![STEMinds logo]

STEMinds

Eduponics Mini V1.0 ESP32 development board Data-sheet

Eduponics Mini V1.0

The STEMinds Eduponics Mini kit is ESP32 based development board designed for learning the subjects of IoT and smart agriculture. The board includes many built-in sensor and support both C programming language in Arduino IDE environment and MicroPython in Thonny IDE.

Features

* Based on the ESP32-WROOVER Micro-controller

* Pre-loaded with MicroPython software

* USB Type-C programming interface (CH340 chip), 12V DC power interface

* On/Off switch

* Reset button

* Wake-up button (useful for deep-sleep functionality)

* RTC DS1307 Module

* HFD4/5S relay

* 4P XH2.54 interface for water quantity sensor

* 3P XH2.54 interface for soil moisture sensor

* 2P XH2.54 interface for pump

* WS2812 RGB LED

* BH1750 I2C Light sensor

* BME280 Temperature, humidity and barometric pressure sensor

* Extension for DHT11/DHT22 (sensor not included)

* AT24C02 I2C EEPROM

* IO Extension pins, 12V, 5V and 3.3V output.

STEMinds
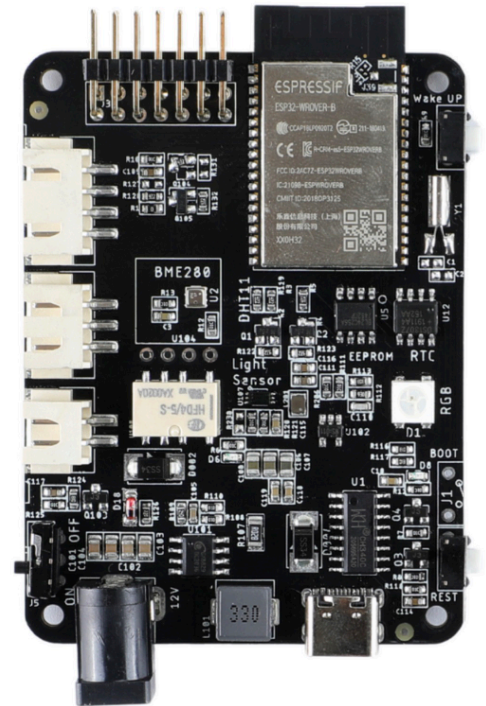
Eduponics Mini Kit

The Eduponics Mini can be purchased as standalone board or part of a kit, for the kit it will include the following extra components:

* x1 Eduponics Mini ESP32 development board

* 12V2A DC American Power supply

* USB Type-C USB data cable

* 12V submersible water pump

* STEMinds soil moisture sensor (either long or short, based on the purchase)

* Contact-less waterproof water quantity sensor + 2 sided stickers

* Irrigation water hose

Useful applications

* Smart watering solutions

* IoT weather station and environmental control

* Green house controller for mushrooms, flowers and all kind of plants

* Smart irrigation system

* Accurate data collection for data scientific and environmental analysis

* Educational purposes and real life applications

Support & Documentation

STEMinds offers complete support and documentation, the documentation is officially available at wiki.steminds.com and the software is open source and available at the official STEMinds GitHub repository: https://github.com/steminds/eduponics-mini

Hardware pinout

Sensor name	VCC	I/O	IO Pin
BME280	3.3V VCC	I2C 0x76	SCL IO23, SDA IO26
DHT11	3.3V VCC	Output	IO19
DS1307 RTC	5V VCC	I2C 0x68	SCL IO23, SDA IO26
WS2812 RGB	5V VCC	Output	IO13
BH1750 Photo-diode	3.3V VCC	I2C 0x5C	SCL IO23, SDA IO26
AT24C02 EEPROM	5V	I2C 0x50	SCL IO23, SDA IO26
Wakeup button	3.3V VCC	Input	IO36
Soil Moisture 3P XH2.54	5V VCC	Input	IO35
Relay pump 2P XH2.54	5V VCC (output 12V)	Output	IO23
Water quantity 4P XH2.54	5V VCC	Input	IO21

Schematic

For the complete schematic at high resolution, please refer to our GitHub repository:

https://github.com/STEMinds/Eduponics-Mini/raw/main/hardware/
Eduponics_Mini_V1.0_schematic.pdf
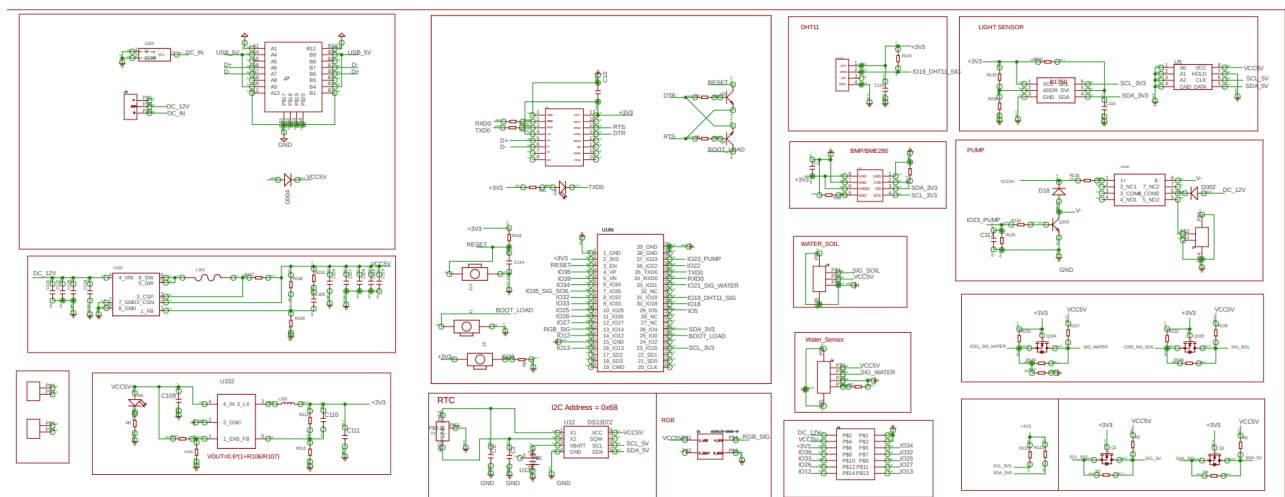
Drivers installation

The Eduponics mini is based on CH340 serial driver, the drivers can be downloaded directly from the manufacturer website the "WCH" company here: http://www.wch.cn/download/CH341SER_ZIP.html

Although the website is in Chinese, the download links are very straight forward.

Related data sheets

Here we attach some extra data sheets of components that we use in our Eduponics Mini board, those data-sheets and websites **are not** affiliated to STEMinds in anyway and provided for educational purpose only.

BME280 - https://www.bosch-sensortec.com/media/boschsensortec/downloads/datasheets/bst-bme280-ds002.pdf

DHT11 - https://www.mouser.com/datasheet/2/758/DHT11-Technical-Data-Sheet-Translated-Version-1143054.pdf

BH1750 - https://www.mouser.com/datasheet/2/348/bh1750fvi-e-186247.pdf

WS2812B RGB - https://www.parallax.com/sites/default/files/downloads/28085-WS2812B-RGB-LED-Datasheet.pdf

AT24C02 I2C EEPROM - https://datasheet.octopart.com/AT24C02D-XHM-T-Microchip-datasheet-25361987.pdf

DS1307 RTC - https://www.sparkfun.com/datasheets/Components/DS1307.pdf

Mouser Electronics

Authorized Distributor

Click to View Pricing, Inventory, Delivery & Lifecycle Information:

[Crowd Supply](#):
  [EDUPON-MINDEV](#) [EDUPON-MINKIT](#)