Lab 1: Introduction to ESP32

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Introduction

ESP32 is actually a series of microcontroller chips produced by Espressif Systems in Shanghai.

So what is the microcontroller?

A microcontroller is an electronic device, the most important part of a microcontroller is a central processing unit (CPU). It also contains the following:

- I/O ports.
- Memory.
- Timers and counters.
- Analog to digital converters (ADCs).
- Digital to analog converter (DAC).
Types of Microcontrollers

- Atmel AVR
- AVR
- ATX Mega
- ATmega 328P
- PIC 18F877A
- 8051
- Arduino
- ARM

www.TheEngineeringProjects.com
Features of the ESP32

• The ESP32 is an updated version of the ESP8266.
• **Features of the ESP32 include:**
  • Microcontroller: Dual-core CPU Xtensa LX6
  • Digital I/O Pins (DIO): 25
  • Analog Input Pins (ADC): 6
  • Analog Outputs Pins (DAC): 2
Features of the ESP32

• UARTs: 3
• SPIs: 2
• I2Cs: 3
• Clock Speed: 240 Mhz
• Wi-Fi
• Note: Not all of the above functions are available concurrently.
Programming the ESP32

• There are Two ways:
  
  1. Arduino IDE: an easy way for beginners.
  
  2. Espressif IoT Development Framework (ESP-IDF): To make use of all of the ESP32 features.

We will use it
Getting started with the Arduino IDE

• Before we can use the Arduino IDE with an ESP32 board we will need to add the ESP32 boards using the Arduino IDE Board Manager. (as in the first video).
• Reference for Arduino Functions.
  • https://www.arduino.cc/reference/en/
• Reference for ESP32:
  • https://docs.zerynth.com/latest/reference/boards/doit_esp32/docs/
void setup() {
    // put your setup code here, to run once:
}

void loop() {
    // put your main code here, to run repeatedly:
}
Introduction to Arduino IDE

The Arduino IDE contains several important feature:

- **Open**: Allows you to open a sketch.
- **Save**: Saves the current sketch.
- **Verify**: Verifies the code for errors.
- **Upload**: Uploads the verified sketch to the Arduino.
- **New**: Creates a new sketch.

The IDE consists of:

- **Text Editor**: Where you write your code.
- **Serial Monitor**: Where you can see the output from the serial port.
- **Output Pane**: Displays any errors or messages from the IDE.

The Arduino Type and Port you are using are displayed at the bottom right.
Serial Monitor

• Serial Monitor is a part of the Arduino IDE software. Its job is to allow you to both send messages from your computer to an ESP board (over USB) and also to receive messages from the ESP.

• https://www.youtube.com/watch?v=s04RJ_52ALk
HW Lab 1

1. Download Arduino and ESP32 library.
2. Upload (WifiScan) Example and see the results on the Serial monitor.
3. Print your Name & ID on the serial monitor. (new code)

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