Monitair Software Build Guide

This document will tell you how to build and deploy the Monitair software for an Air Quality sensor node.

# Pre-Requisites

This is the configuration information that you will need to create a build environment for the software.

## Arduino SDK

You must have at least version 1.6.11 (this is the one that I use for building my nodes)

## ESP8266 Hardware platform

If you use the later versions of the ESP8266 hardware builds you will have problems using Secure Sockets (required for use with Azure IoT Hub) due to memory issues. Version 2.4.2 of the ESP8266 distribution works well.

## Arduino Libraries

You will need to have the following libraries installed on your system. Search for them in the libraries by the names that are given below.

* **Adfruit BME280 Library** (for the temperature, pressure and humidity sensor)
* **Adafruit Unified Sensor** (for the temperature, pressure and humidity sensor)
* **eZtime** (for the network time service)
* **MicroNMEA** (for the GPS receiver)
* **NeopixelBus by Makuma** (for the Neopixels)
* **PubSubClient** (provides the MQTT connectivity). Ensure that you edit the MQTT\_MAX\_PACKET\_SIZE symbol in PubSubClient.h to have a value of at least 256 (the default is 120) when using Azure IoT Hub to allow the larger key values to be transferred

# Build Settings

The following additional build settings are required.

## ESP8266 Clock Speed

The clock speed for the ESP8266 must be set to 160MHz. This improves performance for secure sockets and also allows the Neopixel bus to work correctly.

# Software Serial Ports

The Monitair software uses a customised version of the SoftwareSerial library. This has been optimised for the use of slow baud rates (<9600). This library is included as part of the distribution.

# Work in progress

This is a work in progress. Items to note:

* The Over the Air (OTA) update feature is not yet complete
* If secure sockets are selected for the MQTT connection the web hosting for settings will not work correctly
* The NeoPixels must be connected GPIO2 (Wemos pin D4) to make use of the high performance UART1 interface to NeoPixels that provides the best performance.

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