

KOSMOS

Espressif ESP32 Setup Guide

What will this guide teach me?

 25 - 50 minutes

This guide contains step-by-step instructions on how to set up **Espressif ESP32 microcontrollers** to connect to the Kosmos industrial IoT platform.

Once you've finished these steps, you'll be ready to start gaining valuable insights from your sensors & actuators using Kosmos' dashboards, alerts, controls, and more.

For questions about setting up your Kosmos IoT System, please email support@temboo.com and we'll get back to you as soon as possible.



What You'll Need



Kosmos Gateway
(Raspberry Pi Model 3 B+)



ESP32 SoC



USB Flash Drive



Raspberry Pi 5V 2.5A
Power Adapter



Ethernet Cable
(Optional)



Micro SD Card
(8+GB, U3 Speed)



USB Micro SD
Card Reader

Before You Get Started

Before moving on to the next steps in this guide, please make sure that you've created your Temboo account and generated your Kosmos application files for your chosen hardware. If you haven't, head to temboo.com and complete those steps now!



Gateway Application Setup

- 1 First, install Etcher so that you can copy the Kosmos gateway application to your micro SD card:
<https://www.etcher.io>
- 2 Insert your micro SD card into your USB SD card reader and connect the card reader to your computer.
- 3 Open Etcher and flash the Kosmos gateway **.xz** file onto your micro SD card (you previously downloaded this file while creating your Kosmos application).



ESP32 & Kosmos Gateway Connectivity

1

Locate the **temboo_kosmos_config.ini** file downloaded during Kosmos application creation and open it with your favorite text editor.

2

Add the details of the WiFi network that your ESP32s will connect to (see lines 14 & 15 in the config file screenshot below), then save and close your config file.

3

Connect your USB thumb drive to your computer so that you can copy the config file to the USB drive.

4

Copy the config file to your USB thumb drive and then eject the the thumb drive from your computer.

```
kosmos_gateway_config.ini
1  [credentials]
2  account_name = my-kosmos-account
3  appkey_name = myIndustrialIoTApp
4  appkey_value = WBnnvr12Mu5tlw123uZwaF12vpF1EZj
5
6  [cloud_connection]
7  gateway_id = my_gateway
8  auth_type = standard
9  port = 9009
10 websocket_version = 1
11 ws_url = wss://kosmos.temboo.com
12
13 [wifi]
14 ssid = myWifiNetwork
15 password = my-wifi-password
```

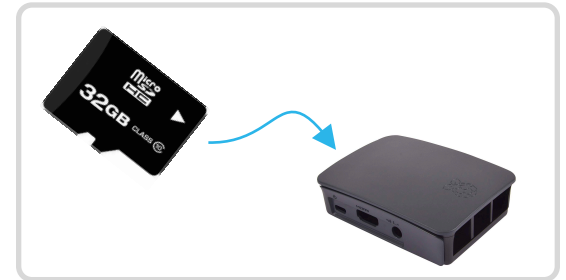
Line 15, Column 28 Tab Size: 4 Plain Text

Kosmos Gateway Hardware Setup

1

Insert SD Card

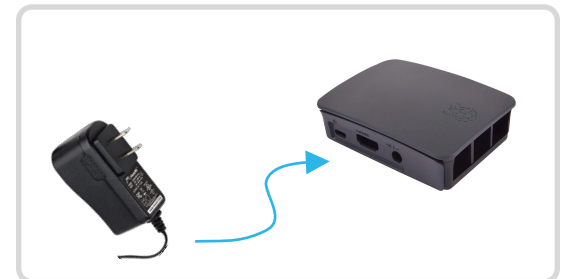
Insert the micro SD card into the underside of the gateway (the metal contacts slide in face up).



2

Power Up The Gateway

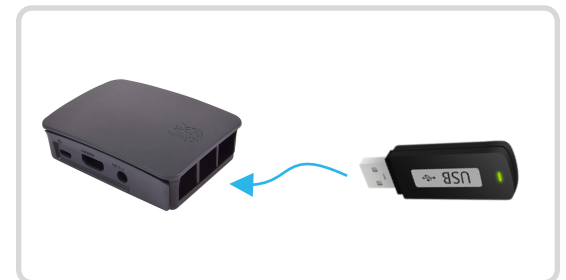
Connect the 5V 2.5A power adapter to your Kosmos gateway. Then, plug the adapter into a power outlet.



3

Insert USB Drive

Insert the USB thumb drive into any available USB port on your Kosmos gateway.

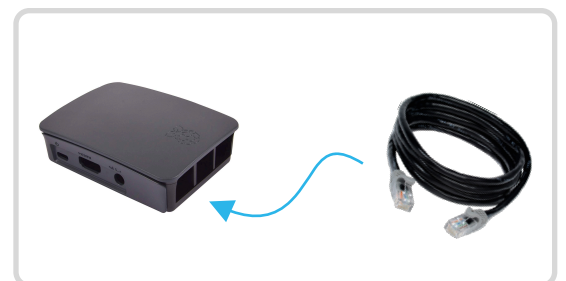


*

Optional: Ethernet

Your Kosmos gateway will automatically connect to the internet via the wifi network it uses to communicate with your ESP32s.

You can optionally connect an ethernet cable to the gateway at this point if you want the gateway to connect to the internet via ethernet.



Setup your Kosmos ESP32 Application

1

ESP32 Toolchain Setup

Follow the [official ESP32 setup guide](#) to completion and make sure that you can successfully program your ESP32 with the official 'Hello World' application before continuing here.

[ESP32 Getting Started Guide](#)

Get Started

[中文]

This document is intended to help you set up the software hardware based on the ESP32 chip by Espressif.

After that, a simple example will show you how to use ESP-Framework for menu configuration, then building, and flashing.

Note

This is documentation for the master branch (latest version) of continual development. [Stable version](#) documentation is also available.

2

Update Kosmos ESP32 Wifi Details

For each ESP32 that you're connecting to Kosmos, you need to insert details of the wifi network that the ESP32 will use to connect to the Kosmos gateway.

In the Kosmos application files you downloaded earlier, locate the **app_main.c** file in the **main** directory for each individual ESP32 device, and add the wifi network details. *Note: the folder name for each ESP32 is based on the device name you gave to your ESP32s when creating your Kosmos application.*

Make sure to save the file when you're done editing.

```
42
43  #define WIFI_SSID "Enter your WiFi network name here"
44  #define WIFI_PWD  "Enter your WiFi Password here"
45
```

Flash your ESP32s

1

Build your Kosmos ESP32 Projects

Use your terminal to navigate to the Kosmos application files you downloaded earlier.

Navigate to the top level of the directory that contains the Kosmos application code for the ESP32 device you want to flash and then run this command:

```
idf.py build
```

2

Flash your ESP32s

With your ESP32 connected to your computer, run the command below from the directory in which you built your Kosmos ESP32 application above.

Replace PORT in the command below with your ESP32's serial port name. If you need help you can find detailed instructions in the [official ESP32 port discovery guide](#).

```
idf.py -p PORT flash
```

When your ESP32 has been flashed it will connect to your Kosmos gateway and both devices will appear online in the Kosmos dashboard.

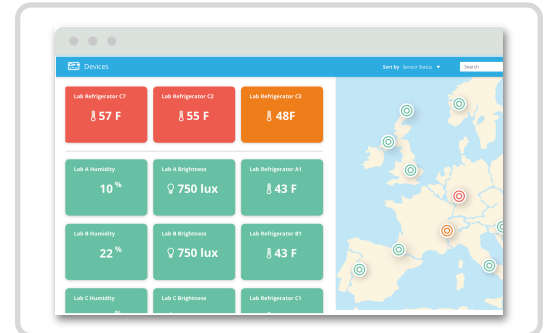
View Your Kosmos Sensor Data

1

Visit Your Dashboard

Log into Kosmos, navigate to the dashboard, and select your new Kosmos application:

<https://temboo.com/devices>



2

Monitor Gateway Status

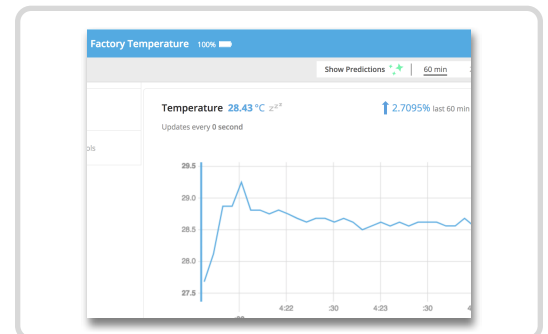
When the gateway connects, a green dot will appear beside the name of your Kosmos application. The gateway takes ~90 seconds to connect.



3

View Sensor Data

Click into your application and then click on your sensor device. You should see the first data point in your graph.



! Troubleshooting Tips

| Problem | Solution |
|--|--|
| Gateway isn't powering up. | When your gateway is powered on you'll see a red LED (solid) and green LED (blinking) inside the case. If you don't see those lights, check that the power supply is securely attached at both ends, and that the wall outlet you are using is active. |
| Your gateway doesn't appear online in your Kosmos dashboard. | Make sure that you've waited at least 10 minutes after powering on your gateway and that all the hardware is connected as described in this guide. If the gateway is still offline after 10 minutes, try restarting the gateway to connect to Kosmos. |
| Your graphs have no data. | Wait at least 10 minutes after powering up your gateway for data to arrive in your graphs. If you still don't see data, double-check that the power supply for your sensors (adapter or batteries) is working correctly. Press the reset button on the sensor device (if available) and refresh the browser in which you are viewing the sensor graph. |

Questions?
support@temboo.com

