Matrix-310
Software Guide

Version: 1.0

2023 Jan.

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Document Amendment History

Revision	Date	Remark
V 1.0	2023 Jan.	Initial

Table of Contents

1. Overview

Matrix-310 is an ARDUINO-based industrial IoT gateway with multi-communication for available / reliable dual network.
It features Dual Serial ports and digital In/Out connectivity for transmission of acquired data to the cloud makes it ideal for real-time monitoring and predictive maintenance also optimization and deployment of factory applications, such as industrial automation, environment monitoring and smart city infrastructure.

1.1 Features

- Rugged Design for Harsh Industrial Environment
- Arduino-Based Programmable Industrial IoT Gateway
- Espressif ESP32 Xtensa® Dual-Core 32-bit LX6 Microprocessor, 240 MHz
- Onboard 520KB SRAM, 4MB Flash7
- Suitable for Accessing Modbus Device
- Easy Software Development (IDE/C-language/Arduino/Micro Python)
- One LAN Port, 10/100Mbps Ethernet
- Two Serial Ports: 1xRS-485 & 1xRS-232
- Wireless: IEEE 802.11b/g/n, 2.4GHz Single
- 2x Digital Inputs and 1xRelay out
- ID Setting by Rotary Switch
- One Micro-SD Socket Internally
- Wide-Range Temperature Operating
- DIN-Rail Mounting, Optional Wall-Mounting
- Protective Earthing Design with Chassis Ground Screw

1.2 Specifications

Easy to Use C/C++ Platform (Arduino ESP32)

- Matrix-310 is C/C++ programmable, Arduino (ESP32) compatible industrial IoT platform
- Installed Arduino core (ESP32) through board manager of Arduino IDE

Free Application Development Tools

- Free Xtensa® C/C++ toolchain
- Free Arduino official IDE
- Free Microsoft Arduino plugin for VS code
    - Text editor: vim/nano/sed
    - Administration: Webmin

2. Access the USB Serial Console

2.1 USB Serial Console Introduction

Matrix-310 IIoT gateways come with a USB client port (micro-USB connector), which is used as the serial console. Please prepare a USB-to-microUSB cable to connect the Matrix-310 to a PC/NB.

2.2 USB Serial Console Connection

When the Matrix IoT gateway finished its boot up process, it will automatically emulate an USB CDC compatible serial device.

Matrix-310 IIoT gateway comes with a USB client port	Use a standard on-the-shelf USB-to-MicroUSB cable to connect to the Matrix-310	Windows/OSX Desktop/Notebook PC
		

The identifier name of the CDC serial port varies depending on your computer's operation system and the numbers of the serial ports which are already installed on your computer.

On OSX system, the serial port name appears like tty.usbmodem1421, tty.usbmodem1422, etc.
On Windows system, the serial port name appears like COM3, COM4, etc.

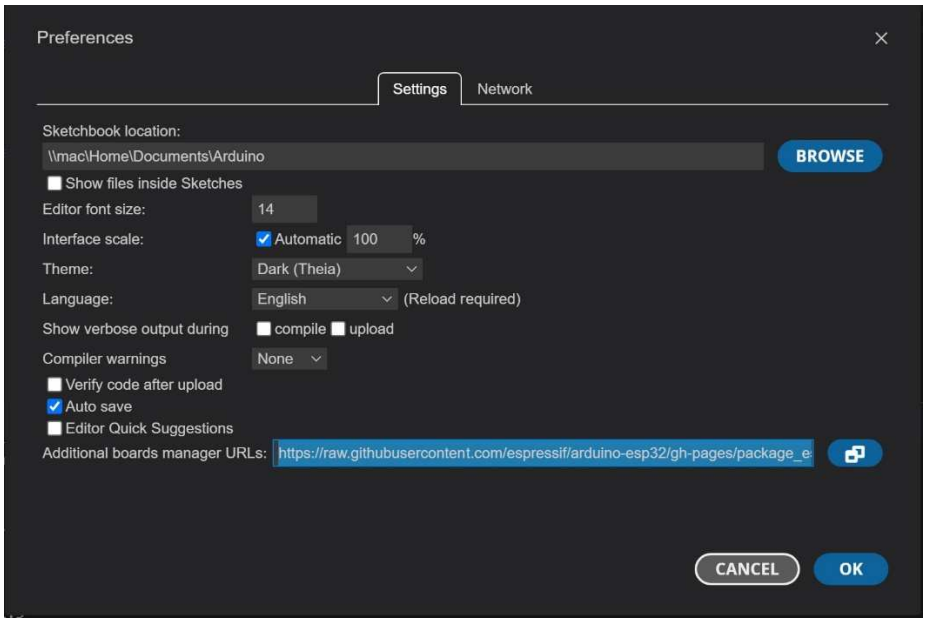
The serial communication parameters are: **115200**, **N81**, **VT100**. Use your preferred serial terminal tools to access the Matrix-310 IIoT gateway's serial console.

3. Arduino Development Environment

3.1 Installation Matrix-310 by using Arduino IDE

Arduino IDE can be downloaded from https://www.arduino.cc/en/software

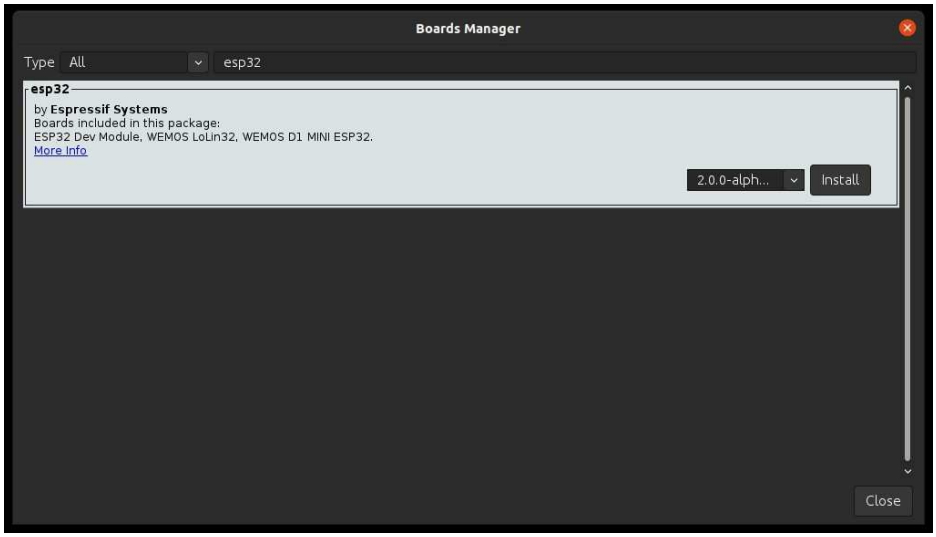
To start the installation process using the **Boards Manager** as following steps:



Enter the release links below into *Additional Board Manager URLs* field. You can add multiple URLs, separating them with commas

https://raw.githubusercontent.com/espressif/arduino-esp32/gh-pages/package_esp32_index.json

Open Boards Manager from Tools > Board menu and install ESP32 platform (and do not forget to select your ESP32 board from Tools > Board menu after installation

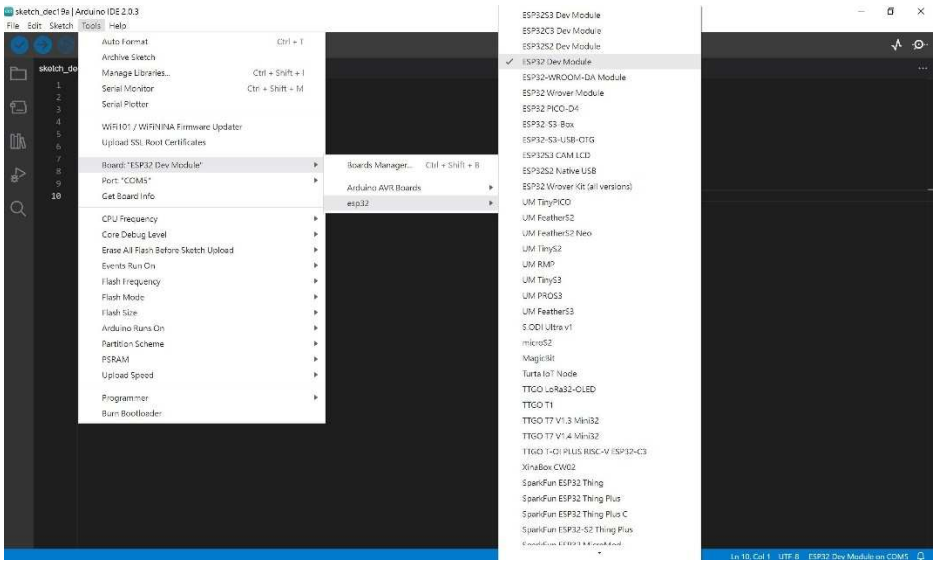


After above installation completed, please restart Arduino IDE

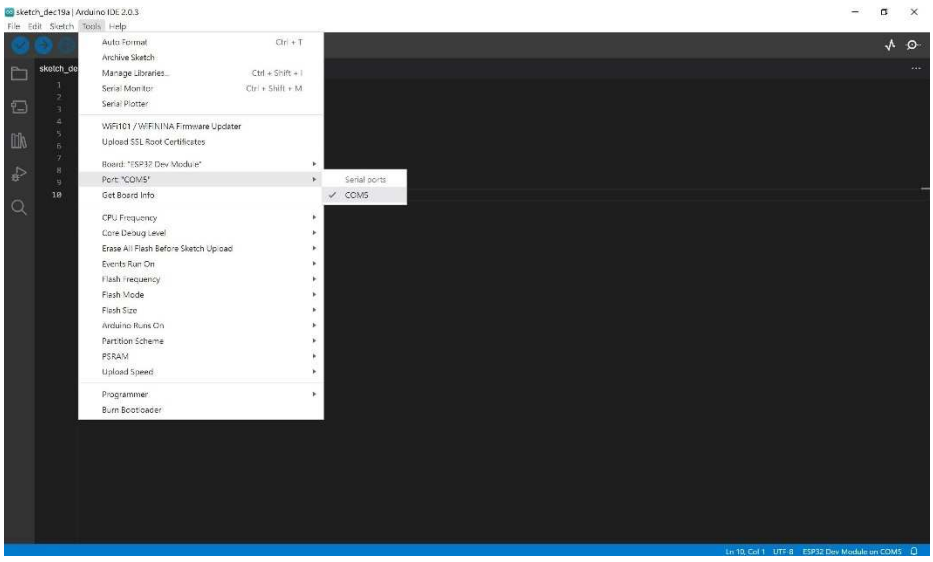
3.2 Config the Arduino IDE

Connect the Matrix-310's Micro USB/serial console to your computer's USB port

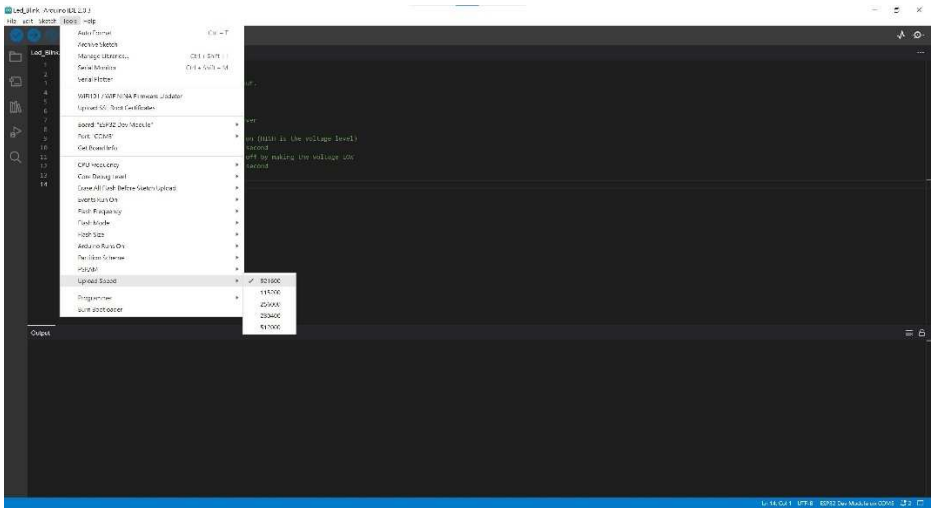
Select the Board from Tools > Board > esp32 > ESP32 Dev Module



Select the Port from Tools > Port > COM Port



Select the Upload Speed (it depends on OS/PC been used) from Tools



Then, You may start to program Matrix-310 under Arduino IDE

4. Examples

Here presents examples for your reference.

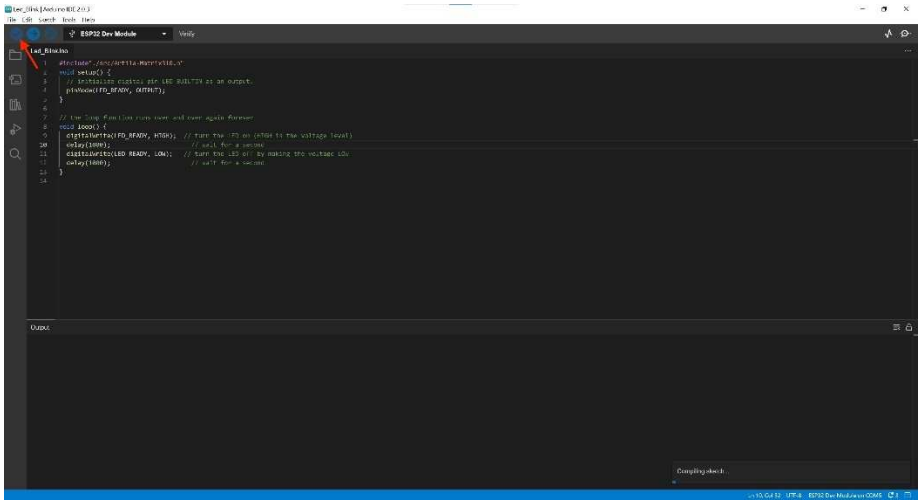
Visit Artila website at http://www.artila.com/en/p_pac.html#Matrix-310,

click Resource for more examples of each function.

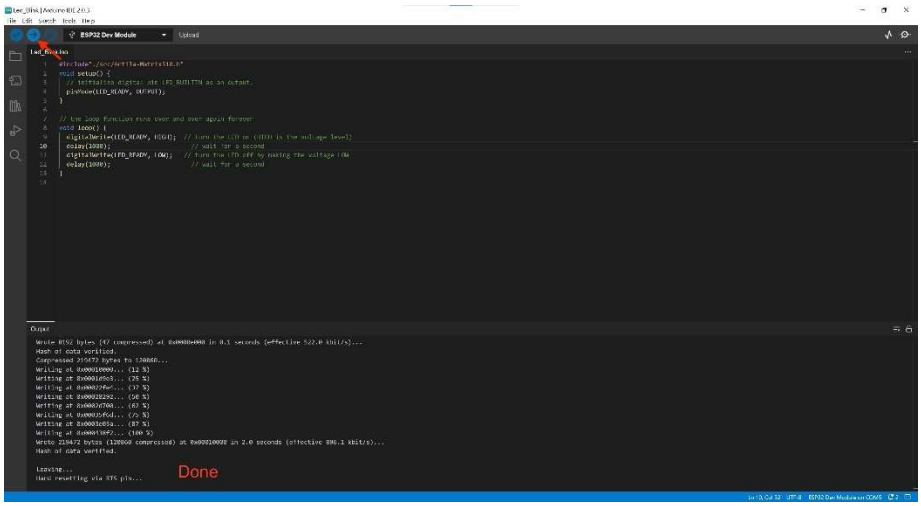
4.1 Verify and Upload the example sketch with Arduino IDE

Open the example sketch from File > Sketchbook > generated_examples.

Click “**Verify**” button to verify the example sketch.



Click “**Upload**” button to upload the example sketch



After message shown on bottom line, operation is completed.

4.2 Open the Serial Monitor

You can use the Arduino environment's built-in serial monitor to communicate with Matrix-310. Click the serial monitor button in the toolbar and select the same baud rate used in the call to *begin()*