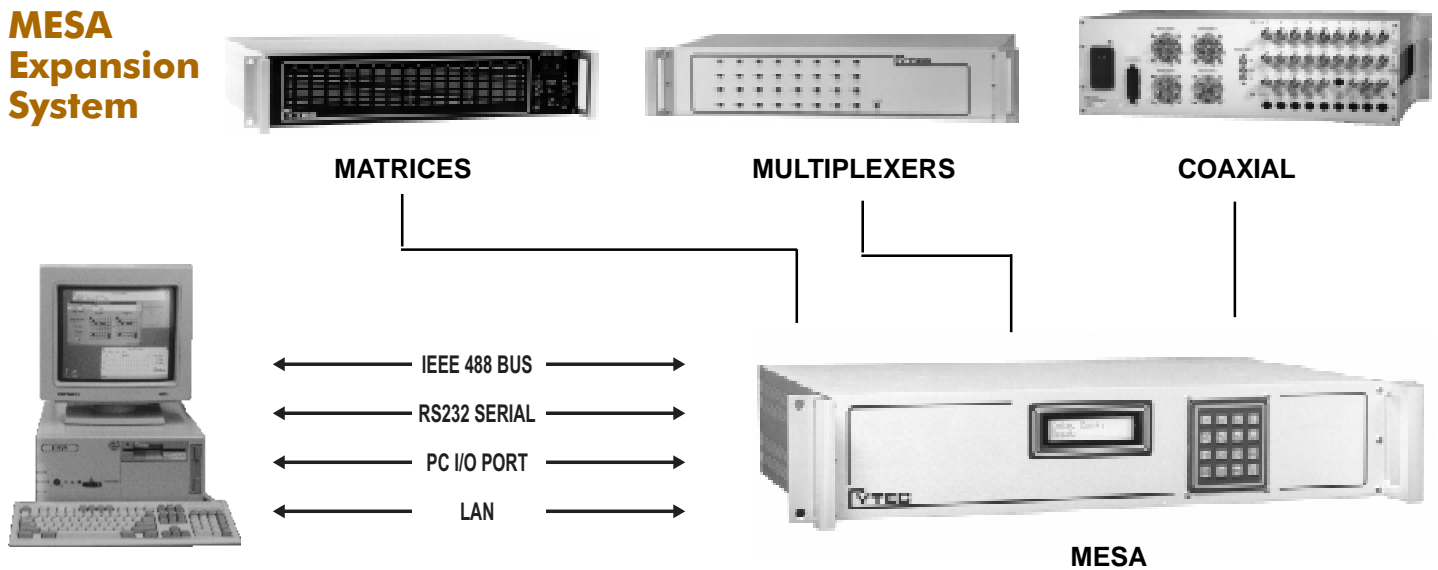


## MESA SERIES MATRIX EXPANSION SYSTEMS

The MESA Series Controllers make it possible to control multiple CYTEC switch chassis from one Control Module. It can be utilized to build large Matrix or Multiplexer configurations or simply run multiple different types of chassis. The MESA also saves money on large systems since each chassis does not need a separate control module and often do not need power supplies.

These Chassis can be any combination of different types of Expansion Chassis from CYTEC's complete line of switching products.

### MESA Expansion System



### MESA CONTROL UNITS

There are three basic Control Units: the MESA 4, the MESA 16 and the MESA 32.

#### MESA 4 CONTROL UNIT

This Control Unit has 4 Output Ports to control 4 Expansion Chassis from one Control Module. The MESA 4 is 3.5" high.

#### MESA 16 CONTROL UNIT

This Control Unit has 16 Output Ports to control 16 Expansion Chassis from one Control Module. The MESA 16 is 3.5" high.

#### MESA 32 CONTROL UNIT

This Control Unit has 32 Output Ports to control 32 Expansion Chassis from one Control Module. The MESA 32 is 7" high.

### MANUAL CONTROL OPTIONS

**MC-2** has keypad selection of the switches with display.

**VMCS** is a software interface which enables the remote operator to view the Status of the Matrix and to Control Switch Selection using a full Graphical User Interface.

### CONTROL MODULES

The following Control Modules are available:

#### CM-1 TTL CONTROL

This module utilizes TTL / CMOS signals and requires 13 input bits and 1 output bit. Typically used when high speed communication is necessary. May be driven from a CYTEC PC-IO computer card.

#### CM-5 IEEE488/RS232

This Module has both the IEEE488 Bus and RS232 Serial Control. See page **MESA-3** for details.

#### IF-6 LAN INTERFACE

This module interfaces between the Local Area Network and the RS232 Control Modules using TCP/IP commands.

**Drivers available for National Instrument's LabView or LabWindows programming platforms or Agilent VEE programming platform.**

# MESA CONTROL UNITS

There are three basic models of the MESA Control Unit: the MESA 4, the MESA 16 and the MESA 32. They contain Power Supplies and an Expansion Motherboard. The Control Module and Expansion Interface Modules plug into the Motherboard so that one Control Module can control up to 32 Expansion Chassis. The System shown in Fig. 1 has a MESA 16 Control Unit and four Expansion Chassis arranged and addressed as a 32x16 Matrix. This leaves 12 additional ports to expand the system by adding twelve Expansion Chassis.

## MESA 4 CONTROL UNIT

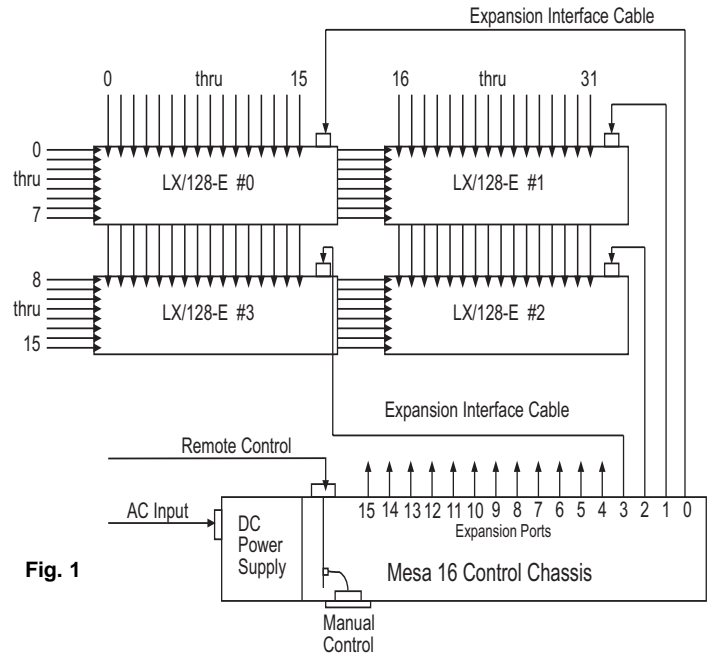
This is a 19" rack mountable chassis, 3.5" high and 12" deep which will accept any of the Control Interfaces and 4 Expansion Ports to control 4 Expansion Chassis. The Power Supply has sufficient logic power to drive all 4 Expansion Chassis and relay power to energize up to 200 relays at one time.

## MESA 16 CONTROL UNIT

This is a 19" rack mountable chassis, 3.5" high and 12" deep which will accept any of the Control Interfaces and 16 Expansion Ports to control up to 16 Expansion Chassis as shown in Fig. 1. The Power Supply has sufficient logic power to drive all 16 Expansion Chassis and relay power to energize up to 200 relays at one time.

## MESA 32 CONTROL UNIT

This is a 19" rack mountable chassis, 7" high and 15" deep which will accept any of the Control Interfaces and 32 Expansion Ports to control up to 32 Expansion Chassis. The Power Supply has sufficient logic power to drive all 32 Expansion Chassis and relay power to energize up to 200 relays at one time.



## MESA TO EXPANSION CHASSIS DISTANCE

Individual Expansion Chassis are normally supplied with 6 foot cables. The expansion chassis can be provided with ribbon cables up to a length of 20 feet on request. Expansion chassis may be located up to 200 feet from the MESA if a better type of cable is used. To discuss these options please contact CYTEC's sales staff.

## RELAY POWER REQUIREMENTS

The 12 volt relay power supplied with the MESA Control Units is sufficient for most Matrix or Multiplex operations. However, some applications require a larger number of switches to be closed. For these cases, two options are offered: Auxiliary Power Supply or Powered Expansion Chassis.

### AUX-1 POWER SUPPLY

This is a separate 19" rack mounting chassis, 3.5" high and 12" deep with +5 volt logic power for up to 32 Expansion Chassis and relay power to energize up to 500 relays.

### POWERED EXPANSION CHASSIS

Where the power requirement in individual Expansion Chassis is very high, each Expansion Chassis can be supplied with its own relay power supply capable of energizing up to 200 relays per Expansion Chassis.

## CONTROL MODULES

The Control Modules are plug compatible with all the MESA control Units and have the same command structures for Control and Switch Selections.

The commands for Mode Control are Latch, Unlatch, Matrix Mode, Mux Mode, Clear or Status Request. The standard commands for selecting a Switchpoint are to select Matrix, Module and Switch.

These modules are available to control the MESA Units from TTL, IEEE488 BUS, RS232 Serial Port or 10Base-T Ethernet LAN.

They include standard or special firmware for different configurations such as:

In a Matrix configuration, the command can be Input # and Output # selection for the crosspoint.

In a Multiplexer application, the command can be Channel # selection for one switch selection only.

## CM-5 IEEE488/RS232

This Module combines both the IEEE488 Talk Listen Control and the RS232 Serial Controls.

### IEEE488 TALK/LISTEN (GPIB)

The Talk and Listen addresses are the same and are set by a 5 position DIP Switch. In the Listen Mode, the Matrix responds to specific commands. The Talk Mode is used to return the Status of the Matrix.

#### Command Summary

**M - Matrix** - Select a specified Matrix.

**L - Latch** - a specified Module and Switch in a Matrix.

**U - Unlatch** - a specified Module and Switch in a Matrix.

**X - Multiplex** - Latches a specified Switch and Clears all others.

**C - Clear** - Unlatches every switch in the Matrix.

**S - Status** - The Status of the Matrix is returned to the Controller.

**F - Front Panel** - Allows the disabling of front panel controls.

**P - Program** - Allows the operator to set up Matrix variables such as size and configuration and stores them in nonvolatile memory.

#### Typical Commands Are:

Command	Function
L, n1, n2, n3	Latch Selected Switch
U, n1, n2, n3	Unlatched Selected Switch
X, n1, n2, n3	Mux Selected Switch n1=Matrix, n2=Module, n3=Switch
C	Clear entire system
C, n1	Clear matrix - n1=Matrix
S	Status of Entire System
S, n1	Status of Matrix - n1=Matrix
S, n1, n2, n3	Return Switch Status n1=Matrix, n2=Module, n3=Switch
F, n1, n2,	Front Panel Lock out n1=0 disable, n1=1 enable, n2=access
P, n1, n2, n3	Program setup n1=Parameter, n2=value, n3=access

### RS232 SERIAL

The module can be configured as either a Data Terminal Equipment (DTE) or Data Communications Equipment (DCE). The Baud Rate is software programmable from 110 to 19,200 Baud and is stored in nonvolatile memory.

The Command structure is the same as the IEEE488 Module and has the following additional command features:

**E - Echo** - Echoes all received characters back to the source.

**V - Verbose** - Enables the matrix to return text strings in response to Commands, including error statements.

**H - Help** - This is a summary of all the Commands.

#### RS232 Specific Commands

Command	Function
B, n1, n2	Baud Rate - n1=rate, n2=access
E, n1, n2	Echo - n1=0 off, n1=1 on, n2=access
V, n1, n2	Verbose - n1=0 off, n1=1 on, n2=access

## CM-6 LAN INTERFACE

This is a 10Base-T Ethernet LAN to RS232 interface module which accepts data in TCP/IP format from the Local Area Network and outputs it in RS232 format to the MESA.

When used with the RS232 Serial Module, it can control the MESA Control Units with the same Command Structure detailed in the CM-5.

This interface can be used to access the MESA Control Unit from remote locations and from several users via the Local Area Network using raw TCP/IP, or Telnet. Setup of the interface is through an external RS232 connection which allows you to specify TCP/IP address, host name, gateways and many other network parameters.

The LAN interface manual is available via e-mail in PDF format by contacting CYTEC's sales staff.

## RAM OPTION

This option is available in the **CM-5** and **CM-6**. Switch selections are stored in the battery backup RAM (Random Access Memory) with the following benefits:

At Power-On, the switches can be latched to a preset default switch configuration.

In cases of momentary power loss, the matrix will be reset to the last selected configuration before loss of power.

Multiple configurations can be stored and recalled as required up to a maximum of 1,000 switch selections.

## MANUAL CONTROL OPTIONS

Two types of Manual Control are offered: the **MC-2** and the **VMCS**.

### MC-2 KEYBOARD CONTROL

This Manual Control has a keyboard and LCD backlit display mounted on the front panel.

The LCD display has two lines of 16 alphanumeric characters. The top line displays the matrix commands and switch selection.

The bottom line displays the Status of a selected switch and Error messages.

This module can only be used with the **CM-5** and **CM-6** Controls.

### VMCS VIRTUAL MANUAL CONTROL SOFTWARE

This enables the remote operator to view the Status of the Matrix using a full Graphical User Interface.

The matrix configuration is displayed and crosspoints are selected by a point and click operation. Each selected crosspoint is prominently shown on the display.

Custom labeling of the Inputs and Outputs can be programmed. One optional mode of operation prevents selection of switches that would interconnect two Inputs or two Outputs.

## SOFTWARE

Drivers and/or sample programs are available with the most commonly available application programming languages.

# EXPANSION CHASSIS

The versatility of the MESA Expansion System is that it enables up to 32 Expansion Chassis of different types to be controlled from one Control Unit. This means that it is possible to build a complete Switching System requiring Matrices, Multiplexers, Group Switches or Individual Relays by selecting the Expansion Chassis and Switch Modules most suitable for the application.

Each Expansion Chassis can be used for handling different types of signals including: Low Level Instrumentation, High Frequency Coaxial, Audio, Video, High Voltage or High Current. The Expansion Chassis can be remote from the Control Unit so that each chassis can be placed close to the signal source, reducing wiring length with improvement in signal transmission.

The Expansion Chassis summarized below can be used in any combination with the MESA Control Unit. Full details on each type of Chassis are described in respective bulletins which are part of the CYTEC catalog. The photograph shows a typical Switching System used to analyze ultrasonic data from a large number of transducers and to record the data on several tape recorders.



Expansion chassis available in the following product series:

## **CXAR SERIES MULTIPLEXERS**

Coaxial 50 or 75 ohm 1xN multiplexers with bandpass up to 1GHz.

## **CX SERIES MATRICES**

Coaxial 50 or 75 ohm NxM matrices with bandpass up to 700 MHz.

## **CXM SERIES**

Microwave multiplexers and matrices with bandpass up to 18GHz.

## **VDX SERIES**

50 or 75 Ohm solid state, video or RF matrices up to 180 MHz.

16x16 through 128x128 sizes.

## **LXA SERIES GENERAL PURPOSE**

128 relay system has the most versatile selection of Switch Modules, for matrix or multiplexer, low level to high power, frequencies below 20 MHz.

## **LXB SERIES MATRICES**

128 relay matrix configurations for power, low level and signals below 20 MHz.

## **HXV SERIES**

Switching for High Voltage Signals up to 5000 volts.

Expansion chassis available in the following product series:

## **RS SERIES**

Multiplexers (1xN configurations) for multi wire communications such as RS232 and RS422. 9, 15 or 25 wires on D type connectors.

## **RSM SERIES**

Matrix configurations for 9, 15, or 25 wire data signals.

## **RJV SERIES**

4 and 8 wire signals on RJ45 connectors such as 10/100/1000 BaseT.

## **RJM SERIES**

2, 4, 6 or 8 wire signals on RJ45 connectors in matrix configurations.

## **GX SERIES**

Used specifically to switch large numbers of signals as a group.

## **VX SERIES**

General purpose, 256 channel units with a versatile range of modules.

## **JX SERIES**

High density 1xN or 2xN configurations. Up to a 1000x1 mux in a single chassis.

## **FX SERIES**

Fiber Optic optical-electrical-optical (OEO) matrices available in non-blocking, full fan out matrix configurations up to 64x64.

## **FO SERIES**

Passive Fiber Optic switches in a variety of configurations.

## **PX SERIES**

Compact, cost effective matrices. 512 relays in a 3.5" high chassis.

## **HDX 4600 SERIES**

High density matrices. Up to a 64x32 two wire matrix in a single chassis.

## **DX SERIES**

Digital matrices up to 64x64 for LVDS, PECL, ECL, HDTV or other extremely fast digital signals.

**All CYTEC Switching Systems have field proven reliability and are backed by a 5 year warranty.**

**For technical assistance with your switching applications, contact the Switching Specialists at:**

**1-800-346-3117**

**or**

**[www.cytec-ate.com](http://www.cytec-ate.com)**