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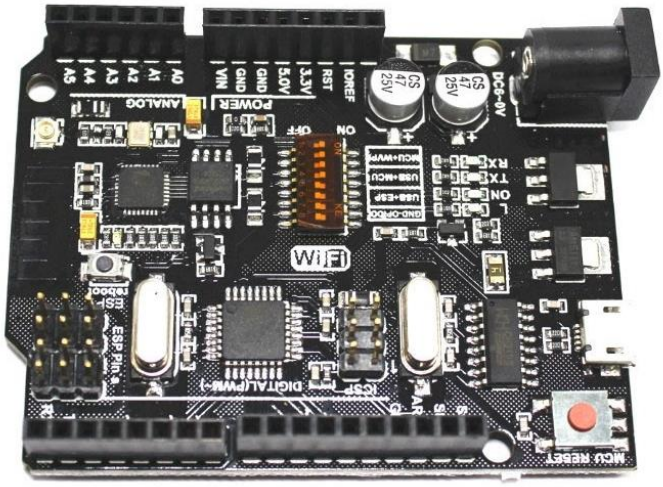
Arduino Uno Wi-Fi ATMega328P + ESP8266

Introduction:



The Arduino Uno Wi-Fi ATMega328P + ESP8266 (32Mb memory) USB–TTL is a feature-rich development board that seamlessly integrates the renowned Arduino Uno platform with enhanced Wi-Fi capabilities provided by the ESP8266 module. Equipped with the familiar ATmega328P microcontroller, it maintains compatibility with a vast array of existing Arduino sketches and libraries. The inclusion of the ESP8266 module, boasting 32 megabytes of memory, elevates the board's capabilities, enabling robust wireless communication and internet connectivity.

The USB–TTL interface ensures easy programming and communication with a computer. This board is well-suited for a variety of applications, including Internet of Things (IoT) projects, home automation, and data-intensive tasks, thanks to the expanded memory. Developers can leverage the synergy of Arduino's user-friendly environment and the ESP8266's powerful features to create sophisticated projects that demand both microcontroller versatility and advanced wireless connectivity.

Features:

- Microcontroller**:** ATMega328P as the primary microcontroller for general-purpose tasks.
- Clock speed: ATMega328P running at 16 MHz (standard Arduino Uno clock speed).
- Wi-Fi connectivity: Integrated ESP8266 module for Wi-Fi connectivity (802.11 b/g/n).
- Memory: 32MB (32 megabits) flash memory for the ESP8266 module.

Specifications:

- Microcontrollers : 1x ATMEGA328P and 1x ESP-8266EX
- Analog input pins : 6 for ATMEGA328P (5V compliant) + 1 for ESP8266 (3.3V compliant)
- Clock speed : 16MHz for ATMEGA328P and 80MHz/160MHz for ESP8266
- ESP8266 Flash: 8Mb

Objectives:

The Arduino Uno Wi-Fi with an integrated ATMega328P microcontroller and ESP8266 module, boasting 32MB of memory and USB – TTL connectivity, seeks to address the growing demand for a unified platform capable of seamlessly integrating microcontroller and Wi-Fi functionalities. The primary objectives encompass simplifying the prototyping process for a diverse range of projects, particularly those in the realm of Internet of Things (IoT) development. Overall, the Arduino Uno Wi-Fi with ATMega328P and ESP8266 aspires to be a versatile and user-friendly solution that enables innovative projects in the intersection of microcontroller programming and wireless communication

Components needed:

- Arduino Uno Wi-Fi ATMega328P + ESP8266
- Micro USB cable

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DIP Switch & Port Configuration

Operation Mode									
GRAY = OFF	GREEN = ON	1	2	3	4	5	6	7	8
CH340 to **ESP8266** (Upload Sketch)						ON	ON	ON	NoUSE
CH340 to **ESP8266** (Connect)						ON	ON		NoUSE
CH340 to **ATmega328P** (Upload Sketch)				ON	ON				NoUSE
CH340 to **ATmega328P** to **ESP8266**		ON	ON	ON	ON				NoUSE
ATmega328P + **ESP8266**		ON	ON						NoUSE
All modules work independent									NoUSE

Operation Mode table

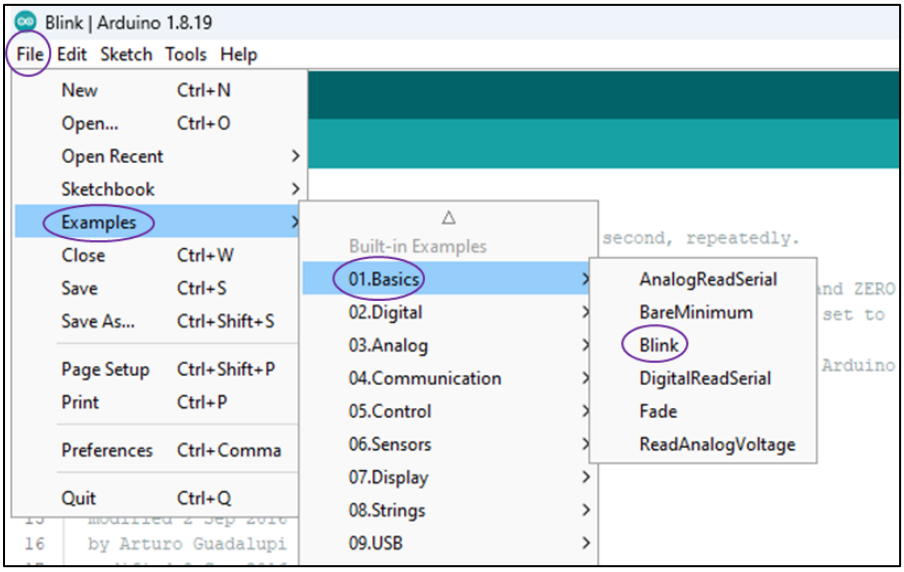
Uploading Program Code to Arduino UNO:

Step 1:

- Turn ON DIP Switch **3 & 4** (Refer Operation Mode table).
- Power the Arduino Uno through USB or an external power supply.

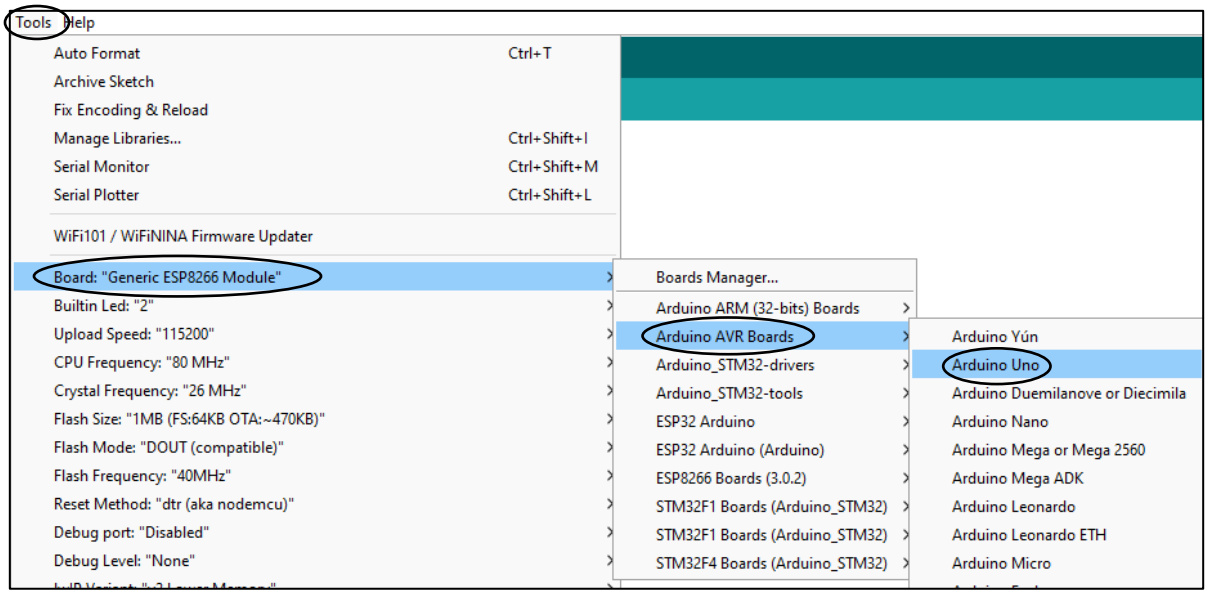
Step 2:

- Do a software setup in your Arduino IDE software
- Open Arduino IDE select Board & **"COMxx"** (xx depend on your PC)
- Next for setting Arduino Uno, choose **File** > **Examples** > **Basics** > **Blink** as picture below:



Step 3:

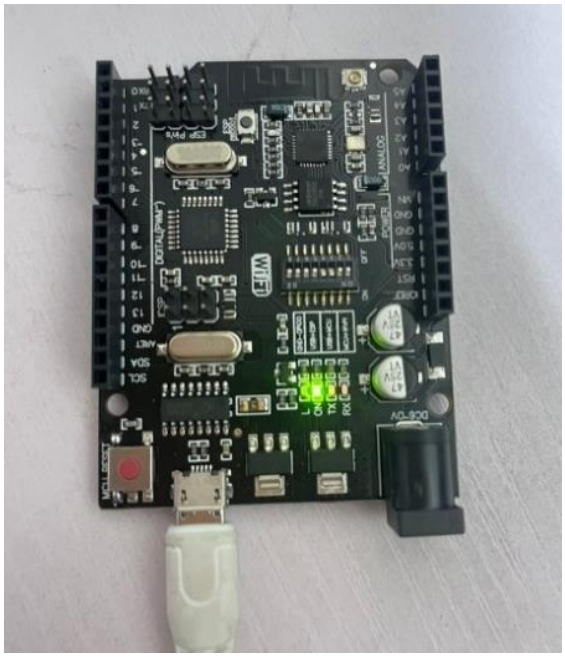
- For the next setting, choose **Tools** > **Board: …**> **Arduino AVR Boards** > **Arduino UNO**



Step 4:

- Then click upload to start compiling and uploading program to the board.

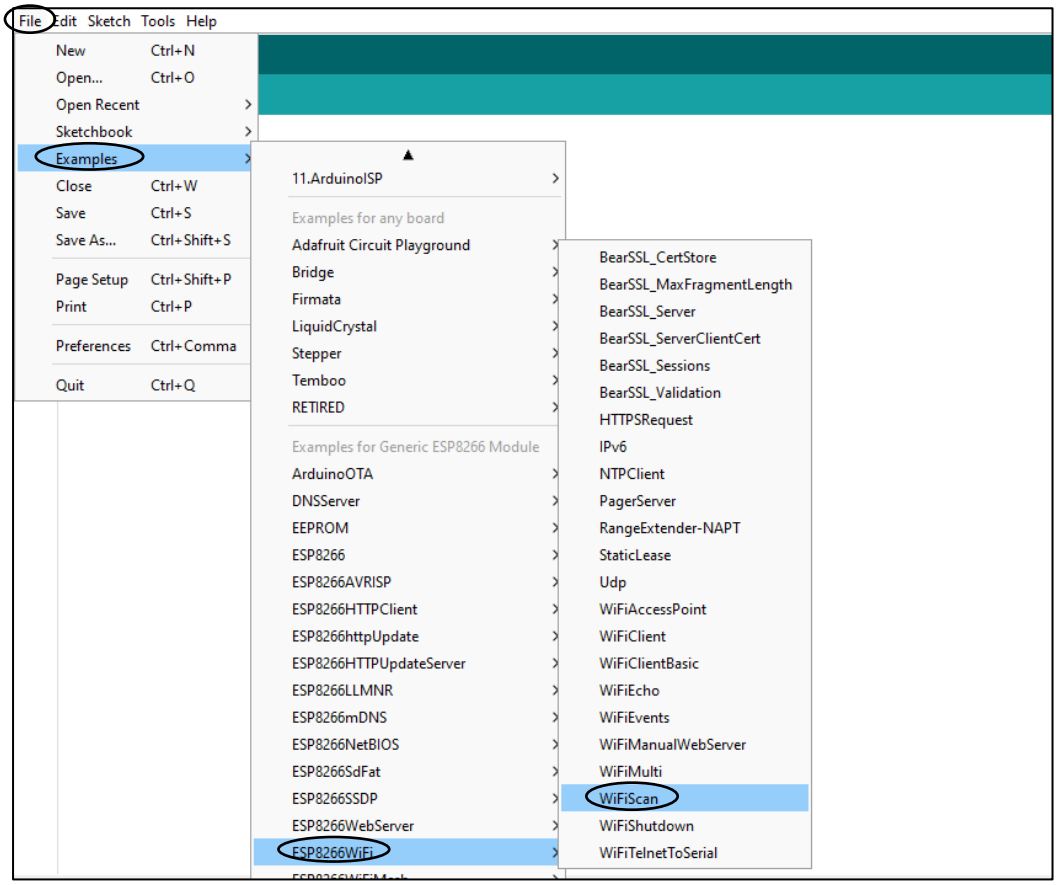
Circuit Connection Reference



Uploading Program Code to ESP8266:

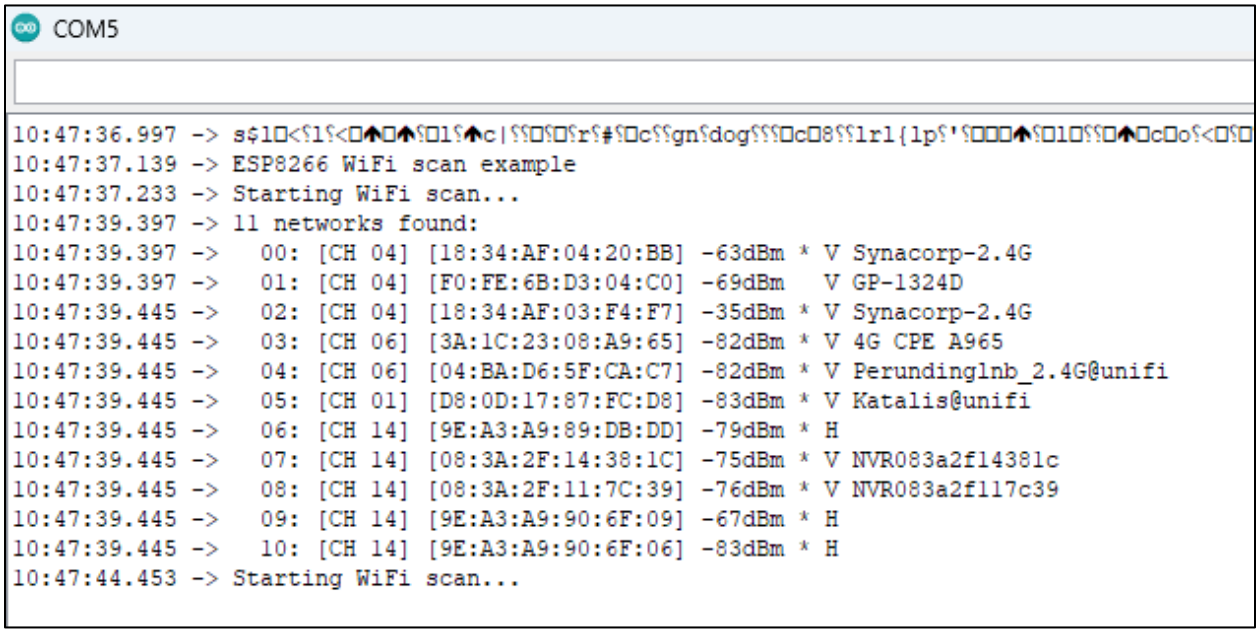
Step 1:

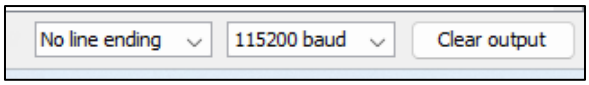
- Turn ON DIP Switch **5, 6 & 7** (Refer Operation Mode table).
- Next for setting Arduino Uno, choose **File > Examples > ESP8266 WiFi > WiFiScan** as picture below:



- Lastly, open the **Serial Monitor** to check the result as shown below

Attachments:





Discussion:

- This board combines the power of Arduino Uno's ATMega328P microcontroller with the Wi-Fi capabilities of the ESP8266 module.
- With the ESP8266 boasting 32Mb of memory, the board provides ample space for storing programs, data, and supporting larger and more complex projects.