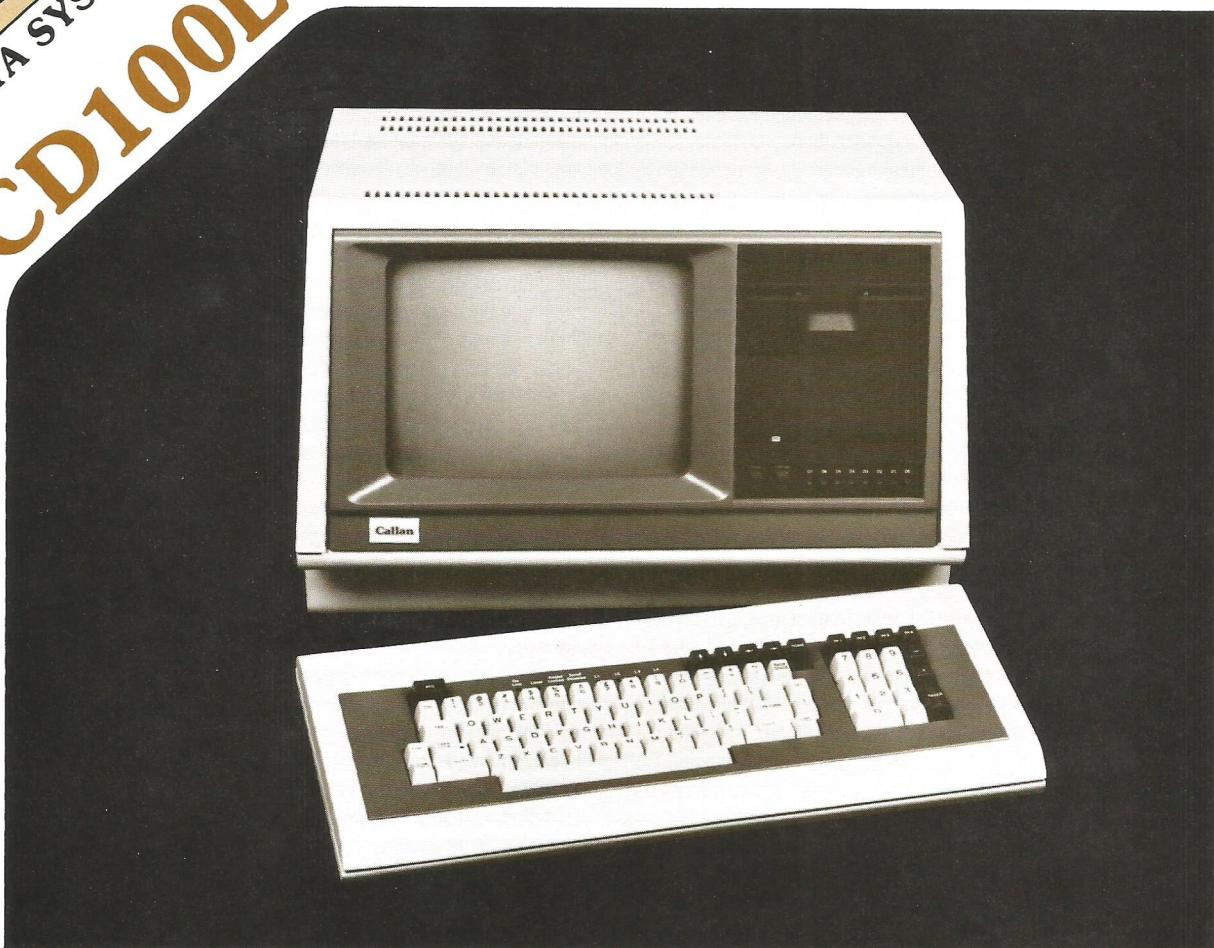# Integrated Work Station

Features

- Full DEC Compatibility
- VT100/VT52 Compatible Terminal
- 7 Quad/14 Dual Height Card Cage
- Keypad Application Mode
- Resident Diagnostics
- RL02 (10.4Mbyte)/RX02 (.5Mbyte) Emulation Option
- Dual RX02 (.5Mbyte) Emulation Option
- Compatible with RT-11 or RSX-11 O.S.
- Dual Screen Partitions
- Key Selectable Smooth Scroll

Description

The CD100L Integrated Workstation provides full DEC hardware and software compatibility for LSI-11 microcomputers with a VT100 compatible video terminal, a fourteen slot dual-height Q-Bus card cage, a 10.4 Mbyte RL02 emulating 5¼ inch Winchester disk, and a .5 Mbyte RX02 emulating 5¼ inch floppy disk all integrated into a very compact single desktop package. The CD100L is fully compatible with the RT-11 or RSX-11 operating systems and standard DEC peripheral software drivers.

The CD100L is available as an OEM workstation to to LSI-11 users in a variety of configurations ranging from a VT103 replacement to a completely configured system with the RL02/RX02 or dual RX02 disk system and either the LSI 11/2 or 11/23 microcomputer.

CD100L Video Display Terminal

The CD100L includes an intelligent display terminal with many standard advanced video features not available in the DEC VT100 or VT103. The video terminal interfaces via an RS232 serial port to the resident LSI-11 microcomputer. The microcomputer controlled videocontroller is integral to the CD100L and provides both VT100 and VT52 compatible modes as well as local and remote keyboard operation modes.

VIDEO TERMINAL HIGHLIGHTS

Advanced Video Features Standard
    Dual intensity, reverse video
    Blink, underline, overstrike

Versatile Screen Formats
    Two screen partitions
    Programmable partition size

RS232 Serial Interface
    Up to 9.6Kbaud rate
    Xon/Xoff protocol

Operator Controls
    Front panel HALT and RESET option
    Intensity, contrast, keyclick

High Resolution Display
    80 char/line, 25 line display
    7x12 character matrix

Scrolling
    Smooth Scroll keyboard selectable
    Scroll area in each partition

Diagnostic Aids
    Power on self test
    Monitor display mode

Switch Selectable Set-Up
    Configures operating environment
    VT100/VT52 mode selection

VT100/VT52 COMPATIBILITY

The CD100L provides a VT100 or VT52 software compatible mode of operation while providing the set-up or configuration through a set of switches mounted in the rear of the unit.

The CD100L does not support the 132 characters per line or display the double height, double width characters. It does provide screen editing features not available in the VT100.

ADDITIONAL FEATURES

- Dual screen partition mode
- Smooth scroll key select
- Insert/delete characters
- Insert/delete lines
- 3 Lower case descenders
- 25 displayable lines
- No fill characters req'd

- Power on diagnostic
- 11 programmable LED's
- Monitor display mode
- Alternate 128 character ROM
- Larger input data buffer
- Front panel halt, reset, run led

KEYBOARD FEATURES

- 82 fully sculptured keys
- Keypad application mode
- VT100 Layout
- 4 addressable LED's
- Selectable keyclick

- Capacitive technology
- Auto repeat
- N key rollover
- Up to 23 function keys

Q-BUS BACKPLANE

The CD100L includes a Q-Bus compatible backplane with seven quad or fourteen dual height card slots. The backplane also provides integral termination resistors to eliminate the need for a termination module. Extended addressing to 2 Mbytes for the LSI 11/23 is fully supported. Also supported on the motherboard are Console Interface, Reset, Halt/Enaple, and Wake Up circuitry.

The power available to the Q-Bus Backplane is a function of the installed Winchester or Floppy Disk options. The maximum ratings of the supply cannot be exceeded.

VOLTAGE SPECIFICATIONS	MAXIMUM AVAILABLE CURRENT
+ 12 volt ±3%	1.8 amps
+ 5 volt ±3%	22.0 amps
− 12 volt ±5%	2.0 amps
DISK CONFIGURATION	MAXIMUM POWER AVAILABLE
No disks	165 watts
Dual mini Floppies	135 watts
Winchester/Floppie	120 watts

VT100 Mode Command Summary

COMMAND SEQUENCE	COMMAND DESCRIPTION	COMMAND SEQUENCE	COMMAND DESCRIPTION
ESC 7	Save cursor.	ESC [0 c	Request terminal device attributes.
ESC 8	Restore cursor.	ESC [?1 ; 2 c	Report to host the device attributes.
ESC D	Index cursor; same as linefeed.	ESC [f	Move cursor to home.
ESC E	Next line; same a CR LF.	ESC [; f	Move cursor to home.
ESC H	Set tab at current character position.	ESC [P1 ; f	Move cursor to row P1; column 1.
ESC M	Reverse Index.	ESC [P1 f	Move cursor to row PI; column 1.
ESC Z	Request by host for terminal I.D.	ESC [; P2 f	Move cursor to row 1; column P2.
ESC c	Reset to Power on state.	ESC [P1 ; P2 f	Move cursor to row P1; column P2.
ESC =	Enter Keypad Application Mode.	ESC [PI ; P2...h	Set modes P1, P2...
ESC >	Enter Keypad Numeric Mode.	ESC [g	Remove tab stop at cursor position.
ESC M	Reverse Index.	ESC [0 g	Remove tab stop at cursor position.
ESC [@	*Insert 1 blank character in line.	ESC [3 g	Remove all tabs.
ESC [0 @	*Insert 1 blank character in line.	ESC [P1 ; P2 ;..1	Reset modes P1, P2...
ESC [P1 @	*Insert P1 blank characters in line.	ESC [m	Set primary character rendition.
ESC [A	Move cursor up 1.	ESC [0 m	Set primary character rendition.
ESC [0 A	Move cursor up 1.	ESC [; m	Set primary character rendition.
ESC [P1 A	Move cursor up P1.	ESC [P1 ; P2 ; P3 m	Set renditions P1, P2 and P3.
ESC [B	Move cursor down 1.	ESC [P1 ; ; P2 ; P3 m	Set renditions P2 and P3.
ESC [0 B	Move cursor down 1.	ESC [P1 ; 0 ; P2 m	Set rendition P2 only.
ESC [P1 B	Move cursor down P1.	ESC [0 n	Report to host terminal is ready.
ESC [C	Move cursor forward 1.	ESC [5 n	Request by host for terminal status.
ESC [0 C	Move cursor forward 1.	ESC [6 n	Request by host for cursor position.
ESC [P1 C	Move cursor forward P1.	ESC [p	*Set partition 1 to 25 lines.
ESC [D	Move cursor backward 1.	ESC [0 p	*Set partition 0 to 25 lines.
ESC [0 D	Move cursor backward 1.	ESC [P1 p	*Partition screen at line P1.
ESC [P1 D	Move cursor backward P1.	ESC [q	Turn off all LED's.
ESC [H	Home cursor.	ESC [0 q	Turn off all LED's.
ESC [; H	Home cursor.	ESC [; P1 q	Turn off all LED's; set LED P1.
ESC [P1 H	Move cursor to row P1; column 1.	ESC [P1 ; P2...q	Turn on LED 1, 2...P1 (not 0.)
ESC [P1 ; H	Move cursor to row P1; column 1.	ESC [r	Reset scroll area to partition.
ESC [; P2 H	Move cursor to row 1; column P2.	ESC [; r	Reset scroll area to partition.
ESC [P1 ; P2 H	Move cursor to row P1; column P2.	ESC [; P2 r	Reset scroll area to 1; P2.
ESC [J	Erase from cursor to end of Edit region.	ESC [P1 ; P2 r	Reset scroll area to P1; P2.
ESC [0 J	Erase from cursor to end of Edit region.	ESC [s	*Select partition 0.
ESC [1 J	Erase from top of edit region to cursor.	ESC [P1 s	*Select partition P1.
ESC [2 J	Erase the Edit region.	ESC # 3	Set top half of double height/width line.
ESC [K	Erase from cursor to End of line.	ESC # 4	Set bottom half of double height/width line.
ESC [0 K	Erase from cursor to End of line.	ESC # 5	Set normal height½ width line.
ESC [1 K	Erase from beginning of line to cursor.	ESC # 6	Set double width line.
ESC [2 K	Erase the active line.	ESC # 8	Set screen to alignment pattern.
ESC [L	*Insert 1 line.	ESC (A	Set G0 set UK character set.
ESC [0 L	*Insert 1 line.	ESC (B	Set G0 set ASCII character set.
ESC [P1 L	*Insert P1 lines.	ESC (0	Set G0 set special graphics set.
ESC [M	*Delete 1 line.	ESC (1	Set G0 set alternate character set.
ESC [0 M	*Delete 1 line.	ESC (2	Set G0 set alternate special graphics set.
ESC [P1 M	*Delete P1 lines.	ESC) A	Set G1 set UK character set.
ESC [P	*Delete 1 character in line.	ESC) B	Set G1 set ASCII character set.
ESC [0 P	*Delete 1 character in line.	ESC) 0	Set G1 set special graphics set.
ESC [P1 P	*Delete P1 characters in line.	ESC) 1	Set G1 set alternate character set.
ESC [P1 ; P2 R	Report cursor positions.	ESC) 2	Set G1 set alternate special graphics set.
ESC [c	Request terminal device attributes.		

* Additional commands not in VT100

VT52 Mode Command Summary

COMMAND SEQUENCE	COMMAND DESCRIPTION	COMMAND SEQUENCE	COMMAND DESCRIPTION
ESC <	Enter VT100 mode.	ESC H	Home cursor.
ESC =	Enter Keypad Application Mode.	ESC I	Execute a reverse linefeed.
ESC >	Enter Keypad Numeric Mode.	ESC J	Erase to end of screen.
ESC A	Move cursor up 1.	ESC K	Erase to end of line.
ESC B	Move cursor down 1.	ESC U	*Delete line.
ESC C	Move cursor right 1.	ESC V	*Insert line.
ESC D	Move cursor left 1.	ESC W	*Clear screen and home cursor.
ESC F	Enter the graphic character set mode.	ESC Y line column	Move cursor to line column.
ESC G	Exit the graphic character set mode.	ESC Z	Request terminal identification.

* Additional commands not in VT52

CD100L Disk Systems

The Callan Integrated Workstation can be configured with DEC compatible disk systems integrated into the desktop unit. The CD100L uniquely can be configured with either an RL02/RX02 disk system or a dual RX02 disk subsystem complete with Q-Bus compatible controllers, bootstrap ROM, and diagnostics ready to interface either an LSI 11/2 or LSI 11/23 and standard DEC software drivers as part of the RT-11, RSX-11 or other operating system. The CD100L eliminates the need for an additional box to house a dual floppy or rigid/floppy disk system reducing cost, increasing system reliability and integrity, and increasing system performance.

The disk systems integrated with the CD100L provide a track for track and sector for sector mapping emulation of the equivalent DEC device on high density 5¼ inch Winchester or Minifloppy disks. Interfaced with custom designed, high performance, Q-bus compatible controllers, a complete DEC hardware and software compatible disk environment is maintained. Either the RX02 or RL02 controller can be selected as the system boot device. Each controller has jumper selectable bootstrap. Disk diagnostic programs are also provided for both Floppy and Winchester devices.

DISK OPTIONS

	WINCHESTER	FLOPPY
Capacity unformatted	15.9 Mbytes	1 Mbyte
Capacity formatted	12.6 Mbytes	.65 Mbytes
Emulation	RL02 10.48 Mbytes or 2 RL01 5.24 Mbytes each	RX02 .5 Mbytes
Peak transfer rate	625 Kbyte/sec	31.25 Kbyte/sec
Avg Access Time*	108.3 msec	230.5 msec
DMA	Yes	Yes
Error Detection	Yes	Yes
Max per controller	2	4
On Board Bootstrap	Yes	Yes
Modules for controller	1 Quad	1 Dual

*Defined as average seek plus average latency

TYPICAL CD100L BACKPLANE CONFIGURATION

ROW		
1	LSI 11/23	DLV11-J Serial Int
2	256 Kbytes Memory	RX02 Controller
3	RL02 Controller	
4	Available	Available
5	Available	Available
6	Available	Available
7	Available	Available

CONFIGURED FOR:

	SLOTS:
LSI11/23	1 dual
256 Kbytes RAM	1 dual
RL02 emulating Winchester	1 quad
RX02 emulating Floppy	1 dual
DLV11-J Serial Int	1 dual
Available	8 dual

Comparison of DEC VT103 and CD100L LSI-11 System

TERMINAL COMPARISON	VT103	CD100L
VT100/VT52 Modes	Yes	Yes
Characters Per Line	132	80
Lines Per Display	24	25
Character Dot Matrix	5 X 9	7 X 12
Double Height Character	Yes	No
Double Width Character	Yes	No
Screen Partitions	1	2
Scroll Regions	1	2
Advance Video Attributes	Opt	Std
Keypad Application Mode	Yes	Yes
Local and Remote Mode	Yes	Yes
Set Up Mode	Keyboard	Switches
Front Panel Switches	None	Halt, Reset
Addressable Leds	4	11
RS232 Interface	To 19.2Kbaud	To 9.6Kbaud
Fill Characters req'd	Yes	No
Back Panel	1 EIA 25D	4 EIA 25D
		4 37D
		1 Flat Ribbon
Self Test	Yes	Yes
Monitor Mode	No	Yes

BACK PLANE COMPARISON	VT103	CD100L
Slots	4 Quad/8 Dual	7 Quad/14 Dual
22 Bit Memory Address	No	Yes
Termination Resistors	No	Yes

DISK MEMORY COMPARISON

DUAL RX02 FLOPPY	EXTERNAL	INTERNAL
Capacity	1.0Mbyte	1.0Mbyte
Disk Size	8'' Floppy	5¼'' Floppy
Controller	1 dual	1 dual
Drives Per Controller	2	4
Peak Transfer Rate	61Kbyte/sec	31.25Kbyte/sec
Average Access Time	263 Msec	230.5 Msec
DMA	Yes	Yes
Space Requirements	10'' High Rack Mount	Integral
Bootstrap ROM Location	Add'l BDV 11 Board	Controller

RL02 RIGID/RX02 FLOPPY	EXTERNAL	INTERNAL
Capacity RL02	10.4Mbytes	10.4Mbytes
RX02	1.0Mbytes	.5Mbytes
	(Dual Drive)	(1 Drive)
Disk Size RL02	8'' Cartridge	5¼ Winchester
RX02	Dual 8'' Floppy	5¼'' Floppy
Controller RL02	Quad	1 Quad
RX02	1 Dual	1 Dual
Drives Per Controller RL02	2	2
RX02	2	4
Peak Transfer Rate RL02	512 Kbytes/sec	625Kbytes/sec
Average Access Time RL02	67.5 Msec	108.3Msec
DMA	Yes	Yes
Space Requirements RL02	21'' High Rack Mount	Integral
RX02	10'' High Rack Mount	Integral
Bootstrap ROM Location	Add'l BDV 11 Board	Controller

Specifications CD100L

DIMENSIONS

Width: 20.5 in. (52cm)
Height: 14.5 in. (37cm)
Depth: 19.25 in. (49cm) without keyboard nested
       25.5 in. (64cm) with keyboard nested
Weight: 64 lbs.

POWER (Switch Selectable)

105 VAC - 125 VAC
210 VAC - 250 VAC

LINE FREQUENCY

47 - 63 Hz

ENVIRONMENT

OPERATING:
Temp: 10.0 to 40.0°C (50.0 to 104.0°F)
Humidity: 10% to 80% non-condensing
Altitude: 8000 ft (2.4Km)

NON-OPERATING:
Temp: −40 to 66°C (−40 to 151°F)
Humidity: 5% to 95% non-condensing
Altitude: 30,000 ft (9.1Km)

Rear Panel Switch Headings

SW1 - UPPER SWITCH BANK

SWITCH NUMBER	SWITCH NAME	OFF POSITION (LEFT)	ON POSITION (RIGHT)
1-8	Autowrap	Enabled	Disabled
1-7	XON/XOFF	Disabled	Enabled
1-6	New Line Mode	Enabled	Disabled
1-5	Margin Bell	Enabled	Disabled
1-4	VT100/VT52 Mode	VT52 Mode	VT100 Mode
1-3	Cursor Blink	Steady Cursor	Blinking Cursor
1-2	Cursor Type	Dash Cursor	Block Cursor
1-1	Screen Mode	Reverse Video	Normal Video

SW2 - LOWER SWITCH BANK

SWITCH NUMBER	SWITCH NAME	OFF POSITION (LEFT)	ON POSITION (RIGHT)
2-8	Local/Online	Local/Test Mode	Online
2-7	Data Length	7 Data Bits	8 Data Bits
2-6	Parity	Even Parity	Odd Parity
2-5	Parity	Process Parity	Ignore Parity
2-4	Buad Rate Select Code		
2-3	Baud Rate Select Code		
2-2	Baud Rate Select Code		
2-1	Baud Rate Select Code		

Callan
DATA SYSTEMS