AN204900

F²MC-8FX Family MB95310/370 Series 8-Bit Microcontroller LCD Library Usage API

Associated Part Family: MB95310/370 Series

This document introduces API for LCD library.

1 Introduction

This document introduces API for LCD library.

Cypress MCU MB95F310 has LCD module and it can drive LCD panel by connecting MCU SEG to panel SEG, MCU COM to panel COM.

In following sections we will describe the library of Cypress MCU MB95F310.

2 LCD Library Function List

This section introduces all functions in LCD library in project Simulate LCD EV Board.prj which uses MB95F310 as MCU.

Table 1 lists the LCD functions.

Table 1. LCD Functions

Function name	Description
void Init_LCD(void)	Initialize LCD module
void LCD_Clear(void)	Clear LCD panel display
void LCD_LigON_NUM(unsigned char Num, unsigned char Dat)	Drive LCD display number or letter

3 LCD Function Detail

This section introduces the detail of LCD functions.

3.1 Init_LCD Function

Table 2 describes Init_LCD function.

Table 2. Init_LCD Function

Function name	Initial_I2C
Function prototype	void Init_LCD(void)
Behavior description	Initialize LCD and selects external voltage drive
Input parameter	None
Return value	None
Example	Select main clock, 1/4 duty, off blink function, set pin as SEG pin: Init_LCD ();

In this function default duty is 1/4 and bias is 1/3.

3.2 LCD_Clear Function

Table 3 describes LCD_Clear function.

Table 3. LCD_Clear Function

Function prototype	void LCD_Clear(void)
Behavior description	Clear LCD panel
Input parameter	None
Return value	None
Example	Turn off all display: LCD_Clear();

3.3 LCD_LigON_NUM Function

Table 4 describes LCD_LigON_NUM function.

Table 4. LCD_LigON_NUM Function

Function name	AD_Read
Function prototype	void LCD_LigON_NUM(unsigned char Num, unsigned char Dat)
Behavior description	Drive LCD to display number or letter
Input parameter1	Num, LED position of LCD panel
Input parameter2	Dat, please refer Table 3 – 4
Return value	None
Example	Light on the first LED and display number 5: LCD_LigON_NUM(0x00,0x05);

Table 5 describes the parameter Dat.

Table 5. Parameter Dat

LED	Dat
0 6 7 8 9 10	0~0x0a, please refer to Table 3 - 5
1 2 3 4 5	0~0x24, please refer to Table 3 - 6

Table 6 describes the value of Dat for LED 0 6 7 8 9 10.

Table 6. Parameter Dat for 8-SEG

Dat	Description
0	displayed Number “0”
1	displayed Number “1”
2	displayed Number “2”
3	displayed Number “3”
4	displayed Number “4”
5	displayed Number “5”
6	displayed Number “6”
7	displayed Number “7”
8	displayed Number “8”
9	displayed Number “9”
0x0a	Closes the LED

Table 7 describes the value of Dat for LED 1 2 3 4 5.

Table 7. Parameter Dat for 16-SEG

Dat	Description
0	displayed Number “0”
1	displayed Number “1”
2	displayed Number “2”
3	displayed Number “3”
4	displayed Number “4”
5	displayed Number “5”
6	displayed Number “6”
7	displayed Number “7”
8	displayed Number “8”
9	displayed Number “9”
0x0a	displayed Number “A”
0x0b	displayed Number “B”
0x0c	displayed Number “C”
0x0d	displayed Number “D”
0x0e	displayed Number “E”
0x0f	displayed Number “F”
0x10	displayed Number “G”
0x11	displayed Number “H”
0x12	displayed Number “I”
0x13	displayed Number “J”
0x14	displayed Number “K”
0x15	displayed Number “L”
0x16	displayed Number “M”
0x17	displayed Number “N”
0x18	displayed Number “O”
0x19	displayed Number “P”
0x1a	displayed Number “Q”
0x1b	displayed Number “R”
0x1c	displayed Number “S”
0x1d	displayed Number “T”
0x1e	displayed Number “U”
0x1f	displayed Number “V”
0x20	displayed Number “W”
0x21	displayed Number “X”
0x22	displayed Number “Y”
0x23	displayed Number “Z”
0x24	Closes the LED

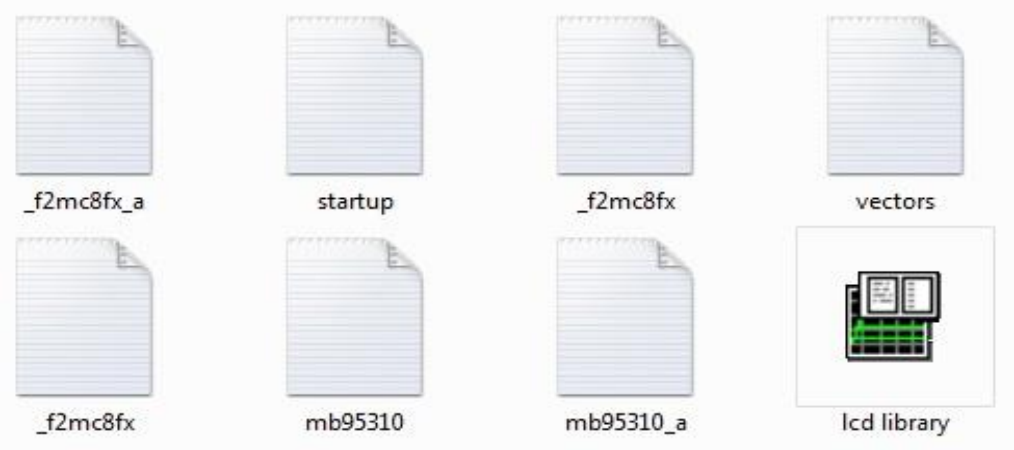
4 Usage Demo

This section describes the steps of how to use this library and some usage attention.

4.1 Steps of Using MB95F310 LCD Library

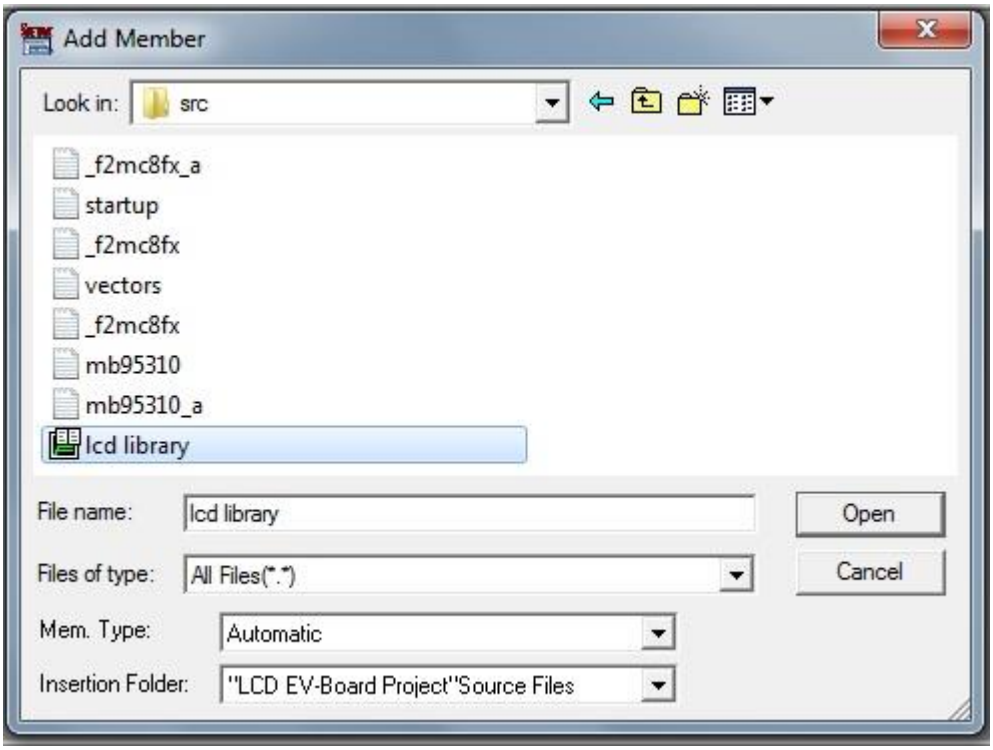
- First step is adding LCD library to project document, Figure 1 is a sample for adding this library.

Figure 1. First Step of Using LCD Library



- Second step is adding LCD library to project, Figure 2 is a sample for this work.

Figure 2. Second Step of Using LCD Library



- Third step is using the LCD library, for detailed library please refer to Table 1.

  Figure 3 is an example for library use.

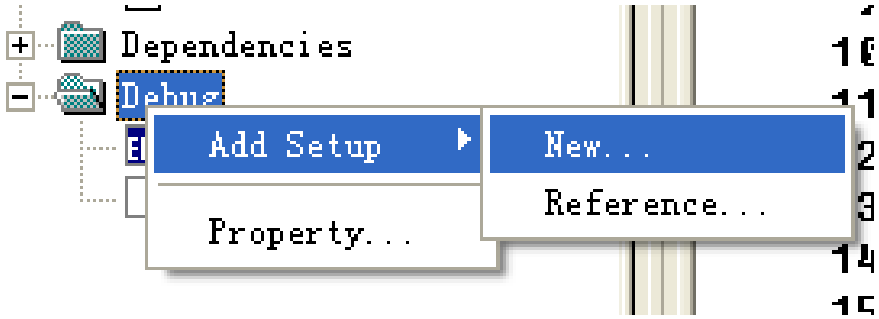
Figure 3. Usage of LCD

```
LCD_Init();
LCD_Clear();
while(1)
{
    LCD_LigON_NUM(0,0);      //display data "0"
    LCD_LigON_NUM(1,0x0b);   //display letter "b"
    LCD_LigON_NUM(2,0x0a);   //display letter "a"
    LCD_LigON_NUM(3,0x1c);   //display letter "s"
    LCD_LigON_NUM(4,0x12);   //display letter "i"
    LCD_LigON_NUM(5,0x0c);   //display letter "c"
    LCD_LigON_NUM(6,0x01);   //display data "1"
    LCD_LigON_NUM(7,0x02);   //display data "2"
    LCD_LigON_NUM(8,0x03);   //display data "3"
    LCD_LigON_NUM(9,0x04);   //display data "4"
    LCD_LigON_NUM(0x0a,0x05);    //display data "5"
}
```

- Fourth step is debugging,

  User needs to add debug document. Figure 4 is an example for creating serial interface debug document.

Figure 4. Step of Setting Debug Environment



For detailed debug information please refer to 5. Debugging.

5 Debugging

This section describes how to debug the sample code lcd_library.prj on EV-Board and what will happen when the code is running.

Attachment is the sample project lcd_library.prj.

This project is based on our EV-Board MB2146-450-E and the target MCU is MB95F310.

Figure 5 is a debugging picture.

Figure 5. Debugging Operation

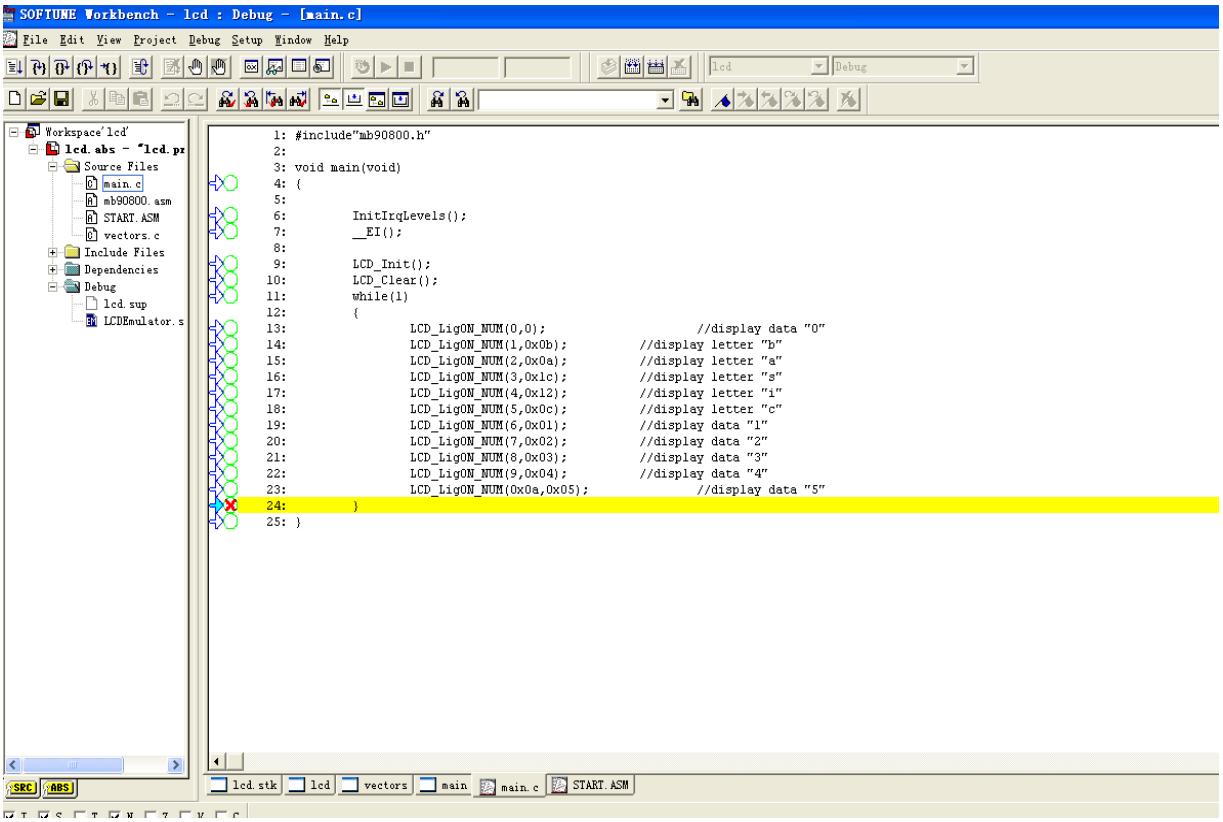


Figure 6 is the result of the running program which shows “0BASIC12345”.

Figure 6. Running Result

6 Additional Information

For more information about how to use MB95310 EV-board, BGM Adaptor and SOFTUNE, please refer to EV-Board MB2146-450-E User Manual, or visit Website:

http://www.cypress.com/documentation/application-notes/mb95310370-mb2146-450-e-lcd-evb-user-manual

Document History

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Revision	ECN	Orig. of Change	Submission Date	Description of Change
**	-	HUAL	01/04/2010	Original version
*A	5245028	HUAL	06/23/2016	Migrated Spansion Application Note MCU-AN- 500065-E-10 to Cypress format.
*B	5844481	MALI	08/04/2017	Updated logo and copyright

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