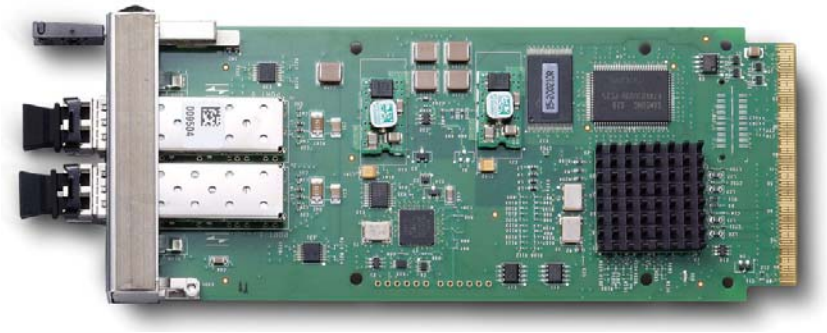
AMC-8100

AdvancedMC™ Dual Port Fibre Channel Controller

User's Manual



Manual Rev.	2.00
Revision Date:	February 3, 2010
Part No:	50-1Z005-1000

Recycled Paper

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Advance Technologies; Automate the World.

Revision History

Revision	Release Date	Description of Change(s)
2.00	2010/02/03	Initial Release

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Preface

Copyright 2010 ADLINK Technology Inc.

This document contains proprietary information protected by copyright. All rights are reserved. No part of this manual may be reproduced by any mechanical, electronic, or other means in any form without prior written permission of the manufacturer.

Disclaimer

The information in this document is subject to change without prior notice in order to improve reliability, design, and function and does not represent a commitment on the part of the manufacturer.

In no event will the manufacturer be liable for direct, indirect, special, incidental, or consequential damages arising out of the use or inability to use the product or documentation, even if advised of the possibility of such damages.

Environmental Responsibility

ADLINK is committed to fulfill its social responsibility to global environmental preservation through compliance with the European Union's Restriction of Hazardous Substances (RoHS) directive and Waste Electrical and Electronic Equipment (WEEE) directive. Environmental protection is a top priority for ADLINK. We have enforced measures to ensure that our products, manufacturing processes, components, and raw materials have as little impact on the environment as possible. When products are at their end of life, our customers are encouraged to dispose of them in accordance with the product disposal and/or recovery programs prescribed by their nation or company.

Trademarks

Product names mentioned herein are used for identification purposes only and may be trademarks and/or registered trademarks of their respective companies.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Using this Manual

Audience and Scope

The AMC-8100 User's Manual is intended for hardware technicians and systems operators with knowledge of installing, configuring and operating industrial grade CompactPCI modules.

Manual Organization

This manual is organized as follows:

Chapter 1, Overview: Introduces the AMC-8100, its features, and package contents.

Chapter 2, Installation: Provides detailed instructions for installing the AMC-8100.

Chapter 3, Functional Description: Describes the major functional features and capabilities of the AMC-8100

Chapter 4, Fibre Channel Firmware Installation: Provides information about installing and configuring the Fibre Channel (FC) firmware.

Chapter 5, BIOS Features: Describes the Fibre Channel Boot BIOS Configuration Utility, the OpenBoot BIOS, and the EFI Boot Services Driver.

Chapter 6, Connector Pin Assignments: Describes the connector pin assignments of the AMC-8100.

Chapter 7, Specifications: Describes the environmental and mechanical specifications of the AMC-8100.

Chapter 8, Front Panel Indicators: Describes the the Front Panel LED indicators.

Chapter 9, IPMI Function List: Contains a listing of IPMI functions supported by the AMC-8100, including and Standard and OEM commands.

Important Safety Instructions: Presents safety instructions all users must follow for the proper setup, installation and usage of equipment and/or software.

Getting Service: Contact information for ADLINK's worldwide offices.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Conventions

Take note of the following conventions used throughout this manual to make sure that users perform certain tasks and instructions properly.



NOTE: Additional information, aids, and tips that help users perform tasks.



CAUTION: Information to prevent ***minor*** physical injury, component damage, data loss, and/or program corruption when trying to complete a task.



WARNING: Information to prevent ***serious*** physical injury, component damage, data loss, and/or program corruption when trying to complete a specific task.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

This page intentionally left blank.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Table of Contents

Revision History ii

Preface iii

List of Tables xi

List of Figures xiii

1 Overview 1

1.1 Introduction 1
1.2 Features 1
1.3 Hardware Configuration 2
1.4 Package Contents 2

2 Installation 3

2.1 Important Information about Your Chassis 3
2.2 Before Installing or Removing the AMC 3
2.3 Verify Slot Usage 5
2.4 Module Hot Swap 5
2.5 Installing the AMC-8100 Module 7
2.6 Removing the AMC Module 8

3 Functional Description 9

3.1 Overview 9
3.2 Operating System Support 12
3.3 PCIe to Fibre Channel Host Adapter 12
3.4 Module Features 13

4 Fibre Channel Firmware Installation 15

4.1 FC Firmware 15
4.2 Updating the FC Firmware 17
4.3 Advanced User Settings 22

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5 BIOS Features 27
5.1 LSI Boot BIOS 27
5.1.1 LSI Boot BIOS Features 27
5.1.2 BIOS Overview 27
5.1.3 LSI BIOS Boot Specification (BBS) 28
5.2 Starting the LSI Boot BIOS Configuration Utility 28
5.3 Using the LSI Boot BIOS Configuration Utility 29
5.3.1 Main Menu 29
5.3.2 Adapter Properties Menu 29
5.3.3 Persistent ID Menu 29
5.3.4 Device Properties Menu 30
5.3.5 Boot Adapter List Menu 31
5.3.6 Global Properties Menu 31
5.3.7 Exiting the LSI Boot BIOS Configuration Utility 31
5.4 Troubleshooting 32
5.5 OpenBoot BIOS 33
5.5.1 OpenBoot BIOS Features 33
5.5.2 Identifying the FC Devices 33
5.5.3 Verifying Installation 35
5.5.4 Adapter-Specific Settings 36
5.5.5 Interrupt Coalescing 39
5.5.6 Set FC Link Speed 40
5.5.7 Persistent Device Naming 41
5.5.8 Manual Selection of FC Topology 43
5.6 EFI Boot Services Driver (BSD) 44
5.6.1 EFI BSD Features 44
5.6.2 EFI BSD Overview 45
5.6.3 Starting the EFI Configuration Utility 46
5.6.4 Using the EFI Configuration Utility 46
5.6.5 Exiting the EFI Configuration Utility 46

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

6 Connector Pin Assignments 47
6.1 AMC-8100 Port Assignments 47

7 Specifications 49
7.1 Environmental Specifications 49
7.2 Power Requirements 49
7.3 EMC Compliance 50

8 Front Panel Indicators 51

9 IPMI Function List 53
9.1 Sensor Data Records 53
9.2 Supported IPMI Commands 56

Important Safety Instructions 59

Getting Service 61

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

This page intentionally left blank.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

List of Tables

Table 3-1: Supported Operating Systems 12
Table 6-1: AMC-8100 AMC Port Assignments 47
Table 7-1: AMC-8100 Power Requirements 49
Table 8-1: AMC-8100 LED Functions 52
Table 9-1: Sensor Data Records 53
Table 9-2: Standard FRU Data Records 54
Table 9-3: AMC-8100 Connectivity 55
Table 9-4: Supported IPMI Commands 57

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

This page intentionally left blank.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

List of Figures

Figure 1-1: AMC-8100 Physical Overview 2
Figure 2-1: AMC Module Handle 6
Figure 3-1: AMC-8100 Functional Block Diagram 11
Figure 4-1: LSIUtil Device Selection 18
Figure 4-2: LSIUtil Download Options..... 18
Figure 4-3: LSIUtil File Download 19
Figure 4-4: MPTUtil Device Selection 20
Figure 4-5: MPTUtil Options 21
Figure 4-6: Interrupt Coalescing Values 24
Figure 8-1: AMC-8100 Front Panel Indicators 51

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

This page intentionally left blank.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

1 Overview

1.1 Introduction

AMC-8100 is an Advanced Mezzanine Card (AMC) that provides embedded system designers of MicroTCA or AdvancedTCA systems the flexibility to connect to an external Fibre Channel SAN or fabric. The use of Fibre Channel provides effective storage solution to larger robust storage. The AMC-8100 is a single-width mid-size module.

The AMC-8100 module provides 2 ports of Fibre Channel connectivity, operating at Fibre Channel speeds of 1G, 2G or 4G.

The AMC-8100 also includes a Module Management Controller (MMC) to support the required AMC management functions.

1.2 Features

The AMC-8100 is a single-width mid-size AMC Module with the following features:

- 2 Ports of 4Gb Fibre Channel (compatible with 2G and 1G)
  - Class 3 Arbitrated Loop (AL), Fabric, Point-to-Point
  - 2Kbyte frame payloads
  - Multiframe transmit and receive buffering
- General Advanced Mezzanine Card Features
  - PICMG AMC.0 R2.0 compliant
- Ejector switches for hot swap
- One blue hot swap LED
- Fibre Channel port speed and activity LED
- OOS LED

Refer to *Chapter 7: Specifications* for additional details regarding environmental, mechanical, power specifications, as well as reliability and compliance statements.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

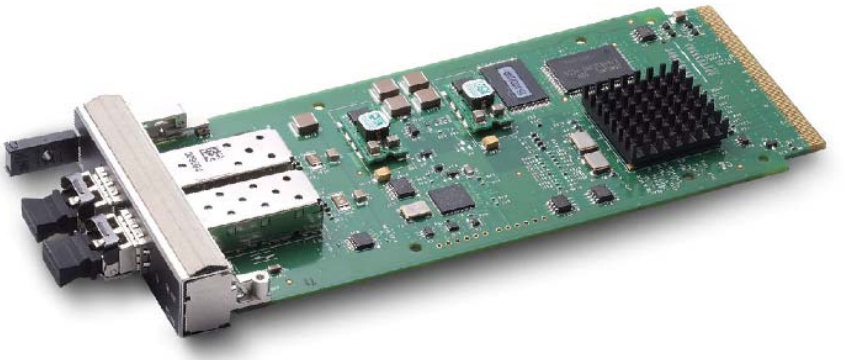


Figure 1-1: AMC-8100 Physical Overview

1.3 Hardware Configuration

The AMC-8100 is a PCI Express to Fibre Channel controller intended for an AdvancedTCA AMC carrier board or MicroTCA chassis/backplane/slot that are AMC.1 (PCI Express) compliant. It supports x1, x4, and x8 PCI Express lanes. It delivers 2 ports of Fibre Channel to the front panel via SFP's. Use of SFP's allows for additional media to be supported for the Fibre Channel ports.

1.4 Package Contents

The AMC-8100 is packaged with the following components. If any of the items on the contents list are missing or damaged, retain the shipping carton and packing material and contact the dealer for inspection. Please obtain authorization before returning any product to ADLINK.

- AMC-8100 AdvancedMC™ Dual Port Fibre Channel Controller
- User's manual

CAUTION:

This product must be protected from static discharge and physical shock. Never remove any of the components except at a static-free workstation. Use the anti-static bag shipped with the product when putting the board on a surface. Wear an anti-static wrist strap properly grounded on one of the system's ESD ground jacks when installing or servicing system components.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2 Installation

This chapter contains the procedures for installing and removing the AMC-8100 AMC module.

The AMC-8100 Module can be installed into a system enclosure or carrier board with a single-width mid-size Advanced Mezzanine card slot supporting PCI Express (x1, x4, or x8 lanes).

2.1 Important Information about Your Chassis

The AMC-8100 is designed to PICMG specifications and is a general-purpose Advanced Mezzanine Card. Before using this board, review the specifications of the chassis and backplane that will house the module to determine the presence of, and any limitations of, chassis, IPMI bus, and user defined pin outs. For example, some chassis backplanes route certain I/O pins to internal resources such as alarm cards and drive resources. The AMC-8100 is intended for an Advanced TCA AMC carrier board or MicroTCA chassis/backplanes/slots that are AMC.1 (PCI Express) compliant. It is your responsibility to verify this system compatibility. Failure to do so could result in improper operation or equipment damage.

2.2 Before Installing or Removing the AMC

Boards may be damaged if improperly installed or handled. Please read and follow the guidelines in this section to protect your equipment.

ESD Precautions

ADLINK strongly recommends that you use an antistatic wrist strap and a conductive foam pad when installing or upgrading a system. Electronic components, such as disk drives, computer boards, and memory modules, can be extremely sensitive to electrostatic discharge (ESD). After removing the component from its protective wrapper or from the system, place the component flat on a grounded, static-free surface (and, in the case of a board, component side up). Do not slide the component over any surface.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

If an ESD station is not available, you can avoid damage resulting from ESD by wearing an antistatic wrist strap (available at electronics stores) that is attached to an active electrical ground. Note that a system chassis may not be grounded if it is unplugged.

Bent Pins or Other Damage

Bent pins or loose components can cause damage to the board, the backplane, or other system components. Carefully inspect your board and the backplane for both pin and component integrity before installation. Our suppliers take significant steps to ensure there are no bent pins on the backplane or connector damage to the boards prior to leaving our factory. Bent pins caused by improper installation or by boards with damaged connectors could void the warranty for the backplane or boards.

If a system contains one or more crushed pins, power off the system and contact your local sales representative to schedule delivery of a replacement chassis assembly.

Caution Areas



When first installing boards in an empty chassis or onto a carrier board, we recommend that you start at the left of the card cage and work to the right.

When inserting or removing a board in a slot adjacent to other boards, use extra caution to avoid damage to the pins and components located on the primary or secondary sides of the boards.

Preserving EMI Compliance

To preserve compliance with applicable standards and regulations for electromagnetic interference (EMI), during operation all front and rear openings on the chassis or board faceplates must be filled with an appropriate card or covered with a filler panel. If the EMI barrier is open, devices may cause or be susceptible to excessive interference.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Understanding Hot Swap

Your AMC-8100 is electrically designed for hot swap within a fully powered chassis. To facilitate hot swap, there is a blue LED on the front faceplate. This LED is under software control.

If your system is using software that provides full hot swap capabilities, the software will illuminate the blue hot swap LED on the AMC faceplate when software has stopped and it is safe to remove the AMC module.

If your system does not have hot-swap aware software running, behavior of the blue LED is indeterminate. In this case, you may need to manually shut down applications or operating systems running on the board prior to board removal, even if the blue LED is lit.

Powering down or removing a board before the operating system or other software running on the board has been properly shut down may cause corruption of data or file systems.

2.3 Verify Slot Usage



Prevent possible damage to module components by verifying the proper slot usage for your configuration. In most cases, electronic keying (E-keying) will prevent powering on of a board installed in an incompatible slot. However, as an extra precaution, you should be familiar with the slot purpose.

2.4 Module Hot Swap

This section describes a recommended procedure for installing a board module in a chassis. The AMC-8100 module has a latching mechanism. The Latch Mechanism includes the module handle with an integrated multi-position shaft and micro-switch.

The module handle is held in place by the faceplate, while the micro-switch is mounted on the module printed circuit board. The module handle is used to activate the micro-switch, which allows for Hot Swap switch as well as for extracting the module out of the connector and the AMC bay.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

There are 3 positions of the Module Handle:

1. Pushed all the way in (IN) - When IN the module sends a signal to the Shelf Manager that the module is not in the Hot Swap state and the Shelf Manager will communicate with the MMC. This is the position that the Module Handle should be in during normal operation.
2. Half Way (HW) - When the Module Handle is in the HW position, the Hot Swap switch is open and the MMC will send a Hot Swap event to the Shelf manager.
3. Out (OUT) - When the Module Handle is in the OUT position the latching mechanism is released and the module can be extracted.

The use of the Module Handle is used in conjunction with the Blue LED. Please refer to the text below for more detailed instructions on insertion and extraction.

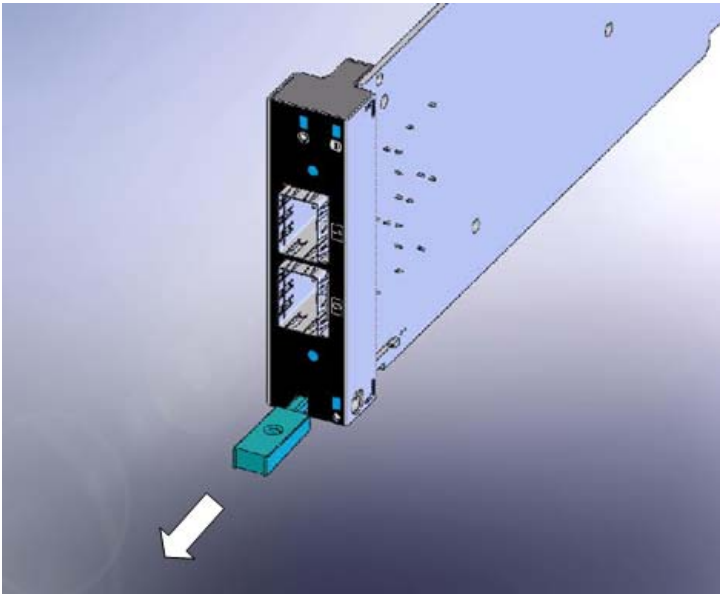


Figure 2-1: AMC Module Handle

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2.5 Installing the AMC-8100 Module

This section describes a recommended procedure for installing a board module in a chassis.

Before you install your module, please read all cautions, warnings, and instructions presented in this section.



Handling modules and peripherals can result in static damage. Use a grounded wrist strap, static-dissipating work surface, and antistatic containers when handling and storing components.

Insert the board by holding the Module Handle—do not exert unnecessary pressure on the faceplate.



Hot swap compliant modules may be installed while the system is powered on. If a module is not hot swap compliant (or the system does not support hot swap), you should remove power to the slot or system before installing the module.

1. Verify that you have taken the necessary antistatic precautions.
2. Pull the Module Handle to the OUT position on your board.
3. Verify the proper slot for the module you are inserting.
4. Align the edges of the module with the card cage rail guides in the appropriate slot or on the carrier board.
5. Using your thumbs, apply equal and steady pressure as necessary to carefully slide the module into the card cage rail guides (Stage 1). Continue to push gently until the fingers of the module snap into the internal AMC connector.
6. DO NOT FORCE THE BOARD INTO THE SLOT.
7. Push the Module Handle to the IN position.

Once power is applied to the module, the internal MMC controller runs a self-test that runs for approximately 10 seconds. Upon a successful power up self-test, the blue hot swap LED will blink and then turn off, indicating that the module has been placed in operation.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2.6 Removing the AMC Module

This section describes a recommended procedure for removing a board module from a chassis.



Before you remove your module, please read all cautions, warnings, and instructions presented in this section. Hot swap compliant modules may be removed while the system is powered on. If the chassis is not hot swap compliant, you should remove power to the slot or system before removing the module.

To remove the AMC module, follow these steps:

1. Begin to remove your module by pulling the Module Handle to the half way (HW) position. Do not remove the module immediately.
2. Powering down or removing a board before the operating system or other software running on the board has been properly shut down may cause corruption of data or file systems.
3. If your module is hot swap compliant and you are running fully functional hot swap-aware software, unlatching this ejector lever will start the shutdown process on the board. The software will slowly blink the blue hot swap LED indicating the module is in the process of being de-activated.
4. Once the module has been de-activated, the Blue LED will solidly illuminate. Once this is done you can extract the module by pulling on the module handle.
5. If your board or system is not running hot swap-aware software, the blue LED may illuminate without regard to software processes still running on the board. Be sure to manually shut down applications or operating systems running on the board prior to board removal.
6. Carefully pull the module from the chassis. If the card slot is to remain empty, install a filler panel in the slot.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3 Functional Description

This chapter provides a functional description of the major components and devices on the AMC-8100.

3.1 Overview

The ADLINK Technology AMC-8100 module provides two ports of 4G Fibre Channel. Each port is capable of 4G, 2G, or 1G data rates.. The PCI Express transmission and reception data rate is 2.5 Gbits/s in each direction, yielding a total bandwidth of 5.0 Gbits/s for each full-duplex lane. The ADLINK Technology AMC-8100 is implemented using one, four or eight PCI Express phys, which provide possible host-side maximum transmission and reception rates of up to 4.0 Gbytes/s.

The ADLINK AMC-8100 module contains Flash ROM for storing the BIOS and firmware. The LEDs on the module report a heartbeat and activity.

Features

- 2 Ports of 4Gb Fibre Channel (compatible with 2G and 1G)
- Class 3 Arbitrated Loop (AL), Fabric, Point-to-Point
- 2Kbyte frame payloads
- Multiframe transmit and receive buffering

PCI Express Features

The PCI Express features of the ADLINK AMC-8100 module include:

- Provides eight PCI Express PHYs
- Supports a single-PHY (1 lane) link transfer rate up to 2.5 Gbits/s in each direction
- Supports x8, x4, and x1 link widths
- Automatically downshifts to a x4 link width if plugged into a x4 connector or into a x8 connector that is wired as a x4 connector

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

- Provides a scalable interface
  - Single-lane aggregate bandwidth of up to 0.5 Gbytes/s (500 Mbytes/s)
  - Quad-lane aggregate bandwidth of up to 2.0 Gbytes/s (2000 Mbytes/s)
  - 8-lane aggregate bandwidth of up to 4.0 Gbytes/s (4000 Mbytes/s)
- Supports serial, point-to-point interconnections between devices
  - Reduces the electrical load of the connection
  - Enables higher transmission and reception frequencies
- Supports lane reversal and polarity inversion
- Supports PCI Express Hot Plug
- Supports Power Management
  - Supports PCI Power Management 1.2
  - Supports Active State Power Management (ASPM), including the L0, L0s, L1 states, by placing links in a power-savings mode during times of no link activity
- Contains a replay buffer that preserves a copy of the data for retransmission in case a CRC error occurs
- Supports the PCI Express Advanced Error Reporting capabilities
- Uses a packetized and layered architecture
- Achieves a high bandwidth per pin with low overhead and low latency
- PCI Express is software compatible with PCI and PCI-X software
  - Leverages existing PCI device drivers
  - Supports the Memory, I/O, and Configuration address spaces
  - Supports memory read/write transactions, I/O read/write transactions, and configuration read/write transactions
- Provides 4 Kbytes of PCI Configuration address space per device
- Supports posted and non-posted transactions

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

- Provides quality of service (QOS) link configuration and arbitration policies
- Supports Traffic Class 0 and one virtual channel
- Supports Message Signaled Interrupts (both MSI and MSI-X) as well as INTx interrupt signaling for legacy PCI support
- Supports end-to-end CRC (ECRC) and Advanced Error Reporting

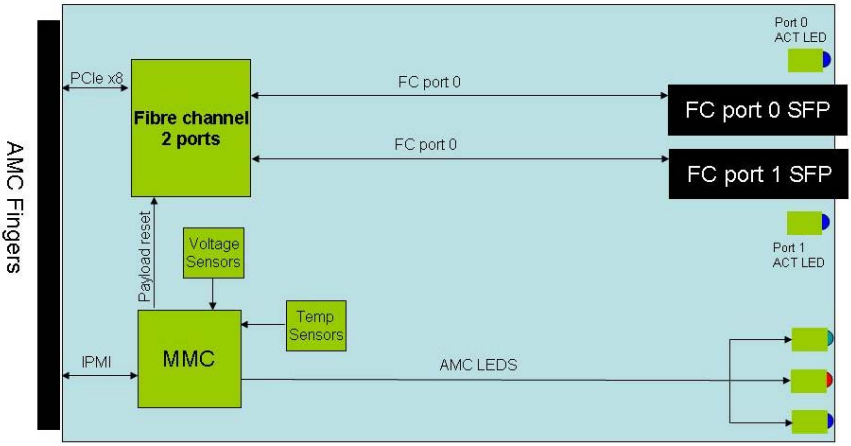


Figure 3-1: AMC-8100 Functional Block Diagram

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.2 Operating System Support

The ADLINK AMC-8100 module supports all major operating systems as shown below.

Operating System	Versions
Windows	XP, 2000, Server 2003, Vista
Red Hat Enterprise Linux (RHEL)	3, 4
SuSE Enterprise Server (SLES)	8, 9
Novel NetWare	5.1, 6.0
Sun Sparc Solaris	2.6, 2.7, 2.8, 2.9, 2.10
Solaris X86	10

Table 3-1: Supported Operating Systems

3.3 PCIe to Fibre Channel Host Adapter

The ADLINK AMC-8100 uses the LSIFC949E controller. The LSIFC949E controller connects two Fibre Channel Ports to a computer system through the PCI Express interface. The LSI controller is implemented using eight PCI Express PHYs. Each PHY operates at 2.5 Gbits/s which provide possible host-side maximum transmission and reception rates of up to 4.0 Gbytes/s. The LSIFC949E controller chip contains the PCI Express functionality for the ADLINK AMC-8100 module. The controller chip connects directly to the PCI Express bus and generates timing and protocol in compliance with the PCI Express specification.

The LSIFC949E controller chip also contains the Fibre Channel functionality for the ADLINK AMC-8100 module. The controller chips connect channels directly Fibre Channel devices through the 2 SFP's. The ADLINK AMC-8100 module contains a 2M x 8-bit Flash ROM for storing the BIOS and firmware.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3.4 Module Features

LEDs

The ADLINK AMC-8100 module has 5 LEDs. In addition to the AMC required Blue Hot Swap (HS) LED and the red Out Of Service (OOS) LED the ADLINK AMC-8100 module also has a heartbeat LED. This green led will blink when the LSIFC949E internal processor is running.

The other 2 LEDs are associated with each Fibre Channel port. These LEDs are tri-colored and are described in Figure 8-1: AMC-8100 Front Panel Indicators on Page 51.

Connectors

This section provides a description of the connectors on the ADLINK AMC-8100 module. See Figure 3-1: AMC-8100 Functional Block Diagram on Page 11 for connector locations.

AMC Fingers: The PCI Express interface has eight PCI Express phys, which provide possible host-side maximum transmission and reception rates of up to 4.0 Gbytes/s. The PCI Express connection is made through the AMC edge connector. The signal definitions and pin numbers conform to the AMC.0 and AMC.3 specifications.

SFP Cages: The ADLINK AMC-8100 module supports 2 ports of Fibre Channel connections through the SFP's on the front panel.

Physical Characteristics

The ADLINK AMC-8100 module board is 7.11 inches x 2.89 inches and conforms to the component height requirements of a compact size module. PCI Express x8 connection is made through the AMC edge fingers.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

This page intentionally left blank.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4 Fibre Channel Firmware Installation

This chapter provides information about installing and configuring the Fibre Channel (FC) firmware.

The ADLINK AMC FC host adapters are preloaded with firmware that presents a multiprotocol service layer based on the LSI Fusion-MPT architecture. The FC firmware provides FCP (SCSI-3 over FC) Initiator, FCP Target, and LAN interface services to the host system.

ADLINK qualifies all firmware prior to shipping. When updates are necessary, ADLINK releases new firmware to improve the functionality or performance of these host adapters. To inquire about firmware updates, contact ADLINK at support@adlinktech.com.

4.1 FC Firmware

This section includes the features, description, installation, and configuration of the FC firmware. The installation method varies depending on the operating system. ADLINK provides firmware installation tools for the Windows, Linux, and Solaris operating systems.

Features

The FC firmware for the LSI FC chips supports the following features:

- 1, 2, or 4 Gbit/s FC transfers, with AutoNegotiation (select 1 Gbit/s, 2 Gbit/s, 4 Gbit/s, or Auto)
- 64-bit/66 MHz host PCI bus and 133 MHz PCI-X bus, and x4/x8 PCI Express bus
- Transaction performance capability of > 160,000 I/Os per second (both channels)
- Throughput capability of ~800 Mbytes/s, across 64-bit/133 MHz PCI-X (both channels)
- Throughput capability of up to 2.5 Mbytes/s, across PCI Express (both channels)
- Low host CPU utilization
- Interrupt coalescing, tunable to system requirements

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

- Auto Topology Detection for Arbitrated Loop, Fabric Loop, or Direct Fabric attachment (user selects N_Port, NL_Port, or Auto)
- FC-Tape/FC-AL2 Class 3 confirmed delivery support
- Fusion-MPT common software interface
- Initiator and Target capability
- FC Class 3 connectionless service
- FC-PH compliance
- FC-AL 7.0 compliance
- FC-FCP, FC-PLDA compliance
- FC-FLA compliance
- FCA-IP, IETF-IPFC compliance
- NL_Port (Arbitrated Loop)
- N_Port (point-to-point)
- FL_Port (public loop attach)
- F_Port (Fabric attach)
- AutoNegotiation between link speeds under firmware control; provides automatic interoperability between 1 Gbit/s, 2 Gbit/s and 4 Gbit/s links (independent for each channel)
- AutoTopology Negotiation enables automatic interoperability of each port to the current port type

Downloading New FC Firmware

To begin, the user must first download new host adapter firmware component(s) from ADLINK. Please contact support@adlink-tech.com.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.2 Updating the FC Firmware

The process of updating the FC firmware varies slightly, depending on the operating system.

GUI Update Tool for Windows and Linux Platforms

With the MyStorage® management software installed on either Windows or Linux operating systems, you can use the MyStorage software from LSI to update the firmware. Users can download the MyStorage software from the LSI web site: www.lsi.com.

Refer to *MyStorage Management Software User's Guide* for detailed usage instructions.

Command Line Update Tool

Solaris, Linux, and Windows

LSI provides a FC Flash command line utility called LSIUtil to update LSI Based adapters with new firmware. The software is available for the Windows, Linux, and Solaris operating systems. This section provides the procedure for operating this program.

`FC949X.ROM`	LSI Firmware update
`MPTBIOS.ROM`	LSI Boot BIOS update
`LSI9x9f.ROM`	LSI Fcode update



The LSIUtil program will not operate properly unless an LSI OS driver is also installed.

Running the LSIUtil Program

The LSIUtil program may be used to update the LSI FC firmware of any 4 Gbit/s host adapter. Locate and copy the LSIUtil.exe program and the FC949X.ROM code files to a directory on your hard drive. To update the firmware, complete the following steps:

1. Ensure that the host adapter is properly installed in the system PCI/PCI-X or PCI Express slot.
2. Open a terminal window, and open the directory containing the LSIUtil program.
3. Execute the LSIUtil program.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4. Select a device to update (see figure below).

```
[root]# lsiutil

LSI Logic MPT Configuration Utility, Version 1.28, November 12,
2004

2 MPT Ports found

     Port Name          Chip Vendor/Type    MPT Rev  Firmware Rev
 1.  /proc/mpt/ioc0     LSI Logic FC949X      103      01000000
 2.  /proc/mpt/ioc1     LSI Logic FC949X      103      01000000

Select a device:  [1-2 or 0 to quit]
```

Figure 4-1: LSIUtil Device Selection

5. From the subsequent displayed list, select option menu 2 or 4 as shown (see figure below).

```
 1. Identify firmware, BIOS, and/or FCode
 2. Download firmware (update the FLASH)
 3. Upload firmware
 4. Download BIOS and/or FCode (update the FLASH)
 5. Upload BIOS and/or FCode
 6. Download SEEPROM
 7. Upload SEEPROM
 8. Scan for devices
 9. Read/change configuration pages
10. Change IOC settings (interrupt coalescing)
13. Change FC Port settings
14. Change (enable/disable) multi-pathing
15. Change persistent mappings
16. Display logged-in devices
17. Show port aliases
19. Test configuration page actions
20. Diagnostics
21. RAID actions
22. Reset bus
23. Reset target
80. Set port offline
81. Set port online
94. Send GID_FT
95. Send GA_NXT
96. Send ELS
97. Reset FC link, Maintain Logins
98. Reset FC link
99. Reset port

Select an option:  [1-99 or 0 to quit]
```

Figure 4-2: LSIUtil Download Options

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

6. When prompted, type the firmware file name.
7. Type Yes, when asked to continue (see figure below).

```
Enter firmware filename: FC949X.ROM
Do you want to continue?  [Yes or No, default is No] Y

Downloading image...
Download succeeded
```

Figure 4-3: LSIUtil File Download

The update process requires about 20–30 seconds. Upon completion, the system should display this message: download succeeded.

8. Reset the adapter using option **99**, or reboot to begin running the new firmware.
9. Enter **0** to quit the program.

Command Line Update Tool for DOS

Using a DOS bootable floppy, users can use a FC Flash Utility called MPTUtil to update LSI adapters with new firmware (see Downloading New FC Firmware on page 16). This section provides the procedure for operating this program.


NOTE:

The MPTUtil program will not operate properly from a windows command window. It must be run from a DOS floppy.

Running the MPTUtil Program

Use the MPTUtil program to update the FC firmware on any 4 Gbit/s host adapter. Locate the MPTUtil.exe program and FC949X.ROM code on your distribution media, as well as the DOS4GW.exe file. Copy these files to a blank, formatted diskette. Label it “FC Firmware diskette.”

To update the firmware, complete the following steps:

1. Ensure that the host adapter is properly installed in the system PCI slot.
2. Insert the LSI FC firmware diskette into drive A:.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

3. Boot the system to the DOS prompt A:\>.
4. Execute the MPTUtil program directly from the DOS command line by typing at the prompt:

   A:\ MPTutil

   The MPTUtil program identifies all LSI based host adapters in the system, and allows you to select which adapter to update (see figure below).

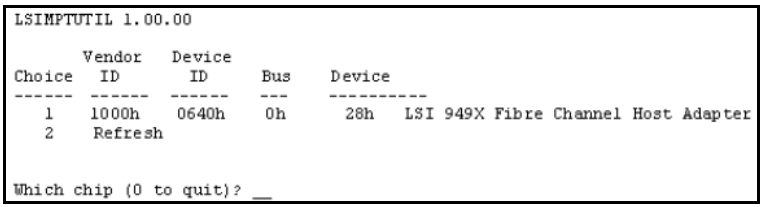


Figure 4-4: MPTUtil Device Selection

5. The MPTUtil program displays a menu of options (see figure below). To update the firmware, select option **a - Update Firmware**.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

```
LSI Logic Corp. FC/SAS Serial EEPROM / FLASH Utility.
LSIMPTUTIL 1.00.00
Copyright (c) 2005 LSI Logic Corporation. All rights reserved.
 ****************************************************************

          Currents           Port 0                Port1
       World Wide P/N... 0x100000062B092438    0x10000062B092439
       World Wide N/N... 0x200000062B092438    0x20000062B092439
       Topology......... AUTO
       Speed............ AUTO
       Device Pathing... All Paths to a device
       Protocol Support. INIT TARG LAN

       Firmware: LSIFC949X 1.00.00 (2005.01.30)
 ****************************************************************

       a - Update Firmware
       b - Update BIOS & FCode

       c - Upload current firmware to a file
       d - Upload current BIOS to a file

       f - Toggle Board Speed on Function 0
       g - Toggle Board Speed on Function 1
       h - Toggle Topologies on Function 0
       i - Toggle Topologies on Function 1

       l - Change Interrupt Coalescing Values on Port 0
       m - Change Interrupt Coalescing Values on Port 1

       x - Erase BIOS
       y - Change Protocol Support
       z - Change Adapters
       q - Quit


 Selection:
```

Figure 4-5: MPTUtil Options

6. When prompted, type the filename of the BIOS/Fcode update. The update process will commence, and will complete in about 20–30 seconds.
7. Exit the MPTUtil utility using the menu option **`q - Quit`**.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

4.3 Advanced User Settings

Adjusting Default Firmware Settings

Occasionally, a user may find it necessary to adjust default firmware parameters set by ADLINK during the original manufacturing process. Adjustments to these parameters will affect future behavior of the host adapters, and should be reserved for advanced users who fully understand the implications of such changes.

The firmware supports several configuration options, defined individually in “Adjusting Link Speed” and “Adjusting Interrupt Coalescing” below. These options may be configured using the MPTUtil utility menu, as described in Command Line Update Tool for DOS on page 19.

Adjusting Link Speed

The link speed of the host adapter is configurable. By default, the link speed is set to Auto. This means the host adapter automatically detects the link speed of all other nodes on the link and automatically adjusts itself to work with those nodes. If this automatic operation fails (for example, other nodes on a loop do not support AutoNegotiation), the host adapter may be configured specifically to either the 4 Gbit/s, 2 Gbit/s, or 1 Gbit/s speed..


NOTE:

The link speed must be configured for each port.

Configure the link speed of the host adapter by following these steps:

1. To set the link speed of the host adapter, execute this command from DOS:

   ```
   A:\ MPTutil
   ```

   The MPTUtil program identifies all LSI host adapters in the system, and allows you to select which adapter to update (Figure 4-4: MPTUtil Device Selection on page 20).

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2. The MPTUtil program displays a menu of options. (Figure 4-5: MPTUtil Options on page 21). To change the link speed on the AMC55 Port 0 Lower port, select the following menu options:

   `f – Toggle Board Speed on Function 0`

   Successively pressing the ‘f’ key will toggle the PORT speed setting between these four modes:

   - AUTO
   - 1 Gbit/s
   - 2 Gbit/s
   - 4 Gbit/s

   To change the link speed on the AMC-8100 Port 1 (upper port from PCI), select the following menu options:

   `g – Toggle Board Speed on Function 1`

   Successively pressing the ‘g’ key will toggle the PORT speed setting between these four modes:

   - AUTO
   - 1 Gbit/s
   - 2 Gbit/s
   - 4 Gbit/s

3. Exit the FCUtil utility using the menu option **`q - Quit`**.

Adjusting Interrupt Coalescing

The host adapters can complete multiple I/O requests per host interrupt. Interrupt coalescing is used to reduce CPU interrupts by pooling multiple disk command completions (I/O) into one interrupt. This feature may be enabled or disabled.

Important: LSI has performed significant testing under multiple I/O conditions, and has determined that interrupt coalescing can be very valuable for small transfer lengths or random, transaction-oriented I/O workloads. For this type of workload, LSI recommends that the Interrupt Coalescing values be set to a queue

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

depth of 9, with a timeout of 1280 (0x500) µs. This means that the host is interrupted only once for 9 I/Os processed by the chip, unless 1280 µs have passed since the host was last interrupted. If the workload is of a large transfer length and sequential, LSI recommends that interrupt coalescing be disabled, to prevent performance degradation.



The AMC-8100 has two FC ports so Interrupt Coalescing must be configured for each port.

Use the following procedure to adjust Interrupt Coalescing depth and timeout values:

1. To set the link speed of the host adapter, execute this command from DOS:

   A:\ MPTutil

   The MPTUtil program identifies all LSI host adapters in the system, and allows you to select which adapter to update. (Figure 4-4: MPTUtil Device Selection on page 20).

2. The MPTUtil program displays a menu of options (Figure 4-5: MPTUtil Options on page 21). To change Interrupt Coalescing on the AMC-8100 Port 0, select the following menu option:

   1- Change Interrupt Coalescing Values on Port 0

   The current values are displayed within a submenu, which allows the values to be changed (see figure below).

```
--- IOC Page 1 ---
1) Flags ................. 0x0001
2) Coalescing Timeout ... 0x500
3) Coalescing Depth ..... 0x9
```

Figure 4-6: Interrupt Coalescing Values

Flags

By default, the host adapter has Interrupt Coalescing enabled, as indicated by the Flags value of 0x0001. If Interrupt Coalescing needs to be disabled, enter a value of 0x0000 for Flags.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Interrupt Coalescing should only be disabled to resolve issues in unique system configurations. Consult with ADLINK Support to verify the need to disable Interrupt Coalescing for specific system configurations. When enabled, two parameters are relevant for interrupt coalescing.

Coalescing Depth

Specifies the number of I/O that must complete before a host interrupt is generated. For example, if set to 4, then the adapter will wait until 4 I/O complete before notifying the host CPU via the interrupt mechanism. You can decrease this value to improve system performance if the system contains lower performance servers and/or peripherals.

Coalescing Timeout

This is fail-safe time period that specifies the maximum amount of time (in milliseconds) to interrupt regardless of Coalescing depth.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

This page intentionally left blank.

Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5 BIOS Features

This chapter describes the Fibre Channel Boot BIOS Configuration Utility, the OpenBoot BIOS, and the EFI Boot Services Driver.

A BIOS is the ROM code that the system loads to facilitate booting from FC drives. The BIOS also contains an embedded configuration manager, with which you configure options provided by the firmware. The LSI BIOS integrates with a standard system BIOS, extending the standard disk service routine provided through INT13h.

Three types of BIOS are available for the LSI host adapters:

- LSI FC boot BIOS for Intel/AMD-based platforms
- LSI FC OpenBoot BIOS for Solaris SPARC platforms
- LSI FC Extensible Firmware Interface (EFI) BIOS for EFI-compliant systems

All of the LSI BIOS images are stored on the FC host adapter boards.

5.1 LSI Boot BIOS

This section provides the features, description, and installation procedure of the LSI FC boot BIOS.

5.1.1 LSI Boot BIOS Features

The LSI FC boot BIOS supports:

- Selection and configuration for up to 256 adapters
- Boot device selection from any four host adapters
- Automatic INT13 drive mapping for FC drives

5.1.2 BIOS Overview

If Boot is enabled, the boot BIOS will scan for FC hard disks connected to the FC host adapter. All discovered disks are enumerated with drive letters and appended to a master list of disks discovered on the host. Upon scan completion, the host will serially inspect the master list of disks beginning with drive letter A:, and attempt to boot from the first device it finds with a boot record. If boot from FC is desired, the user may elect to remove or disable

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

IDE drives, as these tend to get lower drive letter assignments than FC devices.


NOTE:

The Boot feature is disabled by default on all host adapters shipped from ADLINK.

5.1.3 LSI BIOS Boot Specification (BBS)

The LSI BIOS provides support for the BIOS Boot Specification (BBS), which allows you to choose which device to boot from by selecting the priority.

To use this feature, the system BIOS also must be compatible with the BBS. If your system supports the BBS, then use the system BIOS setup menu to select the boot and drive order. In the system BIOS setup, the Boot Connection Devices menu appears with a list of available boot options. Use that menu to select the device and rearrange the order. Then exit to continue the boot process.

5.2 Starting the LSI Boot BIOS Configuration Utility

The LSI boot BIOS allows you to change the default configuration of your host adapters, using the embedded BIOS Configuration Utility (CU). When the BIOS loads, the following message appears on your monitor:

```
Press Ctrl-C to start LSI Configuration Utility...
```

This message remains on your screen for about 5 seconds, giving you time to start the utility. After you press CTRL+C, the message changes to:

```
Please wait, invoking LSI Configuration Utility...
```

After a brief pause, your computer monitor displays the Main menu of the BIOS Configuration Utility.


NOTE:

Not all devices detected by the Configuration Utility can be controlled by the BIOS. Devices such as tape drives and scanners require loading a device driver specific to that peripheral. The BIOS Configuration Utility allows parameters to be modified for these devices.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5.3 Using the LSI Boot BIOS Configuration Utility

This section provides the menu formats and user inputs available to inform users about the boot BIOS Configuration Utility prior to running it. All BIOS Configuration Utility screens that display various menus are partitioned into fixed areas. This area provides static general help text information.

5.3.1 Main Menu

When you invoke the LSI boot BIOS Configuration Utility, the Main menu appears. This screen displays a scrolling list of up to 256 host adapters in the system and information about each of them.

Use the arrow keys to highlight a host adapter. Then press ENTER to view and modify the selected host adapter properties (and to gain access to the attached devices). After selecting an adapter and pressing Enter, the FC Link bus is scanned and the Adapter Properties screen appears.

On the Main menu, two selections are the Boot Adapter List and Global Properties menus.

Boot Adapter List allows selection and ordering of boot adapters. Refer to “Boot Adapter List Menu” below for details.

Global Properties allows changes to global scope settings. Refer to “Global Properties Menu” below for details.

Only host adapters with LSI Control enabled can be accessed.

5.3.2 Adapter Properties Menu

The Adapter Properties menu allows you to view and modify adapter settings. It also provides access to the device settings of a host adapter.

To display this menu, select a device under the Adapter field on the Main menu and press ENTER.

5.3.3 Persistent ID Menu

You can use the Persistent ID menu simply to review the automatic mapping between a drive World Wide Name (WWN) and its

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

assigned logical SCSI bus and Target ID. The screen also can force a drive to a specific logical Target ID.

Selecting **Add WWN** at an unused location clears out the associated WWN/DID field and allows you to enter the first 16 characters of the WWN. Pressing ENTER afterwards allows the last 16 characters to be entered. The Configuration Utility automatically adds any leading zeros, if necessary. If an entry was put in by mistake, selecting **Erase** on the appropriate line removes the entry.

Logical ID selection defaults to be the lowest ID available. This can be changed by using the <+> or <-> keys to cycle the numbers. The Bus field always defaults to 0 and cannot be changed. It is displayed whenever an outside utility had reserved a different number.

The Next Page and Previous Page options are provided on the persistent ID screens through the F2 key, which moves the screen forward or back by 16 entries. However, the CU requires storing any modifications to the current page before new entries may be viewed or modified. A pop-up confirmation window asks to store or discard changes, if needed.

5.3.4 Device Properties Menu

The Device Properties menu allows you to view and update individual device settings for an adapter..


NOTE:

The number of fields on the menu requires that you scroll left/right to view all the information. When accessing this menu, use the Home/End keys to scroll to columns currently not displayed. The scroll indicator on the bottom of the menu shows the position of the cursor relative to the first and last columns.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5.3.5 Boot Adapter List Menu

The Boot Adapter List menu specifies the order in which adapters boot when more than one host adapter is in a system. Up to four adapters in a system can be selected as bootable. Only one of the four bootable adapters can control a Boot Volume.

To select this menu:

1. Press F2 while on the Main menu to move the cursor to the menu area.
2. Move the cursor to Boot Adapter List with the arrow keys.
3. Press ENTER.

Adapters can be added or deleted using this menu. To add an adapter to the boot list, press the INSERT key while on the Boot Adapter List. Use the arrow keys to select the desired adapter, and press ENTER to add it to the end of the Boot Adapter List.

To remove an adapter from the boot list, press the DELETE key while the desired adapter is selected in the Boot Adapter List. You can also change the boot order by using the “+” or “-” keys. For example, place the cursor on the adapter that you want to change, and use the “+” or “-” key to raise or lower the boot order, respectively.

5.3.6 Global Properties Menu

The Global Properties menu allows you to pause if an alert message has been displayed, to view display boot information, and to set display and video modes.

5.3.7 Exiting the LSI Boot BIOS Configuration Utility

The Exit menu for the LSI boot BIOS configuration utility is used for all six of the menus listed in Main Menu above.

However, the available functionality is different for the Main menu and the five subordinate menus.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

To exit from the Adapter Properties, Persistent ID, Device Properties, Boot Adapter List, or Global Properties menus, use the following exit options:

Cancel exit	Returns you to the previous menu.
Save changes then exit this menu	Implements any changes you made on the previous menu and returns you to the Main menu.
Discard changes then exit this menu	Restores the default settings and returns you to the Main menu.

To exit from the Main menu, use the following exit options:

Cancel exit	Returns you to the Main menu.
Exit the Configuration Utility	Exits the configuration and automatically reboots your system.


NOTE:

If you reboot the system without properly exiting from this utility, some changes may not take effect.

5.4 Troubleshooting

The LSI boot BIOS Configuration Utility is a powerful tool. If you disable all of your controllers while using it, pressing CTRL-A or CTRL-E after memory initialization during reboot. This allows you to re-enable and reconfigure.

The following messages may appear during the boot process:

```
Adapter removed from boot order, parameters will be
updated accordingly!
```

Appears when an adapter is removed from the system or is relocated behind a PCI bridge. This message is for information only, and no further user action is required.

```
Configuration data invalid, saving default configuration!
```

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Appears if none of the information in nonvolatile random access memory (NVRAM) is valid. This message is for information only, and can occur when the BIOS is upgraded, or when some external event has rendered the NVRAM temporarily unreadable.

```
Found FC Controller not in following Boot Order List, to
Add: Press Ctrl-C to start LSI Configuration Utility...
```

Appears when fewer than four adapters are in the boot order, and adapters exist in the system that are not in the boot order. This message is for information only, and indicates that more than four adapters exist in the system. The additional adapters are not managed by the Configuration Utility.

5.5 OpenBoot BIOS

LSI Solaris-capable, Fusion-MPT host adapters have Fcode resident on board, allowing operation under the Sun Microsystems OpenBoot console. All basic functionality is available in an OpenBoot environment, including the ability to display devices connected to the adapter, and to boot devices on the adapter.

5.5.1 OpenBoot BIOS Features

The LSI FC OpenBoot BIOS supports the following:

- Solaris SPARC Open Firmware environments, version 2.6 or later
- Root Boot device selection from any target device
- Standard command line interface, with help query
- Configuration options and selection capability for each host adapter

5.5.2 Identifying the FC Devices

The **probe-scsi-all** command identifies the FC devices on your Fusion-MPT adapter.

To show all disks available from the OpenBoot prompt, use the **probe-scsi-all** command. Note that this command is used regardless of whether the disks are FC or SCSI. All disks available on all Fusion-MPT devices are displayed.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

The following example shows the kind of information that is displayed when you enter this command.

```
ok probe-scsi-all

/pci@8,600000/SUNW,qlc@4

LiD HA LUN ---Port WWN--- ----Disk description----

1 1 0 2100002037e4d65b SEAGATE ST318304FSUN18G 0726

/pci@8,700000/IntraServer-Ultra160,scsi@3,1
/pci@8,700000/IntraServer-Ultra160,scsi@3

Target 0
   Unit 0 Disk IBM DDRS-34560D DC1B

/pci@8,700000/IntraServer,fc@2

MPT Version 1.00, Firmware Version 1.02.00

Target 0
   Unit 0 Disk SEAGATE ST39173FC 6615
   WWN 2100002037109d76 Port ID d9

Target 1
   Unit 0 Disk SEAGATE ST39173FC 6258
   WWN 210000203710565a Port ID 17

Target 2
   Unit 0 Disk SEAGATE ST39173FC 6258
   WWN 2100002037105212 Port ID 1

Target 3
   Unit 0 Disk SEAGATE ST39173FC 6258
   WWN 2100002037103da8 Port ID 26

Target 4
   Unit 0 Disk SEAGATE ST39173FC 6258
   WWN 210000203710324a Port ID 73

/pci@8,700000/scsi@6

Target 6
   Unit 0 Removable Read Only device PLEXTOR CD-ROM
PX-20TS
```

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

If the FC devices on your IntraServer adapter are not identified by your system, check the following:

- Is the FC enclosure powered ON?
- Does the LED on the adapter indicate Link? (Note that Link is valid only after the device is probed.)
- Does the LED on the switch or remote enclosure indicate Link?
- Does the Link-SPEED parameter selected by the adapter match that of the bus (1G, 2G, or Auto)?

If you do not see disks, the following additional debug information may help to identify the problem.

5.5.3 Verifying Installation

Use the following procedure to verify installation of your Fusion-MPT adapter in the system:

1. Power-up the system.
2. When the banner is displayed, press the Stop-A keys to interrupt the boot process and stop at the ok prompt.
3. Use the show-devs command to list the system devices. You should see an output similar to the following:

```
ok show-devs

/SUNW,UltraSPARC-III@0,0
/virtual-memory
/memory@m0,0
/aliases
/options
/openprom
/chosen
/packages
/upa@8,480000/SUNW,ffb@0,0
...
/pci@8,700000/IntraServer,fc@2
/pci@8,700000/IntraServer,fc@1,1
/pci@8,700000/IntraServer,fc@1
/pci@8,700000/IntraServer,fc@2/disk
/pci@8,700000/IntraServer,fc@2/tape
```

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

```
/pci@8,700000/IntraServer,fc@1,1/disk
/pci@8,700000/IntraServer,fc@1,1/tape
/pci@8,700000/IntraServer,fc@1/disk
/pci@8,700000/IntraServer,fc@1/tape
/pci@8,700000/scsi@6,1/tape
/pci@8,700000/scsi@6,1/disk

ok
```

- `/pci@8,700000/IntraServer,fc@1` identifies the first FC interface on an LSIFC949X/949E-based adapter.
- `/pci@8,700000/IntraServer,fc@1,1` identifies the second FC interface on an LSIFC949X/949E-based adapter.


NOTE:

The above listing is an example. The **show-devs** output may vary depending on your system and configuration. Use the corresponding entries on your system, not the ones given here.

If these devices are not listed, check to assure that the adapter is correctly installed, and reseat the adapter in the PCI slot if necessary.

5.5.4 Adapter-Specific Settings

In certain circumstances, advanced users may want to change settings for an individual adapter or port, without affecting the other adapters in the system. Specific examples of such settings are FC bus speed, host adapter ID (SCSI only: Not Applicable to FC), and Interrupt Coalescing.

To select a specific Fusion-MPT adapter as the current adapter, use the **select** command. Selecting a port or adapter brings the port online and allows you to show or set certain adapter specific parameters.

You should use caution while issuing the following commands because some commands (such as forcing 1 Gbit/s operation on a 2 Gbit/s FC loop) could render the bus unusable.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

select Command

Use the **select** OpenBoot command to choose the adapter entry. This opens the port to bring the port online.

```
ok select /pci@8,700000/IntraServer,fc@1
```

.properties Command

Use the **.properties** command to show the adapter properties.

```
ok .properties

firmware-version 1.02.00
mpt-version     1.00
scsi-initiator-id00 00 00 0f
assigned-addresses81001010 00000000 00000700 00000000
00000100
83001014 00000000 001a0000 00000000 00020000
8300101c 00000000 00190000 00000000 00010000
82001030 00000000 02000000 00000000 00100000
compatible      70 63 69 31 33 65 39 2c 36 32 31 00 70 63
69 31
model                LSI,949
reg                  00001000 00000000 00000000 00000000
00000000
01001010 00000000 00000000 00000000 00000100
03001014 00000000 00000000 00000000 00020000
0300101c 00000000 00000000 00000000 00010000
02001030 00000000 00000000 00000000 00100000
version         1.00.16
device_type     scsi-2
name                 IntraServer,fc
fcode-rom-offset 00000000
66mhz-capable
devsel-speed    00000001
class-code      00010000
interrupts      00000001
latency-timer 00000040
cache-line-size 00000010
max-latency     00000008
min-grant       0000001e
subsystem-id    00000621
subsystem-vendor-id 000013e9
revision-id     00000001
device-id       00000621
vendor-id       00001000
```

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

show-children Command

While you have the host adapter or port selected, use the **show-children** command to display the devices currently connected to this adapter.

First, select the port or adapter shown (use the port name your system assigns):

```
ok select /pci@8,700000/IntraServer,fc@1

ok show-children

MPT Version 1.00, Firmware Version 1.02.00

Link is ready, port is online
   WWN 100000a0b8040353 Port ID ef

Target 0
   Unit 0 Disk SEAGATE ST39173FC 6615
   WWN 2100002037109d76 Port ID d9

Target 1
   Unit 0 Disk SEAGATE ST39173FC 6258
   WWN 210000203710565a Port ID 17

Target 2
   Unit 0 Disk SEAGATE ST39173FC 6258
   WWN 2100002037105212 Port ID 1

Target 3
   Unit 0 Disk SEAGATE ST39173FC 6258
   WWN 2100002037103da8 Port ID 26

Target 4
   Unit 0 Disk SEAGATE ST39173FC 6258
   WWN 210000203710324a Port ID 73
```

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5.5.5 Interrupt Coalescing

The LSI host adapters can complete multiple I/O requests per host interrupt. Interrupt coalescing is used to reduce CPU interrupts by pooling multiple disk command completions (I/O) into one interrupt. This feature may be enabled or disabled.

LSI has performed significant testing under multiple I/O conditions, and has determined that interrupt coalescing can be very valuable for small transfer lengths or random, transaction-oriented I/O workloads. For this type of workload, LSI recommends that the Interrupt Coalescing values be set to a queue depth of 9, with a timeout of 1280 µs (0x500). This means that the host is interrupted only once for 9 I/Os processed by the chip, unless 1280 µs have passed since the host was last interrupted. If the workload is of a large transfer length and sequential, LSI recommends that interrupt coalescing be disabled, to prevent performance degradation.

Although LSI has determined that these settings are optimal for a wide variety of situations, your own I/O load may benefit from a deeper queue or a longer timeout. LSI provides a mechanism to modify these values and write them to the nonvolatile EEPROM on the adapter.

Select the port or adapter shown (use the port name your system assigns):

```
ok select /pci@8,700000/IntraServer,fc@1
```

Then enter commands as shown in the following example:

```
ok show-interrupt-coalescing

Interrupt coalescing timeout is 500 (1280 decimal)
microseconds
Interrupt coalescing depth is 9 (9 decimal)

ok set-interrupt-coalescing
```


NOTE:

The OpenBoot BIOS provides help when you enter a command that does contain the proper arguments. In this case, OpenBoot responds with:

```
usage is <timeout><depth> set-interrupt-coalescing
```

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

```
ok 100 8 set-interrupt-coalescing

Interrupt coalescing timeout selected is 100 (256
decimal) microseconds
Interrupt coalescing depth selected is 8 (8 decimal)
Interrupt coalescing has been set
Change will take effect after system reset
```


NOTE:

The system must be power cycled before the changes take effect. It is not sufficient to execute the reset-all command.

5.5.6 Set FC Link Speed

There are three modes of operation for FC: 1 Gbit/s, 2 Gbit/s, and 4 Gbit/s. It is important to match the speed of the port with the speed of the loop or fabric to which the port is attached.

LSI has implemented AutoNegotiation on the 2 Gbit/s-capable, Fusion-MPT devices. If you are experiencing difficulty with the AutoNegotiate algorithm on your fabric or loop, or if you wish to set or show the link speed for the adapter manually, use the following procedure:

Select the port or adapter shown (use the port name your system assigns):

```
ok select /pci@8,700000/IntraServer,fc@1
```

Then enter commands as shown in the following example:

```
ok show-link-speed

Link speed selected is 1 Gbaud
Current link speed is 1 Gbaud

ok set-link-speed
```


NOTE:

The OpenBoot BIOS provides help when you enter a command that does contain the proper arguments. In this case, OpenBoot responds with:

```
usage is <link-speed> set-link-speed
```

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

```
ok a set-link-speed

Link speed selected is autobaud
Link speed has been set
Change will take effect after system power cycle

ok show-link-speed

Link speed selected is autobaud
Current link speed is 1 Gbaud
```

NOTE: The system must be power-cycled before the changes take effect. It is not sufficient to execute the reset-all command.

5.5.7 Persistent Device Naming

One of the most powerful benefits of storage area networks (SANs) is scalability; the freedom to quickly add or delete storage components. To facilitate trouble-free SAN reconfigurations, the user can save a list of devices currently connected to the host adapter. Later, if certain devices are powered off, the adapter will ensure the remaining devices appear at the same mount point. Technically, the LSI host adapter will “lock” the association of an FC target with an alias name reference. The LSI host adapter manages the details. When the user marks a device persistent, mapping information is saved on the LSI host adapter in a nonvolatile memory device.

The following is an example of how to save devices in the persistent device table using LSI Fcode:

1. Select the controller you want to modify, making a selection from the list as shown below:

```
ok show-disks
a) /pci@1f,0/pci@1/IntraServer,fc@2/disk
b) /pci@1f,0/pci@1/IntraServer,Ultra2-scsi@1/disk
c) /pci@1f,0/pci@1,1/ide@3/cdrom
d) /pci@1f,0/pci@1,1/ide@3/disk
e) /pci@1f,0/pci@1,1/ebus@1/fdthree@14,3203f0
q) NO SELECTION
Enter Selection, q to quit: a
```

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

2. From the displayed list, select a device to mark persistent as shown below:

```
/pci@1f,0/pci@1/IntraServer,fc@2/disk has been selected.

ok select /pci@1f,0/pci@1/IntraServer,fc@2
ok show-children
MPT Firmware Version 1.00
Target 0
Unit 0 Disk SEAGATE ST39173FC 6615
WWN 200000203710c4e8 PortID a3
```

3. Type CTRL-Y to insert disk name in the command line as shown below:

```
ok set-persistent
usage is <current-target-id> <persistent-target-id> set-persistent
```

NOTE: The OpenBoot BIOS (Fcode) provides help when you enter a command that does contain the proper arguments. In this case, OpenBoot responds with usage syntax.

Setting Device 0 as Persistent

```
ok 0 0 set-persistent
ok show-persistent
Entry 1 WWN 200000203710c4e8 Target 0
```

NOTE: The command sequence above records an entry for device 0, as item 0 in the persistent device list.

Clearing Persistent Device Map

```
ok 1 clear-persistent
Entry 1 has been cleared
ok show-persistent
ok
```

NOTE: The command sequence above may be used to clear an entry in the persistent device map.

Entry 1 has been deleted from the table, and the table is now empty.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5.5.8 Manual Selection of FC Topology

Under certain configurations, it may be desired to force the selection of FC topology and disable the auto detect mechanism in the FC adapter. This can be done on a port-by-port basis by using the following procedure.



It should not be necessary to change from automatic detection of topology. Also, firmware version 1.00.03 is the earliest version to support this functionality.

The following is an example of how to select a manual topology N_Port or NL_Port on a selected FC port.

Select the controller you want to modify, as follows:

```
ok show-disks

a) /pci@1f,0/pci@1/IntraServer,fc@2/disk
b) /pci@1f,0/pci@1/IntraServer,Ultra2-scsi@1/disk
c) /pci@1f,0/pci@1,1/ide@3/cdrom
d) /pci@1f,0/pci@1,1/ide@3/disk
e) /pci@1f,0/pci@1,1/ebus@1/fdthree@14,3203f0
q) NO SELECTION

Enter Selection, q to quit: a
/pci@1f,0/pci@1/IntraServer,fc@2/disk has been selected.

Type ^Y ( Control-Y ) to insert it in the command line.
e.g. ok nvalias mydev ^Y for creating devalias mydev for
/pci@1f,0/pci@1/IntraServer,fc@2/disk

ok select /pci@1f,0/pci@1/IntraServer,fc@2
```

Then enter commands as shown in the following example:

```
ok show-topology

Topology selected is auto
Current topology is unknown (no link)

ok set-topology <-Command with no options provides help

usage is <topology> set-topology
```

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

```
topology = 1 NL_Port
topology = 2 N_Port
topology = a auto

ok 1 set-topology

Topology selected is NL_Port
Topology has been set
Change will take effect after system power cycle

ok 2 set-topology

Topology selected is N_Port
Topology has been set

Change will take effect after system power cycle

ok a set-topology

Topology selected is auto
Topology has been set
Change will take effect after system power cycle
```



NOTE:

The system must be power-cycled before the changes take effect. It is not sufficient to execute the **reset-all** command.

5.6 EFI Boot Services Driver (BSD)

This section provides the features, description, and installation of the LSI FC EFI Boot Services Driver.

5.6.1 EFI BSD Features

The LSI FC EFI Boot Services Driver provides BIOS and Configuration services for systems that use an EFI system BIOS, such as an Intel Itanium processor system, or Apple Intel-based platforms. The BSD provides:

- Selection and configuration for all installed FC adapters
- Automatic drive mapping for a maximum of 8 logical buses and 128 FC drives per bus
- Boot device selection from one of 128 FC drives/volumes (limited to the first logical bus)

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5.6.2 EFI BSD Overview

The EFI BSD will scan for FC Hard disks connected to the FC host adapter. All discovered FC disks are appended to a master list of disks discovered on the host. Upon scan completion, and if boot from FC is enabled, the host will read each FC drive starting at bus 0, drive 0 and attempt to boot from the first FC device it finds with a boot record.

Several key inputs are listed in Table 2. For more detail, refer to Chapter 8 of the *LSI Fusion-MPT Device Management User's Guide*.

General Input Keys

Key	Definition	Description
F1 (Shift+1)	Help	Displays context sensitive help for the field in which the cursor is positioned.
F2 (Shift+2)	Menu	Moves the cursor to the menu selection area, where you can highlight a menu item and press Enter to select it.
Arrow Keys (H,J,K,L)	Select Item	Up, down, left, right movement to position the cursor.
Home (I) End (O)	Select Item	
+/-	Change Item	Items with values in [ ] brackets are modifiable. Use the numeric keypad '+' and '-' keys to change a modifiable field to its next relative value.
Esc	Abort/Exit	Aborts the current context operation and/ or exits the current menu. The user is asked to confirm, if changes have been made.
Enter	Execute <Item>	Executable items are indicated by highlighted text and a different background color. Press Enter to execute the field's associated function. Selections that are not currently permissible are grayed out.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

5.6.3 Starting the EFI Configuration Utility

The LSI EFI BSD allows you to change the default configuration of your host adapters, using the embedded BIOS Configuration Utility (CU). Enter the CU by typing the drvcfg command on the EFI shell command line, or by pressing the ALT key when the EFI system is not at the command line.

5.6.4 Using the EFI Configuration Utility

Refer to Chapter 8 of the *LSI Fusion-MPT Device Management User's Guide* for detailed instructions.

5.6.5 Exiting the EFI Configuration Utility

Because some changes only take effect after the system reboots, it is important to exit the configuration utility properly. To exit, press ESC and respond to the verification prompts. Some changes might be lost if you reboot before properly exiting the configuration utility.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

6 Connector Pin Assignments

This chapter provides connector pin assignments for AMC-8100.

This module is AMC.1 compliant and uses ports 4 through 11 as defined in the AMC.1 specification.

Below are the specific ports that are used by the AMC-8100. All other pins match the AMC.0 specification.

6.1 AMC-8100 Port Assignments

Port	Signal
4	AMC.1 PCI Express lane
5	AMC.1 PCI Express lane
6	AMC.1 PCI Express lane
7	AMC.1 PCI Express lane
8	AMC.1 PCI Express lane
9	AMC.1 PCI Express lane
10	AMC.1 PCI Express lane
11	AMC.1 PCI Express lane

Table 6-1: AMC-8100 AMC Port Assignments

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

This page intentionally left blank.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

7 Specifications

This chapter contains the environmental and mechanical specifications for the AMC-8100.

7.1 Environmental Specifications

The atmospheric characteristics for the AMC-8100 are:

- Temperature range: 0 °C to 60 °C (dry bulb)
- Relative humidity range: 5% to 90% non-condensing
- Maximum dew point temperature: 32 °C

The following parameters define the storage and transit environment for the AMC-8100:

- Temperature range: 45 °C to +105 °C (dry bulb)
- Relative humidity range: 5% to 90% non-condensing

7.2 Power Requirements

The AMC-8100 shall consume no more than the following from the system supplies under normal operating conditions

Supply	Power (max.)
Management Power (MP)	100 mA
Payload	8.7 W
Off State	Less than 0.4 W

Table 7-1: AMC-8100 Power Requirements

Module Current Draw: 0.725 A

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

7.3 EMC Compliance

This product was tested in an EMC-compliant chassis and meets the requirements for EN55022 Class A equipment. Compliance was achieved under the following conditions:

- Conductive chassis rails connected to earth ground, providing the path for connecting shields to earth ground
- Front panel screws properly tightened

For minimum RF emissions, it is essential that the conditions above be implemented. Failure to do so could compromise the EMC compliance of the equipment containing the module.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

8 Front Panel Indicators

The faceplate of the AMC-8100 module has 3 LED indicators. The figure and table that below describe their functions.

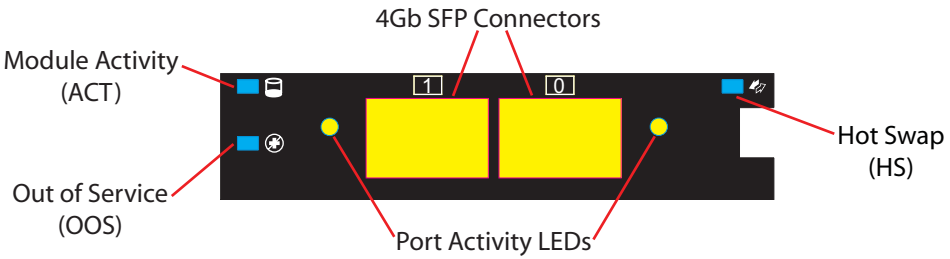


Figure 8-1: AMC-8100 Front Panel Indicators

Indicator	Color	State	Function
Hot Swap (**HS**)	Blue	On	Management power available to the module and the module can safely be extracted
		Off	The module is operational and is unsafe for extraction
		Long Blink	Delay before module is activated
		Short Blink	Delay before module is de-activated
Fault or “Out of Service” (**OOS**)	Red	On	Module Fault set by Shelf manager or 12V payload power not detected.
		Off	No module fault 12V payload power is being supplied to board
Module Heartbeat Activity (**ACT**) and “in service”	Green	Blink	Fibre Channel Controller heart beat. Blinks to show FC internal processor status.
		Off	12V payload power is not detected

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Indicator	Color	State	Function
Port Activity LED (Tri-Color)	Green Amber Blue	Bright White On	Loss of sync, no link
		Bright White Blinking: 1 blink/sec	Fault
		Amber On	1G link
		Amber Blinking: 4 blinks/sec	1G activity
		Green On	2G link
		Green Blinking: 4 blinks/sec	2G activity
		Blue On	4G link
		Blue Blinking: 4 blinks/sec	4G activity

Table 8-1: AMC-8100 LED Functions

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

9 IPMI Function List

The AMC-8100 module employs a Module Management Controller (MMC) as specified in the AMC.0 R2.0 specification. The MMC provides an Intelligent Platform Management Interface (IPMI) which will communicate with the AdvancedTCA and µTCA shelf managers. This MMC controls and monitors the following:

- Hot Swap communication with the shelf manager
- Inlet air temperature
- Voltage monitoring
- Electronic Keying as described in the AMC.0 specification
- FRU information
- Drives LED indicators for Hot Swap. OOS (out of service), and Port selection

9.1 Sensor Data Records

The MMC monitors the status of the module and provides this data so it can be read by the shelf manager. Below are the SDRs that the AMC-8100 module creates.

Signal Type	Item Monitored
Event	Hot Swap Switch
Threshold	+1.2V Payload Power
Threshold	+3.3V Payload Power
Threshold	+12V Payload Power
Threshold	Inlet Air Temperature
Threshold	Exit Air Temperature over HDD

Table 9-1: Sensor Data Records

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

The AMC-8100 includes the standard FRU data records per the IPMI Platform Management FRU Information Storage Definition, Board Info Area. The AMC-8100 includes additional FRU records as defined in the PICMG 2.9 specification.

Board Information	AMC-8100
Version	1
Language Code	EN (English)
MFG date.time	See Note 1
Manufacturer Name	ADLINK Technology, Inc.
Product Name	AMC-8100
Product Serial Number	055YMsssslr (Note 2)
Product Part / Model#	AMC-8100

Table 9-2: Standard FRU Data Records

Note 1: Manufacturing time is defined as 'minutes since 1/1/96' in the IPMI FRU spec.

Note 2: Serial Number format: 055YMsssslr
Y=year (hex: 4=2004 A=2010)
M=month (hex: 1=JAN, A=OCT)
ssss=sequence number (0-9999)
l=R for RoHS 6/6 or L for RoHS 5/6 (leaded solder used per storage exception) or other Alpha for non RoHS
r=revision (Alpha, A,B, etc.)

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

AMC Port Assignments

The AMC-8100 connects to 8 ports on the AMC connector. These are defined by the AMC.1 specification for serial storage. The link type and link type extension are defined in the table below.

Resource	AMC definition	
	Link Type 2	Link Type Extension
Channel 4	AMC.1 PCI Express type 8	0, Gen 1
Channel 5	AMC.1 PCI Express type 8	0, Gen 1
Channel 6	AMC.1 PCI Express type 8	0, Gen 1
Channel 7	AMC.1 PCI Express type 8	0, Gen 1
Channel 8	AMC.1 PCI Express type 8	0, Gen 1
Channel 9	AMC.1 PCI Express type 8	0, Gen 1
Channel 10	AMC.1 PCI Express type 8	0, Gen 1
Channel 11	AMC.1 PCI Express type 8	0, Gen 1

Table 9-3: AMC-8100 Connectivity

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

9.2 Supported IPMI Commands

The MMC communicates with the carrier controller through the local IPMB-L bus of the carrier and responds to all mandatory commands for AMC Module Management Controllers (as defined in the AMC Specification), as well as some optional ones. The table below lists all the commands supported by the MMC. The rightmost column indicates if a particular command is required by AMC Specification or is optional.

Command	IPMI/PICMG/ AMC Spec	NetFn	CMD	MMC Req
IPM Device "Global" Commands				
Get Device ID	17.1	App	01h	Mandatory
Broadcast "Get Device ID"	17.9	App	01h	Mandatory
Messaging Commands				
Send Message	18.7	App	34h	Optional
Event Commands				
Platform Event	23.3	S/E	02h	Mandatory
Sensor Device Commands				
Get Device SDR Info	29.2	S/E	20h	Mandatory
Get Device SDR	29.3	S/E	21h	Mandatory
Reserve Device SDR Repository	29.4	S/E	22h	Mandatory
Get Sensor Reading Factors	29.5	S/E	23h	Optional
Set Sensor Hysteresis	29.6	S/E	24h	Optional
Get Sensor Hysteresis	29.7	S/E	25h	Optional
Set Sensor Threshold	29.8	S/E	26h	Optional
Get Sensor Threshold	29.9	S/E	27h	Optional
Set Sensor Event Enable	29.10	S/E	28h	Optional
Get Sensor Event Enable	29.11	S/E	29h	Optional
Rearm Sensor Events	29.12	S/E	2Ah	Optional
Get Sensor Event Status	29.13	S/E	2Bh	Optional
Get Sensor Reading	29.14	S/E	2Dh	Mandatory

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Command	IPMI/PICMG/ AMC Spec	NetFn	CMD	MMC Req
FRU Device Commands				
Get FRU Inventory Area Info	28.1	Storage	10h	Mandatory
Read FRU Data	28.2	Storage	11h	Mandatory
Write FRU Data	28.3	Storage	12h	Mandatory
AdvancedTCA Commands				
Get PICMG Properties	3-9	PICMG	00h	Mandatory
FRU Control	3-22	PICMG	04h	Mandatory
Get FRU LED Properties	3-24	PICMG	05h	Mandatory
Get LED Color Capabilities	3-25	PICMG	06h	Mandatory
Set FRU LED State	3-26	PICMG	07h	Mandatory
Get FRU LED State	3-27	PICMG	08h	Mandatory
Get Device Locator Record ID	3-29	PICMG	0Dh	Mandatory
AMC Commands				
Set AMC Port State	3-27	PICMG	19h	Mandatory
Get AMC Port State	3-28	PICMG	1Ah	Mandatory

Table 9-4: Supported IPMI Commands

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

This page intentionally left blank.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Important Safety Instructions

Please read and follow all instructions marked on the product and in the documentation before operating the system. Retain all safety and operating instructions for future use.

- Please read these safety instructions carefully.
- Please keep this User's Manual for future reference.
- The equipment should be operated within the recommended operating temperature.
- The equipment should be operated only from the type of power source indicated on the rating label. Make sure the voltage of the power source is correct when connecting the equipment to the power outlet.
- If the user's equipment has a voltage selector switch, make sure that the switch is set to the proper position for the area. The voltage selector switch is set at the factory to the correct voltage.
- For pluggable equipment, ensure they are installed near a power socket that is easily accessible.
- Secure the power cord to prevent accidents. Do not place anything over the power cord.
- If the equipment will not be in use for long periods of time, disconnect the equipment from the power source to avoid damage caused by transient overvoltage.
- All caution and warning labels on the equipment should be noted.
- Please keep this equipment away from humidity.
- Do not use this equipment near water or a heat source.
- Place this equipment on a stable surface when installing. A drop or fall could cause injury.
- Never allow any liquids to enter equipment openings, as this could cause fire or electrical shock.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

- Openings in the case are provided for ventilation. Do not block or cover these openings. Make sure there is adequate space around the system for ventilation when setting up the work area. Never insert objects of any kind into the ventilation openings.
- To avoid electrical shock, always unplug all power and cables from wall outlets before removing equipment covers.
- Lithium battery provided (real time clock battery).



Risk of explosion if battery is replaced with one of an incorrect type. Dispose of used batteries as instructed by the manufacturer.

- The equipment should be checked by service personnel if one of the following situation arises:
  - The power cord or plug is damaged.
  - Liquid has penetrated the equipment.
  - The equipment has been exposed to moisture.
  - The equipment is not functioning or does not function according to the User's Manual.
  - The equipment has been dropped and damaged.
  - The equipment has obvious sign of breakage or damage.
- Never open the equipment. For safety reasons, the equipment should only be opened by qualified service personnel.

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

Getting Service

Contact us should you require any service or assistance.

ADLINK Technology, Inc.
Address: 9F, No.166 Jian Yi Road, Chungho City,
Taipei County 235, Taiwan
台北縣中和市建一路 166 號 9 樓
Tel: +886-2-8226-5877
Fax: +886-2-8226-5717
Email: service@adlinktech.com

Ampro ADLINK Technology, Inc.
Address: 5215 Hellyer Avenue, #110, San Jose, CA 95138, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200 (USA only)
Fax: +1-408-360-0222
Email: info@adlinktech.com

ADLINK Technology Beijing
Address: 北京市海淀区上地东路 1 号盈创动力大厦 E 座 801 室(100085)
Rm. 801, Power Creative E, No. 1, B/D
Shang Di East Rd., Beijing, 100085 China
Tel: +86-10-5885-8666
Fax: +86-10-5885-8625
Email: market@adlinktech.com

ADLINK Technology Shanghai
Address: 上海市漕河泾高科技开发区钦江路 333 号 39 幢 4 层 (200233)
4F, Bldg 39, Caoheting Science & Technology Park,
No.333 Qinjiang Rd., Shanghai, 200233 China
Tel: +86-21-6495-5210
Fax: +86-21-5450-0414
Email: market@adlinktech.com

ADLINK Technology Shenzhen
Address: 深圳市南山区科技园南区高新南七道 数字技术园
A1 栋 2 楼 C 区 (518057)
2F, C Block, Bldg. A1, Cyber-Tech Zone, Gao Xin Ave. Sec. 7,
High-Tech Industrial Park S., Shenzhen, 518054 China
Tel: +86-755-2643-4858
Fax: +86-755-2664-6353
Email: market@adlinktech.com

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000

ADLINK Technology, Inc. (German Liaison Office)
Address: Nord Carree 3, 40477 Duesseldorf, Germany
Tel: +49-211-495-5552
Fax: +49-211-495-5557
Email: emea@adlinktech.com

ADLINK Technology, Inc. (French Liaison Office)
Address: 15 rue Emile Baudot, 91300 Massy CEDEX, France
Tel: +33 (0) 1 60 12 35 66
Fax: +33 (0) 1 60 12 35 66
Email: france@adlinktech.com

ADLINK Technology Japan Corporation
Address: 151-0072 東京都渋谷区幡ヶ谷
1-1-2 朝日生命幡ヶ谷ビル 8F
Asahiseimei Hatagaya Bldg. 8F
1-1-2 Hatagaya, Shibuya-ku, Tokyo 151-0072, Japan
Tel: +81-3-4455-3722
Fax: +81-3-5333-6040
Email: japan@adlinktech.com

ADLINK Technology, Inc. (Korean Liaison Office)
Address: 서울시 서초구 서초동 1506-25 한도 B/D 2 층
2F, Hando B/D, 1506-25, Seocho-Dong, Seocho-Gu,
Seoul 137-070, Korea
Tel: +82-2-2057-0565
Fax: +82-2-2057-0563
Email: korea@adlinktech.com

ADLINK Technology Singapore Pte. Ltd.
Address: 84 Genting Lane #07-02A, Cityneon Design Centre,
Singapore 349584
Tel: +65-6844-2261
Fax: +65-6844-2263
Email: singapore@adlinktech.com

ADLINK Technology Singapore Pte. Ltd. (Indian Liaison Office)
Address: No. 1357, "Anupama", Sri Aurobindo Marg, 9th Cross,
JP Nagar Phase I, Bangalore - 560078, India
Tel: +91-80-65605817
Fax: +91-80-22443548
Email: india@adlinktech.com

LRI Distribuída no Brasil pela LRI | vendas@lri.com.br | 51 2129-3000