

التدريب الصيفي 2
SUMMER TRAINING 2

التدريب التقني المتقدم لمعمل إنترنت الأشياء

لصيف ١٤٤١ هـ - ٢٠٢٠



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overview

- HTTP and MQTT
- Node-RED
- ESP8266



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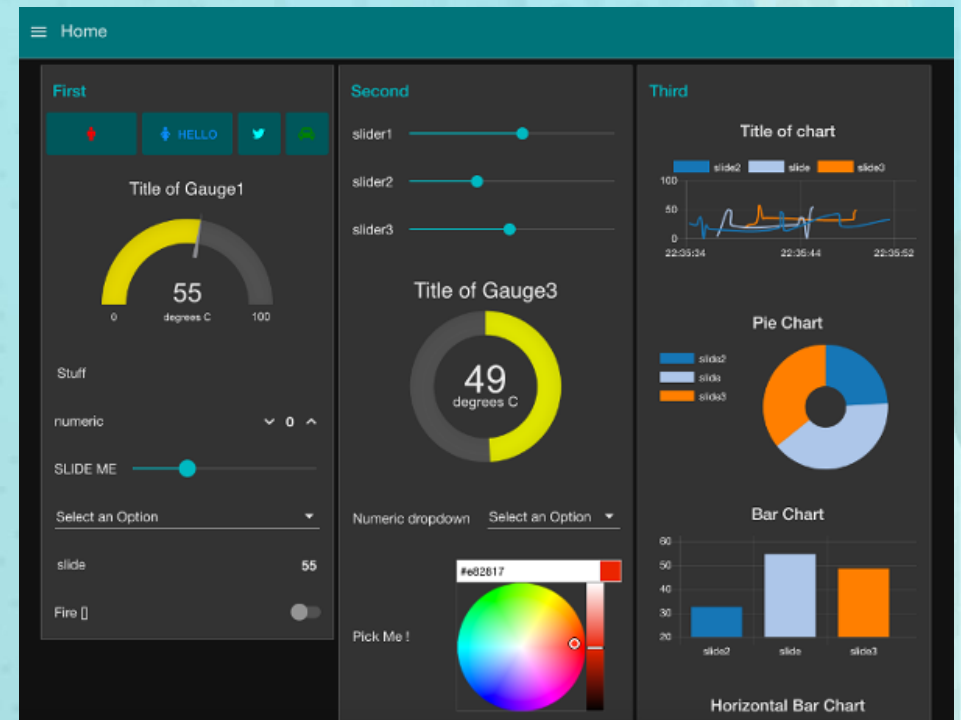
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Node RED



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HTTP

The **Hypertext Transfer Protocol (HTTP)** is an [application protocol](#).

GET requests



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Requirements for IoT Protocols

- The capacity to connect a large number of elements
- High reliability
- Real-time data transmission
- High protection on the data flow
- Cost-effectiveness for a large number of connected objects



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MQTT



MQTT (Message Queue Telemetry Transport)

- Broker
- Publisher to a topic
- Subscriber to a topic

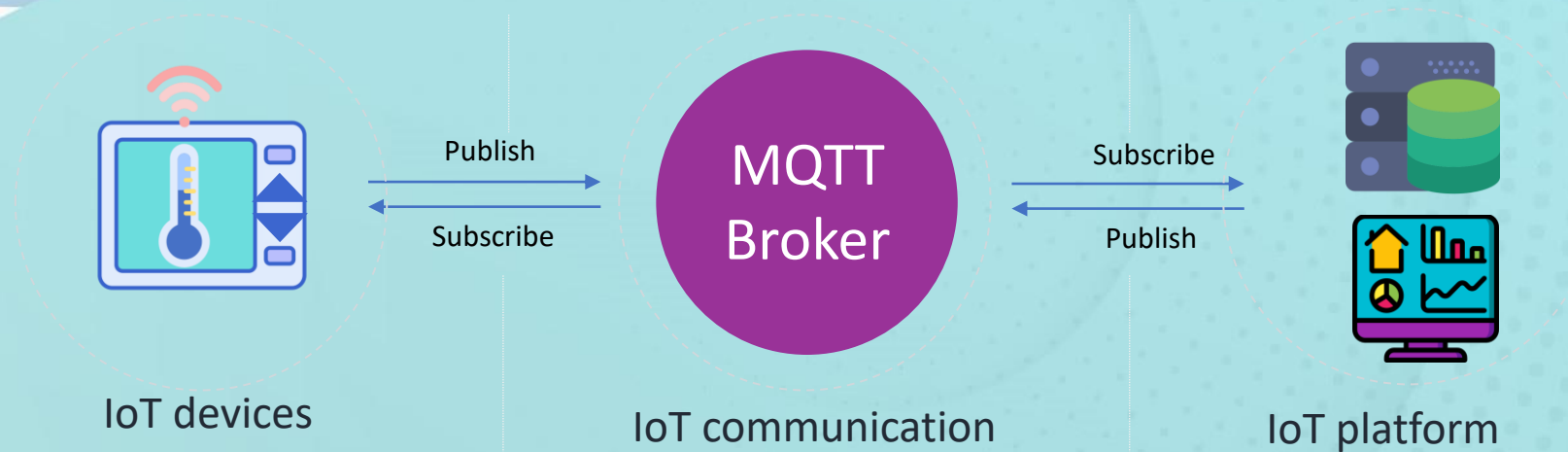


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IoT Protocols

MQTT (Message Queue Telemetry Transport)



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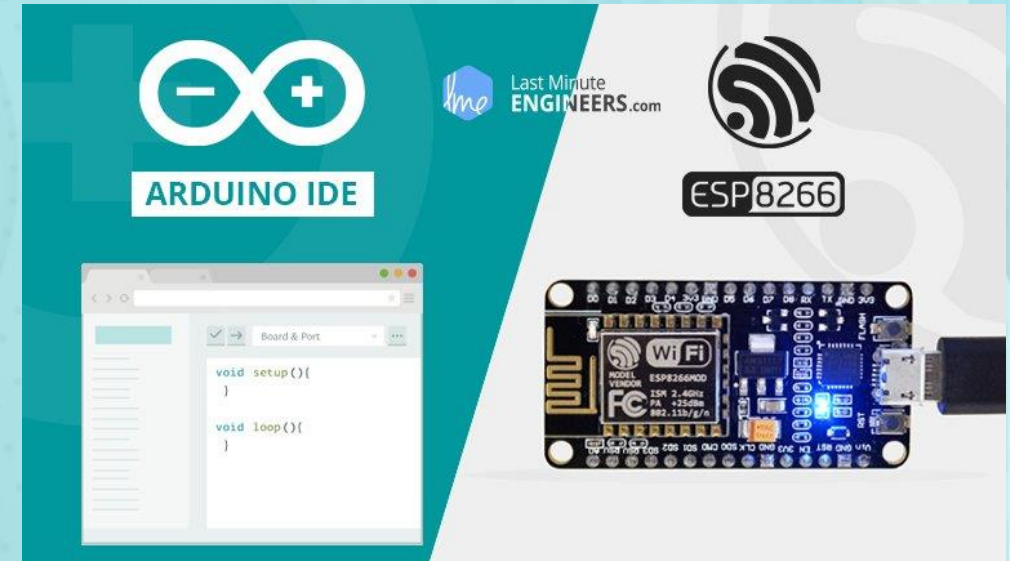
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ESP8266

The Internet of Things (IoT) has been a trending field in the world of technology. It has changed the way we work. Physical objects and the digital world are connected now more than ever. Keeping this in mind, [Espressif Systems](#) (A Shanghai-based Semiconductor Company)



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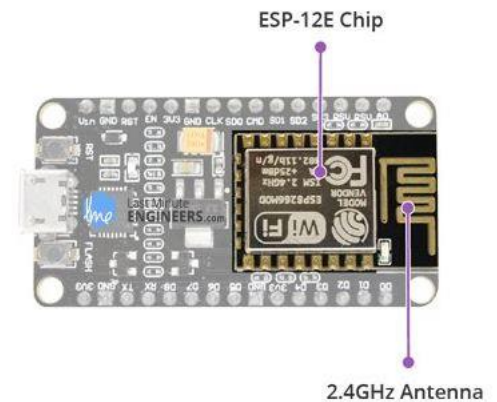
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ESP-12E Module

There's also 128 KB RAM and 4MB of Flash memory (for program and data storage) just enough to cope with the large strings that make up web pages, JSON/XML data, and everything we throw at IoT devices nowadays.

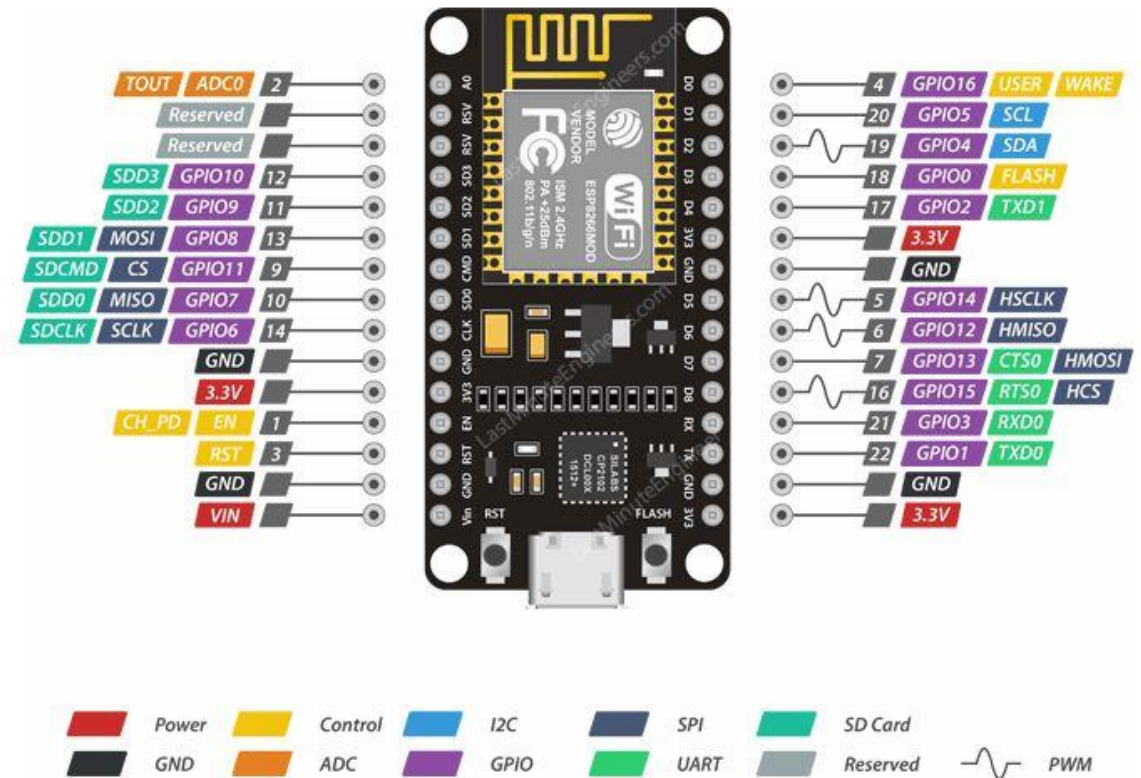
ESP-12E Chip

- Tensilica Xtensa® 32-bit LX106
- 80 to 160 MHz Clock Freq.
- 128kB internal RAM
- 4MB external flash
- 802.11b/g/n Wi-Fi transceiver



ESP8266 NodeMCU Pinout

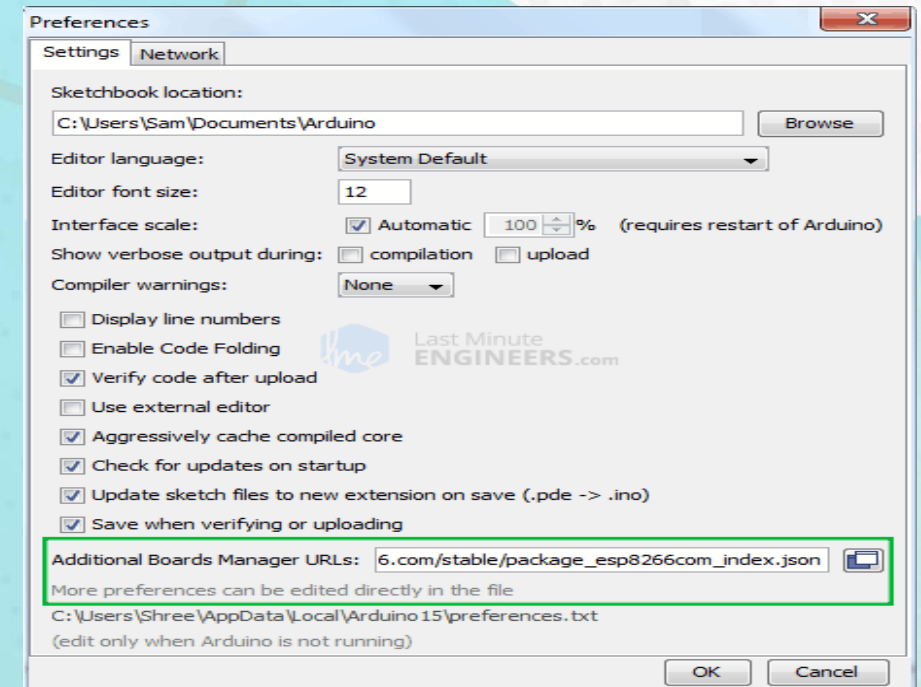
The ESP8266 NodeMCU has total 30 pins that interface it to the outside world. The connections are as follows:



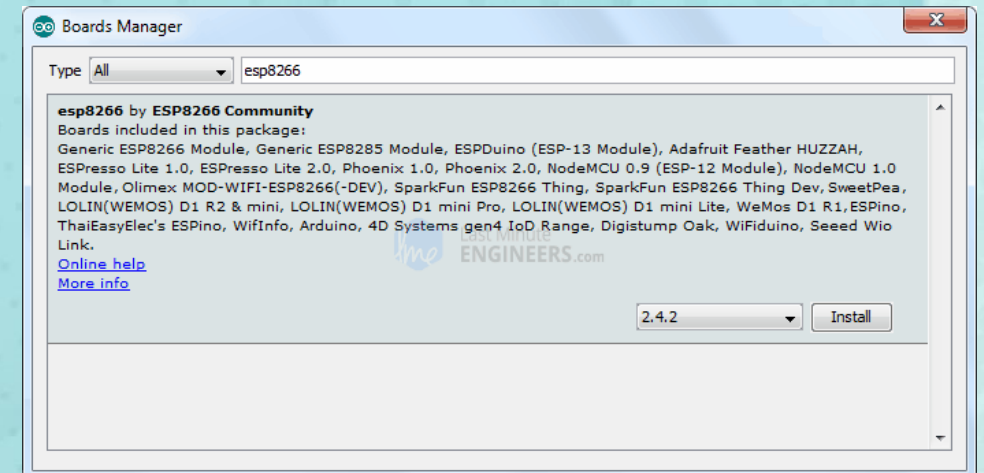
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To begin, we'll need to update the board manager with a custom URL. Open up Arduino IDE and go to File > Preferences. Then, copy below URL into the Additional Board Manager URLs text box situated on the bottom of the window:

`com_index.json8266pse_egakcap/elbats/moc.8266http://arduino.esp`



Hit OK. Then navigate to the Board Manager by going to Tools > Boards > Boards Manager. There should be a couple new entries in addition to the standard Arduino boards. Filter your search by typing esp8266. Click on that entry and select Install.



Referents

<https://lastminuteengineers.com/esp8266-nodemcu-arduino-tutorial/>

<https://www.concurrency.com/blog/june-2019/why-http-is-not-suitable-for-iot-applications>

https://www.snap4city.org/download/video/Node-RED_dashboard_user_manual.pdf



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