

HARDWARE

COMPONENTS:

- **STM32F103C8:** ARM Cortex-M3 MCU with 12-bit ADC for sensor data acquisition and USART communication.
- **LM35 Temperature Sensor:** Analog sensor providing $10\text{mV}/^{\circ}\text{C}$ output, connected to ADC channel.
- **ACS712 Current Sensor:** Hall-effect based current sensor for AC/DC measurement with isolated output.
- **Virtual Terminal:** Serial interface at 9600 baud for real-time parameter display and logging.
- **Crystal Oscillator (8MHz):** External clock source for precise timing and ADC accuracy.
- **Filter Capacitors:** Decoupling capacitors for stable power supply and noise reduction.