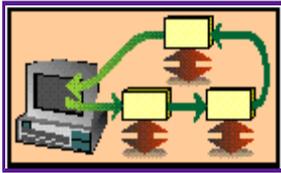




CY233-LINC Local Intelligent Network Controller



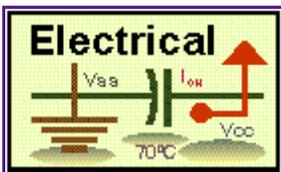
[...Modes of Operations](#)



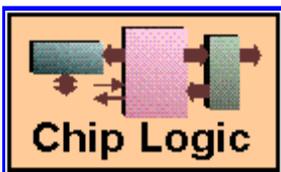
[... Command Summary](#)



[... Pin Descriptions](#)



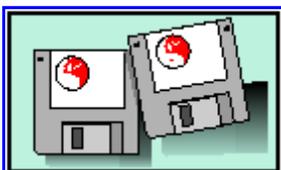
[... Electrical Specifications](#)



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Standard Features

- Ring or Bus Network Capability
- Special Local Area Network mode

- Selectable Token support
- Half or Full duplex operation
- Line turnaround capability
- Selectable address range
- Supports 255 encoded addresses
- Supports 8 decoded addresses
- Strobed parallel data transfers
- Handshake parallel data transfers
- Low power CMOS technology
- Single 5 volt, 40 pin device
- TTL compatible I/O levels
- Works with standard drivers
- RS232 serial timing and format
- Baud Rates from 300 to 57600
- 7 or 8 bit character data lengths
- Odd, Even, Mark, Space, or No Parity
- Master or Slave device operation
- Simple UART data transfer mode
- Powerful expanded command set

Modes of Operation

CY233 LINC (Local Intelligent Network Controller)

The CY233 provides a general mechanism for passing data between a serial network, or computer port, and local parallel devices. It operates in one of three basic modes, which determine the complexity of the connections and the format of the serial data.

UART Mode

UART Mode is the simplest operating mode in which there is one CY233 connected between a single serial device, such as an RS232 port of a personal computer, and a single parallel device, such as a parallel printer. Data may flow uni-directional or bi-directionally between the devices, and the serial device deals with only the direct data flow.

Network Mode

Network Mode is a medium complexity operating mode that allows a single serial port from a host computer to control multiple parallel devices or special parallel hardware. The CY233 uses addressing functions to select between a maximum of 255 unique parallel devices. These devices may all be connected to a single CY233, with that CY233 responding to any address. Alternately, the possible addresses may be split into smaller groups, with a CY233 responsible for each group of addresses. It is possible to have a network of 255 CY233s in this case, with each CY233 responsible for only one parallel device and one address assignment. Any combination between these two extremes is also possible. A special prototyping board, the CYB-233, is available from Cybernetics for support of this operating mode.

Host Ring and Party Line Networks

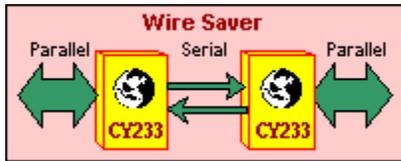


Host Ring and Party Line Networks are two of the various network connection schemes possible in this mode. These topologies will usually have a host computer controlling several CY233 nodes, with parallel device hardware connected to each node.

Data flow is bi-directional, with the host writing messages to and reading messages from the CY233 nodes.



Wire Saver



Wire Saver is another possible connection, in which parallel data is generated at one location, transmitted serially to another location, and reconstructed in parallel at the destination. In this case, the CY233s act to convert the data between the parallel and serial sides. The scheme can be very economical if there is any distance between locations, since it saves the need to run expensive parallel cables over that distance. Also, data flow can be bi-directional in the Wire Saver Design.

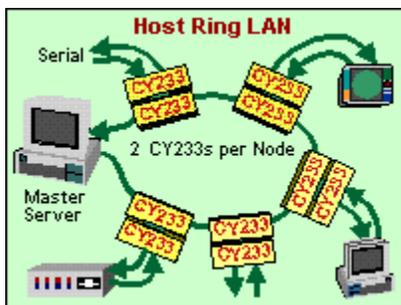
CY233 Message Structure

The CY233 Message Structure is used to transfer data in the Network mode. This structure (see [Basic Message Structure](#)) is used to specify the address of the parallel device involved in the specific set of data transfers. The structure is very simple, and involves minimum overhead for the number of devices that can be controlled through one serial channel.

LAN (Local Area Network)

LAN is the most complex mode of operation, in which multiple serial devices can be connected in a network. In this scheme, two CY233s are required at each network node, one to connect that node to the others of the network, and a second to connect the local serial device to the node. Optional token support functions may be used to control the flow of messages in such networks. The CYB-233-LAN prototyping kit, available from Cybernetics, implements one LAN node.

Host Ring LAN



Host Ring LAN is the first of two possible network designs, in which a network master computer is connected at the network level. Communications between the various nodes of the network are controlled through this master/server system. The local serial devices could be other computers, terminals, or custom serial hardware.

Peer Ring LAN

Peer Ring LAN is the second LAN design, in which the network consists of only CY233 nodes, connected to local systems. In this design, communications can occur between any two nodes of the network, without involving a master/server computer. This is a very general communications scheme, and allows a local area network to be designed without special hardware requirements. The standard serial communications ports of the local systems are connected to the CY233 nodes, which form the only special hardware in the network, and represent a very economical network design.

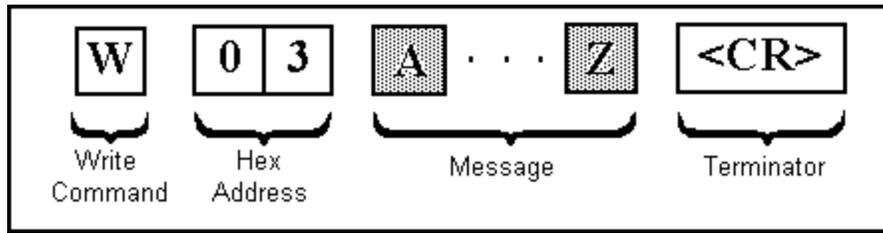
[CYB-LAN/2 Prototyping Board for LAN Communications available.](#)

Basic Message Structure

ASCII Message Format

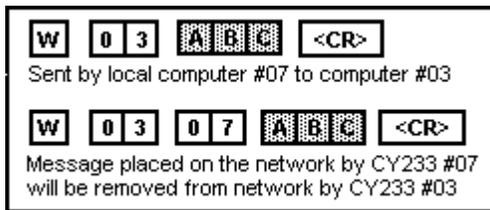
When multiple CY233s are connected in a network, messages cause data to flow between nodes of the network. A message is

a simple structure that consists of four elements: a command letter, an address, the data contents, and a message terminator. A typical message is shown below:



This message will write 'A .. Z'[cr] to the device attached to the network as address #03. The above message format is typical of Host Ring and Party Line networks in which a host computer sends messages to devices.

When most devices on the net are computers, it is desirable to identify the source as well as the destination of the message. This is done automatically in LAN networks, both Peer Ring and Host Ring LANs. A local computer creates write message with data and target address to which the data is to be sent. The local CY233 appends its address to the target address, as it places the message on the network.



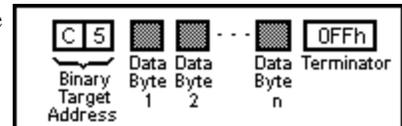
This structure allows any computer on the network to communicate with any other unambiguously. Network query and status commands allow each local computer to poll the network for automatic configuration.

Token Support

CY233s recognize local intelligent devices and perform special functions in support of token passing modes in which local devices wait for the 'token' before placing their message on the network. Watchdog timeout functions prevent the token from being 'stuck' at any node that does not respond. Each local CY233 takes responsibility for keeping the token passing, if its local device fails to respond in a specified period.

Binary Message Format

For simple modes, such as the Wire Saver, a simple binary mode message uses only the destination address, data contents, and the special terminator, 0FFh. All messages in this mode are implied writes. For example:



CY233 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 ground ...	-0.5V to Vcc+0.5V
Power dissipation	0.2 Watts

DC & Operating Characteristics

(TA = 0°C to +70°C, Vcc = +5V +/-10%)



SYM	PARAMETER	MIN	MAX	UNIT	REMARKS
I CC	pwr supply current		20	mA	
V IH	input high level	1.9	Vcc	V	(3.5V for XTAL, Reset)
V IL	input low level	-0.5	0.9	V	
I LO	data bus leakage		10	uA	high impedance state
V OH	output high level	2.4		V	I OH = -60 uA
V OL	output low level		0.45	V	I OL = 1.6 mA
F CY	crystal frequency	3.5	12	MHz	see clock circuits



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