

Introduction to Keil, Proteus, and Basic Program with LPC2148

✓1. Introduction to Keil μ Vision

Keil μ Vision is an Integrated Development Environment (IDE) used for writing, compiling, and debugging embedded C programs, especially for ARM-based microcontrollers.

□ Features:

- Supports ARM7, Cortex-M, 8051, and more.
 - Inbuilt compiler and debugger.
 - User-friendly interface.
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✓2. Introduction to Proteus

Proteus Design Suite is a simulation software used for designing and testing circuits without physical hardware.

□ Features:

- Simulates microcontrollers and embedded systems.
 - Visual testing of circuits using virtual components.
 - Allows HEX file loading for real-time program simulation.
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✓3. Stepwise Process: Keil + Proteus + LPC2148

□ Step 1: Install Keil μ Vision and Proteus

- Download and install Keil from <https://www.keil.com>.
 - Download and install Proteus from <https://www.labcenter.com>.
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□ Step 2: Create New Project in Keil

- Open Keil → Project → New μ Vision Project
 - Name and save your project.
 - Select Device: **NXP (Philips)** → **LPC2148**.
 - Add startup code when prompted.
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□ Step 3: Write Basic Program (LED Blinking)

```
c
CopyEdit
#include <lpc214x.h>

void delay() {
    for (int i = 0; i < 100000; i++); // Rough delay loop
}

int main() {
    IO0DIR = 0x000000FF; // Set P0.0 to P0.7 as output
    while(1) {
        IO0SET = 0x000000FF; // Turn ON LEDs
        delay();
        IO0CLR = 0x000000FF; // Turn OFF LEDs
        delay();
    }
}
```

□ Step 4: Build the Project

- Right-click Source Group → Add .c file.
 - Click Build (F7) → Check for errors.
 - Ensure **Create HEX File** is enabled in Project → Options for Target.
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□ Step 5: Simulate in Proteus

- Open Proteus → New Project → Design Schematic.
 - Add LPC2148, LEDs, resistors, oscillator (12 MHz), etc.
 - Double-click LPC2148 → Load HEX file from Keil.
 - Click **Run** → Watch LEDs blink as per your program.
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□ Step 6: Optional - Upload to Hardware

- Use **Flash Magic** software to load the HEX file to a physical LPC2148 development board.