

Simple Raspberry Pi Control With .NET IoT and Python

Follow the “Prerequisites” and “Prepare the hardware” instructions [here](#). (Note: These instructions specify .NET SDK 5 or higher. We’ll actually be using .NET 6.)

Assumes that you’re using Linux on your development machine as well.

.NET

On the development machine, create a console application:

```
dotnet new console -o BlinkTutorial  
cd BlinkTutorial
```

Add the [Iot.Device.Bindings](#) package to the project:

```
dotnet add package Iot.Device.Bindings --version 1.5.0-*
```

Replace the contents of Program.cs with the following code:

[Program.cs](#)

```
using System;  
using System.Device.Gpio;  
using System.Threading;  
  
Console.WriteLine("Blinking LED. Press Ctrl+C to end.");  
int pin = 18;  
using var controller = new GpioController();  
controller.OpenPin(pin, PinMode.Output);  
bool ledOn = true;  
while (true)  
{  
    controller.Write(pin, ((ledOn) ? PinValue.High : PinValue.Low));  
    Thread.Sleep(1000);  
    ledOn = !ledOn;  
}
```

Make sure the application builds without errors:

```
dotnet build
```

Publish it:

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```
dotnet publish -c Release -r linux-arm --self-contained true  
/p:PublishSingleFile=true
```

Copy the application to the Raspberry Pi (adjust the remote machine name and path as needed):

```
scp -r bin/Release/net6.0/linux-arm/publish/* pi@raspi4-  
main:/home/pi/projects/BlinkTutorial
```

Log in to the Raspberry Pi, go to the publish directory, and run the application:

```
ssh pi@raspi4-main  
  
cd projects/BlinkTutorial  
  
.BlinkTutorial
```

Enjoy the blinking light!

Makefile, to simplify the steps:

Makefile

```
REMOTE_USER_MACHINE = pi@raspi4-main  
  
default:  
    @echo 'Targets:'  
    @echo ' build'  
    @echo ' publish'  
    @echo ' copy'  
    @echo ' ssh'  
  
build:  
    dotnet build  
  
publish:  
    dotnet publish -c Release -r linux-arm --self-contained true  
/p:PublishSingleFile=true  
  
copy:  
    scp -r bin/Release/net6.0/linux-arm/publish/*  
$(REMOTE_USER_MACHINE) :/home/pi/projects/BlinkTutorial  
  
ssh:  
    ssh $(REMOTE_USER_MACHINE)
```

Python

Log in to the Raspberry Pi:

```
ssh pi@raspi4-main
```

Create a directory for the Python script:

```
mkdir blink_tutorial  
cd blink_tutorial
```

Install the gpio packages:

```
sudo apt-get install python-rpi.gpio python3-rpi.gpio
```

Create the script:

[blinking_led.py](#)

```
#!/usr/bin/python3

import RPi.GPIO as GPIO
from time import sleep

gpio_pin = 18
pause_seconds = 1

GPIO.setwarnings(False)
GPIO.setmode(GPIO.BCM)
GPIO.setup(gpio_pin, GPIO.OUT, initial=GPIO.LOW)

while True:
    GPIO.output(gpio_pin, GPIO.HIGH)
    sleep(pause_seconds)

    GPIO.output(gpio_pin, GPIO.LOW)
    sleep(pause_seconds)
```

Make the script executable, and run it:

```
chmod u+x blinking_led.py  
./blinking_led.py
```

Enjoy the blinking light! (Again!)

[embedded and iot, dotnet, python](#)

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