Andhra Pradesh State Skill Development Corporation

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Embedded systems

Interfacing LED to ARM7 _ LED blinking

3. LED Blinking

Aim: To Blink a led using keil.
Software:
Keil uVision 5

Magic Flash Tool
Before getting into the project we must know few things about the led modes of operation and about the led Hex codes

Components required:
ARM7-LPC2148 Microcontroller board
Led
resistor
Breadboard
Connecting Wires
Micro USB cable

Theory: LED: A light-emitting diode (LED) is a semiconductor device that emits visible light when an electric current passes through it. The light is not particularly bright, but in most LEDs, it is monochromatic, occurring at a single wavelength. The output from an LED can range from red (at a wavelength of approximately 700 nanometers) to blue, violet (about 400 nanometers). Some LEDs emit infrared (IR) energy (830 nanometers or longer); such a device is known as an infrared-emitting diode (IRED).

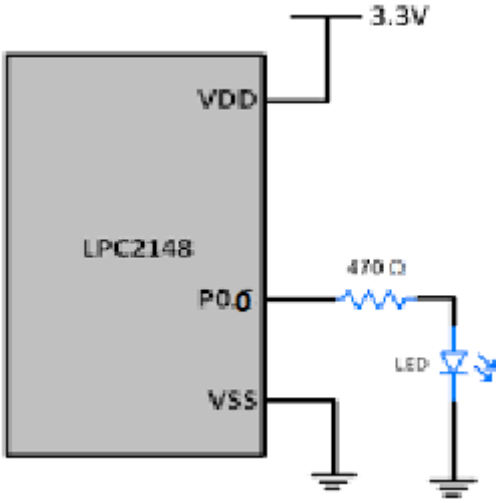
Advantages of LED's.

- Low power requirement: Most types can be operated with battery power supplies.
- High efficiency: Most of the power supplied to an LED or IRED is converted into radiation in the desired form, with minimal heat production.
- Long life: When properly installed, an LED or IRED can function for decades.

Applications:

- Indicator lights: These can be two-state (i.e., on/off), bar-graph, or alphabetic numeric readouts.
- LCD panel backlighting: Specialized white LEDs are used in flat-panel computer displays.
- Fiber optic data transmission: Ease of modulation allows wide communications bandwidth with minimal noise, resulting in high speed and accuracy.
- Remote control: Most home-entertainment "remotes" use IREDs to transmit data to the main unit.
- Optoisolator: Stages in an electronic system can be connected together without unwanted interaction.
-

Circuit Diagram:



Procedure:

- ✓ Open Keil µVision from the icon created on your desktop.
- ✓ Create a new project on Kiel with the appropriate name and destination.
- ✓ Take a new text file and write the code in a text editor.
- ✓ Save the text file with ".c "extension.
- ✓ add ".c " file to source group and check errors and warnings.
- ✓ change the target options and create a hex file.
- ✓ Now open flash magic to burn hex file into the development board.
- ✓ Connect the hardware circuit and Connect your development Board to the USB port of your computer.
- ✓ In the flash-magic window select the target device, serial port, board rate, and hex file.
- ✓ Click on the start button to burn the hex file to the development board.
- ✓ after uploading press the reset button and check the output.

Code:

```
//include header file
#include<lpc21xx.h>
//define user sub function for delay
 void delay(unsignedint);
// assign address of pin to the variable name
#define led 0x00000001
// start main function
int main(){
// initially all pins are declared as input
// above led pin change to output
IODIR0|=led;
// start continues loop
    while(1){
            //assigne 1 to pin for on led
             IOSET0|=led;
```

```
            // call delay function for delay
            delay (1000);
            // assigne 0 to pin for off the led
            IOCLR0|=led;
            // call delay function for delay
            delay (1000);
        }
    }
    void delay (unsigned int a){
        int x,y;
        for(x=0;x<a;x++)
        for(y=0;y<1000;y++);
    }
```

Result : LED blinks continuously.