## A / Heltec ESP32+LoRa Series Quick Start

For more details, please go to this

## link:https://docs.heltec.org/en/node/esp32/quick\_start.html.

# Heltec ESP32+LoRa Series Quick Start

#### [简体中文]

Before all operation, please confirm whether the USB driver, Git and Arduino IDE has been installed correctly. If not, please refer to this two articles establish serial connection and Install Git and Arduino IDE.

The Heltec ESP32 development environment already contains the basic code. For the special codes related to the Heltec ESP32 development board, please refer to: https://github.com/Heltec-Aaron-Lee/WiFi\_Kit\_series/tree/master/esp32/libraries/Heltec-Example.

| New                 | Ctrl+N                 |                               |                    |
|---------------------|------------------------|-------------------------------|--------------------|
| Open                | Ctrl+O                 |                               |                    |
| Open Recent         | >                      |                               |                    |
| Sketchbook          |                        | 2.h"                          |                    |
| Examples            |                        | *                             |                    |
| Close               | Ctrl+W                 | RETIRED                       | >                  |
| Save                | Ctrl+S                 | Examples for WiFi LoRa 32(V2) | 0x00, 0x88, 0x8    |
| Save As             | Ctrl+Shift+S           | ArduinoOTA                    | > 0x00, 0x00, 0x0  |
| Deve Cabo           | Chille Children        | BluetoothSerial               | > 0x88, 0x88, 0x8  |
| Page Setup<br>Print | Ctrl+Shift+P<br>Ctrl+P | DNSServer                     | >                  |
| Print               | Curte                  | EEPROM                        | >                  |
| Preferences         | Ctrl+Comma             | ESP RainMaker                 | >E, 0xa4, 0x63, 0x |
| Quit                | Ctrl+Q                 | ESP32                         | >5, 0x8c, 0xdc, 0x |
|                     | evaar -                | ESP32 Async UDP               | >                  |
|                     |                        | ESP32 BLE Arduino             | >                  |
| *LoraWan            | channelsm              | ESPmDNS                       | >                  |
| int16_t u           | serChanne              | Ethernet                      | >>,0x0000,0x0000,0 |
|                     |                        | FFat                          | >                  |
| *LoraWan            | region, s              | Heltec-Example                | E-INK >            |
| oRaMacReg           | ion_t lor              | HTTPClient                    | Factory_Test >     |
|                     |                        | HTTPUpdate                    | LoRaBasic >        |
| *LoraWan            | Class, Cl.             | HTTPUpdateServer              | LoRaWAN            |
| eviceClas           | s_t lora               | 12S                           | OLED >             |
|                     |                        | LittleFS                      | >                  |
| *the appl           | ication d              | NetBIOS                       | >:le. value in [m  |
| int32_t a           | ppTxDutyC              | Preferences                   | >                  |
|                     |                        | SD                            | >                  |
| *OTAA or            | ABP*/                  | SD_MMC                        | >                  |
| ool overT           | heAirActi              | SimpleBLE                     | >                  |
|                     |                        | SPI                           | >                  |
| *ADR enab           | le*/                   | SPIFFS                        | >                  |
| ool loraW           | anAdr = t              | Ticker                        | >                  |
|                     |                        | Update                        | >                  |
| one uploading.      |                        | USB                           | >                  |
| riting at           | 0x0005ca6              | WebServer                     | >                  |
| rote 32152          | 20 bytes (             | WiFi                          | >00010000 in 3.1   |
| ash of dat          | a verifie              | WiFiClientSecure              | >                  |
|                     |                        | WiFiProv                      | >                  |
| eaving              |                        | Wire                          | >                  |

There are three methods to install the development framework, choose one of they:

- Via Arduino Board Manager
- Via Git
- Via Local File

#### 🛛 Tip

When we updated the V3 series development environment, we integrated the sample code and added it to the development environment without additional downloading libraries. We have handled the compatibility of the sample code so that the code can be used for various versions of the ESP32 development board. When you use the new development environment, the old version of the library can no longer be used, such as ESP32\_LoRaWAN, Heltec\_ESP32. When you update the development environment, we recommend that you delete the old development environment, download the new development environment, and delete the old version of the library. For Git, it has been updated to the V3 series development environment on September 19, 2022. For "Arduino Boards Manager", V0.0.7 is the V3 series development environment. If you modify a lot of code in the old development environment and use it in the project, we recommend that you still use the old development environment.

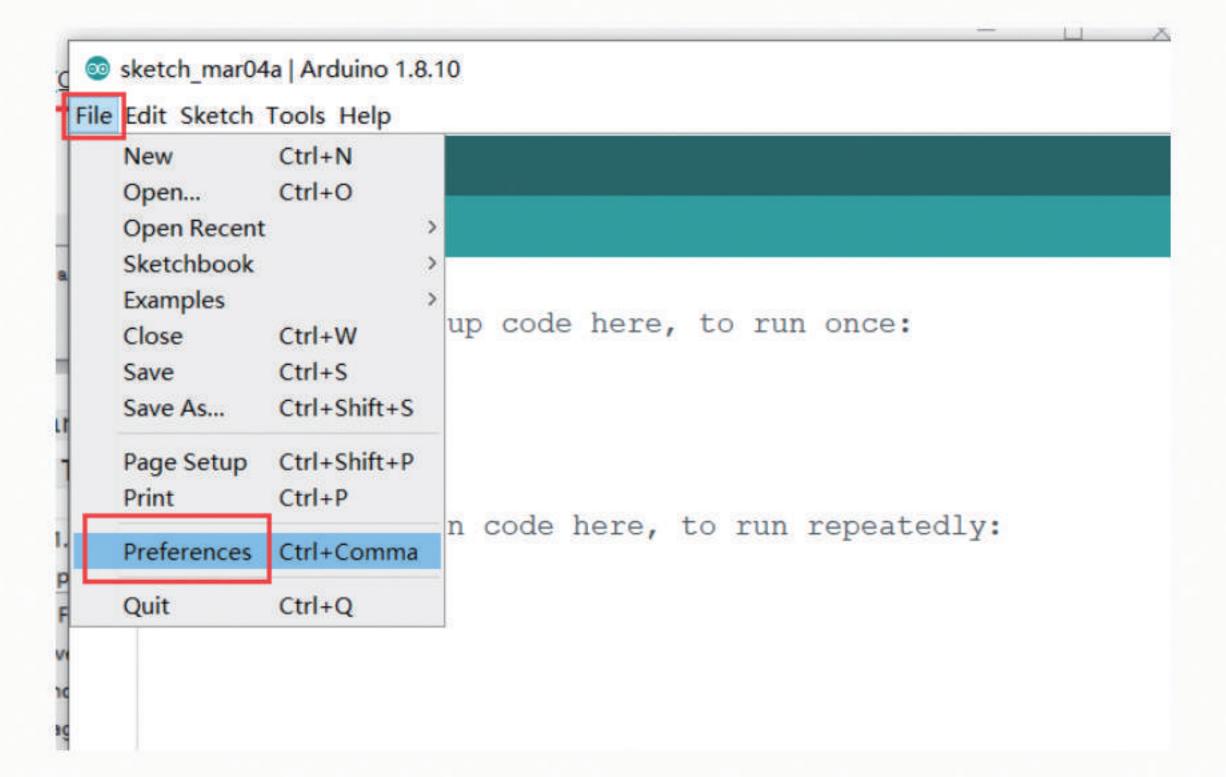
#### 🕒 Tip

Due to the ESP32 chip was replaced in the V3 version of the ESP32 series product. If you install the old environment through Git and get updates through "git pull", you need to execute 'get.exe "under the" WiFi\_Kit\_series\esp32\tools "path again to download the latest compilation chain.

## Via Arduino Board Manager

### Step1. Download Arduino-ESP32 Support

Open Arduino IDE, and click File -> Peferences .



| Preferences                   |                                 |                          |                                 | >      |
|-------------------------------|---------------------------------|--------------------------|---------------------------------|--------|
| Settings Network              |                                 |                          |                                 |        |
| Sketchbook location:          |                                 |                          |                                 |        |
| D:\Documents\Arduino          |                                 |                          |                                 | Browse |
| Editor language:              | English (English)               | ~]                       | (requires restart of Arduino)   |        |
| Editor font size:             | 16                              |                          |                                 |        |
| Interface scale:              | Automatic 100 🔅 🐐 (require      | s restart of Arduino)    |                                 |        |
| Theme:                        | Default theme ~ (requires real  | start of Arduino)        |                                 |        |
| Show verbose output during:   | 🕝 compilation 🛛 upload          |                          |                                 |        |
| Compiler warnings:            | None 🗸                          |                          |                                 |        |
| 🛃 Display line numbers        |                                 | 🗌 Enable Code Foldi      | ng                              |        |
| 🛃 Verify code after upload    |                                 | 🗌 Use external edit      | or                              |        |
| Check for updates on star     | tup                             | Save when verifyi        | ng or uploading                 |        |
| Use accessibility features    | 5                               |                          |                                 |        |
| Additional Boards Manager URL | s: -Aaron-Lee/WiFi_Kit_series/r | eleases/download/0.0.7/p | package_heltec_esp32_index.json |        |
| More preferences can be edite | d directly in the file          |                          |                                 |        |
| C:\Users\lxy\AppData\Local\Ar | duino15\preferences.txt         |                          |                                 |        |
| (edit only when Arduino is no | t running)                      |                          |                                 |        |
|                               |                                 |                          | OK                              | Cancel |

#### Input the last ESP32 package URL: https://github.com/Heltec-Aaron-Lee/WiFi\_Kit\_series/releases /download/0.0.7/package\_heltec\_esp32\_index.json

| Additional Boards Manager URLs  |           |
|---|-----------|
| Enter additional URLs, one for each row   |           |
| https://github.com/HelTecAutomation/CubeCell-Arduino/releases/dou<br>https://github.com/Heltec-Aaron-Lee/WiFi_Kit_series/releases/dow |           |
| Click for a list of unofficial boards support URLs  |           |
|   | OK Cancel |

Click Tools --> Board --> Boards Manager..., search Heltec ESP32 in the new pop-up dialog, then select the latest version and click install

sketch\_mar12a | Arduino 1.8.10

| etch_mar12a | Adto Format<br>Archive Sketch<br>Fix Encoding & Reload   | Ctrl+T                   |  |  |
|-------------|--|--------------------------|--|--|
| void se     | Manage Libraries   | Ctrl+Shift+I             |  |  |
| // pi       | Serial Monitor   | Ctrl+Shift+M             |  |  |
| // pc       | Serial Plotter   | Ctrl+Shift+L             |  |  |
| }           | WiFi101 / WiFiNINA Firmware Upd  | ater                     |  |  |
|             | Board: "WiFi LoRa 32(V2)"  | >                        | Boards Manager   |  |
| void lo     | Upload Speed: '921600'<br>CPU Frequency: "240MHz (WiFi/BT<br>Flash Frequency: "80MHz"<br>Flash Mode: "QIO"<br>Flash Size: "8MB (64Mb)"<br>Partition Scheme: "default_8MB"<br>Core Debug Level: "None"<br>PSRAM: "Disabled"<br>Port<br>Get Board Info | )" ><br>><br>><br>><br>> | Arduino/Genuino Micro<br>Arduino Esplora<br>Arduino Mini<br>Arduino Ethernet<br>Arduino Fio<br>Arduino BT<br>LilyPad Arduino USB<br>LilyPad Arduino<br>Arduino Pro or Pro Mini |  |
|             | Programmer: "AVRISP mkll"<br>Burn Bootloader   | >                        | Arduino NG or older<br>Arduino Robot Control<br>Arduino Robot Motor<br>Arduino Gemma<br>Adafruit Circuit Playground<br>Arduino Yún Mini<br>Arduino Industrial 101              |  |

| Heltec ESP32 Series Dev-boards<br>by Heltec Automation(TM)<br>Boards included in this package:<br>WiFi Kit 32, WiFi LoRa 32, WiFi LoRa 32(V2), Wirreless Stick Lite, Wireless Stick, WIFI_LoRa<br>More Info | 0.0.7 | :3.     |  |
|---|-------|---------|--|
|   | 0.0.7 | Install |  |
|   |       |         |  |
|   |       |         |  |
|   |       |         |  |
|   |       |         |  |
|   |       |         |  |
|   |       |         |  |

The source code of Heltec ESP series (ESP32 & ESP8266) framework available here: https://github.com/Heltec-Aaron-Lee/WiFi\_Kit\_series

# Via Git

After obtaining updates through "git pull", please execute "get. exe" under the path of "Arduino\hardware\WiFi\_Kit\_series\esp32\tools" to obtain the latest compilation tool.

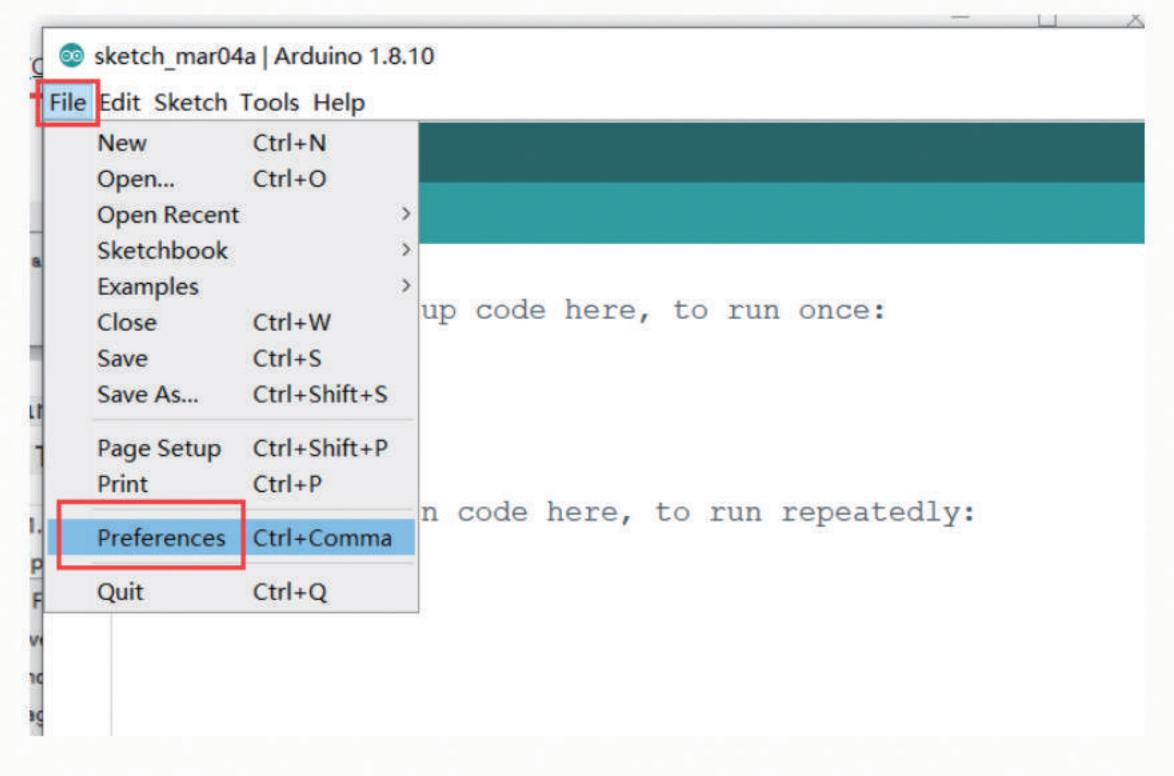
| rduino\hardware\WiFi_Kit_series | \esp32\tools    | ~ C          | Q 在to |
|---------------------------------|-----------------|--------------|-------|
| 名称 へ                            | 修改日期            | 类型           |       |
| xtensa-esp32s3-elf              | 2022/9/26 10:44 | 文件夹          |       |
| espota.exe                      | 2022/6/30 16:42 | 应用程序         |       |
| espota.py                       | 2022/6/30 16:42 | <b>PY</b> 文件 |       |
| esptool.py                      | 2022/9/24 17:02 | <b>PY</b> 文件 |       |
| <pre>gen_crt_bundle.py</pre>    | 2022/9/24 17:02 | <b>PY</b> 文件 |       |
| gen_esp32part.exe               | 2022/9/24 17:02 | 应用程序         |       |
| gen_esp32part.py                | 2022/9/24 17:02 | <b>PY</b> 文件 |       |
| 🚰 get.exe                       | 2022/6/30 16:42 | 应用程序         |       |
| 📝 get.py                        | 2022/9/24 17:02 | <b>PY</b> 文件 |       |
| platformio-build.py             | 2022/9/24 17:02 | PY 文件        |       |

- /windows.md
- For MacOS: https://github.com/Heltec-Aaron-Lee/WiFi\_Kit\_series/blob/master/InstallGuide/mac.md
   For Linux
- For Linux
  - Debian/Ubuntu: https://github.com/Heltec-Aaron-Lee/WiFi\_Kit\_series/blob/master/InstallGuide
     /debian\_ubuntu.md
  - Fedora: https://github.com/Heltec-Aaron-Lee/WiFi\_Kit\_series/blob/master/InstallGuide/fedora.md
  - OpenSUSE: https://github.com/Heltec-Aaron-Lee/WiFi\_Kit\_series/blob/master/InstallGuide /opensuse.md

# Via Local File

Download the development environment. https://resource.heltec.cn/download/tools /WiFi\_Kit\_series.zip

Open Arduino IDE, and click File -> Peferences .



Go to the folder in the red box.

| Preferences                  |                    |                                |       |           |         | ×           |
|------------------------------|--------------------|--------------------------------|-------|-----------|---------|-------------|
| Settings Network             |                    |                                |       |           |         |             |
| Sketchbook location:         |                    |                                |       |           |         |             |
| D:\Documents\Arduino         |                    |                                |       |           |         | Browse      |
| Editor language:             | English (English)  |                                | ~     | (requires | restart | of Arduino) |
| Editor font size:            | 15                 |                                |       |           |         |             |
| Interface scale:             | Automatic 100      | 🗘 % (requires restart of Ardui | ino)  |           |         |             |
| Theme:                       | Default theme ~    | (requires restart of Arduino)  |       |           |         |             |
| Show verbose output during:  | compilation [      | ]upload                        |       |           |         |             |
| Compiler warnings:           | None 🗸             |                                |       |           |         |             |
| Display line numbers         |                    | 🗌 Enable Code Foldi            | ng    |           |         |             |
| Verify code after upload     |                    | 🗌 Use external edit            | or    |           |         |             |
| Check for updates on star    | tup                | 🕝 Save when verifyi            | ng or | uploading |         |             |
| Use accessibility feature    | s                  |                                |       |           |         |             |
| Additional Boards Manager UR | Ls:                |                                |       | ]         |         |             |
| More preferences can be edit | ed directly in the | file                           |       |           |         |             |
| C:\Users\lxy\AppData\Local\A | rduino15\preferenc | es. txt                        |       |           |         |             |
| (edit only when Arduino is r | ot running)        |                                |       |           |         |             |
|                              |                    |                                |       |           | OK      | Cancel      |

Create a new "hardware" folder in the Arduino folder. If there is already a "hardware" folder, you don't need to create a new one.

| 名称        | 修改日期            | 类型  |  |
|-----------|-----------------|-----|--|
| hardware  | 2022/7/19 11:00 | 文件夹 |  |
| libraries | 2022/6/30 17:04 | 文件夹 |  |

Go to the "hardware" folder and extract "WiFi\_Kit\_series" into this folder.

| Documents\Arduino\hardware |                 |              | ~ C        | 22 |
|----------------------------|-----------------|--------------|------------|----|
| 名称                         | 修改日期            | 类型           | 大小         |    |
| CubeCell                   | 2022/7/14 16:34 | 文件夹          |            |    |
| esp32                      | 2022/7/2 15:11  | 文件夹          |            |    |
| WiFi_Kit_series            | 2022/6/30 17:04 | 文件夹          |            |    |
| WiFi_Kit_series.zip        | 2022/7/19 11:00 | 360压缩 ZIP 文件 | 604,131 KB |    |

Go to the "WiFi\_Kit\_series" folder, refer to the figure below to confirm whether the path in the red box is correct.

| :\Documents <mark>\</mark> Arduino\hardware\Wi | Fi_Kit_series   |               | ~  | C    |
|--|-----------------|---------------|----|------|
| 名称   | 修改日期            | 类型            | 大小 |      |
| git  | 2022/6/30 17:04 | 文件夹           |    |      |
| esp32  | 2022/6/30 17:04 | 文件夹           |    |      |
| esp8266  | 2022/6/30 17:04 | 文件夹           |    |      |
| InstallGuide                                   | 2022/6/30 17:04 | 文件夹           |    |      |
| Kicad5_lib_footprint                           | 2022/6/30 17:04 | 文件夹           |    |      |
| 🚞 PinoutDiagram                                | 2022/6/30 17:04 | 文件夹           |    |      |
| 🚞 SchematicDiagram                             | 2022/6/30 17:04 | 文件夹           |    |      |
| 🗋 .gitignore                                   | 2022/6/30 16:42 | txtfile       |    | 1 KB |
| ] .gitmodules                                  | 2022/6/30 16:42 | txtfile       |    | 1 KB |
| README.md                                      | 2022/6/30 16:42 | Markdown File |    | 7 KB |

Restart the Arduino IDE to confirm whether the development environment is installed successfully.

| ketch_jul20a<br>id setup (<br>// put yo | Auto Format<br>Archive Sketch<br>Fix Encoding & Reload<br>Manage Libraries<br>Serial Monitor<br>Serial Plotter       | Ctrl+T<br>Ctrl+Shift+I<br>Ctrl+Shift+M<br>Ctrl+Shift+L |   |   |   |
|---|--|--|---|---|---|
|   | WiFi101 / WiFiNINA Firmware Update   | r  |   |   |   |
| id loop()<br>// put yo                  | Board: "WiFi LoRa 32(V2)"<br>Upload Speed: "921600"<br>CPU Frequency: "240MHz (WiFi/BT)"<br>Core Debug Level: "None" | 2  | Boards Manager<br>Arduino AVR Boards<br>CubeCell (in sketchbook)<br>ESP32 Arduino (in sketchbook) | > |   |
|   | LoRaWan Region: "REGION_EU868"   | 2  | Heltec ESP32 Arduino (in sketchbook)  |   | WiFi Kit 32   |
|   | LoRaWan Debug Level: "None"<br>LORAWAN_DEVEUI: "CUSTOM"<br>Port<br>Get Board Info<br>Programmer                      | >  | Heltec ESP8266 Boards (2.7.0-dev) (in sketchbook)   | • | WiFi LoRa 32<br>WiFi LoRa 32(V2)<br>Wireless Stick<br>Wireless Stick Lite<br>Wireless Bridge<br>Lora Eink Board |

# Example

This section for verifying whether you can program with Arduino or not. Now, The USB cable connects to Heltec ESP32 board, then select your serial port which is connected to Heltec ESP32 board.

Select a demo example, compile and upload.

### Execute an example

Correctly select a board and relevant options in the Tools menu:

|           | uto Format<br>rchive Sketch    | Ctrl+T       |                      |
|-----------|--------------------------------|--------------|----------------------|
| 201       | x Encoding & Reload            |              |                      |
| N         | lanage Libraries               | Ctrl+Shift+I |                      |
| ito S     | erial Monitor                  | Ctrl+Shift+M | clud                 |
| nc S      | erial Plotter                  | Ctrl+Shift+L |                      |
| LE N      | /iFi101 / WiFiNINA Firmware Up | dater        |                      |
| er B      | oard: "WiFi LoRa 32(V2)"       |              | >                    |
| 3         | pload Speed: "921600"          |              | >                    |
|           | PU Frequency: "240MHz (WiFi/B  | T)"          | >                    |
| 14        | ore Debug Level: "None"        |              | >                    |
| 1 23      | SRAM: "Disabled"               |              | > ncoming messages); |
| -         | oRaWan Region: "REGION_EU86    | 8"           | > hessages);         |
|           | oRaWan Debug Level: "None"     |              | >                    |
| P         | ort: "COM3"                    |              | >                    |
| Le G      | et Board Info                  |              |                      |
| el P      | rogrammer: "AVRISP mkII"       |              | >                    |
| ec B      | urn Bootloader                 |              |                      |
| Tithub.co | m/HelTecAutomation/Heltec_I    | ESP32        |                      |

Then select an example.

| New                 | Ctrl+N                 |                               |                    |
|---------------------|------------------------|-------------------------------|--------------------|
| Open                | Ctrl+O                 |                               |                    |
| Open Recent         | >                      |                               |                    |
| Sketchbook          | > 1                    | ?.h"                          |                    |
| Examples            |                        | ۸.                            |                    |
| Close               | Ctrl+W                 | RETIRED                       | >                  |
| Save                | Ctrl+S                 | Examples for WiFi LoRa 32(V2) | 0x00, 0x88, 0x8    |
| Save As             | Ctrl+Shift+S           | ArduinoOTA                    | > 0x00, 0x00, 0x0  |
| Dama Catura         | Chill Child and        | BluetoothSerial               | > 0x88, 0x88, 0x8  |
| Page Setup<br>Print | Ctrl+Shift+P<br>Ctrl+P | DNSServer                     | >                  |
| Print               | Ctri+P                 | EEPROM                        | >                  |
| Preferences         | Ctrl+Comma             | ESP RainMaker                 | >E, 0xa4, 0x63, 0x |
| Quit                | Ctrl+Q                 | ESP32                         | >5, 0x8c, 0xdc, 0x |
|                     | evaar -                | ESP32 Async UDP               | >                  |
|                     |                        | ESP32 BLE Arduino             | >                  |
| *LoraWan channelsm  |                        | ESPmDNS                       | >                  |
| int16_t userChanne  |                        | Ethernet                      | >),0x0000,0x0000,0 |
|                     |                        | FFat                          | >                  |
| *LoraWan region, s  |                        | Heltec-Example                | E-INK >            |
| ORaMacRegion_t lor  |                        | HTTPClient                    | Factory_Test >     |
|                     |                        | HTTPUpdate                    | LoRaBasic          |
| *LoraWan Class, Cl  |                        | HTTPUpdateServer              | LoRaWAN            |
| eviceClass_t lora   |                        | 125                           | OLED >             |
|                     |                        | LittleFS                      | >                  |
| *the application d  |                        | NetBIOS                       | >cle. value in [m  |
| int32_t appTxDutyC  |                        | Preferences                   | >                  |
|                     |                        | SD                            | >                  |
| *OTAA or ABP*/      |                        | SD_MMC                        | >                  |
| ool overTheAirActi  |                        | SimpleBLE                     | >                  |
|                     |                        | SPI                           | >                  |
| *ADR enable*/       |                        | SPIFFS                        | >                  |
| ool loraWanAdr = t  |                        | Ticker                        | >                  |
|                     |                        | Update                        | >                  |
| one uploading.      |                        | USB                           | >                  |
| riting at 0x0005ca6 |                        | WebServer                     | >                  |
| rote 321520 bytes ( |                        | WiFi                          | >00010000 in 3.1   |
| ash of data verifie |                        | WiFiClientSecure              | >                  |
|                     |                        | WiFiProv                      | >                  |
| eaving              |                        | Wire                          |                    |

Compile & Upload



### New a Heltec ESP32 program

Open Arduino IDE, create a new .ino file, then copy the below code.

```
#include <heltec.h>
// the setup routine runs once when starts up
void setup(){
    // Initialize the Heltec ESP32 object
    Heltec.begin(true /*DisplayEnable Enable*/, true /*LoRa Disable*/, true /*Serial Enable*/, true /*PAL
}
// the loop routine runs over and over again forever
void loop() {
}
```

compile it and upload, the screen (if this board has a screen) will show and Arduino's serial monitor will print something, it means Heltec ESP32 board is running successfully!



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Built with Sphinx using a theme provided by Read the Docs.