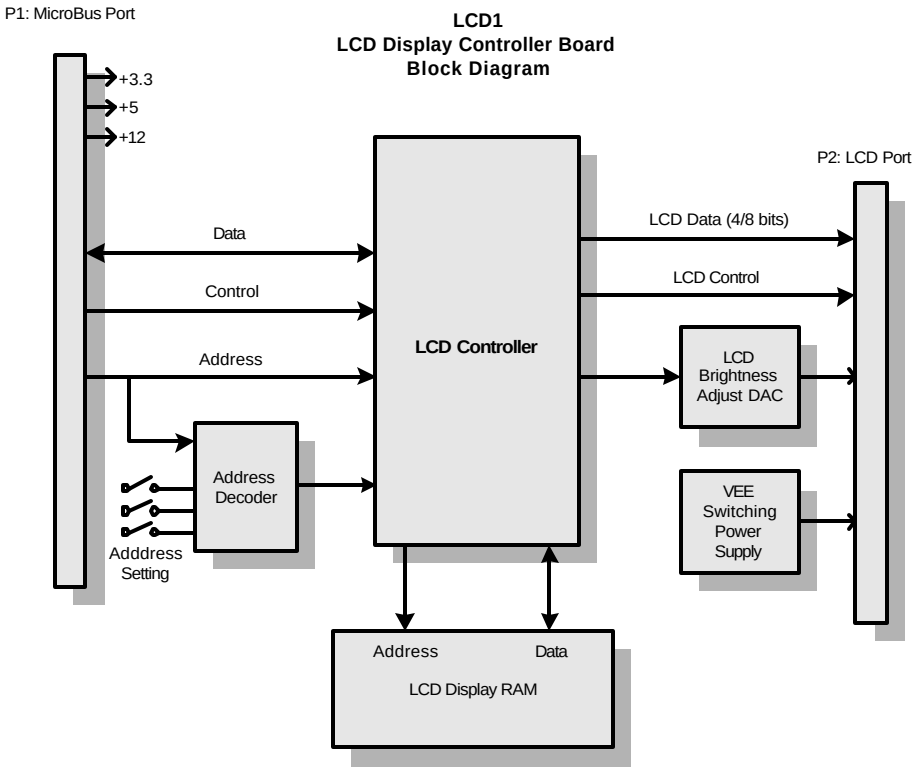
MicroBus (logo)
LCD1
Graphics LCD Controller Board

Description

The LCD1 Graphics display controller for MicroBus systems adds graphics LCD display to any MicroBus system. It supports most monochrome graphics (black and white, one bit per pixel) displays from 128 X 64 up to VGA format: 640 X 480. LCD1 includes the display controller, display memory, and LCD power supply and brightness controls.

There are three versions of LCD1 to allow support of the many panels available. LCD1-3 supports LCDs with Epson type interfaces. LCD1-4 Supports LCDs with Seiko and Optrex interfaces and most 1/4VGA (320 X 240) panels. LCD1-6 supports most manufacturers 480 X 640 LCD panels. LCD1 is easy to set up, requiring only a simple clock adjustment and jumper setting to establish the timing for the LCD panel. To change versions of LCD1, only a socketed 8 pin PROM needs to be changed. These can be obtained from MicroBus separately.

LCD1 Version	LCD Panels Supported
LCD1-3	All Epson monochrome panels
LCD1-4	Optrex, Seiko, Hantronix, all ¼ VGA 320 X 240 monochrome panels
LCD1-6	All VGA 640 X 480 monochrome Panels



LCD1 controllers accept pixel coordinates in direct H and V values. ALU hardware enables them to perform pixel set, clear, and XOR operations, or byte write and byte XOR operations. The result is that drawing operations are fast and efficient. Figure 1 is a block diagram for LCD1.
The table below shows which panels are supported by each version

All LCD1 controllers include display RAM, the LCD -Vee power supply, and provisions for both manual and programmable contrast adjustments. Graphic software libraries are provided with drawing primitives (lines, circles, ellipses and rectangles) and character font and string display. Examples of graphical user interfaces (GUIs) are provided. The graphics library is written in C and occupies only about 4K bytes of code space.

See the MicroBus web site at www.micro-bus.com for other available products and the MicroBus specification.

LCD1 Features

- LCD1-3 supports Epson LCDs from 128 X 64 to 640 X 200
- LCD1-4 supports Seiko and Optrex LCDs from 128 X 64 to 640 X 200, ¼ VGA (320 X 240)
- LCD1-6 supports most 640 X 480 monochrome
- Direct register mapping and hardware functions speed drawing operations
- Screen addressing is in X-Y coordinates
- Pixel and Byte drawing operations in hardware
- Programmable frequency clock source
- Simple and consistent drawing operations across all LCD1 LCD controllers.
- 64k display memory for up to 640 X 480 display\
- Programmable or manual (external variable resistor) Vee supply from 0 to –22V
- Programmable contrast adjust
- MicroBus Interface
- Graphics Software library in C including:
    - Pixel Set
    - Byte Set
    - Line Draw
    - Circle / Ellipse draw
    - Variable sized character fonts
    - String display
    - Rectangular area fill
    - Bit Blit: image transfer from image

Other MicroBus Boards:

- **AVR1** AVR Mega processor board
- **RAB1** Rabbit 3000 based processor board
- **ANA12** 12 bit Data acquisition system with sensor interfaces and D/As
- **ANA20** 20 bit Data acquisition system with sensor interfaces and D/As
- **DIG1** 48 bit Digital I/O expansion
- **PROTO1** Hardware Prototyping board for MicroBus

Specifications

DC Power:	<100 mW (plus LCD power)	Power Input:	11.5-16.0 VDC @ 10ma
Vee Supply:	0 to –22 V	Vee limit range:	-5 to -22V
LCD Connectors:	14 pin Epson Compatible	MicroBus I/F:	MicroBus Slave
Size:	2.5” x 3.5” x 0.5”		

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