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## Program mBot Mega with Raspberry Pi in Python

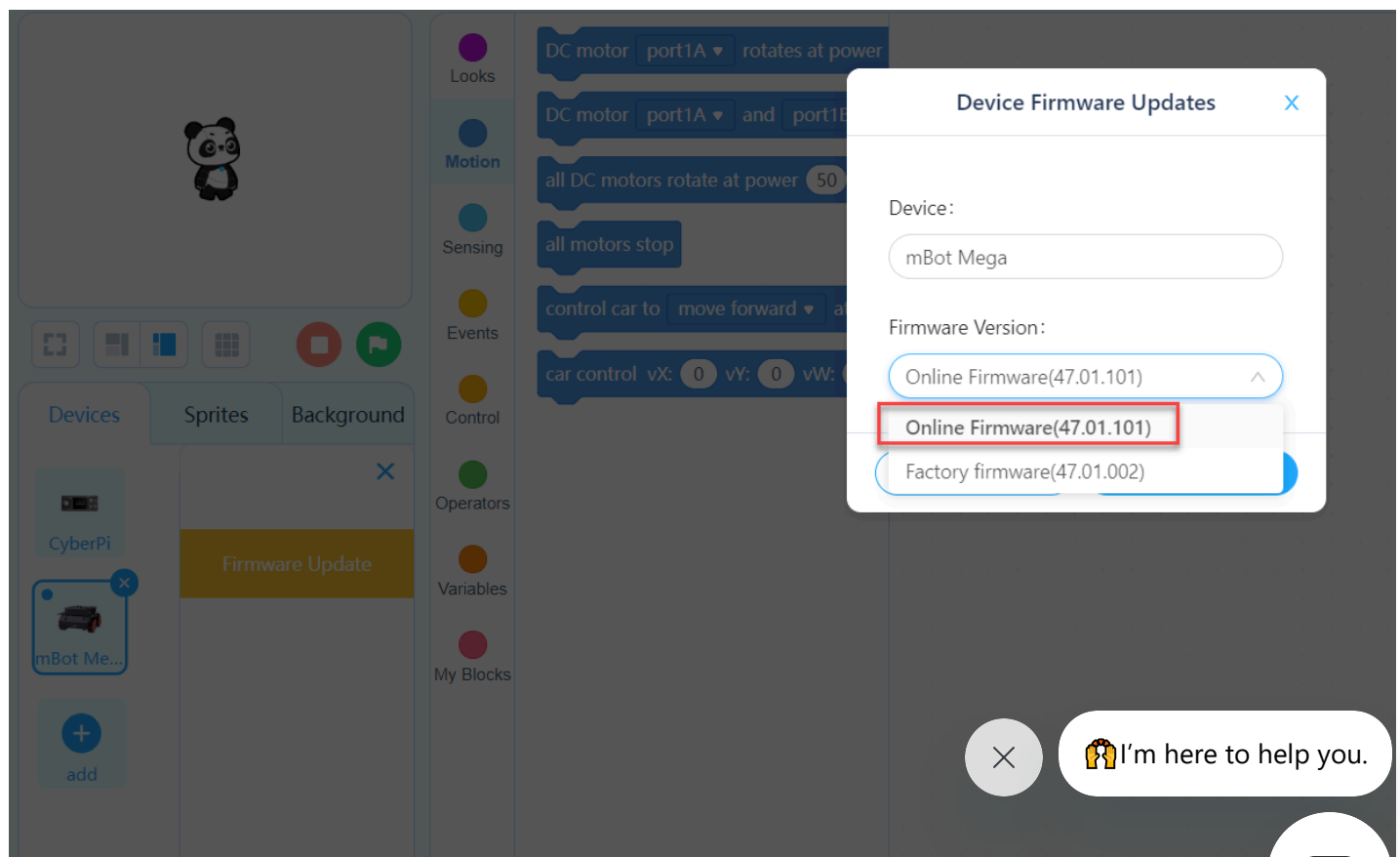
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June 02, 2021 01:23

To use Raspberry Pi to communicate with mBot Mega, drive its motors, and obtain the output data of its sensors, you need to update the firmware of mBot Mega on mBlock 5 to the online firmware first and then connect it to Raspberry Pi.



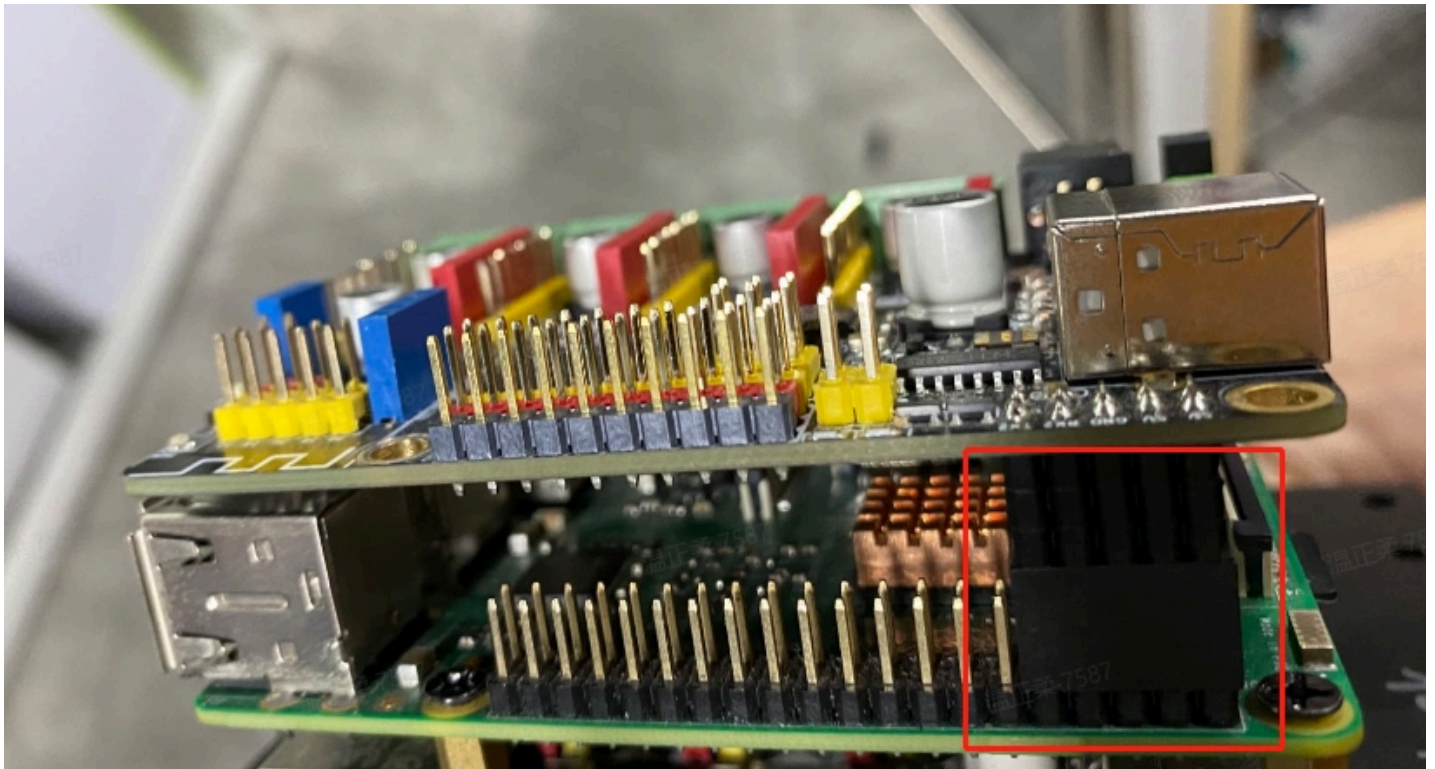
For details about how to update the firmware, see [Updating the Firmware of mBot Mega](#).

# Prepare the Raspberry Pi:

Here are some steps to successfully connect mBot Mega to Raspberry Pi:

## The first connection method: GPIO method

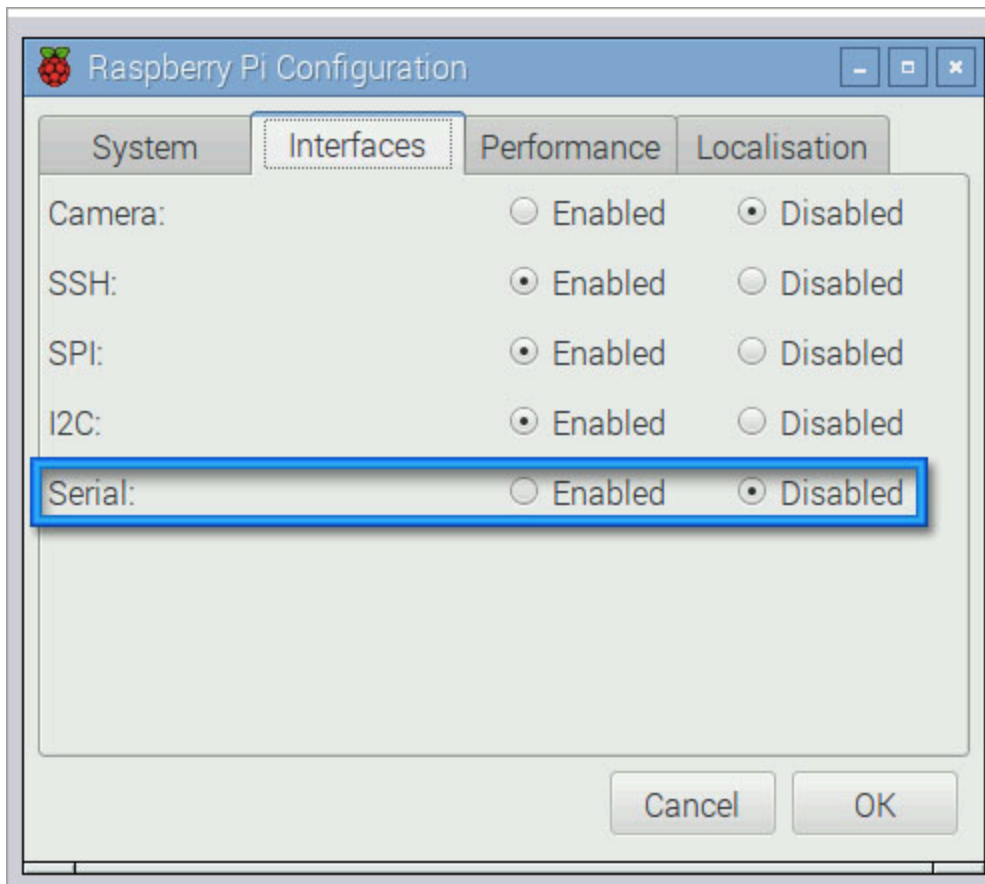
Connect Raspberry Pi and MegaPi with a cable or 2.54mm female header connector (see the pictures for your reference)





**Tip: When you** connect Raspberry Pi and MegaPi with a 2.54mm female header connector, you only need one battery pack to power both of them.

First in your Raspberry Pi, disable the login prompt from **Desktop > Menu > Preferences > Raspberry Pi Configuration**.



- If you are using raspberry 3 B+, since the Bluetooth function takes up the ttyAMA0 port, you have two ways to solve this problem.
  - a. Disable the pi3 bluetooth and restore UART0/ttyAMA0 over GPIOs 14&15
  - b. Switch pi3 bluetooth function to use the mini-UART(ttyS0) and restore UART0/ttyAMA0 over GPIOs 14&15.
- Here, I disable the pi3 bluetooth as an example
  - a. Search for pi3-disable-bt in file /boot/overlays/README, it will show you how to disable the bluetooth; if you want switch the bluetooth to mini-UART(ttyS0), you can search for pi3-miniuart-bt.

```
Name: pi3-disable-bt
Info: Disable Pi3 Bluetooth and restore UART0/ttyAMA0 over GPIOs 14 & 15
      N.B. To disable the systemd service that initialises the modem so it
      doesn't use the UART, use 'sudo systemctl disable hciuart'.
Load: dtoverlay=pi3-disable-bt
Params: <None>

Name: pi3-disable-wifi
Info: Disable Pi3 onboard WiFi
Load: dtoverlay=pi3-disable-wifi
Params: <None>

Name: pi3-miniuart-bt
Info: Switch Pi3 Bluetooth function to use the mini-UART (ttyS0) and restore
      UART0/ttyAMA0 over GPIOs 14 & 15. Note that this may reduce the maximum
      usable baudrate.
      N.B. It is also necessary to edit /lib/systemd/system/hciuart.service
```

b. Modify the file /boot/config.txt. At the end of the file, add the following content.

```
#Enable uart
```

```
enable_uart=1
```

```
dtoverlay=pi3-disable-bt
```

```

config.txt
文件(F) 编辑(E) 搜索(S) 选项(O) 帮助(H)
# uncomment to increase signal to HDMI, if you have interference, blanking, or
# no display
#config_hdmi_boost=4

# uncomment for composite PAL
#sdtv_mode=2

#uncomment to overclock the arm. 700 MHz is the default.
#arm_freq=800

# Uncomment some or all of these to enable the optional hardware interfaces
#dtparam=i2c_arm=on
#dtparam=i2s=on
#dtparam=spi=on

# Uncomment this to enable the lirc-rpi module
#dtoverlay=lirc-rpi

# Additional overlays and parameters are documented /boot/overlays/README

# Enable audio (loads snd_bcm2835)
dtparam=audio=on

#Enable uart
enable_uart=1
dtoverlay=pi3-disable-bt

```

c. Reboot Raspberry Pi

d. Open the Terminal and input the following command:

```
sudo systemctl disable hciuart
```

e. Now you can use ttyAMA0 as UART over GPIOs 14&15

- install python library for Makeblock

```
# pip3 install makeblock
```

- enter the initial code for Python

```

from time import sleep
from makeblock import MegaPi, SerialPort
megapi = MegaPi.connect(SerialPort.connect("/dev/ttyAMA0"))

```

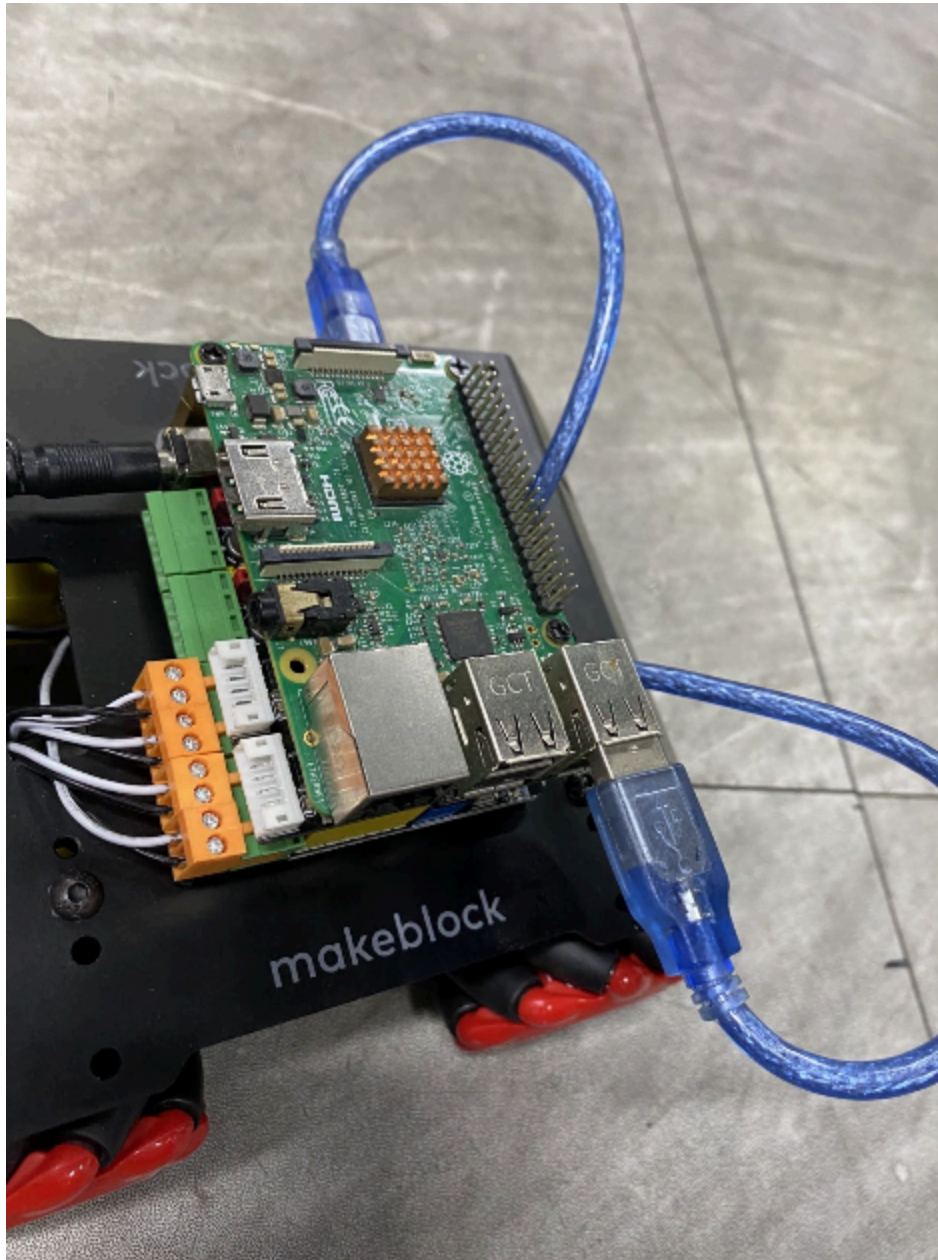
- compile your code in Python

## The second connection method: USB cable connection method



a. Connect mBot Mega to the computer and update it to the online firmware (47.01.101) on mBlock.

**Tips:** When you connect Raspberry Pi and MegaPi with a cable, you need to use two different battery packs to power each of them, respectively.





Please connect mBot Mega to the computer first and update to the online firmware on mBlock.

- install python library for Makeblock

```
# pip3 install makeblock
```

- enter the initial code for Python

```
from time import sleep
from makeblock import MegaPi, SerialPort
megapi = MegaPi.connect()
# or megapi = MegaPi.connect(SerialPort.connect("/dev/ttyUSB0"))
```



- Tip: When using USB connection, there are two ways to connect to the USB serial port.  
Method 1: Do not specify the serial port—: `MegaPi.connect()`, `MegaPi.connect()` connects to the USB serial port by default.  
Method 2: Specify the serial port: `MegaPi.connect(SerialPort.connect("/dev/ttyUSB0"))`, not necessarily `ttyUSB0`, subject to actual conditions.
- compile your code in Python

Some related content for reference:

Open source schematic of Megapi:

<http://t.hk.uy/kPk>

<http://t.hk.uy/kPn>

To control the sensors and motors on mBot Mega with Raspberry Pi, you need to install the corresponding library first.

- To control the obstacle avoidance and line following sensors and the impact switches, use the library: <https://gist.github.com/xeecos/ceeb8fd83cc15b4e83b713bb75a982fd>
- To control the RGB LED module, use the library: <https://gist.github.com/xeecos/0a326e03f44633fed726867b0e71a3fe>
- To control the motors, use the library: <https://gist.github.com/xeecos/5fa6cb5876a8c9449562d8026942fff1/revisions>

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KT

August 05, 2021 17:23



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Thanks for the post, have couple questions:

1. How different it is to connect Raspberry Pi 4B to Mega?
2. I bought the makeblock robotic arm addon pack and wonder if it can also be controlled by Pi through Mega? Any library I can use?

Thanks a lot.

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