0x513 by Dave Gold / https://513.ooo/0x513

ETH Ticker

Quick installation guide — firmware v9.5.0

What you need

- Waveshare ESP32-S3-Touch-AMOLED-1.75C board (with battery, optional) and a USB-C data cable.
- A computer with Arduino IDE 2.3 or newer (tested with 2.3.10).
- The firmware package ETH_Ticker_v9.5.0.zip, unpacked. It contains the sketch folder eth_ticker/, lv_conf.h and README.md.
- The Waveshare demo package for the ESP32-S3-Touch-AMOLED-1.75C (from the board's Waveshare wiki page): the folder examples/arduino/libraries.

1. Install the ESP32 board package

Arduino IDE › Settings › Additional boards manager URLs, add:

```
https://espressif.github.io/arduino-esp32/package_esp32_index.json
```

Then Tools › Board › Boards Manager, search "esp32" and install **esp32 by Espressif Systems, version 3.3.11**.

2. Install the libraries

Libraries live in Documents/Arduino/libraries/ (create the folder if it does not exist).

Library	Version	Where from
GFX_Library_for_Arduino, SensorLib, XPowersLib, lvgl	as supplied (LVGL 8.4)	Copy from the Waveshare package, examples/arduino/libraries.
lv_conf.h	from this firmware	Copy into Documents/Arduino/libraries/ itself (next to the lvgl folder, not inside it). It replaces Waveshare's file.
ArduinoJson	7.4.2	Library Manager (Benoit Blanchon).
WebSockets	2.7.3	Library Manager (Markus Sattler).
JPEGDEC	1.8.4	Library Manager (Larry Bank).

Use LVGL 8.4 as supplied by Waveshare, not LVGL 9: the firmware is written for version 8.

3. Open the sketch and (optionally) set Wi-Fi

Open eth_ticker/eth_ticker.ino. In config.h you can put a first Wi-Fi network and your time-zone offset in minutes; both are optional, networks can also be added on the device later.

```
#define WIFI_SSID "YourNetwork"
#define WIFI_PASS "YourPassword"
#define TZ_OFFSET_MINUTES 240
#define LCD_QSPI_HZ 40000000
#define ALERT_WAKES_SCREEN 1
```

LCD_QSPI_HZ is the display bus speed. 40000000 is the safe default. 80000000 makes animations smoother, but may not work on every board: if stripes or garbage appear on the screen, set it back to 40000000. ALERT_WAKES_SCREEN 1 lights the screen up for an alert while it is off; 0 plays the sound only.

4. Board settings (Tools menu)

Setting	Value
Board	ESP32S3 Dev Module
USB CDC On Boot	Enabled
Flash Size	32MB (256Mb)
Partition Scheme	32M Flash (13MB APP/6.75MB SPIFFS)
PSRAM	OPI PSRAM
Port	the board's USB port (on a Mac: /dev/cu.usbmodem…)

5. Upload

- Connect the board with the USB-C cable and press Upload (the arrow button).
- The first build takes a few minutes; later builds are faster.
- When the upload finishes the board restarts by itself and shows the loading screen.

6. First start

- If no network is saved yet, press BOOT once (or swipe down from the top) to open the panel, then Settings › WiFi networks, pick your network and type the password.
- Use a 2.4 GHz network. For an iPhone hotspot turn on "Maximize Compatibility".
- Once connected, the price appears within seconds and the loading screen opens when everything is ready.

7. Your own alert sounds (optional)

The sounds live in the device's file storage, separate from the firmware, so they can be changed at any time without uploading the firmware again.

- Install the free Arduino IDE plugin **arduino-littlefs-upload** (Earle F. Philhower): download its .vsix file from github.com/earlephilhower/arduino-littlefs-upload (Releases), put it in the folder ~/.arduinoIDE/plugins/ (create the folder if needed) and restart Arduino IDE.
- Put your mp3 files in eth_ticker/data/ with the names from data/README.txt (up.mp3, down.mp3, spike_up.mp3, wall_down.mp3 and so on). The package includes up.mp3 and down.mp3: the built-in sounds, as examples.
- Close the Serial Monitor, then press Cmd+Shift+P (Ctrl+Shift+P on Windows) and run **Upload LittleFS to Pico/ESP8266/ESP32**. The board restarts with your sounds.
- The Serial Monitor (115200) then shows lines such as [sound] up.mp3: 1.2 s (44100 Hz, stereo).
- Back to the built-in sounds: empty the data folder and run the same command again.

Troubleshooting

Problem	What to do
Upload cannot connect to the board	Hold BOOT, press PWR, release BOOT, then upload again. Make sure the cable carries data, not only power.

Problem	What to do
“Sketch too big”	Check Partition Scheme: 32M Flash (13MB APP/6.75MB SPIFFS) and Flash Size 32MB.
Black screen or restarts right after start	Check PSRAM: OPI PSRAM.
Compile errors in LVGL	Use LVGL 8.4 from Waveshare and put this firmware’s lv_conf.h directly in the libraries folder.
A Wi-Fi network is missing from the list	It is probably 5 GHz only; switch the router or hotspot to 2.4 GHz.
My sounds do not play	Check the file names (data/README.txt) and that the upload command ran with the Serial Monitor closed; the log shows [sound] lines for each file loaded.
Need to see what the device does	Tools › Serial Monitor at 115200 baud: [wifi], [app], [perf] and other lines explain each step.