
USB Display 4x20 Backlit - V1.0

Guide

The Mirrorbow USB Display is a 20x4 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, Windows XP and Vista32bit

Mirrorbow
Electronics

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 IO Comms Port". Note the COM port allocated 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 (1-4), cc is column (0-19) e.g. \p310 places the cursor at the 3 rd line and 11 th character (1 st char is 0)
\dxy	Allows specific display function control codes to be sent, see software examples for more information. This allows direct control of the display controller for maximum flexibility. From software example <pre>result = WriteString("\d\x001", 3); Sleep(5); clears the display.</pre>

Please note: By default the cursor is turned off, so on initial power up the display will be blank until characters are send to it. See the software example for scrolling and turncursoron() routine for information on how to turn the cursor on.

The table to the right shows the standard ASCII character set of the display.

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

Upper 4 bits Lower 4 bits	0	1	2	3	4	5	6	7	11
0000	CG RAM (1)			0	a	P	`	P	
0001	CG RAM (2)		!	1	A	Q	a	q	
0010	CG RAM (3)		"	2	B	R	b	r	
0011	CG RAM (4)		#	3	C	S	c	s	
0100	CG RAM (5)		\$	4	D	T	d	t	
0101	CG RAM (6)		%	5	E	U	e	u	
0110	CG RAM (7)		&	6	F	V	f	v	
0111	CG RAM (8)		'	7	G	W	g	w	
1000	CG RAM (1)		(	8	H	X	h	x	
1001	CG RAM (2)		)	9	I	Y	i	y	
1010	CG RAM (3)		*	:	J	Z	j	z	
1011	CG RAM (4)		+	;	K	[	k	[
1100	CG RAM (5)		,	<	L	¥	l	l	
1101	CG RAM (6)		-	=	M	]	m]	
1110	CG RAM (7)		.	>	N	^	n	^	
1111	CG RAM (8)		/	?	O	_	o	_	

Simple test using Windows HyperTerminal: For this simple test open windows Hyperterminal (Windows, applications, communications, HyperTerminal). Choose the COM port of the Mirrowbow 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 3rd line at the 5th column (columns are numbered 0 to 19).

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.

USB display simple - example 1:
This demonstrates writing text to the display using \p positioning commands

USB Display - Scroll Example
Demonstrates scrolling of the display. A message is continually scrolled on the LCD display.

USB Display – User Defined chrs
Shows how to program your own 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.

The dimensions of the whole unit are as below except that the Mirrorbow USB interface board increases the total depth (dimension A) to 30mm.

EXTERNAL DIMENSIONS AND DISPLAY PATTERN

