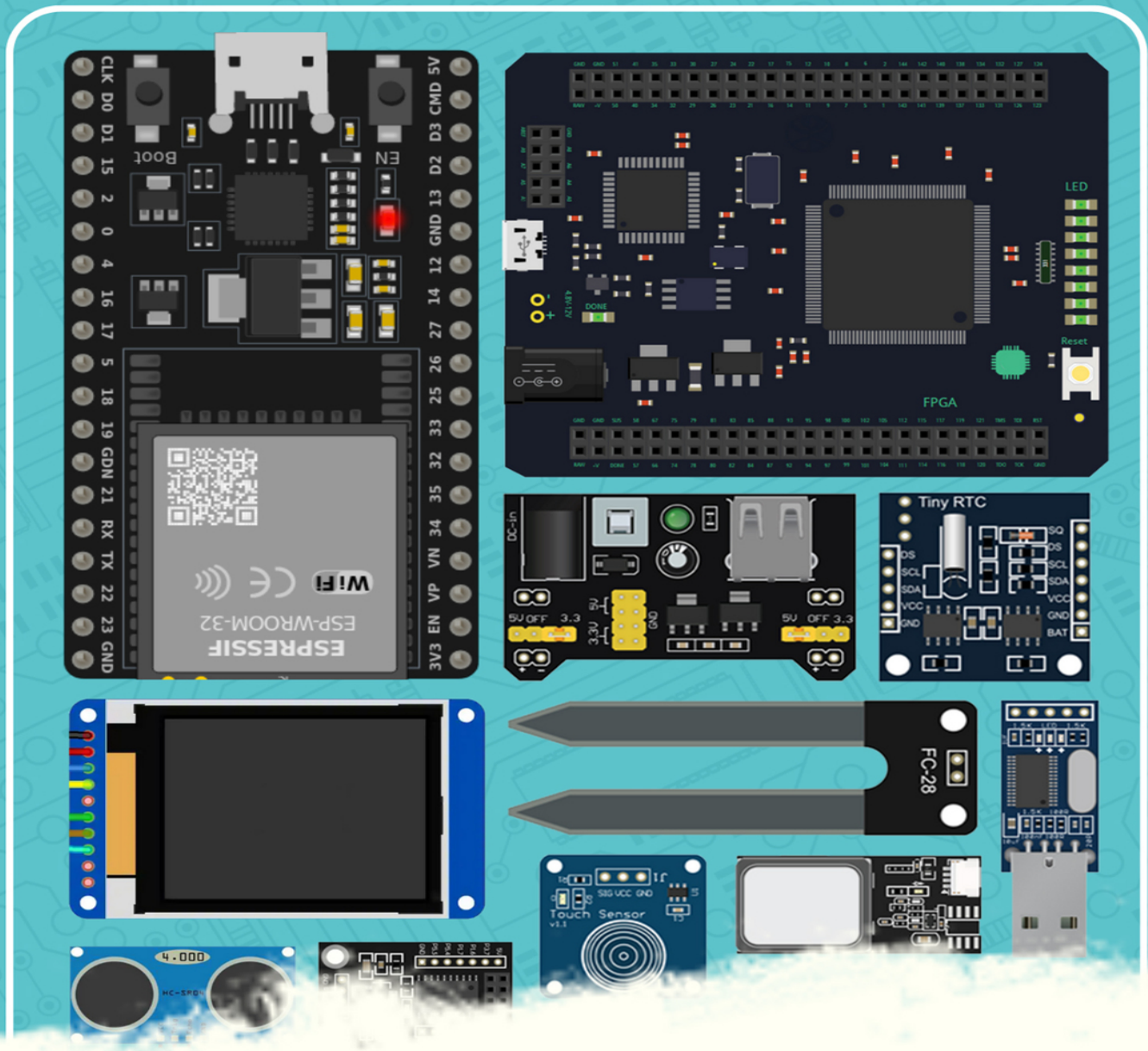

MASTERING THE ESP32 IOT PROJECTS WITH ARDUINO IDE

Building Connected Devices with the ESP32 Practical Guide to Arduino IDE

MASTERING THE ESP32 IOT PROJECTS WITH ARDUINO IDE

Building Connected Devices with the ESP32 Practical Guide to Arduino IDE

By

Mikasa Mizuki

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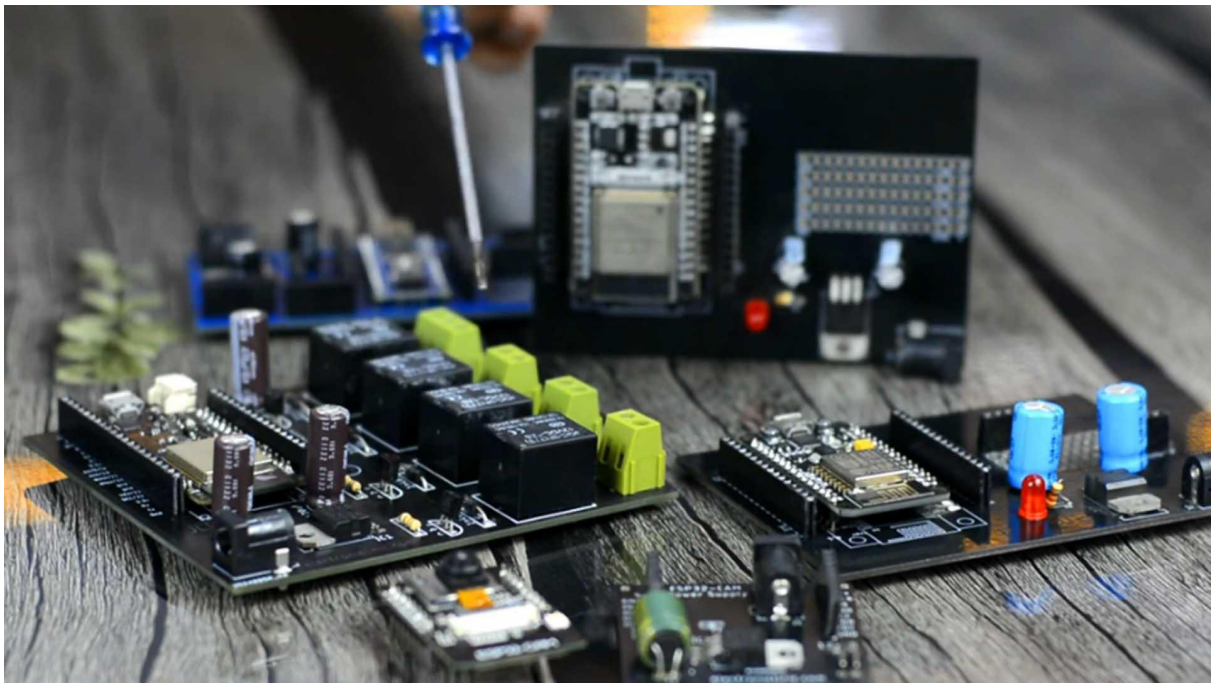
DESIGNING USING MP1584

Using this 5V and 3A power supply, you can power up all your controller boards like Arduino ESP8266, ESP32, Raspberry Pi Pico, ESP32 Camera Module, STM32, and more. Besides this, you can also use this 5V power supply for charging your cell phones. You can power up your portable displays, robots, servo motors, LED strips, and many other input and output modules.

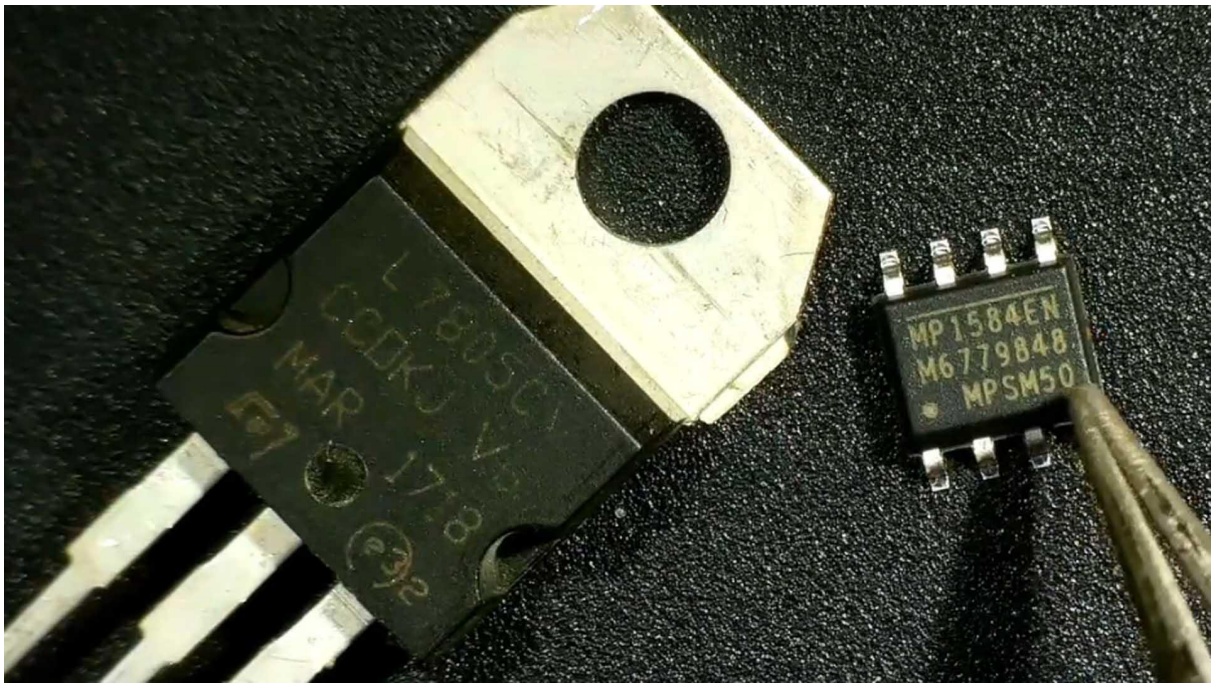
In this project, I'm going to share with you every bit of information. For example, in which software I designed this PCB, how I generated the Gerber files, how I placed an online order on the JLC PCB official website, from where I purchased all these tiny SMD components, how I did the soldering, and in the end, I will practically test it with different loads.

Let me tell you in detail why I needed to make this 5V 3A power supply module right from the beginning. I have been using 7805 voltage regulators for powering up my development boards. This is the Arduino Nano Development Board which I use for testing my Arduino-based projects, and you can see it has this 7805 voltage regulator. The same exact 5V power supply you will also find in my ESP32 Wi-Fi Bluetooth module Development Board.



I also used it with NodeMCU ESP8266 and the same exact voltage regulator I also used in my ESP32 Camera Development Board. It's not like that the 7805 voltage regulator is the best or it has outstanding performance. I used it only because of its cheap price and it's easy availability. You can get it from any local electronic shop and more. It's easy to use.

So it's good for testing prototype models, but in the long run, it's really a big idea to use a 7805 voltage regulator because after only 5 to 6 minutes of use, it gets really hot. And this is because of its low output current. And sometimes even during performing the test, the controller boards are frozen. I'm sure you might have faced this weird situation with the Arduino or ESP32 or ESP8266 or any other controller board suddenly stops working, and then you would manually reset the controller board or you would disconnect the supply and connect it again. So that's why in battery-powered devices and in high-end user products, you won't see 7805 voltage regulators.



Anyway, since I am starting a new series on product designing, it's time to say goodbye to the 7805 voltage regulator, and I am going to start with the MP1584 DC-DC step-down converter. Just look at the size difference using MP1584; we can tremendously reduce the PCB size anyway. It accepts a wide range of input voltages from 4.5V to 28V. Its output is completely adjustable. Only by changing one resistor, you can get 1.8V, 3.3V, 5V, 9V, 12V, and so on. In the MP1584 datasheet, output typical application circuit diagrams are given. So first, I decided to start with this 5V output typical application schematic.

Figure 3—1.8V Output Typical Application Schematic

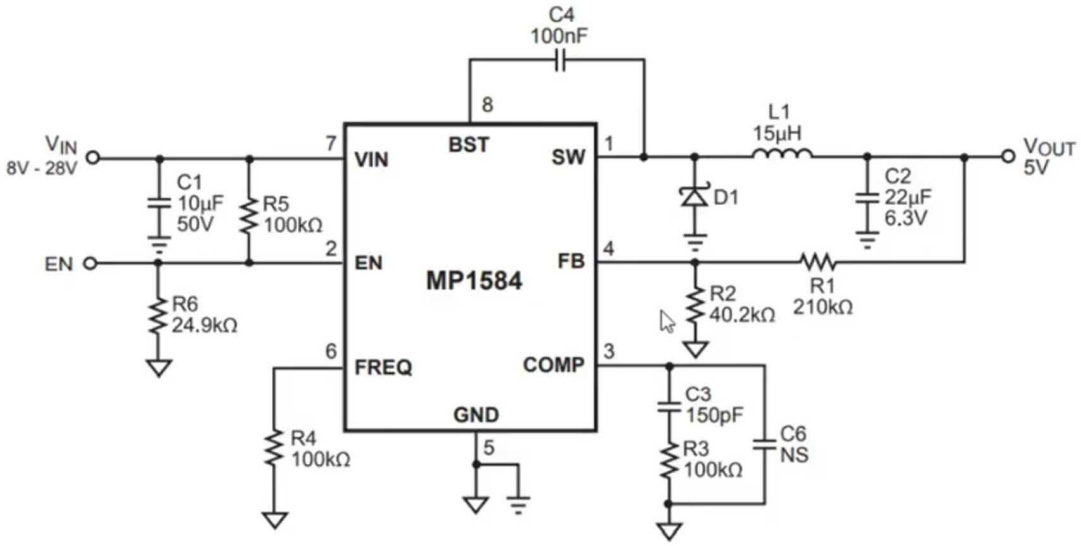
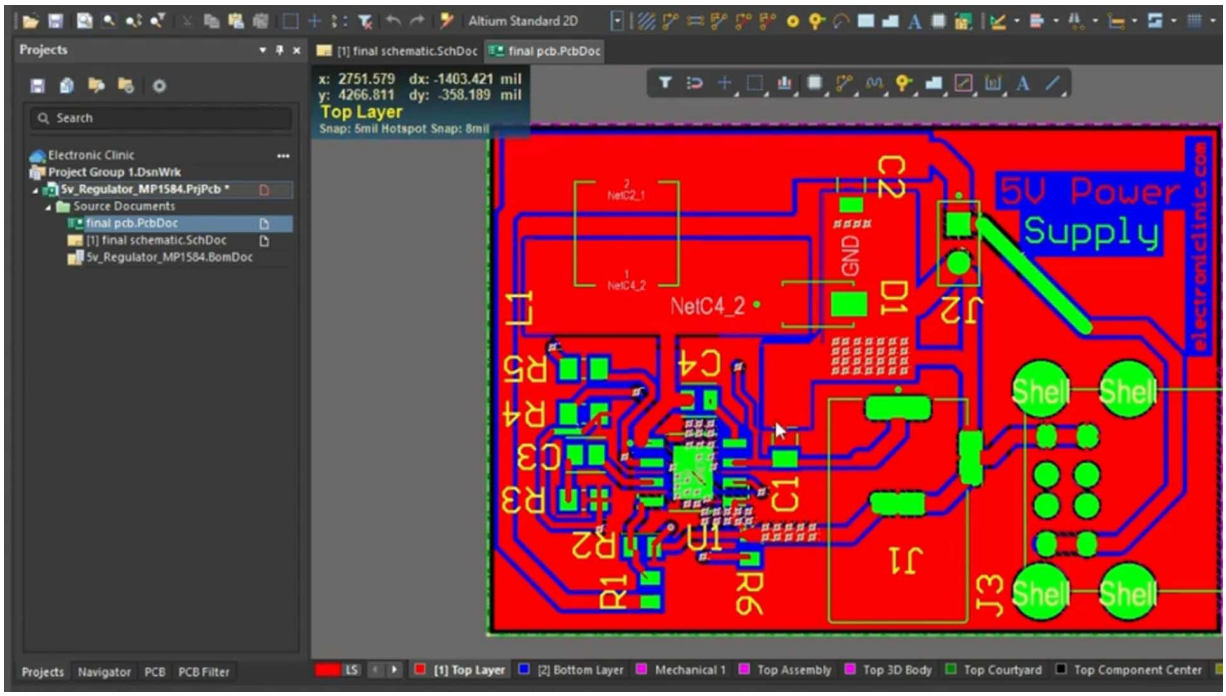


Figure 4—5V Output Typical Application Schematic

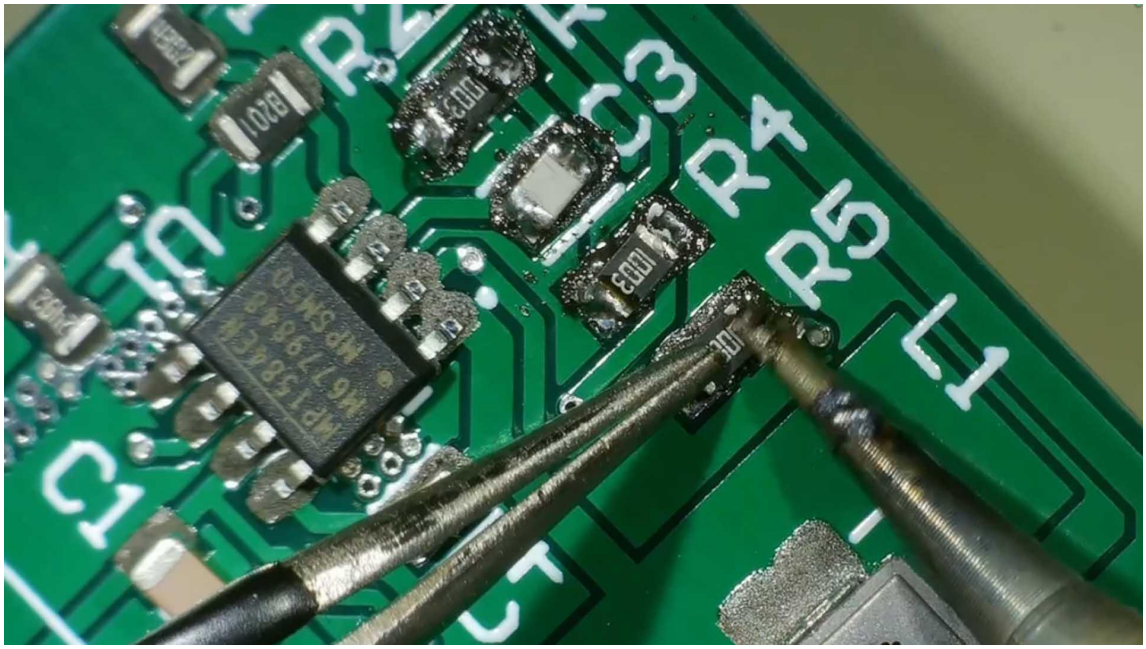
Using the same exact components, I designed this PCB in Altium Designer. Anyway, when I checked the output voltage, it was greater than 6V. You know, in this circuit diagram, the resistors R1 and R2 set the output voltage. If we divide R1 by R2, we get 5.2V. But in my circuit, I got the wrong voltage. So what did I do? I checked the actual MP1584 module, and what I found was they were using R2 equals 8.2 kilo ohms. So using this formula, V is equal to R1 / R2. I calculated the value of R1 while keeping R2 equal to 8.2 kilo ohms, and as I am doing this calculation for 5V output, I selected 5. Therefore, R1 is equal to 41 kilo ohms. Now, if you divide 41k by 8.2k, you will get exactly 5V. But to compensate for any losses, I selected a 43k ohm resistor. This way, I expect to get 5.2V. Now, using the same exact method, you can do it for any voltage, but remember to keep R2 equals to 8.2 kilo ohms. Otherwise, you may end up getting a wrong voltage at the output.

Next, I switched over to LTM Designer for creating the schematic and designing the PCB. Before creating the schematic and PCB design, first, I started off by searching for the components on the world's fastest component search engine, Octopart. I selected the

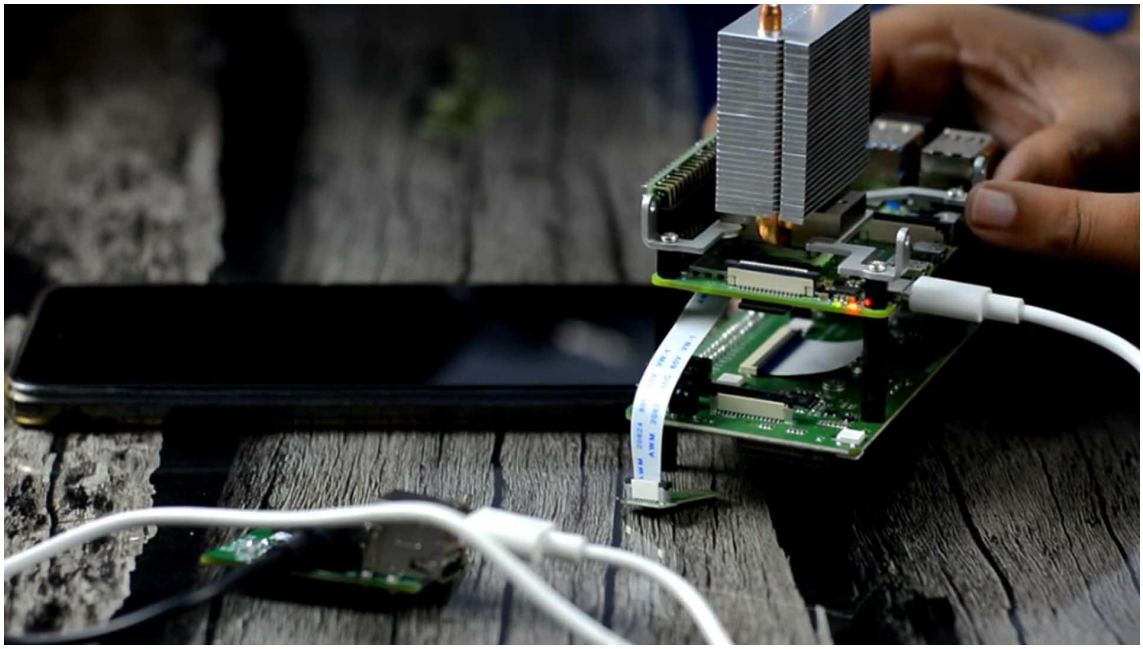
desired components with footprint models and used them for creating the schematic as per the recommended circuit diagram. I made only two changes:



I changed R1 to 43k ohms and R2 to 8.2 kilo ohms. I already have a very detailed project on how to make a schematic and PCB using Ultim Designer. I will add a link in the description anyway. Then I switched over to the PCB designing document. I defined the PCB port size and rearranged all the components. Using Ultim Designer, you can automatically route all the wires, but I did it manually. Finally, before generating the Gerber files, I activated the 3D layout mode by clicking #3 on the keyboard.



I double-checked all the connections and, once satisfied, I again activated the 2D layout mode by clicking #2 on the keyboard. Finally, I was ready to generate the Gerber files. I have already explained this in my previous project on e-bike battery control circuit designing. You should definitely watch this project if you want to learn how to charge 36V, 48V, or 72V e-bike batteries using a 12V power supply. Anyway, after generating the Gerber files, finally, I was ready to place an online order on the JLC PCB official website.



For the online order placement, I'm going to open the JLC PCB official website. They offer extremely cheap prices. You only need to pay $2.00 for one- and two-layer PCBs of 100x100mm size. For the same price, you can also order four- and six-layer PCBs of 50x50mm size. 5 PCBs for only $2.00. It's quite affordable. Besides this, JLC PCB also offers PCB assembly services.

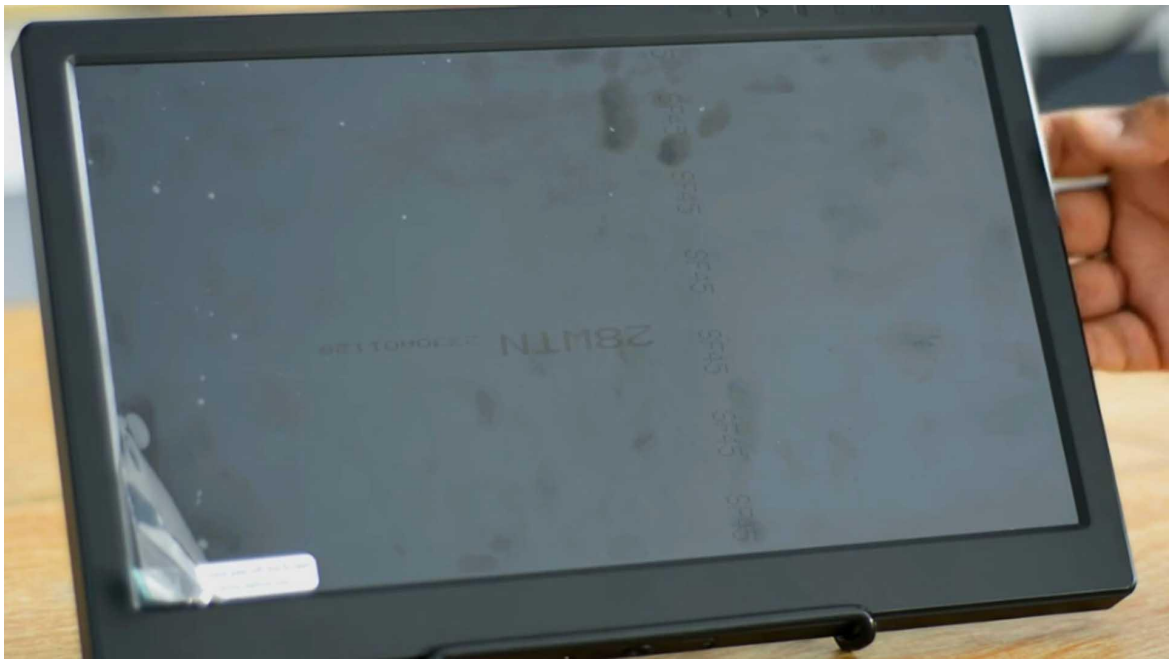
PORTABLE IPS MONITOR FOR RASPBERRY PI

This project is brought to you by Altium 365 via the World Designs Electronics and Octopart, the fastest search engine for electronic parts. If you guys are searching for an amazing all-in-one type full HD HDMI supported 1920 by 1080 portable monitor that can be used with Raspberry Pi, DSLR cameras, DISH internal receivers, laptops, CPUs, Xbox 360, PS3, PS4, Windows, FPV drones, cars, and robots, as it supports OSD and so on, then you need this 13.3-inch full HD IPS monitor from SunFounder. I will also test this monitor with my 3S LiPo battery and 4S lithium-ion battery packs. So let's go ahead and start the unboxing.

If you want to use this monitor with Raspberry Pi, first, you will need to adjust the resolution; otherwise, you may encounter an incomplete display with blank spaces around. So, it's like a guide explaining how to make changes in the config.txt file.

Inside this box, we have this AC to DC adapter with all the specs clearly printed. This adapter outputs 12 volts DC and can supply 3000 milliamps. Instead of using this adapter, you can also use a power bank. At Velbolt Party, you can also use a LiPo battery or lithium-ion battery pack. I will practically demonstrate this in a minute. We have also got this foldable stand which I think is made of steel and is coated with a non-slip rubber-type material. It also protects it from rusting. This is extremely easy to use; simply loosen the screws, unfold the stand, set the desired angle, and tighten the screws. Inside this box, we have also got these four different types of cables: regular-sized HDMI cable, micro HDMI to HDMI cable, USB-A to USB-C cable, and a USB-C to USB-C cable.

Ladies and gentlemen, presenting to you the lightweight 550-gram 13.3-inch Full HD HDMI 1920 by 1080 Portable IPS Monitor display compatible with Raspberry Pi, PS3, PS4, Xbox 360, Windows, and all other HDMI-supported devices.



This SunFounder 13.3-inch monitor is so lightweight that you can carry it or move it outside easily. It also allows being powered with a portable battery when you are outside. As a professional IPS monitor, it is made with mature technology that is capable of outstanding performance in showing the HD picture. That would be the best choice to use. It is a gaming monitor. In addition, it's perfect for a portable Raspberry Pi system. Above all, this monitor can drive this monitor.

The key features are a 13.3-inch Full HD IPS monitor with 1920 by 1080 resolution, supports key operation, has a wide visual angle, fast response speed, and accurate color rendition.

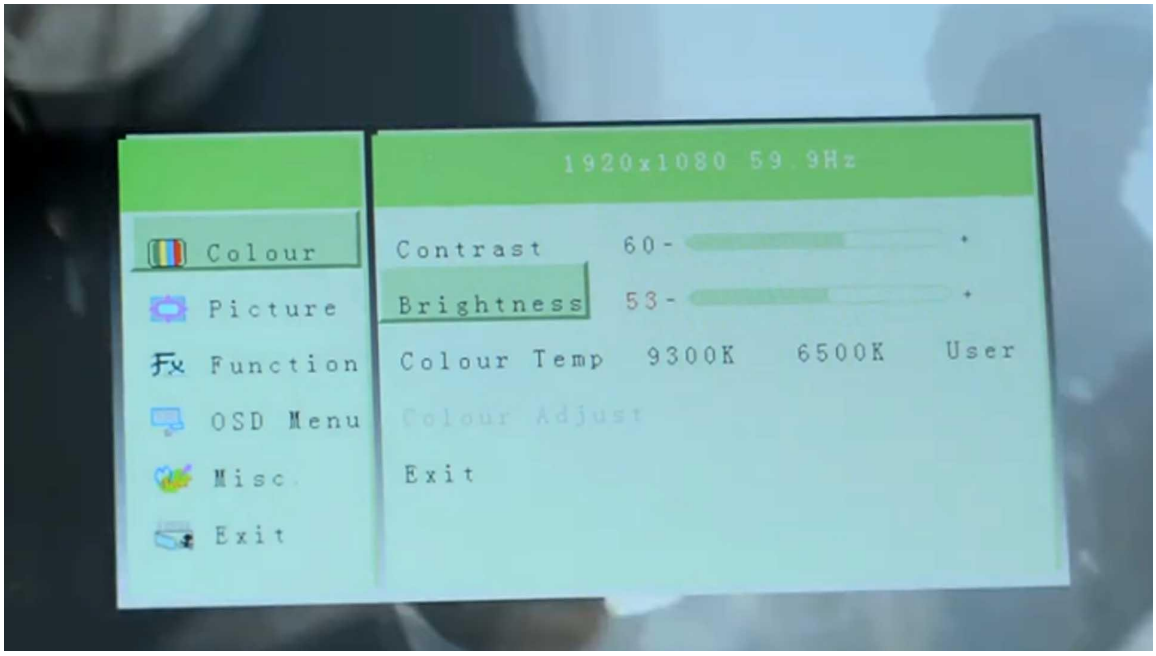
It can also be used with other models of Raspberry Pi, including Model B3, Model B, or B+2 Model B and Model B+. Plus, it's only 15mm thick. This can be the best portable gaming monitor for travel and business occasions.

On the right side, we have this DC 12-volt power jack, USB-C port, HDMI 1, HDMI 2, and earphone jack. When it comes to power consumption, it's only 10 watts. It has 2 speakers on the big side. The display color is 262K. The interface type is digital. Response time is only 5 milliseconds. The working temperature is from minus 20 degrees Celsius to plus 80 degrees Celsius. Working voltage ranges from 5 volts to 12 volts DC.

It supports 50 Hertz and 60 Hertz. If you need 120 Hertz and 144 Hertz professional gaming monitors, it cannot meet the requirements. It supports multifunction OSD operations and multiple OSD languages. The viewing angle is 178 degrees, which is pretty amazing.

On the top side, we have got buttons for the power source, menu, volume plus, and volume minus. On the bottom side, it also has a 1/4 inch twenty female tripod mount for those who want to use it with a tripod or any male 1/4 inch 20 screw mount. If you want to know more about this monitor, you can visit the SunFounder official product page. I will provide a link in the description.

Now I am going to use this monitor as a second display with my laptop, but first, I am going to peel off the screen protector. Connect the monitor to the laptop using an HDMI cable. Connect the power supply. Press the power button to turn on the monitor.

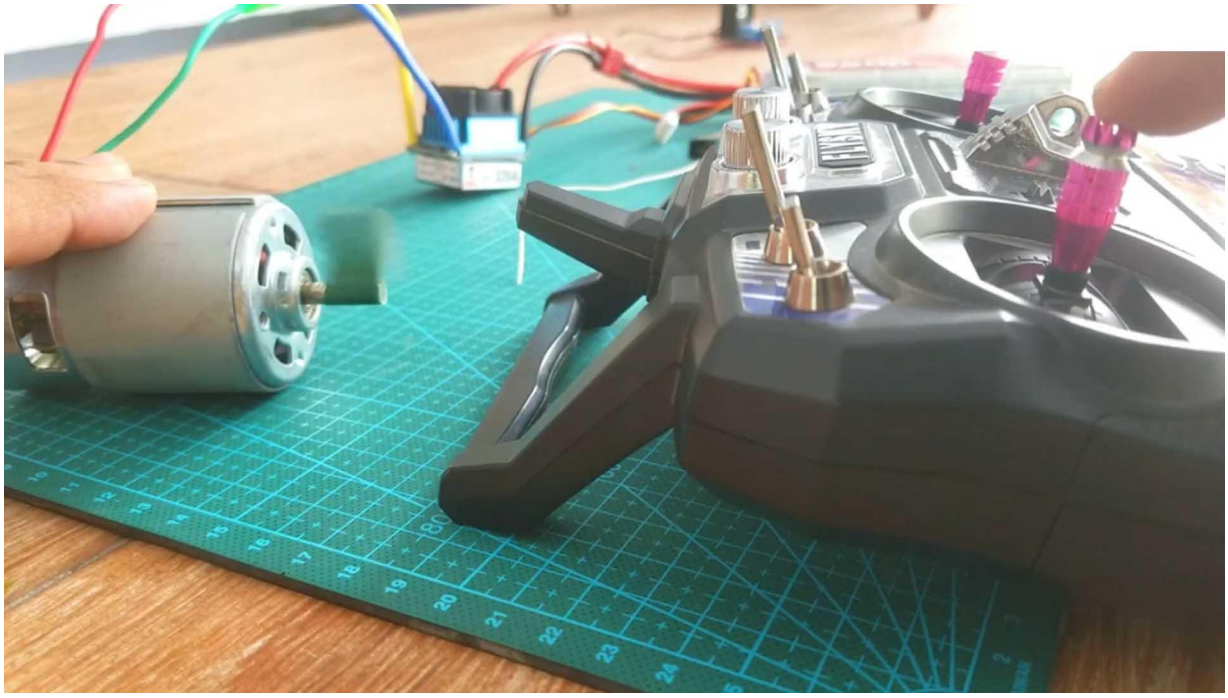


It works right out of the box. I didn't have to do any settings. I'm going to play a project. We can increase and decrease the volume using the volume plus and volume minus buttons. Click on the menu button and scroll through the menu items, click on...

775 DC MOTOR SPEED CONTROLLER

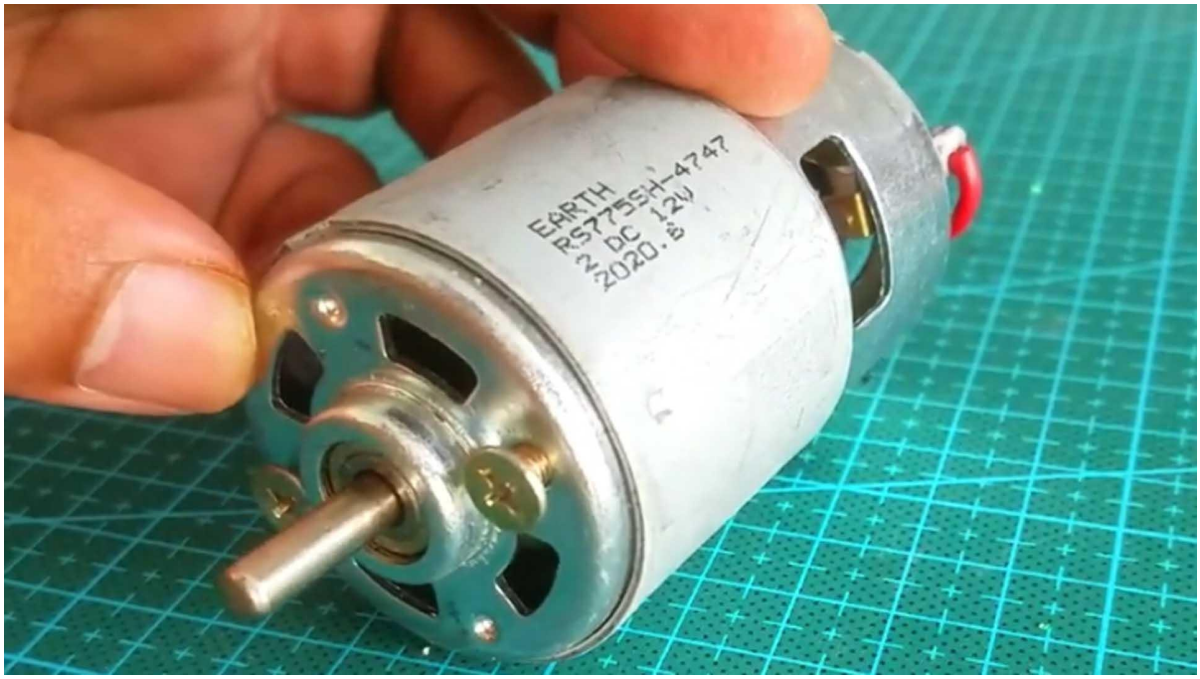
Recently, I got myself these double 775 DC motors, which you might have seen in different projects. With these double 775 DC motors, you can make trail machines, electric bikes, grinders, RC toys, cars, RC boats, solar fans, water pumps, powerful table saws, and so on. In most applications, you will need a speed controller.

In order to control the speed of the 775 DC motor, this project is sponsored by ULTM. ULTM Designer is the world's most trusted PCB design system. ULTM Designer enables engineers to effortlessly connect with every facet of the electronics design process. Over 35 years of innovation and development focused on a truly unified design environment makes it the most widely used PCB design solution. With Ultimate Designer, you can create PCB designs with an intuitive and powerful interface that connects you to every aspect of the electronics design process.



Route it your way through any angle, tune for delay, push, slide, and walk around faster than ever. Interact and collaborate with mechanical designers like never before in a photorealistic 3D design environment. If you want to get started with the Ultimate Designer, you can click on the first link in the description.

So in this episode, we are going to be looking at different ways to control the 775 motor. I have these four different types of motor drivers. Each one has different voltage and current ratings. We will take a closer look at the technical specifications, pinout connections, and practical demonstration. Throughout this project, I will use a 3S 11.1-volt LiPo battery, but you can use any DC power supply between 10 and 24 volts without any further delay. Let's get started. The components and tools used in this project can be purchased from Amazon. The component purchase links are given in the description.

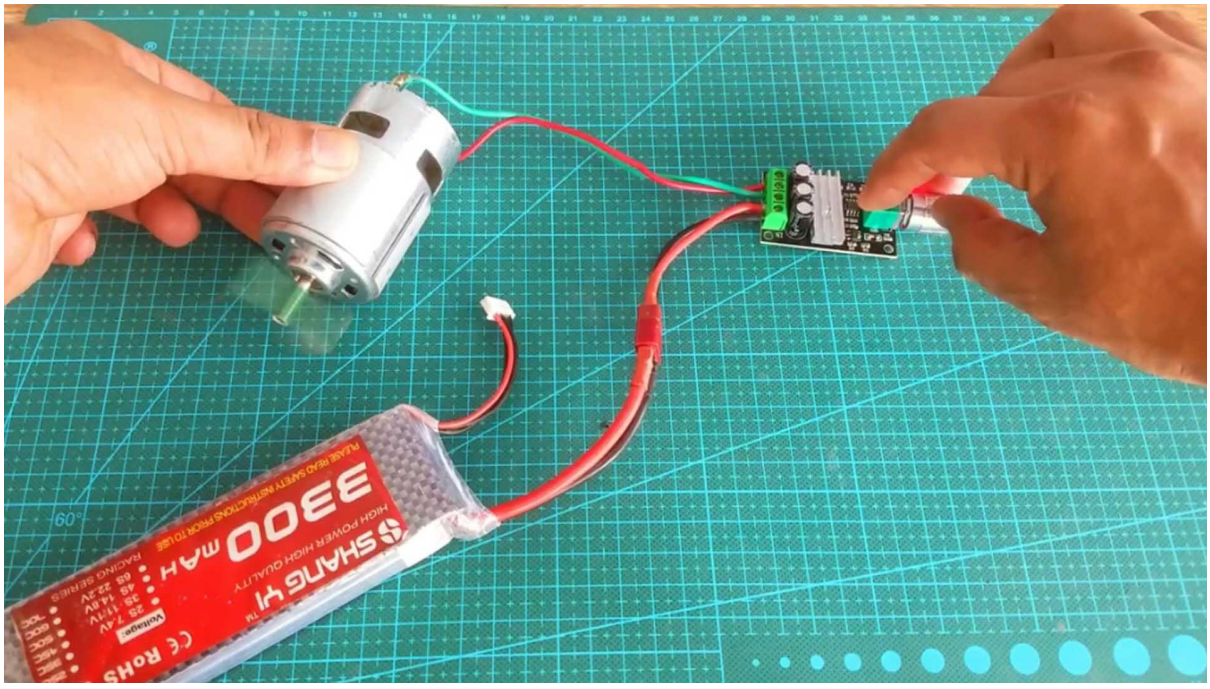


This is the double 775 DC motor with a shaft diameter of approximately 5 mm and has a rated voltage of 24 volts, and the maximum voltage is 36 volts. The rated speed of the double 775 motor is from 3500 to 7000 RPM (revolutions per minute). This RPM depends on the supplied voltage. At 24-volt DC, current is 0.14 Ampere, and speed is 3500 RPM. At 18-volt DC, current is 0.15 Ampere, and speed is 4500 RPM. At 24-volt DC, current is 0.16 Ampere, and speed is 7000 RPM. Unlike other DC motors, the double 775 motor has these two wires, and when connected with the desired voltage, the shaft starts spinning. The direction of rotation can be controlled by swapping the voltage wires.

Now things get a little complicated when it comes to controlling the speed of the double 775 DC motor because in the market, we have different types of low-cost and expensive motor drivers offering low and high current ratings. I have got these different motor drivers, and we will use each one with the 775 motor. These are not the only motor drivers; there are so many other types, but the ones you can see are the most commonly used motor drivers.

This is a 3Mpair PWM DC 6 Volt to 28 Volt 1203 BDC motor speed controller module. This DC motor speed controller allows controlling

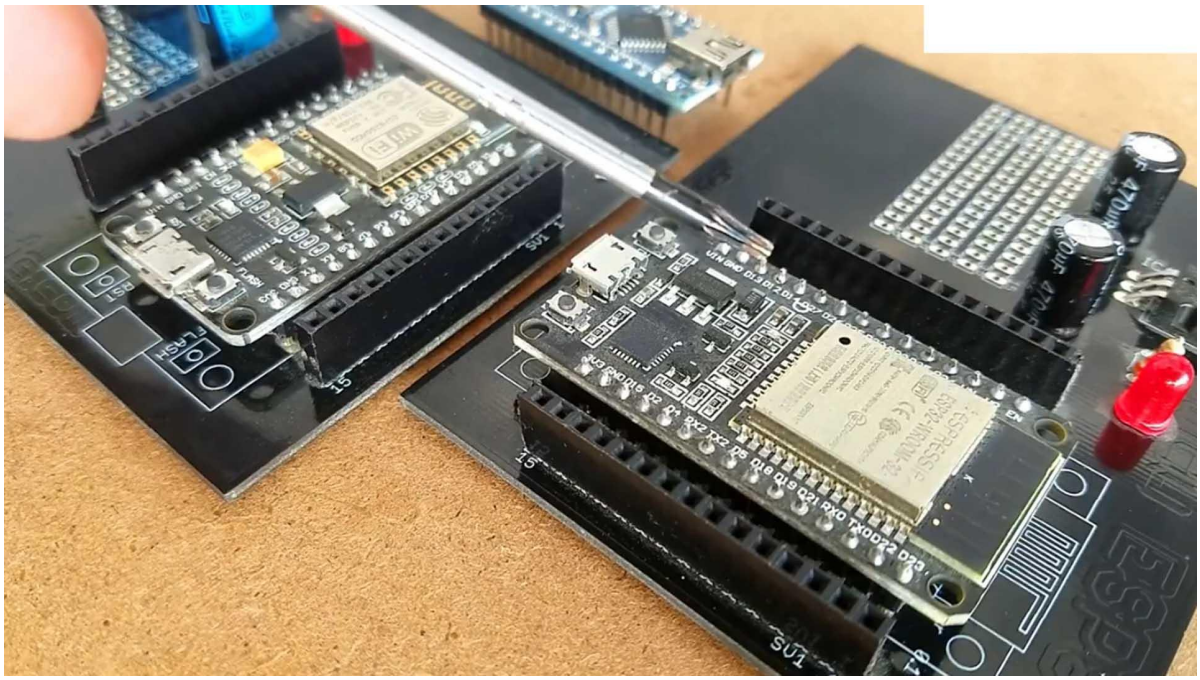
the speed of a DC motor using pulse width modulated DC voltage. With a duty cycle fully adjustable from 5% to 100%, this motor speed controller can easily provide a continuous current of three amps to your DC motor or other DC loads. The speed of the DC motor can be controlled using the onboard potentiometer. The module is also provided with terminal blocks used to connect the motor and power supply on the bottom side. The terminals are clearly labeled as Power minus, Power plus, Motor plus, and Motor Minus. The input supply voltage of this motor driver is from 6 volts to 28 volts DC and has a maximum output power of 80 watts. Connect the ground via with the power minus contact and connect the positive voltage via with the power plus. Connect the two wires of the 775 motor with the motor plus and motor minus contacts of the motor driver.



Our connections are completed, and now we can start controlling the double 775 DC motor using the potentiometer. The voltage applied to the motor will be the supply voltage applied to the circuit.

MULTIPLE ANALOG SENSORS MONITORING

The NodeMCU ESP8266 is no doubt an amazing microcontroller board developed by Expressive Systems. It has multiple digital and PWM pins. You can interface SPI, Serial, I2C, and one-wire supported devices, just like the Arduino boards. If you compare the NodeMCU ESP8266 with the ESP32 and Arduino, you will find that the NodeMCU ESP8266 Wi-Fi module has only one analog pin, A0, while in ESP32 and Arduino boards, we have multiple analog pins.

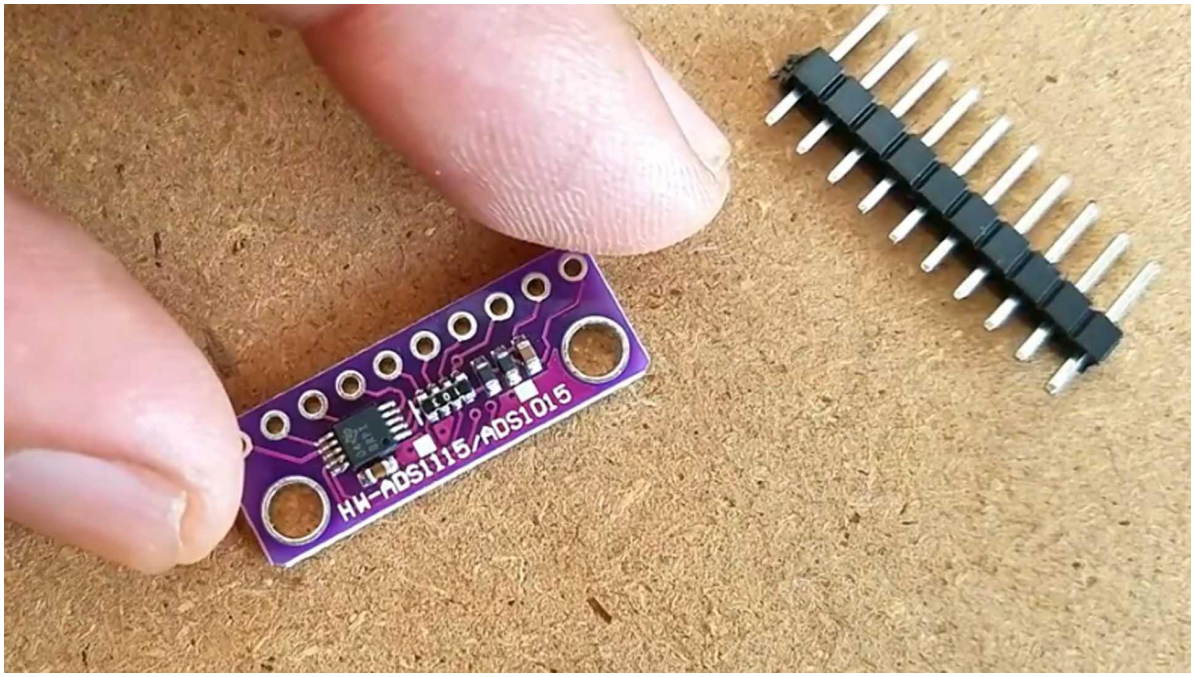


Now we have got three options:

1. You can use the ESP32 Wi-Fi plus Bluetooth module, which has multiple analog pins, and you can do all the

same things that you can do with the NodeMCU ESP8266.

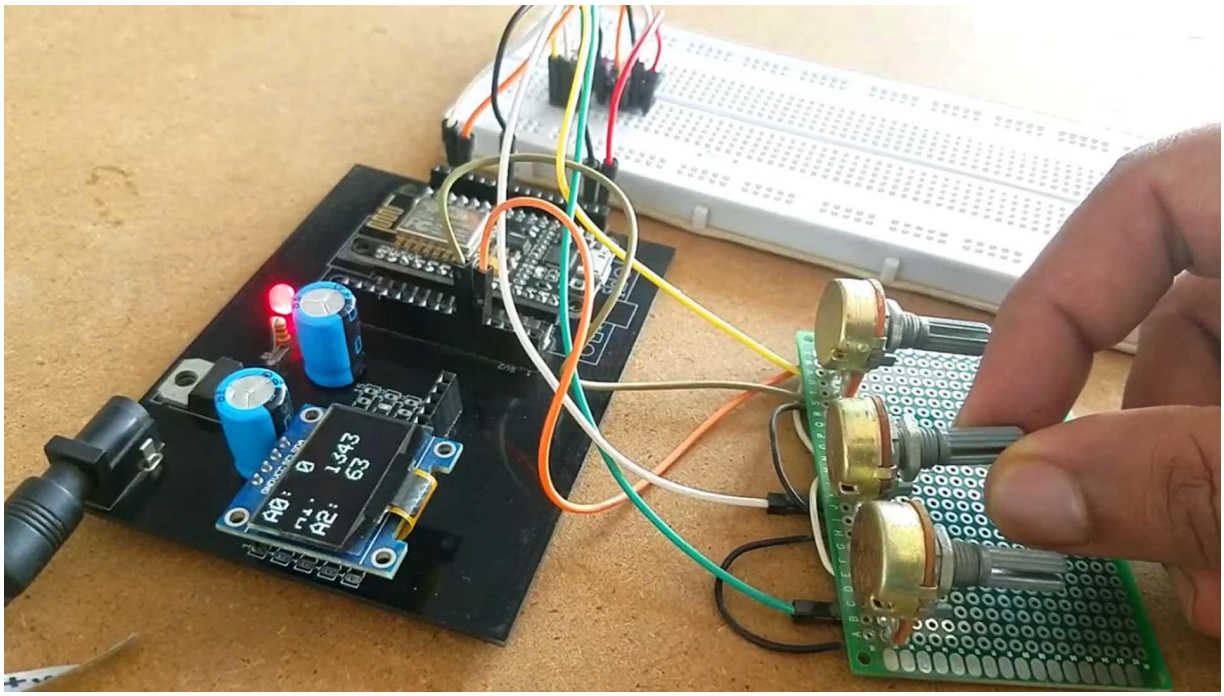
2. You can use the ADS1015 or ADS1115 Analog-to-Digital converter to increase the number of analog pins.
3. You can use Arduino with NodeMCU ESP8266 to increase the number of analog pins, which I would not recommend as this will increase the project's overall cost and will also increase the coding effort. It seems quite impractical unless you are working on a very complicated project. So my recommendation is that you should use the ESP32 Wi-Fi Bluetooth module. But if still, you want to use the NodeMCU ESP8266, then I highly recommend using the analog pins extender port like the ADS1015 or the ADS1115.



The ADS1015 is a 12-bit analog-to-digital converter, while the ADS1115 is a 16-bit analog-to-digital converter. It really doesn't matter whether you want to use the ADS1015 or the ADS1115. Both modules have got the same pins and are programmed in the same exact way. So in this tutorial, we will learn how to use the ADS1015,

a 12-bit I2C-supported analog-to-digital converter with the NodeMCU ESP8266 to increase the number of analog pins so that multiple analog sensors can be interfaced with the NodeMCU ESP8266. For demonstration purposes, I have connected three potentiometers, which I am using as the sensors, which of course, you can replace with other analog sensors.

I started with a very basic program and displayed the values of all three potentiometers on the serial monitor. I further modified the code, and this time, I displayed the values of all three analog sensors on the I2C-supported OLED display module



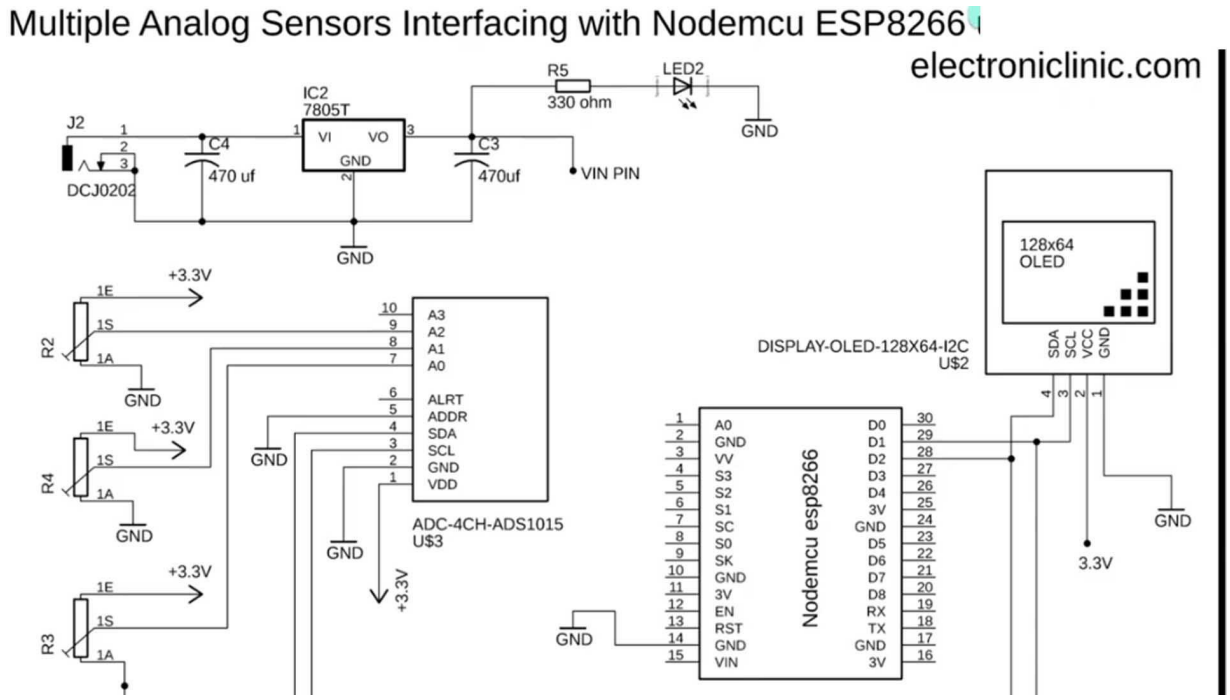
The ADS1015 and the OLED display module both support I2C communication, which means using only two pins, SCL and SDA, I can communicate with both the modules. In this tutorial, we will cover:

1. ADS1015 Analog-to-Digital Converter Pinout and Technical Specifications
2. Complete Circuit Diagram Explanation

3. ADS1015 Library Installation
4. Program Explanation
5. Testing

Without any further delay, let's get started. The components and tools used in this project can be purchased from Amazon. The component purchase links are given in the description.

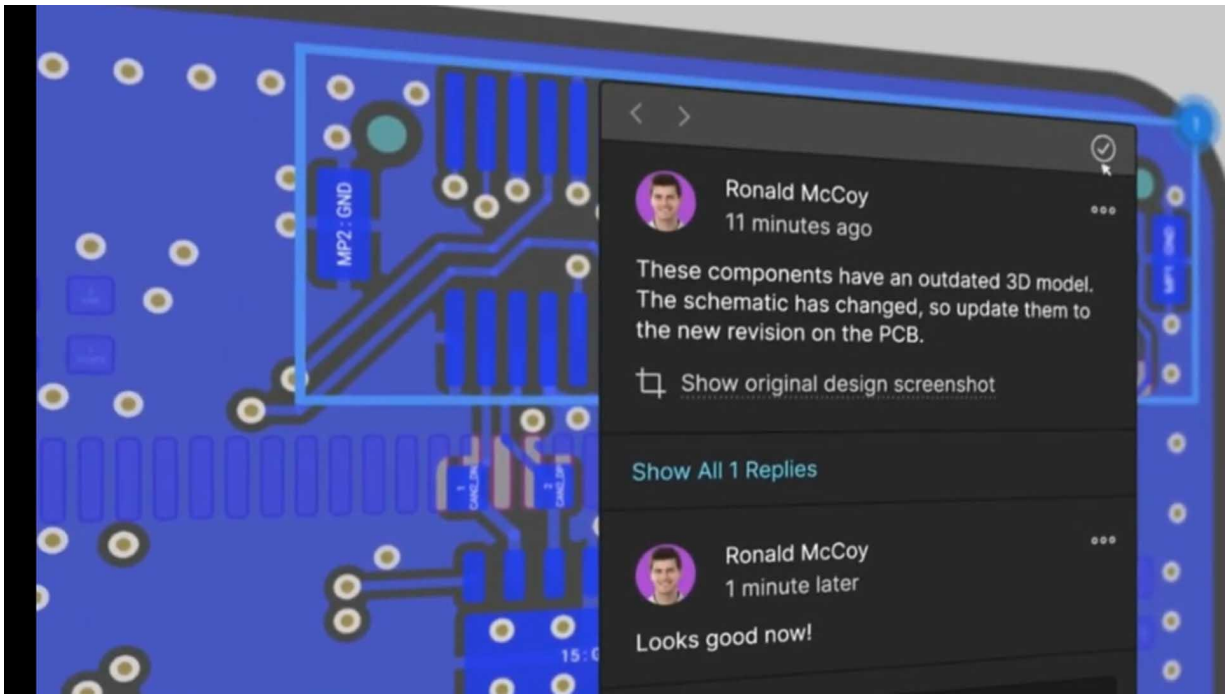
The ADS1013, ADS1014, and ADS1015 are precision analog-to-digital converters with 12 bits of resolution used for extending the analog pins. This is an I2C-supported device and can be easily operated from a single power supply ranging from 2.0 volts to 5.5 volts. Due to this wide range of input voltages, the ADS1015 can be easily used with 3.3-volt and 5-volt compatible controller boards. The ADS1015 can perform conversions at rates up to 3300 samples per second. It has an onboard PGA that offers input ranges from the supply to as low as plus-minus 256 millivolts. This allows both large and small signals to be measured with high resolution. The ADS1015 also features an input multiplexer that provides 2 differential or 4 single-ended inputs. The ADS1015 can be operated either in continuous conversion mode or in a single-shot mode that automatically powers down after a conversion and greatly reduces the current consumption during idle periods. The ADS1015 has a total of 10 headers, clearly labeled as voltage, ground, SCL, SDA, Address, Alert, A0A, A1A, and A2. So, a total of 4 analog sensors can be connected with this analog-to-digital converter. For more details, read my article available on electronicclinic.com. I will provide a link in the description. Now let's take a look at the complete circuit diagram.



The 5-volt regulated power supply based on the LM7805 voltage regulator is used to power up the NodeMCU ESP8266 Wi-Fi module. The output of the regulator is connected with the V and GND pins of the NodeMCU module. J1 is the input female power jack, and this is where we connect the voltage source. You can connect any voltage source between 7 to 25 volts to the input jack.

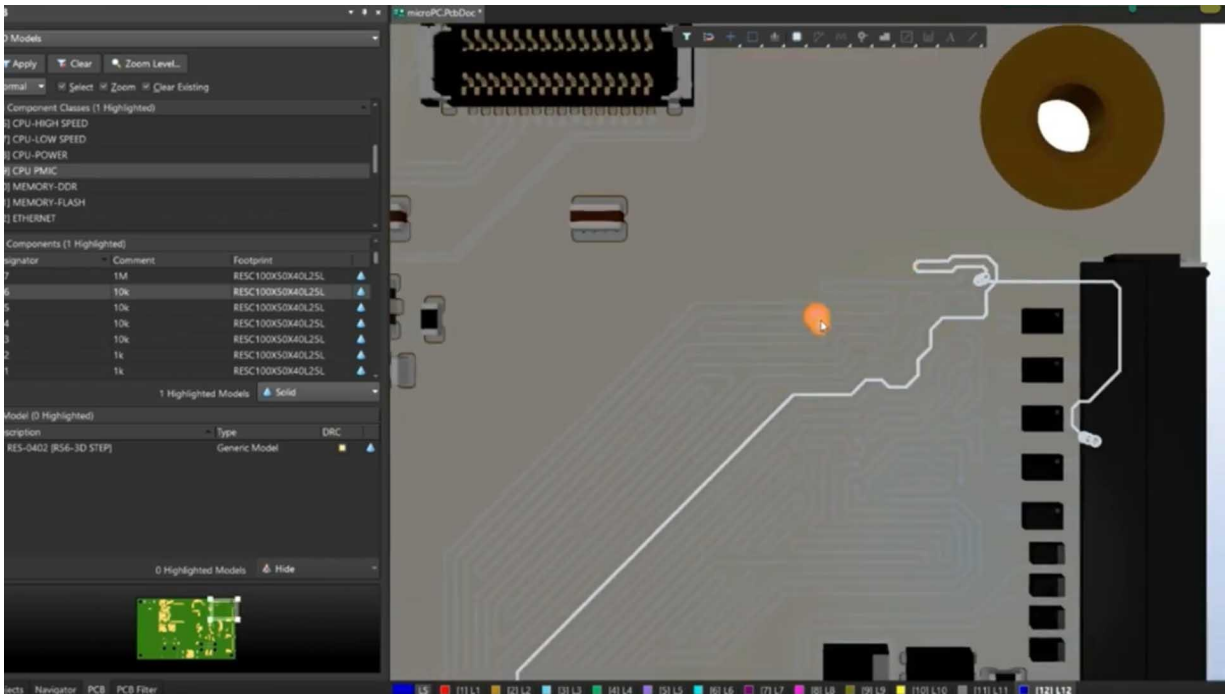
ALTIUM DESIGNER ALTIUM 365 AND OCTOPART

Ultium 365 lets you hold the fastest design reviews ever. Share your designs from anywhere and with anyone. With a single click, it's easy. Leave a comment, tag your teammate, and they will instantly receive an email with a link to the design. Anyone you invite can open the design using a web browser.



Using the browser interface, you are able to comment, markup, cross-probe, inspect, and more. Comments are attached directly to the project, making them visible within Ultium Designer as well as through the browser interface. Design, share, and manufacture all in the same space with nothing extra to install or configure. Connect to

the platform directly from Ultium Designer without changing how you already design electronics.

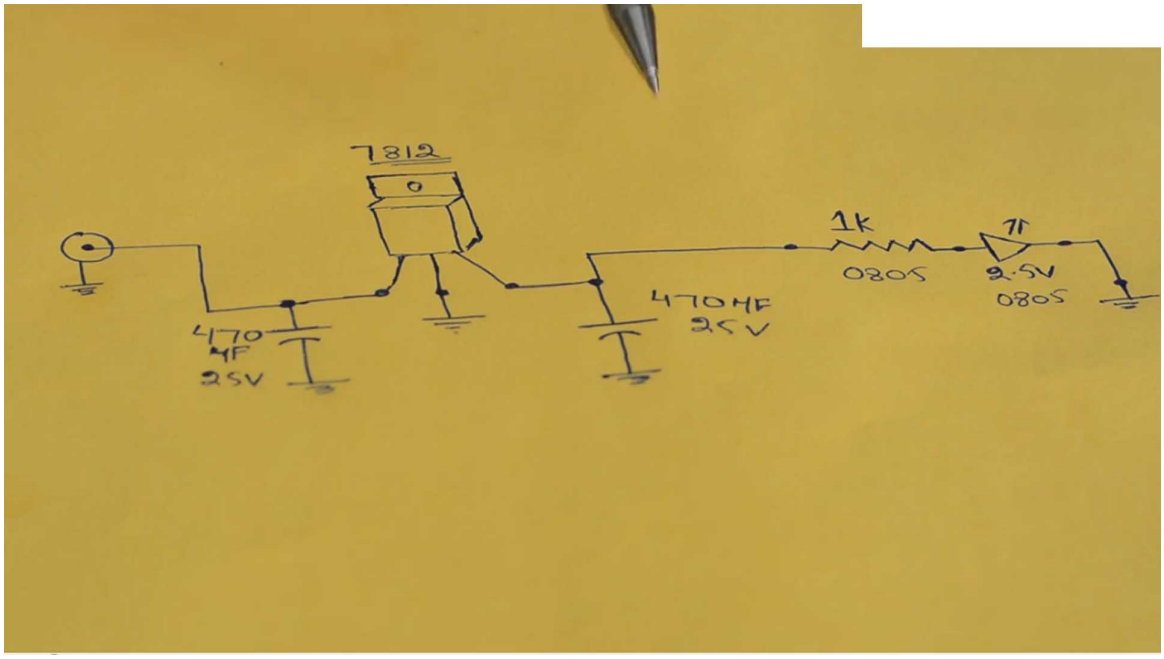


Ultium 365 requires no additional licenses and comes included with your subscription plan. Kit Real Time Component Insights is included as you design with UpTopPart built into Ultium 365. UpTopPart is the fastest search engine for electronic parts and provides you with the most updated part data, like specs, data sheets, kit models, and how much the part costs at different quantities, all right in the design environment so you can focus on your designs.

Links to Ultium Designer, RTM 365, and Octopart are given in the description.

ALTIUM COMPONENTS SEARCHING COMPONENT LIBRARY

In today's episode, you will learn how to search for components and how to add existing components, libraries, and Ultium Designer. Before you start making schematics and PCB designs in Altium Designer Software, there are some very important things that I believe as a beginner you should know to speed up your Ultium Designer learning process. Number one, before creating a schematic of PCB in Altium Designer, you must know the complete connections of your project or product in advance.

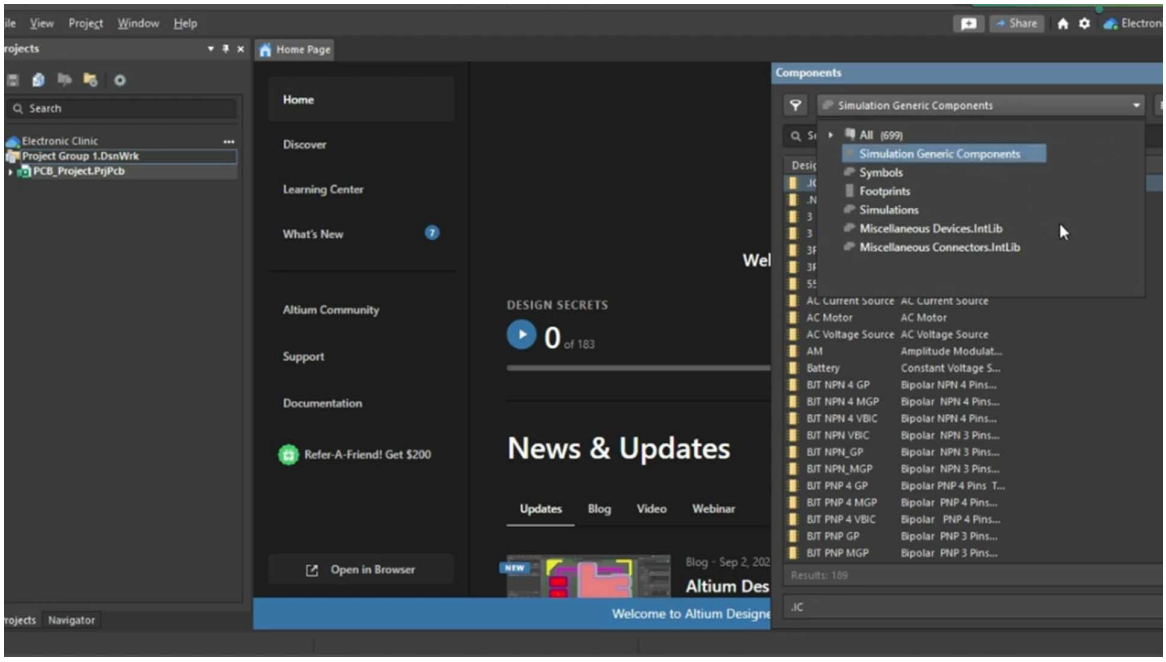


As you can see, I have made a rough circuit diagram of a 12 Volt regulated power supply. I must know about the components I am

using to build a 12 Volt regulated power supply. For example, if I am using this resistor, then I should know its value, whether I am going to use an SMT type resistor or through-hole type resistor, its footprint, etc. Similarly, we must have a complete idea about all the components. Next, you should write the names and specs of all the components in a file. It will really help you at the time of searching for components.

So, as you can see, to build a 12 Volt regulator power supply, I need a DC power jack, resistor, LED, capacitors, and a terminal block. So, I have the circuit diagram and I also know about the components which I am going to use. So, let's go ahead and open Ultium Designer and search for all these components. I'm using the licensed version of Ultium Designer, but as a beginner, you can start with the trial version of Ultium Designer. You can click on the first link in the description.

For now, you don't need to open a new project first. We will search for all the components so that our time is not wasted during schematic and PCB designing.



Because it becomes quite boring to search for components again and again while making the schematic. You can see the components

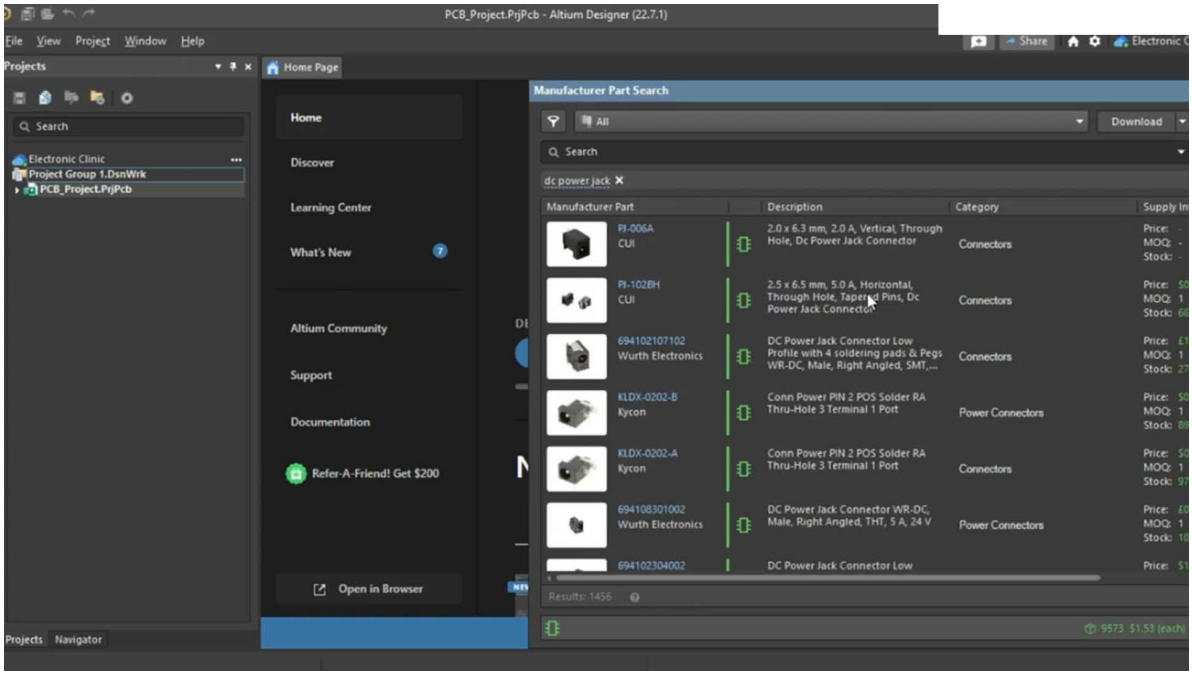
panel on the right side. Simply click on this. You can also access the same components panel by clicking on the "Panels" button.

You can see we have got different panels. For now, click on the "Components" panel. You can also open the components panel by going to the "View" menu and then to "Panels". Once the components panel is open, click on this button if you want to make a simulation. Then you can select the simulation, generate components, and if you want to search ICs, controllers, resistors, capacitors, and other devices, then you can click on "Miscellaneous Devices". And if you want to search for connectors, then click on "Miscellaneous Connectors" on the right.

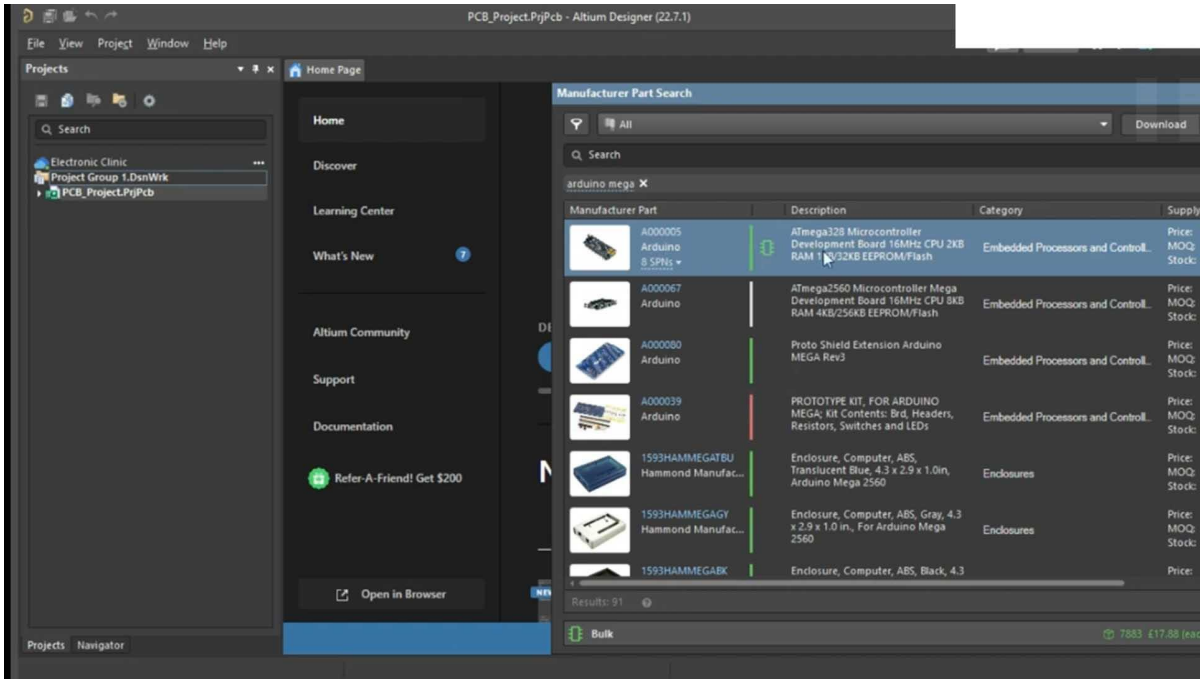
Now I want to search for the DC power jack. So, I will select "Miscellaneous Connectors". We already have this long list of the most commonly used connectors. Let's go ahead and check if we can find the DC power jack. Let's check this "Low Voltage Power Supply Connector". Its design item ID is "PWR 2.5". Right now, I have no idea how its schematic symbol and what its PCB footprint looks like.

To find out more about this item, simply click on the double arrow button to reveal the component details. Unfortunately, this is not the type of DC power jack I am searching for. If your desired connector is not available in this list, no worries at all. You can make a search by typing the name of the item, and Ultium will find the related items for you in just one to two seconds. And this is possible due to Octopart built into Ultium. Octopart is the world's fastest component search engine.

Anyway, as you can see, Ultium has searched for more than 1000 components. So let's go ahead and click on the "Manufacturer Part Search".

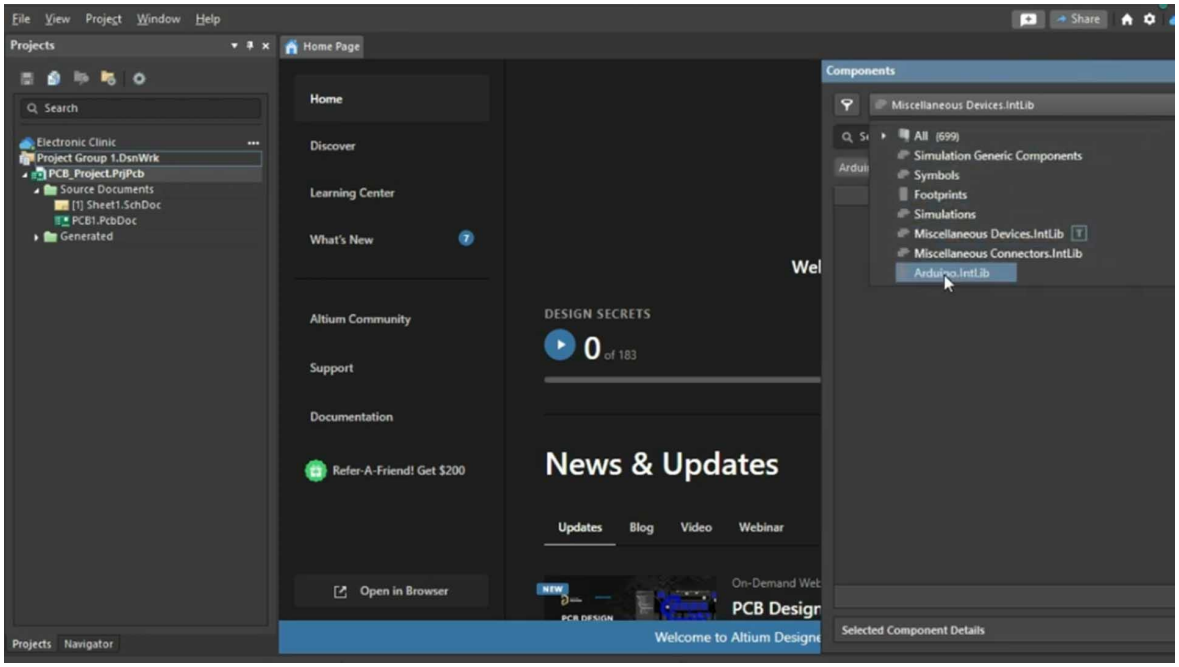


We have hundreds of different types of DC power jacks. The components' images and descriptions really make it easy to find the desired component. This is the one I am interested in. These are available in stock and the price is also given. If you want to know more about this DC power jack, then simply click on the part number, and it will take you to the Octopart website. You can check the prices of different models, check and download the datasheet.



So after you are completely satisfied with the component, then you can copy the part number and paste it in the file. Next time, if you will need this DC power jack, then you can simply search for this part number. One more thing, select the component which has this IC symbol. Next, I am going to search for the terminal block, which also comes under the category of connectors. So let's go ahead and search for the terminal block. It has found thousands of different types of terminal blocks, so select the one you are interested in.

In my case, I'm going to select this terminal block because I already have these terminal blocks, so I'm going to copy its part number and paste it into the file.



Next, I'm going to search for the 470 microfarad capacitor. This time, select the "Miscellaneous Devices". Write the capacitor value and the voltage. Now you have these hundreds of SMD and through-hole type capacitors. Select the one you need. In my case, I will select the SMD type. This is the one I'm going to use, so I'm going to copy its part number.

Next, I'm going to search for the 1K ohm SMD resistor of 0805 footprint. I'm going to copy its part number and paste it into the file. Using the same exact method, I search for the 7812 SMD type voltage regulator and 2.5 Volt LED with footprint 0805. By the way, you will find every component in Altium, but sometimes it also happens.

A4988 HYBRID STEPPER MOTOR DRIVER

This is a basic getting started tutorial in which you will learn how to use the AutoVano CNC Shield V 3.0 and A4988 Stepper Motor Driver to control a hybrid stepper motor. This project is sponsored by DFRobot and DigitSpace. I will start with a very basic explanation of how to control the direction of the stepper motor using a simple AutoVano program. Then I will make it a little bit more complex by adding a joystick which can be used to control the stepper motor. I will also explain how to use these main headers in custom-made projects.

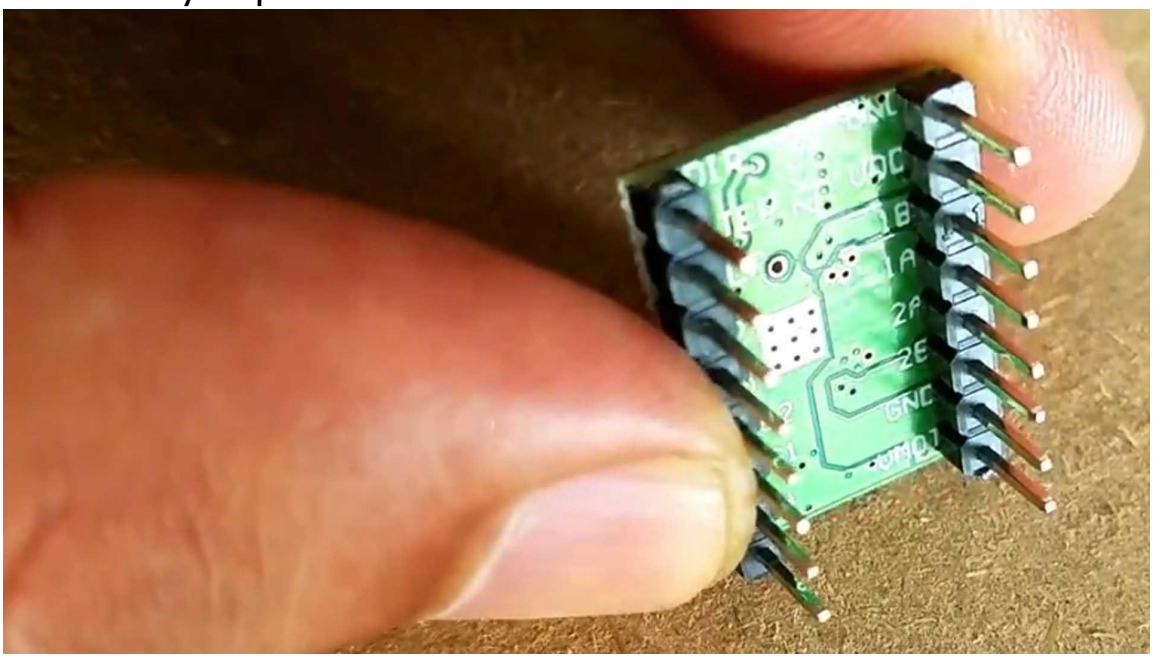
In this tutorial, we will cover:

1. A4988 Stepper Motor Driver Pinout and Technical Specifications
2. CNC Shield V 3.0 Pinout and Technical Specifications
3. Hybrid Stepper Motor Wires and Technical Specifications
4. Interfacing
5. AutoVano Programming

The components and tools used in this project can be purchased from Amazon, and the component purchase links are given in the description.

The A4988 is a complete microstepping motor driver with a built-in translator for easy operation. It is designed to operate bipolar stepper motors in full, half, quarter, 8th, and 16th step modes with an output drive capacity of up to 35 V and 2 A. The A4988

includes a fixed off-time counter regulator which has the ability to operate in slow or mixed decay modes. The translator is the key to the easy implementation of the A4988.



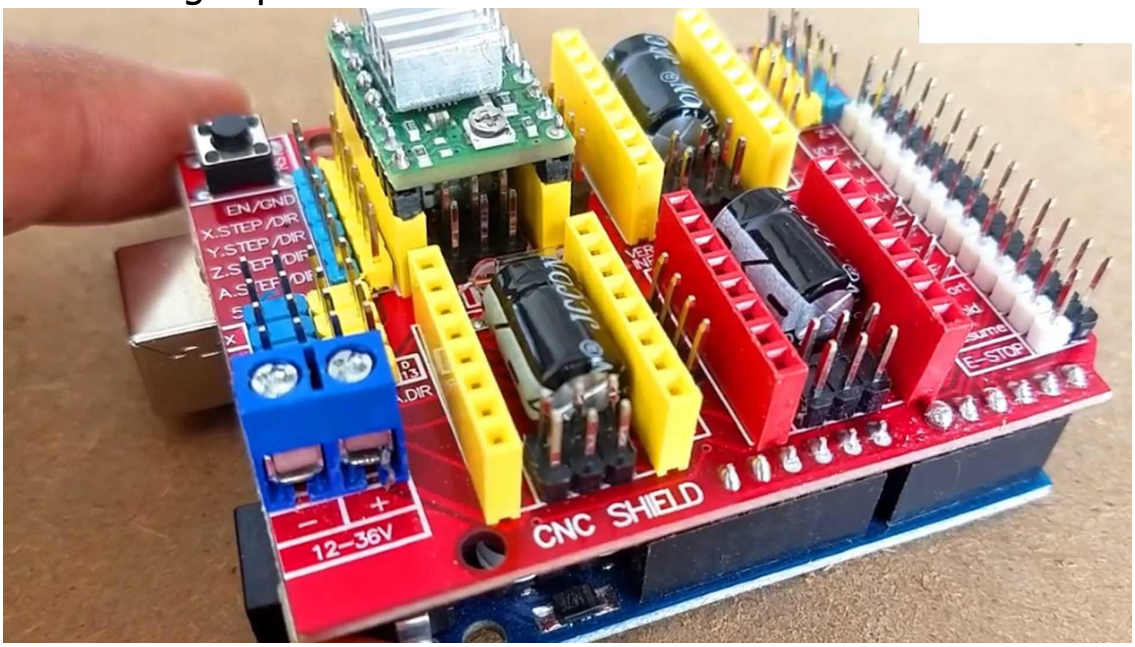
Simply inputting one pulse on the step input drives the motor one microstep. There are no phase sequence tables, high-frequency control lines, or complex interfaces to program. The A4988 interface is an ideal fit for applications where a complex microprocessor is unavailable or is overburdened.

As you can see, the A4988 stepper motor driver has a total of 16 pins which are clearly labeled as Ground, VDD, 1B, 1A, 2B, 2A, VMOT, DIR, STEP, SLP, RESET, MS3, MS2, MS1, and EN.

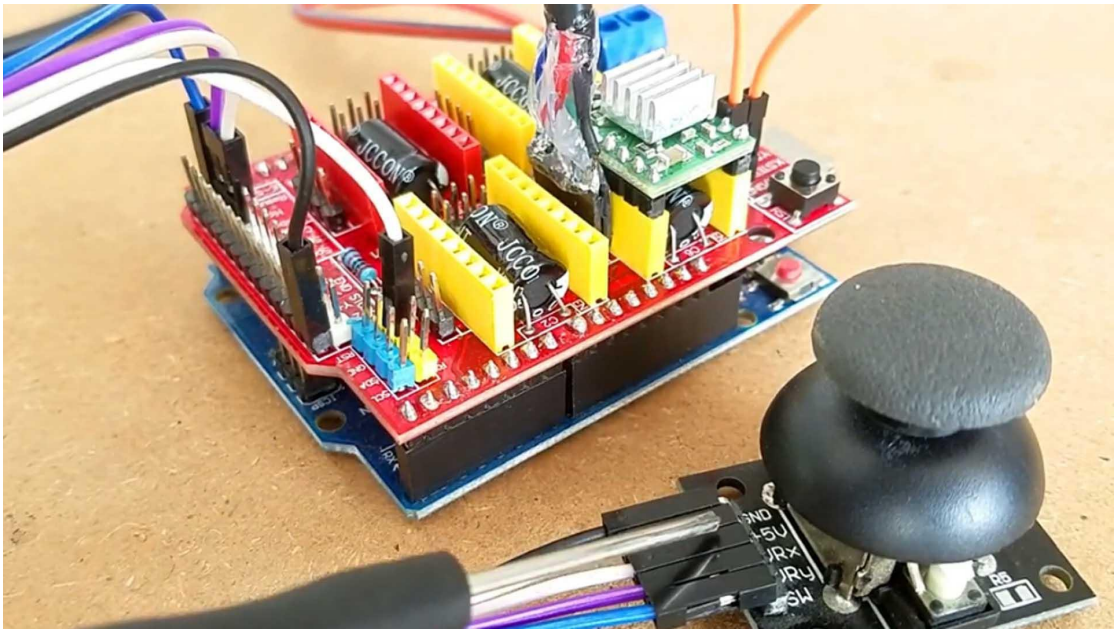
Let's start with the Ground and VDD pins. These two pins are connected with a power supply of 3 to 5.5 V to power up the driver. You can connect these two pins with the corresponding ground and power pins. The next 4 pins, 1A, 1B, 2A, and 2B, are connected with the bipolar stepper motor. As you know, a bipolar stepper motor has four wires which are internally connected with the two coils. So the pins 1A and 1B will be connected to one coil

of the stepper motor, and the pins 2A and 2B will be connected to the other coil of the bipolar stepper motor.

The next two pins, Ground and VMOT, are used to power up the bipolar stepper motor. The Ground and VMOT pins are connected to a power supply from 8 to 35 volts. If you are not using the CNC shield, then I highly recommend using a decoupling capacitor across these two pins. The capacitor value should be at least 47 microfarads. This capacitor is used for protecting the A4988 driver from voltage spikes.



The next two pins, STEP and DIRECTION, are the pins that we actually use for controlling the motor movements. The direction pin controls the rotation direction of the motor, and we need to connect it to one of the digital pins on the microcontroller. With the STEP pin, we control the microsteps of the motor, and with each pulse sent to this pin, the motor moves one step.



So, that means we don't need any complex programming, phase sequence tables, frequency control lines, and so on because the built-in translator of the A4988 driver takes care of everything.

I will also need to mention that these two pins are not pulled to any voltage internally, so we should not leave them floating in our program. The SLP pin can be used to minimize the power consumption when the motor is not in use. A logic low input on this pin puts the A4988 stepper motor driver in sleep mode. The next pin is the RESET pin that sets the translator to a predefined home state. If you want to study more about this, you can download the A4988 driver datasheet available on my website, ElectronicClinic.com.

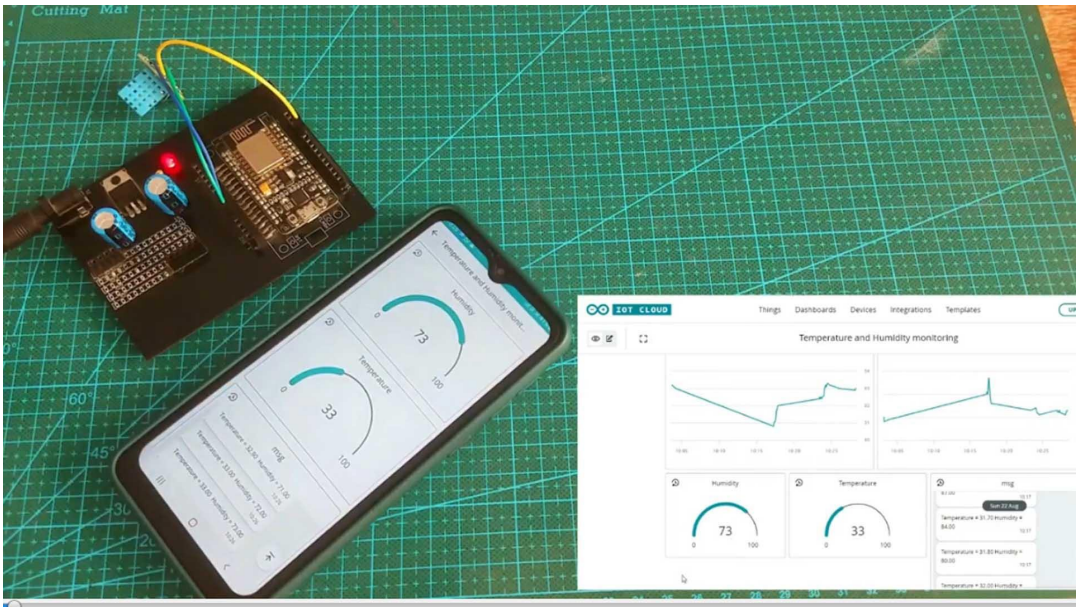
The next three pins, MS1, MS2, and MS3, are used for selecting one of the five step resolutions. As per the truth table available in the datasheet, these pins have internal pull-down resistors, so if we leave them disconnected, the board will operate in full step mode. The last pin is the EN (Enable) pin, which is used for turning on or turning off the FET outputs. So, logic high will keep the outputs disabled.

This is the CNC Shield V 3.0 which I got from DigitSpace. If you have this CNC shield, then using the A4988 stepper motor driver is

very simple. You don't need a breadboard for the connections. You can easily plug in the A4988 drivers. You can plug in four drivers, but in this tutorial, I will use only two drivers. First, I will explain everything.

TEMPERATURE AND HUMIDITY MONITORING

I explained how to get started with the Artvino IoT Cloud using the ESP32 Wi-Fi Bluetooth module and detailed the most basic concepts that I believe beginners should know. In my first project, I demonstrated how to control the onboard LED of the ESP32 and how to monitor a potential meter. This tutorial will help you understand how to utilize the digital and analog pins of the ESP32 module. In my second tutorial, I created a home automation project using the same ESP32 module, where I controlled 220 Volt A/C light bulbs and a fan through my cellphone and computer. If you're interested in controlling A/C or DC loads using relays, you should definitely watch that tutorial.



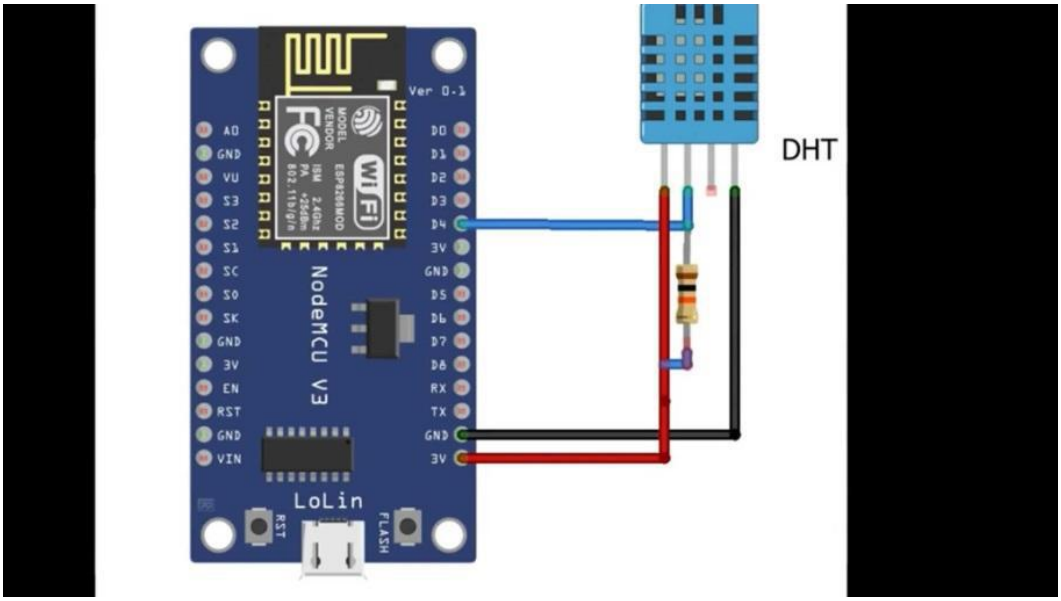
In today's episode, we'll be integrating the Artvino IoT Cloud with the NodeMCU ESP8266 Wi-Fi module. We'll be using the DHT11

temperature and humidity module along with the NodeMCU ESP8266. Our goal is to measure temperature and humidity and then send these values to the Artevino IoT cloud, where they'll be displayed on gauges, charts, and message widgets. You'll be able to monitor these values using your cellphone or computer. The dashboard you see on your cell phone is automatically generated, and I've explained this process in my previous tutorials. With this project, you can monitor temperature and humidity values from anywhere in the world, as long as you have an internet connection.

In this tutorial, I won't be covering the most basic steps, such as account registration and Arduino Create Agent installation, since these are the same for both the ESP32 and NodeMCU ESP8266 Wi-Fi modules. Without further delay, let's jump into the project.

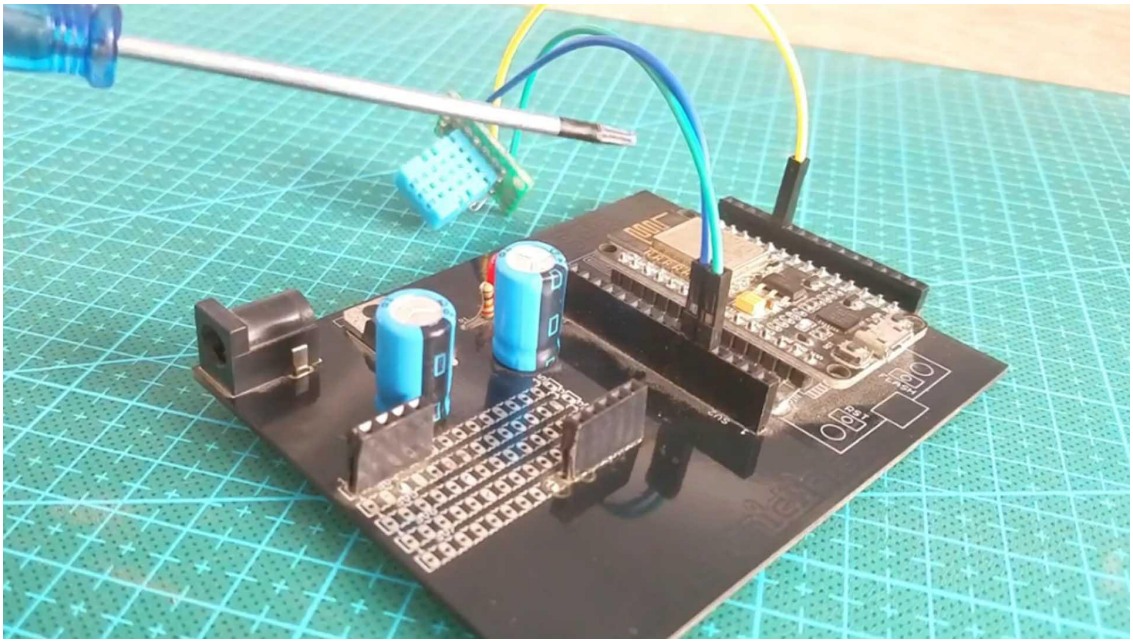
The components and tools used in this project can be purchased from Amazon. You'll find the component purchase links in the description.

Here are the minimal connections you can use to power up the NodeMCU ESP8266 Wi-Fi module with your laptop for testing purposes.



A 10K ohm resistor is connected between the data and VCC pins of the DHT11 sensor. The data pin of the DHT11 sensor is connected to the D4 pin of the NodeMCU ESP8266 Wi-Fi module. Now, let's look at another circuit diagram.

The DHT11 temperature and humidity sensor connections with the NodeMCU ESP8266 remain exactly the same. This time, I've added a 5V regulated power supply based on the 7805 voltage regulator. You'll need this 5V regulated power supply for the NodeMCU ESP8266 module since you cannot use your laptop or computer as a permanent power source. Here's my NodeMCU ESP8266 development board based on the same connections as explained in the circuit diagram.



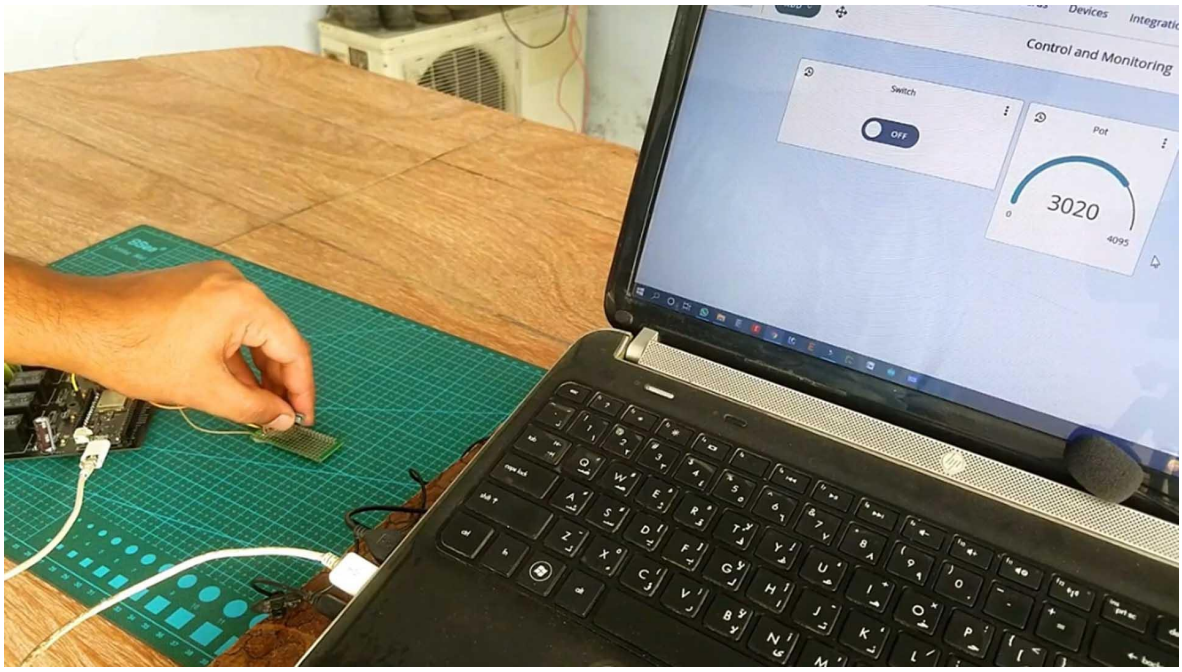
I've already described the design and construction process. If you're interested, I'll provide a link in the description for making the same development board. This is the DHT11 sensor, to which I've already soldered some jumper wires and a 10K ohm resistor between the data and VCC pins. I've connected the DHT11 temperature and humidity sensor to a NodeMCU ESP8266. As per the circuit diagram, let's now proceed to work on the Artevino IoT Cloud.

Open your Arduino IoT Cloud registered account and follow the same execution steps.

CLOUD GETTING STARTED BLYNK ALTERNATIVE

I have been using different IoT platforms, including UVdots, ThingSpeak, and the Blink application, for remote sensor monitoring and controlling various electrical devices. Today, for the first time, I am going to use the AutoVino IoT Cloud. So, in essence, this will be a getting started tutorial explaining how to use the AutoVino IoT Cloud with the ESP32 Wi-Fi Bluetooth module.

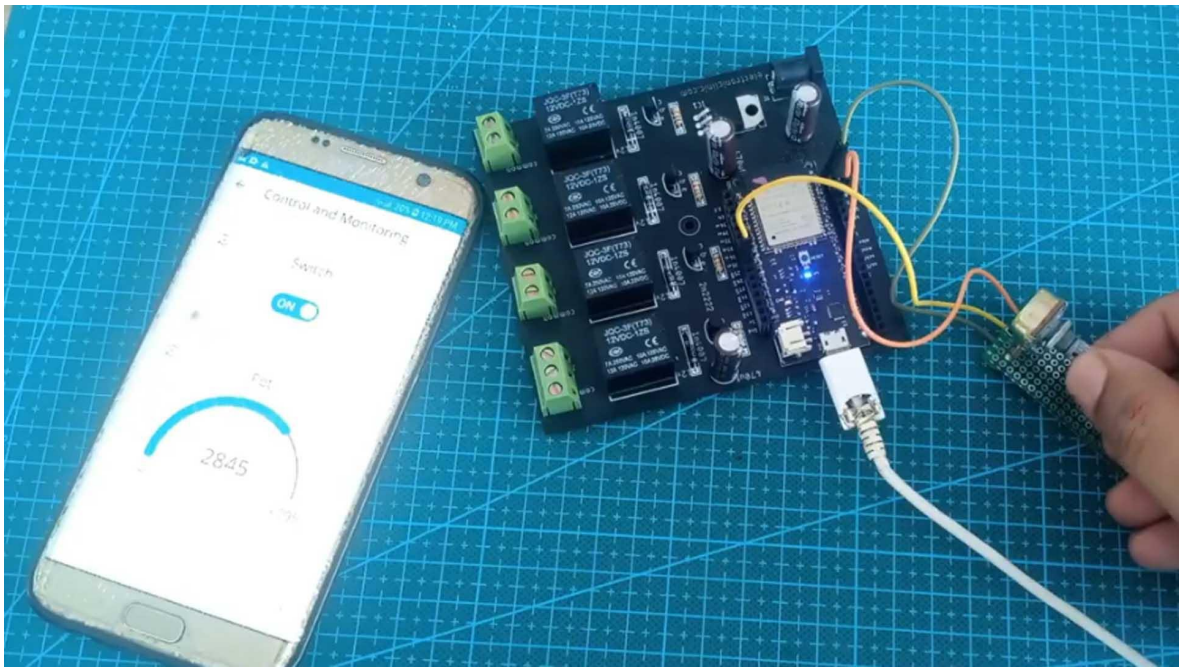
To be honest with you all, the AutoVino IoT Cloud may not be as powerful as the Blink application and UVdots. However, you can consider using the AutoVino IoT Cloud as an alternative because it's straightforward compared to other IoT platforms. Additionally, the AutoVino IoT Cloud is gaining popularity, and I'm confident that they will add more widgets and features in the future.



Anyways, with the AutoVino IoT Cloud, you can monitor and control anything you want, but there is a limit, which I will explain later in this project. This project is sponsored by Ultium.

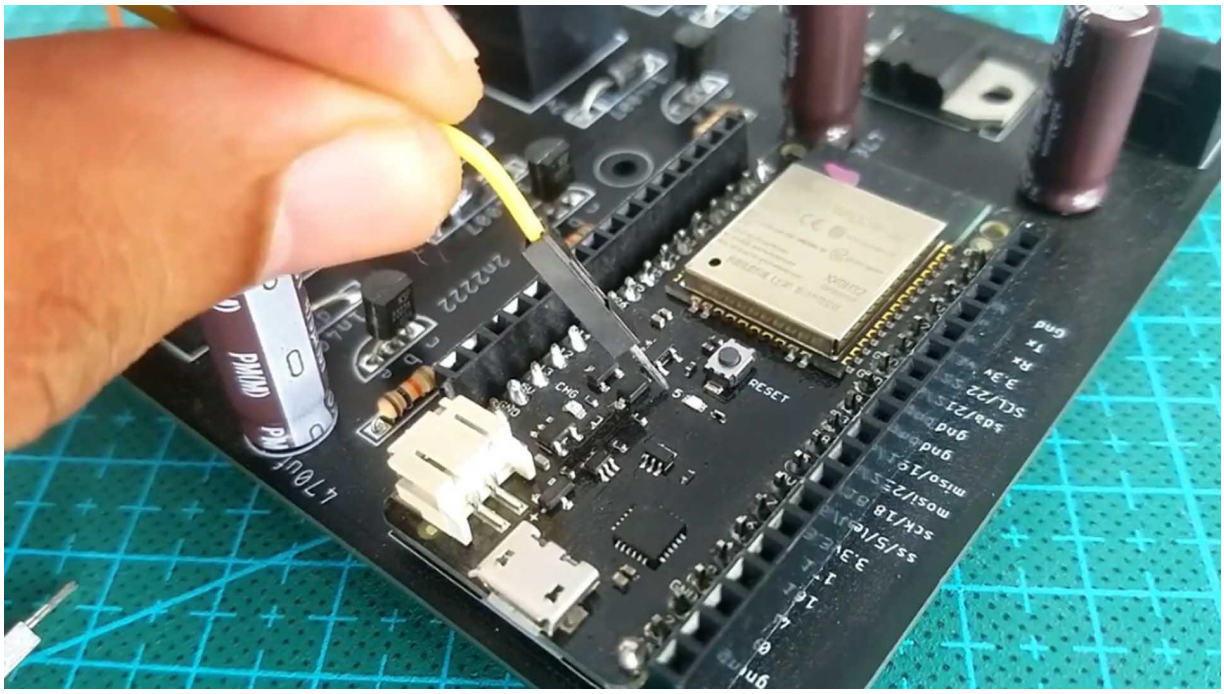
Ultium Designer is the world's most trusted PCB design system. Ultium Designer enables engineers to effortlessly connect with every facet of the electronics design process. With over 35 years of innovation and development focused on a truly unified design environment, it is the most widely used PCB design solution. With Ultium Designer, you can create PCB designs with an intuitive and powerful interface that connects you to every aspect of the electronics design process. You can route it your way through any angle, tune for delay, push, slide, and walk around faster than ever. Interact and collaborate with mechanical designers like never before in a photorealistic 3D design environment. If you want to get started with Ultium Designer, you can click on the first link in the description.

In this episode, we will write a very basic program to control the ESP32 onboard LED, and then we will modify the code to monitor an analog sensor. For demonstration purposes, I will use a potentiometer.



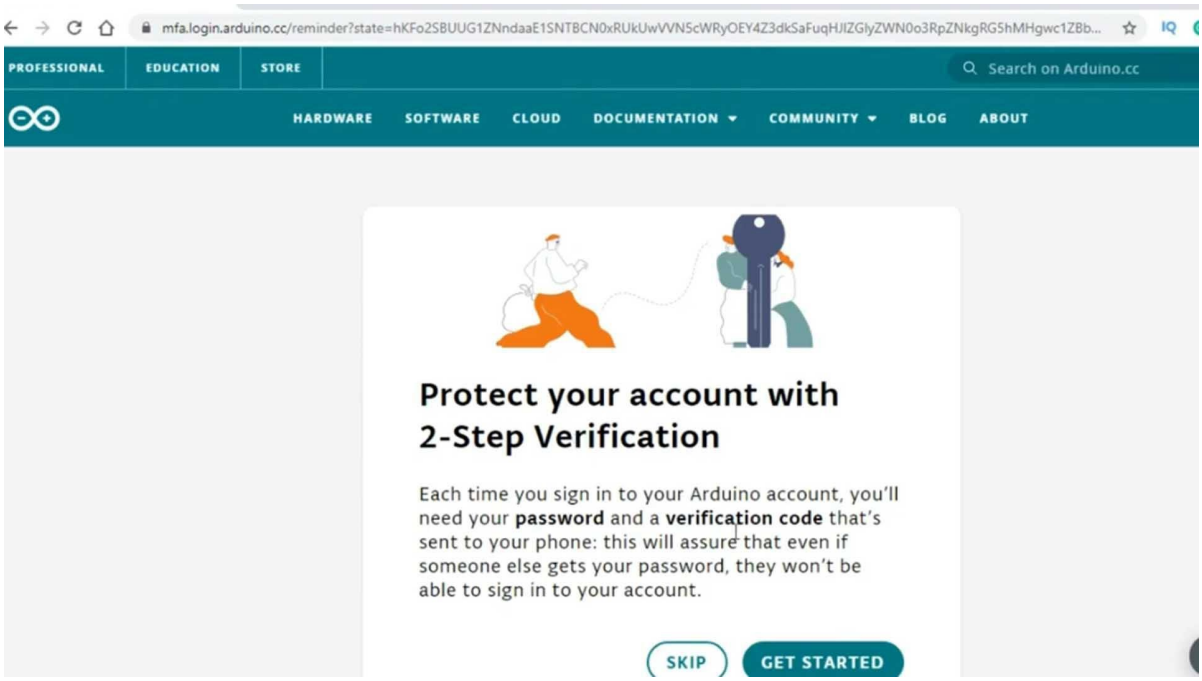
The very best thing about the Arvino IoT Cloud is that when you create the dashboard on your PC, the Android or iOS app is automatically generated. This means you can monitor and control things from your cell phone without any further delay. Let's get started.

The components and tools used in this project can be purchased from Amazon. You can use the ESP32 Wi-Fi Bluetooth module alone, or you can use my designed ESP32 Development Board. I'll provide a link in the description if you want to make the same ESP32 Development Board.



In the first example, we will control the ESP32 onboard LED, which is connected to GPIO 5. Different versions of the ESP32 modules have onboard LEDs connected to different pins. The one I am using has its LED connected to GPIO 5.

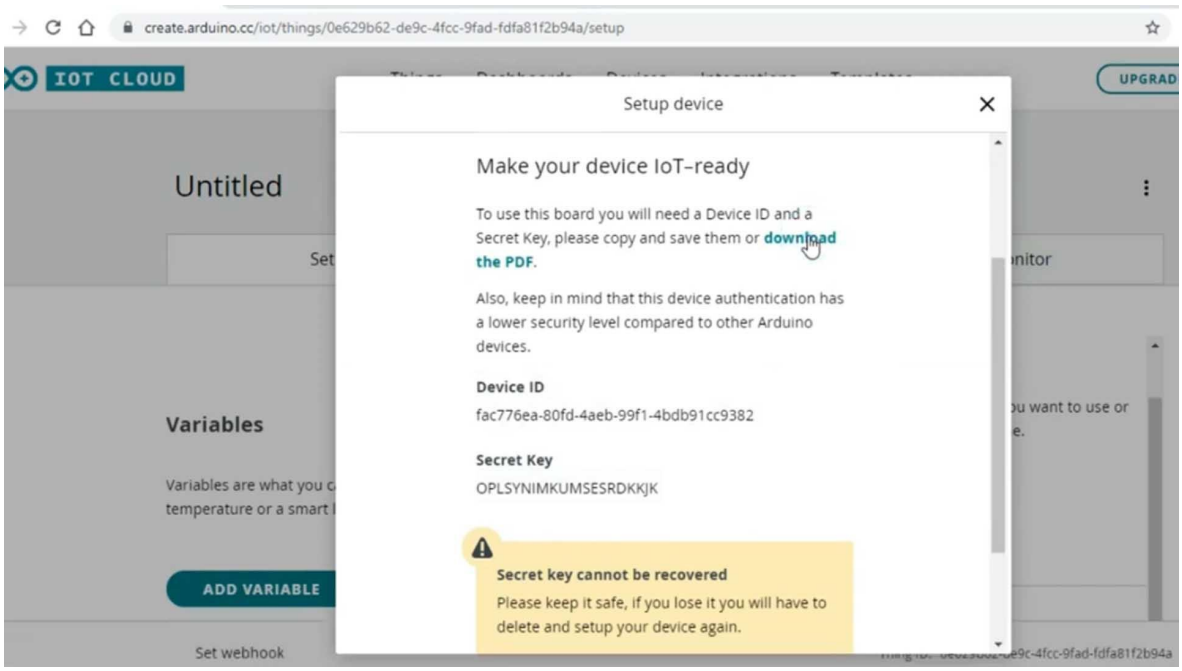
Now, let's set up the AutoVino IoT Cloud. Search for the AutoVino IoT Cloud and click on "Create One" if you are not registered. I have already created my account, so I will simply enter my username and password.



You can also protect your account with two-step verification, something you are already familiar with. I will skip this step.

That's it. Let's take a look at the different plans before we create our first thing. We have these four monthly and yearly plans. As a beginner, you can start with a free plan, and then if you like it, you can try other plans. The free plan is not bad at all for beginners. You can create two things, unlimited dashboards, 100 MB to store sketches, one-day data retention, and nice compilation time. I myself am using the free plan. You can compare the free plan with the other three plans and select the one that suits your requirements.

Enough with the talking. Now let's go ahead and create our first thing. Click on the "Create Thing" button, then click on the "Select Device" button, followed by "Setup New Device." Select "Setup a Third-Party Device" and then choose the device and model. Give your device a name.



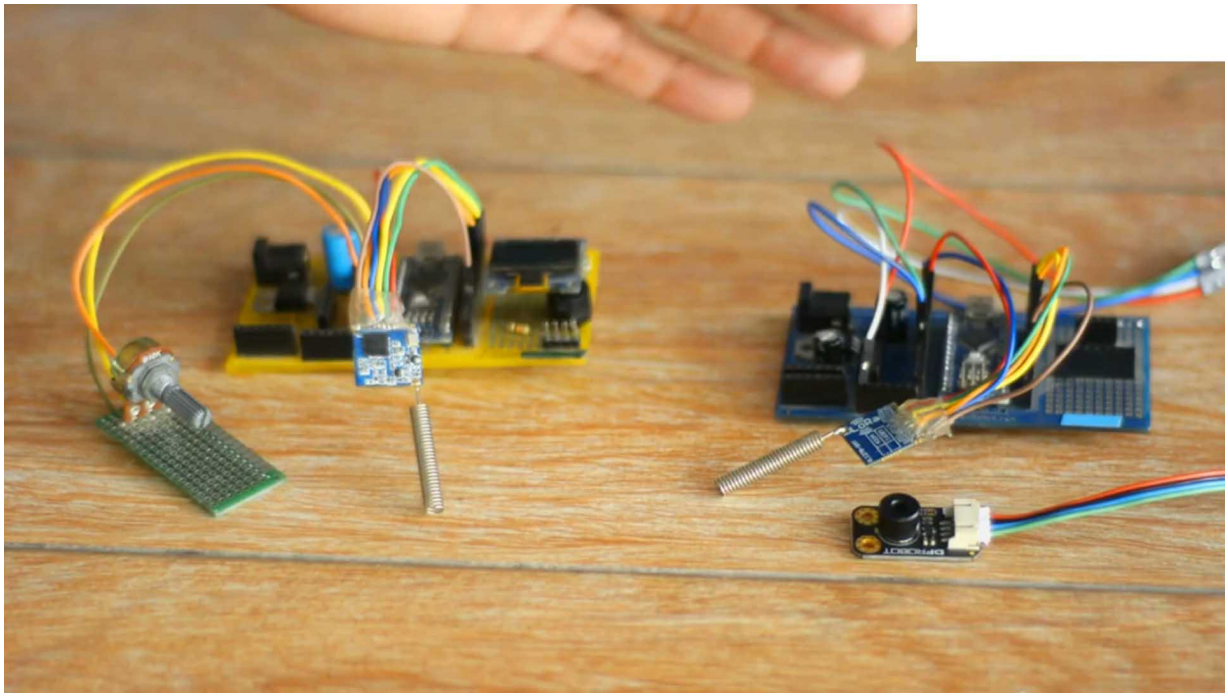
Never share this information with anyone. We will need the device ID and the secret key later. I highly recommend downloading the PDF file. Scroll down, check the box, and click on the "Continue" button.

Now scroll down, and you can see the network configuration. The "Configure" button is disabled now. It will become enabled after adding at least one variable. So, let's add a variable. Choose the variable type, give it a name, and select the variable type. In my case, I'll select the Boolean type since the LED can have only two states.

TEMPERATURE SENSOR WITH LORA

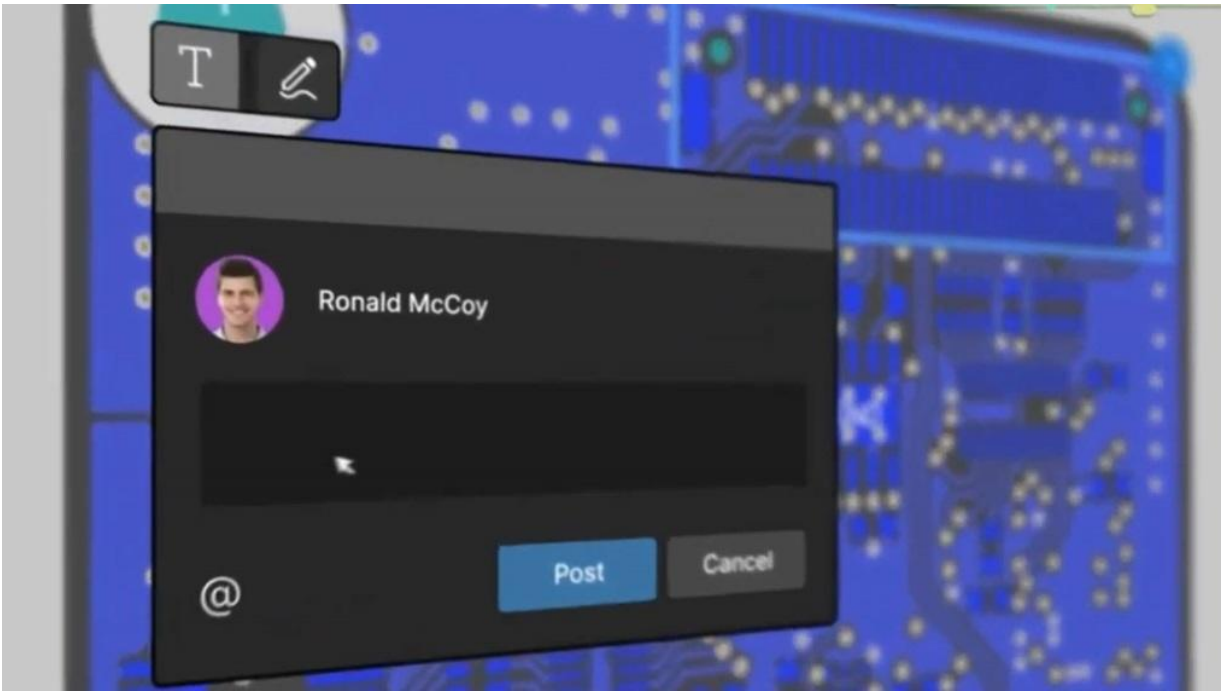
This project is brought to you by Altium 365 via the World Designs Electronics and Octobot, the fastest search engine for electronic parts. In today's episode, you will learn how to make a long-range wireless temperature monitoring system using the MLX 9614 infrared contactless temperature sensor, a pair of Arduino boards, SX1278 LoRa transceiver modules, SSD 1306 I2C-supported OLED display module, a potentiometer, and a 5V buzzer. This is my third project on the MLX 9614 temperature sensor and is entirely based on my previous tutorials.

In my first project on the MLX 9614, I covered the extreme basics, including the MLX 9614 sensor's technical specifications, its collaboration using the emissivity value, how to use it with Arduino, and display the temperature readings on the OLED display module.



If you're just getting started with the MLX 9614 non-contact infrared temperature sensor, then I must say you should definitely watch my first project on the MLX 9614 temperature sensor. In my second project, I used the MLX 9614 infrared temperature sensor with the NodeMCU ESP8266 module. So, if you're thinking of monitoring the temperature from any part of the world using the MLX 9614 temperature sensor, then you should watch my second project. Now, let's get back to our original topic.

Here is a prototype model of my long-range wireless temperature monitoring system. This is the transmitter side, along with which the MLX 9614 temperature sensor and SX1278 LoRa module are connected. The Arduino reads the MLX 9614 temperature sensor and sends the temperature readings to the receiver side using the SX1278 LoRa module. And this is the receiver side. It has been connected with a potentiometer, an OLED display module, a 5V buzzer, and an SX1278 LoRa transceiver module. The potential meter is used to set the threshold value.



This way, when the temperature exceeds the set value, the buzzer will turn on.

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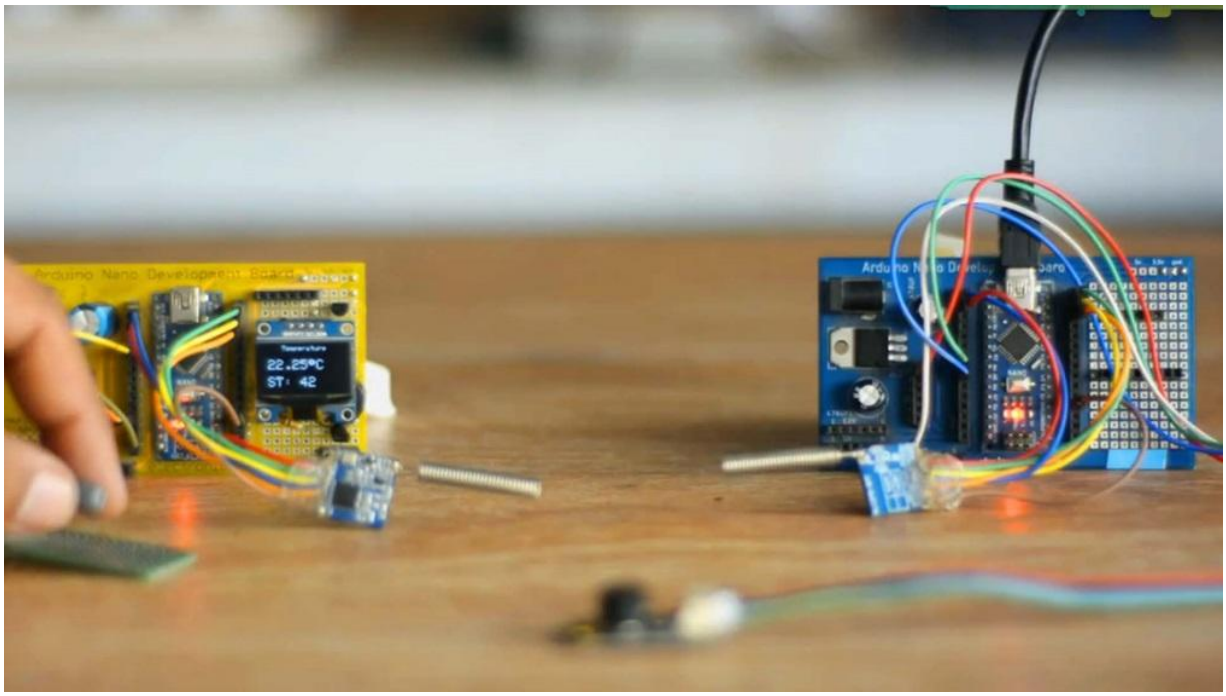
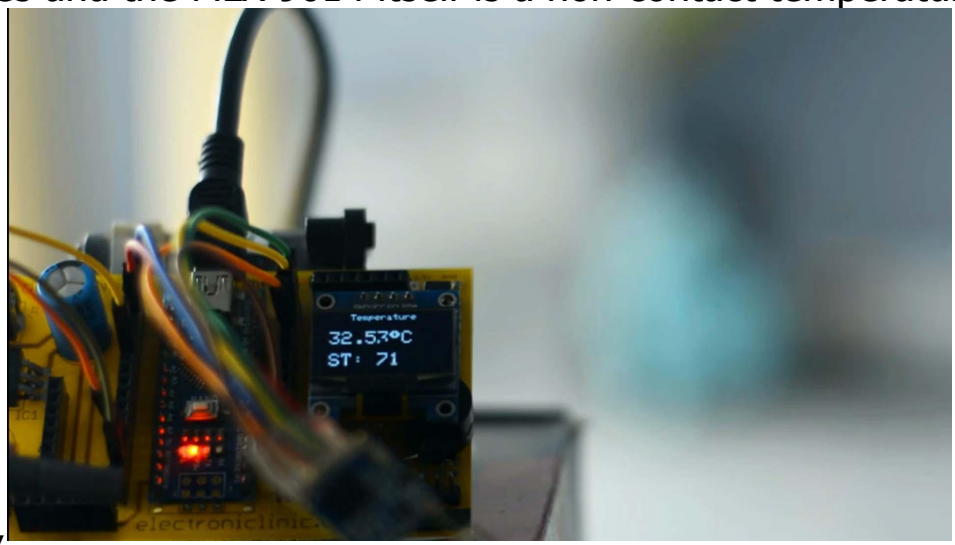
I have powered up the transmitter as well as the receiver side. You can view temperature readings in Celsius along with the set value on the OLED display module.



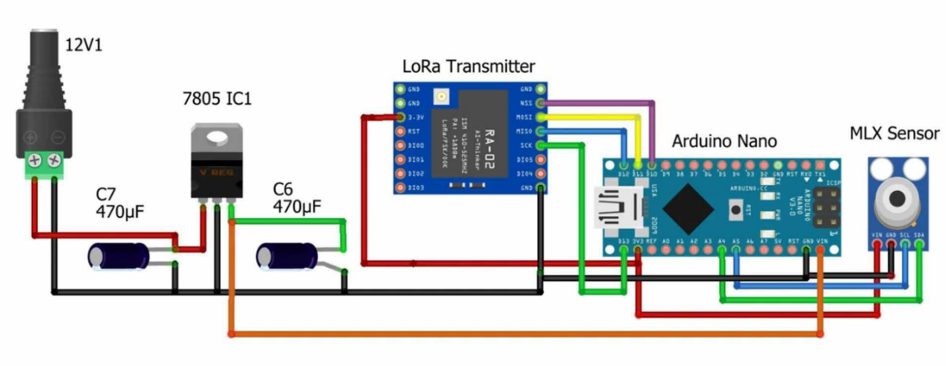
Right now, the buzzer is off because the temperature reading is below the set value. Now let's go ahead and measure the temperature. You can see that each time the temperature exceeds the set value, the buzzer is automatically turned on. Now let's go ahead and change the set value.

Since this project is based on the long-range LoRa transceiver modules and the MLX 9614 itself is a non-contact temperature sensor,



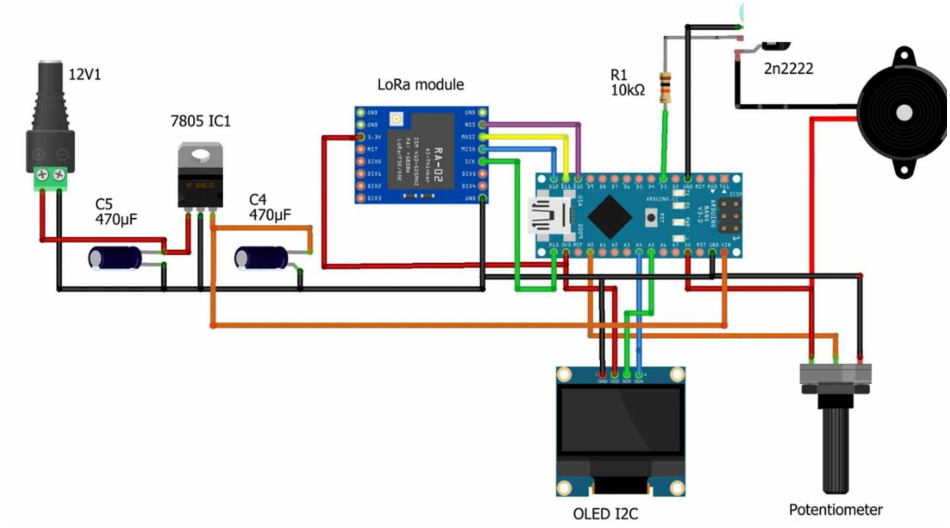
This project can be used for monitoring the temperature of any particular object or human, etc. All you need to do is focus the sensor and set the threshold value. The receiver side is completely portable. You can keep it with yourself or fix it inside your room or office. It obviously depends on how you plan to use it.

I'm sure by now you might have got an idea of how the system works. So, without any further delay, let's get started.



This concludes the practical demonstration. The components and tools used in this project can be purchased from Amazon. The component purchase links are given in the description.

This is the transmitter side circuit diagram. The VCC of the LoRa module is connected to 3.3V of the Arduino. The MISO pin of the LoRa module is connected to the Arduino's MISO pin. The MOSI pin is connected with pin 11. The SCK pin of the LoRa module is connected with pin 13. The NSS pin is connected to the Arduino's pin 10, and the ground pin of the LoRa module is connected to the Arduino's ground. The VCC and ground pins of the MLX 9614 infrared temperature sensor are connected to the Arduino's 3.3V and ground pins. The SDA and SCL pins of the MLX 9614 implementation are connected with pins A4 and A5 of the Arduino. A4 is SDA, and



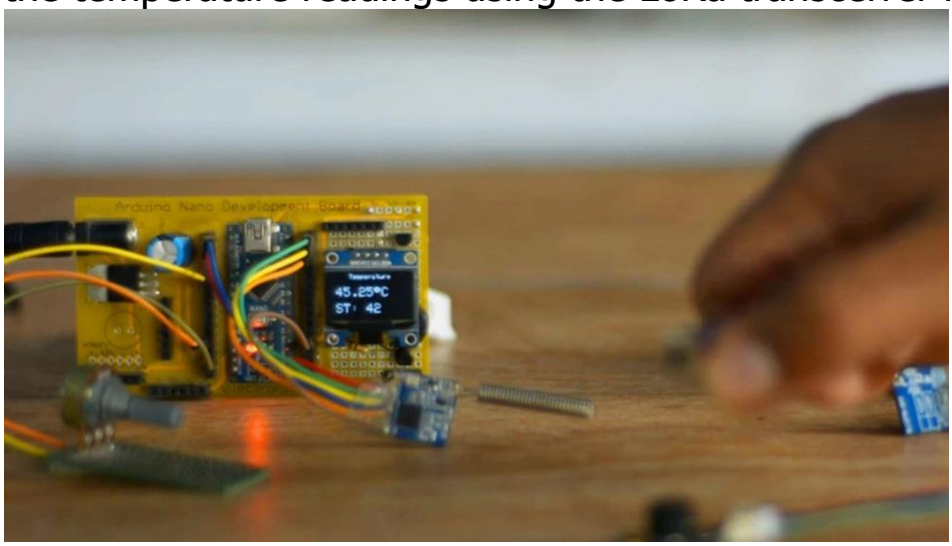
A5 is SCL.

On the left side, you can see a 5V regulated power supply based on the LM7805 voltage regulator. We use this regulated 5V to power up the Arduino and all the other electronics. This is the receiver side circuit diagram. The LoRa module connections with the Arduino and the 5V power supply wiring remain exactly the same. The SDA and SCL or SCK pins of the SSD 1306 or OLED display module are connected with pins A4 and A5 of the Arduino. The VCC and ground pins of the OLED display module are connected to the Arduino's 3.3V and ground pins. A potentiometer is connected to analog pin A0 of the Arduino. Digital pin 3 on the Arduino is used to control the 5V buzzer. We use a 10k ohm resistor and 2N2222 NPN transistor to control the buzzer. The 10k ohm resistor and transistor make up the driver's circuit.

Now let's take a look at the programming. This wireless temperature monitoring system is based on two programs. This program is written for the transmitter side, whereas this program is written for the receiver side. Before you start programming, make sure you download all the necessary libraries from our website, electronicclinic.com. I will provide a link in the description.

Now let's take a look at the programming. This wireless temperature monitoring system is based on two programs. This program is written for the transmitter side, whereas this program is written for the receiver side. Before you start programming, make sure you download all the necessary libraries from our website, electronicclinic.com. I will provide a link in the description.

Let's first start with the transmitter side programming. I developed this code by combining the codes of my previous two projects. For a detailed explanation, watch my project on LoRa SX1278 two-way communication. In my getting started project on the MLX 9614 temperature sensor, I didn't change anything. I'm using the same LoRa node's addresses. The code inside the setup function remains exactly the same. I'm using the same code that I previously used for reading the MLX 9614 temperature sensor. This time, I'm sending the temperature readings using the LoRa transceiver module.

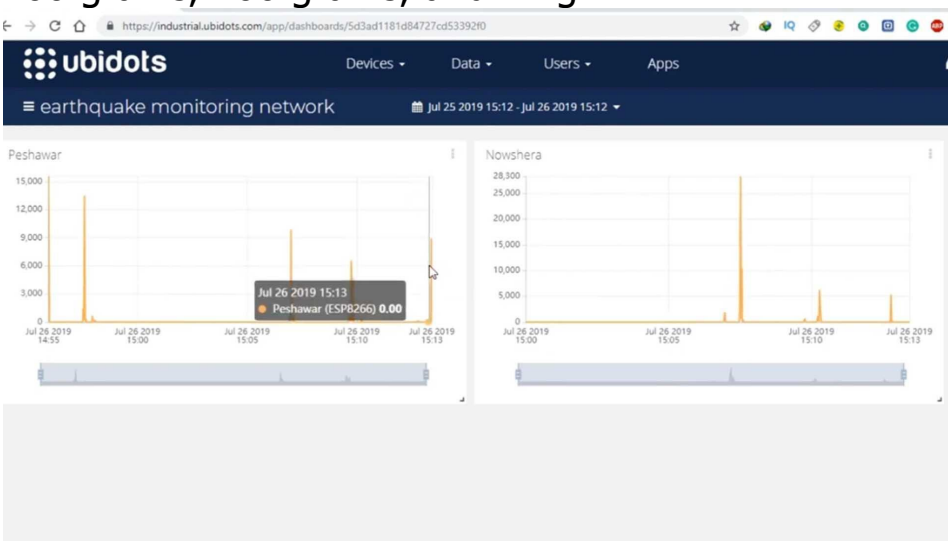


If you want to learn the details, then you should watch my other projects on LoRa and the MLX 9614 temperature sensor. Now let's

take a look at the receiver side programming. Most of the code I have already explained in my previous projects. The only addition is that this time I'm using the potentiometer to set the threshold value. I simply read the potentiometer and then use its value to define the range. The temperature reading received from the transmitter side is printed on the OLED display module and is also compared with the set value. Then, accordingly, the buzzer is turned on or off. That's all about the programming.

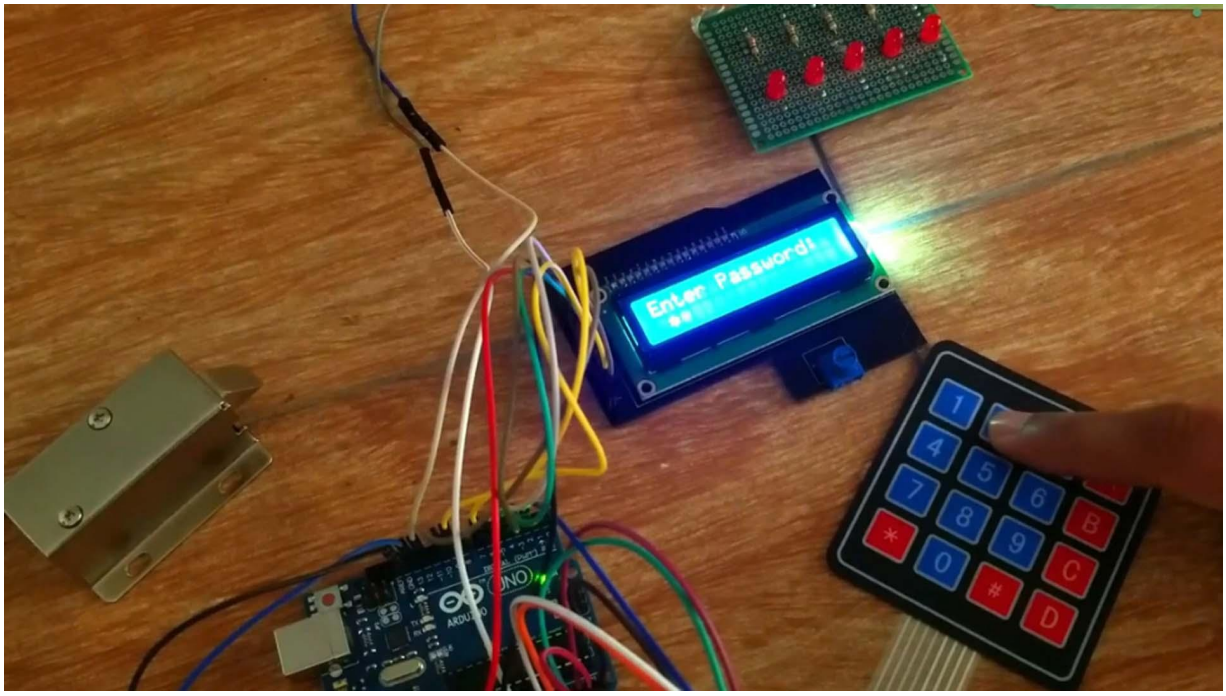
ARDUINO PROJECTS IOT PROJECTS ESP8266 PROJECTS

In today's episode, you will learn how to make an IRG weighing scale using Hx711, a 24-bit analog-to-digital converter, a 5 KG load cell or strain gauge. Not MCU ASP8266 Wi-Fi module, Art Vino, and a cell phone application designed in Blynk. Later in this tutorial, I will explain why I'm using Art Vina with the NodeMCU ESP8266 module. With this DIY low-cost IoT weighing scale, you can measure and monitor weights from anywhere around the world. For demonstration purposes, I'm using some known weights: 50 grams, 100 grams, 200 grams, and 1 kg



In today's episode, you will learn how to make an advanced level IoT-based real-time earthquake detector and early warning system using multiple NodeMCU ESP8266 modules, APA102-65 LED modules, and SW-420 vibration sensors. With the help of this project, the earthquake detection system can be installed in every

city, creating a complete wireless network. Every earthquake monitoring device, represented by a green dot, can be monitored in real time using the IoT platform. Real-time monitoring aids in predicting earthquake wave directions, providing timely alerts for affected areas.



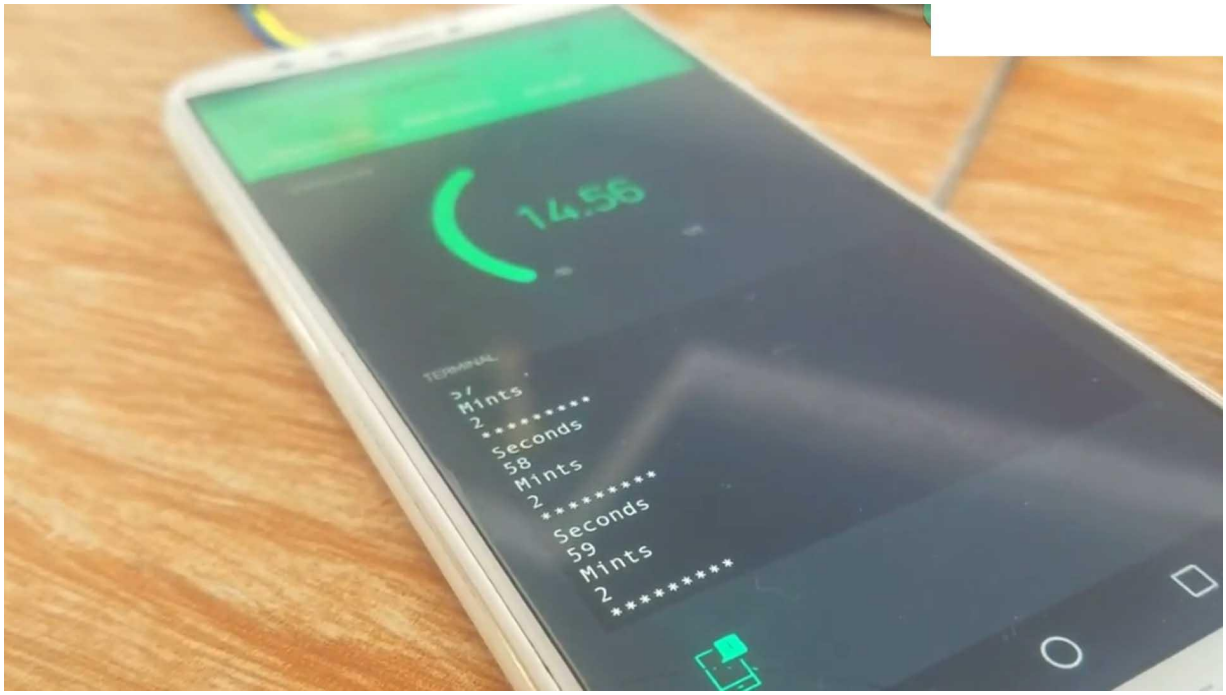
Each earthquake sensor data will include date and time information. For practical demonstration, I have considered 2 locations: Vishavo and Nowshera. Later, you can increase the number of locations. When vibrations are detected, the chart updates in real time. If vibrations exceed a predefined value, emails are sent to concerned individuals with date and time information.

In today's episode, you will learn how to make the most efficient password protected door lock security system using Arduino and a keypad.

In today's episode, you will learn how to make the most efficient password-protected door lock security system using Arduino and a keypad. When you enter the correct 4-digit password, the door opens for 5 seconds. The current password is 1234, which you can

change in the programming. You can even select a password with more than 8 digits. This password door lock security system has been thoroughly tested and functions perfectly. For wrong passwords entered three times, a person is locked out for 5 seconds, and an LED (or buzzer) is activated. The number of wrong attempts can be adjusted as needed.

The internet of things based fridge smart IIT refrigerators are becoming very popular because with the help of a smart IIT refrigerator, you can check the temperature. Food items expire. door opening and closing status from anywhere around the world using the Wi Fi technology. In this episode, you will learn how to convert any fridge or refrigerator into a smart internet of things based fridge or refrigerator using a push button or a limit switch.

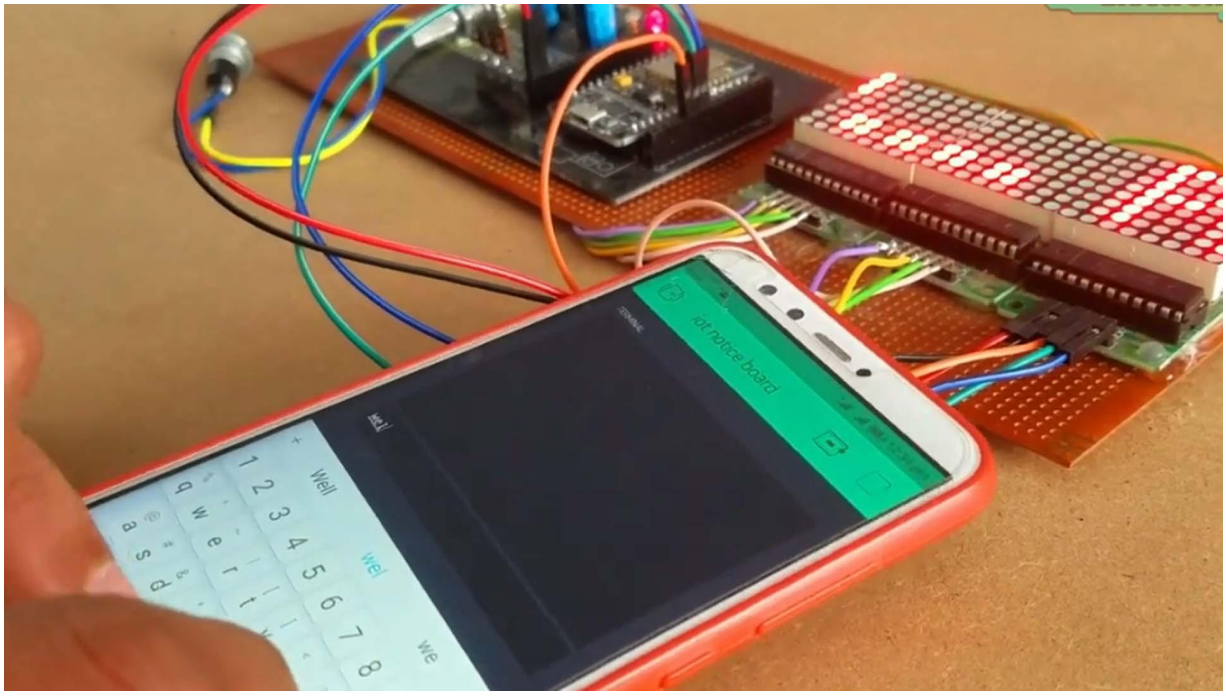


Not in CU SPA 2, double 6, 55, module, a variable resistor. DS18b20 1 wire. Waterproof, digital temperature sensor capable of measuring the temperature from minus 55 c to 125 way and a cell phone application designed and playing. The values are updated every second. The notification messages are sent to the owner each time

the temperature increases above or decreases below a certain predefined which can be adjusted using a variable resistor.

Any value between minus 40 and plus 40 can be selected. This limit is specified in the programming, which can be changed to a spot requirement. A push button or a limit switch can be used with a fridge or a refrigerator to check if the fridge door is open or closed. If the door remains open for 3 minutes, a notification message is sent to the owner. The 3 minutes delay can be increased or decreased as per the requirement.

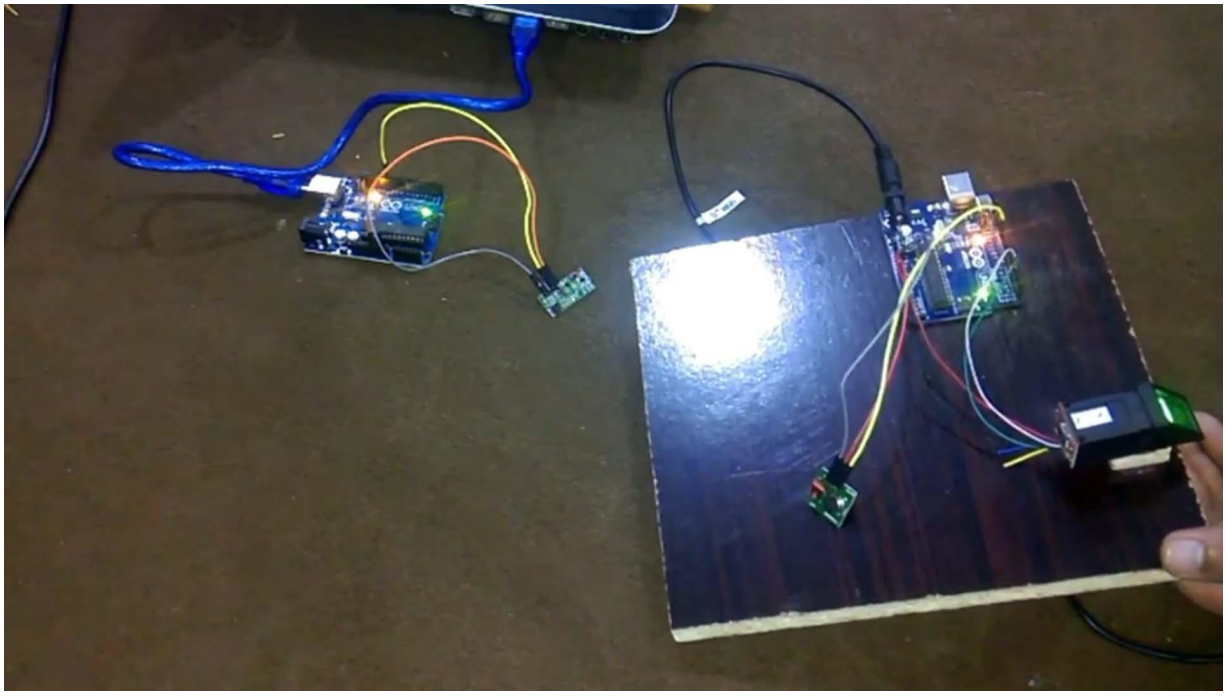
The notification messages are sent even if the application is running in the background. If in case due to some problem, the Wi Fi connection is disconnected, a notification message is sent to the honor or supervisor. This project can be easily modified by adding more sensors and some relays for controlling the fridge or refrigerator. In today's episode, you will learn how to make an IoT. internet of THINGS based notice board using, nod MCU, ASB 8 to double 6 Wi Fi module.



Max 7219 dot matrix 8 into 8 LED modules and link application. The scrolling text message on the 8 into 8 l d metrics can be updated at any time from anywhere around the world using the blank application. The scrolling speed of the text message can be controlled using a variable resistor or potentiometer. In today's episode, you will learn how to make a biometric student attendance system and save the record in a database whether a particular student is present late or absent. This is a complete virus system.

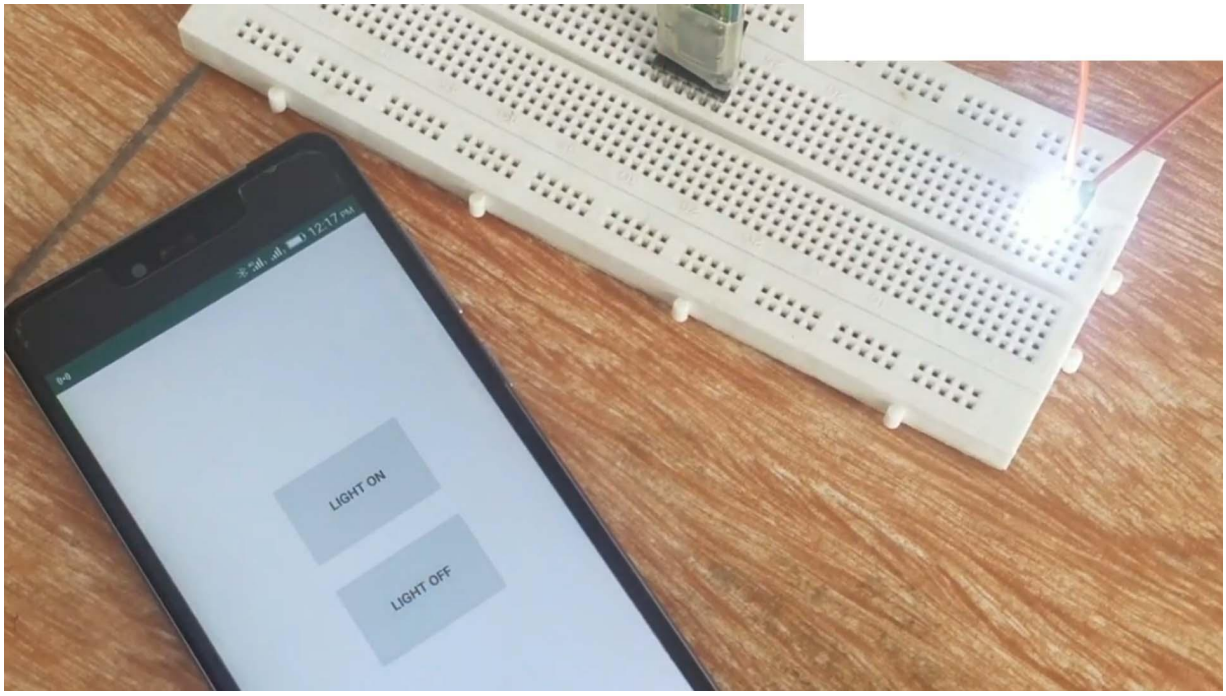
The transmitter and receiver side has no physical connection. The computer application is designed in visual basic 2010 express edition. and this project 2 is used. 1 is a transmitter which is connected with a fingerprint module and the other one is the receiver which is connected with the laptop. In this episode, you will learn how to accurately measure the water volume using the water flow sensor, hardware, and a twelve volt DC water pump.

Voking on the water flow sensor is a bit tricky, and that's the reason most of the people complain about the wrong values. There are things that we need to take care of while using the water flow sensor. As per the datasheet, when water flows through the rotor, the rotor rolls. Its speed changes with different rates of flow. If we can keep the pressure and flow constant, we can make an accurate water volume measurement system.



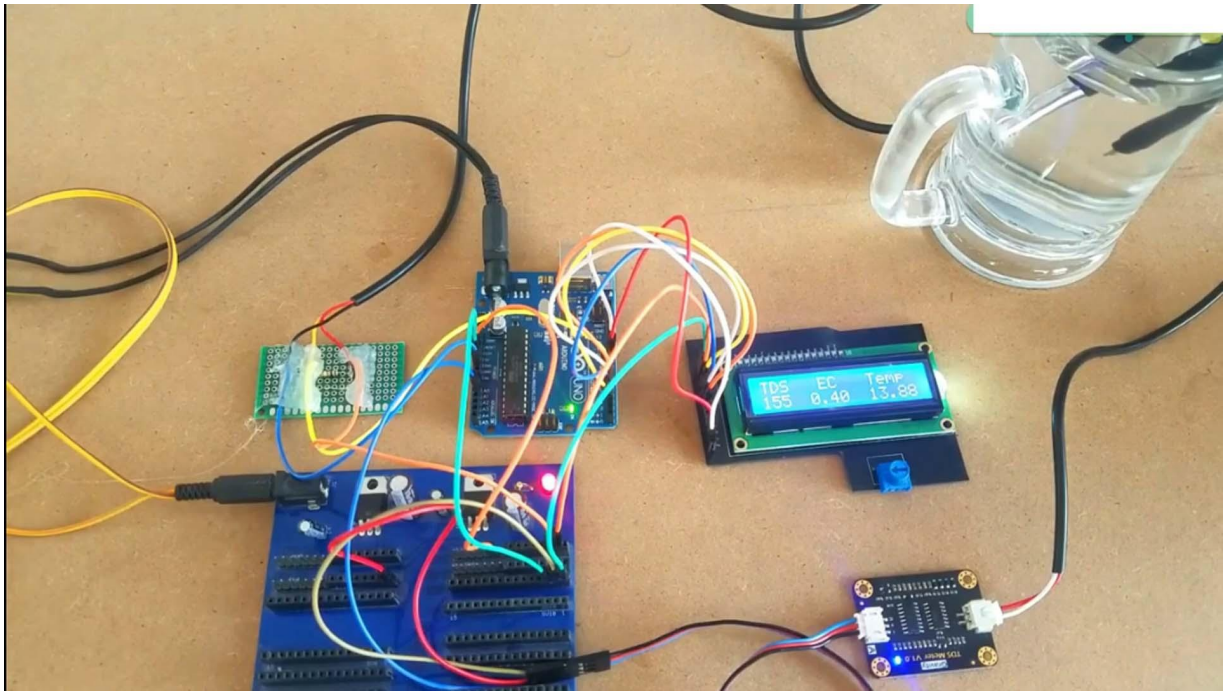
I solved this problem by using a twelve volt water pump. As you can see, each time I press the push button, I get the same water flow and pressure. In today's episode, you will learn how to make an IoT based smoke detector system using the MCU SPA 2, double 6, 55 module. mq135 case sensor and blink application. The sensor value can be monitored in real time from anywhere around the world.

If the sensor value crosses a predefined value, a notification message is sent to the concerned person. In today's episode, you will learn how to reduce distracted driving extensively using only Artino, MPU 6050, and a buzzer. If a driver writes a message and looks down for more than 2 seconds, the buzzer is activated. So if the driver looks down or looks up for more than 2 seconds, A buzzer is activated which alerts the driver. This project can also be used as the driver draws in this detection system.



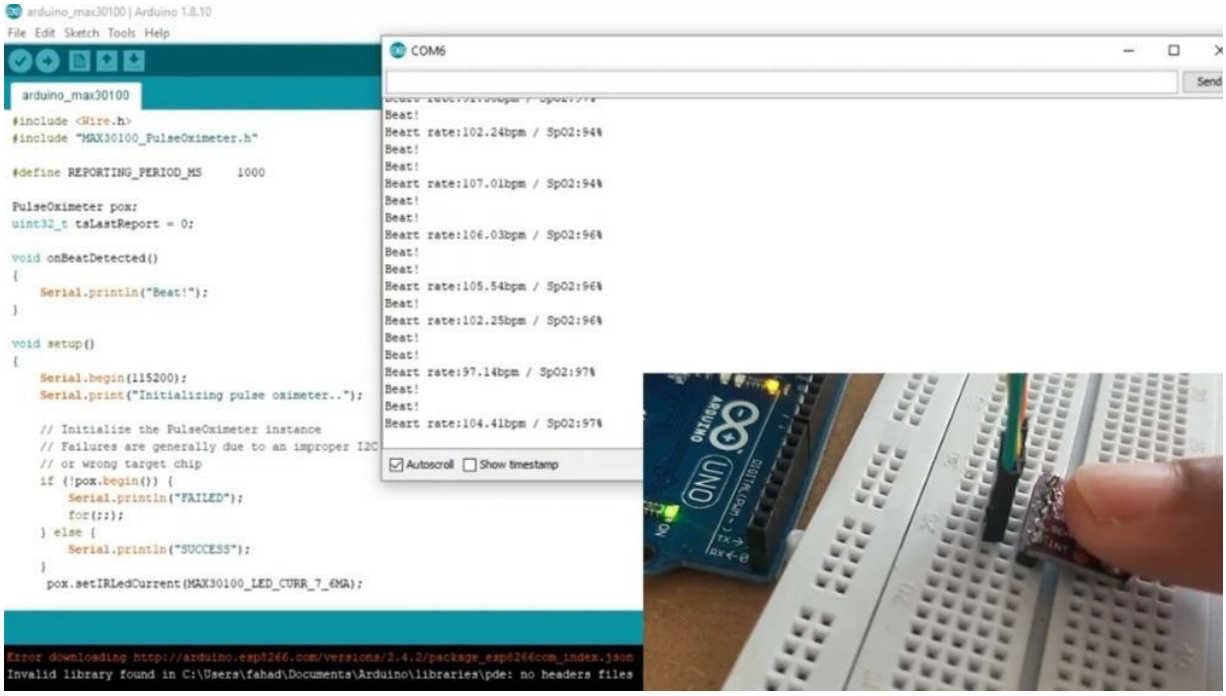
In today's episode, you will learn how to create your own Android cell phone application to control an LED using Arduino. hddash05 Bluetooth module and an Android cell phone. For the best understanding, I used only two buttons: light on and light off. These two buttons are used to turn on and turn off the LED. After watching this tutorial, you will be able to aid multiple buttons.

This LED can be replaced with the transistor to control a relay which can be used to control AC loads, or it can be replaced with a mass fit to control high amperage DC loads. This Android cell phone application is designed and programmed in Android Studio. In today's episode, you'll learn how to make an IoT based water quality monitoring system using arduino Paige sensor, note MCU SB 82, double 6, 55, and module, and link application. This is an IoT internet of things based project. The water quality can be monitored from anywhere around the world.



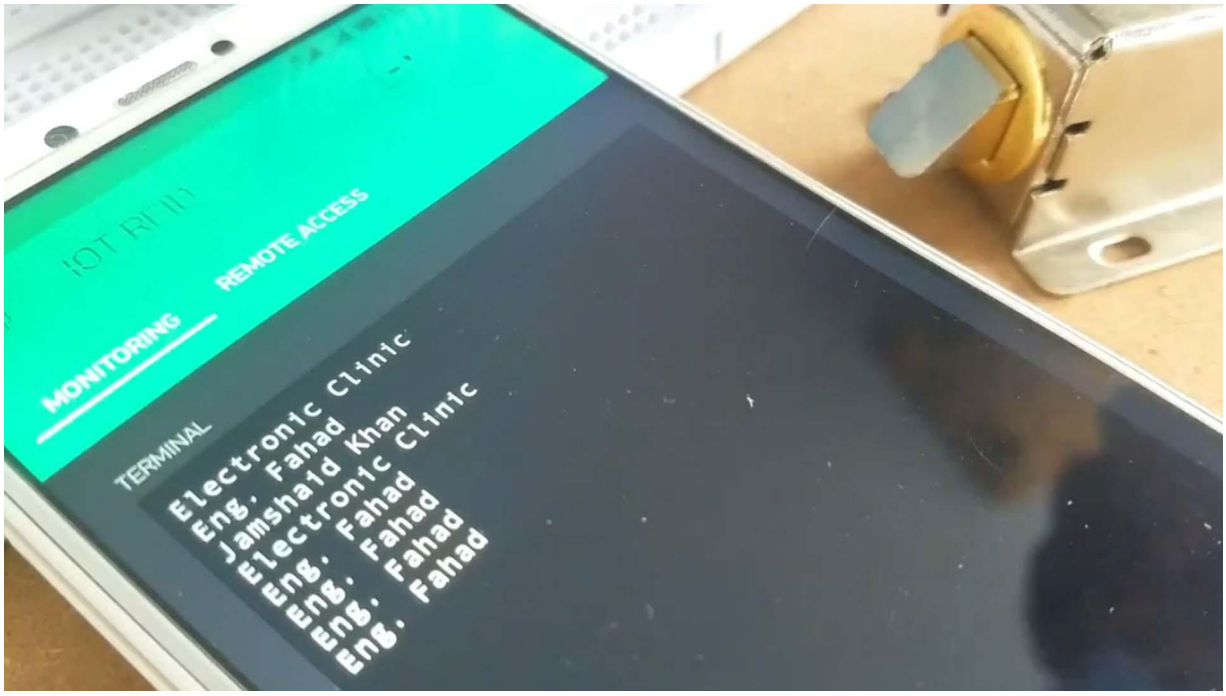
In today's episode, you will learn how to make a water quality monitoring system using the Cravity TDS meter V 1.0. DS18b20 waterproof 1 via digital temperature sensor and 16 into 2 LCD with Art Vena for measuring the tedious value. TDS stained for total dissolved solids. The tedious value as you can see on the LCD screen indicates how many milligrams of soluble solids are dissolved in one liter of water. Many tedious meters display the deus value in PPM, which stands for parts per million.

In general, the higher the tedious value, the more soluble solids are dissolved in water. And the less clean the water is. Right now, the water under test is excellent if the tedious value is less than 300. The tedious value starts increasing as I start adding the soil. So using this small DIY low cost serious meter.



You can find out if the water you are drinking is clean or not. In this tutorial, you will learn how to use the max 31100 full oximeter with Arduino and display the heart rate and blood oxygen on the 16 into the LCD. The heart rate or pulse rate or heartbeat is measured in BPM, which is also known as the beats per minute. while the black oxygen concentration is measured in percentage. In today's episode, you will learn how to make RFID and IoT based remote access door lock control systems.

Using Nordem CU, SB 82, double 6, a Wi Fi module. MFRC RFID module, electronic log, and blink application. With the help of this project, you can remotely monitor your door lock from anywhere in the world with your iPhone or Android device. In the cell phone app, I added 2 tapes. One is used for monitoring each time a user swipes an ID card, a message is received.

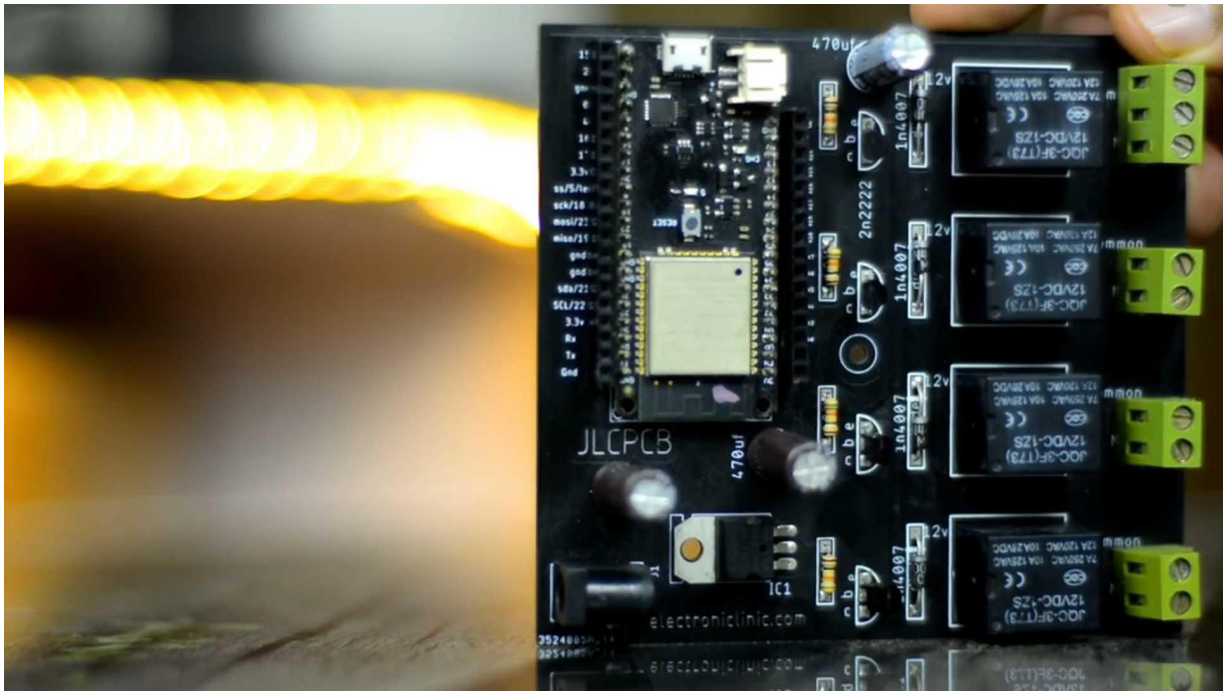


The other tape is used for the remote access control. As you can see, all the buttons are turned on, which means I have given access to all the 3 users. If all the buttons are turned off, then the users won't be able to open the dot lock. In order to open the door lock, permission should be granted by the admin. Let's give control access to electronic clinics.

BLUETOOTH CONTROLLED CEILING LED STRIP LIGHTS

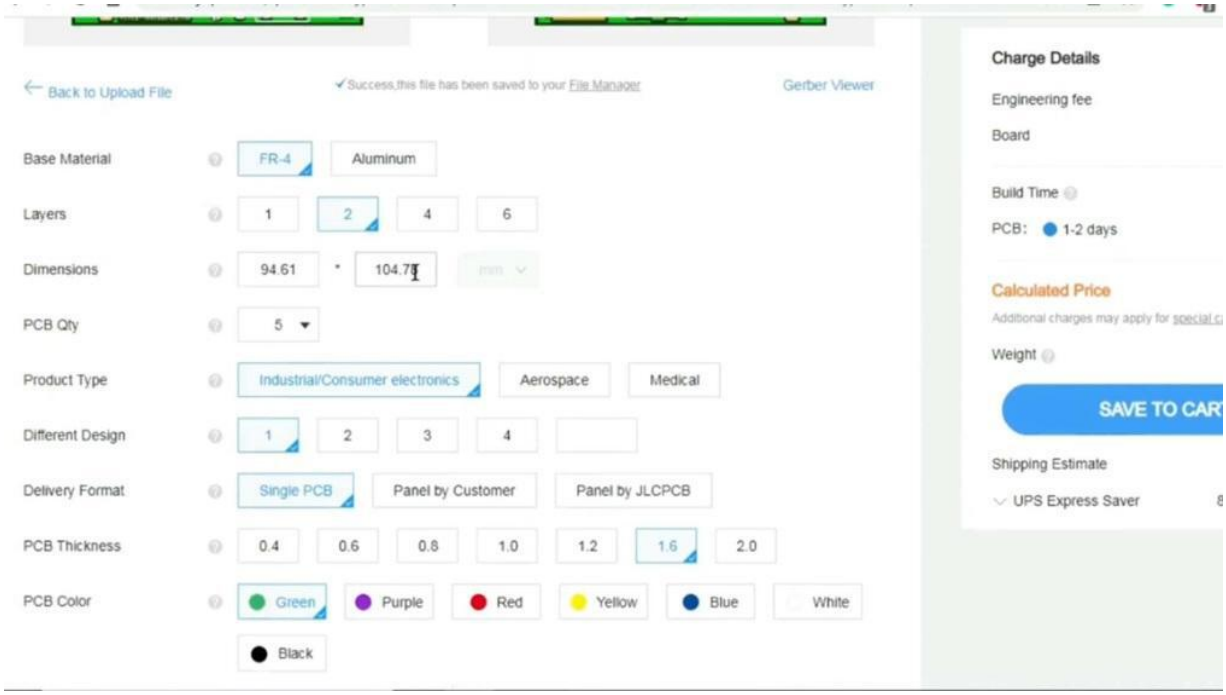
This project is brought to you by JLCPCB. Finally, the work of installing AD strips in my room is done. As you can see I have used 3 different colored AD strips. These AD strips run on a 220 fold AC supply and these are simple LED strips. There is no remote controller.

So right now, I can't turn these LED strips on or off remotely. So I'm thinking of designing a Bluetooth application for this so that I can easily control these ceiling lights from my bed. By the way, ready made LED strip lights are also available that come with a remote controller. You can also purchase them, but There is a different fun in making a control system with your own hands. For this project, I am going to use a speed 32 wifi plus Bluetooth module, you can also use Artino, but it will increase the project overall cost.

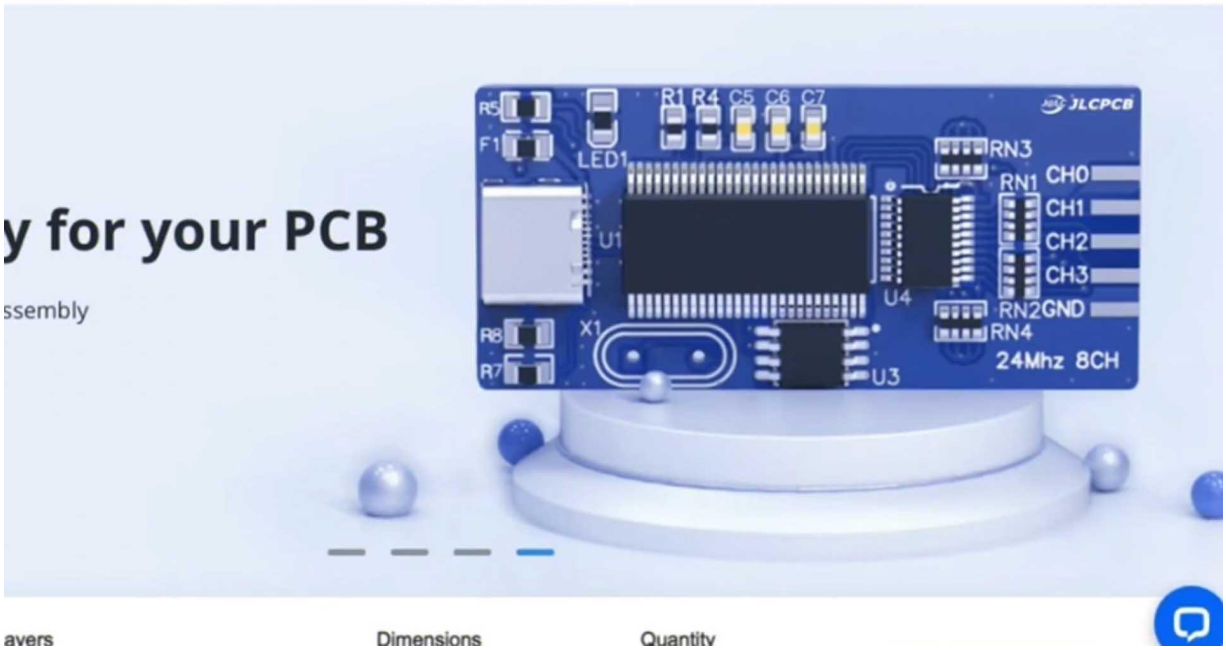


And with Artino, you can't show much creativity. But if you use the E SP 32 controller board, then the cost of your project will decrease because you don't have to purchase the Bluetooth modules separately. It's available on the ESP 32 board itself. And in addition to that, ESP 32 has wifi as well. So you can make an IoT application for it in the future by using blink IOT application.

And this way, you will be able to control your ceiling lights from any part of the world. I have already made many projects on this. I have added links to all the related projects in the description. Anyway, before I'm going to explain the connections and programming firstly watch this Bluetooth controlled ceiling AD strip lights controller connection. This project is sponsored by JLCPCB.



Feel free to visit their website, jlcbcb.com/escale to not only find out what awesome PCB and assembly services they offer, but also to easily upload your Gerber files. It automatically detects the number of layers and dimensions. Select the number of PCVs you want to order. select your favorite PCB color. The price is automatically updated as you select different features.

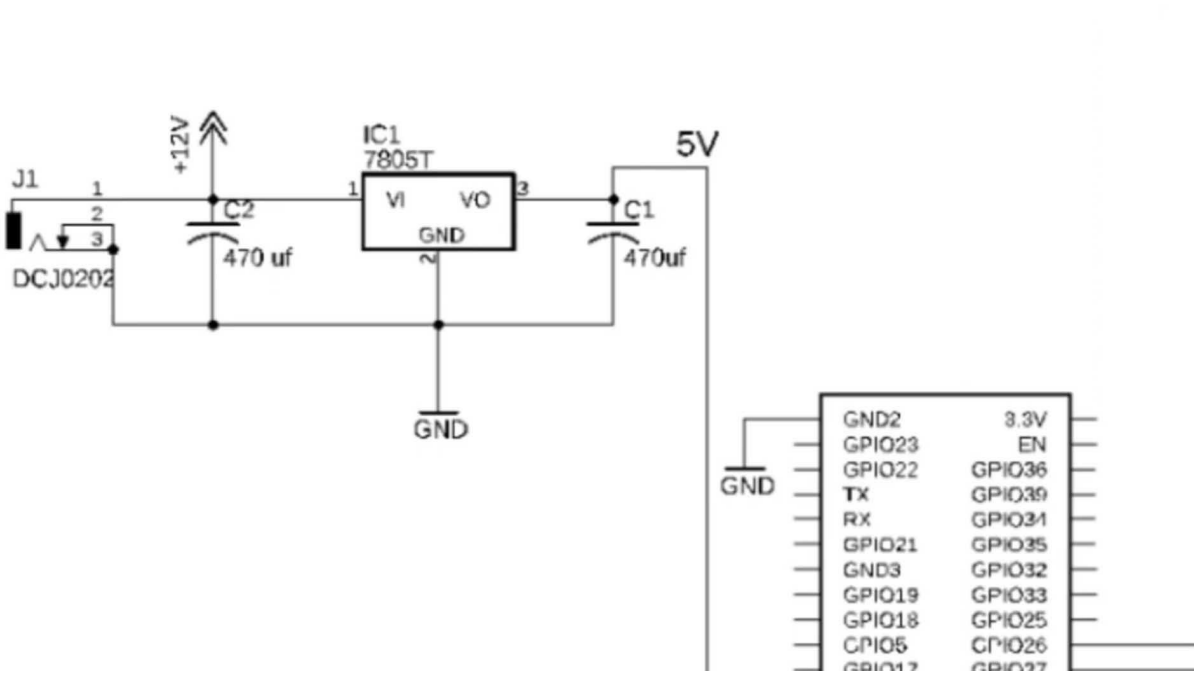


Finally, you can click on the save to cart button. You will only need to pay $2 for 1 to 4 layer PCBs and $0 for your PCB assembly. Besides this, GLC, PCB also offers industrial 3 d printing services starting at only one dollar, you can start by clicking on the first link in the description. My SB 32 based Edit strips Bluetooth controller is already powered up and right now you can't see it because it's hidden. Next, I'm going to open my internet cell phone application.

I'm going to click on the search button to select my device. You can see my Bluetooth just got connected, and now I can use these buttons to control all the three area strips. So this is exactly what you are going to learn after watching this project. So without any further delay, Let's get started. The components and tools used in this project can be purchased from Amazon.

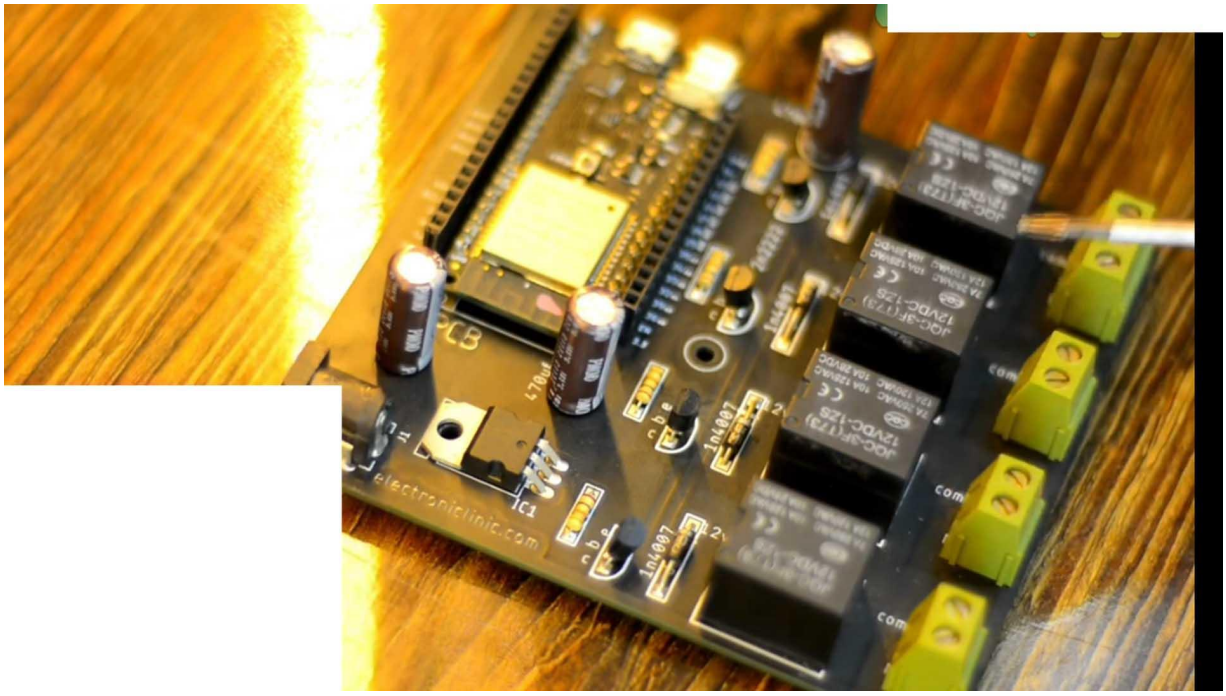
The components purchase links are given in the description. Given is the DC female power check, and this is where we connect at 12 volts, a doctor, battery, or a solar panel to 470 microfilter capacitors connected at the input and output signs of the voltage regulator. The output of the voltage regulator connected with the 5 fold pin of the ESP 32 module and the ground of the power supplies connected with the ground of the ESP 32 module. These are 12 volt spdt type

relays and can't be directly controlled using the ASP 32 module. So that's why we need a driver to control these relays.



You can use a relay driver ICR. You can use a n2222 npn transistor and a 10 kilo ohm resistor. One pin of the relay coil is connected with the collector of the 2nd 2222 NPN transistor While the other pen of the relay coil is connected with the 12 volts, the emitter of the transistor is connected with the ground while the base is connected with a 10 kilo ohm resistor. Now to control these relays, you simply need to connect these 10 kilo ohm resistors with the speed 32 i0 pins. In this project, I'm using the gpi0 pins, 13, 12, 14, and 27. I'll be using the same pins in the programming.

The neutral wire from the 220 volt AC supply is connected with the neutral of all the arity strips. while the live wire from the AC suppliers connected with the IOD strips through these relays. These are the PCBs I received from JLCPCB. You can see the quality is really great. The silk screen is quite clear and Blake's shoulder mask looks amazing. This is how my ESP 30 development board looks after soldering.



If you want to make the same development board, then you can watch my previous project. I will provide a link in the description anyway if you can see this port has 4 relays and using these 4 relays you can control for loads Now let's go ahead and take a look at the programming. If this is your first time using the ESP 32 wifi plus bluetooth module, then first, you will need to install the SP 32 board in the Arduino IDE. I already have a very detailed project on this to provide a link in the description. This is the same exit code from my SB 32 based home automation project.

So if you want to know in detail about this code, then just go ahead and watch my project on s p 32 wifi plus bluetooth module. based home automation project. I have already uploaded this program and now let's start with the indirect cell phone application. As you know, it takes hours and even days to sign an Android application. So in this project, I'm not explaining how to design this Bluetooth application for controlling ceiling LED strips. I have a separate project on how to design your own Android application using Android Studio.

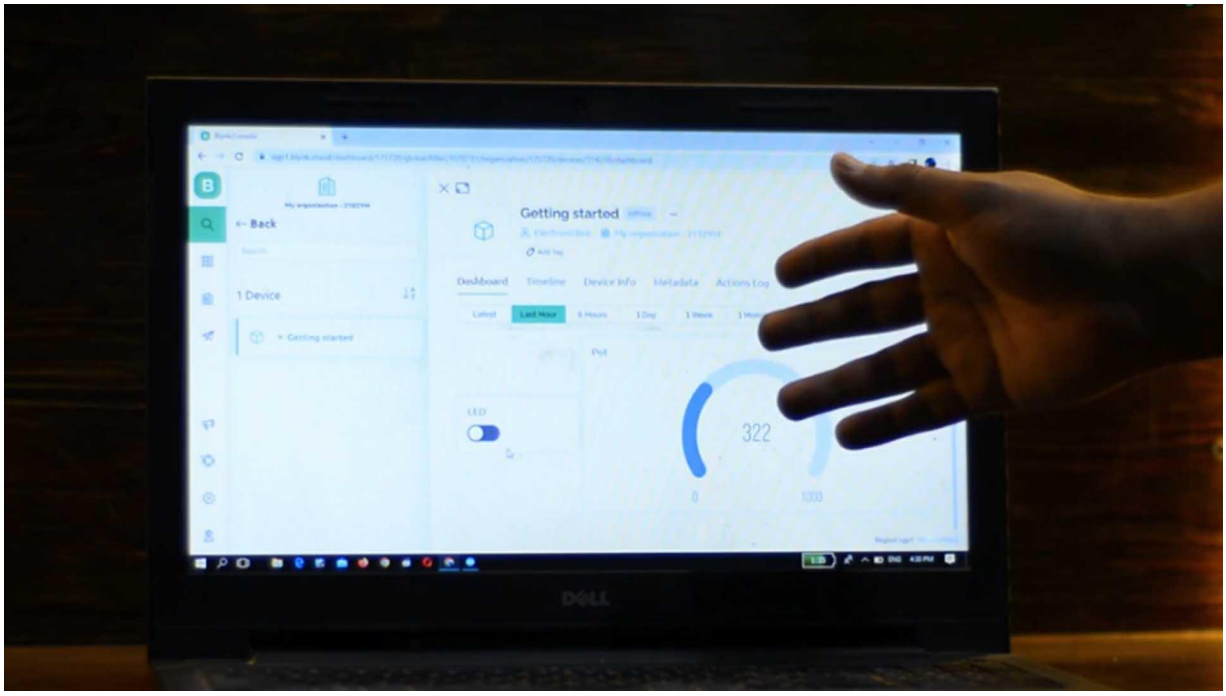
But if you want to use the same application, then you can download it from our website electronic clinic.com. For demonstration

purposes, I have connected only 180 strips for the circuit diagram. I have powered up my SP 32 department board using a 12 volt adapter. And I have also connected 220 volt AC supply for powering up this LED strip. Never touch the relay contacts when the AC supply is on because it can be really dangerous.

So we are protected by gloves when working on such high voltage projects. Anyway, the whole setup is ready for the testing. Before you open the indirect application, first turn on Bluetooth on your cell phone to pair the ESP 32 Bluetooth. As you can see, my cell phone is now paired. Next, open the Android application.

NEW BLYNK APP V2.0
WITH ESP32

This project is brought to you by JLCPCB. Over the last three years, I made several IoT based projects using the legacy version of Blink. blink legacy or blink 1.0. And the bad news is the legacy server is going to be completely shut down on December 31, 2022. So if you have an older version of the Blink installed in your cell phone, stop using it.

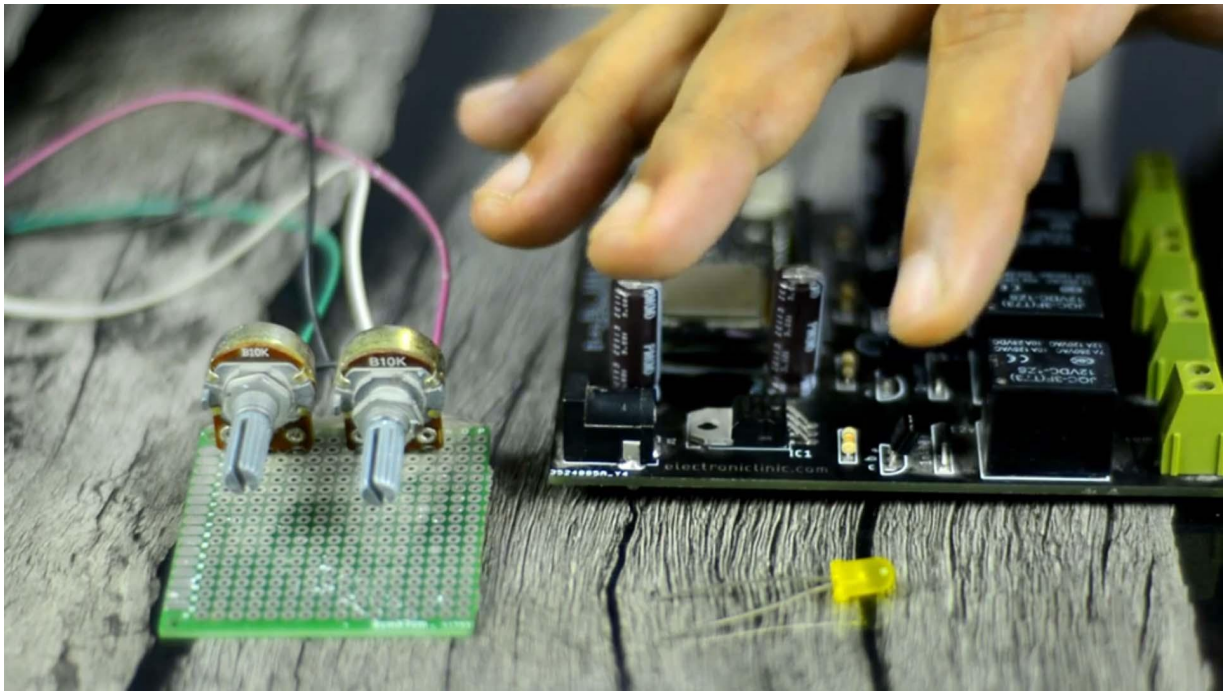


because. Number 1, the Link legacy platform support has already stopped on May 27 2021 Number 2. Blink Legacy app closed for a new user illustration on September 5 2021. number 3. It was already removed from the Abe store and Google Play on June 30 2022.

but Blink 1.0 continues to work for existing users. So if you remove the older version of the Blink, then you won't find it in the Abe store and Google Play. Right now, if you go to the Abe store and search for Blink Abe. You will see Blink IoT. Number 4, in a purchase, is duplicated on September 32,022.

And number 5 is, as I have already said earlier, the Blink legacy server is going to be completely shut down on 312,022. This means we have to migrate from blink 1.0 to blink 2.0. doing 2.0 is much more powerful than the legacy version, and it maintains the familiar graphical user interface for creating mobile applications, and you can also add a cloud dashboard, just like adafruit, arduino, IOD cloud, UV dots, ThinkSpeak, etcetera. So before the Blink 1.0 completely shutdowns by the end of this year, I decided to start a project on the new Blink V2.0. After watching this getting started project, then you will be able to migrate any project from blink 1.0 to blink 2.0.

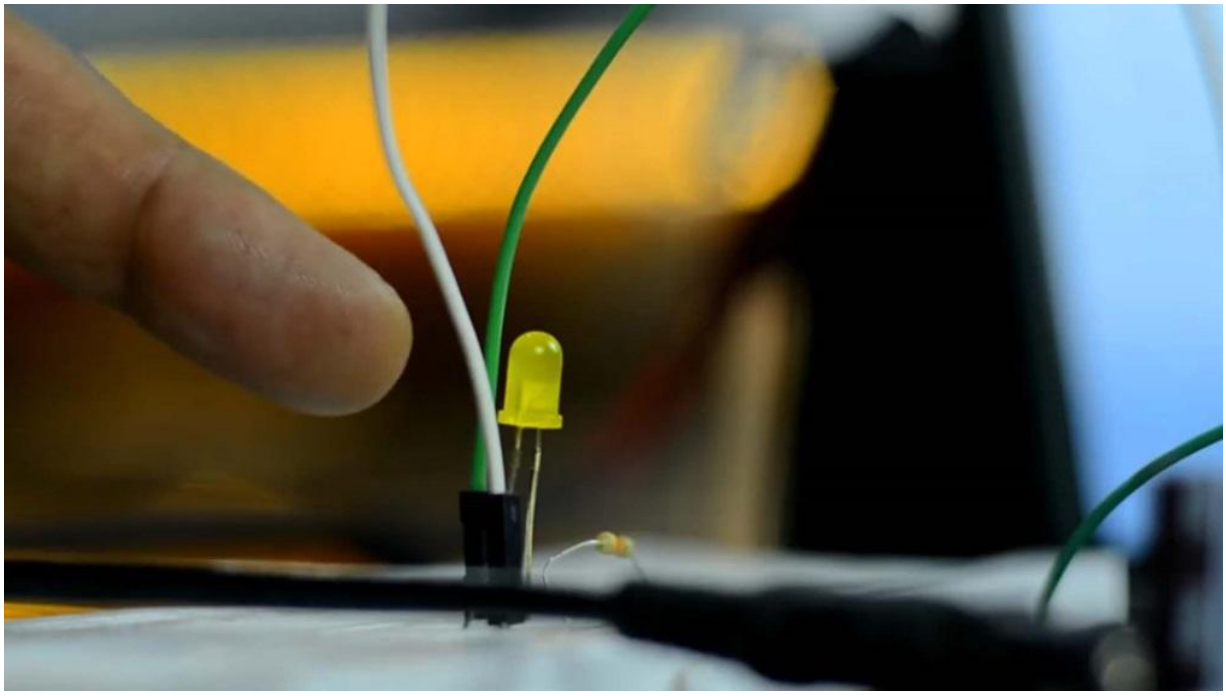
Is it for beginners the only things you need to focus on, or number 1, how to set up a dashboard on blink.cloud Number 2, how to aid different widgets in link mobile apps. And number 3, the most important one, is how to use virtual paints to send and receive data from a Wi Fi supported controller board, like SB32, or ESP8266 etc, and this is what I'm going to explain in this project. I will be making a 2 way communication system for controlling and nurturing a potentiometer.



After learning the very basics, then you can replace this irredi with a relay or a mass fit for controlling high MPI loads. And the same thing applies to the furniture meter, which you can replace with any analog or digital sir.

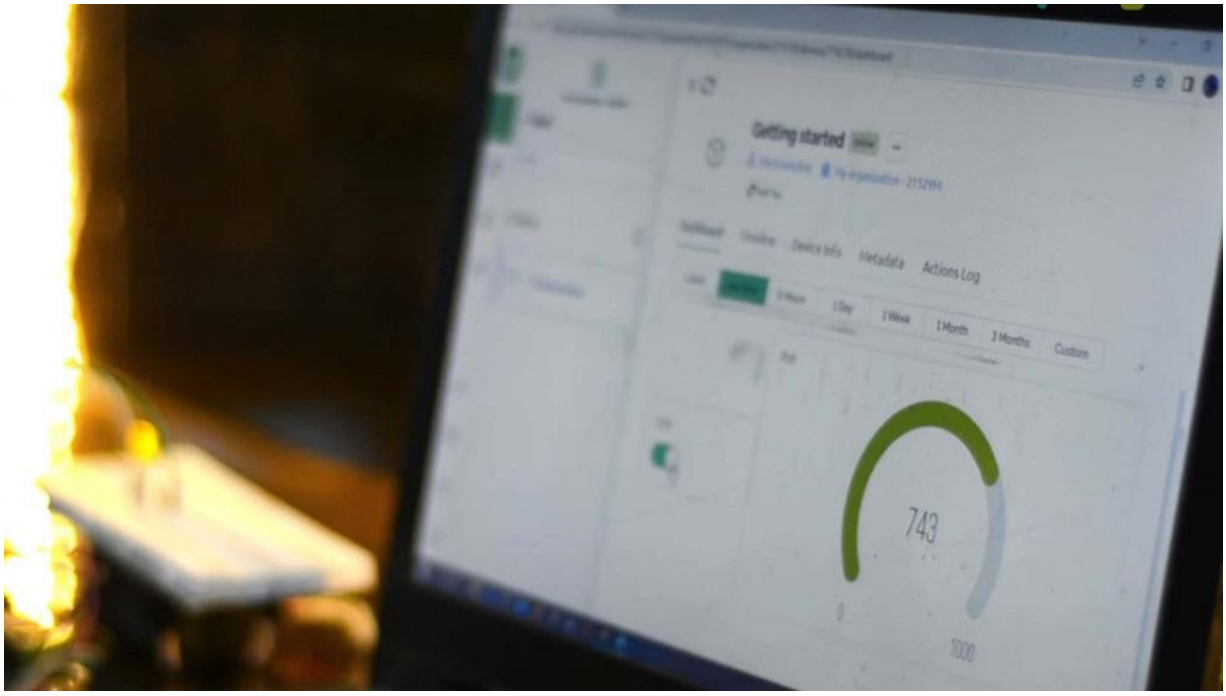
Anyway, first, I'm going to share with you the final test results. And afterward, I will explain everything else. This project is sponsored by JLCPCB. Feel free to visit their website, jlcpcb.com/escale to not only find out what awesome PCB and assembly services they offer, but also to easily upload your Gerber files. It automatically detects the number of layers and dimensions.

Select the number of PCBs you want to order. Select a favorite PCB color. The price is automatically updated as you select different features. Finally, you can click on the save to cart button. You will only need to pay $2 for 1 to 4 layer PCBs and $0 for your PCB assembly.

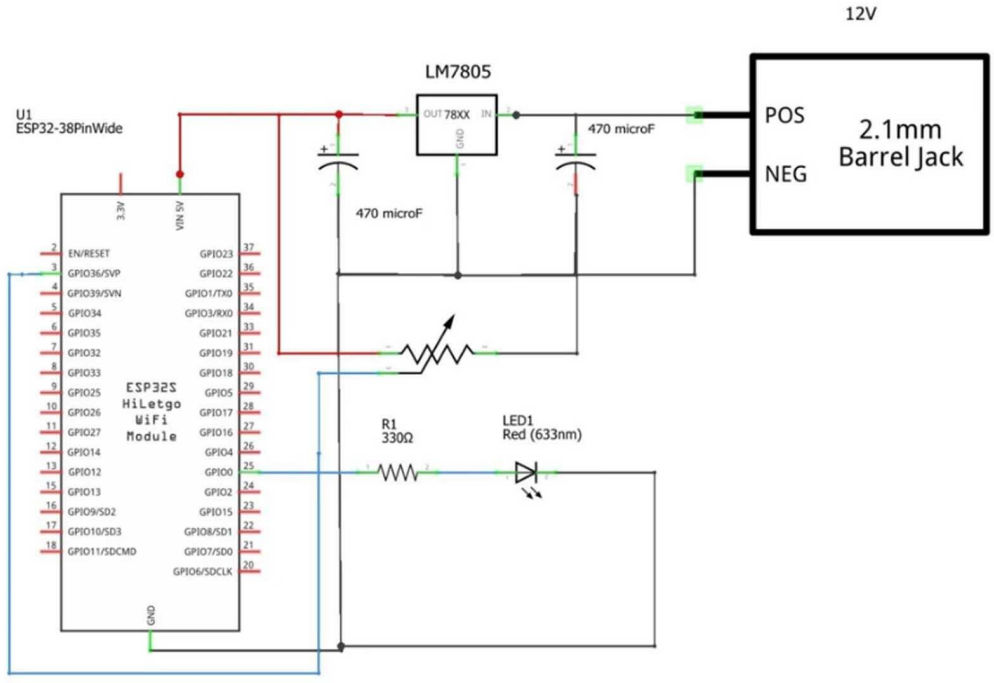


Beside this JLC PCB also offers industrial 3d printing services, starting at only $1. You can start by clicking on the first link in the description. I have connected the potentiometer and LED for the circuit diagram, which I will explain in a minute. Right now, my ISB 32 voltment board is connected with wifi. Now using my cell phone, I can control this editing and monitor this potentiometer from any part of the world provided if an internet connection is available.

I can also do the same exact thing using my designed dashboard on the blink dot cloud.



I'm sure by now, you might have got an idea of how the system works? So without any further due date, let's get started. The components and tools used in this project can be purchased from Amazon. The company's purchase links are given in the description.

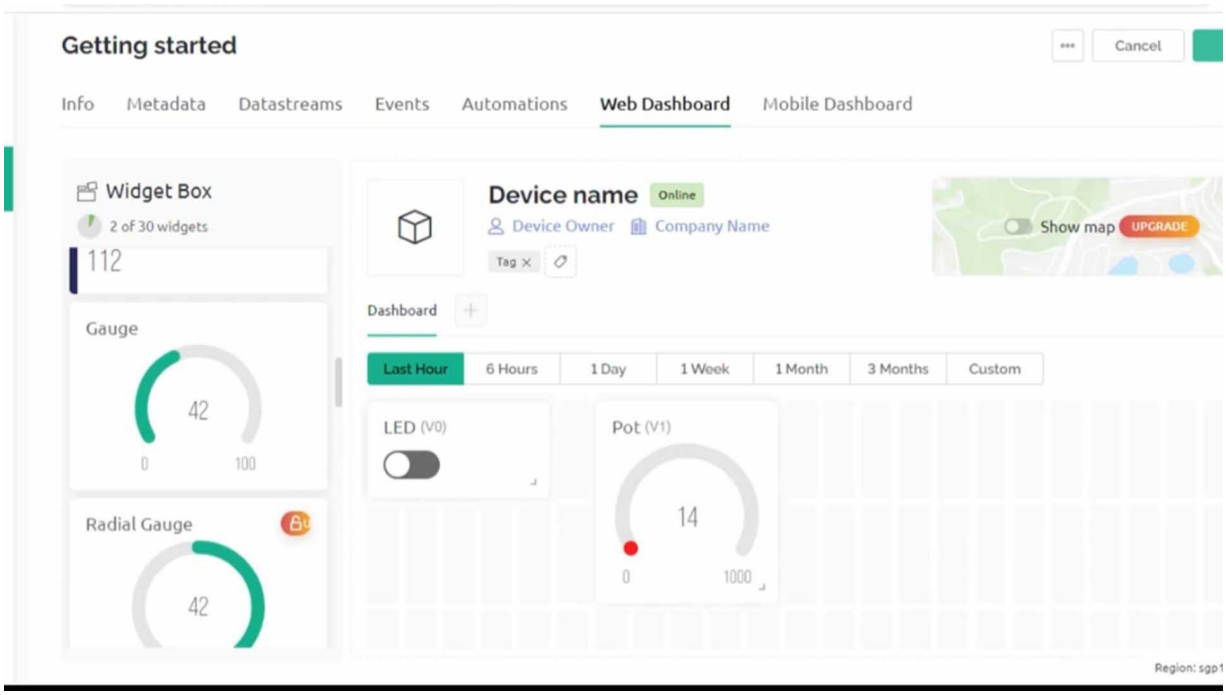


I'm using GPI00 to control the LED, and I'm using GPI036 monitoring the potentiometer. If you want to use your laptop or PC for powering up your speed 3d to WiFi plus bluetooth module, Then there is no need to add this regular 5 fold power supply. You will only need this if you want to externally power up your entire project. These are the PCB boats which I received from the GLC PCB, as you can see the quality is really great. The silk screen is quite clear, and the blade solar mask looks amazing.

Next, I started off by placing the components and completed the job. This is how my ESP32 development board looks after soldering or the components. I will use this development board for testing all my SB 32 based projects. And now forget about all these relays. Anyway, I connected the editor and potentiometer Ace for the circuit diagram, and now let's start with the blink.

Go to blink dot cloud and register a free account. There is nothing complicated just to follow the same exact steps. If you want to follow a step by step guide, then you can click on the let's go button It will help you with hardware setup, IDE, print library, code, and device activation. Anyway, I'm going to continue by clicking on the Kindle button. Free plant supports 5 users and 2 devices.

if you want more users and devices, then simply click on the get more button. Anyway, I'm going to start by clicking on the templates. Enter the template name. Select the hardware type. Select connection type.



You can also write a description. Finally, click on the done button. On the data streams, click on the new data stream and select the virtual pin. Write the name. Select virtual pin data type.

You can also select units and you can also set the minimum and maximum limits. After all the parameters are set, then you can click on the create button. Now again, click on the new data stream button and follow the same exact steps for the potentiometer. You can also define all the parameters, then you can click on the create button. Our 2 data streams are ready, and now we can click on the save button.

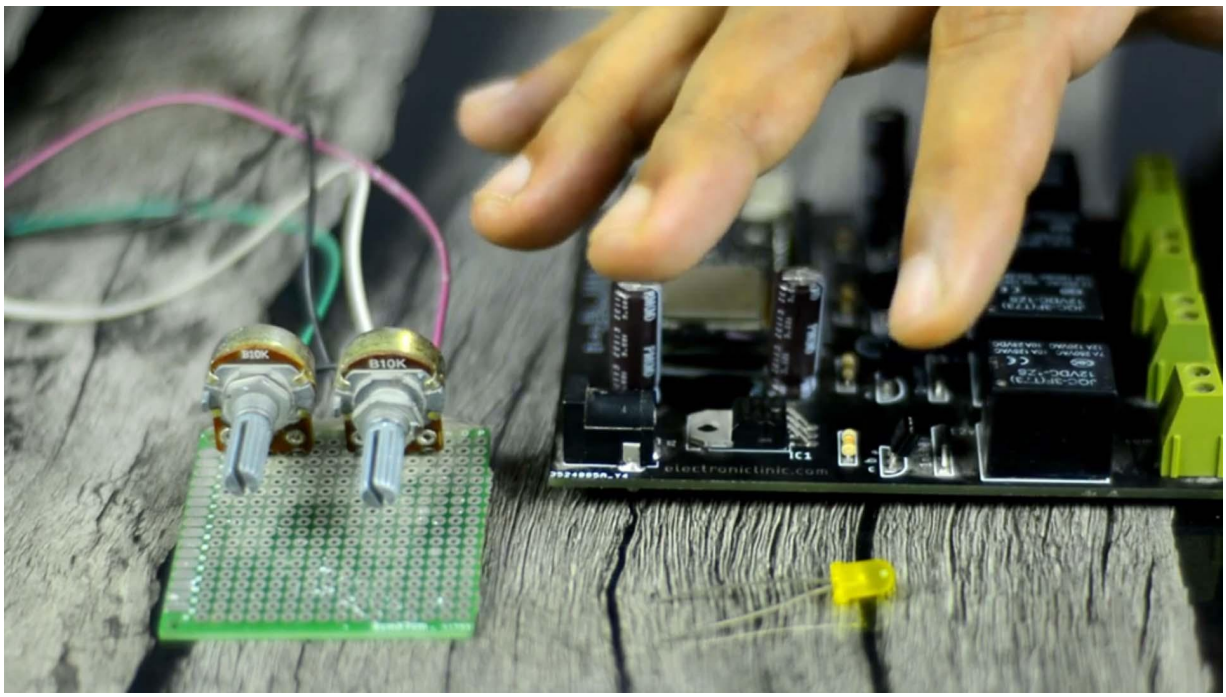
Now go to the web dashboard. Click on the edit button. Drag again dropped the switch for controlling the air day. Click on settings. Select the data stream.

Activate the show on off labels. If you want, you can also change the color. Finally, click on the save button. Now, I'm going to use a gauge for monitoring the potentiometer. Once you have added all the widgets, then click on the save button.

My dashboard is ready. Now I can use this button to control the LED and gauge for monitoring the potentiometer. Click on the search. Click on the new device. Click on the template to create a new device.

So select the template we just created. Now, we have to use the template ID device name and authorization token in the programming. Copy the template ID and paste it next to the blank template ID. Repeat the same steps for the revised name and authorization token. You can download this entire project code from our website electronicclinic.com, I will provide a link in the description.

Finally, you can click on the upload button. You will also need to install wifi.h Wi Fi client. h, and blink simple ESP32. h libraries. For this, you can watch my kiddings project on the speed 3255 plus bluetooth module.



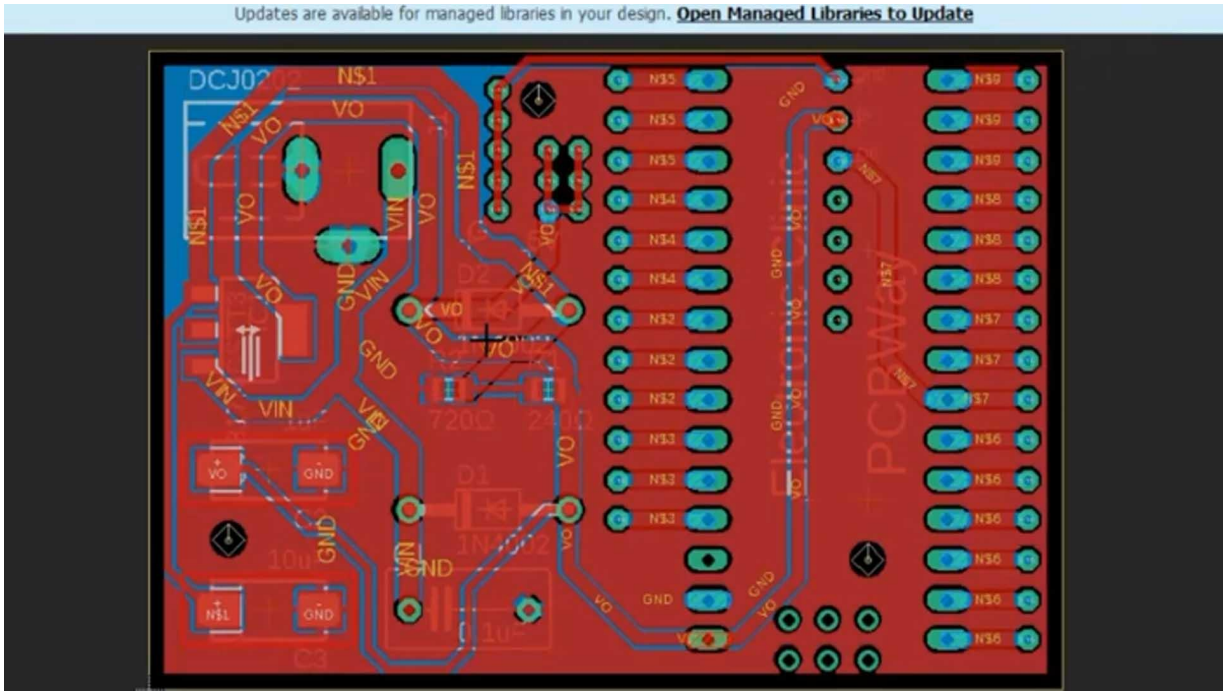
Using these tips, you can migrate all your link 1.0 projects to blink 2.0. Anyway, once the court is uploaded, Court the APP store and search for the Blink cape, make sure you install the Blink IoT. Once

the Blink IoT is installed, log in with the same Gmail ID. Click on the developer mode. Data button.

Click on the button. Select data stream. Select switch. Now irrigate and repeat the same steps. My blink mobile app is also ready.

PCBWAY ONLINE BRD TO GERBER CONVERTER

A lot of people ask me about how I generate the Gerber files because the beginners find the gates of the eagle, PCB designing software very difficult to generate the gerber files. So in this project, I'm going to share with you the easiest method, which doesn't need any software. In fact, this is an online tool designed by the PCB for their members so that they can easily generate the Gerber files and place an online order. If you want to use their online BRT girdle tool, first you will need to register yourself which hardly takes 1 minute. You can click on the first link to see the description.

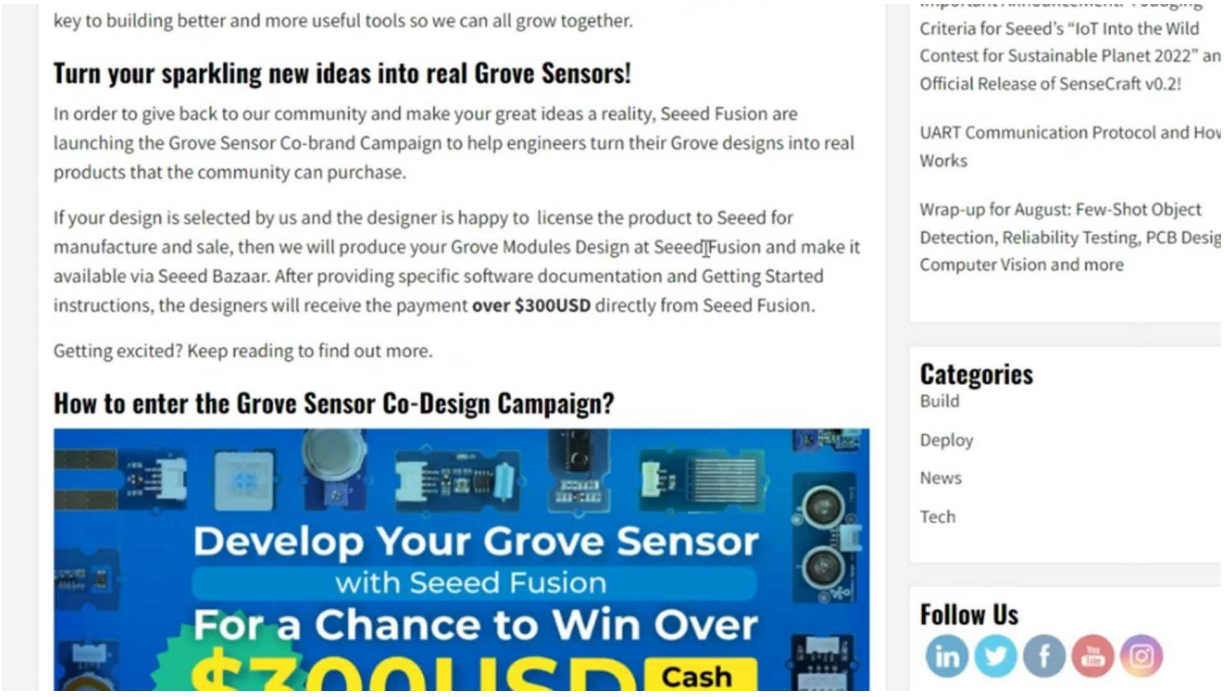


PCB is quite professional in the field of PCB manufacturing. You can try their services at extremely low prices. Only $5 for 10 PCBs $30 in total for 20 PCBs assembly. Besides this, the new members also get

a $5 bonus. This is the power supply and development board I designed for which I will use in some of my upcoming projects. I will show you how to generate the global files.

Design a Grove Sensor with Seeed Fusion and Win Over 300 USD Dollars

studios has started a campaign via electronic hobbyists and professional designers are invited to design their dream group sensor with seed fusion for a chance to win over 300 USD dollars. You know very well seed studio is a renowned company and I have been personally using their controller boards and other modules. Anyway, seed studio already has more than 400 growth modules from sensors, LEDs, inputs, wireless displays, actuators, and so on, but they don't have all the sensor modules So they have given us the opportunity to design our own groove sensor for them. I will add a link in the description if you want to check their groove modules. Anyway, before you join the campaign, I highly recommend that you guys read this blog post written by Amanda Sun.



She has explained each and every detail about the group since a co brand campaign. And let me also tell you the exciting news is all the

participants will get a chance to win or 300 USD dollars in cash prize. Obviously, if you successfully design and submit the groove module to seed studio. This is not the first campaign launched by seed studio, baked in September 2 18, they launched the 100 plus group modules wish campaign with the objective of turning the top 10 ideas into a real group module. That campaign really helped seed the studio and develop 100 group sensors.

Anyway, if your design is selected and the designer agrees to license the product to see studio form manufacturing and sale, a seed studio will produce your groove modules design at seed fusion and make it available via seed bazaar. And after providing specific software documentation, and getting started instructions, the designers will receive the payment over $300 directly from seed fusion. To join the campaign, you will need to fill out the form by clicking this link. I have added this link in the description. In the form, you will have to enter your name.

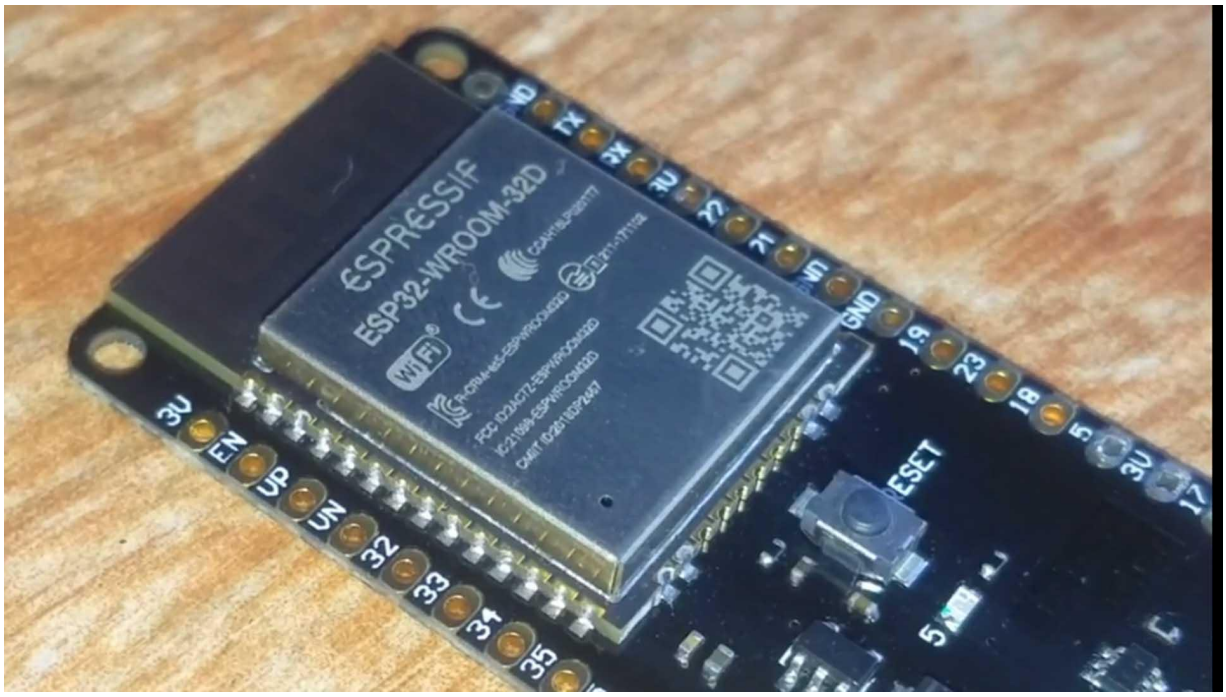
country, your email address, about your work, your LinkedIn account, a few words about your group sensor module, write the chip name which you are going to use and then 3 more questions and then finally you can click on the submit button If your group idea is approved, then seed studio will contact you via email and LinkedIn as soon as possible, and then you can start to prepare your gerber files and bom file. Each person is limited to 2 PCVA ports, 100% free for one crew design. including PCB fabrication, the cost of parts, assembly, and free worldwide delivery. Before you start PCB designing, make sure you know about the standard size of the groove sensor and hole. More than 40 designers from around the world have already joined the 2022 group since a co event campaign. I will add a link to the status tracker in the description.

If your idea is selected, then it will be marked approved, and it will be rejected only if seed studio already has that sensor. they will share the link. So make sure to check out the already available proof sensor modules on the seed studio of your website. So that's on

about the campaign. And for you guys, I have added all the links in the description.

BOARD MANAGER INSTALL ESP32 ARDUINO

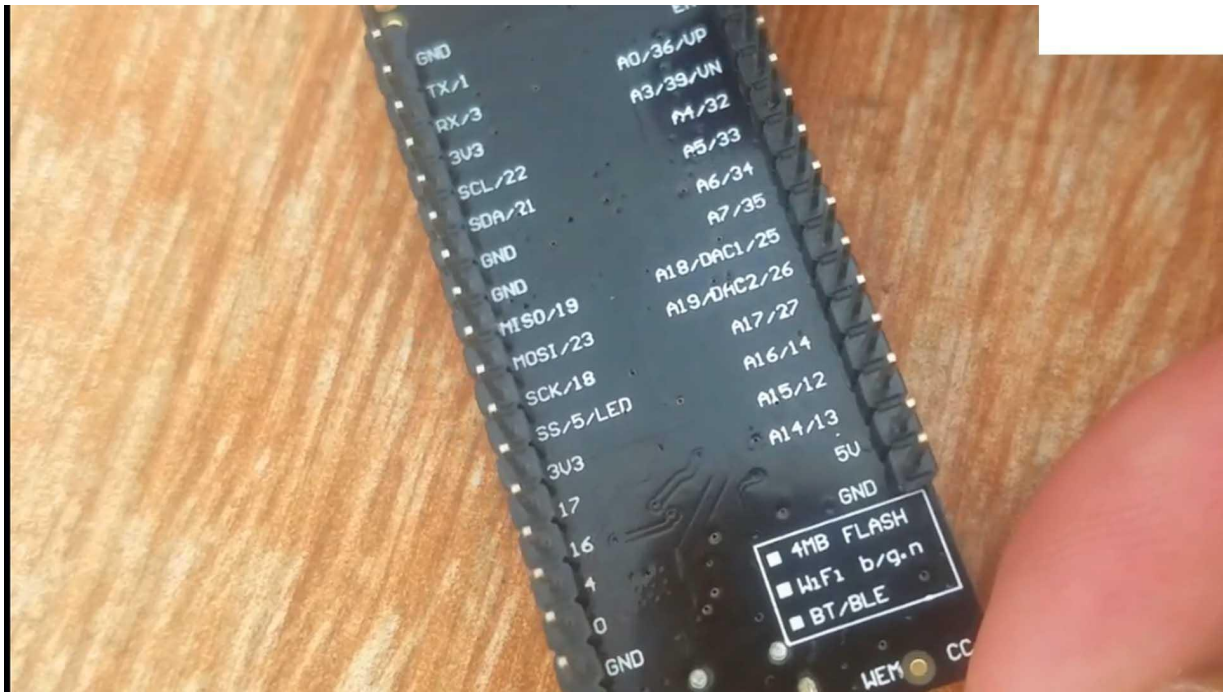
This is my first starting tutorial on the ASP 32 Wi Fi plus bluetooth module by Espresso Systems. This is the same company that created the ASP a 2 double 6 series of chips, modules, and devotional boards. This episode only covers the extreme basics, like for example, ASP 32 and out. Soltering. esp32 arduino ide board manager installation and how to write a very basic program using the arduino IDE to control an ID using the blink application.



Without any further delay, let's get started. The components and tools used in this project can be purchased from Amazon. The components purchase links are given in the description. This is the expressive ASP 32 w room 32 d module. Before I'm going to explain

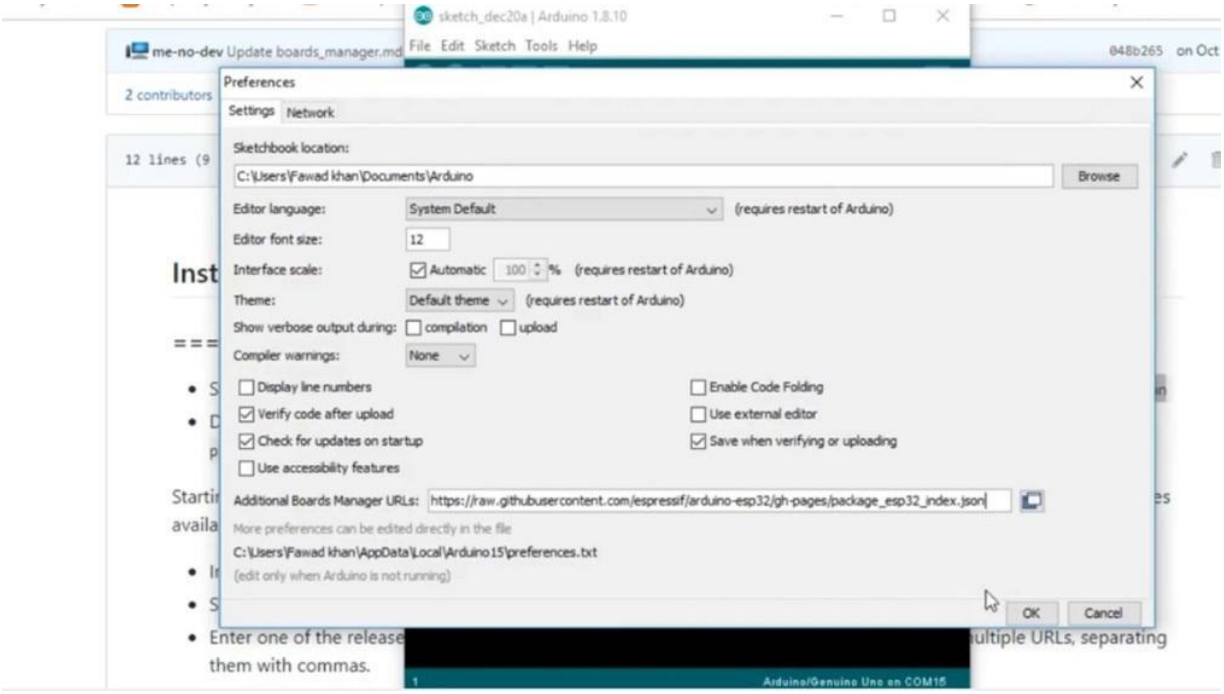
anything, first, I'm going to solder the male hitters so that I can easily use it with the art winner and other sensor board.

I'm done with the soldiering, and this is how the E SP 32 Wi Fi module looks after soldiering. The ESP 32 module has a total of 38 pins, including the label battery connector pins. So you can use a label battery to power up the ESP 32 WiFi module. Next to the lipo, battery connectors to male headers are labeled with five feet and ground. You can make your own five foot triple power supply to power up this module The power supply should be able to deliver at least 500 milliamps for the datasheet.



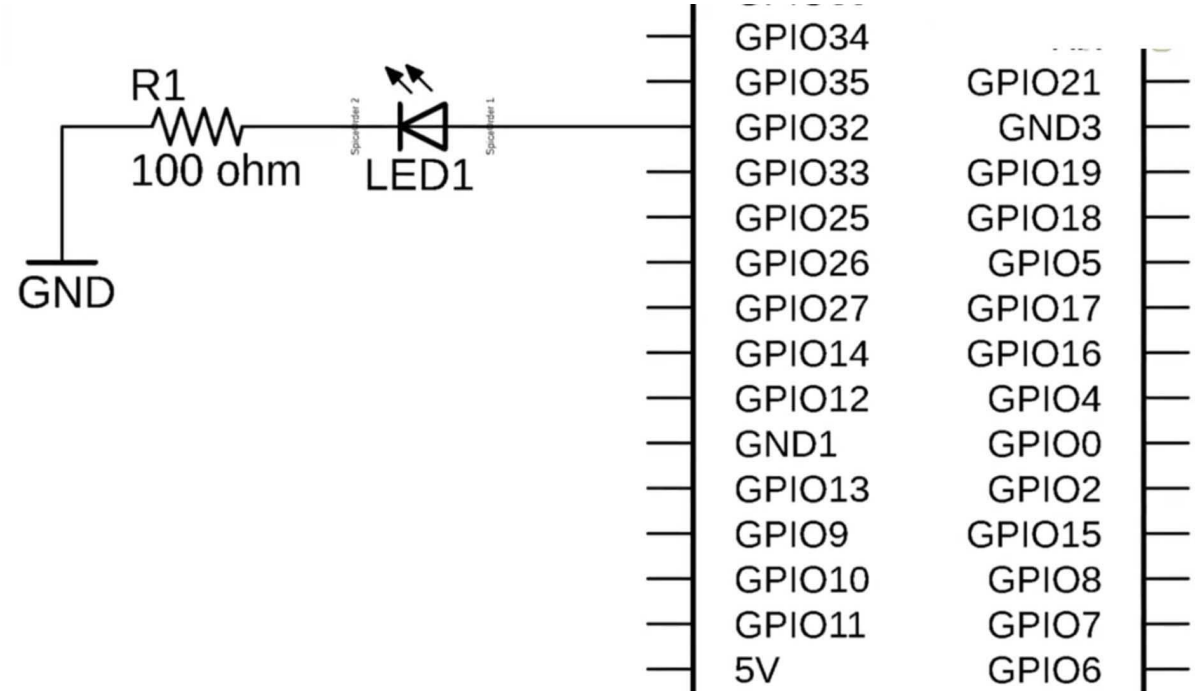
I think a 5 volts regulated power supply based on the LM 7805 voltage regulator will work just fine. Which I will cover in the upcoming projects. All the pins are clearly labeled. You can easily find the crown pins, t x, and Rx pins, 3.3 volt pins, analog pins, digital to airlock converter pins, the SPI pins, etcetera. This way you can use the ASP 3255 module with the SD cards, serial communication, UARD, SPI I Square C and I Square S supported devices.

You can also connect IR sensors pulse counters, capacitive, touch sensors, motor PDGram modules, analog to digital converters, and digital to analog converter modules. This module also comes with the on chip hole sensor. It has a 40 Megahertz integrated crystal. Integrated SBI flash of 4 MBs and the operating voltage of the ASP 32 module is 3.0 volts to 3.6 volts. The best thing about the ESP 32 module is that it can be programmed using the Arduino IDA. So before we start the programming, first we have to install the ASP 32, which is very easy.



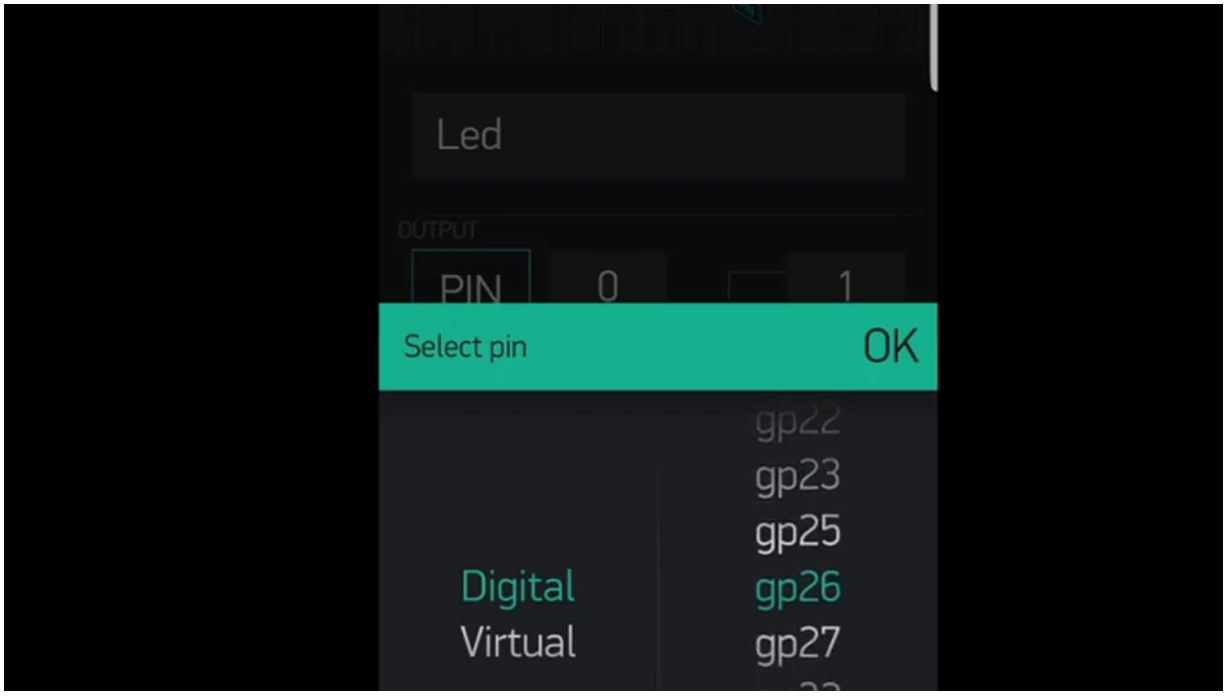
Oh, let's do it. Make sure the latest version of the Arduino IDA is already installed on your computer. Copy this link, which you can find in the description. Open the arduino IDE. Click on the file menu and then click on the preferences and simply paste the URL.

Now click on the tools menu, boards, and click on the boards manager. Search for the ASP 32. and install. This can take several minutes depending on the speed of your internet connection. Next check if the design board is installed.



As you can see, the ASP 32 diff module is available. As you can see, the circuit diagram is really simple. And it is connected with the GPI open 32 of the ESP 32 module. The Eagle Library of the ASP 32 module can be downloaded from our website. You can find a link in the description.

This is a simple LED blinking program. I'm going to use the IO 32 or gpio32, which is also the ADC channel 4. While the ESP 32 death module is selected, make sure the ESP 32 module is connected with a laptop. Select the port. Finally click on the upload button and wait for a while.



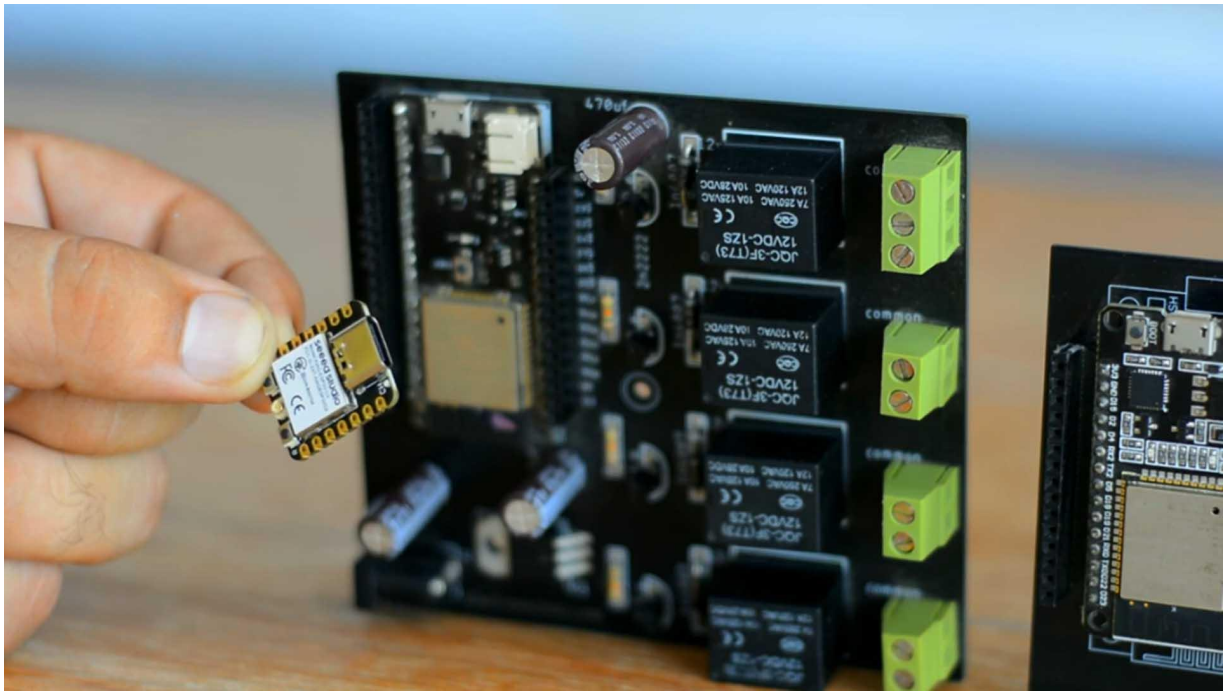
As you can see, the airdie is blinking. Now let's control this airdie using the blink application. The Blink Library can be downloaded from our website, electronicclinic.com. You can find a link in the description. This is the authentication token which I simply copied and pasted over here.

This is the name of the Wi Fi router and this is the password. It will be connected with the same GPI open 32. The white state function and the white loop function consist of the same instructions I have been using in all of my node MCU, ESPA 2, double 6, 55, module based projects. I have already uploaded this program into the ESP 32 WiFi module. Now let's make a blank application.

Our application is ready. Now let's watch this budget election. As you can see, I can control this Italy using the Blink application.

ESP 32 C3 BY SEEED STUDIO_ XIAO ESP32C3

This project is brought to you by Altium 365 via the World Designs Electronics And Octobot the fastest search engine for electronic parts. As usual, seed studios has surprised everyone by launching the smallest ESP 32c3. Wi Fi plus Bluetooth development board. Shao means small in Chinese. Previously, they launched a seed reader sharing the smallest arena and this time the Shell ESP32 C3.

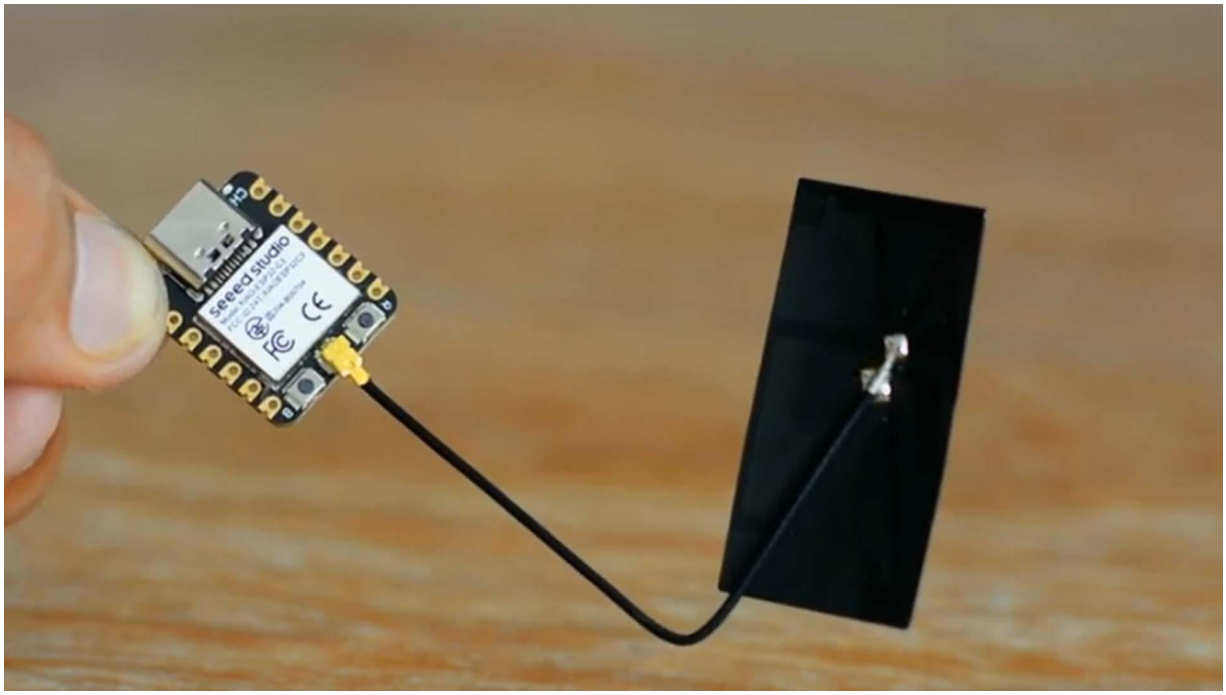


These are the ESP32 WiFi plus bluetooth modules I've been using for a long time and this is the Shell ESP 3 to C3 wifi, plus Bluetooth module. Just look at the size difference. The seed studios, ESP 3 to C3, are extremely small in size. Anyway, since this is a getting started tutorial, I will try my level best to explain each and every

detail including Number 1, technical specifications. Number 2, Binaut.

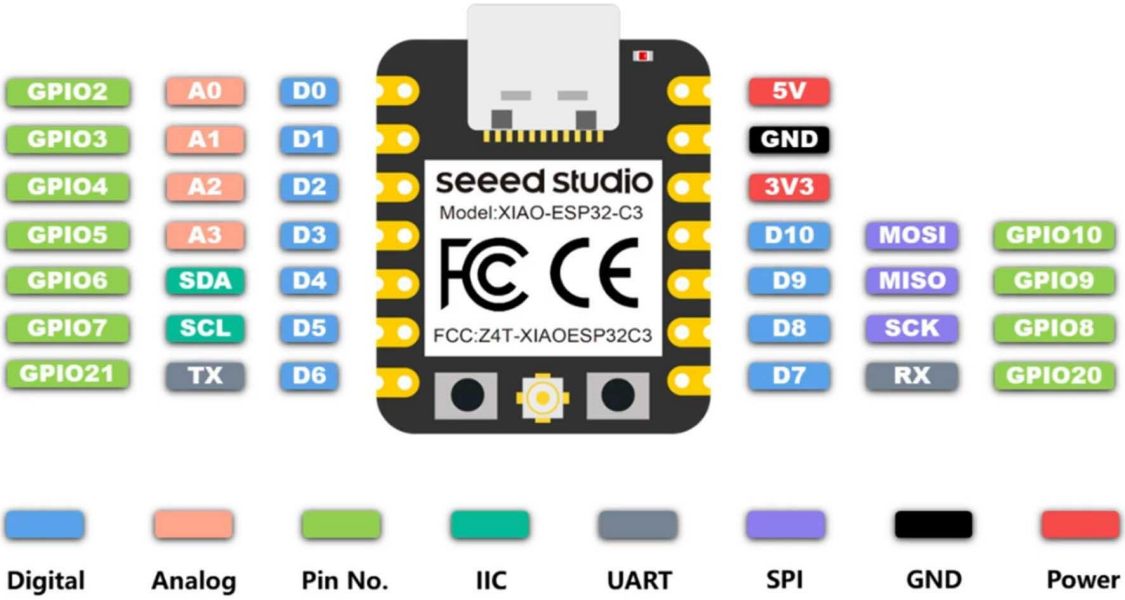
Number 3, ESP32 C3 port installation using arduino IDE. Number 4, writing our first program to control NADA. Number 5, I will also use it with the ADA fruit IO for maneuvering temperature and her melody. So without any further delay, let's get started. The components and tools used in this project can be purchased from seed studios, and Amazon.

The components purchase links are given in the description. Here are the seed studios, Shiau, ESP III, which is an IoT Internet of Things mini development board based on the Espressive ESP3 to C3, wifi, and Bluetooth dual mode chip. you might be wondering what C3 is? Well, actually, ESP32 has a number of variants. For example, ESP32S2S3.



C3, C5, C6, and H2. The SP 32 C3 type is a single co30 robust risk with CPU. up to 160 Megahertz. It has excellent radio frequency performance supporting IAAA 802.11 BTN, wifi 2.4 gigahertz and Bluetooth 5 low energy protocols. The board has this ipix connector

which is used to connect the WiFi Bluetooth antenna to increase the signal strength for your wireless applications.



This is an ultra low power module that consumes only 43 micro ams when in deep sleep mode. This board also has the battery charge chip that can be used to charge the lithium battery. It has 400 kilobytes of RAM and 4 megabytes of onboard flash memory For other technical specs, you can refer to the product page or you can read my article available on electronicclinic.com. I will provide a link in the description. Now, let's take a look at the Piano diagram.

Apart from the fivefold ground and 3.3 volt pins, it has got a total of 11 GPI opens; these are multipurpose pins. All these 11 GPS pins can be used as digital pins. GPIOS 23 45 can also be used as analog pins for interfacing analog sensors. GPIOs 6 and 7 can be used as I2C pins for connecting I2C supported sensors and display modules. GPIOS 2120 can also be used as Dx and rx.

And finally, GPIOs 8, 9, and 10 can be used as the SPI pins. Now, let's take a look at the onboard components. ULium 365 lets you hold the fastest design reviews ever, share your designs from anywhere and with anyone with a single click. It's easy. Leave a

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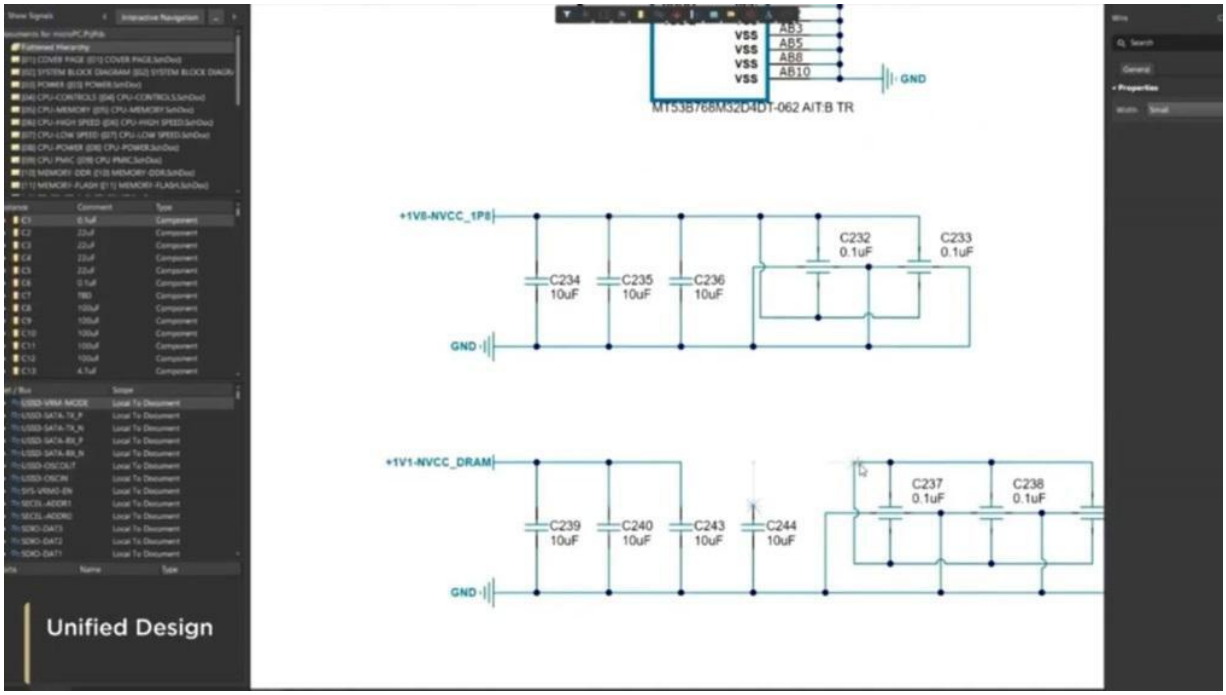

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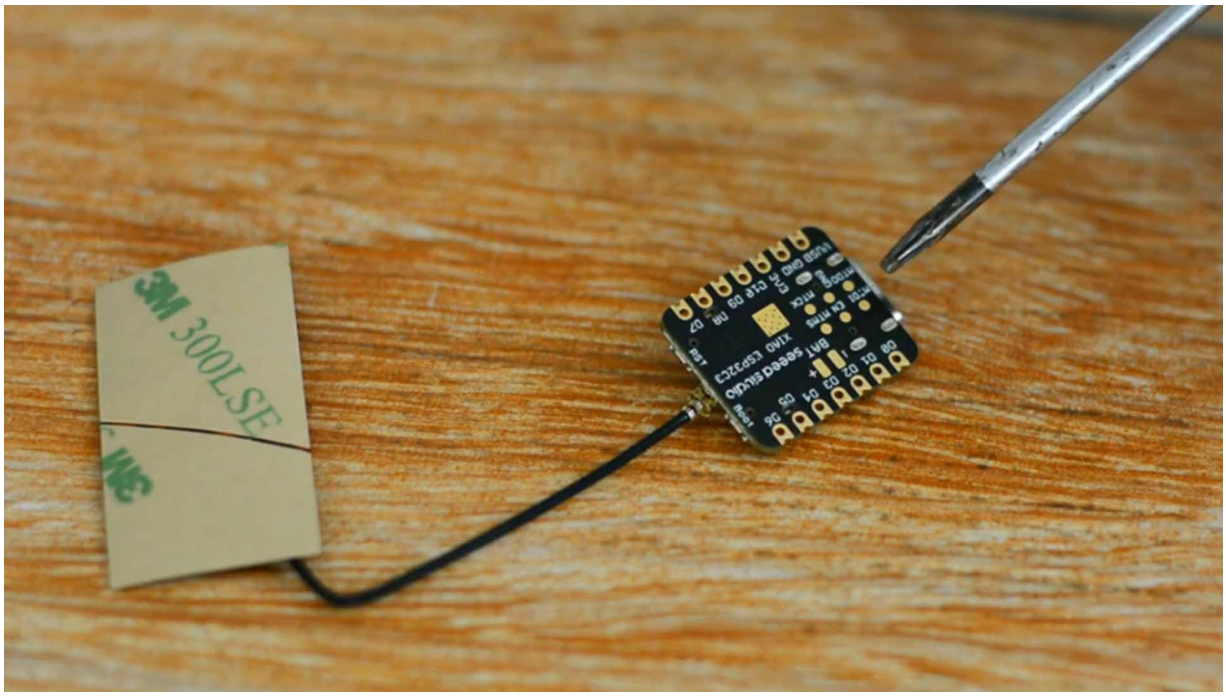
Altium 365 and octoport are given in the description. This is the USB Type C interface This is the charge a day. The ESP32 C3 itself, a reset button. wiFi Bluetooth antenna connector and a boot button. On the bottom side, we have a JTek Bates card, battery connector, and a thermal bay. Now, I'm going to solder made headers so that I can easily use them on a breadboard.

As you can see, I have soldered the mail headers. Now, to use the ESP 32c3 with the Arduino IDE, you will need to install the latest ESP 32 board manager URL link. You will need to copy this link from the article. Then open the arduino IDE. Click on the file menu. Click on the preferences.

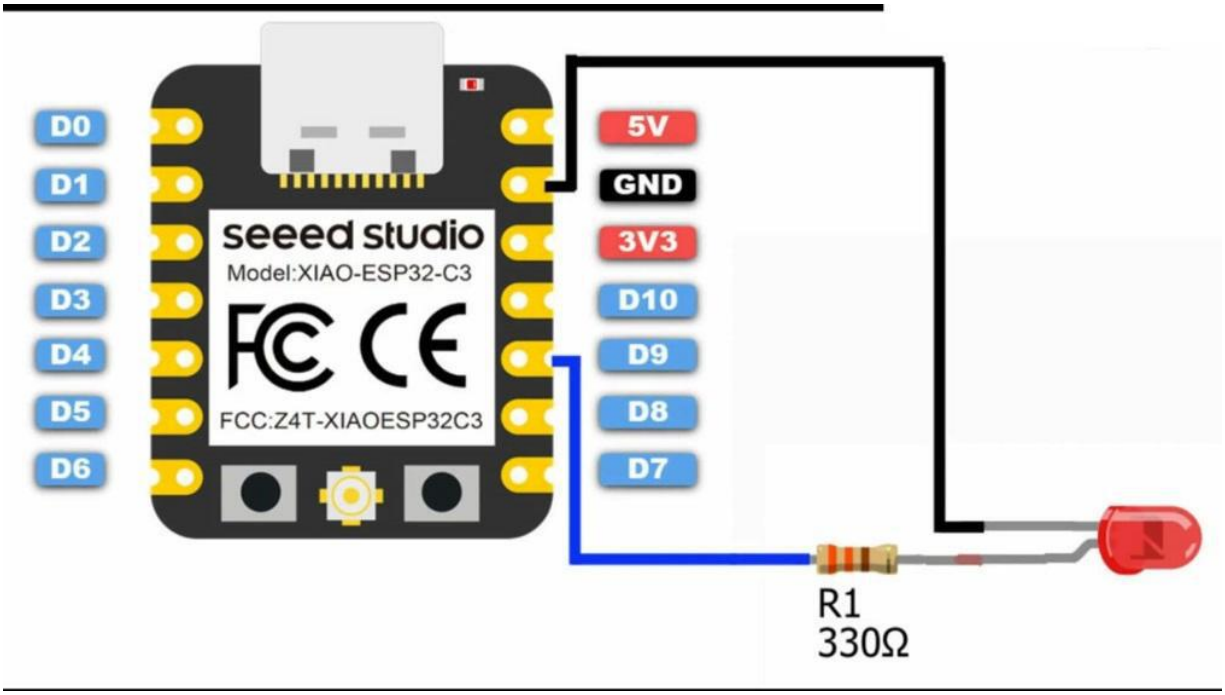
and paste the link in the additional boards manager URLs. As you can see, I have already added the link If you already have some URLs, then simply put a comma and paste the URL. Finally, click on the okay button. This time, click on the tools menu. Go to board and click on the board's manager.



Search for the ESP 32 and install the latest version. As you can see, I have already installed the latest version of the ESP 32 board. Now,

go to the boards and check if you can find the Shell speed 32c3. If it's available in the list, then congrats you are done with the hard part. Now, I'm going to start with a simple ADT project.

connect the cathode leg of the irreddy with the ground pin on the ESP 3 to C3, connect the anode leg of the irreddy with the digital pin 9 through a current limiting resistor of 330 ohms. I connected the diagram. And now let's take a look at the programming. Here, I have this very simple code. You can see the LED is connected to digital pin D9.

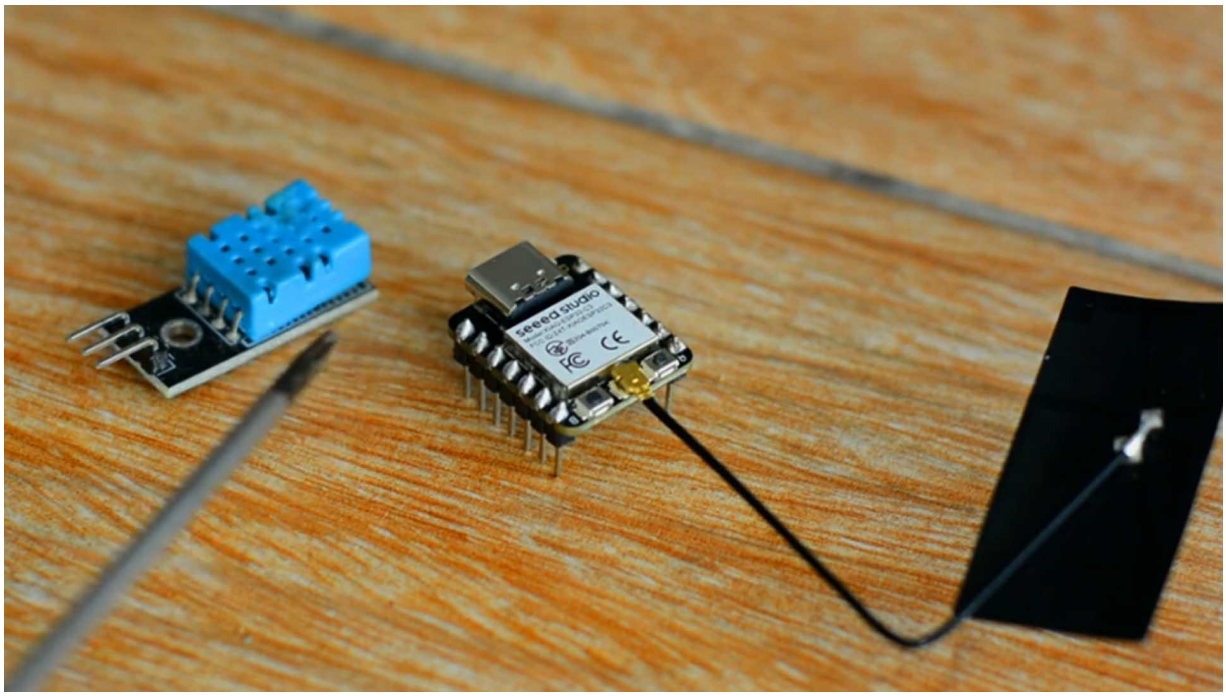


Inside this set of functions, I set the LED as output. Inside the loop function, I'm simply turning on and turning off the LED. I'm using a delay of once again. Now, to upload the code, select the shiausp32c3. Make sure the correct communication port is selected.

Finally click on the upload button and wait for a while. You can see the code has been uploaded. The l d is blinking, which means we have done everything correctly. Now, in this next example, I'm going to use ESP 3goc3 with Adafruit IO for monitoring temperature and humidity using a DHT11 sensor. You can run your previously designed projects without changing the code.

You will only need to change the pin numbers to practically explain this. I'm going to use my previously designed Adafruit IO dashboard. If you want to learn how to make the same IOT dashboard using Adafruit i o, then I highly recommend watching my project tutorial on eta root i o and s p a to double 6. I will provide a link in description. Now let's take a look at the circuit diagram. The data pin or the s pen of the DHT 11 sensors connected with a D Six pen while the voltage and ground pins of the DHT 11 sensor are connected with 3.3 volt and ground pins.

I connected the DHT 11 sensor sir, Ace per the circuit diagram. Now let's take a look at the programming. I have already explained this code in my previous project on the Adafruit IO and ESP a 2, double 6, this time I'm using ESP 3 to C3. So I changed the ESP a 2, double 6, 55 to WiFi. and I only changed the HD11 pin.



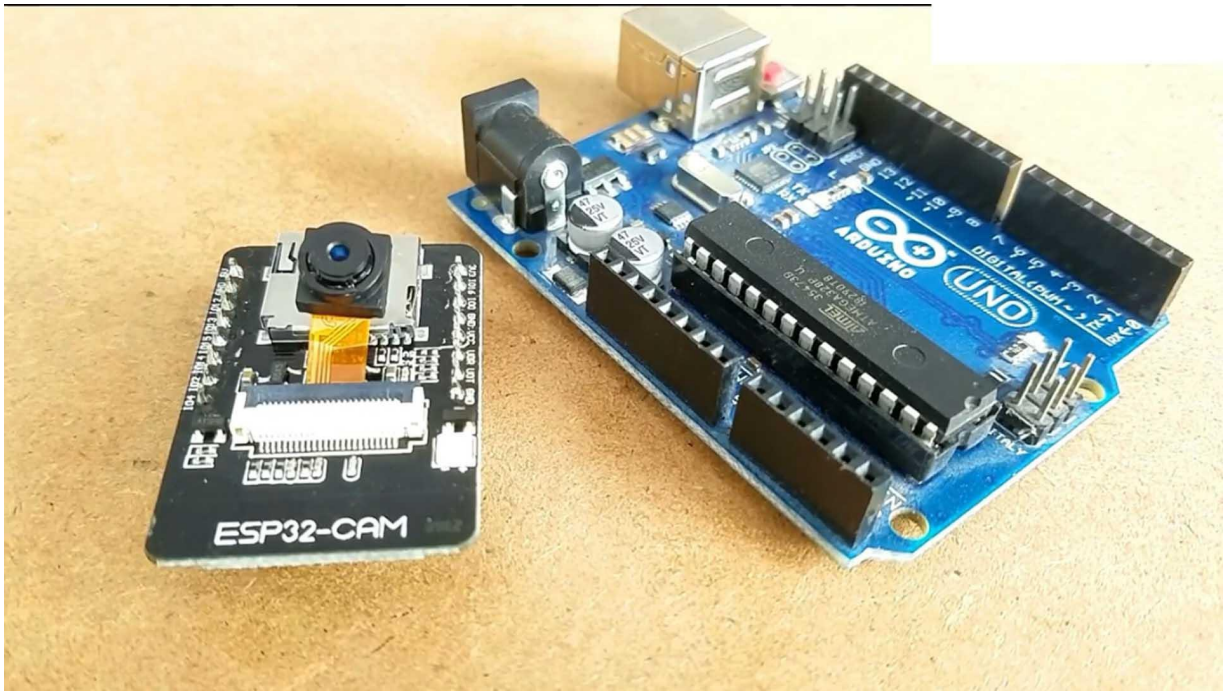
This time, I'm using digital pin D6. There was code for the buzzer and OLED which I removed, while everything else remains exactly the same. You can copy modified code from my article, I'll be providing a link in the description. Upload this code the same way as

we did in the AOD example. Right now, the Shell ASP 32c3 and laptop both are connected to the Wi Fi.

You can use the same Wi Fi network or different Wi Fi networks. Anyway, you can see temperature and humidity values on the gauges. Let me apply some heat and you will see an increase in the temperature.

ESP32 FACE RECOGNITION

This is my third project on the ESP 32 camera module. In this tutorial, you will learn how to make face recognition based door locks. control system using a speed 32 camera module and a 12 volt electronic lock. For the authorized person, the onboard white ADA is turned on and also the electronic lock is opened. This ESP 32 Camera based face recognition door lock control system depends on what the previous two tutorials said.



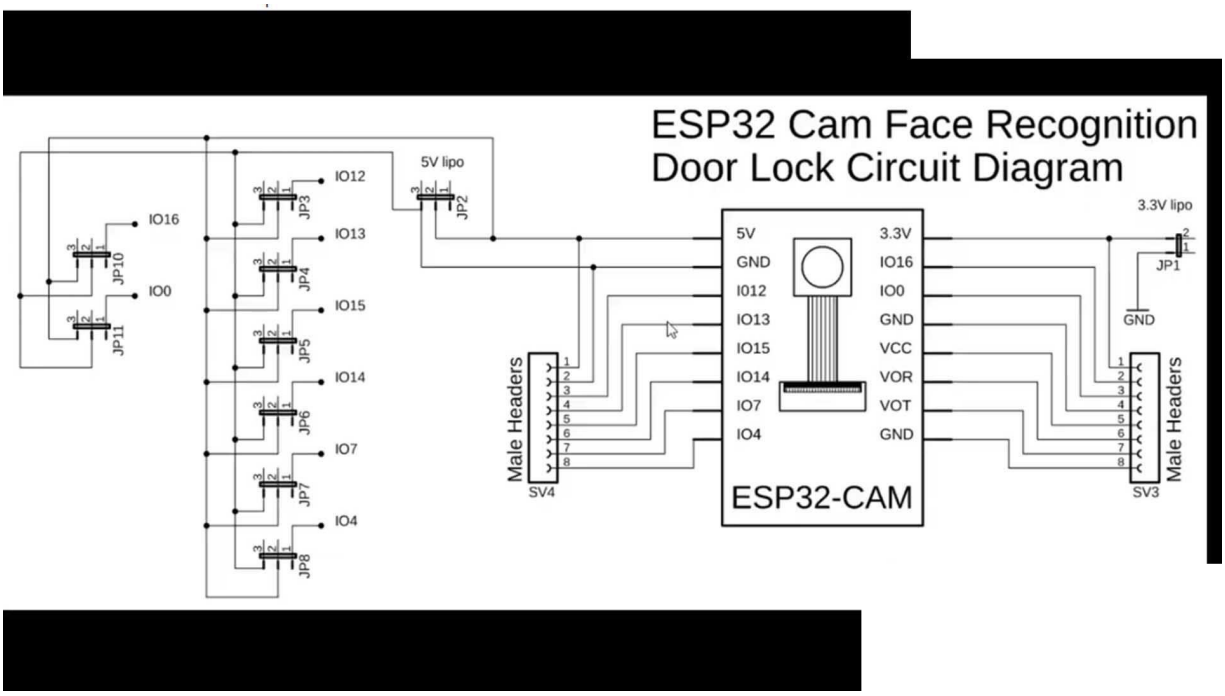
In my first project tutorial, I explained how to program the ESP 32 camera using the Arduino IDE. In this project, I covered the basic settings including the ASP 32 camera port manager installation. And I also explained how to fix the most common errors including the detected camera not supported and the camera prop failed with error 0 x 2004. I also explained some other issues. While in my second tutorial, I designed a development board for the ESP32

camera module so that the ESP32 camera tool can be easily interfaced with other I O devices.

So I highly recommend first watching my previous two tutorials, then you can resume from here. Because in this project, I will only explain the modified circuit diagram and the programming. Without any further delay, let's get started. The components and tools used in this project can be purchased from Amazon. The components for Chase links are given in the description.

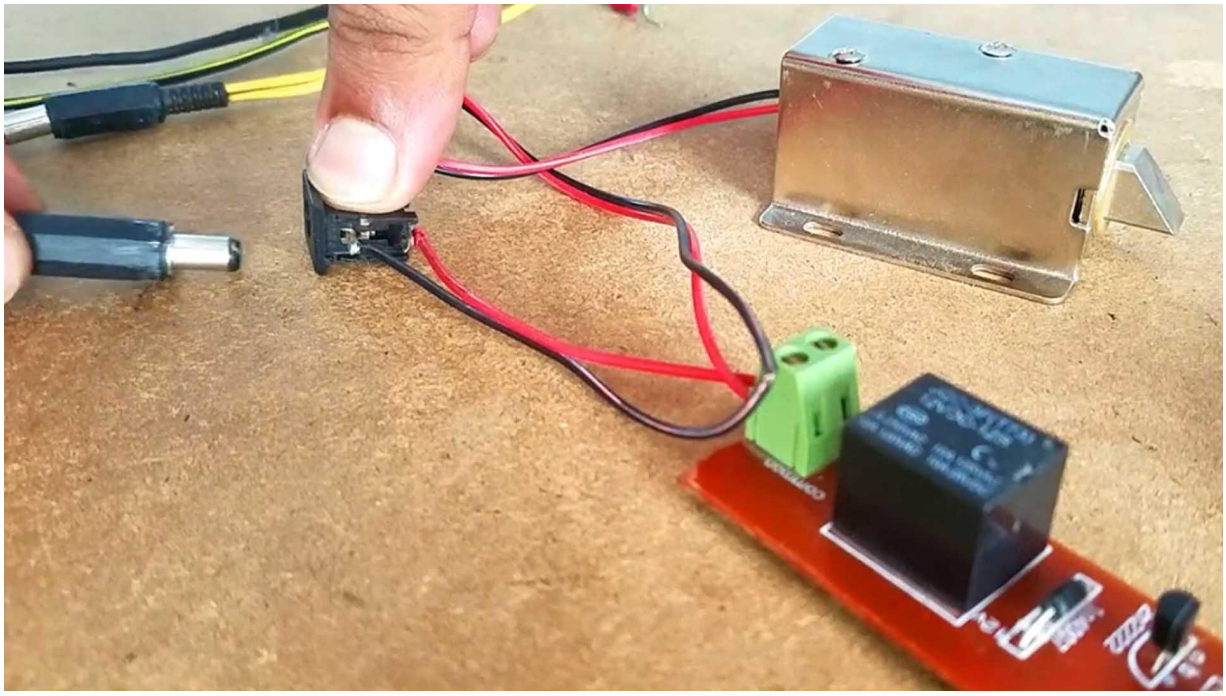
The Dom circuit remains the same. I didn't even change a single connection. Now let's have a look at the bottom circuit. The 5 volt regulated power supply and the headless connection with the SB 32 camera module remains the same. This time, I edited a 1 channel relay module, which is used to control the electronic lock.

The one general relay model is controlled using the IO pin 12 of the ESP 32 camera module. The onboard white irides connected with the IO 4. I soldered the 12 fold and ground wires from the relay module with the 12 fold and ground points of the power supply and connected the relay module input wire with the I or 12 of ESP 32 camera module. Finally, I connected the electronic lock with the relay module, normally open and common contact. I completed my connections as per the circuit diagram already explained. Now let's have a look at the programming.



This is the same exact program I used in my previous two tutorials. This time, I made a few changes. I defined pins for the Eruditus and the electronic lock. I also defined 2 variables, match face, and open lock of the time. I also defined an interval of 6 seconds when the face is recognized, the electronic lock will remain open for 6 seconds.

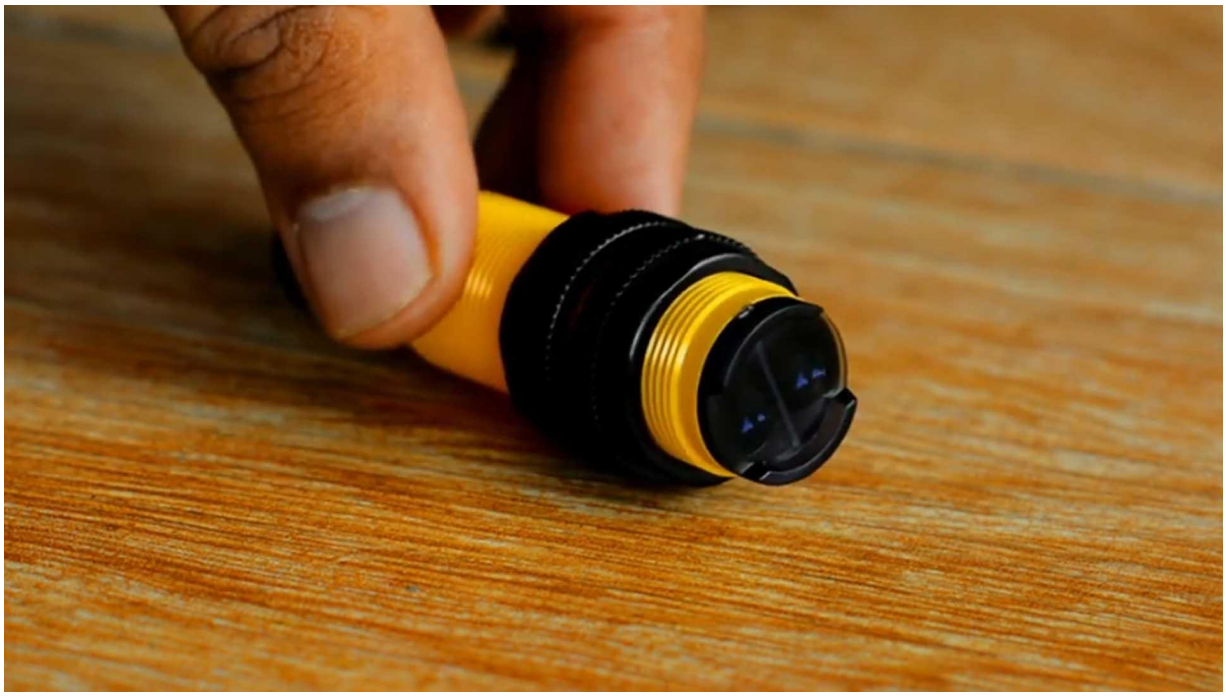
In the end two conditions which locks and unlocks the electronic lock and also controls the I have already uploaded this program. Let's watch this project in action. I started off by powering up the electronic lock and the ASP 32 camera module using a 12 volt adapter. You will need the local IP address for the live project streaming using the same wifi network. I have already explained this in the first project So I know about my local IP address.



Turn on face detection and face recognition and click on the start stream button. Click on the enrolled face and start taking the samples. When everything is done successfully, the electronic lock will open and also, the wide elity will turn on.

IR SENSOR WITH ESP32 CAM

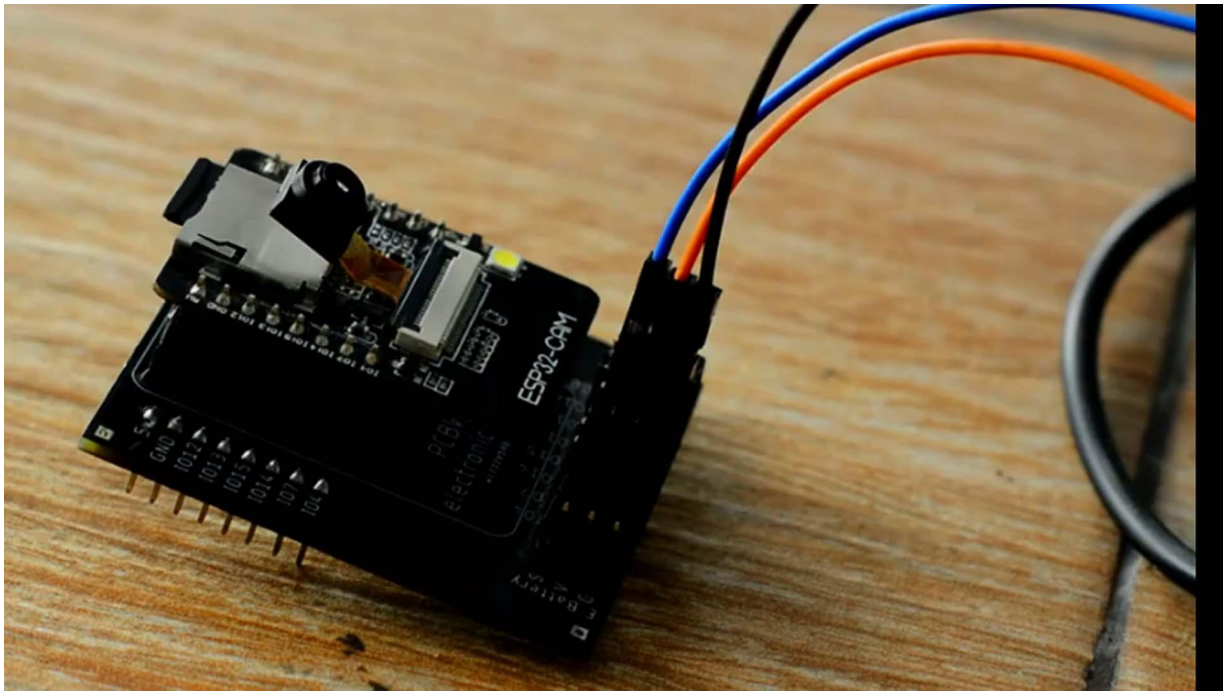
This project is brought to you by Altium 365 via the World Designs Electronics And Octobot the fastest search engine for electronic parts. I have already made many projects on ESP 32 games. If you haven't used the ESP 32 camera module before, I highly recommend that you watch my getting started project because in that project, I have discussed the issues related to ESP 3 to camera module, and I have also practically demonstrated how to solve those issues. In addition, I use the ESP 32 game as a smart IOD doorbell in which I created a cell phone app with the help of the blink application which I used for monitoring the camera. And at the same time, I used it to control the door lock.



I have also used the SP 32 game with Google Drive. And a lot of people like that project because with the help of this project, you can monitor your camera from any corner of the world provided the internet connection is available. For more ESP 3rdoclaim related projects, check my playlists. You may have noticed that there is a micro SD card slot by which you can store images in it. and this way you can make a time lapse camera for yourself.

I have already explained the time lapse camera function to the Google Drive project. In today's project, I will use this long range adjustable ir sensor with the USB 32 camera module. I have taken this IR sensor from D. F. Robot.

I will share the complete specification of this IR sensor with you guys . If you guys don't have this IR sensor, you can use a simple push button for testing. I connected the IR sensor with ESP 32 camera module for the circuit diagram, which I will explain later in this project. First, I'm going to explain that it's working, and then I will start to practically station. Before using the camera module, you have to insert the SD card into it, then you have to install this IR sensor and camera at the place which you have to monitor if you can see there is quite a long cable with this IR sensor. So you can easily install it at your desired location.



For demonstration purposes, I will check this project on this table so that all friends can easily understand it's working. You can see I have part of the USB 30 camera module. Now, if any object or person comes in the range of this IR sensor, SB32 K will automatically capture its picture. and will save it on the SD card. So let's go ahead and start our practical demonstration.

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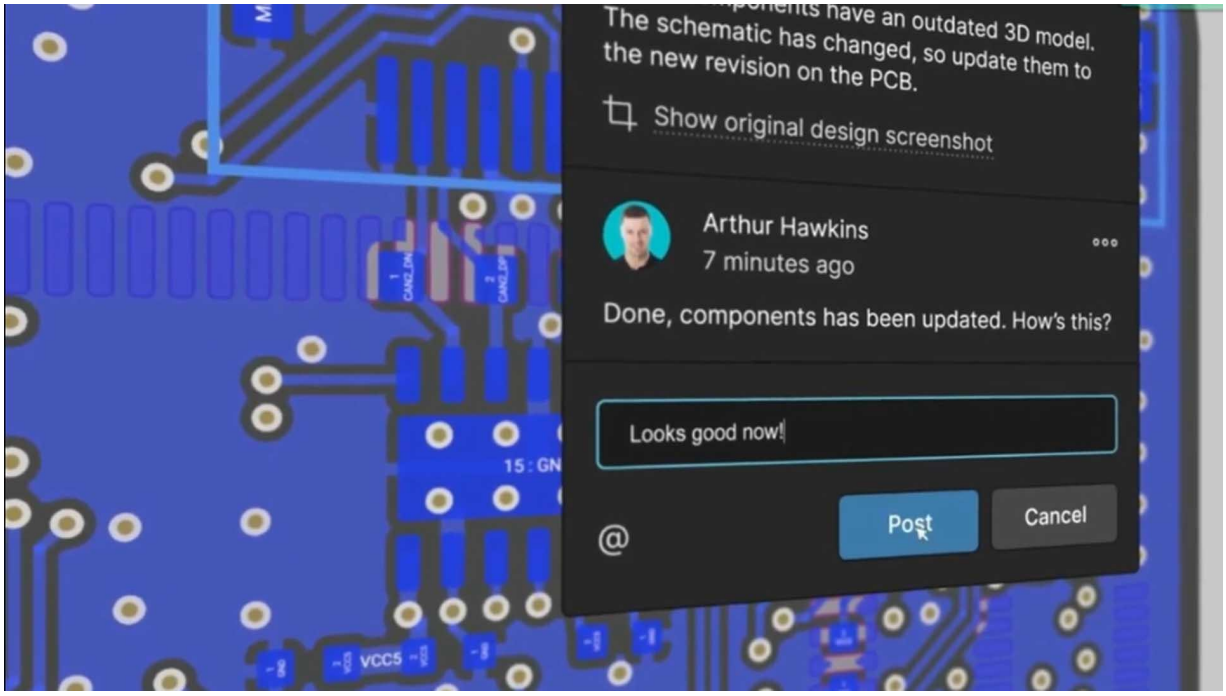

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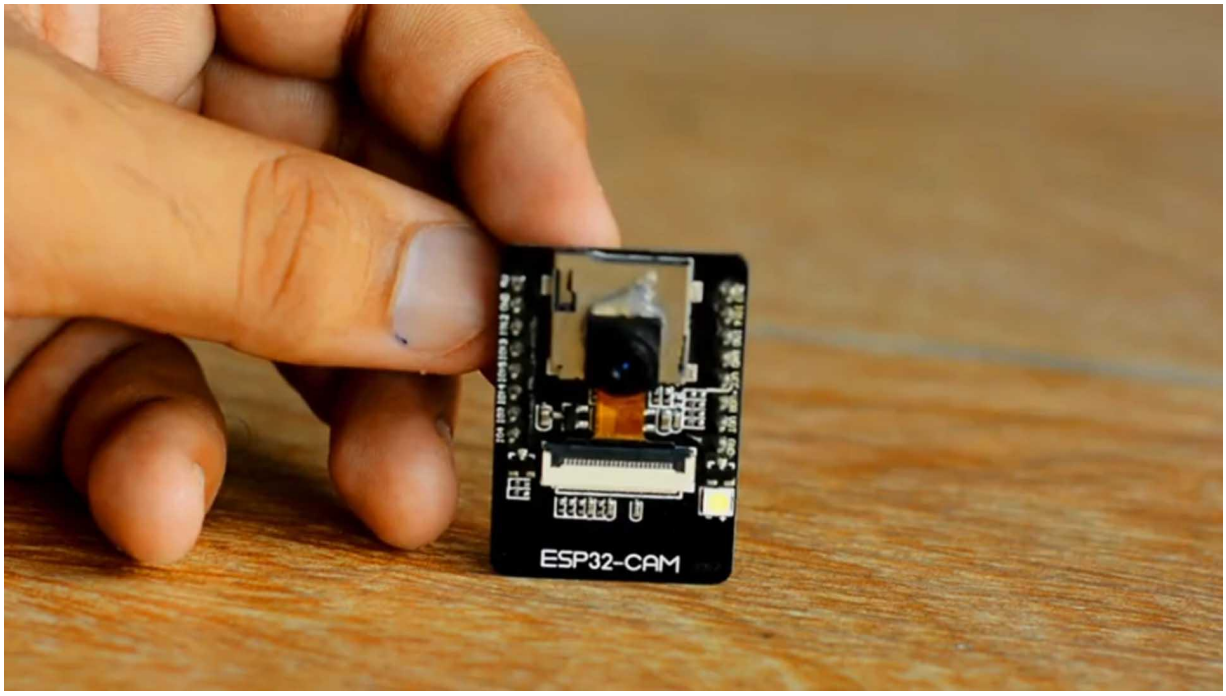
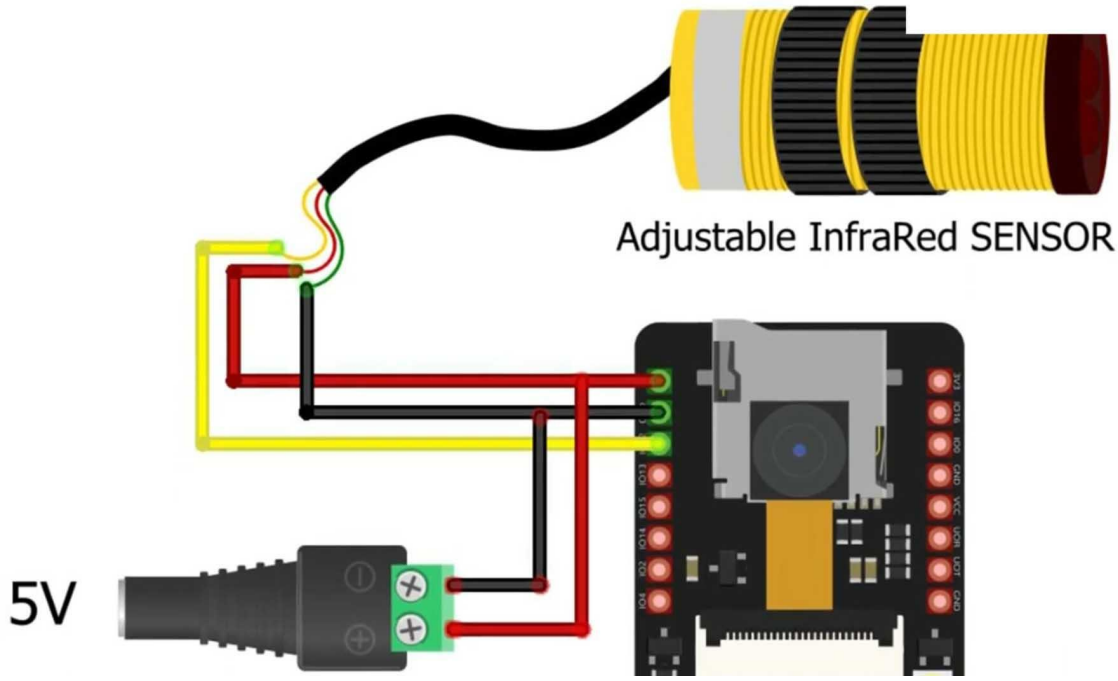


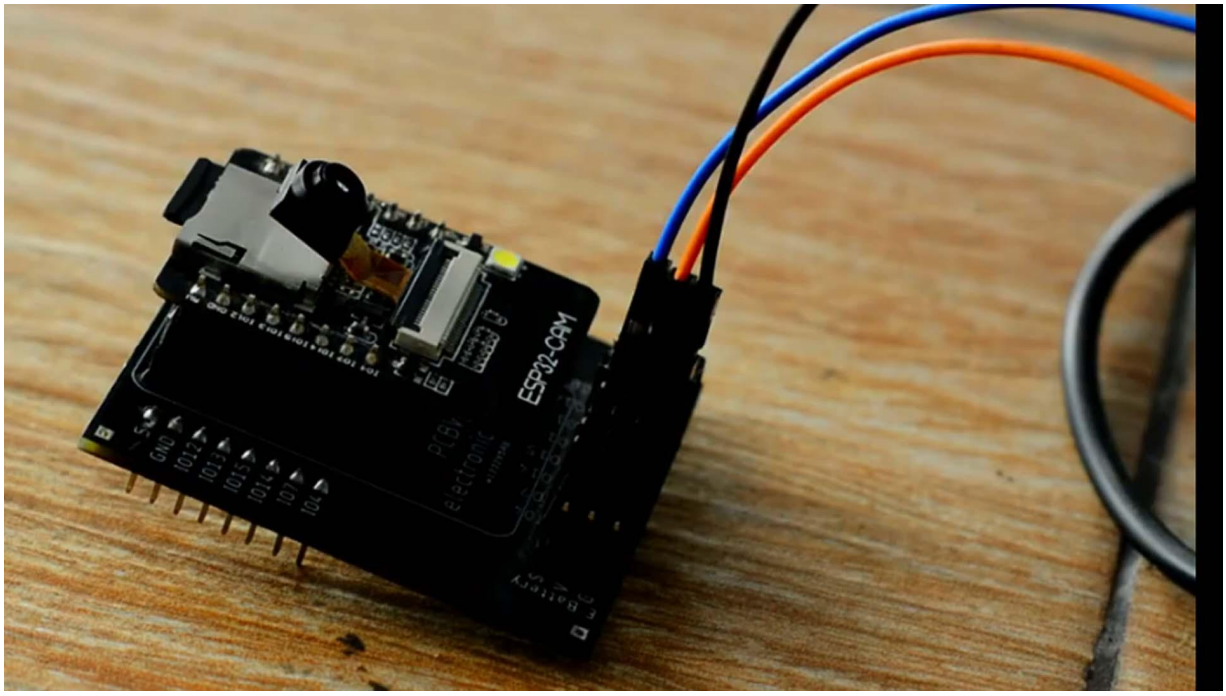
You can see the speed 32 games successfully gifted all the images and saved them in the micro SD card. I'm sure by now, you might have got an idea of how this system works.

So without any further delay, let's get started. Access granted. The components and tools used in this project can be purchased from Amazon. The components purchase links are given in the description. I have got this long range adjustable IR sensor from emitting and receiving IR LEDs.



On the big side, you will find this red LED, which lights up each time she detects anything. Next to the LED, you can see this small screw which you can use to adjust the detection range: the blue wire is the signal wire, the brown wire is the voltage wire, and the blade wire is the ground wire. The output form is PNP normally open. The signal type is digital. The operating voltage is 3 volt 2.

five volts. Due to such a wide input voltage range, it can be used with all 3.3 volt and five volt compatible controller boards like ESP 32k name, Artevino, ESP32, ESP A 2, double 6, STM 32, etcetera. The detection range is from 0 to 200 centimeters. For more technical specifications, read my article, I will provide a link in the description. Now let's take a look at the circuit diagram.



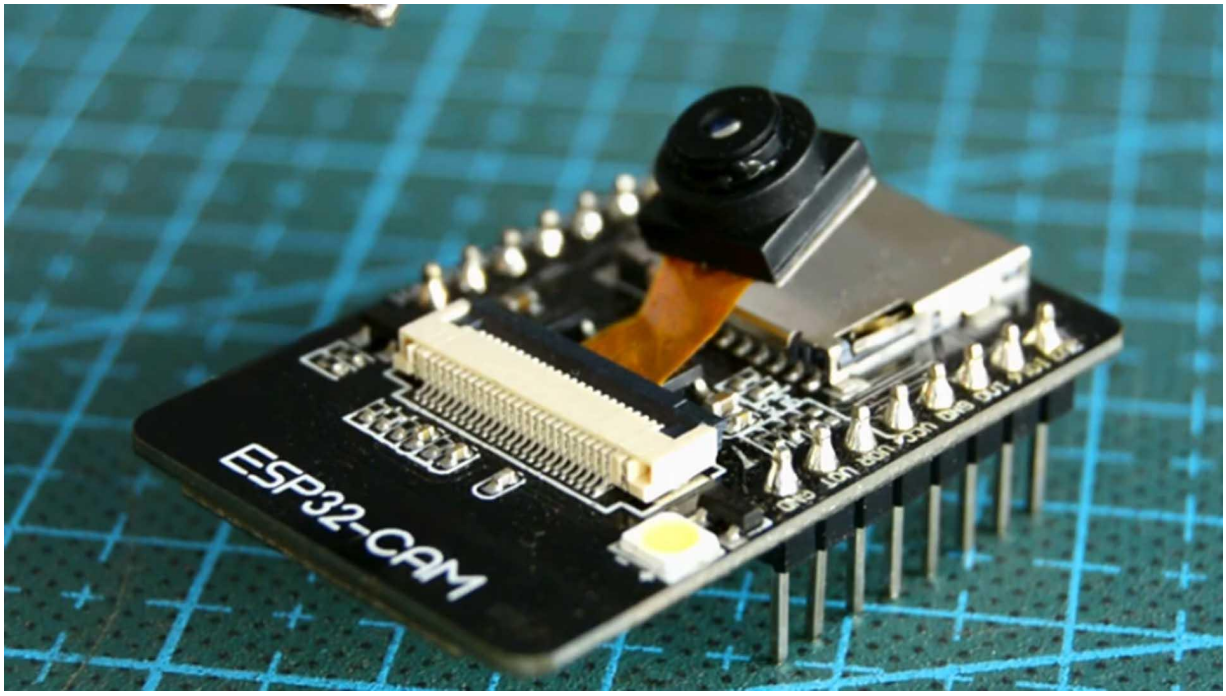
The circuit diagram is very simple. The signal wire of the ir sensor is connected with the IO 12 pin of the ESP 302 camera module. I have designed this simple development board for the USB 32 camera module. You can see I have eric these male and female headers for connecting the full power supply and for connecting different types of sensors. If you want to make the same development port, then you should watch my previous project. I will provide a link in the description. You can download this code from our website electroniccollect.com.

I will provide a link in the description. Uploading code into the ESP 32 game is a bit tricky. You will have to connect it to the arduino to upload the code. You can follow these connections for detailed explanation, read my article. Anyway, after uploading the code, I connected my IR sensor with a USB 32 camera module and I powered up the speed 32 game using a 5 fold regulated power supply.

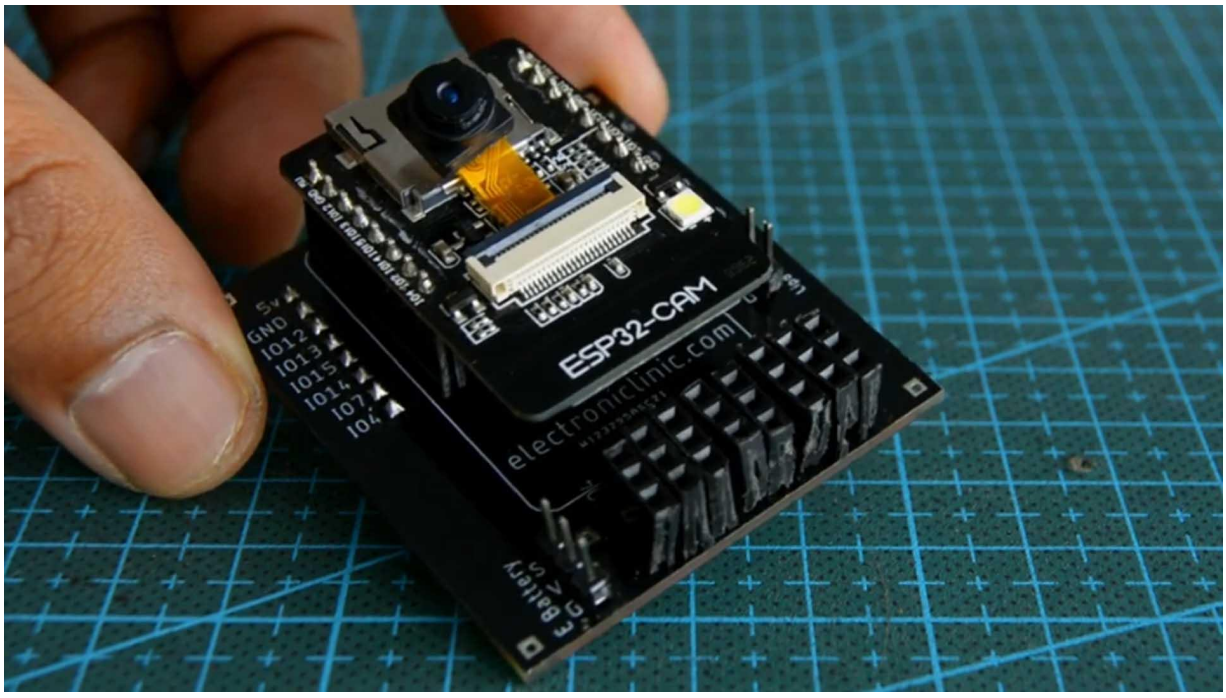
CAMERA USING ESP32 CAMERA MODULE

This project is brought to you by Altium. The ESP 32 game is one of my favorite camera modules. I've been using the ESP 302 game module in different projects. Previously, I used it for controlling the electronic door lock using the human face recognition technique, and I have also used the same SP 32 camera module for the live project streaming. These previously designed projects will really help you in getting started with the ESP 32 camera module. If you're using the ESP 32 camera module for the first time, then you might face some issues.

I, myself, when I first started with the ESP 32 camera module, I had to deal with some errors including the detected camera not supported, and the camera prop failed with error 0 X 2004. There is also another issue that you might face while working on the ESP 32 camera module, and that is the ESP 32 k module keeps resetting automatically. So if you face any of these issues, then I highly recommend watching my Getting Start Equatorial on the speed 32 camera module. You already know SP 32 cam is an IoT supported camera module, which means you can connect this low cost camera module with your Wi Fi network And this way you can build yourself an extremely powerful IoT security camera or surveillance system. In today's episode, you will learn how to make an IoT security camera using the speed 32k module and Google drive.



The speed 32 captures the images and then sends them to Google Drive. The images can be captured in 2 different ways. Number 1, we can make it fully automatic by using a delay. So the ESP 32 cam will capture the image after a fixed delay and then send it to Google Drive. The delay time can be changed in the programming.



So let's say if you want the SP 32 camera module, to send an image after every one minute or, let's say, 10 minutes simply change the delay time in the code Now this technique can be quite useful in situations where you need to monitor progress at a construction site or any other activity So this technique is useful when it comes to monitoring some kind of progress or activity. But the same technique fails when the ASP 32 game is used for security purposes. Because it seems quite impractical to send images at a regular time interval while there is no activity at all. So that's why I also created a second version of the same project which I named is the IOT security camera. Number 2.

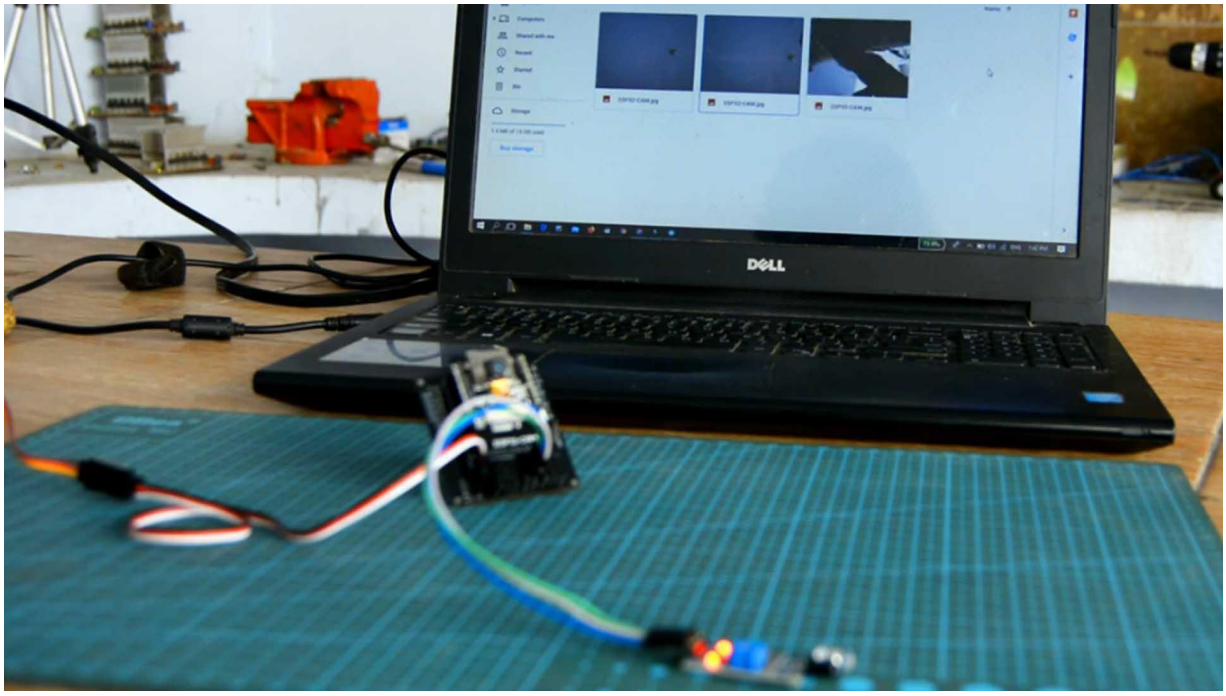
Now, the second version is also fully automatic but it captures and sends the images only when a sensor is activated. It can be any analog or digital sensor. For demonstration purposes, I'm going to use this IR sensor. So each time the IR sensor is activated, it will send an image to Google Drive. Let me practically show you both the techniques and then I will explain everything else.

 To get rid of the jumper wires, I designed these 2 PCB boards.

If you want to use a 3.3 volt laboratory or a five volt power supply, then you can use only this board. This board also has these female headers which you can use to connect sensors and other electronic circuits. You can connect a fivefold power supply over here or you can connect a 3.3volt lipo pantry over here. The E speed 32 camera module nicely sits in on the top of this circuit. If you want to use a solar panel or any other voltage source, which is between 925 faults, then you can use this circuit As you can see, this board has the 7805 voltage regulator, which accepts a wide range of input voltages and gives regulated 5 folds is the output, which can be used to power up the SP 32 camera module and other sensors. So if you are planning to control 12 volts then you should use this circuit.

These circuits are provided with the male and female hitters due to which the sport can be easily connected together without using the jumper virus. Since in this project, I'm not using any relays and pitfalls electronic devices so I'm not going to use this circuit. I have already uploaded the program which sends images to Google Drive after every few seconds. Don't worry. Later in this project, I will explain how to upload a program.

My ASP 32 cam is absolutely ready. and now it's time to connect my five volt tablet power supply. When the air release flashes means the s p 32 cam has connected with the WiFi network. You can see I just received an image in my Google drive from the ESP 3 to camera module. This is version 1, and its job is to send images to Google Drive after every few seconds.



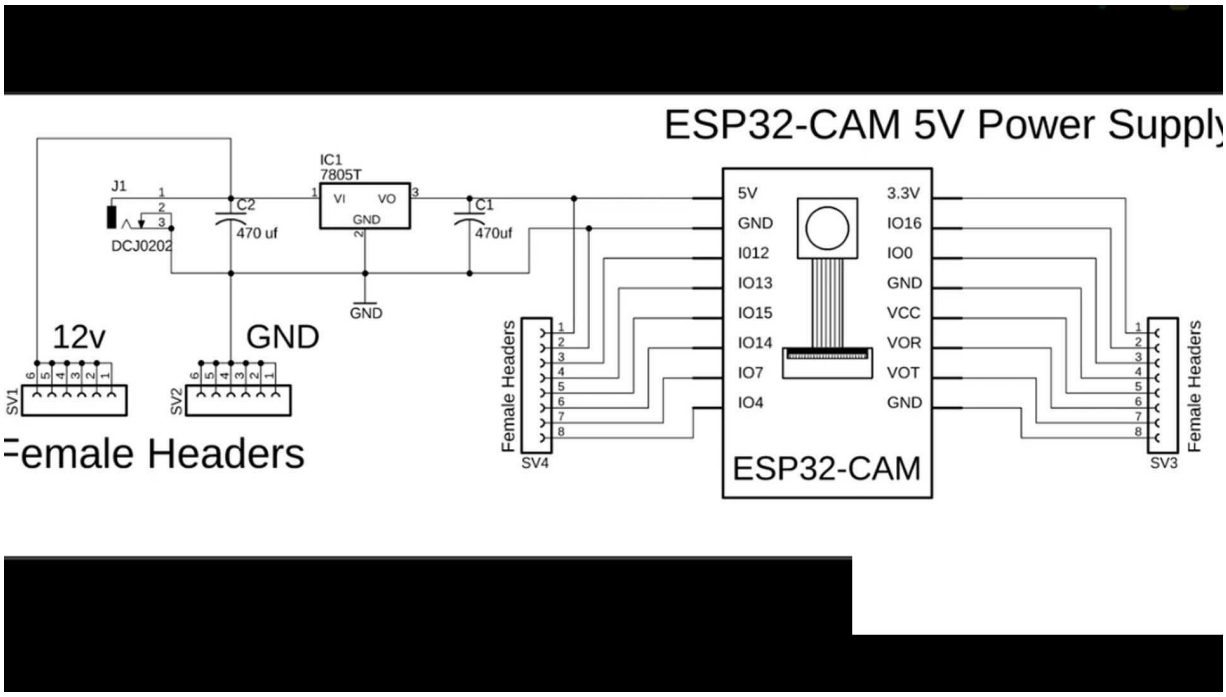
As I explained earlier, this type of project can be useful in situations where you need to monitor a specific type of activity or work progress, etcetera. Since the images are uploaded to Google Drive, it means you can monitor any specific activity from anywhere in the world. You might know every Google account comes with 15 GB of storage that's shared across Google Drive, Gmail, and Google photos. So make sure you don't use short delays otherwise in a day or so your entire Google Drive will be filled with images. You can see I have already received many images from the SB 32 game.

And if I don't stop the SB 32 game, it will keep sending the images to my Google drive. So I'm going to stop my SP 32 game, and I'm also going to delete all the images. Now, let's watch the second version of the same project and action. This time, I connected this IR sensor with the ASP 32 game. If you want, you can also use a PIR sensor or a microwave sensor or an ultrasonic sensor.

or any other sensor is for your requirement. Anyways, now the speed 32 game will only send images when the ir sends is activated. So let's go ahead and power up the SP 32 camera module. You can

see the ESP 32 cam only sends an image to Google Drive when the IR sensor is activated. This is how easily you can convert your USB 32 cam into an IoT security camera.

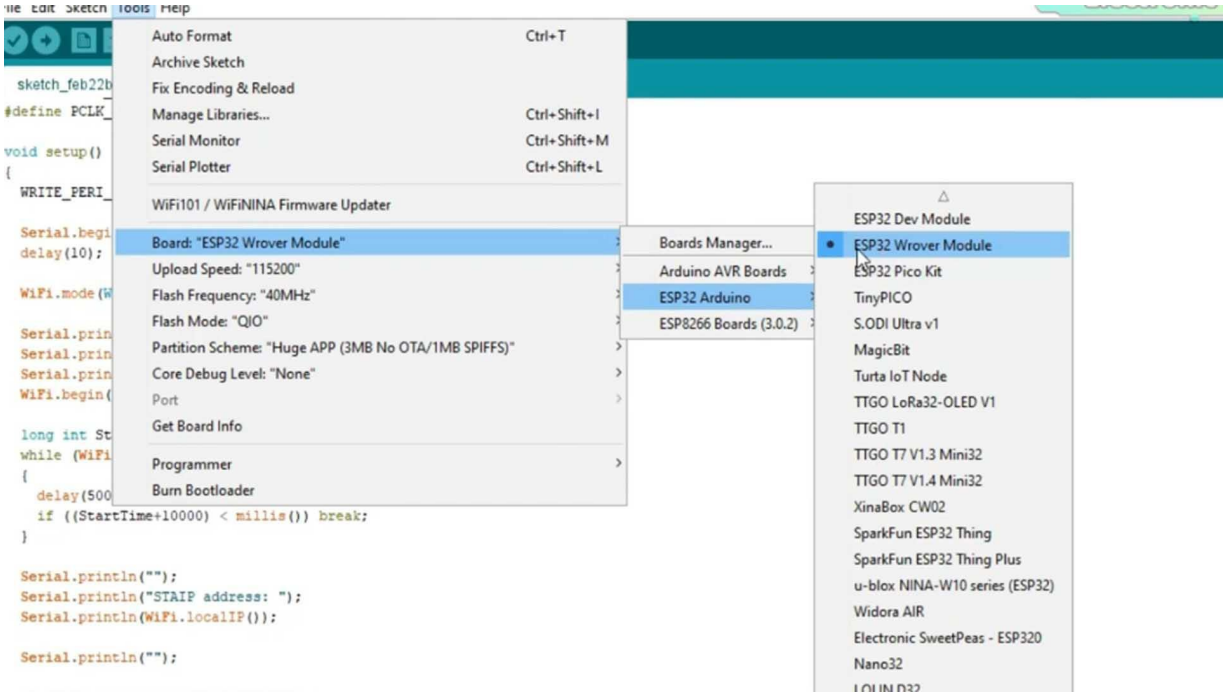
Now you have got an idea of what exactly you are going to learn after watching this project. So without any further delay, let's get started. Access granted. The components and tools used in this project can be purchased from Amazon. The company's purchase links are given in the description.



This is the circuit diagram of the top PCB board . As you can see, there is nothing complicated. Male and female headers or connected with the power supply and eye opens of the SP 32 camera module. The SP 3 and SB4 male hitters are used to make connections with the bottom circuit board. The JP 1 is used to connect a 3.3 volt laboratory while the jp2 is used to connect the five volt regulated power supply. All the other headers are used for interfacing sensors and other output devices.

This is the circuit diagram of the bottom PCB board. Female headers are connected with the power supply and eye opens of the ASP 32

camera module. The bottom PCB board is provided with the 5 volt regulated power supply based on the linear voltage regulator, LM7805. A voltage source greater than 6 volt and less than 28 volts is connected with a DC female power jack j 1. This way, the SP 32 camera module can also be powered up using a solar panel.



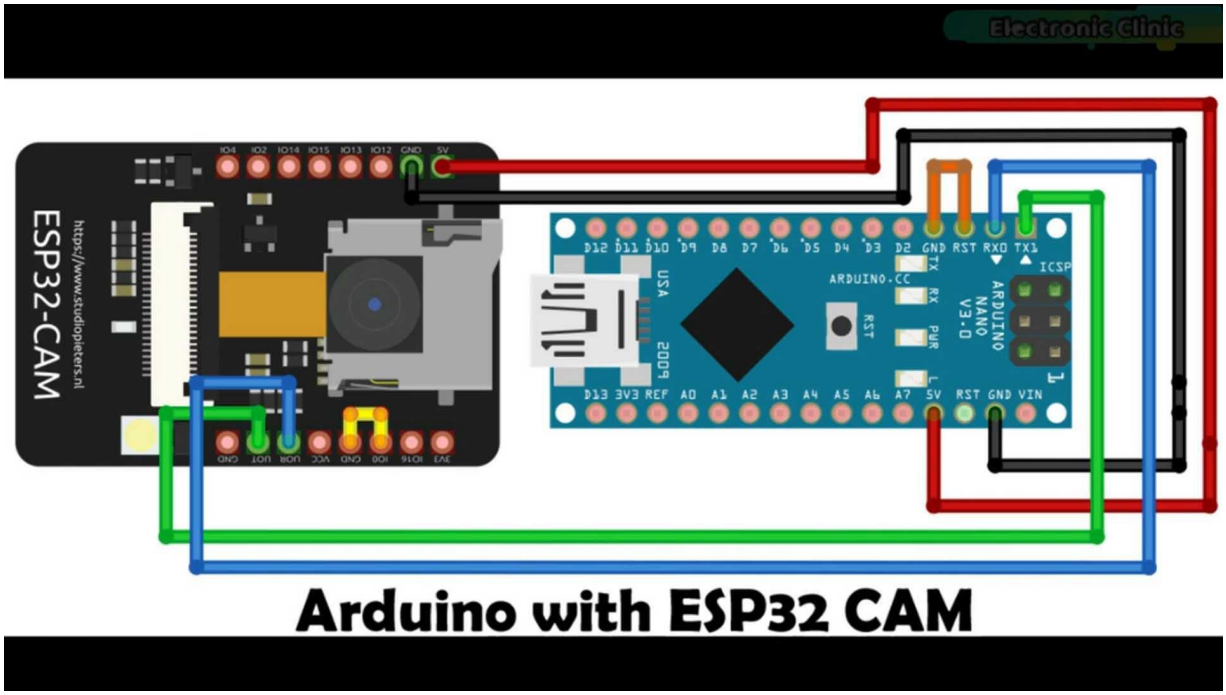
12 volt battery or a 12 volt adapter, etcetera. I also added headers for the 12 volt and ground connections if you want to control 12 volt relays, small 12 volt DC motors, etcetera, I used gates for designing the top and bottom PCBs. I have already explained the PCB designing and soldering in my previous project based on the face recognition door lock control system. You need to watch this project if you want to learn how to control a tilt volt relay and an electronic door lock. Anyways, here are my PCBs and as I explained earlier, and this project I'll be only using this PCB board Now, let's go ahead and take a look at the programming.

This is the code which sends images to Google Drive at regular intervals. There are a few things which I would like to explain. Before you start the programming, first of all, make sure you install the ESP32 port manager URL link And for this, you can watch my

getting started tutorial on the ASP 32 module. Once you have installed the board, then you should be able to see the ESP 32 role module. ESP came is the main core which consists of the SSID password.

and the Google apps script path, which I will explain in a minute. Now, if we go to the main loop function, You can see inside this loop function, we have only one function, the descent captured image function, and then a delay. you can increase or decrease this delay. Personally, I don't like delays inside the main loop function because it really disturbs normal execution of the program because once the control enters into the delay function, then it stays there, and the controller won't do anything until the delay is over. So, apart from sending the images to the Google drive, if you also want to monitor some sensors, then I highly recommend that you don't use a delay.

You can use a timer. This code is ready to use, means you don't need to change anything except the delay SSID, password, and the Google API script path. The ASP came base64.cppand base64.files need to be inside the same folder you can download all these three files from our website, electronic clinic.com. I will provide a link in the description now start working on the Google apps script. Open the web browser and search for the Google apps script.



Click on the start scripting button. Click on the new project button. Enter the project name. You can download this Google script code from my article. Click on the save button.

Click on the publish menu and then click on the deploy as a web app. Select who has access to the app. Click on the review permissions. Select your Gmail account. Click on the advanced and then click on the go to SB 32 and save.

Click on the allow button. You will get this current web app URL link. This is basically the Google apps script path. copy this URL and paste it in the web browser. Now you have to copy only this part of the link and paste it in your god.

Now the program is ready for upload, but before you upload the program first, make sure you select the correct board which is speed 32 or module, select the bot rate 1152100, select the face frequency 40 megahertz, select the Flash mode QIO. Select the partition scheme. Now, you have 2 ways to upload the program. You can use this USB to tutorial converter, or you can use an Arduino board to

upload the program since most beginners don't have this USB to detail converter. So I will use an arduino with the ESP 32 camera model to upload the program.

Let's take a look at the connections diagram. Connect the fivefold and ground pins of the SP 32 cam with the Autino's fivefold and ground pins On the ESP 32 game, connect the IO 0 with the ground pin. Connect the receive and transmit pins of the ESP 32 camera module with the receive and transmit pins of the arvino. Make sure you connect to receive with the receive and transmit with the transmit. Finally, connect the reset pen of the arduino with the ground.

I connected the ESP 32 with the arduino for the connections diagram. Now, I'm going to connect my arduino port with the laptop. On the arduino ID, make sure you select the correct communication board. Finally, click on the upload button and wait for a while. You can see the program has been uploaded.

Next, remove all the wires. Now the speed 32 cam is completely ready. You can use fivefold and ground from the arduino to power up the speed 32 camera module, which is good for the initial display. But in the long run, it seems quite impractical to use Onpino to power up the E speed 32 game. I highly recommend you should get a board like this.

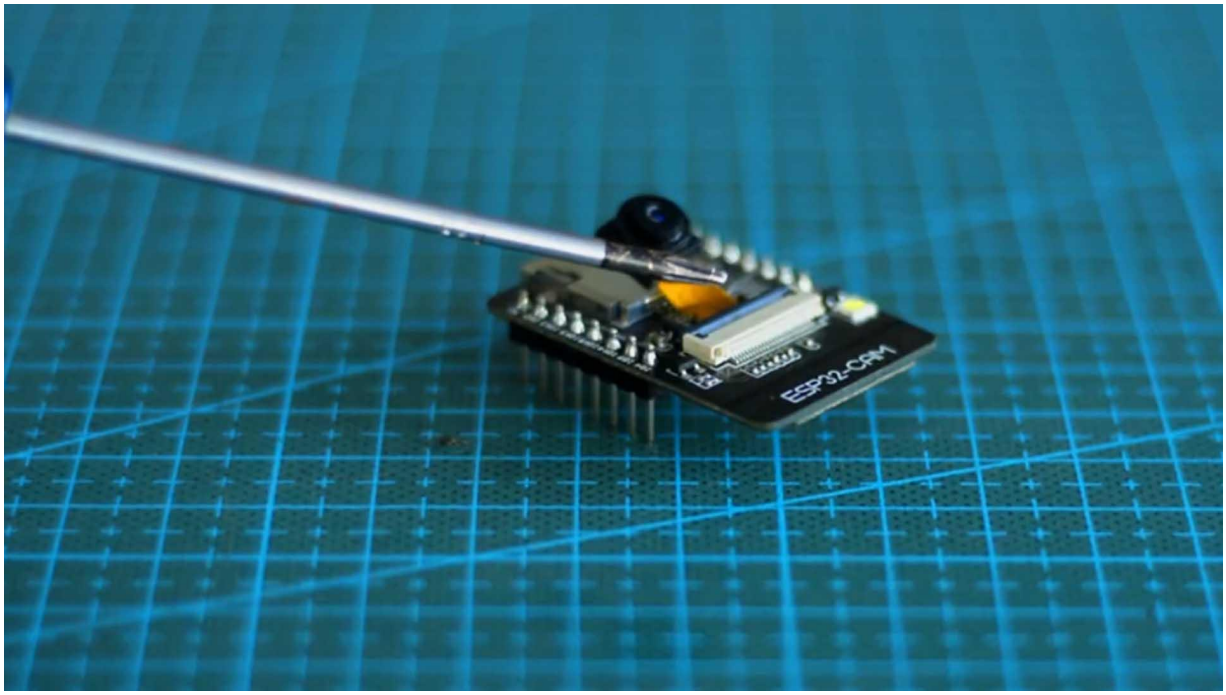
So if you want to make the same SP 32 cam development port, then you can download the PCB design files from the article. My SP 32 game is absolutely ready, and now it's time to connect my 5 volt regulated power supply. You can see I just received an image and my Google drive from the SP 32 camera module. This is version 1, and its job is to send an image to Google Drive after every second. Now let's take a look at the circuit diagram of version 2, which is the IoT security camera.

The VCC and ground pins of the IR sensor are connected with 3.3 volt and ground pins of the speed 32 camera module. The outband of the ir sensor is connected with the IO 13 pin of the speed 32 camera module. I connected my IR obstacle sensor module with the SP 32 came as per the circuit diagram. And now let's take a look at the SP 32 came based IoT security camera code. This is the same exact program.

I didn't change anything except adding this if condition. Now, the USB 32 cam will only send images to the Google drive when the IR sensor is activated. I have already uploaded the program using the same method as previously explained. Now let's watch the speed 32 cam based IoT security Gambra Addiction.

ESP32 CAM SMART IOT BELL AND DOOR LOCK PROJECT

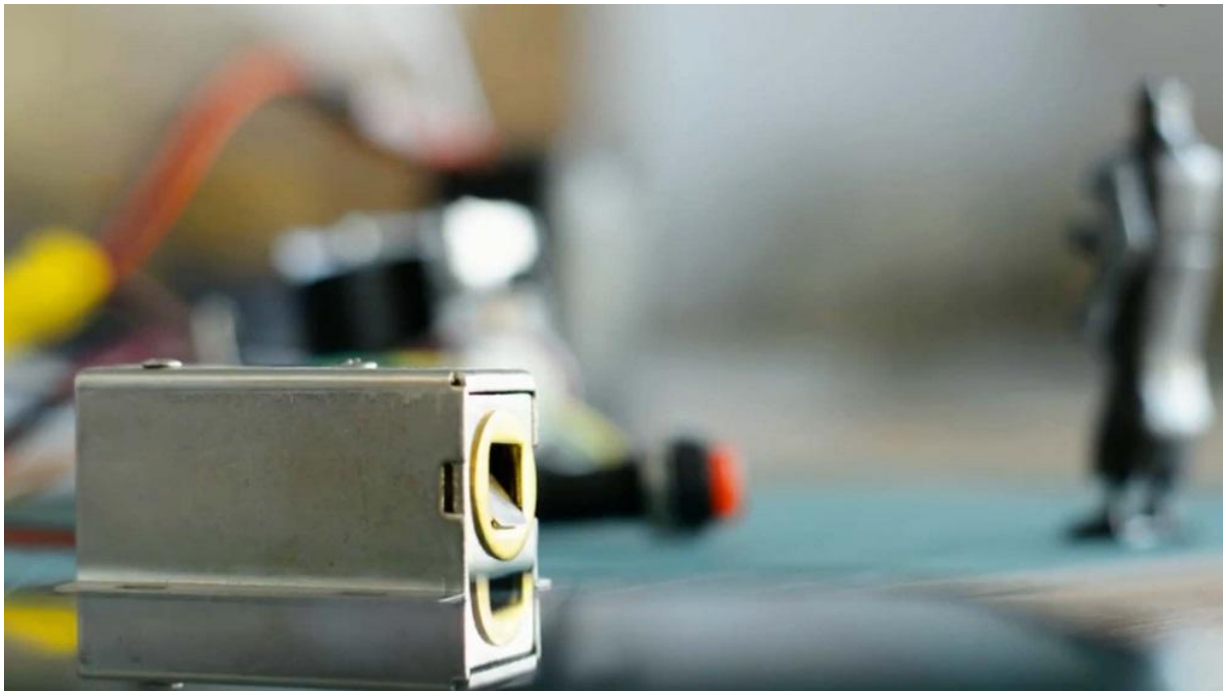
This project is a party who buys Altium 365 via the World Designs Electronics. In today's episode, you will learn how to make a smart IoT bill and door lock project using ESP32k module electronic door lock and blink application. From the very beginning, the ESP 32 camera module has been one of my favorite camera modules which I have been frequently using in all of my ESP 32 game based projects. I have recently used the ESP 32 camera module with Google Drive. I have applied 2 methods during this project. In my first method, I used to send images directly on Google Drive, and according to the second method, images were sent on Google Drive.



when the IR sensor was activated. I have previously comprehensively explained this project. I also used it for opening the electronic door lock using the human face recognition technique. And I have also used the same camera module for the live project streaming using the blink application. This previously designed project will really help you in getting started with the ESP32 camera module.

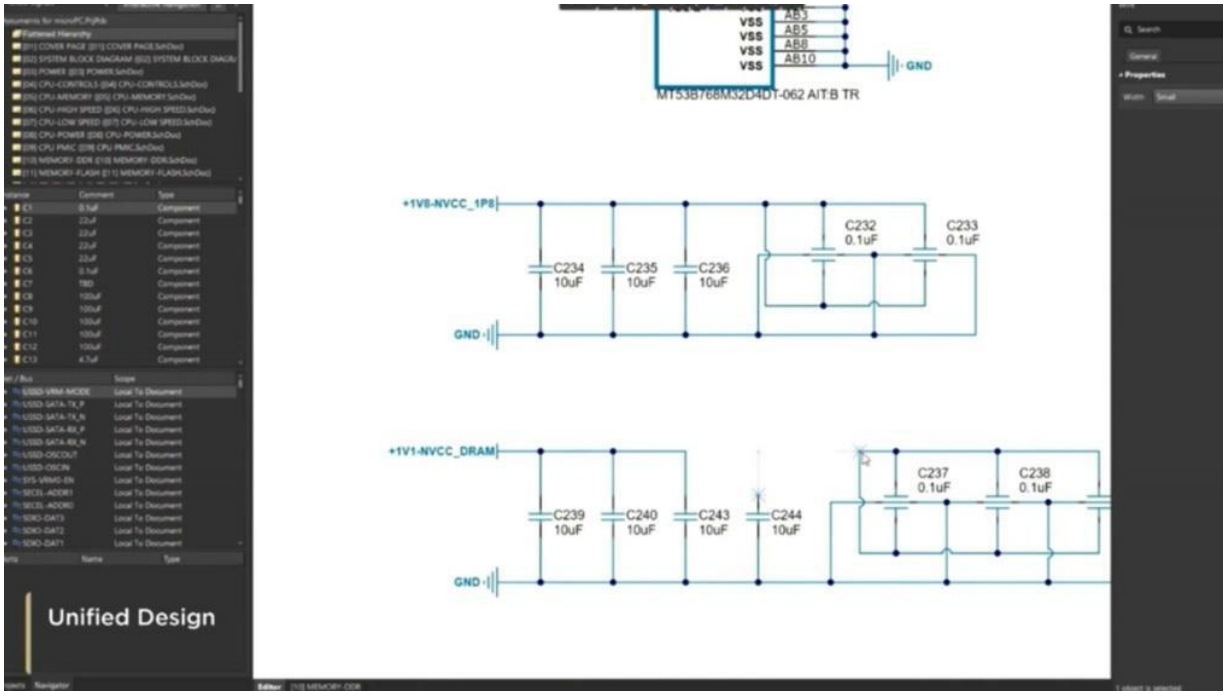
I have reminded you during my previous projects, And I remind you once again that if you are going to use an SP 32 camera module for the first time, you may come up with certain issues. I also came across similar certain issues, however, quickly found a solution for the same. I have discussed these issues in detail during my previous projects and also emphasized how we can sort out and fix these types of issues. Ordinary doorbells are generally of a very boring type. Inmates do not have any idea who is at the door. Besides you might have also experienced people who have an unpleasant habit of aimlessly pressing the doorbell and then running away quickly.

When any of the inmates opens the door, he or she finds none outside. Moreover, you are well aware of the fact how alarmingly the crime ratio has increased nowadays in case only a family member of a family is present at home, and suddenly the doorbell rings, you can better imagine a serious nature problem she might come up with particularly when she is unaware of who is at the door. But with my design project, she will know exactly who is at the door. My design smart doorbell and door lock system is specifically handy for disabled people because whenever the doorbell rings, the disabled person can watch on his mobile who is at the door. If he wants to allow that person, he or she can press a button on the blink application to open that electronic door lock.



Now, you can decide for yourself how useful this cyst can turn out to be for you guys. And the interesting point about the system is that it is pretty cheap. Anybody can design this system easily if my instructions are followed carefully. Before I'm going to explain the diagram, I'm doing application designing and programming. First, let's watch the ESP Therdu came based smart IoT bill and door lock project in action. Altium 365 lets you hold the fastest design reviews ever.

Share your designs from anywhere. And with anyone with a single click, it's easy. Leave a comment, take your teammate, and they will instantly receive an email with a link to the design. Anyone you invite can open the design using a browser. Using the browser interface, you are able to comment markup Cross Pro, inspect, and more.

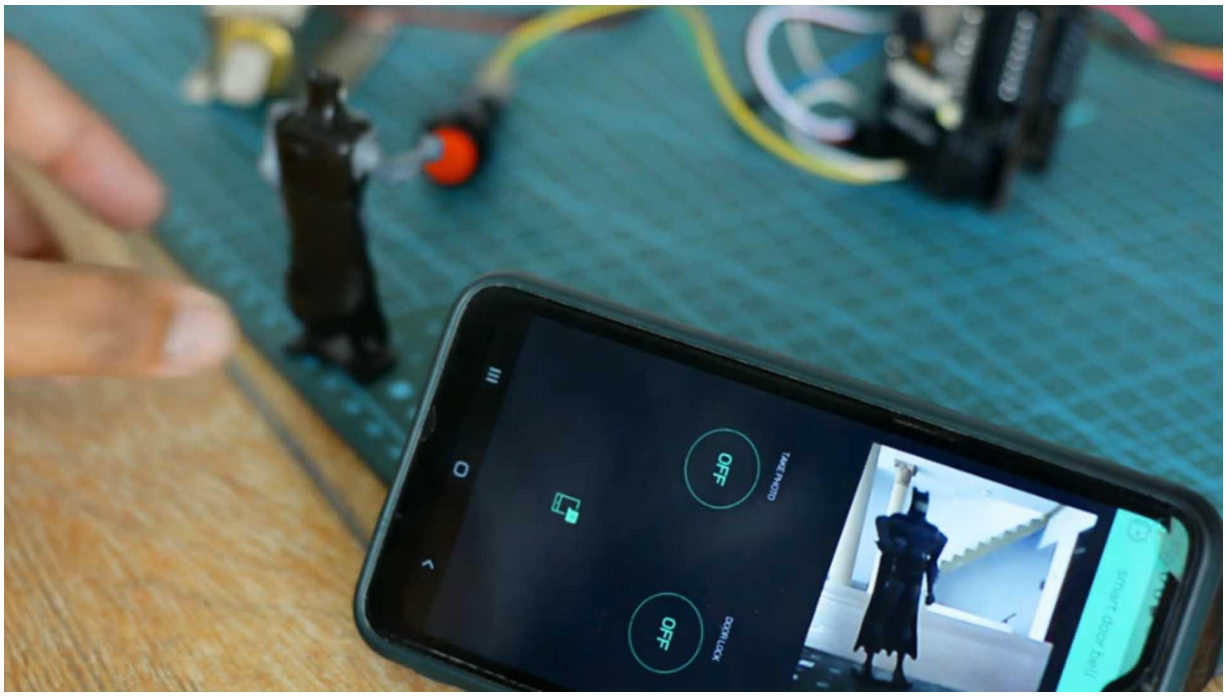


Comments are attached directly to the project, making them viewable with an ultimate designer as well as through the browser interface. Design, share, and manufacture all in the same space with nothing extra to install or configure. connect to the platform directly from Altium Designer without changing how you already design electronics. Altium 365 requires no additional licenses. and comes included with your subscription plan.

If you want to start with Ultimate Designer, then you can click on the first link in the description. The entire system will be installed on the door and connected with a Wi Fi system. Anyways, my project is on right now. I've also opened my blink application. The image will be visible in this particular area.

I have added 2 buttons in this app. The best thing about it is that I can click this button anytime and watch whether there is anyone besides the doe or not. And by pressing the second button I can open or close the door. Now if anybody presses the button, I receive a notification along with an image And then it is up to me whether

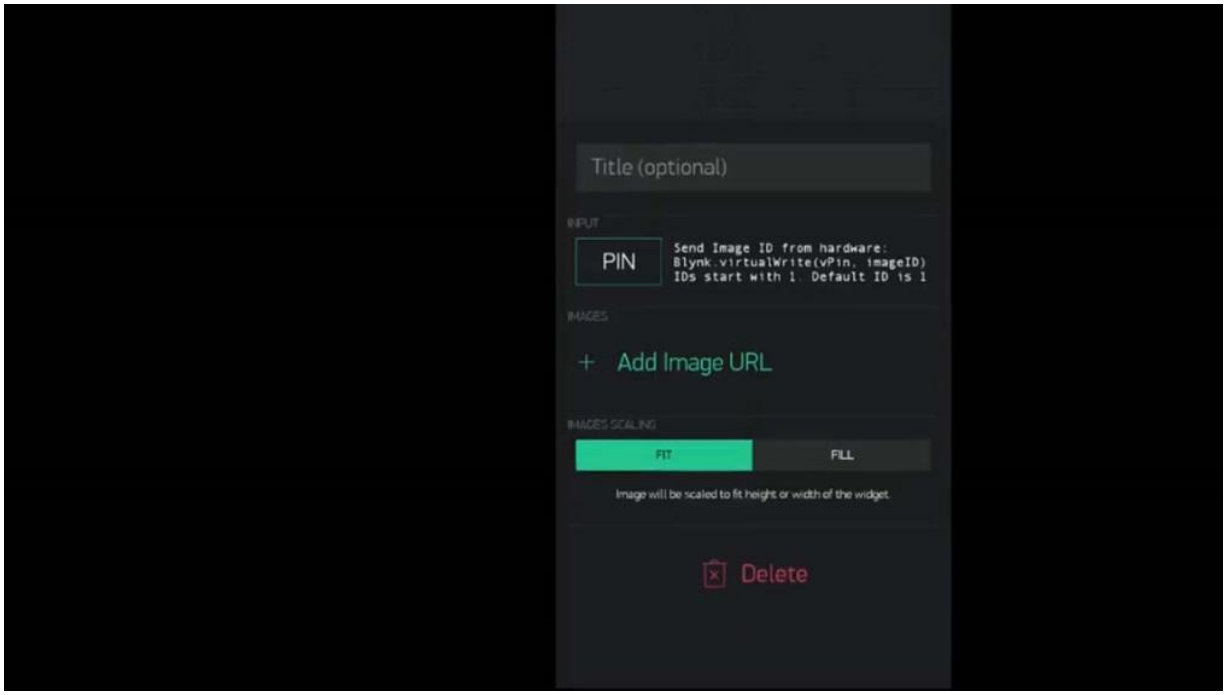
to open the door for that person or not. Let us say, I want to open the door for that person or simply click on the second button.



You might have noticed that whenever I press the doorbell button or button on the application, the camera flash also turns on. We can capture pretty clear images even during the nighttime with the help of this feature. I'm sure by now you might have got an idea of how this system works. So without any further delay, let's get started. Anseless Transit. The components and tools used in this project can be purchased from Amazon.

The components purchase links are gear in the description. This is the same circuit diagram, which I have already explained in my previous project face recognition based door lock control system. The only difference is the addition of this push button, which is connected with the gpio13 of the ASP 32 camera module. This is my ASP 32 camera model development kit, which I have been using in all of my ASP 32 game based projects. If you want to make the same development kit, then you can download the PCB Gerber files from the article.

I'll provide a link in the description. I connected the push button and electronic door lock ace for the circuit diagram. Now let's make the blink application follow the same exact steps. Blink application is ready. And now let's take a look at the programming.



Almost 80% of the code is exactly the same as explained in my previous ASP 32 camera based projects The purpose of this quote is to send a notification message along with a captured image to the blink application and also to control the electronic door lock. Before you upload the program, first of all, make sure you copy and paste the same authentication code sent by the blink while creating the application. Finally, confirm the board. Upload speed, flash frequency, flash mode, partition scheme, Port number. Finally click on the upload button and wait for a while.

The code has been uploaded. And now let's practically check the SP 32 game smart IoT bill and door lock project in action.

OBJECT DETECTION AND IDENTIFICATION

This project is brought to you by Altium 365. And for this project, I'm going to use a speed 32 camera Mario with Python OpenCV Yolo V3 for object detection and identification. I'm only using a speed 32 camera module for the live project streaming various images for the image processing, I'm using yolo v 3. I will test it on 3 different machines and you will be amazed with the end results. First, I will test it using the Raspberry Pi 4 and it has 8 GB RAM.

Then I will test it on my Core I three laptop. And finally, I will test it on my MSI Intel Core I7 with Nvidia G Four 16 GB GPO and 16 GB RAM. I specially purchased this laptop for project editing and image processing. Anyway, after performing the initial test, then I will share with you the final code, which can be used for the detection and identification of specific objects. Let's say you want to send an alert message when a specific object is detected.

In my case, I sent an alert message when a bird and gate are detected both at the same time. while all the other objects are totally ignored. We have a long list of the objects that we can detect. So after watching this project, you will be able to detect all these objects at the same time, or you can select 1 or multiple objects of your choice and this way you can build amazing image processing based projects. So without any further detail, let's get started. First, we'll install Python and for this, simply copy this link and paste it in the Internet browser.

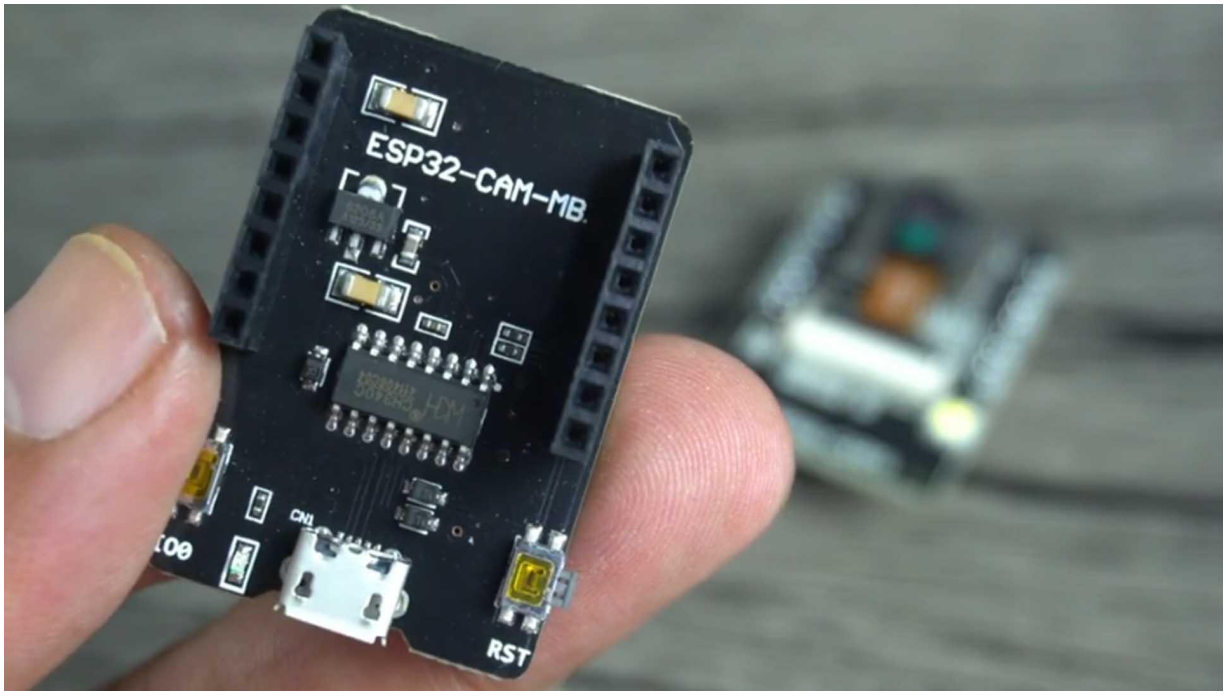
Scroll down and download the Windows x86 dash 64 executable installer. Double click to install the Python and make sure you check this box. Now to check if Python is installed simply open the CMD. Type Python double dash version. As you can see Python 3 6.1 has been installed.

Next, we are going to install OpenCV. Open the CMD command prompt and type this command. As you can see, I have already installed it. There is nothing complicated. It's just a simple installation process.

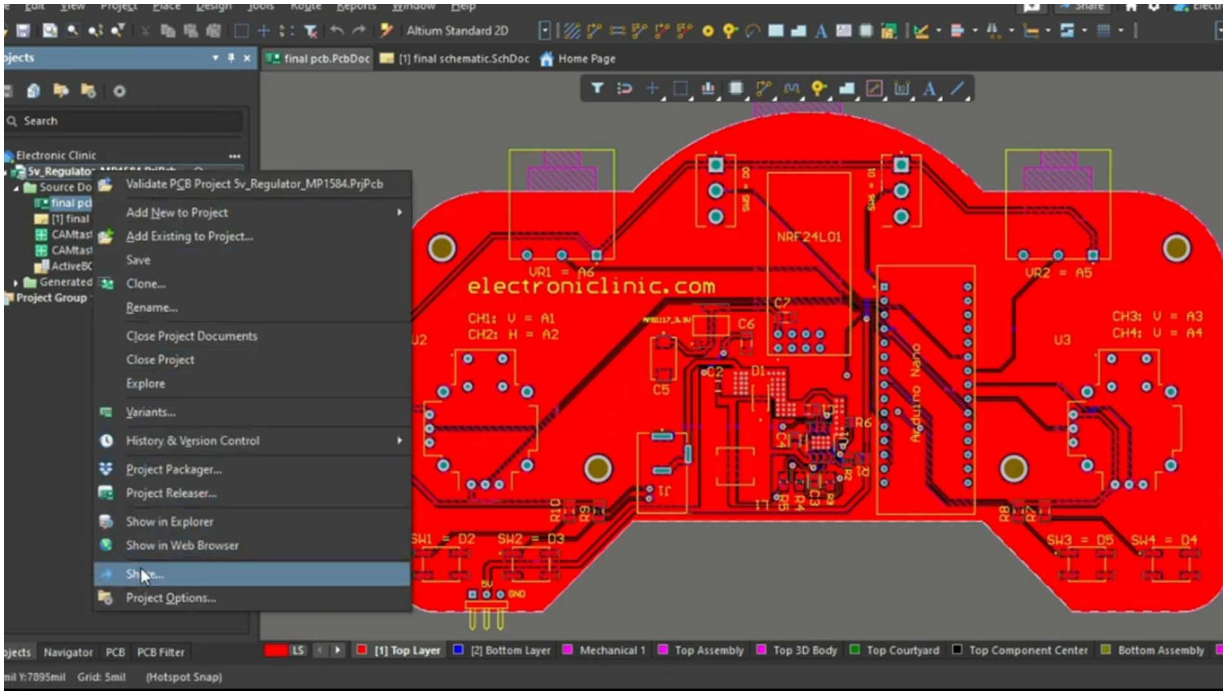
Now we will install Yodo to copy this link. paste it in the browser. Scroll down and download the weights and CFG files of the yolo v 3 dash 320. After downloading the weights and CFG files, next we will copy the cocoa dot names. For this, copy this link and paste it in the browser.

Copy all the names. Open the notepad and paste these names. save it with the name coco dot names. Remove the dot TXT extension. Keep the coco.names, yorov3.cfgandyorov3.weightsfiles in the same folder with the main programming file.

The gate in bird detection dot py is the main programming file. Next, we are going to start with the ESP 32 camera module. You will need to upload this program into the ESP 32 camera module for the live project streaming. You can download this code from our website electronic clinic.com. But first, you will need to download this library, then go to GitHub and download the speed 32 games app.



Then go back to arvino IDE. Click on the sketch menu. then include library and click on a.zip library, then browse to the location and select the zip folder. As you can see, I have already added the slide ready. For uploading the program, I'm using the ESP 32 camera development board.



This way I don't need to use arduino But if you don't have this development board, then you can use the Athena UNO for uploading the program. For this, you can watch my getting started project on the ESP 32 camera module. Simply insert the ESP 32 camera module into the development board and connect it to your laptop or computer. Get your Altium 365 workspace activated because Altium 365 provides a useful solution cases when you are facing difficulties with your PCB design and unsure of your next step, you can share your project ultium designer or on the web with any user in just a few clicks. You will have full control of who you want to give free only access for, let's say, comments and design inspections and who you want to give, read, write access to allow full global collaboration by a geographically dispersed team with editing performed through Luteum Designer.

Let me show you how to share your project. Simply right click on the project name and select share. Write the user's email. Select read or write permissions from the drop down menu on the right. and click on a share button.

It's just simple. I've added links to the Altium Designer, Altium 365, and Octapart, the world's fastest component search engine. Now let's get back to our project. select the s p 32 game board. Then check the communication port.

```
import cv2
import urllib.request
import numpy as np

# Replace the URL with the IP camera's stream URL
url = 'http://192.168.43.219/cam-hi.jpg'
cv2.namedWindow("live Cam Testing", cv2.WINDOW_AUTOSIZE)


# Create a VideoCapture object
cap = cv2.VideoCapture(url)

# Check if the IP camera stream is opened successfully
if not cap.isOpened():
    print("Failed to open the IP camera stream")
    exit()

# Read and display video frames
while True:
    # Read a frame from the video stream
    img_resp=urllib.request.urlopen(url)
    imgnp=np.array(bytearray(img_resp.read()),dtype=np.uint8)
    #ret, frame = cap.read()
    im = cv2.imdecode(imgnp,-1)

    cv2.imshow('live Cam Testing',im)
    key=cv2.waitKey(5)
    if key==ord('q'):
        break


cap.release()
cv2.destroyAllWindows()
```

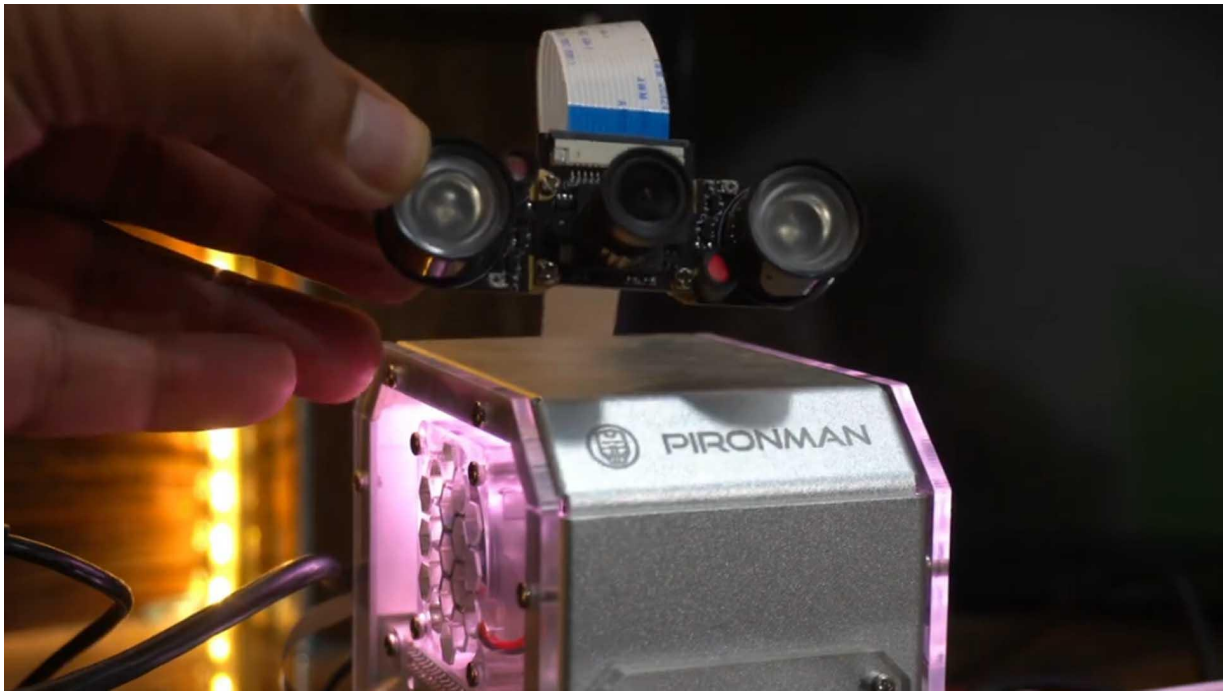
and then finally click on the upload button. You can see the program has been uploaded. After uploading the program, restart your ESP 30 camera module. Then open the serial monitor. Wait for the speed 32 camera module to connect.

Copy this IP address. You will need this Python OpenCV code. You can download it from our website electronicclinic.com. Here's this IP address. again, go back to the serial monitor.

resolutions low, high end med. Use the one is per your needs, but I'm going to start with a low resolution. Based on the address and make sure there are no spaces. Otherwise, it will give you an error. Remove the extra spaces and run the program.

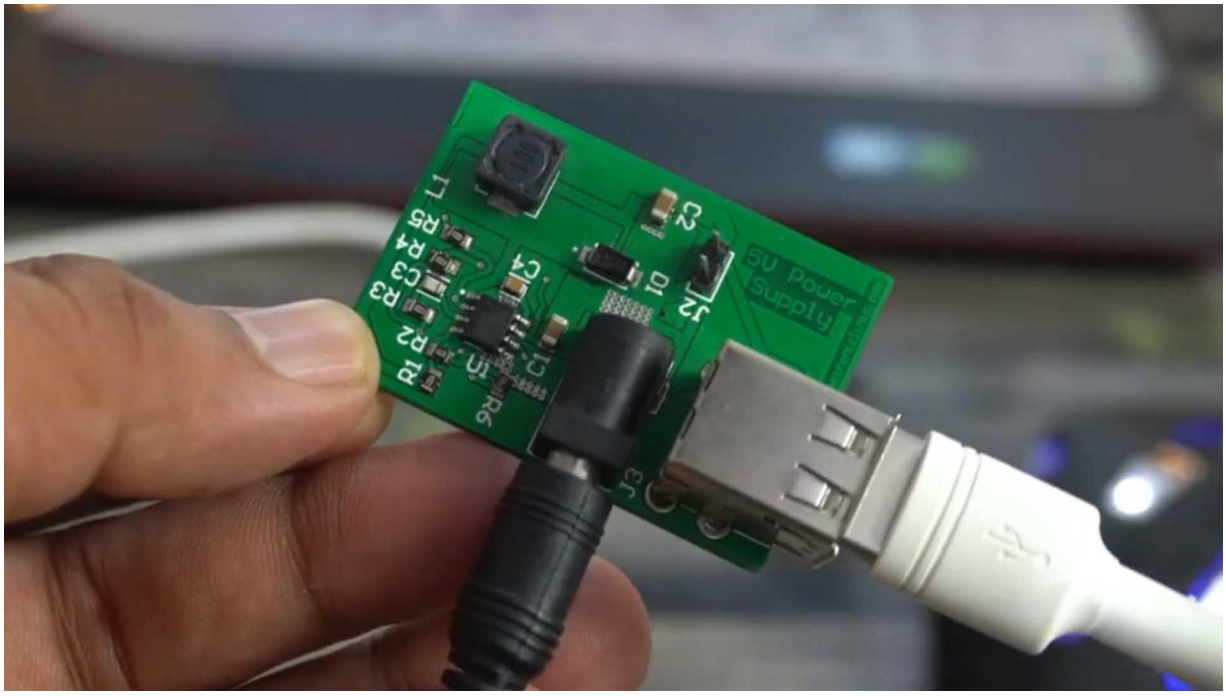
As you can see, we can't do the live project streaming, but as I'm using low image resolution, that's why the image isn't good. Let's try high image resolution. It's working. So the SP 32 camera module is ready for object detection and identification using yolo V3. Let me tell you, we are only using the SP 32 camera module for the live project streaming.

We are not doing image processing on the s p 32 camera module, the image processing object detection and identification will be done on a laptop or Raspberry Pi So let's go ahead and do it. So first, let's go ahead and check this test code written for the detection of all the objects. By all objects, I mean only those objects which are available in the cocoa dot names list and make sure you keep the cocoa dot names yolo v3.cfgandyolo v3.weights file in the same folder with the main programming file. So first, let's start with the Raspberry Pi. So guys, this is the smallest Raspberry Pi for PC and it has 8 GB RAM. I got it from Sunfounder.



The reason I'm doing this test is just to let you know that it is powerful enough to handle image processing using Python Opencv Yolo V Three? I already have a camera connected to my Raspberry Pi, so I'm going to use this camera. Raspberry Pi4 is perfectly detecting all the objects, but it's really slow. So Raspberry Pi 4 isn't good for image processing. Although the 8 gb variant of the Raspberry Pi 4 is quite popular, you can even play games with it.

But when it comes to high end image processing, it fails unless you add some kind of external hardware to it. Next, I'm going to test this using a Core I Three laptop. image processing on core I three laptop is better than the Raspberry Pi 4, but still it's low. Anyway, if you have a core I three laptop, then this is what you can expect. Next, I'm going to test it on my MSI Intel Core I 7 9th generation gaming laptop. Image processing on this machine is quite impressive, although it's not very fast, but still it's acceptable for me. I can use it in my future image processing based projects.



Now let's check this final code written only for the detection and identification of birds and cats. It will ignore all the other objects But the line by line explanation, read my article available on electronicclinic.com. My design 5 fold and 3 m's power supply and my creation for its lithium ion battery makes the SP 32 camera module completely portable. As you can see, it can detect birds and cats flawlessly. When both a bird and a cat are detected at the same time it generates an alert, Now you might be wondering why birds and gates.

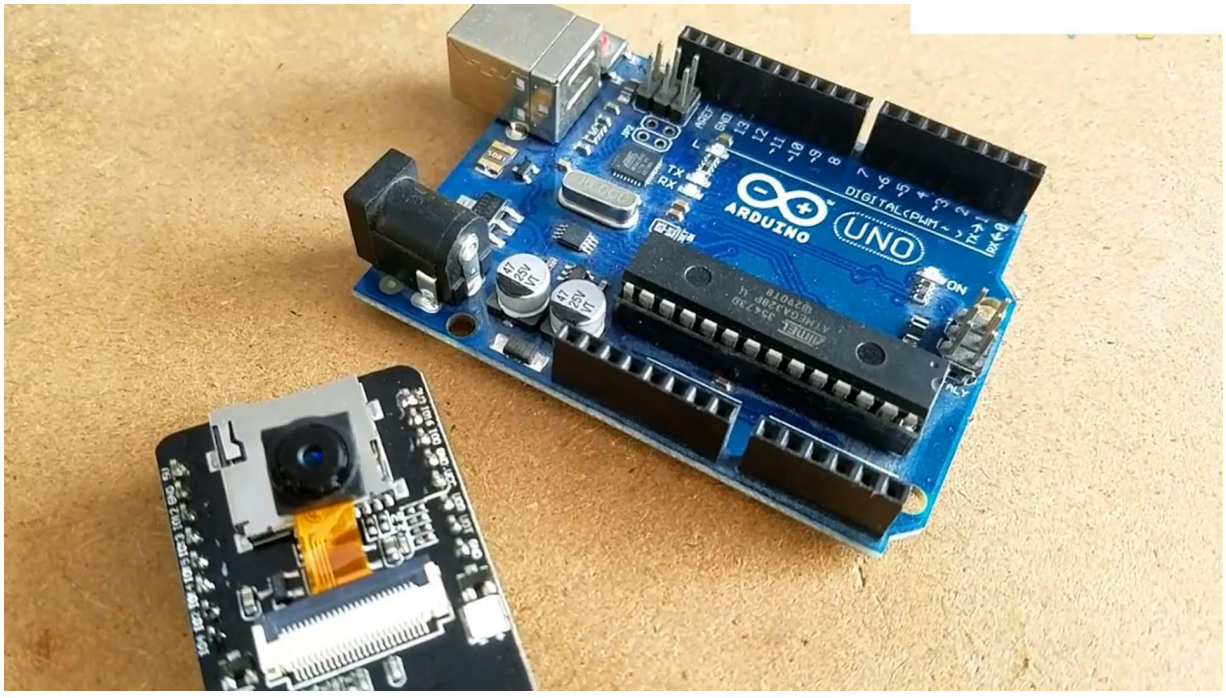
Well, in our house, this particular area is a favorite part for birds. And there are nests in those trees. So when a kid comes, the birds start chirping and making nice sounds. My idea is that when birds are eating and during the day when a kid comes, I should receive an alert. I can send the alert to my selfie email and I can also use arduino and GSM to send an SMS to myself. Once the alert is generated, we can take any necessary action.

You can use the same technique for any other object. You can create a high level security system. You can use it in more than a million ways. In my upcoming project, I will explain how to train your own

object that is not available in the coco.names list. So that's all for now.

ESP32 CAMERA PROGRAMMING USING ARDUINO

In today's episode, you will learn how to program the ESP 32 game using arduino uno or arduino nano. We will also go through all the basic settings including the ASP 32 game board manager installation. In the end, I will also explain how to fix the most common errors, including the detected camera not supported, and the camera prop failed with error 0 x 2004. There is also another issue which you might face while working on the ASP 32 cam. That is the ASP 32 module keeps resetting automatically.



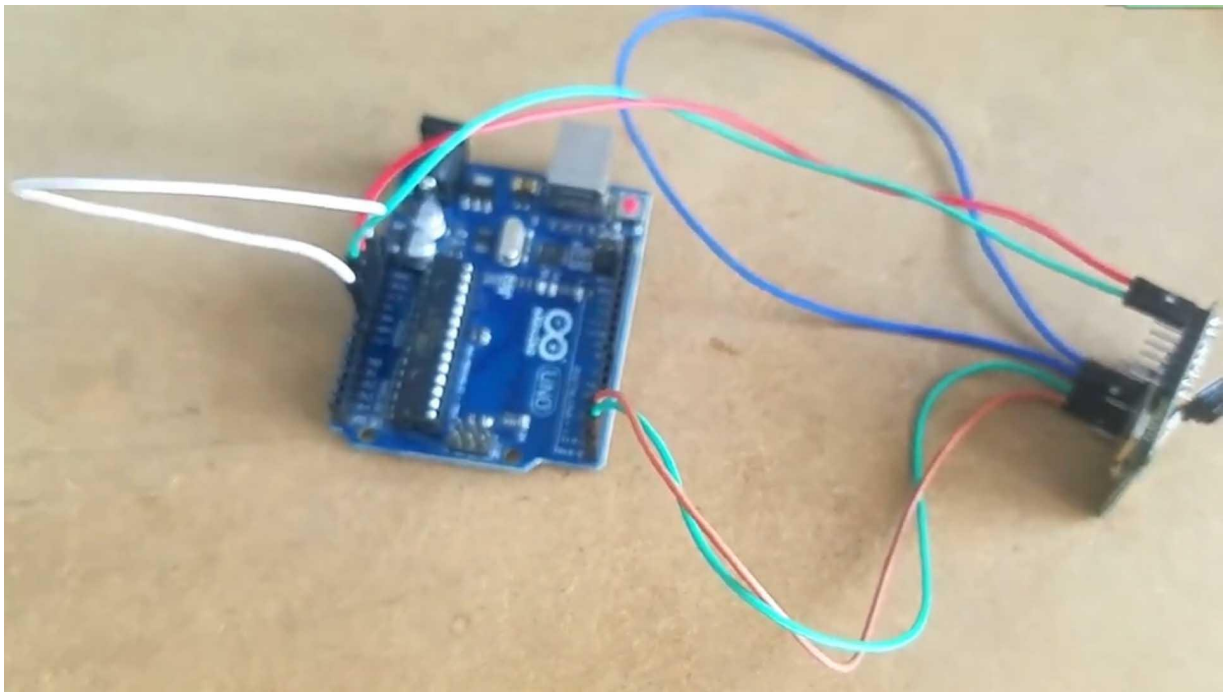
I will practically show you how to fix these errors and run your ASP 32 camera module without any problems. Without any further delay,

Let's get started. The components and tools used in this project can be purchased from Amazon; the company's purchase links are given in the description. ASP 32 is a series of low cost, low power systems on chips, microcontrollers, with integrated Wi Fi and dual mode Bluetooth. The ASP 32 cam is a small camera module with the SP 32 S chip that costs approximately $10.

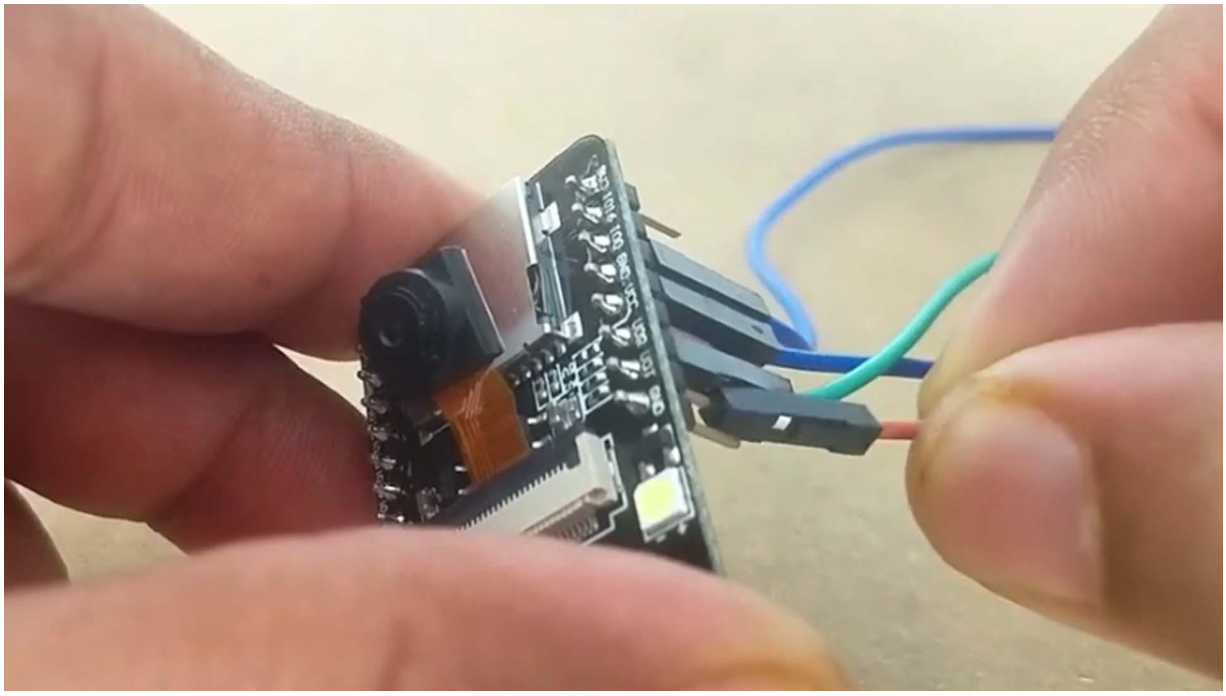
Besides the O V 264 0 camera, and several GPIOs to connect peripherals. It also features a micro SD card slot that can be useful to store images taken with a camera or to store files to serve to clients. If you want to know more about ESP 32 Camtek, for example, the ESP 32 camera module pinout features and technical specifications then consider reading my article available on electronicclinic.com. You can find a link in the description. Can you reset the pen off the arduino with the ground?

Connect the 1 double 0 pin of the ASP 32 cam with a pound pen. For this, you can use a female to female type jumper wire. Connect the fivefold and ground pins of the ASP 32 cam with the Autino's fivefold and ground. Connect the receive pen of the ASP 32 cam with the Rx

pen of the arduino. Connect the transmit pen of the ASP 32 cam with the t expand of the arduino.

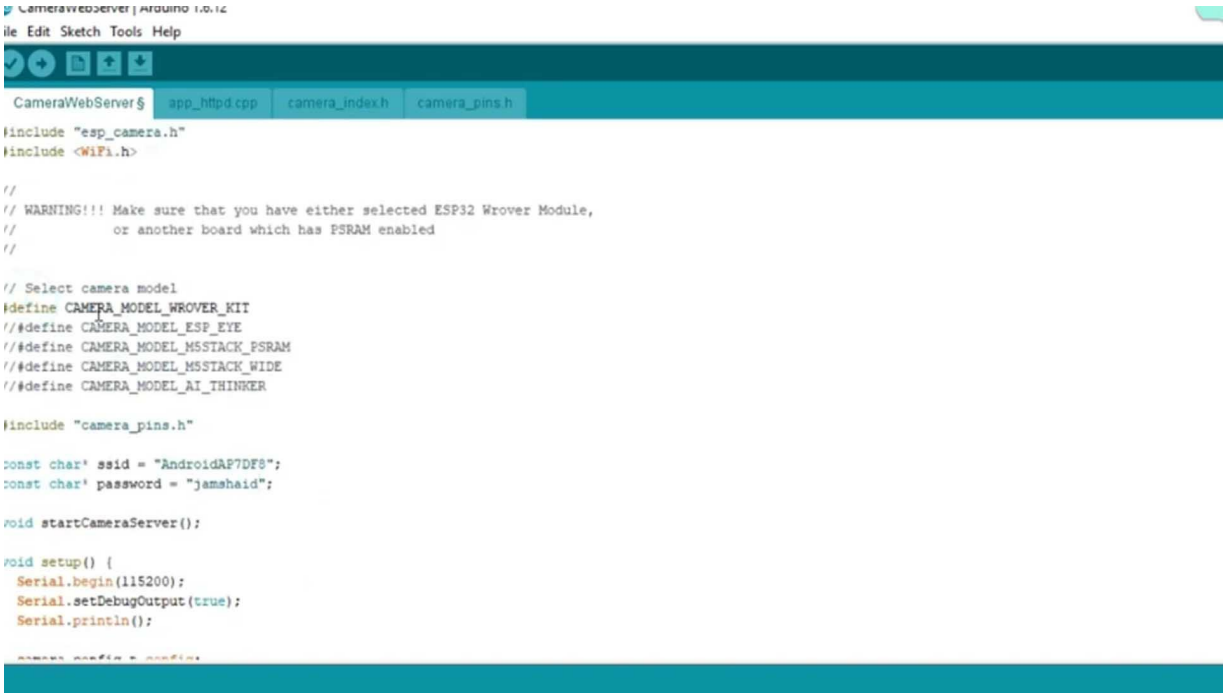


The ESP 32 cam interfacing with the arduino is completed. Now let's go to the computer screen and install the ESP 32 cam board. Make sure the latest version of the arduino IDE is installed on your computer. Copy this link, which you can find in the description. Click on the file menu and then click on the preferences and simply paste the URL.



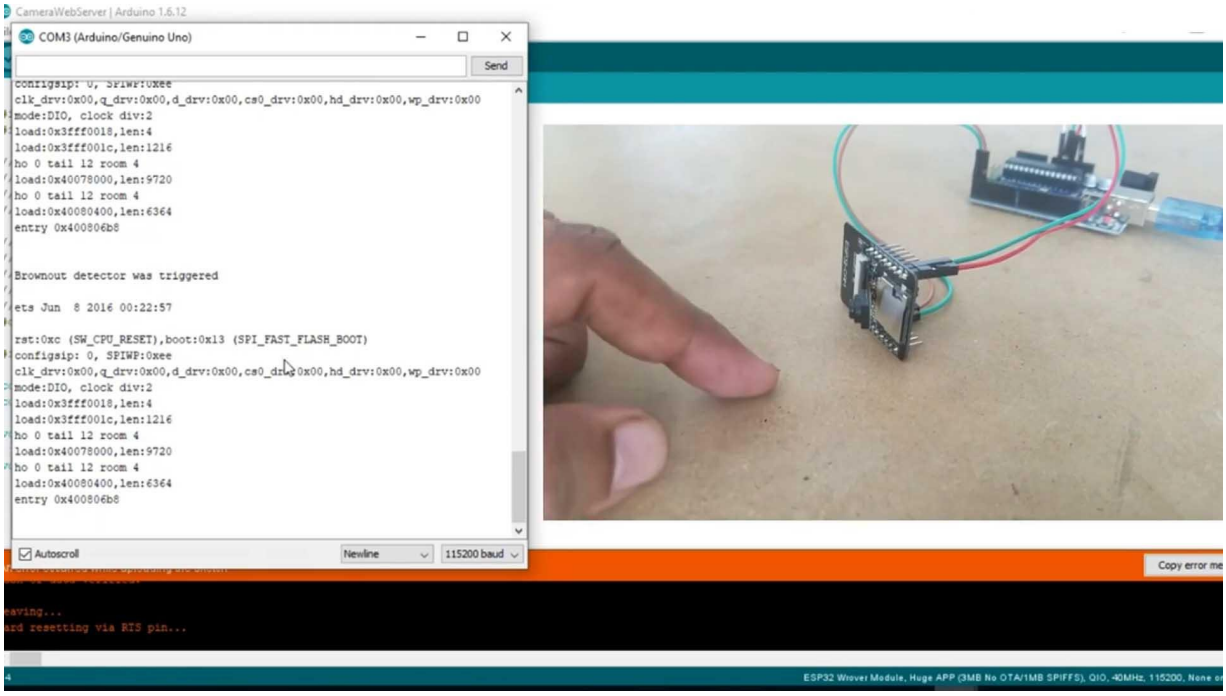
As you can see, I have already passed this URL. Now click on the tools menu and click on the board's manager. Search for the USB 32 and install. This can take several minutes depending on the speed of your internet connection. As you can see, I have already installed the ESP 32.

Next check if the design port is installed. As you can see, the s p 32 W Raw module is available. Next, go to the Flash mode and select QIO. Select the inflation memory as the 40 Megahertz. Select the partition screen as the huge app.



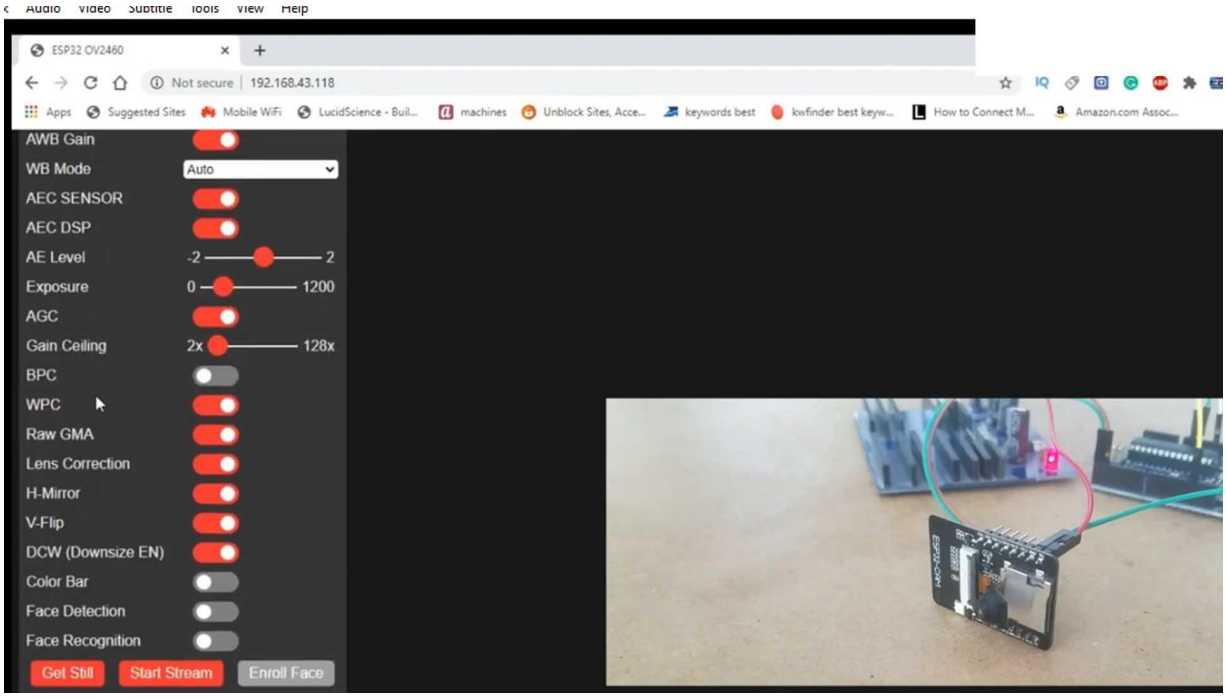
Select double 15, double 0 as the upload speed. And finally, select the programmer AVRISP. Right now, as you can see, the arduino board is not connected. So let's go ahead and connect the arduino board with the laptop. As you can see, the arduino is connected.

Open the camera web server program. Next, enter your SSID and password. Select your camera model. We are all set now. We can click on the upload button.



Don't worry if you get an error like this. The program will upload anyway. The program has been uploaded Now the next step is to remove the wire that we use to short the 1, double 0 pin and ground. Click on the serial monitor. Place the push button available on the back side of the ESP 32 cam.

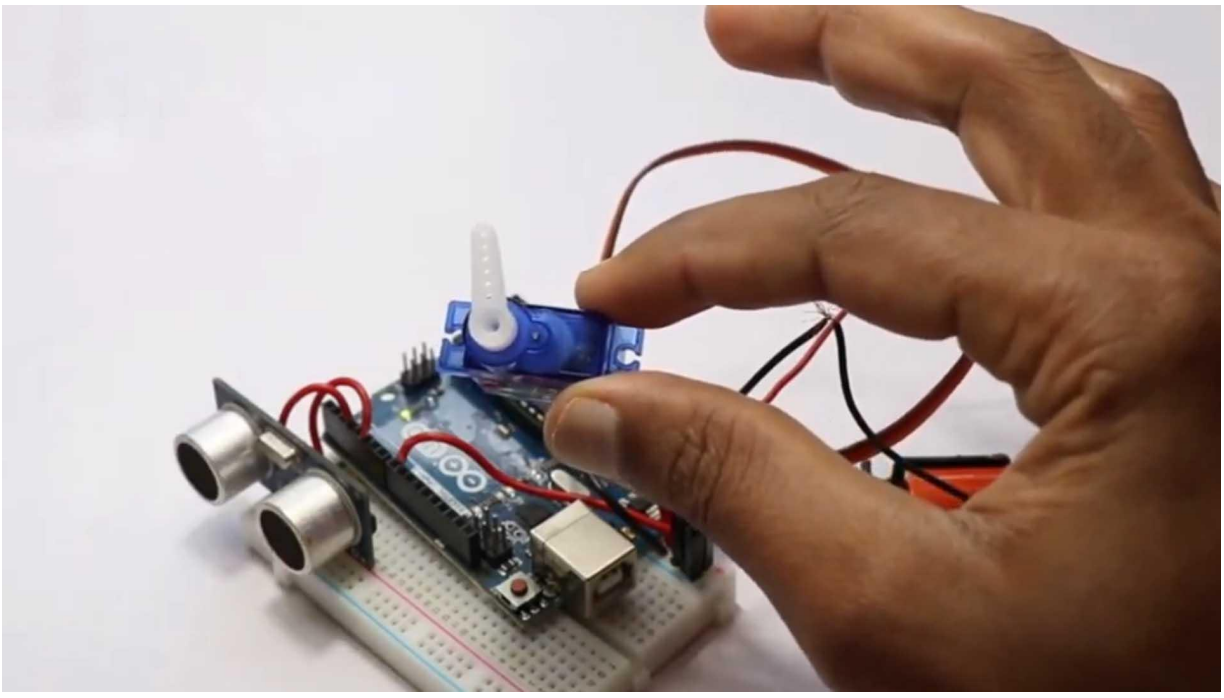
As you can see, the ESP 32 cam is unable to connect with the Wi Fi and seems as if the ESP 32 camera module is resetting automatically. This is just because the arduino is not able to provide enough current to the ASP 32 raw module. Sometimes you will see detected cameras not supported or camera prop failed with error 0 x 2004. Now to fix these types of errors, we can use an external 5 volt regulated power supply to power up the ASP 32 module. So I'm going to get a 54 regulator power supply board based on the LM 7805 voltage regulator.



Connect the five volt panel of the ASP 32 can with the 54 pin of the power supply and make sure the power supply ground is connected with the SP 32 camera module ground pin. Finally power up the power supply board. As you can see on the serial monitor, the HP 32 camera module is connected with the Wi Fi, and now on the screen, I can see my local IP address. Copy this link. Open the internet browser and paste this link.

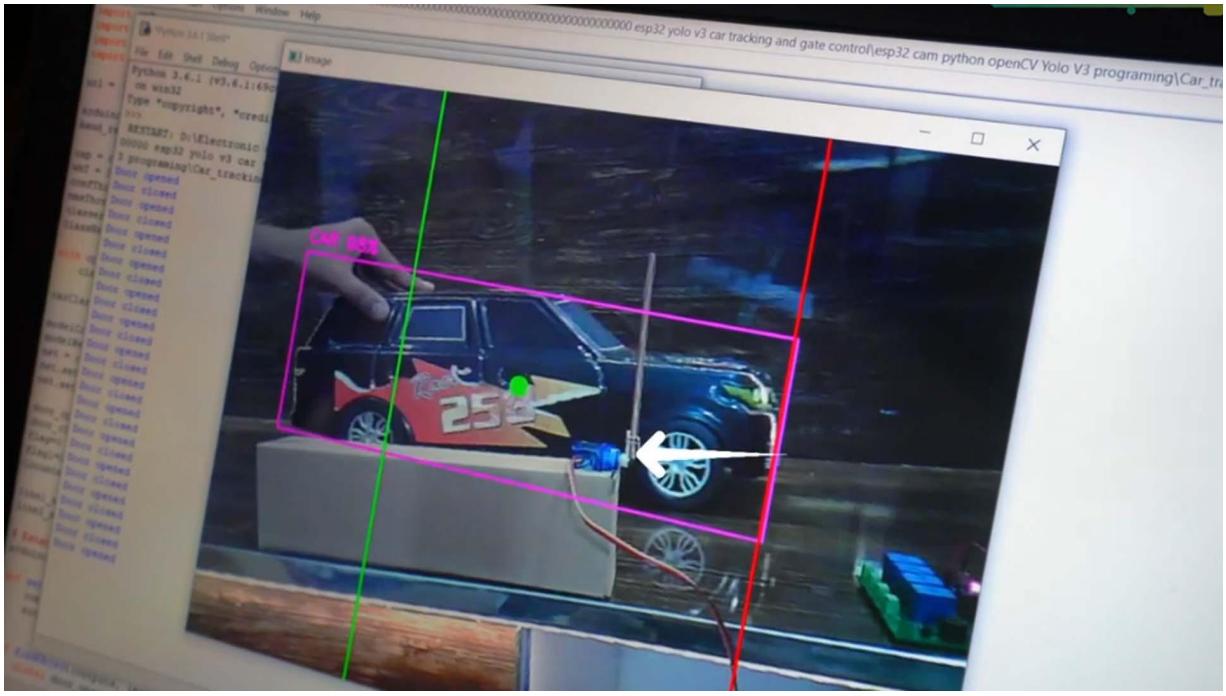
CAR PARKING BARRIER GATE CONTROL SYSTEM

This project is brought to you by Altium 365. Last year, I created a project on a car barrier control system in which I used an ultrasonic sensor to control the car, barrier, or gate. This project is suitable for beginners. However, in reality, this project is not practical at all. This is because an ultrasonic sensor can only sense the presence of objects and measure their distance, but it cannot identify those objects. Therefore, if any object comes in front of the ultrasonic sensor, it would open the car barrier or gate, which is not ideal.

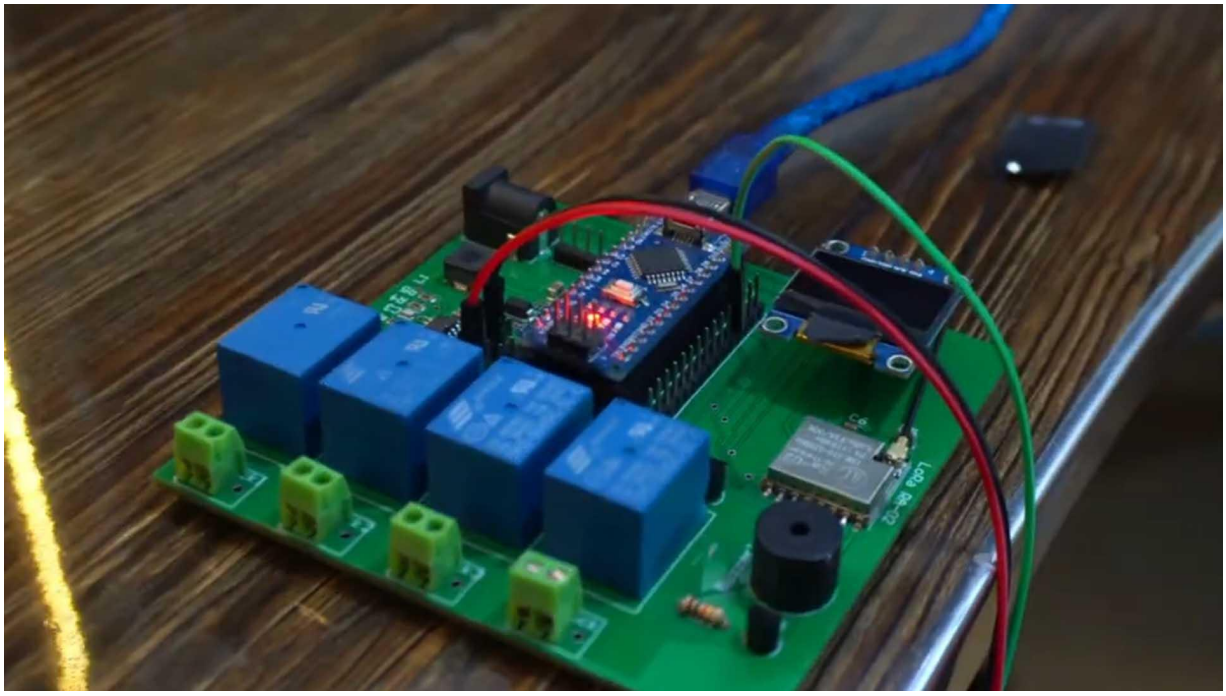


So I thought, why not take it to a slightly advanced level? So this time, I'll be using the arduino along with a USB 32 came for wireless light project streaming. And for the image processing, I'm going to use Python Opencv Yolo V Three. Now the barrier or gate will only

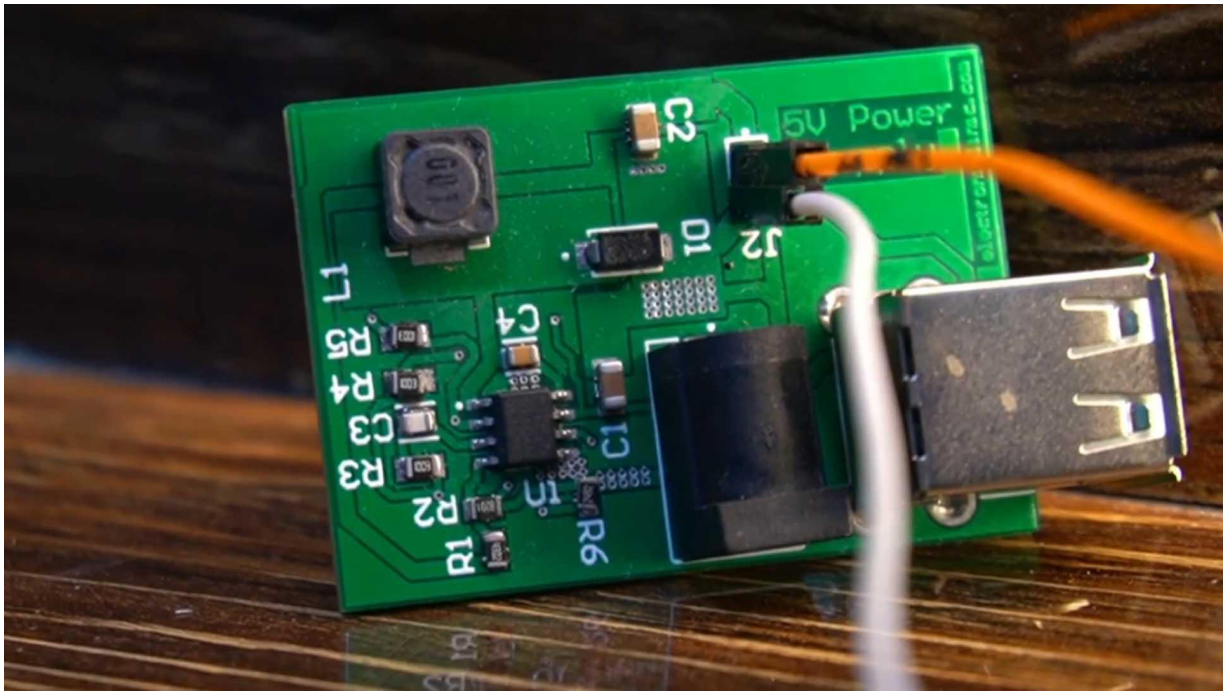
open for cars, it will not open for any other objects. This project is entirely based on my previous project where I explained the most basic things such as how to perform wireless project streaming using the ESP 32 game module, how to install Python, OpenCV and Yolov3, and how to detect and identify different objects.



In my studio, I detected and identified various objects, and not only did I identify and trick birds and cats, but I also displayed alert messages on the screen. So I have already explained all of these things and I won't repeat them today. Today, I will only explain new things including servo motor interfacing with Arduino and its programming. how to detect and identify a car and how to send car barrier or gate opening and closing commands to Artino from Python OpenCV Yellow V3. So without any further delay, let's get started.



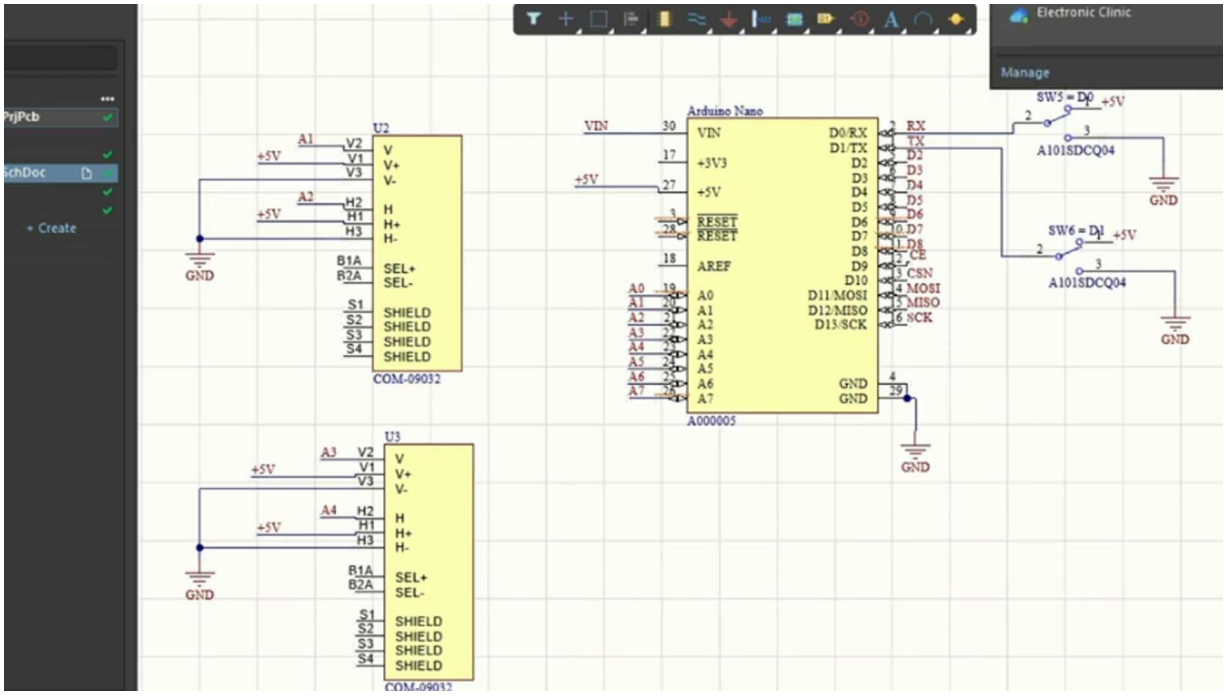
I'm using my arduino nano and LoRa based development board, but you can also do the same exact connections on a breadboard. Anyway, connect the signal wire to the Arduino pin 9 and connect the VCC and ground wires of the server to the original fivefold and ground pins, you can follow this circuit diagram. And let me also tell you if you are planning on using large silver motors like the ones you can see on the screen, then don't use five fold from the arduino because it might damage your arduino board. use an external 5 fold power supply on my development board. I have this 5 fold and 3 ms power supply, and it's more than enough for powering these all types of servers.



So you can make yourself this development board, or you can make yourself this fivefold and three amp power supply. And then you can use it with different microcontroller boards, servers, breakout boards. And you can even use this five foot and three amp power supply to charge your cell phone. I have added links to all the related projects in the description. Now let's go ahead and take a look at arvino programming.

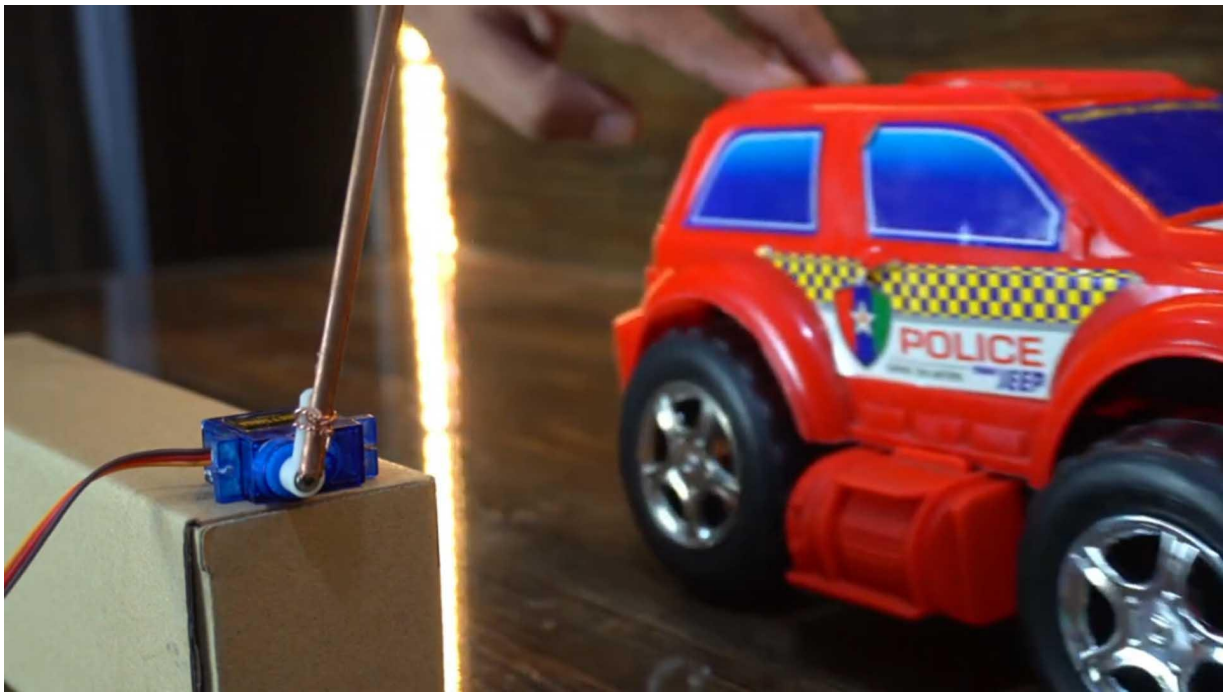
I started off by adding the server dot edge header file where you can see the server signal wire is connected to the original pin 9. The s leg variable I'm going to use is the flake. I could also define it as bullion, but anyway, I'm using it to stop the unnecessary repetition of the cord. And the loop function, we simply check if any data is available on the serial port or in simple words, if any data is received from the Python In my case, I sent 2 numbers from Python, so that's why I have used the 1st integer. So if the receive number is 1 and the eastlake lake equals 0, then move the server arm to 90 degrees and change the east lake state to 1. So these instructions will only execute once.

If the received number is 2 and the s leg equals 1, then move the server arm to 0 degrees. I have already uploaded this program, and now let's take a look at the Python OpenCV Yolo V3 programming. 5 lets you invite users to your workspace so everyone can collaborate on projects and access the latest design revisions. To invite a user to the workspace, click the name of the workspace, and select my Altium 360 5 to open the workspace configuration in your browser. On the left side, select workspace members. Click the invite workspace members button to start the invitation process.



To invite a user to enter their email address in the aid members field, you can invite multiple users at the same time. Finally, you can add a note that users will see in the invitation or after entering all the necessary data, click the invite button to complete the process specifying the administrator role for the invited user. Once a new team member accepts the invitation, they will have defined access to the workspace and can collaborate with other members. I have added links to the LTM Designer, LTM 365, and Octapart, the world's fastest competent search engine. Now, it's kit packed for the whole project.

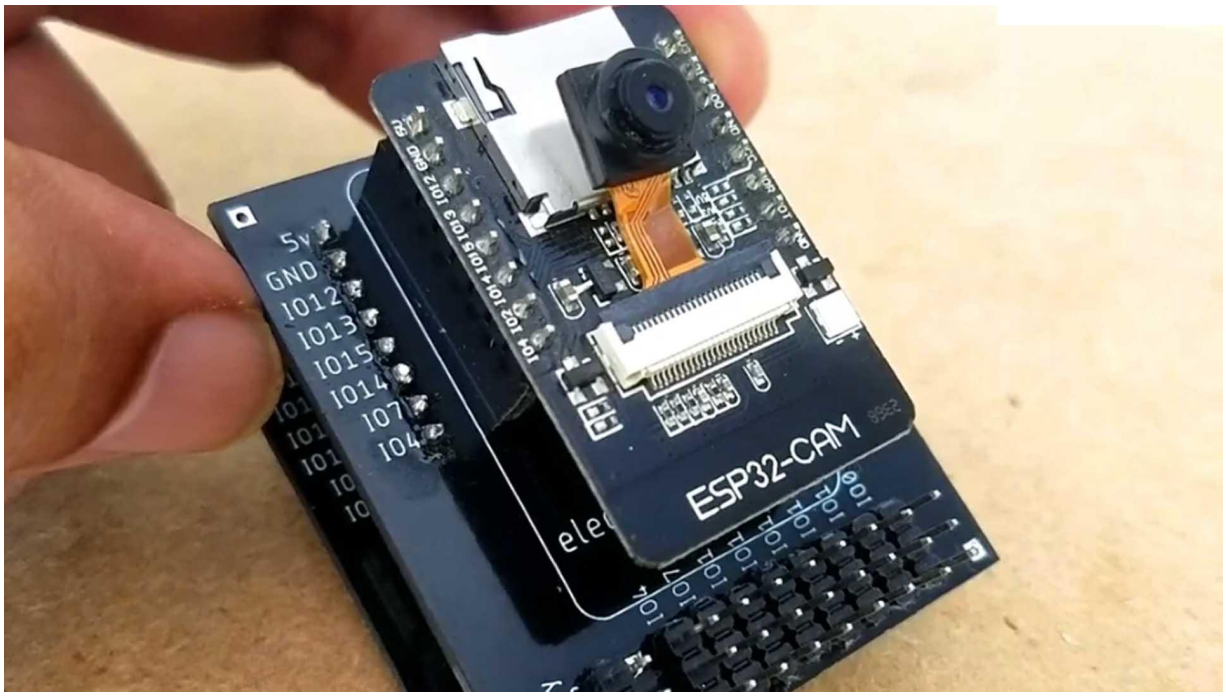
This is the same exit program from my previous project. You can see I'm using the same IP address through this IP address, I received high quality images from the ESP 32 camera module. I have already explained how to set up your ESP 32 camera module for the live project streaming. This is the arvino port. My arvino board is connected to the communication port 11, and this is the bar rate.



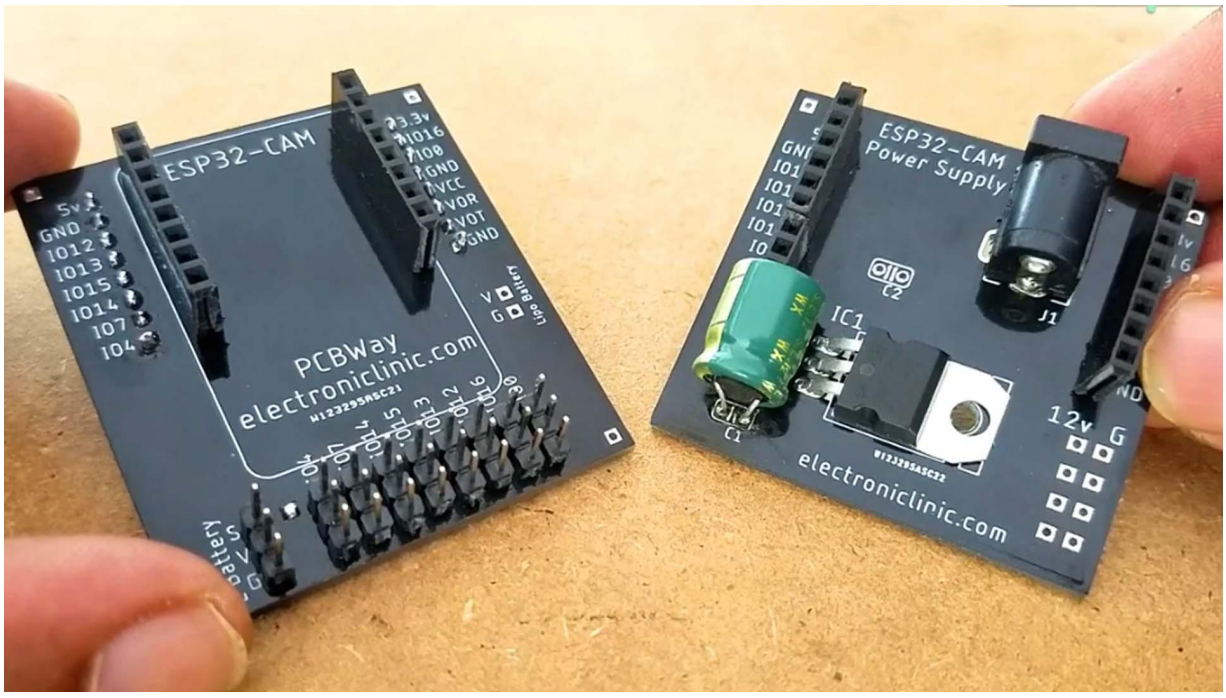
This time around, I'm using cocol dot names for the detection and identification of a car. You can see we have a long list of the objects. So you can select any of these objects for controlling the car, barrier, or gate. In my case, I'm going to continue with a car. These are the coordinates of two lines used to open and close the car barrier. These are the instructions used to send the command 1 and 2 when the car crosses line 1, it sends one to the arduino to open the barrier And when the car crosses line 2, then it sends it to the arduino to close the barrier.

BOARD FOR LIVE PROJECT STREAMING

In my last project tutorial, I explained how to program the SP 32 camera module using the original IDE. In this project, I covered the basic settings including the ASP 32 camera module, board manager installation, and I also explained how to fix the most common errors including the detected camera not supported and the camera probe failed with error 0x2004. I also explained some other issues. So I highly recommend first watching my previous tutorial on the SP 32 camera module, and then you can resume from here. In today's episode, you will learn how to design your own SP 32 camera development board, which can be used for the live project streaming, sensors, monitoring, and controlling anything you want.



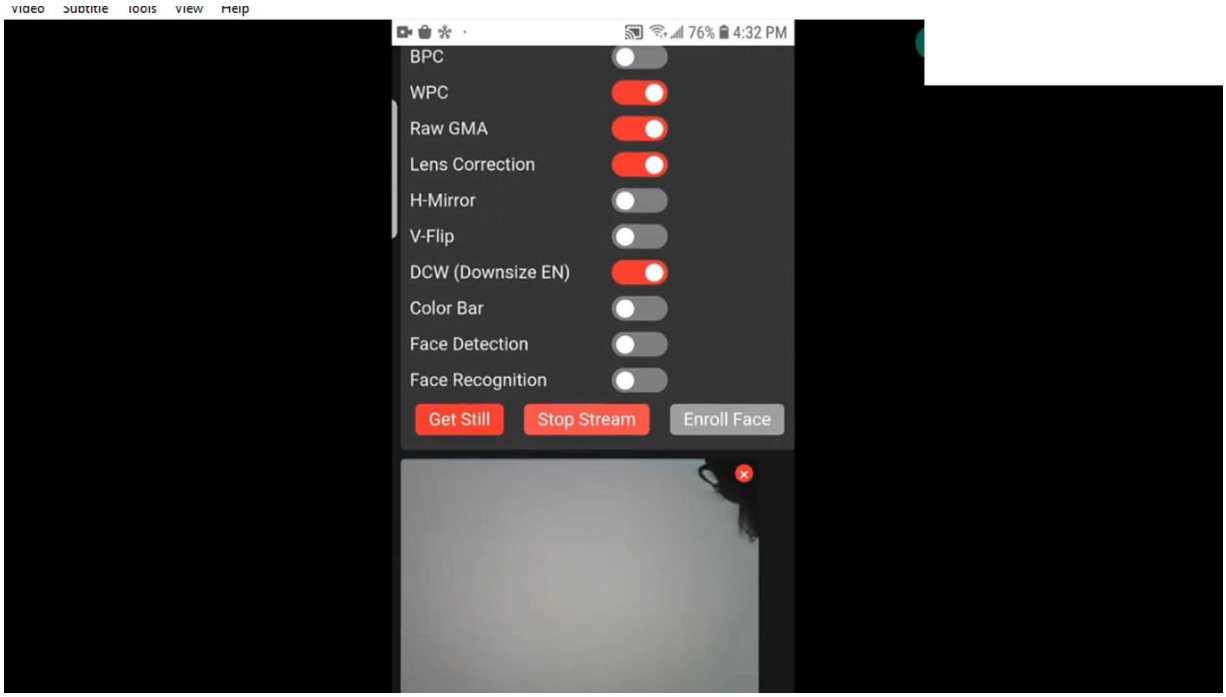
The PCB boards used in this project are sponsored by the PCB company. Only $5 for 10 PCBs and $30 in total for 20 PCBs assembly. Besides this, PCB also provides a great variety of services including aluminum PCB, rigid flex, metal core, flexible, high frequency, high DG, thick copper, HDI and Italian PCBs. The sign up process hardly takes 1 minute. and you are welcomed with a $5 welcome bonus.



What are you waiting for? Go and get your 1st prototype order for free. Click on the first link in the description. To get rid of the jumper wires, I design the SP 32 camera development board, which consists of 2 circuits provided with the male and female headers, due to which these boards can be easily connected together without using the jumper wires. The SP 32 camera module nicely sets in on the top circuit.

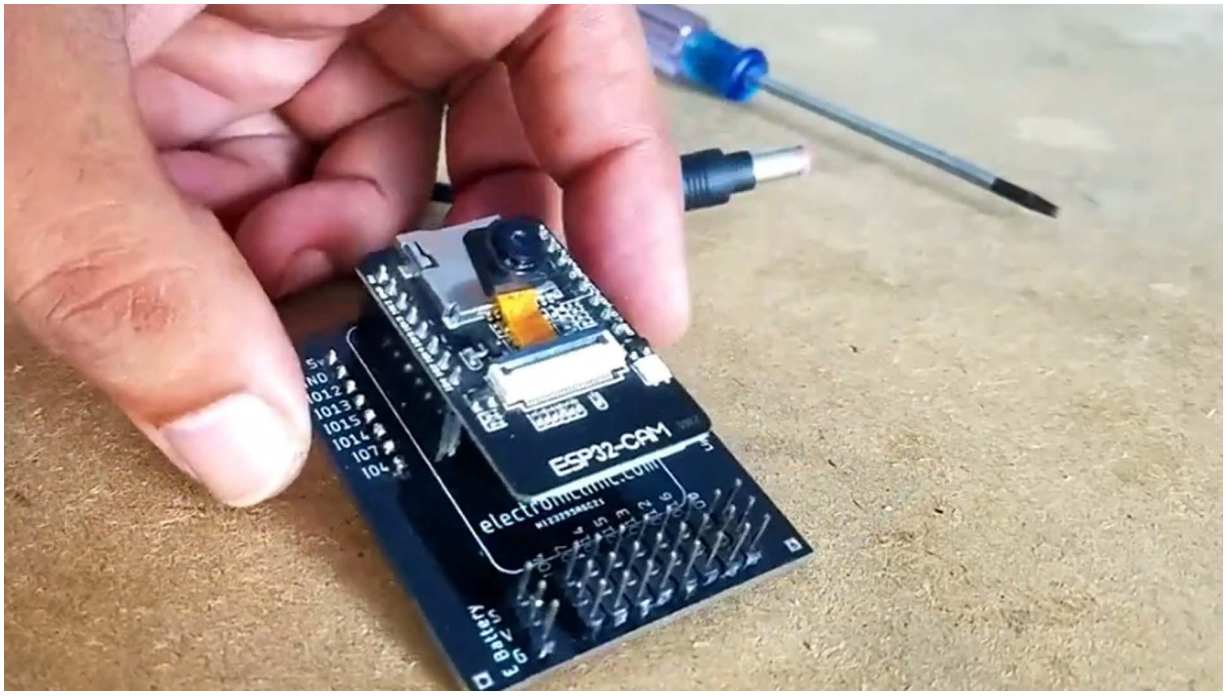
using this setup, the SP 32 camera module can be powered up using multiple voltage sources. The bottom side circuit is provided with the 7805 voltage regulator due to which the SP 32 camera module can be powered up using a 12 volt adapter, battery or a solar panel. So using a 12 volt adapter or battery along with the live project

streaming, you can also control 12 volt relays, electronic locks, small DC motors, etcetera. The IO devices and sensors can be connected with these male headers. The SP 32 camera module can also be powered up using a 5 fold adapter or 5 fold telemetry bake.



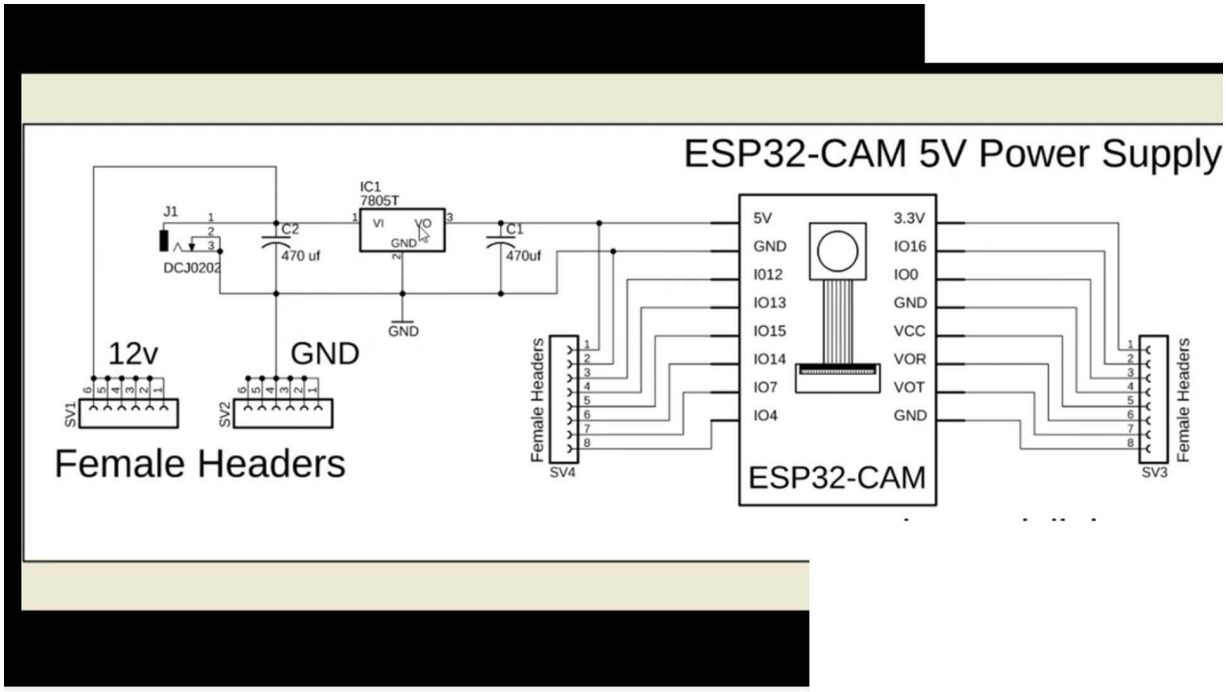
You can also power up the ESP 32 camera module using 3.3 volt lipopatri. If you plan to use it only for the live project streaming, then you can remove the bottom circuit. connect the 5 fold Lipo Patriot, and that's it. So before I'm going to explain the circuit diagrams and PCBs, first, let's practically see how we can use a twelve foot adapter and five foot laboratory. This is completely portable.

It can be used in robots, drones, security systems, automation projects, as a monitoring automatic door opening system and 100 of other projects where you need live project streaming along with the monitoring and control. Without any further delay, let's get started. The components and tools used in this project can be purchased from Amazon. The components purchase links are given in the description. This is the schematic of the top PCB board as you can see There is nothing complicated.



Mail headers are connected with the power supply and eye opens of the ASP 32 camera module. The SB 3 and SB 4 male headers are used to make connections with the bottom circuit board. The JP 1 and JP 2 made headers are used to connect 3.3 volt and 5 volt Lipo batteries. While all the other male headers are used for interfacing sensors and other output devices, this is the schematic of the bottom PCB board. Female headers are connected with the power supply and eye opens of the ASP 32 camera module The bottom PCB board is provided with the 5 volt regulated power supply based on the linear voltage regulator LM 7805.

A voltage source greater than six fold and less than 28 volts is connected with a female power jack J 1. This way the ESP 32 camera module can also be powered up using a solar panel twelve volt battery or a twelve volt adapter, etcetera. I also added headers for the twelve volt and ground connections, if I want to control twelve volt relays, small twelve volt DC motors, etcetera. Finally, I designed PCBs using the gates of the eagle, schematic and PCB designing software. I double checked all the connections and generated the Gerber files for checking the Gerber files.



I used the PCB way online Gerber viewer. I have a very detailed tutorial on how to generate the Gerber files and how to use the PCBway online Gerber Vivo. I will provide a link in the description. Finally, I uploaded the Gerber files along with site information. These are the top and bottom circuit boards.

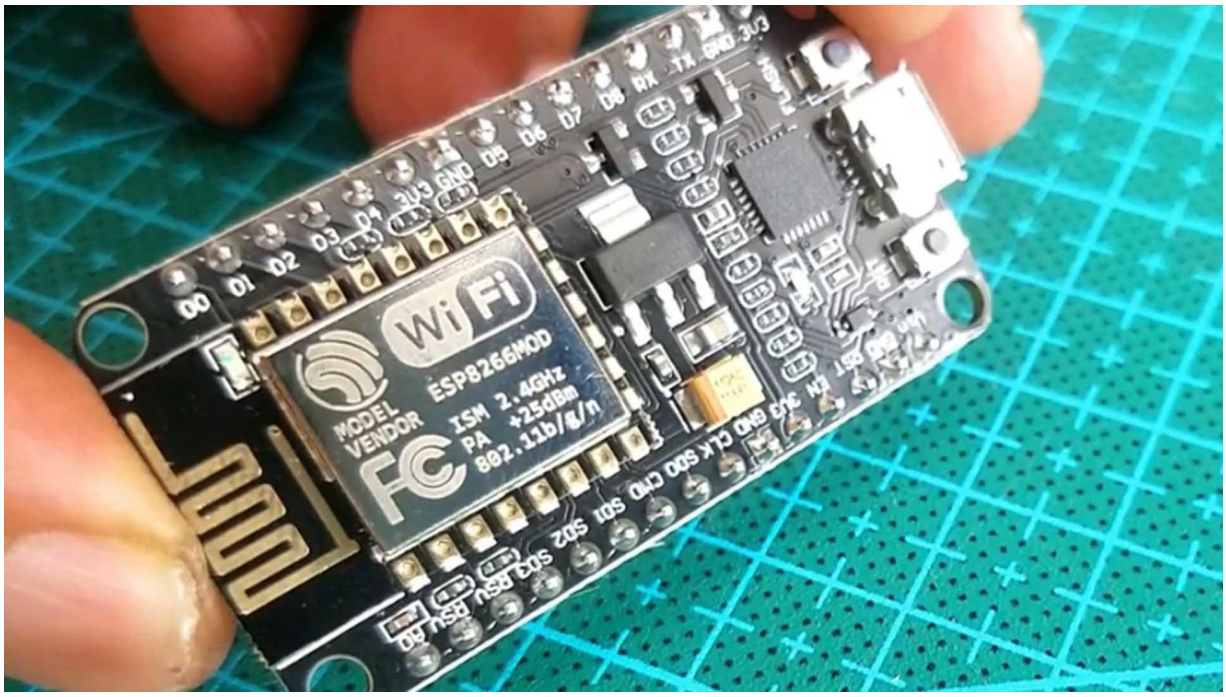
As you can see, the quality is really graded next. I started off by placing the components and completed the saltering job. This is how the files circuit boards look after soldering. These circuits are ready for use. I will use the same program which I explained in my previous tutorial on the ESP 32 camera module. I have already uploaded this program.

Let's watch this project in action. Let's first check the ASP 32 camera development board using the 12 volt adapter after powering up the ASP 32 camera module. You would need the local IP address for the live project streaming using the same over WiFi network. I have already explained this in the first project so I know about my local IP address. As you can see, it's working. Now it's totally up to you for what purpose you are going to use this.

You can also let me know in a comment Now, let's check this using the 5 fold Lipobettery pig. The advantage of using the Lipobettery pig is that it becomes completely portable. And this way you can use this in robots, cars, any other place which you want to monitor. In my upcoming tutorials, I will use the same ASP 32 camera development board for monitoring and controlling a door lock. I will use this camera with different types of sensors and so on.

ESP32 IOT PROJECTS
PART1

This project is brought to you by. This is a getting started tutorial on the ESP 32 Wifi plus bluetooth module developed by the Espresso. The same company that created the ESP a 2, double 6 series of chips, modules, and development boards. Only by looking at the modules It's hard to tell which one is the ESP, 32, y5 plus Bluetooth module, and which one is the node MCU ESP A 2, double 6. But if you look closely, you will be able to clearly see the module names.



So this one is the ESP 32 Wi Fi plus Bluetooth module. and this one is the node MCO ESP A 2, double 6. A monitoring and control system with ASP 32, Wi Fi plus Bluetooth module is simple compared to the MCO ASP A 2, double 6, and between our boards. With ESP32, You can control different types of AC and DC loads, and you can also

monitor different types of analog and digital sensors over very long range using Wi Fi or short range using the ESP 32, built in low energy Bluetooth module And this is the reason I prefer ASP 32 or ASP a 2, double 6, and more it has more analog and digital pins. While in Note MCU, ESPA 2, double 6, we have only one analog pin is 0.

So in this project, We will only cover the ESP 3 to Wi Fi plus bluetooth module. I will explain the extreme basics, which I believe as a beginner, you should know. In this project, we will cover 1, ESP 32 comparison with the node MCO ESP 8266. Number 2, ESP 32 pan out and technical specifications. Number 3, ESP32 board installation using the arduino IDA.

Number 4, ESP32 firstenergy program. Number 5. Blink IoT platform with ASP 32 to control a device from anywhere around the world. Number 6. Bring RG platform with ASP 32 to monitor a sensor from anywhere around the world.

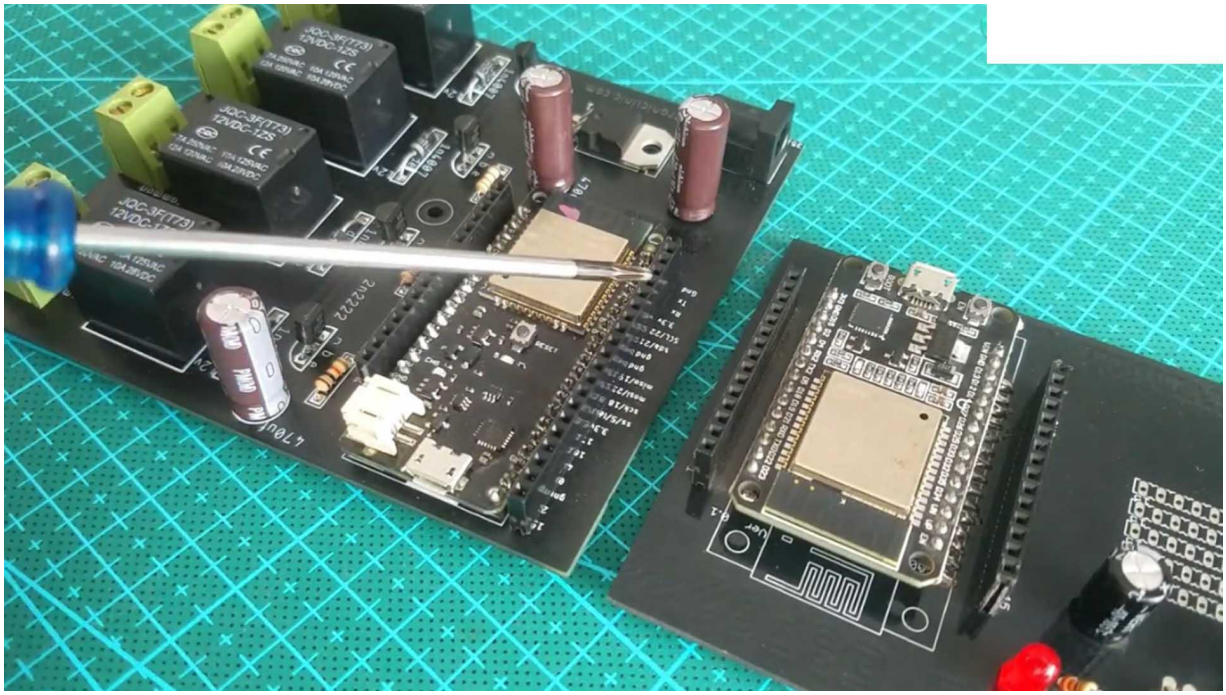
ESP32 WiFi + Bluetooth Module	Comparison	Nodemcu ESP8266
32 bit processor with dual core	Processor	32 bit single core
2.5 V to 3.6 V	Operating Voltage	2.5 V to 3.6 V
Has Bluetooth 4.2 + Wifi	Bluetooth	No Bluetooth
448 Kb	ROM	No
EEPROM flash	Flash memory	No flash
160 MHz clock frequency	Clock speed	80 MHz
Boot flash encryption. OTP 1024-bit	Security	No
Can protocol for automotive communications	Can Protocols	No CAN protocol
34 GPIO pins	GPIO Pins	17 GPIO pins
More Analog Pins	Analog Pins	One Analog Pin A0
12 bit Analog to digital converter	ADC	10 bit ADC
Inbuilt hall sensor, temperature sensor	Inbuilt sensor	No inbuilt sensor
4	SPI	2

Number 7. managing a sensor using the ESP 32 built in Bluetooth module. And finally, number 8, we will also make a home

automation system for controlling home appliances using the ESP 32 built in Bluetooth module. Without any further delay, let's get started. As a beginner, you may find it quite hard to decide whether you need to get started with the note MCU ASPA to double 6 or the ASP 32, 55 plus Bluetooth module.

Both the modules are default by the same company espresso systems and can be used in IoT based projects. Let's do a side by side comparison of both the modules. ESP 32 has a 32 bit processor with dual core while the processor in node MCU, ESP 8 to double 6 is 32 bit, but single core. The operating voltage of both the modules is the same, which is 2.5 folds to 3.6 volts. ESP32 has Bluetooth 4.2 plus Wi -Fi.

This is a low energy Bluetooth module and is designed specifically for Bluetooth smart technology. While on the other hand, the node MCU SP air to double 6 has the Wi Fi, but no built in Bluetooth module. So if you need a Bluetooth module, then you will need to externally connect the Bluetooth module. You can start with the 8c05 or hc 06 Bluetooth modules. These are low cost modules.



Read only memory is available in ASP 32, which is 448 KB, but it's not available in node MCO ASP a 2, double 6, wifi module. ESP 32, wifi, plus Bluetooth module has the EAP, RAM, Flash, and this is not available in the node MCO, APA 2, double 6, Wi Fi module. Clock speed in AP32 is 160 Megahertz clock frequency, while in ASP a to double 6, it's 80 megahertz, which is half of the clock frequency used in ESP 3255 plus Bluetooth module. Boot Flash encryption, OTP 1024 bit is available in ESP32, but not an ESP A 2 double 6 Wi Fi module. ESP 32 has the gain protocol for automotive communications, but in node MCU, ESP 8 to double 6, there is no gain protocol.

An SP 32 Wi Fi plus Bluetooth model, we have more IO pins than the MCU SB 8 to double 6. SP 32 module has more analog pins via a node MCO ASP a 2, double 6. We have only one analog pin: 0. ASB 32 has a 12 bit analog to a digital converter while the ESPA to double 6 has a 10 bit analog to digital converter. ESP 32 Wi Fi plus Bluetooth module is provided with the end built haul sensor and temperature sensor While in the node MCU is a 2 double 6, you will need to externally connect these sensors, even in case you need them.

ESP 32 has 4 SBI while SPA 2, double 6, has 2 of these. ESP 32 has an ethernet interface. The ESP 3255 plus bluetooth module is a bit expensive than the MCU SBA 2, double 6, but it is really worth it as it has more analog pins, more digital pins, and has low energy, bluetooth module, etcetera. This project is sponsored by Altium. Altium Designer is the world's most trusted PCB design system.

Altium Designer enables engineers to effortlessly connect with every facet of the electronics design process. Over 35 years of innovation and development focused on a truly unified design environment makes it the most widely used PCB Design solution. With Altium Designer, you can create PCB designs with an intuitive and powerful interface that connects you to every aspect of the electronics design

process. routed your way through any angle. June for delay, push, slide, and walk around faster than ever.

interact and collaborate with mechanical designers like never before in a photo realistic 3d design environment If you want to get started with the ultimate designer, you can click on the first link in the description. ESP 3255 plus Bluetooth module is a 3.3 volt compatible controller board, which means only 3.3 volt support sensors and ports should be connected with the ESP 32 Wifi plus Bluetooth module. If you need to connect a five volt sensor, with any GPI open, then don't forget to use a bidirectional voltage converter module Otherwise, this will damage the ESP 32 module. Before I'm going to explain the ESP 32 pinout and technical specifications, First, let's take a look at these 2 different versions of the ESP 3 to Wi Fi plus Bluetooth modules. This one is a 36 pins version of the ESP 32 module while this one is a 30 pins version of the ESP 32 module.

This version of the ASP 32 Wi Fi plus Bluetooth module is slightly bigger as a connector for the small 3.3 volt laboratory. Both the modules are provided with these micro USB ports. It really doesn't matter which version you have because both the modules can be programmed using the Arduino IDE. The PIN numbers may be different, but their use is exactly the same. You can clearly see this version of the ESP 32 module has ESP 32 W RAM 32 printed on it.

and the same is printed on this module. In this project, I'm going to use both the modules, but initially I will start with this module to explain the pen out. But for the practical demonstration, I will use this version of the SP 32 model because I have these relays already connected. For now, you don't need to be worried about these components as I would explain the complete circuit diagram later in this project. This board also has these female hitters on the left and right sides, which I can use to connect different sensors and display modules.

So basically, we can use this as the development board for testing our code and connections. So let's start with this basic ESP 3255 plus Bluetooth module so that you can easily understand the very basic things. This board has these 2 small LEDs. This one is the power editor while this area is connected with the GPI 2. This board is also provided with this 3.3volt voltage regulator, so you can easily power up this model using a fivefold regulated power supply. The board is also provided with these 2 small push buttons.

This push button is used for the booting, which is only used when a software update is needed. While this push button is the reset button which is used to restart the speed 32.55 plus Bluetooth module. This module has a total of 30 pins, 15 pins on the left side and 15 pins on the right side, as can see all these pins are clearly labeled. It has 2 R2S interfaces, 3 SPI interfaces, two I2C interfaces, and 3 UART interfaces for connecting serial communication supported devices. It has 18 ADC analog to digital converter channels, 2 digital to analog converters, 16 PWM output channels, and 10 capacitive sensing GBIOs.

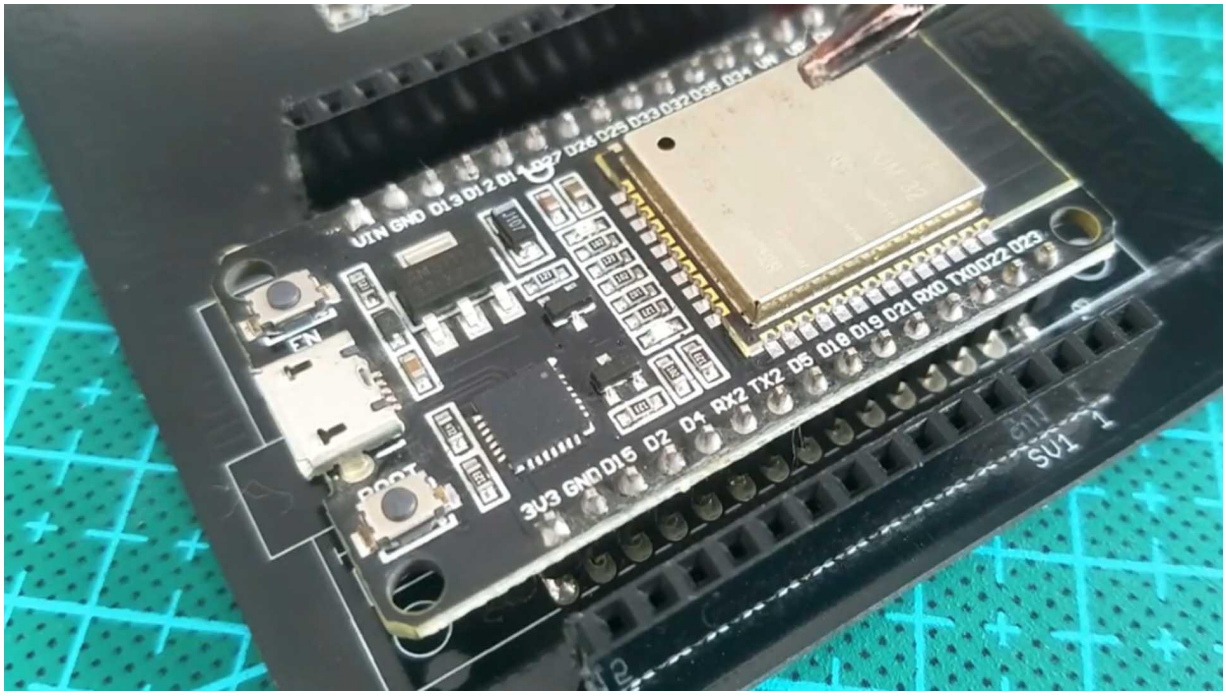
Out of these 30 pins, the ESP32 wroom 32 has a total of 25 GBIOs which are divided into 3 groups. Input only pins the pins with internal pull up resistors and the pins without internal pull up resistors. The input only pins are GBIOs 34, 35, 36, and 39. So if you're planning to use these pins as the input for reading digital signals, then don't forget to add pull up resistors. Depends with internal pull up resistors are gbios 14.

16, 17, 18, 19, 21, 22, 23. The pins without an internal pool of resistors are gbios 132526 27, 32, 33. Now let's go through all these pins. Let's start with the VIN and ground pins, which are the power supply pins, and this is where we connect our five volts and ground wires to power up this module. Remember, apart from the power supply pins and the e n pen, all the other pens are multi functional, and this is what we are going to discuss now.

We have a total of 15 ADC pens available with GPIO prints: 30, 12, 14, 27, 26, 25, 33, 32, 35, 34, 39, 36, 15, 2, and 4. With all these analogue to digital converter pins, you can connect different types of analogue sensor I will explain this later in this project. The ASP 32 Wi Fi plus Bluetooth module has a total of 10 internal capacity of sensors connected with the ESP 32 GBI opens 4 2 15, 13, 12, 14, 27, 33, and 32. You can easily convert these pens into capacity or page, and this way you can easily replace push buttons. You can also use these pens to wake up ASP 32 Wi Fi plus Bluetooth module from the deep sleep.

On GPS 2526, we have 8 bits digital to analog converters. Take 1 is available on gpiO 25 and DAC 2 is available on GPIO 26. All the GPIOs except 3439 can be used as the PWM pins Using these pins, you can control the speed of a DC motor, or you can control the LED brightness, etcetera. There are a total of 3 serial ports and ESP 32, 55 plus Bluetooth module. The first serial port is used for the programming The second serial port, Rx 0, TX 0, is available on GPIOs 3 and 1.

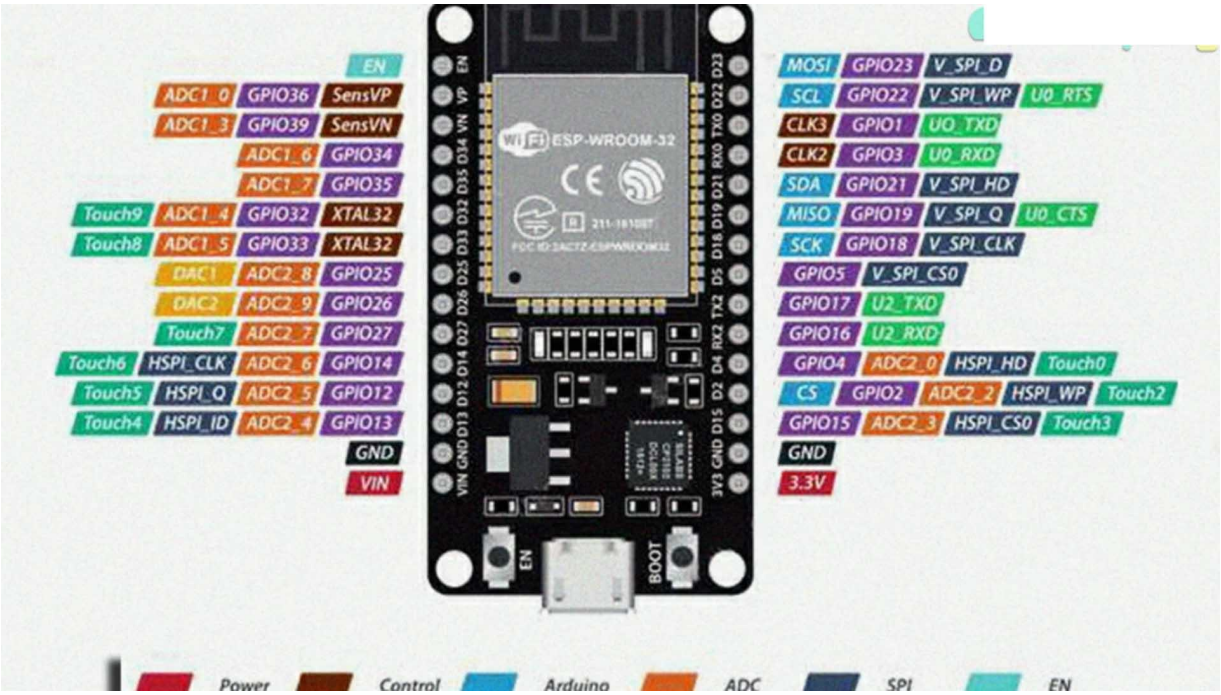
And the 3rd serial port, Rx 2, Teaks to is available on GPIOS 1617. In programming, this C report can be referred to as serial 2 So these serial ports can be used for interfacing serial communication supported devices like GSM modules, GPS modules, and other devices which support serial communication. Unlike the arduino boards, the speed 32 Wi Fi plus Bluetooth module Also, here's the I2C bus available on gpio pins 2122. 21 is the SDA, and 22 is the SEL. Using these two pins, you can communicate with multiple ITC supported devices if every I do see a supported device or sensor has a unique address.



Later in this project, I will interface an I do see supported or validate display module for displaying the sensor values. All the gPOs can be configured as interrupts. The EN pin, which is the enable pin, which controls the 3.3 volt regulator, by default, it's pulled up. So if you want to disable the 3.3 volt regulator, then connect this pin with the ground. So in simple words, you can use some kind of remote trigger or an external board or a push button to restart the SB 3255 plus bluetooth module Finally, you can see the SPI pins labeled as MOSI MISO SCK and CS.

These pins are used with SPI supported devices, like, for example, the famous RFID module MFRC 5.2 uses the SPI communication. Just like the arena boards, the ESP 32, Wi Fi plus Bluetooth module can also be programmed using the arduino ID. You can download the latest version of the arduino idea from the Arduino official website. To download the Arduino IDE, click on the Windows zip file. If you want, you can support the artvin or development team with a small donation, or you can click on the just download button.

This may take several minutes depending on the speed of your Internet connection. Open the Arduino ID. Go to the tools menu and then to the board. When you run the Arduino IDA for the first time, you won't see the ASP 32 board. You will have to manually install the ASP 32 Wi Fi plus Bluetooth module in order to be able to program it using the audio IDA.



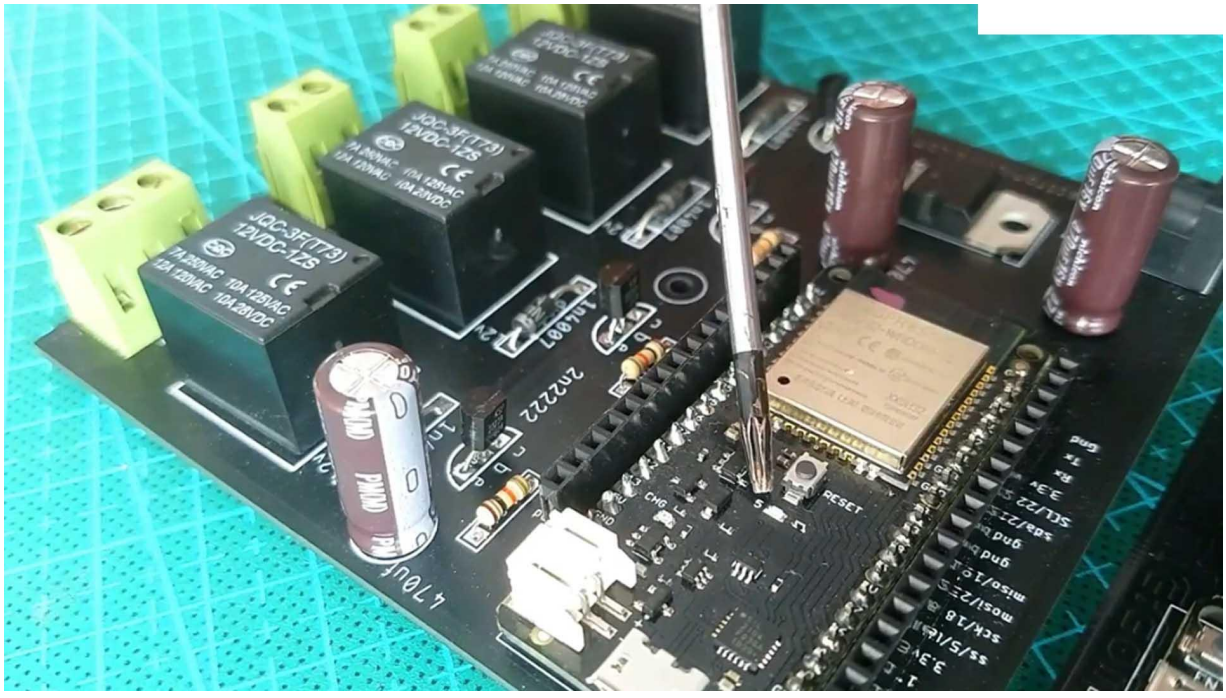
To install the ESP 32 board, you will need this URL link, which I will aid in the project description. Click on the file menu and then click on the preferences and paste the URL link. and also check the compilation and upload boxes. And then finally, you can click on the okay button. Again, go to the tools menu and then to the board.

And this time, click on the board's manager and wait for a few seconds. Search for the ASP 32. Select the latest version and then click on the install button. This may take several minutes depending on the speed of your Internet connection. You can see the ESP 32 board installation is completed.

Now let's go ahead and check if the E speed 32 board is already installed. Great. We have just installed our ESP 32 Wi Fi plus Bluetooth module.

ESP32 IOT PROJECTS
PART2

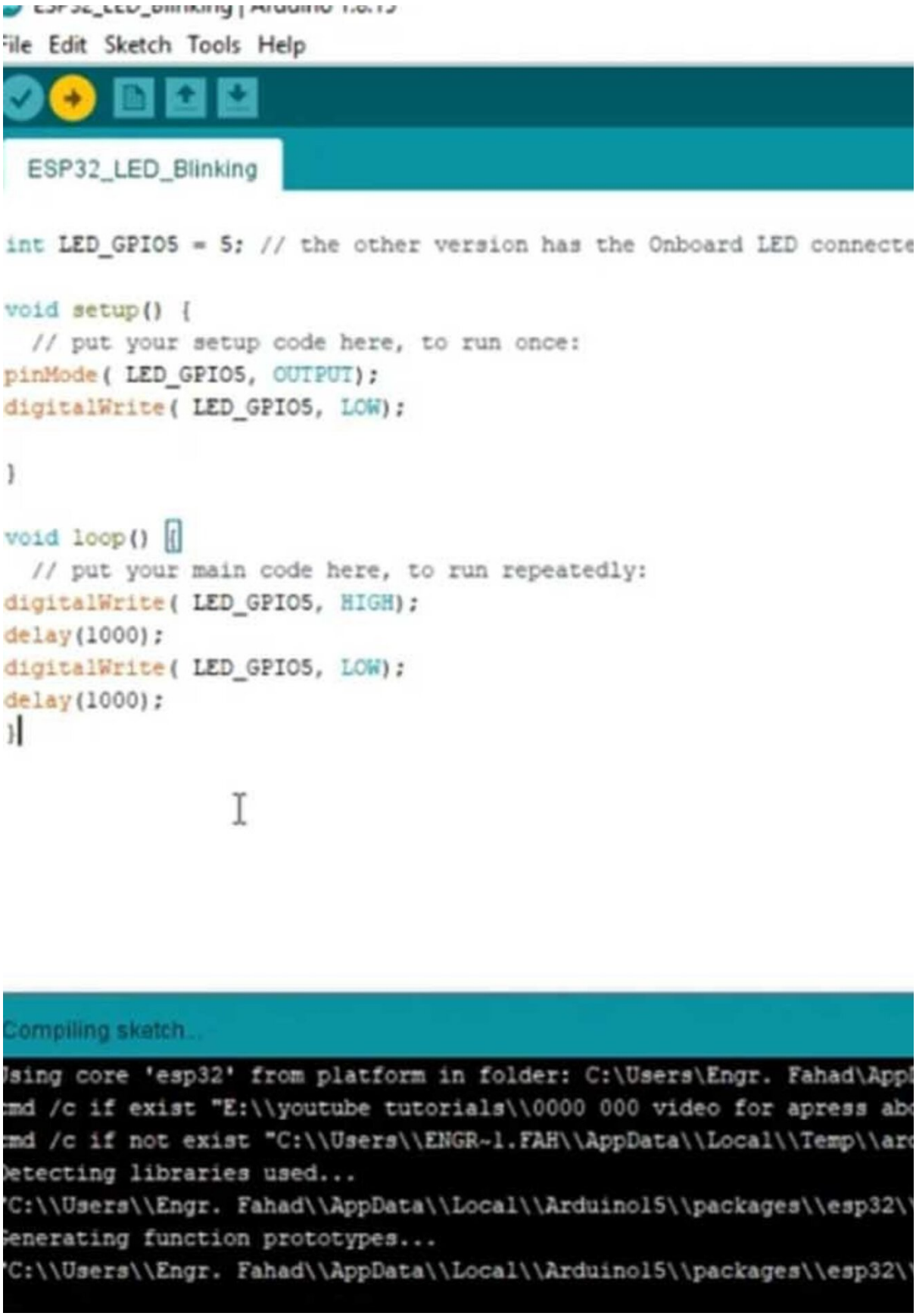
This project is brought to you by. Before we are going to write our first early blinking program, there are a few things that I would like to explain. so that you can easily understand the basic things. I explained the pinout of this ASP 32 module which is onboard it with a GPI 2. While in this version of the ASP 3255 plus Bluetooth module, the onboard area is connected with the GPI 5.



You can see 5 written with this editing. For the editing banking program, you don't need all these components. As a beginner, you can simply start with the ASP 32 alone and start controlling the onboarded entity. or you can simply connect an external elodee with any GPI open of your choice. Now let's go ahead and take a look at the elodee plane incurred. For this example, we don't need any

libraries as we are not using Bluetooth and Wi Fi I simply started off by defining a pin to which the onboard is connected.

If you are using any other version of the ESP 32 module, which has the onboard LED connected to some other GPI open, then go ahead and change this number. inside the white stop function, I set the gpio5 as the output using the pen mode function. Using the digital write function, you can hang on and turn off any GPI open. By default, I want to keep it off. The code which is placed inside the white set of functions executes only one time when you start the controller.

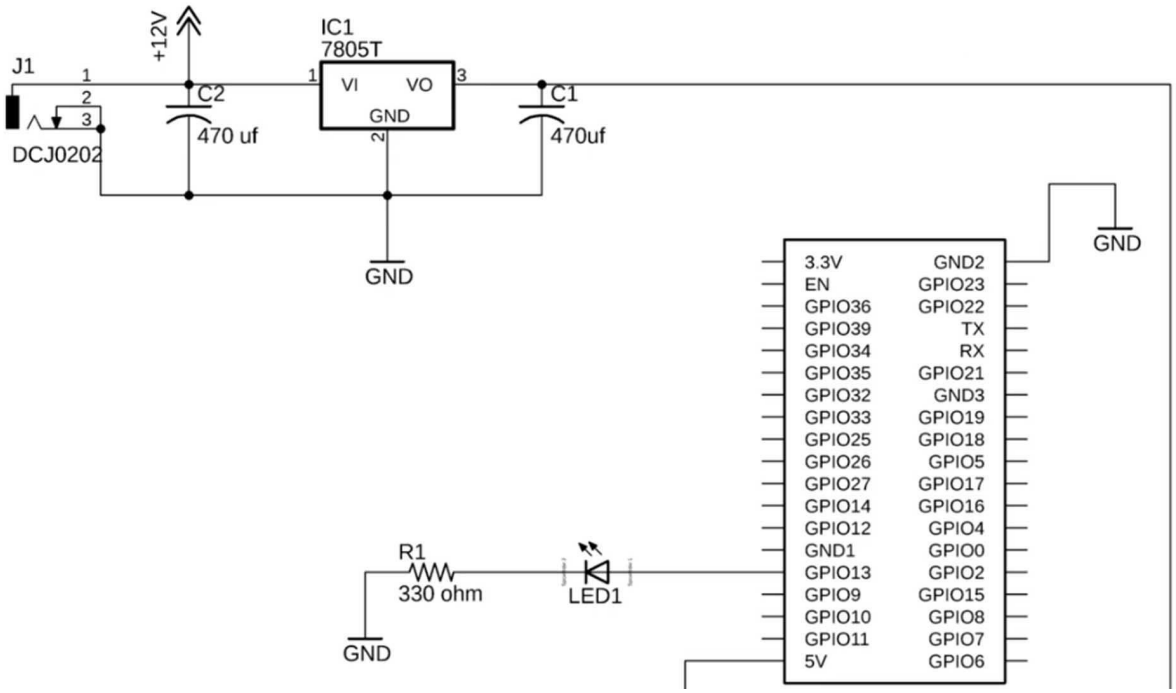

File Edit Sketch Tools Help
ESP32_LED_Blinking
int LED_GPIO5 = 5; // the other version has the Onboard LED connecte
void setup() {
// put your setup code here, to run once:
pinMode(LED_GPIO5, OUTPUT);
digitalWrite(LED_GPIO5, LOW);
}
void loop() {
// put your main code here, to run repeatedly:
digitalWrite(LED_GPIO5, HIGH);
delay(1000);
digitalWrite(LED_GPIO5, LOW);
delay(1000);
}
Compiling sketch...
Using core 'esp32' from platform in folder: C:\Users\Engr. Fahad\App
cmd /c if exist "E:\\youtube tutorials\\0000 000 video for apress ab
cmd /c if not exist "C:\\Users\\ENGR~1.FAH\\AppData\\Local\\Temp\\ar
Detecting libraries used...
"C:\\Users\\Engr. Fahad\\AppData\\Local\\Arduino15\\packages\\esp32\
Generating function prototypes...
"C:\\Users\\Engr. Fahad\\AppData\\Local\\Arduino15\\packages\\esp32\

The code which is placed inside the file to function executes again and again until you turn off the controller This line of code turns on the iridium, and then there is a delay of 1 second. 1000 milliseconds equals to one second. This line of code turns off the l d and, again, the rigid delay of one second. So that's all about the programming. Now to upload this code, connect at the ASP 32 module with the laptop.

As you can see, the onboard editor is off as the program is not yet uploaded. One more thing If you don't know with which communication port your ASP 32 module is connected, then you should open the device manager. Before you are going to upload the program, first of all, make sure you select the correct communication board and the correct version of the ASP 32 Wi Fi plus Bluetooth module, which is the ASP 32 diff module. Click on the verify button to check for any errors. As you can see, the quote has no errors, and now we can click on the upload button.

You can see the LED is blinking. Now let's say you are using a version of the ESP 32 auto, which has no onboard LED, or you want to use any other GPI open. Let's take a look at the circuit diagram and explain how to connect an LED with another GPS open. The inode side of the LED is connected with the GPS 13 of the ASP 32

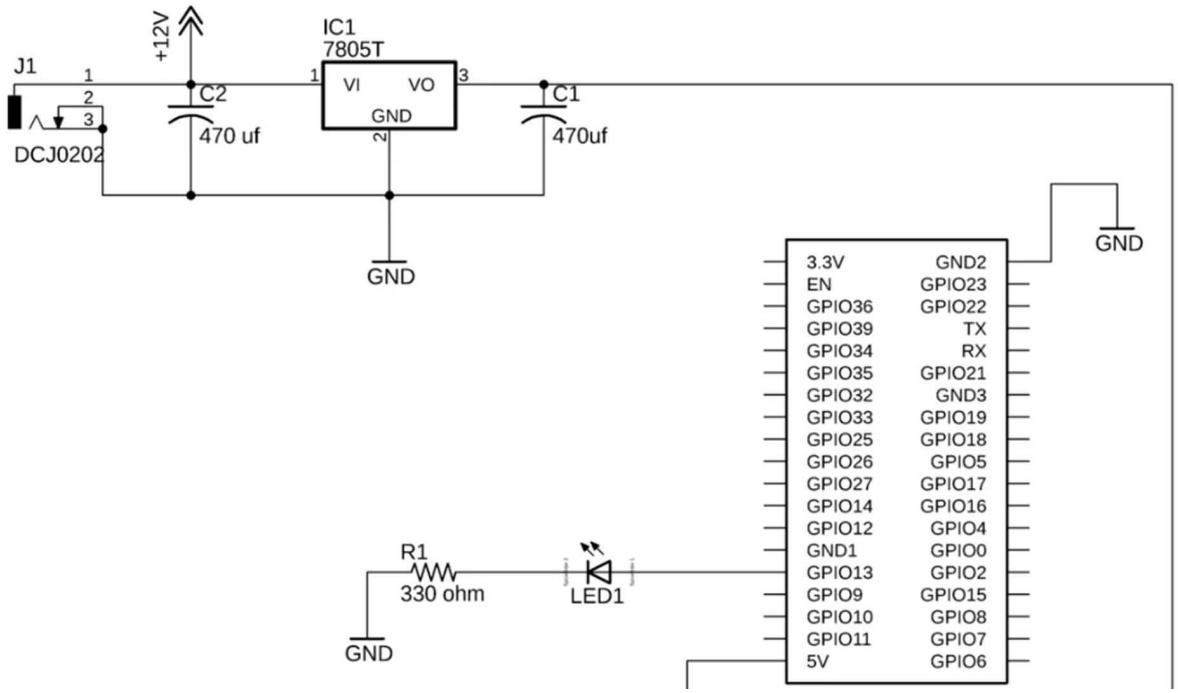
module, and the 3rd side of the IROD is connected with the ground through this 330 ohm current limiting sister. The note side, which is the positive leg of the earliest connected over the gpio13, a 330 ohm resistor is connected in series with this 2.5 volt LED.



This is a current limiting resistor. The other end of the resistor is connected with the ground pin of the ESP 32 module. So that's all about the interfacing. This is the same exact code which I just explained, I did only one change. That is I changed this number from 5 to 13 as this time I'm using the gbio 13.

Connect ESP 32 with the laptop and click on the upload button and wait for a while. As you can see, the code has been uploaded, and now you can see the ID connected with the GPIO 13 is blinking. With this setup, If I need to run this editor for 2 hours, then the laptop should remain connected with the ESP 32 module which seems quite impractical, we can make our own regular to 5 volt power supply to power ESP 32 Wifi plus Bluetooth module. Let's take a look at the circuit diagram. This project is sponsored by Altium.

ULTium Designer is the world's most trusted PCB design system. Altium Designer enables engineers to effortlessly connect with every facet of the electronics design process. Over 35 years of innovation and development focused on a truly unified design environment makes it the most widely used PCP design solution. With Altium Designer, you can create PCP designs with an intuitive and powerful interface that connects you to every aspect of the electronics design process. Route your way through any angle, June for delay, push, slide, and walk around faster than ever.



Interact and collaborate with mechanical designers like never before in a photo realistic three d design environment. If you want to get started with the ultimate designer, you can click on the first link in the description. Jaywin is the DC female power chick, and this is where we connect our 9 volt to 25 DC power supply to power up the ESP 32 module. While using a power supply, make sure you never see the maximum input voltage rating of the 7805 voltage regulator. Recommended power supply is 12 volts.

470 microfarad, 16 volt capacitors are connected on the input and output sides of the 5 volt regulator. These are decoupling capacitors

and must be connected. Otherwise, the ESP 32 module will keep resetting automatically. The regulated five faults can then be connected with the ESP 3 to 5 fault pen. And don't forget to connect the ground of the power supply with the ground pen of the ASP 32 Wi Fi plus Bluetooth module.

I designed this ESP 32 based development board and gates of Eagle's schematic and PCB designing software. I will add a link in the description to download the Gerber files. It took around 15 to 20 minutes to complete the soldering. On the PCB board, you can see I have the 2 decoupling capacitors, 7805 voltage regulator, and this DC female power jig. All these other components are used to control the relays of which I will explain later in this project.

Anyhow, now let's control the same. But this time, we are going to power up the ESP32 module using a 12 volt power supply. You can see the l d is blinking, and now I'm not using my laptop anymore. So far, I have explained the maximum basic things and now, you know, exactly how to install the ESP 32 board, how to write your 1st program to control an LED, and how to power up the speed 32 Wi Fi plus Bluetooth module using a 12 volt power supply. Now let go ahead and control the same LED using the blink application. This time, we will connect the ESP 32 Wifi plus Bluetooth module with your Wi Fi.

This way we'll be able to control this ability from anywhere around the world using the blink application. Before you can start controlling different types of electrical loads or monitoring different types of sensors, first you will need to download the Blink Library. Just like the Artino boards, the ESP32, Wi Fi plus Bluetooth module can also be programmed using the arduino IDE. You can download the latest version of the arduino IDE from the arduino official website. To download the arduino ID, click on the Windows zip file.

If you want, you can support the arduino development team with a small donation, or you can click on the just download put in. This may take several minutes depending on the speed of your Internet connection. Open the Arduino ID. Go to the tools menu and then to the board. When you run the Arduino IDA for the first time, you won't see the HP 32 board.

You will have to manually install the ESP 3255 plus Bluetooth module in order to be able to program it using the arduino IDE. To install the ESP32 board, you will need this URL link, which I will add in the project description. Click on the file menu and then click on the preferences and paste the URL link. and also check the compilation and upload boxes. And then finally, you can click on the okay button.

Again, go to the tools menu and then to the board. And this time, click on the board's manager and wait for a few seconds. Search for the ASP 32. select the latest version and then click on the install button. This may take several minutes depending on the speed of your internet connection.

You can see the ESP 32 board installation is completed. Now let's go ahead and check if the speed 32 board is already installed. Great. We have just installed our USB 32 Wi Fi plus Bluetooth module. While your audio IDE is opened, click on the Sketch menu and then go to the include a library and click on the manage live duties.

Search for the link. Select the latest version and then finally click on the install button and wait for a while. Our blink library has been installed. Next, we will need to download the Blink application from the Play Store. The Blink application can run on both the Android and iOS supported cell phones.

ESP32 Board Manager URL Link:
https://raw.githubusercontent.com/espressif/arduino-esp32/gh-pages/package_esp32_index.json

It's a good designing practice to first start with the Blink application. This way, you know exactly which digital and virtual pins you will need for your project after you have downloaded and installed your Blink application. Open the blink application. Click on the new project. Right.

The project name. Click on the chosen device and select ESP 32 dev board and make sure the connection type is set to Wi Fi and then finally click on the create button. Authentication token will be sent on your adjusted email ID, which will be later used in the programming Click anywhere on the screen to add a button. Right.The button name.

Next click on the pen and while the digital is selected, search for the GP13, as our Eruditus is connected with the gpio13. Our application is ready. Announced. Take a look at the programming. You will need to add this header file if you want to control ESP 32 using the blink application.

This is the authentication token which was sent through email while making the blink application. I simply copied and pasted over here. This is the name of the wifi router, and this is the password. Next, I defined a plan to which the l d is connected. Inside the white set of functions, I activated the serial commune using the serial dot begin function.

And inside the parentheses, you can see 96100. This is the bar tray I activated the serial communication only for the debugging purposes. Next, I activated the blink and set the l g s output. Inside the white loop function, we have only one function which is the plain dot run function So that's all about the programming. I've already uploaded this program.

Let's watch this basic LD control system in action using ESP 32 and plain application. There is no change on the hardware side. The LED is still connected with GP IO 13. So let's go ahead and power up the ESP 32 board. Now open the blink application.

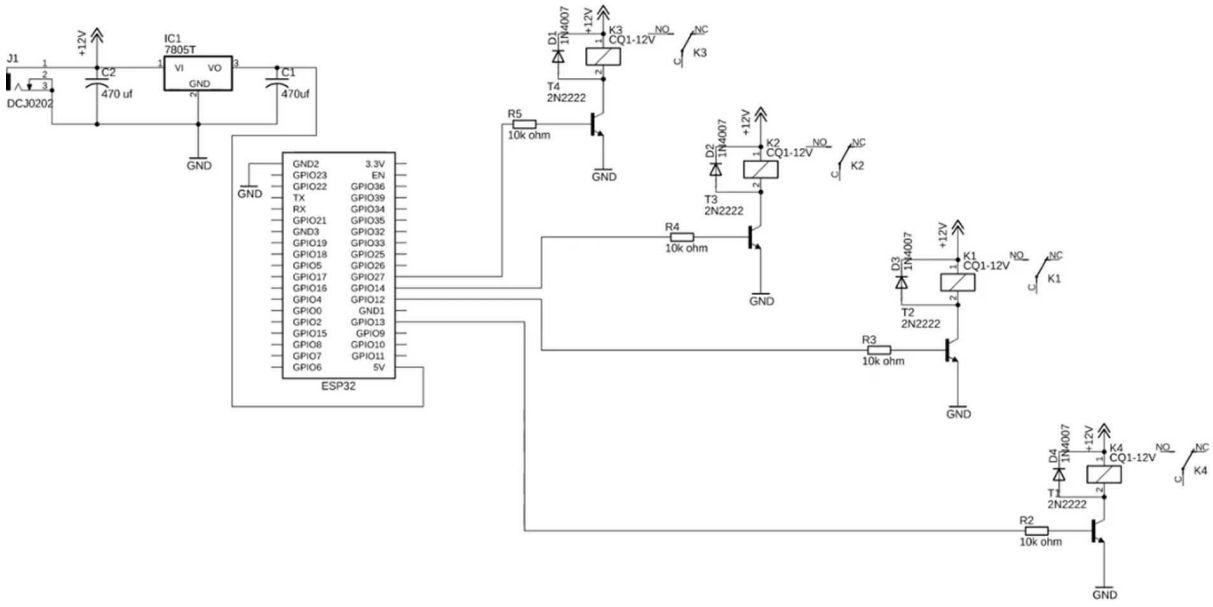
Click on the play button. and start controlling the energy from anywhere around the world. This is simply amazing. Now you can

replace this early with a relay to control AC or DC loads. This is what I'm going to explain next.

But first, let's take a look at the circuit diagram. The power supply remains exactly the same. I have removed the LED. You can see 4 relays are connected with the ASP 32 gpios 13. 12, 14, 127.

If you want, you can add more relays. All these relays are of the type aspiry, single pole, and double throw. You can use a ready made relay model, or you can make your own relay model by following these connections. You cannot directly control these relays using the SP 32 module. You will need a driver to turn on and turn off these relays.

You can see I'm using a pair of 2 n22222 NPN transistors and a 10 kilo ohm resistor to control each relay. So the 2n222 NPN transistor and the 10 kilo ohm resistor make the driver circuit. One side of the relay coil is connected with the tread volts while the other side of the relay coil is connected with the lector of the 2n222 NPN transistor, and the base is connected with the GPI open through this 10 kilo ohm resistor. You can connect your ACRTC load with a common and normally open pin of the relay. You can see this relay is connected with the gpio 13.

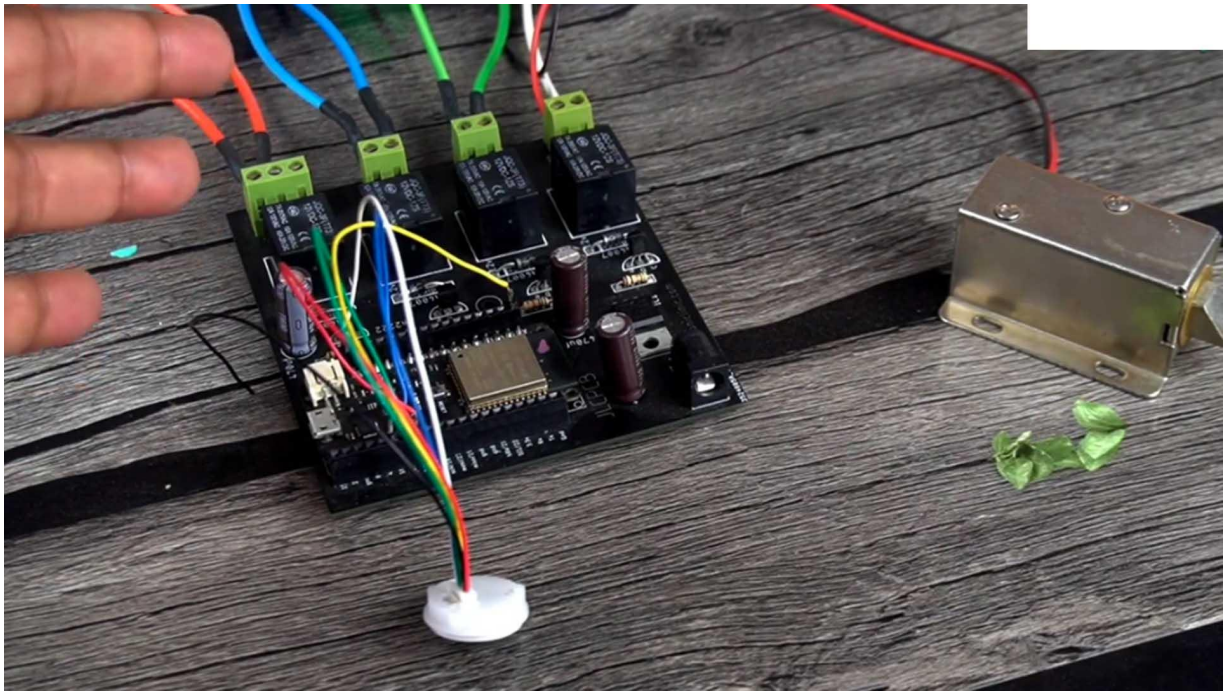


And if you remember, we have been using this plan to control the editing. This means we can use the same program and the same link application to control this relay. I will add a link to the PCB Curber files in case you want to make the same ESP 32 development board. For the demonstration purposes, I have connected this 220 volt AC fan, which we are going to control wirelessly using our cell phone. Be very careful while working with 220 volt ACS.

It can be really dangerous. Don't forget to wear protective gloves. So now you have got the idea how different types of loads can be controlled over long distances using WiFi.

ESP32 FINGERPRINT BASED BIOMETRIC DOOR LOCK

This project is brought to you by Altium 365 via the World Designs electronics and Octopart, the world's fastest search engine for electronic parts. Until now, you may have seen many home automation systems, but the home automation system that I'm going to present today is different from all of them because this system is based on the fingerprint sensor and this has never been done before. A fingerprint based biometric door lock makes sense, but a fingerprint based home automation sounds quite weird, doesn't it? Well, you don't have to control all your home appliances, but you can secure certain loads that you don't want anyone else to turn on or turn off. Now it could be a TV or a computer or a gaming machine if you don't want your kids to turn on these things while you are not around.

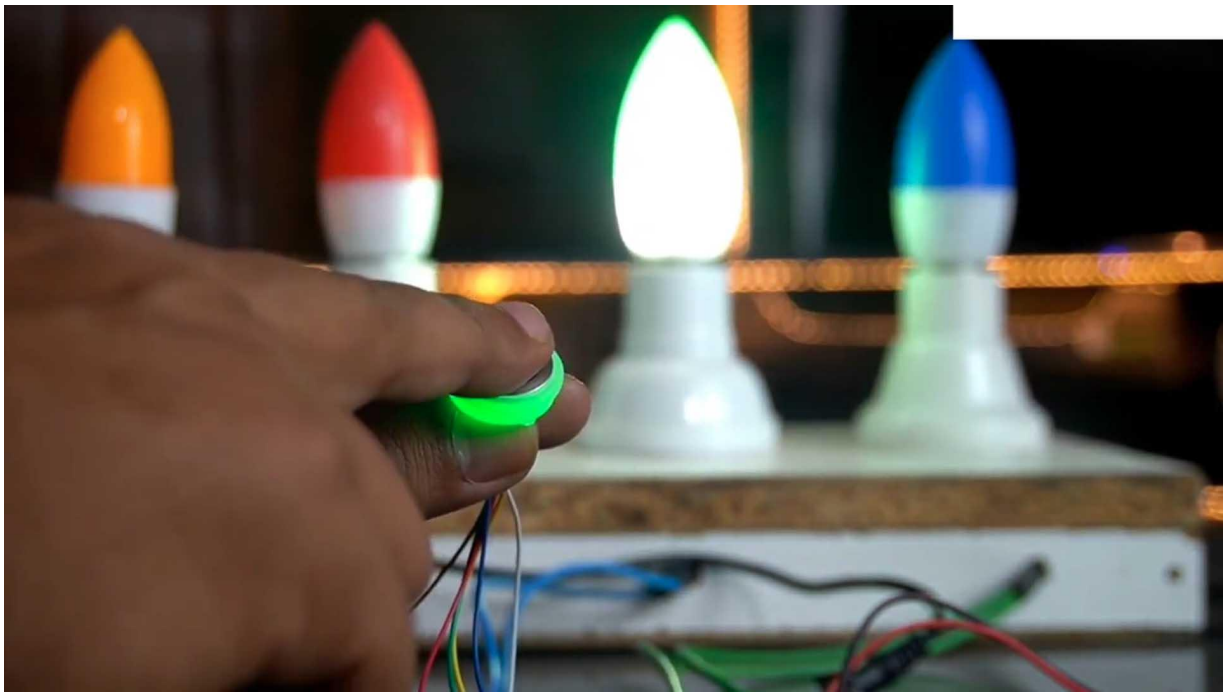


Anyway, it totally depends on you which loads you want to secure with a fingerprint sensor. Anyway, first I will tell you about the hardware and then we will start the practical demonstration. As you can see, I'm using my design speed 3255 Bluetooth module development board, but it doesn't matter if you don't have this development board, you can use a Brit board for the initial testing and then you can use a variable for the final connections. But still, if you want to make the same development board, then you can download its gerber files from the article available on a chronic clinic dot com. This board has 4 spirety type relays.

So using these four relays, I can control AC and DC loads both at the same time. If you want to control more AC or DC loads, then go ahead and increase the number of relays. Don't worry. I will explain the circuit diagram. Anyway, this is the r capability of the fingerprint module and it has the ability to store 120 fingerprints.

You can watch my getting started project on this fingerprint sensor if you want to know more about its technical specifications, wiring details, and lots of other things. This is a 12 volt electronic door lock,

and these are 220 volt AC bulbs. Now let's go ahead and start a practical demonstration. I have powered up the entire system in the 110 or 220 volt ACS and never touch the relay contacts because it can be really dangerous. We are protective gloves and it's good to have someone on your side while working on such high voltage projects.

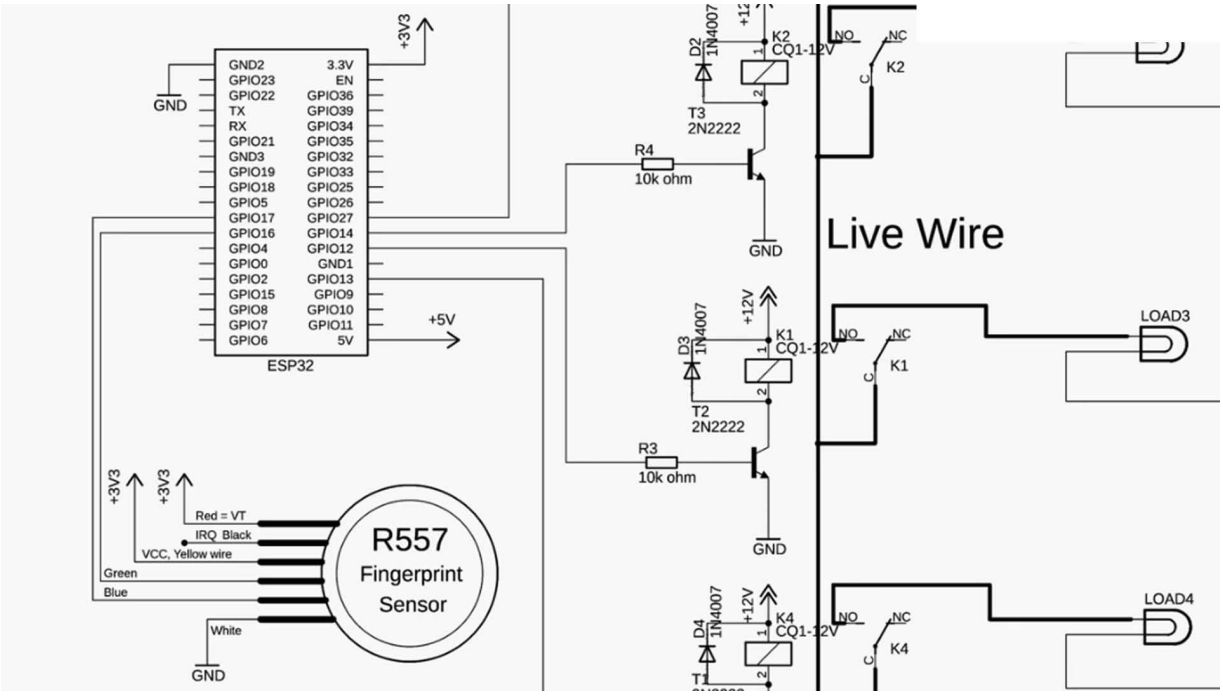


Anyway, for this project, I have adjusted a total of 4 fingers and using these four fingers I'm going to control these four loads. I'm sure by now you might have got an idea of how this system works. So without any further delay, Let's get started. The companies and tools used in this project can be purchased from Amazon. The company purchase links are given in the description.

Given is the DC female power jack and this is where we connect a twelve volt adapter battery or a solar panel. 2470 microfarad capacitors are connected at input and output sites of the voltage regulator The output of the voltage regulator is connected to the 5 volt pin of the SB 32 module, the ground of power supplies connected to the ground of the ESP32 module. The R double 57 capacity of fingerprint module VTE and VCC wires are connected with a 3.3 volt pin on the SP 32 module. The irQ wire is not

connected. The green and blue wires on the TXD and Rxd pins are connected with the GPIO pins 6 17.

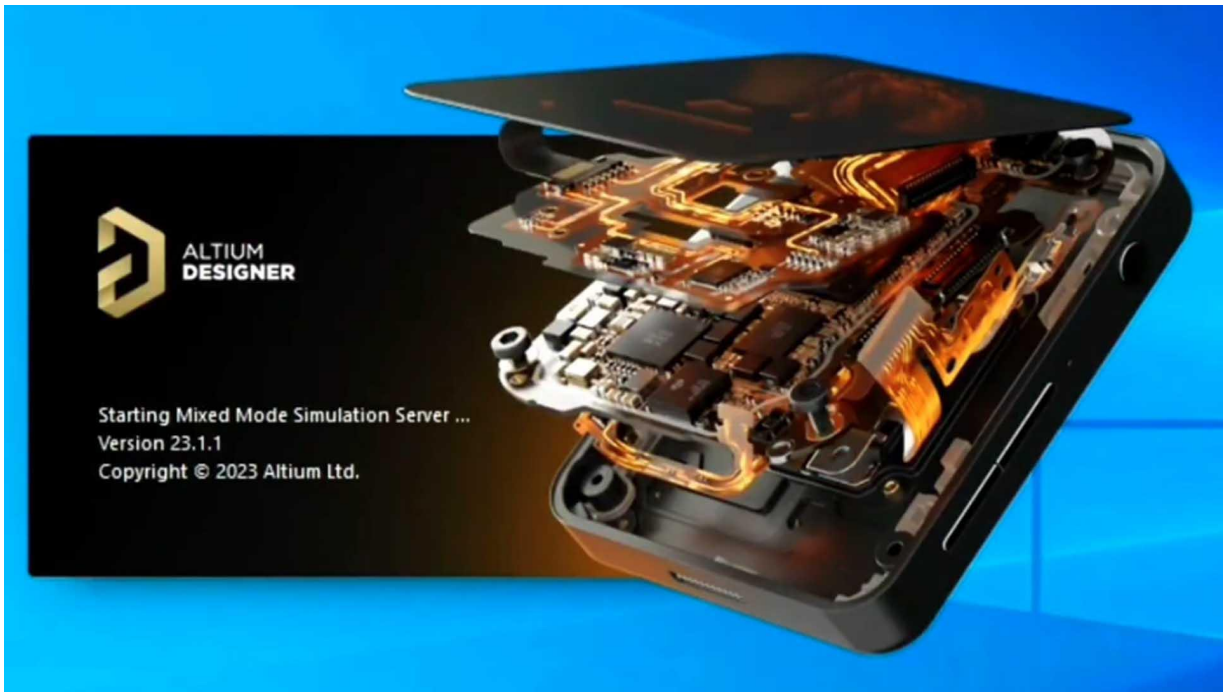
And the white wire is the ground wire and it's connected to the ground pin of the ESP32 module These are the 12 volt SPurity type relays and can't be directly controlled using the ESP32 module. So that's why we need a driver to control these relays. You can use a relay driver IC or you can use 2n2222 NPN transistors and 10 kilo ohm resistors. One pin of the relay coil is connected with the collector of the 2N 2, 2, 2, 2, 2, 2, NPN transistor, while the other pin of the relay coil is connected with the 12 volts. The emitter of the transistor is connected with the ground while the base is connected with a 10 kilo ohm resistor.



Now to control these relays, you simply need to connect these 10 kilo ohm resistors with the ESP 32 io pins. In this project, I'm using the GPI opens. 13, 12, 14, and 27. The neutral wire from the 110 or 220 volt AC supply is connected with the neutral of all the lights while the live wire from the AC supply is connected with the lights through these relays. Here is my ESP 32 development board.

And as you can see right now, only the fingerprint module is connected. Now the next step is to enroll in the fingerprints but first we are going to install the fingerprint library. For this, open the arduino IDE. Click on the Sketch menu. Go to include library and then click on manage libraries.

Search for the adafruit fingerprint. Click on the install button. You can see my Adafoot fingerprint sensor library is now installed. Next for the fingerprint enrollment, connect your SP 32 Wi Fi plus Bluetooth module with a laptop or PC and upload this. You can download this quote from our website electronicclinic.com. I will provide a link in the description.



You can see the code has been uploaded. If you have been using Altium Designer for creating schematics and designing your PCBs and you don't know about LTM 365, then let me tell you about it. LTM 365 lets you stone projects in the cloud with all the documents and components you might need to complete all your tasks. To unlock all of the functionality of LDM 365, you must first connect to your workspace, a separate environment where all your data exists.

After logging into your account, you can exceed all of the features of the LTM 365 platform.

Let me show you how to create a workspace. Click on the not signed in drop down button and click on the sign in, click on the register and account. It's just a 2 steps process into your email ID, or you can also register with gmail, and Facebook. Once you complete the registration, then come back to Altium Designer, enter your email ID and password, check the sign in automatically box and click on the sign in button. And your Ultium 365 workspace will activate Click on manage if you want to change your password, your information, and you can also write about your experience in projects.

And finally, you can click on the save button. I will share more tips and tricks with you in my upcoming projects. I have added links to the LTM Designer, LTM 3 65 and october, the world's fastest component search engine. Now let's get back to overprom next, open the serial monitor and follow the instructions. Right now, it's saying please type in the ID number from 1 to 127.

You want to save this finger. So I'm going to type 3. Now I can place my finger. I'm going to place the same finger again Now my finger is enrolled and its ID is 3. Now I'm going to repeat the same steps for another finger and this time I'm going to use 4 as the ID number.

Using the same method, I registered 3 more fingers Right now, I'm using IDs 3, 4, 5, and 6 for all these fingers. This is the final quote that I used to lock and unlock the electronic door lock and to control other appliances on loads. If this is your first time using the ESP 32 Wifi plus Bluetooth module, then you would also need to install the ESP32 board in the original IDA. And for this, you can watch my project on the ESP32 Anyway, let me show you how I use the ID's. A finger dot finger ID equals equal 3 then turn on or turn off the relay 1.

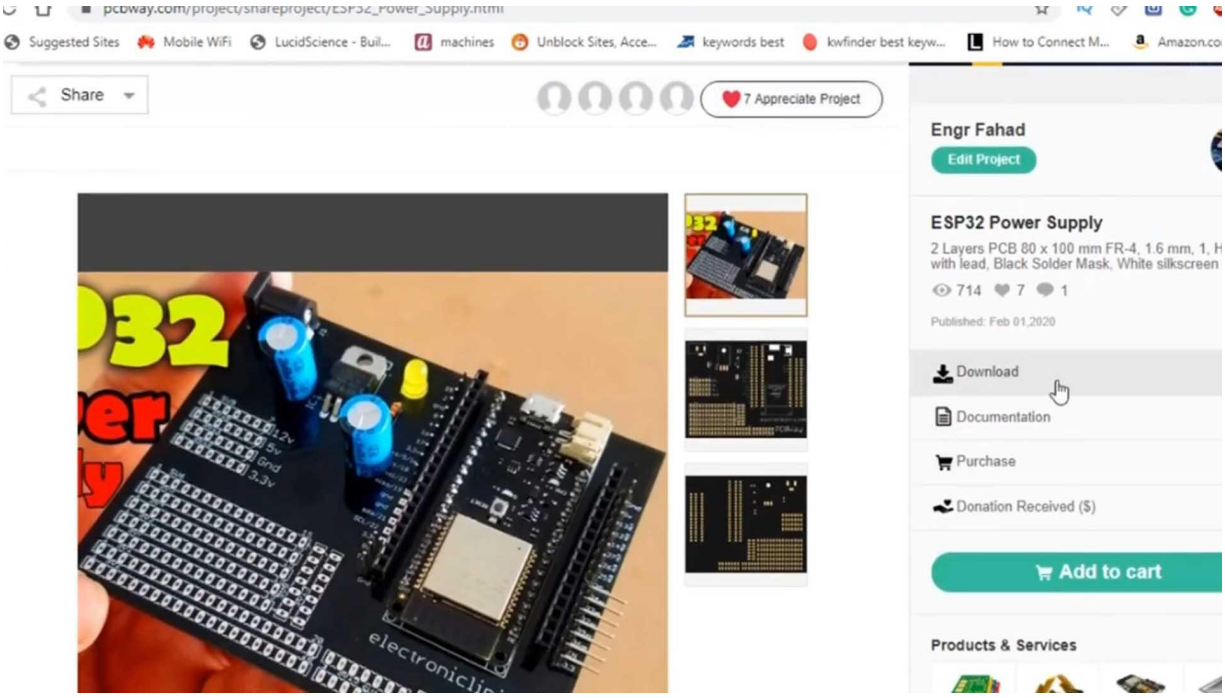
First, it reads the status of the relay 1 pin. If it's off, then it will be turned on. And if it's on, then it will be turned off. As you can see, I'm doing it the same way for the remaining IDs and relays. I have

already uploaded this program and now let's watch the ESP 32 and fingerprint based biometric door lock and home automation project connection.

SETUP GOOGLE FIREBASE ACCOUNT

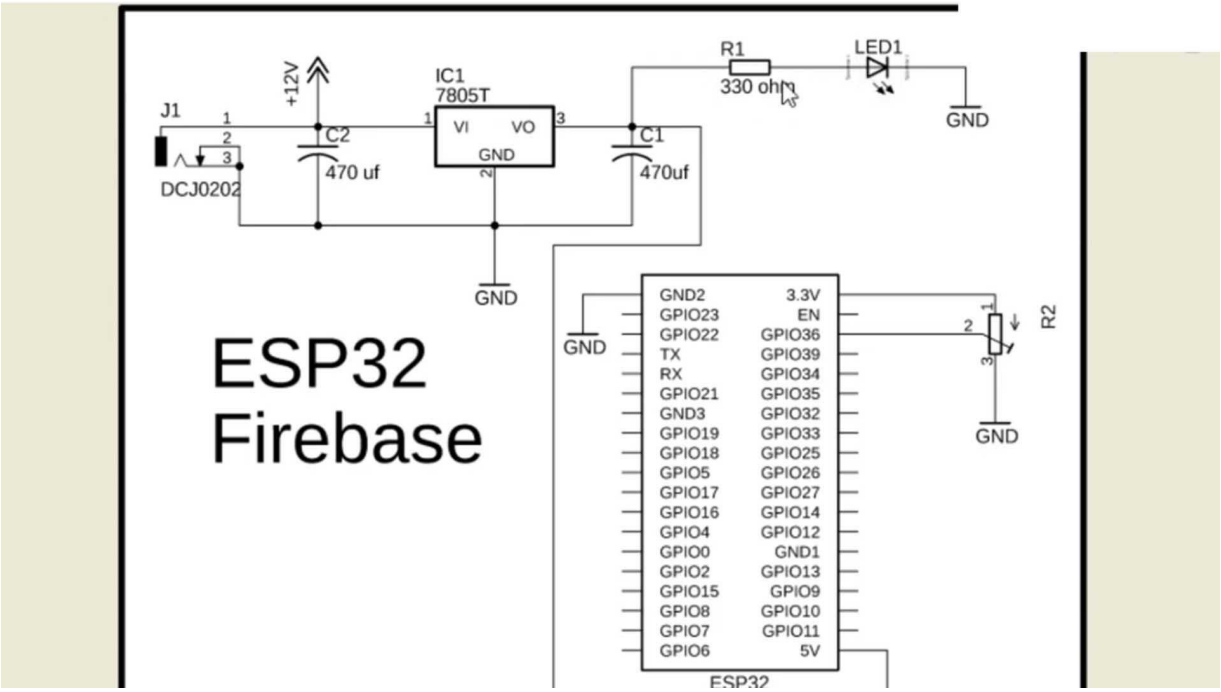
In my last tutorial on the Google Firebase database, I explained how to send a sense of value from the node m to the Google Firebase database. In today's episode, we are thinking of using the ESP 32 Wi Fi plus Bluetooth module by the Espresso systems. This is the same exact company that created the ESPA to double 6 series of chips, modules, and development boards. The ESP 32 power supply PCB board used in this project is sponsored by the PCB Way company. PCB Way is quite professional in the field of PCB Manufacturing.

You can try their services at extremely low prices. Only $5 for 10 PCBs $30 in total for 20 PCBs assembly. Besides this, the new members also get 5 star spawners. The Gerber files of the PCB port used in this project can be downloaded from the PCB Way official website. You can find a link in the description.



If this is a getting started tutorial, I will try to keep things simple so that you can easily follow this tutorial. All we're using a variable resistor operator meter is the sensor. In this tutorial, we will cover number 1, circuit diagram explanation. Number 2, How to set up your Google Firebase database account? Number 3, ESP32 Firebase Programming and finally number 4 testing.

Without any further delay, let's get started. The company and tools used in this project can be purchased from Amazon. The company's purchase links are given in the description. Let's first start with the 5 volt regulator power supply based on the LM 7805 voltage regulator. This is the same five volt regulated power supply I have been using for the node MCU, ESP 8 to double 6 Wi Fi module.

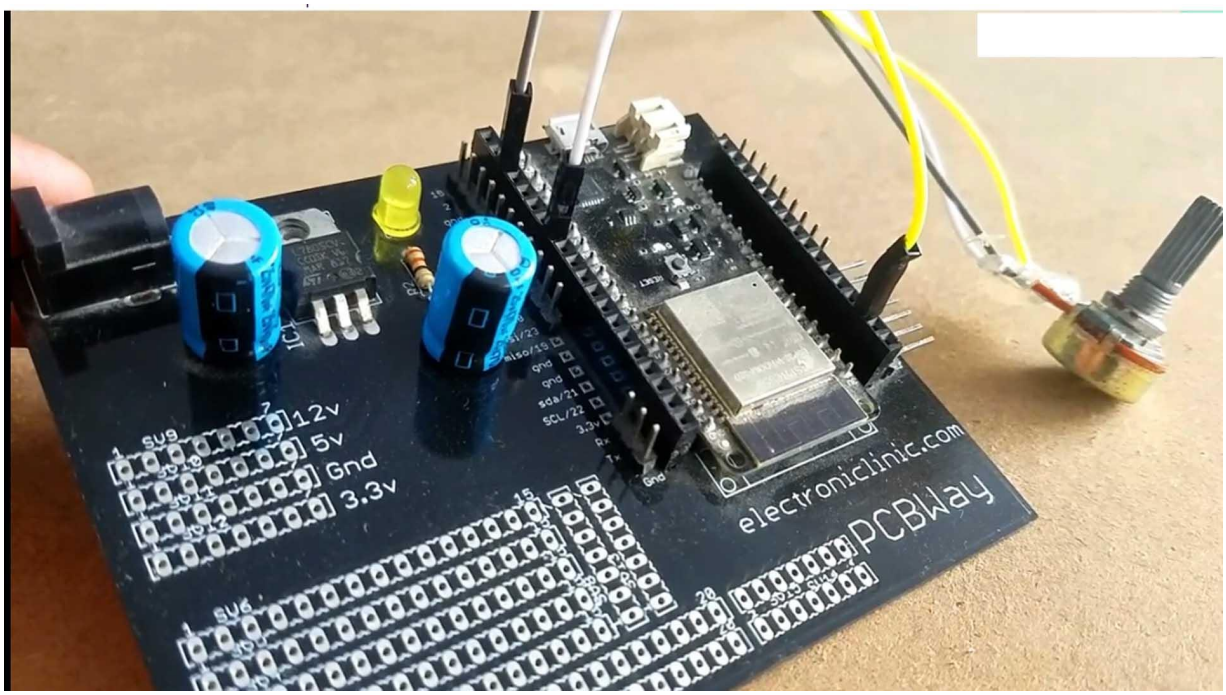


Jaywan is a female power check, and this is where we connect a 12 volt adapter, battery, or a solar panel. 2 470 microfarad capacitors are connected at the input and output sides of the voltage regulator. 330 ohm resistors connected in series with a 2.5 volt LED. This is a current limiting resistor. The output of the voltage regulator is connected with the fivefold pin of the ESP 32 module and the ground of the power supplies connected with the ground pin of the ESP 32 module.

This is the ESP 32 power supply board manufactured by the BCBA company. As you can see, the PCB quality is really great. The silk screen is quite clear, and the plague's shoulder mask looks amazing. I'm 100% satisfied with your work. The power supply PCB board designing and soldering is already explained in my previous project tutorial.

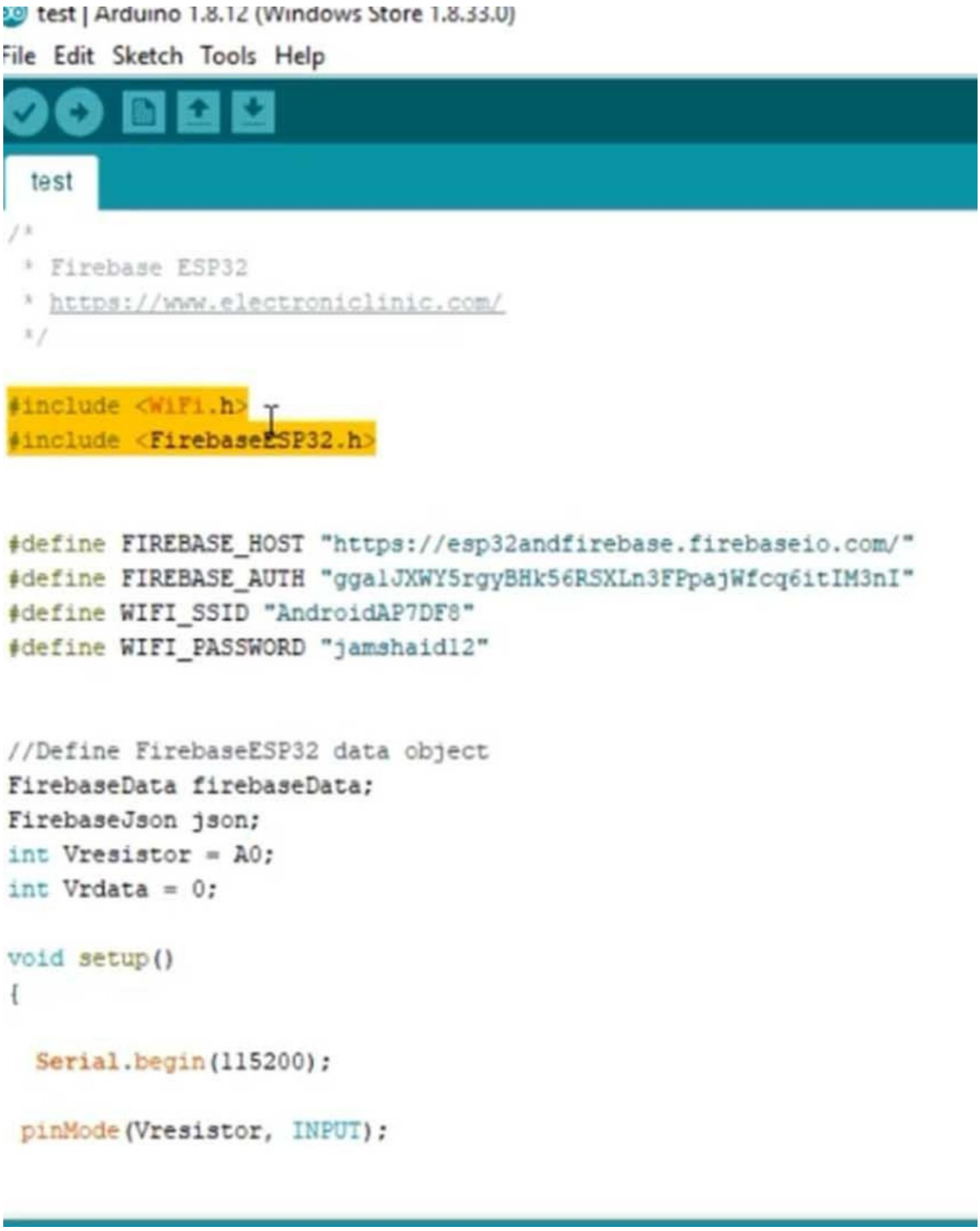
I will provide a link in the description. Finally, I connected a potentiometer with the analog pin 0 of ASP 3255 plus the bluetooth module for the circuit diagram already explained. Our hardware is ready. Now let's make a Google Firebase account. Follow the same

exact steps and enjoy the music. Our Google Firebase account is ready.



Detailed explanation of each and every step is explained in the article. You can find a link in the description. Before you start the programming, first of all, make sure that you download all the necessary libraries from our website electronicclinic.com. This is the same exact code I used in my previous tutorial based on the node MCU. s p a 2, double 6, a wifi module.

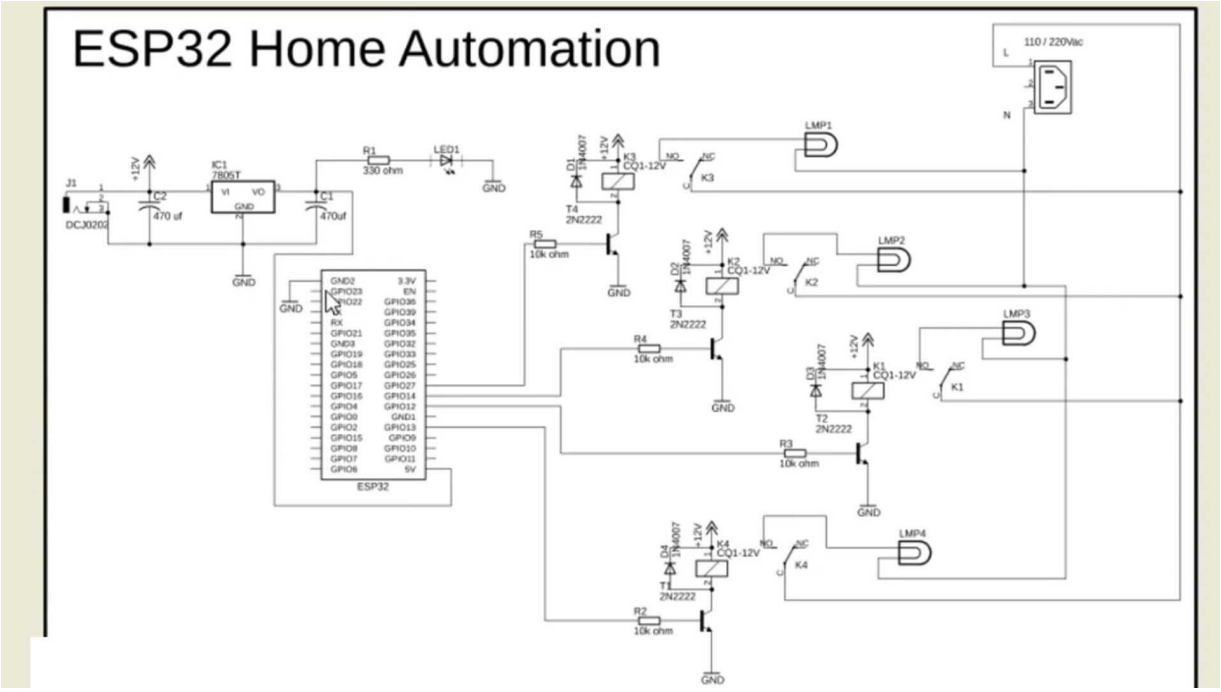
This time, I did a few changes as per my new 5 days account. The circuit diagram, libraries, and code can be downloaded from our website, electronicclinic.com. You can find a link in the description. I have already uploaded this program. Let's watch this basic project in action.


test | Arduino 1.8.12 (Windows Store 1.8.33.0)
File Edit Sketch Tools Help
test
/*
* Firebase ESP32
* https://www.electroniclinic.com/
*/
#include <WiFi.h>
#include <FirebaseESP32.h>
#define FIREBASE_HOST "https://esp32andfirebase.firebaseio.com/"
#define FIREBASE_AUTH "ggalJXWY5rgyBHk56RSXLn3FPpajWfcq6itIM3nI"
#define WIFI_SSID "AndroidAP7DF8"
#define WIFI_PASSWORD "jamshaid12"
//Define FirebaseESP32 data object
FirebaseData firebaseData;
FirebaseJson json;
int Vresistor = A0;
int Vrdata = 0;
void setup()
{
Serial.begin(115200);
pinMode(Vresistor, INPUT);

IOT SMARTPHONE HOME AUTOMATION USING WIFI

In today's episode, you will learn how to make an IoT internet of things based home automation system. using ESP 3255 plus bluetooth module by the expressive systems. For the demonstration purposes, I have connected 220 Volt AC line bulbs, which can be controlled using the plane application from anywhere around the world. If you have never used the ASP 32 module, then I highly recommend first watching my previous two tutorials on the ASP 32 Wi Fi plus Bluetooth module by Espresso Systems. In my first getting started tutorial on the ASP 32 module, I covered the extreme basics, including the SB 32 pinout, soldiering, ESP32 IDE board manager installation and how to write a very basic program using the original IDE to control an editor using the Blink application.

Why in my second tutorial? I designed my own 5 volt regulated power supply board for the ESP 32, Wi Fi plus bluetooth module. The tutorials links are given in the description. The PCB board used in this project is sponsored by the PCB company. The global files of the ESP 32 power supply PCB port can be downloaded from the PCB official website you can find a link in the description.



In this tutorial, we will cover number 1. ESP 32 home automation complete circuit diagram explanation. Number 2, blink application designing. Number 3, SP 32 home automation programming using the arduino IDE. And finally, number 4, testing.

Without any further delay, let's get started. The components and tools used in this project can be purchased from Amazon. The company's purchase links are given in the description. The HP 32 home automation circuit diagram is very simple. Let's first start with the regulated 5 volt power supply based on the LM 7805 voltage regulator.

This is the same fivefold regulated power supply that has been used for the node MCU SPA 2, double 6 Wi Fi module. Jaywan is the

female power chick, and this is where we connect a 12 4th adopter, battery, or a solar panel. 2470 microfarad capacitors are connected at the input and output sites of the voltage regulator. A 330 ohm resistor connected in series with a 2.54 LED. This is a current limiting resistor.

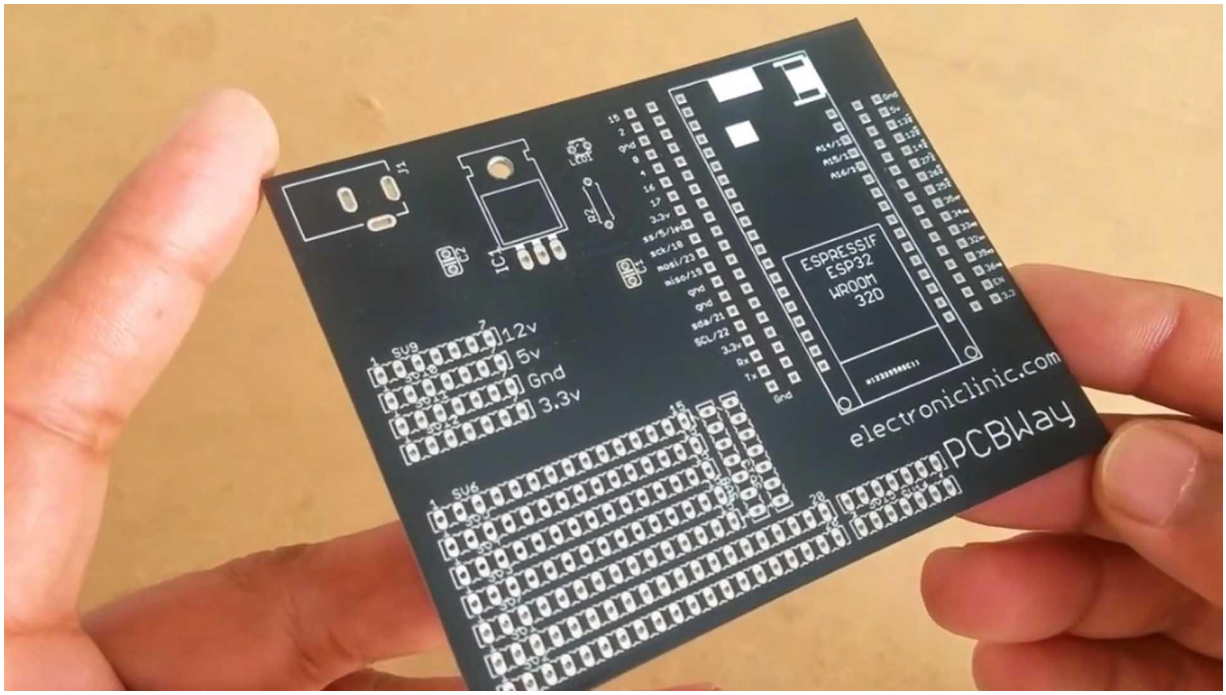
The output of the voltage regulator is connected with the 5 full pins of the ESP 32 module and the ground of the power supplies connected with the ground of ESP 32 module. Currently, I have connected a 4 channel relay to you. You can use a ready made relay model, or you can follow the same exact connections and build one by yourself. All the relays used in this project are of the type spdt single pole and double throw. As you can see, the connections of all the relays are exactly the same.

This relay has a total of 5 pins. 2 relay coil pins, common, normally closed, and normally open. These are 12 volt relays and cannot be directly controlled using the SP 32 module. So that's why we need a driver to control these relays. You can use a relay driver IC or you can use a 2n22222 NPN transistor and a 10 kilo ohm resistor.

One pin of the relay coil is connected with the collector of the 2 n2222npN transistor while the other pin of the relay coil is connected with the 12 volts. The emitter of the transistor is connected with the ground while the base is connected with a 10 kilo ohm resistor. Now to control these relays, you simply need to connect these 10 kilo ohm resistors with the ESP 32 i0 pins. In this project, I'm using the GPI0 pins 30, 12, 14, and 27. We all use the same pins in the programming.

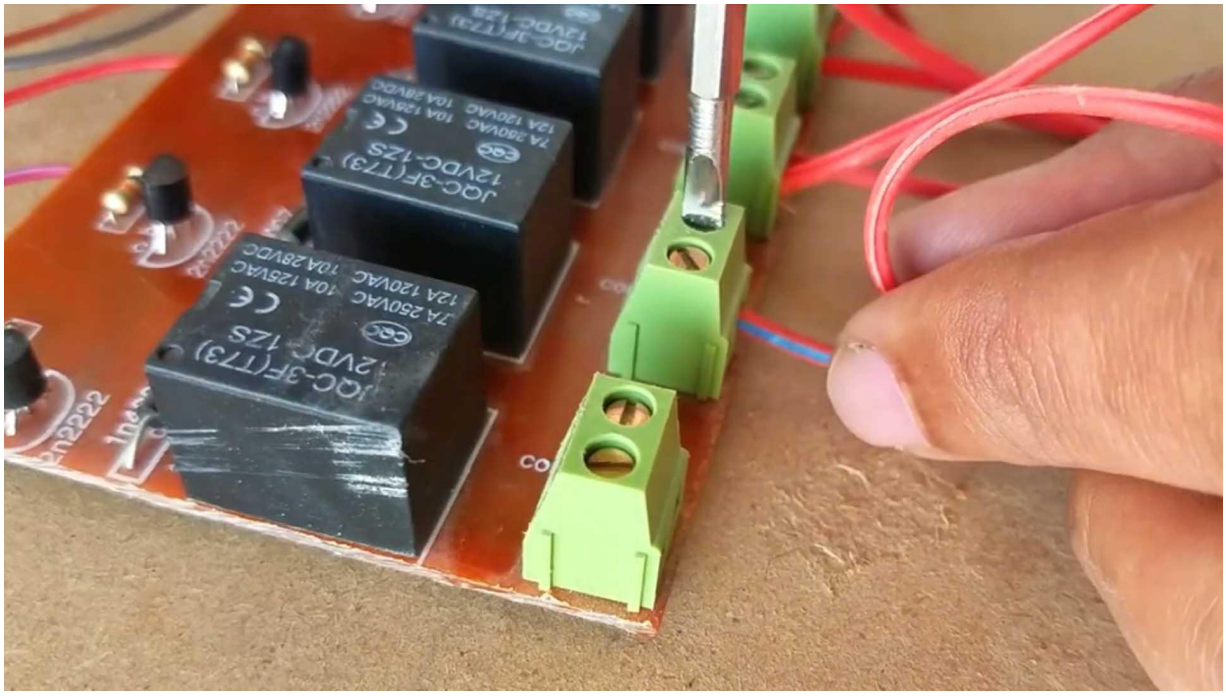
A neutral wire from the 110 or 220 volt AC is connected directly with the neutral point of the light bulbs while the live wire is connected with the bulbs through the relays. This is a 4 channel relay model which all use for controlling the light bulbs. This is the ASP 32 power supply board, which I designed in my previous tutorial. As you can

see, the PCB quality is really great. The silk screen is quite clear, and the blade soda mask looks amazing.



I'm 100% satisfied with your work. The Google files of the PCB port can be downloaded from the PCBway official website. You can find a link in the description. Finally, I connected everything as for the circuit diagram already explained. Now let's start with a blink application.

follow the same exact steps. Before you start the programming first of all, make sure that you download the Blink Simple E SP 32 library from our website. You can find a link in the description. This is the authentication code which was sent via email. I simply copied and pasted over here.



This is the name of the wifi router and this is the password. Next, I defined pins for the relays. 4 relays are connected with a SP 32 GPI that opens 13, 12, 14, and 27. inside the white cell function, I activated the serial communication using the serial dot begin function which is used for the debugging purposes. Y 9600 is the bar trade.


File Edit Sketch Tools Help
sketch_jan06b
// Your WiFi credentials.
// Set password to "" for open networks.
char ssid[] = "AndroidAP7DF8";
char pass[] = "jamshaid";
int device1 = 13; // gpio 13
int device2 = 12; // gpio 12
int device3 = 14; // gpio 14
int device4 = 27; // gpio 27
void setup()
{
// Debug console
Serial.begin(9600);
Blynk.begin(auth, ssid, pass);
pinMode(device1, OUTPUT);
pinMode(device2, OUTPUT);
pinMode(device3, OUTPUT);
pinMode(device4, OUTPUT);
}
void loop()
{
Blynk.run();
}

I set all the devices as output using the pin function. Inside the white loop function, we have only one function, which is the blink.ron. So that's all about the speed 32 home automation programming. I have already uploaded this program.