adic Intelligent Storage™

FastStor® 1 Installation and User Guide

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1 About This Guide

This guide describes how to install and use the ADIC FastStor 1 with an LTO tape drive. It is intended for use by anyone who installs, uses and maintains the device.

Chapter 2: *General Information* provides a product description of the FastStor 1.

Chapter 3: *Installation* describes how to install the device.

Chapter 4: *Operating and Configuration* describes how to use the local interface, how to configure the device, and how to handle the cartridges and magazines.

Chapter 5: *Remote Management* describes the functionality of the Remote Management via Ethernet.

Chapter 6: *Maintenance* describes cleaning and upgrading procedures, and how to prepare the FastStor 1 for shipping.

Chapter 7: *Troubleshooting* lists possible areas to investigate if you are having problems with the FastStor 1.

Appendix A: *Specifications* provides the specification data for the ADIC FastStor 1.

Related Publications

- *ADIC FastStor 1, SCSI Interface Functional Specifications* provides the SCSI interface specification for the ADIC FastStor 1. (ADIC part number 6-01512-01)

2 General Information

ADIC FastStor 1 is a compact tape cartridge loader designed for secure, reliable, unattended system backup. The loader can be mounted in a 19” rack. Its height is 1U.

The loader is equipped with oneLTO tape drive and has room for 8 cartridges in two 4-cartridge magazines.

Figure 2.1 Overview of ADIC FastStor 1

The entire system is under host control via an industry-standard SCSI interface. Its robotic tape handling is both rugged and simple for utmost reliability.

The key features of the FastStor 1 include:

- Two removable cartridge magazines, each with space for four cartridges
- Integrated Barcode Reader
- Magazine release under system control
- Low Voltage Differential (LVD) / Single-Ended (SE) SCSI Interface
- On-board Diagnostics
- Remote management
- Operator interface with front panel display and four control buttons
- Standby functionality

***** IMPORTANT *****

Review the **READ ME FIRST** caution at the beginning of Chapter 3 before you power up the unit for the first time.

Models

For additional specification information for this model, refer to Appendix A.

Capacity

FastStor 1 Model	Cartridge Capacity (Native)	Cartridge Capacity (Comp 2:1)	Magazine Capacity (Native)	Magazine Capacity (Comp 2:1)
ADIC FastStor 1 LTO2	200GB	400GB	1.6TB	3.2TB

Table 2-1 Data Storage Capacity

Data Transfer Rates

FastStor 1 Model	Maximum Sustained Rate, Native	Maximum Sustained Rate, Compressed
LTO2	24MB/s 86.4GB/hr	48MB/s 172.8GB/hr

Table 2-2 Data Transfer Rates

Product Description

The FastStor 1 has several features designed to increase the product's ease of use and utility, such as:

- Two removable magazines allow easy management of data sets or archival storage. For the FastStor 1 each magazine has room for four cartridges.
- A menu-driven operator control panel interface with backlit LCD provides easy control for configuration and diagnostic activities.
- An Ethernet connection allows management by an operator with a standard web browser on a remote computer. The remote operator can do most of

the operations that can be done through the front panel, such as monitoring the loader's status and downloading statistical and diagnostic information.

For information on the installed tape drive, see the tape drive manuals referred to in Chapter 1.

Front Panel

The Front Panel includes the User Control Panel with LCD display, four Control Buttons, two LED indicators and a Standby switch. The bezels of the two magazines are also visible from the front.

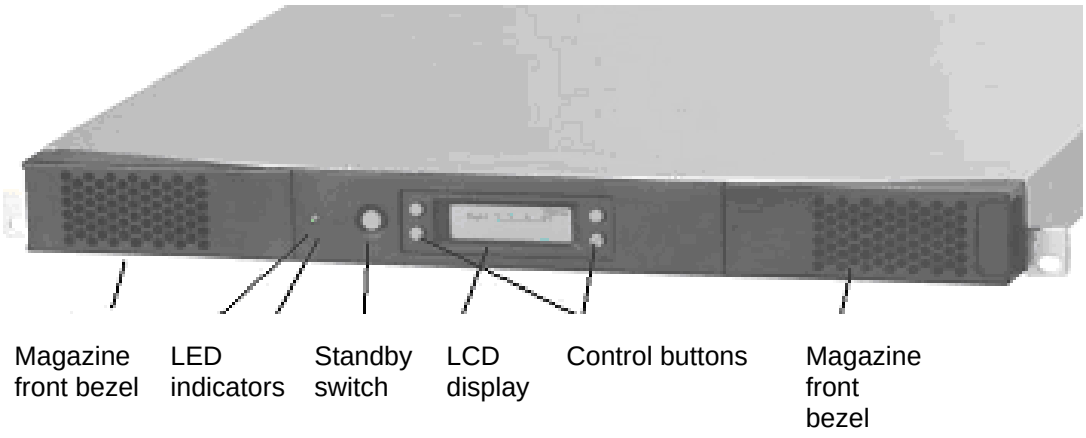


Figure 2.2 Front panel of the FastStor 1

LCD – liquid crystal display

The display is a backlit 122 x 32, dot-matrix graphical display that can show four lines of 20 characters.

In various modes of operation, the display panel screens and control buttons allow you to do the following:

- Enter settings for FastStor 1 configuration
- Issue operational commands
- View FastStor 1 status and information
- Test FastStor 1 functionality

Control Buttons

The labels for the four control buttons are displayed in the corners of the LCD. All buttons have "soft labeling" for different modes of operation (i.e., the functions and labels of the buttons change during different activities). The actual soft label for each button for any activity is always visible on the display.

LED Indicators

The two LED indicators are green and amber. They indicate the FastStor 1 activity as follows:

- Green LED on: The FastStor 1 is either running or ready for operation.
- Green LED blinking: Short blinks followed by long intervals indicate that the loader is in low power standby mode.
- Amber LED on: Fault LED; the FastStor 1 has encountered an electrical or mechanical failure.
- Both LED's off: The FastStor 1 is offline. This is the case while the loader is initializing after power-on, and when a magazine is removed.

Standby Switch

A switch on the front panel provides a Loader Standby. If the switch is pushed when the loader is active, the loader completes the current operation and then goes offline and enters standby mode. See Standby Functionality for more details.

Magazine Front Bezel

The front bezel of the magazines is visible from the front. All magazine handling is described in detail in Magazine Handling.

Rear Panel

The figure below shows the rear panel of the FastStor 1.

Figure 2.5 Rear panel of the FastStor 1

Two Integrated Cooling Fans

The rear panel contains two forced-air cooling fans, which draw air inward through the front and expel it out in the back. The fans start whenever the drive is operating or when the internal temperature in the FastStor 1 gets too high.

Main Power Switch/ Fuse/Power cord connection

The main power switch is found on the rear of the loader on the power supply bracket. The power switch, the fuse holder (with a 250V 2A (H) fuse) and the AC power cord connection are combined in one common unit.

SCSI Interface Connectors

The FastStor 1 has two shielded 68-pin VHDCI SCSI connectors on the rear panel. The connectors are used for connecting the tape drive and the FastStor 1 to a SCSI bus. These connectors can link to the following:

- A shielded male VHDCI SCSI cable
- A shielded male VHDCI SCSI terminator

Ethernet Port

This port is for the Remote Management system and allows you to connect the FastStor 1 to a 10/100 BaseT Ethernet network.

3 Installation

This chapter provides step-by-step instructions on how to properly prepare and install the ADIC FastStor 1.

READ ME FIRST

CAUTION! !

YOU MUST REMOVE THE ROBOT TRANSPORT LOCK

WHEN POWERING UP THE UNIT FOR THE FIRST TIME

OR IT WILL NOT OPERATE.

SEE THE PROCEDURE ON THE FOLLOWING PAGES.

Performing the Installation

To install the FastStor 1, complete the following steps.

Step 1. Unpacking the FastStor 1

Carefully unpack the unit from the shipping container. Save the container and packing materials in case you need to transport the FastStor 1 in the future. The packaging is specifically designed for the loader to ensure it is not damaged during transportation.

Review the contents of the shipping container to be sure that all parts were included in the shipment. A standard package for the FastStor 1 consists of the following items:

- A factory-assembled FastStor 1 unit containing two cartridge magazines.
- A Standard Accessory Kit containing:
    - 1 Warranty/Registration Card
    - Rack Mount Hardware Kit
    - 2 Line Power Cords: one for USA/Japan and one for European power outlets
    - 1 VHDCI SCSI Interface Cable
    - 1 68-pin VHDCI LVD/SE SCSI Terminator
    - 1 Ethernet cable
    - Tool for Emergency Magazine Release
    - Media barcode label kit (contains media labels and cleaning

cartridge labels)

There may be variations of this list.

Note: The FastStor 1 contains no cartridges before shipment.

Step 2. Installing the FastStor 1 in a Rack

The FastStor 1 is designed for use in a 19” rack system using 1U of rack space. The length of the power cord and the SCSI cable may restrict the placement.

Attention: The FastStor 1 is designed to operate in a horizontal position. Do not attempt to operate the FastStor 1 in any other position than horizontally. Also make sure that:

- The airflow around the front and back of the FastStor 1 is not obstructed.
- There is a minimum of 60cm free space in front of the unit to allow the operator to safely remove the magazines.
- The display and operator controls are easily accessed.
- The FastStor 1 is away from the floor and in a clean environment with temperatures within specifications. See Appendix A.

The Rack Mounting Kit includes the following items:

- Rail Left Assembly
- Rail Right Assembly
- Screw M6x12 (6 pieces)
- Screw M5x8 (2 pieces)

Recommended mounting tools:

- Folding rule or tape measure
- Screwdriver
- 7 mm open-end wrench

Note: The rails are mounted to the loader during transportation. Before mounting the rails into the rack, dismount the rails from the loader and remove the spacers between the rails and the loader.

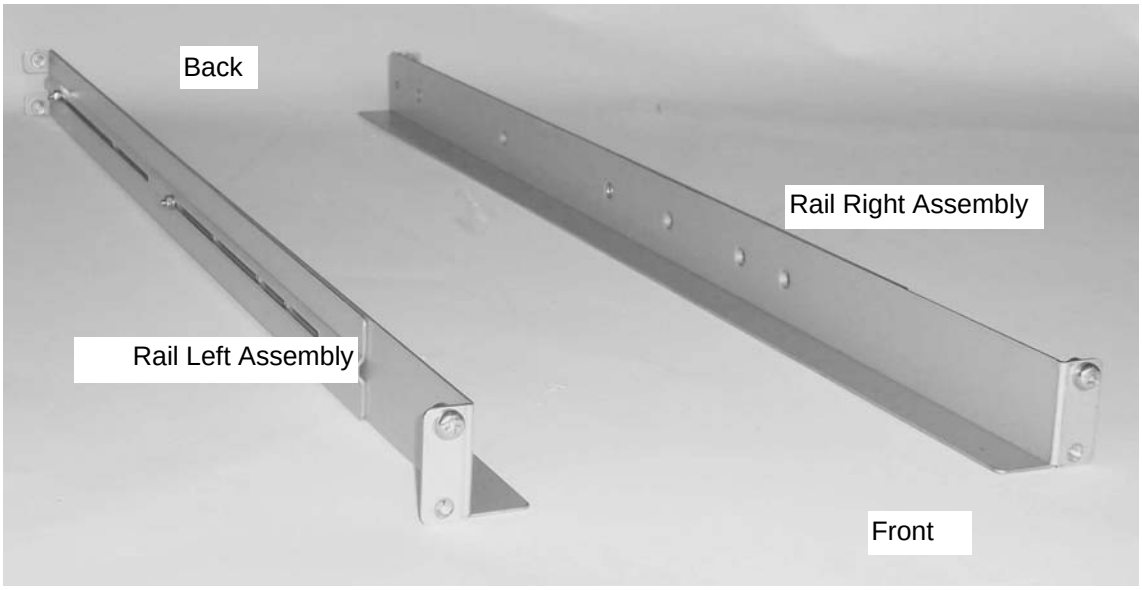


Figure 3.1 Rack Mounting kit

Installing the Rack Mounting Kit

- Determine the proper position of the rails in the rack.

Caution: Consider rack stability when deciding where to place the FastStor 1. Hazardous conditions can result from uneven mechanical loading of a rack.

The FastStor 1 uses 1U of vertical rack space. The rails must be installed in a full U position (The bottom of the rails must be aligned with the bottom of a U). See figure 3.2.

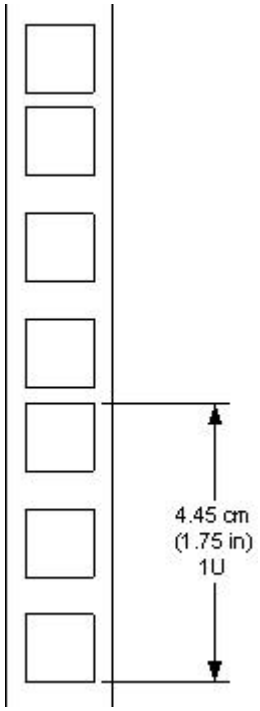


Figure 3.2 Rack mount rail

Installing the “Rail Left Assembly”

1. Measure the length between the rear rack mount rails and the front rack mount rails. If the measurement is shorter than the FastStor 1, move the two sets of screws M4x12, washers and nuts shown in Figure 3.3.

2. Adjust the “Rail Left Assembly” to fit the measurement in step 1.

3. Use a 7 mm open-end wrench together with the screwdriver to tighten the two M4x12 screws to fix the rail length.
   Note: *Using more than two screws increases the stability of the Rack Mounting Kit.*

4. Place the “Rail Left Assembly” on the left side of the rack, between the rear rack mount rail and the front rack mount rail.

5. Mount the “Rail Left Assembly” at the desired height using one M6x12 screw in front (upper hole in rail only) and two M6x12 screws at the backside. See figure 3.4.

Installing the “Rail Right Assembly”

On the right side of the rack, follow the “Rail Left Assembly” instructions, substituting “right” where “left” is referenced.

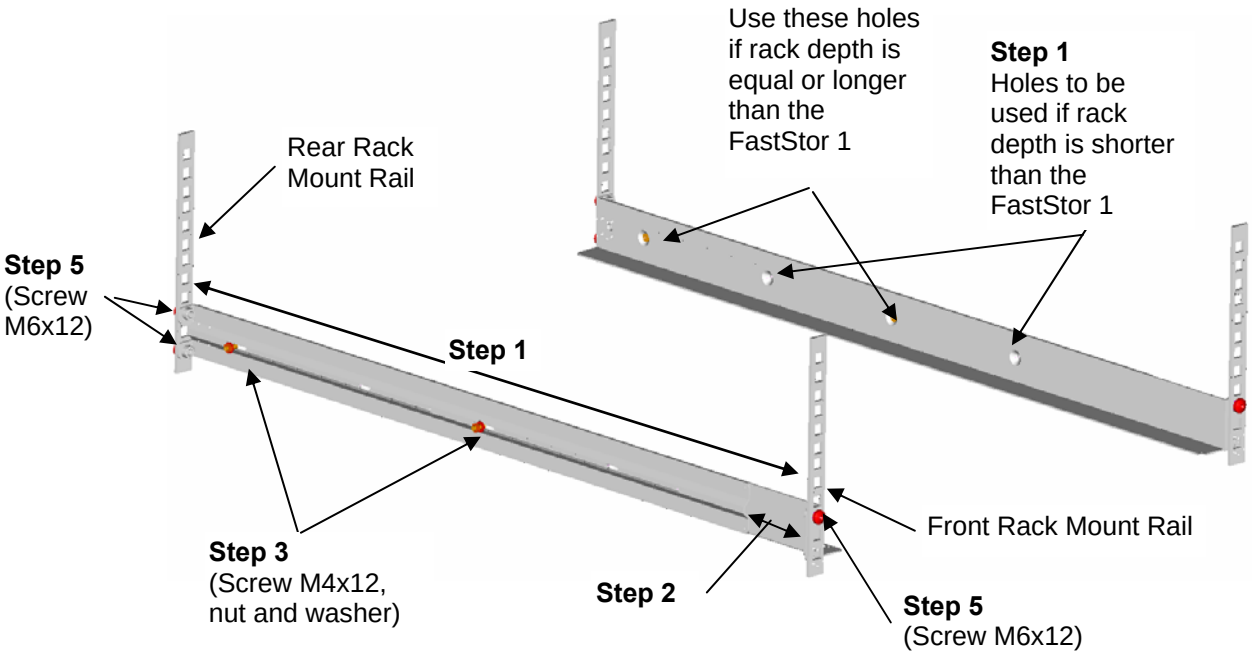


Figure 3.3 Mounting the Rack mounting kit to a rack

Figure 3.4 shows step 5 in the description:

Rack mounting kit mounted in rack with one screw M6x12 in upper hole on both left and right side.

On the rear side two screws must be used on both left and right side.

A total of six screws are used to install the rack mounting kit to the rack.

Figure 3.4 Rack mounting kit mounted in rack

Mounting the FastStor 1 to the Rack

Make sure all the screws in the Rack Mounting Kit are tightened properly before installing the FastStor 1 in the rack.

Slide the FastStor 1 on the rails from the front of the rack, as shown in figure 3.5. Then fix the FastStor 1 using one M6x12 screw in front of the rack on both left and right side (see figure 3.6) and one M5x8 on the backside of the Rack Mounting Kit on both left and right side (see figure 3.7).

Figure 3.5 Slide the FastStor 1 in from the front

Figure 3.6 Fasten the front of the FastStor 1 to the rack

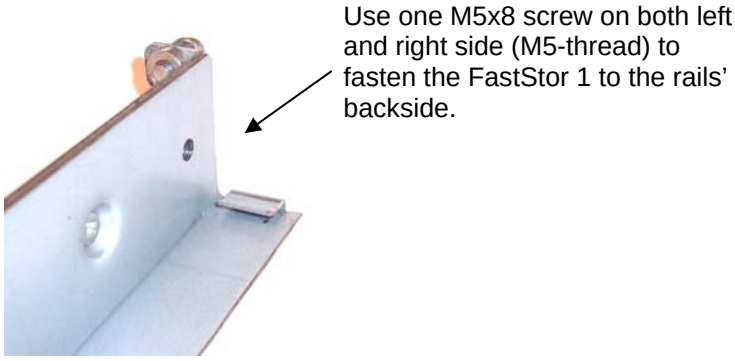


Figure 3.7 Fasten the rear of the FastStor 1 to the rails.

How to dismount the FastStor 1 from the rack

Make sure you have disconnected all cables before you start dismounting the FastStor 1 from the rack.

Unscrew the M5x8 screws at the back of the rack mounting kit. (See figure 3.7)

Unscrew the M6x12 screw at the front of the rack. Note that you only unscrew the lowest screw. (See figures 3.5 and 3.6)

Slide the FastStor 1 gently out of the rack. Note that the FastStor 1's weight is 32 pounds.

Step 3. Connecting Power Cable

Before connecting the FastStor 1 to your host computer system, you should run the unit's self-diagnostic test. This preparation requires power to the FastStor 1. Follow these steps to perform this test:

1. Use the power cables from the accessories included in the shipment. Make sure you select the power cord suited for your power system.

2. Plug the power cable into the rear of the FastStor 1 (see figure 3.8). Plug the other end of the cable into a properly grounded electrical outlet.

Note: *Reliable grounding depends on grounding in the AC electrical outlet in which the FastStor 1's power cable is connected. For security, a 250V 2A (H) fuse is located near the power switch.*

3. Turn on the FastStor 1 by switching the Power Switch to "I".
   If the transport lock is present, the loader will detect this and instruct the user to remove it. See next step.

Figure 3.8 Power switch, fuse holder and power cord connection

Step 4. Removing the Transport Lock

Figure 3.9 Magazine lock marked with red plastic tab

The robot mechanism is protected from damage during shipment with a screw holding the robotics in a locked position.

This locking screw is marked with a red plastic tab protruding between the right magazine and the front panel assembly.

This locking screw must be removed before the FastStor 1 can operate normally.

The locking screw will be detected when the FastStor 1 is powered on. The display will show a message indicating the locking screw has been detected. The display will instruct the user to remove the magazine to gain access to the locking screw. Remove the screw and reinsert the magazine. The loader will now continue its power-on sequence. See next step.

To release the magazine manually or perform an emergency release, see *Manual/Emergency Release of Magazines.*

Note*: Keep the locking screw in a safe place. You will need it to lock the robot if you need to return your FastStor 1 for service or repair.*

Important: *The warranty does not cover damage to the loader if shipped without the locking screw properly installed. See Reinstalling* the Transport Lock *for instructions on how to re-install the transport lock.*

Step 5. Running Power-On Self-test

After the transport lock is removed, the loader will continue running its power-on self-test and doing an inventory of its cartridges.

The word “Idle” and the cartridge map will appear on the default display screen. If the self-diagnostics and the inventory sequence are successfully completed, the green LED illuminates. The FastStor 1 is now ready to be installed in the system.

If a problem occurs during the power-on sequence, the FastStor 1 displays an error message on the display. Refer to **Error! Reference source not found.** to learn the

procedures for resolving the problem.

Step 6. Setting the SCSI Address

The SCSI address is a unique address that identifies the unit connected to the SCSI bus. The FastStor 1 uses two SCSI addresses or ID's. One is for the loader robotics controller, and the other is for the tape drive. The SCSI addresses can be configured through the operator buttons and the display on the front panel. In most cases the default addresses can be used. The default SCSI address for the FastStor 1 robotics is 4, and the tape drive has SCSI address set to 5.

To set the SCSI addresses for the FastStor 1 and the built-in tape drive, refer to SCSI Setup for more information. You may also wish to reserve a magazine slot for a cleaning cartridge, and set a security password at this time. After some settings are changed, the FastStor 1 and the drive may require rebooting.

Step 7. Connecting the SCSI Bus Cable

Guidelines before connecting the SCSI cable:

A) Before the SCSI bus cable is connected to the FastStor 1, turn the FastStor 1 power switch off.

B) Make sure your host system is in a state where a new SCSI device can be safely connected to the SCSI bus.

C) Do not exceed SCSI bus length restrictions.

   1. Add the length of all external and internal SCSI cables on the bus.

   2. Add 80 cm (31.5 inch) for the internal cable length in the FastStor 1.

   3. The maximum allowed length of an LVD SCSI bus is 12 m (39 ft) if the number of SCSI devices exceeds two.

   4. For an SE SCSI bus, be very careful regarding bus length. The normal combination has an SE bus transfer speed of 160 Mbytes/s with a maximum bus length of 3 m (9.8ft) and up to 4 SCSI devices connected. If your SE system operates with a different transfer speed or has more than 4 SCSI devices, we refer to the actual SCSI standard for complete bus length restrictions.

D) Before the FastStor 1 is powered on and the system is restarted, make sure the SCSI bus is properly terminated. If the FastStor 1 terminates the SCSI bus, ADIC recommends connecting the terminator from the accessory kit box on the lower SCSI connector on the back plane. See Figure 3.10.

To connect the SCSI bus cable:

1. On the rear of the FastStor 1, attach the device connector of the SCSI cable to the upper SCSI connector. See Figure 3.10.

2. Secure the cable with the thumbscrews on the connector.
3. Connect the other end of the SCSI cable to the appropriate SCSI adapter on your system, and fasten it with the thumbscrews.
4. If the FastStor 1 is the last device on the SCSI bus, install a SCSI bus terminator to the free SCSI connector on the FastStor 1. Make sure the terminator is of the correct type for your SCSI system.
5. It is possible to daisy chain several SCSI devices on the SCSI bus. If you do so, the terminator must be connected to the last device on the bus. Note that there are limitations to the SCSI cable length.

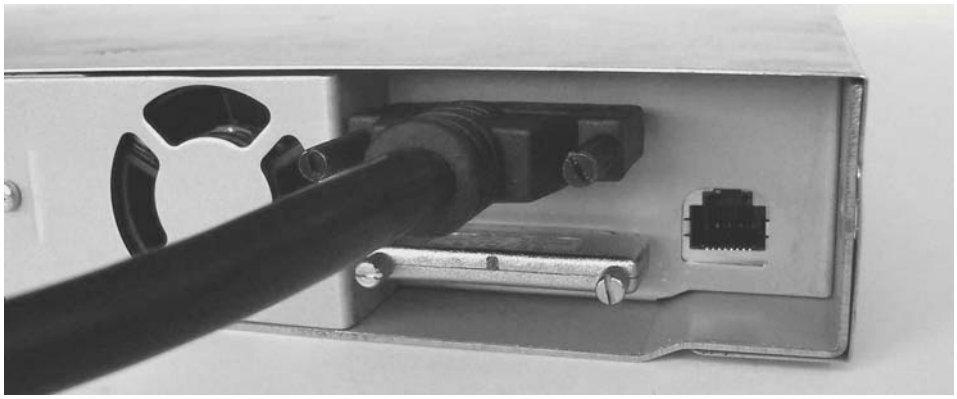


Figure 3.10 SCSI cable and SCSI terminator connection

Step 8. Connecting the Ethernet Connector

To connect the FastStor 1 to the Ethernet, use the provided cable from the accessory kit box.

1. Insert one end of the cable into the FastStor 1 Ethernet port. Push until it snaps into place. The open port in Figure 3.10 is for Ethernet connection.
2. Connect the other end to a normal 10/100 BaseT Ethernet outlet.

The Ethernet-based Remote management system is described in Remote Management.

Step 9. Restarting Your System

ADIC recommends that all external SCSI devices, including the FastStor 1, are powered on before the computer system is re-started. After restarting your system, including the FastStor 1, the FastStor 1 runs a power up self-test (described in Step 5). When the display reports that the FastStor 1 is in the “Idle“ state and the green LED is on, the FastStor 1 is ready for further configuration and operation (described in Operation and Configuration).

Note: The tape drive needs up to 40 seconds after power on until it’s active on the SCSI bus. You should turn on the power at least 40 seconds before the computer

system is started.

Step 10. BCR: Labeling cartridges

Your loader is equipped with a barcode reader. If you want to use this functionality, you must attach barcode labels to the cartridges.

Note: You must use FastStor 1-specific barcode labels to ensure reliable functionality of the barcode reader.

Cartridge labels **must** be oriented on the cartridges as shown in the figure below with the locking mechanism to the left.

Figure 3.11 Positioning of barcode label for LTO cartridges.

4 Operation and Configuration

The Local User Interface (LUI) consists of a small LCD panel capable of displaying four lines of 20 characters each, and four control buttons, one near each corner of the display. The buttons have soft labels in the corners of the display. The figure below shows the power-on screen on the panel.

Figure 4.1 Power-on Screen

System Power-On

With mechanical installation and electrical connection complete, turn on the AC power switch. At power-on, for the first few seconds the unit performs a sequence of diagnostic tests called Power-On Self Tests (POST). POST also includes a loop-back test of the robot cabling. As the tests complete, the control panel displays a sign-on message. See Figure 4.1.

After the POST sequence completes successfully, the loader will respond to SCSI selections. Then the system starts a series of initialization functions, a process that consists of robot calibration operation and cartridge inventory of magazines and drive. If the barcode reader is enabled, the barcode labels on the cartridges will be read when running inventory.

During these operations the loader continuously shows the map status on the screen. See Figure 4.2. The status of all magazine slots and the drive are initially unknown, and a ”?” is displayed for each slot. As the robot searches the magazine slots for cartridges during inventory, the display is updated.

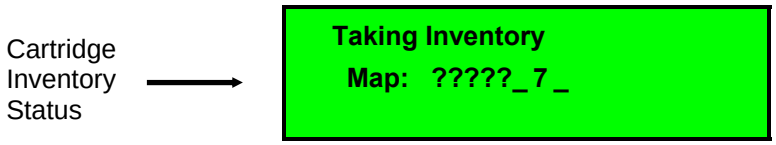


Figure 4.2 Snapshot while running Inventory

After the unit has completed the initialization processes, the *Default screen* appears and the loader is ready for SCSI commands. See Figure 4.3

The map of the cartridges has the following symbols:

1. A “?” when status is unknown and Inventory is still running.
2. A *number* indicates a slot occupied by a cartridge. (Figure 2.3 shows how the cartridge slots are numbered in the magazines.)
3. An underscore line indicates an empty slot.
4. ”C” indicates that a Cleaning Cartridge occupies the slot.

The line below the map on the default screen gives the drive status. The drive status displayed is drive dependent.

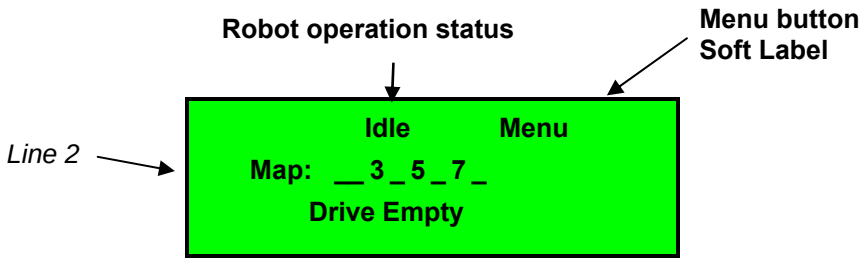


Figure 4.3 The Default screen

The robot operation status has the following options:

1	Idle	The loader is idle
2	Fetching	The loader is moving a cartridge from a magazine slot or from the drive to the robot.
3	Stowing	The loader is moving a cartridge from the robot to a magazine slot or to the drive.
4	Moving	The loader is moving the robot.

Table 4-1 Robot Operation Statuses

The Drive Status line (line 3) can show the following statuses:

1	Drive Empty	There is no cartridge in the drive.
2	Drive Loaded	A cartridge is loaded.
3	Drive Idle	A cartridge is loaded and the drive is ready to use it.
4	Drive Rewinding	The drive is rewinding the tape
5	Drive Seeking	The drive is searching for specific data on the tape.
6	Drive Reading	The drive is reading data for transfer to a host via the SCSI interface.
7	Drive Writing	The drive is writing data received from a host to the tape.
8	Drive Erasing	The drive is erasing data from parts of or the whole of the tape.
9	Drive Cleaning	A cleaning tape has been inserted into the drive, and the drive is using it to clean the relevant mechanical parts.
10	Drive Loading	A tape has been inserted into the drive. The drive is in the process of mechanically loading the tape.
11	Drive Unloading	The drive is in the process of mechanically unloading the tape.
12	Drive Update Ready	The drive has completed an internal update.
13	Drive Updating	The drive is in the process of an internal firmware update.
14	Drive Calibrating	A data tape has been inserted and loaded into the drive. The drive is in the process of measuring its physical properties.

Table 4-2 Drive Operation Statuses

Front Panel Display Modes

The front panel displays three types of screens for different purposes: menus, dialogs and messages.

Menus

The major contributor is the MENU. It is used to select operations to perform by enabling the operator to navigate a menu tree using the control buttons.

Due to the size of the display, only one menu item is shown at a time. See Figure 4.4 for a standard menu layout, and Figure 4.5 for a complete menu tree.

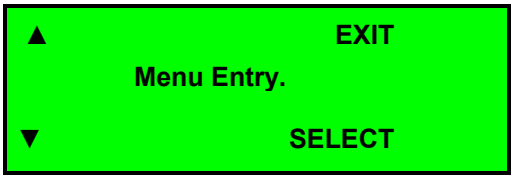


Figure 4.4 Standard Menu Layout

The two arrows on the left are used to show the next (down arrow) and previous (up arrow) entries on the current menu level.

The *Exit* button on the right is used to ascend to the menu level above, while the *Select* button is used to descend to the submenu designated by the Menu Text, or to activate the function selected if the Menu Entry describes a function.

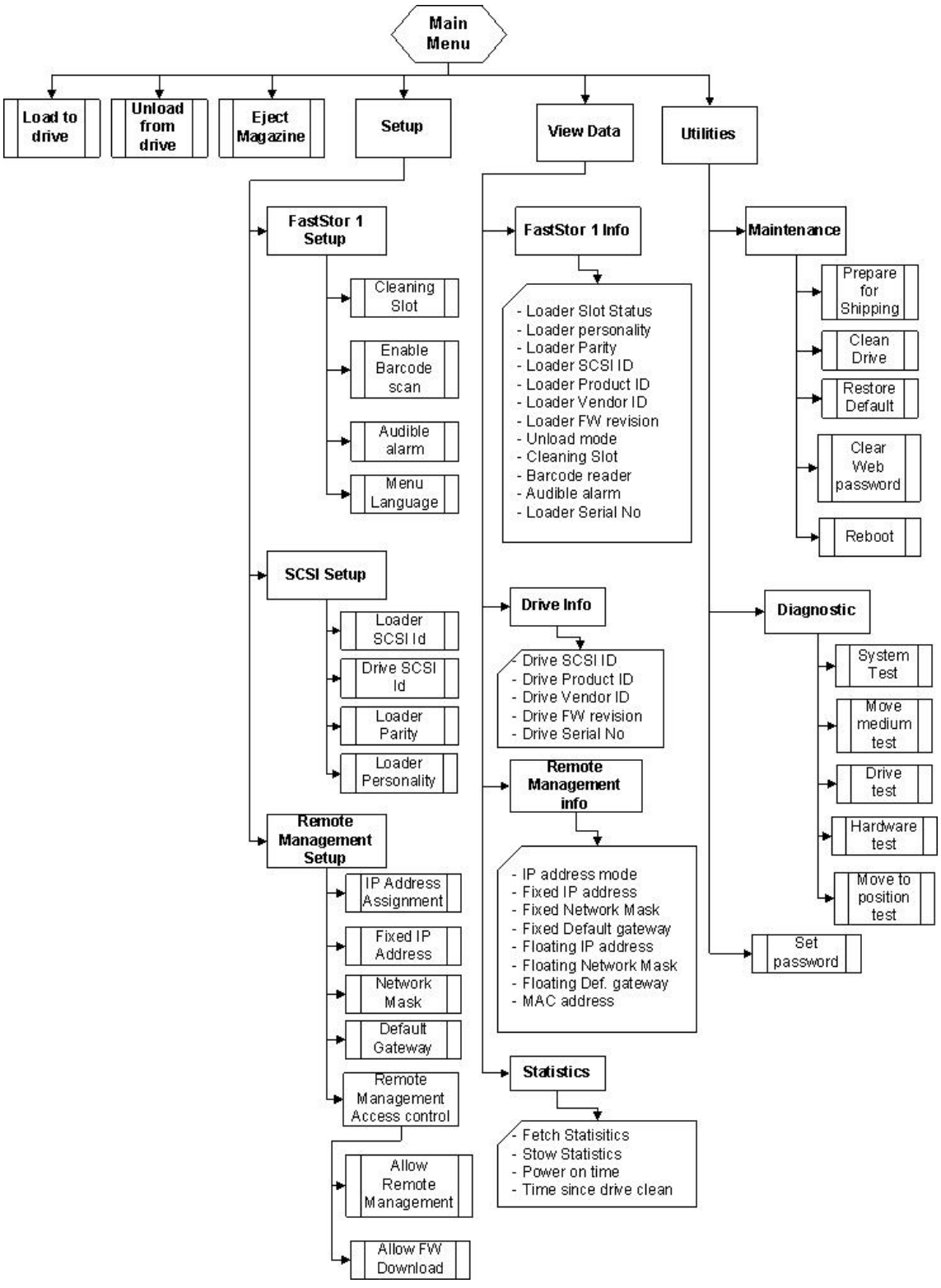


Figure 4.5 The Complete Menu Tree

Dialogs

A dialog is a screen type used to get detailed input from the operator, such as a SCSI ID, name, or password. See Figure 4.6.

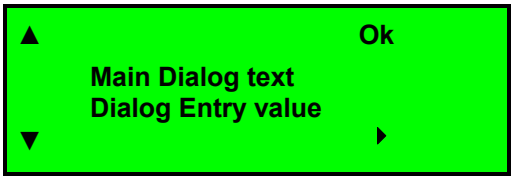


Figure 4.6 Standard Dialog Layout.

The dialogs come in several forms, but there are only a few main types.

Dialogs, Discrete Values

The dialog in Figure 4.7 is used to enter discrete values. It handles one character or digit at a time. The digit or character being manipulated is said to be in *focus.* The digit or character in focus is shown in inverse video. As the character map on the screen used restricts the flexibility of the inverse display of the character, some digits and characters appear distorted when inverted. For example, the “0” digit appears as an open rectangle when inverted.

The Up and Down arrows on the left are used to increment (up arrow) or decrement (down arrow) the value of the character or digit in focus. If increment is selected and the value of the character of digit in focus is at its highest legal value, it wraps to its lowest legal value, and vice versa.

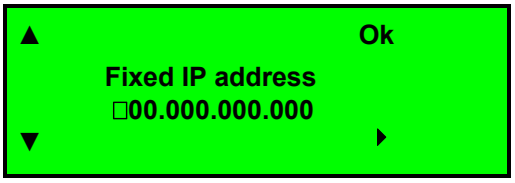


Figure 4.7 Dialog layout, entering discrete values

The Right arrow (on the right side) is used to shift the focus one place to the right. If the focus is already at the rightmost position, the focus wraps to the leftmost position.

The Ok button is used to accept the value displayed.

If the value was changed, the selected and original values will then be displayed as messages. The operator may then accept or reject the change.

The discrete value type of dialog does a running check of the validity of what the user enters, and changes it if needed.

Examples: If the value “0” or “1” is selected in the Fixed IP address dialog above, the user is allowed to select values between “0” and “9” as the next

two digits. (The maximum value allowed in this dialog is “255” within each group.) If, however, “2” is selected, only values between “0” and ”5” are available in the second digit. If a value between “0” and “4” is selected for the second digit, “0” to “9” is available for the third, but if “5” is selected for the second digit, only “0” to “5” is available for the third one.
Or
the user selects the value “199” in one group in the above dialog, then presses the “Next Digit” button until the “1” in “199” is selected, and increments it to “2,” so the group shows “299.” Since this is an illegal value, when the user selects the “Next Digit” or the *Ok* to leave the group, the value is changed to “255” and the focus is repositioned to the “2” in the first position of the group.

Dialogs, Predefined Options

The second form of dialog allows the operator to select between a predefined set of options, which can be shown on-screen simultaneously, as when selecting a magazine slot number, see Figure 4.8.

To select a cartridge and move it from a magazine slot to the drive or vice versa, a slightly different dialog is used:

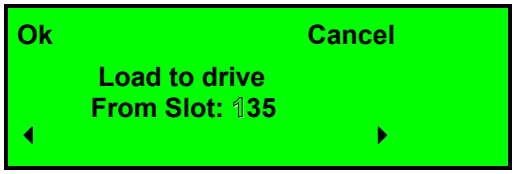


Figure 4.8 Slot dialog layout.

Here, the right and left arrows select the digit to load from. *Ok* accepts the cartridge selected, and *Cancel* aborts the operation.

Figure 4.9 shows the third form, where the operator can select predefined options that can be shown only one at a time.

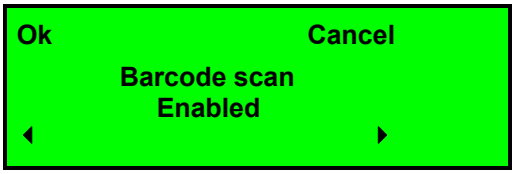


Figure 4.9 Predefined options, shown one at the time.

Here, the user can scroll through a set of options one at a time by using the left and right arrow buttons. Only one option is shown at a time. In the example above, the user can select either “Enabled” or “Disabled” mode.

This kind of menu also has a Cancel function.

Messages

Messages can inform the operator about situations that arise during operation, such as error conditions and situations where a process requires operator approval or intervention to continue.

An example of the latter is when the loader detects a wrong magazine type. The loader will eject that magazine and show the message “Left (or right) magazine is the wrong type”. This message is removed by inserting a correct type magazine.

Status and Information

Some of the menus, dialogs and messages provide status and information in the form of one or two-word messages that appear within the display.

An example is the default screen shown in Figure 4.10. It has a navigation button *Menu*, but it displays the cartridge map (Map: __3_5_7_) as the major menu text and the robot’s and drive’s status (Idle, Empty).

Figure 4.10 A default screen.

Another example is the message displayed while a diagnostics self-test is running. This message shows the progress of the self-test in the form of a loop counter, and also shows the robot status.

Main Menu

The Main menu contains a set of frequently used functions and links to a set of sub menus.

Item name	Description
Load to Drive	Loads a cartridge from a selected magazine slot into the drive. When **Select** is pressed on this menu item, a magazine slot selection dialog is displayed. The operator must scroll to the wanted slot and press **Ok** to start the operation. The progress of the operation is displayed, and when the loader part of the operation is completed, the main menu is displayed. The loader must be idle to make this function selectable. See “To load a cartridge to the drive: for more details
Unload from Drive	Unloads a cartridge from the drive and stores it in a selected magazine slot. When **Select** is pressed on this menu item, a magazine slot selection dialog is displayed. The operator has to scroll to the wanted destination slot and press **Ok** to start the operation. The progress of the operation is displayed, and when the operation is completed the main menu is displayed. The loader must be idle to make this function selectable. See “To unload a cartridge from drive: for more details.
Eject Magazine	Ejects one or both of the two magazines. When **Select** is pressed on this item, a magazine selection menu is displayed. The operator has to choose left, right or both magazines and press **Ok** to start the operation. The progress of the operation is displayed, and when the operation is complete a status message informs the operator that one or both magazines are not in place. The loader must be idle to make this function selectable. See “Magazine Handling” for more details.
Setup	Selects the loader and drive setup functions. The loader must be idle to make this function selectable. See “Setup Menu” for more details.
View Data	Selects the access to loader and drive system data. This is the only menu entry that is selectable when the loader is not idle. See “View Data Menu” for more details.
Utilities	Selects a set of the loader and drive maintenance and diagnostic functions. The loader must be idle to make this entry selectable. See “Utilities Menu” for more details.

The Main menu can be selected even if the loader is not in the idle state. While in the main menu, the loader will accept and execute SCSI commands. When any of

the main menu entries except the View Data entry is selected, the loader will go to its busy state, and SCSI commands will be terminated with Check Condition and Not Ready status.

Setup Menu

To enter this menu, scroll to the Setup item in the Main Menu and press the Select button. The loader enters the busy state when this menu is selected.

Item name	Description
FastStor 1 setup	This menu item gives access to the FastStor 1 setup menu.
SCSI setup	This menu item gives access to the SCSI bus setup menu. Both the FastStor 1 and the Drive SCSI bus setup are available here.
Remote Management setup	This menu item gives access to the Remote Management setup menu. It allows the operator to enable, disable and configure the Loader Web interface.

FastStor 1 setup

The number of selectable values for each FastStor 1 setting are listed in the following table.

Item name	Legal values.	Default value
Cleaning Slot	Legal Slot ID 1..8 or 0 = not selected.	0 = not selected
Barcode scan*	Enabled, Disabled	Enabled
Audible Alarm	Enabled, Disabled	Disabled
Set Language	English	English

* The barcode of the cartridge in each occupied magazine slot and in the drive (if any) will be scanned during the Inventory process.

SCSI Setup

The SCSI setup menu allows selecting SCSI addresses for both the loader and its internal drive. In addition, the SCSI Bus Parity can be enabled or disabled. Because of the SCSI protocol, the values selected take effect only after the next reset of the loader and drive.

Item name	Legal values.	Default value
Loader SCSI ID	Legal SCSI ID: 00..15	04
Drive SCSI ID	Legal SCSI ID: 00..15	05
Loader Parity	Enabled, Disabled	Disabled
Loader Personality	LTO: FastStor 1	FastStor 1

Remote Management setup

The Remote management setup menu allows enabling, configuration and access control to the loader via the loader's Remote Management Web interface. The loader may either obtain an IP address, the network mask, and default gateway from a DHCP server, or they can be set manually.

Item name	Legal values.	Default value
IP Address assignment	Static mode, DHCP mode	DHCP mode
Static IP address *	Legal IP address range: 000.000.000.000 to 255.255.255.255	255.255.255.255
Network mask *	Legal IP address range: 000.000.000.000 to 255.255.255.255	255.255.255.255
Default Gateway *	Legal IP address range: 000.000.000.000 to 255.255.255.255	255.255.255.255
Remote Management access control	This menu gives access to dialogs that enables remote management and remote FW upgrading of the Loader (see table below).	

***** Used only while the IP address assignment is in Static mode.

Remote Management Access Control

Item name	Legal values.	Default value
Allow Remote Management	Allowed, Not allowed	Allowed
Allow Remote FW download	Allowed, Not allowed	Not allowed

View Data Menu

To enter this menu, scroll to the View Data item in the main menu and press the

Select button. The loader will remain in its ready state when this menu is selected.

The View Data menu contains the values assigned during device setup (see Setup Menu), and also statistical data related to the drive and the robotics. The view-only fields display data that can be changed from the Setup menu only. If you select the *Change* button and the robot is idle, a dialog appears where the value may be changed. This requires entering a password if the Loader Password system is enabled.

Item name	**Description**
FastStor 1 info	This menu item gives access to the FastStor 1 view menu.
SCSI info	This menu item gives access to the SCSI bus view menu. Both the FastStor 1 and the Drive SCSI bus parameters are available here.
Remote Management info	This menu gives access to the Selected IP addresses and masks. This menu also shows the MAC address of the unit.
Statistics	This menu item gives access to the loader's view menus internal count and statistics values.

FastStor 1 Info

An overview of the possible values for each FastStor 1 setting is listed in the following table.

Item name	**Legal values**.	**Default value**
Cleaning Slot	Defined cleaning slot, Disabled	Disabled
Barcode Reader	Enabled, Disabled	Enabled if installed, else Disabled
Loader Serial No.	Loader Serial number.	---
Loader FW revision	FastStor 1 FW id and revision	xx.yy
Loader Vendor ID	Current Inquiry Vendor Id	"ADIC"
Loader Product ID	Current HW/FW Product Id	AT3200-1R LTO2
Loader SCSI ID	SCSI Id 0 to SCSI Id 15	SCSI ID = 4
Loader Parity	Disabled, Enabled	Enabled
Loader Slots State	View status for each loader slot	Not applicable
Loader personality	FastStor 1	FastStor 1
Audible Alarm	Enabled, Disabled	Disabled

Drive Info

The different drive types used in the FastStor 1 might not provide all the information listed below. If an unavailable entry is selected, the string “Data Unavailable” is displayed.

Item name	Legal values	Default value
Drive Product ID	Drive Inquiry Product Id	Drive dependent
Drive Vendor ID	Drive Inquiry Vendor Id	Drive dependent
Drive FW Revision	Drive Firmware Revision	Drive dependent
Drive Serial No.	Drive Serial Number	Drive dependent
Drive SCSI Id	SCSI Id 0 to SCSI Id 15	SCSI ID = 5

Remote Management Information

The Remote Management (RMM) setup is shown in the choices listed below. This menu tree is the place to find the currently allocated dynamic IP address, default gateway and network mask when running in DHCP mode. The loader’s MAC address is also shown here.

Item name	Legal values	Default value
IP address mode	Static mode, DHCP mode	DHCP mode
Static IP address	0.0.0.0 to 255.255.255.255	0.0.0.0
Static netmask	0.0.0.0 to 255.255.255.255	0.0.0.0
Static default gateway	0.0.0.0 to 255.255.255.255	0.0.0.0
Dynamic IP address	0.0.0.0 to 255.255.255.255	Not applicable
Dynamic netmask	0.0.0.0 to 255.255.255.255	Not applicable
Dynamic default gateway	0.0.0.0 to 255.255.255.255	Not applicable
MAC-address	Value is fixed	Value is fixed

Statistics

Item name	Description
Fetch Statistics	When selected, the operator can scroll through the fetch count and fetch retries for the drive and all magazine slots.

Stow Statistics	When selected, the operator can scroll through the stow count and stow retries for the drive and all magazine slots.
Power On Time	Displays Power On Hours for the loader
Time since clean	If available from the drive, this entry displays the number of hours since the drive was last cleaned.

Utilities Menu

Option	Description
Maintenance	Displays a set of maintenance functions
Diagnostics	Displays a list of exercise test programs
Access control	Set Password

The Maintenance Menus

Item name	Description
Prepare to Ship	When selected, the robotics are positioned for installing the locking screw. The right magazine is ejected to facilitate the installation. The left magazine is also ejected if it contains one or more cartridges. The loader cannot be safely shipped with cartridges in the magazines This option must be executed before the loader is prepared for transport by inserting the Locking Pin. (See Performing the Installation and Reinstalling the Transport Lock.)
Clean Drive	Performs a drive clean, provided a slot is reserved for a cleaning tape and a cleaning tape is present
Restore default	Sets the loader settings to their factory default values.
Clear Web Password	Deletes the web passwords. This is useful when the password is lost.
Reboot	Performs a hard reset of the loader.

The Diagnostics Menu

Item name	Description
System test	Starts a test where cartridges are moved randomly between magazine slots and between the drive and the magazines.
Move medium test	Starts a test where cartridges are moved randomly between magazine slots. The drive is excluded.

Drive test	Starts a drive self test. (Only when supported by the installed tape drive.)
Hardware test	Runs a test of the loader hardware, including the Loader internal cabling.

Set Password

Item name	Description
Set Password	Allows the operator to set a four-digit password protection for the menu system. The default password is <0000>, meaning the password is disabled.

WARNING: If you set a password, make sure you do not forget it. If you do, it can only be cleared with assistance from ADIC technical support or by a qualified service technician.

Cartridge Handling

Cartridge Slot Numbers

The cartridge slots have been given numbers as follows:

Left magazine: Slot 1, Slot 2, Slot 3 and Slot 4 (lowest number closest to the front)

Right magazine: Slot 5, Slot 6, Slot 7 and Slot 8 (lowest number closest to the front)

Moving Cartridges to and from the Drive

The normal operations of the unit are controlled by the host software application. When you must load or unload a specific cartridge using the control buttons on the front panel, do the following:

To load a cartridge to the drive:

1. From the default display press the menu button and select *Load to Drive* from the main menu. A screen picture like Figure 4.11 will be displayed. The selected cartridge's barcode is displayed in the bottom line.

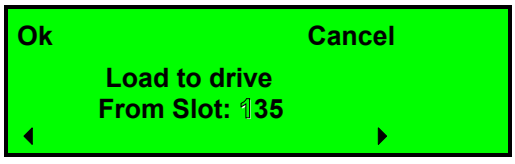


Figure 4.11 Load to Drive

2. Select the slot number of your choice. The system ignores empty slots. Press the ▸ button to increment and the ◂ button to decrement.
3. Press the Ok button.

The robot removes the cartridge from the selected magazine slot and moves it to the drive.

To unload a cartridge from drive:

1. From the default display, press the menu button and select *Unload from Drive* from the main menu. A screen similar to Figure 4.12 displays the available slots.

Figure 4.12 Unload From Drive

2. Select the cartridge slot number of your choice. Press the ▶ button to increment and the ◀ button to decrement.

3. Press the Ok button.

   The robot removes the cartridge from the drive and moves it to the selected magazine slot.

If the drive is empty, a screen similar to the following figure appears.

Figure 4.13 Empty Drive Message

Magazine Handling

You must remove the magazine from the unit in order to insert or remove cartridges. When inserting cartridges, be sure the slot you intend to use is not already reserved by the software application for a cartridge in the drive. The best way to avoid conflicts is to unload the cartridge from the drive; either through your software application or by using the *Unload from drive* option in the main menu.

Removing the Magazine from the Unit

The following illustration shows the correct way to remove the magazine from its bay.

Note: *You cannot remove the magazine if the unit is password protected or locked by host software through a* ***Prevent Medium Removal*** *SCSI command.*

Before you can remove a magazine, the loader must be idle. When the loader is idle, press the Menu button and select the Eject Magazine option from the Main

Menu.

The following screen, Figure 4.14, appears, identifying the magazine:

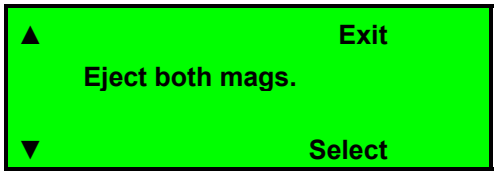


Figure 4.14 Removing magazine

Scroll to the correct magazine (Both, Left or Right magazine) and press *Select*. The selected magazine will pop out 2 to 3 cm, See next figure.

The display will show a message telling that the magazine or magazines is/are ejected. *If only one magazine is ejected, the display indicates a button to push to eject the other magazine.*

Figure 4.15 Magazine eject

With one hand, grip the handle on the outer side of the magazine bezel and hold the other hand under the magazine. Pull the magazine carefully out and keep it in level with the loader. Use the hand under the magazine to prevent the back of the magazine to fall down when it leaves the magazine bay. See the following illustration.

Figure 4.16 Removing the magazine from the loader

Inserting Cartridges into the Magazine

When inserting cartridges, the access door of the cartridge must face the magazine. Push it carefully into the magazine until it locks in place. The rear side of the cartridge with the Write Protect switch and the barcode label must face out. Make sure the cartridges latch properly.

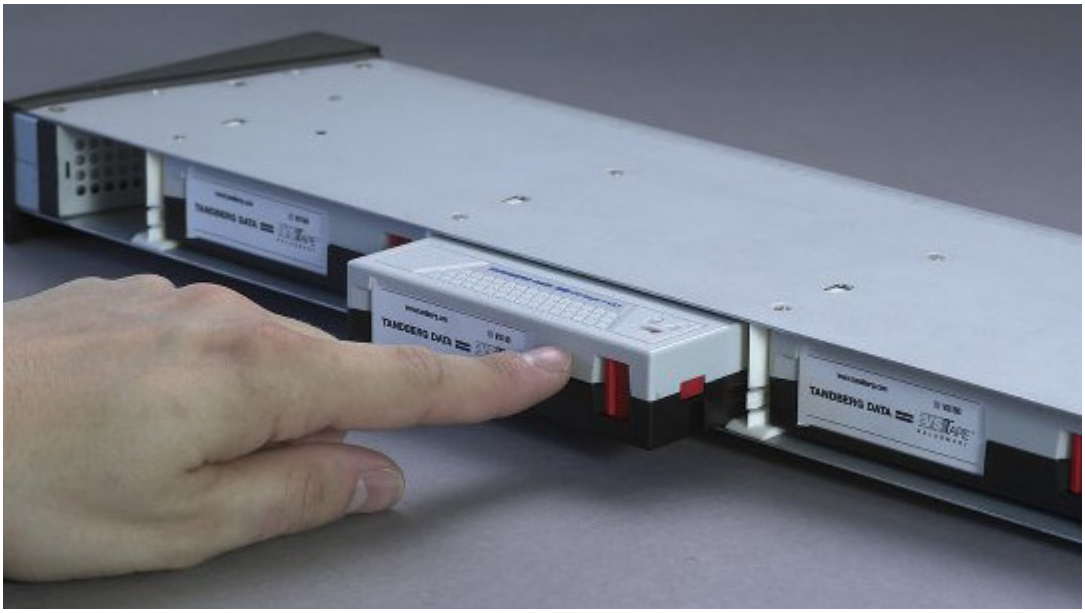


Figure 4.17 Gently push the cartridge into the magazine slot

Removing Cartridges from the Magazine

Press the cartridge release tab towards the cartridge until the cartridge is released. The cartridge slot is spring loaded, so it is important to prevent the cartridge from popping all the way out. *If the cartridge falls down, it might be damaged and data*

could be lost. Pull the cartridge carefully out of the magazine slot.

Figure 4.18 Push the release knob towards the cartridge to eject

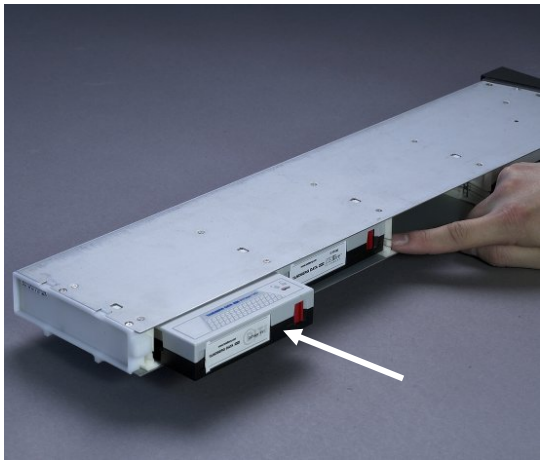


Figure 4.19 Cartridge position after manual release from magazine slot

Inserting a Magazine into the Unit

The right and left magazines are mirrored and can only be inserted into the correct left or right magazine bay. See Figure 4.20.

1. Enter the back of the magazine into the correct magazine bay. Make sure it is in level with the loader.
2. Slide the magazine carefully in until the eject spring engages.
3. Push the magazine further in against the spring until the magazine is latched.

Figure 4.20 Push magazine until it clicks into place

Manual/Emergency Release of Magazines

In failure situations (either in the loader itself, a power loss, or situations where you need to manually release the magazines), a manual/emergency release is available. To activate the emergency magazine feature, you must use the special magazine release tool that is part of the accessory kit shipped together with the FastStor 1. This tool must be inserted through the hole marked in Figure 4.21.

Note: *The manual eject must only be used when power is turned off.*

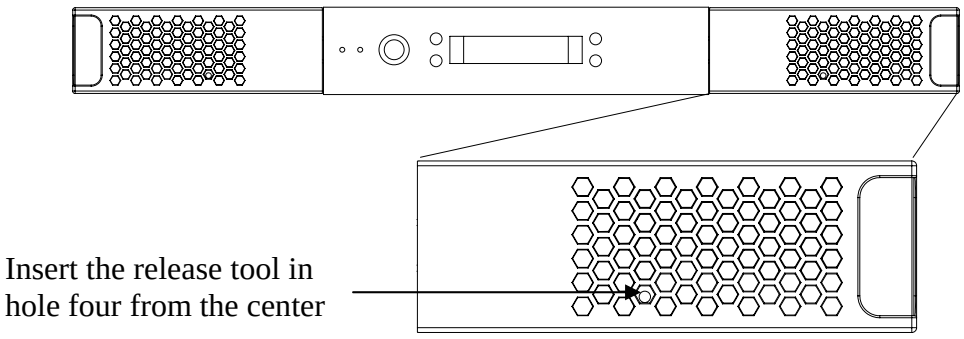


Figure 4.21 Pointing out hole used to insert release tool

Figure 4.22 shows the release tool inserted into the correct hole on the right hand side magazine bezel.

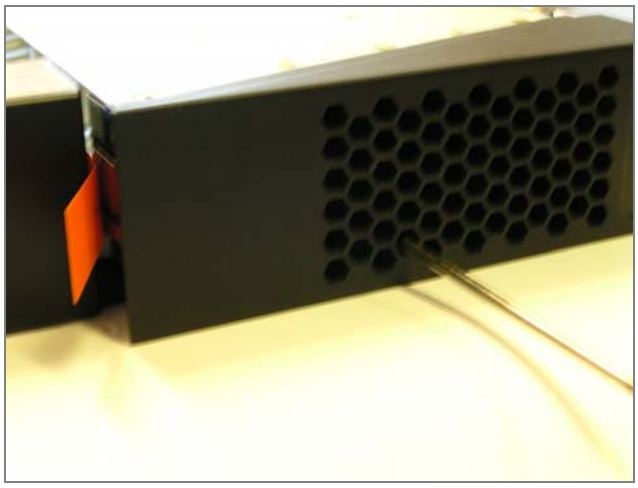


Figure 4.22 Magazine release tool in use

Standby Functionality

On the front panel a standby button is available.

To activate Standby mode, press the button for a minimum of 2 seconds. The FastStor 1 will enter a standby mode in a controlled manner. The following takes place before the FastStor 1 goes into standby mode:

1. Finish any FastStor 1 activity.
2. Controlled aborting of tape drive activity; buffered data is flushed to tape; cartridge is unloaded from drive but not ejected.
3. The display is turned off.
4. No FastStor 1 activity is allowed until the standby button is pressed again.
5. While in standby mode, the attached server/host can see the two SCSI devices in the FastStor 1, but the SCSI status will be “not ready.”
6. The green LED on the front will blink with short blinks- long intervals.
7. To leave the standby mode, press the standby button for 2 second. The FastStor 1 will then restart and perform a full inventory.

5 Remote Management

In order to facilitate Remote Management, the FastStor 1 is equipped with an Ethernet interface and a built in web server. The Remote Management Interface (RMI) can be accessed with a standard web browser, such as Internet Explorer, Mozilla or Opera.

Remote Management Configuration

In order to start the FastStor 1 Remote Management Interface, the FastStor 1 must obtain a valid IP address. By default, the FastStor 1 connects to a DHCP server to dynamically configure its network interface. If a DHCP server is available, the loader will get an IP address automatically after booting.

If no DHCP server is available, select *Static mode* and enter a legal IP-address, netmask and default gateway with the buttons. In the browser's address field, enter the IP address of your FastStor 1. See Remote Management setup for details.

Quick Start Instructions

The following is intended to help you get a new FastStor 1 online as quickly as possible. If you need to enable the RMI to perform a memory dump of a faulty FastStor 1, please see Enabling the RMI Without Rebooting instead.

1. Connect the FastStor 1 to the network and reboot it.
2. From the front panel, check the dynamic IP address by accessing **Menu →View data → Remote man. info → Dyn IP Addr. state**.
   2.1. If the response is a valid IP address, the remote management interface is ready and can be accessed at the URL http://IP-address/, e.g. http://192.168.0.5/.
   2.2. If the response is 0.0.0.0, enable remote management from the front panel by setting **Menu → Setup → Remote management → Access control → Allow remote management** to "Allowed." Check the network cable and the DHCP server and reboot.

Enabling the RMI Without Rebooting

1. Connect the FastStor 1 to the network.
2. Configure network:
   - ❑ If you want to use a static IP address, use the front panel to enter a valid static IP configuration, see Remote Management setup.
   - ❑ If you want to configure the network subsystem dynamically, from the front panel set **Menu → Setup → Remote management → Set IP**

Addr. mode to DHCP mode.

3. Via the front panel, first set **Setup → Remote management → Access control → Allow remote man.** to “Not allowed” and select “OK.” Then set the same value to “Allowed” and select “OK.” This will restart the networking subsystem. Obtaining a new IP address may take some time if the FastStor 1 is in DHCP mode.

4. Check the IP address via the front panel by accessing either **View Data → Remote man. info → Sta IP Addr. state** or **View Data → Remote man. info → Dyn IP Addr. state**, depending on whether the FastStor 1 is in static or dynamic IP address mode.

Remote Management Web Pages

Most of the operations you can perform from the front panel can also be performed remotely using Web Administration. The Remote Management interface provides access to loader and drive status and statistical operation information.

The Web pages include a navigation menu making it easy to use, see Figure 5.1.

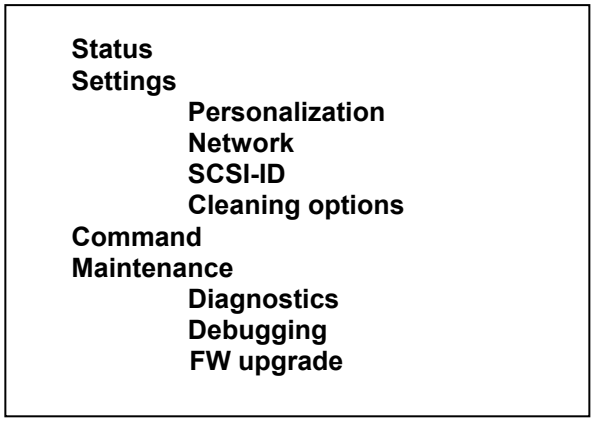


Figure 5.1 Navigation Menu

Information Boxes

All the Remote Management web pages show FastStor 1 and drive information. This information includes:

- FastStor 1 information containing model, serial number, firmware version, cumulative power-on time and present activity of the loader.
- Drive information containing technology, serial number, firmware version and activity

FastStor 1 Start Page

After successfully connecting to the FastStor 1 from your browser, you will see the FastStor 1 Start page, Figure 5.2. This contains:

- Select language for user-interface.
  1. The language used last time will come up as the default language at start-up.
  2. The default language is English.
- Log in to use Remote Management. The system has two levels of login. By default the passwords are blank. (That is, type in the user ID and leave the password field blank.) To secure your system, change both passwords under **Settings > Personalization**, the first time you use Remote Management.
  1. The user ID Administrator has full access to the Remote Management pages.
  2. The user ID Operator has limited access to the Remote Management, and cannot access the Settings and Maintenance pages.

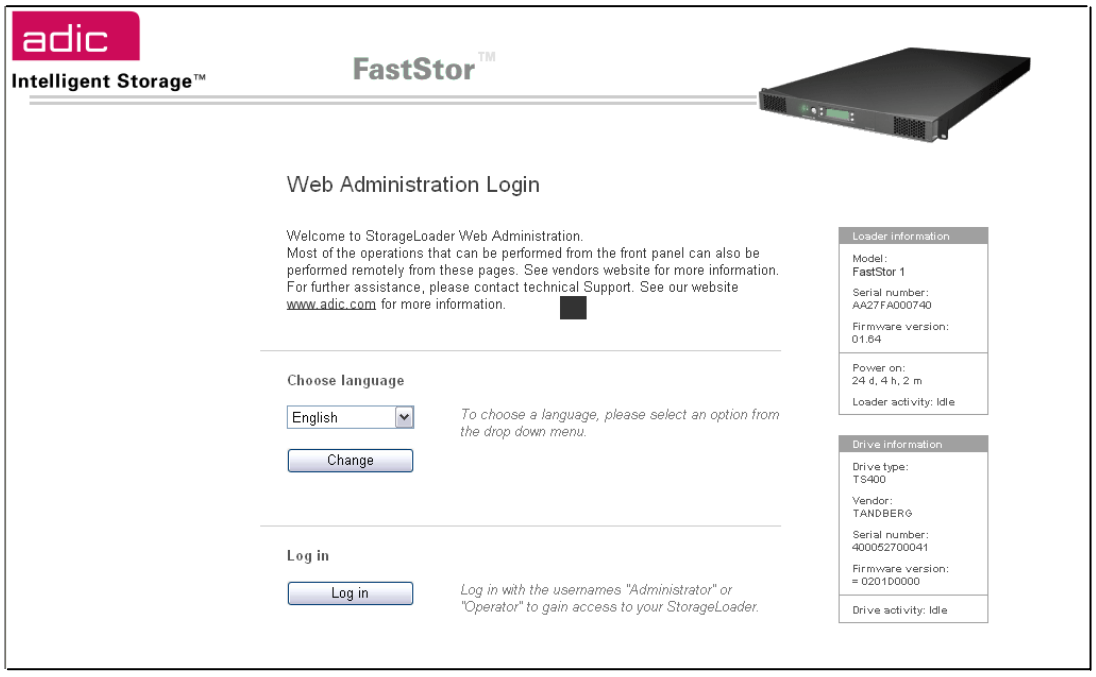


Figure 5.2 Remote Management Start Page

***Note**: FastStor 1 network traffic is not encrypted, so anyone with physical access to the network path will be able to access the information with a packet sniffer. Passwords, however, are encrypted. It is not possible to reach the*

plaintext password, but it is possible to sniff "the challenge key" and use it to gain access. The system is therefore not safer than the network it is using.

If you need high security, make sure packets to and from the FastStor 1 do not leave the secure network, and employ separate encryption when traffic traverses unsecured networks.

Status Page

The FastStor 1 Status page looks like the figure below.

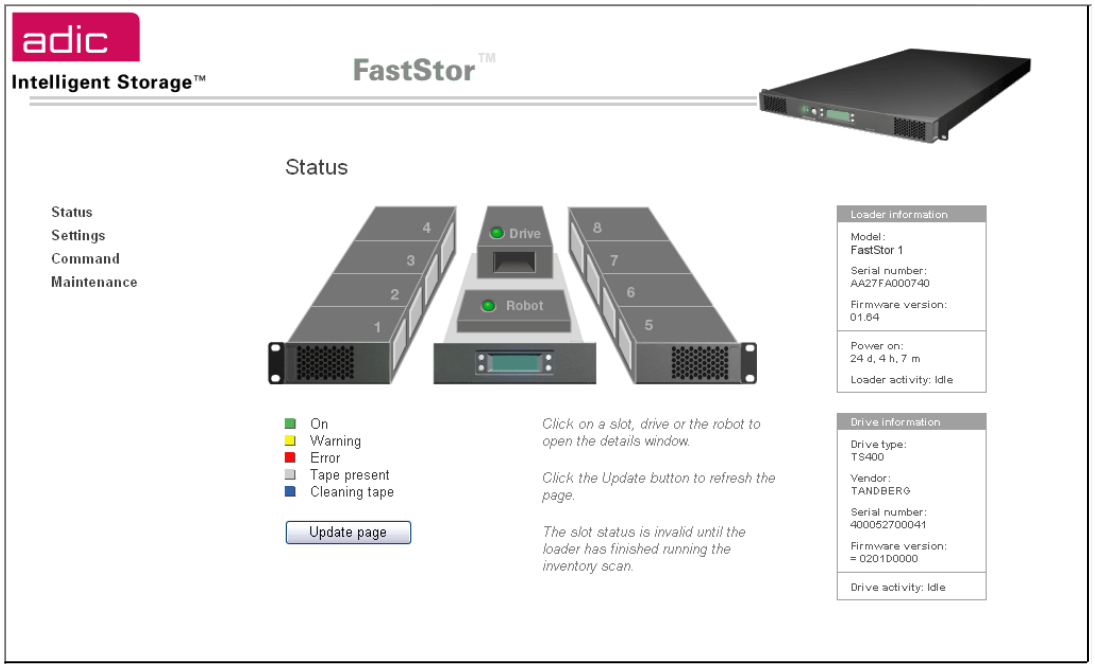


Figure 5.3 Remote Management Status Page

The figure provides an updated status of drives, robotics and cartridges using color-coding and symbols.

The Drive and Robot statuses are shown as a green (OK), yellow (Warning) or red (Error) dot. If you click on the text, additional information appears in a pop-up window.

The cartridge locations are shown with rectangles in the slots or the drive. The status codes are:

- Black — Empty slot, no cartridge present
- Grey — Cartridge present
- Blue — Cleaning cartridge in the slot
- Yellow — Warning
- Red — Error

If you click on a slot, additional cartridge information is shown in a pop-up window. This information includes the cartridge barcode (if label and barcode reader are installed) and the error code.

Settings Pages

You can change the FastStor 1 configuration on the setting pages. These pages can be accessed only by someone who is logged in as Administrator.

Personalization

On this page you can change the Remote Management passwords. To secure your system, change both the passwords the first time you use the system. It is possible to clear the remote management passwords via the front panel. Please see The Maintenance Menus.

Here you may also turn on email event notification. When event notification is enabled, the FastStor 1 sends warnings and errors by email to the recipient's e-mail address.

Network

On this page it is possible to change the IP configuration. See details in Remote Management setup. The new configuration will take effect at next system reset.

Warning: Please verify that the chosen settings are correct and consistent before resetting the loader. Any mistakes must be corrected via the front panel.

SCSI-ID

On this page it is possible to change the SCSI-ID on your drive and loader. See details in SCSI Setup.

Cleaning Options

By defining a cleaning slot, the FastStor 1 regards the cartridge in this slot as the cleaning cartridge unless:

1. another cartridge has previously been designated a cleaning cartridge by the drive, or
2. the loader contains a cartridge with a barcode label indicating it is a cleaning cartridge.

Command Page

On this page it is possible to move cartridges between magazine slots and the drive. All cartridges in the FastStor 1 can be found in a pull-down list sorted by location. The other pull-down list shows the empty locations where it is possible to move the cartridge.

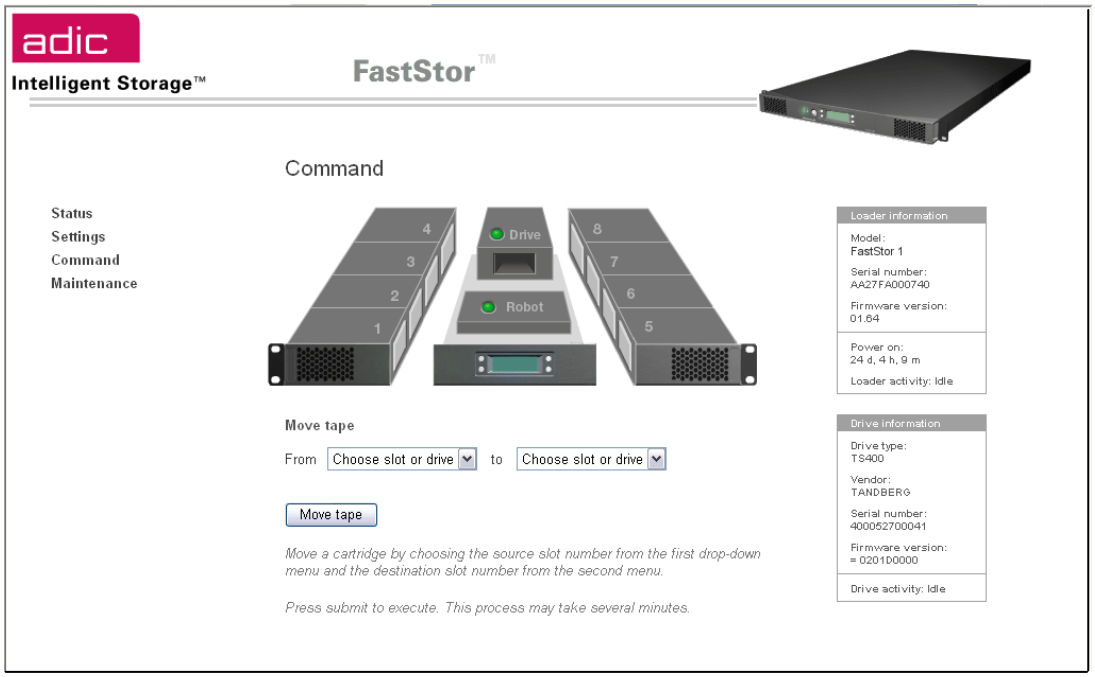


Figure 5.4 Remote Management Command Page

Maintenance Pages

On these pages it is possible to select predefined tests and actions to check the FastStor 1's reliability. In addition it is possible to upgrade the loader's firmware over TCP/IP.

Diagnostics

- Clean the drive by importing a cleaning cartridge.
- If you choose *Identify loader*, the front panel display light toggles on and off for 15 seconds. This makes it easy to verify that you are connected to the correct loader if several loaders are stacked.
- Test robotics by moving cartridges.
- Test robotics without moving cartridges.

Debugging

- Memory dump downloads a snapshot of the loader's system memory to a file that can be sent to ADIC service for diagnostic purposes.
- Memory dump drive downloads a snapshot of the drive's system memory to a file that can be sent to ADIC service for diagnostic purposes.
- Perform a system reset.
- Media log displays a log of all cartridge movements and a map of the

current cartridge locations.

FW Upgrade

Upgrade the loader's firmware by uploading a binary file. The loader must be configured to allow remote firmware upgrade. This configuration is done by using the front panel interface (Menu → Setup → Remote management → Access control → Allow rem. FW.upg.).

6 Maintenance

Using the Cleaning Cartridge

The cleaning cartridge is similar in size and shape to the regular LTO data cartridge. Place a cleaning cartridge barcode label on the cartridge before using it.

Important: *This label has a six-digit ID, where the three first digits are "CLN".*

A cleaning occurs whenever a cleaning cartridge is loaded into the drive. Before cleaning, you must install the cartridge into the magazine correctly. The cleaning cartridge may be inserted in any magazine slot.

NOTE: The only absolute authority on cleaning tapes is the drive. The drive starts a cleaning operation whenever a tape recognized as a cleaning tape is inserted. The loader cannot, by itself, recognize a cleaning tape. It may be mislead by a wrong label on a data tape, by a data tape inserted in a designated cleaning slot, or by the operator.

Running an Installed Cleaning Cartridge

1. Install a cleaning cartridge into a magazine slot in the loader. If a cleaning slot is defined, this slot should be used.
2. Select Clean Drive from the Maintenance section of the Utilities menu. This causes the loader to search for a cleaning cartridge in the following sequence:
   a. A cartridge reported to be a cleaning cartridge by the drive
   b. A cartridge with a barcode label indicating it is a cleaning cartridge
   c. A cartridge in the slot defined as the cleaning slot

   If all of the above fail, the loader displays a dialog asking the operator for the slot from which to fetch the cleaning cartridge.
3. While the cleaning operation is on-going, the display shows the drive status "Drive Cleaning". After the operation completes, the cartridge is automatically moved back to the slot from which it was fetched.

If a data tape is erroneously inserted via the loader "Clean Now" menu, this is detected by the loader when the drive identifies it as a non-cleaning tape. The cartridge is returned to its original slot and an error message is displayed.

Some drive families and types have means of checking if the cleaning cartridge is expired. If an expired cleaning cartridge is inserted in such a drive, this is detected by the loader and an error message is displayed after the tape has been returned to its original slot.

Note: All cleaning cartridges wear out. If the drive does not support expiration detection, the operator must keep track of cleaning cycles manually and discard expired cartridges.

Note: Pressing the standby button while the drive is cleaning will not abort the cleaning operation in the drive. However the cleaning cartridge is left loaded in the drive. When the loader is brought out of standby mode, the drive is reset as part of the initialization process. The drive will re-discover the cleaning cartridge and run another cleaning sequence. The cleaning cartridge is left in the drive and must be unloaded by the operator by using the unload command from the front panel menu.

Removing the Cleaning Cartridge

1. Determine whether a cartridge is loaded into the drive. If so, unload it.
2. Remove the magazine with the cleaning cartridge from the unit.
3. Remove the cleaning cartridge from the magazine.
4. Insert any desired data cartridge into the slot vacated by the cleaning cartridge.

   Note: *The cleaning slot must be disabled (set to 0) in the Setup menu to make use of a data cartridge in this slot.*
5. Insert the magazine into the unit.

Installing Firmware Upgrades

The loader firmware can be upgraded via the SCSI interface or the web interface. The drive firmware can be upgraded via the SCSI interface.

Loader Firmware Upgrade via SCSI

A suitable utility program, FlashIt, and the latest firmware image file, can be downloaded from the ADIC web site http://www.adic.com/. The program is available for Windows XP, Windows 2000/2003, and Windows NT.

Note: *Read this entire procedure before you perform an upgrade.*

1. Copy the FlashIt utility on your computer or server where the loader is connected.
2. Make sure the computer has detected the loader. (Look for “Medium changers” in the “Device Manager”: Right click "My Computer" – “Manage” – “Device Manager”).
3. Most Windows operating systems may require that all backup services started by the backup software application be stopped before the FlashIt utility is started.

4. If a Windows driver is loaded for the Medium changer in question, it will block the SCSI port for the flashing utility and FlashIt will not see the drive. Cure: Disable the device. (Select and disable the Medium changer in the Device Manager: "My Computer" – “Manage” – “Device Manager”).

5. Start the FlashIt utility and follow the instructions in the program.

6. As the Download Utility begins data transfer, the FastStor 1 displays this message:

Flash Firmware SCSI Update: Transferring Data

7. When the firmware image file has been downloaded, the loader checks the integrity of the firmware image while displaying this message:

Flash Firmware SCSI Update: Checking ECC

8. Once the code is approved, the loader starts the erase and reprogram operation while displaying this message:

Flash Firmware SCSI Update Reprogramming Do not interfere!

   During the Erase part of the reprogramming cycle, the amber LED lights to warn against interference. The erase operation takes less than 20 seconds.

   During the Programming part of the reprogramming cycle, the green LED flashes in addition to the amber LED remaining lit. The programming operation takes less than one minute.

9. When reprogramming is completed, the loader does a normal reboot. Due to the reboot, the FlashIt utility could display an error message, which should be ignored.

If the firmware upgrade operation fails during step 8 due to a power shutdown or similar occurrence, the loader may require service.

To verify that the firmware version in the loader is correct, enter the View Data menu from the front panel. Select the “FastStor 1 Info” and from there the “Loader FW Revision” entry to see the revision number.

Loader Firmware Upgrade via Web

The loader firmware can be upgraded via remote management.

1. Log into the Remote Management web page.

2. In the left menu, click on Maintenance and then "FW Upgrade"
3. Click on the "I accept upgrade firmware" button
4. Select the new binary FW file that loader is to be upgraded with by clicking on the "Browse..." button
5. Click on the "Upgrade" button. The upgrade process has now started.
6. The Remote Interface is, after uploading the file, stalled. The progress of the upgrade can be observed on the front panel.
7. Front panel: Flash Firmware / RMM Update / Preparing (This message is displaying for 5 - 10 seconds)
8. Front panel: Flash Firmware / RMM Update / Checking ECC (This message is displaying for 1 - 2 minutes)
9. Front panel: Flash Firmware / DACI Update / Reprogramming / Do Not Interfere! (this message is displaying for 20 - 30 seconds.)
10. The Front panel's green backlight is turned off - a reset of the loader is taking place.

The firmware revision is displayed on the remote management pages. It can also be viewed from the front panel menu.

Drive Firmware upgrade via SCSI

A suitable utility program, FlashIt, and the latest firmware image file, can be downloaded from the ADIC web site http://www.adic.com/. The program is available for Windows XP, Windows 2000/2003, and Windows NT.

Note: *Read this entire procedure before you perform an upgrade.*

1. Copy the FlashIt utility on your computer or server where the loader is connected.
2. Make sure the computer has detected the tape drive. (Look for "Tape drives" in the "Device Manager": Right click "My Computer" – "Manage" – "Device Manager")
3. Most Windows operating systems may require that all backup services started by the backup software application be stopped before the FlashIt utility is started.
4. If a Windows driver is loaded for the tape drive in question, it will block the SCSI port for the flashing utility and FlashIt will not see the drive. Cure: Disable the device. (Select and disable the tape drive in the Device Manager: "My Computer" – "Manage" – "Device Manager").
5. The appropriate firmware file must be located in the same directory as the

FlashIt utility.

6. Start the FlashIt utility and follow the instructions in the program.

To verify that the firmware version in the tape drive is correct, enter the View Data menu from the front panel. Select the “Drive Info” and from there the “Drive FW Revision” entry to see the revision number.

Possible Upgrade Problems

If a power loss or a failure occurs during code download and ECC Checking, the original firmware might be intact. It is possible to restart the firmware upgrade procedure. However, if the failure occurs during flash erase or programming, the firmware will be corrupted and a special procedure must be used to load a new code. Contact your Technical Support Representative for assistance.

Embedded Diagnostics

The FastStor 1 includes two levels of diagnostics:

- *The Power-On Self Test (POST)* — Performs several verification and memory tests when you power on the unit.
- *User Diagnostics* — Selectable from the front panel

Reinstalling the Transport Lock

Before the FastStor 1 is shipped over a distance, the transport lock must be installed. The transport lock prevents damage to the robotics during transport and handling.

Note: *Damage to the robotics during shipping will not be covered by warranty unless the transport lock is installed*.

Figure 6.1 Transport lock marked with red plastic tab

Transport Lock Installation Procedure

To insert the locking screw, do the following:

1. If there is a cartridge in the drive, unload the drive first.
2. When the loader is powered on and idle, push the ***Menu*** button and go to the *Prepare to Ship* menu entry (see The Maintenance Menus).
3. If there are any cartridges in the magazines, the loader will eject those magazines and a descriptive message will be shown. Empty the magazines and put the magazines back in place.
4. If the magazines are empty, only the right magazine will be ejected and a descriptive message will be shown.
5. Turn the main power off at the back of the loader.
6. Remove the magazine and insert the locking screw. The red plastic tab shall protrude from the front of the loader.

Insert the magazine and push it in until it locks in place.

7 Troubleshooting

How to Take Memory Dumps of the Loader

1. Log in to the remote management interface as Administrator.
2. Navigate to Maintenance → Debugging.
3. Click “Memory dump”.
4. Select “Save to disk” in the file download dialog box.
5. Use a zip utility to compress the downloaded memory image.
6. Send the zipped memory image as an email attachment to technical support.

Note that the memory image contains the passwords for the FastStor 1. If you do not want to compromise them, clear them first by changing them to nothing or some harmless value, see Settings Pages or The Maintenance Menus.

How to Take Memory Dumps of the Drive

1. Log in to the remote management interface as Administrator.
2. Navigate to Maintenance → Debugging.
3. Click "Memory dump (drive)".
4. Select "Save to disk" in the file download dialog box.
5. Use a zip utility to compress the downloaded memory image.
6. Send the zipped memory image as an email attachment to technical support.

Hardware checking

a. The autoloader uses one SCSI ID for the tape drive and one for the autoloader robotics. Verify that the loader SCSI ID and the drive SCSI ID are set to unique SCSI IDs that are not used by any other SCSI device on the same bus. Depending on other devices attached to the same SCSI bus and their SCSI IDs, you may need to change the SCSI ID of the tape drive or autoloader before you can use the autoloader.

b. Verify that the system recognizes the tape drive and the loader during

the boot process.

c. Verify that the SCSI host adapter recognizes the tape drive and the loader during its initialization.

d. Verify that the status on the loader's front panel interface is OK.

e. Verify that the power cable is inserted correctly.

f. Verify that the SCSI cables are properly connected at both ends. Check that the cables are not damaged, and verify the lengths of your SCSI cabling. The length of the internal SCSI cabling inside the loader is 85cm. This length must be included in any calculation of cable length.

g. Verify that the SCSI bus is properly terminated. Only the devices physically at the beginning and end of the cable must be terminated.

Software checking

1. Verify that the operating system does not report a problem during the boot.
2. Verify that the driver for the SCSI host adapter is present and loaded properly.
3. Verify that the correct Drivers have been installed properly – if applicable.
4. Verify that the Backup software does not report any error messages when loading.
5. If any problem occurs, reinstall the Backup Application Software and check that both the loader and the tape drive are recognized.

Verifying Recent Changes

If the autoloader has been installed previously and operating correctly but is now incurring a problem, verify any recent changes to the system to ensure that these changes are not causing the problem. Try the following:

i. If the system configuration has changed: Remove the change to see if it affected the loader.

ii. If an operating system corrective patch has been installed: Remove it to see if it affected the loader.

iii. If a SCSI device has been added: Check for SCSI ID conflicts.

iv. If a SCSI device has been added: Check if the SCSI termination has been properly set.

Troubleshooting matrix

The table below describes different problem situations and suggested actions to try to resolve the problem.

PROBLEM	SOLUTION
Power	
Autoloader does not power on	• Check the power cord connection. • Make sure the power switch on the rear panel is in the ON position. • Make sure there is power to the outlet. Try another working outlet. • Replace the power cord. • Make sure the fuse located beside the power connector on the rear panel is not blown. Replace fuse if blown (a spare fuse is located behind the fuse door). • Remove the back panel cover plate and verify that all cables are connected properly. • Replace the FRU power supply. • Contact your service representative.
The display is dead	• Power cycle the loader by turning off and on the main power switch on the rear of the loader. • Verify that the fans starts at power on and then stops after a few seconds. • Check the power cord connection. • Make sure the power switch on the rear panel is in the ON position. • Make sure there is power to the outlet. Try another working outlet. • Replace the power cord. • Make sure the fuse located beside the power connector on the rear panel is not blown. Replace fuse if blown (a spare fuse is located behind the fuse door). • Remove the back panel cover plate and verify that all cables are connected properly. • Replace the FRU power supply. • Contact your service representative.
The front panel does not display information but the back light on the front panel is on	• Power cycle the loader by turning off and on the main power switch on the rear of the loader. • Verify that the fans starts at power on and then stops after a few seconds. • Contact your service representative.
Cartridge movement	
Loader does not take inventory	• Make sure the transport screw is removed. • Make sure both magazines are in their locked position. • Look up the error code and follow the instructions in the “suggested action” column. • Contact your service representative.
Cartridge stuck in drive	• Power cycle the loader by turning off and on the main power switch on the rear of the loader. Allow both the loader and the drive to complete initialization (which in rare cases can take as long as 10 minutes,) and then retry

	unloading the tape using the autoloader operator panel controls. • Make sure the backup software is not reserving the slot or preventing the tape drive from ejecting the cartridge. The backup software needs to cancel the reservation and any hold it has on the tape drive. • Temporarily disconnecting the autoloader from the host server system eliminates the host system and its software as a problem source. • Remove drive FRU from the drive bay. Connect power to the drive either by connecting it to the loader's power supply or to an external power supply. Try to eject the cartridge by pushing the drive's eject button. • Follow the drive's emergency eject procedure to remove the cartridge from the drive. • Replace the drive FRU. • Contact your service representative.
Cartridge stuck in magazine	• Remove the magazine using the front panel interface. Manually remove the cartridge from the magazine slot. • Contact your service representative.
Cartridge stuck in robotics	• Power cycle the loader by turning off and on the main power switch on the rear of the loader. • Look up the error code, follow the instructions in the "suggested action" column. • Contact your service representative.
Failed to move cartridges	• Look up the error code (1101-1109, 1201-1209), and then follow the instructions in the "suggested action" column. • Contact your service representative.
Failed to insert cartridge into drive	Check failing media for pin damage (buckling pin). Hold the cartridge in your hand with the Write Protect Switch to your left and orientation arrow pointing away from you. On the right side all the way in front is a small door that can be opened by sliding a door against you. Inside the cartridge you should see a metal pin. The pin should be parallel with the cartridge front and is held in place by two metal grippers at each end (top and bottom of the cartridge). The media should be attached to this pin, and you should see only the top and bottom part of the pin. If the pin is missing, loose or damaged, the tape will be damaged and rejected from the drive.
Media	
Media barcode labels	• Make sure the barcode labels are applied in the correct orientation on the cartridge. See the section called "Labelling cartridges" in the User and Installation Guide's "Performing the Installation" chapter. • Make sure there are no wrinkles on the label. • Make sure FastStor-specific labels are used. • If all of the above are OK, replace the label with a new one. • If the problem continues, contact your service representative.
Data cartridge incompatible with drive	• Make sure you are using a data cartridges that is compatible with the drive. See the tape drive's reference manuals for details. • The software backup application detects if an incompatible data cartridge is used, and communicates this to the user. • Remove the cartridge from the loader.
Cannot write to or read from tape	• Make sure the cartridge is write enabled (move the write-protect switch to the enabled position).

	• Make sure the cartridge has not been written using an incompatible format. • Make sure the cartridge is an acceptable format for your drive type. See the tape drive's reference manuals for details. • Make sure the cartridge has not been exposed to harsh environmental or electrical conditions and is not physically damaged in any way. • Many backup applications do not read or write to cartridges that were created using a different backup application. In this case, you might have to perform an erase, format, or label operation on the cartridge. • Make sure you understand any data protection or overwrite protection schemes your backup application might be using, which could prevent you from writing to a given cartridge. • Retry the operation with a different, known good tape. • Clean the tape drive. See the section called "Using the Cleaning Cartridge" in the User and Installation Guide's "Maintenance" chapter.
SCSI problems	
Changed drive or loader SCSI ID, but the host server system does not recognize the new ID	• Make sure all SCSI devices on the same bus have unique ID numbers. • If the SCSI bus is narrow (50-pin) only SCSI IDs 0 through 7 are available. • Make sure you reboot the autoloader after changing the SCSI ID. • Reboot the host server system.
The tape drive responds on the SCSI bus to the host, but the loader does not respond	•Verify that a SCSI terminator is attached to both the last and first SCSI device on the SCSI bus. • Verify the SCSI cables are connected to the rear of the loader. See the section called "Connecting the SCSI Bus Cable" in the "Installation" chapter. • Make sure the correct host controller card is installed. • Verify that the SCSI cables are not damaged, and that the total SCSI cable length is not exceeding the maximum required length. • Verify that the loader SCSI ID and the drive SCSI ID are set to unique SCSI IDs that are not used by any other SCSI device on the same bus. • Verify that the host application and the device drivers are installed with the most resent patches to support the loader • Reboot the loader by turning power off from the rear of the loader, and then on. • Reboot the host system when the loader has completed its power on sequence. • Contact your service representative.
The tape loader responds on the SCSI bus to the host, but the tape drive does not respond	• Verify that a SCSI terminator is attached to both the last and first SCSI device on the SCSI bus. • Verify that the SCSI cables are connected to the rear of the loader. See the section called "Connecting the SCSI Bus Cable" in the "Installation" chapter. • Make sure the correct host controller card is installed. • Verify that the SCSI cables are not damaged, and that the total SCSI cable length is not exceeding the maximum required length. • Verify that the loader SCSI ID and the drive SCSI ID are set to unique SCSI IDs that are not used by any other SCSI

	device on the same bus. • Verify that the host application and the device drivers are installed with the most resent patches to support the tape drive • Issue a system reset from the front panel or remote management • Remove the back panel cover plate on the loader and verify that the cables are properly connected to the drive. • Reboot the loader by turning power off from the rear of the loader, and then on. • Reboot the host system when the loader has completed its power on sequence.. • Contact your service representative.
Autoloader Performance	
The autoloader is not efficiently backing up data	• Check the network bandwidth from the host system. If you are backing up data over a network, consider comparing to a local-only backup. • Make sure the autoloader and tape drive are on their own SCSI bus and not daisy-chained to another tape drive or to the hard drive being backed up. • Verify that the host application and the device drivers are installed with the most resent patches to support the tape drive and the loader. • Connect the autoloader to an LVD SCSI bus and make sure there are no SE devices on the same bus, because this causes the entire bus to negotiate down to SE speed. • Clean the tape drive. See the section called “Using the Cleaning Cartridge” in the “Maintenance” chapter. • Try a new cartridge. A marginal cartridge can cause performance problems due to bad spots on the tape, requiring retries. • Backing up compressed data lowers performance. • Check the size of the files. Small file size can impact performance.
Cleaning	
Cannot load the cleaning Cartridge	• Make sure there is no cartridge present in the drive before you load a cleaning cartridge. • Make sure the cleaning cartridge is not expired. • Contact your service representative.
Write or read issues	
Contaminated head	Avoid contamination by ensuring that the autoloader is installed in a clean, contamination-free environment. Cartridges should be stored vertically in their plastic cases. Continue cleaning the tape drive as needed. If a cleaning cartridge is not successful in resolving the problem after 3 or more attempts, the cleaning cartridge may be contaminated and should not be used in another drive.
Non-acclimated media	A cartridge should be acclimated for at least 24 hours before being used, particularly if it has been stored at a substantially different temperature or level of humidity than the autoloader.
Cleaning cartridge is Incompatible	Make sure you are using an allowed cleaning cartridges
Expired cleaning cartridge	Verify the number of cleanings per cleaning tape for your media type
Bad/defective/contaminated media	• If the write/read errors persist and the drive has been cleaned, that cartridge should be suspected as being defective, if it is not an invalid cleaning cartridge.

	• If this occurs, export the cartridge and load a known good cartridge. In some cases, a cartridge can be worn out, have a defective cartridge memory, or have been formatted as a Firmware Upgrade Tape. • Any cartridge you suspect is defective or contaminated should NOT be reused in any drive.
LED error messages	
Amber LED on	• When the amber LED is on, the loader has encountered an electrical or mechanical failure. An error message displays on the front panel (and RMI). Refer to the error codes for details.
Errors Displayed on Front Panel	
There is an error code on the LCD display	• Look up the error code and try to resolve the failure. • Power cycle the loader by turning off and on the main power switch on the rear of the loader. • Contact your service representative.
There is an error code on the RMI	• Look up the error code and try to resolve the failure. • Power cycle the loader by turning off and on the main power switch on the rear of the loader. • Contact your service representative.
Remote Management	
The unit does not respond on the RMI	• Verify that the Ethernet cable is connected to the correct hub • Verify the Ethernet settings via the front panel. See user and installation guide, chapter “Remote management” for details. • Reboot the loader by issuing a system reset. Wait at least 30 seconds for the RMI to initialize. • Power cycle the loader by turning off and on the main power switch on the rear of the loader. Wait at least 30 seconds for the RMI to initialize. • Contact your service representative.
Forgot password	
Forgot password on RMI	• The RMI password can be cleared from the front panel interface. See the user and installation guide for details (see figure “The complete menu tree”).
Forgot password on FPI	• Look up the RMI IP address from the front panel menu (view data menu). • Connect the RMI interface and perform a memory dump of the loader (see user and installation guide for details). • Send the memdump to your Service representative. The FPI password can be decoded from the memdump by using a special SW.

The Error Screen

When the FastStor 1 detects an error condition, the red/amber Fault LED is illuminated and one of the error screens appears on the front panel. Figure 7.1 illustrates how the FastStor 1 reports error conditions on the front panel display:

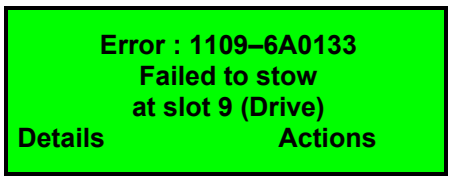


Figure 7.1 Error Code Page

The top line shows an Error code in the following format: XXXX-YYRRVV
The XXXX is the error number, while the YY is the internal loader error code. The RRVV is the FW revision numbers, where RR is the major revision and VV is the minor revision.

The next two lines give more detailed error information. There are two option buttons, “Details” and “Actions”. Pressing the Details button gives access to a multi-page error description text. Pressing Action gives access to a set of actions that can be taken to recover from the error. An example of pressing “Details” and continuing with pressing “More” is shown in figures 7.2 and 7.3.

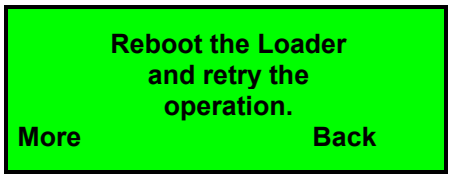


Figure 7.2 Example of detailed information

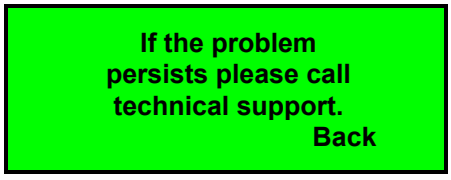


Figure 7.3 Example of further detailed information

In this example, pressing “Back” twice takes you back to the Error Code Page (figure 7.1) where you can press “Actions” to go to the Actions menu. Figure 7.4

shows an example of pressing “Actions”. Pressing the buttons next to the up/down arrows on the screen gives you access to other action options.

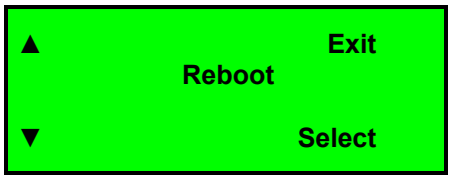


Figure 7.4 Example of action

In figure 7.4, you have been prompted to reboot the Loader. Pressing “Select” will result in the warning message shown in figure 7.5. Press “Ok” to execute the reboot.

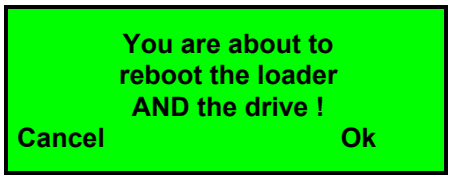


Figure 7.5 Warning message concerning reboot

When an error condition occurs, identify the problem using the displayed error codes and follow the suggested actions. The error codes are listed in the next section.

Error Codes

The error codes are listed in numerical sequence by their Fault Symptom Code (FSC) in the tables that follow. If a persistent error condition prompts you to call your Technical Support representative, be sure to supply the code information to help identify the problem.

Error Code	Display Message	Description	Suggested Action	Most likely cause (for guidance only)
01ZZ	Diagnostic number ZZ failed.	The diagnostics number ZZ failed.	Reboot the loader and retry the operation.	(This error code is reserved for future use)
0200	Initialization of the robotics failed.	The robotics failed to complete the calibration or the inventory sequence.	1. Reboot the loader and retry the operation. 2. Verify that the magazines are locked. 3. Turn off the loader and try to remove the magazines by using the emergency eject pin. 4. Contact your service representative.	Cartridge blocked, faulty robotics
1001	Failed moving the robotics.	The robotics was not able to move.	Reboot the loader and retry the operation.	Cartridge blocked, faulty robotics
1101-1108	Failed to stow at slot 01 .. 08	The robotics is not able to stow the cartridge to the magazine	1. Reboot the loader and retry the operation. 2. Remove the magazine if possible. Remove all cartridges. 3. Verify that the cartridge is not damaged. 4. Insert empty magazines. 5. Power cycle the loader. 6. Retry the operation. 7. Retry the operation with a new magazine.	Defect robotics, defect magazine, defect cartridge
1109	Failed to stow at slot 09	Failed to insert cartridge in drive	1. Reboot the loader and retry the operation. 2. If failure persists, insert the cartridge into a magazine slot, remove the magazine and verify that the cartridge is not damaged.	
1201 - 1208	Failed to fetch at slot 01 .. 08	The robotics is not able to fetch the requested cartridge from the magazine	1. Reboot the loader and retry the operation. 2. Remove the magazine if possible. Remove all cartridges. 3. Verify that the cartridge is not damaged. 4. Insert empty magazines. 5. Power cycle the loader. 6. Retry the operation. 7. Retry the operation with a new magazine	Defect robotics, defect magazine, defect cartridge
1209	Failed to fetch at slot 09	Failed to eject cartridge from drive	1. Reboot the loader and retry the operation. 2. Try to eject the cartridge from	Defect drive or robotics. Defect cartridge.

			the drive via the front panel menu. 3.Remove the drive FRU. Connect power to drive and push the drive's eject button. If this fails, remove cartridge by following the drive's emergency eject procedure.	
2000	Drive not found	Communication error between the loader and the drive.	1. Reboot the loader and retry the operation. 2. Remove back-panel cover plate and check the SCSI cabling and the ADI cabling.	SCSI and signal cables, power cables; defective power supply; defective drive.
2001	Drive hardware fault detected.	The drive has reported a hardware fault.	Reboot the loader and retry the operation. If the problem persists replace the drive.	Defective drive

Appendix A – Specifications

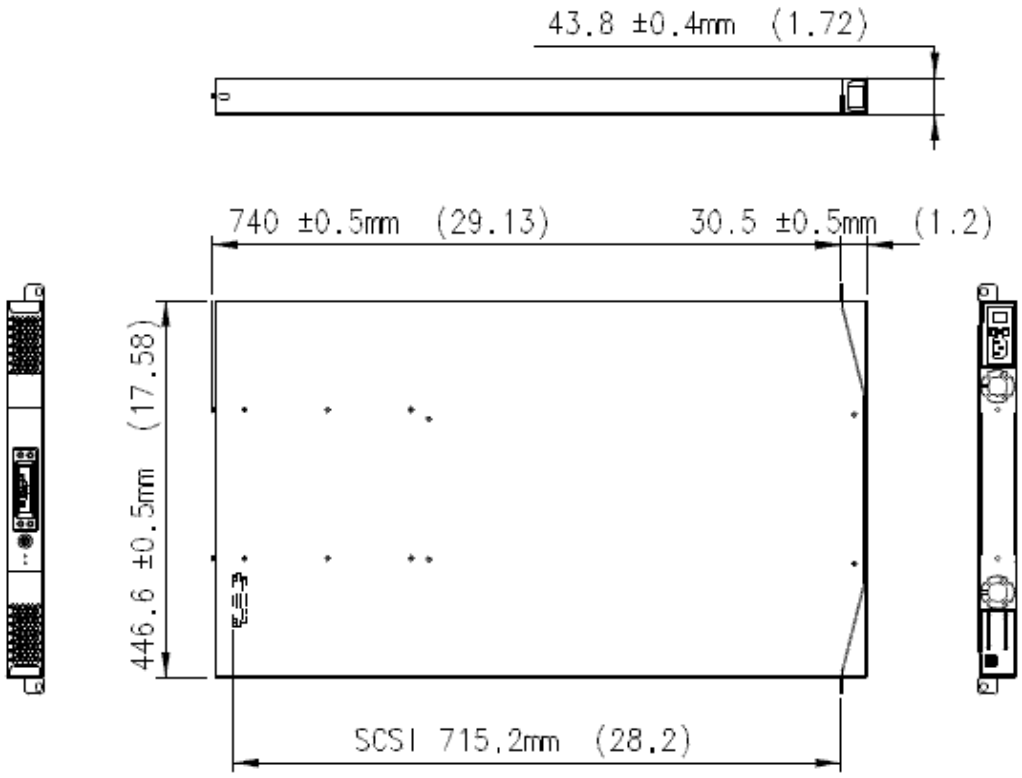
A.1. Mechanical Dimensions and Weight

The ADIC FastStor 1 is designed as a rack mount unit. The FastStor 1 can also be used as a tabletop unit.

Dimensions:

Length	740 mm (29.13 in) ±0.5 mm from front rail to rear of unit
Width	446.6 mm (17.58 in) ±0.5 mm
Height	43.8 (1.72 in) ±0.4 mm
Weight	14.6 kg (32.2 lb) without cartridges

Table A - 1 FastStor 1 Mechanical Dimensions and Weight



A.2. Power Requirements

Input voltage	90 VAC – 264VAC
Input Frequency	47 Hz – 63 Hz
Inrush Current (Cold Start)	Less than 30 A, 115VAC Less than 60 A, 230 VAC
Power consumption average	35W
Power consumption peak*	70W*

* Maximum peak length, less than 10ms

Table A - 2 FastStor 1 Power Requirements

A.3. Vibration Specifications

Sinusoidal sweep			
Sweep Rates	1 octave/minute		
Axes	X, Y and Z		
Duration	2 hours		
	Frequency Range (Hz)		Level
Operating	5	24.2	0.01 in p-p
	24.2	500	0.3g
Non-Operating (Storage)	5	27.1	0.02 in p-p
	27.1	500	0.75g
Transport	5	200	0.5g

Table A - 3 FastStor 1 sine sweep levels

Random		
Crest factor	3	
Axes	X, Y, Z	
Duration	30 min/axis	
	Frequency (Hz)	Level (g^2/Hz)
Operating	5	2.0E-5
	17	3.0E-4
	150	3.0E-4
	200	8.0E-5
	500	8.0E-5
Total	$0.27g_{rms}$	
Non Operating/Storage	5	2.3E-3
	500	2.3E-3
Total	$1.07g_{rms}$	
Transport	5	0.03
	8	0.03
	40	0.003
	45	0.01
	70	0.01
	200	0.001
Total level	$1.03g_{rms}$	

Table A - 4 FastStor 1 random vibration levels

A.4. Mechanical Shock Specifications

Mechanical Bump/Shock				
Axes	X, Y, Z			
Directions	Positive and negative			
Pulse interval	3 seconds			
	Pulse shape	Pulse duration	Pulse Level	Pulses/axis/direction
Operating	Half sine	5ms	3g	1000
Storage (X,Z)	Half sine	8ms	20g	3
Storage (Y)	Half sine	8ms	15g	3

Table A - 5 FastStor 1 mechanical shock levels

A.5. Drop

Drop test	
Standard	ASTM D-4169
Drop sequence	10 drops, 1 corner, 3 edges, 6 faces
Drop height	30 inches

Table A - 6 FastStor 1 drop test

A.6. Climatic Specifications

Temperature		
Operating	Range	+10°C to +35°C
	Gradient	10°C/hour
Non-Operating	Range	-35°C to +60°C
	Gradient	20°C/hour

Table A - 7 FastStor 1 temperature specification

Installing the equipment in a closed or multi-unit rack assembly, the operating ambient temperature of the rack environment may be greater than room ambient.

Humidity		
Operating	Range	20%Rh to 80%Rh
	Gradient	10%Rh/hour
Non-Operating	Range	10%Rh to 90%Rh
	Gradient	20%Rh /hour

Table A - 8 FastStor 1 humidity specification

Altitude		
Operating	Range	-500 to 10000 ft
Non-Operating	Range	-500 to 40000 ft

Table A - 9 FastStor 1 altitude specification

A.7. Noise Specification

Acoustic	
Idle (L_wA)	60 dBA
Operating (L_wA)	65 dBA

Table A - 10 FastStor 1 noise specification

A.8. Product Reliability

MTBF: 250.000 hours for FastStor 1 electronics

MSBF: 250.000 Mean cartridge swaps between failures

Appendix B – Safety and regulatory information

B.1 Safety Approvals

This product complies with the following safety standards:

Europe

EN60950-1:2001

USA

UL60950-1:2003, First Edition

Canada

CSA C22.2 No. 60950-1-3 1st Edition April 1,2003

CB report

IEC 60950-1:2001

B.2 EMC Approvals

This product complies with the following EMC standards:

Europe

EN55022: 1998 +A1: 2000 +A2:2003, Class A

Warning: This is a class A product. In a domestic environment this product may cause radio interference in which case the user may be required to take adequate measures.

EN61000-3-2: 2000

EN61000-3-3: 1995 +A1:2001

EN55024:1998 +A1: 2001 +A2:2003

EN61000-6-2: 2001

USA

FCC part 15, Class A

Note: 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 his own expense.

Japan

VCCI, Class A

この装置は、情報処理装置等電波障害自主規制協議会（ＶＣＣＩ）の基準に基づくクラスＡ情報技術装置です。この装置を家庭環境で使用すると電波妨害を引き起こすことがあります。この場合には使用者が適切な対策を講ずるよう要求されることがあります。

Translation:
This is a Class A product based on the standard of the Voluntary Control Council for Interference by Information Technology Equipment (VCCI). If this equipment is used in a domestic environment, radio interference may occur, in which case, the user may be required to take corrective actions.

Canada

ICES-003

This Class A digital apparatus complies with the Canadian ICES-03.

Cet appareil numérique de la classe A (ou classe B, si ainsi indiqué sur l'étiquette d'enregistration) est conforme á la norme NMB-003 du Canada.

B.3 Conformity Declarations

Europe

CE

Marking by the CE symbol indicates compliance of this system to the applicable Country Directives of the European Union, including the EMC directive (89/336/EEC) and the Low Voltage Directive (73/23/EEC). A 'Declaration of Conformity' in accordance with the applicable directives has been issued for this product.

Australia/New Zealand

C-Tick, Class A

Marking by the C-Tick symbol indicates compliance of this system to the Australian EMC standard AS/NZS 3548: 1995:' Information Technological Equipment'. A 'Declaration of Conformity' in accordance with the applicable standard has been issued for this product.

B.4 Safety Precautions

- **ALL SERVICE ACTIONS APPROPRIATE TO END-USERS ARE DESCRIBED IN THE PRODUCT DOCUMENTATION. ALL OTHER SERVICING SHOULD BE REFERRED TO AN ADIC-AUTHORIZED SERVICE TECHNICIAN.**

- **NEVER PULL MORE THAN ONE COMPONENT OUT OF THE RACK AT A TIME. DOING SO CAN CAUSE THE RACK TO TIP OVER, WHICH COULD CAUSE BODILY INJURY.**

- Maschinenlärminformations-Verordnung 3. GPSGV: Der höchste Schalldruckpegel beträgt 70 db(A) oder weniger gemäß EN ISO 7779, falls nicht anders gekennzeichnet oder spezifiziert.