



LCD custom character display using PIC18F4550

Introduction

LCDs (Liquid Crystal Displays) are used for displaying status or parameters in embedded systems.

LCD 16x2 is a 16 pin device which has 8 data pins (D0-D7) and 3 control pins (RS, RW, EN). The remaining 5 pins are for supply and backlight for the LCD.

The control pins help us configure the LCD in command mode or data mode. They also help configure read mode or write mode and also when to read or write.

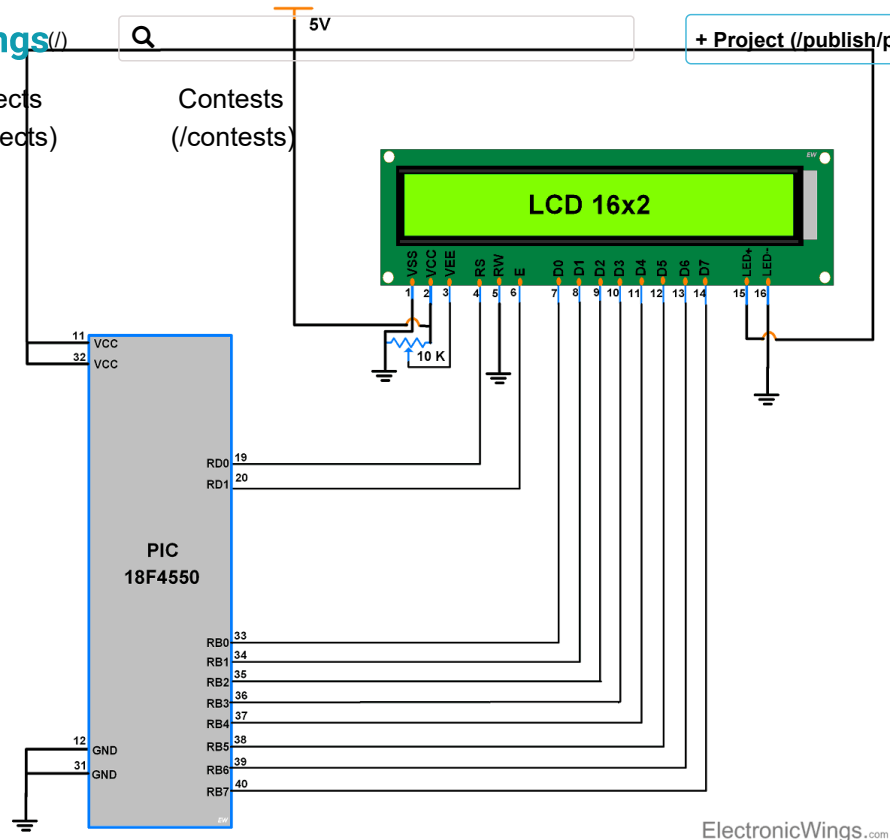
LCD 16x2 can be used in 4-bit mode or 8-bit mode depending on the requirement of the application. In order to use it we need to send certain commands to the LCD in command mode and once the LCD is configured according to our need, we can send the required data in data mode.

For more information about LCD 16x2 and how to use it, refer to the topic LCD 16x2 display module (<http://electronicwings.com/sensors-modules/lcd-16x2-display-module>) in the sensors and modules section.



LCD16x2 Custom Character

Connection Diagram LCD16x2 to PIC18F4550



Example 1

Here let's display custom characters along with their name on 16x2 LCD using PIC18F4550.

There are 5 different custom characters shown on LCD16x2.

Suppose, we decide to put “Pi” shape custom character at pattern number 1 then to store them in CGRAM following function is used.

```
void LCD_Custom_Char (unsigned char loc, unsigned char *msg)
{
    unsigned char i;
    if(loc<8)
    {
        LCD_Command (0x40 + (loc*8));    /* Command 0x40 and onwards force
        for(i=0;i<8;i++)    /* Write 8 byte for generation of 1 character */
            LCD_Char(msg[i]);
    }
}
```

The above function will be used to store the custom characters in CGRAM.

Display Custom Characters

After storing all custom characters in CGRAM, we can display it on LCD16x2.



To display custom characters, simply provide custom character number (from 0 to 7) as a data to LCD16x2.

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```
/*
 * Interfacing 16x2 LCD with PIC18F4550 to display Custom Character
 * http://www.electronicwings.com
 */

#include <pic18f4550.h>
#include "Configuration_Header_File.h" /* Header file where some configurator

#define RS LATD0 /*PORTD 0 pin is used for Register Select*/
#define EN LATD1 /*PORTD 1 pin is used for Enable*/
#define ldata LATB /*PORTB is used for transmitting data to LCD*/

void LCD_Init();
void LCD_Command(char );
void LCD_Char(char x);
void LCD_String(const char *);
void LCD_String_xy(char ,char ,const char*);
void LCD_Clear();
void MSdelay(unsigned int );
void LCD_Custom_Char(unsigned char,unsigned char*);
```

Example 2

Here generate bouncing ball animation using custom characters and display it on 16x2 LCD using PIC18F4550.

```
unsigned char character1[8] = {0x00,0x00, 0x0e, 0x1f, 0x1f, 0x0e, 0x00, 0x00}; /*
centre Ball */

unsigned char character2[8] = {0x0e, 0x1f, 0x1f, 0x0e, 0x00, 0x00,0x00,0x00}; /* top
Ball */

unsigned char character3[8] = { 0x00, 0x00,0x00,0x00,0x0e, 0x1f, 0x1f, 0x0e}; /* lower
Ball */
```

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*****Main Program*****

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void main(void)

char i;

OSCCON=0x72; /*Use Internal Oscillator with Frequency 8MHZ*/

LCD_Init(); /*Initialize 16x2 LCD*/

LCD_Custom_Char(0,character1); /*Write custom character to CGRAM (

LCD_Custom_Char(1,character2); /*Write custom character to CGRAM (

LCD_Custom_Char(2,character3); /*Write custom character to CGRAM (

while(1)

{

LCD_Clear();

LCD_Command(0x80);

LCD_Char(0);

MSdelay(250);

LCD_Clear();

LCD_Command(0xc1);

LCD_Char(1);

Components Used

MOUSER

ELECTRONICS

(https://www.mouser.in?utm_source=electronicswing&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0)

Powered By

LCD16x2 Display X 1


(https://www.mouser.com/ProductDetail/Adafruit/1447?qs=XAKIUOoRPe6AClmsjw7y7g%3D%3D&utm_source=electronicswings&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0)


Components Used

Powered By

PICKit 4 MPLAB
PICKit 4 MPLAB


X 1


 (https://www.mouser.in/ProductDetail/Microchip-Technology/PG164140?qs=r5DSvIrkXmLKDuYNJlmlWw%3D%3D&utm_source=electronicswing&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0)

 [Datasheet \(/components/pickit-4-mplab/1/datasheet\)](#)

PIC18f4550
PIC18f4550

X 1

 (https://www.mouser.in/ProductDetail/Microchip-Technology/PIC18F4550-I-P?qs=oKK8NaWdAJs8nLDXBGwMXw%3D%3D&utm_source=electronicswing&utm_medium=display&utm_campaign=mouser-componentslisting&utm_content=0x0)

 [Datasheet \(/components/pic18f4550/1/datasheet\)](#)



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PIC18F4550 LCD Custom Character Project File

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PIC18F4550 LCD Custom character Animation
Project File

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PIC18F4550 16x2 LCD Proteus Simulation File

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