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FireBeetle ESP32 IOT Microcontroller (Supports Wi-Fi & Bluetooth) SKU: DFR0478

Introduction

DFRobot FireBeetle series is the low-power consumption micro-controller intentionally designed for Internet of Things (IoT) projects. FireBeetle Board - ESP32 integrates a Dual-Core ESP-WROOM-32 module, which supports MCU and Wi-Fi &Bluetooth dual-mode communication. The electric current is just 10μA in the deep-sleep mode. The main controller supports two power supply methods: USB and 3.7V external lithium battery. And both USB and external DC can charge the Lipo battery directly.<br4> FireBeetle Board-ESP32 has made a special hardware design for Arduino IDE. You can make a download without switching booth-mode manually. It supports Arduino, IDF (linux), micropython etc. Moreover, FireBeetle made a pin mapping for Arduino IDE. It can be configured with Dx transport, compatible with UNO and reduce the entry barrier.

The small size and high performance makes FireBeetle become idea solution for IOT low power consumption projects.

Please kindly note that developers are the most common users of FireBeetle Board-ESP32 and not all of the peripherals have examples for reference, and there are still some bugs being found and fixed. For Arduino IDE, all GPIO function, I2C/SPI communication has been working. But the other functions are still under development. We recommend this board for experienced engineer.

Feature

- Compatible with products in the DFRobot FireBeetle serials
- Low-power consumption(the electricity current under ultra-low power is 10µA)
- Quick Response(the top frequency is 400KHz)
- Cost-effective
- Small size, convenient to install

Specification

- Working voltage: 3.3V
- Input voltage: 3.3V~5V
- Support electric current of low power consumption: 10 µA
- Support maximum discharge current: 600mA
- Support maximum charge current: 500mA
- Support USB charging.
- Processer: Tensilica LX6 dual core processer (One for high speed connection; one for independent programing).
- Frequency: 240MHz
- SRAM：520KB
- Flash：16Mbit
- Wi-Fi standard：FCC/CE/TELEC/KCC
- Wi-Fi protocol: 802.11 b/g/n/d/e/I/k/r (802.11n, high speed can reach to 150 Mbps), converge A-MPDU and A-MSDU, supporting 0.4us protecting interval.
- Frequency range: 2.4~2.5 GHz
- Bluetooth protocol: Comply with BR/EDR/BLE standard of Bluetooth v4.2.
- Bluetooth audio: the current under low power consumption of CVSD and SBC is 10µA
- Working current: 80mA in average
- Frequency range: 2.4~2.5GHz
- Support one-key downloading.
- Support micropython.
- On-chip clock: 40MHz crystal and 32.768 KHz crystal.
- Digital I/O: 10 (default setting of arduino)
- Simulative input: 5(default setting of arduino)
- SPI: 1 (default setting of arduino)
- I2C: 1 (default setting of arduino)
- I2S: 1 (default setting of arduino)
- LED_BUILTIN：D9
- Interface: FireBeetle series compatible
- Working temperature: -40℃~+85℃
- Dimension: 24 × 53(mm)/0.94 x 2.09(inches)
- The dimension of mounting hole: inner diameter 3.1mm; outside diameter 6mm.

Board Overview

FireBeetle Board - ESP32 is not only compatible with ESP32 PinMap, but also make a special compatible with Arduino IDE PinMap. Dx(x=0,1,2,3...9)

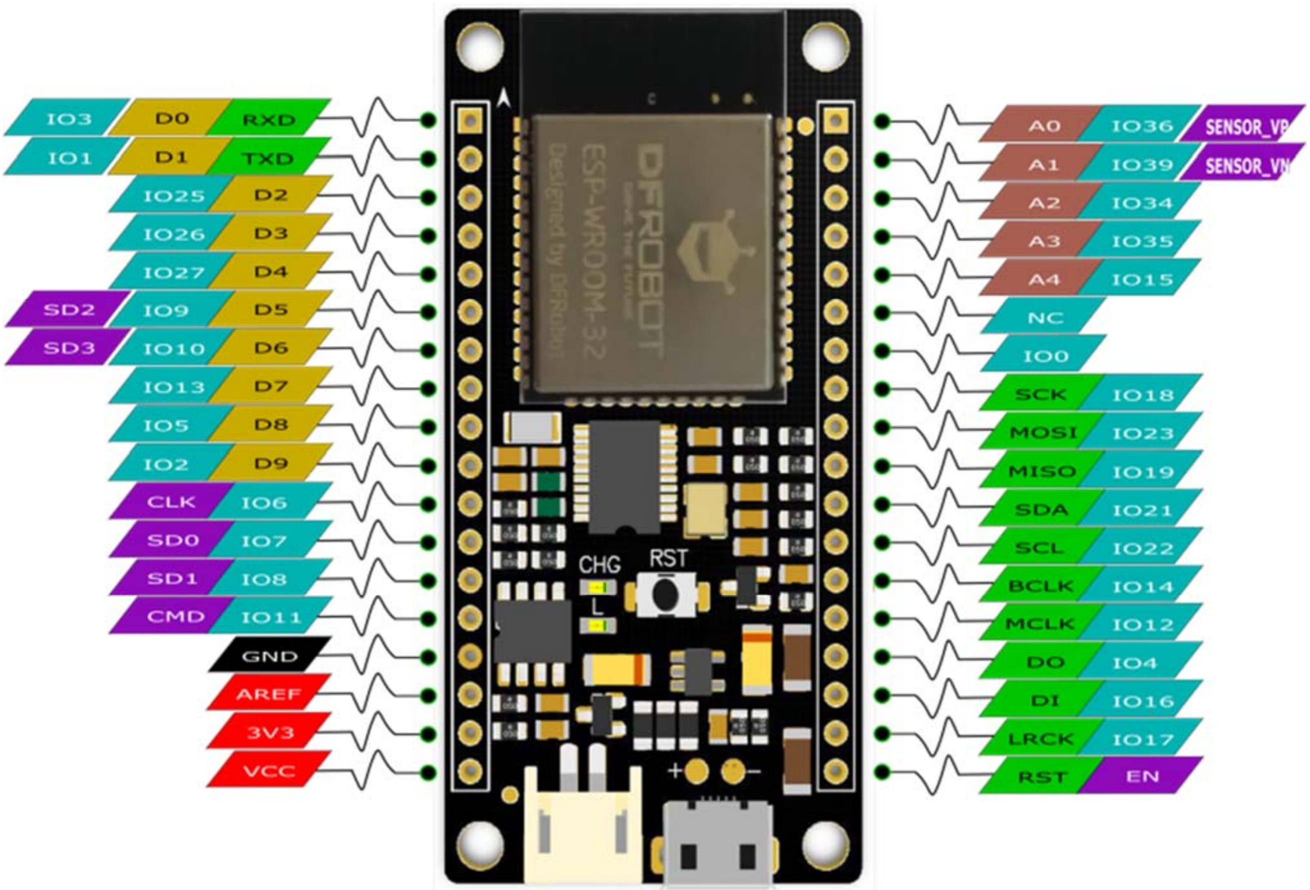


Fig1: FireBeetle Board-ESP32 PinOUT

Note: NC = Empty; VCC = VCC (5V under USB power supply, Around 3.7V under 3.7V lipo battery.power supply)

Tutorial

In this tutorial, we'll show you some basic operation with FireBeetle-ESP32 Microcontroller.

Requirements

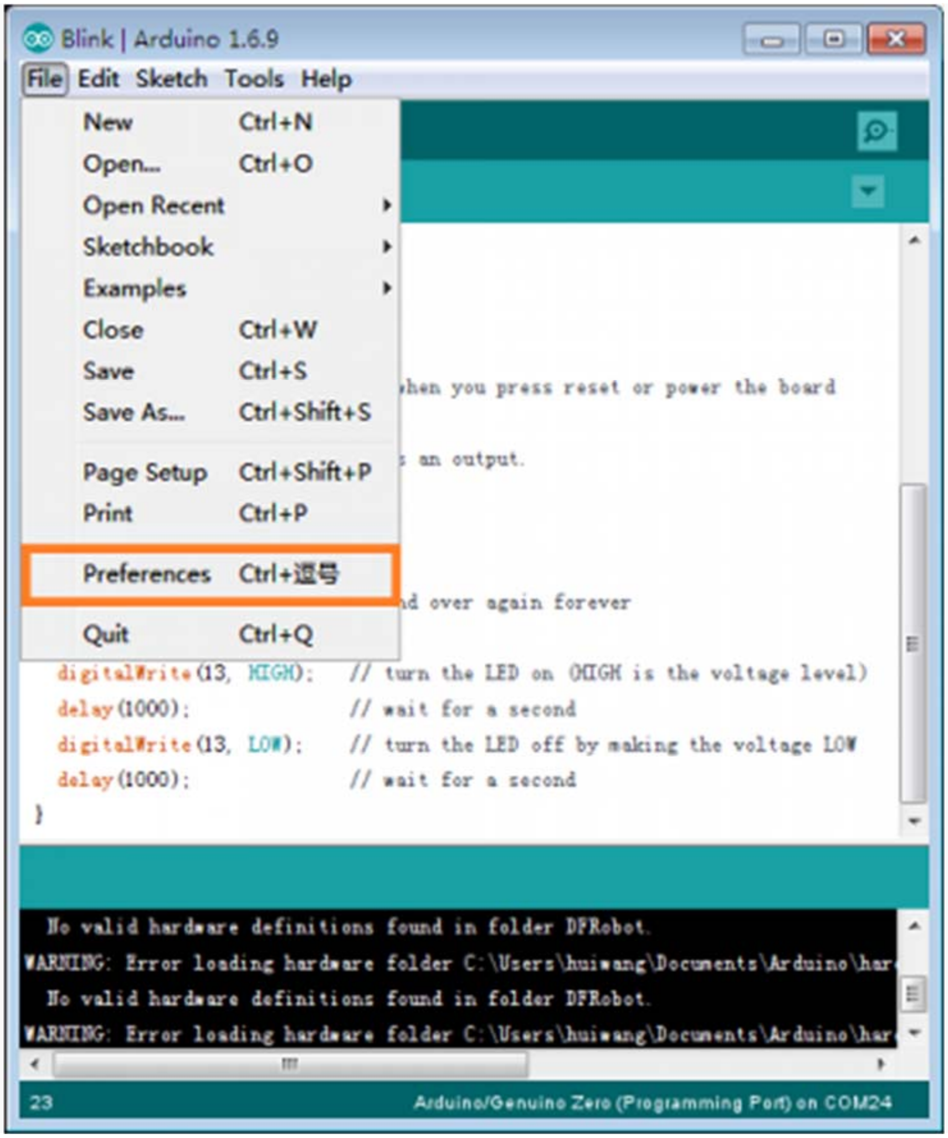
- **Hardware**
  FireBeetle ESP32 IOT Microcontroller x 1
  Micro USB Cable x1

- **Software**
  Arduino IDE (newest), Click to Download Arduino IDE from Arduino®
  Download FireBeetle ESP32 Window Driver **Note: Win8 + need disable the digital signature**

Setup Arduino IDE Development Environment

- Plug FireBeetle to your computer, install the driver manually.
- Add FireBeetle Board URL to Arduino IDE
- Open Arduino IDE, **File->Preferences**, find **Additional Boards Manager URLs**, copy the below link, and paste in the blank.

https://git.oschina.net/dfrobot/FireBeetle-ESP32/raw/master/package_esp32_index.json

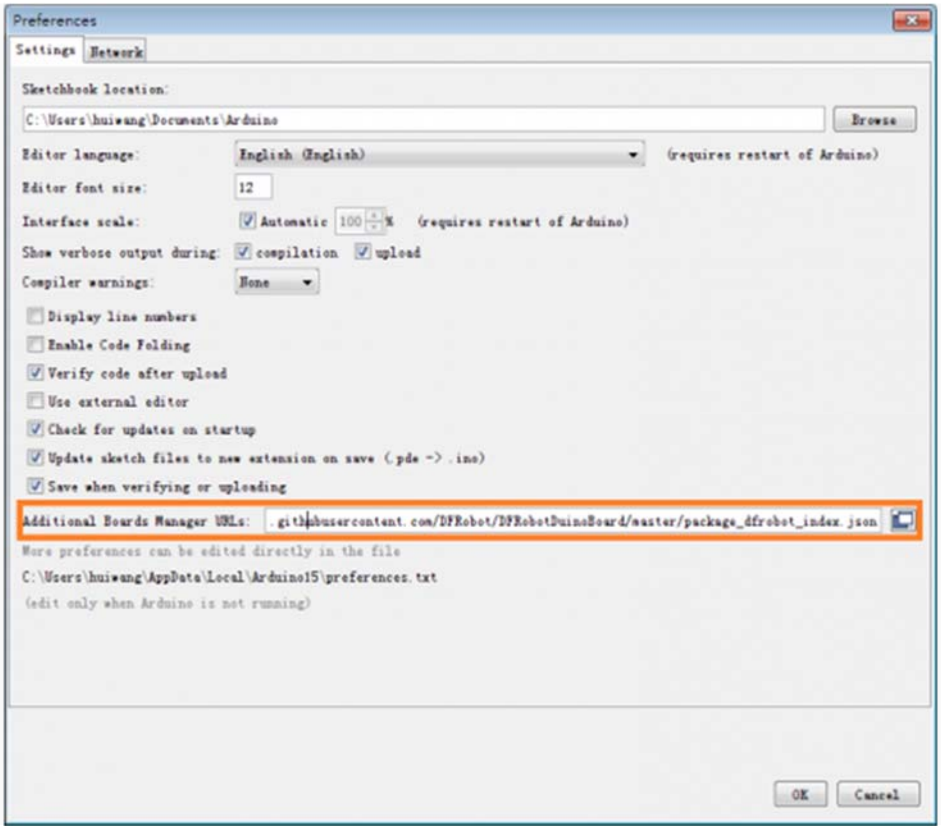


```
hen you press reset or power the board

s an output.

nd over again forever
  digitalWrite(13, HIGH);   // turn the LED on (HIGH is the voltage level)
  delay(1000);              // wait for a second
  digitalWrite(13, LOW);    // turn the LED off by making the voltage LOW
  delay(1000);              // wait for a second
}
```

```
 No valid hardware definitions found in folder DFRobot.
WARNING: Error loading hardware folder C:\Users\huiwang\Documents\Arduino\har
 No valid hardware definitions found in folder DFRobot.
WARNING: Error loading hardware folder C:\Users\huiwang\Documents\Arduino\har
```

23 Arduino/Genuino Zero (Programming Port) on COM24

File->Preferences

- 

Preferences

Settings | Network

Sketchbook location:

C:\Users\huiwang\Documents\Arduino

Editor language: English (English) (requires restart of Arduino)

Editor font size: 12

Interface scale: ☑ Automatic 100 % (requires restart of Arduino)

Show verbose output during: ☑ compilation ☑ upload

Compiler warnings: None

☐ Display line numbers

☐ Enable Code Folding

☑ Verify code after upload

☐ Use external editor

☑ Check for updates on startup

☑ Update sketch files to new extension on save (.pde -> .ino)

☑ Save when verifying or uploading

Additional Boards Manager URLs: .githubusercontent.com/DFRobot/DFRobotDuinoBoard/master/package_dfrobot_index.json

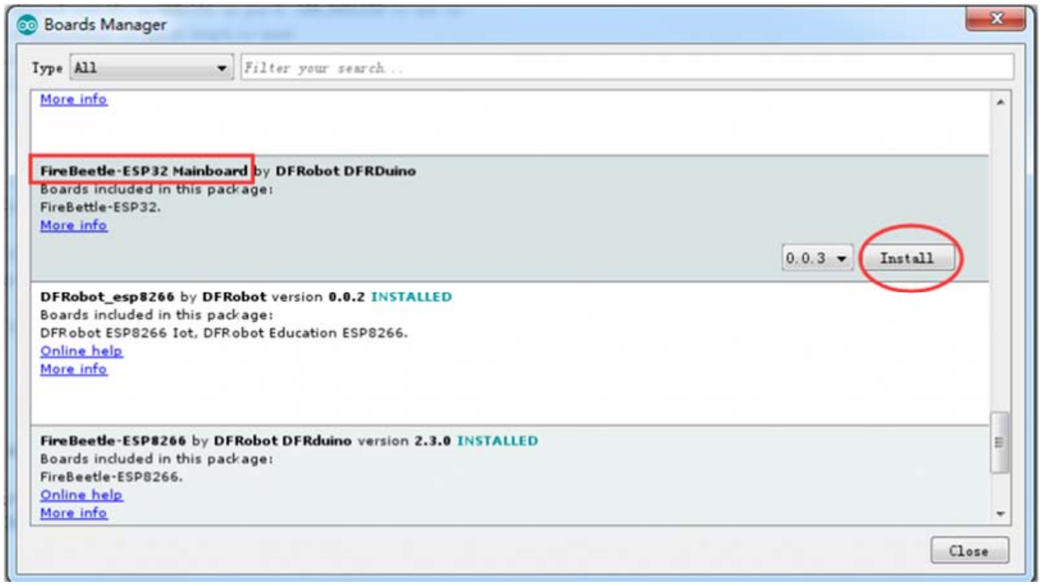
More preferences can be edited directly in the file

C:\Users\huiwang\AppData\Local\Arduino15\preferences.txt

(edit only when Arduino is not running)

paste url here

- Click **OK**
- Open **Tools->Board->Boards Manager**, waiting automatic update. You'll find **FireBeetle-ESP32**



Boards Manager

Type All | Filter your search...

More info

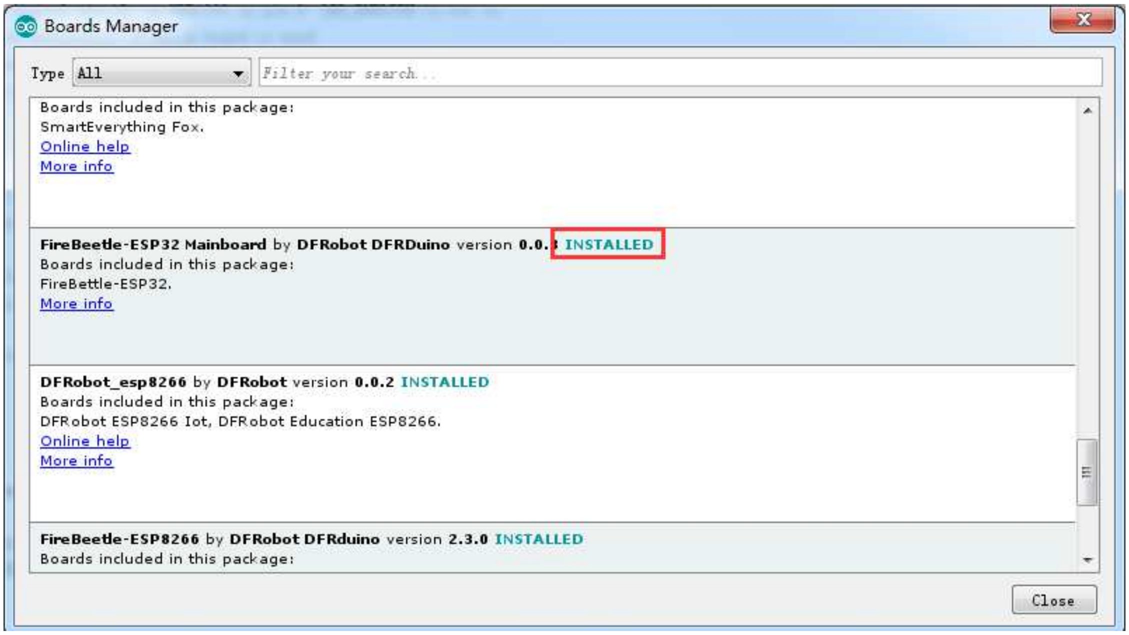
FireBeetle-ESP32 Mainboard by **DFRobot DFRDuino**
Boards included in this package:
FireBettle-ESP32.
More info

0.0.3 Install

DFRobot_esp8266 by **DFRobot** version **0.0.2** INSTALLED
Boards included in this package:
DFRobot ESP8266 Iot, DFRobot Education ESP8266.
Online help
More info

FireBeetle-ESP8266 by **DFRobot DFRduino** version **2.3.0** INSTALLED
Boards included in this package:
FireBeetle-ESP8266.
Online help
More info

Now, the development environment has been installed, you can use it like a normal Arduino board.



Boards included in this package:
SmartEverything Fox.
Online help
More info

FireBeetle-ESP32 Mainboard by **DFRobot DFRDuino** version **0.0.3** INSTALLED
Boards included in this package:
FireBettle-ESP32.
More info

DFRobot_esp8266 by **DFRobot** version **0.0.2** INSTALLED
Boards included in this package:
DFRobot ESP8266 Iot, DFRobot Education ESP8266.
Online help
More info

FireBeetle-ESP8266 by **DFRobot DFRduino** version **2.3.0** INSTALLED
Boards included in this package:

Sample Code - **Blink**

The default LED for FireBeetle Board-ESP32 is D9, input following code:

```
// the setup function runs once when you press reset or power the board
void setup() {
  // initialize digital pin LED_BUILTIN as an output.
  pinMode(LED_BUILTIN, OUTPUT);
}

// the loop function runs over and over again forever
void loop() {
  digitalWrite(LED_BUILTIN, HIGH);   // turn the LED on (HIGH is the voltage level)
  delay(1000);                       // wait for a second
  digitalWrite(LED_BUILTIN, LOW);    // turn the LED off by making the voltage LOW
  delay(1000);                       // wait for a second
}
```

For more code and instruction, please refer to **FIreBeetle User Manual**

More

- FireBeetle Arduino Bluetooth Examples https://github.com/Chocho2017/DFRobot_ESP32_WiFiBLE