

USER MANUAL

FOR WRITING TEXT ON LCD MODULE ON SBC51 (designed by Prof. Wichit Sirichote), BY USING FUNCTIONS LIBRARY “SBC51.LIB”.

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The zip file contains the following files.

- A. This user manual **User Manual.pdf**.
- B. The Library file **sbc51.lib**. (which should be place in the folder (C:\keil\c51\lib\)
- C. The header file **sbc51.h**. (which should be placed in the folder C:\keil\c51\inc\).
- D. The **schematic.pdf** file, (in which I have shown the interfacing of LCD module with 8051 micro controller, if someone wants to use this library without SBC51).
- E. Example Program **test.c**.

The library contains the following functions for writing text on LCD Module header file provides c51 functions for controlling HD44780 based LCD modules using 8051 micro controller, using the KEIL micro Vision2 IDE.the LCD module should be interfaced as shown in the schematics file.

Any C51 program may use these functions by just including this header file. These functions help the programmer to execute following tasks:

1. LCD can be initialize

Using InitLCD() function

2. Print text on the LCD

Using WriteLCD() and WriteData() functions

3. Print characters or strings at user specified locations

Using LocateLCD() function

4. Scroll the displayed text at different speeds and in different directions

using ScrollLCD() function

5. Delay of different durations can also be produced,

using delay() function

- 6.Serial port can be initialized by using the

InitSerial() function in 9600,8n1 mode.

The use of some of these functions is described below

InitLCD function

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Always used as

InitLCD();

It initializes the LCD into eight bit data transfer and two line display mode, clears the LCD by writing space to all addresses and returns the cursor to the home position (i.e line 1, position 1).

### **WriteLCD function**

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Input : A null terminated (i.e. with appended \0) string in double quotes.

No Return Value

Output : Prints the string on LCD starting at current cursor location

Example : WriteLCD("Welcome to CAE\0");

NOTE : FOR STANDARD 'C' STRING FORMATTING USING sprintf FUNCTION BY

INCLUDING 'stdio.h' IN YOUR CODE

Example :

char buffer[10];

int Integer = 10;

float Decimal = 4.43;

sprintf(buffer,"Sum = %d, Quotient = %f\0", Integer, Decimal)

WriteLCD(buffer);

Note that null termination (\0) of the string has been catered for.

WriteData() function

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Input : Single character in single quotes or ASCII code without quotes.

No Return Value

Output : Prints the given character at current cursor location

Examples :

WriteData ('A');

PutCharLCD(0x41);

both print the character 'A' on the lcd screen

### **ScrollLCD function**

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Inputs :

1. Direction ('r', 'l' for right and left respectively)
2. Speed ('f', 'm', 's' for fast, medium and slow respectively)
3. No of repetitions (integer)

Output : Scrolls the displayed data according to the abovementioned inputs.

Example :

```
ScrollLCD('r','f',3);
```

Scrolls the LCD 3 times towards the right at fast speed.

LocateLCD function

Inputs:

1. Line no. (1 or 2)
2. Position (1 to 40 while only 1-16 are visible. Rest must be scrolled for viewing)

Output:

Takes the cursor to the specified location

Examples :

```
LocateLCD (1,5);
```

```
PutCharLCD ('u');
```

prints the character u at line 1 position 5.

whereas,

```
LocateLCD (2,3);
```

```
PrintLCD("CAE\0");
```

prints 'CAE' starting from position 3 on line 2.

delay() function

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this function can be used to generate the delay of different durations,  
and 1 is equal to 1 milli second,  
for example:

```
delay(1000); //this will generate delay of 1000 msec or 1 second,
```

Suggestions for further development:

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1. A controlled 'Highlighting' function is needed for such application as Highlighting selected text on the LCD.
  2. A 'Vertical Scroll' function for paragraph display may also be developed
- It is requested that any further improvements in this software should be brought to the notice of the developer before the release of a newer version is considered.

Instructions for Distribution

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Distribution of LCD manufacturer's application notes and data sheets along with this C51 function library is recommended as it will greatly benefit the user.