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YTEC CORP.

BULLETIN
LX-6-2015

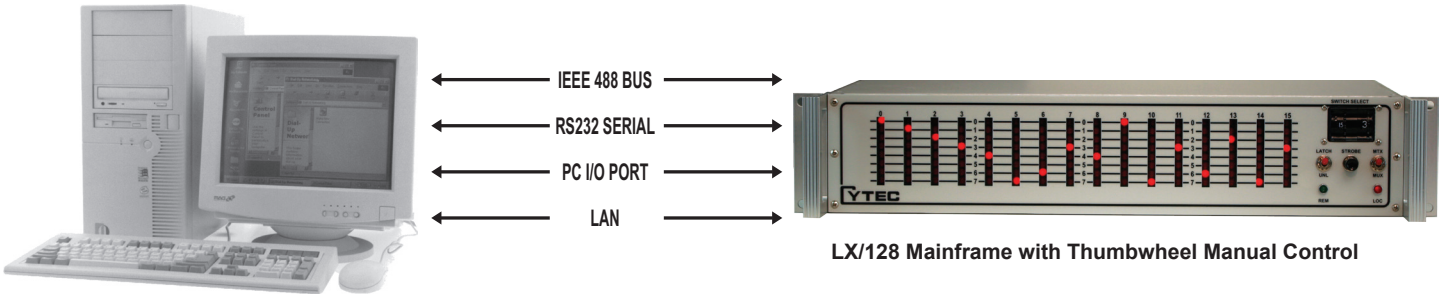
2555 Baird Road, Penfield, New York 14526 (585) 381-4740 Fax (585) 381-0475

LX SERIES

GENERAL PURPOSE SWITCHING MATRICES

FOR AUTOMATIC TEST, INSTRUMENTATION AND CONTROL

The LX Series are high reliability, low cost, versatile Switching Systems. A modular design concept is used, and interchangeable Control Modules, Switch Modules and Display Modules can be assembled into Matrices, Multiplexers or Individual Switch Point configurations. All chassis have full front panel LED displays, and Status Feedback from all switches is provided. A variety of switch modules are offered, including those designed to handle the following signals: Coaxial RF, Low Level with a DC offset less than 1 microvolt, High Voltages to 1500 volts, and High Current to 8 amps.
Control Modules available are 10/100Base-T Ethernet LAN, IEEE488 Bus, RS232 Serial and TTL Parallel Port. USB and Manual Controls are optionally available.



LX/128 Mainframe with Thumbwheel Manual Control

LX MAINFRAMES

The LX Series Mainframes are 19" rack mounting chassis, 3.5" high and 15.6" deep with power supplies and motherboards that hold up to 16 Switch and Display Modules and one Control Module. Signal connectors are located at the unit's rear panel and LED display is visible through the front panel.
The following Mainframes are standard:

LXA GENERAL PURPOSE

These are the most versatile units, accepting any of the LX Series Switch Modules and capable of furnishing Multiplexers, Matrices or Individual Switches as needed.

LXB MATRICES

These mainframes hold the LXB Series Switch Modules and furnish several prewired Matrix configurations.

LX EXPANSION CHASSIS

These units have the same motherboards as the Mainframes but do not have built-in power supplies or Control Modules. They are powered and controlled from a single MESA Control Mainframe as described in the **MESA** Bulletin. Larger configurations can be created from up to 16 Expansion Chassis, and different product series can be combined to supply a complete system for switching a variety of signals.

LX-W WIRED UNITS

All Mainframes and Expansion Chassis can be supplied in 16" deep chassis with modules wired out to user specified connectors. Please contact our Applications Engineers for more information.

SWITCH MODULES

There are two basic switch module series: the **LX8 Series** and **LXB Series**. All modules have signal connectors accessed at the chassis rear panel.

LX8 SERIES

These modules are used in the LXA Mainframes and include the following:
LX8/G2 Switch Modules are built with 8 two pole relays and have signal inputs and outputs arranged so that they can be wired to supply several matrix configurations.
LX8/G1P Switch Modules are built with 8 single pole Type P Power Relays. These are designed for high power and current applications and have signal connectors that can be wired to provide several matrix configurations.
LX8/K Switch Modules have 8 Normally Open single pole relays with inputs and outputs wired to a signal connector.
LX8/OD Driver Modules have 8 optoisolated Output Drivers and are used to drive external logic or electrical loads.
LX8/ID Input Detection Modules have 8 optoisolated Input Detectors that are capable of sensing DC or AC voltage levels.

LXB SERIES

These Switch Modules are used in the LXB Matrices and include the following:
LXB/2(1x4) Switch Modules have 8 two pole relays arranged as two 1x4 matrices.
LXB/4(1x2) Switch Modules have 8 two pole relays arranged as four 1x2 matrices.

LXA GENERAL PURPOSE SERIES

The LXA Series are 19" rack mounting Mainframes or Expansion Chassis, 3.5" high, with mother-boards that hold any of the LX Series of Switch Modules, Display Modules and a Control Module.

LXA/128 MAINFRAME

This chassis is 15.6" deep and is built with power supplies and motherboards that hold a Control Module and up to 16 LX8 Switch Modules and 16 CL8 Display Modules. The Signal Motherboard busses the switch modules together as shown in **Fig. 1** to furnish a number of different Matrix configurations.

LXA/128-E EXPANSION CHASSIS

These chassis are 15.6" deep and hold the same motherboards as the Mainframe but without power supplies or a Control Module. Each Expansion Chassis is powered and controlled via a MESA Control Mainframe as described in the **MESA** Bulletin.

LXA/128-W WIRED CHASSIS

Mainframes and Expansion Units can be supplied in 16" deep chassis with signal inputs and outputs wired to user specified connectors on the rear panel.

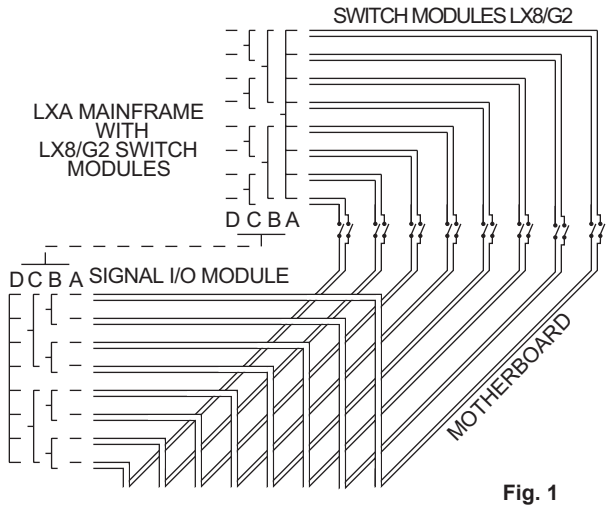


Fig. 1

LXA SWITCH MODULES

These Switch Modules plug into the LXA Motherboard and have signal connectors that are accessed from the chassis rear. The CL8 Display Modules mate with and drive the relays on the Switch Modules and have LEDs which are visible through the chassis front panel. The following modules can be assembled in any LXA chassis.

LX8/G2 SWITCH MODULES

Each module has 8 two pole relays. One side of each relay wires to the module's rear panel connector, and the other side wires to a card edge connector which plugs into the Signal Motherboard. The motherboard busses together the switch modules and a Signal I/O Module as shown in Fig. 1. Energizing a relay connects the path between the switch module and the Signal I/O.

Switch Module and Signal I/O Module connectors can be wired to furnish the following different configurations:

A-each module is a 1x8 and 16 modules create a 16x8 matrix.
B-each module is a 2x4 and 16 modules create a 32x4 matrix.
C-each module is a 4x2 and 16 modules create a 64x2 matrix.
D-each module is an 8x1 and 16 modules create a 128x1 mux.

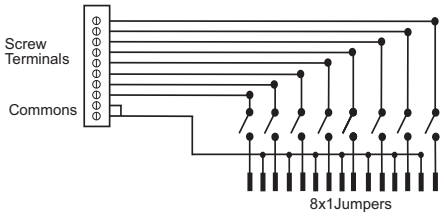
Two reed relay versions of this Module are offered:

LX8/G2-R is built with a 20 pin IDC header signal connector with J20R or J20C mates. The switch module is available with Type S Standard, M Mercury or LT Low Thermal reed relays.

LX8/G2-E has a card edge connector with J20 mates and is recommended for higher voltages when using Type M Mercury or Type HV High Voltage reed relays.

LX8/G1P-ST POWER SWITCH MODULE

This module is built with 8 Type P Power relays and Screw Terminal signal connectors. It differs from the other LX8/G Switch Modules in that single pole, high power switching is provided. This module can also be used as an individual 8x1 multiplexer.



LX8/K SWITCH MODULES

These modules have 8 individual Form A (SPST) single pole relays. The two sides of the relays wire out to the signal connector located at the chassis rear as shown in Fig. 2 .

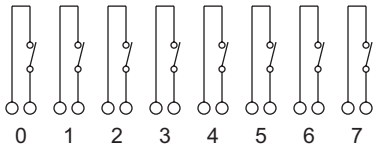


Fig. 2

Three LX8/K Modules are offered.

The **LX8/K-E** is built with a 20 pin card edge connector with J20 Mates and is available with Type S, HV or M reed relays.

The **LX8/K-R** has an IDC header connector and is available with Type S, M or LT relays.

The **LX8/KP** is built with screw terminal connectors and Type P relays that are capable of switching high power and current. Mating connectors are included in the price of the module.

LX8/OD OUTPUT DRIVER MODULE

These modules have 8 individual optoisolated Solid State Output Drivers with 16 Pin Screw Terminal connectors. Mating connectors are included in the price of these modules.

LX8/OD-TTL Outputs TTL level signals of 100 mA at 5 VDC.
LX8/OD-MP is a medium power driver with up to 1 amp drive at 24 VDC.
LX8/OD-HP is a high power driver outputting 1 amp at 48 VDC.

LX8/ID INPUT DETECTION MODULE

This module is used to detect voltage levels in either DC or AC Circuits. The module supplies eight separate, optoisolated two wire inputs and has 20 pin header connectors with J20R or J20C Mates. This module does not require a CL8 Display Module as it has its own LEDs which show Input States (e.g. detected signals above threshold level).

LXB MATRIX SERIES

The LXB Series units are two pole switch matrices and are available as either Mainframes or Expansion Chassis. They are well suited for use in two wire data communications applications, including T1 and ISDN, where wiring is minimized and performance is optimized. The following matrix configurations are available: two separate 16x4s in one chassis, one 16x8, or one 64x2. Signals connectors are BNCs, Screw Terminals or Three Pin Headers. Twin BNCs are available at extra cost.

MAINFRAMES

There are two basic Mainframes: the LXB/2(16x4) and the LXB/64x2. Both are 19" rack mounting chassis, 3.5" high and 15.6" deep. Each Mainframe is built with power supplies and motherboards that hold up to 16 Switch Modules, 16 Display Modules and a Control Module. Manual Controls are optional.

LXB/2(16x4) MAINFRAME

This mainframe accepts up to16 LXB/2(1x4) Switch Modules to form two separate 16x4 Matrices as shown in **Fig. 3.**
Jumpering Inputs A & B on the Switch Modules forms a 16x8 Matrix. Motherboard jumpers can also be added to bus Outputs 1 & 5, 2 & 6, 3 & 7, and 4 & 8 connecting the two 16x4 Matrices to create a single 32x4 Matrix.
Bandpass is 40 MHz at -3dB and **Crosstalk** is less than -60dB at 10 MHz.

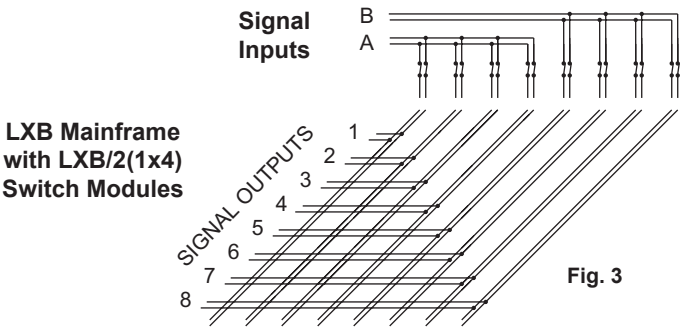


Fig. 3

LXB/64x2 MAINFRAME

This mainframe accepts up to 16 LXB/4(1x2) Switch Modules and one Signal I/O Module. The Signal I/O Module interconnects the Signal Motherboard bus traces to form a 64x2 Matrix as shown in **Fig. 4**.
Bandpass is 15 MHz and **Crosstalk** is less than -60dB at 10 MHz.

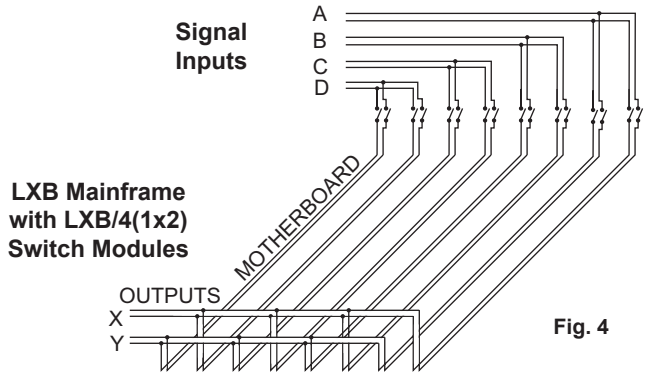


Fig. 4

LXB/2 (16x4)-E EXPANSION CHASSIS

This unit has the same motherboards as the Mainframe without power supplies, and is controlled from a MESA Unit as described in the **MESA** Bulletin.

LXB/64x2-E EXPANSION CHASSIS

This unit has the same motherboards as the Mainframe without power supplies, and is controlled from a MESA Unit as described inthe **MESA** Bulletin.

LXB SWITCH MODULES

LXB/2(1x4) SWITCH MODULE

This module has 8 two pole relays arranged as two separate 1x4 matrices as shown on **Fig. 3.** It plugs into the LXB Signal Motherboard. The two matrices, A & B, can be jumpered on the module to create one 1x8 matrix.
This module is available with Type S Standard, Type M Mercury, Type LT Low Thermal, and Type HV High Voltage relays and with the following connectors: Type N - BNC receptacles, Type H - Three Pin Headers or Type ST - Screw Terminals. Twin BNCs are available at extra cost.

LXB/2(1x4)-2P-ST SWITCH MODULE

This module is similar to the above but is built with 8 two pole Type P Power Relays and Screw Terminal connectors. It is used for higher power or current applications where a matrix configuration is required. Mating connectors are included in the price of the module.

LXB/4(1x2) SWITCH MODULE

This module has 8 two pole relays arranged as four 1x2 matrices as shown in **Fig. 4**.
The module is available with Type S, Type M, Type LT or Type HV relays and with the following connectors: Type N - BNCs, Type H - Three Pin Headers or Type ST - Screw Terminals. Twin BNCs are available at extra cost.

CL8 DISPLAY MODULE

One CL8 Display Module is needed for each LX8 or LXB Series Switch Module. These have the control logic and drives that energize selected relays. Individual LEDs show every switchpoint's state (open or closed).

GX GROUP SWITCH

LX8/G2 Switch Modules can be used in either the GX/8 or GX/16 Group Switch Chassis to switch signals in groups of 16 wires in up to a 16x1 Multiplexer configuration. For more information see the GX Bulletin .

LX SERIES SWITCH SPECIFICATIONS

Switch modules are built with several different relay types as determined by the switched signals.

Type S Standard reed relay is used for general purpose instrumentation level signals.

Type M Mercury reed relay switches higher power signals.

Type LT Low Thermal reed relay has a thermal offset of less than 1 microvolt and is for very low level signal applications.

Type HV High Voltage reed relay is rated at 1500 volts breakdown voltage.

Type P High Power armature relay has an AC rating of 2000 VA and can switch 8 amps.

Type S, **Type M**, **Type LT**, and **Type HV** are all high reliability reed relays with a guaranteed life of 100 million operations when used within the following specifications. **Type P** relays are armature type and have a mechanical life of 10 million cycles.

SPECIFICATIONS	S	M	LT	HV	P
Contact Rating VA	10	50	10	10	150
Switching Voltage	200	500	100	1000	500
Switching Current	.5VA	1.0A	.25A	0.1A	8A
Carrying Current	1.0A	2.0A	1.0A	1.0A	10A
Breakdown Voltage	400	1000	400	1500	1400
Operate Time msec	1	2	1	1	10
Rated Operations	10^8	10^8	10^8	10^8	10^6

OVERALL SPECIFICATIONS

DIMENSIONS - Standard Mainframes are 19 inch Rack Mounting, 3.5 inches high and 15.6 inches deep. Wired Mainframes are 16 inches deep.

WEIGHT - Maximum weight with full complement of Modules is less than 25 lbs.

POWER - 100 watts at 100-130 Volts AC or 200-260 Volts AC.

ENVIRONMENT - Operating 0^0 C to 50^0 C
Storage -25^0 C to 65^0 C

ACCESSORIES

MATING CONNECTORS

J3 -Three Pin Header Connector
J10 -Ten Pin Card Edge Connector
J16B -Screw Terminal Connector
J20 -Twenty Pin Card Edge Connector
J20R -Twenty Pin Ribbon Connector
J20C -Twenty Crimp Pin Connector

CHASSIS SLIDES

CHS-1 Chassis Slides with 15 inches travel

LX CONTROL MODULES

The LX Mainframes can be computer controlled via the modules listed below. Each Control Module selects any switchpoint and Latches, Unlatches and returns Status of that point.

IF-1 PARALLEL PORT

This module requires 14 individual TTL level binary lines from the controlling computer. These select Switch and Mode, Strobe the selected command and return switch point Status.

IF-11 LAN/GPIB/RS232

Cytec's newest control module has the three most popular control interface protocols built into one module and is backwards compatible with all previous Cytec control modules.

LAN - 10/100BaseT Ethernet with an RJ45 Connector.
The interfaces uses a static IP easily reset by the end user. There are three ports avaiable and all may be used at the same time. Two ports can be set by the end user and one is the default Telnet which may be disabled.

GPIB - IEEE488.2 compliant control module.
Commonly used with automated test applications. Works with all GPIB control cards and software including National Instruments, Matlab and Keysight. Drivers available upon request.

RS232 - Standard D9 serial port which can be used from computer com ports or USB to COM port cables

MANUAL CONTROLS

MC/128-TW MANUAL CONTROLS

Front panel thumbwheels and push button switches select and control all mainframe switchpoints. This manual control can be "locked out" by the computer.

VMCS VIRTUAL MANUAL CONTROL SOFTWARE

This Software displays a full Graphical User Interface (GUI) on the controlling computer. The operator controls the Mainframe with simple mouse point-and-click operations. The software can also be used to control the unit over a LAN.

SOFTWARE

Drivers and Sample Programs are available for the most common programming languages. These check the entire system by cycling through all switches, sequentially latching and unlatching each switch while checking Status.

WARRANTY

CYTEC Corp. warrants that all products are free from defects in Material or Workmanship for a period of 5 years and that all switches are guaranteed for their Rated Operations.

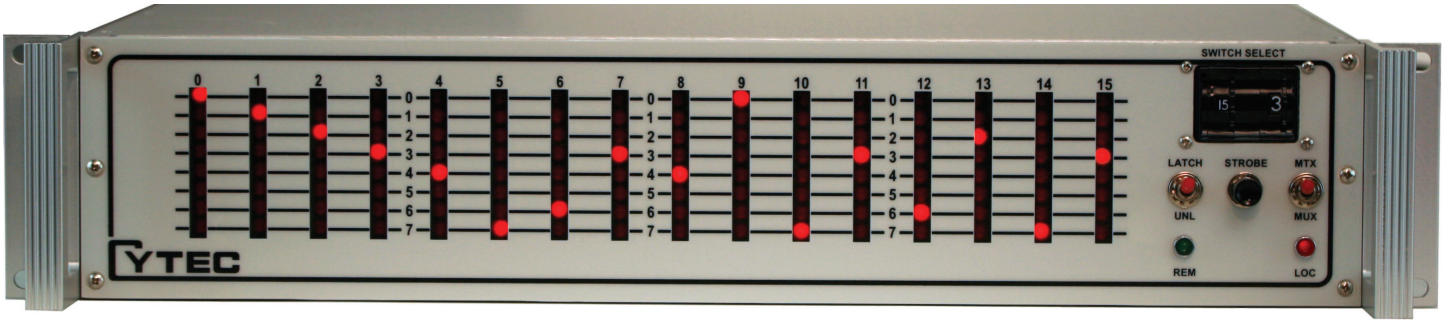
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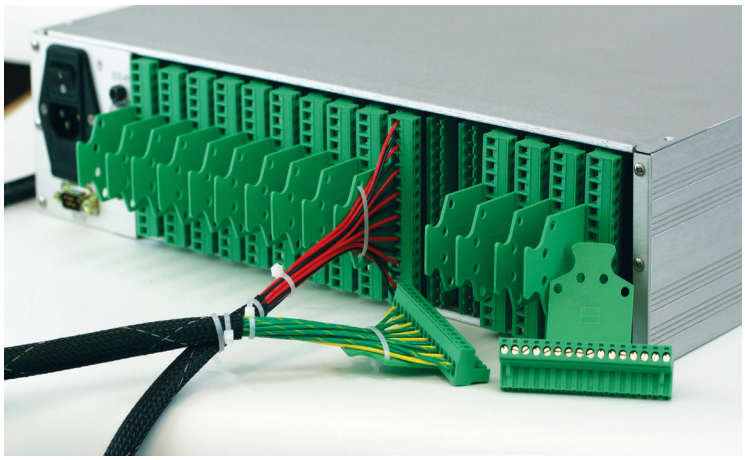
FEATURES:

- **Standard off-the-shelf 19" rack mount LX/128 Mainframe 2U chassis with 16 LX8/G2-ST Switch Modules installed.**
- **Wide variety of switching configurations are possible with simple external wiring changes. NxM matrix or 1xN mux.**
- **128 two pole Type A general purpose, Type P power or Type HV high voltage relays.**
- **Easy to use Screw Terminal connectors - mating connectors included in system price.**
- **GPIB and RS232 or 10/100 Ethernet LAN and RS232 remote control.**
- **Full LED display & status feedback to controlling computer give visual indication and aids debugging.**
- **Manual Control for use without computer control.**
- **Simple command set and addressing.**
- **Five Year Warranty! • Field proven for 30 years.**

Common Two Pole Configurations:

Matrix	Mux
16x8	128x1
32x4	Two 64x1's
64x2	Four 32x1's
Two 32x2's	Eight 16x1's
Four 16x2's	64x1x64
Two 16x4's	Two 32x1x32's

Hundreds more possible!



SWITCH CHARACTERISTICS

Relay Type	Type A	Type P	Type HV
Switch Voltage	110V	500V	1000V
Switch Current	1.0A	8.0A	0.1A
Breakdown Voltage	750V	1400V	1500V
Operating Time	3ms	10ms	1ms
Life Expectancy	10^8	10^7	10^8
Contact Rating	30VA	150VA	10VA

Call or e-mail for current $

Specify GPIB and RS232 or LAN and RS232 Control. Specify relay type. 2 weeks ARO. Smaller and larger systems are available. Many other module types available.

• View more of Cytec's LX Series offerings.

• Link to Cytec home page with over 500 different switching products.

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