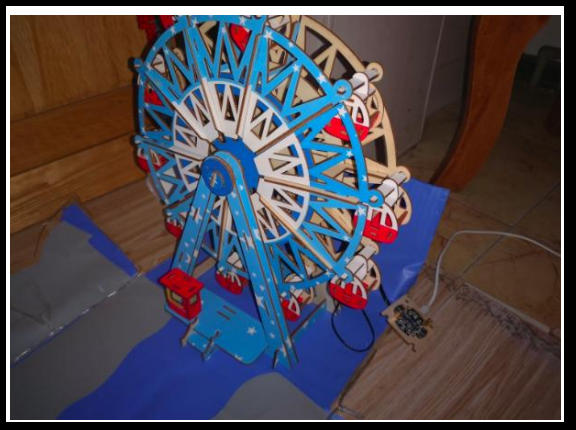
Sample projects



Smart Festive Lantern

Smart Festive Lantern

Click to play the video

Main Control Boards：

- Halocode

Modules of mBuild：

- Heat Sensor x 1
- Speaker x 1

Design concept:

- Use Halocode's speech recognition feature and the speaker to vocally interact with the lantern and use the heat sensor to turn on/off the light.

How it works:

- When the lantern is turned on, the light starts glimmering. When someone's coming close, the light gets brighter and it starts playing music. When music is done, the voice interaction mode is turned on. The lantern can recognize keywords. Based on its recognition result, the lantern automaticallys introduces the features of different cities.

Security Alarm

Security Alarm

Click to play the video

Main Control Boards :
- Halocode

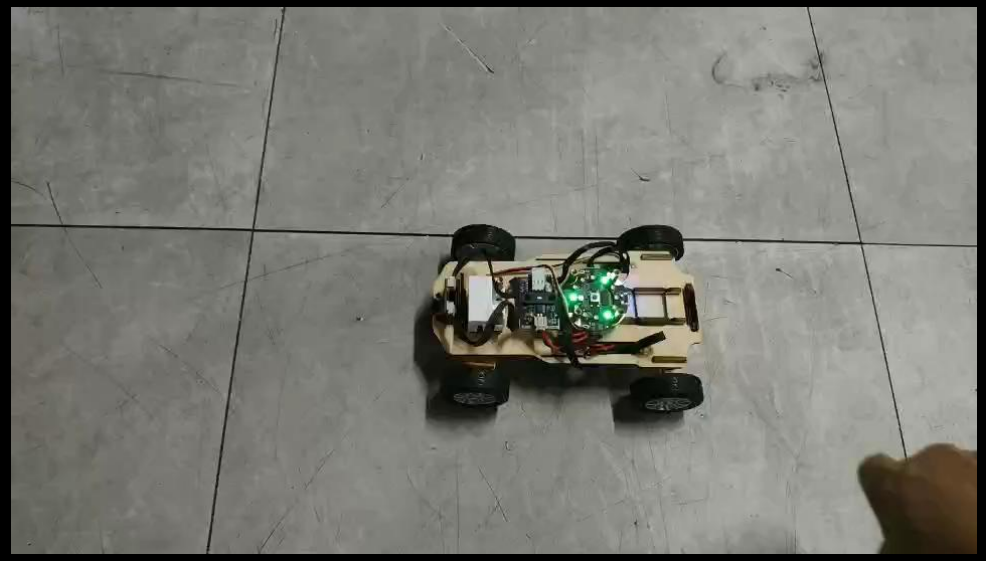
Modules of mBuild :
- Speaker x 1
- Ranging Sensor x 4
- Servo x 1

Other supplementary materials
- Halocode Strip x 4
- Display x 1

How it works:
- When the distance between an object and the ranging sensor is less than 30cm, Halocode starts flashing red, the servo rotates and the speakers gives an alarm.
- When the distance is 30cm-40cm, Halocode keeps flashing yellow, the servo rotates.
- When the distance is above 40cm, Halocode's lights turn solid green.
- When the button is pressed, all lights are turned off and all equipment stops workings.

Self-driving car

Self-driving car



Click to play the video

Description
- The video is in manual mode, which can simulate reverse storage.

Main Control Boards :
- Halocode

Modules of mBuild :
- Motor driver x 1
- TT Motor x 4
- Ranging sensor x 1
- Battery x 1

Other Tools & Materials
- Laserbox
- Linden wood

Big mouth

Big mouth

Click to play the video

Description
- Paper mold with wood panel construction. The steering motor and connecting lever control the dimension of mouth opening. Since the ears and hands conduct current, you can create a series of actions with sound and light.

Main Control Boards：
- Halocode

Modules of mBuild：
- Motor driver x 1
- TT motor x 1
- Speaker x 1
- Battery x 1

Other Tools & Materials
- Laserbox
- Linden wood
- Ordinary paper
- Color painting pen

Interactive companion robot

Interactive companion robot

Click to play the video

Description

- Motor-controlled rotatable chassis. A single steering motor together with a connecting lever controls both hands. The electronic screen can display various information emojis. After writing the corresponding program can produce rich interactive play.

Main Control Boards :

- Halocode

Modules of mBuild :

- Motor driver x 1
- TT motor x 1
- LED matrix x 1
- Battery x 1

Other Tools & Materials

- Laserbox
- Linden wood

Naughty little animal

Naughty little animal

Click to play the video

Description
- Naughty little animal. The steering motor control small animal tail or mouth. You can make it by yourself for different animal images.

Main Control Boards：
- Halocode

Modules of mBuild：
- Servo driver x 1
- Servo x 1
- Speaker x 1
- Battery x 1

Other Tools & Materials
- Laserbox
- Linden wood
- Carton

Smart trash can

Smart trash can

Click to play the video

Description
- As long as the PIR sensor detect the object, the cover of trash box open automatically. In order to educate children to solve the ordinary problem within the latest technology.

Main Control Boards :
- Halocode

Modules of mBuild :
- Servo x 1
- Servo driver x 1
- PIR sensor x 1
- Battery x 1

Other Tools & Materials
- Laserbox
- Linden wood
- Carton
- Connecting lever

Moiré Pattern Ring

Moiré Pattern Ring

Click to play the video

Description
- The mirror image creates a dynamic effect when rotated; it will present more changes with lighting.
- With the speaker module, it can work as a rotating music box.

Main Control Boards :
- Halocode

Modules of mBuild :
- TT motor x 1
- Motor Driver x 1
- Battery x 1

Other Tools & Materials
- Laserbox
- Basswood
- Transparent acrylic

Rangefinder

Rangefinder

Main Control Boards ：
- Halocode

Modules of mBuild：
- Ranging sensor x 1
- Battery x 1
- TT motor x 1
- Motor driver x 1

Other Tools & Materials
- Laserbox
- Basswood

Click to play the video

Music Box

Music Box/Countdown Alarm Clock

Click to play the video

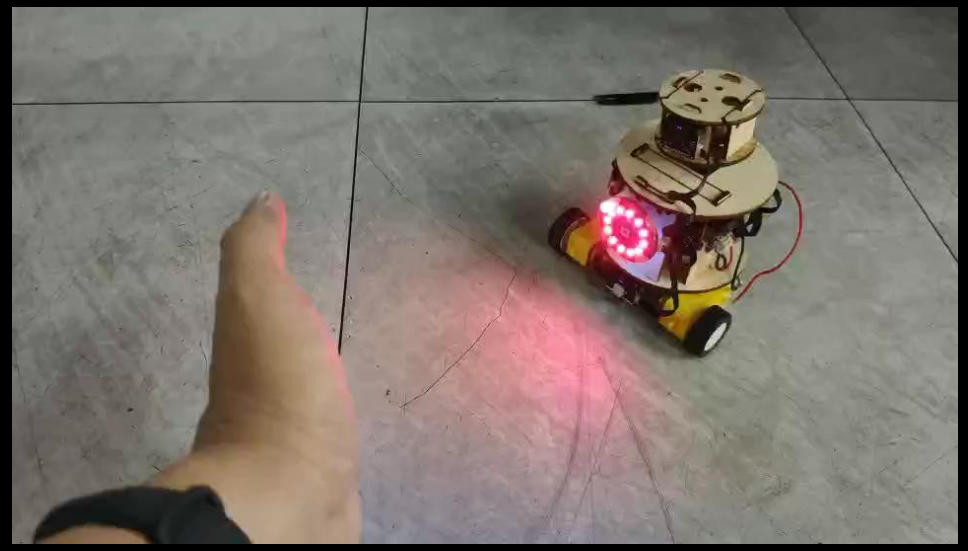
Main Control Boards ：
- Halocode

Modules of mBuild：
- Speaker x 1
- Battery x 1

Other Tools & Materials
- Laserbox
- Basswood
- Screws

Security Robots

Security Robots



Click to play the video

Description

- With dual motor driver, the robot can automatically walk in the room, servo driving the head to rotate left and right, and the head equipped with PIR and ranging sensors to avoid obstacles.

Main Control Boards ：

- Halocode

Modules of mBuild：

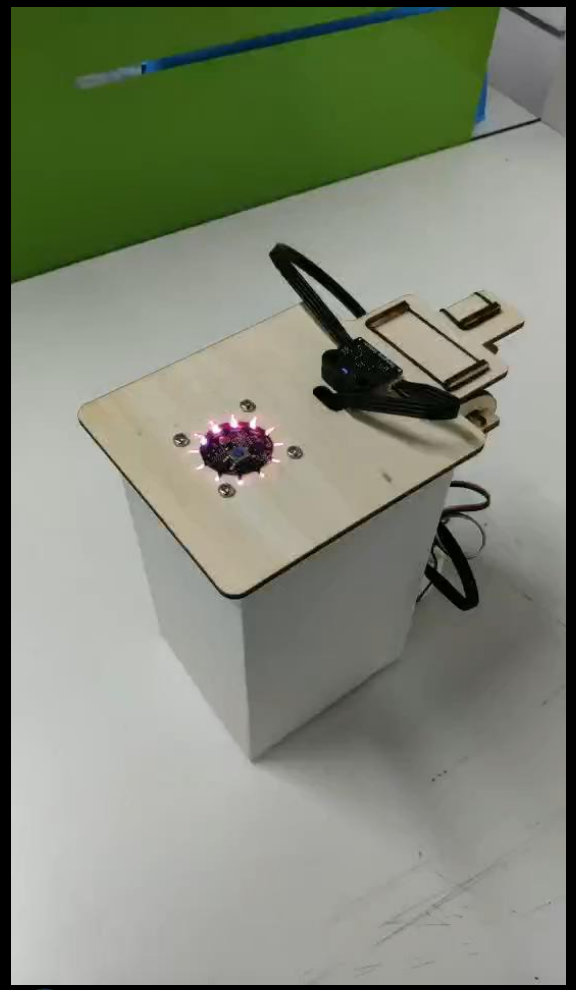
- Ranging Sensor x 1
- IR sensor x 1
- Motor Driver x 2
- Motor x 2
- Servo x 1
- Servo driver x 1
- Battery x 1

Other Tools & Materials

- Laserbox
- Basswood
- Screws
- Small tires

Gesture Control Trash Box

Gesture Control Trash Box



Click to play the video

Description

- Within a fixed range, say 2-20cm, the ranging module controls the size of the lid switch according to the detected distance of the item. The closer the distance is, the larger the opening can be. This enables the control of the trash lid, or even makes it to "dance".

Main Control Boards ：

- Halocode

Modules of mBuild：

- Ranging sensor x 1
- Battery x 1

Other Tools & Materials

- Laserbox
- Basswood
- Screws
- Small tires

Finger-guessing Robot

Finger-guessing robot

Description
- Touch the four Touch sensor of Halocode, which can control the servo to rotate to a certain angle while the LED matrix will show four photos randomly.

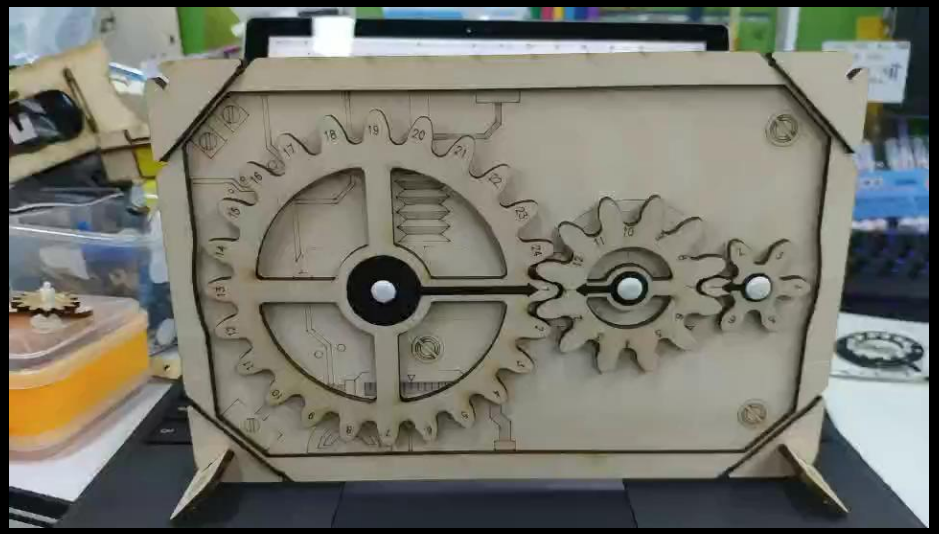
Main Control Board：
- Halocode

Modules of mBuild：
- Battery x 1
- Servo x 1
- Speaker x 1
- LED matrix x 1

Other Tools & Materials
- Laser Box
- Basswood
- Screw
- Tiny tire

Speed-change Gear

Speed-change Gear



Click to play the video

Description
- Rotate one gear, observe what happens on the other two gear.

Main Control Board
- Halocode

Modules of mBuild
- Motor x 1
- Motor driver x 1
- Battery x 1

Other Tools & Materials
- Laserbox
- Basswood
- Screw

Shoot Game

Shoot Game

Click to play the video

Main Control Board
- Halocode

Modules of mBuild
- Ranging Motor x 1
- LED matrix x 1
- Battery x 1

Other Tools & Materials
- Laserbox
- Basswood
- Screw
- Tiny tire

Touching-elephant Park

Touching-elephant Park

Click to play the video

Main Control Board
- Halocode

Modules of mBuild
- Servo x 1
- Servo driver x 1
- Battery x 1

Other Tools & Materials
- Laserbox
- Basswood
- Screw

Mars Explorer

Mars Explorer

Click to play the video

Main Control Board
- Halocode

Modules of mBuild
- Motor x 2
- Motor driver x 1
- Servo x 1
- Servo motor x 1
- Battery x 1

Other Tools & Materials
- Laser box
- Basswood
- Screw