

## **Stage 2a – Software Components Firebase**

The below section provides step-by-step instructions to set-up the software components of the FarmBOX.

In production, these steps do not need to be undertaken. This is because the Firestore account needs to be set up only once. The Android App will be available on the Google Play Store and require no special configuration. In addition, a 'FarmBOX' SD card .iso image that has all the required firmware files and setup is supplied with the FarmBOX. This .iso image can be bulk flashed and therefore no special configuration is required.

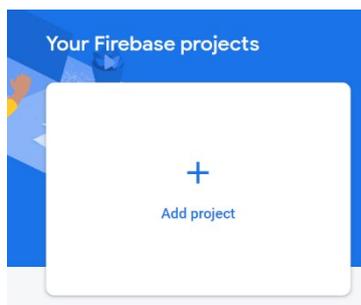
### **Step 1 – Create a Firebase Project: Access Firebase**

Using an Internet connected modern PC or Android device, please follow the below instructions.

In any modern web browser (Microsoft Edge recommended) navigate to the URL [console.firebase.google.com](https://console.firebase.google.com)

Sign in with your Google Account and click on 'Add Project'.

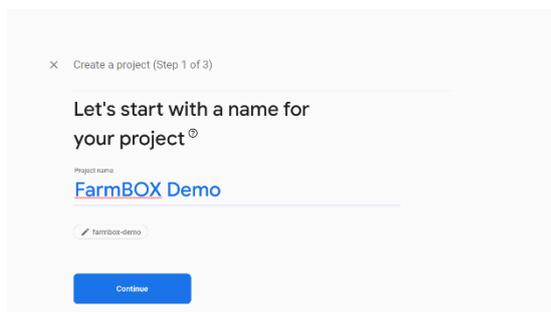
If you do not have a Google Account, please create one.



### **Step 2 – Create a Firebase Project: Name the Project**

Please give your project a name, it doesn't really matter what you set it to, 'FarmBOX Demo' is used as an example here.

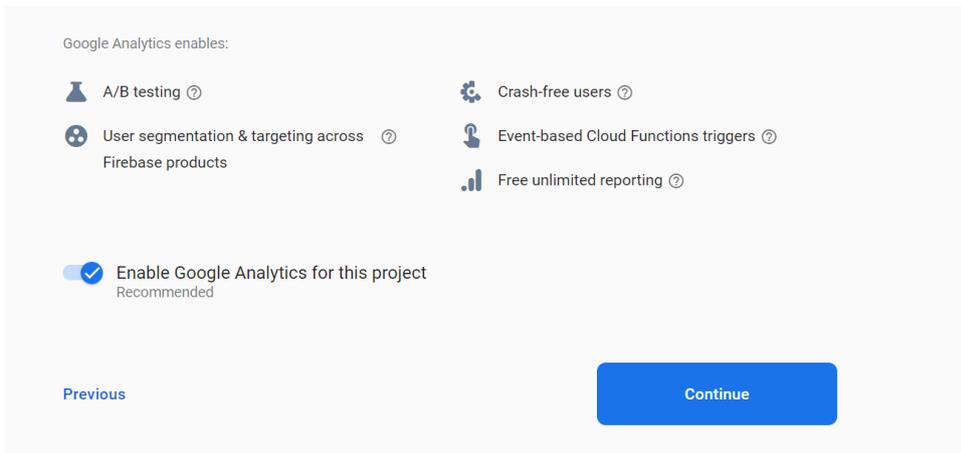
Press the Blue Continue button.



### **Step 3 - Create a Firebase Project: Continue with the set-up**

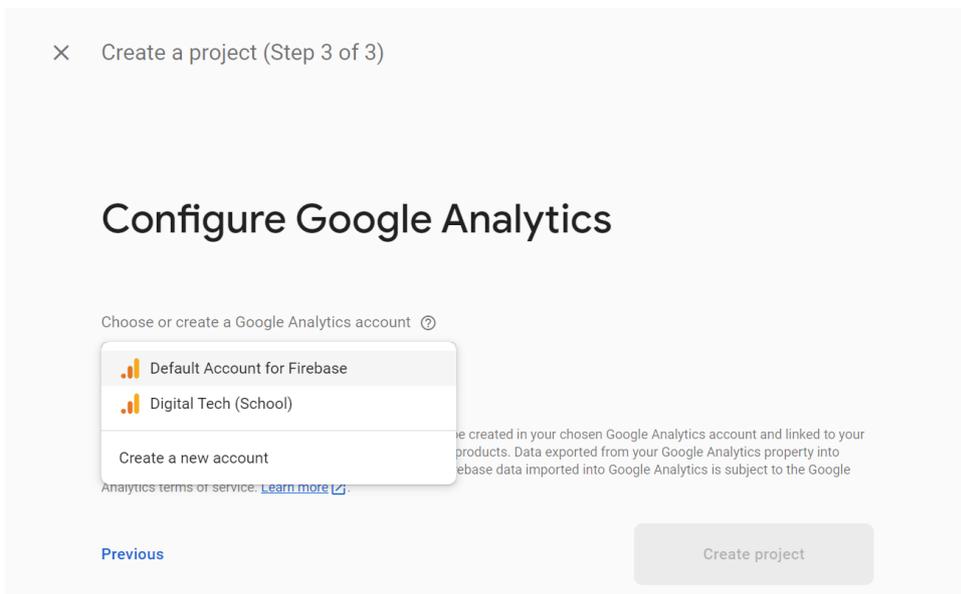
The below screen will be displayed. Ensure the Google Analytics setting is enabled.

Scroll down and press the Blue Continue button.



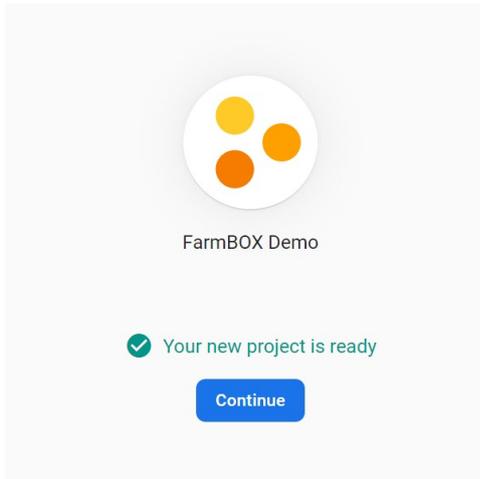
#### Step 4 – Create a Firebase Project: Configure Google Analytics

When asked to configure Google Analytics, select the dropdown and select the 'Default Account for Firebase' and then press the Create Project button.



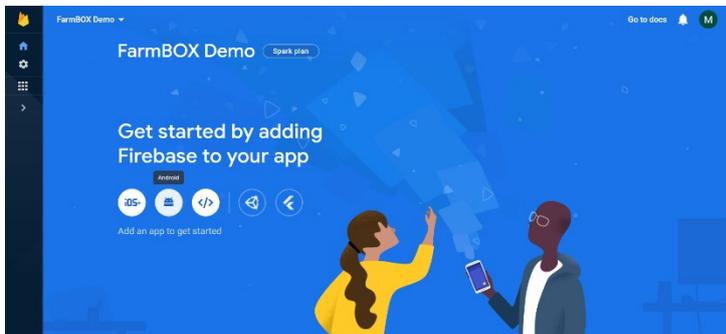
#### Step 5 – Create a Firebase Project: Configure Google Analytics

Please wait while your project is created. When you see the "Your new project is ready" press the Blue Continue button.



### Step 6 – Create a Firebase Project:

On the page that loads next, press the Android Figure Head icon (second circle from the left) on the main page.



### Step 7 – Create a Firebase Project: Register the App Details

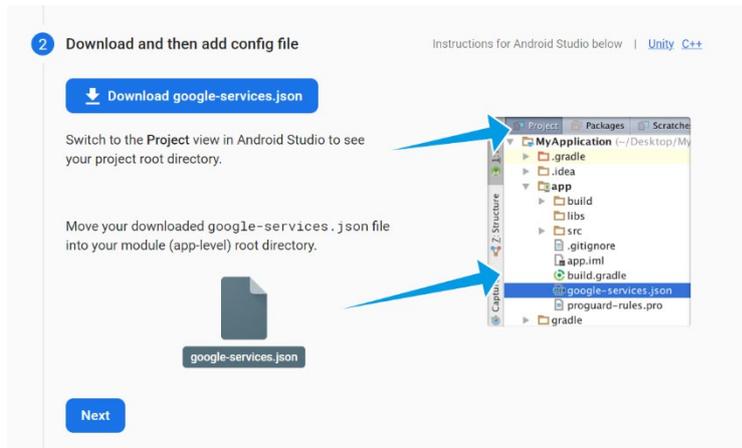
Enter the precise settings shown below and press the Blue 'Register app' button.

A screenshot of the 'Register app' form in the Firebase console. The form is titled '1 Register app'. It has three input fields: 'Android package name' with the value 'com.teamfarmbox.farmboxandroid', 'App nickname (optional)' with the value 'My Custom FarmBOX Android App', and 'Debug signing certificate SHA-1 (optional)' with a long hexadecimal string. Below the third field, there is a small note: 'Required for Dynamic Links, and Google Sign-In or phone number support in Auth. Edit SHA-1s in Settings.' At the bottom of the form, there is a blue button with the text 'Register app'.

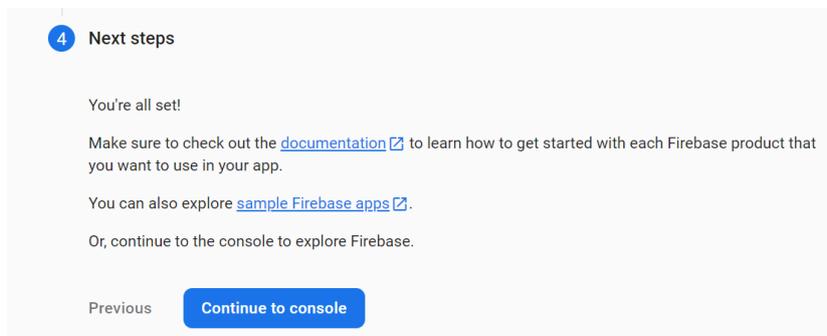
### Step 8 – Create a Firebase Project: Download google-services.json

Press the 'Download google-services.json' button and then continue, do not worry about the instructions on screen. The google-services.json will be used at a later stage to link to our FarmBOX Android App.

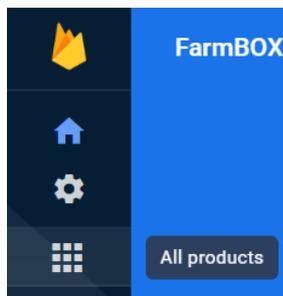
On the next screen, scroll to the bottom and press the 'Next' button, again do not worry about the instructions on screen.



### Step 9 – Press the 'Continue to console' button

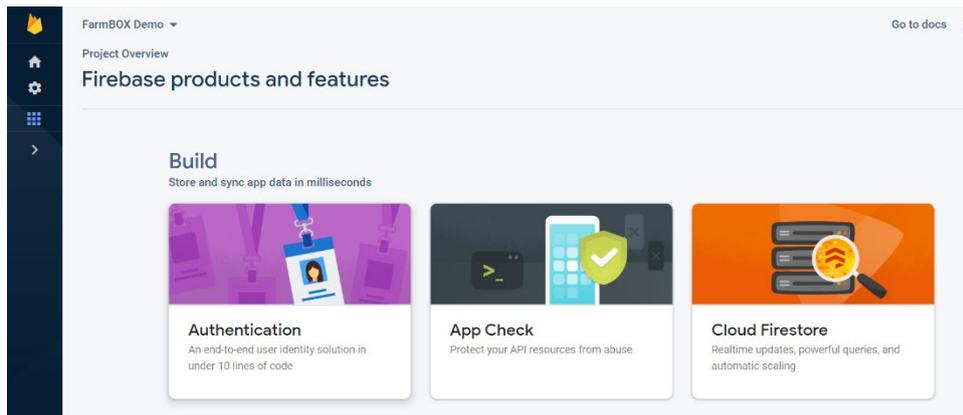


### Step 10 – Press the 'All Products' button on the side



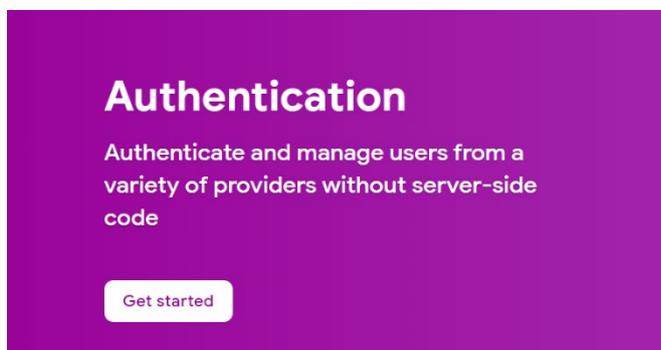
### Step 11 – Create a Firebase Project: Firebase Authentication

Select 'Authentication'



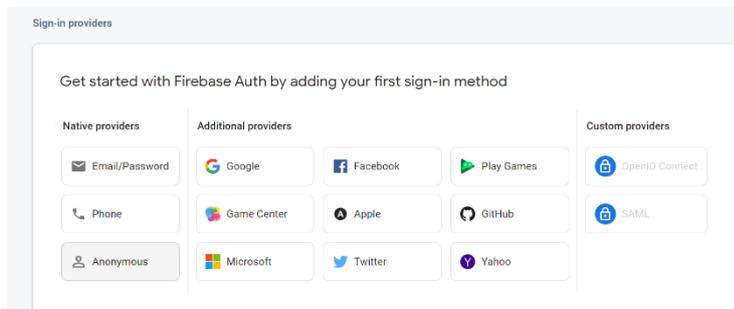
## Step 11 – Create a Firebase Project: Authentication (continued)

Press the 'Get Started' button



## Step 12 – Create a Firebase Project: Select sign-in method

For the first sign-in method select 'Anonymous'.



## Step 13 – Create a Firebase Project: Enable Anonymous Sign-in Method

Ensure the toggle switch is set to 'Enable' and then press the 'Save' button.



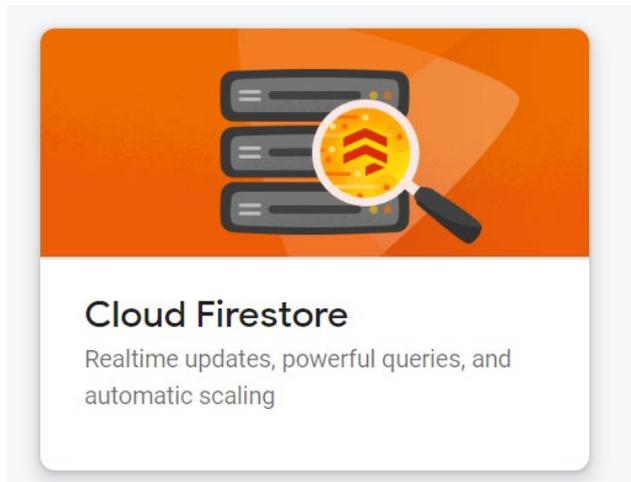
Enable anonymous guest accounts in your application, which lets you enforce user-specific Security and Firebase Rules without requiring credentials from your users. [Learn more](#)

Cancel **Save**

## Step 14 – Create a Firebase Project: Selecting Cloud Firestore

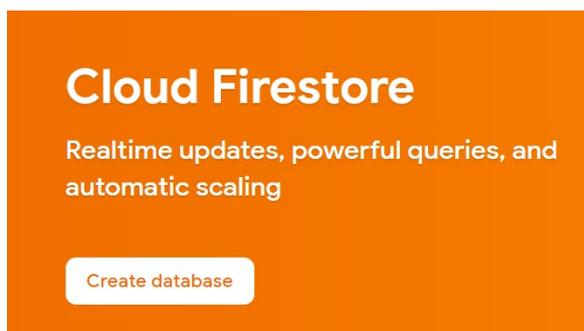
Return to the All Products screen (as shown in step 11).

This time, please select 'Cloud Firestore'



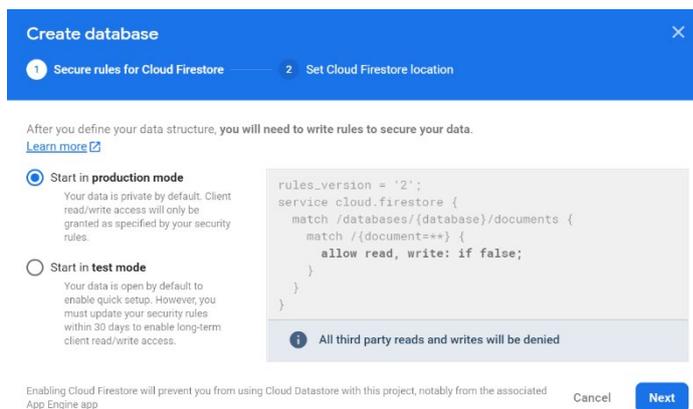
## Step 15 – Create a Firebase Project: Create the database

Press the 'Create database' button



## Step 16 – Create a Firebase Project:

Press the Blue 'Next' button, do not worry about security rules for now



## Step 17 – Create a Firebase Project: Cloud Firestore Location

Select an appropriate location, here "Australia-souteast1" is used as an example.

Press the 'Enable' button.

**Create database** ✕

Secure rules for Cloud Firestore
  2 Set Cloud Firestore location

Your location setting is where your Cloud Firestore data will be stored.

**⚠** After you set this location, you cannot change it later. Also, this location setting will be the location for your default Cloud Storage bucket.

[Learn more](#)

Cloud Firestore location

australia-southeast1 ▼

Enabling Cloud Firestore will prevent you from using Cloud Datastore with this project, notably from the associated App Engine app

Cancel Enable

**Step 18 – Wait while it ‘provisions cloud firestore’**

**Step 19 – Start a Collection**

Press “Start a Collection” and then type ‘farmboxes’, and press the Blue ‘Next’ button.

**Start a collection**

1 Give the collection an ID
  2 Add its first document

Parent path

/

Collection ID ?

farmboxes

---

Cancel Next

**Step 20 – Configure Settings**

Configure the settings as shown below and press the Blue ‘Save’ button.

Document parent path

/farmboxes

Document ID ?

TestDevice

Field	=	Type	Value
init		number	0

+ Add field

---

Cancel Save

**Step 21** – Follow the same steps, but this time start the collection phone-info-updates.

Configure the settings as shown below.

Press the Blue 'Save' button. We will cover how to push updates later.

Document parent path ⓘ  
/phone-info-updates

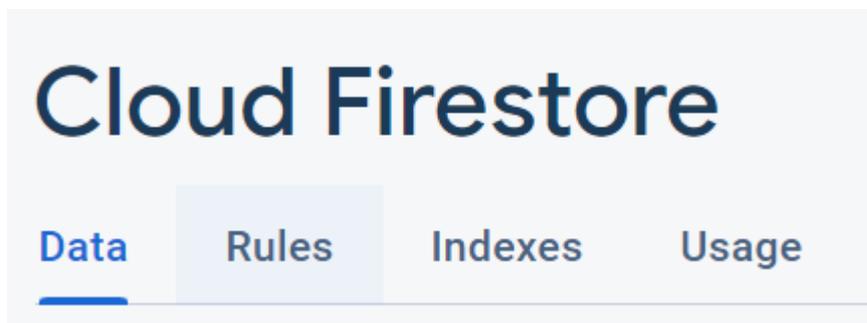
Document ID ⓘ  
latest

Field	Type	Value
name	string	Allepo1

+ Add field

Cancel Save

**Step 22** – Click on the "Rules" Tab at the top



**Step 23** – Create a Firebase Project: Update Rules

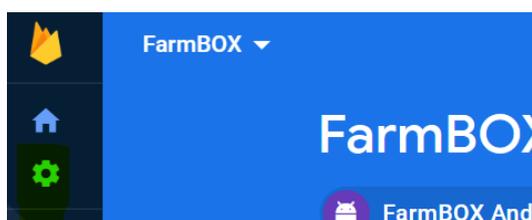
Update your rules to what is shown below and press the 'Publish' button.

```
unpublished changes | Publish Discard
```

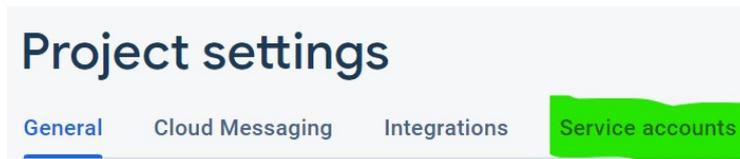
```
1 rules_version = '2';
2 service cloud.firestore {
3   match /databases/{database}/documents {
4     match /{document=**} {
5       allow read, write: if
6         request.auth != null;
7     }
8   }
9 }
```

**Step 24** – Create a Firebase Project: Get serviceAccount.json

Return to the Firebase homepage, and press the cog icon, then select 'Project Settings'



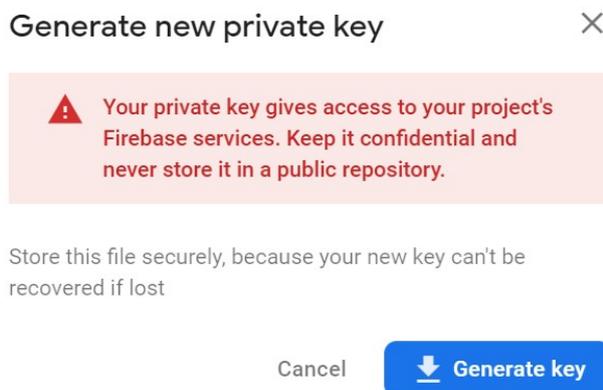
Navigate to the 'Service Accounts' tab highlighted in green below:



Scroll Down, and press 'Generate New Private Key':



Read the warning (shown in the screen-shot below) and press 'Generate Key'.



Next, copy your new Private Key to a USB Flash Drive.  
Ensure the file is called "serviceAccount.json".

Next, safe eject or unmount this flash drive however is customary for your operating system.

**We are now done with Firebase Set-up!**

## **Stage 2b – Software Components Android App**

For the next software component, Android Studio is required to load the FarmBOX Android App with your custom Firebase Server' google-services.json file.

### **Step 1 – Download and Install Android Studio**

Please go to this link: <https://developer.android.com/studio>, and press Download Android Studio.

Follow these instructions: <https://developer.android.com/studio/install>, to install Android Studio for your platform.



Android Studio provides the fastest tools for building apps on every type of Android device.

[Download Android Studio](#)

Android Studio Dolphin | 2021.3.1 for Windows 64-bit (906 MiB)

### **Step 2: Clone github repository**

Clone our github repository, located here:

<https://github.com/Kotin-for-win/FarmBOX-Android-App>

If you need assistance to clone a github repository, please see this link:

<https://www.howtogeek.com/451360/how-to-clone-a-github-repository>

### **Step 3: Copy google-services.json file**

Copy the google-services.json file you downloaded earlier (in step 8) to whereYouClonedMyRepo/FarmBOX/app

### **Step 4: Enable Android Debug Bridge on Android Device**

Enable Android Debug Bridge on your target Android Device by following these steps:

- Go to your Android Device
- Go to Settings section on the Android Device (icon is usually a cog wheel or similar)
- Go to "About device" (note: this may be named slightly differently depending on the Android version)
- Click the "Build number" field seven (7) times. This will activate the Android "Developer options"
- Return to Settings
- Go to "Developer options"
- Scroll down and enable "USB debugging"

### **Step 5: Set-up Android Studio for FarmBOX**

Return to the PC and run Android Studio.

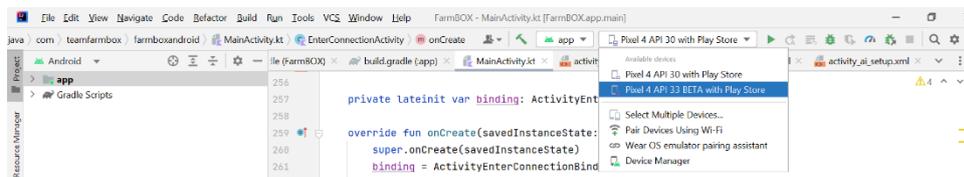
On the Android Studio welcome screen, press 'Open an Existing Android Studio Project' and click the folder 'FarmBOX', which will be located in the directory where you cloned it to from our GitHub Repository.

### Step 6: Connect Android Device to the PC

Connect your Android Device with USB Debugging enable into the computer that is running Android Studio by using a USB cable and tap 'yes' on your phone when prompted to "Allow USB Debugging".

### Step 7: Select Target Android Device within Android Studio

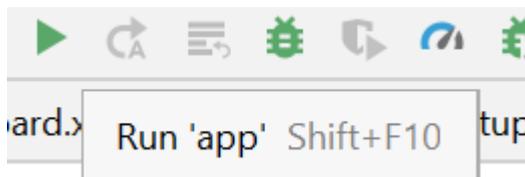
Within Android Studio, click on the dropdown menu as shown in the picture below and select your Android Device as appropriate. In the case it may be greyed out; wait for the Gradle Build, Gradle Sync and Index to fully complete. In this example, a Pixel 4 is shown.



### Step 8: Install FarmBOX to Android Device from within Android Studio

Install our FarmBOX app onto your Android Device from within Android Studio.

To do this press the play button (green arrow symbol) next to the (Device selection) dropdown menu used in the previous step.



This will now install the FarmBOX App onto your Android Device.

### Step 9: Disconnect Android Device from the PC

Wait for the installation of the app to complete. This will be indicated when the FarmBOX app launches on your Android Device.

Now disconnect your Android Device from the PC by removing the USB cable.

This completes the Android App portion of the software installation and you may now close Android Studio on the PC.

## Stage 2c – Software Components Raspberry Pi

The next section of the software installation is focused on the Raspberry Pi configuration.

Please follow the instructions below to install Ubuntu Server on your Raspberry Pi. This requires a PC with Internet connection and an SD Card inserted into the PC. Once, configured with the correct Ubuntu Server software, the SD Card will then be inserted into the Raspberry Pi

### Step 1: Download Raspberry Pi Imager tool

On the PC, download the official Raspberry Pi Imager tool by googling ‘raspberry pi imager’ or going to the following link:

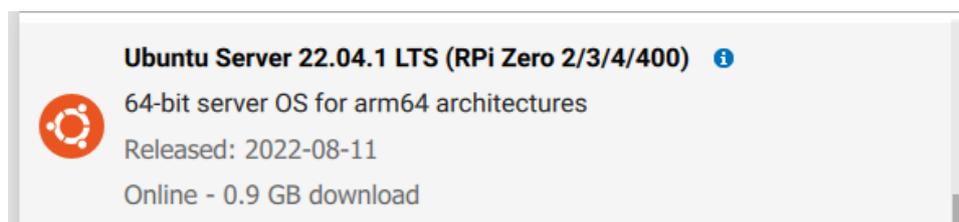
<https://www.raspberrypi.com/software/#:~:text=Install%20Raspberry%20Pi%20OS%20using>

### Step 2: Selecting the Ubuntu OS

Once the Raspberry Pi Imager tool is successfully installed on the PC, start the tool and press ‘CHOOSE OS’ under Operating System.



Next, navigate to Other General Purpose OS -> Ubuntu, and choose the option ‘Ubuntu Server 22.04.1 LTS (RPI Zero 2/3/4/400)’ as shown in the screen-shot below:



### Step 3: Select Target (SD Card)

Insert your SD Card into the PC.

Under the “Storage” section, click on “CHOOSE STORAGE” and select your SD Card.

### Step 4: Write to the Target (SD Card)

Press ‘Write’. Once complete eject or unmount the SD card however is customary for your OS.

Now that the SD card is set-up, we are completed with the PC.

### **Step 5: Insert the SD Card into the Raspberry Pi**

Go to the Raspberry Pi. Ensure the Raspberry Pi is not running and if required, unplug the power connection from the Raspberry Pi.

Next, insert the SD card into your Raspberry Pi. Connect your Raspberry Pi to a keyboard, mouse and monitor (you may need to use a mini-HDMI adapter). Connect your Raspberry Pi to Ethernet LAN. Additionally, insert the USB Flash Drive containing your service account file.

### **Step 6: Boot the Raspberry Pi**

Reconnect the power to the Raspberry Pi and let it boot.

Watch the Ubuntu Server boot. After a login prompt appears, wait for some more lines to be printed by cloud-init.

### **Step 7: GitHub Personal Access Token**

A GitHub Personal Access Token is required to clone the GitHub repository on the Raspberry Pi.

If you do not have a personal access token for GitHub you will need to create one to continue.

Here are the instructions to create a GitHub Personal Access Token, these need to be run on your PC when connected to the Internet:

- Log into GitHub with your username and password (or create a new GitHub account)
- Navigate to your GitHub account settings
- Scroll down and click 'Developer settings' in the list of links to the left
- Click the Personal access tokens link
- Click the 'Generate new token' button
- Add a 'Note' to describe the tokens usage
- Set an expiration date for the GitHub personal access token, maybe press never?
- Select 'repo' and 'read:org'
- Click the 'Generate token' button

### **Step 8: Install FarmBOX Firmware on Raspberry Pi using Command line**

Now, return to the Raspberry Pi running Ubuntu.

Once the Ubuntu Server is running wait for the command prompt to display.

Please run the commands shown below in sequence within the command terminal. Please login as the user 'ubuntu' with the password 'ubuntu'. When asked for a password after running 'sudo bash' please enter 'ubuntu'.

```
sudo bash
```

```
git clone https://your github prpersonal access token here@github.com/  
Kotin-for-win/FarmBOX-Firmware-Latest
```

```
cd FarmBOX-Firmware-Latest
```

```
chmod +x installFarmBOXFirmware.sh
```

```
./installFarmBOXFirmware.sh TestDevice
```

### **Step 9. Enabling the Raspberry Pi Camera**

Now run this command: `raspi-config`

Choose 'Interface Options'

Choose 'P1 Camera'

Choose 'Yes'

Choose 'OK'

### **Step 10: Enabling I2C (PiicoDev Sensors)**

Choose 'Interface Options'

Choose 'P5 I2C'

Choose 'Yes'

Choose OK

Press the right arrow key twice

Choose 'finish'

*Note to choose the value – please press the enter key once when over the value*

### **Step 11: Ensure FarmBOX Automatically Logs-in**

Run the command `systemctl edit getty@.service`. Change the `ExecStart=-` line to `/sbin/agetty -a ubuntu --noclear %I $TERM`

Press Ctrl+X, type y, press enter

### **Step 12: Restart the Raspberry Pi to Apply the Changes**

Run the command:

```
systemctl reboot
```

This completes the Raspberry Pi set-up. You may now disconnect the Raspberry Pi from the Monitor, Keyboard and mouse and Internet.