

Electronics Solutions

Components

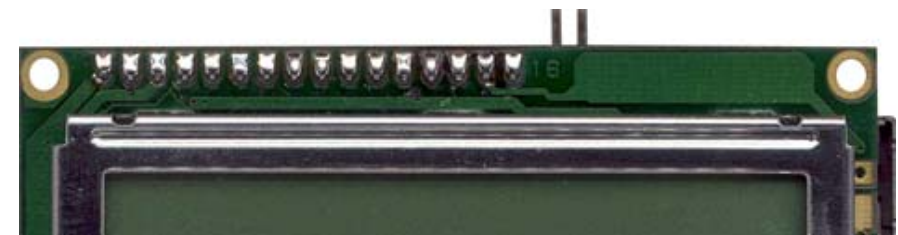
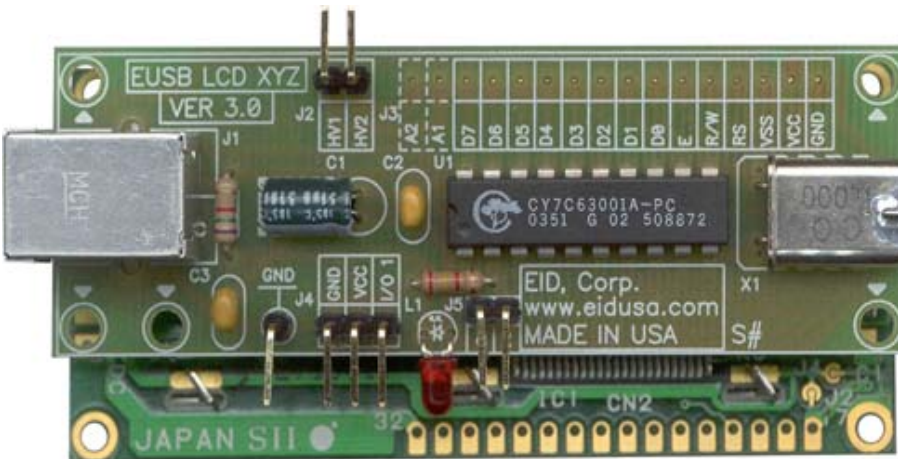
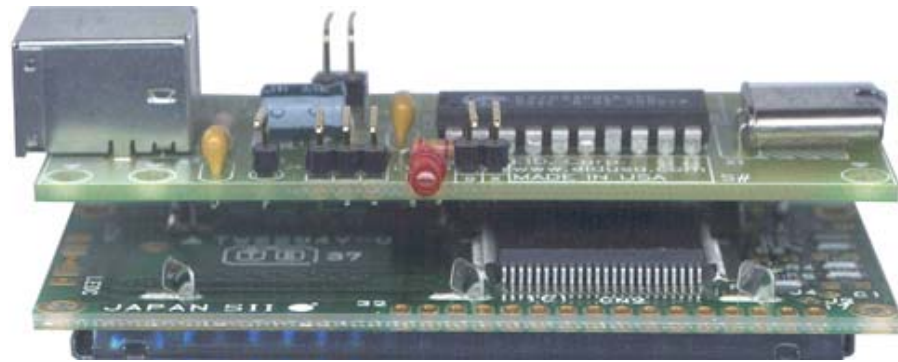
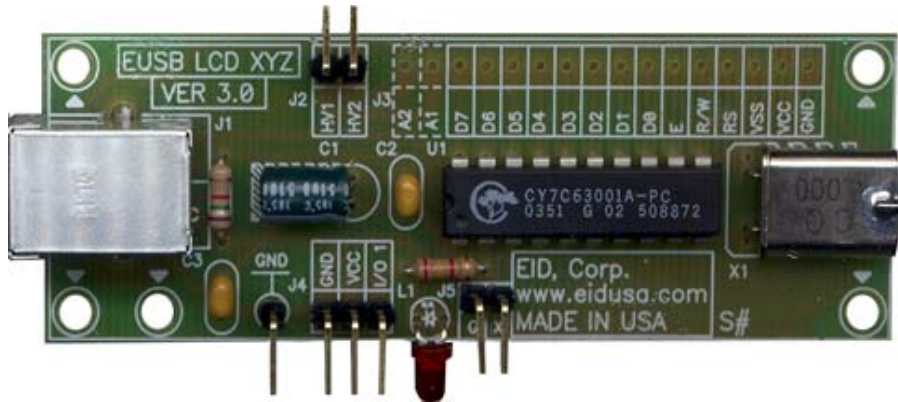
ASICs

PCB

Kits

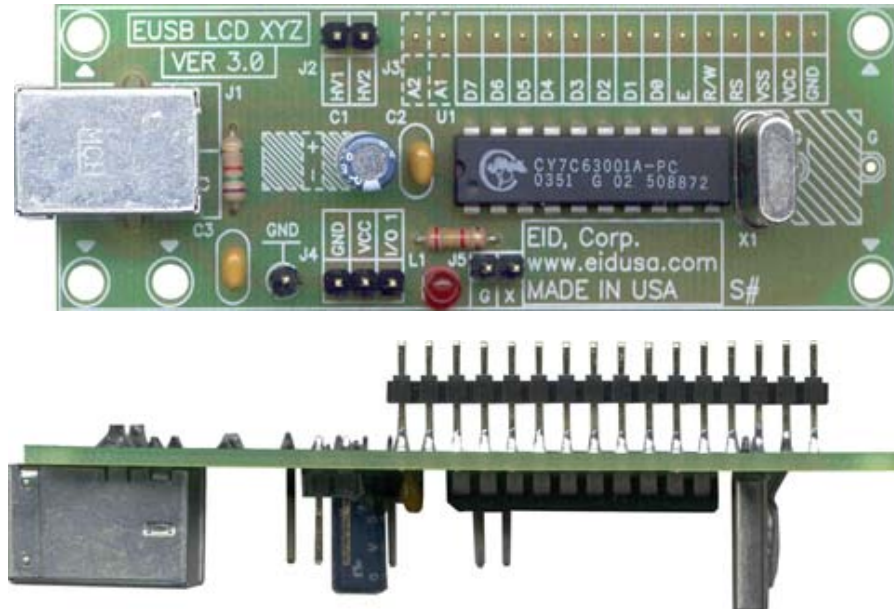
EUSB LCD

The **Liquid Crystal Display (LCD)** via EID's universal serial bus (EUSB) kit is an educational electronics kit. It allows you to control LCD directly from your personal computer (PC) via universal serial bus.

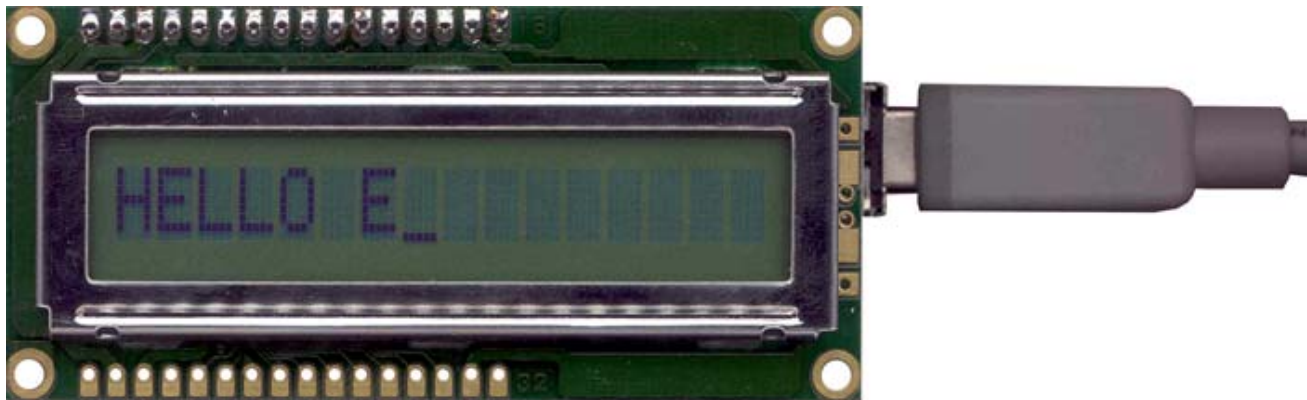




Shown above assembly flat (90 Deg. pins, Xtal and Cap). LCD sold separately.



Shown above standard configuration



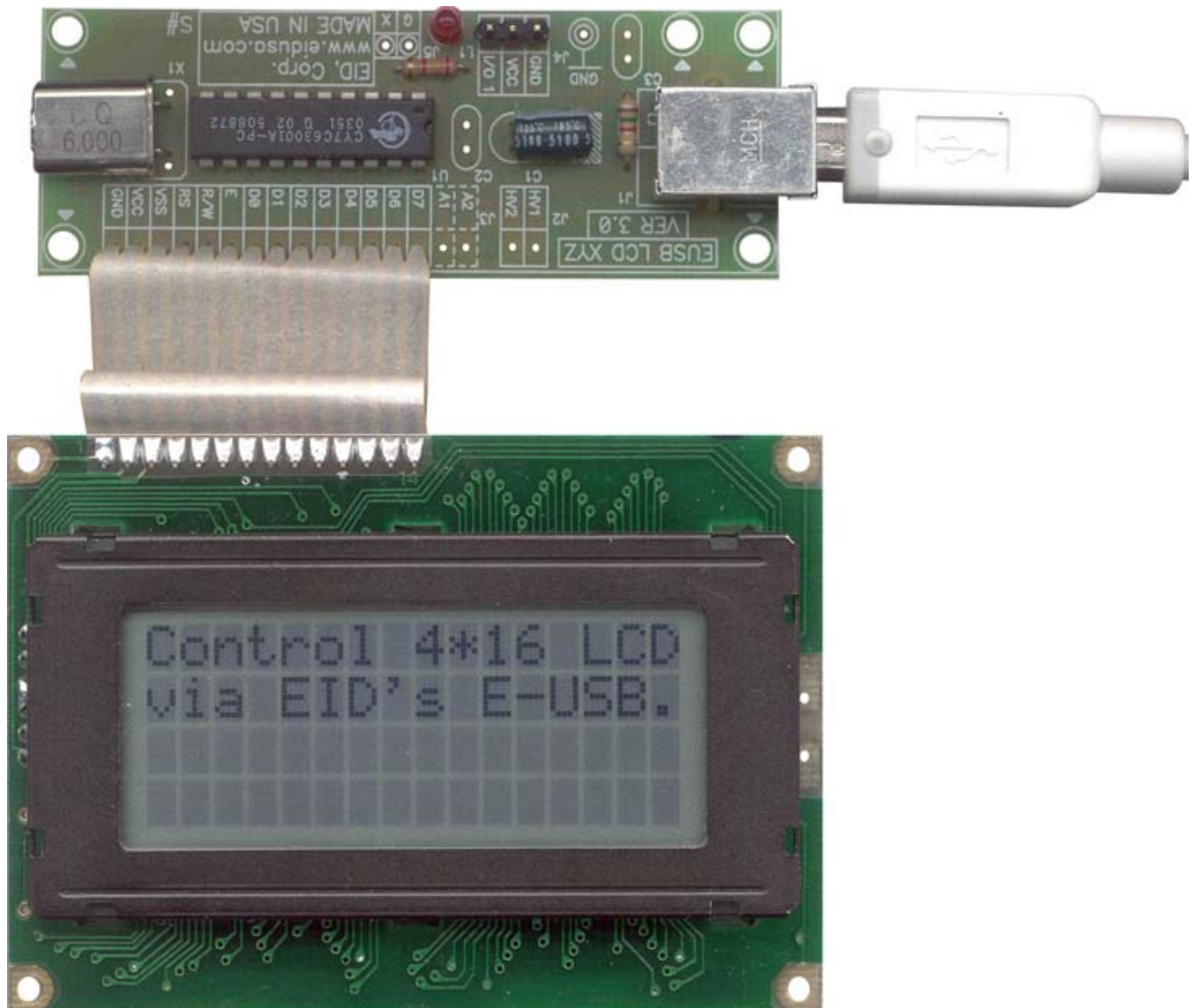
Few lines of code--HELLO E_...

* No need for external Power supply! The board and the LCD are powered directly from your PC.





Shown above connected to 2-lines * 16-characters LCD



Shown above connected to 4-lines * 16-characters LCD via flex-cable

* Please be advised that LCD and flex-cable are sold separately.

Kit Includes

- | | | |
|-------------|--------------------------|------|
| • CY7C63001 | IC | 1pc. |
| • 7.5K Ohms | Resistor | 1pc. |
| • 2.4K Ohms | Resistor | 1pc. |

- 0.1MF [Capacitor](#) 2pc. (option)
- 14 Pins Molex [Connector](#) 1pc.
- 1 Pins Molex [Connector](#) 1pc.
- 2 Pins Molex [Connector](#) 1pc. (option)
- 3 Pins Molex [Connector](#) 1pc.
- 4.7MF [Capacitor](#) 1pc.
- Red LED [LED](#) 1pc.
- USB Connector 1pc.
- Crystal 6MZ 1pc.
- LCD See options.
- PCB 1pc.

Character Type Liquid Crystal Display (LCD) Modules Features

1. 5x8 dot matrix
2. Built-in controller (KS0066 or equivalent)
3. +5V or +3.3V power supply
4. 1/16 duty cycle
5. 8-bit parallel interface

Kit Interface pin Connections information

LCD 16 pins (14 I/O + 2 for Back-light)

No.	Symbol	Function	CY7C63001A No.	Symbol
1	VSS	Ground	7 & 8	VSS & VPP
2	VDD	Power supply	12	VCC
3	VO	Contrast adjust	12	VCC
4	RS	Register select	4	PO.1
5	R/W	Read / Write	3	PO.2
6	E	Enable signal	4	PO.3
7	DB0	Data bus	5	P1.0
8	DB1	Data bus	6	P1.2
9	DB2	Data bus	15	P1.3
10	DB3	Data bus	16	P1.1
11	DB4	Data bus	17	PO.7
12	DB5	Data bus	18	PO.6
13	DB6	Data bus	19	PO.5
14	DB7	Data bus	20	PO.4

Back-light

No.	Symbol	Function	J2 Pins	Symbol
15	K	Backlight (-)	1	HV1
16	A	Backlight (+)	2	HV2

J4 & J5 I/O or Power indication or LED control:

*** For power indication G short to X

No.	Symbol	Function	CY7C63001A No	Symbol
G	VSS	Ground	7 & 8	GND
X	I/O 1'	I/O	1	PO.0 via 2.4K resistor to I/O1

LCD Character Address Code

Display position	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
Display DDRAM address	00	01	02	03	04	05	06	07	40	41	42	43	44	45	46	47

Code Instruction Set for Character Type LCD Modules

Instruction	Code										Description
	RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0	
Clear display	0	0	0	0	0	0	0	0	0	1	Clear display and return the cursor to home position (Address 0). Sets I/D=1 of Entry Mode
Return home	0	0	0	0	0	0	0	0	1	*	Return the cursor to the home position (Address 0). Also return the display being shifted to the original position. DD RAM contents remain unchanged. Set DD RAM addresses to zero.
Entry mode set	0	0	0	0	0	0	0	0	I/D	S	Set the cursor move direction and specifies or not to shift the display. These operations are performed during data write and read of DD RAM/CG RAM. For normal operation, set S to 0.
Display On/Off control	0	0	0	0	0	0	1	D	C	B	Set On/Off all display (D), cursor On/Off (C), and blink of cursor position character (B)
Cursor of display shift	0	0	0	0	0	1	S/C	R/L	*	*	Move the cursor and shift the display without changing DD RAM contents
Function set	0	0	0	0	1	DL	N	F	*	*	Set interface data length (DL), number of display lines (N) and character font (F)
Set the CG RAM address	0	0	0	1	MSB			ACG		LSB	Set the CG RAM address. CG RAM data is sent and received after this setting
Set the DD RAM address	0	0	1	MSB			ADD		LSB	Set the DD RAM address. DD RAM data is sent and received after this setting	
Read busy flag & address	0	1	MSB			AC		LSB	Read Busy flag (BF) indicating internal operation is being performed and read address counter contents		
Write data to CG or DD RAM	1	0	MSB			LSB			Write data into DD RAM or CG RAM		
Read data from CG or DD RAM	1	1	MSB			LSB			Read data from DD RAM or CG RAM		

S=1 : accompanies display shift when data is written for normal operation set to 0

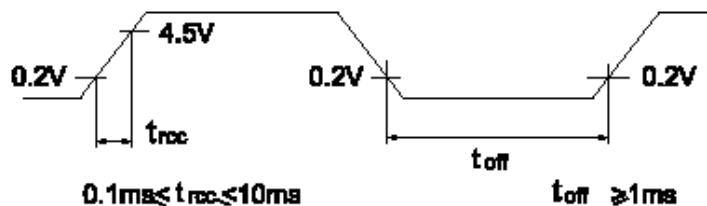
DD RAM : Display Data RAM

I/D = 1 : Increment	DL = 1 : 8 bits	CG RAM : Character Generator RAM
I/D = 0: Decrement	DL = 0: 4 bits	ACG : CG RAM Address
S/C = 1 : Display shift	N = 1 : 2 (1) line	ADD : DD RAM Address corresponds to cursor address
S/C = 0: Cursor move	N = 0 : 1 line	AC : Address Counter used for both DD and CG RAM addresses
R/L = 1 : Shift to the right	F = 1 : 5x10 dots	B : 1 = On, 0= Off (Blinking cursor)
R/L = 0: Shift to the left	F = 0: 5x7 dots	C : 1 = On, 0= Off (Cursor)
BF = 1 : Internally operating		D : 1 = On, 0= Off (Display)
BF = 0: Can accept instruction		*= Don't care

* The module automatically performed initialization when powered on (using internal reset circuit). The following instructions are executed during initialization:

1 Clear Display	The Busy Flag in the buisy state (BF = 1) unit initialization ends. The time is 15 ms.
2 Function Set	DL = 1 : 8 bits long interface data N = 0: 1 Line display
3 Display On/Off Control	D = 0: Display OFF C = 0: Cursor OFF B = 0: Blink OFF
4 Entry mode Set	I/D = 1 : +1(INCREMENT) S = 0: NO SHIFT
5 DD RAM is Selected	Power On Initialization depends on rise time of the supply when it is turned on. The following time relationship must be satisfied.

Item	Symbol	Standard			Unit
		Min	Typ	Max	
Power Supply Rise Time	t _{rec}	0.1	-	1.0	ms
Power Supply Off Time	t _{off}	1.0	-	-	ms



Power On Timing Diagram

Note: When the above power supply condition is not satisfied, the internal reset circuitry does not operate correctly. In this case perform the needed initialization by sending function set instructions thrice from MPU after turning the power on. For example, to designate an 8-bit data length, set the following instructions thrice.

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
0	0	0	0	1	1	*	*	*	*
0	0	0	0	1	1	*	*	*	*

0	0	0	0	1	1	*	*	*	*
---	---	---	---	---	---	---	---	---	---

Character Type LCD Modules Initialization For 8 bit data interfacing

Power On

Wait for 15ms or more after Vcc rises to 4.5v Please be advised that BF cannot be checked at this time

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
0	0	0	0	1	1	X	X	X	X

Function set :

DL = 1, 8 bit interface data

DL must be set at H during this initialization

Wait for 4.1ms or more Please be advised that BF cannot be checked at this time

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
0	0	0	0	1	1	X	X	X	X

Function set :

DL = 1, 8 bit interface data

DL must be set at H during this initialization

Wait for 100us or more

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
0	0	0	0	1	1	X	X	X	X

Function set :

DL = 1, 8 bit interface data

DL must be set at H during this initialization

BF cannot be checked at this time, check for not busy

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
0	0	0	0	1	1	N	F	X	X

Function set :

DL = 1, 8 bit interface data

DL must be set at H during this initialization

check for not busy

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
0	0	0	0	0	0	1	0	0	0

Display off

check for not busy

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
0	0	0	0	0	0	0	0	0	1

Clears all display and returns cursor to home position

check for not busy

RS	R/W	DB7	DB6	DB5	DB4	DB3	DB2	DB1	DB0
0	0	0	0	0	0	0	1	I/D	S

Set the shift mode

End of Initialization

Character Type LCD Modules Initialization For 4 bit data interfacing

Power On

Wait for 15ms or more after Vcc rises to 4.5v. Please be advised that BF cannot be checked at this time

RS	R/W	DB7	DB6	DB5	DB4
0	0	0	0	1	1

Function set :

DL = 1, 8 bit interface data

DL must be set at H during this initialization

Wait for 4.1ms or more. Please be advised that BF cannot be

RS	R/W	DB7	DB6	DB5	DB4
0	0	0	0	1	1

Function set :

DL = 1, 8 bit interface data

DL must be set at H during this initialization

Wait for 100us or more Please be advised that BF cannot be

RS	R/W	DB7	DB6	DB5	DB4
0	0	0	0	1	1

Function set :

DL = 1, 8 bit interface data

DL must be set at H during this initialization

check for not busy

RS	R/W	DB7	DB6	DB5	DB4
0	0	0	0	1	0

Function set :

DL = 0, 4 bit interface data

check for not busy

RS	R/W	DB7	DB6	DB5	DB4
0	0	0	0	1	1

Function set :

DL = 1, 8 bit interface data

DL must be set at H during this initialization

check for not busy

RS	R/W	DB7	DB6	DB5	DB4
0	0	0	0	1	0
0	0	N	F	X	X

Function set :

DL = 0, 4 bit interface data

N = No. of lines

F = character font

check for not busy

RS	R/W	DB7	DB6	DB5	DB4
0	0	0	0	0	0
0	0	1	0	0	0

Display off

check for not busy

RS	R/W	DB7	DB6	DB5	DB4
0	0	0	0	0	0
0	0	0	0	0	1

Display on

Check for not busy

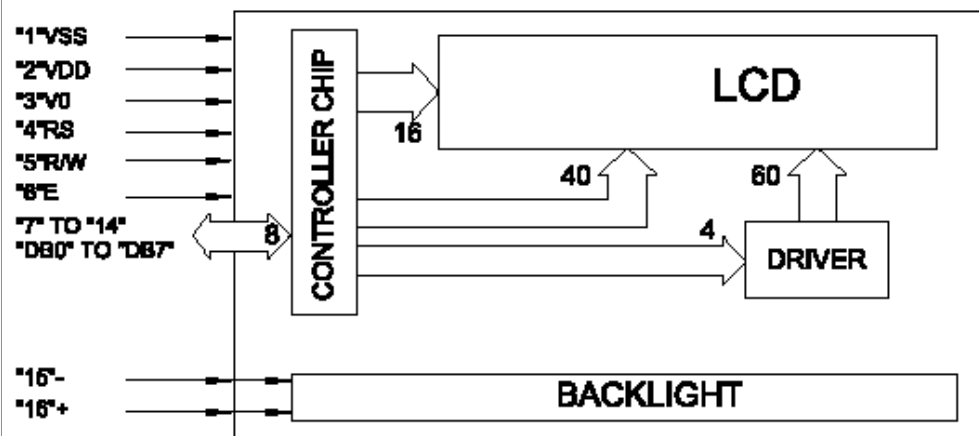
RS	R/W	DB7	DB6	DB5	DB4
0	0	0	0	0	0
0	0	0	1	I/D	S

Entry mode set

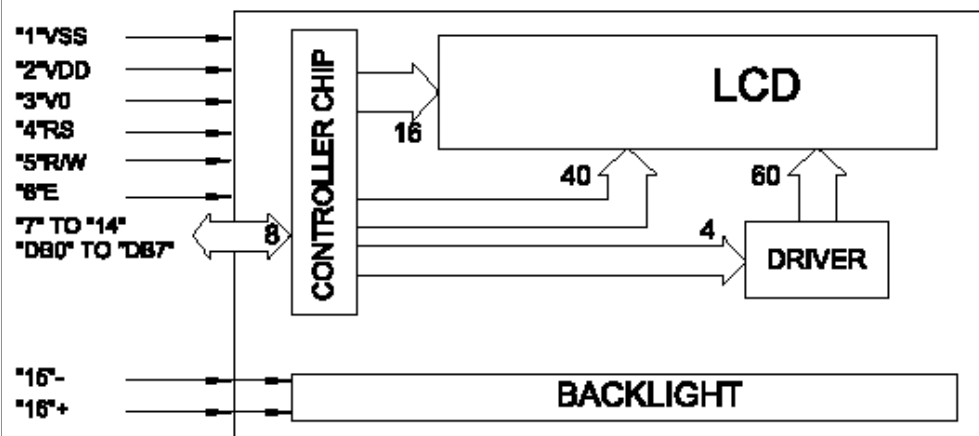
End of Initialization

Typical Character Type LCD Modules Block Diagrams

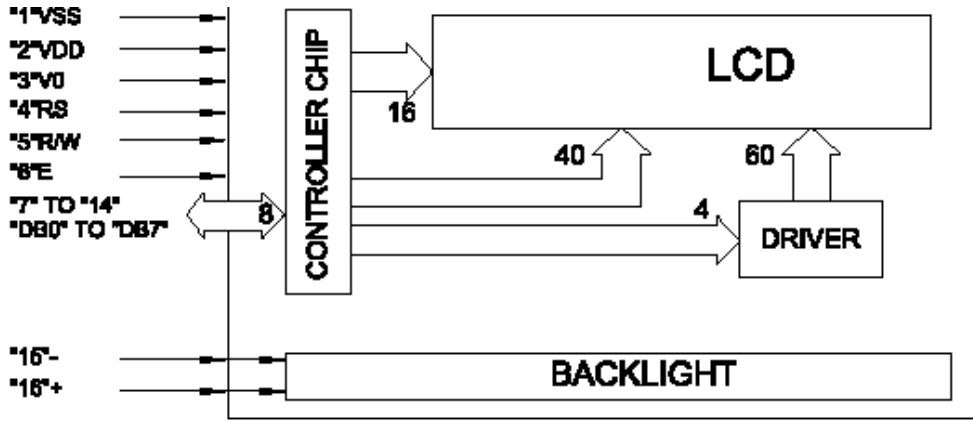
16x1 DMM, 1/16 MUX



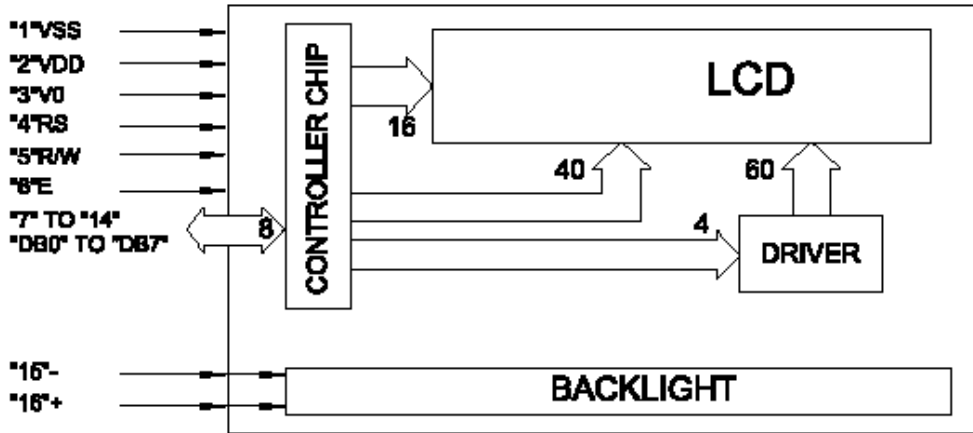
16x2 DMM, 1/16 MUX



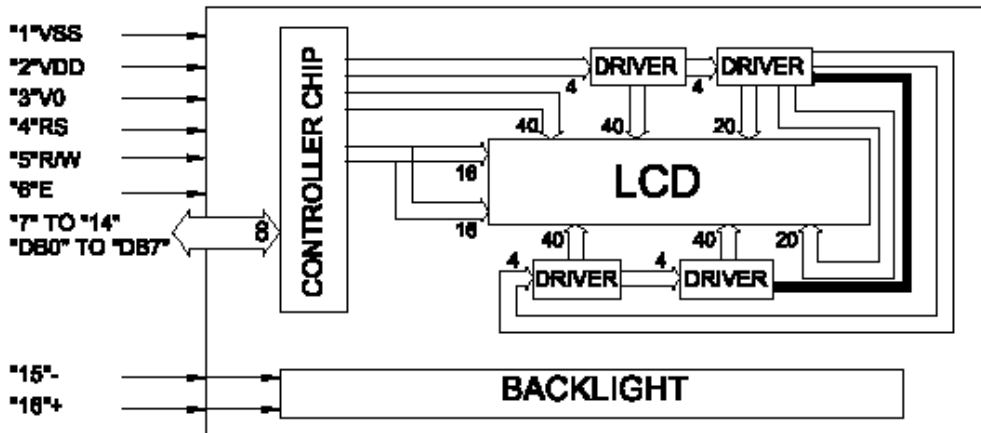
16x4 DMM, 1/16 MUX



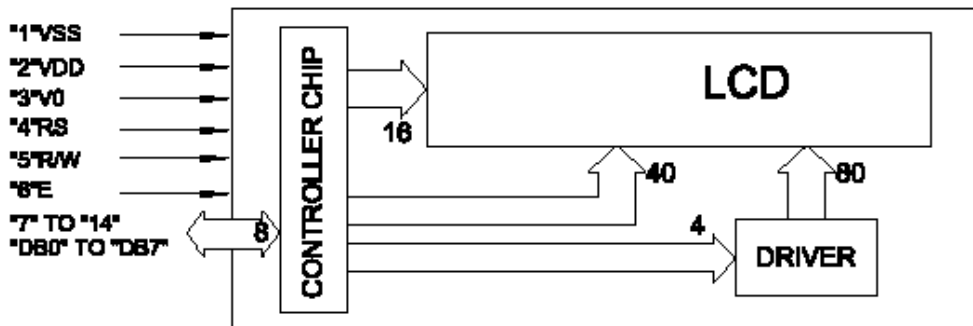
20x2 DMM, 1/16 MUX

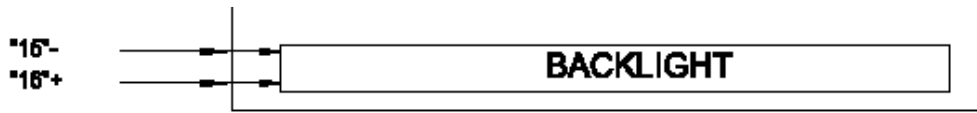


20x4 DMM, 1/16 MUX

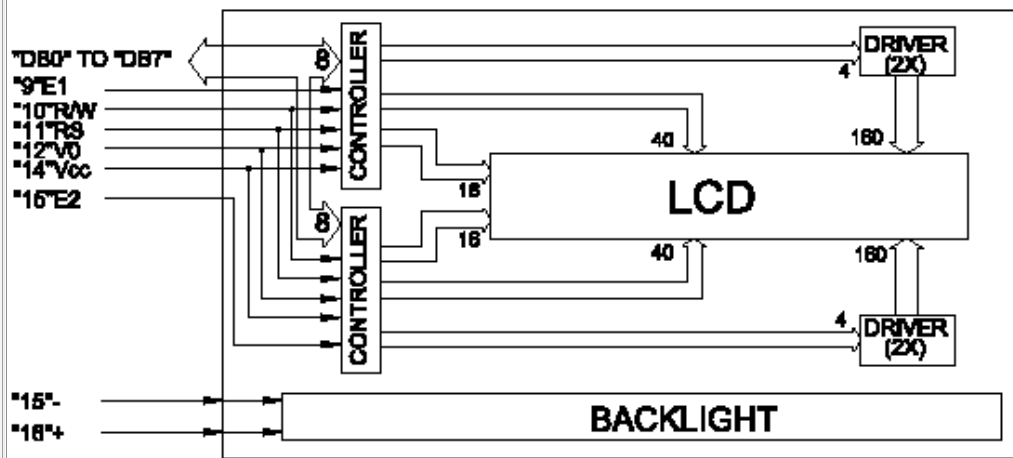


24x2 DMM, 1/16 MUX





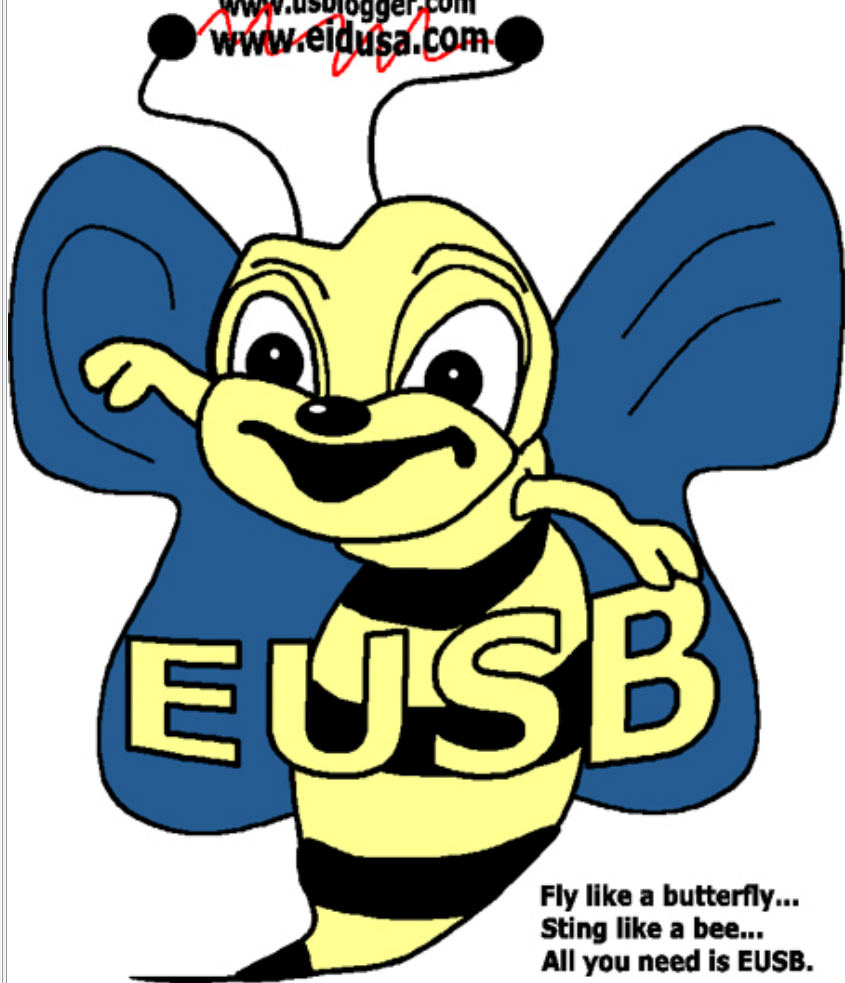
40x4 DMM, 1/16 MUX





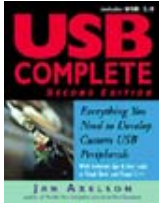
EUSB Basics

EUSB Basics

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 Sting like a bee...
 All you need is EUSB.

Description and SKU#	Price	Picture
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EUSB to LCD PCB EID-K-EUSB-LCD-XX-YY-PCB PCB Only	17.00	
I/O DLL, SDK Library only EID-K-EUS-BS-LIB1S Software (Library only)	12.00	
EUSB A to B Cables This cable is used to connect the EUSB port to the USB peripheral. A male to B male. EID-C-USB-32-930 3' EID-C-USB-32-931 6' EID-C-USB-32-932 10' EID-C-USB-32-933 15'	9.99 10.99 11.99 15.99	
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