STARTER GUIDE

magicbit

www.magicbit.cc

Welcome to the world of Magicbit

Magicbit is a feature-rich, easy-to-use, and cost-effective platform made for everyone. Magicbit provides a unique advantage for users to learn and practice a wide range of application areas such as robotics, programming, the Internet of Things(IoT), and electronics.

Magicbit is an innovation ecosystem with hardware, software, mobile app, content, community, and partners. Innovative solutions can be developed more easily with programming and cloud platforms using Magicbit.

Let's start the innovation journey!
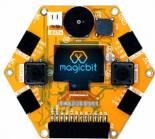
Index

Magicbit Innovation Ecosystem

The complete solution

Magicbit is a complete solution with hardware, software, mobile apps, and content to empower innovators.

- **Hardware** - Magicbit hardware products are designed as feature-rich, easy-to-use and cost-effective devices
- **Software** - Magicbit supports a wide range of commonly supported open-source software frameworks such as Scratch, Arduino, Python, etc.
- **Learning Portal** - Magicbit Academy learning portal provides premium access to structured learning content. Free lessons, projects, and guides are published on the Magicbit website.
- **Mobile App** - Magicblocks.io mobile app is available to connect mobile devices with applications.
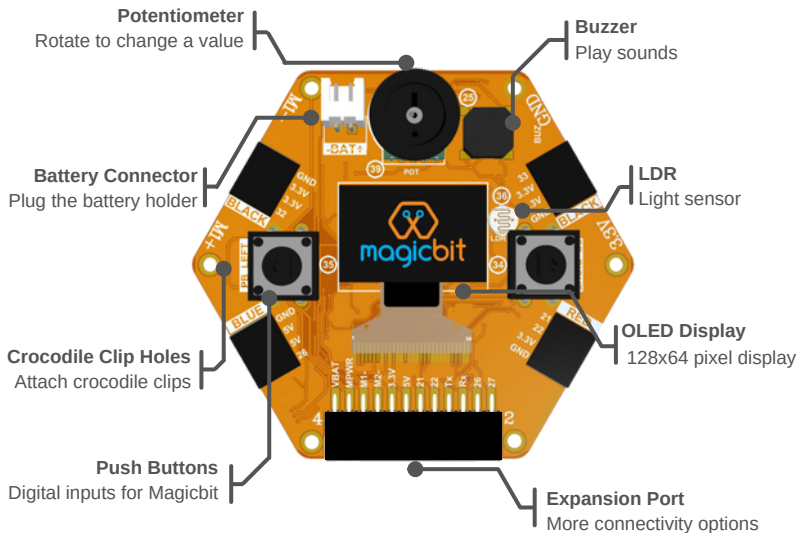
Hardware	Software	Learning Portal	Mobile Apps

Magicbit Front

Potentiometer
Rotate to change a value

Buzzer
Play sounds

Battery Connector
Plug the battery holder

LDR
Light sensor

Crocodile Clip Holes
Attach crocodile clips

OLED Display
128x64 pixel display

Push Buttons
Digital inputs for Magicbit

Expansion Port
More connectivity options

Magicbit **Rear**

Micro USB
Connect to computer &
Power Magicbit

Charging Indicator

**Reset
Button**

Power Indicator

ESP32 Module
Brain of the Magicbit

Motor Driver
Control 2x Motors
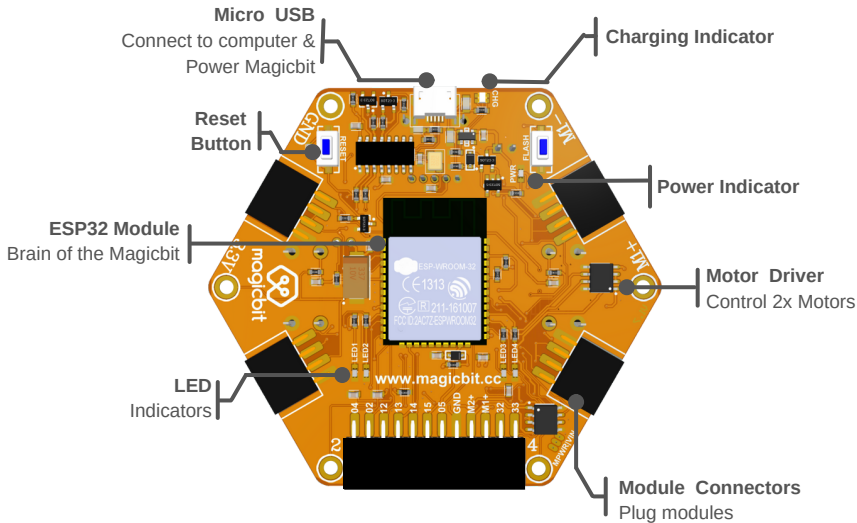
LED
Indicators

Module Connectors
Plug modules

magicbit

www.magicbit.cc

Magicbit OS

Magicbit OS is an application pre-installed in the device to experience awesome demos and select the different programming modes more easily.

When the Magicbit device is powered, the OS allows the user to select the options shown below.

MagicCode - This is the Scratch software version supported by Magicbit

Magicblocks.io - Cloud IoT platform for Magicbit to easily develop applications

Examples - Preloaded examples to display the result

Robotics - Preloaded robotics applications

Modules - Test different sensor modules in operation

Games - Experience and play the classic games on the Magicbit display

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Important: Restore the Device

Users can reinstall the Magicbit OS on the device. Magicbit OS usually loads when the device is powered up. The OS might not work after programming Magicbit with Arduino or Python.

If the Magicbit OS is not loaded when the device is powered, in order to reinstall the OS, the Magicbit Uploader tool can be used from the link below.
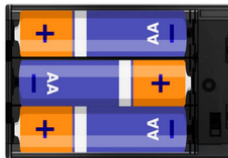
https://magicbit.cc/uploader/

Important

- Magicbit Learning Kits are recommended for students aged 8 years and above.
- The device can be powered by the USB cable provided or batteries can be used based on your battery holder type as below.
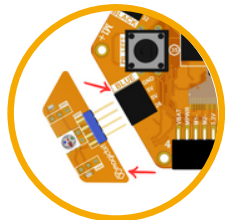
1x 18650 Li-ion flat top battery

3x AA Alkaline batteries

Battery Connector

- Sensor modules can be plugged into the module connector in the Magicbit matching the connector color and logo printed on the module as shown in the figure.
- The maximum operating voltage of the Magicbit is 3.3V
- More info is available on www.magicbit.cc/faq

Connecting sensor module

Getting **Started**

01

Power up Magicbit using either a USB cable or battery. USB cable can be connected to a computer or a mobile phone charger.

02

Once the Magicbit OS is loaded, use the potentiometer knob on the Magicbit device to select from the menu and the right-push button to load the menu item. Use the left button to navigate to the previous menu.
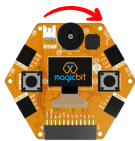
Users can navigate through the menu in Magicbit OS and try different modes in the device. Let's take a look at a few examples in the following pages. More details on different modes in the menu can be found in the link below.
https://magicbit.cc/magicbitos

Example 01 - Name Badge

Display name on Magicbit

```
Provide any text input and display it on the Magicbit screen.
```
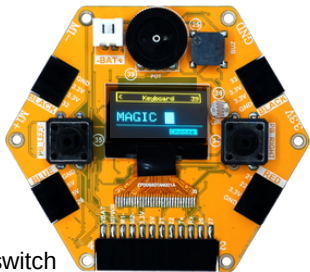
STEP 1 :
Power up your Magicbit using USB cable or battery.

STEP 2 :
Open **Keyboard** example on Magicbit OS.

Navigate: **Examples** > **Keyboard**

STEP 3 :
Type any text. Use the potentiometer knob to switch between the letters and the right push button to move the cursor. Press the left push button to move back to the list of examples.

You will be able to display any text, graphic on Magicbit display once you start programming.

Example 02 - Music Player

Play music tones

Different music melodies that are saved on Magicbit OS can be played.

STEP 1 :
Power up your Magicbit using USB cable or battery.

STEP 2 :
Open **Music** example on Magicbit OS.
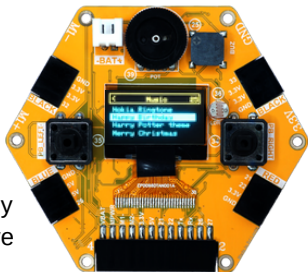
Navigate: **Examples**   **Music**

STEP 3 :
Use the right push button to select the melody from the list. Press the left push button to move back to the list of examples.

> You will be able to generate any music tone with buzzer once you start programming.

Example 03 - Gaming Console

Retro game with Magicbit

Play retro games such as Snake & Dino games on Magicbit
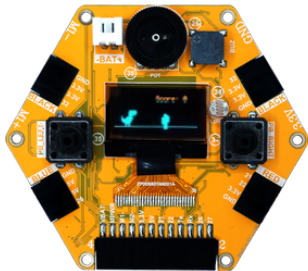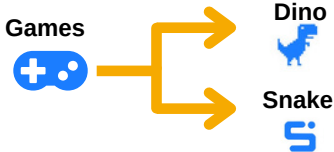
STEP 1 :
Power up your Magicbit using USB cable or battery.

STEP 2 :
Open **Game mode** on Magicbit OS.

Navigate: **Games**   **Dino**

                                          Snake

STEP 3 :
Play the game using the push buttons

> **Important**
> To exit from any mode, restart the Magicbit OS using the Reset button in the back side of the Magicbit. Or else unplug and replug the Magicbit from the power source.

Example 04 - Night Light

10

Automatic Dark Activated Light

Detect the light level and activate a LED

STEP 1 :
Power up your Magicbit using USB cable or battery.

STEP 2 :
Open **Auto Light** example on Magicbit OS.
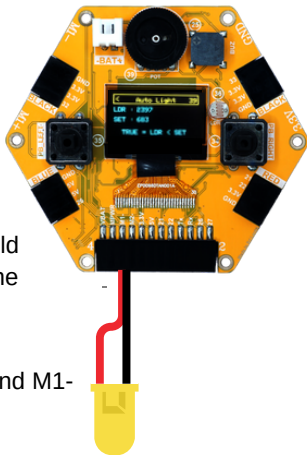
Navigate: **Examples** > **Auto Light**

STEP 3 :
Rotate the potentiometer to change the threshold value and cover the LDR with a hand. Check out the LEDs on the back of Magicbit.

STEP 4 :
Connect a LED externally to the Magicbit via M1+ and M1- or M2+ and M2- pins (Check the Magicbit pinout)

Example 05 - Fan Regulator

Control speed of a fan

```
Control speed and direction of the DC motor
```

STEP 1 :
Power up your Magicbit using USB cable or battery.

STEP 2 :
Open **Motor** example on Magicbit OS.

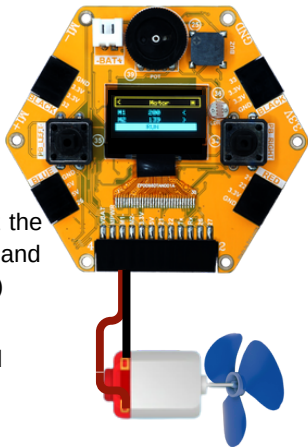Navigate: **Examples** > **Motor**

STEP 3 :
Attach the fan blade to the DC motor and connect the cables of the DC motor to the M1+ and M1- or M2+ and M2- pins in the magicbit (Check the Magicbit pinout)

STEP 4 :
Rotate the potentiometer and check the speed and direction of the motor.

Learning **Content**

Magicbit learning content guides the user to learn the fundamentals of innovation and develop cool applications. For each of these applications, Magicbit has to be programmed.

The Magicbit learning portal includes step-by-step guidelines on using Magicbit with different programming options to create applications.

Steps to access the Magicbit learning portal :
- Navigate to https://academy.magicbit.cc from any web browser
- Enter your details with a valid email address
- Register with the unique **referral code*** provided inside the package
- Enrol and browse the lessons in each course

If the user is familiar with Scratch, Arduino, MicroPython, or similar platforms, quick configuration guides are also available at https://magicbit.cc/learn/.

> **Important**
> **Referral code** is a unique code provided for each user to access the learning portal. This is provided for individual use only. Inquiries on the bulk user account for institutions can be made via info@magicbit.cc

Programming Magicbit

Magicblocks.io is an IoT platform used to create IoT projects for both beginners and experts
https://magicbit.cc/magicblocks

Arduino is a C/C++-based language with a large community all around the world with free and open-source resources
https://magicbit.cc/arduino

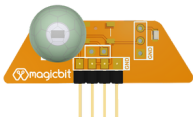MicroPython is a programming language compatible with Python 3. It's a smart way to start learning Python programming
https://magicbit.cc/micropython

MagicCode is specially designed for kids to learn to program with visual code blocks. It's based on Scratch 3
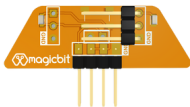https://magicbit.cc/magiccode

Magicbit **Modules**

Motion (PIR) Sensor

Detect the motion of
a human or an animal

Digital Signal   Range :5m

Proximity Sensor

Identify close objects
without contact

Digital/Analog Signal   Range :5cm

RGB LED

Create a combination of
Red, Blue & Green lights

Neo Pixel

Black Ext. Module

Connector to plug the
soil Moisture and ultrasonic
sensors to Magicbit

Blue Ext. Module

Connector to plug the
servo motor to Magicbit

Tilt Sensor
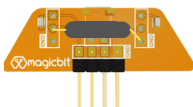
Detect the incline or
motion of an object

Digital Signal

Magicbit **Modules**

IR Receiver
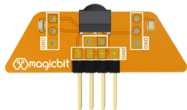
Detect signals from
an IR remote

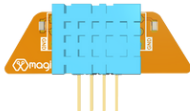## IR Emitter
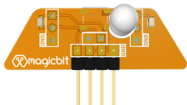
Transmit IR signal
patterns

Temp.& Humi.Sensor

Measure temperature and
humidity in environment

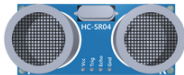Temp- 0-50°C Humidity 20%-80%

Servo Motor

A motor to control the
angle of rotation

Range 0-180 degrees

Ultrasonic Sensor

Measure the distance
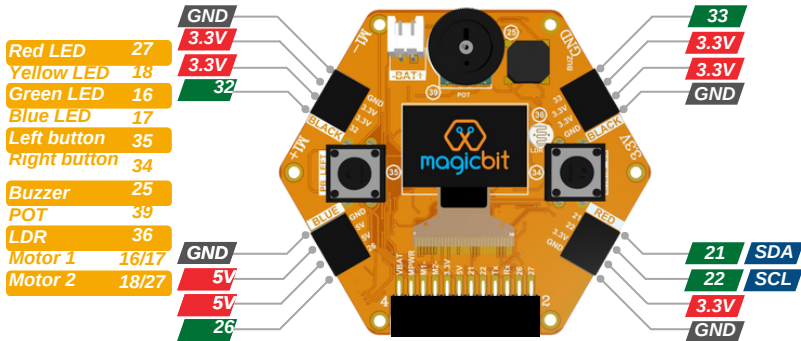to a target object

Range : 2cm to 4m

Soil Moisture Sensor

Determine the moisture
level in soil

Analog Signal Range : 0-3V

Magicbit Pinout

Red LED	27
Yellow LED	18
Green LED	16
Blue LED	17
Left button	35
Right button	34
Buzzer	25
POT	39
LDR	36
Motor 1	16/17
Motor 2	18/27

GND
3.3V
3.3V
32

GND
5V
5V
26

33
3.3V
3.3V
GND

21 SDA
22 SCL
3.3V
GND

- All pins support PWM except pin 5
- 1,3,5,16,17,18,21,22 pins doesn't support analog in function
- When WiFi is enabled, Analog in working only for pin 32 to 39
- Max input voltage for any pin is 3.3V / battery connector is 4.2V
- 2,4,5,12,15 are strapping pins. learn more at *magicbit.cc/pinout*

VBAT	MPWR	M1-	M2-	3.3V	5V	21	22	01	03	26	27
						SDA	SCL	TX	RX		

33	32	M1+	M2+	GND	05	15	14	13	12	02	04
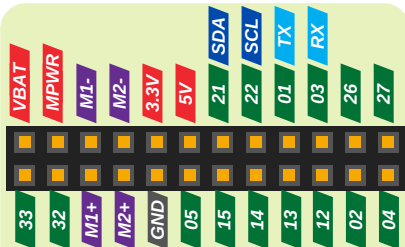
Magicbot

What is Magicbot?

Magicbot is a versatile robotics platform for developing and deploying robotics applications. A few robotics applications which can be practiced with Magicbot are:

- Line following robot
- Obstacle avoiding robot
- Remote-controlled robot (Wifi/Bluetooth)

Connecting Magicbit with Magicbot

Connect the Magicbit to the Magicbot platform using the pin headers set on the top side of the Magicbot with the expansion port of Magicbit. Make sure to keep the OLED display of the Magicbit on top.

Magicbot

Layout

Ultrasonic Sensor
Measure the Distance

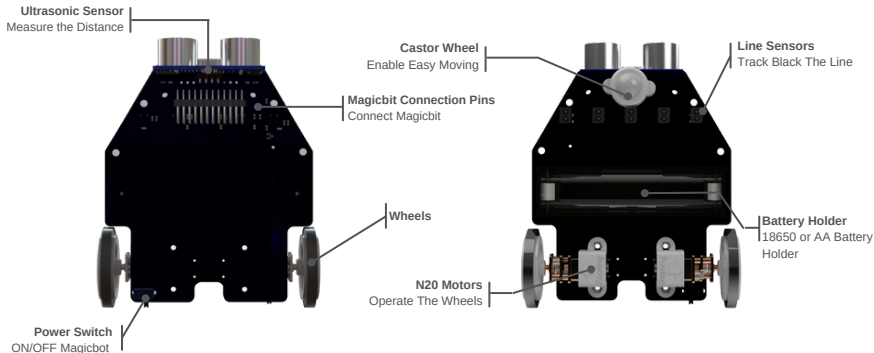**Castor Wheel**
Enable Easy Moving

Line Sensors
Track Black The Line

Magicbit Connection Pins
Connect Magicbit

Wheels

Battery Holder
18650 or AA Battery Holder

N20 Motors
Operate The Wheels
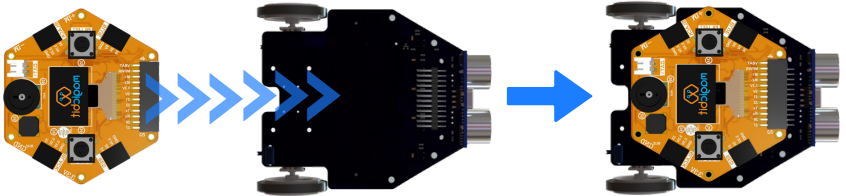
Power Switch
ON/OFF Magicbot

Pinout

- Line tracking sensors (From Left to Right) : Pins 32, 14, 26, 04,13
- Ultrasonic sensor: Pin 05
- Motor 01 M1 : M1+ and M1- (Pins 16 & 17)
- Motor 02 M2 : M2+ and M2- (Pins 18 & 27)

Magicbot

Battery for Magicbot

Magicbot does not include batteries so the user has to purchase batteries separately. It has two battery options which can be selected at the time of the purchase as a Li-Ion 18650 battery or three AA batteries.

One "Li-Ion 18650 flat top battery" is adequate for the Magicbot. Since the Magicbit contains a charging circuit, the battery will be recharged if the Magicbot is powered via a USB cable and the power switch is "ON".

For the AA-type battery option "Three AA Alkaline batteries" would be the best-recommended method.

Powering up the Magicbot

1. Plug the Magicbit to the Magicbot
2. Connect the Magicbit to the Laptop or PC using the USB cable.
3. Program the Magicbit with Scratch, Arduino, or Python
4. Upload the code to the Magicbit
5. Connect the battery (1x 18650 or 3x AA) and turn on the power switch
6. Unplug the Magicbit from the USB cable and enjoy the application.

Refer to the examples under magicbit.cc/learn or learning portal **Robotics** lessons

Our Products

Magicbit Learner

Magicbit Learner is a special kit designed with Magicbit core device together with lesson content and additional components. Users can do more than 50 activities with this kit referring to the lessons portal.

Magicbit Explorer

Magicbit Explorer is a kit that includes Magicbit Core and Magicbot, together with lesson content and additional components. Users can do more than 100+ activities with this kit referring to lessons. This kit has a robotics platform to practice robotics easily.

Magicbit Master

Magicbit Master is a kit includes Magicbit Core, Magicbot and 10 sensor modules, together with lessons content and additional components. Users can do more than 150+ activities with this kit referring to lessons. This kit has everything an innovator needs to build a range of applications.

Magicbit is an innovation platform and a STEM tool made for Coding, Internet of Things (IoT), Robotics, and Electronics. It's a great tool to explore creativity with technology.

Magicbit was created to make innovation with technology easy for everyone. Whether you are a kid trying to blink a LED or you are an expert working on your next complex project, Magicbit is the perfect tool to solve any problem with innovation.

Whatsapp Support Channel

+94764641100

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AUTHENTICATED™
EDUCATIONAL PRODUCT

Funded with
KICKSTARTER

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