

Data Communication and Network

IoT

Internet of Things

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Internet of Things (IoT)



Remote Raspberry Pi

192.168.1.32

Terminal Sessions View X server Tools Games Settings Macros Help

Session Servers Tools Games Sessions View Split MultiExec Tunneling Packages Settings Help X server Exit

Quick connect...

2. 192.168.1.32

MobaXterm 8.5
(SSH client, X-server and networking tools)

- > SSH session to pi@192.168.1.32
 - SSH compression : ✓
 - SSH-browser : ✓
 - X11-forwarding : ✓ (remote display is forwarded through SSH)
 - DISPLAY : ✓ (automatically set on remote server)
- > For more info, ctrl+click on [help](#) or visit our [website](#)

```
Linux raspberrypi 4.1.13-v7+ #826 SMP PREEMPT Fri Nov 13 20:19:03 GMT 2015 armv7
[

The programs included with the Debian GNU/Linux system are free software;
the exact distribution terms for each program are described in the
individual files in /usr/share/doc/*/copyright.

Debian GNU/Linux comes with ABSOLUTELY NO WARRANTY, to the extent
permitted by applicable law.
Last login: Sun Jan 24 18:18:06 2016
pi@raspberrypi ~ $
```

UNREGISTERED VERSION - Please support MobaXterm by subscribing to the professional edition here: <http://mobaxterm.mobatek.net>

```
pi@raspberrypi ~ $ ifconfig
eth0      Link encap:Ethernet  HWaddr b8:27:eb:90:d2:52
          UP BROADCAST MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:0 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:0 (0.0 B)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:65536  Metric:1
          RX packets:8 errors:0 dropped:0 overruns:0 frame:0
          TX packets:8 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:0
          RX bytes:1104 (1.0 KiB)  TX bytes:1104 (1.0 KiB)

wlan0     Link encap:Ethernet  HWaddr 00:f1:40:41:0c:fb
          inet addr:192.168.1.32  Bcast:192.168.1.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:691 errors:0 dropped:9 overruns:0 frame:0
          TX packets:304 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:137688 (134.4 KiB)  TX bytes:52654 (51.4 KiB)

pi@raspberrypi ~ $
pi@raspberrypi ~ $
```

install ice weasel

```
pi@raspberrypi ~ $
pi@raspberrypi ~ $ sudo apt-get install iceweasel
Reading package lists... Done
Building dependency tree
Reading state information... Done
Suggested packages:
  fonts-stix otf-stix fonts-oflb-asana-math fonts-mathjax mozplugger
  libgnomeui-0
The following NEW packages will be installed:
  iceweasel
0 upgraded, 1 newly installed, 0 to remove and 7 not upgraded.
Need to get 35.5 MB of archives.
After this operation, 75.6 MB of additional disk space will be used.
Get:1 http://mirrordirector.raspbian.org/raspbian/ wheezy/main iceweasel armhf 3
8.5.0esr-1~deb7u2+rpil [35.5 MB]
Fetched 35.5 MB in 1min 47s (330 kB/s)
Selecting previously unselected package iceweasel.
(Reading database ... 139581 files and directories currently installed.)
Unpacking iceweasel (from ../iceweasel_38.5.0esr-1~deb7u2+rpil_armhf.deb) ...
Adding 'diversion of /usr/bin/firefox to /usr/bin/firefox.real by iceweasel'
Processing triggers for mime-support ...
Processing triggers for desktop-file-utils ...
Processing triggers for hicolor-icon-theme ...
Processing triggers for man-db ...
Processing triggers for menu ...
Setting up iceweasel (38.5.0esr-1~deb7u2+rpil) ...
Processing triggers for menu ...
pi@raspberrypi ~ $
```

ติดตั้งไลบรารี **beebotte** บน **Python**

- **sudo pip-3.2 install beebotte requests**

```
pi@raspberrypi ~ $ sudo pip-3.2 install beebotte requests
Downloading/unpacking beebotte
  Downloading beebotte-0.4.0.tar.gz
  Running setup.py egg_info for package beebotte

Downloading/unpacking requests
  Downloading requests-2.9.1.tar.gz (484Kb): 484Kb downloaded
  Running setup.py egg_info for package requests

Installing collected packages: beebotte, requests
  Running setup.py install for beebotte

  Running setup.py install for requests

Successfully installed beebotte requests
Cleaning up...
pi@raspberrypi ~ $ █
```


Beebotte

Teeratus

https://beebotte.com

Beebotte

Connect anything and everything in real time.



Cloud Platform for Real Time Connected Objects

The image shows a screenshot of a web browser displaying the Beebotte website. The browser's address bar shows the URL https://beebotte.com. The website's header features the Beebotte logo and a hamburger menu icon. The main content area has a dark blue background with the text 'Connect anything and everything in real time.' To the right of this text is a central white cloud icon with a blue outline. Three blue arrows point from the cloud to three circular icons: a speech bubble, a speedometer, and a game controller. Below the main content area, there are three small white dots and the text 'Cloud Platform for Real Time Connected Objects'.



Platform for Real Time Connected C

Focus on what

Beebotte takes care of infrastructure & connectivity

[See Plans & Pricing](#)

[Get Started for Free](#)

orm as a Service



SIGN UP

Get your free account, no credit card required!







[SIGN UP](#)



SIGN UP


Get your free account, no credit card required!

| | |
|---|--|
|  | <input type="text" value="teeratus"/> |
|  | <input type="text" value="t0861246000@hotmail.com"/> |
|  | <input type="password" value="....."/> |
|  | <input type="password" value="..... "/> |

SIGN UP

ups

หน้า LOG IN ของ Beebotte เพื่อลงชื่อเข้าใช้งาน



LOG IN

[Forgot password?](#)







Remember me

LOG IN

Don't have an account? [Sign up](#)

ตัวอย่างการออกแบบคลาวด์เซิร์ฟเวอร์ สำหรับแสดงค่าความชื้นสัมพัทธ์และอุณหภูมิ







- (1) สร้างช่องเก็บข้อมูลที่มีชื่อว่า **RaspberryPi**
- (2) สร้างส่วนประกอบที่มีชื่อว่า **Temp** ชนิดข้อมูลเป็น **temperature** เพื่อเก็บค่าอุณหภูมิ
- (3) สร้างส่วนประกอบที่มีชื่อว่า **humi** ชนิดข้อมูลเป็น **humidity** เพื่อเก็บข้อมูลค่าความชื้นสัมพัทธ์

-  Home
-  My Dashboards
-  Console
-  Account Settings
-  Account Usage
-  Support

My Channels

Create and manage your Channels. Check the [tutorials](#) and the [documentation](#) to get started

Your don't have any configured **channel**. Create one now: [Create Channel](#)

-  Home
-  My Dashboards
-  Console
-  Account Settings
-  Account Usage
-  Support

Create a new channel

RaspberryPi

channel RaspberryPi 01

Public

Configured Resources

| | | | | |
|------|-------------------------|-------------|---|---|
| Temp | <u>temperature data</u> | temperature | <input checked="" type="checkbox"/> SoS | X |
| humi | humidity data | humidity | | |

SoS X

[+ Resource](#)


[Create channel](#)

My Channels

Create New

Create and manage your Channels. Check the [tutorials](#) and the [documentation](#) to get started

RaspberryPi channel RaspberryPi 01 by Teeratus

 **teeratus**  **Public** *Created: January 29th 2016*

My Channels

Create and manage your Channels. Check the tutorials and the documentation to get started

Create New

Home

My Dashboards

Console


Account Settings

Account Usage

Support

RaspberryPi channel RaspberryPi 01 by Teeratus
teeratus Public Created: January 29th 2016

RaspberryPi
channel RaspberryPi 01 by Teeratus

 teeratus Public Created: January 29th 2016

Channel Token: 1454048519461_fwEx8YouEEFENdBQ

Configured resources

| | |
|------------------------------|-------------------|
| Temp temperature data | No Persisted Data |
| humi humidity data | No Persisted Data |

ทดสอบและตรวจสอบข้อมูลที่ส่งมายัง Beebotte

The screenshot shows the Beebotte account page at <https://beebotte.com/account>. The page has a dark header with the Beebotte logo and a navigation menu with options: Plan, Credentials, Profile, and Change Password. The 'Credentials' option is highlighted with a red box. On the left sidebar, 'Account Settings' is also highlighted with a red box. The main content area is titled 'Access Keys' and contains a yellow warning box about the Secret Key. Below this, there are two text boxes: 'API Key' with the value '323037cb74dc8d301949f9b14358d92b' and 'Secret Key' with the value '1037a7f4305a9317dc0497906990fa6db44e365ff4e7707f8ac9ca63d579f294'. The 'Secret Key' value is highlighted with a red box, and a red arrow points from a red box labeled 'Copy' to it.

323037cb74dc8d301949f9b14358d92b

1037a7f4305a9317dc0497906990fa6db44e365ff4e7707f8ac9ca63d579f294

Beebotte - teeratus x Google Translate x

https://beebotte.com/dev/console

Paste

Beebotte

Secret Key `1037a7f4305a9317dc0497906990fa6db44e365ff4e7707f8ac9ca63d579f294`

Home

My Dashboards

> Console

Account Settings

Account Usage

Support

Subscribe

Subscribe: Subscribes to a channel resource. Every time a data is written or published to that resource, you will be notified.

Channel

Resource

Subscribe

Publish

Publish Data: Publishes (transient) data record to a channel resource (that can be virtual). Published data will be delivered to subscribers.

Channel

Resource

Data

Publish data

Read API

Write API

Subscribe

Data

Publish data

Log

true

Read API

Read Data: Reads data records from a channel resource.

Channel

Resource

Limit

Read data

Write API

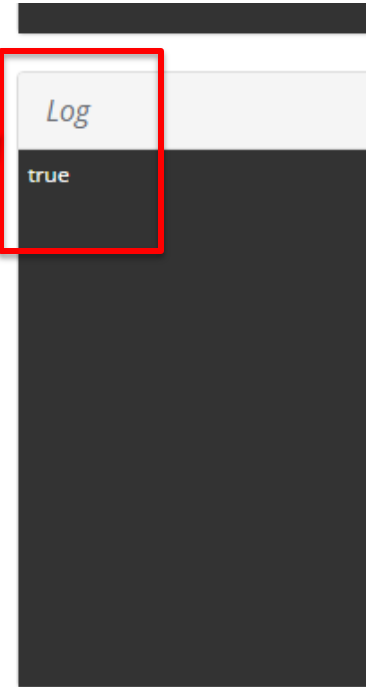
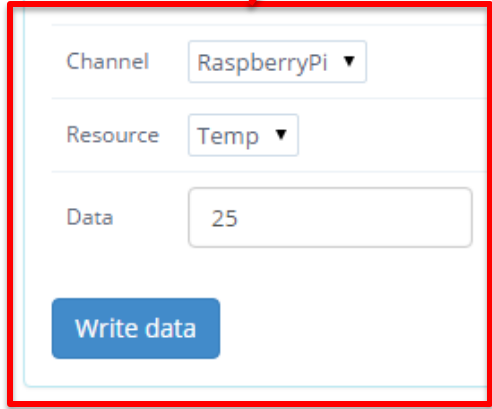
Write Data: Write data record to a specified channel resource. Written data will be persisted in a database.

Channel

Resource

Data

Write data



Read API

Read Data: Reads data records from a channel resource.

Channel

Resource

Limit

Read data

Messages

```
[  
  { "data": 25, "wts": 1454049875559, "ts": 1454049875559 }  
  { "data": 25, "wts": 1454049875559, "ts": 1454049875559 }  
  { "data": 25, "wts": 1454049875559, "ts": 1454049875559 }  
  { "data": 25, "wts": 1454049875559, "ts": 1454049875559 }  
  { "data": 25, "wts": 1454049875559, "ts": 1454049875559 }  
]
```

การตรวจสอบสถานะการส่งข้อมูลไปยังช่องเก็บข้อมูล หรือ Channel ที่ชื่อ **RaspberryPi**

The screenshot shows a web browser with two tabs: 'Beebotte - teeratus' and 'Google Translate'. The address bar displays the URL 'https://beebotte.com/teeratus/RaspberryPi'. The page header features the Beebotte logo and name. A left sidebar contains navigation links: Home, My Dashboards, Console, Account Settings, and Account. The main content area is titled 'RaspberryPi' and identifies it as 'channel RaspberryPi 01 by Teeratus'. It includes a settings icon, the user 'teeratus', 'Public' status, and a creation date of 'January 29th 2016'. A 'Channel Token' is displayed as '1454048519461_fwEx8YouEEFENdJBQ'. Below this, a 'Configured resources' section shows two data points: 'Temp' (temperature data) with a value of '25.00°' and a timestamp of '10 minutes ago', and 'humi' (humidity data) with a status of 'No Persisted Data'.

Beebotte

RaspberryPi

channel RaspberryPi 01 by Teeratus

teeratus Public Created: January 29th 2016

Channel Token: 1454048519461_fwEx8YouEEFENdJBQ

Configured resources

| | | |
|-------------------------------------|-------------------|----------------|
| Temp <i>temperature data</i> | 25.00° | 10 minutes ago |
| humi <i>humidity data</i> | No Persisted Data | |



Home

My Dashboards

Console

Account Settings

Account Usage

Dashboards

Create and manage your dashboards







Create Dashboard

Search:

| TITLE | DESCRIPTION | CREATED ON | SCOPE | VIEWS |
|----------------------------|-------------|------------|-------|-------|
| No data available in table | | | | |

Showing 0 to 0 of 0 entries

Previous Next

-  Home
-  My Dashboards
-  Console
-  Account Settings
-  Account Usage
-  Support









New Dashboard

Add Widget ▾ [Save Changes](#)

Description

Public

+ Add Widget ▾

-  Clock
-  Text Area
-  Basic Value
-  Gauge meter
-  Timeline Chart
-  Multi-line Chart
-  Table Chart
-  Heat Map

Beebotte - teeratus x Google Translate x How to configure Outlook x

https://beebotte.com/teeratus/dashboards/create

Beebotte teeratus Help

New Dashboard

Add Widget Save Changes

Description

Public

+ Add Widget

Temperature

25.00°

3 hours ago

Temperature

25.00

3 hours ago

Humidity

NA

Last update

Temperature History

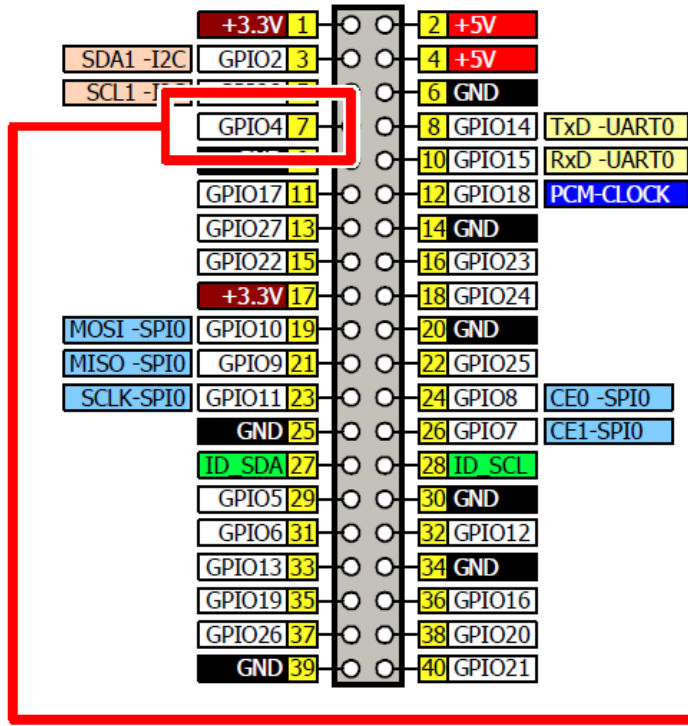
Last Hour

RaspberryPi.Temp

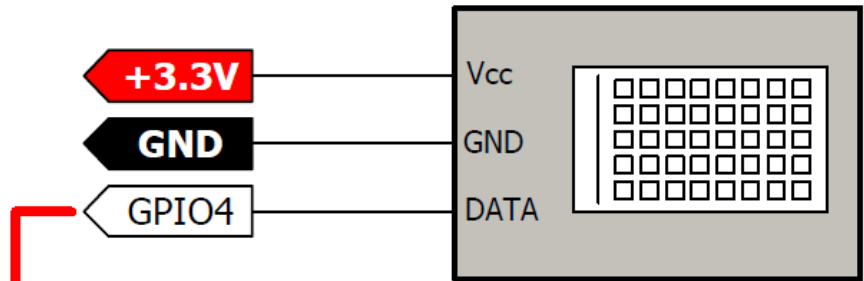
- Home
- My Dashboards
- Console
- Account Settings
- Account Usage
- Support

```
1 #!/usr/bin/env python
2 #####
3 # This code uses the Beebotte API, you must have an account.
4 # You can register here: http://beebotte.com/register
5 #####
6 import time
7 import json
8 import Adafruit DHT
9 from beebotte import *
10 API KEY = 'xxxxxxxxxxxxxxxxxxxxxx'
11 SECRET KEY = 'xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx'
12 ### Replace API KEY and SECRET_KEY with those of your account
13 bbt = BBT(API_KEY,SECRET_KEY)
14 period = 5 ## Sensor data reporting period (5 seconds)
15 pin = 4 ## Assuming the DHT11 sensor is connected to GPIO pin number 4
16 ### Change channel name and resource names as suits you
17 temp resource = Resource(bbt, 'RaspberryPi', 'Temp')
18 humid resource = Resource(bbt, 'RaspberryPi', 'humi')
19 def run():
20     while True:
21         ### Assume
22         humidity, temperature = Adafruit_DHT.read_retry(Adafruit_DHT.DHT11, pin
23 )
24         if humidity is not None and temperature is not None:
25             print('Temp={0:0.1f}*C Humidity={1:0.1f}%'.format(temperature,humid
26 ity))
27             try:
28                 #Send temperature to Beebotte
29                 temp resource.write(temperature)
30                 #Send humidity to Beebotte
31                 humid resource.write(humidity)
32             except Exception:
33                 ## Process exception here
34                 print ("Error while writing to Beebotte")
35             else:
36                 print ("Failed to get reading. Try again!")
37                 #Sleep some time
38                 time.sleep(period)
39 run()
40
```


Raspberry Pi 2 GPIO

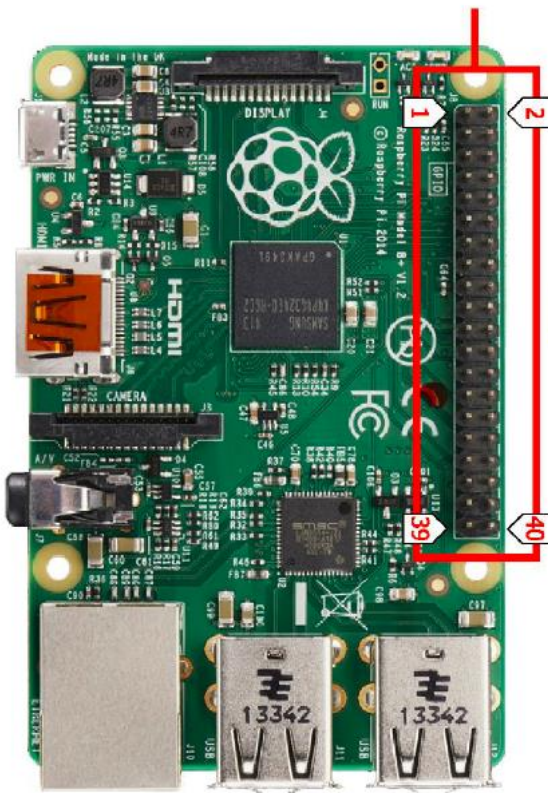


ZX-DHT11 Humidity/Temperature sensor module




```
1 #!/usr/bin/env python
2 #####
3 # This code uses the Beebotte API, you must have an account.
4 # You can register here: http://beebotte.com/register
5 #####
6 import RPi.GPIO as GPIO
7 import time
8 import json
9 from beebotte import *
10 GPIO.setwarnings(False)
11 GPIO.setmode(GPIO.BCM)
12 LED_pin=16
13 GPIO.setup(LED_pin,GPIO.OUT)
14 API_KEY = 'xxxxxxxxxxxxxxxxxxxxxxxxxxxx'
15 SECRET_KEY= 'xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx'
16 ### Replace API_KEY and SECRET_KEY with those of your account
17 bbt = BBT(API_KEY,SECRET_KEY)
18 while True:
19     try:
20         # Read from Beebotte return json
21         records = bbt.read('RaspberryPi','StLED')
22         print (records)
23
24         # Get data from json
25         StLED=records[0]['data']
26         print (StLED)
27         GPIO.output(16,StLED)
28     except Exception:
29         print ("Error while writing to Beebotte")
30
```

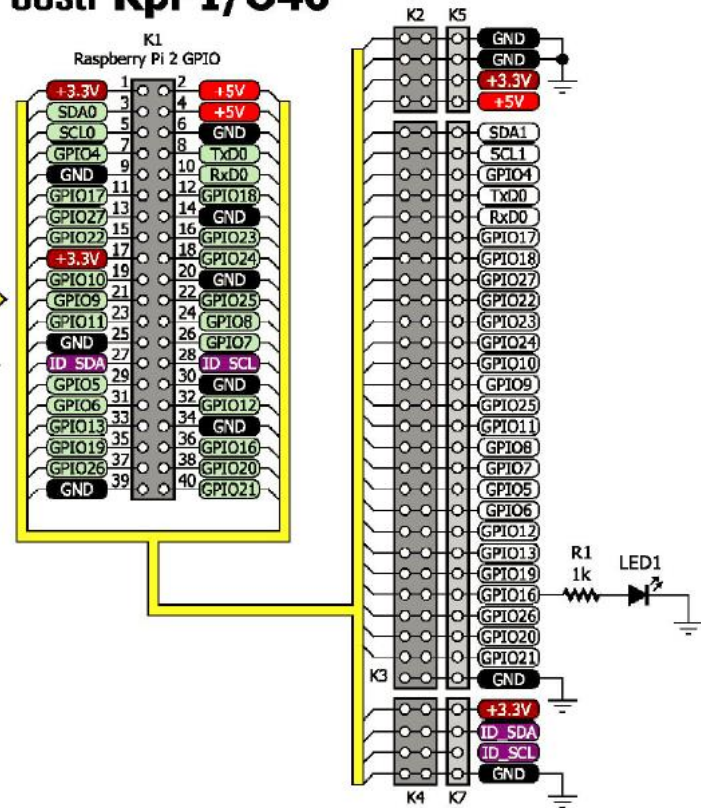
คอนเน็กเตอร์ GPIO



บอร์ด Raspberry Pi 2

บอร์ด Rpi-I/O40

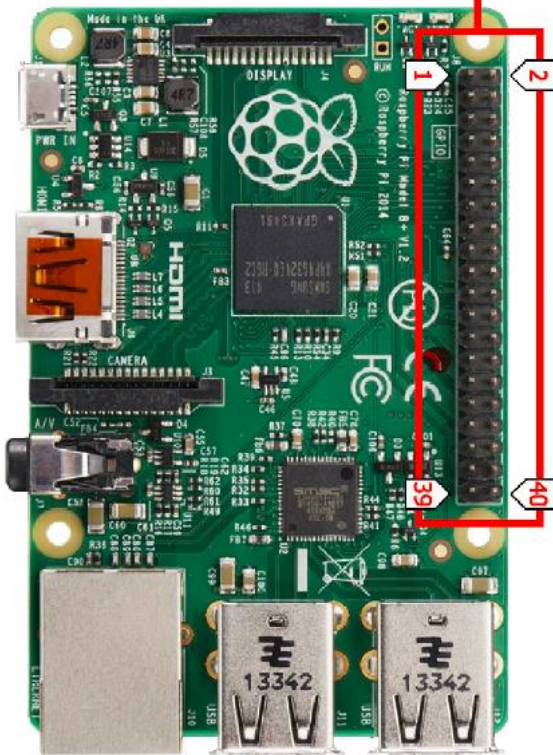
เชื่อมต่อบอร์ดด้วยสาย 40 เส้น



LED-PWM

```
1 #!/usr/bin/python
2 # -*- encoding: utf-8 -*-
3 import RPi.GPIO as GPIO
4 import time
5 from beebotte import *
6 LED_pin=19
7 GPIO.setwarnings(False)
8 GPIO.setmode(GPIO.BCM)
9 GPIO.setup(LED_pin, GPIO.OUT)
10 blink = GPIO.PWM(LED_pin,500)
11 blink.start(0)
12
13 API_KEY = 'xxxxxxxxxxxxxxxxxxxxxx'
14 SECRET_KEY= 'xxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxxx'
15 ### Replace API_KEY and SECRET_KEY with those of your account
16 bbt = BBT(API_KEY,SECRET_KEY)
17 while True:
18     try:
19         # Read from Beebotte return json
20         records = bbt.read('RaspberryPi','valDuty')
21         print (records)
22
23         # Get data from json
24         valpwm=records[0]['data']
25         print (valpwm)
26         blink.ChangeDutyCycle(valpwm)
27
28     except Exception:
29         print ("Error while writing to Beebotte")
30
```

คอนเนกเตอร์ GPIO



บอร์ด Raspberry Pi 2

บอร์ด Rpi-I/O40

เชื่อมต่อกับสายลายแพน 40 เส้น

