

VadaTech MicroTCA

ScorpionWare® System Manager

Interface Reference Manual

September 20, 2009

Version 1.1

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Table of Contents

1	Overview	9
1.1	Applicable VadaTech Products	9
1.2	Document References	9
1.3	Acronyms Used in this Document	10
2	Installation	12
2.1	Linux	12
2.2	Windows	12
3	Getting Connected	13
3.1	UTC001 Interfaces	13
3.2	Configuring the Shelf Manager IP Connections	13
3.3	Server Connection	14
3.4	Starting the Application	16
3.4.1	Linux	16
3.4.2	Windows	17
3.5	Session	17
3.5.1	Configuration	17
3.5.2	Login	18
3.5.3	Keep Alive	19
3.5.4	Virtual Shelf/Carrier	19
4	System Manager Interface	20
4.1	Main Menu	20
4.2	Toolbar Options	20
4.3	Status	20
4.4	Connection Status	21
4.5	Management Resource Tabs	21
4.5.1	Shelf Manager	21
4.5.1.1	Shelf Tab Overview	21
4.5.1.2	Shelf Alarm Panel	23
4.5.1.3	Chassis Temperature Panel	23
4.5.1.4	Chassis Voltage Panel	23
4.5.2	Carrier Manager	24
4.5.2.1	Carrier Tab Overview	24
4.5.2.2	Carrier Alarm Panel	25
4.5.2.3	Chassis Temperature Panel	25
4.5.2.4	Chassis Voltage Panel	25
4.5.2.5	Carrier Telco Alarms	25
4.6	Shelf Virtual View	26
4.6.1	Shelf FRU Information	27
4.6.2	Carrier Active Status	27
4.6.3	Carrier Resource	27
4.7	Carrier Virtual View	28
4.7.1	FRU Active Status	28

4.7.2	Carrier Manager FRU	28
4.8	Resource and Entity Navigation	29
4.8.1	Tree Hierarchy.....	29
4.8.2	Resource/Entity Icons	30
4.8.3	Expand and Collapse	31
4.8.4	Shelf/Carrier Commands.....	31
4.9	Shelf Manager Commands	36
4.9.1	FRU Management	36
4.9.1.1	FRU Info	36
4.9.2	Alerting.....	37
4.9.2.1	Get PEF Configuration	37
4.9.2.2	Set PEF Configuration	38
4.9.2.3	SNMP Trap Information	39
4.9.2.4	SNMP Trap Test.....	40
4.9.3	Cooling	41
4.9.3.1	Parameters	41
4.9.3.2	Get Fan Geography	43
4.9.4	LAN	44
4.9.4.1	Get Channel Access.....	44
4.9.4.2	Get Channel Cipher Suites.....	45
4.9.4.3	Get Channel Information	45
4.9.4.4	Get LAN Configuration Parameters	46
4.9.4.5	Set LAN Configuration Parameters.....	46
4.9.4.6	Shelf IP Connection	47
4.9.4.7	List Active Sessions	47
4.9.5	Administration	49
4.9.5.1	User Access.....	49
4.9.5.2	List Users.....	50
4.9.6	System Management	51
4.9.6.1	Chassis Controls.....	51
4.9.6.2	Shelf Information	52
4.10	Shelf FRU Information	53
4.11	Carrier Manager.....	54
4.11.1	FRU Management	54
4.11.1.1	FRU Info	54
4.11.1.2	FRU Activate	55
4.11.1.3	FRU Deactivate.....	55
4.11.1.4	FRU Cold Reset.....	55
4.11.1.5	FRU Warm Reset.....	55
4.11.1.6	FRU Graceful Reboot.....	55
4.11.1.7	FRU Diagnostic Interrupt.....	55
4.11.1.8	FRU Activation Policy.....	55
4.11.1.9	FRU Temperature	55
4.11.1.10	FRU Event Receiver.....	56
4.11.1.11	FRU Power Levels	56
4.11.1.12	Set Extracted	56
4.11.2	Alerting.....	56

4.11.3	Cooling	56
4.11.3.1	Parameters	56
4.11.3.2	Get Fan Geography	57
4.11.4	E-Keying	58
4.11.4.1	Get Carrier Point to Point.....	58
4.11.4.2	Get Clock Point-to-Point.....	60
4.11.5	LAN	60
4.11.6	Administration	60
4.11.7	Power	61
4.11.7.1	Get Power Distribution	61
4.11.7.2	Get Power Policy	63
4.11.8	System Management	64
4.11.8.1	Chassis Controls.....	64
4.11.8.2	Carrier Information	65
4.11.8.3	Address Table	65
4.11.8.4	Activation Sequence.....	66
4.11.8.5	Failover	67
4.12	MCMC, EMMC and MMC.....	68
4.12.1	FRU Management	68
4.12.1.1	FRU Info	68
4.12.1.2	Activate.....	68
4.12.1.3	Deactivate	68
4.12.1.4	Set Extracted	69
4.12.1.5	Cold Reset.....	69
4.12.1.6	Warm Reset.....	69
4.12.1.7	Graceful Reboot	69
4.12.1.8	Diagnostic Interrupt.....	69
4.12.1.9	Activation Policy.....	69
4.12.1.10	Temperature	69
4.12.1.11	Event Receiver.....	70
4.12.1.12	Power Levels.....	70
4.12.2	E-Keying	71
4.12.2.1	Get AMC PTP.....	71
4.12.2.2	Get Clock Configuration	72
4.12.2.3	Get Clock State.....	73
4.12.2.4	Get Port State	74
4.12.3	Cooling	75
4.12.3.1	Get Fan Level.....	75
4.12.4	Power	76
4.12.4.1	Channel Status	76
4.12.4.2	Power Up	77
4.12.4.3	Power Down.....	77
4.12.4.4	Hard Reset	77
4.12.4.5	Diagnostic Interrupt.....	77
4.12.4.6	Soft Shutdown	78
4.12.4.7	Power Feed Reset.....	78
4.13	Telco	79

4.13.1	Capabilities.....	79
4.13.2	State	80
4.14	Sensors	81
4.14.1	Sensor Classes.....	81
4.14.2	Threshold Sensors.....	81
4.14.2.1	Settable/Readable Parameters	83
4.15	LEDs.....	84
4.16	Carrier FRU Information	85
4.16.1.1	Upload.....	85
4.16.1.2	Download	85
4.17	Sensor Data Record Repository	86
4.17.1	Get SDR Information	86
4.17.2	Get SDR	86
4.18	System Event Log.....	88
4.18.1	Get SEL Information.....	88
4.18.2	Get SEL.....	88
4.18.3	Clear SEL.....	89
4.19	Alarm Panel.....	90

Tables

Table 1: Acronyms.....	11
Table 2: Main Menu Description	20
Table 3: Tool bar Description.....	20
Table 4: Server Connection Status	21
Table 5: Carrier Addressing	26
Table 6: Shelf Tree Hierarchy	30
Table 7: Resource/Entity Icons	30
Table 8: Resource/Entity Commands.....	35
Table 9: Shelf Chassis Controls.....	51
Table 10: Carrier Chassis Controls	64
Table 11: Fan Tray Controls.....	75
Table 12: Sensor Classification.....	81
Table 13: Threshold Sensor Controls	83
Table 14: LED Controls.....	84
Table 15: Alarm Classification	91
Table 16: Alarm Panel Controls.....	91

1 Overview

ScorpionWare® is a VadaTech System Management Software Application used to Control, Manage and Monitor AdvancedTCA and MicroTCA platforms. Telecom, Military and Aerospace projects are increasingly using AdvancedTCA and MicroTCA platforms. Integration and testing of these complex platforms are one of the stumbling blocks to integrators and add delays to final deployment. ScorpionWare® provides an easy to use Graphical User Interface with several features for monitoring, trouble shooting and easy integration of these platforms.

ScorpionWare® is a cross-platform application. The application interfaces with any ATCA and UTCA Platform Management Interface Compliant Management Software using RMCP+ to establish a secure connection.

ScorpionWare® provides an interface to the VadaTech MicroTCA Shelf Manager or the Carrier Manager. The interface is based on IPMI 2.0, AdvancedTCA™ PICMG 3.0, and MicroTCA 1.0 specifications and can be used to access information about the current state of the Shelf or the Carrier, obtain information such as the FRU population, or monitor alarms, power management, current sensor values, and the overall health of the Shelf. The interface can also be used to update Shelf and Carrier configurable parameters.

The information provided in this document is the interface to MicroTCA systems using the ScorpionWare® GUI and is a supplement to the information found in the MicroTCA Base Specification.

1.1 Applicable VadaTech Products

UTC001, UTC002, UTC003, VT85x

1.2 Document References

- Intelligent Platform Management (IPMI) Interface Specification v2.0
- PICMG® 3.0 Revision 3.0 AdvancedTCA® Base Specification
- PICMG® AMC.0 R2.0 Advanced Mezzanine Card Base Specification
- PICMG® Specification MTCA.0 R1.0 (MicroTCA)
- VadaTech MCH Software Management Manual
- UTC001 Getting Started Guide

1.3 Acronyms Used in this Document

Acronym	Description
IPMI	Intelligent Platform Management Interface. A specification and mechanism for providing inventory management, monitoring, logging, and control for elements of a computer system as defined in intelligent Platform Management Interface Specification.
MicroTCA	MicroTelecommunication Computing Architecture
FRU Device ID	A value that uniquely identifies a FRU relative to an IPM Controller. In MicroTCA the most frequent use of FRU Device ID is to uniquely identify a FRU within a MicroTCA Carrier relative to the Carrier Manager.
FRU information	Data that describes a FRU with an emphasis on data that characterizes the FRU. Format for this data is described in IPMI Platform management FRU information Storage Definition and extended herein.
Hot Swap	To remove a component (e.g., an AdvancedMC Module) from a system (e.g., an MicroTCA Shelf) and plug in a new one while the power is still on and the system is still operating
LED	Light Emitting Diode
Link	<ol style="list-style-type: none"> 1. One or more Ports aggregated under a common protocol. Links are groups of Ports that are enabled and disabled by Electronic Keying operations. 2. A group of Lanes which operate together to connect two devices. The number of Lanes used is negotiated.
Managed FRU	Either an Intelligent FRU or a FRU that is represented by an Intelligent FRU via a FRU Device ID
Module	Refers to any MicroTCA Module types, including CU, PM, MCH, OEM Module, or AdvancedMC
Payload	The primary function that a FRU provides. This includes all the hardware on the FRU except that associated with management. It may also include the firmware, operating system and application software running on the Payload hardware.
Shelf	An electronic assembly consisting of the Subrack, Backplane, Modules, cooling Devices, power subsystems, etc. Also historically known as a chassis. Shelves are usually mounted in Frames.
Shelf Manager	The entity responsible for managing the cooling in a MicroTCA Shelf. It also routes messages between the System Manager Interface and the Shelf-Carrier Manager Interface, provides interfaces to system repositories, and responds to event messages.
System Manger	A level of management functionality above the Shelf Manager charged with the management of an entire system, whatever that may mean in a specific Implementation
System Manager Interface	The communication interface between Shelf Manager and System Manager
PEF	Platform Event Filter(ing)
SDR	Sensor Data Record
SDR Repository	Sensor Data Record Repository
SEL	System Event Log
MicroTCA Carrier	An assembly providing MicroTCA Carrier functions needed to support up to

Hub (MCH)	twelve Hub (MCH) AdvancedMCs including MCMC, optional ShMC, optional Fabric switch, and clock.
MicroTCA Carrier Management Controller (MCMC)	Management controller on the MCH. The required management controller that interfaces to AdvancedMC MMCs via IPMB-L and to CU, PM, and OEM Module EMMCs via IPMB-0.
MMC	The required management controller on an AdvancedMC Module the MicroTCA Carrier Manager on the MCH via IPMB-L
EMMC	Management Controller on PMs, OEM Modules, and CUs.

Table 1: Acronyms

2 Installation

The ScorpionWare® System Manager Application is available for Linux and Windows Operating Systems for 64-bit and 32-bit architectures.

2.1 Linux

The ScorpionWare® Linux package requires Fedora 10 or later.

To install the x86_64 or i386 RPM package

```
#rpm --install sysmanager-x.x.x.x.86_64.rpm  
#rpm --install sysmanager-x.x.x.x.i386.rpm
```

If an earlier version of ScorpionWare® is already installed, then use the upgrade option.

```
#rpm --upgrade sysmanager-x.x.x.x.86_64.rpm  
#rpm --upgrade sysmanager-x.x.x.x.i386.rpm
```

2.2 Windows

The ScorpionWare® Windows packages are available for 64-bit and 32-bit architectures running Windows XP or Vista.

3 Getting Connected

The information provided in this section is supplemental to the information found in the [UTC001 Getting Started Guide](#)

3.1 UTC001 Interfaces

The various VadaTech MicroTCA Shelf Managers support the following front panel interfaces:

- Two Ethernet connections via an RJ-45 connector
- An RS-232 serial management port interface via an RJ-45 connector

Any of these interfaces can be used to log in to the Shelf Manager or the Carrier Manager. To configure the system IP address the first time, log in using the serial port console.

3.2 Configuring the Shelf Manager IP Connections

On the MCH side, if the system IP address is not configured / not configured properly for its network, logging onto the UTC001 console the first time must be done via the serial port console.

The default administrative user name and password are 'root' and 'root', respectively, for console authentication.

Please refer to the [VadaTech UTC001 Getting Started Guide](#) for more information on how to configure the UTC001 Shelf or Carrier Manager out of band interfaces.

If the MicroTCA Shelf Manager IP address is configured properly, the user can communicate with the Shelf Manager over the network. The ScorpionWare® can run on a Remote Management Console and connect to the Shelf Manager through the RMCP interface to send IPMI messages. The Shelf Manager is configured with a system manager default user account with administrative privileges.

There are two Shelf Manager IP Connection addresses as defined by the MicroTCA Specification. The Vadata default setting for the Shelf Manager IP Connection addresses are "192.168.1.230" and "192.168.1.231". This can be changed during the initial configuration via the serial console.

View the available IP connections to the MicroTCA Shelf Manager:

```
# get_ip_connection

Shelf Manager IP Address 0      : 192.168.1.230
Shelf Manager Gateway Address 0 : 192.168.1.1
Shelf Manager Netmask 0        : 255.255.255.0
Shelf Manager IP Address 1      : 192.168.1.231
Shelf Manager Gateway Address 1 : 192.168.1.1
Shelf Manager Netmask 1        : 255.255.255.0
```

To change the IP connections to the Shelf Manager, use the `set_ip_connection` CLI command. The changes take effect on the next power cycle.

Please refer to the [VadaTech MicroTCA Shelf Manager Command Line Interface Reference Manual](#) for more information on how to configure the UTC001 Shelf or Carrier Manager IP Connections.

3.3 Server Connection

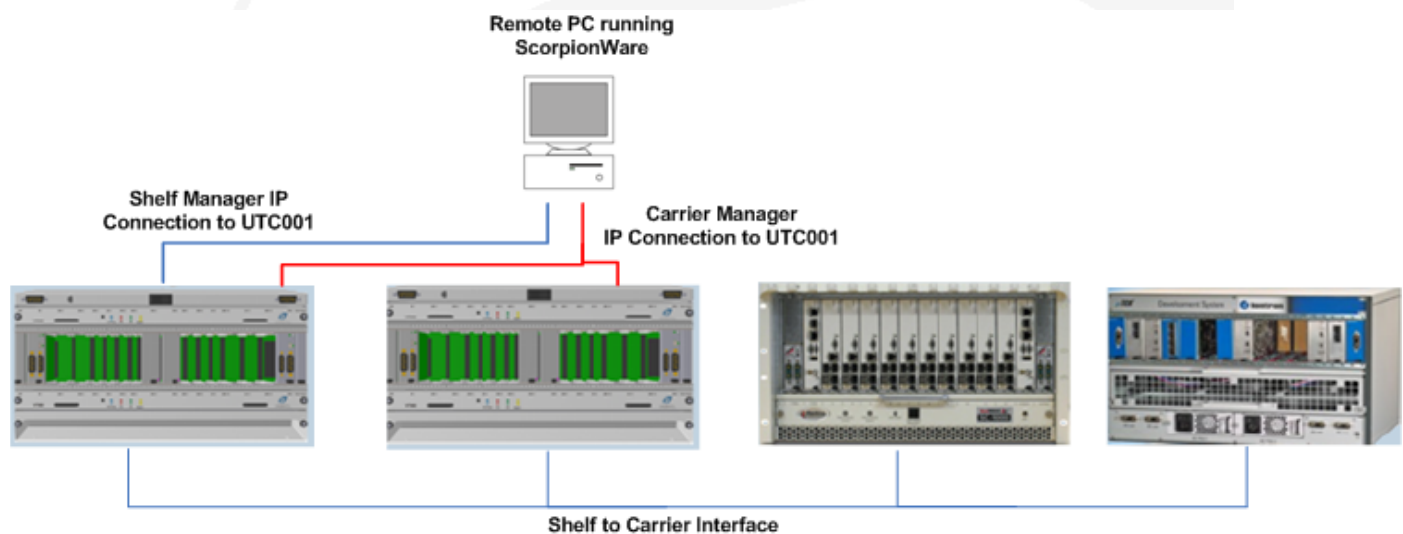


Figure 1: System Manager Connection

After the Shelf and the Carrier Manager IP Connections are configured properly on the VadaTech UTC001 MCH, the Remote PC running ScorpionWare® and the MCH must be on the same network.

From the Remote PC, ping the Shelf or Carrier Manager IP Connection address to verify communication between the MCH and the remote PC has been established. If there is a problem with the communication check your network connection.

With the network connection verified, ScorpionWare® should be able to open a session and get connected to the Shelf.

The following shows the list of default IP addresses assigned on a UTC001 that is running as a Shelf Manager.

```
[root@vtipmi root]# ifconfig
eth0      Link encap:Ethernet  HWaddr 00:13:3A:00:24:88
          inet addr:192.168.1.252  Bcast:192.168.1.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:547940 errors:0 dropped:0 overruns:0 frame:0
          TX packets:871209 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:42654453 (40.6 MiB)  TX bytes:63517831 (60.5 MiB)
          Base address:0xb000

eth0:1    Link encap:Ethernet  HWaddr 00:13:3A:00:24:88
          inet addr:192.168.16.1  Bcast:192.168.16.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          Base address:0xb000

eth0:8    Link encap:Ethernet  HWaddr 00:13:3A:00:24:88
          inet      addr:192.168.16.17      Bcast:192.168.16.255
Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          Base address:0xb000

eth0:9    Link encap:Ethernet  HWaddr 00:13:3A:00:24:88
          inet addr:192.168.1.230  Bcast:192.168.1.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          Base address:0xb000

eth0:10   Link encap:Ethernet  HWaddr 00:13:3A:00:24:88
          inet addr:192.168.1.231  Bcast:192.168.1.255  Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          Base address:0xb000

eth1      Link encap:Ethernet  HWaddr 00:13:3A:00:24:89
          inet      addr:192.168.40.250      Bcast:192.168.40.255
Mask:255.255.255.0
          UP BROADCAST RUNNING MULTICAST  MTU:1500  Metric:1
          RX packets:0 errors:0 dropped:0 overruns:0 frame:0
          TX packets:2 errors:0 dropped:0 overruns:0 carrier:0
          collisions:0 txqueuelen:1000
          RX bytes:0 (0.0 B)  TX bytes:104 (104.0 B)

lo        Link encap:Local Loopback
          inet addr:127.0.0.1  Mask:255.0.0.0
          UP LOOPBACK RUNNING  MTU:16436  Metric:1
          RX packets:15788775 errors:0 dropped:0 overruns:0 frame:0
          TX packets:15788775 errors:0 dropped:0 overruns:0 carrier:0
```

Figure 2: Shelf Manager Default IP Address assignments

The following illustrates the use of each of the above listed IP addresses.

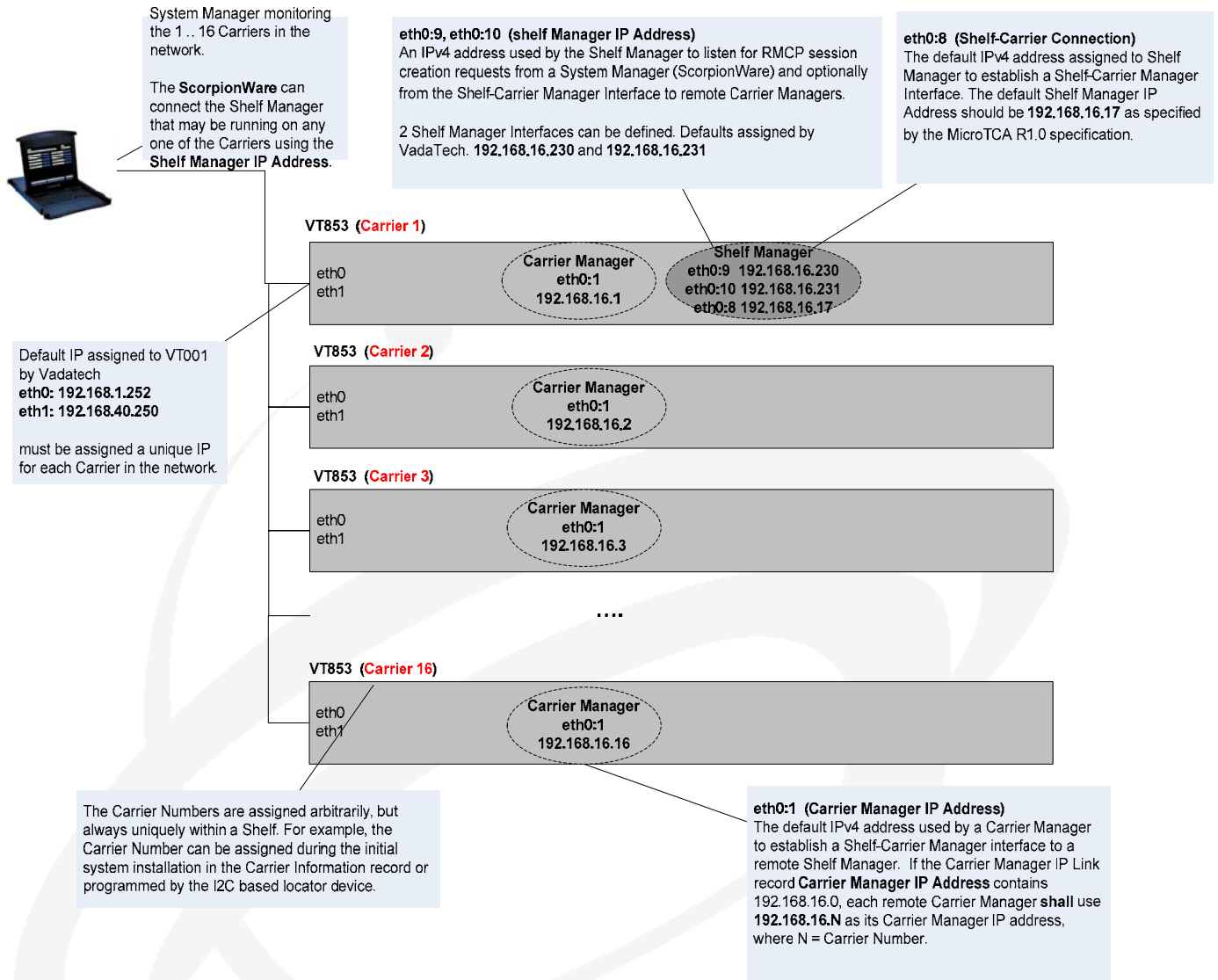


Figure 3: Shelf/Carrier Interconnection

3.4 Starting the Application

3.4.1 Linux

After completing the installation on the remote PC running Linux, **ScorpionWare®** can be started by issuing the following from the Linux prompt:

```
# sysmanager
```


3.4.2 Windows

After installing the ScorpionWare® Windows package the System Manager Application short cuts are available in the Windows Start Menu and Desktop.

3.5 Session

When the ScorpionWare® System Management application is started the Session Configuration screen allows the user to configure a session with UTC001 Shelf Manager or the Carrier Manager.

There are two types of connections on the UTC001 depending on its configuration:

- Carrier Manager using the Carrier Manager IP Address
- Shelf Manager using the Shelf Manager IP Address

3.5.1 Configuration

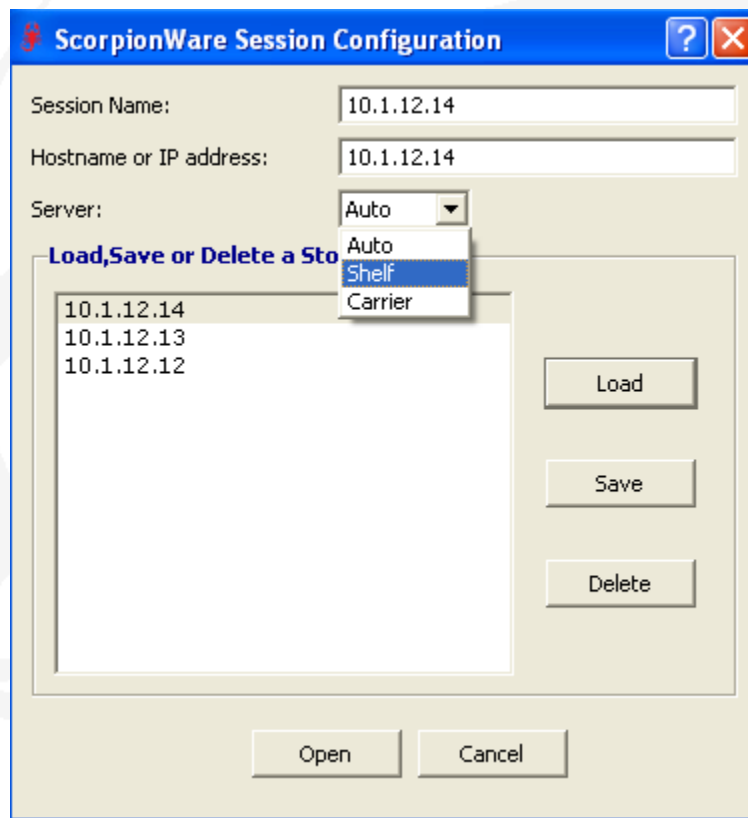


Figure 4: Session Configuration

The **Session Configuration** dialog allows the user to configure, save and load session connections with the UTC001 Shelf or the Carrier. There are two types of Server Interfaces, namely Carrier and Shelf. The destination Server Interface depends on the mode the UTC001 is currently configured. If the Server Type is set to "Auto", the System Manager will automatically detect a Server Interface to get connected.

In the auto Interface detect mode the System Manager will always try to first establish connection with the Shelf, failing which it will then try to connect to the Carrier at the specified IP address. The user can also select the server type to selectively connect to the Shelf or Carrier Interface.

3.5.2 Login


The image shows a Windows-style dialog box titled "VadaTech System Manager Login". The title bar is blue with a red icon on the left and help and close buttons on the right. The main area has a light beige background. At the top, the word "SCORPIONWARE" is written in large, bold, red capital letters, with "SYSTEM MANAGEMENT V1.1" in smaller black capital letters below it. A section titled "VT UTCA Auto-Discovery" is enclosed in a thin border. Inside this section, there are four labels with corresponding input fields or checkboxes: "User Name:" followed by a text box, "Password:" followed by a text box, "Keep Alive:" followed by a checked checkbox, and "Virtual shelf/carrier:" followed by a checked checkbox. At the bottom of the dialog, there are two buttons: "Submit" and "Cancel".

Figure 5: Login

When the System Manager initiates a connection, the user will be prompted to enter the User Name and Password to the destination server.

The default Shelf Manager User Name is "*shelf*" and the Password is "*shelf*". The default Carrier Manager User Name is "*carrier*" and the Password is "*carrier*".

In auto server detect mode the User Name and Password entered by the user will be attempted on both Shelf and Carrier Interfaces.

3.5.3 Keep Alive

The **Keep Alive** option allows the user to remain connected with the server when there is no user activity. When enabled during login, the System Manager keeps the session alive by sending a heart beat message to the server periodically. If the Keep Alive option is not selected during log in the System Manager will close the session after 60 seconds of inactivity. The user may enable or disable Keep Alive at any time when the System Manager is running.

3.5.4 Virtual Shelf/Carrier

The **Virtual Shelf/Carrier** option allows the user to view the end system and FRUs using the System Manager. If this option is selected the System Manager will construct the Chassis and the FRUs populated and display the virtual status of the Shelf or Carrier.

Note: By default Virtual Shelf/Carrier display is supported on all VadaTech Chassis and FRUs. All other types of Vendor Chassis will require Images of the Chassis and FRUs to be loaded and configured on the System Manager.

If Vendor Chassis images are not available, this option can be disabled during log in.

4 System Manager Interface

4.1 Main Menu

Main Menu	Sub-menu	Hot Keys	Description
File	Log out	CTRL+L	Log out from current open session
View	Sensor Monitor		The list of sensor monitor sub windows open
Tools	Refresh	CTRL+R	Refresh Shelf Information
	Pase Auto-Refresh	CTRL+P	Enable/Disable Auto refresh
	Setting	CTRL+S	Custom ScorpionWare® settings
	Logger	CTRL+G	View System Manager Log file
	Chassis View	CTRL+H	Enable/Disable Chassis View
	Rotate Chassis	CTRL+O	Rotate Chassis
	Trap Listener	CTRL+T	Open SNMP Trap Listener
	Sensor Monitor	CTRL+M	Open Sensor Monitor Instance
Help	About		Information about ScorpionWare®

Table 2: Main Menu Description

4.2 Toolbar Options










ICON	Description
	Refresh Shelf Information on demand
	Pause Auto Refresh
	Custom ScorpionWare® settings
	Open ScorpionWare® log file
	Chassis View enable/disable
	Chassis Rotate
	Open SNMP Trap Listener
	Open Sensor Monitor Instance
	Logout from the current open session
Carriers ▼	Open a Carrier tab

Table 3: Tool bar Description

4.3 Status

The System Manager Status bar (bottom left) is used to report activities and command completion status.

4.4 Connection Status

Server Connection: 10.1.12.14/623  Copyright 2004-2010 VadaTech Inc.

The System Manager Server connection status bar presents the Server IP address/Port number of the current open session. An indicator is provided to present the user with the status of the server connection.

Color	Description
GREEN	Shelf Manager session is active and healthy
BLINK GREEN	System Manager is sending a heart beat to the remote server to keep session alive
RED	Shelf Manager session is Inactive
BLINK RED	System Manager lost connection with remote server and trying to re-establish connection.

Table 4: Server Connection Status

4.5 Management Resource Tabs

4.5.1 Shelf Manager

The **Shelf Tab** represents the Shelf resource at event receiver address 0x20.

4.5.1.1 Shelf Tab Overview

Selecting the Shelf Tab presents the Shelf Virtual Display, the Navigation Tree, the Resource/Entity Information and the FRU View.

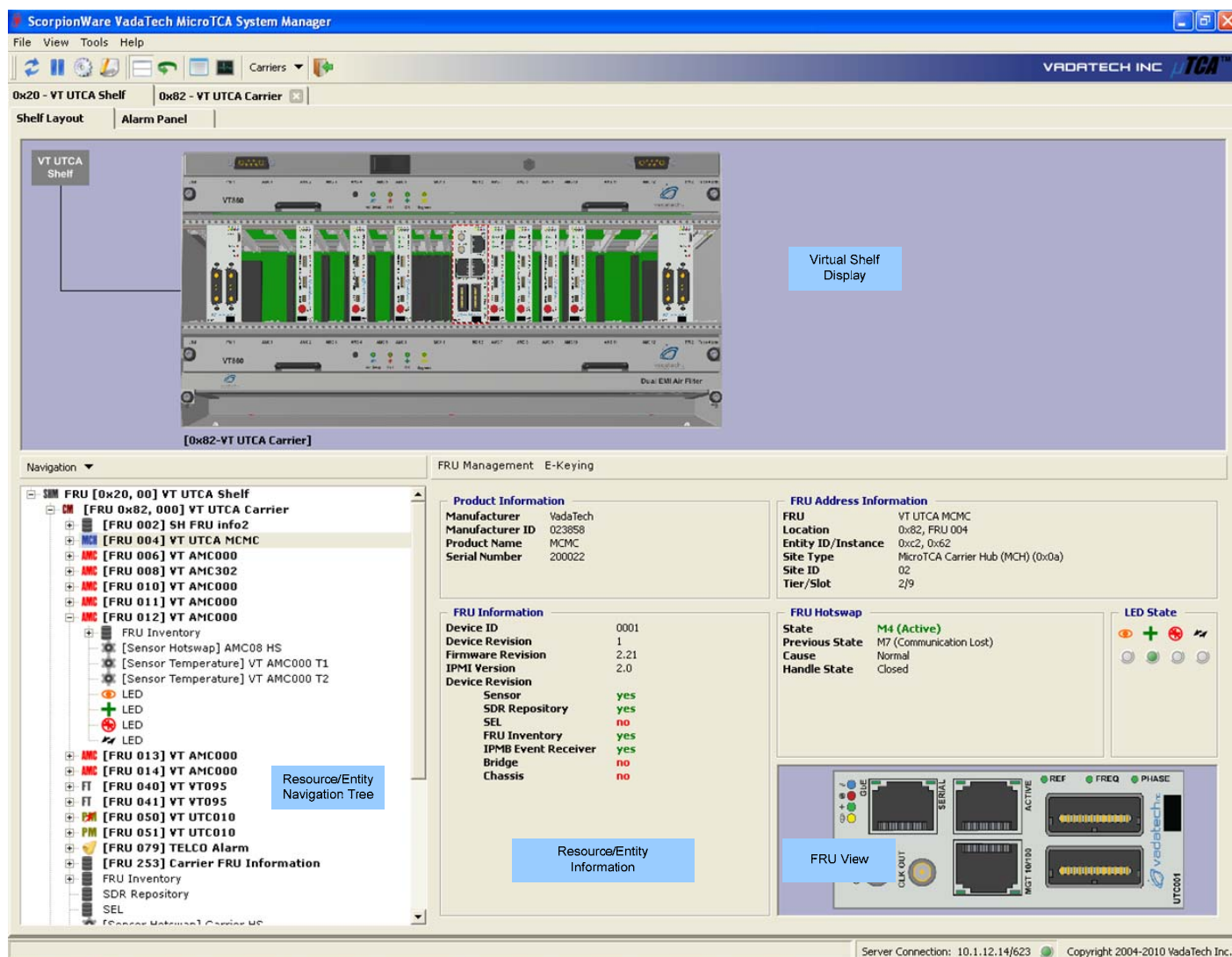


Figure 6: Shelf Layout

- **Virtual Shelf View** – A virtual representation of the Shelf connected to the various Carriers as described in the MicroTCA Shelf Information Record. The Shelf View shows all the Carriers that are active and connected to the Shelf and the location of the Shelf FRU Information.
- **Navigation** – A tree representing the Shelf as the root node and the Carriers managed by the ShMC. Only the Carriers currently connected to the Shelf are displayed. The resources and entities behind the Carriers are presented under the Carrier node. The navigation tree is used to traverse down the Shelf resource hierarchy.
- **Resource/Entity Information** – Presents the information of the selected Resource or Entity. Product, FRU Address, Hotswap, and other detail information of the Resource/Entity are displayed in this section.
- **FRU View** – Presents the image of the selected FRU.

4.5.1.2 Shelf Alarm Panel

0x20 - VT UTCA Shelf | **0x82 - VT UTCA Carrier** [X]

Shelf Layout | **Alarm Panel**

Description

Sensor Event Type n/a
 Sensor Number n/a
 Event Data (1,2,3) n/a
 Event Lower critical going k

Summary

Started Wed Mar 3 09:29:11 2010
 Duration
 Logging

Minor 0
 Major 11
 Critical 1
 Info 0

Event Type

☒ Active Events
☐ History

Alarms

Alarm	Device	Location	Sensor Type	Sensor	Event Code
MAJOR	VT VT095	0x82, 40	Fan	0x35	0x063
MAJOR	VT VT095	0x82, 40	Fan	0x36	0x063
MAJOR	VT VT095	0x82, 40	Fan	0x37	0x063
MAJOR	VT VT095	0x82, 40	Fan	0x38	0x063
MAJOR	VT VT095	0x82, 40	Fan	0x39	0x063
MAJOR	VT VT095	0x82, 40	Fan	0x3a	0x063
MAJOR	VT VT095	0x82, 40	Fan	0x3b	0x063
MAJOR	VT VT095	0x82, 40	Fan	0x3c	0x063
MAJOR	VT VT095	0x82, 40	Fan	0x3d	0x063
MAJOR	VT VT095	0x82, 40	Fan	0x3e	0x063
MAJOR	VT VT095	0x82, 40	OEM	0x40	0x08a
CRITICAL	VT VT095	0x82, 40	n/a	n/a	0x0c7

Figure 7: Shelf Alarm Panel

The Shelf Alarm Panel displays all the active alarms on the Shelf as well the option to view the history of alarms that occurred since system startup.

4.5.1.3 Chassis Temperature Panel

The Chassis Temperature Panel is used to view the temperature status of the Carriers installed in the Shelf.

(Note: Chassis Temperature Panel is not available in System Manager V1.1)

4.5.1.4 Chassis Voltage Panel

The Chassis Temperature Panel is used to view the voltage status of the Carriers installed in the Shelf.

(Note: Chassis Temperature Panel is not available in System Manager V1.1)

4.5.2 Carrier Manager

The **Carrier Tab** represents a remote Carrier connected to the Shelf. Up to 16 Carriers can be connected to a Shelf Manager.

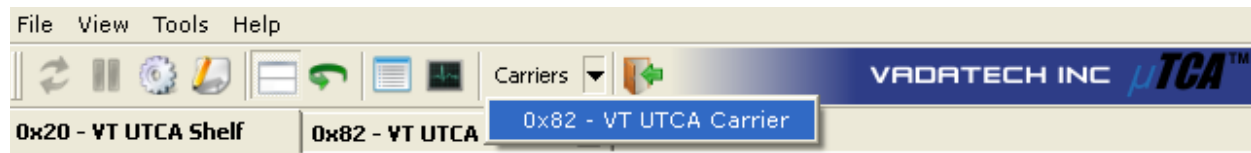


Figure 8: Carrier List

A new Carrier Tab can be added using the “Carrier” drop down list in the System Manager Tool bar option. The drop down list will contain all the Carriers currently connected to the Shelf. The user can select a Carrier by name to open its Carrier Tab. If a Carrier loses communication with the Shelf Manager, the respective Carrier entry will be grayed out and disabled.

A Carrier Tab can be closed by the user at anytime.

4.5.2.1 Carrier Tab Overview

The Carrier Tab presents the Virtual Carrier View, the Navigation, the Resource/Entity, and FRU Information.

- Virtual Carrier View – A virtual representation of the Carrier chassis and the FRUs installed in it.
- Navigation – A tree representing the Carrier as the root node and the FRUs managed by the MCMC. Only the FRUs currently installed to the Carrier are displayed. The resources and entities behind the Carriers are presented under the Carrier node. The navigation tree is used to traverse down the Carrier resource hierarchy.
- Resource/Entity Information – Presents the Information of the selected Resource or Entity.
- FRU View - Presents the image of the selected FRU.

4.5.2.2 Carrier Alarm Panel

The Carrier Alarm Panel displays all the active alarms on the Carrier as well the option to view the history of alarms that occurred since system startup.

4.5.2.3 Chassis Temperature Panel

The Chassis Temperature Panel is used to view the temperature of the Carrier and the FRUs installed.

(Note: Chassis Temperature Panel is not available in System Manager V1.1)

4.5.2.4 Chassis Voltage Panel

The Chassis Temperature Panel is used to view the voltage of the Carrier and the FRUs installed.

(Note: Chassis Temperature Panel is not available in System Manager V1.1)

4.5.2.5 Carrier Telco Alarms

The Carrier Telco Alarms shows the current state of the Minor, Major and Critical alarms. These Carrier Alarms are reported by the Carrier TELCO FRU. If the TELCO FRU is not discovered or is not present for a Carrier, the Carrier Alarms will remain inactive and grayed out.



Figure 9: Carrier Telco Alarms

Controls:

	Telco Cut-off Disabled
	Telco Cut-off Enabled

4.6 Shelf Virtual View

The Virtual Shelf View provides a pictorial representation of the Shelf and its connections to the various OEM Carriers.

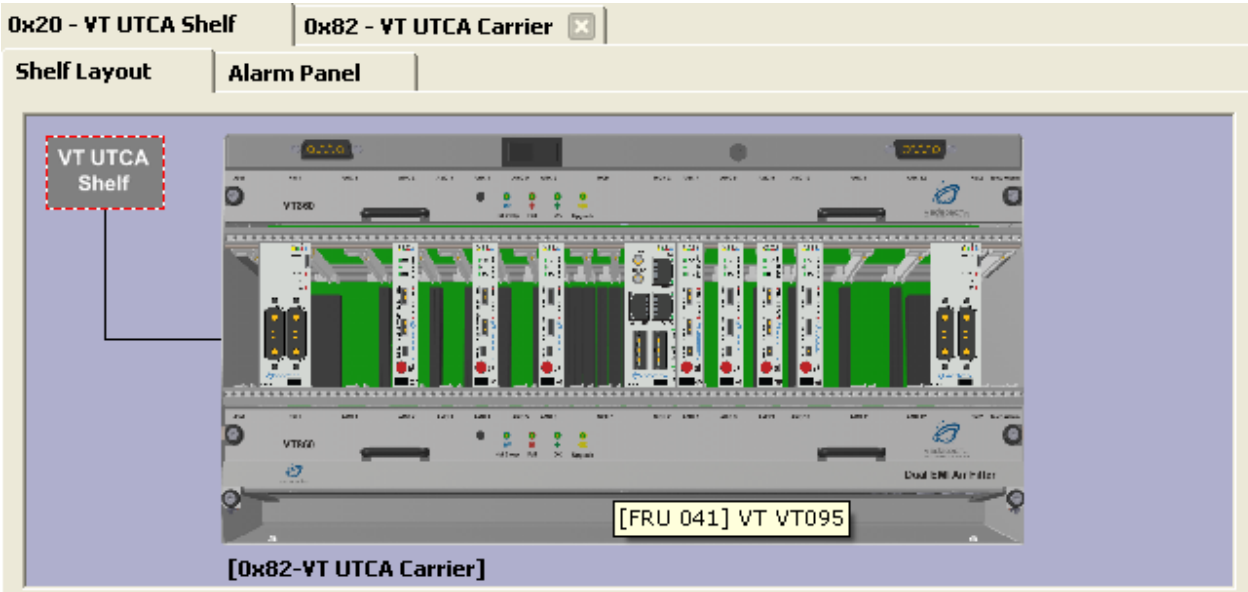


Figure 10: Shelf View

The Carriers front or back can be viewed using the Shelf/Chassis rotate option.

The following table lists the Carrier IDs and access addresses in the Shelf domain:

Carrier ID	Address
1	0x82
2	0x84
3	0x86
4	0x88
5	0x8a
6	0x8c
7	0x8e
8	0x90
9	0x92
10	0x94
11	0x96
12	0x98
13	0x9a
14	0x9c
15	0x9e
16	0xa0

Table 5: Carrier Addressing

4.6.1 Shelf FRU Information

The Shelf FRU Information can be located on any one of the Carriers connected to the Shelf. During startup the Shelf Manager will discover the Shelf FRU Information. Based on this data the Shelf Manager will initialize the Shelf Cooling Management, Shelf Activation, IP connections, etc.

The Carrier that contains the Shelf FRU Information is indicated by a '🔍' tag under the Carrier image.

4.6.2 Carrier Active Status

When the Shelf detects a Carrier, the respective Carrier image is added to the Shelf View. If communication is lost with a Carrier, the respective Carrier image is grayed out until the communication is re-established. If a Carrier is removed or extracted from the Shelf then the Carrier image is removed from the Shelf View.

4.6.3 Carrier Resource

The Shelf View can also be used to navigate to the selected Carrier resource. Any of the installed and active Carriers can be selected to view that Carrier's Tab.

4.7 Carrier Virtual View

The Carrier Layout provides a pictorial representation of the Carrier and the FRUs installed in the Carrier Chassis. The Carriers are identified by their Manufacturer ID and Part Number provided by the Vendor and the System Manager will load the respective Carrier image if one is available. The example shows a VadaTech VT860 Chassis Virtual front view.

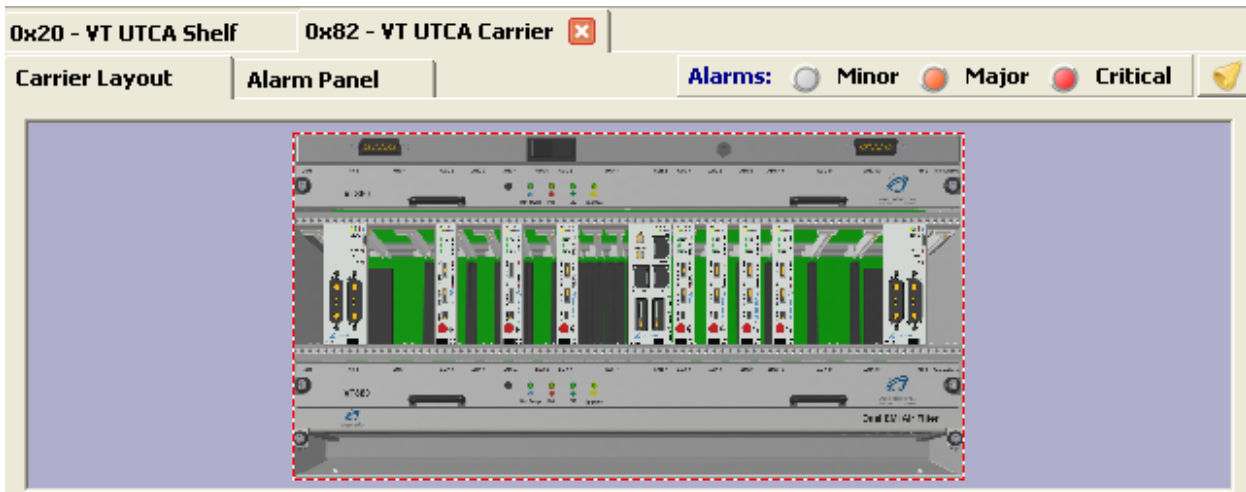


Figure 11: Carrier View

The Carriers front or back can be viewed using the Chassis rotate option.

4.7.1 FRU Active Status

When the System Manager detects a FRU installed in the Carrier, the respective FRU image is populated in the Carrier View. If communication is lost with a FRU, the respective FRU image is grayed out until the communication is re-established. If a FRU is removed or extracted from the Carrier then the FRU image is removed from the Carrier View.

4.7.2 Carrier Manager FRU

The Carrier View can also be used to navigate to the selected Carrier FRU. Any of the installed FRU can be selected to view its entities.

4.8 Resource and Entity Navigation

Resources actually represent the managed elements, called Entities, and the management instruments associated with these entities. In other words, resources are a logical representation of a piece of managed hardware and the management capabilities and methods for that hardware.

4.8.1 Tree Hierarchy

The Shelf and Carrier navigation tree presents the all the resources and entities in a hierarchal tree with the Shelf and Carrier as the root node and all the managed resources and entities under it.

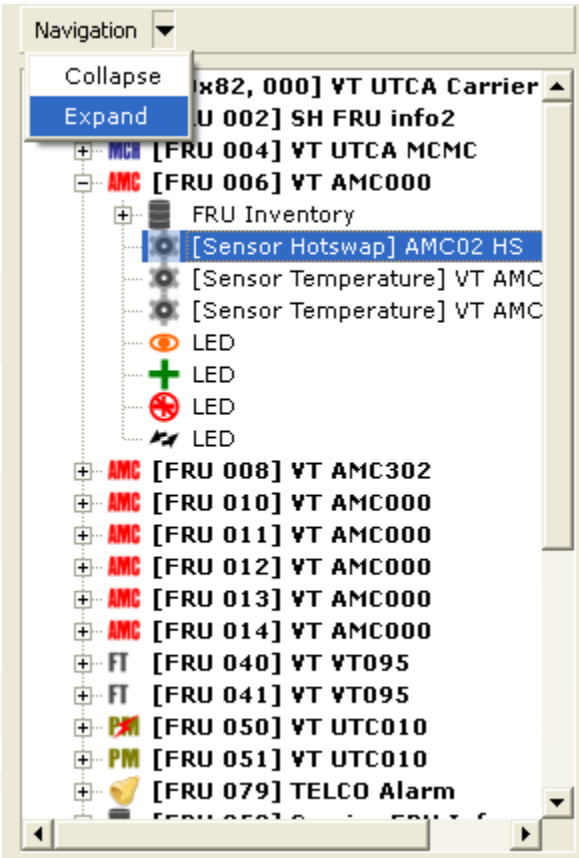


Figure 12: Navigation with Expand/Collapse Option

The following table represents the FRUs and entities under the Shelf navigation tree.

Shelf/Carrier Resource	Level
Shelf Manager	1
Carrier 1..16	2
Shelf FRU Inventory	2
Shelf Sensor Data Repository (SDR)	2
Shelf System Event Log (SEL)	2
Shelf Hot swap Sensor	2
Shelf FRU Information (FRU 254)	2
Carrier FRUs	3
Carrier Sensors	3
Carrier FRU Inventory	3
Carrier Sensor Data Repository (SDR)	3
Carrier System Event Log (SEL)	3

Table 6: Shelf Tree Hierarchy

4.8.2 Resource/Entity Icons

The navigation tree presents each resource or entity using an Icon which enables the user to easily identify its type. The following table lists the Icons and its type.

















ICON	Resource / Entity
	Shelf Manager
	Carrier Manager
	FRU Inventory
	Shelf Sensor Data Repository (SDR)
	Shelf System Event Log (SEL)
	Sensors
	AMC
	MCH
	Telco
	Fan Tray
	Active Power Module
	Passive Power Module
	Hotswap LED
	Error LED
	Health LED
	User LED

Table 7: Resource/Entity Icons

4.8.3 Expand and Collapse

The navigation tree can be fully expanded and collapsed using the navigation menu. Individual resource nodes can be expanded or collapsed using the + or – buttons.

4.8.4 Shelf/Carrier Commands

Selecting an entry in the navigation tree will provide details about the resource or entity.

Using the right mouse button, click on the resource or entity to obtain the list of commands available for that resource.

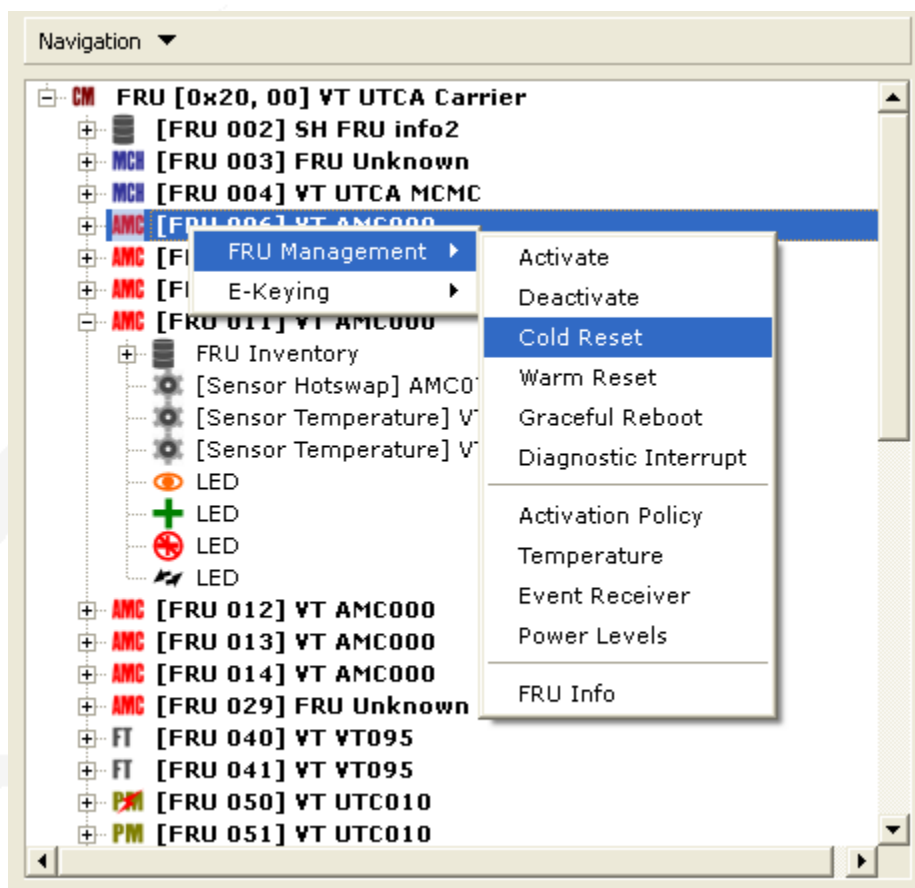


Figure 13: Resource/Entity Commands

The command options for a FRU are also be accessed using the resource or entity information menu or the Virtual Shelf/Carrier View.

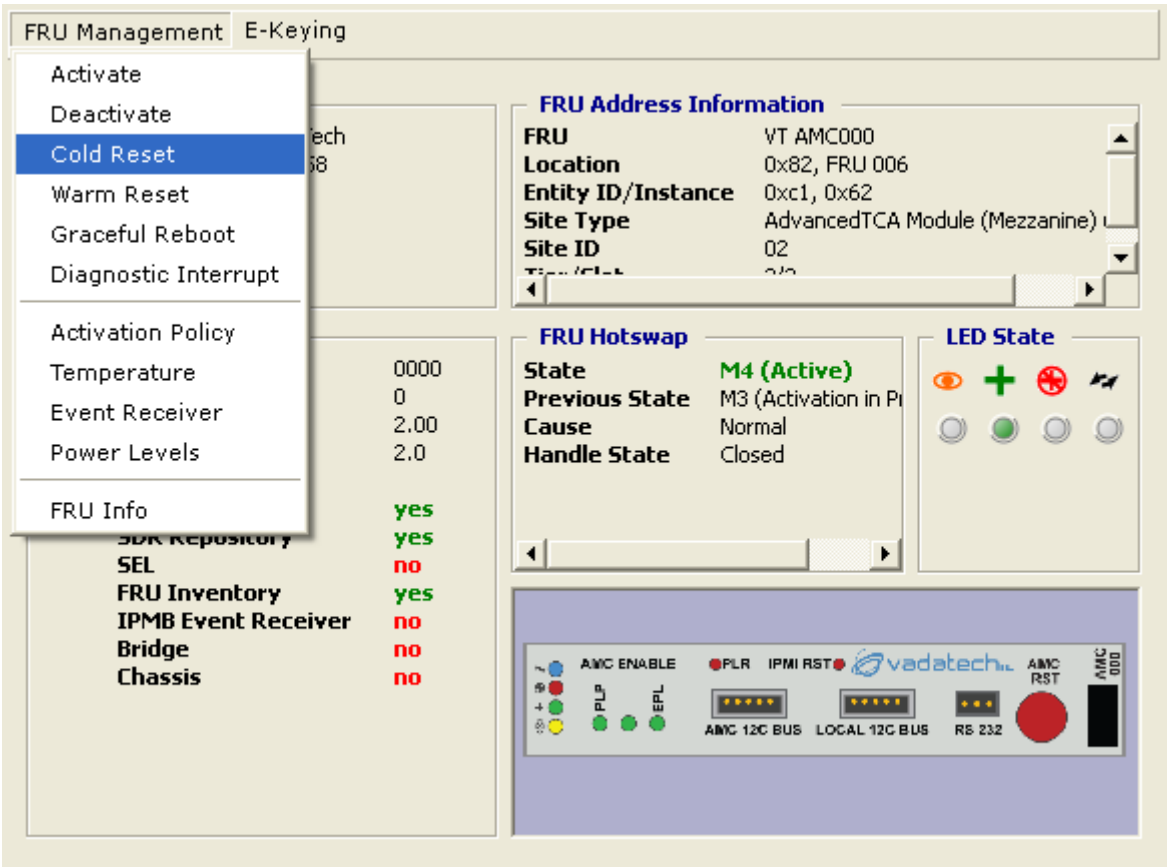


Figure 14: Resource/Entity Command Menu



Figure 15: FRU Command selection using the Shelf/Carrier View

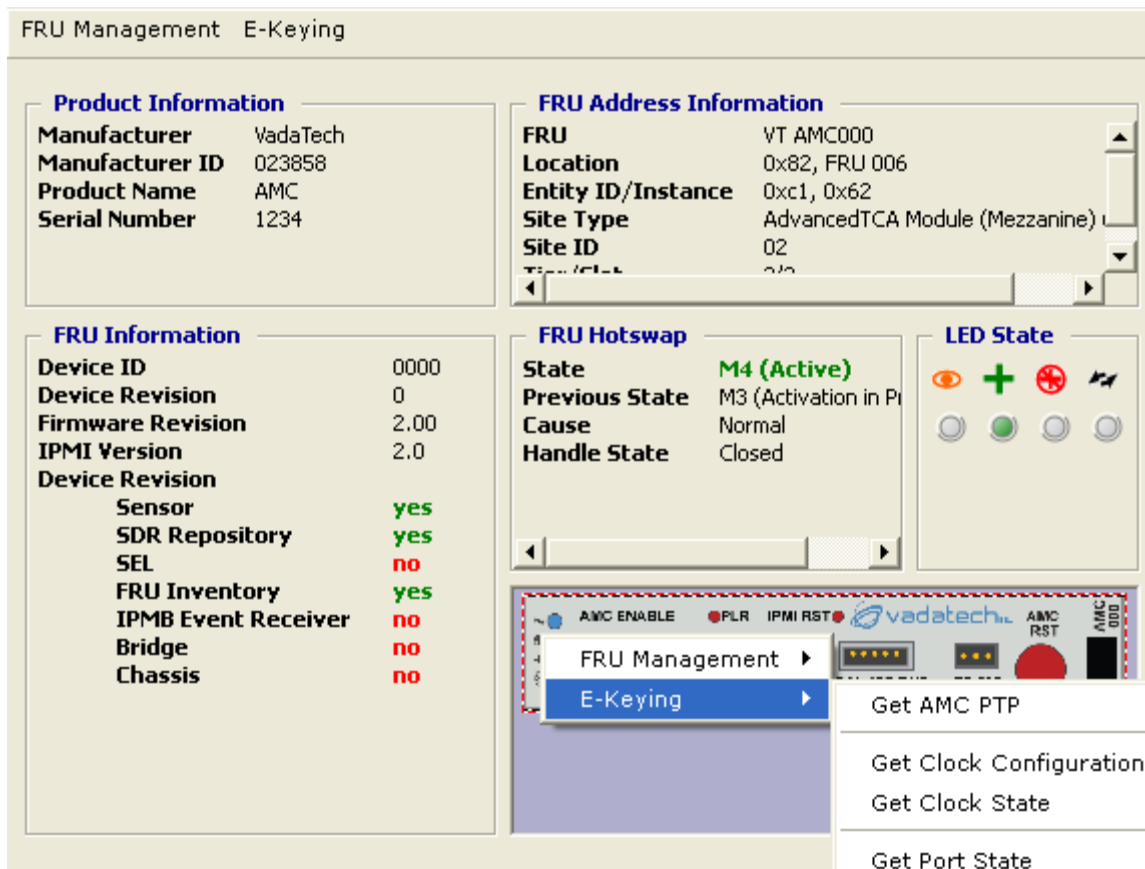


Figure 16: FRU Command selection using the FRU Image

The following table presents the list of commands that are applicable for each Resource or Entity.

Resource / Entity	Main Menu	Functions
Shelf Manager	FRU Management	FRU Info
	Alerting	Get PEF Configuration
		Set PEF Configuration
		SNMP Trap Information
		SNMP Trap Test
	Cooling	Parameters
		Get Fan Geography
	LAN	Channel Access
		Get Channel Cipher Suites
		Get Channel Information
		Get LAN Configuration
		Set LAN Configuration
		Get/Set Shelf IP
		Connection
		List Active Sessions
	Administration	User Access
		List Users
	System Management	Chassis Control Up
		Chassis Control Down

Carrier Manager		Chassis Control Reset
		Chassis Control Soft Shutdown
		Chassis Control Diagnostic Interrupt
		Shelf Information
	FRU Management	Activate
		Deactivate
		Set Extracted
		FRU Info
	Alerting	Get PEF Configuration
		Set PEF Configuration
		SNMP Trap Information
		SNMP Trap Test
	Cooling	Parameters
		Get Fan Geography
	E-Keying	Get Carrier PTP
		Get Clock PTP
	LAN	N/A in 1.0
	Power	Get Power Distribution
		Get Power Policy
	Administration	N/A in 1.0
	System Management	Chassis Control Up
		Chassis Control Down
		Chassis Control Reset
		Chassis Control Soft Shutdown
		Chassis Control Diagnostic Interrupt
		Carrier Information
		Activation Sequence
		Failover
Shelf FRU Information	N/A	Upload
		Download
MCH, AMC, OEM	FRU Management	Activate
		Deactivate
		Cold Reset
		Warm Reset
		Graceful Reboot
		Diagnostic Interrupt
		Activation Policy
		Temperature
		Event Receiver
		Power Levels
		FRU Info
	E-Keying	Get AMC PTP
		Get Clock Configuration
		Get Clock State
		Get Port State

Fan Tray	FRU Management	Activate
		Deactivate
		Cold Reset
		Warm Reset
		Graceful Reboot
		Diagnostic Interrupt
		Activation Policy
		Temperature
		Event Receiver
		Power Levels
		FRU Info
	Cooling	Fan Level
Power Module	FRU Management	Activate
		Deactivate
		Set Extracted
		Cold Reset
		Activation Policy
		Temperature
		Event Receiver
		FRU Info
	Power	Channel Status
		Power Up
		Power Down
		Hard Reset
Telco	Alarm Management	Diagnostic Interrupt
		Soft Shutdown
Carrier Information	N/A	Power Feed Reset
		Telco Capabilities
FRU Inventory	N/A	State
		Upload
SDR	N/A	Download
		Upload
SEL	N/A	Download
		Get SDR Info
Sensor	N/A	Get SDR
		Get SEL Info
		Get SEL
		Clear SEL
		N/A

Table 8: Resource/Entity Commands

Each entry in the navigation tree provides a specific set of commands that can be used to obtain information, current status of the resource or entity. The following sections will describe these commands in detail.

4.9 Shelf Manager Commands

4.9.1 FRU Management

FRU Management		Alerting	Cooling	LAN	Administration	System Management
FRU Info						
Product Information				FRU Address Information		
Manufacturer	VadaTech			FRU	VT UTCA Shelf	
Manufacturer ID	023858			Location	0x20, FRU 000	
Product Name	UTCA Shelf			Entity ID/Instance	0xf0, 0x01	
Serial Number				Site Type	MicroTCA Shelf (0xc2)	
				Site ID	01	
FRU Information				FRU Hotswap		
Device ID	0001			State	M4 (Active)	
Device Revision	1			Previous State	M3 (Activation in Progress)	
Firmware Revision	1.44			Cause	Normal	
IPMI Version	2.0			Handle State	Closed	
Device Revision						
Sensor	yes					
SDR Repository	yes					
SFI	yes					

Figure 17: Shelf Manager FRU Management Commands

4.9.1.1 FRU Info

This command is used to obtain the following information about the ShMC:

- Product information
- FRU Information as described by the Get Device ID Command
- Address information
- Current hot swap state
- LED State
- FRU Image (if one is available)

4.9.2 Alerting

This Shelf FRU command set is used to program the Platform Event Filters (PEF) and Configure and test SNMP Traps.

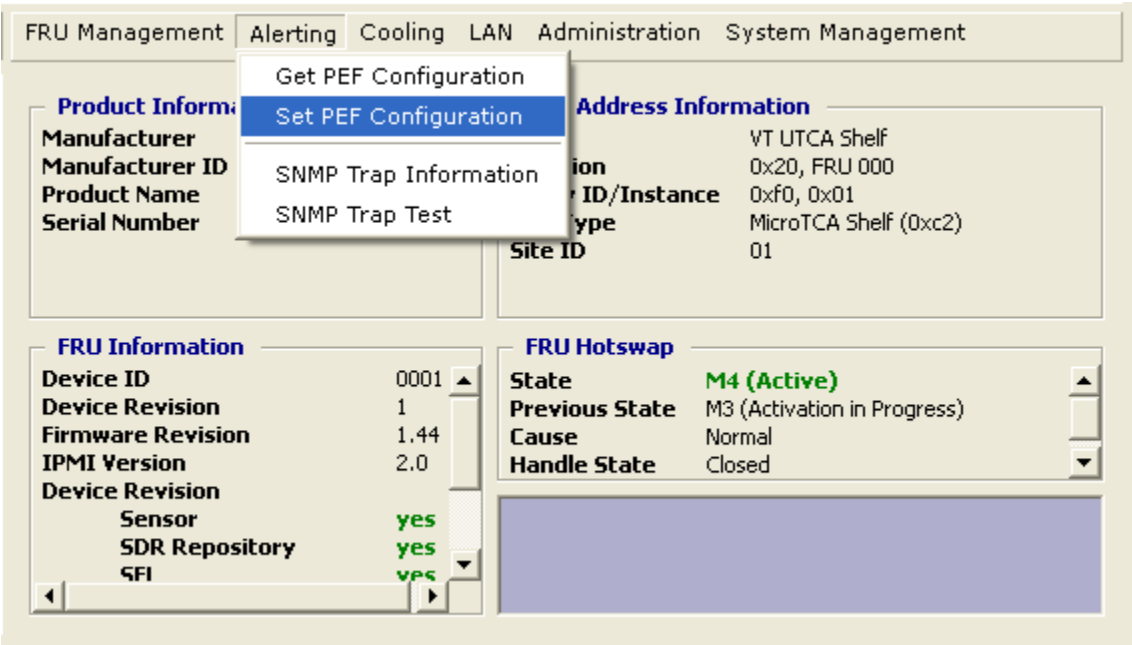


Figure 18: Shelf Manager Alerting Commands

4.9.2.1 Get PEF Configuration

This command is used to get the Shelf Manager Platform Event Filter Configuration.

FRU Management Alerting Cooling LAN Administration System Management

FRU Address Information

FRU VT UTCA Shelf
Location 0x20, FRU 000
Entity ID/Instance 0xf0, 0x01

PEF Format/Filter Actions

Parameter: Set in Progress
 Dump Raw: ☐

PEF Parameters

Parameter Revision
 Present Revision : 1
 Oldest Revision with Backward Compatibility : 1
 Progress : Set complete

Figure 19: Get PEF Configuration

The PEF Parameters can be selected using the PEF Format/Filter actions. For more information on PEF Parameters refer to IPMI 2.0 Specification.

4.9.2.2 Set PEF Configuration

This command is used to set the Shelf Manager Platform Event Filter Configuration.

FRU Management Alerting Cooling LAN Administration System Management

FRU Address Information

FRU VT UTCA Shelf
Location 0x20, FRU 000
Entity ID/Instance 0xf0, 0x01

Set PEF Configuration

Parameter: Select Parameter
 Data:
 String:

Submit

Figure 20: Set PEF Configuration

4.9.2.3 SNMP Trap Information

This command is used to get the SNMP Trap destination addresses currently programmed in the Shelf Manager SNMP Configuration.

For each SNMP Trap destination address a table of IPMI channel and its alerting state is displayed.

FRU Management Alerting Cooling LAN Administration System Management

FRU Address Information

FRU VT UTCA Shelf
Location 0x20, FRU 000
Entity ID/Instance 0xf0, 0x01

SNMP Trap Information

Channel	Alerting State
2	Enabled
3	Disabled
4	Disabled
5	Disabled

Destination IP Addresses

192.168.0.250
10.1.0.255

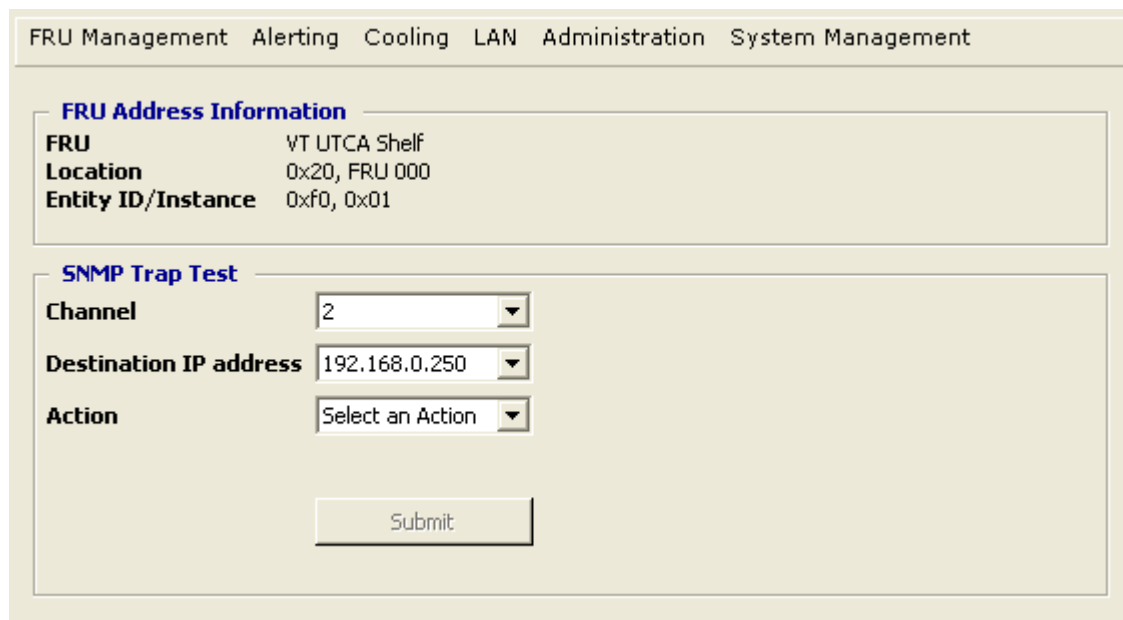
Disable Enable All Disable All Add Edit Remove

Figure 21: SNMP Trap Information

Controls:

- SNMP traps can be enabled or disabled per IPMI channel.
- Destination IP Addresses can be added, removed or edited.

4.9.2.4 SNMP Trap Test



The screenshot displays the VadaTech MicroTCA System Manager interface. At the top, a navigation bar includes links for FRU Management, Alerting, Cooling, LAN, Administration, and System Management. The main content area is divided into two sections. The first section, titled "FRU Address Information", shows the following details: FRU (VT UTCA Shelf), Location (0x20, FRU 000), and Entity ID/Instance (0xf0, 0x01). The second section, titled "SNMP Trap Test", contains three dropdown menus: "Channel" (set to 2), "Destination IP address" (set to 192.168.0.250), and "Action" (set to "Select an Action"). A "Submit" button is located at the bottom of this section.

Figure 22: Shelf SNMP Trap Test

This command can be used to select an IPMI Channel, a Destination IP Address and an Action to perform on the selected parameters. To use the SNMP Trap Test the IPMI Channel on the selected Destination IP Address must be at enabled state.

Actions:

- Get the status of the SNMP Trap Test issued previously to the server.
- Clear the status of the SNMP Trap Test issued previously to the server.

4.9.3 Cooling

The cooling commands are used to configure the Shelf Manager cooling management and to obtain the Shelf cooling geography information.

Product Information		Shelf Information	
Manufacturer	VadaTech	Location	VT UTCA Shelf
Manufacturer ID	023858	Entity ID/Instance	0x20, FRU 000
Product Name	UTCA Shelf	Site Type	0xf0, 0x01
Serial Number		Site ID	MicroTCA Shelf (0xc2)
			01

FRU Information		FRU Hotswap	
Device ID	0001	State	M4 (Active)
Device Revision	1	Previous State	M3 (Activation in Progress)
Firmware Revision	1.44	Cause	Normal
IPMI Version	2.0	Handle State	Closed
Device Revision			
Sensor	yes		
SDR Repository	yes		
SFI	yes		

Figure 23: Shelf Manager Cooling Commands

4.9.3.1 Parameters

This command is used to configure the Shelf cooling parameters stored in the ShMC FRU Inventory.

The screenshot displays a web-based interface for managing a VadaTech MicroTCA system. At the top, a navigation bar includes links for FRU Management, Alerting, Cooling, LAN, Administration, and System Management. The main content area is divided into two sections. The first section, titled 'FRU Address Information', shows details for a specific FRU: 'VT UTCA Shelf' at location '0x20, FRU 000' with entity ID/instance '0xf0, 0x01'. The second section, titled 'Cooling Parameters', contains several configurable settings: 'Normal Level (%)' set to 20, 'Increment Level (%)' set to 5, 'Decrement Level (%)' set to 3, 'Readiness Allowance' set to 60, 'Monitor Cycle' set to 20, and 'Shelf Cooling' which is currently checked (enabled).

FRU Address Information	
FRU	VT UTCA Shelf
Location	0x20, FRU 000
Entity ID/Instance	0xf0, 0x01

Cooling Parameters	
Normal Level (%)	20
Increment Level (%)	5
Decrement Level (%)	3
Readiness Allowance	60
Monitor Cycle	20
Shelf Cooling	<input checked="" type="checkbox"/>

Figure 24: Shelf Cooling Parameters

Configurable Parameters:

- Fan Normal Operating Levels, Increment and Decrement Levels, Cooling Readiness Allowance, and Monitor Cycle can be set.
- The Shelf cooling management can be enabled or disabled.

4.9.3.2 Get Fan Geography

The screenshot displays the 'FRU Management' tab in the VadaTech MicroTCA System Manager. The 'FRU Address Information' section shows details for a 'VT UTCA Shelf' at location '0x20, FRU 000' with entity ID '0xf0, 0x01'. The 'Fan Geography' section contains a table mapping fan tray locations to cooled areas.

Fan Tray Location (Carrier Address/FRU ID)	Cooled Area	
	Carrier Address	FRUs
0x82, FRU 40	0x82	03, 04, 05, 06, 07, 0...
0x82, FRU 41	0x82	03, 04, 05, 06, 07, 0...

Figure 25: Shelf Fan Geography

This command is used to obtain the Shelf Fan Geography Information.

Shelf Manager will manage the Shelf-level cooling, based on the MicroTCA Fan Geography record(s) stored in the Shelf FRU Information. Shelf Managers must interact with a Carrier Manager for any Cooling Unit that is part of that Carrier Manager's MicroTCA Carrier. The mapping between FRUs and the Cooling Units that cool those FRUs is defined by the MicroTCA Fan Geography record(s). Each Cooling Unit FRU entry associates a list of FRU Device IDs and the Carrier Number the FRUs are in with the Carrier Number and FRU Device of the Cooling Unit that covers them.

4.9.4 LAN

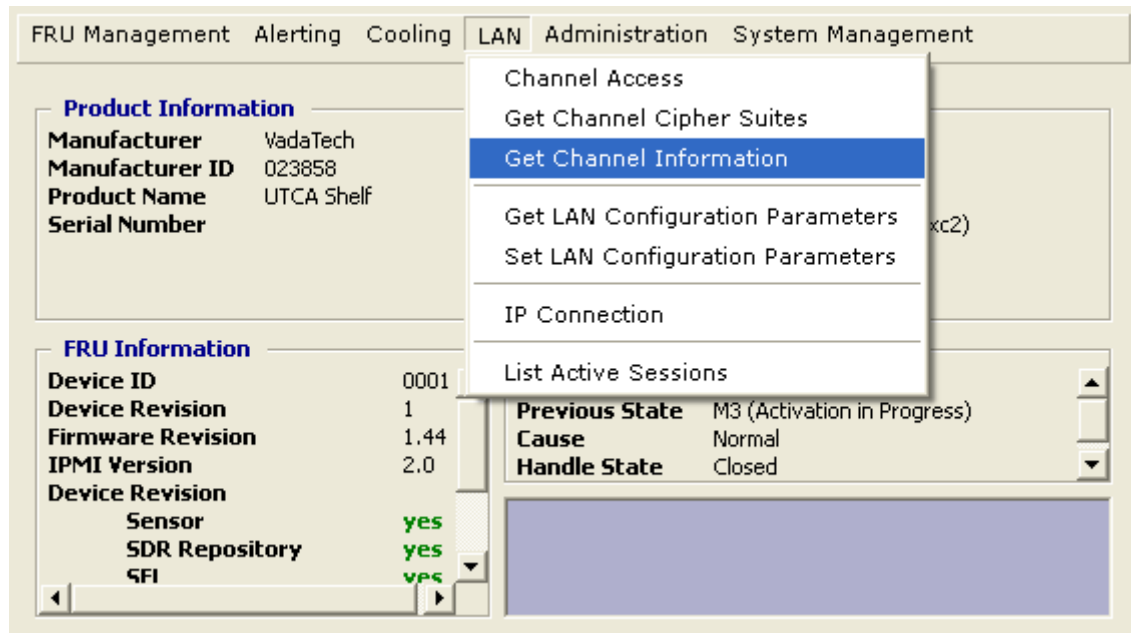


Figure 26: Shelf Manager LAN Configuration Commands

4.9.4.1 Get Channel Access

FRU Management Alerting Cooling LAN Administration System Management

FRU Address Information

FRU: VT UTCA Shelf
 Location: 0x20, FRU 000
 Entity ID/Instance: 0xf0, 0x01

Parameter

Storage: Volatile

Channel Access

Channel	Alerting	Per Message Authentication	User Level Authentication	Access Mode	Privilege Level Limit
2	enable	disable	enable	always available	Admin
3	disable	disable	enable	always available	Admin
4	disable	disable	enable	always available	Admin
5	disable	disable	enable	always available	Admin
6	disable	disable	enable	always available	Admin
8	disable	disable	enable	always available	Admin

Modify

Figure 27: Shelf Manager Channel Access Parameters

4.9.4.2 Get Channel Cipher Suites

FRU Management Alerting Cooling LAN Administration System Management

FRU Address Information

FRU: VT UTCA Shelf
 Location: 0x20, FRU 000
 Entity ID/Instance: 0xf0, 0x01

Cipher Suites

Channel	ID	OEM IANA	Authentication Algorithm	Integrity Algorithm	Confidentiality Algorithm
2	00	N/A	RAKP-none	None	None
2	01	N/A	RAKP-HMAC-...	None	None
2	02	N/A	RAKP-HMAC-...	HMAC-SHA1-96	None
2	03	N/A	RAKP-HMAC-...	HMAC-SHA1-96	AES-CBC-128
2	04	N/A	RAKP-HMAC-...	HMAC-SHA1-96	xRC4-128
2	05	N/A	RAKP-HMAC-...	HMAC-SHA1-96	xRC4-40
2	06	N/A	RAKP-HMAC-...	None	None
2	07	N/A	RAKP-HMAC-...	HMAC-MD5-128	None
2	08	N/A	RAKP-HMAC-...	HMAC-MD5-128	AES-CBC-128

Figure 28: Shelf Manager Channel Cipher Suites

4.9.4.3 Get Channel Information

FRU Management Alerting Cooling LAN Administration System Management

FRU Address Information

FRU: VT UTCA Shelf
 Location: 0x20, FRU 000
 Entity ID/Instance: 0xf0, 0x01

Channel Information

Channel	Medium	Protocol	Session Support	Active Sessions	IANA Enterprise Number
2	802.3 LAN	IPMB-1.0	multi-session	1	0x001bf2
3	802.3 LAN	IPMB-1.0	multi-session	0	0x001bf2
4	802.3 LAN	IPMB-1.0	multi-session	0	0x001bf2
5	802.3 LAN	IPMB-1.0	multi-session	0	0x001bf2
6	802.3 LAN	IPMB-1.0	multi-session	0	0x001bf2
8	802.3 LAN	IPMB-1.0	multi-session	0	0x001bf2
9	802.3 LAN	IPMB-1.0	multi-session	0	0x001bf2
10	802.3 LAN	IPMB-1.0	multi-session	0	0x001bf2
11	802.3 LAN	IPMB-1.0	multi-session	0	0x001bf2

Figure 29: Shelf Manager Channel Information

4.9.4.4 Get LAN Configuration Parameters

FRU Management Alerting Cooling LAN Administration System Management

FRU Address Information

FRU VT UTCA Shelf
Location 0x20, FRU 000
Entity ID/Instance 0xf0, 0x01

Configuration Parameter

Channel 2
Parameter Selector Set in progress
Set Selector (optional)
Get Revision ☐

Display

LAN Configuration

Figure 30: Shelf Manager LAN Configuration Parameters

4.9.4.5 Set LAN Configuration Parameters

FRU Management Alerting Cooling LAN Administration System Management

FRU Address Information

FRU VT UTCA Shelf
Location 0x20, FRU 000
Entity ID/Instance 0xf0, 0x01

LAN Configuration

Channel 2
Parameter Selector Set in progress
Format String
Data

Figure 31: Shelf Manager Set LAN Configuration Parameters

4.9.4.6 Shelf IP Connection

FRU Management Alerting Cooling LAN Administration System Management

FRU Address Information

FRU VT UTCA Shelf
Location 0x20, FRU 000
Entity ID/Instance 0xf0, 0x01

Shelf IP Connection

Shelf IP

IP Address 0

Gateway Address 0

Netmask 0

Figure 32: Shelf Manager Self IP Connection

There are two Shelf Manager Interfaces defined by the MicroTCA Specification. These Interfaces are the out of band connection to the Shelf Manager. This command is used to setup these two IP Connections to the Shelf Manager.

4.9.4.7 List Active Sessions

This command lists all the currently active sessions to the Shelf Manager.

FRU Management Alerting Cooling LAN Administration System Management

FRU Address Information

FRU VT UTCA Shelf
Location 0x20, FRU 000
Entity ID/Instance 0xf0, 0x01

Active Sessions

Session Index	Session Handle	Channel	IP Address	Port	User ID	Privilege Level
1	1	2	192.168.1...	39142	2	Admin
2	2	13	127.0.0.1	50150	3	Admin
3	3	12	10.1.0.255	3589	1	Admin

Number of possible active sessions : 63
Number of currently active sessions : 3

Session protocol auxiliary data : IPMI v2.0/RMCP+
MAC address of remote console : ff:ff:ff:ff:ff:ff

Figure 33: Shelf Manager List Active Sessions

4.9.5 Administration

FRU Management Alerting Cooling LAN Administration System Management

Product Information

Manufacturer VadaTech
 Manufacturer ID 023858
 Product Name UTCA Shelf
 Serial Number

FRU Address Information

FRU VT UTCA Shelf
 Location 0x20, FRU 000
 Entity ID/Instance 0xf0, 0x01
 Site Type MicroTCA Shelf (0xc2)
 Site ID 01

FRU Information

Device ID 0001
 Device Revision 1
 Firmware Revision 1.44
 IPMI Version 2.0
 Device Revision
 Sensor yes
 SDR Repository yes
 SFI yes

FRU Hotswap

State M4 (Active)
 Previous State M3 (Activation in Progress)
 Cause Normal
 Handle State Closed

Figure 34: Shelf Manager Administration Commands

4.9.5.1 User Access

FRU Management Alerting Cooling LAN Administration System Management

FRU Address Information

FRU VT UTCA Shelf
 Location 0x20, FRU 000
 Entity ID/Instance 0xf0, 0x01

Channel

Select channel: 2

Users

Maximum number of User IDs: 63
 Count of currently enabled User IDs: 3
 Count of User IDs with fixed names: 3

User ID	User Name	Privilege Level	Account Status	IPMI Messaging	Link Authentication	Callback Restriction	Max Sessions
1	null	Admin	enable	enable	enable	enable	5
2	shelf	Admin	enable	enable	enable	enable	5
3	snmp	Admin	enable	enable	enable	enable	5

Modify

Figure 35: Shelf Manager User Access

4.9.5.2 List Users

FRU Management Alerting Cooling LAN Administration System Management

FRU Address Information

FRU VT UTCA Shelf
Location 0x20, FRU 000
Entity ID/Instance 0xf0, 0x01

Users

User ID	User Name	Account Status
01	null	enable
02	shelf	enable
03	snmp	enable

Add Modify Delete

Figure 36: Shelf Manager List of Users

4.9.6 System Management

FRU Management Alerting Cooling LAN Administration **System Management**

Product Information

Manufacturer VadaTech
 Manufacturer ID 023858
 Product Name UTCA Shelf
 Serial Number

FRU Address Information

FRU
 Location
 Entity ID/Instance
 Site Type
 Site ID

Chassis Control Up
Chassis Control Down
 Chassis Control Reset
 Chassis Control Soft Shutdown
 Chassis Control Diagnostic Interrupt
 Shelf Information

FRU Information

Device ID 0001
 Device Revision 1
 Firmware Revision 1.44
 IPMI Version 2.0
 Device Revision
 Sensor yes
 SDR Repository yes
 SEL yes
 FRU Inventory yes

FRU Hotswap

State **M4 (Active)**
 Previous State M3 (Activation in Progress)
 Cause Normal
 Handle State Closed

Figure 37: Shelf Manager System Management Commands

4.9.6.1 Chassis Controls

Command	Description
Up	Activates all the FRUs in the specified Carrier
Down	Deactivates all the FRUs in the specified Carrier
Reset	Issue cold reset on all the powered FRUs in the Carrier
Soft Shutdown	Deactivates all the FRUs in the specified Carrier
Diagnostic Interrupt	Pulse diagnostic interrupt on all the FRUs in the Carrier

Table 9: Shelf Chassis Controls

4.9.6.2 Shelf Information

The screenshot displays a web-based interface for managing MicroTCA components. At the top, a navigation bar includes links for FRU Management, Alerting, Cooling, LAN, Administration, and System Management. The main content area is divided into three sections:

- FRU Address Information:** Displays details for a specific FRU: VT UTCA Shelf, located at 0x20, FRU 000, with Entity ID/Instance 0xf0, 0x01.
- Shelf Information:** Shows the System GUID as 8dda9e1f-4a11-4311-9ccf-7784c7342d60. Below this, the Shelf Address Information is shown as N/A, with an Update button.
- Carrier Location Information:** A table mapping FRU to Tier, Slot, and Coordinates.

FRU	Tier (1-based)	Slot (1-based)	Coordinates (x,y)(mm)
VT UTCA Carrier	0	0	(0, 0)

Figure 38: Shelf Information

The location of the MicroTCA Carrier within a Shelf is implementation-defined by the system integrator. The MicroTCA Shelf Information record as described in the Shelf FRU Information contains mapping information used to describe the physical location of Carriers and Modules in the Shelf.

4.10 Shelf FRU Information

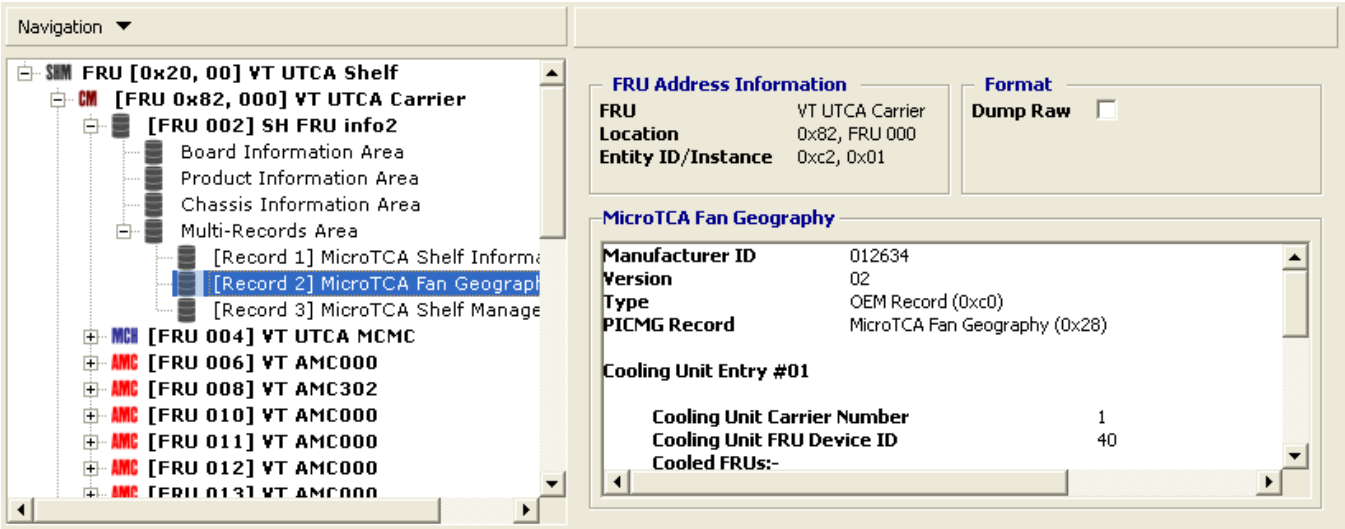


Figure 39: Shelf FRU Information

The MicroTCA Shelf FRU Information is specified as a logical entity and can be located in the Carrier FRU Information device. The Shelf FRU Information is located in one of the Carrier FRU Information Device.

The contents the Shelf FRU Information can be viewed by navigating further into the Board, Product, Chassis and Multi-Record sections of the FRU Inventory.

4.11 Carrier Manager

4.11.1 FRU Management

4.11.1.1 FRU Info

This command is used to obtain the following information regarding the MCMC:

- Product information
- FRU Information as described by the Get Device ID Command
- Address information
- Current hot swap state
- FRU Image (if available)

The screenshot displays the 'FRU Management E-Keying' window. It is divided into several sections:

- Product Information:**
 - Manufacturer: VadaTech
 - Manufacturer ID: 023858
 - Product Name: AMC
 - Serial Number: 1234
- FRU Address Information:**
 - FRU: VT-AMC000
 - Location: 0x82, FRU 006
 - Entity ID/Instance: 0xc1, 0x62
 - Site Type: AdvancedTCA Module (Mezzanine)
 - Site ID: 02
 - Site Class: 02
- FRU Information:**
 - Device ID: 0000
 - Device Revision: 0
 - Firmware Revision: 2.00
 - IPMI Version: 2.0
 - Device Revision:
 - Sensor: yes
 - SDR Repository: yes
 - SEL: no
 - FRU Inventory: yes
 - IPMB Event Receiver: no
 - Bridge: no
 - Chassis: no
- FRU Hotswap:**
 - State: M4 (Active)
 - Previous State: M3 (Activation in progress)
 - Cause: Normal
 - Handle State: Closed
- LED State:**
 - Buttons: +, -, x, y
 - LEDs: Four circular LEDs, the second one from the left is green.

At the bottom of the window is a hardware status bar with the following indicators:

- AMC EVABLE (blue circle)
- PLR (red circle)
- IPMI RST (red circle)
- Vadatech logo
- AMC RST (red circle)
- AMC 000 (black rectangle)
- AMC 12G BUS (5 yellow LEDs)
- LOCAL 12G BUS (5 yellow LEDs)
- RS 232 (5 yellow LEDs)

Figure 40: FRU Information

4.11.1.2 FRU Activate

This command is used to activate all the FRUs in the Carrier.

4.11.1.3 FRU Deactivate

This command is used to deactivate all the FRUs in the Carrier.

4.11.1.4 FRU Cold Reset

FRU Control (Cold Reset)" command shall cause a hardware reset to its payload, similar to a power on reset.

4.11.1.5 FRU Warm Reset

FRU Control (Warm Reset) command shall cause the Module's payload to be reset to a stable condition, attempting to preserve its operational state. If this command variant is unsupported, the MMC shall return the "Invalid data field in Request (CCh)" *Completion Code*.

4.11.1.6 FRU Graceful Reboot

FRU Control (Graceful Reboot) command on a Module which supports this command shall initiate a graceful shutdown and reboot of its payload operating system. If this command variant is unsupported, the MMC shall return the "Invalid data field in Request (CCh)" *Completion Code*.

4.11.1.7 FRU Diagnostic Interrupt

FRU Control (Issue Diagnostic Interrupt) command on a Module which supports this command shall trigger a diagnostic interrupt to the Module's payload. If this command variant is unsupported, the MMC shall return the "Invalid data field in Request (CCh)" *Completion Code*.

4.11.1.8 FRU Activation Policy

The Set FRU Activation Policy command modifies the way a FRU's operational state transitions behave. The policy bits indicate whether the FRU is *Locked* or not and whether the FRU is *Deactivation-Locked* or not. Conceptually, the *Locked* bit is like a software equivalent of the Handle Switch. Similar to the situation with the hardware Handle Switch, the FRU cannot proceed from state M1 to M2 if the *Locked* bit has a value 1b. The *Deactivation-Locked* bit indicates whether the Extraction Criteria Met condition exists. The FRU can only proceed from M4 to M5 if the *Deactivation-Locked* bit is cleared.

4.11.1.9 FRU Temperature

The FRU temperature command is used to obtain the current status of all the temperature sensors that are present on the target FRU.

4.11.1.10 FRU Event Receiver

This command is used to obtain the the slave address and LUN of its Event Receiver. The command is also used to set the receiver addresss.

4.11.1.11 FRU Power Levels

If the Carrier Manager has the power budget to allow the FRU to change power levels, up or down, it sends a Set Power Level command. This command can be used to obtain the current FRU power level or to change the power level.

4.11.1.12 Set Extracted

This command is used to set the Carrier has been removed or extracted from the Shelf. Normally this command is used if a Carrier was removed from a Shelf domain, and currently remains at a Communication Lost state.

4.11.2 Alerting

These set of commands is used to configure and enable Carrier Alerting.

The Carrier Manager Alerting is similar to the Shelf Manager. Please refer to Section 4.9.2

4.11.3 Cooling

4.11.3.1 Parameters

This command is used to configure the Carrier cooling parameters.

The Shelf cooling parameters is stored in the MCMC FRU Inventory. The VadaTech Carrier cooling parameters is similar to the VadaTech Shelf Manager. Please refer to Section 4.9.3

4.11.3.2 Get Fan Geography

FRU Address Information

FRU VT UTCA Carrier
Location 0x20, FRU 000
Entity ID/Instance 0xc2, 0x01

Fan Geography

Fan Tray Location (IPMB Addresses/FRU ID)	Cooled FRUs (Site Type/Number)
0xa8, FRU# 00	0x0b, 01
	0x0b, 02
	0x0a, 01
	0x0a, 02
	0x07, 01
	0x07, 02
	0x07, 03
	0x07, 04
	0x07, 05
	0x07, 06
	0x07, 07
	0x07, 08
0x07, 09	
0x07, 10	
0x07, 11	
0x07, 12	

Figure 41: Carrier Fan Geography

This command is used to obtain the fan geography information for the VadaTech Carrier Manager.

This command is only available when connected to the VadaTech Carrier Manager. The VadaTech Carrier Manager is capable of managing its chassis cooling provided one or more Fan Tray(s) are available in the chassis. When a Shelf Manager is absent or communication is lost with the Shelf Manager the Carrier Manager will automatically take over its cooling. This is so the Carrier cooling is not compromised if the Shelf Manager communication was lost.

4.11.4 E-Keying

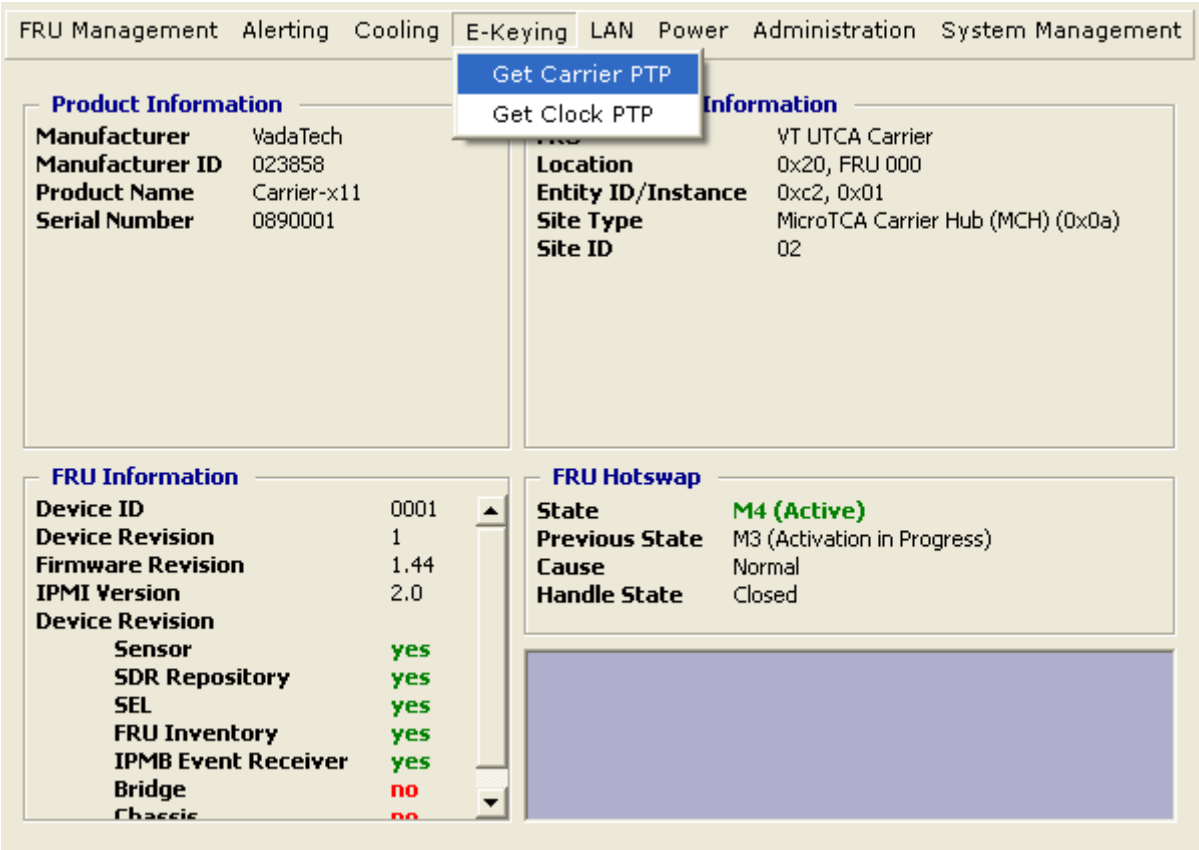


Figure 42: Carrier Fan Geography

4.11.4.1 Get Carrier Point to Point

This command is used to obtain the Carrier Point-to-Point Information.

The Carrier Point-to-Point Connectivity record contains information about the MicroTCA Carrier physical connections, as defined by the Backplane implementation. The Carrier Point-to-Point Connectivity record is located in the Carrier FRU Information. The fields in these records describe how Fabric connectivity is routed.

The System Manager lists the Carrier PTP records as defined in the Carrier FRU Information. The record information can be viewed by selecting the respective record in the Record/Descriptor Table.

FRU Management Alerting Cooling E-Keying LAN Power Administration System Management

FRU Address Information
FRU VT UTCA Carrier
Location 0x20, FRU 000
Entity ID/Instance 0xc2, 0x01

Carrier Point-to-Point

Record Number	Descriptor	
	Type	Number
1	AMC Resource	0
2	AMC Resource	1
3	AMC Resource	2
4	AMC Resource	3
5	AMC Resource	4

Record Information:

Resource ID (on-Carrier, Device ID 0)
Point-to-Point Port Count : 12
PTP Port Des #0
Remote Resource ID (AMC, Bay ID 1)
Port(Local 0 -> Remote 0)
PTP Port Des #1
Remote Resource ID (AMC, Bay ID 2)
Port(Local 1 -> Remote 0)

Figure 43: Carrier Point-to-Point

4.11.4.2 Get Clock Point-to-Point

FRU Address Information

FRU: VT UTCA Carrier
 Location: 0x20, FRU 000
 Entity ID/Instance: 0xc2, 0x01

Clock Resource

Resource ID: Clock resource 0x00
 Resource Type: On-Carrier Device
 Device ID: 0

Clock Configuration

Record Number	Descriptor	
	Type	umber
1	On-Carrier Device Clock	00
2	On-Carrier Device Clock	01
3	On-Carrier Device Clock	02
4	On-Carrier Device Clock	03

Descriptor Information:

Local Clock ID: 00
 Remote Resource ID: 0x41
 Remote Clock ID: TCLKA (01)
 Remote Resource Type: AMC Module (01)
 Site Number: 01

Figure 44: Clock Point-to-Point

This command is used to obtain the Carrier Clock Point-to-Point information.

4.11.5 LAN

These Commands are similar to Shelf Manager. Please Refer to Section 4.9.4

4.11.6 Administration

These Commands are similar to Shelf Manager. Please Refer to Section 4.9.5

4.11.7 Power

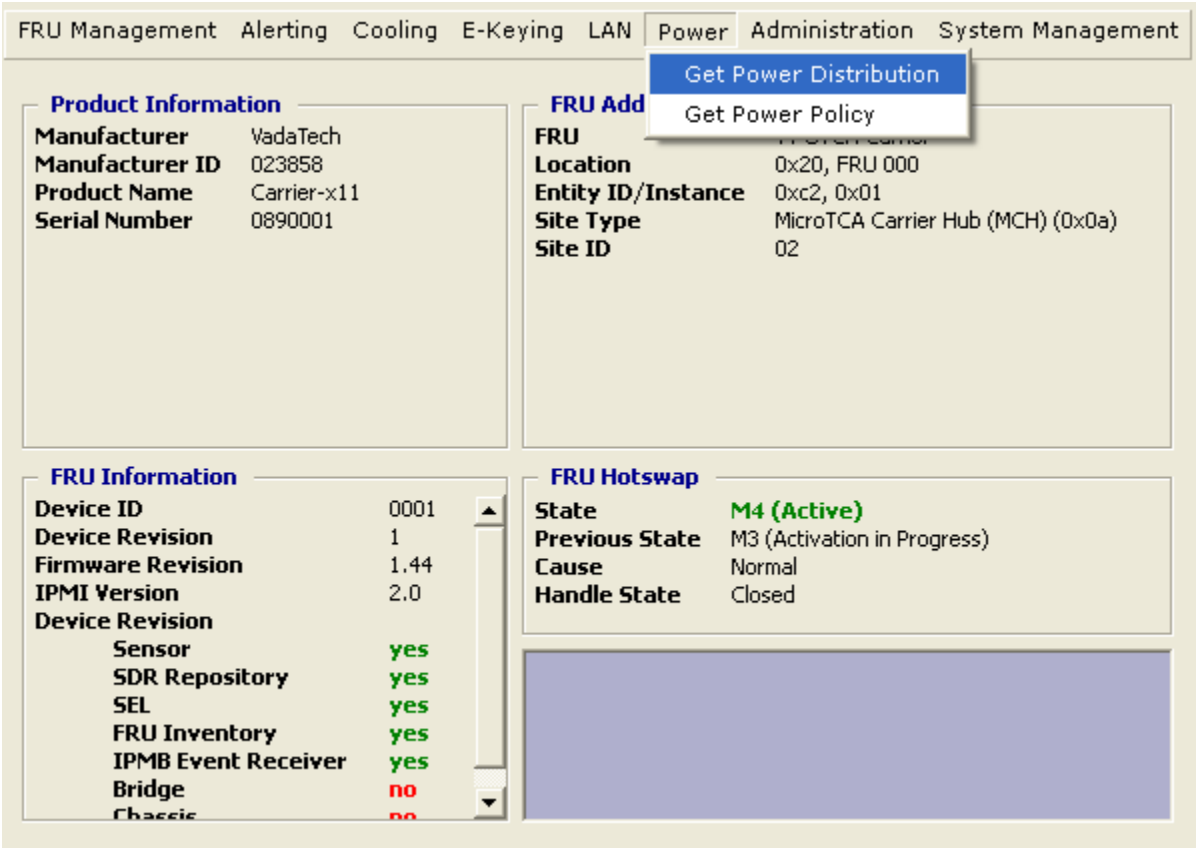


Figure 45: Carrier Power Distribution Commands

4.11.7.1 Get Power Distribution

This command is used to obtain the Carrier Power Distribution.

MicroTCA Carrier Activation and Power Management Records describe the Maximum Channel Current that the backplane is capable of delivering to a module.

The Carrier Manager will obtain the Module's current requirement from its FRU Information and then validate it against the Maximum Channel Current data defined in the MicroTCA Carrier FRU Activation and Power Management Record. The current delivered to a Module cannot exceed the Maximum Channel Current.

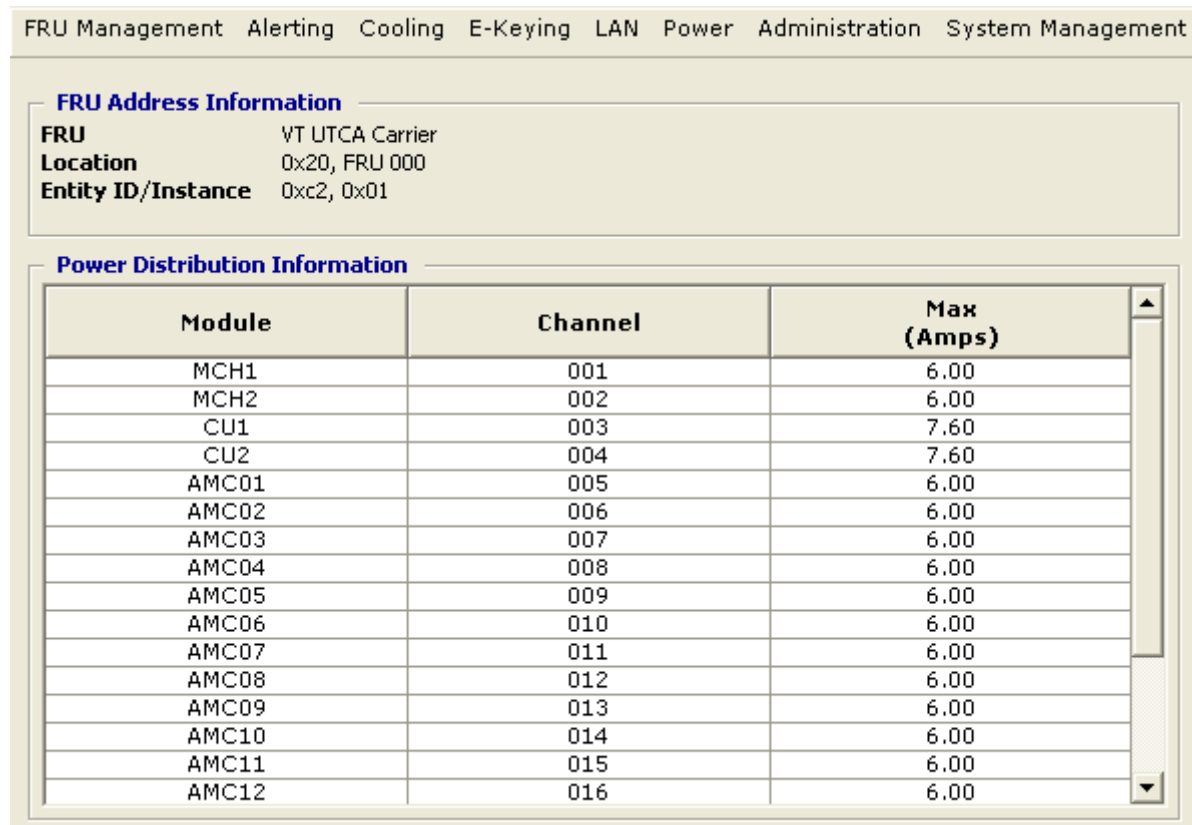


Figure 46: Carrier Power Distribution

4.11.7.2 Get Power Policy

FRU Address Information	
FRU	VT UTCA Carrier
Location	0x20, FRU 000
Entity ID/Instance	0xc2, 0x01

Power Policies	
Power Feed 1	
Power Feed 2	

Policy Information:	
Configured Role:	PRIMARY
Site:	1
Maximum Current Override:	57.00 Amps
Associated Power Channels:	1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16

Figure 47: Carrier Power Policy

This command is used to obtain the Carrier Power Policy Record.

The MicroTCA Carrier Power Policy record specifies the Maximum Current Override and recommends Primary/Redundant roles and preferences for Power Channel allocation to each PM. The Maximum Current Override field optionally limits the maximum available Payload Power from the PM due to external constraints such as cabling, external power limitations, and power supply efficiency. Regardless of the power capability reported by the PM, the power drawn from the PM cannot exceed this value.

The optional Power Channel Array specifies the preferred Power Channels to which a PM provides Payload Power.

4.11.8 System Management

The screenshot displays the 'System Management' tab in the VadaTech MicroTCA System Manager. The interface is divided into several sections:

- Product Information:**
 - Manufacturer: VadaTech
 - Manufacturer ID: 023858
 - Product Name: Carrier-x11
 - Serial Number: 0890001
- FRU Address Information:**
 - FRU: VT UTCA Carrier
 - Location: 0x20, FRU 000
 - Entity ID/Instance: 0xc2, 0x01
 - Site Type: MicroTCA Carrier
 - Site ID: 02
- FRU Information:**
 - Device ID: 0001
 - Device Revision: 1
 - Firmware Revision: 1.44
 - IPMI Version: 2.0
 - Device Revision: 0001
 - Sensor: yes
 - SDR Repository: yes
 - SEL: yes
 - FRU Inventory: yes
 - IPMB Event Receiver: yes
 - Bridge: no
 - Chassis: no
- FRU Hotswap:**
 - State: M4 (Active)
 - Previous State: M3 (Activation in Progress)
 - Cause: Normal
 - Handle State: Closed
- System Management Menu:**
 - Chassis Control Up
 - Chassis Control Down
 - Chassis Control Reset
 - Chassis Control Soft
 - Chassis Control Diag
 - Carrier Information
 - Address Table
 - Activation Sequence
 - Failover

Figure 48: Carrier System Management

4.11.8.1 Chassis Controls

Command	Description
Up	Activate all FRUs in the Chassis
Down	Deactivate all FRUs in the Chassis
Reset	Send Cold Reset to all FRUs in the Chassis
Soft Shutdown	Deactivate all FRUs in the Chassis
Diagnostic Interrupt	Pulse diagnostic interrupt to all FRUs in the Chassis

Table 10: Carrier Chassis Controls

4.11.8.2 Carrier Information

FRU Management Alerting Cooling E-Keying LAN Power Administration System Management

FRU Address Information

FRU VT UTCA Carrier
Location 0x20, FRU 000
Entity ID/Instance 0xc2, 0x01

Carrier Information

System GUID cca46bcb-109b-4f7a-a85c-7d77d771396f
Carrier Number 0

FRU Location Information

Carrier Orientation Horizontal

FRU	Tier (1-based)	Slot (1-based)	Coordinates (x,y)(mm)
FRU Unknown	2	8	(88, 215)
VT UTCA MCMC	2	9	(88, 245)
VT AMC000	2	3	(88, 108)
VT AMC302	2	5	(88, 149)
VT AMC000	2	7	(88, 184)
VT AMC000	2	10	(88, 260)
VT AMC000	2	11	(88, 281)
VT AMC000	2	12	(88, 301)
VT AMC000	2	13	(88, 321)

Figure 49: Carrier Information

The physical location of Modules within a MicroTCA Carrier is determined by the layout of the MicroTCA Carrier Backplane. The MicroTCA Carrier Information record as described in the Carrier FRU Information contains mapping information used to describe the physical location of Modules in the Carrier.

Each MicroTCA Carrier is identified by its MicroTCA Carrier Number from 1 through 16 within a MicroTCA Shelf. Typically, the Carrier Number is assigned based on the Carrier's physical location in the MicroTCA Shelf.

4.11.8.3 Address Table

This command is used to obtain the Carrier Module address table.

FRU Management Alerting Cooling E-Keying LAN Power Administration System Management

FRU Address Information

FRU VT UTCA Carrier
Location 0x20, FRU 000
Entity ID/Instance 0xc2, 0x01

FRU Address Table

Module	IPMB Address	Site Number
MicroTCA Carrier Hub (MCH)	0x10	0x01
MicroTCA Carrier Hub (MCH)	0x12	0x02
AdvancedTCA Module (Mezzanine)	0x72	0x01
AdvancedTCA Module (Mezzanine)	0x74	0x02
AdvancedTCA Module (Mezzanine)	0x76	0x03
AdvancedTCA Module (Mezzanine)	0x78	0x04
AdvancedTCA Module (Mezzanine)	0x7a	0x05
AdvancedTCA Module (Mezzanine)	0x7c	0x06
AdvancedTCA Module (Mezzanine)	0x7e	0x07
AdvancedTCA Module (Mezzanine)	0x80	0x08
AdvancedTCA Module (Mezzanine)	0x82	0x09
AdvancedTCA Module (Mezzanine)	0x84	0x0a
AdvancedTCA Module (Mezzanine)	0x86	0x0b
AdvancedTCA Module (Mezzanine)	0x88	0x0c
AdvancedTCA Module (Mezzanine)	0xa2	0x19
AdvancedTCA Module (Mezzanine)	0xa4	0x1a

Figure 50: Carrier Address Table

4.11.8.4 Activation Sequence

The MicroTCA Carrier Activation and Power Management Record describe the Module activation sequence, as well as the Maximum Channel Current that the Backplane is capable of delivering to the Module.

FRU Management Alerting Cooling E-Keying LAN Power Administration System Management

FRU Address Information

FRU VT UTCA Carrier
Location 0x20, FRU 000
Entity ID/Instance 0xc2, 0x01

Activation Sequence

Module Readiness Allowance 30

Module	Channel	Power On Delay (1/10 sec)	Activation Control	Deactivation Control
MicroTCA Carrier Hub (MCH)	001	0.0	Carrier	Carrier
MicroTCA Carrier Hub (MCH)	002	0.0	Carrier	Carrier
Cooling Unit	003	0.0	Carrier	Carrier
Cooling Unit	004	0.0	Carrier	Carrier
AdvancedTCA Module (Mez...	005	0.0	Carrier	Carrier
AdvancedTCA Module (Mez...	006	0.0	Carrier	Carrier
AdvancedTCA Module (Mez...	007	0.0	Carrier	Carrier
AdvancedTCA Module (Mez...	008	0.0	Carrier	Carrier
AdvancedTCA Module (Mez...	009	0.0	Carrier	Carrier
AdvancedTCA Module (Mez...	010	0.0	Carrier	Carrier
AdvancedTCA Module (Mez...	011	0.0	Carrier	Carrier
AdvancedTCA Module (Mez...	012	0.0	Carrier	Carrier
AdvancedTCA Module (Mez...	013	0.0	Carrier	Carrier
AdvancedTCA Module (Mez...	014	0.0	Carrier	Carrier
AdvancedTCA Module (Mez...	015	0.0	Carrier	Carrier

Figure 51: Carrier Activation Sequence

4.11.8.5 Failover

This command enables the user to issue a Carrier redundancy failover to the standby MCH if one is present. If a redundant MCH is healthy and active the Carrier Manager will failover immediately.

4.12 MCMC, EMMC and MMC

4.12.1 FRU Management

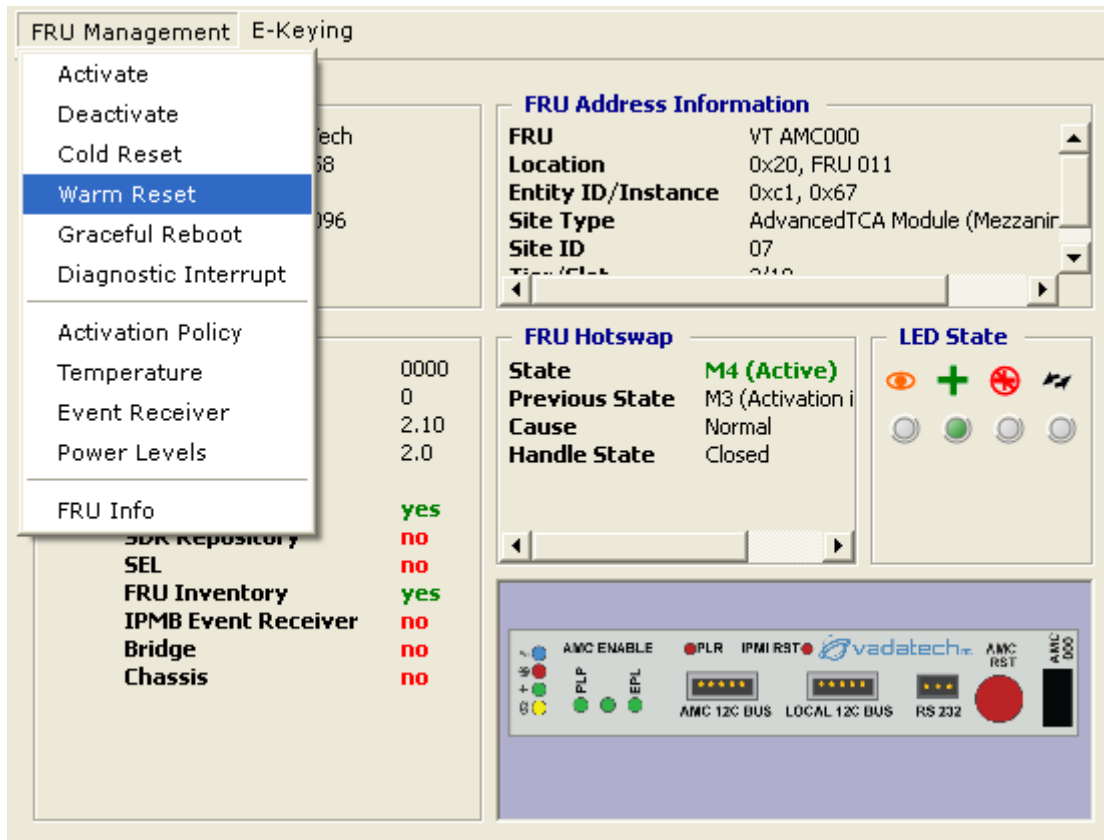


Figure 52: MCMC,EMMC,MMC FRU Management

4.12.1.1 FRU Info

This command is used to obtain the FRU:

- Product information
- FRU Information as described by the Get Device ID Command
- Address information
- Hot swap state of FRU
- LED state

4.12.1.2 Activate

This command is used to activate the specified FRU to M4 state.

4.12.1.3 Deactivate

This command is used to deactivate the specified FRU to M1 state.

4.12.1.4 Set Extracted

Applicable only for Power Module, this command is used to set PM as extracted or not installed.

4.12.1.5 Cold Reset

Applicable only for MCMCs, MMCs, Fan Trays and OEM EMMCs, this command is used to trigger a hardware reset of the specified FRU payload.

4.12.1.6 Warm Reset

Applicable only for MCMCs, MMCs, Fan Trays and OEM EMMCs, this command is used to trigger a reset of the specified FRU payload to a stable condition while attempting to preserve its operational state. The FRU may not support this command.

4.12.1.7 Graceful Reboot

Applicable only for MCMCs, MMCs, Fan Trays and OEM EMMCs, this command is used to trigger a graceful shutdown to the specified FRU and reboot of its payload operating system. The FRU may not support this command.

4.12.1.8 Diagnostic Interrupt

Applicable only for MCMCs, MMCs, Fan Trays and OEM EMMCs, this command is used to trigger a diagnostic interrupt to the specified FRU's payload. The FRU may not support this command.

4.12.1.9 Activation Policy

Applicable only for MCMCs, MMCs, Fan Trays, PM and OEM EMMCs, this command is used to get the current state of the specified FRU Activation Policy. The policy bits indicate whether the FRU is Locked or not and whether the FRU is Deactivation-Locked or not. Conceptually, the Locked bit is like a software equivalent of the Handle Switch. Similar to the situation with the hardware Handle Switch, the FRU cannot proceed from state M1 to M2 if the Locked bit has the value 1b. The Deactivation-Locked bit indicates whether the Extraction Criteria Met condition exists. The FRU can only proceed from M4 to M5 if the Deactivation-Locked bit is cleared.

4.12.1.10 Temperature

Applicable only for MCMC, MMCs, Fan Trays, PM and OEM EMMCs, this command is used to get the current temperature reading and threshold status of the specified FRU.

FRU Management E-Keying

FRU Address Information

FRU VT AMC000
Location 0x20, FRU 011
Entity ID/Instance 0xc1, 0x67

FRU Temperature

Device	Belongs To Entity ID/Instance	Sensor Number	Reading	Threshold Status
VT AMC000 T1	0xc1, 0x67	0x24	28 degrees C	Normal
VT AMC000 T2	0xc1, 0x67	0x25	28 degrees C	Normal

Figure 53: FRU Temperature Status

4.12.1.11 Event Receiver

This command is used to get the Event Receiver address and LUN setting for the specified FRU. The command can also be used to set the Receiver address and LUN.

4.12.1.12 Power Levels

This command is used to get the current operating power level for the specified FRU. The user can change the power level of the FRU by selecting one of the available power levels supported by the FRU.

4.12.2 E-Keying

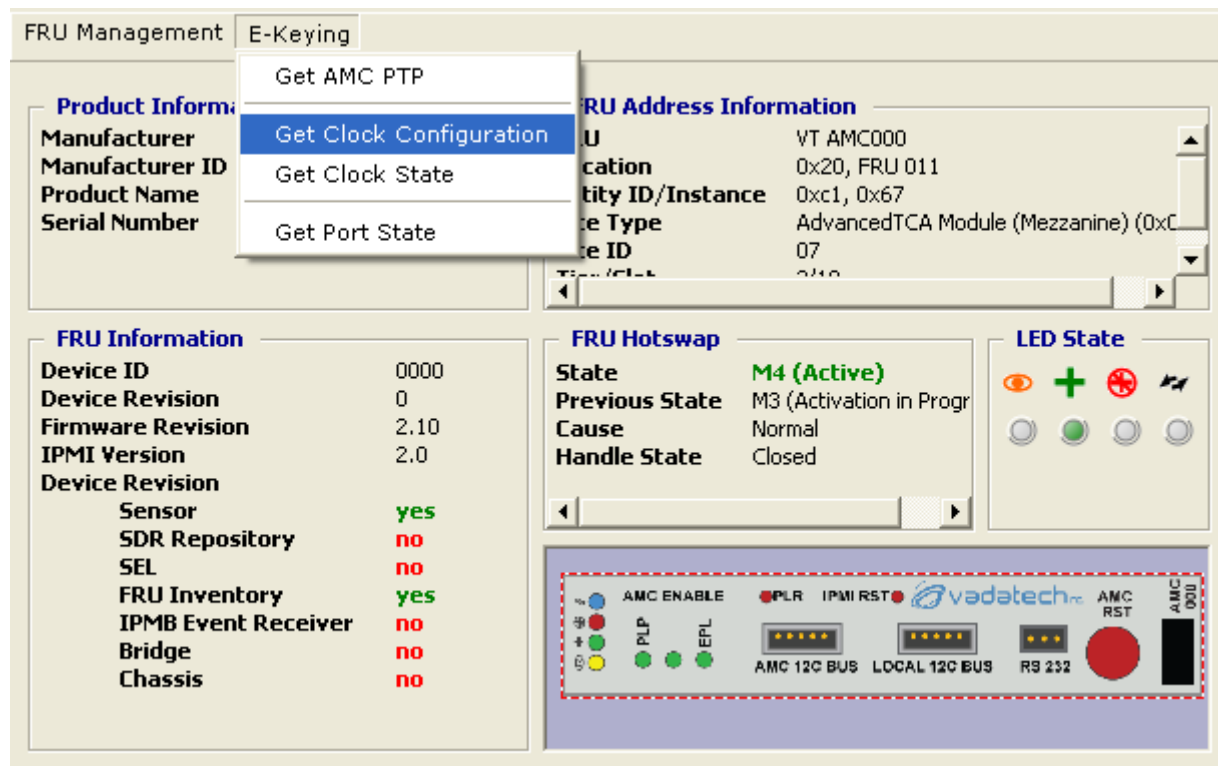


Figure 54: Carrier E-Keying Commands

4.12.2.1 Get AMC PTP

Applicable only for MCMCs, MMCs and OEM EMMCs, this command is used to obtain the AMC Point-to-Point Information of the specified FRU.

FRU Management E-Keying

FRU Address Information

FRU VT AMC000
 Location 0x20, FRU 011
 Entity ID/Instance 0xc1, 0x67

AMC Point-to-Point

Record Number	Descriptor	
	Type	Number
1	AMC Channel	0
2	AMC Channel	1
3	AMC Channel	2
4	AMC Link	n

Record Information:

Lane 0 = Port 4
 Lane 1 = Port 5
 Lane 2 = Port 6
 Lane 3 = Port 7

Figure 55: AMC Point-to-Point

One or more AMC Point-to-Point Connectivity records are included in the AMC FRU Information and describe the Channel and Link connectivity that is implemented on the AMC Module. Each AMC point-to-point connectivity record contains AMC Link Descriptors, each of which identifies a Link and an associated protocol. Multiple AMC Link Descriptors can exist for a given point-to-point AMC Channel. This would be used when a Channel can support multiple protocols such as PCI-Express and Advanced Switching.

AMC Channel Descriptors define AMC Channels (each composed of an essentially arbitrary set of up to four Ports) that are implemented on a Module or an on-Carrier device (depending on the value of the Record Type field in the AMC Point-to-Point Connectivity record). An AMC Channel is referenced in other FRU Information records via an AMC Channel ID/Number, which is the zero-based sequential index into the corresponding AMC Channel Descriptor in a composite list combining the AMC Channel Descriptors from all the AMC Point-to-Point Connectivity records that occur in a given FRU Information area. This list preserves the order of the groups of AMC Channel Descriptors to match the order of the containing AMC Point-to-Point Connectivity records in the FRU Information area.

For more information on AMC Channel and Link Descriptors please refer to PICMG Advanced Mezzanine Card AMC.0 Specification.

4.12.2.2 Get Clock Configuration

Applicable only for MCMCs, MMCs and OEM EMMCs, this command is used to obtain the Clock configuration of the specified FRU.

FRU Management E-Keying

FRU Address Information

FRU VT-AMC000
Location 0x20, FRU 011
Entity ID/Instance 0xc1, 0x67

Clock Configuration

Record Number	Descriptor	
	Type	Number
1	Clock Configuration	0

Description Information

Clock ID: On-Carrier Device Clock (1)
Clock Control: Activated by Carrier IPMC
Direct Descriptor Count: 1
 Direct Descriptor #1
 Asymmetric Match: Receiver
 PLL: Bypassed
 Family: COMET/COMET/COMET (6-01)

Figure 56: Clock Configuration

4.12.2.3 Get Clock State

Applicable only for MCMCs, MMCs and OEM EMMCs, this command is used to obtain the Clock state of the specified FRU.

FRU Management E-Keying

FRU Address Information

FRU VT AMC000
 Location 0x20, FRU 011
 Entity ID/Instance 0xc1, 0x67

Clock State

Clock ID	Direction	PLL Control	State
1	Receiver	Default	Disabled

Description

Clock Disabled

Figure 57: Clock State

4.12.2.4 Get Port State

Applicable only for MCMCs, MMCs and OEM EMMCs, this command is used to obtain distinct *Link Info* and *State* for up to four ports.

FRU Management E-Keying

FRU Address Information

FRU VT AMC000
 Location 0x20, FRU 011
 Entity ID/Instance 0xc1, 0x67

AMC Port State

Channel	Lanes	Link Type	Type Ext	Group ID	State
0	0xf	AMC.1 PCI Express	Gen 1-capable	0	Disabled
0	0xf	AMC.1 PCI Express	Gen 1-capable, spread sp...	0	Disabled
0	0xf	AMC.1 PCI Express	Gen 2-capable	0	Disabled
0	0xf	AMC.1 PCI Express	Gen 2-capable, spread sp...	0	Disabled
1	0x3	AMC.1 PCI Express	Gen 1-capable	0	Disabled
1	0x3	AMC.1 PCI Express	Gen 1-capable, spread sp...	0	Disabled
1	0x3	AMC.1 PCI Express	Gen 2-capable	0	Disabled
1	0x3	AMC.1 PCI Express	Gen 2-capable, spread sp...	0	Disabled
2	0x1	AMC.1 PCI Express	Gen 1-capable	0	Disabled
2	0x1	AMC.1 PCI Express	Gen 1-capable, spread sp...	0	Disabled
2	0x1	AMC.1 PCI Express	Gen 2-capable	0	Disabled
2	0x1	AMC.1 PCI Express	Gen 2-capable, spread sp...	0	Disabled

Figure 58: AMC Port Status

4.12.3 Cooling

4.12.3.1 Get Fan Level

Applicable only for Fan Tray, this command is used to obtain and modify the Fan Level.

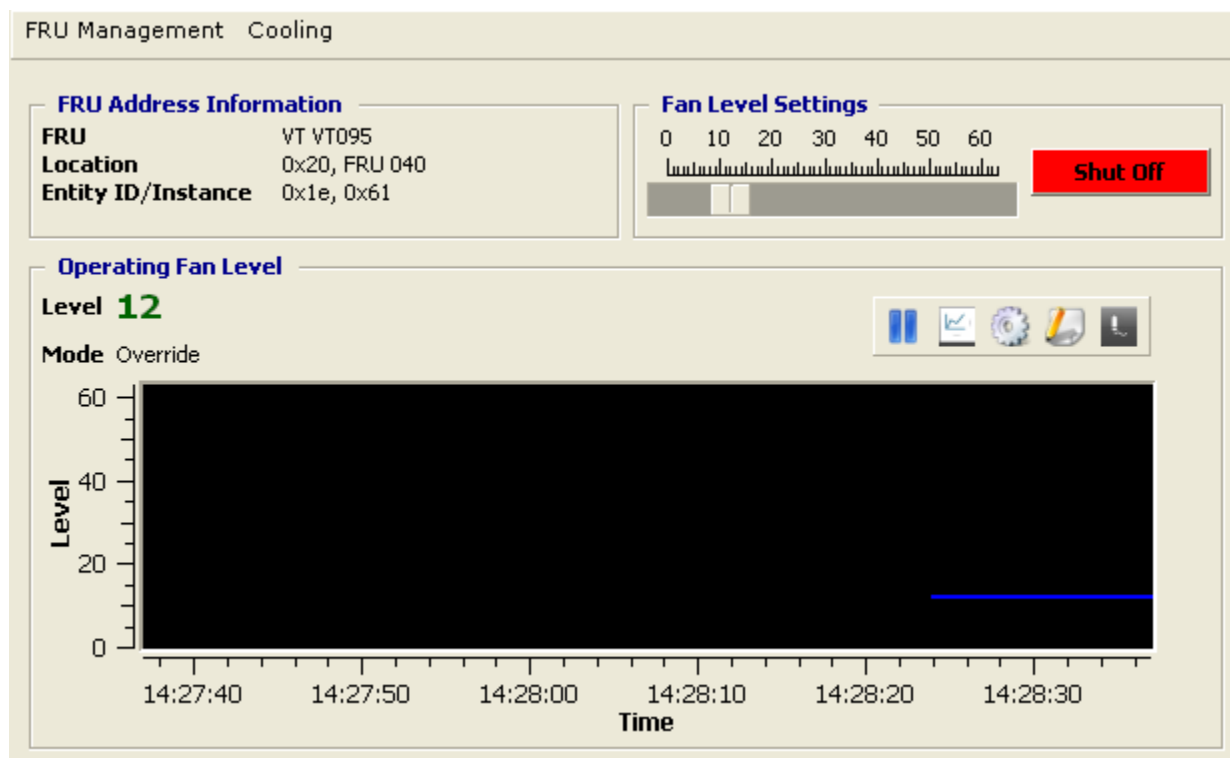


Figure 59: Fan Tray Controls

Display:

- Real time graph plotter that updates the graph with the Fan Level.
- The current Fan Level and the Operating Mode.

Controls:

- Fan Level setting and emergency shutoff button.

ICON	Function	Description
	Pause/Resume	Pause and Resume data collection
	Scale	Configure the graph scale
	Refresh Rate	Configure the date refresh rate
	Log Setting	Enable data logging to a file
	Erase	Clear history

Table 11: Fan Tray Controls

4.12.4 Power

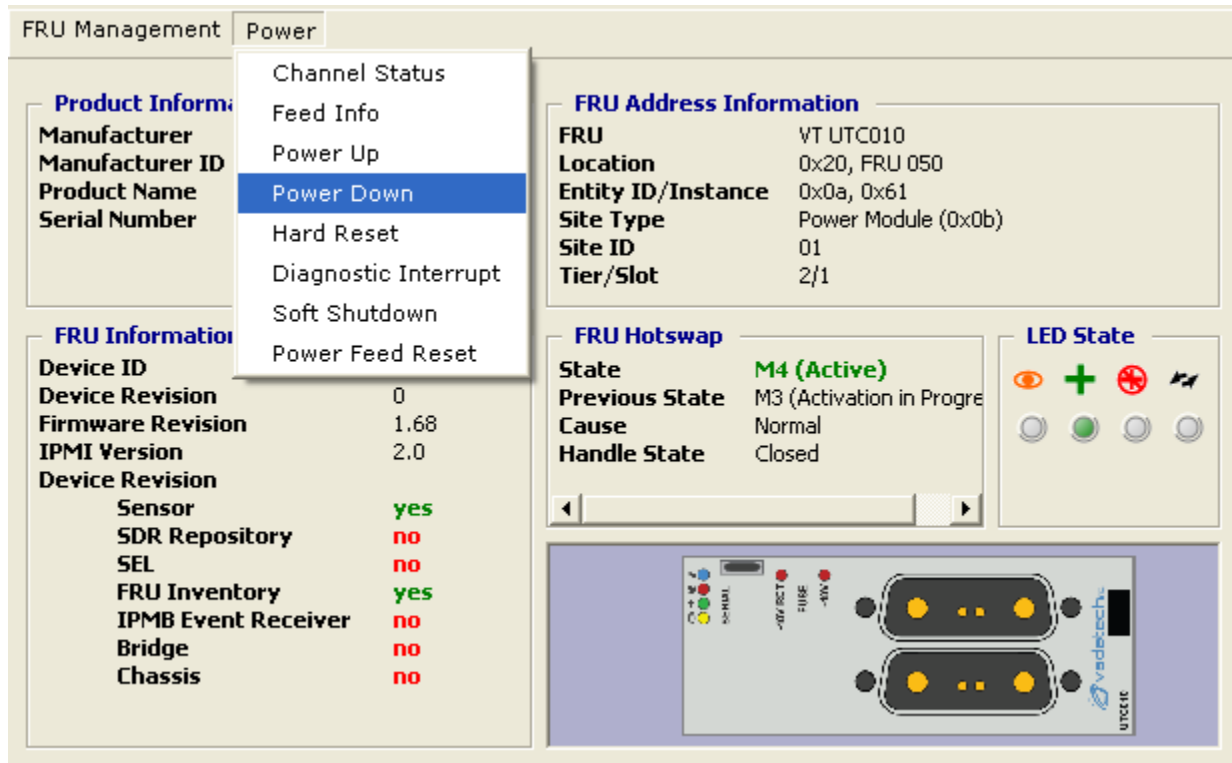


Figure 60: Power Module Commands

The following commands in this section are applicable only for Power Modules.

4.12.4.1 Channel Status

This command is used to obtain the following information from the Power Module:

- Current role of the Power Module i.e. Primary or Redundant.
- Management Power status
- Payload Power status
- Maximum Power Channels supported by the Power Module.
- Per Module slot Information:
 - Channel number
 - Presence status
 - Reset Enable status
 - Management Power On/Off state with current status
 - Payload Power On/Off state with current status
 - PWR_ON state

FRU Management Power

FRU Address Information

FRU VT UTC010
 Location 0x20, FRU 050
 Entity ID/Instance 0x0a, 0x61

Power Channel Status

Role PRIMARY
 Management Power Status HEALTHY
 Payload Power Status HEALTHY
 Maximum Power Channel 16

Module	Channel	PS1	Enable
MCH1	1	Asserted	Asserted
MCH2	2	Asserted	Asserted
CU1	3	Asserted	Asserted
CU2	4	Asserted	Asserted
AMC01	5	Deasserted	Deasserted
AMC02	6	Asserted	Asserted
AMC03	7	Deasserted	Deasserted

Figure 61: Power Channel Status

4.12.4.2 Power Up

This command is used to enable power for all supported modules. This is an optional command for Power Modules and may not be implemented.

4.12.4.3 Power Down

This command is used to disable power for all supported modules. This is an optional command for Power Modules and may not be implemented.

4.12.4.4 Hard Reset

This command is used to trigger a reset event in the system that initializes all components and invalidates caches. This is an optional command for Power Modules and may not be implemented.

4.12.4.5 Diagnostic Interrupt

This command is typically used to cause the operating system to do a diagnostic dump. This is an optional command for Power Modules and may not be implemented.

4.12.4.6 Soft Shutdown

This command is used initiate a soft shutdown. This is an optional command for Power Modules and may not be implemented.

4.12.4.7 Power Feed Reset

This command is used to reset the alternate PM(s) in the Chassis. This command must be sent to a secondary PM, which will drive a reset signal to the specified PM if present.

4.13 Telco

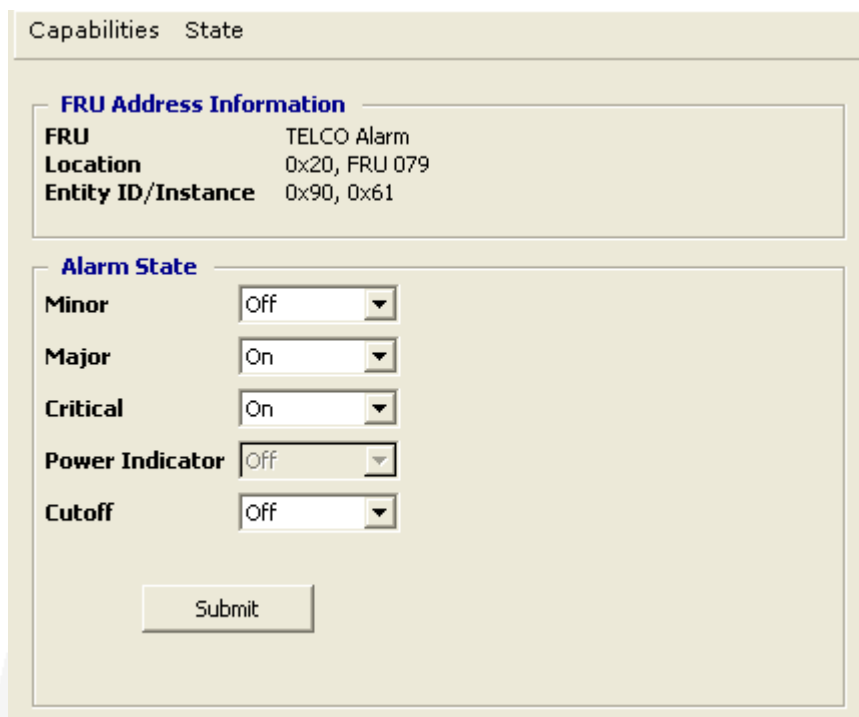
4.13.1 Capabilities

Capabilities		State	
Product Information		FRU Address Information	
Manufacturer		FRU	TELCO Alarm
Manufacturer ID	13487565	Location	0x20, FRU 079
Product Name		Entity ID/Instance	0x90, 0x61
Serial Number		Site Type	Unknown (0x00)
		Site ID	00
Capabilities		FRU Hotswap	
Critical Alarm Control	yes	State	M4 (Active)
Major Alarm Control	yes	Previous State	M2 (Activation Request)
Minor Alarm Control	yes	Cause	Normal
Power Alarm Control	no	Handle State	Closed
Test Mode Enable	no		
Alarm Cutoff Action	yes		
Autonomous Minor Reset	no		
Autonomous Major Reset	no		

Figure 62: Telco FRU Capabilities

- Indicates which alarms can be controlled by "Set Telco Alarm State" command.
- Hot swap status

4.13.2 State



The screenshot shows a web-based configuration interface for a Telco system. It has two tabs: 'Capabilities' and 'State', with 'State' being the active tab. The interface is divided into two main sections: 'FRU Address Information' and 'Alarm State'. The 'FRU Address Information' section displays three fields: 'FRU' (TELCO Alarm), 'Location' (0x20, FRU 079), and 'Entity ID/Instance' (0x90, 0x61). The 'Alarm State' section contains five rows, each with a label and a dropdown menu: 'Minor' (Off), 'Major' (On), 'Critical' (On), 'Power Indicator' (Off), and 'Cutoff' (Off). A 'Submit' button is located at the bottom of the 'Alarm State' section.

FRU Address Information	
FRU	TELCO Alarm
Location	0x20, FRU 079
Entity ID/Instance	0x90, 0x61

Alarm State	
Minor	Off
Major	On
Critical	On
Power Indicator	Off
Cutoff	Off

Submit

Figure 63: Telco Status

Controls:

- The current status of the Telco Alarm
- Enable/Disable Minor, Major, Critical, Power Indicator alarms.
- Enable/Disable Telco Cutoff.

4.14 Sensors

4.14.1 Sensor Classes

Sensors fall into the following classes:

Class	Description
Discrete	<p>Multiple states possible. Discrete sensors can contain up to 15 possible states. For discrete sensors, the Get Sensor Reading command returns a bit field where each bit reflects a different state. It is possible for a discrete sensor to have more than one state active at a time.</p> <p>Discrete sensors can be designed to provide either Generic or Sensor-specific states. The Event/Reading Type Codes in IPMI 2.0 Interface Specification are used to specify the particular set of possible Generic states for a discrete sensor</p>
Digital	A digital sensor is not really a unique class, but a term commonly used to refer to special case of a discrete sensor that only has two possible states.
Threshold	'Threshold based'. Changes event status by comparing the reading to fixed threshold values. Threshold enumerations may be considered a special case of the discrete sensor type. The Event/Reading Type Code for threshold-based sensors is specified in, Generic Event/Reading Type Codes in IPMI 2.0 Interface Specification. The offsets specify each particular possible threshold state.
OEM	Special case of discrete where the meanings of the states (offsets) are OEM defined.

Table 12: Sensor Classification

4.14.2 Threshold Sensors

The Temperature, Voltage and RPM sensors are some of the important threshold sensors. The System Management tool presents these sensors in a real time plotter that updates the graph with the sensor reading.

Real Time Plotting:



Figure 64: Threshold Sensor Graph

Analog Display:

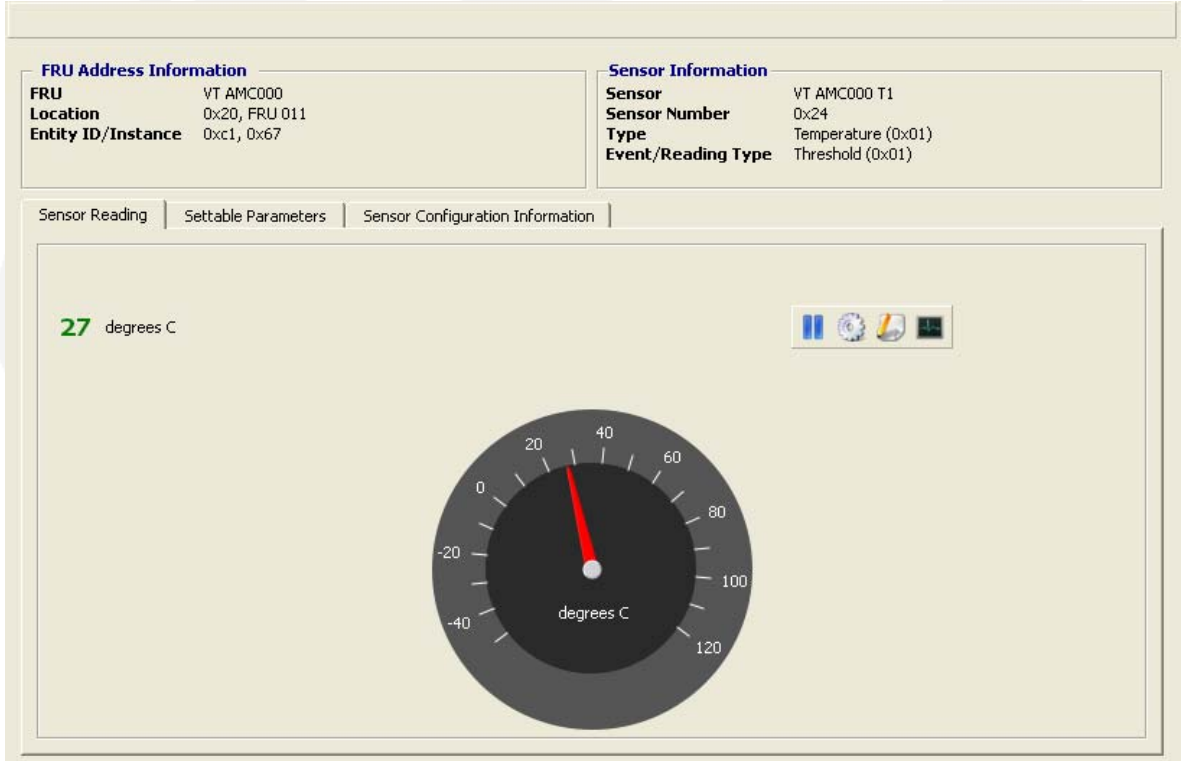


Figure 65: Threshold Sensor Analog Reading

Controls:







ICON	Function	Description
	Pause/Resume	Pause and Resume data collection
	Scale	Configure the graph scale
	Refresh Rate	Configure the date refresh rate
	Log Setting	Enable data logging to a file
	Erase	Clear history
	Switch View	Switch between Graph and Analog view

Table 13: Threshold Sensor Controls

4.14.2.1 Settable/Readable Parameters

Sensor Settable Parameters enable the user to change the Threshold and Hysteresis for the sensor. Enable/Disable Event Messages and Sensor Scanning
 Sensor Configuration Information as programmed in the Sensor Data Record (SDR).

4.15 LEDs

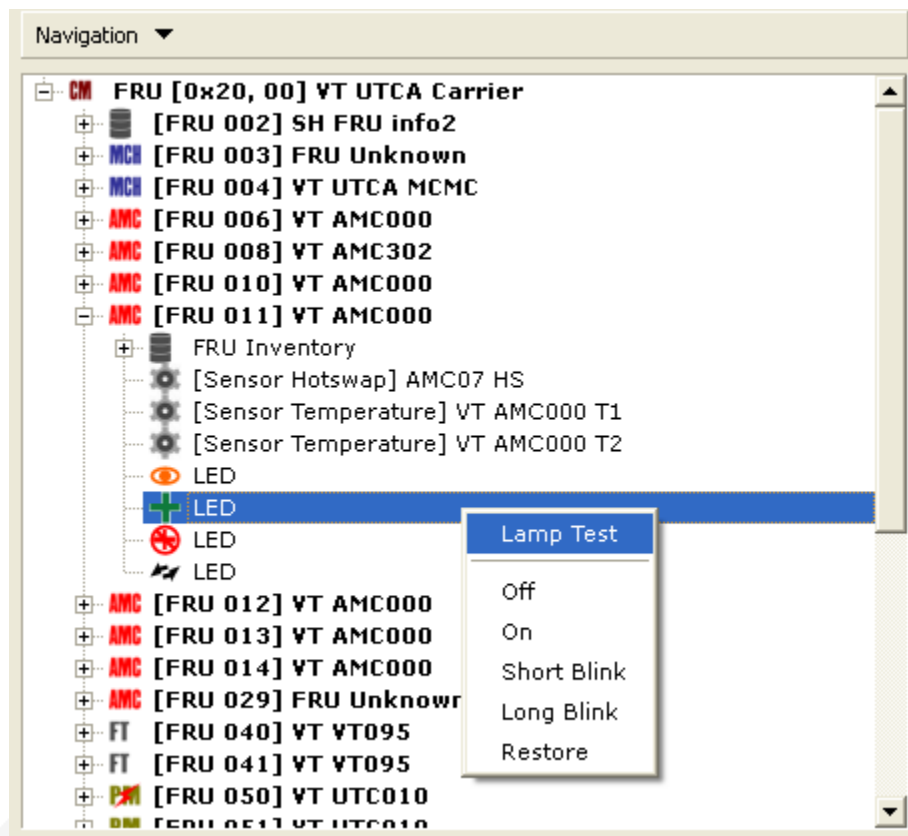


Figure 66: LED Controls

There are four standard ATCA LED indicators. These are named LED-0, LED-1, LED-2 and LED-3. The first three LEDs indicate the FRU's hot swap, fault, and ready/OK states, respectively. The fourth LED is application-specific. The status of each of these LEDs can be obtained by selecting the respective LED in the FRU.

Controls:

Control	Description
Lamp Test	Lamp Test for a specified duration
Off	LED off
On	LED on
Short Blink	LED short blink
Long Blink	LED long blink
Restore	Restore LED to local control

Table 14: LED Controls

Note that On, Off, Short Blink and Long Blink override the local control state of the LED, and Lamp Test overrides all other controls.

4.16 Carrier FRU Information

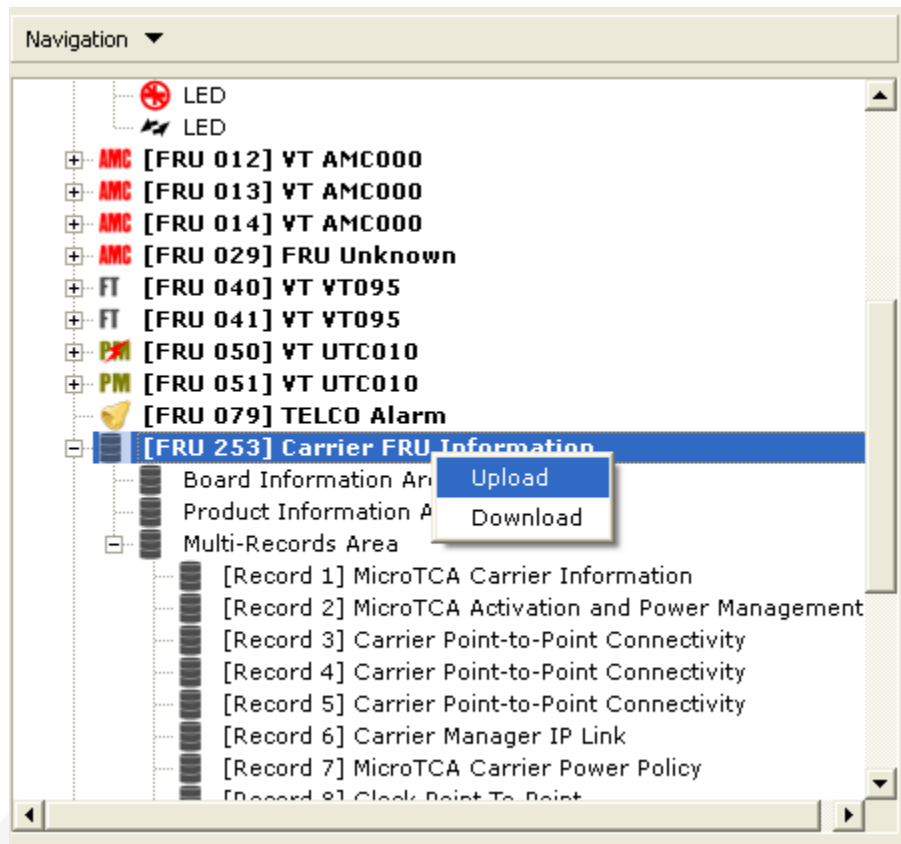


Figure 67: Carrier FRU Information

This is the logical device managed by the Carrier Manager that contains the Carrier FRU Information.

The contents the Carrier Information FRU can be viewed by navigating further into the Board, Product, Chassis and Multi-Record sections of the FRU Inventory.

4.16.1.1 Upload

This command is used to upload Carrier FRU information to the Carrier backplane eeprom.

4.16.1.2 Download

This command is used to download Carrier FRU binary information from the Carrier backplane eeprom.

4.17 Sensor Data Record Repository

Sensor Data Records are data records that contain information about the type and number of sensors in the platform, sensor threshold support, event generation capabilities, and information on what types of readings the sensor provides. The primary purpose of Sensor Data Records is to describe the sensor configuration of the platform management subsystem to system software.

Sensor Data Records are kept in a single, centralized non-volatile storage area that is managed by the Base Management Controller. This storage is called the Sensor Data Record Repository.

4.17.1 Get SDR Information

This command is used to return the SDR command version for the SDR Repository and the timestamp for when the last ADD, DELETE, or CLEAR occurred.

4.17.2 Get SDR

The screenshot shows a software interface with two tabs: 'Get SDR Info' and 'Get SDR'. The 'Get SDR Info' tab is active.

FRU Address Information

FRU	VT UTCA Carrie
Location	0x20, FRU 000
Entity ID/Instance	0xc2, 0x01

Filter Options

Owner Addr	<input type="text"/>	LUN	<input type="text"/>
Entity ID	<input type="text"/>	Entity Instance	<input type="text"/>
Record Type	<input type="text"/>	Show Raw data	<input type="checkbox"/>

SDR Information

SDR Version 0x51

Number of Records 142

Record ID	Owner Address	Entity ID / Instance	Type	Name
0	(0x82, LUN 00)	(0xc2,0x01)	MCDL	VT UTCA Car...
1	(0x82, LUN 00)	(0xc2,0x01)	CS	Carrier HS
2	(0x82, LUN 00)	(0xc2,0x01)	CS	Carrier IPMB-0
3	(0x82, LUN 00)	(0xc2,0x01)	CS	IPMB-A Fault
4	(0x82, LUN 00)	(0xc2,0x01)	CS	IPMB-B Fault
5	(0x82, LUN 00)	(0xc2,0x01)	CS	IPMB-L Fault
6	(0x82, LUN 00)	(0xe1,0x60)	FRUDL	Carr FRU Info
7	(0x82, LUN 00)	(0xc2,0x01)	DREA	
8	(0x82, LUN 00)	(0xf2,0x61)	FRUDL	SH FRU Info1
9	(0x82, LUN 00)	(0xf2,0x61)	CS	SH FRU Info1...

Figure 68: SDR Repository Contents

This command is used to retrieve all the Sensor Data Records contained in the Sensor Data Record Repository.

Options:

Filter options allow the user to search records by Owner Address, LUN, Entity ID, Entity Instance, Record Type and any combination of these parameters.

The Show raw data option will allow the user to view the SDR information in hex format.



4.18 System Event Log

The Shelf Manager provides a centralized, non-volatile System Event Log, or SEL. The SEL Device is the logical management device that provides the interface to the System Event Log for the system. The SEL Device provides a set of commands for managing the System Event Log. The SEL and logging helps ensure that 'post-mortem' logging information is available should a failure occur that disables the systems processor(s).

4.18.1 Get SEL Information

This command returns the SEL command version for the System Event Log. It also returns a timestamp for when the last ADD, DELETE, or CLEAR occurred.

4.18.2 Get SEL

The screenshot shows a software window titled 'Get SEL Info' with three tabs: 'Get SEL Info', 'Get SEL', and 'Clear SEL'. The 'Get SEL Info' tab is active.

FRU Address Information

FRU	VT UTCA
Location	0x20, FR
Entity ID/Instance	0xc2, 0x0

Format/Filter Options

Item Number: --OR--

Sensor Type:

FRU Owner Addr:

Sensor Number:

Verbose ☒ Raw ☐

SEL Information

SEL Version 0x51

Number of Entries 696

Time	Item Number	Location .addr, Chan/LU	Sensor Type/Number	Direction
Tue Mar 02 0...	0001	(0x82, 00/00)	(0xf0, 0x0e)	Asserted
Tue Mar 02 0...	0002	(0x82, 00/00)	(0xf0, 0x7a)	Asserted
Tue Mar 02 0...	0003	(0x82, 00/00)	(0xc1, 0x8a)	Asserted

Event Type 0x6f
Hotswap Event: (0x82, FRU# 14)
State changed from M2 (Activation Request) -> M3 (Activation in Progress)
Cause: Normal

Figure 69: SEL Contents

This command is used to retrieve entries from the System Event Log.

Options:

- Filter options allow the user to search entries by Item Number or by Sensor Type, FRU Owner Address, Sensor Number and a combination of all these parameters.
- Show raw option will allow the user to view the SEL information in hex format.
- Show Verbose option will allow the user to view the SEL decoded and presented in a readable format.

4.18.3 Clear SEL

This command clears all the entries in the System Event Log.

4.19 Alarm Panel

The System Manager periodically monitors the Shelf and the Carriers for alarms due to temperature, voltage or other faults

The System Manager Alarm panel is used to view the active alarms in the Shelf or a Carrier connected to the Shelf. The user can also obtain the history of all alarms that occurred from system startup.

The screenshot shows the 'Alarm Panel' interface. At the top, there are tabs for 'Carrier Layout' and 'Alarm Panel', and a filter for 'Alarms' with radio buttons for 'Minor', 'Major', and 'Critical'. The 'Alarm Panel' tab is active. Below the tabs, there are three main sections: 'Description', 'Summary', and 'Event Type'. The 'Description' section shows 'Sensor Event Type' as 'n/a', 'Sensor Number' as 'n/a', 'Event Data (1,2,3)' as 'n/a', and 'Event' as 'Lower critic'. The 'Summary' section shows 'Started' as 'Wed Mar 3 13:59:46 2010', 'Duration' as '11', 'Logging' as '0', and 'Info' as '0'. The 'Event Type' section has two radio buttons: 'Active Events' (selected) and 'History'. Below these sections is a toolbar with an 'Alarm' dropdown and several icons. The main area is titled 'Alarms' and contains a table with the following data:

Alarm	Device	Location	Sensor Type	Sensor	Event Code
MAJOR	VT VT095	0x20, 40	Fan	0x35	0x063
MAJOR	VT VT095	0x20, 40	Fan	0x36	0x063
MAJOR	VT VT095	0x20, 40	Fan	0x37	0x063
MAJOR	VT VT095	0x20, 40	Fan	0x38	0x063
MAJOR	VT VT095	0x20, 40	Fan	0x39	0x063
MAJOR	VT VT095	0x20, 40	Fan	0x3a	0x063
MAJOR	VT VT095	0x20, 40	Fan	0x3b	0x063
MAJOR	VT VT095	0x20, 40	Fan	0x3c	0x063
MAJOR	VT VT095	0x20, 40	Fan	0x3d	0x063
MAJOR	VT VT095	0x20, 40	Fan	0x3e	0x063
MAJOR	VT VT095	0x20, 40	OEM	0x40	0x08a

Figure 70: Alarm Panel

- Description of an alarm can be obtained by selecting the alarm entry in the table.
- The summary provides the following information:
 - Logger start time.
 - The duration of logging.
 - Enable/Disable status for logging.
 - The number of Minor, Major, Critical alarms.
- View active alarms or the history of all alarms that occurred since system startup.

Alarm Classification:

Class	Description
INFO	An event occurred in the Shelf which may not be an error and classified as Information.
MINOR	An event occurred in the Shelf or Carrier which is classified as a minor alarm
MAJOR	An event occurred in the Shelf or Carrier which is classified as Major alarm.
CRITICAL	An event occurred in the Shelf or Carrier which is classified as Critical alarm.

Table 15: Alarm Classification

Controls:






ICON	Description
	Pause/Resume alarm monitoring
	Set alarm panel data refresh interval
	Enable/Disable alarm logging to a file
	Clear history
	Alarm filter options

Table 16: Alarm Panel Controls

Logging:

Logging option allows the user to log all alarms that occur in the system to a file. The logging option is available only when the event type is set to 'history'.

Index

A

Activate, 5, 6, 31, 32, 33, 42, 47, 51
 Activation Policy, 6, 32, 33, 52
 Activation Sequence, 5, 32, 49, 50
 Administration, 39, 45
 Alarm Panel, 72
 Alerting, 5, 31, 35, 42
 applicable products, 8

C

Capabilities, 61
 Carrier Alarm Panel, 4, 24
 Carrier Alarms, 4, 24
 Carrier Display, 4, 22, 23, 27
 Carrier FRU Information, 67
 Carrier ID, 25
 Carrier Information, 5, 32, 34, 49, 67
 Carrier Layout, 4, 22, 23, 27
 Carrier Manager, 4, 5, 8, 9, 10, 12, 13, 14, 16, 22, 28, 31, 39, 42, 43, 46, 50, 67
 Carrier Manager FRU, 27
 Carrier Resource, 4, 26, 28
 Chassis Controls, 5, 7, 40, 47, 48
 Chassis Temperature Panel, 4, 21, 24
 Clear SEL, 71
 Cold Reset, 6, 32, 33, 47, 51
 Commands, 5, 7, 30, 34
 Configuration, 4, 5, 6, 14, 15, 31, 32, 35, 36, 55, 65
 Cooling, 37, 43, 57

D

Deactivate, 5, 6, 31, 32, 33, 42, 47, 51
 Diagnostic Interrupt, 6, 31, 32, 33, 40, 48, 52, 59

E

E-Keying, 5, 6, 32, 44, 54
 Event Receiver, 6, 32, 33, 53
 Expand and Collapse, 5, 29

F

Failover, 5, 32, 50
 FRU Info, 5, 6, 31, 32, 33, 35, 42, 51
 FRU Management, 5, 6, 31, 32, 33, 35, 42, 51

G

Get AMC PTP, 6, 32, 54
 Get Carrier Point to Point, 5, 44
 Get Clock Configuration, 55
 Get Clock Point-to-Point, 5, 45
 Get Clock State, 6, 32, 56
 Get Fan Geography, 5, 31, 39, 43
 Get Fan Level, 57
 Get Port State, 6, 33, 56
 Get Power Distribution, 5, 32, 46
 Get Power Policy, 5, 32, 47
 Get SDR, 68
 Get SDR Information, 68
 Get SEL, 70
 Get SEL Information, 70
 Graceful Reboot, 6, 32, 33, 52

H

Hard Reset, 6, 33, 59

K

Keep Alive, 4, 16

L

LAN, 39, 45
 LEDs, 66
 Linux, 4, 11, 14
 Login, 4, 16

M

Main Menu, 4, 7, 17, 31

N

Navigation, 5, 19, 20, 22, 23, 28

P

Parameters, 37, 43

Power, 46, 58

Power Down, 6, 33, 59

Power Feed Reset, 6, 33, 60

Power Levels, 6, 32, 33, 53

Power Up, 6, 33, 59

R

References, 8

Resource/Entity Icons, 5, 28, 29

Resource/Entity Information, 19, 20, 22, 23

S

Sensor Classes, 63

Sensor Data Record Repository, 68

Sensors, 63

Server Connection, 13

Session, 4, 14, 15

Set Extracted, 5, 6, 31, 33, 42, 51

Settable/Readable Parameters, 65

Shelf Alarm Panel, 4, 21

Shelf Display, 4, 19, 20, 25, 26, 41

Shelf FRU Information, 4, 5, 20, 26, 28, 32, 39, 40, 41

Shelf Information, 5, 17, 20, 31, 40

Shelf Layout, 4, 19, 20, 25

SNMP Trap Information, 5, 31, 36

SNMP Trap Panel, 4, 21, 24

SNMP Trap Test, 5, 31, 37

Soft Shutdown, 6, 31, 32, 33, 40, 47, 60

State, 61

Status, 4, 5, 6, 7, 19, 26, 27, 33, 53, 57, 58, 61, 66

System Event Log, 70

System Management, 5, 8, 14, 31, 32, 40, 47, 63

T

Telco, 61

Temperature, 4, 6, 21, 24, 32, 33, 52, 53, 63

Threshold Sensors, 63

Toolbar Options, 4, 17

Tree Hierarchy, 5, 7, 28

U

UTC001 Interfaces, 12

W

Warm Reset, 6, 32, 33, 52

Windows, 4, 11, 14