CYTEC

BULLETIN
MESA(v7)

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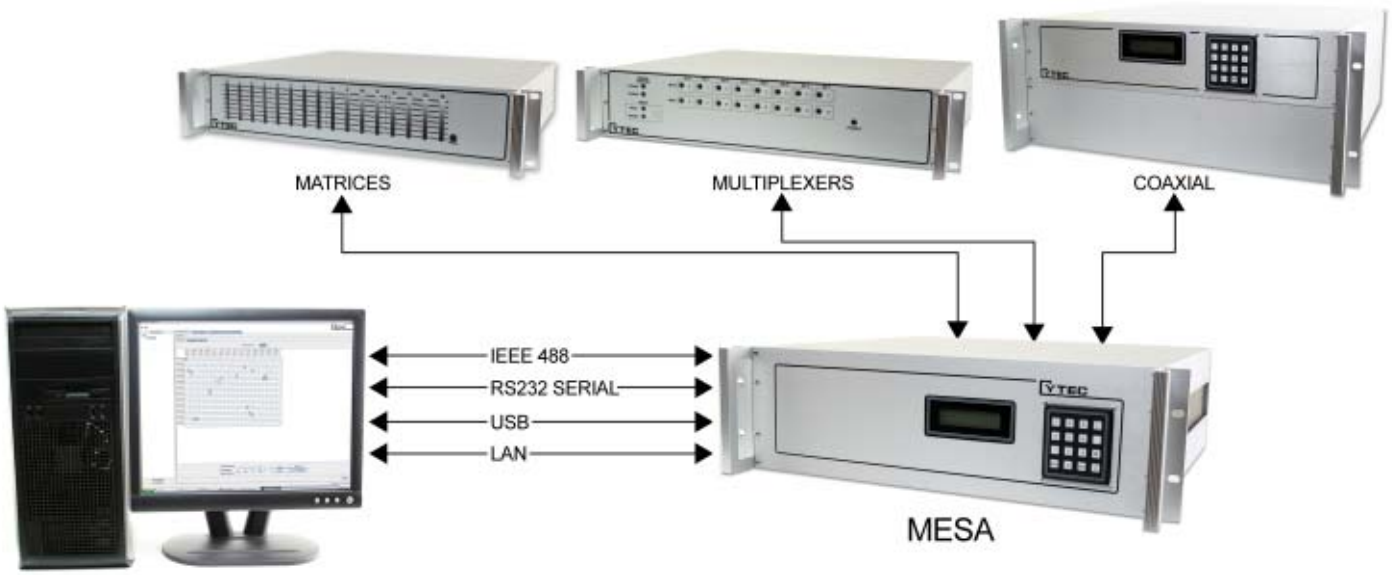
MESA SERIES
MATRIX EXPANSION SYSTEMS

The MESA Series Controllers make it possible to control several different CYTEC Expansion Chassis via a single control module. They are used to build large matrix or multiplexer configurations or simply run different types of expansion chassis. The MESA also reduces the costs of large systems since each chassis does not need it's own control module, and often they do not need power supplies either. Expansion Chassis can be any combination of different series types from Cytec's complete line of switching products.



MESA CONTROL CHASSIS

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

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 Chassis has 32 output ports to control 32 expansion chassis from one control module. The MESA 32 is 7" high.

MESA II CONTROL UNIT
Cytec's newest control unit, built for large digital communication systems with up to 16 chassis. It is 5.25" high.

MANUAL CONTROL OPTIONS

MC-2 has keypad selection of the switches with LCD display. **Switch Manager Software** is an interface which enables remote operators to view the status of the system 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. Used in MESA 16 & 32

CM-5 IEEE488/RS232
This Module has the IEEE488 Bus and RS232 Serial Control . See page **MESA-3** for details. Used in MESA 16 & 32

CM-8 CONTROL MODULE
This module has IEEE488, RS232 and Lan Interfaces. For use with the MESA II Controller only. See page 3 for more details.

IF-6 LAN INTERFACE
This module interfaces between the local area network and the RS232 Control Modules using TCP/IP commands.

MESA CONTROL UNITS

There are three basic models of the MESA Control Unit: the MESA 16, the MESA 32 and the MESA II. Each 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 16 CONTROL UNIT

This is a 19" rack mounting chassis, 3.5" high and 15" deep. It accepts the CM-1, CM-5 and IF-6 Control Modules and also has 16 Expansion Ports that control up to 16 Expansion Chassis as shown in Figure 1. Its power supplies output sufficient logic power to drive all Expansion Chassis and relay power to energized up to 200 relays at the same time.

MESA 32 CONTROL UNIT

This is a 19" rack mountable chassis, 7" high and 15" deep which will accept the same Control Modules as the MESA 16. It has 32 Expansion Ports to control up to 32 Expansion Chassis. Power supplies have sufficient logic power to drive all 32 Expansion Chassis and relay power to energize up to 200 relays at once.

MESA II CONTROL UNIT

The MESA II is a 19" rack mounting chassis, 5.25" high and 15" deep. It accepts one or two of the CM-8 IEEE488/RS232/ Ethernet Control Modules and also has 16 Expansion Ports that control up to 16 Expansion Chassis. It is optimized to control several large solid state expansion chassis, such as the DX/ 256x256 Series. All modules are hot swappable.

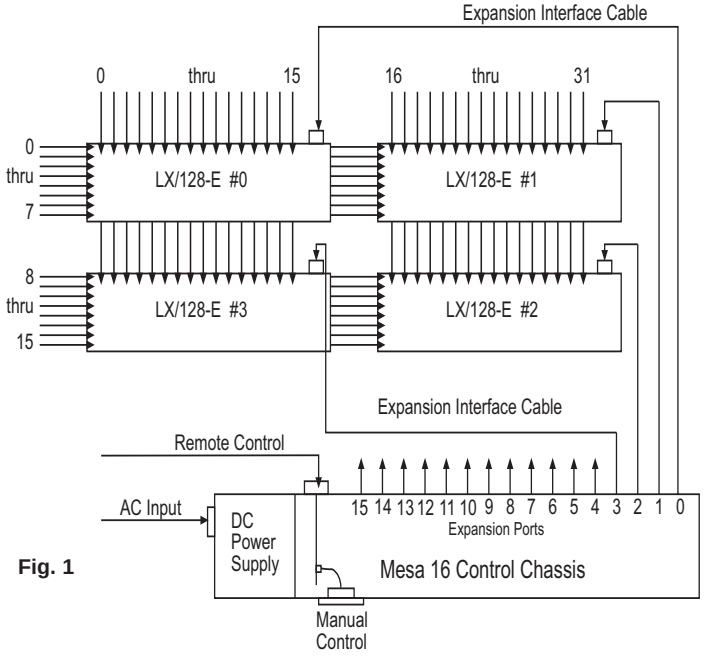


Fig. 1

MESA TO EXPANSION CHASSIS DISTANCE

Individual Expansion Chassis are normally supplied with 6 foot cables. The expansion chassis can be furnished 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, shielded 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 16 & 32 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: An Auxiliary Power Supply Chassis 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 large, each Expansion Chassis can be supplied with its own dedicated relay power supply capable of energizing up to 200 relays in that chassis.

CONTROL MODULES

The Control Modules are plug compatible with the MESA control Units and utilize 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 addressing a Switchpoint select an individual Matrix, Module and Switch.

Control modules are available that control the MESA 16&32 chassis via TTL, combined IEEE488/RS232, 10BaseT Ethernet LAN or USB. Standard or special firmware is installed on the modules, with the special firmware being for for some custom applications. In Matrix configurations, programming commands can address Input and Output numbers to select crosspoints, while in Multiplexer modes commands can address one Channel number to select the appropriate switch.

CM-5 IEEE488/RS232

This Module installs with the MESA 16 & 32 and combines both IEEE488 Talk Listen and 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

L - Latch - a specified Module and Switch in a Matrix.
U - Unlatch - a specified Module and Switch in a Matrix.
X - Multiplex - While in MUX mode, latches a specified Switch and Clears all others.
C - Clear - Unlatches every switch and clears interface.
S - Status - The Status of all switches is returned to the Controller.
F - Front Panel - Allows the disabling/enabling 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 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

IF-6 LAN INTERFACE

The LAN Interface accepts TCP/IP packets from a 10BaseT Ethernet Network, converts the data into RS232 format, and then transmits it to the RS232 port located on the standard CM-5 Control Module installed in the MESA. Data is also transmitted in the reverse direction; that is, RS232 data from the MESA is converted and sent over the Ethernet LAN. The command structure is the same as shown for the CM-5. In the MESA 16 & 32, the LAN must be used with the CM-5. The LAN Interface allows several users to access the MESA remotely via Ethernet TCP/IP and also via TELNET. The IF-6 is set up via an external RS232 connection that allows the user to specify IP Address, host name, gateway and many other network parameters.

CM-8 CONTROL MODULE

The CM-8 installs in the MESA II Control Chassis ONLY and has three remote control interfaces: RS232 via a D9 connetor, IEEE488 Talk/Listen and 100BaseT Ethernet via a RJ45 45 port. All interfaces can be active at the same time. As an option, two CM-8's can be installed in the MESA II, with one Control Module designated the Primary and the second designated as the Secondary controller. The control modules are also hot swappable, meaning the can be removed and then replaced without shutting down the MESA or the full switching sytem. Network parameters can be set up via any of the remote interfaces.

Control is via the same commands shown in the CM-5 Control Module section.

RAM OPTION

This option is available for the **CM-5** and **CM-8**. Switch selections are stored in the battery backup RAM (Random Access Memory) with the following benefits:

- At Power On, switches can be set to a preset default configuration.
- In cases of momentary power loss, the matrix will be reset to the last selected configuration when power returns.
- Several configurations can be stored and recalled as required, up to a maximum of 1,000 switch selections.

MANUAL CONTROL OPTIONS

Two Manual Controls are offered for the MESA: The MC-2 Keypad and the Switch Manager Software.

MC-2 KEYPAD CONTROL

This option supplies a Keypad and LCD backlit display that mounts on the MESA's front panel. The LCD Display shows two lines of 16 characters each. The top line displays entered Commands and switch selections, while the bottom line displays switch Status and Error Messages.

The MC-2 is used with the CM-5 and CM-8 Control Modules and can be installed on the MESA 16, 32, and MESA II Chassis .

CYTEC SWITCH MANAGER SOFTWARE

Using this Software, the remote operator can control and monitor the Status of any Cytec switching system via a full Graphical User Interface (GUI) installed on the controlling PC. The switching configuration is graphically displayed, and switch crosspoints are selected via point-and-click operations. Each selected crosspoint is prominently displayed.

MESA II

CYTEC MESA II Series Controllers allow the control of up to 16 separate expansion chassis from a single point of control. That is, the MESA II holds the overall system's single Control Module, and it directly controls multiple expansion chassis. The MESA II can be used to build large Matrix or Multiplexer configurations requiring multiple expansion chassis, or it can simply run several different expansion chassis.

The MESA II Switching System is composed of one primary MESA II CM-8 Control Module and up to 16 expansion chassis. It is possible to add an optional redundant/backup CM-8 .

Expansion Chassis are typically high density solid state switches, such as the DX/256x256, TX/128x128, DX/64x64 or VDX/32x32. However, the Expansion Cassis can be many combinations of product types, including but not limited to CXAR, CX, LX, HXV, VX, and PX Matrices, JX Multiplexers, GX and RS Group Switches, VDX Video Switches, FX and FO Fiber Optic Switches, HDX 4600 High Density Matrices and DX Digital Matrices. Full details on each expansion chassis type are given in their respective bulletins, which can be viewed in the full product catalog or downloaded from www.cytec-ate.com.

Standard computer control is via IEEE488, RS232 and Ethernet TCP/IP, and Keypad Manual Control can be supplied as an option.

EXPANSION CHASSIS

The versatility of the MESA Controller 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 including 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, RF Coaxial, Audio, Video, High Voltage or High Current. The Expansion Chassis can be located remotely from the Control Unit so that each chassis can be placed close to the signal source, reducing connecting wiring length with improvement in signal transmission.

The Expansion Chassis can be used in any combination with the MESA Control Unit. Full details on each type of Chassis are described in their respective bulletins which are part of the CYTEC catalog and can also be viewed at www.cytec-ate.com.

CYTEC SWITCH MANAGER SOFTWARE

The Cytec Switch Manager provides a GUI interface for controlling matrices and multiplexers via remote computer. The software includes an intuitive graphical interface, security implementation, built in test functionality, multiple device control, switchpoint memory, as well as many other useful features. You can download the Switch Manager free of charge from our website.

Available for Windows, Linux, Mac OS, or any other Java enabled platform

SOFTWARE

Free drivers and/or sample programs are available for the most commonly available application programming languages.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in material or workmanship for a period of five years.

FOR TECHNICAL ASSISTANCE, PLEASE CONTACT CYTEC AT 800-346-3117 OR VISIT OUR WEBSITE AT cytec-ate.com