Arduino Architecture Overview

Arduino is an open-source electronics platform used for prototyping and embedded applications. It features a microcontroller, I/O interfaces, power management, and communication modules.

Core Components:

Microcontroller (MCU): Executes code and manages operations. Common models include ATmega328P (Uno) and ESP32 (Wi-Fi boards).

Power Supply: Can be powered via USB (5V) or external source (7-12V), with onboard voltage regulators for stability.

I/O Pins: Digital and analog pins for reading signals and controlling devices, with PWM support.

Clock System: Typically a 16MHz crystal oscillator for timing accuracy.

Communication Interfaces: UART (serial), I2C (multi-device communication), and SPI (high-speed data exchange).

Memory: Flash (stores code), SRAM (temporary data), and EEPROM (persistent storage).

USB Interface: Enables programming and serial monitoring.

Reset Circuit: Allows rebooting for debugging and reprogramming.

Additional Features: Some models have built-in LEDs, voltage reference pins, and Wi-Fi/Bluetooth for IoT applications.

Conclusion: Arduino's flexible and modular design makes it ideal for both beginners and professionals in robotics, automation, and IoT. Various models cater to different project needs