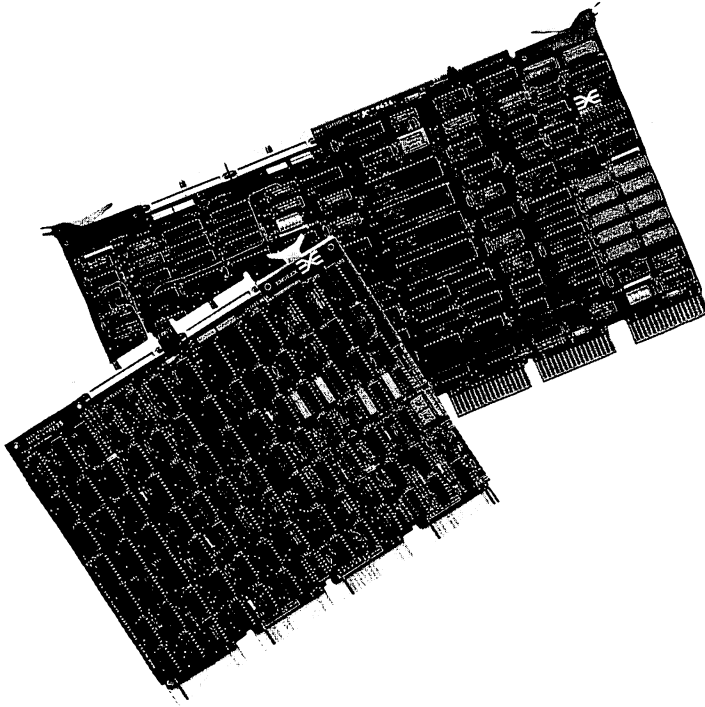
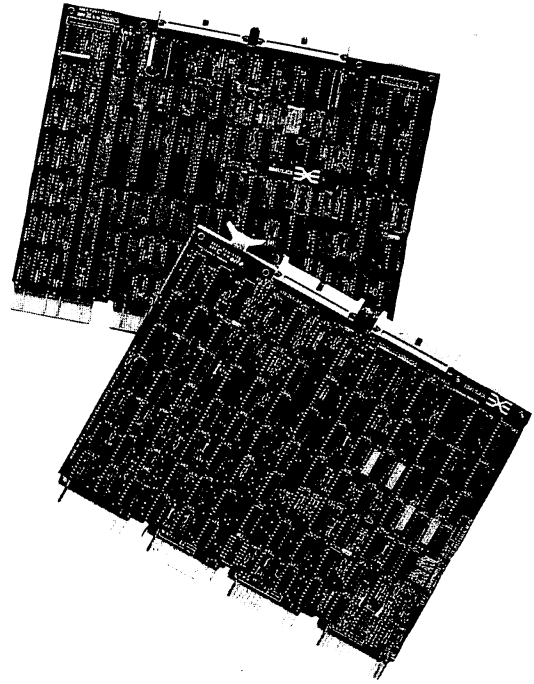




**THE GENUINE ALTERNATIVE
FOR VAX/PDP/LSI-11 TAPE CONTROLLERS
TU10/TM11 COMPATIBLE
EMULEX TC11 AND TC11/V
FOR PDP-11 AND VAX-11 COMPUTERS
EMULEX TC01 FOR LSI-11 COMPUTERS**



MODEL TC11, TC11/V



MODEL TC01

FILL ALL YOUR MAGNETIC TAPE NEEDS FROM A SINGLE SOURCE.

Half-inch magnetic tape continues to be the basic, universally accepted answer to disk back-up and software/data interchange. And no matter what kind of

DEC computer—LSI-11, PDP-11 or VAX-11—you use, or which tape manufacturer you prefer, EMULEX has the perfect answer for your controller needs.



EMULEX MODEL TC11 AND TC11/V FOR PDP-11 AND VAX-11 COMPUTERS.

THIS MODERN, PROVEN CONTROLLER GIVES YOU ALL THE ADVANTAGES...

INCORPORATING any industry standard reel-to-reel magnetic tape drives—NRZ, PE, and Dual Density—at speeds up to 125 ips.

IMBEDDING the controller in only one (NRZ) or two (PE/Dual Density) existing SPC slot(s) of your standard backplane or system unit.

EXECUTING standard DEC PDP-11 system and diagnostic software.

OPERATING on the VAX-11 using the VMS/UT software package, designed and fully supported by EMULEX.

PERFORMING a comprehensive set of controller-generated self-test and extended subsystem diagnostics.

WORKING when you plug it in and continuing to work reliably for thousands of hours.

YOU GET THESE ADVANTAGES— AND MORE—BECAUSE...

The TC11 was designed specifically—and exclusively—for the VAX/PDP-11 Unibus. Because it is not just a “universal” type controller adapted to operate on a Unibus, its packaging and performance are optimum in every respect. And the unique, powerful bipolar microprocessor-based architecture provides a lot more: full performance required for high-speed/high-density operations; PDP-11 diagnostic and operating software transparency; VAX/VMS software compatibility with the EMULEX supplied package; and extensive controller self-test and extended subsystem diagnostic operations executed entirely by controller firmware.

COMPARE THIS COMBINATION OF KEY FEATURES AGAINST THOSE OF ANY OTHER PRODUCT...

...and we think you will agree that the TC11 is the best choice for meeting all your VAX/PDP-11 tape subsystem requirements.

COMPACT PACKAGING. Only one stand-alone pc board, plugged into any standard SPC slot, handles all NRZ formatting and control operations; a second quad height pcb, plugged into any other convenient SPC slot, adds full phase encode (PE) capability.

TRANSPARENT PDP-11 OPERATION. The TC11, combined with any standard tape drive, emulates the functions of a TU10/TM11 subsystem, including execution of standard PDP-11 diagnostic programs.

COMPATIBLE VAX-11 OPERATION. The TC11/V, combined with any standard tape drive and the EMULEX VMS/UT software driver/diagnostic package, provides reliable, economical tape storage on all VAX-11s.

INTERNAL SELF-TEST. The TC11 automatically performs extensive tests, not only of itself (including all elements of the PE electronics) but also of the computer interface. On-board LED displays pinpoint a probable controller or PE board failure.

FLEXIBLE, HIGH-PERFORMANCE DRIVEN INTERFACE. Any four industry standard tape drives—operating with 9 tracks, at densities up to 1600 bpi, speeds up to 125 ips, and at a cumulative cable distance of 25 feet—may be incorporated. Overlapped tape rewinds are permitted.

STANDARD UNIBUS INTERFACE. The controller interfaces, via the controller pc board only, to any standard SPC slot and presents only one unit load on all lines. Full 16-bit word NPR data transfers are made, and the controller checks for parity errors if a parity controller is installed in the system.

FLEXIBLE FORMATTING. Data may be packed in either DEC or IBM format, 9 channel. Tape drives may be daisy-chained together. User may edit previously recorded records.

DATA INTEGRITY. LRC and CRC (9 track) is generated and checked. Read-after-write parity check is made on all recorded characters.

VAX PRODUCT SUPPORT

The VMS/UT software package—developed and fully supported by EMULEX—consists of a driver (VMS/UTD) and diagnostics (VMS/UTX) which completely supports installation, operation, and maintenance on VAX-11/750, 780 computers under VMS version 2.0 and above. Software is supplied with each controller on either TU58 compatible cartridge (11/750) or RX01 compatible diskette (11/780) and carries a one-year warranty and update service.

EMULEX MODEL TC01 FOR LSI-11 COMPUTERS.

THIS FIRST—AND BEST— IMBEDDED DUAL DENSITY CONTROLLER THAT GIVES YOU THE ADVANTAGES OF...

EXECUTING standard DEC and PDP/LSI-11 system and diagnostic software.

INCORPORATING any industry-standard reel-to-reel magnetic tape drives—PE and Dual Density—at speeds up to 75 ips.

IMBEDDING the controller in only one or two existing quad slots of your standard LSI-11 backplane or system unit.

PERFORMING a comprehensive set of controller-generated self-test and subsystem diagnostics.

WORKING when you plug it in and continuing to work reliably for thousands of hours.

YOU GET THESE ADVANTAGES— AND MORE—BECAUSE...

The TC01 was designed specifically—and exclusively—for the LSI-11 computer. Because it is not just a "universal" or Unibus type controller adapted to operate on the Q Bus, its packaging and performance are optimum in every respect. And the unique, powerful bipolar microprocessor-based architecture provides a lot more: full performance required for high-speed/high-density operations; complete diagnostic and operating software transparency; and extensive controller self-test and subsystem diagnostic operations executed entirely by controller firmware.

COMPARE THIS COMBINATION OF KEY FEATURES AGAINST THOSE OF ANY OTHER PRODUCT...

...and we think you will agree that the TC01 is the best choice for meeting all your LSI-11 tape storage requirements.

COMPACT PACKAGING. Only two stand-alone pc boards, plugged into any two standard quad slots, handle all NRZ/PE formatting and control operations.

TRANSPARENT OPERATION. The TC01, combined with any standard tape drive, emulates the functions of DEC TU10/TM11 subsystem, including execution of standard diagnostic programs.

INTERNAL SELF-TEST. The TC01 automatically performs extensive tests, not only of itself (including all elements of the PE electronics) but also of the computer interface. On-board LED displays define a probable controller or PE board failure.

FLEXIBLE, HIGH-PERFORMANCE DRIVE INTERFACE. Any four industry standard 9-track tape drives—operating at densities of 800/1600 bpi, speeds up to 75 ips, and at a cumulative cable distance of 25 feet—may be incorporated. Overlapped tape rewinds are permitted.

STANDARD Q BUS INTERFACE. The unit interfaces via the controller pc board only to any standard Q Bus quad slot and presents only one unit load on all lines. Full 16-bit word NPR data transfers are made, and the controller checks for parity errors on all memory read operations.

FLEXIBLE FORMATTING. Data may be packed in either DEC or IBM format. User may edit previously recorded records.

DATA INTEGRITY. LRC and CRC (9-track) is generated and checked. Read-after-write parity check is made on all recorded characters.

RELIABLE OPERATION. Unit meets all specs over wide voltage margin and clock margin ranges. Timing is generated by crystal clock. Conservative derating is made on all components. Environmental range exceeds that of all commercial LSI-11 host computers and applicable industry tape drives.

SPECIFICATIONS (TC01, TC11, TC11/V)

Characteristic	Specification
FUNCTIONAL	
Design	High-speed 16-bit bipolar microprocessor controller.
CPU's	TC01: LSI-11, 11/2, 11/23 TC11: PDP-11/04 thru 11/70 TC11/V: VAX-11/750, 11/780
Computer Interface TC01/N (NRZ)	Standard Q Bus via quad interface on controller board (A-B connectors).

Characteristic	Specification
TC11/N (NRZ)	Standard Unibus via SPC interface on controller board (C-F connectors).
PE Board	Power and ground pins only (common to TC01 and TC11 except for NPG grant line strapping).

SPECIFICATIONS (TC01, TC11, TC11/V)

Characteristic	Specification
Tape Speed TC01	One selectable: 12.5, 15, 18, 75, 25, 37.5, 45 and 75 ips.
TC11, TC11/V	Two selectable: Same as TC01 plus 125 ips.
Bus Address Range	0-128 K Words.
Register Base Address	772520 ₈
Interrupt Vector	224 ₈
Priority Level	5
Tape Transports	Type: ½ inch, reel-to-reel, IBM standard format. Interface: Pertec-standard, Heads: Dual gap, read-after-write. Track/Densities: 9 Track, 800/1600 bpi.
Number of Transports	Daisy-Chain, 1-4 drives. Simultaneous rewind operations permitted.
Data Checking	Read-after-write parity check on all characters; LRC and CRC (9 track).
Self-Test	Controller automatically executes extensive power-up self-test which includes: microprocessor, write clock generator, DMA, and PE Read Board. Runs simulated PE records into PE Read Board with various data Bad Tracks configuration. Complete read out of test progress and errors via tape controller registers. Various operating modes allow for fault detection and scope display.
Fault/Activity Display	LED indicates detected board fault and controller read/write activity.
Option Switches Controller Board	Six on-board slide switches for selection of program-controlled operation/configuration options.
PE Board	Tape speeds set up by slide switches.

PHYSICAL

Packaging TC01/N (NRZ)	Quad-size board, standard quad slot.
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Characteristic	Specification
TC11/N (NRZ)	Hex-size board, standard SPC slot.
PE Board	Quad-size board, standard quad or SPC slot.
Cabling	One 40-conductor flat cable between boards and two 40-conductor flat cables to first tape transport.
Adapters	Daisy-Chain adapters available for most industry tape drives.

ELECTRICAL

Computer Interface TC01	To standard Q Bus using DEC approved drivers and receivers; one unit load per bus line.
TC11	To standard Unibus using DEC approved drivers and receivers; one unit load per bus line.
Transport Interface	24ma drivers used on all output lines, receivers or all inputs, max 25 feet cumulative daisy-chain cable length.
Power TC01/N (NRZ)	+5v±5%, 5 amps.
TC11/N (NRZ)	+5v±5%, 5 amps.
PE Board	+5v±5%, 2 amps.

ENVIRONMENTAL

Exceeds all environmental ranges and conditions specified for commercial LSI-11, PDP-11, VAX-11 computers and applicable tape drives.

SOFTWARE

LSI-11 and PDP-11 Diagnostics	DEC ZJF12-RB Kit
Operating Systems	All applicable to TU10/TM11 subsystem on PDP/LSI-11.
VAX-11 (TC11/V)	EMULEX VMS/UT package includes driver and on-line diagnostic in execution code for load- and-go integration into VMS, plus stand-alone diagnostic. Furnished on TU58 or RX01-compatible media. Fully supported for VMS V2.0 and above.