

ESP32 Wi-Fi/Bluetooth Modules

DT Workshop Equipment Reference — D&T / STEM resource for school workshops | Electronics & Prototyping

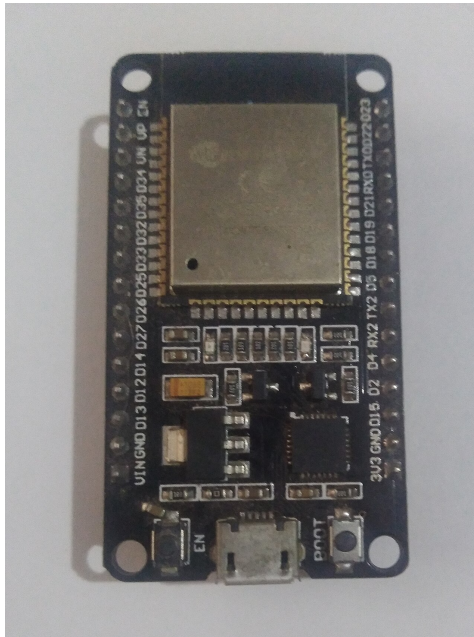


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ESP32 modules are low-cost microcontrollers with built-in Wi-Fi and Bluetooth, letting student projects connect to the internet, phones and each other. They are the standard platform for IoT, remote sensors and wireless robots in school technology programmes.

Key Features

- Dual-core processors up to 240 MHz
- Built-in 2.4 GHz Wi-Fi and Bluetooth
- GPIO with ADC, PWM and touch inputs
- Low power modes for battery projects
- Huge library and example ecosystem

Typical Uses in the Workshop

- Build IoT projects that send data to dashboards
- Wireless control of robots and lights
- Environmental sensors that log to the cloud
- Communicate with phones and other boards

Safe Operation

1. Install the board support in the IDE
2. Connect via USB and select the right port
3. Write code using the Wi-Fi and Bluetooth libraries
4. Connect to the school Wi-Fi network with credentials
5. Test the wireless link before adding complexity

SAFETY NOTES

- Keep the module within the Wi-Fi power limits
- Check the antenna area is not shorted
- Use a regulated 3.3 V supply or the board's regulator
- Do not power motors from the board pins
- Keep the module away from water and metal

Maintenance & Consumables

- Keep firmware updated
- Check USB cables are data, not charge-only
- Store boards in antistatic bags
- Keep the antenna area clean
- Label boards with their names and IPs

Specification & Buying Notes

Buy genuine or quality ESP32 dev boards with USB-C and headers. CP2102 or CH340 USB chips both work - just install the drivers. A 2-pack of boards per student covers failures.