LibraryXpress™ Series

DLT Library System

Including

LXG, LXB, and LXC Modules
and XpressChannel

Installation

and User Manual

DIGITAL Part Number
EK–TL890–OM. A01

P/N 104139-101, Rev. A 3/97

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28.8 kbaud, no parity, 8 bits, 1 stop bit
Protocols: **ASCII, Xmodem (checksum), Xmodem (CRC), Xmodem (1K), Ymodem**

(batch),

Ymodem (G), Zmodem, Zmodem (resume after abort), Kermit/super Kermit

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Chapter 1 - Introduction

The DLT LibraryXpress™ System is an expandable, modular tape library system combining DLT drive technology with advanced robotics. The LibraryXpress System is designed for high duty-cycle on-line and near-on-line applications, such as hierarchical storage management (HSM). It is a superior performer in high-volume backup and archival service as well.

Modules

Available modules in the LibraryXpress series are the following.

- Global Control Module (LXG)
- Base Module (LXB)
- Capacity Module (LXC)

Every DLT LibraryXpress System consists of one Global Control Module, and any combination of up to eight of the remaining modules stacked in a rack. The Global Control Module can move media freely between itself, Base Modules, and Capacity Modules via the robotically-controlled XpressChannel™.

In a DLT LibraryXpress System, you can combine modules to provide the right combination of capacity and performance to meet your present requirements. Overland Data's Smartscale Storage™ architecture lets you change or add to the mix of modules to optimize throughput, capacity, or both as your needs change.

When connected as a system, the robotics in Base Modules and Capacity Modules act as commanded by the Global Control Module. The host computer or computers need no knowledge of the internal geometry of the system, or of the actions or capabilities of any of the slave modules. The Global Control Module presents to the host or hosts a single SCSI medium changer device with a single SCSI Medium Transport element, a number of SCSI Storage elements equal to the total number of cartridge magazine slots, a number of SCSI Import/Export elements as specified by the user during configuration of

the Global Control Module, and a number of SCSI Data Transfer elements equal to the total number of drives in the system.

SmartScale Storage™ Architecture

Flexibility

The DLT LibraryXpress Smartscale Storage™ architecture is uniquely suited to growing storage needs. Overland Data's Smartscale Storage architecture enables the robotics in each of the LibraryXpress modules to exchange cartridges by means of the XpressChannel™ pass-through elevator, and integrates the robotics in the individual modules and the Global Control's XpressChannel into a single high-performance library robotics system. You can start with a system configured to your present requirements, confident that as your storage needs evolve, the LibraryXpress can easily be modified by adding modules and extending the XpressChannel. Add drives for faster performance or magazine space for greater capacity, as needed. Then just turn on the power, and immediately the system updates the system map so the host is informed of the expanded capability.

Multi-Server Data Sharing

A host computer with a SCSI controller connected to a bus is a SCSI Initiator. The Global Control Module is a SCSI Target. SCSI rules permit multiple Initiators on a single bus. Therefore, with the proper host software, it is possible to connect multiple hosts to a single Global control Module over a single SCSI bus. This allows multiple hosts to operate the library robotics, loading and unloading cartridges as each host requires.

In a system with many drives, it is desirable to use multiple SCSI busses for the drives, so the data transfer rate of the drives is not limited by bus bandwidth. In a large, high-performance system, drives may be connected to separate hosts. Using special software, one of the hosts can act as a master server, processing all robotics commands. In this way several hosts may share a common data base.

The Global Control Module

Description

The LXG0016 Global Control Module integrates the robotics in the individual modules into a single coordinated library robotics system. The Global Control Module performs and maintains an inventory of all media present in the system, including bar code data, if the modules are equipped with bar code readers. All necessary system control operations may be performed from the control panel of the Global Control Module, as well as from the host via software. The SCSI interface for the library robotics is designed for high-speed communication with the host, and is available in standard SCSI-2, Fast SCSI-2 or Fast/Wide SCSI configurations.

In addition to its system control functions, the Global Control Module has a 16-cartridge magazine with a rugged random access robotic mechanism. The module robotics moves cartridges between the XpressChannel and any of the 16 cartridge storage locations.

The user may designate a magazine in one of the slave modules as a mail slot for inserting or removing one or more single cartridges, which implements the SCSI Import/Export commands. ***Note:*** a magazine which has been reserved for Import/Export service may not be used for data storage.

The Base Module

Description

The Base Module has one or two DLT drives and a 10-cartridge magazine with a rugged random access robotic mechanism.

Models

The DLT LibraryXpress Base Module is currently available in six models. The first digit of the model number refers to the DLT drive model series. The second digit of the model number denotes the number of drives. The third and fourth digits denote the number of slots in the module’s magazine.

The LXB2110 and LXB2210, using 2000XT series drives, read from and write to the DLTtape™ (formerly CompacTape®) IIIXT 1/2 inch cartridges, with a native capacity of 15 GB per cartridge. The LXB4110 and LXB4210, using 4000 series drives, can use both DLTtape IIIXT and higher-density DLTtape IV cartridges. The latter have a native capacity of 20 GB per cartridge. The LXB7110 and LXB7210, using 7000 series drives, also use the DLTtape IV cartridges, but provide a native capacity of 35 GB per cartridge. All models can also read and write DLTtape III cartridges. Both read and write densities are selectable from the front panel, and under SCSI control from the host.

Note: It is strongly recommended that if you do not equip all Base Modules with the same drive model, you set up tape grouping via host software. This will avoid tape interchange problems among drives capable of writing different densities.

The Capacity Module

Description

The LXC0016 Capacity Module has a 16-cartridge magazine, and no tape drives, and a rugged random access robotic mechanism. The module robotics, under control of the Global Control Module, moves cartridges between the XpressChannel and any of the 16 cartridge storage locations.

SCSI Interface Configurations

The DLT LibraryXpress system's standard SCSI interfaces are SCSI-2 for systems equipped with 2000XT drives and Fast SCSI-2 for systems equipped with 4000 drives. Both of these use high-density 50-pin D-series connectors. Also available, in systems equipped with 7000 series drives, is a Fast/Wide SCSI interface using high-density 68-pin D-series connectors. The section on SCSI Interfaces in **Chapter 2 - Installation** describes the available interface options.

SCSI Bus Performance Considerations

Data Transfer Rate

The data transfer rate of the DLT LibraryXpress is dependent on the type of drives and on the SCSI bus configuration. The bandwidth of the SCSI bus is limited. As a result, the transfer rate of exceptionally fast drives such as the 7000 series can be limited by sharing a SCSI bus with another drive or with the library robotics.

Drives

With a standard SCSI interface, modules equipped with 2000XT series drives can provide a sustained native transfer rate of 1.25 MB/second. With both drives operating, the 2000XT's rate is 2.5 MB/second. For the 4000 series, the maximum sustained native rate is 1.5 MB/second. With both drives operating, the 4000's native rate is 3.0 MB/second. In modules equipped with 7000 series drives, the native data transfer rate is 5.0 MB/second, 10 MB/sec for two drives. The rates for compressed data are the native rates multiplied by the compression factor, which depends on file content, but averages approximately 2:1.

Internal Cabling Configuration

The LibraryXpress System is wired in an independent-bus SCSI configuration. That is, the robotics and each of the drives has its own SCSI bus. SCSI jumpers are available for those applications requiring that some combination of drives and robotics be daisy-chained to a single SCSI bus. These configurations are described in more detail in the section on SCSI Interfaces in **Chapter 2 - Installation**.

Bus Length Limitations

The single-ended SCSI-2 bus is limited to 6 meters overall length, and the single-ended Fast SCSI-2 bus is limited to 3 meters overall length. In contrast, differential SCSI-2 and Fast SCSI-2 buses may be up to 25 meters. The internal wiring of a single-ended LibraryXpress system may consume a significant fraction of the allowed length, leaving very little extra for

attachment to the host. Overland Data strongly urges use of the differential configuration for best performance.

Physical Configuration

All modules in a LibraryXpress System must be mounted in a rack. When a system is ordered, all of the modules are supplied in rack mount configuration. None of the modules may be operated alone, except for the LibraryXpress Base Module, which may be converted to operate as a free-standing 10-slot library. For users who wish to remove a Base Module from a system and use it alone, a conversion kit is available to convert a rack mount module to desktop configuration. Another kit is available for conversion in the opposite direction. See **Appendix B - Accessories/Spares/FRUs** for the part numbers.

System Expansion

A DLT LibraryXpress System may be expanded in capacity or performance or both by adding or removing modules. Associated with each module is a section of the XpressChannel™ pass-through cartridge elevator. Smartscale Storage system firmware integrates the robotics in the individual modules and the Global Control's XpressChannel into a single high-performance library robotics system.

Conversion of Free-Standing Base Modules for System Use

Your existing LibraryXpress Base Modules may be added to your system by changing firmware, resetting internal jumpers, removing the pass-through cover plate, and in some cases converting from desktop to rack mount. These tasks should be performed by qualified service personnel. Contact your technical support representative for instructions.

Features

Figures 1-1, through 1-7 identify some of the external features of the Global Control Module, the Base Module, and the Capacity Module.

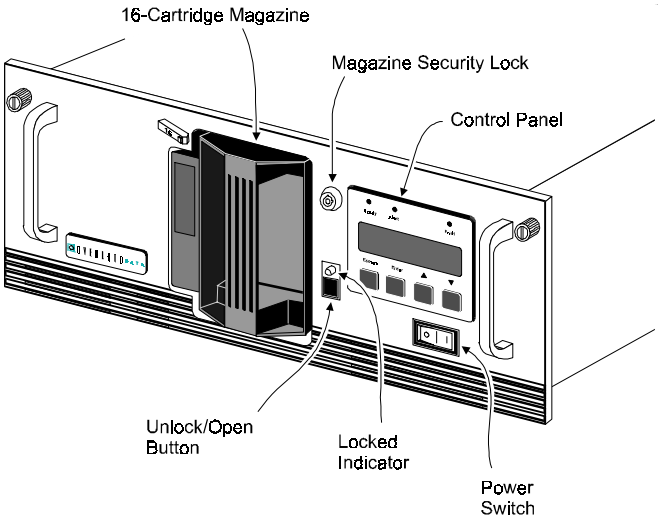


Figure 1-1 Global Control Module Front View

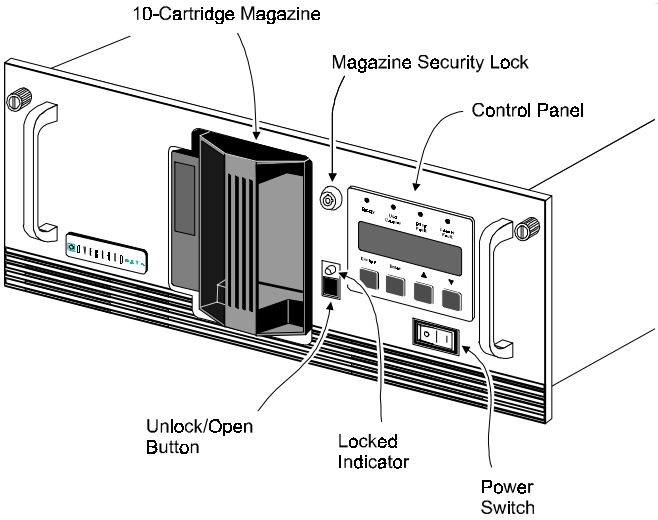


Figure 1-2 Base Module Front View

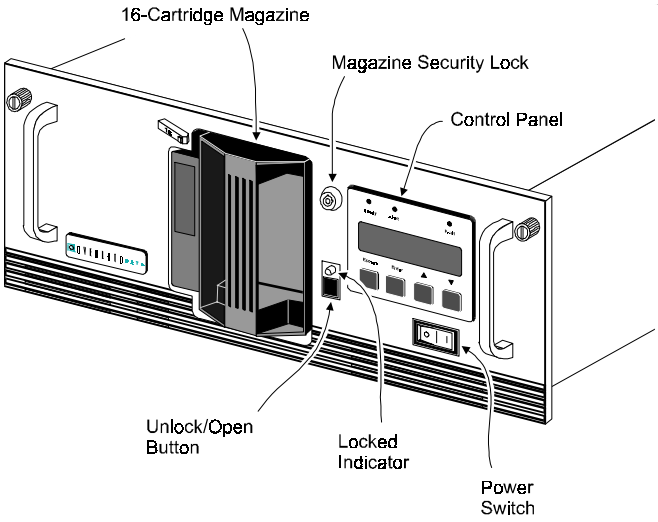


Figure 1-3 Capacity Module Front View

Control Panel

The control panels for all modules are the same, except for the number of LED indicators. The control panel features a 4-line by 20-character backlit LCD display, three or four LED indicators, and four buttons. The buttons enable the operator to navigate through the menu structure to select and display operating modes, device status, diagnostic and maintenance functions, device history and error statistics, and system configuration. The functions of the control panel are described in detail in **Chapter 3 - Operation**.

Display

The backlit 4-line by 20-character control panel display provides a highly intelligible presentation of drive and loader status, menu choices and error messages. The scrolling feature greatly expands the amount of information available to the operator. In the Global Control Module, status information is available for the entire system. The slave modules display other information as needed for localizing malfunctions.

Magazine Security Lock

The Magazine Security Lock is a key-operated switch on the front panel of each module. It can be used to prevent inadvertant removal of the cartridge magazine.

Power Supply

The AC Power switch is located on the front panel of the module. The autoranging power supply will adjust automatically to either of two operating voltage ranges. The ranges are 100-120 VAC and 200-240 VAC. The power supply is capable of operating at 50 or 60 Hz without any adjustment or modification. AC power is supplied to the power supply by a single IEC-compatible socket which can be connected to any properly grounded outlet.

Tape Cartridge Magazines

The ten-cartridge and sixteen-cartridge magazines are removable from the front panel, but may be protected from tampering by any of three means: 1) a key-operated Magazine Security Lock which must be unlocked before the magazine can be removed, 2) an electronic combination lock operated by using buttons on the Global Control Module control panel, and 3) issuance by the host of a SCSI ‘Prevent Medium Removal’ command. The rugged carbon-fiber-reinforced polymer magazine fits into an extruded track, which assures precise positioning with respect to the library robotics. A ten-cartridge tape magazine is shown in Figure 1-4. Insertion and removal of the magazine is described in **Chapter 3 - Operation**.

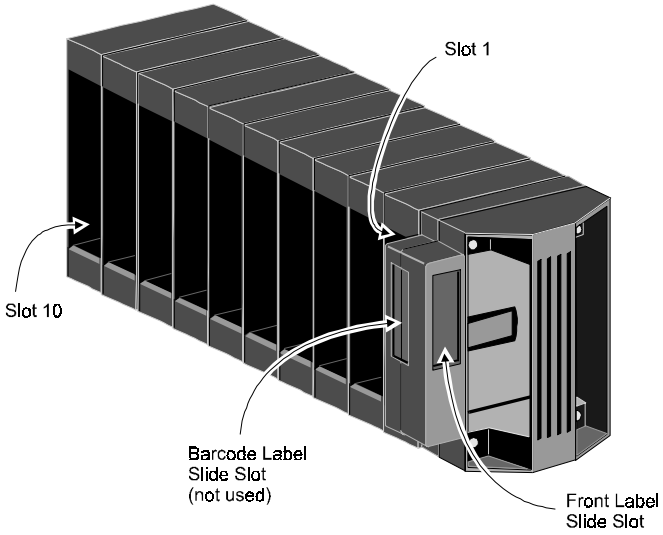


Figure 1-4 Base Module 10-Cartridge Magazine

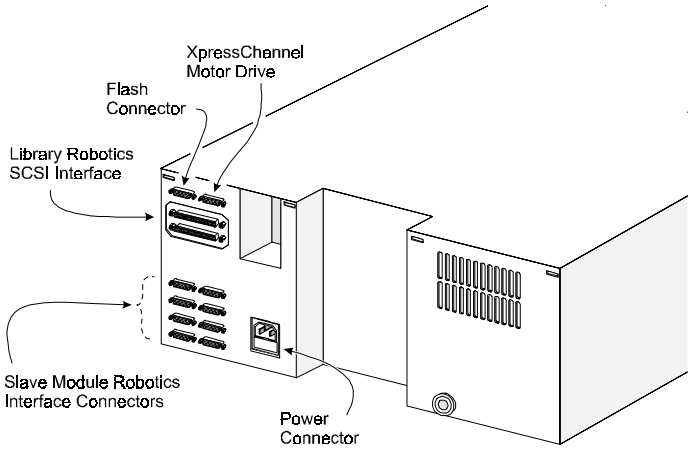


Figure 1-5 Global Control Module Rear View

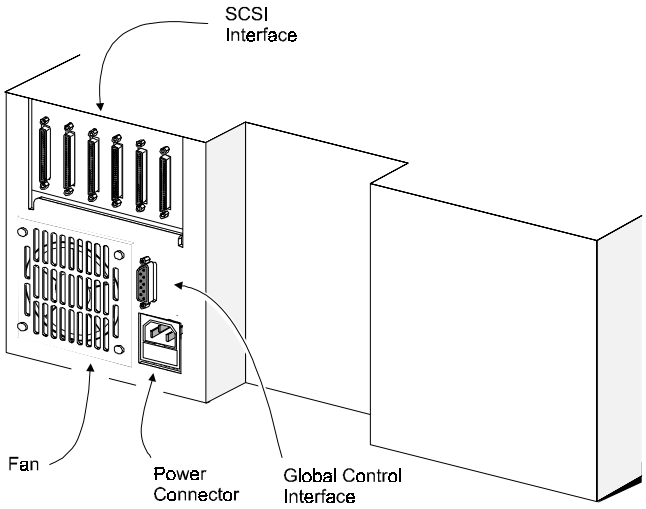


Figure 1-6 Base Module Rear View

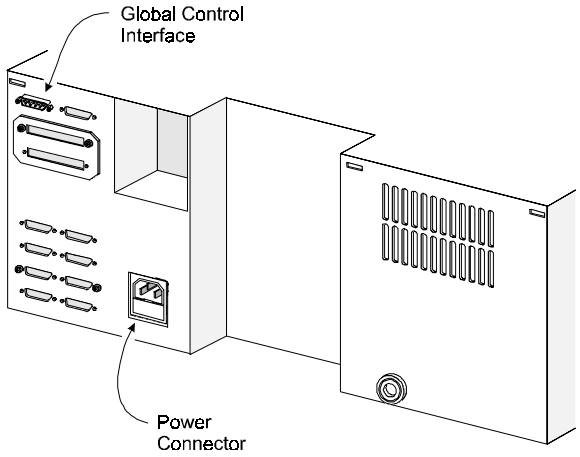


Figure 1-7 Capacity Module Rear View

Integral Fan Cooling

A single forced-air fan is mounted inside each module to provide optimum cooling for critical parts, and to prevent the drive and robotics electronics, motors and power supply from overheating.

Library Robotics

The DLT LibraryXpress System features library robotics that can load any of the cartridges stored in any magazine in the system into any of the DLT tape drives, moving cartridges among as many as nine modules within the DLT LibraryXpress System. The robotics design utilizes Overland Data's Mainframe-Class™ Library Robotics, which is known for ruggedness and reliability.

Bar Code Reader

The optional bar code reader may be mounted on the cartridge shuttle in each module. It reads bar code labels attached to each cartridge, and maintains the bar code data in memory as part of the library System Map. Upgrade kits to add the bar code reader are available for the Global Control Module, the Base Module and the Capacity Module. See **Appendix B - Accessories/ Spares/FRUs** for the part number.

Advanced Design Features

The DLT LibraryXpress System incorporates many significant improvements in tape drive and library design. One of the most important is the use of highly reliable DLT technology, with media rated by the media manufacturer at better than 1,000,000 head passes.

Embedded Diagnostics

The DLT LibraryXpress System and each of its modules provide three levels of embedded diagnostics. The Power-On Self Test (POST) performs various verification tests on the system's configuration and host interface and device control functions, as well as memory tests, at power-up. The second level of diagnostics is the User Diagnostics, which provide for displaying and changing configuration options. The third level, CE Diagnostics, include advanced diagnostics to be used by Customer Engineers for servicing the LibraryXpress System. Both the User Diagnostics and the CE Diagnostics may be selected from the front panel.

User Diagnostics are described in greater detail in **Chapter 2 - Installation**. CE Diagnostics are described in the Service Manual.

Error Checking

All drive models used in the DLT LibraryXpress System apply a 16-bit parity check to each record, a 64-bit CRC to each 4 kB of data, and Reed-Solomon error correction code overall. In addition, there is an internal parity check on the data buffer.

Buffer

Drives of the 2000XT, and 4000 series are equipped with a 2 MB data buffer, while 7000 series are equipped with a 4-MB data buffer.

Compression

All drive models used in the DLT LibraryXpress System use the standard Digital Lempel-Ziv (DLZ) data compression algorithm.

Capacity

A single Base Module with its ten-cartridge magazine offers formatted capacities as shown in Table 1-1. The data capacities of a Global Control and a Capacity Module are shown in Table 1-2. The capacity of any module is determined by the series of drive used, as well as the media type. When DLTtape III or IIIXT cartridges are used with 4000 or 7000 series drives, capacities are limited accordingly.

Table 1-1 Base Module Tape Capacities

MODEL	CARTRIDGE	CAPACITY PER CARTRIDGE[A]	FULL MAGAZINE COMPRESSED[B]
LXB2X10	**DLTtape IIIXT** **DLTtape III**	**15 GB** **10 GB**	**300 GB** **200 GB**
LXB4X10	**DLTtape IV**	**20 GB**	**400 GB**
LXB7X10	**DLTtape IV**	**35 GB**	**700 GB**

Table 1-2 Global Control and Capacity Module Tape Capacities

DRIVE SERIES	CARTRIDGE	FULL MAGAZINE NATIVE[A]	FULL MAGAZINE COMPRESSED[B]
2000XT	**DLTtape IIIXT** **DLTtape III**	**240 GB** **160 GB**	**480 GB** **320 GB**
4000	**DLTtape IV**	**320 GB**	**640 GB**
7000	**DLTtape IV**	**560 GB**	**1120 GB**

[A]native capacities, uncompressed.

[B]Maximum capacities given assume average 2:1 compression. Actual compression will vary with file content. The native capacity for a full Base Module magazine is ten times the native capacity per cartridge; for Global Control and Capacity Modules, 16 times the native capacity per cartridge.

Media Life

The media used in the DLT LibraryXpress is rated by the media manufacturer at over 1,000,000 head passes, and a shelf life of at least 30 years.

Related Publications

For additional information about the DLT LibraryXpress System product line, refer to the following publications.

- DLT LibraryXpress System SCSI Specification, P/N 104134-101
- DLT LibraryXpress System Service Manual, P/N 104140-101

Chapter 2 - Installation

Introduction

There are three major steps to the installation of a DLT LibraryXpress System: mechanical installation, cabling and configuration.

Mechanical installation consists of:

- assembling the XpressChannel (the two-module version is factory assembled),
- installing the module mounting slides in the rack,
- installing the XpressChannel in the rack, and
- installing the modules in the rack.

Cabling consists of interconnecting the slave modules with the Global control Module, connecting the Global Control Module to the XpressChannel motor, connecting the slave module drive SCSI busses to host SCSI interfaces, connecting the Global Control Module to a host SCSI interface, and terminating the busses properly.

Configuration consists of using the Configure Menu to customize the configuration options to your particular application.

The remainder of this chapter describes each of these steps.

Planning Your Installation

The DLT LibraryXpress System is intended to be mounted in a standard 19-inch EIA/RETMA equipment rack with a depth of 24 to 30 inches. Each of the modules is shipped with two rack slides installed.

Every DLT LibraryXpress System includes:

one Global Control Module,

one expandable XpressChannel cartridge elevator, and

one or more slave modules (up to eight).

The Global Control Module has 16 slots and no drives. The slave modules can be Base Modules (10 slots plus one or two drives), or Capacity Modules (16 slots, no drives), in any useful combination. (All slots and no drives is not a useful combination.) Each module occupies seven inches (4 units) of rack space.

The XpressChannel is composed of a motor drive assembly plus sections of track whose combined length is equal to the combined heights of the Global Control Module plus the slave modules. An extension section is needed for installation with each module.

Positioning the Modules

The Global Control Module must be mounted at the top of the stack, which places its control panel at a convenient height. The control panels of the slave modules are of secondary importance, as they serve mainly to help localize system failures. When installed, the motor drive assembly of the XpressChannel is directly behind the Global Control Module.

Slave modules may be installed anywhere below the Global Control Module, in any order. There may be a slight performance advantage in making the slave modules contiguous, but gaps are permitted. The size of a gap is limited by the fact that each gap must be bridged by some number of 7” XpressChannel track sections. For safety, available cover plates should be installed on all XpressChannel sections which are not connected to LibraryXpress modules.

The Global Control Module senses the position of each module during initialization at power-up. Even if there are gaps between modules, the system will operate correctly. If you plan to leave gaps between modules, be sure to order additional XpressChannel track segments and cover plates equal to the length of the gap.

Mechanical Installation

Assembly of the XpressChannel requires experience working with moderately complex mechanisms, and the ability to follow directions carefully. If you can assemble and adjust a bicycle with a derailleur mechanism, you probably can assemble and install the XpressChannel.

Identifying the Parts of the XpressChannel

Locate and identify the XpressChannel internal and external parts. The XpressChannel is made up of the following external parts, shown in Figure 2-1:

- Motor drive section (1)
- Extension sections (2)
- Elevator base with idler pulley (3)
- Tie bars (4)
- Support brace (5)
- Left and right rack slide extensions (6)
- Angle brackets (7)
- L-Shaped Nut Plates (8)

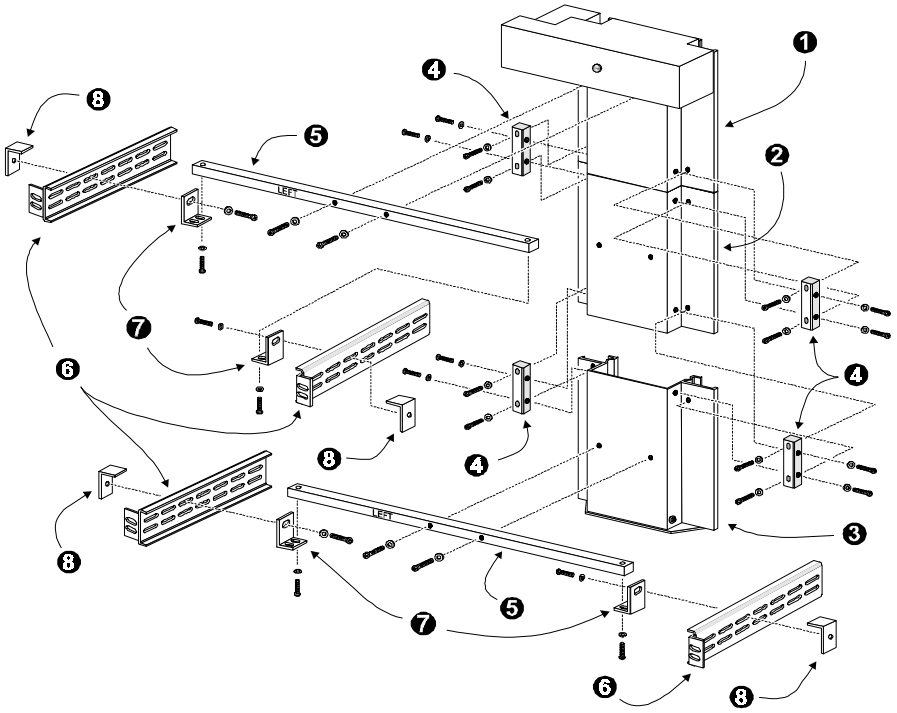


Figure 2-1. XpressChannel External Parts

Note: The slide extensions, (6) in Figure 2-1, are not enclosed with the XpressChannel parts. They are supplied as part of the installation hardware for the slides that come with each of the modules.

Follow the instructions for installing rack slides, later in this chapter. After the rack slides and the slave modules are in place, and after the XpressChannel is assembled, you will install the XpressChannel in the rack by attaching the support braces (5) to the slide extensions (6) using the angle brackets (7) and L-shaped nut plates (8).

The internal parts you will need to recognize during assembly are shown in Figures 2-2 and 2-3.

- Car
- Belt Block

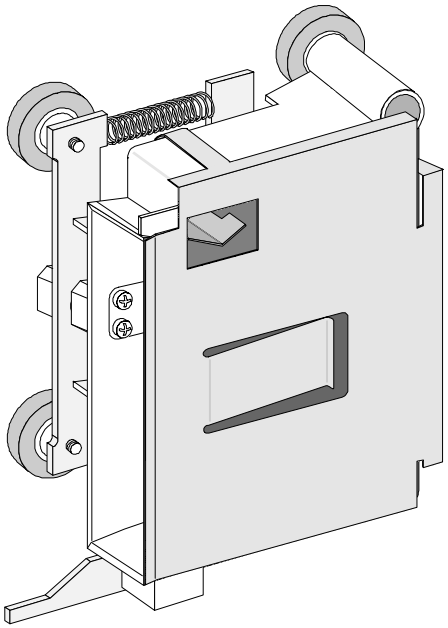


Figure 2-2. XpressChannel Car
(Front View)

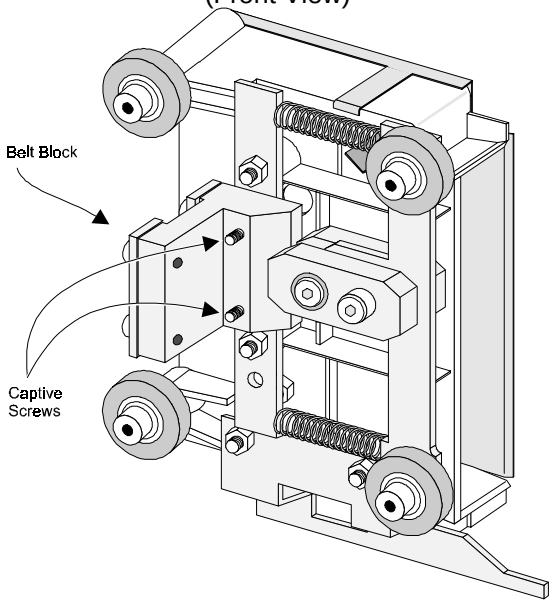


Figure 2-3 Car Rear View Showing Belt Block

The belt block comes fastened to the back of the car with two captive screws. Carefully note the orientation of the block with respect to the car, as shown in Figure 2-3.

Orientation of Parts During Assembly

To determine the orientation of an extension section, examine the flanges on the edges of the section, and note that they are dissimilar. Position the section so that its orientation matches that of the elevator base.

Figure 2-4 shows a typical XpressChannel assembly. The motor drive section always goes on top, and the base section with the idler pulley always goes on the bottom. Extension sections are mounted between the motor drive section and the base section. All sections are joined together with tie bars. For systems up to four modules, two support braces are needed, one attached to the motor drive and one to the base section. For larger systems, a third support brace should be mounted near the center of the XpressChannel.

Preparing to Assemble the XpressChannel

You will need a clean, flat work area such as a table or work bench. The surface should be long enough to support the full height of the XpressChannel. The height is equal to the height of the stack of modules in your system plus any gaps you intend to include in the stack. Use the following procedure to assemble your XpressChannel.

Assembling the XpressChannel

In most cases, you have received a pre-assembled XpressChannel. If its length is correct for your system, turn to the section titled ‘Mounting the Module Rack Slides’ and continue on to the end of the chapter. If you need to add sections, please take a few minutes to read this section and the next section on installing the belt before proceeding to the section titled ‘Adding to an Existing XpressChannel.’

Note: References to left and right refer to the position of the part when the XpressChannel is assembled and mounted in the rack, as viewed from the front of the rack.

Refer to Figures 2-1 and 2-4.

1. Place the base section, with the inside facing down, overhanging the right end of the work area, with the bottom plate of the section toward the right.
2. Place each of the extension sections, with the inside facing down, in a row aligned edge-to-edge beginning with the base section. The bottoms of the sections should be toward the right. Omit the motor drive at this time.
3. Center one of the support braces across the rear of the base section over the holes on the rear surface of that section. Be sure that the word ‘LEFT’ that is stamped on the brace is upright.
4. Insert two M4 x 20 Phillips sems screws through the holes in the support brace into the holes in the base section, and tighten.

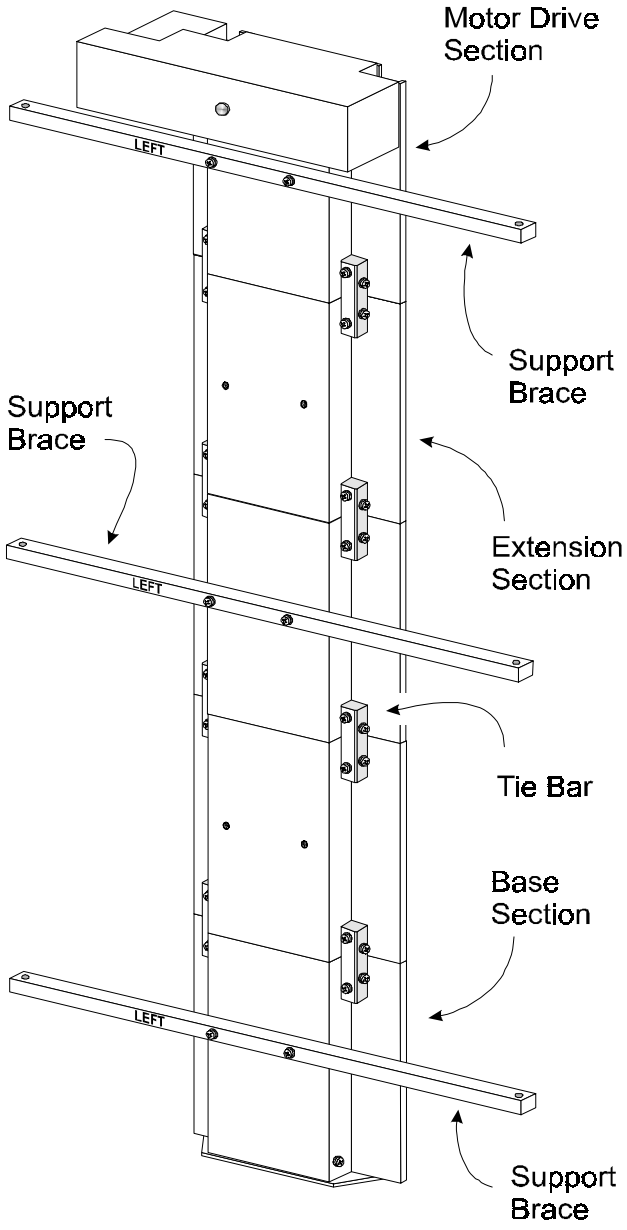


Figure 2-4 XpressChannel Assembled

5. Place pairs of tie bars so that they straddle all of the joints where sections come together. Be sure that the beveled edge is toward the inside corner of the sections.
6. Install two M3 x 20 mm Phillips sems screws through each tie bar into the threaded holes in the flanges of the extrusion sections. Tighten finger tight only. Insert two M3 x 20 mm sems screws through each tie bar into the side of the extrusion sections and finger tighten.
7. Firmly press the neighboring sections together while tightening the two M3 x 20 mm screws through each tie bar into the flanges of the sections. Alternately tighten the screws into the flanges and those into the sides of the extrusions to ensure that each tie bar is drawn into the corner of the extrusion. *Important Note:* These screws should be tightened to no more than 4 inch-lbs.
8. Inspect the joint to see that the sections are well aligned, with minimal irregularities and gaps.
9. Repeat steps 6, 7 and 8 for each pair of sections. It may be necessary to use suitable blocks to support the row of sections so that neither the motor housing nor the bottom flange of the base section touches the work surface while you are connecting the motor drive section.
10. Center one of the support bars across the rear of the motor drive section over the holes on the rear surface of that section. Be sure that the word 'LEFT' that is stamped on the brace is upright.
11. Insert two M4 x 20 Phillips sems screws through the holes in the support brace into the holes in the motor drive section, and tighten.
12. Go on to the section entitled 'Installing the Belt.'

Installing the Belt

Refer to Figures 2-5 through 2-9.

1. Turn the assembled XpressChannel over so that the motor points upward.

2. Referring to Figure 2-6, locate the tensioner ramp in the base section. Compress the spring until the hole in the tensioner ramp is aligned with a hole in the base section. Insert an 0.050” Allen wrench or a paper clip through the holes. This sets the idler pulley for zero belt tension.

3. Locate the length of toothed belt that was enclosed with the extension section.

Table 2-1 Belt Length for Various System Sizes

Number of Modules	Length of Belt
2	27 inches
3	41 inches
4	55 inches
5	69 inches
6	83 inches
7	97 inches
8	111 inches
9	125 inches

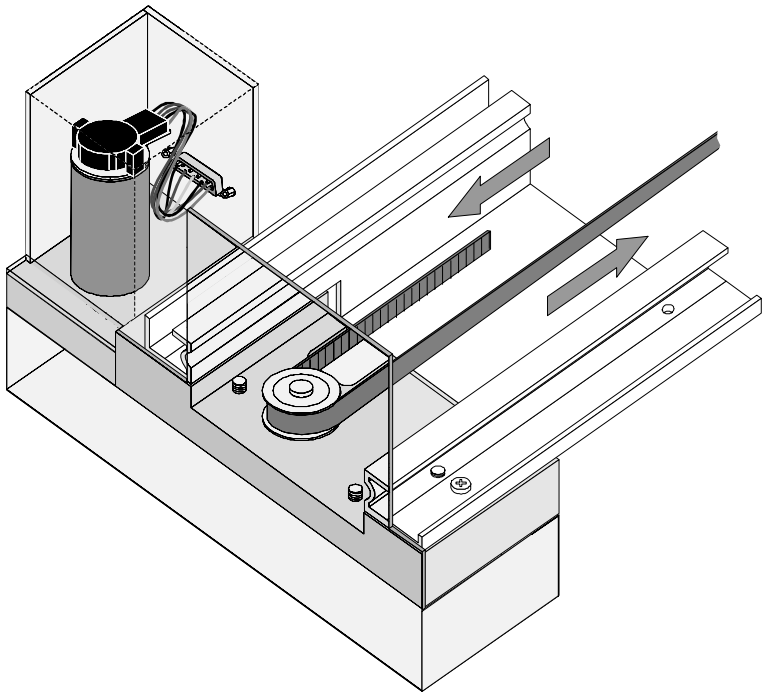


Figure 2-5 Threading the Belt Through the Drive Section

4. Refer to Table 2-1 for the required belt length for your system. After double-checking the length specified, cut the belt between teeth.
5. With the toothed side of the belt toward you, position the right end of the belt about halfway along the XpressChannel.
6. Referring to Figure 2-5, thread the left end of the belt counter-clockwise around the motor drive pulley.
7. Referring to Figure 2-6, thread the belt from the motor drive counter-clockwise around the idler pulley and back to the right end.
8. Holding the ends of the belt as shown in Figure 2-7, the two ends should be touching or very slightly overlapping.

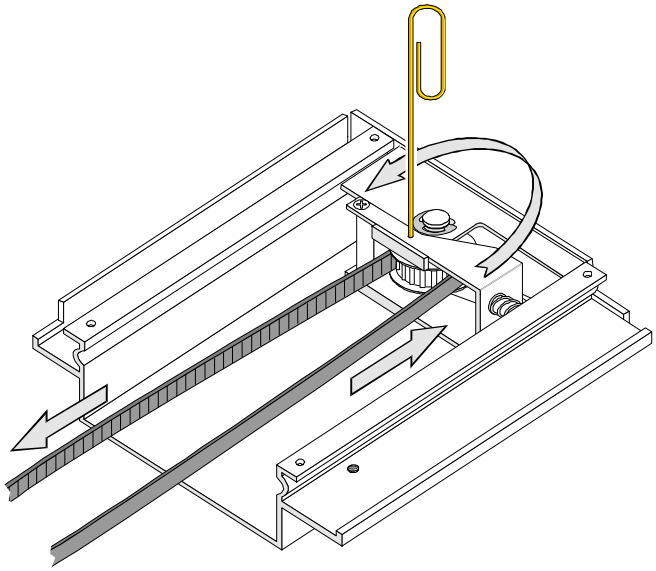


Figure 2-6 Threading the Belt Through the Base Section

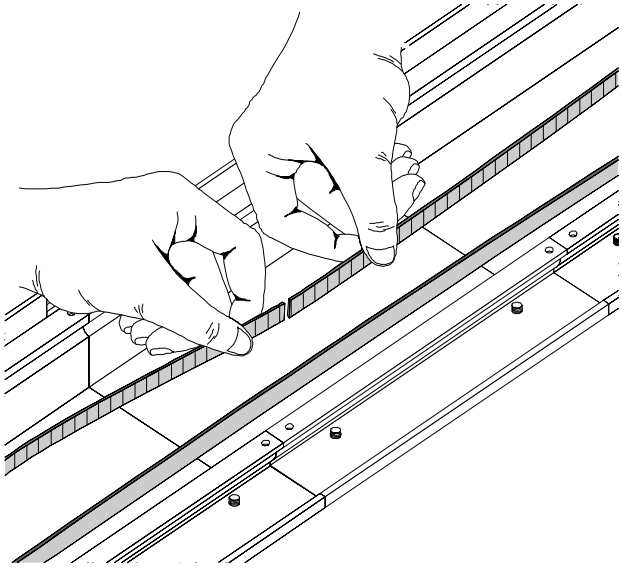


Figure 2-7 Checking Belt Length

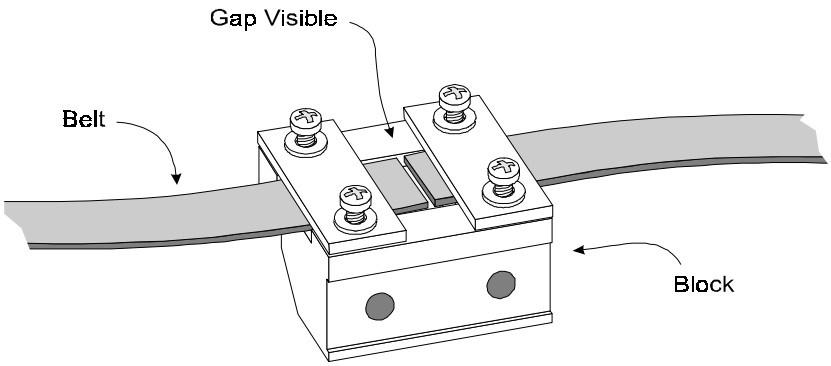


Figure 2-8. Belt Block With Belt In Place

9. Loosen the four screws that hold the belt retaining plates to the block. Slide the ends of the belt under the plate until they engage the teeth on the block. Both ends of the belt should be visible through the gap between the plates as shown in Figure 2-8. Set the belt so there is only a small space between the ends of the belt (approximately 1/32”).

10. Tighten the four screws that hold the belt retaining plates.

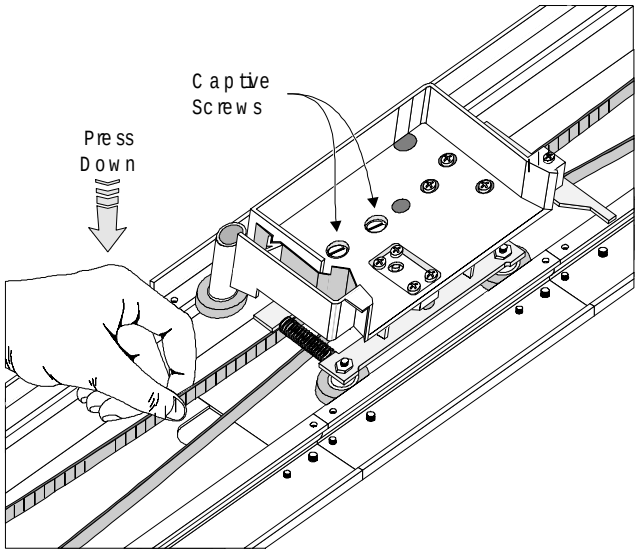


Figure 2-9 Aligning the Captive Screws With the Block

1. Pull out the paper clip previously installed in the base section This applies the proper tension to the belt.
2. Locate the two captive screws in the car. Screw them backward approximately one thread into the bracket in the car so they are held in an upright position.
3. Position the belt block at least six inches from the motor drive pulley.
4. Locate the spring-loaded wheels of the car. Referring to Figure 2-9, engage the spring-loaded wheels in the track, while positioning the car so the captive screws are directly over the holes in the belt block. *Note:* Figure 2-9 omits the door on the car for clarity. *Do not remove the door*.
5. To steady the belt block, grasp the belt several inches from the block and push toward the back of the track until the block is pressed firmly against the back of the track. While holding the belt with one hand, compress the springs and swing the car downward until the remaining wheels are aligned with their groove in the track.
6. While continuing to press the belt block against the back of the track, release the car so that the stationary wheels engage their groove in the track.
7. While continuing to press the belt block against the back of the track, begin to tighten the captive screws. When both screws are partially threaded into the belt block, release the belt and finish tightening the screws. Be sure that the block is fully seated against the bracket on the car. Close and secure the door on the car.
8. Using nylon button rivets, install covers over any exposed XpressChannel sections that are not covered by modules.
9. Proceed to the section titled ‘Mounting the Module Rack Slides.’

10. Adding to an Existing XpressChannel

Before reading this section, it may be helpful to familiarize yourself with the parts and procedures by reading the two preceding sections. To add to an existing XpressChannel, you must first partly disassemble it, then make the necessary changes as described in the preceding sections. Use the following procedure for disassembly.

1. Locate the covers over the drive motor section and the base assembly. Note that the covers are held in place by nylon button rivet fasteners. Using a suitable thin-bladed tool, pry up the cover until the fasteners can be removed. Set the covers aside, and save the fasteners for re-use.
2. Place the XpressChannel on a suitable work surface with the motor at the left and pointed upward.
3. Referring to Figure 2-9, open the door of the car to gain access to the captive screws. *Do not remove the door*. Loosen the captive screws until they are disengaged from the belt block.
4. Grasp the closed side of the car and pull it toward you so as to compress the springs underneath the car. When the wheels on the closed side are clear of the track, lift the car from the track and set it aside.
5. Referring to Figure 2-6, locate the tensioner ramp in the base section. Compress the spring until the hole in the tensioner ramp is aligned with a hole in the base section. Insert an 0.050” Allen wrench or a paper clip through the holes. This sets the idler pulley for zero belt tension.
6. Referring to Figure 2-8, loosen the four screws on the belt block far enough to pull the ends of the belt free of the block. Pull the belt free of the motor drive assembly and the base section and set the belt aside.
7. Turn the XpressChannel over and support it so that neither the motor nor the flange at the bottom of the base assembly is touching the work surface.
8. Referring to Figure 2-1 and 2-4, remove the eight screws holding a pair of tie bars in place. Separate the XpressChannel at that joint.

9. You may now add sections as needed and install a new belt as described in the sections entitled ‘Assembling the XpressChannel’ and ‘Installing the Belt.’

Mounting the Module Rack Slides

At this point, it is necessary to install the rack slides for all of the modules in order to complete installation of the XpressChannel. Follow the directions in the shipping container to unpack each of the modules and place them in the desired physical location. Save the packing materials for re-use in case you need to send the module to Overland Data for repairs.

Note: The cooling grilles at the rear of the modules must not be obstructed when the modules are installed in the rack. It is advisable to allow two inches of clearance behind the rear panel of the module.

CAUTION!

MAKE CERTAIN THAT WHEN THE MODULE IS FULLY EXTENDED THAT A FORCE OF 20% OF THE RACK WEIGHT, BUT NOT MORE THAN 57 LB. APPLIED IN ANY DIRECTION BUT UPWARDS DOES NOT CAUSE THE RACK TO OVERBALANCE.

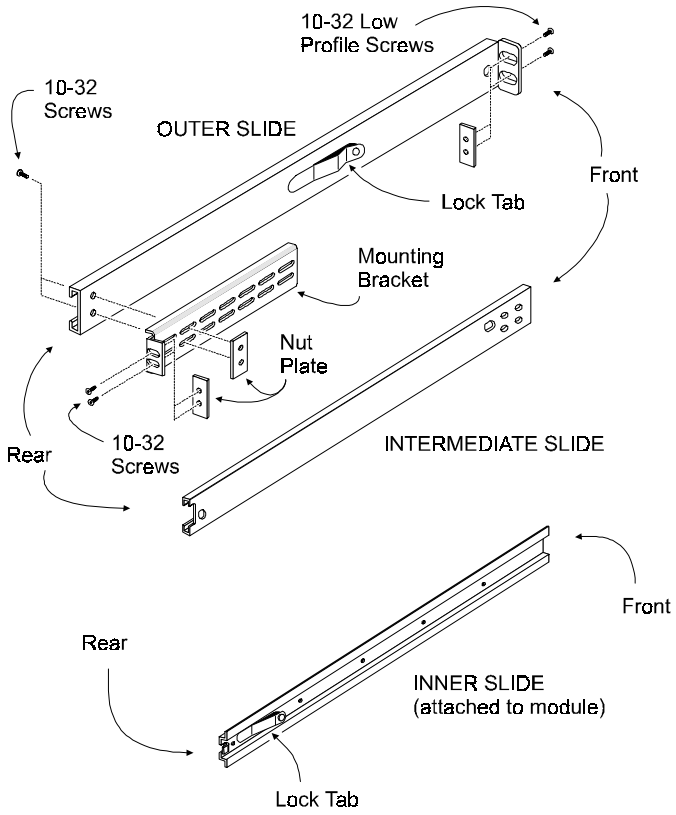
VORSICHT:

BITTE BEACHTEN, DAß WAHREND DAS MODUL AUSGEZOGEN SIND, LEDIGLICH EINE ZUSÄTZLICHE LAST VON 20% DES GESTALLGEWICHTES, ABER NICHT MEHR ALS 26 KG IN ALLE RICHTUNGEN AUßER NACH OBEN, DIE STABILITÄT DES GESTALLS NICHT GEFÄHRDET.

Note: All of the screws, washers and nut plates required for rack mounting are supplied with each module. The slides must be fastened to the front rails of the rack using four stainless steel 10-32 ***low-profile*** screws and the nut plates provided. Two 10-32 clip nuts are provided to engage the captive screws on the front panel.

Follow the instructions below to install each LibraryXpress Module into the rack. You will need a #2 Phillips screwdriver and a flathead screwdriver. Refer to the figures as directed.

Note: The left and right slides are alike, so there is no risk of confusing the parts on assembly.



1. 2.

Figure 2-10 Rack Slide Parts

1. Refer to Figure 2-10 to identify and orient the parts of the slides. The slide is attached to the Module enclosure by means of three screws through the inner slide. These will be accessible after the slides have been separated.

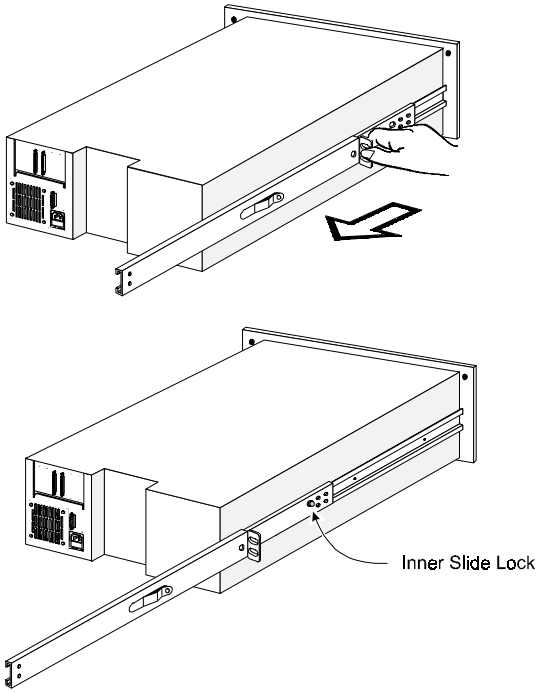


Figure 2-11 Separating a Rack Slide

2. Refer to Figure 2-11. Separate each set of slides as follows:

3. a) Pull the outer slide toward the rear, along with the intermediate slide until the inner slide lock engages the intermediate slide.

4. b) Continue to pull the outer slide towards the rear until the outer slide lock engages the intermediate slide. Press down on the ***inner slide*** lock to permit the intermediate slide to continue to move toward the rear. Continue to move the outer and intermediate slides toward the rear until they are separated from the inner slide.
5. Locate the screw holes in the front and rear rails of the cabinet or equipment rack where the module is to be installed.
6. Assemble a mounting bracket to each outer slide, using two 10-32 screws with washers and a nut plate for each. Select slots in the mounting brackets so the length of the assembly equals the distance between the front and rear rails of the rack. Finger tighten only.
7. Fasten each outer slide *behind* the front rail of the rack using two 10-32 stainless steel low-profile screws and one nut plate.
8. Fasten each of the mounting brackets to the *front* of the rear rail of the rack using two 10-32 screws and one nut plate.
9. Tighten the screws installed in step 4.
10. Pull the intermediate slides toward the front (out of the rack) so that they lock in the extended position.
11. ***Note:*** This step should be performed by two people. In front of the rack, lift the module to its installed height. Engage the inner slides mounted on the module with the intermediate slides protruding from the rack, and slide the module toward the rack until the inner slide lock engages the intermediate slide. This leaves the entire module protruding from the rack, locked in position, supported by slides.
12. Press inward (toward the module) on each of the inner slide locks to permit the intermediate slides to move toward the rack.
13. Slide the module in and out several times, ensuring that the inner and outer slide locks engage, and that the module does not bind against the slides. If other modules are in place, ensure that the module does not bind against an adjacent module, and that clearance between modules is evenly divided between top and bottom.

14. If binding occurs, loosen the four screws that secure the slides to the front rails and the four screws that secure the slides to the rear rails, reposition the slides, then retighten the screws.
15. If necessary, repeat steps 11 and 12 until the module does not bind against the slides or against adjacent modules.
16. Install a clip nut on each front rail at the height of the captive screws on the front panel of the module.
17. Slide the module into the rack until the captive screws just begin to engage, then tighten the captive screws to fully seat the module. ***Note:*** *Do not* slam the module against the rack. Doing so can dislodge the clip nuts.
18. Repeat this procedure for each of the modules to be mounted in the rack.
19. Loosen the captive screws of all modules except the top and bottom modules, and pull them out so that the front panels are approximately one inch from the rails.
20. Go on to the section on installing the XpressChannel.

Installing the XpressChannel in the Rack

1. If you have not previously done so, install the angle brackets on the rack slide extensions of the top and bottom modules, using one 10-32 screw and an L-shaped nut plate for each angle bracket. The L-shaped nut plates should hang from the top of the slide extensions on the outside. Place the angle brackets so the front edge of the vertical part is 15/16” behind the rear edge of the slide body, as shown in the inset in Figure 2-12.
2. Referring to Figure 2-12, position the XpressChannel against the back of the installed modules so that the support braces rest on the previously installed angle brackets. Install an M4 x 20 mm screw and washer through the rear hole in each angle bracket into the support braces. Do not tighten.

3. Look closely at the right flange of the XpressChannel (left side as viewed from the rear of the rack) as shown in the inset in Figure 2-12. At the top module, position the XpressChannel horizontally so that the edge of the flange fits exactly into the slot on the rear of the chassis of the top and bottom modules.

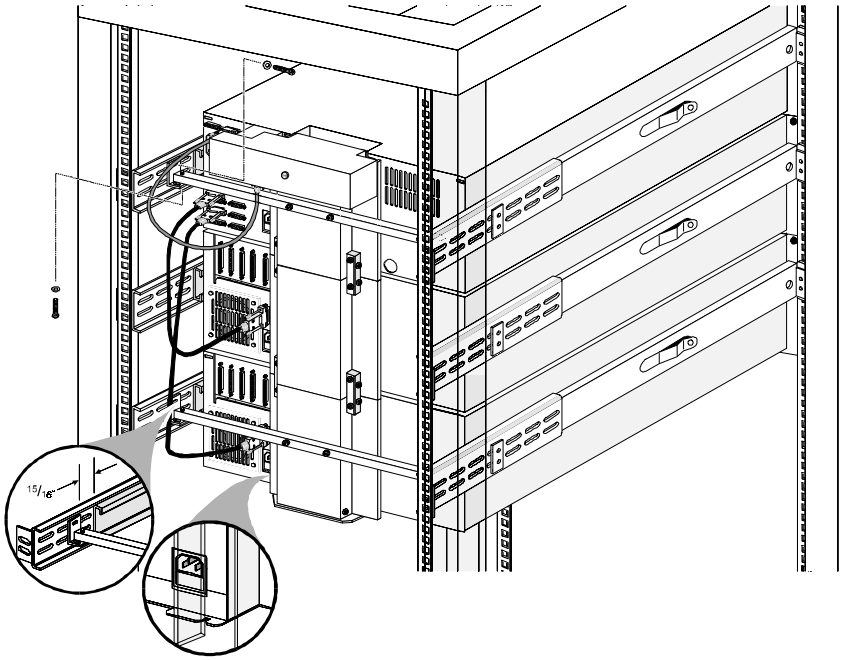


Figure 2-12 Installing the XpressChannel in the Rack

4. Ensure that the bottom edge of the XpressChannel motor drive section is flush with the bottom surface of the module chassis. If necessary, adjust the vertical position of the angle brackets.

5. Repeat steps 3 and 4 at the bottom module. Tighten all of the screws that hold the XpressChannel to the angle brackets while ensuring that:

6. a) The XpressChannel is centered horizontally, as indicated by the flange engaging the slot on the top and bottom modules, and

7. b) It is centered vertically, as indicated by the bottom of the bottom of the XpressChannel being flush with the bottom of the lowest module, and
8. c) The XpressChannel is pressed firmly against the backs of the top and bottom modules.
9. One by one, push the remaining modules into place and tighten the captive screws. In each case, ensure that the module does not bind against an adjacent module, that clearance between modules is evenly divided between top and bottom, and that the flange on the XpressChannel engages the slot on the back of the module.
10. If binding occurs, or if the module is not centered on the XpressChannel, loosen the four screws that secure the slides of the binding module to the front rails and the four screws that secure the slides to the rear rails, reposition the slides, then retighten the screws.
11. If necessary, repeat steps 6 and 7 until the module does not bind against the slides or against adjacent modules.
12. Repeat steps 6, 7, and 8 for all of the remaining modules.

Note: If your LibraryXpress system consists of more than four modules, install a third support bar on a third pair of angle brackets near the center of the stack.

Interfaces and Cabling

Refer to Figure 2-13. The connections required depend on the type of module. The Global Control Module always has the SCSI connection to the host for the library robotics. Base Modules have a separate SCSI connection to the host for each drive*, but the SCSI connectors for the robotics should not be used. The portion of the library robotics that is located in the slave modules is controlled by the Global Control Module through a cable connected to the Global Control Interface connector on each module. Each module has a separate AC power connection.

* In principle it is possible to daisy-chain the SCSI connections for multiple drives, to save SCSI controllers. Overland Data strongly recommends against this practice because it may severely limit the data throughput performance and reliability of the library.

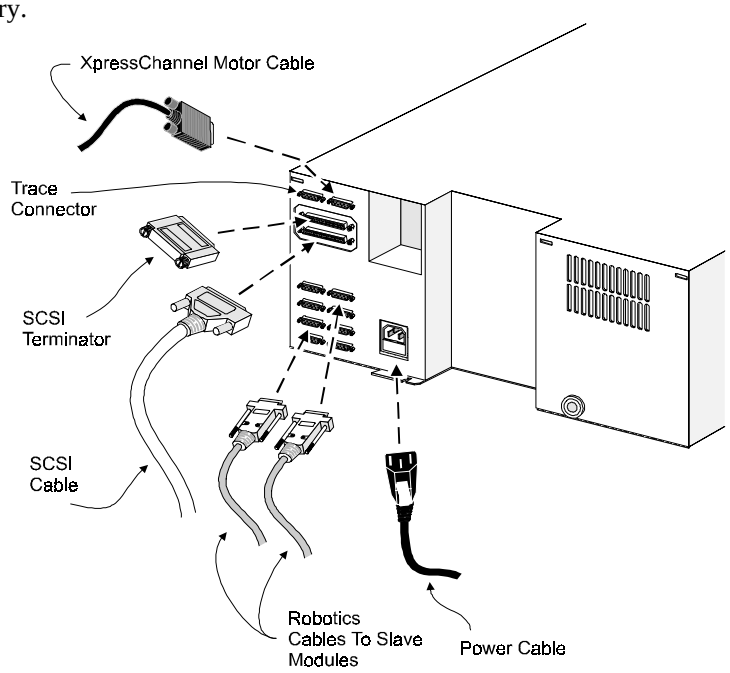


Figure 2-13 Global Control SCSI Connectors, Terminator and Cables (Fast/Wide SCSI Shown)

XpressChannel Motor Cable

The XpressChannel motor cable is 36 inches long and has a male DB-15 connector on each end. Connect the cable from the connector on the motor housing to the elevator connector on the Global Control Module.

Control Cables

Connect each slave module to the Global Control Module using one of the cables with a DB-9 male connector at the slave end and a DB-9 female at the Global Control Module end. A cable is required for each slave module. ***Note:*** Any of the control cables may be connected to any of the DB-9 connectors on the back panel of the Global Control Module. The Global Control Module determines the location of each module during power-up tests.

Power Cord

The detachable AC power cord is a standard grounding AC cord which attaches to an IEC-compatible connector on the rear panel. Connect a cord to the connector on each module, and connect the other end to a reliably grounded AC outlet or rack power outlet.

To maintain safety compliance, use a power cord with a suitable rating that is approved for the country in which the product is used. In the US cords must be UL listed, in Canada, CSA certified, and in Europe use a Harmonized cord marked <HAR> or a nationally certified cord.

SCSI Interfaces

DLT LibraryXpress Modules may be ordered with a choice of single-ended or differential SCSI-2 interfaces, or, if 7000 series drives are used, differential Fast/Wide SCSI. Both SCSI-2 interfaces use two parallel female high-density 50-pin D-series connectors per bus. SCSI-2 cables and terminators are secured to the connectors by spring-loaded latches. Fast/Wide SCSI is available only as differential, and uses two parallel female high-density 68-pin D-Series connectors per bus. Fast/Wide SCSI cables and terminators are secured to the connectors by jackscrews.

Note: The internal wiring length of any rack-mounted SCSI system can approach the maximum length specification of a single-ended SCSI bus. The maximum length specification for a differential SCSI bus is four times longer. Overland Data strongly recommends that you use differential controllers and high-quality SCSI cables to ensure the highest performance of your LibraryXpress. Bus errors caused by excessive length or poor quality cables can significantly degrade performance and reliability.

In the Base Module, which has drives, each drive is wired to an independent bus, with a pair of SCSI connectors. Because it can be used in free-standing applications, the Base Module has a pair of SCSI connectors for that module's library robotics. The library robotics connectors *should not be connected* when installed in a system with a Global Control Module. The Capacity Module has no SCSI connectors, because it has no drives, and no independent robotics. The Global Control Module controls the library robotics for all of the modules in the system. It has a single SCSI bus, with a pair of SCSI connectors, to enable a host to control the library robotics.

Each of the drives in the system and the library robotics is a separate SCSI device and is wired to a separate SCSI bus. Any of the separate buses may be combined using a SCSI jumper cable, available from Overland Data. If any two or more devices are connected to the same SCSI bus, each must be assigned a unique SCSI address. For information on assigning SCSI addresses, see the section headed 'Configuration' later in this chapter.

Note: For best performance, no more than four 2000 series drives, two 4000 series drives, or one 7000 series drive should be connected to a single SCSI bus, because of the bandwidth limitations of the SCSI bus.

A terminator of the proper type (50-pin single-ended or differential, or 68-pin differential) must be installed on each unused connector at the end of each bus, as explained below in the section headed 'Interface Cable and Terminator Installation. Figure 2-13 shows the SCSI cable, connectors and bus terminator used on the module.

In order to connect a module to a host computer system, the host system must have at least one SCSI controller and the appropriate driver software. As noted earlier, higher-speed drives may require the use of separate SCSI controllers for each drive or each pair of drives. No more than one 7000 series drive, and no more than two 4000 series drives, should be connected to a single SCSI bus. Your Technical Support representative is available to answer your questions about installation procedures for specific host systems.

Before cabling the system, see the recommended SCSI cable specifications in the following section. Also, see the section on Interface Cable and Terminator Installation later in this chapter.

Interface Cable Specifications

The DLT LibraryXpress is a high-performance system. To avoid degradation of performance, use the highest-quality interface cables. The detailed requirements for SCSI cables are set forth in ANSI X3.131-1994. It is recommended that all SCSI cables used with the DLT LibraryXpress Module meet at least the following requirements:

- Shielded or double-shielded, as required to meet EMI specifications;
- Impedance match with cable terminators of 132 ohms, ideally;
- Characteristic impedance between 90 and 132 ohms, required;
- 50-conductor flat cable or 25-pair twisted-pair should be used;
- Each end of the twisted pair ground must be connected to chassis ground;
- The maximum cable length for a single-ended SCSI bus is 19.68 feet (6 m)*;
- The maximum cable length for a single-ended Fast SCSI bus is 9.8 feet (3 m)*;
- The maximum cable length for a differential Fast SCSI bus is 82 ft. (25 m)*;
- Cables of different impedances should not be used together.

* When calculating the overall length of the bus, be sure to include the internal cabling of the module, which is as follows:

Base Module:

SCSI-2, Fast SCSI-2 (2000XT and 4000 Drives)	
DLT1	20 inches (51 cm)
DLT2	27 inches (67 cm)
Fast/Wide (7000 Drives)	
DLT1	14 inches (36 cm)
DLT2	23 inches (57 cm)
Global Control Module:	32 inches (81 cm)

Additional specifications to assure the highest SCSI performance can be found in ANSI X3.131-1994 or later.

Note: This equipment has been tested for electromagnetic emissions and immunity using good quality shielded cables. The use of unshielded cables, poor quality cables or other variances from good practice may result in non-compliance with national and international rules.

Terminators

A terminator must be installed on the device if the device is to be used at either end of a SCSI bus, such as the first or last device along a daisy-chain, or as a single SCSI peripheral. The appropriate type and quantity of terminator is shipped with your module. They are packaged in the accessory bag that arrives with the module.

Notes: 1) For single-ended busses, active terminators are strongly recommended. 2) It is important to use only differential terminators on a differential SCSI bus.

Interface Cable and Terminator Installation

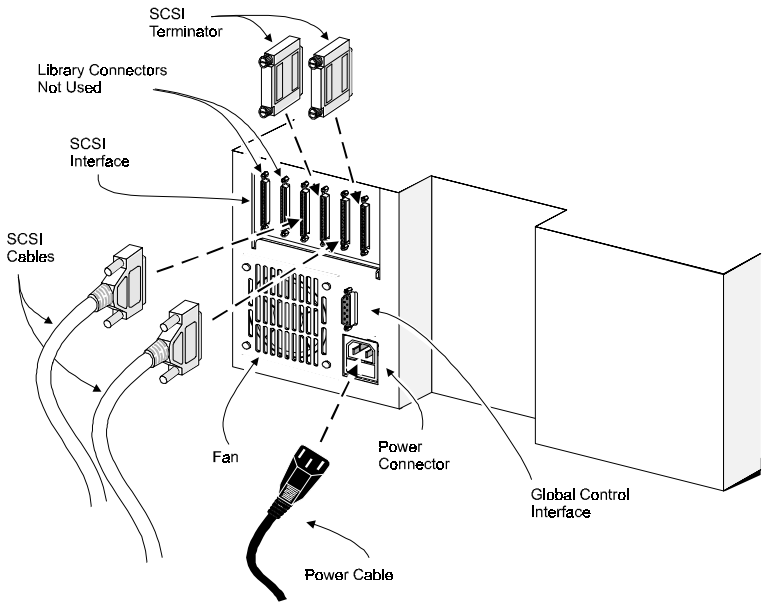


Figure 2-14 Base Module SCSI Connectors, Terminators and Cables (Fast/Wide Interface, Independent Bus Connection Shown)

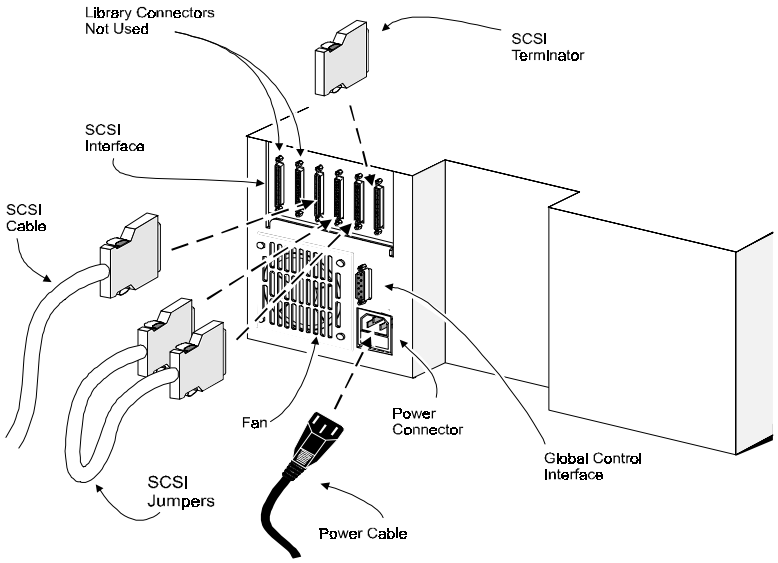


Figure 2-15 Base Module SCSI Connectors, Terminator, Jumpers and Cables
(SCSI-2 Interface, Daisy-chained Connection Shown)

To properly cable a module:

1. Make sure that your host system has an appropriate SCSI interface card for each SCSI bus and software drivers installed.
2. Inspect the terminator and make sure whether it is a single-ended or differential type, to match your system. SCSI terminators should be clearly marked “single-ended” or “differential”.
3. Determine whether the module is to be connected in daisy-chain fashion with other devices.
   - If not used in a daisy-chain, install the terminator in the second SCSI connector.
   - If used in a daisy-chain, and the drive is the last device of the chain, install the terminator in the second SCSI connector. Otherwise, do not use the terminator. Connect the next cable in the chain to the second SCSI connector.
4. Make sure that the cable you use meets the specifications listed earlier in this chapter.

5. Measure the cable length to connect the module to the computer system.
6. Be sure that the length of the entire bus falls below the maximum permissible length given in the section on SCSI cable specifications

Configuration

The LibraryXpress System is designed with several configuration options, each offering multiple settings to support a variety of applications and platforms. The setting of each option is stored in non-volatile memory in the module. For most applications, you will not need to change the factory default settings. If you need to change the configuration, go on to the next section. If you are uncertain whether you need to change a setting, contact your Technical Support representative.

To change settings, you need to use the Control Panel on the Global Control Module. For an overview of how the Control Panel works, and a description of the functions of the buttons, indicators and display, refer to the sections titled ‘Entering the Menu Mode,’ ‘Exiting the Menu Mode,’ and ‘Navigating Through the Menu Structure’ in **Chapter 3 - Operation**.

The settings can be changed using the procedure described below under “How to Customize Configuration.” Before changing any configuration settings, consult your host system documentation to determine which settings may need to be changed.

A Configuration Example - Setting the SCSI ID

1. Turn the system on*, and wait until the Power-On Self Test terminates and the default screen appears on the display. Figure 2-16 shows a typical default screen. Yours may vary depending on the number of modules in your system, as shown in the second line.
2. *see the section titled ‘Starting the DLT Library System’ in **Chapter 3 - Operation**.

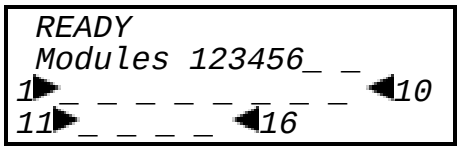


Figure 2-16 Default Screen

2. At the Default Screen, press the **Enter** button. The display will show the Main Menu, as in Figure 2-17.

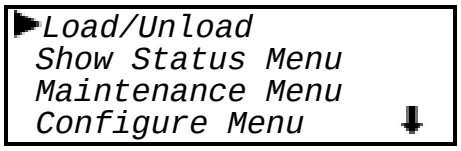


Figure 2-17 Main Menu

3. Press the ▼ button three times to move the ▶ to Configure Menu, then press the **Enter** button. The display will show the Configure submenu, as shown in Figure 2-18. Note that the ⬇ at the end of the fourth line means that there are additional configuration options that can be reached by scrolling with the ▼ button.

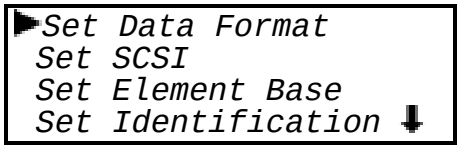


Figure 2-18 Configure Submenu

4. To select a configuration option, press the ▲ or ▼ button on the control panel until the ▶ on the display is next to the option you want to change. In this case, let us choose Set SCSI. Press the **Enter** button to display the choices for that option. The submenu in Figure 2-19 appears.

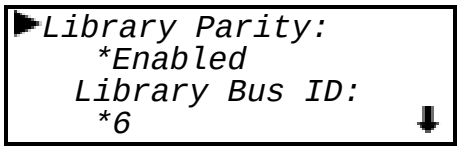


Figure 2-19 Set SCSI Submenu

Note: Take a moment to look closely at the submenu in Figure 2-19. Note that the ► on the display is next to line 1, *and* that line 2 is indented. This tells you that Figure 2-19 is a *two-tiered menu*. The ▲ and ▼ buttons work on two levels in this kind of menu, which is typical of many submenus of the Configure Menu. The first level is as follows: If you press the ▼ button, the ► moves to line 3. If you press the ▲ button, the ► moves back to line 1.

If you press the **Enter** button while the ► is next to line 1 (or line 3), the ▲ and ▼ buttons operate on the second level. You can tell because the ► moves next to line 2 (or line 4), and a ↓ appears at the end of line 4, indicating that there is a list of settings that can be scrolled using the ▲ and ▼ buttons.

The ↓ at the end of line 4 means that there are other items that can be displayed by scrolling, using the ▼ button repeatedly.

---

5. Note that the Library SCSI ID is set to 6. Suppose you want to set the DLT1 bus ID to 4. With the ► next to line 1, press the ▼ button repeatedly until the display scrolls as shown in Figure 2-20.

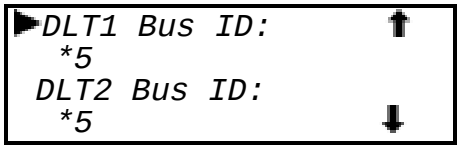


Figure 2-20 Set SCSI Submenu Scrolled

6. With the ▶ next to line 1, press the **Enter** button The ▶ moves to line 2 and the ↓ remains at the end of line 4, and a ↓ appears at the end of line 1. Now you can use the ▲ and ▼ buttons to scroll line 2 to display the possible settings. Scroll downward so that 4 is displayed, then press the **Enter** button to save the new selection. An * appears to the left of the 4, to indicate that it is the current selection.
7. Press the **Escape** button repeatedly until the submenu in Figure 2-18 reappears.
8. Repeat this procedure for each configuration option you want to change.

Setting Up a Mail Slot

Some of the available host software enables the system administrator to limit access to the library as a whole while permitting insertion into or removal from the library of one or more tape cartridges when needed. This feature is commonly called a mail slot. It is implemented using SCSI Import/Export elements.

In the LibraryXpress system, you can designate the magazine of any slave module as the mail slot magazine. When you do so, the entire magazine is withdrawn from the list of storage elements. You can designate any number of mail slots from one slot up to the full size of the magazine. To configure a mail slot, use the following procedure.

1. As shown in Figures 2-16 through 2-18 in the preceding procedure, navigate from the Default Screen through the Main Menu to the Configure Submenu.
2. Scroll down on the Configure Submenu until you see ‘Set Mail Slot,’ and select that option. The screen shown in Figure 2-21 appears.

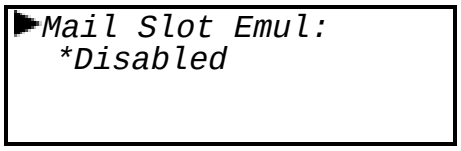


Figure 2-21 Set Mail Slot Submenu

3. With the ▶ next to line 1, press the **Enter** button The ▶ moves to line 2 and a ↓ appears at the end of line 4. Now you can use the ▲ and ▼buttons to scroll line 2 to display the possible settings. These options enable you to specify which module should have the mail slot enabled. Scroll downward to the desired module, then press the **Enter** button to save the new selection. ***Note:*** The Global Control Module is not on the list. Module 1 refers to the slave module just below it.
4. Scroll line 2 to display Module 1, then press the **Enter** button to select it. The screen changes as shown in Figure 2-22

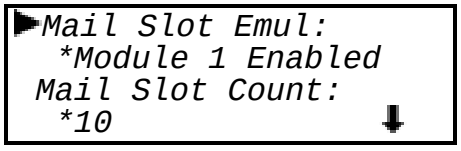


Figure 2-22 Set Mail Slot Submenu Enabled

5. The ▶ returns to line 1. Press the ▼ button. The ▶ moves to line 3.
6. Press the **Enter** button The ▶ moves to line 4. Now you can use the ▲ and ▼buttons to scroll line 4 to specify how many slots will be designated as mail slots. Scroll to the desired number, then press the **Enter** button to save the new selection
7. Press the **Escape** button repeatedly to return to the Default Screen.

Reserved Slots

Some host software imposes size limits on tape library magazines for licensing purposes, and will not operate with a library that exceeds the licensed size. This configuration option enables you to withdraw some of the slots in the Global Control Module from use as storage slots in order to meet licensing requirements.

1. As shown in Figures 2-16 through 2-18, navigate from the Default Screen through the Main Menu to the Configure Submenu.
2. Scroll down on the Configure Submenu until you see 'Set Reserved Slots,' and select that option. The screen shown in Figure 2-23 appears.

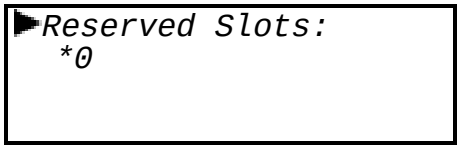


Figure 2-23 Set Reserved Slots Submenu

3. With the ▶ next to line 1, press the **Enter** button The ▶ moves to line 2, a ↓ appears at the end of line 4, and a ↓ appears at the end of line 1. Now you can use the ▲ and ▼ buttons to scroll line 2 to specify the number of slots to be reserved. Scroll to the desired number, then press the **Enter** button to save the new selection.
4. Press the **Escape** button repeatedly to return to the Default Screen.

Descriptions of Configuration Options

The items available on the Configuration Menu are as follows:

Set Data Format: This setting enables you to 1) set the data format to Auto Selection, THZ01, THZ02, DLT2000, DLT2000XT, DLT4000; or DLT7000; and 2) enable or disable data compression. Compression can not be enabled when either THZ01 or THZ02 format is in use. This setting applies to the next or the currently loaded cartridge only. An unload command returns to the default. This setting does not display the current format of the loaded tape. Use the Show Status Menu for this purpose. The defaults are Auto Selection and compression Disabled.

Set SCSI: This setting enables you to 1) enable or disable the library robotics SCSI bus parity checking, and 2) set the SCSI addresses of the drives and the library robotics. The defaults are: parity enabled; Library Bus ID = 6. The designators DLT 1 through DLT*n* refer to the first through *n*th drives, counting from top to bottom. The actual designator used by the system depends on the number of drives in the system and the placement of the module in the system;

Set Element Base: This setting allows you to set the base addresses of each of the four SCSI *elements* of the module. In order to identify sources and destinations in commands to the robotics, the Library System is divided into elements, each of which is assigned a separate designator or *element address*. The *Transport Element* is the robotics mechanism itself; the *Storage Elements* are the slots in the magazines; the *Transfer Elements* are the drives, and the *Import/Export Element* is the mail slot or slots. The Module reports these settings in response to the SCSI Mode Sense command, in the Element Address Assignment Page. The defaults are Transport element base = 0000; Storage element base = 0001, Transfer element base = 00F0, and Import/Export element base = 00E0.

Set Identification: This setting enables you to specify the response of the Module's robotics to the SCSI Inquiry command in the Vendor ID and the Product ID fields. The defaults are: Vendor ID = OVERLAND; Product ID -LXB.

Set Date: Enables you to set the system's calendar.

Set Time: Enables you to set the system's clock.

Set Baud Rate: Enables you to set the data transmission rate of the Global Control Module's trace port. This function is intended for use by CEs only. The default is 38400 bits/sec.

Set Serial number: This setting enables you to alter the Global Control Module's serial number as stored in the unit. The Module's robotics reports these settings in response to the SCSI Inquiry command, in the Unit Serial Number Page.

Set Unload Mode: This setting determines whether a SCSI Move Medium command is interpreted as implicit or explicit. If implicit, the Global Control unloads a drive before attempting to move a cartridge from that drive. If explicit, the host must issue a SCSI Unload command to the drive before each Move Medium command from a drive to a slot. The default is Implicit.

Set Negotiation: This option offers two choices: Initiate Negotiation and Set Transfer Rate. Initiate Negotiation, if set, allows the system to initiate SCSI Synchronous Negotiation with the host (the default is No). The Global Control always responds to host-initiated negotiation.

Set Transfer Rate can be set to 10 Mbytes/sec, 5 Mbytes/sec or Asynchronous. The default is 10 Mbytes/sec.

Set Mail Slot: Some of the available host software enables the system administrator to limit access to the library as a whole while permitting insertion into or removal from the library of one or more tape cartridges when needed. This feature is commonly called a mail slot. It is implemented using SCSI Import/Export elements.

Set Reserved Slots: Some host software imposes size limits on tape library magazines for licensing purposes, and will not operate with a library that exceeds the licensed size. This configuration option enables you to withdraw some of the slots in the Global Control Module from use as storage slots in order to meet licensing requirements.

Set Special Configuration: This option serves three functions: 1) It enables you to choose between two lengths of the SCSI Mode Sense Device Capabilities Page (Page 1Fh), which are 14 bytes and 18 bytes, to accommodate different SCSI device implementations of this page. The default is Short. 2) It enables you to change the model number information displayed on the initial screens. You can choose between 'OVERLAND LX - - - - -,' a blank line, and a vendor unique designator. The default is 'OVERLAND LX - - - - -.' 3) It enables you to specify the system's response to the SCSI Initialize Element Status command. The possible settings are No Inventory, Force Inventory, and Force Label Scan. The default is No Inventory,

Set Default: This option resets all of the preceding configuration options to their factory defaults. ***Note:*** it does not affect the settings of the SCSI IDs of the DLT drives.

Table 2-1 summarizes the configuration settings for the DLT LibraryXpress System. The default settings are shown in the fourth column. other possible settings are shown in the third column.

Note: The options described in this table represent the version of the firmware in use when this manual was written. If the displays on your control panel differ from those described here, contact your Technical Support representative for additional information.

Table 2-1 LibraryXpress Configuration Options

Option	Settings	Default
Data Format	Density: THZ01, THZ02, DLT2000, DLT2000XT, DLT4000, DLT7000, Auto Selection Compression: Enabled, Disabled (Enabled at 10.0 only)	Auto Disabled
SCSI	Lib Bus Parity: Enable, Disable Lib Bus ID: (SCSI ID) DLT0 Bus ID: (SCSI ID) DLT*n* Bus ID: (SCSI ID)	Enabled 6
Element Base	Transport: NNNN (hex) Storage: NNNN (hex) Transfer: NNNN (hex) Import/Export: NNNN (hex)	0000 0001 00F0 00E0
Identification	Vendor ID: OVERLAND EXABYTE, DEC, Quantum, Vendor Unique Product ID: LXB, EXB-210, EXB-440, EXB-480, TZ Media Changer, Vendor Unique	OVERLAND LXB
Date	DD, MMM, YYYY	Current date
Time	HH, MM	Current Time
Baud Rate	[Overland CE Use Only]	38400
Serial Number	NXNNNNNNN	999999999
Unload Mode	Implicit, Explicit	Implicit
Negotiation	Negotiation Mode: Do Not Initiate, Initiate Transfer Rate: 10 MB/sec, 5 MB/sec, Asynchronous	Do Not Initiate 10 MB/sec
Mail Slot	Mail Slot Emul: Disabled, Enable Module 1, . . .Enable Module *n* Mail Slot Count: 1 through *n*	Disabled

Option	Settings	Default
Reserved Slots	Reserved Slots: 0 through *n*	0
Special Config	Mode Page 1F Length: Short (0x0E), Long (0x12) Model Number: OVERLAND LX, Blank Line, Vendor Unique Init. Elem. Status: No Inventory, Force Inventory, Force Label Scan	Short OVERLAND LX No Inventory
Default		

Chapter 3 - Operation

This chapter describes manual operation of the system through the Global Control Module control panel, which is the normal manner of manual operation. Later in the chapter, some online and offline operations which may be performed through the control panels of the Base Module and the Capacity Module are described.

Global Control Module

Front Panel

The front panel of the Global Control module includes a power switch for the module, and the control panel, which has buttons, a display and indicators. Figure 3-1 shows the front panel.

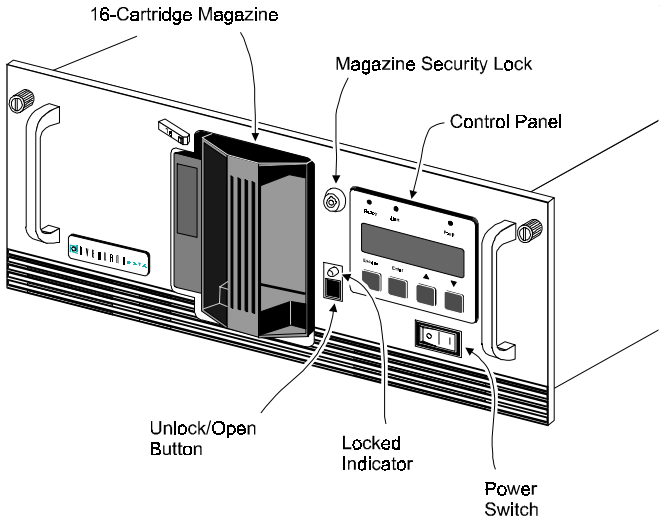


Figure 3-1 Global Control Module Front Panel

Power Switch

The power switch controls the supply of AC power to the module. It is set into a recess in the front panel to prevent accidental operation. Press **1** to turn the module ON and **0** to turn the module OFF.

Note: The Global Control Module must be turned on after or simultaneously with the slave modules. If this is not done, the Global Control Module may not be notified of the presence of one or more of the slave modules.

Control Panels

The Global Control Module control panel consists of three LED indicators, a four-line by 20-character backlit LCD display, and four buttons. Figure 3-2 shows the control panel. The Capacity Module control panel is identical in appearance to Figure 3-2. The Base Module control panel has four LED indicators. It is shown in Figure 3-3.

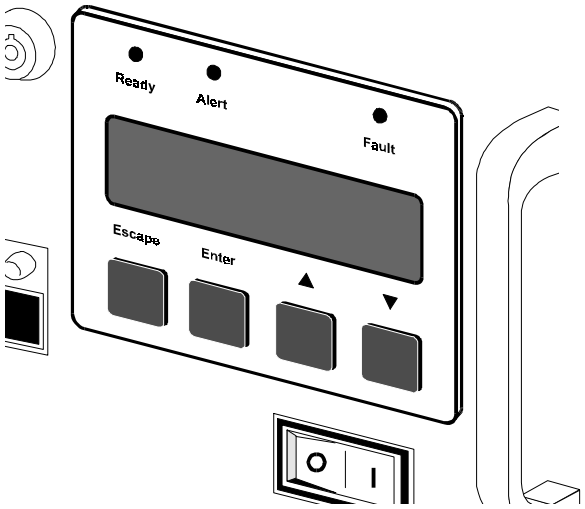


Figure 3-2 Global Control Module and Capacity Module Control Panel

Global Control Indicators

There are three LED indicators on the control panel, labeled **Ready** (green), **Alert** (yellow), and **Fault** (red).

The **Ready** LED (green) is illuminated when the system is ready to accept commands, either from the Control Panel or from the host computer. The **Ready** indicator goes out when you enter the Menu Mode.

The **Alert** LED (yellow) indicates that a fault or some other matter that requires attention has occurred in one of the modules in the system. Line 2 of the display blinks the number of the module where the fault has occurred. The control panels of the indicated module may give a further indication of the cause of the alert. Often, when the **Alert** LED is lit, a **Fault** LED is illuminated on one or more of the slave modules as well.

The **Fault** LED (red) indicates that a fault has occurred in the Global Control Module, or that the magazine door is unable to close. When the LED is illuminated, a Fault Screen appears on the LCD display. The Fault Screen is described later in this chapter. A list of fault symptom codes (FSC) and error recovery procedures (ERP) appears in **Chapter 5 - Troubleshooting**.

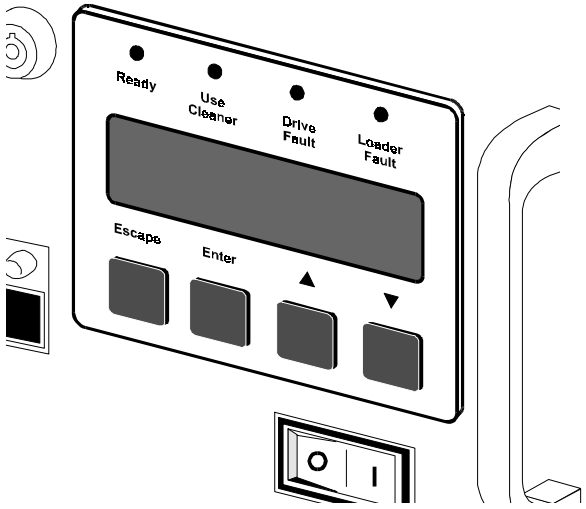


Figure 3-3 Base Module Control Panel

Base Module Indicators

There are four LED indicators on the control panel, labeled **Ready** (green), **Use Cleaner** (yellow), **Drive Fault** (red), and **Loader Fault** (red).

The **Ready** indicator (green) is illuminated when the Base Module is ready to accept commands, either from the Control Panel or from the host computer via the Global Control Module. The **Ready** indicator goes out when you enter the Menu Mode.

The **Use Cleaner** LED (yellow) indicates that either or both drives require cleaning. A cleaning operation should be performed as described in **Chapter 4 - Maintenance**. When the **Use Cleaner** LED comes on, you can find out which drive needs cleaning by selecting Cleaning Needed on the Drive Status submenu.

When either the **Drive Fault** or the **Loader Fault** LED (red) is illuminated, a Fault Screen appears on the LCD display. The Fault Screen is described later in this chapter. A list of fault symptom codes (FSC) and error recovery procedures (ERP) appears in **Chapter 5 - Troubleshooting**.

Capacity Module Indicators

There are three LED indicators on the control panel, labeled **Ready** (green), **Alert** (yellow), and **Fault** (red).

The **Ready** indicator (green) is illuminated when the system is ready to accept commands, either from the Control Panel or from the host computer via the Global Control Module. The **Ready** indicator goes out when you enter the Menu Mode.

The **Alert** LED (yellow) performs no function in this module.

When the **Fault** LED (red) is illuminated, a Fault Screen appears on the LCD display. The Fault Screen is described later in this chapter. A list of fault symptom codes (FSC) and error recovery procedures (ERP) appears in **Chapter 5 - Troubleshooting**.

Buttons - All Modules

There are four buttons on the control panel, labeled **Escape**, **Enter**, ▲, and ▼. The buttons do not directly control specific functions or options. Instead, you use the buttons to navigate from the Default Screen through a multi-level menu structure, then select the desired option from the appropriate menu using the **Enter** button. Table 3-1 describes the effect of each of the four buttons under various conditions.

The three most important things you need to know about the buttons are

1) To enter the Menu Mode and display the Main Menu from the Default Screen, press the **Enter** button.

2) To return to the Main Menu from a submenu, press the **Escape** button repeatedly until the Main Menu appears. Pressing the **Escape** button while the Main Menu is displayed exits the Menu Mode and returns you to the Default Screen. The Default Screen is shown in Figure 3-6; the Main Menu is shown in Figure 3-10.

3) To display the Show Status Menu *only* without entering the Menu Mode, press the **Escape** button at the Default Screen. The system remains online.

Important Note: When you enter the Menu Mode at the Global Control Module, the **Ready** light on that module goes out. This means that the DLT LibraryXpress system is *off-line*, and the system responds to all commands from the host with a SCSI 'Not Ready' until you exit the Menu Mode and the **Ready** light goes on.

When you enter the Menu Mode at any of the slave modules, the Ready light on that module goes out. This means that the *individual module* is off-line, and the system responds to all commands from the host pertaining to that module with a SCSI 'Not Ready' until you exit the Menu Mode and the **Ready** light goes on.

Table 3-1 Control Panel Button Functions

	Escape	**Enter**	▲	▼
At POST Screen	N/A	N/A	N/A	N/A
At Default Screen	Displays StatusSubmenu	Enters Menu Mode	N/A	N/A
At Status Subenu (while online)	Returns to Default Screen	Same as in Menu Mode	Same as in Menu Mode	Same as in Menu Mode
In Menu Mode	Rejects Currently Displayed Choice, or Aborts Control Panel Operation In Progress, or Exits to Next Higher Menu Level, or Exits Menu Mode to Default Screen	Accepts Currently Displayed Choice	Moves ▶ 1 Line Upward Through List of Options, or Scrolls Part of Display 1 Line Toward Top of List of Options	Moves ▶ 1 Line Downward Through List of Options, or Scrolls Part of Display 1 Line Toward Bottom of List of Options
At Fault Screen	N/A	Clears Soft Errors	N/A	N/A

Note: There is an auto-repeat feature for the ▲ and ▼ buttons. When the user presses either button for more than one-half second, the control panel behaves as if the user were pressing and releasing the button about four times per second. This effect stops when the user releases the button.

Front Panel and Media Locks

To avoid accidental interruption of system operation by entering the Menu Mode or removing cartridges while the host is accessing the system, the front panel and the media for each module may be electronically locked. When the front panel of the Global Control Module is locked, you can only enter the Menu Mode after entering a 4-digit code. That is, when the Default Screen is displayed, pressing the **Enter** button does not invoke the Menu Mode until you enter the code. The front panel of a slave module cannot be unlocked without using the Security submenu on the Global Control Module to unlock it.

All slave module front panels are locked by default when connected to a Global Control Module.

Media located in any or all modules may be locked and unlocked using the Security submenu on the Global Control Module. When the media are locked, you can only remove media after unlocking the module from the Global Control Module using the Security submenu.

Procedures for locking and unlocking front panels and media are described later in this chapter.

Starting the System

Note: When turning on power to the DLT LibraryXpress System, power *must* be applied to the Global Control Module either simultaneously with or after the other modules. If the Global Control Module is powered on first, its inventory of modules may be incorrect, and the contents of some or all of the modules will be inaccessible to the system and to the host.

Display Messages

The display on the control panel is capable of displaying four lines of 20 characters each, to allow the use of easy-to-understand messages. Many of these messages and their functions are described in this chapter. Those displays that are described in other chapters are cross-referenced here as well.

Power-On Self Test Screen

When power is first applied to the module, a series of power-on self test (POST) diagnostics are performed. During POST execution, the model number of the module, the firmware revision, the status or result of the test in progress and the current date and time are displayed on the control panel as shown in figure 3-4.

Figure 3-4 POST Screen

Initialization Screens

After the POST is completed, the library robotics system is initialized. A series of screens similar to Figure 3-5 is displayed during this process.

Figure 3-5 Initialization Screen

Default Screen

After the POST diagnostics have concluded successfully and initialization is complete, the system default screen appears, as shown in Figure 3-6.

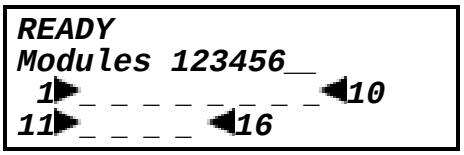


Figure 3-6 Default Screen

The numbers on the second line correspond to the slave modules that are connected to the system. Up to eight slave modules may be connected. The third and fourth lines represent the cartridge magazine in the Global Control Module. A rectangle will appear in each position which contains a cartridge. An underline represents an empty slot.

Fault Screen

When a fault is detected within the Global Control Module or the XpressChannel, a screen similar to Figure 3-7 appears.

When a fault is detected in one of the slave modules, the Alert LED on the Global Control Module control panel is illuminated. The Fault Screen appears on the malfunctioning slave module. At the same time, either the Drive Fault or the Loader Fault LED is illuminated on that module.

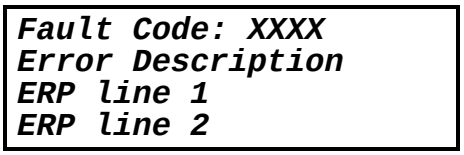


Figure 3-7 Fault Screen

The first line in Figure 3-7 shows a numerical fault symptom code (FSC). The second line shows a brief description of the error, in place of the words 'Error Description.' The third and fourth lines will contain a one- or two-line message describing the initial error recovery procedure (ERP) in place of the words shown in the figure.

A list of the fault symptom codes (FSC) and error recovery procedures (ERP) appears in **Chapter 5 - Troubleshooting**.

Slave Module Default Screen

The slave modules display a different default screen, as shown in Figure 3-8.

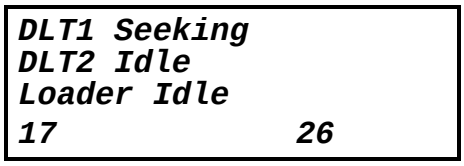


Figure 3-8 Slave Module Default Screen

The example shown is a Base Module in the module 1 position. The first and second lines of the Default Screen show the status of the two drives within the Base Module. On line 4, a rectangle appears in each position which contains a cartridge. An underline would appear at each empty slot. The numbers at the beginning and end of line 4 represent the numbers the system has assigned to the first and last slots of that module.

The Default Screen of a Capacity Module omits drive status on lines 1 and 2, and shows the status of the library robotics within the module. On lines 3 and 4, a rectangle will appear in each position which contains a cartridge. An underline represents an empty slot.

The possible status conditions of the drives are:

- No Tape
- Idle
- Rewinding
- Seeking
- Reading
- Writing
- Erasing
- Cleaning
- Unloaded
- Loading
- Unloading
- Hard Error
- In Flux
- Fault

The third line (in a Base Module) or the second line (in a Capacity Module) tells the status of the library robotics (Loader) within the slave module. The possible conditions of the library robotics are:

- Idle
- Fetch/Stow
- Taking Inventory
- Checking Drives
- Scanning Labels
- Orphaned Cartridge
- Trapped Cartridge
- Elevator Home

The fourth line (in a Base Module) or the third and fourth lines (in a Capacity Module) is a map of the magazine. The numbers from 17 to 26 in Figure 3-8 represent the map numbers of the cartridge slots. In this case, we have a 10-slot magazine in the first position below the 16-slot Global control Module. These numbers vary according to the position of the module within the system and the size of the magazine. If no magazine is installed, line 4 says 'No Magazine.' The boxes which are present on this line indicate that a cartridge is present in the corresponding slot of the magazine. An underline means that there is no cartridge present in that slot.

Selecting Control Panel Display Modes

As previously described, the POST Screens, the Initialization Screen and the Default Screen appear without operator or host intervention. The Fault Screens appear whenever a fault occurs. The screens which follow appear in response to operator actions.

The LibraryXpress Menu Structure

Figure 3-9 shows the structure of the LibraryXpress menus.

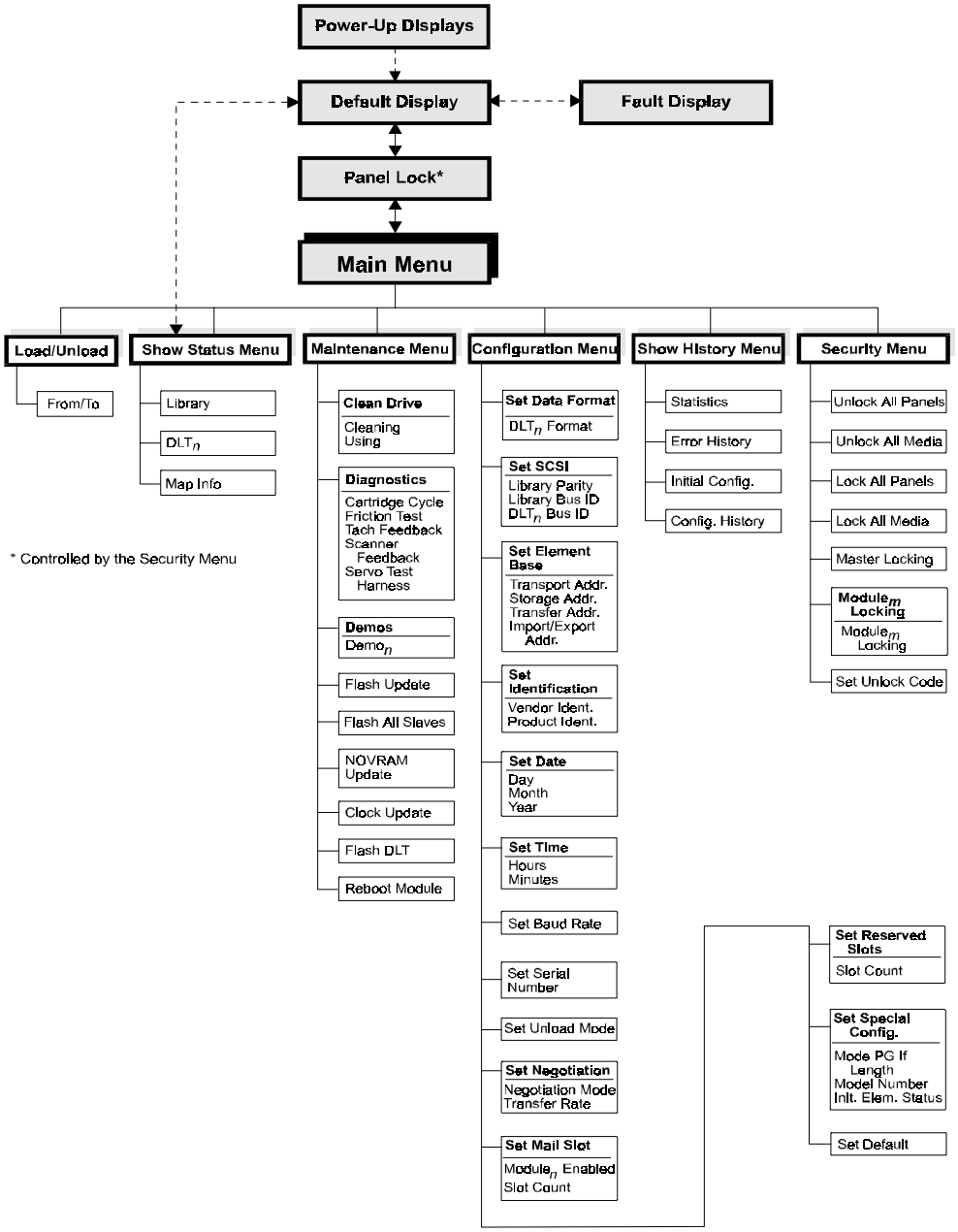


Figure 3-9 LibraryXpress Menu Structure

Entering the Menu Mode

Important Note: When the Global Control Module enters the Menu Mode, the **Ready** light goes out. This means that the module is *offline*, and responds to all commands from the host with a SCSI 'Not Ready' until you exit the Menu Mode and the **Ready** light goes on.

To prevent inadvertent interruption of host operations, you may lock out the Menu Mode using the Security Menu. See the section titled 'Security Menu' later in this chapter. When all control panels are locked, you must enter your unlock code in order to display the Main Menu. Note that the Show Status Menu of each module remains accessible. It may be displayed from the module's Default Screen at any time by pressing the **Escape** button.

When the Default Screen appears on the screen, you can enter the Menu Mode by pressing the **Enter** button. The Main Menu shown in Figure 3-10 appears.

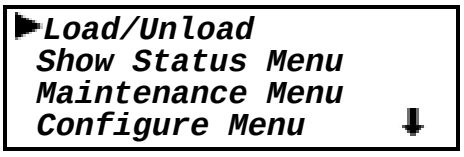


Figure 3-10 Main Menu

Note: If the Control Panel has been locked, the screen shown in Figure 3-11 appears instead of Figure 3-10. You must know the unlock code for the system before you can proceed.

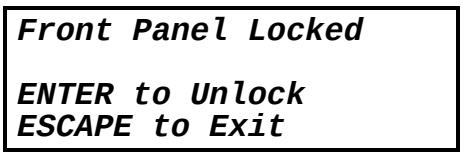


Figure 3-11 Panel Locked Screen

When you press the **Enter** button, the screen in Figure 3-12 appears.

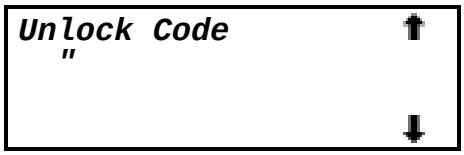


Figure 3-12 Code Entry Submenu

Using the ▲ and ▼ buttons, set the first digit of the unlock code. When you have set it, press the **Enter** button to move the cursor to the second digit and repeat the process. When you have finished, press the **Escape** button, then the **Enter** button to confirm your entry. If the code is correct, the Main Menu is displayed. If the code is incorrect, an error screen appears.

Exiting the Menu Mode

To leave the menu mode and return to the Default Screen, press the **Escape** button repeatedly. Each time you press the **Escape** button, the display moves to a higher menu level. When the Main Menu is visible, pressing the **Escape** button once returns to the Default Screen. At this point, the Ready LED lights.

Navigating Through the Menu Structure

To select a submenu, move the ▶ on the display to the desired line using the ▲ and ▼ buttons. Then press the **Enter** button to confirm your choice and display the submenu. The ↓ at the end of the fourth line of the Main Menu means that there are one or more additional items that can be reached by scrolling, using the ▼ button. The items available on the Main Menu are:

- Load/Unload
- Show Status Menu
- Maintenance Menu
- Configuration Menu
- Show History Menu
- Security Menu

The following paragraphs describe the submenus that correspond to each of the Main Menu selections.

Load/Unload Menu

The Load/Unload Menu is described later in this chapter, under the heading 'Loading and Unloading Tapes.'

Show Status Menu

When you select Show Status, the menu shown in Figure 3-13 appears.

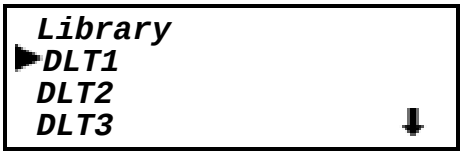


Figure 3-13 Show Status Menu

The items available on the Show Status menu are:

- Library
- DLT1
- DLT2
- . . .
- DLT*n*
- Map Info

Move the ▶ up or down with the ▲ and ▼ buttons, then press the **Enter** button to select the item.

Library Status Submenu

When you select Library, the menu in Figure 3-14 appears.

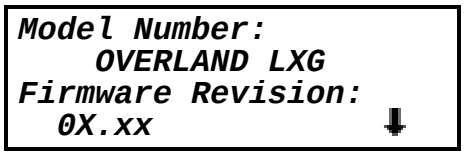


Figure 3-14 Library Status Submenu

This screen is scrollable. The list of Library Status categories available is as follows:

- Model Number
- Firmware Revision
- Date
- Time
- Loader Status
- Library Configuration
- Vendor Identification
- Product Identification
- Transport Address
- Storage Address
- Transfer Address
- Imp/Exp Address
- Serial Number
- SCSI Bus ID
- SCSI Bus Parity
- Negotiation Mode
- Transfer Rate
- Unload Mode
- Mail Slot Emulation
- Mail Slot Count
- Mode Page 1F Length
- Initialize Element Status
- Boot Version
- Flash Type

Drive Status Menu

When you select either of the drives, the menu in Figure 3-15 appears.

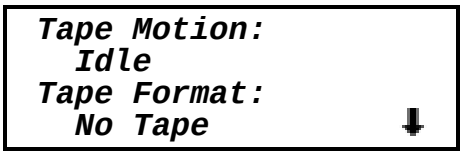


Figure 3-15 Drive Status Menu

This screen is scrollable. The list of Drive Status categories available is as follows.

- Tape Motion
- Product Type
- Tape Format
- Compression
- SCSI Bus ID
- Drive Revision
- Controller Revision
- Cartridge Present
- Hardware Error
- Cleaning Needed
- Write Protected
- Operate Handle

Map Information Screen

When you select Map Info, the screen in Figure 3-16 appears. The location being reported appears on Line 1. The content of the bar code on the label, up to 8 characters, appears on Line 4.

Figure 3-16 Map Info Submenu

The list of locations available for display on line 1 is as follows. If you do not designate any mail slots, those lines are omitted from the list.

- DLT1
- DLT2
- . . .
- DLT*n*
- Slot1
- Slot2
- . . .
- Slot*n*
- Mail Slot1
- . . .
- Mail Slot*n*

Depending on the report for each location, Line 2 may display either ‘Empty,’ or ‘Occupied,’ or, if a magazine is absent, ‘Not Installed.’

Depending on the report for each location, Line 3 may display either ‘Label Valid,’ or ‘Label Not Present.’

For each location reported, Line 4 will display the actual bar code on the label, up to 8 characters.

Maintenance Menu

The Maintenance Menu and the options under it that are intended for operator use are described in **Chapter 4 - Maintenance**. Additional options on the Maintenance Menu that are intended for use by service personnel are described in the Service Manual.

Configure Menu

The Configure Menu, how to use it and the options available under it are described in **Chapter 2 - Installation**.

Show History Menu

The Show History Menu enables the operator to review the history of the system. An example of the use of the Show History Menu, appears later in this chapter under the heading 'Displaying Error Logs.' You can retrieve the configuration history, the original configuration, as well as statistics on the number of operations the library robotics and the drives have performed.

Security Menu

The Security Menu permits the operator to lock the control panel, preventing inadvertent or unauthorized access to the Menu Mode, which takes the system offline. ***Note:*** You can display the Show Status Menu without unlocking the panel (and without taking the system offline) by pressing the **Escape** button at the Default Screen.

When you select the Security Menu, the screen shown in Figure 3-17 appears.

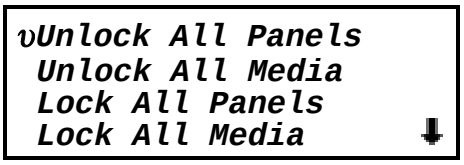


Figure 3-17 Security Menu

This screen is scrollable. The list of Security functions available is as follows.

- Unlock All Panels
- Unlock All Media
- Lock All Panels
- Lock All Media
- Master Locking
- Module 1 Locking

. . .

- Module *n* Locking
- Set Unlock Code

To change the unlock code, or to enable or disable the panel locking function, scroll downward by pressing the ▼ button until the ▶ is next to 'Set Unlock Code.' Press the **Enter** button. The screen shown in Figure 3-18 appears.

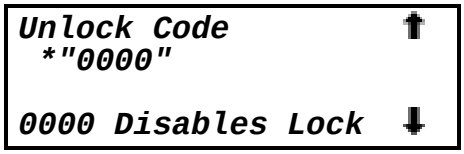


Figure 3-18 Code Select Submenu

An underline cursor appears underneath the first digit. To set the first digit, press the ▲ button or the ▼ button until the desired number is displayed. To move the cursor to the second digit, press the **Enter** button. Repeat the process for each of the four digits. Be sure to remember the 4-digit number, as you will need it in order to enter the Menu Mode. An unlock code of 0000 disables panel locking.

When you have finished entering four digits, press the **Escape** button. The screen shown in Figure 3-19 appears. Your code is shown in place of XXXX.

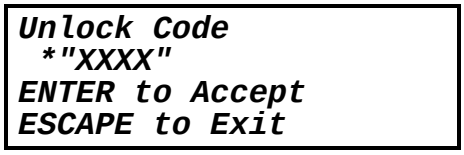


Figure 3-19 Code Accept Submenu

Press the **Enter** button if you want to adopt the unlock code that is displayed. Press the **Escape** button if you do not want to accept it. Press the **Escape** button again to return to the Main Menu, and again to return to the Default Screen.

The next time you attempt to enter Menu Mode, the screen shown in Figure 3-20 appears. You can still display the Status Menu without using the security code by pressing the **Escape** button at the Default Screen

Figure 3-20 Panel Locked Screen

When you press the **Enter** button, the screen in Figure 3-21 appears.

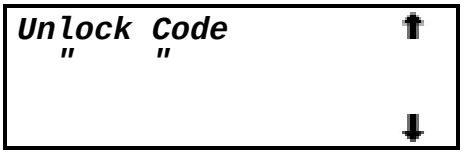


Figure 3-21 Code Entry Submenu

Using the ▲ button and the ▼Buttons, set the first digit of the unlock code. Press the **Enter** button to move the cursor to the second digit and repeat the process. When you have finished, press the **Escape** button. The screen in Figure 3-22 appears.

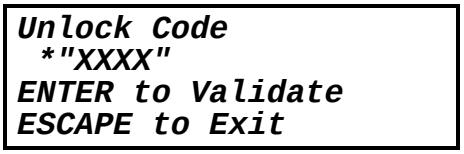


Figure 3-22 Code Validate Submenu

Press the **Enter** button to validate your choice. If the code is correct, the Main Menu is displayed. If the code is incorrect, an error screen appears. If you have forgotten your unlock code, contact your technical support representative for assistance.

Displaying Firmware Revision

You may display the library robotics firmware revision at any time by pressing the **Escape** button at the Default Screen to display the Show Status Menu. It appears as one of the items on the Library Status submenu of the Show Status Menu. It is also displayed on line 2 of the POST Screen and the Initialization Screens.

Displaying Error Logs

To display the error history of the module, you need to use the Show History menu. Access it as follows.

1. At the Default Screen, press the **Enter** button to enter the Menu Mode. The Main Menu is displayed.
2. At the Main Menu, press the ▼ button four times until the ► in the display is next to 'Show History Menu.'
3. Press the **Enter** button to select the submenu.
4. At the Show History Submenu, press the ▼ button once so that the ► in the display is next to 'Error History.'
5. Press the **Enter** button to select the function. A circular list of 4-line error reports is displayed in the format shown in Figure 3-23.

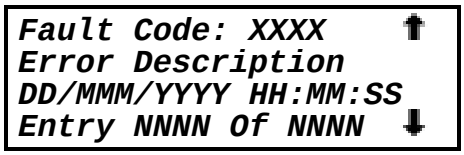


Figure 3-23 Error History Screen

6. Using the ▲ and ▼ buttons, scroll the list to display the error history of the module.

Loading and Unloading Tapes

The Load/Unload menus enable you to specify a source and a destination for a cartridge movement. As a result, you use exactly the same procedure to load and unload. To load or unload a tape from the front panel of the module, use the Load/Unload menus as follows.

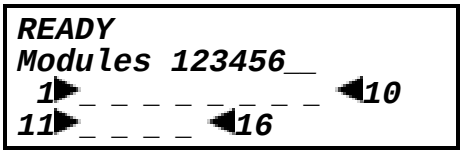


Figure 3-24 Default Screen

A default screen is shown in Figure 3-24. From the Default Screen, enter the Menu Mode by pressing the **Enter** button. The Main Menu shown in Figure 3-25 appears.

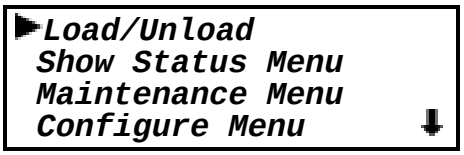


Figure 3-25 Main Menu

The ▶ is next to the line that reads 'Load/Unload.' Press the **Enter** button to display the first Load/Unload submenu, which is shown in Figure 3-26.

Figure 3-26 Load/Unload Initial Screen

In Figure 3-26, the ▶ is next to line 2 of the display. Line 2 shows the top item in a scrollable list of sources. Note that a ↓ has appeared on the right of the bottom line. This indicates that the ▼ button may now be used to scroll through the list, and that the top item on the list is displayed. As soon as you press the ▼ button, three things happen.

- the list scrolls down one item (only line 2 scrolls)
- a ↑ appears on the right of line 1 of the display. This indicates that there is one or more items above the item displayed on line 2.
- The ✶ at the left of line 2 disappears. This is because the ✶ indicates the current selection or the default selection, and you have scrolled the default selection offscreen, and haven't yet selected an item from the list.

Note: The contents of the lists on line 2 and line 4 will vary as follows.

Initial Screen - 'From' Line

The list on line 2 in Figure 3-26 (the 'From' line) will include every drive and every magazine slot (including mail slots) that has a cartridge in it (you can't get a cartridge from a slot or drive that is empty).

Initial Screen - 'To' Line

The list on line 4 of Figure 3-26 (the 'To' line) will include all of the valid destination choices, that is, drives and slots that are empty (you can't put a cartridge into a slot or drive which already has one in it.)

Scroll List - 'To' Line

There is another limitation on the 'To' list. If you have selected a drive on the 'From' screen, the 'To' list can include only slots. If you have selected a slot on the 'From' screen, the 'To' list can contain only drives.

Let us assume that you want to load the cartridge that is in Slot 4 into any available drive. Use the ▼ button to scroll line two to Slot 4. The display appears as shown in Figure 3-27.

Figure 3-27 Load/Unload 'From' Entry Screen

When you have scrolled to your desired source, press the **Enter** button to select it. Notice that in Figure 3-28, two changes occur in the display.

- The * reappears at the beginning of line 2, indicating that you have made a selection.
- The ▶ now moves to line 4, indicating that you may now select a destination.

Figure 3-28 Load/Unload 'To' Entry Screen

You can now simply press the **Enter** button to select DLT1 as the destination. Note that there is no ↓ at the end of line 4, nor ↑ at the end of line 1. There are no additional choices because 1) you have selected a slot as the source, so the destination must be a drive, and 2) DLT2 already has a cartridge in it, so it cannot be a valid destination. Press the **Enter** button to select DLT1. In response, the confirmation screen in Figure 3-29 appears.

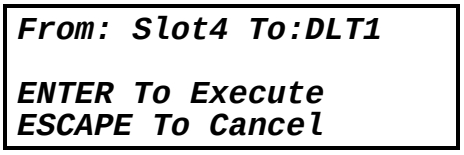


Figure 3-29 Confirmation Screen

As the confirmation screen indicates, to execute the load or unload, press the **Enter** button. If the confirmation screen does not show your intended source and destination, press the **Escape** button to return to the 'From' entry screen.

When you press the **Enter** button, the screen shown in Figure 3-30 appears. If the source is a drive, the word 'Unload' appears in place of the word 'Load' on line 4.

Figure 3-30 Load/Unload 'In Progress' Screen

When the load or unload operation is finished, the Default Screen reappears.

Inserting and Removing Cartridges

When inserting cartridges, be sure that the slot you intend to use is not already reserved in the system map for a cartridge in a drive. The best way to avoid conflicts is to unload all drives, either through your host computer software or by using the Load/Unload command on the Main Menu, described in the previous section.

The tape magazine must be removed from the module in order to insert or remove cartridges. To insert or remove the magazine, the following conditions must be met.

- The Magazine Security Lock must be unlocked, using the key supplied with the module. Refer to Figure 3-31. When the Magazine Security Lock is locked, the **Unlock/Open** button has no effect. If the module is installed in a reasonably secure environment, you may elect to leave the Magazine Security Lock in the unlocked position.

- Media locking on the Security Menu must be disabled. Refer to Figure 3-17.

- The host computer must allow medium removal. The host computer can enable or disable the **Unlock/Open** button using the SCSI Prevent Allow Medium Removal command. When you press the **Unlock/Open** button, the message ‘Magazine Locked” will be displayed.

- The Global Control Module must be ready, and not actually executing a command.

Important Note: When you enter the Menu Mode, the **Ready** light goes out. The magazine cannot be inserted or removed unless the **Ready** light is on. To remove the magazine when a failure prevents the Ready light from illuminating, see the paragraph headed ‘Emergency Magazine Removal’ later in this chapter.

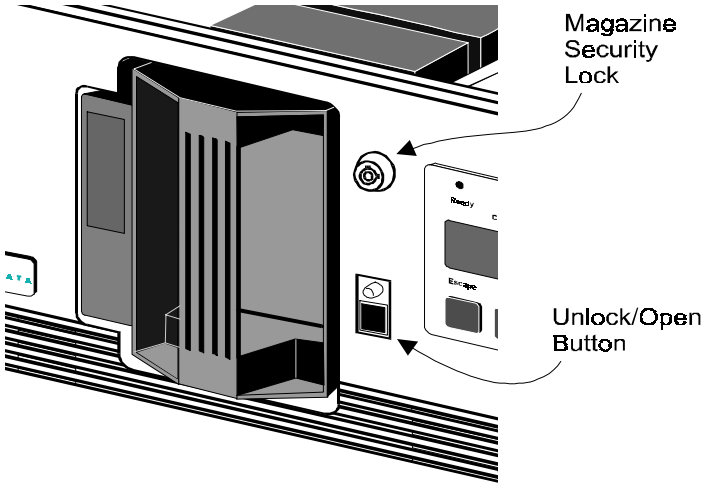


Figure 3-31 Magazine In Place

Removing a Magazine

1. Press the **Unlock/Open** Button on the front panel of the module. If the message ‘Magazine Locked’ appears on the control panel of that module, continue with step 2. If no such message appears, skip to step 8.

2. On the control panel of the Global Control Module, at the Default Screen, press the **Enter** button to display the Main Menu shown in Figure 3-32. ***Note:*** if the display says that the front panel is locked, you need to know the unlock code for your system. See the section titled 'Entering the Menu Mode' earlier in this chapter for unlocking instructions.

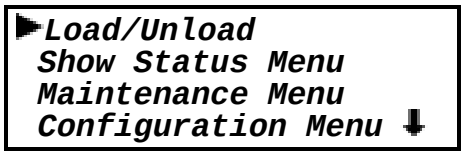


Figure 3-32 Main Menu

3. Press the ▼ button five times to scroll the display and move the ▶ next to 'Security Menu'. The display will appear as follows.

Figure 3-33 Main Menu, Scrolled

4. Press the **Enter** button to select the Security Menu, shown in Figure 3-34.

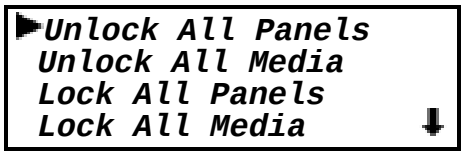


Figure 3-34 Security Menu

5. Press the ▼ button once to move the ▶ next to 'Unlock All Media', then press the **Enter** button. The display will appear as follows.

Figure 3-35 Unlock All Media Screen

6. When the words 'In Progress' disappear, press the **Escape** button repeatedly until the Default Screen appears.
7. Press the **Unlock/Open** Button on the front panel of the Module. If the module does not unlock, be sure that the key lock on the Module's front panel is unlocked.
8. When the 'Door Open' message flashes, grasp the handle, and pull the magazine from the module.

Emergency Magazine Removal

If a fault occurs that prevents removal of the magazine, turn the power off for five seconds. Power up while continuously pressing the ⏏ button. Continue to hold the button until all of the indicators on the control panel light, then go out. Release the button. The magazine may now be removed.

If you are unsuccessful in removing the magazine using this procedure, contract your technical support representative for further advice.

Inserting Cartridges Into the Magazine

A full magazine is shown in Figure 3-36. Insert cartridges so that the label end with the write protect switch is outward, with the write protect switch toward the bottom of the magazine. The lowest numbered cartridge slot in the magazine is closest to the handle.

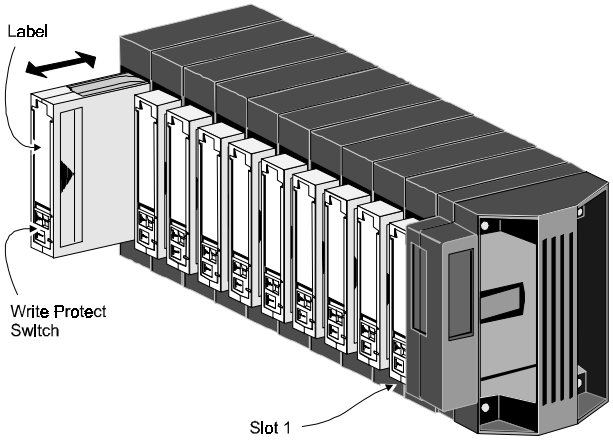


Figure 3-36 10-Slot Tape Magazine With Cartridges Installed

Inserting a Magazine

1. Press the **Unlock/Open** Button on the front panel of the module If the message 'Magazine Locked' appears on the control panel of that module, continue with step 2. If no such message appears, skip to step 8.

2. On the control panel of the Global Control Module, at the Default Screen, press the **Enter** button to display the Main Menu. ***Note:*** if the display says that the front panel is locked, you need to know the unlock code for your system. See the section titled 'Entering the Menu Mode' earlier in this chapter for unlocking instructions.

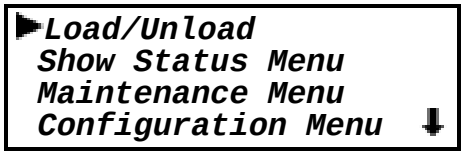


Figure 3-37 Main Menu

4. Press the ▼ button five times to scroll the display and move the ▶ next to 'Security Menu'. The display will appear as follows.

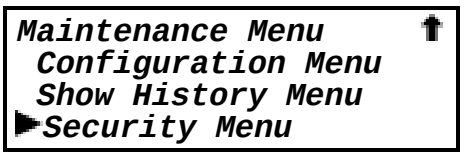


Figure 3-38 Main Menu, Scrolled

4. Press the **Enter** button to select the Security Menu, shown in Figure 3-38.

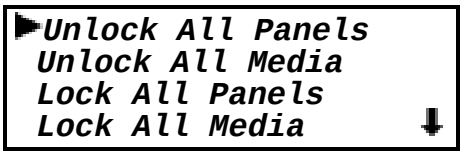


Figure 3-39 Security Menu

5. Press the ▼ button once to move the ▶ next to 'Unlock All Media', then press the **Enter** button. The display will appear as follows.

Figure 3-40 Unlock All Media Screen

6. When the words 'In Progress' disappear, press the **Escape** button repeatedly until the Default Screen appears.
7. Press the **Unlock/Open** Button on the front panel of the Module. If the module does not unlock, be sure that the key lock on the Module's front panel is unlocked.
8. Insert the magazine into the module, with the cartridges protruding toward the left.
9. If you want to relock the media, repeat steps 2 through 4.

10. Press the ▼ button three times to move the ▶ next to 'Lock All Media', then press the **Enter** button. The display will appear as follows.

Figure 3-41 Lock All Media Screen

12. All media are now locked. When the words 'In Progress' disappear, press the **Escape** button repeatedly until the Default Screen appears.

Base Module

The front panel of the Base Module is nearly identical to the Global Control Module. It includes a power switch for the module, the magazine door, the Magazine Security Lock, the Unlock/Open button with its Locked indicator. The control panel, shown in Figure 3-3, has one more LED indicator than the Global Control Module. Figure 3-42 shows the Base Module front panel.

The Magazine Security Lock, the Unlock/Open Button and the Locked Indicator LED

These features are described earlier in this chapter under the heading 'Inserting and Removing Cartridges.'

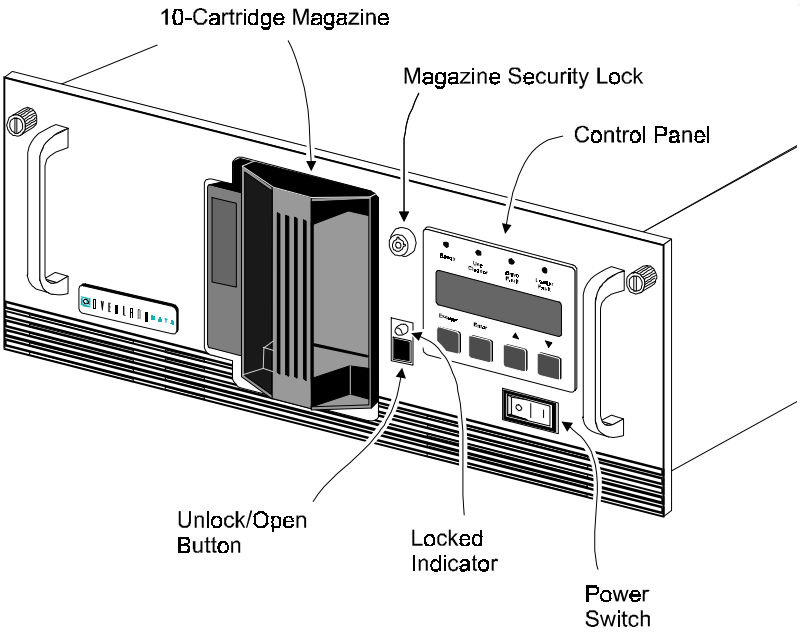


Figure 3-42 Base Module Front Panel

Capacity Module

The front panel of the Capacity Module is identical to the Global Control Module. It includes a power switch for the module, the magazine door, the Magazine Security Lock, the Unlock/Open button with its Locked indicator, and the control panel shown in Figure 3-2. The Capacity Module has a 16-slot magazine, and no tape drives.

Tape Requirements

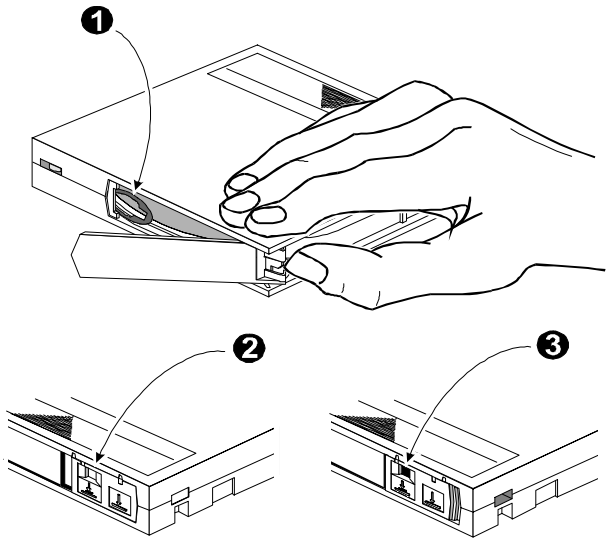
The LibraryXpress uses ECMA-approved and ANSI proposed-standards DLTtape cartridges. The DLTtape cartridge is a four inch square plastic cartridge. According to the media manufacturer, the cartridge and the medium are designed to withstand 1,000,000 passes, and to have a shelf life of 30 years when properly stored.

Cartridge handling and Storage

A DLTtape cartridge should be stored vertically until you select it for use. Do not expose a cartridge to moisture or direct sunlight. Maintain a clean, dust-free working and storage environment.

If a DLTtape cartridge is dropped:

- Inspect the cartridge carefully before you insert it into a LibraryXpress magazine or any drive.
- Shake the cartridge while listening for the sound of a broken part. Any rattling sound makes a cartridge unfit for use.
- Inspect the case for distortion or cracks.
- Inspect the leader by opening the cartridge door as shown in Figure 3-43. The leader should be positioned as shown in view (1), and should protrude at about a five degree angle from the case. If the leader is out of position, ***do not use the cartridge;*** damage to the drive could result.



1-Leader **2**-Write Protect OFF **3**-Write Protect ON

Figure 3-43 DLTtape Cartridge

Write Protection

The write protection switch of a DLTtape cartridge is also shown in Figure 3-43. To enable data recording, slide the write protect switch to the right so that no orange color is visible through the window in the write protect switch (2). To write protect the DLTtape cartridge, slide the write protect switch to the left until the orange indicator shows through the window on the write protect switch (3).

Barcode Labels

Barcode labels should be 2.2 x 8.2 cm on card stock or similar heavy paper. The label slips into the slot adjacent to the write-protect switch on each tape cartridge. The code used may be Code 39, Codabar, 3-of-9, standard 2-of-5, or interleaved 2-of-5, with a length of 8 digits. Minimum element width is 7.5 mm. Several vendors supply software to print barcode labels on laser and ink jet printers.

Chapter 4 — Maintenance

The only maintenance task that should be periodically performed by the user is to run the cleaning cartridge. The system will notify you when a drive needs cleaning. Occasionally, new firmware is issued by Overland Data. Firmware upgrades must be performed by qualified service personnel.

The Maintenance Menu offers the following options:

- Clean Drive
- Diagnostic Menu
- Demo Menu
- Flash Update
- Flash All Slaves
- Novram Update
- Clock Update
- Flash DLT
- Reboot Module

Of these, only Clean Drive and the Demo Menu are intended for the user. This chapter tells you how to clean the drives. The Demo Menu is described in **Chapter 5 - Troubleshooting**.

Cleaning Cartridge

The cleaning cartridge is similar in appearance to the cartridge shown in Figure 3-43. The command to run the cartridge is issued from the control panel of the Global Control Module. The procedures that follow tell you how to install a cleaning cartridge, how to clean a drive, and how to remove the cleaning cartridge.

The default location for a cleaning cartridge is slot 1. That is, unless you specify a different slot when you start a cleaning operation, the system will look for the cleaning cartridge in slot 1. A cleaning cartridge can be run from any slot in any module.

Note: The cleaning cartridge is abrasive, and should not be used unless the **Use Cleaner** LED comes on one of the slave modules. To determine which drive requires cleaning, unload all of the drives in that module and select 'Cleaning Needed' on the Drive Status submenu. See the section headed 'When to Run the Cleaning Cartridge' later in this chapter.

Required Location for the Cleaning Cartridge

Generally, there are no restrictions on the location of the cleaning cartridge. However, if 1) you have designated a mail slot, or 2) you are using the reserved slots option, any undesignated slots in the mail slot magazine or the reserved magazine become inaccessible to the system. In these cases, the system designates one of these inaccessible slots as a cleaning cartridge slot. On line 4 of the screen shown in Figure 4-3, 'Cleaning Slot 1' appears instead of 'Slot1.' The question is where is Cleaning Slot 1 located. The answer is as follows.

If you have designated *n* mail slots, Cleaning Slot 1 is at the rearmost slot (10 or 16) in the magazine containing the mail slots. If you have reserved slots, Cleaning Slot 1 is slot 16 of the magazine in the Global Control Module.

Installing a Cleaning Cartridge

This section assumes that you intend to use the default cleaning cartridge slot, slot 1, which is in the Global Control Module.

1. Examine the Default Screens on the control panels of the Base Modules to determine whether any cartridges are loaded into the drives. If so, then unload each as described in **Chapter 3 - Operation**. in the section titled 'Loading and Unloading Tapes.'
2. Remove the magazine from the Global Control Module using the procedure described in **Chapter 3 - Operation**, in the section titled 'Inserting and Removing Cartridges.'
3. Remove any cartridge present in Slot 1 (the slot nearest the handle).
4. Insert the cleaning cartridge into Slot 1. You can use any slot, but using Slot 1 saves some keystrokes each time you clean a drive.

5. Press the **Unlock/Open** button on the front panel of the Global Control Module.
6. Insert the magazine into the module. If you want to lock the magazine, perform step 7. Otherwise, this completes the operation.
7. On the control panel of the Global Control Module, select 'Security Menu' on the Main Menu, then 'Lock All Media' on the Security Menu. ***Note:*** Modules may be unlocked and locked individually using the individual module locking items on the Security Menu.

When to Run the Cleaning Cartridge

When a Use Cleaner LED (yellow) lights on the front panel of a slave module, one of the drives in that module requires cleaning. If there is only one drive in the module, note the DLT number displayed on the control panel of the module and perform the cleaning operation on that drive as described in the next section. If there are two or more drives, note the DLT numbers displayed on the control panel of the module. To determine which drive needs to be cleaned, press the **Escape** button on the Global Control Module control panel to display the Status Menu. Select first one drive, then the other and scroll down to 'Cleaning Needed' on the Drive Status Menu for each drive. The drive that needs to be cleaned will show 'Yes' below 'Cleaning Needed.'

Running the Cleaning Cartridge

This procedure assumes that the cleaning cartridge has been installed into Slot 1 of the system.

1. On the control panel of the Global Control Module, at the Default Screen, press the **Enter** button. The display will show the following.

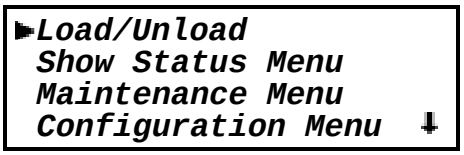


Figure 4-1 Main Menu

2. Press the ▼ button twice to move the ▶ next to 'Maintenance Menu', then press the **Enter** button to select the Maintenance Menu. The display will show something similar to the following.

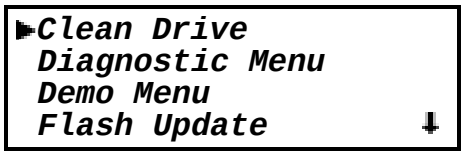


Figure 4-2 Maintenance Menu

3. Press the **Enter** button once to select Clean Drive., The following screen appears.

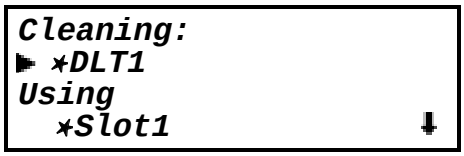


Figure 4-3 Cleaning Submenu

4. Lines 2 and 4 are scrollable. The choices available on Line 2 are DLT1 through DLT*n*. Let us assume you want to clean DLT1. Press the **Enter** button once to accept DLT1. The ▶ moves to line 4 of the display. Press the **Enter** button again to use the cartridge in Slot 1. ***Note:*** If you are unable to use slot 1 for the cleaning cartridge, you can scroll line 4 to select another slot.
5. The Clean Confirmation Screen appears, as shown below.

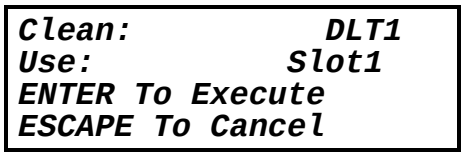


Figure 4-4 Cleaning Confirmation Screen

6. As the confirmation screen indicates, to execute the cleaning operation, press the **Enter** button. If the confirmation screen does not show your intended drive and cleaning cartridge, press the **Escape** button to return to the Cleaning submenu.

   When you press the **Enter** button, the In Progress screen appears.

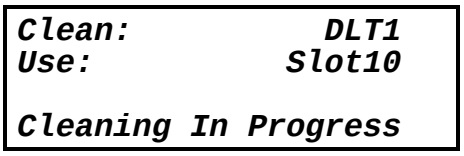


Figure 4-5 Cleaning In Progress Screen

When the cleaning operation is completed, the Default Screen reappears.

Removing the Cleaning Cartridge

This section assumes that the cleaning cartridge is in slot 1, which is in the Global Control Module.

1. Examine the Default Screens on the control panels of the Base Modules to determine whether any cartridges are loaded into the drives. If so, then unload each as described in **Chapter 3 - Operation**. in the section titled 'Loading and Unloading Tapes.'
2. Remove the magazine from the Global Control Module using the procedure described in **Chapter 3 - Operation**, in the section titled 'Inserting and Removing Cartridges.'
3. Remove the cleaning cartridge from Slot 1 (the slot nearest the handle).
4. Insert any desired cartridge into Slot 1.
5. Press the **Unlock/Open** button on the front panel of the Global Control Module.
6. Insert the magazine into the module. If you want to lock the magazine, perform step 7. Otherwise, this completes the operation.

7. On the control panel of the Global Control Module, select ‘Security Menu’ on the Main Menu, then ‘Lock All Media’ on the Security Menu. ***Note:*** Modules may be unlocked and locked individually using the individual module locking items on the Security Menu.

All media are now locked.

Chapter 5 — Troubleshooting

Diagnosing Problems

There are two main types of problems that can cause the LibraryXpress System to malfunction or fail to perform correctly: platform problems and general drive errors. Some errors cause Fault Symptom Codes (FSC) to be displayed on the control panel of the Global Control Module, along with a description of the fault. Other errors cause the Alert lamp to light, while an FSC is displayed on the control panel of one of the other modules in the system. Error Recovery Procedures (ERP) are available for some FSCs. They are described in this chapter.

Platform Problems:

These errors arise out of incorrect installation and configuration. The most common characteristic of this type of error is that the system appears to operate normally, except that no data can be interchanged. You may or may not get an error code on the Global Control Module control panel. To identify an error caused by this type of problem, check your installation and configuration setup, referring back to **Chapter 2 - Installation**.

General Drive Errors:

These errors usually result from a) a miscommunication between the Global Control Module and one or more slave modules, or between a module's processor and a drive processor or b) a mechanical malfunction within the LibraryXpress System. In most cases, both of these types of errors report an error message and an FSC on the Global Control Module control panel, and often on the control panel of a slave module. The chief exceptions are power supply problems and display malfunctions which can interfere with the display of error messages. The FSC is used to report errors to your technical support representative, and in some cases can be used to determine a recovery procedure.

A simple error recovery procedure is displayed on the bottom line of the control panel display. Some errors can be cleared by pressing the **Enter** button on the control panel, others by cycling the power to the module. Often the module will resume normal operation. Other errors are repeated when the operation is attempted again. Such recurrent errors may require more extensive recovery procedures such as replacement of a part.

Error Recovery

Figure 5-1 is a flow chart that outlines the recommended steps for error recovery. This chart should be followed in all cases.

Error Recovery Procedures (ERP) are described in detail in Table 5-1. Fault Symptom Codes are listed in Table 5-2. ERP are listed for each FSC.

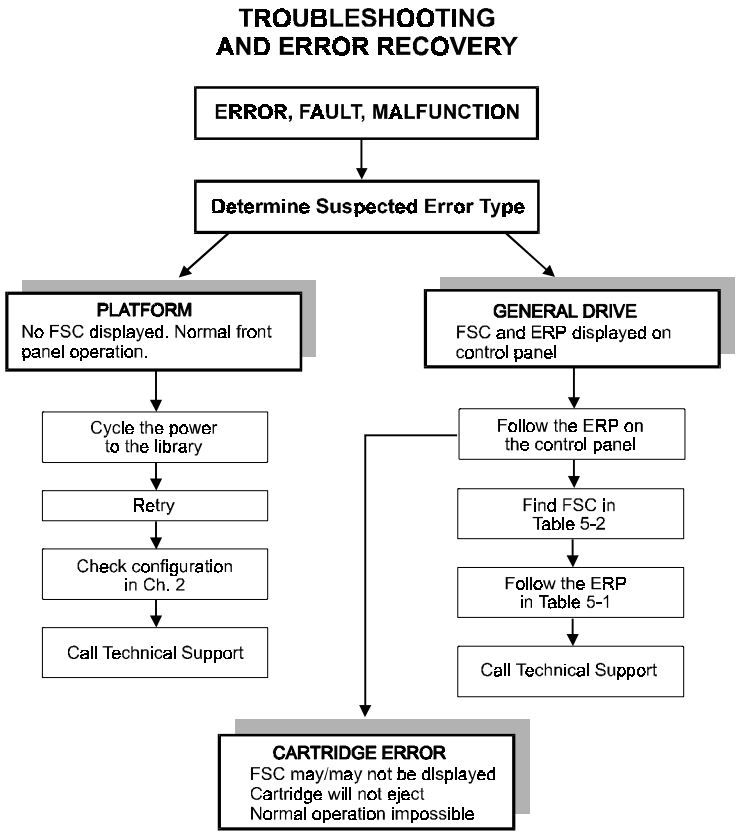


Figure 5-1 Troubleshooting Flow Chart

Error Recovery Procedures

Table 5-1 gives error recovery instructions for errors reported on the front panel of the Global Control Module. This list includes only those procedures that may be safely performed by an operator. The Service Manual includes additional procedures that may be performed by a qualified service technician.

Table 5-1 Error Recovery Procedures

ERP NUMBER	PROCEDURE DETAIL
C	Cycle power to the drive using the AC switch on the front panel of the module. Wait 30 seconds to power on again.
D	Turn off power to the module and inspect connectors and cables.
F	Invalid operation. Select parameters correctly and try again.
G	Call Technical Support.

Fault Symptom Codes (FSC)

Fault Symptom Codes appear in the Fault Screen described in **Chapter 3 - Operation**. Each FSC is accompanied by a descriptive message and instructions for clearing the fault. When a fault persists, the operator should look up the FSC in Table 5-2 to determine the error recovery procedure to be followed. If you call your Technical Support representative about a fault condition, be sure to furnish the FSC to aid in identifying the problem.

Table 5-2 Fault Symptom Codes

FSC	Displayed Message	ERP
3001	Picker Tries Excd Power Down to Clear	C, D, G
3002	Picker Tach Errors	D, G

	Power Down to Clear	
3003	Elevator Tach Errors Power Down to Clear	D, G
3004	Elevator Jammed Power Down to Clear	C, D, G
3005	Picker Jammed Power Down to Clear	C, D, G
5002	All DLTs/Slots Empty Press Enter to Clear	F
5003	All DLTs/Slots Full Press Enter to Clear	F
5012	All Drives Full Press Enter to Clear	F
FSC	Displayed Message	ERP
5014	DLT Already Loaded Press Enter to Clear	F
5015	Expired Clean'g Cart Press Enter to Clear	F
5016	Not a Clean'g Cart Press Enter to Clear	F
5020	All DLTs/Slots Empty Press Enter to Clear	F

If an error message is displayed that is not included in Table 5-2, please write down the fault code number and follow the recovery procedure described on line 4 of the display. If the same error occurs again, call your technical support representative.

Appendix A - Specifications

Operational Performance Specifications

Host Interface ..... SCSI-2 (s/e or diff) or Fast/Wide SCSI (diff)
Number of Cartridges, Full Magazine
- Base Module 10
- Capacity Module 16
- Global Control Module 16

Media type
- 2000XT Drives ..... DLTtape IIIXT
- 4000 Drives ..... DLTtape IV
- 7000 Drives ..... DLTtape IV

Tape Speed ..... 110 in/sec read/write, 150 in/sec search
Tape Tension ..... 3.0 +/- 1 oz. when stationary
..... 4.7 +/- 1 oz. at operating speed
Load Time ..... 10 sec (max.), including picking from slot
Unload Time ..... 10 sec (max.), including returning to slot
Rewind Time ..... 45 sec (avg.)
Sustained native data transfer rate, maximum
- LXB2110, 2210 ..... 1.25 MB/sec
- LXB4110, 4210 ..... 1.5 MB/sec
- LXB7110, 7210 ..... 5 MB/sec

Peak SCSI transfer rate, synchronous mode
- LXB2110, 2210 ..... 5.0 MB/sec
- LXB4110, 4210 ..... 10.0 MB/sec
- LXB7110, 7210 ..... 20.0 MB/sec

Native Data Capacity (Per Cartridge):
- LXB2110, 2210 ..... 15 GB
- LXB4110, 4210 ..... 20 GB
- LXB7110, 7210 ..... 35 GB

Reliability Specifications (Drives)

Mean cycles between operator intervention 150,000
Data Error Rate ..... 1 in 10^{15} bytes
MTBF ..... 280,000 hrs (unlimited duty cycle)
MTTR ..... 15 min
Head Life ..... 30,000 tape motion hrs
Design Life ..... 5 years @ 3,300 power-on hrs/year

Reliability Specifications (Library Robotics)

Life Expectancy, Load/Unload Operations 500,000
Design Life ..... Seven years

Power Specifications

Voltage ..... 115-240 VAC
Amperage, Each Module
- LXB ..... 1.8-1.2 A
- LXG, LXC 1.0-0.5A

Line Frequency ..... 50-60 Hertz

Mechanical Specifications

Height ..... 6.97 in. (17.70 cm.)
Width ..... 17.00 in. (43.18 cm.)
Depth
- overall ..... 23.75 in. (60.35 cm.)
- behind panel ..... 22.75 in. (57.79 cm.)

Weight
- Base Module
  - dual drive ..... 62 lbs. (28 kg.)
  - single drive ..... 48 lbs. (22 kg.)
- LXG, LXC ..... 41 lbs. (20 kg.)
- XpressChannel (2-module height) ..... 5 lbs (2.3 kg.)

Shipping Weight
- Base Module
  - dual drive ..... 70 lbs. (32 kg.)
  - single drive ..... 56 lbs. (25 kg.)
- Global Control Module (packed with XpressChannel) .... 75 lbs. (34 kg.)
- Capacity Module ..... 55 lbs. (25 kg.)

Environmental Specifications

Operating

Dry Bulb Temp. ..... 50°F to 104°F (10°C to 40°C)
Temperature Gradient ..... 1.8°F/min. (1°C/min.)
Temperature Shock ..... 59°F (15°C) over 2 min.
Wet Bulb Temperature ..... 78.8°F (26°C)
Relative Humidity $_{\text{non-condensing}}$ ..... 15% to 85%
Humidity Gradient 10%/hour
Altitude ..... -100ft. to +10,000 ft (-305m to 3050m)

Non-Operating (Packed or Unpacked)

Dry Bulb Temp. ..... -40°F to 140°F (-40°C to 60°C)
Temp. Gradient ..... 36°F (20°C)/hour (across the range)
Temperature Shock ..... 27°F (15°C) (over 2 min.)
Wet Bulb Temp. ..... 86°F (30°C)
Relative Humidity $_{\text{non-condensing}}$ ..... 10% to 95%
Humidity Gradient 10%/hour
Altitude ..... -100 to +10,000 ft. (-305 to 3050m)

Environmental Specifications, Cont'd

Storage/Transit

Dry Bulb Temp. ..... -40°F to 140°F (-40°C to 60°C)
Temp. Gradient ..... 45°F (25°C)/hour (across the range)
Temperature Shock ..... 27°F (15°C) (over 2 min.)
Wet Bulb Temp. ..... 86°F (30°C)
Relative Humidity$_{\text{non-condensing}}$ ..... 5% to 95%
Humidity Gradient..... 10%/hour
Altitude .....-100 to +10,000 ft. (-305 to 15,250m)

Acoustic Emissions

Drive Condition..... Emission Level
Two drives operating ..... <50 dBA
(Intermittant robot motion excepted)

Safety

The LXB, LXG, and LXC models carry the following Regulatory Agency product safety certifications:

Certification .....Standard
UL Listed .....UL 1950
TUV/Product Service ..... EN 60 950
GS Mark
CE Mark ..... EMC Directive, Low Voltage Directive
Canadian UL Listed .....CSA 22.2 No. 950

Electromagnetic Emission

Notice

This equipment has been tested using double shielded cables for EMI compliance. The use of unshielded cables or modifications requires system testing for EMI testing for compliance to the standard.

Industry Canada Industrie Canada

This Class A digital apparatus meets all requirements of the Canadian Interference-causing Equipment regulations.

Cet appareil numérique de la classe A respecte toutes les exigencies du Règlement sur le matériel brouilleur du Canada.

FCC Notice

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at their own expense.

DECLARATION OF CONFORMITY

We, **Overland Data Incorporated**
8975 Balboa Avenue
San Diego, CA 92123-1599, USA

on our own responsibility, declare that the product:

Kind of equipment: **Cartridge Tape Control Module**

Type designation: **Models DLT-LXGS, DLT-LXGD**

is in compliance with the following norms and documents:

European Council Directive 89/336/EEC laws relating to electromagnetic compatibility. (EMC Directive)

EN 55 022, Radio Frequency Interference limits and measurement, Information Technology Equipment, class B, standard.

EN 50 082-1, Electromagnetic compatibility, generic immunity standard.

European Council Low Voltage Directive 73/23/EEC
EN 60 950, Information Technology Equipment Safety Standard.

Accredited test laboratory: **TUV Product Service**
10040 Mesa Rim Drive
San Diego, CA 92121, USA

Scott McClendon, President
Manufacturer/Authorized representative, name and signature.

17 March 1997
San Diego, California, USA
place and date of issue.

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DECLARATION OF CONFORMITY

We, **Overland Data Incorporated**
8975 Balboa Avenue
San Diego, CA 92123-1599, USA

on our own responsibility, declare that the product:

Kind of equipment: **Cartridge Tape Capacity Module**

Type designation: **Models DLT-LXC**

is in compliance with the following norms and documents:

European Council Directive 89/336/EEC laws relating to electromagnetic compatibility. (EMC Directive)

EN 55 022, Radio Frequency Interference limits and measurement, Information Technology Equipment, class B, standard.

EN 50 082-1, Electromagnetic compatibility, generic immunity standard.

European Council Low Voltage Directive 73/23/EEC
EN 60 950, Information Technology Equipment Safety Standard.

Accredited test laboratory:

TUV Product Service
10040 Mesa Rim Drive
San Diego, CA 92121, USA

Scott McClendon, President
Manufacturer/Authorized representative, name and signature.

17 March 1997
San Diego, California, USA
place and date of issue.

DOC LX3X.DOC 5 MARCH 1996

DECLARATION OF CONFORMITY

We, **Overland Data Incorporated**
8975 Balboa Avenue
San Diego, CA 92123-1599, USA

on our own responsibility, declare that the product:

Kind of equipment:	**Cartridge Tape Drive**

Type designation:	**Model DLT-LXBS, DLT-LXBD**

is in compliance with the following norms and documents:

European Council Directive 89/336/EEC laws relating to electromagnetic compatibility. (EMC Directive)

EN 55 022, Radio Frequency Interference limits and measurement, Information Technology Equipment, class B, standard.

EN 50 082-1, Electromagnetic compatibility, generic immunity standard.

European Council Low Voltage Directive 73/23/EEC
EN 60 950, Information Technology Equipment Safety Standard.

Accredited test laboratory:	**TUV Product Service** **10040 Mesa Rim Drive** **San Diego, CA 92121, USA**

Scott McClendon, President
Manufacturer/Authorized representative, name and signature.

5 March 1996
San Diego, California, USA
place and date of issue.

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Japanese Voluntary Control Council for Interference (VCCI)

この装置は、第一種情報装置（商工業地域において使用されるべき情報装置）で商工業地域での電波障害防止を目的とした情報処理装置等電波障害自主規制協議会(VCCI)基準に適合しております。
従って、住宅地域またはその隣接した地域で使用すると、ラジオ、テレビジョン受信機等に受信障害を与えることがあります。
取扱説明書に従って正しい取り扱いをして下さい。

(Translation)

This equipment is in the 1st Class category (information equipment to be used in commercial and/or industrial areas) and conforms to the standards set by the Voluntary Council For Inteference by Information Technology Equipment aimed at preventing radio interference in commercial and/or industrial areas.

Consequently, when used in a residential area or in an adjacent area thereto, radio interference may be caused to radios and TV receivers, etc.

Read the instructions for correct handling.

Appendix B - Accessories/Spares/ FRUs

P/N	Description
106030-001	Bar Code Reader Assembly
108167-001	Bearings, Leadscrew, pkg/6
108168-001	Belt, Timing, 150 Tooth, pkg/5
108169-001	Bracket, Anti-rotation, pkg/5
108145-001	Caddy Assembly
972057-001	Cartridge, Cleaning
108135-001	Control Panel Assembly, LXB
108134-002	Controller PWB Assembly, Diff
108134-001	Controller PWB Assembly, S/E
106029-001	Desktop Conversion Kit, LXB
108166-00X	Door Assy - Specify Color
106036-001	2000XT SE Drive, DLT
106036-002	2000XT Diff Drive, DLT
106037-001	4000 SE Drive, DLT
106037-002	4000 Diff Drive, DLT
106040-002	7000 Diff Drive
108154-001	DLT Drive Door Lever, pkg/10
108136-001	Fan Assembly
106035-001	Magazine Assembly, 10-slot
106035-002	Magazine Assembly, 16-slot

108141-001	Magazine Unlock/Open Switch
108140-001	Magazine Security Lock
104139-101	Manual, Installation and User
104140-101	Manual, Service
108170-001	Motor Assembly, Tach
	Multiplexer PWB
108142-001	Opto Sensor
108138-001	Power Supply Assembly
108165-001	Power Switch
106028-001	Rack Mount Conversion Kit, LXB
108144-001	Shuttle Assembly
972057-001	Tape Cartridge, Cleaning
972350-001	Tape Cartridge, DLTtape IIIXT
972272-001	Tape Cartridge, DLTtape IV

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