USB Display 40x16 Backlit - V1.0

Guide

The Mirrorbow USB Display is a 40x16 character backlit LCD that is interfaced over USB. The USB drivers provided, allow the USB display to appear as a simple serial comms port, thus ensuring that software interfacing at the host is straightforward. Use of this display does not require any USB programming knowledge or Windows DDK understanding!

The display is controlled via simple commands that allow text to be positioned etc. Software examples are provided in Visual C++ that demonstrate both how to send simple messages and how to implement full scrolling.

Warning: *As with any bare electronics It is wise to take static precautions when handling this board. Overloading IO outputs or exceeding 5V on inputs may cause permanent damage to the board. The maximum loading for any single output is 10mA, however total loading on all IO pins must not exceed 100mA. The 5V supply provided on the board is the USB supply, care must be taken not to exceed the available USB power which on a desktop PC is usually at least 400mA, but on a laptop may be much less.*

Compatible with Windows 2000 and Windows XP

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Installation

Put the CD supplied in your PC's drive, then plug in the Mirrorbow USB Display board using a standard USB cable (not supplied). Windows will recognise the new device and prompt for a driver. Select the Mirrorbow CD using browse, and then hit next. Windows will then install the required driver.

Simple Commands and Testing

After installation above, go to My Computer and View System Information (top left in winxp, or right click MyComputer in win2k). Select the Hardware tab, and the push the button marked "Device Manager". This will show a list of the devices on your system. Scroll down to "Ports (COM & LPT)" and click on the + to open the folder. You should now see the USB Display. Note the COM port allocated to the Mirrorbow USB Display board as you will need this later.

Command Set:

Command	Description
Any text without "\"	All text sent to the display will appear except the chr "\" which is for control codes. See below for full ASCII character set of the display
\plcc	Places the cursor at the position specified where l=line number (0,1,2,3,4,5,6,7,8,9,A,B,C,D,E,F) where 0 is the top line and F the bottom, cc is column (decimal 0-39) e.g. \p310 places the cursor at the 4th line (1st line is 0) & 11th character (1st char is 0)

\dx (sends data)
\cx (sends command)
	Allows specific display function control codes to be sent, see software examples for more information. NOTE the x in \dx is a byte value between 0 and FF. This allows direct control of the display controller for maximum flexibility. From software example
	`result = WriteString("\\d\x000",3);`
	`result = WriteString("\\d\x000",3);`
	`result = WriteString("\\c\x024",3);`
	sets the cursor to the top left corner
	This is a more complicated way of communicating with the display, and requires understanding of the software example and the datasheet for the display controller.

Byte sequence,
0xFF,0x00,0xFF,'O'
,0xcc
	This sequence shows commands that access the 8 bit IO capabilities of the board. This can be used to add keys, etc. Example…
	`WriteString("\x0FF\x000\x0FF",3);`
	`WriteString("D00",3);`
	D00 sets the direction to all outputs, DFF would be all inputs.
	OAA outputs hex hex value 0xAA (O for OUT) and I results in two characters being received which are equivalent to the hex value read from the ports.

Formatting commands: Note the commands always start with a backslash "\" and there are no spaces.

Simple test using Windows HyperTerminal: For this simple test open windows Hyperterminal (Windows, applications, communiations, HyperTerminal). Choose the COM port of the Mirrorbow USB Display Board, and select 115200,N,8,1. Then under ASCII options click "send LF" and "Echo". You are now ready for testing.

(A full explanation of the use of HyperTerminal is out of scope for this guide).

Now anything you type should appear on the display.

Now type:
Hello World!

Now type:
\p304line 3 col 4

You will see “line 3 col 4” appear on the 4th line (lines are numbered 0 to F) at the 5th column (columns are numbered 0 to 39).

Host Software

An example of host software is provided on the accompanying disk. It is currently setup to use COM5 so must be changed to reflect the COM port the Mirrowbow USB Display appears in your system.

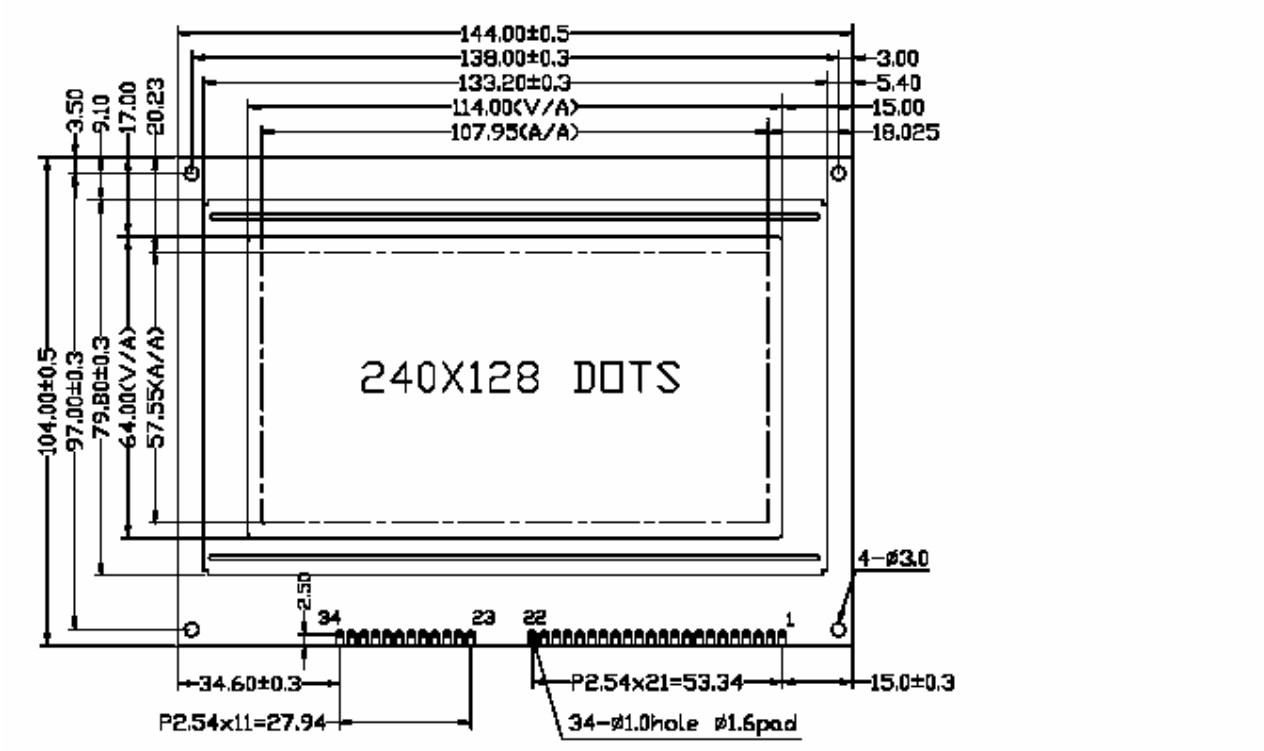
The software is documented, please refer to the code for more information.
The example provided demonstrates scrolling and simple text output. There are also two routines that by default are commented out, called graphicsdemo() and attributemodedemo(); These are a more complicated way of interfacing with the display.

Graphicsdemo() called the graphics mode initialisation and demonstrates writing some very simple graphics.

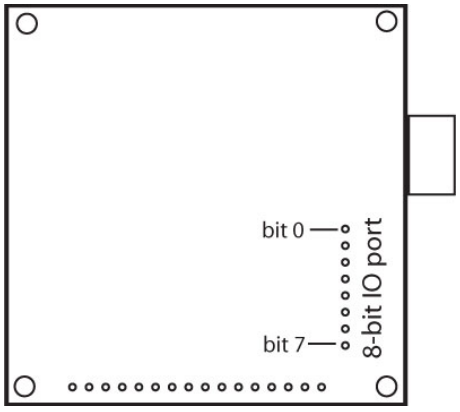
Attributemodedemo() uses a mode that allows you to do flashing and reverse text. It also include a demonstration of user defined characters.

Display Technical Data

Please note: The information provided below is for reference only. The connector shown is connected to the Mirrorbow USB interface board. The only interface required by the user is USB.



IO Port shown from back of unit



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