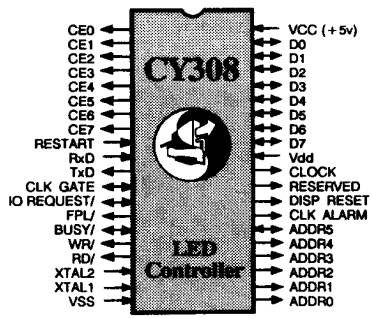
LED Module Controller CY308

The CY308 Display Controller is a standard 5 volt 40 pin CMOS LSI device designed to control multiple intelligent LED based display modules. These modules contain ASCII encoded character fonts, with 5 by 7 dot matrix or 17 segment character displays, plus control registers for functions such as blinking and display intensity. Each module can contain from one to eight characters, with four and eight character sizes being the most popular. The CY308 will directly drive eight such modules (up to 64 characters), with no external logic, and it can drive up to 256 such modules with external address decoding and module selection. The CY308 allows you to use these modules as an integrated display, without worrying about addressing each one or having words flow across multiple modules. It provides the ability to write to individual character locations, or to write a string of characters, with automatic display update, blanking, and rewriting, as selectable options. User programmable address selection functions allow the CY308 to control most intelligent display modules available. Also, access to the control registers of the modules allows you to implement special display functions, such as blinking or custom fonts, without additional hardware or software requirements over those needed to operate the basic display functions.

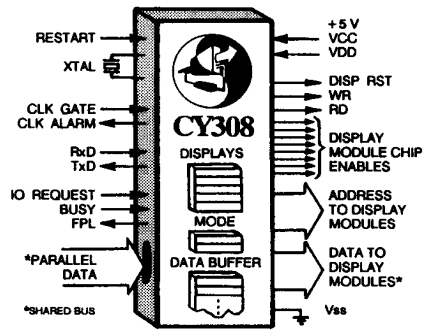
Standard Features

- CMOS, 5 volt, 40 pin LSI device
- ASCII decimal, Hex, and Binary data formats
- Handles most 1 to 8 char intelligent displays
- Decoded mode supports 8 modules
- Encoded mode supports up to 256 modules with only external address decoding and CS
- Directly access display features and registers
- Write to display sequentially or at specified positions
- Internal 56 character buffer for scrolling
- Time of day, elapsed time, and count down timer
- Serial or Parallel interface with simple handshake
- User selectable operating modes

Pin Configuration



Logic Diagram



CY308 Command Summary

A complete description of the CY308 commands may be found in the user manual available from Cybernetic Micro Systems.

Command		Function
	^C	Command mode select
	^D	Display mode select
	^H	Back space over previous display character
	^K	Clear the display
	^R	Scroll display window to the left
	^S	Scroll display window to the right
	^Z	Fix display window at start of RAM buffer
A	a	Use LSBit to Set CLK_ALARM
B	base	Define address Base parameter
C	mode,hr,min,sec,hun	Set Clock mode and initial time
D	d	Delay for specified milliseconds (to 64k)
F	chr,row1..row7	Define custom Font for display (HDSP only)
G	g	Use LSbit to set CLK_GATE
L	mod,addr	Load module char count and address
M	mode	Mode command sets mode byte to value
N	num,chars	Number of modules, characters per module
O	mode	Define general Operational modes
P	pos	Set internal RAM buffer Pointer Position
S	addr,data	Write data to single address of all modules
W	mod,addr,data	Write data to address of one module
?	Cmd	Query specified parameter values

CYB-308 Proto Board

The CYB-308 prototyping board supports all of the features of the CY308. In its minimum configuration, the CYB-308 will support up to 4 display modules (32 characters). An additional 4 display modules may be added in the maximum (64 character) configuration. The board provides both parallel and serial interfaces.

For multi-board systems, a CY233 network chip is fully supported, and provides addressing for up to 255 boards on a single serial network.

The CYB-308 is provided in kit form and measures 188mm x 53mm (7.40" x 2.1"). The board requires +5volts and internally generates RS232 level signals for the serial interface.

CY308 Electrical Specifications

Absolute Maximum Ratings:	
Ambient Temperature under bias	0°C to 70°C
Storage Temperature	-65°C to +150°C
Voltage on any pin with respect to GND	-0.5V to V_{CC} + 0.5V
Power Dissipation	0.2 watts

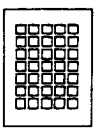
DC & Operating Characteristics (T_A = 0°C to 70°C, V_{CC} = +5V +/-10%)

SYM	PARAMETER	MIN	MAX	UNIT	REMARKS
I_{CC}	pwr supply current		20	mA	
V_{IH}	input high level	1.9	V_{cc}	V	(3.5V for XTAL RESTART)
V_{IL}	input low level	-0.5	0.9	V	
I_{LO}	data bus leakage		10	µA	high impedance state
V_{OH}	output high level	2.4		V	I_{OH} = -80 µA
V_{OL}	output low level		0.45	V	I_{OL} = 1.6 mA
F_{CY}	crystal frequency	3.5	12	MHz	see clock circuits

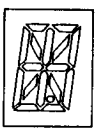
Supported Display Modules

Char.	Type	Part #
8	5x7 dot matrix	HDSP-211x
4	5x7 dot matrix	PD243x PD343x PD353x
8	17 segment	DL1814
4	17 segment	DL141x DL2416 DL3416
Other		DL413x DL713x

Note: The CY308 should support any display module with built-in ASCII decoder, multiplexer, memory, and driver.



5x7 Dot Matrix Display Format



17 Segment Display Format