14 slot ATCA Shelf

including 40G Backplane

User's Manual

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11990-602
11990-603

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1 Safety

The intended audience of this User's Manual is system integrators and hardware/software engineers.

1.1 Safety Symbols used in this document

	Hazardous voltage! *This is the electrical hazard symbol. It indicates that there are dangerous voltages inside the Shelf.*

	Caution! *This is the user caution symbol. It indicates a condition where damage of the equipment or injury of the service personnel could occur. To reduce the risk of damage or injury, follow all steps or procedures as instructed.*

	Danger of electrostatic discharge! *The Shelf contains static sensitive devices. To prevent static damage you must wear an ESD wrist strap.*

1.2 General Safety Precautions

	Warning! *Voltages over 60 V can be present in this equipment. As defined in the PICMG 3.0 Specification, this equipment is intended to be accessed, to be installed and maintained by qualified and trained service personnel only.*

- Service personnel must know the necessary electrical safety, wiring and connection practices for installing this equipment.
- Install this equipment only in compliance with local and national electrical codes.
- For additional information about this equipment, see the PICMG 3.0 Specification (*www.picmg.com*).

1.3 References and Architecture Specifications

- Pigeon Point Systems IPM Sentry Shelf-External Interface Reference (*www.pigeonpoint.com*)
- PICMG® 3.0 R3.0 AdvancedTCA® Base Specification (*www.picmg.com*)
- Schroff Shelf Manager User's Manual, Order-no. 63972-331

The documentation is available for registered users at www.schroff.biz

1.4 Product definition

The 11990-60x is an DC-powered 13 U / 14 Slot ATCA Shelf with enhanced per-slot power and cooling capability along with 40G backplane connectivity.

- Product Number 11990-600: Dual Star **40G** Backplane, bused IPMB
- Product Number 11990-601: Dual Star **40G** Backplane, radial IPMB
- Product Number 11990-602: Full Mesh **40G** Backplane, bused IPMB
- Product Number 11990-603: Full Mesh **40G** Backplane, radial IPMB

The Schroff 11990-60x is designed to work with two redundant Schroff Shelf Managers, at least one Shelf Manager is needed for a working System.

Shelf Manager with bused IPMB: 21990-401 (Product Number)
21990-404 (Catalog Number with packaging)

Shelf Manager with radial IPMB: 21990-402 (Product Number)
21990-405 (Catalog Number with packaging)

The Shelf Managers are not included with the Shelf

The torque of all FRU (Fan Tray, Air Filter, PEM, PEM cover) fixing screws is 0.7 Nm (6.2 in-lbs)

1.5 Terms and Acronyms

Table 1: Terms and Acronyms

Term	Definition
ATCA	Advanced Telecom Computing Architecture
Backplane	Passive circuit board providing the connectors for the front boards. Power distribution, management and auxiliary signal connections are supported
CDM	Shelf Data Module
Shelf	Enclosure containing subrack, Backplane, boards, cooling devices, PEMs, same as Shelf
ESD	Electrostatic Discharge
ETSI	European Telecommunications Standards Institute
FRU	Field Replaceable Unit
IPMB	Intelligent Platform Management Bus
IPMC	Intelligent Platform Management Controller
IPMI	Intelligent Platform Management Interface
PCB	Printed Circuit Board
PEM	Power Entry Module
RTM	Rear Transition Module
Shelf	See Shelf
VRTN	Voltage Return

2 Hardware Platform

- Removable mounting brackets for 19“ cabinets
- ESD Wrist Strap Terminals at the front and the rear
- 14 slot ATCA 40G Backplane with Dual Star or Full Mesh Fabric Interface, Dual Star Base Interface and bused interface, supporting twelve 8 U node board slots and two 8 U hub slots
- 2 dedicated Shelf Manager slots accepting Schroff ShMM-ACB-VI Shelf Managers
- Enhanced cooling capability:
  300 W per slot (t_a = 55 °C, Δt = 12 K measured with CP-TA boards)
- 3 Hot Swap Fan Trays, rear pluggable
- Air inlet filter including air filter presence sensor
- Front pluggable Shelf Alarm Panel (SAP): Provides Telco Alarm interface
- Front pluggable Shelf Alarm Display (SAD): Provides Alarm Status LEDs, Fan Tray Alarm LEDs and serial interfaces for the Shelf Managers
- Rear pluggable dual redundant 140 A Power Entry Modules (PEM)
- Electrical power 300 W/slot

2.1 Shelf Front and Rear View

Figure 1: Shelf Front View

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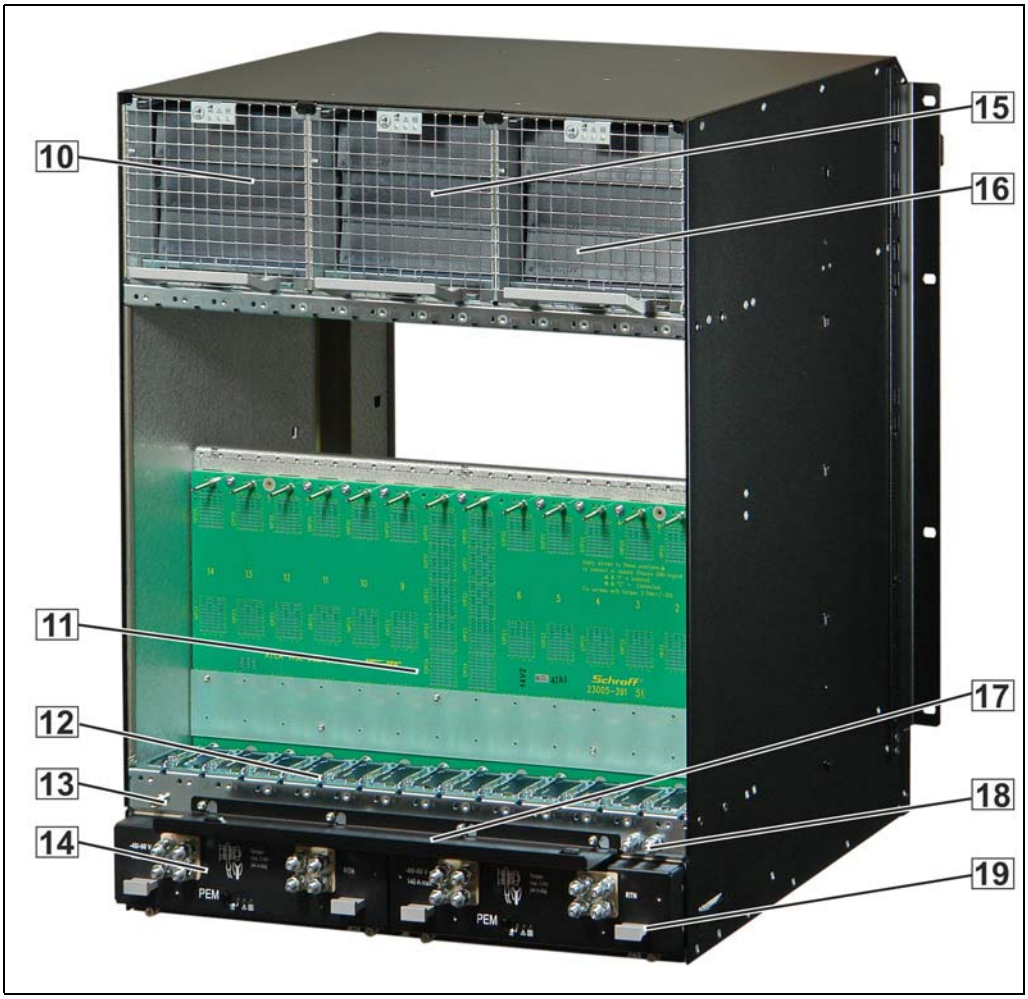
1	Shelf Alarm Display (SAD)	6	Shelf Alarm Panel (SAP)
2	ATCA 14-Slot Backplane	7	Front Cable Tray
3	Front Card Cage	8	19“ Mounting breaket
4	Air Filter Tray	9	Slot for Shelf Manager 2
5	Slot for Shelf Manger 1		

Figure 2: Shelf Rear View



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10	Fan Tray #2	15	Fan Tray #1
11	ATCA BAckplane	16	Fan Tray #0
12	Rear Card Cage	17	Rear Cable Tray
13	Rear ESD Wrist Strap Terminal	18	Shelf Ground Terminal (M6 studs)
14	PEM B	19	PEM A

2.2 ESD Wrist Strap Terminals

	Danger of electrostatic discharge! **Static electricity can harm delicate components inside the Shelf. You must wear an ESD wrist strap before exchanging any part or electric component!**

Two ESD Wrist Strap Terminals (4 mm banana jacks) are located at the lower front and rear side of the Shelf.

3 ATCA Backplane

The 14-slot ATCA monolithic Backplane provides:

- 40 Gb/s connectivity
- 12 ATCA Node slots
- Two ATCA Hub slots
- Two dedicated Shelf Manager slots
- Two Power Entry Module (PEM) slots
- Two slots for the Shelf Data Modules (CDM)

3.1 Logical to Physical Slot Mapping

The physical slots are sequentially numbered from left to right. The logical slots are mapped to the physical slots according to Table 2.

Table 2: 14-Slot ATCA Backplane physical to logical slot mapping

	Node	Node	Node	Node	Node	Node	Hub Slot	Hub Slot	Node	Node	Node	Node	Node	Node
Physical slot	1	2	3	4	5	6	7	8	9	10	11	12	13	14
Logical slot	13	11	9	7	5	3	1	2	4	6	8	10	12	14
HW-Address (Hex)	4D	4B	49	47	45	43	41	42	44	46	48	4A	4C	4E
IPMB-Address (Hex)	9A	96	92	8E	8A	86	82	84	88	8C	90	94	98	9C
Update Channel	●	●	●	●	●	●	●	●	●	●	●	●	●	●
Power Domain	1	2	1	2	1	2	1	3	4	3	4	3	4	3

3.2 Interfaces

3.2.1 Base Interface

Logical slots 1 and 2 are the hub slots for the Dual Star Base Interface.
Base Interface Channel 1 (ShMC) of logical slot 1 and 2 is cross connected to both dedicated Shelf Manager slots on the ATCA Backplane.

3.2.2 Fabric Interface

The Fabric Interface in the ATCA Backplane is wired as Dual Star or Full Mesh, supporting four ports per channel.

See PICMG® 3.0 AdvancedTCA® Base Specification for details.

3.2.3 Synchronization Clock Interface

6 differential pairs of synchronization clocks are bused between all 14 ATCA slots and terminated at both ends with 80.5 Ohms between each differential pair.

3.2.4 Update Channel Interface

The Update Channels are wired between two redundant ATCA Backplane slots as 10 differential pairs with 100 Ohms impedance. (See Table 2 in this Chapter)

The Update Channel is intended to pass information between two redundant ATCA Boards.

The Update Channel assignment is printed on the frontside of the Shelf.

3.2.5 Power Interface

Power distribution within the ATCA Backplane is divided into four Power Branches. This topology is used for safety reasons to keep the max. current per fuse less than 35 A. Slots connected by update ports, are on separate power branches as well as both hub slots, the Shelf Manager slots and the Fan Trays.

3.3 Dedicated Shelf Manager Slots

The front accessible Shelf Manager slots accept Schroff Shelf Managers and are wired to:

- IPMB-A and IPMB-B (I²C-bus)
- Base Interface Channel 1 (ShMC) of the Base Interface Hub slots, supporting Shelf Manager Cross Connect (10/100 Base T Ethernet)
- Fan Tray connectors
- PEM A and PEM B connector

The dedicated Shelf Manager slots also have interconnected signals that allow the Shelf Managers to run in a redundant configuration.

3.3.1 Intelligent Platform Management Interface

The Shelf uses an Intelligent Platform Management Bus (IPMB) for management communications among all ATCA Boards and the Shelf Managers. The reliability of the IPMB is improved by the addition of a second IPMB, with the two IPMBs referenced as IPMB-A and IPMB-B.

IPMB-A and IPMB-B are routed to the ATCA slots in:

- a bused configuration
  (Product Number: 11990-600/602)
- a radial configuration
  (Product Number: 11990-601/603)

Figure 3: Bused IPMB

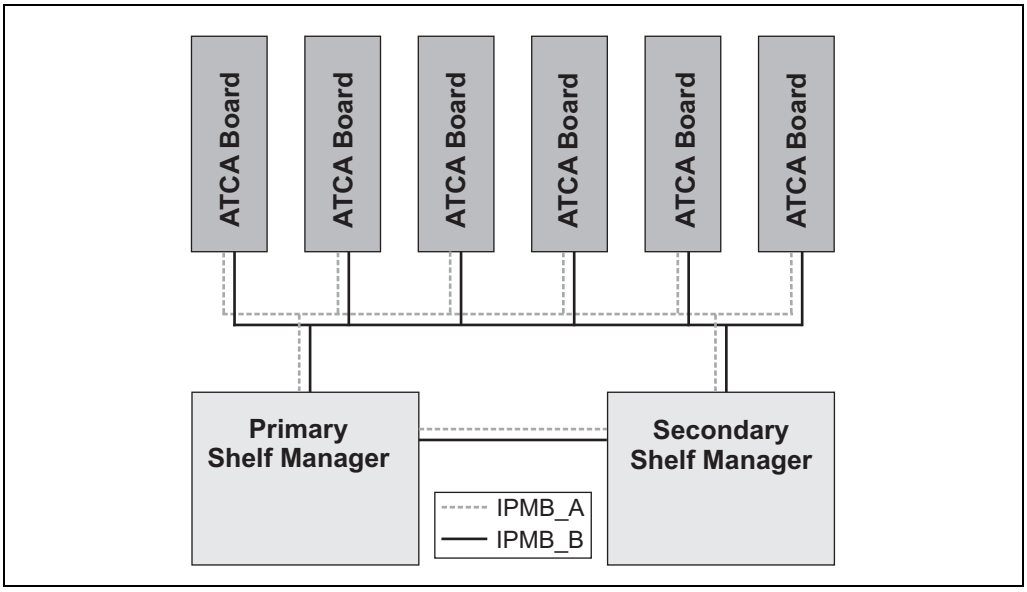

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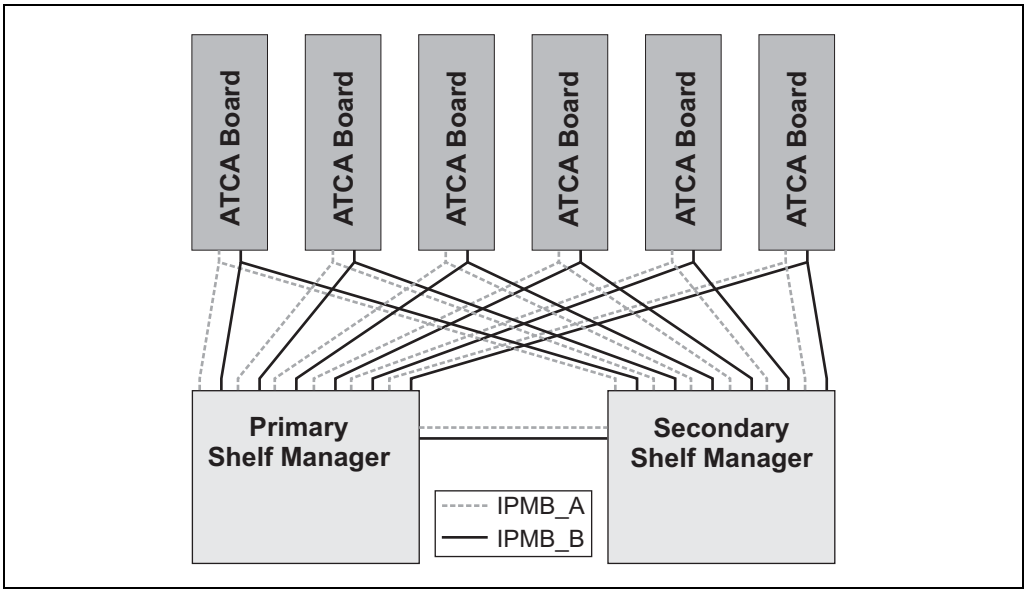
Figure 4: Radial IPMB



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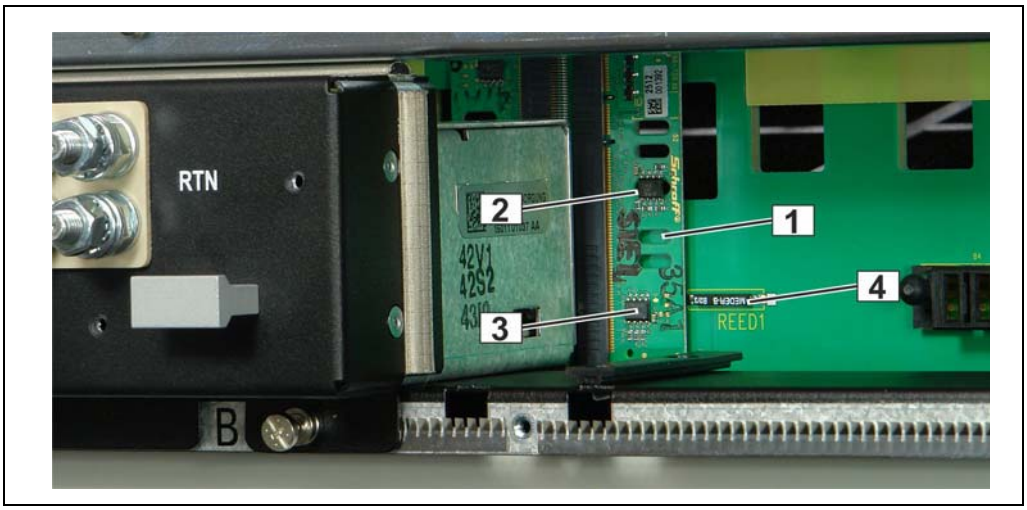
3.4 Shelf Data Modules (CDM)

The Shelf Data Module (CDM) is a carrier board for:

- The FRU SEEPROM (24LC256)
- A temperature sensor (LM75)

Figure 5: Shelf Data Modules (CDM)



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1	CDM 1	3	SEEPROM
2	Temperature Sensor	4	REED Switch for air filter presence

The 2 CDMs are pluggable modules and located on the rear side of the ATCA Backplane. CDM 1 is located behind PEM A, CDM 2 is located behind PEM B, The modules can be accessed after removing the resp. PEM.

Table 3: Shelf Data Module I²C addresses

CDM	I²C-Channel	I²C-bus address
CDM 1, SEEPROM	Channel 1	0xa4 / 52
CDM 2, SEEPROM	Channel 2	0xa4 / 52
CDM 1, LM75	Channel 3	0x98 / 4c
CDM 1, LM75	Channel 3	0x9c / 4e

3.4.1 IPMB-A Connector (Assembly Option)

Connector IPMB-A is wired to the IPMB-A bus and is not assembled by default.

Table 4: IPMB-A Connector

Pin#	Signal name	Description
1	SCL_A13	IPMB-A, Serial clock
2	GND	Logic Ground
3	SDA_A13	IPMB-A, Serial Data
4	I2C_PWR_A	3,3 VDC power supply for Shelf I²C-bus devices

3.4.2 IPMB-B Connector (Assembly Option)

Connector IPMB-B is wired to the IPMB-B bus and is not assembled by default.

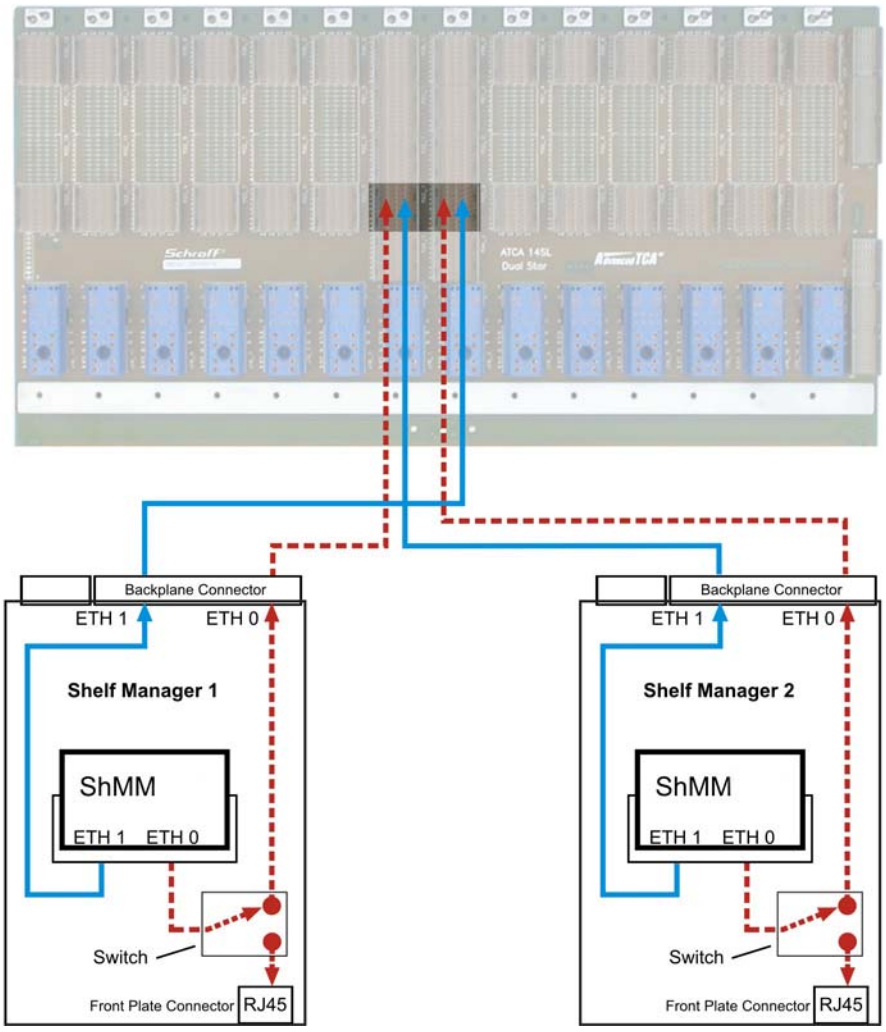
Table 5: IPMB-B Connector

Pin#	Signal name	Description
1	SCL_B13	IPMB-B, Serial clock
2	GND	Logic Ground
3	SDA_B13	IPMB-B, Serial Data
4	I2C_PWR_B	3,3 VDC power supply for Shelf I²C-bus devices

3.5 Shelf Manager Cross Connect

The ATCA Backplane provides cross connect traces between the Base Hubs and the Shelf Managers with dual 10/100 Base-T links from each Base Hub to both dedicated Shelf Manager slots.

Figure 6: Shelf Manager Cross Connect



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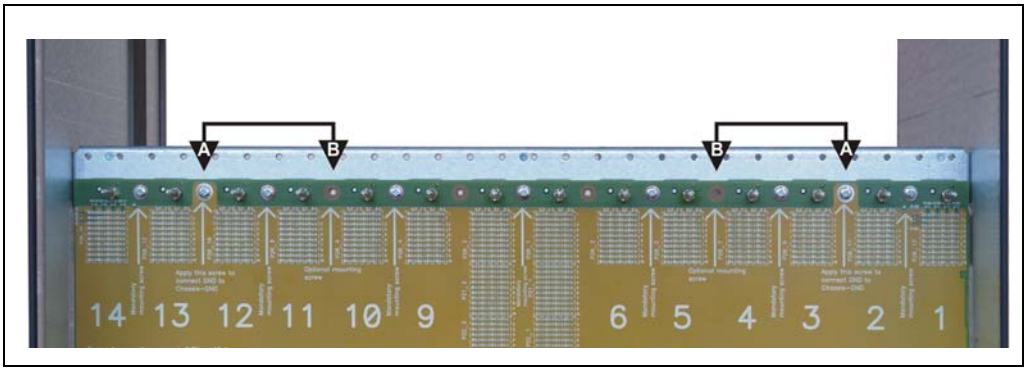
3.6 Logic Ground (GND) and Shelf Ground (Shelf_GND)

Figure 7: Logic Ground/Shelf Ground Connection



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The ATCA Backplane provides a mechanism to connect Logic Ground (GND) and Shelf Ground (Shelf_GND). You can connect/isolate Logic Ground by swapping two screws from position (A) to position (B).

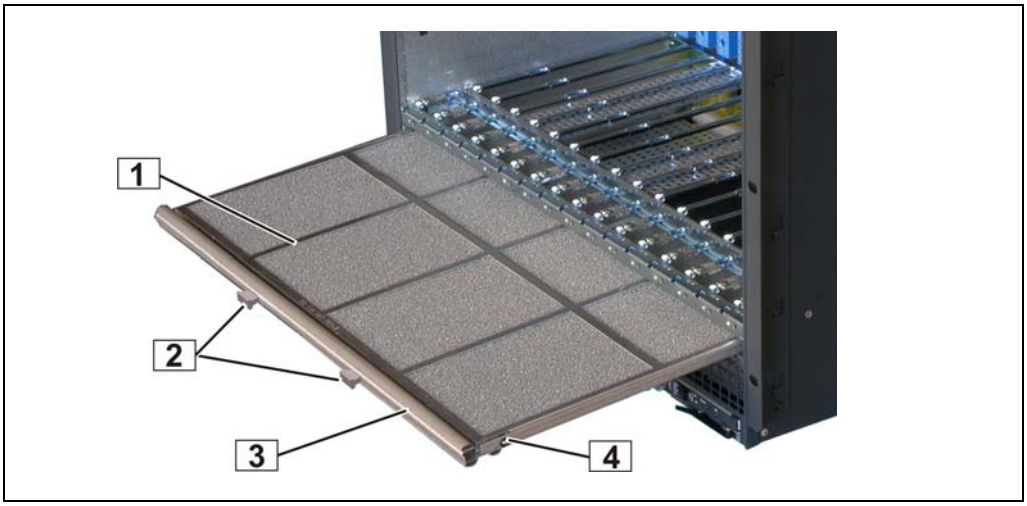
- Screws at position (A): Logic Ground and Shelf Ground connected.
- Screws at position (B): Logic Ground and Shelf Ground isolated.

Torque for the Screws: 0.7 Nm +10%

Logic Ground and Shelf Ground is not connected by default.

4 Air Filter

Figure 8: Air Filter



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1	Filter Element	3	Filter Tray
2	Handles	4	Spring mounted ball lock

4.1 Introduction

The ATCA Shelf provides a front replaceable air filter.

The filter meets the requirements of the Telcordia Technologies Generic Requirements GR-78-CORE specification.

4.2 Air Filter Replacement

The air filter tray can be removed by pulling the air filter's handle. To re-install, push the air filter tray into the guide rails at each side of the shelf until the spring mounted ball lock engage.

When installing the air filter, the filter element must be in top position

4.3 Air Filter Presence Sensor

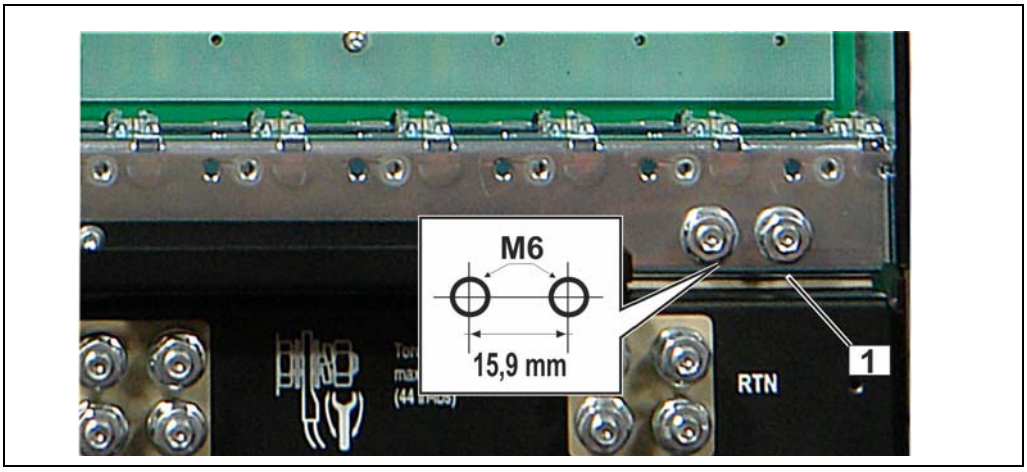
The air filter presence is detected by a reed contact located on the backplane. The reed contact is activated by a magnet mounted at the rear side of the air filter metal frame.

5 Shelf Ground Connection

	Hazardous voltage! *Before powering-up the Shelf, make sure that the Shelf Ground terminals are connected to Protective Earth (PE) of the building.*

The ATCA Shelf provides a Shelf ground terminal at the right rear bottom side. The Shelf ground terminal provides two M6 studs to connect a double-lug Shelf ground terminal cable.

Figure 9: Shelf ground terminal



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1 Shelf Ground Terminal

5.1 Specification for the Shelf Ground connection cable

Required wire size: AWG 3/0

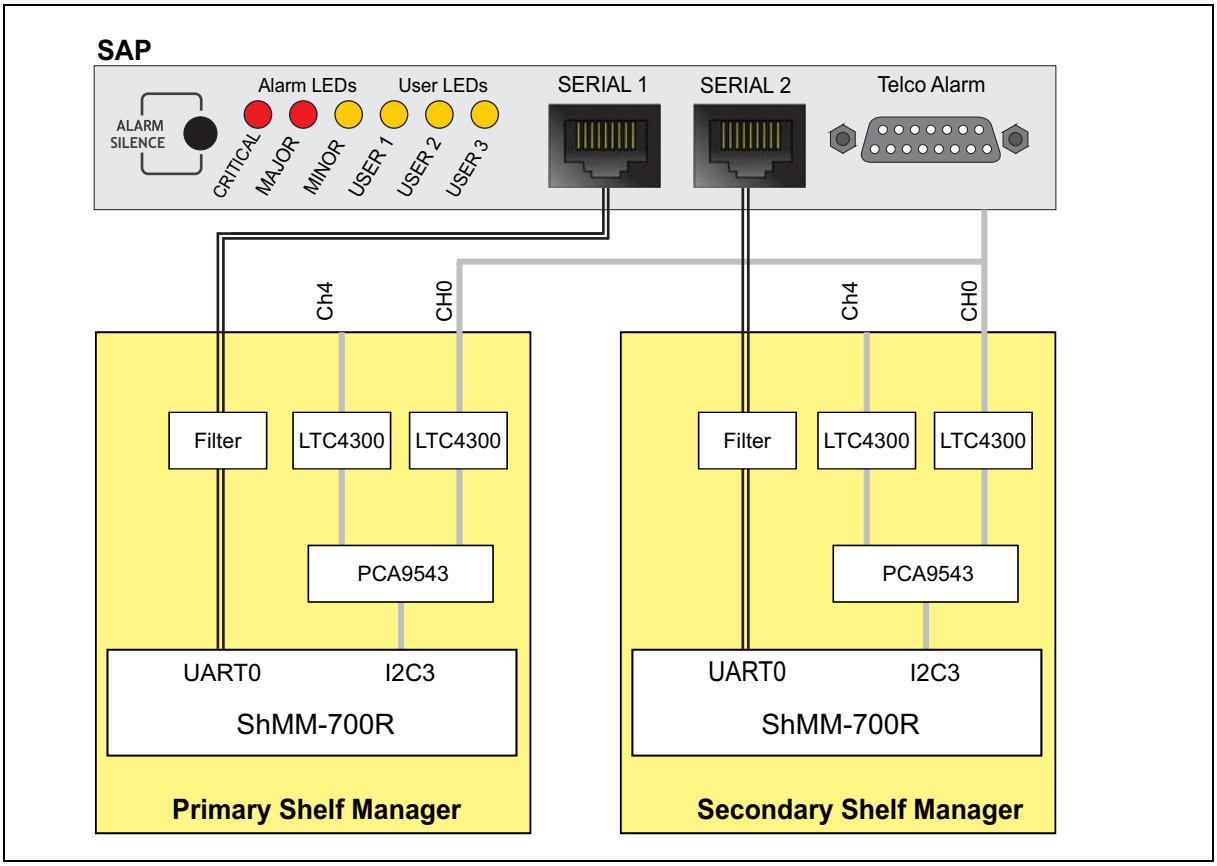
Required terminals: Use only two hole terminals.

6 Shelf Alarm Panel and Shelf Alarm Display

6.1 Introduction

Some Shelf Manager I/O functionalities have been moved to separate boards called Shelf Alarm Panel (SAP) and Shelf Alarm Display (SAD).

Figure 10: Connection between Shelf Manager and SAP



6.2 Shelf Alarm Panel (SAP)

The Shelf Alarm Panel (SAP) is located at the right front top side of the Shelf. It provides the Telco Alarm connector (DB15-male). The I²C-bus devices on the SAP are connected to the Master-Only I²C-bus of both Shelf Managers. Only the active Shelf Manager has access to the SAP.

Figure 11: Shelf Alarm Panel (SAP)

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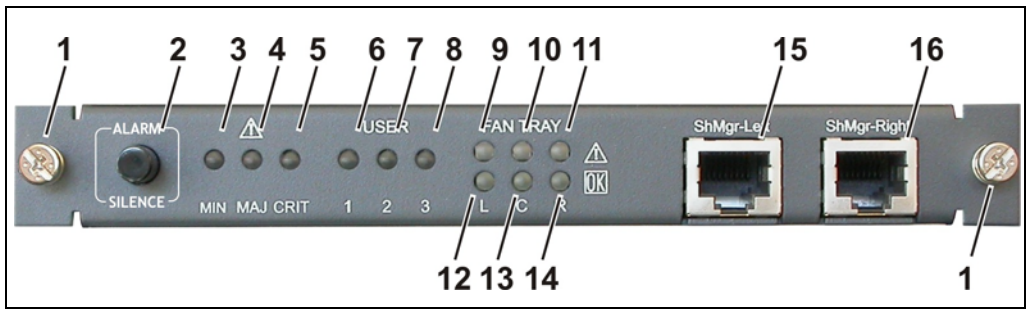
1	Shelf Alarm Panel (SAP)	3	Fixing screw
2	Telco Alarm Connector (DB15-male)		

6.3 Shelf Alarm Display (SAD)

The Shelf Alarm Display (SAD) is a user interface and located at the left front top of the Shelf. It provides:

- 3 Shelf Alarm LEDs (MINOR, MAJOR, CRITICAL)
- 3 User-definable LEDs (USER1, USER2, USER3)
- 3 Fan Tray Alarm LEDs (Left, Center, Right)
- 3 Fan Tray OK LEDs (Left, Center, Right)
- The Alarm Silence push button
- 2 serial console interfaces for both Shelf Managers (RJ45 connectors)

Figure 12: Shelf Alarm Display



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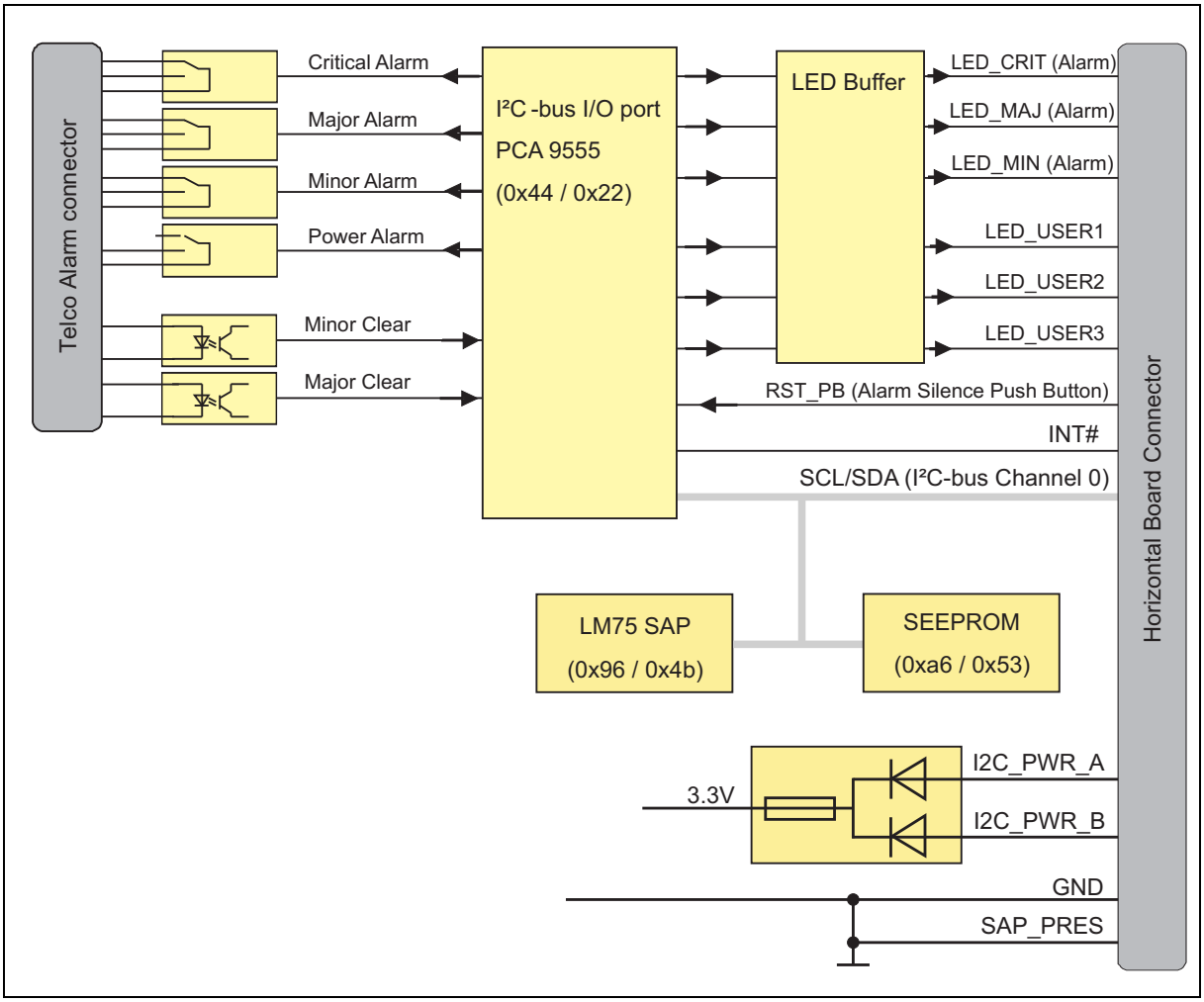
1	Fixing screw	9	LED Fan Tray Left Alarm (red)
2	Alarm Silence push button	10	LED Fan Tray Center Alarm (red)
3	LED Min. Alarm (yellow)	11	LED Fan Tray Right Alarm (red)
4	LED Maj. Alarm (amber)	12	LED Fan Tray Left OK (green)
5	LED Crit. Alarm (red)	13	LED Fan Tray Center OK (green)
6	User definable LED 1 (red)	14	LED Fan Tray Right OK (green)
7	User definable LED 2 (green)	15	Serial Console Interface Shelf Manager 1 (Left)
8	User definable LED 3 (amber)	16	Serial Console Interface Shelf Manager 2 (Right)

6.3.1 User definable LEDs

The LEDs USER (1, 2, 3) are user definable and connected to the I²C-bus I/O port of the PCA 9555 on the SAP.

6.4 Shelf Alarm Panel (SAP) Block Diagram

Figure 13: SAP Block Diagram



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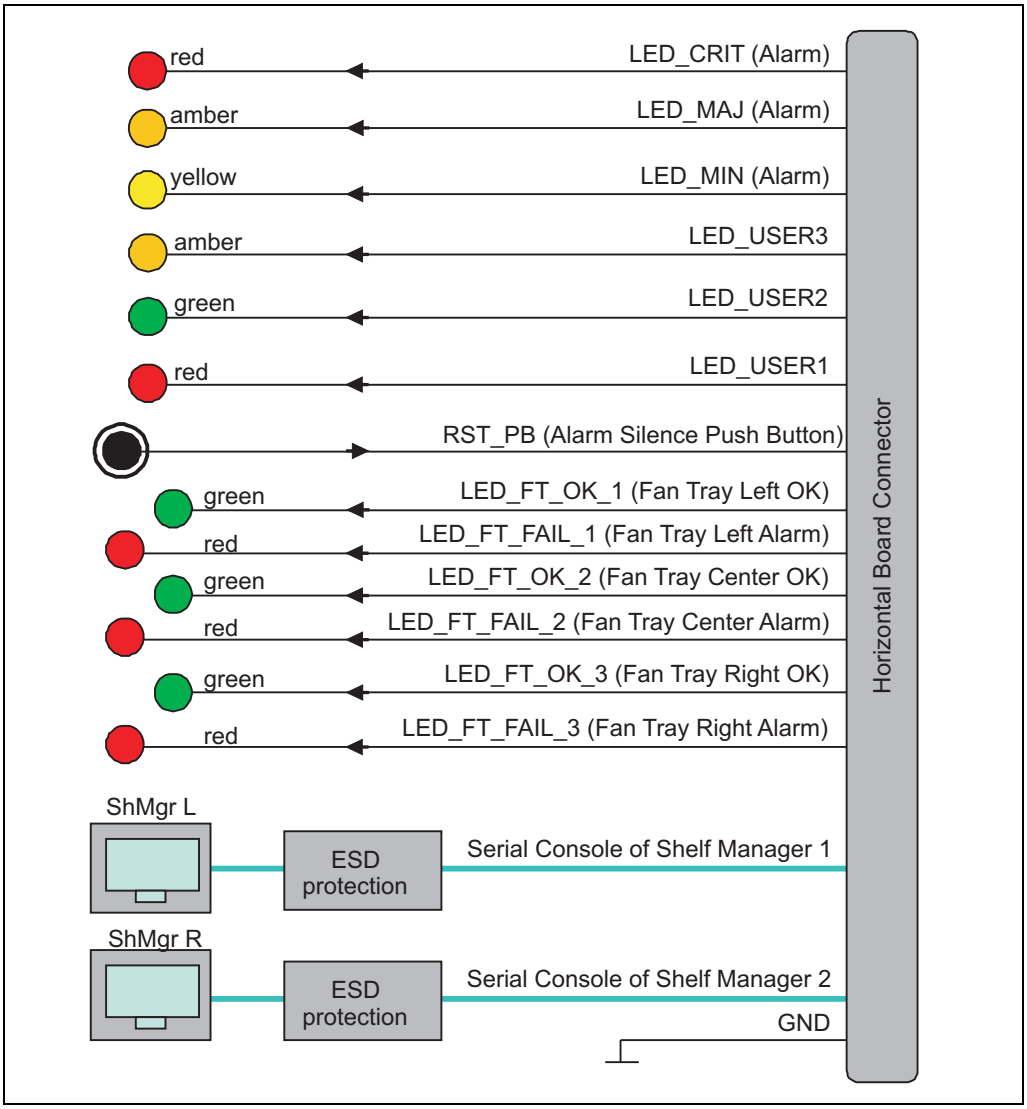
6.5 Shelf Alarm Display (SAD) Block Diagram

Figure 14: Shelf Alarm Display Block Diagram



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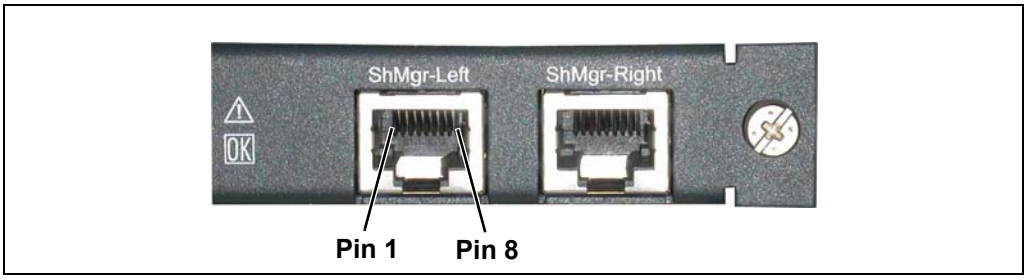
6.6 RS-232 Serial Console Interfaces on Shelf Alarm Display

Figure 15: RS-232 Serial Console Interfaces on Shelf Alarm Display



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The Shelf Alarm Display provides two RS-232 serial console connectors for Shelf Manager 1 and Shelf Manager 2. The connectors are 8-pin RJ45 modular receptacles.

The serial console default configuration is:

- *115200 baud*
- *no parity*
- *8 data bits*
- *1 stop bit*

Table 6: RS-232 Serial Console Interface Pin assignment

RJ45 Pin	RS-232 Signal	ShMM-500 Signal	Type	Description
1	RTS	RTS	Out	Request To Send
2	DTR	DTR	Out	Data Terminal Ready
3	TxD	TXD0	Out	Transmit Data
4	GND	GND	---	Logic Ground
5	GND	GND	---	Logic Ground
6	RxD	RXD0	In	Receive Data
7	DSR	DSR	In	Data Set Ready
8	CTS	CTS	In	Clear To Send

6.7 SAP Telco Alarms

6.7.1 Telco Alarm Interface

The SAP provides a Telco Alarm interface on the DB15-male connector. Three relay outputs are used for remote alarm distribution, reflecting the state of the three Alarm LEDs. The relays are capable of carrying 72 VDC or 1 A with a max. rating of 30 VA.

6.7.2 Telco Alarm LEDs

The Shelf Alarm Panel provides the Telco Alarm LEDs. These LEDs indicate presence of Critical, Major and Minor alarms as follows:

Table 7: Telco Alarm LEDs

State	Description
Off	No alarm active
On	Alarm active
Flashing	Alarm active, but silenced

6.7.3 Alarm Silence Push Button

The Alarm Silence push button on the Shelf Alarm Panel faceplate deactivates the alarm relays. During the time Alarm Silence is activated, the Alarm LEDs flash. By pressing the Alarm Silence push button a second time, the alarm relays are reactivated and the Alarm LEDs are solid.

*The **Alarm Silence** push button only activates the Alarm Silence state, but does not reset the alarms. If the silence interval (default 600 s) is exceeded without resolving the alarms, the alarms will be re-initiated.*

6.7.4 Alarm Reset

Hardware Reset:

Two relay inputs at the DB15 connector are used to reset the Minor and Major alarm state.

The reset inputs accept timed pulse inputs for clearing Minor and Major alarm states. Reset is accomplished by asserting a voltage differential from 3.3 VDC to 72 VDC for between 200 ms and 300 ms. The acceptance voltage range is from 0 to 48 VDC continuous (handles up to 60 VDC at a 50% duty cycle). The current drawn by a reset input does not exceed 12 mA.

There is no hardware reset (reset input) for the Critical Alarm state.

Software Reset:

The RMCP and CLI functions can be used to set and reset the Telco Alarms (incl. Critical Alarm). See the Pigeon Point Shelf Manager External Interface Reference for more information.

6.8 SAP and SAD Connectors

6.8.1 SAP Telco Alarm Connector (DB15-male)

Figure 16: Telco Alarm Connector (DB15-male)

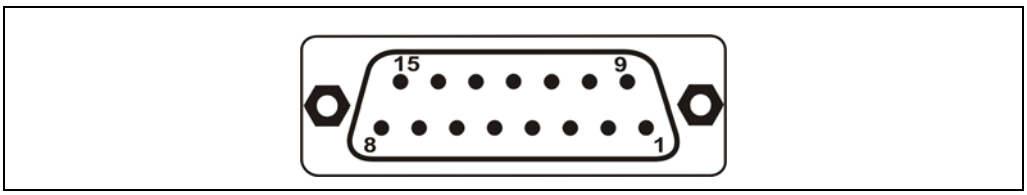

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Table 8: Telco Alarm Connector Pin Assignment

Pin	Name	Description
1	AMIR+	MinorReset+
2	AMIR-	MinorReset-
3	AMAR+	MajorReset+
4	AMAR-	MajorReset-
5	ACNO	CriticalAlarm - NO
6	ACNC	CriticalAlarm - NC
7	ACCOM	CriticalAlarm - COM
8	AMINO	MinorAlarm – NO
9	AMINC	MinorAlarm – NC
10	AMINCOM	MinorAlarm – COM
11	AMANO	MajorAlarm – NO
12	AMANC	MajorAlarm – NC
13	AMACOM	MajorAlarm – COM
14	APRCO	PwrAlarm – NO
15	APRCOM	PwrAlarm - COM
Shield	Shelf-GND	Shelf Ground

6.8.2 Shelf Alarm Display Horizontal Board Connector

Figure 17: Shelf Alarm Display Horizontal Board Connector

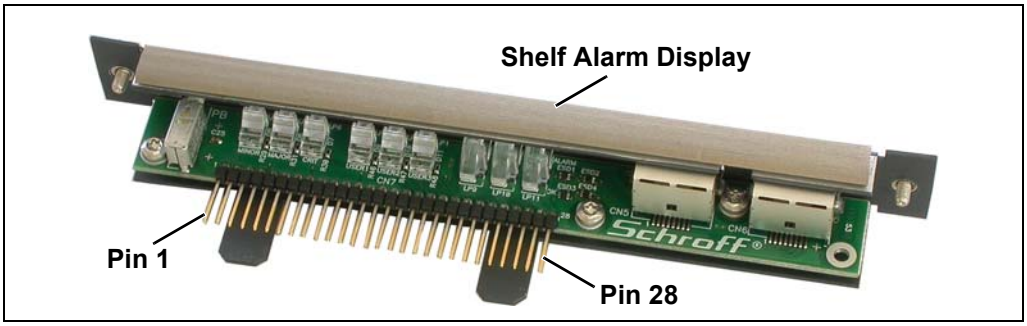

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Table 9: Shelf Alarm Display Horizontal Board Connector Pin Assignment

Pin	Signal Name	Description
1	GND	Ground
2	GND	Ground
3	GND	Ground
4	RXD0_ACB1	Receive Data to Shelf Manager 1
5	RXD0_ACB2	Receive Data to Shelf Manager 2
6	TXD0_ACB1	Transmit Data from Shelf Manager 1
7	TXD0_ACB2	Transmit Data from Shelf Manager 2
8	DSR_ACB1	Data Set Ready to Shelf Manager 1
9	DSR_ACB2	Data Set Ready to Shelf Manager 2
10	DTR_ACB1	Data Terminal Ready from Shelf Manager 1
11	DTR_ACB2	Data Terminal Ready from Shelf Manager 2
12	CTS_ACB1	Clear To Send from Shelf Manager 1
13	CTS_ACB2	Clear To Send from Shelf Manager 2
14	RTS_ACB1	Request To Send to Shelf Manager 1
15	RTS_ACB2	Request To Send to Shelf Manager 2
16	LED_MIN	Signal to Minor Alarm LED
17	LED_MAJ	Signal to Major Alarm LED
18	LED_CRIT	Signal to Critical Alarm LED
19	LED_USER1	Signal to User Definable LED1
20	LED_USER2	Signal to User Definable LED2
21	LED_USER3	Signal to User Definable LED2
22	RST_PB	Signal from Alarm Silence Push Button
23	LED_FT_FAIL_1	Signal to Fan Tray Left Alarm LED
24	LED_FT_FAIL_2	Signal to Fan Tray Center Alarm LED
25	LED_FT_FAIL_3	Signal to Fan Tray Right Alarm LED
26	LED_FT_OK_1	Signal to Fan Tray Left OK LED
27	LED_FT_OK_2	Signal to Fan Tray Center OK LED
28	LED_FT_OK_3	Signal to Fan Tray Left OK LED

6.8.3 Shelf Alarm Panel Horizontal Board Connector

Figure 18: Shelf Alarm Panel Horizontal Board Connector

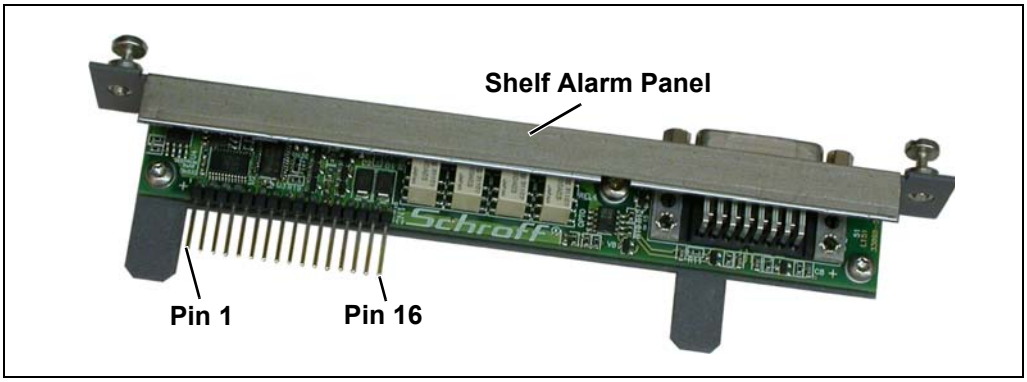

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Table 10: Shelf Alarm Panel Horizontal Board Connector Pin Assignment

Pin	Signal Name	Description
1	LED_USER1	Signal to User Definable LED1 on Shelf Alarm Display
2	LED_USER2	Signal to User Definable LED2 on Shelf Alarm Display
3	LED_USER3	Signal to User Definable LED3 on Shelf Alarm Display
4	LED_MIN	Signal to Minor Alarm LED on Shelf Alarm Display
5	LED_MAJ	Signal to Major Alarm LED on Shelf Alarm Display
6	LED_CRIT	Signal to Critical Alarm LED on Shelf Alarm Display
7	RST_PB	Signal from Alarm Silence Push Button on Shelf Alarm Display
8	GND	Ground
9	SCL_CH0	Serial Clock Master-Only I²C-Bus Channel 0
10	SDA_CH0	Serial Data Master-Only I²C-Bus Channel 0
11	GND	Ground
12	SAP_PRES (GND)	SAP Presence signal (Grounded on SAP)
13	INT#	External Interrupt Request (Master-Only I²C-Bus)
14	GND	Ground
15	I2C_PWR_B	3,3 VDC power supply for Shelf I²C-bus devices
16	I2C_PWR_A	3,3 VDC power supply for Shelf I²C-bus devices

6.9 SAP SEEPROM

The SAP SEEPROM is connected to the Master-Only I²C-bus and is a Microchip 24LC256 device.

6.10 SAP Temperature Sensor

The LM75 temperature sensor measuring the board temperature is located on the SAP PCB. The temperature sensor is connected to the Master-Only I²C-bus.

6.11 SAP I²C Addresses

Table 11: SAP I²C Addresses

LM75	SEEPROM	PCA9555
0x96/0x4b	0x26/0x13	0x44/0x22

6.12 SAP PCA9555

The PCA9555 device:

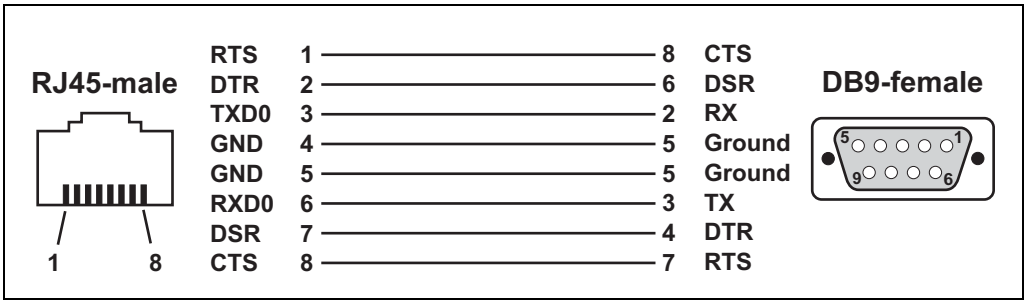
- controls the status of the LEDs at the Shelf Alarm Display
- reads the status of the Telco Alarm push button (RST)
- controls the Telco Alarm relays

Table 12: SAP PCA9555 Device Function

PCA9555 I/O pins	Function	State
0.0	Power Alarm to telco relays output	1 = relays powered
0.1	Minor Alarm to telco relays output	1 = relays powered
0.2	Major Alarm to telco relays output	1 = relays powered
0.3	Critical Alarm to telco relays output	1 = relays powered
0.4	N/C	Pulled High
0.5	LED_MIN (Minor alarm LED) output	1 = On
0.6	LED_MAJ (Major alarm LED) output	1 = On
0.7	LED_CRIT (Critical alarm LED) output	1 = On
1.0	Alarm cutoff push button input	0 = push button pushed
1.1	Minor Clear input	0 = voltage applied to input pins
1.2	Major Clear input	0 = voltage applied to input pins
1.3	N/C	Pulled High
1.4	N/C	Pulled High
1.5	LED_USER3 output	1 = On
1.6	LED_USER2 output	1 = On
1.7	LED_USER1 output	1 = On

6.13 SAP Console Cable for the Shelf Manager Serial Interface

Figure 19: RJ45 to DB9 Serial Console Cable



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The connectors are shown with the cables pointing away.

The serial console default configuration is:

- *115200 baud*
- *no parity*
- *8 data bits*
- *1 stop bit*

The serial console cable is not included with the Shelf.

Order No.: 23204-187

7 Fan Trays

7.1 Introduction

The 14 Slot ATCA Shelf contains three hot-swappable Fan Trays. The Fan Trays are plugged-in at the upper rear side of the Shelf and can be removed by lifting the retention lever.

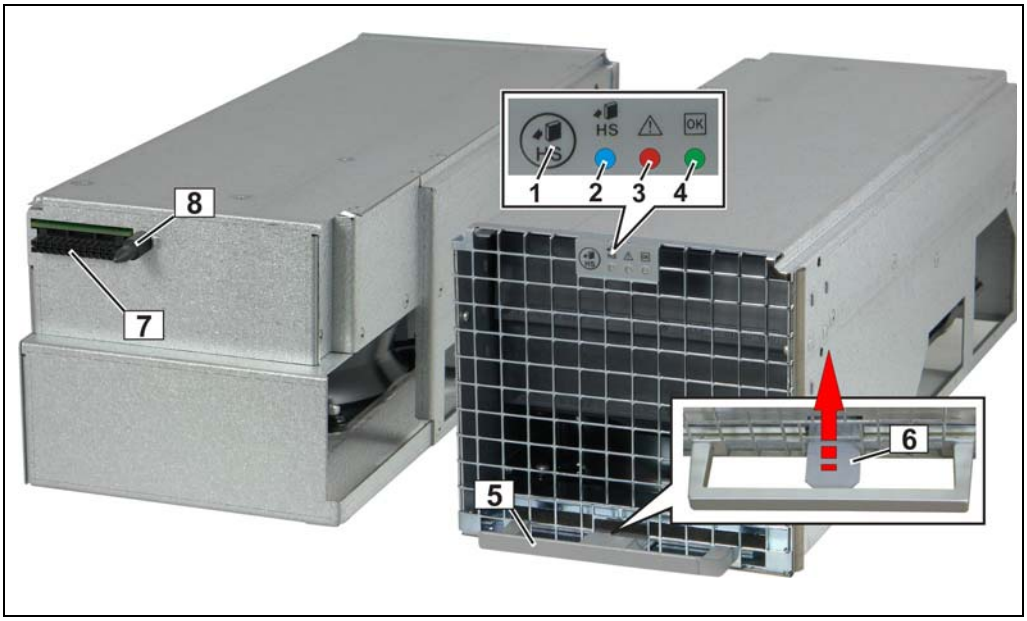
Each Fan Tray contains two fans for cooling the front boards and the RTM section of the Shelf. The cooling of the RTM section is provided by guiding air through cutouts in the ATCA Backplane.

The fan speeds are monitored by tachometer signals sent from the Fan Trays to the Shelf Manager. The Shelf Manager regulates the fan speed with a DC voltage.

The display module at the Fan Tray provides:

- A blue Hot Swap LED
- A red Fan Tray Alarm LED
- A green Fan Tray OK LED
- A Hot Swap push button

Figure 20: Fan Tray, Front and Rear View



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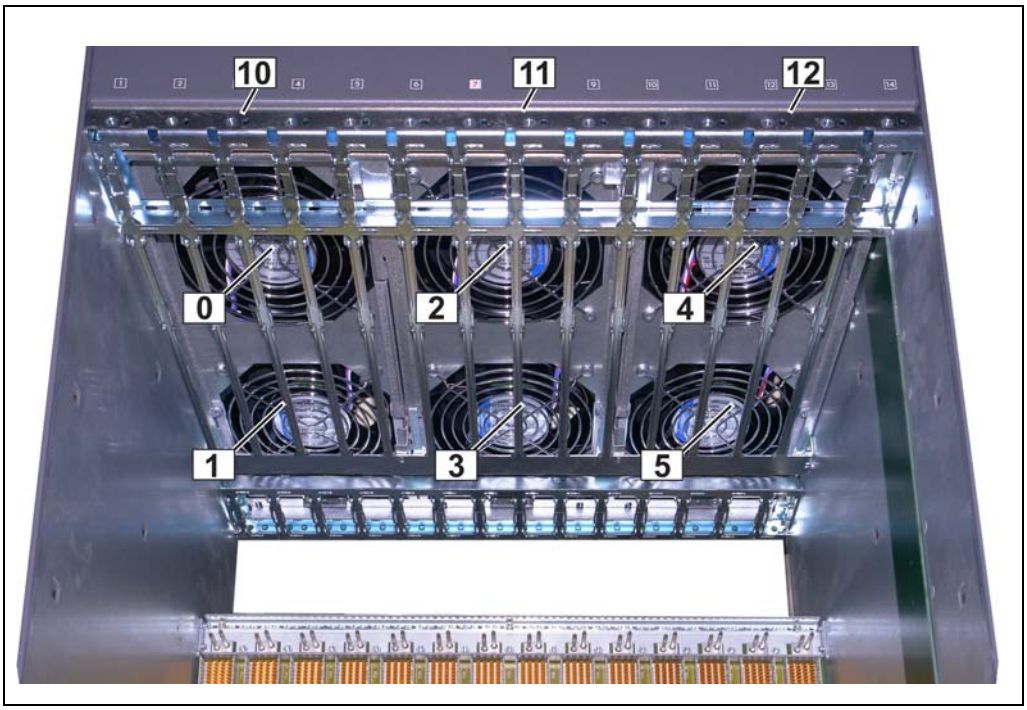
1	Hot Swap push button	5	Extraction handle
2	Hot Swap LED (blue)	6	Retention lever
3	Fan Tray Alarm LED (red)	7	Horizontal Board connector
4	Fan Tray OK LED (green)	8	Guiding Pin

Figure 21: Fan Tray Numbering



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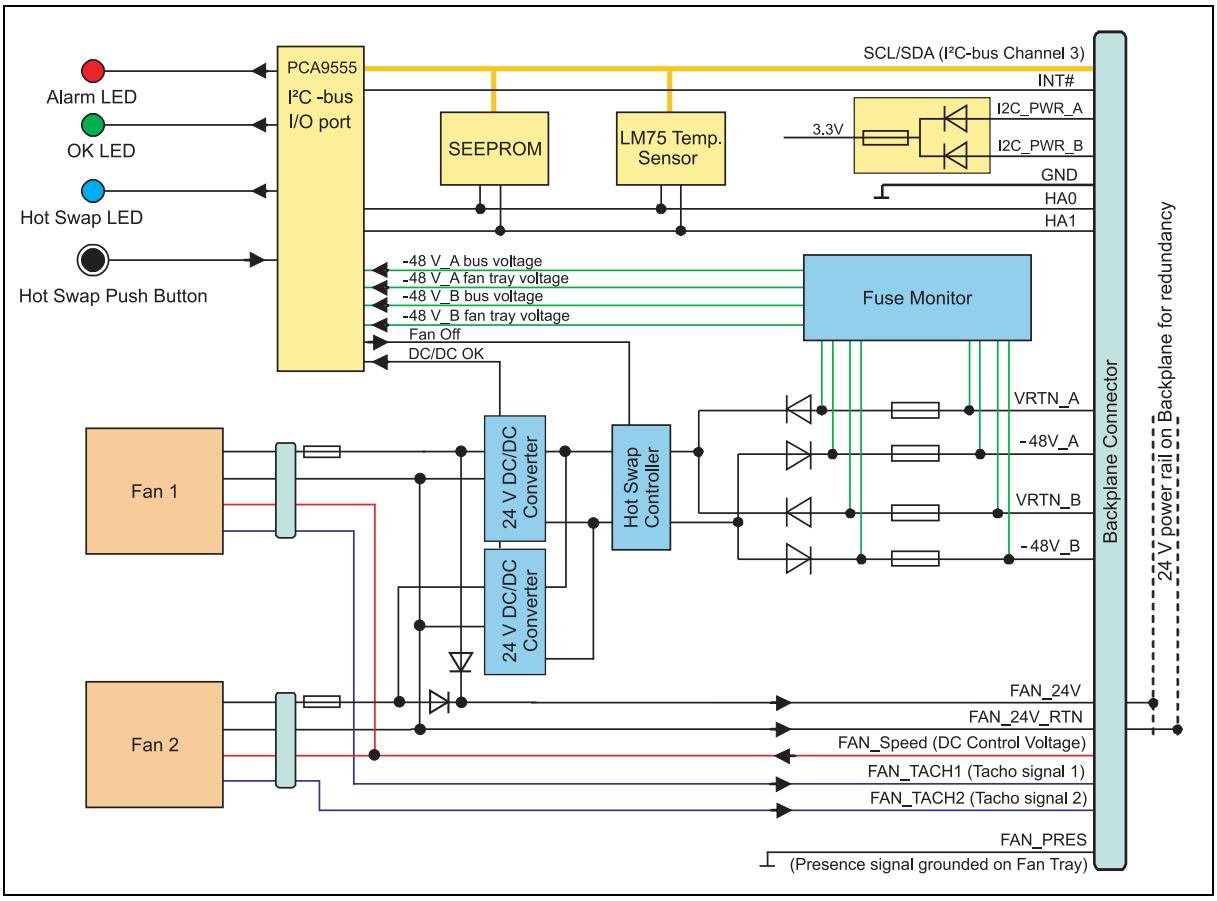
0	Fan #0		
1	Fan #1		
2	Fan #2		
3	Fan #3	10	Fan Tray #0 (left)
4	Fan #4	11	Fan Tray #1 (center)
5	Fan #5	12	Fan Tray #2 (right)

7.2 Fan Tray Block Diagram

Figure 22: Fan Tray Block Diagram



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7.3 Fan Tray Signals

The Fan Tray provides signals for:

- Supply Voltage monitoring
- Switching off the fans
- Status of the 24 V DC/DC converter

These signals are controlled by the PCA9555 I²C device on the Fan Tray PCB. The Shelf Manager has access to these signals via the Master-Only I²C-bus.

Table 13: Fan Tray Signals

Signal	description
-48 V_A bus voltage	Indicates the presence of the –48V_A / VRTN_A at the Horizontal Board Connector
-48 V_A fan tray voltage	Indicates the presence of the –48V_A / VRTN_A after the fan tray's mains fuse
-48 V_B bus voltage	Indicates the presence of the –48V_B / VRTN_B at the Horizontal Board Connector
-48 V_B fan tray voltage	Indicates the presence of the –48V_B / VRTN_B after the fan tray's main fuse
DC/DC OK	Indicates the proper functioning of the DC/DC converter which generate the 24 V voltage supply for the fans and the optical-isolation devices on the Shelf Manager
Fan Off	Turns off the fans

7.4 Fan Tray Temperature Sensor

The temperature sensors (LM75) in the Fan Trays measure the exhaust temperatures of the Shelf. The temperature sensors are connected to Channel 3 of the Master-Only I²C-bus.

I²C-bus addresses see *Table 16*.

7.5 Fan Tray control board SEEPROM

The SEEPROM (Microchip 24LC256) on the Fan Tray control board stores the FRU data and is connected to Channel 3 of the Master-Only I²C-bus.

I²C-bus addresses see *Table 16*.

7.6 Fan Tray Connectors and Indicators

Table 14: LEDs on Fan Tray control panel

Color	Description
blue	Hot Swap LED
red	Alarm LED
green	Fan Tray OK LED

Figure 23: Fan Tray Backplane connector

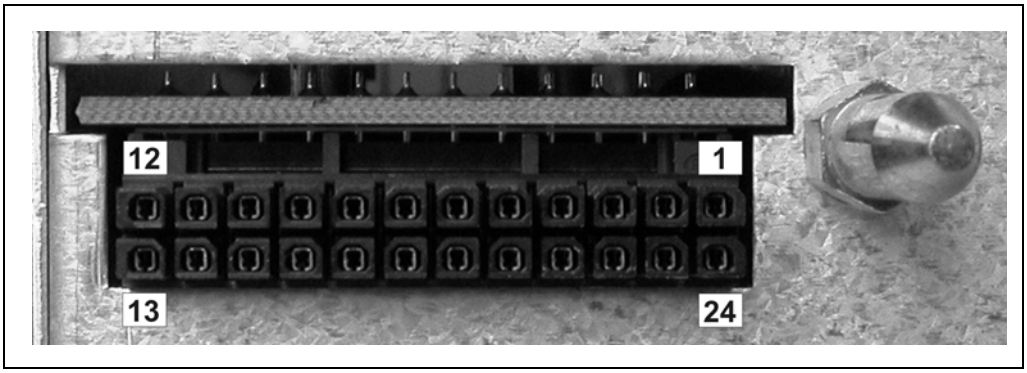

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Table 15: Fan Tray Backplane connector pin assignment

Pin #	Signal	Pin #	Signal
1	I2C_PWR_A	13	GND
2	I2C_PWR_B	14	FAN_PRES
3	SCL_CH3	15	HA0
4	SDA_CH3	16	HA1
5	LED_FT_FAIL	17	INT#
6	LED_FT_OK	18	
7		19	VRTN_B
8		20	VRTN_A
9	FAN_TACH2	21	-48V_B
10	FAN_TACH1	22	-48V_A
11	FAN_Speed	23	FAN_24V_RTN
12		24	FAN_24V

7.7 Fan Tray I²C Addresses

Geographic address pins (HA0, HA1) at the Fan Tray Horizontal Board connector determine the I²C addresses of the devices.

Table 16: Fan Tray I²C addresses

Fan Tray Location (front view)	SEEPROM	LM75	PCA9555
#0 (Left)	0xa8/0x54	0x90/0x48	0x48/0x24
#1 (Center)	0xaa/0x55	0x92/0x49	0x4a/0x25
#2 (Right)	0xac/0x56	0x94/0x4a	0x4c/0x26

The addresses are shown in 8 bit/7 bit format.

7.8 Fan Tray I/O Device

The Fan Tray I/O device (PCA9555):

- controls the status of the LEDs
- reads the status of the Hot Swap push button
- reads the status of the DC/DC converter for the 24 VDC fan power supply
- can enable the Hot Swap controller to switch off the fans

Table 17: Fan Tray PCA9555 pin assignment

PCA9555 I/O pins	Function	State
0.0	-48V_A bus voltage	0 = Voltage OK
0.1	-48V_A fan tray voltage	0 = Voltage OK
0.2	-48V_B bus voltage	0 = Voltage OK
0.3	-48V_B fan tray voltage	0 = Voltage OK
0.4	24 VDC OK	0 = Voltage OK
0.5	FAN OFF	0 = Fans switched off
0.6	N/C	Pulled high
0.7	N/C	Pulled high
1.0	N/C	Pulled high
1.1	N/C	Pulled high
1.2	N/C	Pulled high
1.3	Green LED (OK)	1 = On
1.4	Hot swap push button switch	1 = not pushed, 0 = pushed
1.5	Red LED (Alarm)	1 = On
1.6	N/C	Pulled high
1.7	Blue LED (Hot swap)	1 = On

Configuration registers 6 and 7 in the PCA9555 control the direction of the I/O pins. Normally a 0xdf is written to register 6 and a 0x17 is written to register 7. This will make all pins to inputs except for 0.5, 1.7, 1.6, 1.5 and 1.3. Configuration registers 4 and 5 in the PCA9555 control the inversion of the I/O pins. Normally a 0x00 is written to register 4 and 5. This will make the polarity of all of the pins the same as the bits in the registers.

7.9 Front Board Air Distribution

The airflow is measured with impedance boards acc. to the PICMG 3.0 R3.0 specification.

- Front board pressure drop: 37 Pa at 0.85 m³/min

Figure 24: Front Board Air Distribution

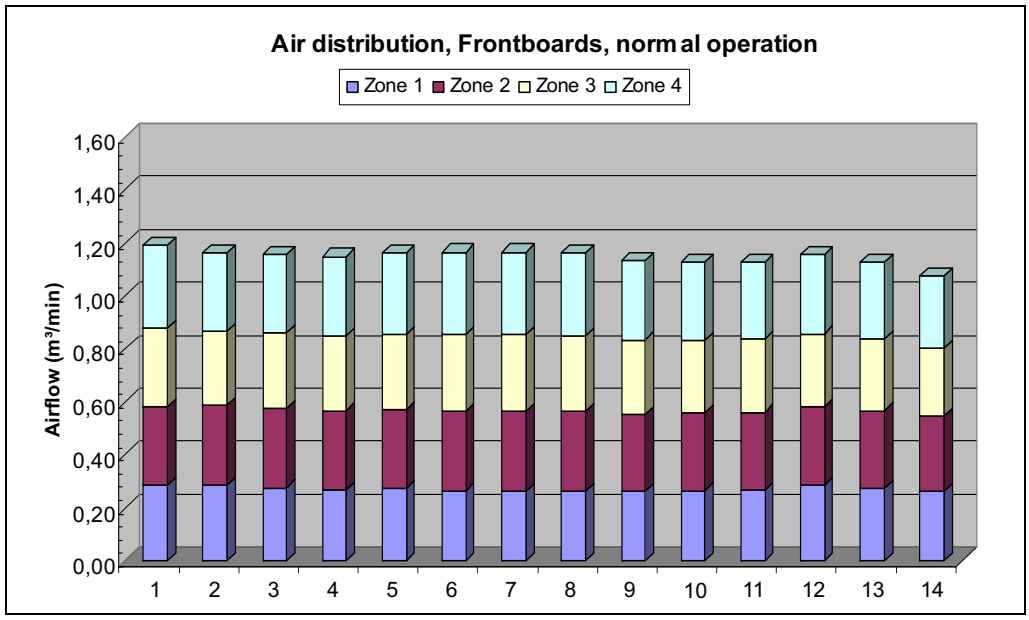


Table 18: Airflow and calculated cooling capacity front slots

	Zone1 [m³/min]	Zone2 [m³/min]	Zone3 [m³/min]	Zone4 [m³/min]	Σ [m³/min]	Σ [m³/h]	Σ CFM	CP-TA Cat.
Slot 1	0,28	0,3	0,29	0,32	1,19	71,58	42,11	>B4
Slot 2	0,29	0,3	0,28	0,29	1,16	69,64	40,97	>B4
Slot 3	0,28	0,3	0,28	0,3	1,15	69,3	40,76	>B4
Slot 4	0,27	0,3	0,28	0,3	1,15	68,91	40,54	>B4
Slot 5	0,27	0,3	0,29	0,31	1,16	69,79	41,05	>B4
Slot 6	0,27	0,3	0,29	0,31	1,17	69,98	41,17	>B4
Slot 7	0,26	0,3	0,29	0,31	1,17	69,97	41,16	>B4
Slot 8	0,26	0,3	0,29	0,31	1,16	69,65	40,97	>B4
Slot 9	0,26	0,29	0,28	0,3	1,13	68,07	40,04	B4
Slot 10	0,27	0,29	0,28	0,29	1,13	67,61	39,77	B4
Slot 11	0,27	0,29	0,27	0,29	1,13	67,72	39,84	B4
Slot 12	0,28	0,29	0,28	0,3	1,15	69,3	40,76	>B4
Slot 13	0,27	0,29	0,27	0,29	1,13	67,61	39,77	B4
Slot 14	0,26	0,28	0,26	0,27	1,08	64,55	37,97	B3
Σ	3,8	4,14	3,93	4,19	16,06	963,67	566,87	

7.10 Rear Board Air Distribution

The airflow is measured with impedance boards acc. to the PICMG 3.0 R3.0 specification.

- Rear board pressure drop: 24 Pa at 0.14 m³/min

Figure 25: Rear Board Air Distribution

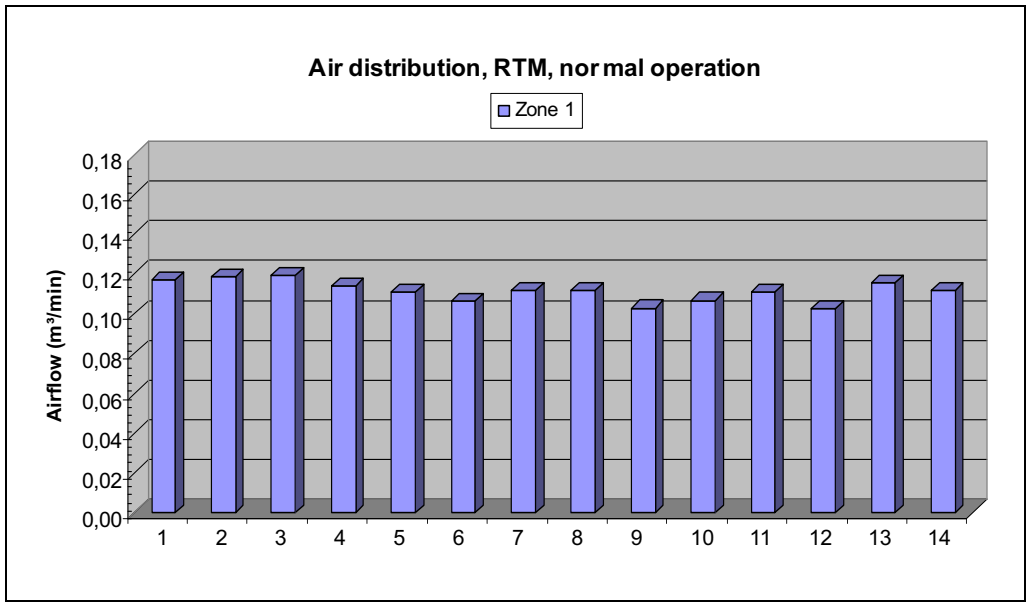
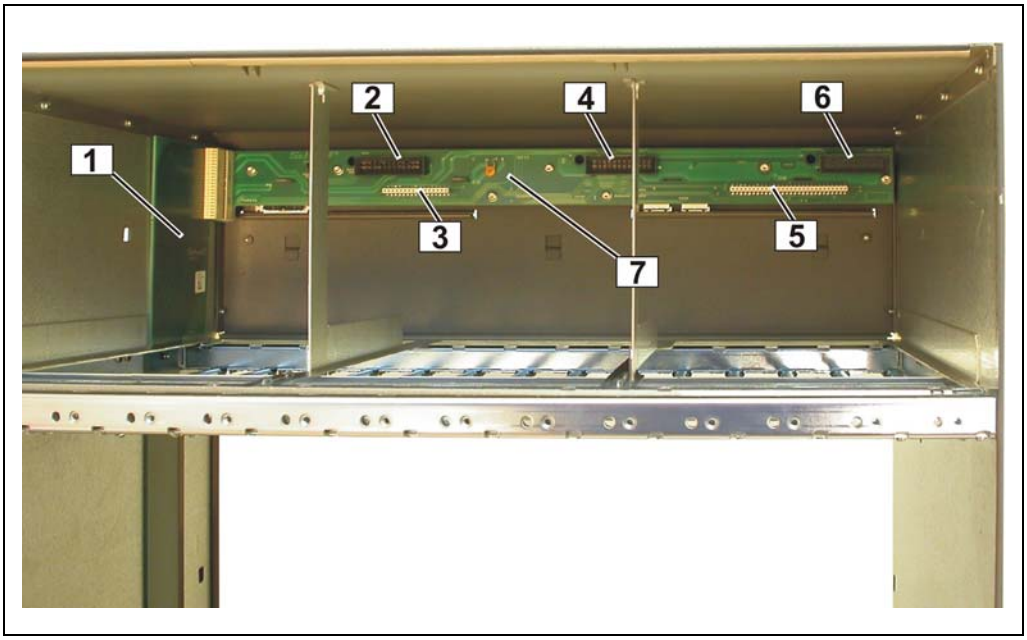


Table 19: Airflow and calculated cooling capacity rear slots

	Zone1 [m³/min]	Zone1 [m³/h]	Zone1 CFM	CP-TA Cat.
Slot 1	0,12	7,02	4,13	B3
Slot 2	0,12	7,13	4,19	B3
Slot 3	0,12	7,18	4,22	B3
Slot 4	0,11	6,84	4,02	B2
Slot 5	0,11	6,65	3,91	B2
Slot 6	0,11	6,39	3,76	B2
Slot 7	0,11	6,7	3,94	B2
Slot 8	0,11	6,72	3,95	B2
Slot 9	0,1	6,18	3,63	B1
Slot 10	0,11	6,41	3,77	B2
Slot 11	0,11	6,67	3,92	B2
Slot 12	0,1	6,18	3,63	B1
Slot 13	0,12	6,93	4,08	B3
Slot 14	0,11	6,71	3,95	B2
Σ	1,56	93,69	55,11	

8 Horizontal Board

Figure 26: Horizontal Board



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1	Riser Board	5	Connector SAD
2	Connector Fan Tray #2	6	Connector Fan Tray #0
3	Connector SAP	7	Horizontal Board
4	Connector Fan Tray #1		

The Horizontal Board (7) is located behind the Fan Trays at the top of the Shelf. The Horizontal Board provides the connectors for the Fan Trays (2, 4, 6), the SAP (3) and the SAD (5).

The signals from the Fan Trays, the SAP and the SAD are routed through the Riser Board (1) to the ATCA Backplane.

9 Power Entry Module (PEM)

	Hazardous voltage! *Before working ensure that the power is removed from the power connection cables. When the system is powered on, do NOT touch the power terminals.*

	Warning! *Although there are fuses in the power entry circuit of the Shelf, the power lines must be protected on rack level with circuit breakers.*

The Shelf can be powered using a regular telecommunication power supply of -48/-60 VDC with a VDC return. The specified voltage range is from -40.5 VDC to -72 VDC.The Shelf supports redundant power supplies but the two supplies should be independently powered.

9.1 Introduction

Two pluggable redundant Power Entry Modules (PEMs) are located at the rear bottom side of the Shelf. Each PEM provides power terminals for 140 A power feeds. Each power feed consists of 2 –48 VDC cables and its corresponding return cables and is protected by a 50 A fuse.
Each input feed is divided internally at the PEM in 4 output branches toward the backplane. In this way, each PEM has 1 input feed and 4 output branches.

Over current protection is provided by 50 A fuses in each output branch. The segmentation is shown in *Chapter 9.3, "Power Branches"*.

The power filtering consists of filtered power terminals and a discrete line-filter for each power branch.

The input voltage range for the Shelf is from -40 VDC to -72 VDC.

Input voltage measurement is implemented, by means of dedicated voltage monitor device.

Current measurement is available only as an option.

The PEM provides:

- PCA9555 I/O device for voltage monitoring and Hot Swap functionality
- LM75 temperature sensor
- 24LC256 FRU SEEPROM
- INA220B Current/Voltage measurement device

These devices are connected to the I²C-bus via an LTC4300 I²C buffer.

To detect a blown fuse, the presence of the voltages before and after the fuses is monitored by the PCA9555.
To indicate to the Shelf Manager the presence of the PEM, a presence signal is grounded by the PEM.

A Hot Swap Push Button and a Blue Hot Swap LED provide Hot Swap functionality.
A red (power failure) and a green (OK) LED provide status indication.

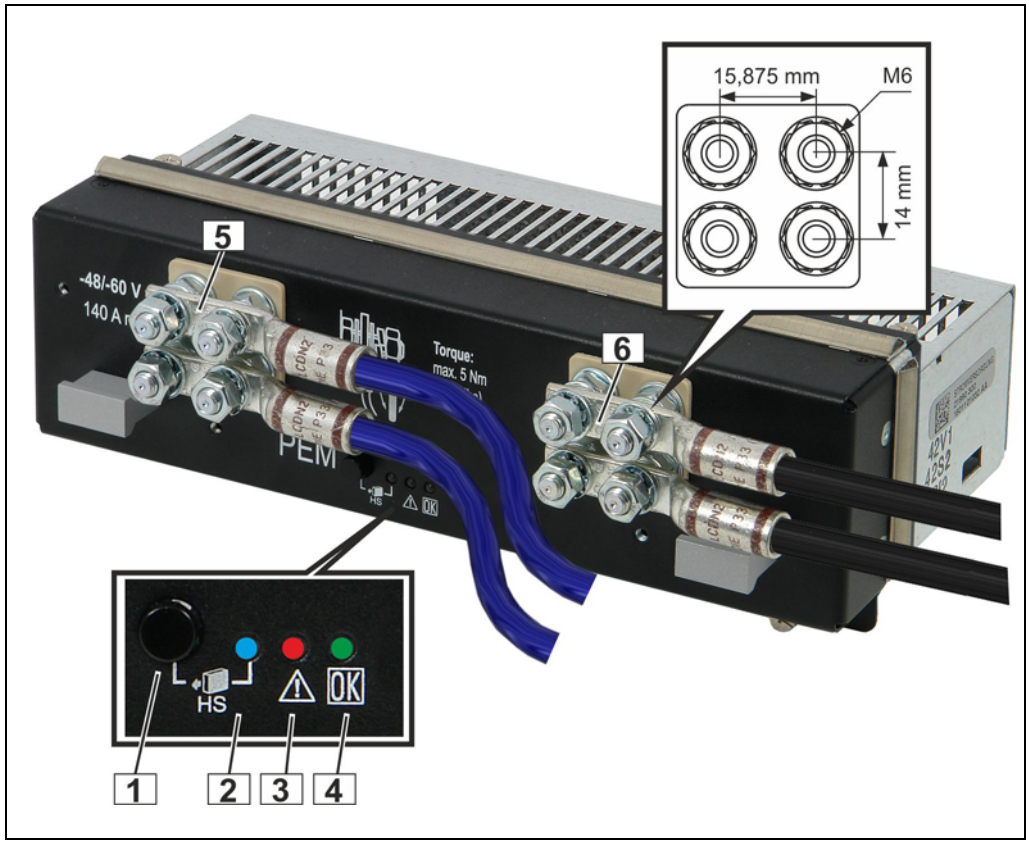
Each of the 4 redundant output branches supply power to a separate part of the ATCA Backplane.

The PEM (together with all shelf related FRUs) are protected against wrong polarity up to +57 V DC, but it does not block wrong polarity voltage being applied to shelf related FRUs and to Zone 1 power wiring of payload slots.

Suppressor diodes are included in the feed chain that provide protection against a K.20 pulse of 500 V being applied to its input (K.20 surge pulse, "Basic level", Table 7, pulse type 7.3, 500 V applied to -48V and -48V RTN branches at the same time against shelf ground) so that PEM itself and other shelf related FRUs can sustain this level of pulse.

9.2 PEM Front View

Figure 27: PEM Front View



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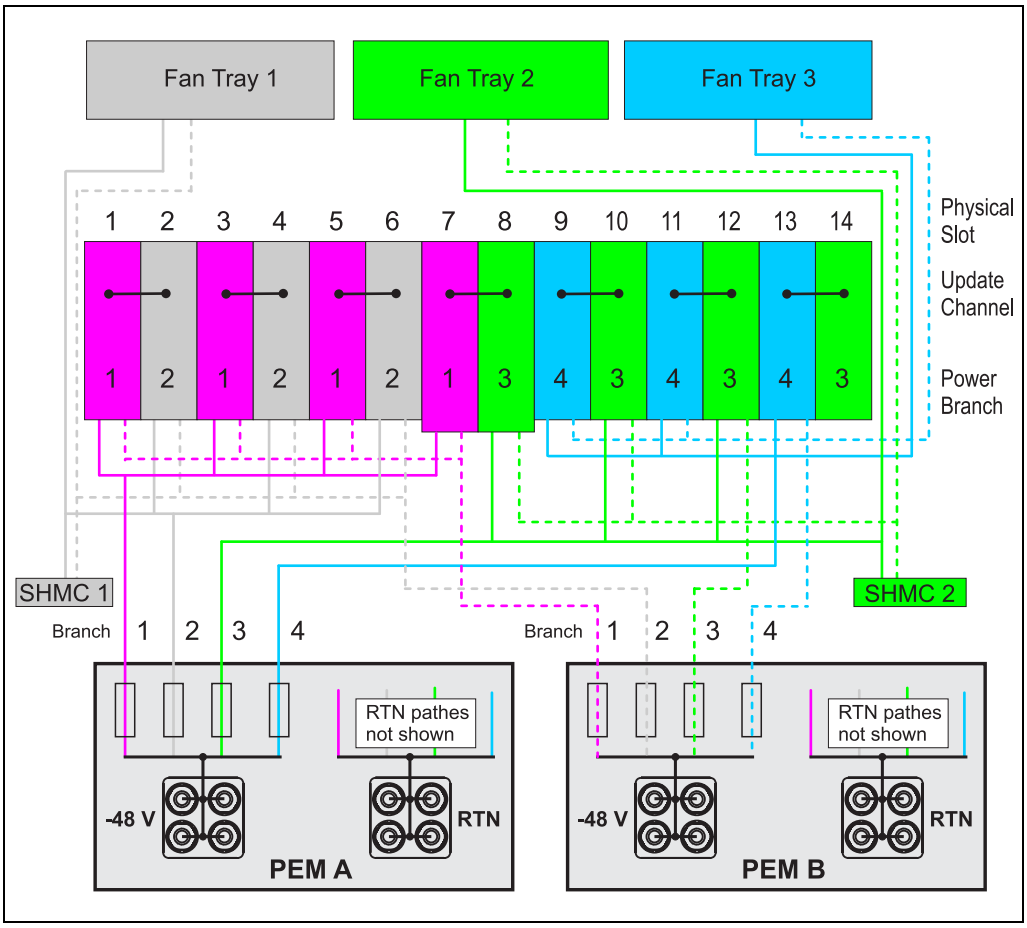
1	Hot-Swap Push Button	5	-48 V Input (-)
2	Hot-Swap LED (blue)	6	RTN Input (+)
3	Status LED „Failure“ (red)		
4	Status LED „OK“ (green)		

9.3 Power Branches

The Backplane‘s power supply is divided into 4 power branches. Each of the PEM’s 4 power branches supplies power to a group of slots and a Fan or Shelf Manager. This topology is used to keep the max. current per branch less than 35 A.

Figure 28: Power distribution of the 6 Power Branches within the Shelf



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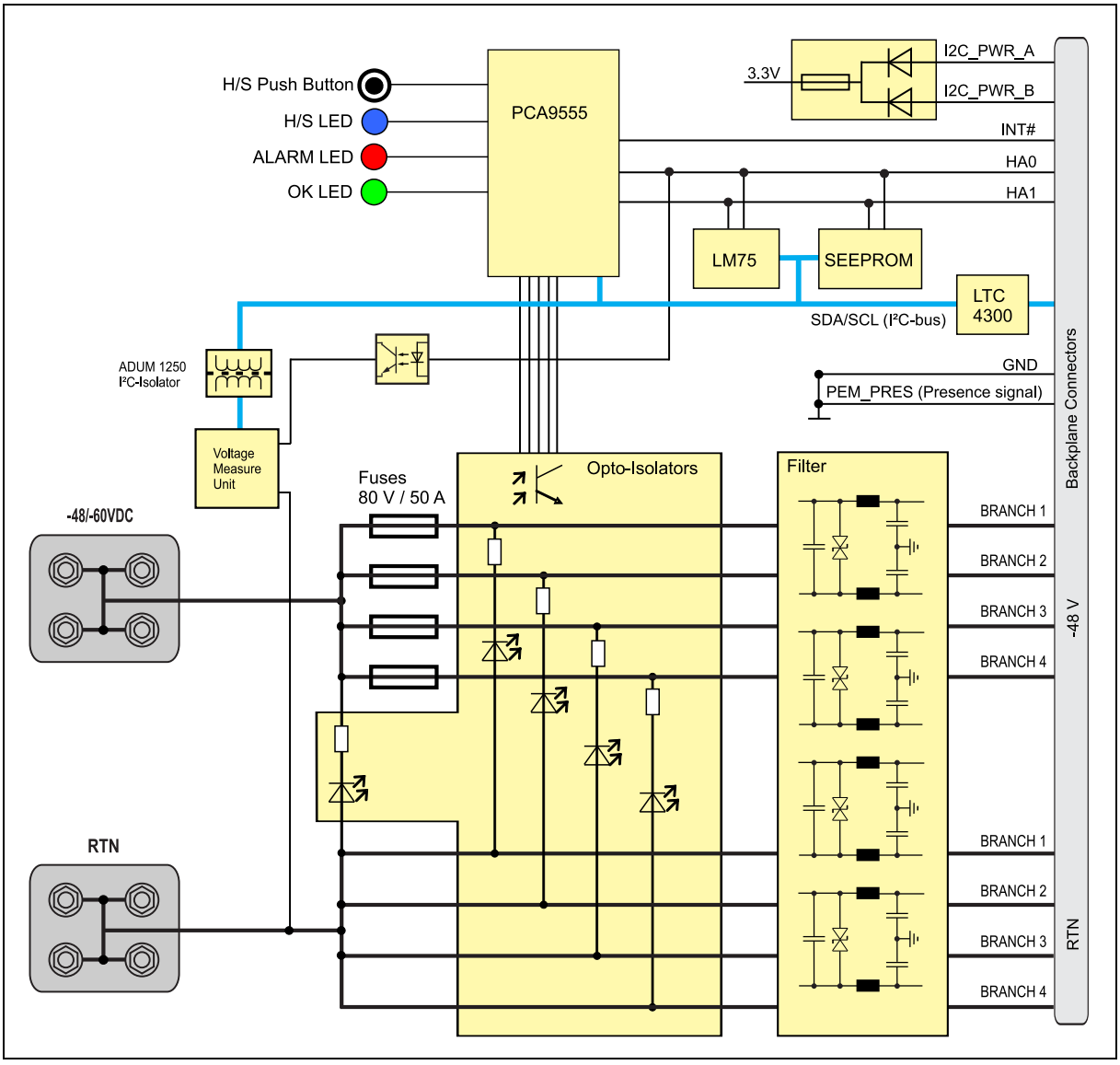
9.4 PEM Block Diagram

Figure 29: PEM Block Diagram



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9.5 PEM I²C-bus addresses

Geographic address pins (HA0, HA1) on the PEM Backplane connector determine the I²C addresses of the devices. The I²C devices on the PEMs are connected to channel 4 of the Master-Only I²C-bus of the Shelf Managers.

Table 20: PEM I²C-bus addresses

PEM Location	SEEPROM	LM75	PCA9555
PEM A (Right, view from rear)	0xa8/54	0x98/4c	0x48/24
PEM B (Left, view from rear)	0xaa/55	0x9a/4d	0x4a/25

9.6 PEM I/O Device

The PEM I/O device (PCA9555):

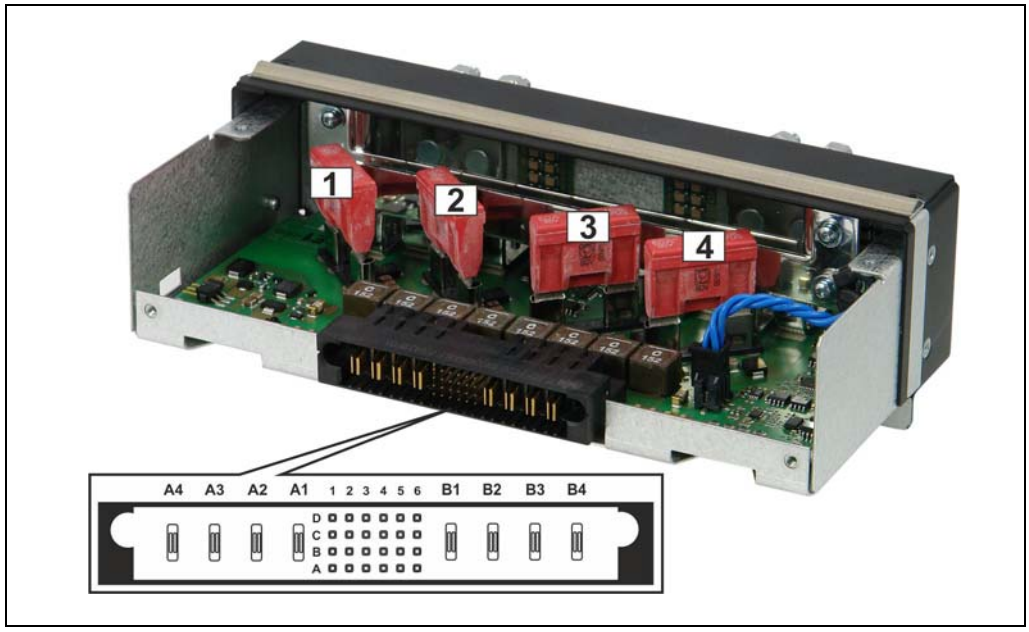
- controls the status of the LEDs
- reads the status of the Hot Swap push button
- reads the status of the -48 VDC inputs

Table 21: PEM PCA 9555 pin assignment

PCA9555 I/O pin	Function	State
0.0	Power Input 2 present	-48 V present = 0 -48 V absent = 1 (3.3V)
0.1	Power Input 2 after the fuse present	-48 V present = 0 -48 V absent = 1 (3.3V)
0.2	Power Input 1 present	-48 V present = 0 -48 V absent = 1 (3.3V)
0.3	Power Input 1 after the fuse present	-48 V present = 0 -48 V absent = 1 (3.3V)
0.4	N/C	Pulled High
0.5	N/C	Pulled High
0.6	Power Input 4 present	-48 V present = 0 -48 V absent = 1 (3.3V)
0.7	Power Input 4 after the fuse present	-48 V present = 0 -48 V absent = 1 (3.3V)
1.0	Power Input 3 present	-48 V present = 0 -48 V absent = 1 (3.3V)
1.1	Power Input 3 after the fuse present	-48 V present = 0 -48 V absent = 1 (3.3V)
1.2	N/C	Pulled High
1.3	Green LED	1=on
1.4	Hot Swap Push-button switch	1=not pushed, 0=pushed
1.5	Red LED	1=on
1.6	N/C	Pulled High
1.7	Blue LED	1=on

9.7 PEM Connectors

Figure 30: PEM Backplane Connector



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1	50 A Fuse Branch 1	3	50 A Fuse Branch 3
2	50 A Fuse Branch 2	4	50 A Fuse Branch 4

Table 22: PEM Backplane connector power contacts

A4	A3	A2	A1	B1	B2	B3	B4
-48 V_1	VRTN_1	-48 V_2	VRTN_2	-48 V_3	VRTN_3	-48 V_4	VRTN_4

Table 23: PEM Backplane connector signal contacts

Pin #	1	2	3	4	5	6
D		INT#	PEM_PRES			
C		HA0	HA1			
B		SCL_CH4	GND			
A		SDA_CH4	I2C_PWR_A	I2C_PWR_B		

9.8 Specification for the power connection cables

2 pcs AWG2 per connection

.

10 Distribution of the Master-Only I²C Bus

Figure 31: Distribution of the Master-Only I²C-bus

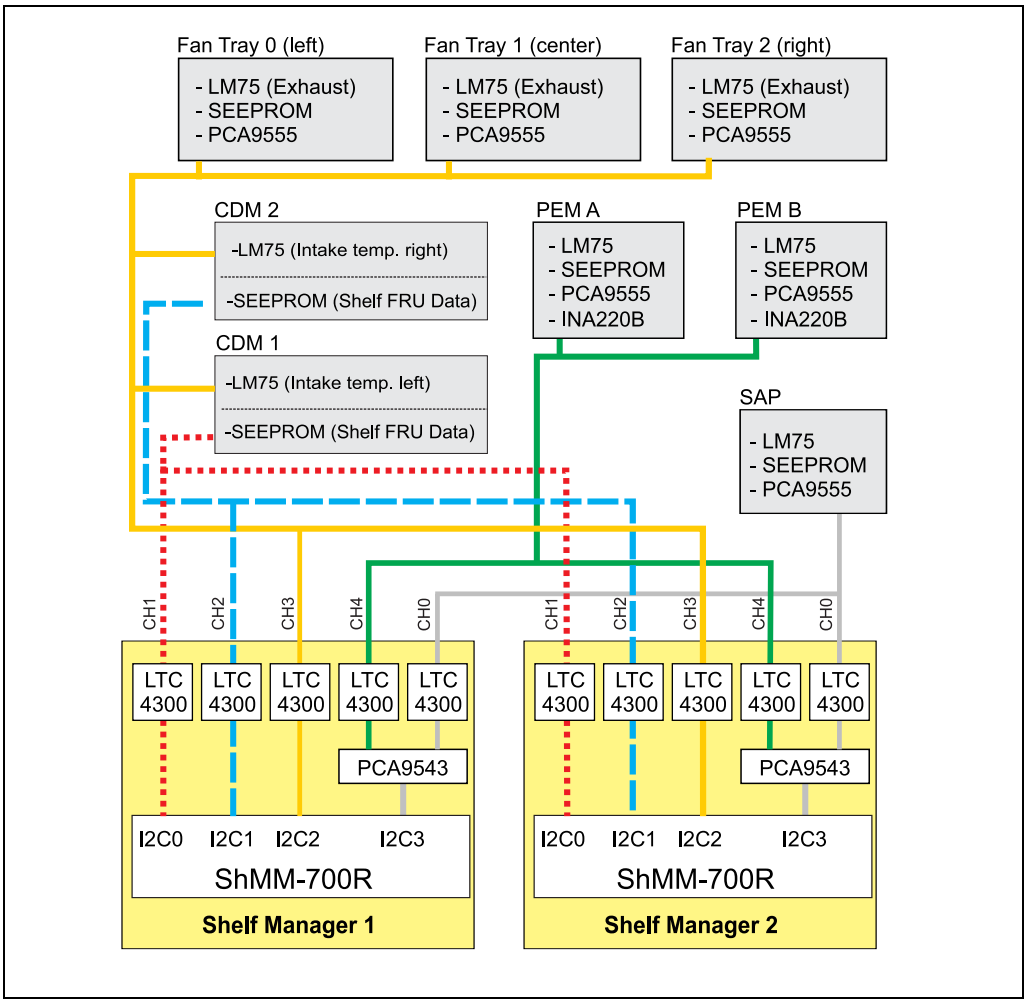


Table 24: I²C-bus addresses of the Shelf

I²C addr.	SAP (CH 0)	CH 1	CH 2	CH 3	CH 4
0x44 / 22	PCA9555 Telco Alarms				
0x46 / 23					
0x48 / 24				PCA9555 Fan Tray 0 (left)	PCA9555 PEM A
0x4a / 25				PCA9555 Fan Tray 1 (center)	PCA9555 PEM B
0x4c / 26				PCA9555 Fan Tray 2 (right)	
0x58 / 2C					
0x5c / 2E					
0x90 / 48				LM75 exhaust temp. left	
0x92 / 49				LM75 exhaust temp. center	
0x94 / 4a				LM75 exhaust temp. right	
0x96 / 4b	LM75 SAP temperature				
0x98 / 4c				LM75 intake temp. (left)	LM75 PEM A
0x9a / 4d					LM75 PEM B
0x9c / 4e				LM75 intake temp. (right)	
0xa0 / 50					
0xa4 / 52		SEEPROM CDM 1	SEEPROM CDM 2		
0xa6 / 53	SEEPROM SAP				
0xa8 / 54				SEEPROM Fan Tray 0 (left)	SEEPROM PEM A
0xaa / 55				SEEPROM Fan Tray 1 (center)	SEEPROM PEM B
0xac / 56				SEEPROM Fan Tray 2 (right)	
0xe0 / 70					
0xe8 / 74					
0xea / 75					
0xee / 77					
0xd0 / 68					

11 Schroff Shelf Manager ACB-VI

These Chapters describe the Shelf Manager hardware. For explicit software documentation see:

- Pigeon Point Shelf Manager User Guide
- Pigeon Point Shelf Manager External Interface Reference
- Schroff Shelf Manager User‘s Manual, Order-no. 63972-243

The documentation is available for registered users at www.schroff.biz

Shelf Manager with bused IPMB: 21990-401 (Product Number)

21990-404 (Catalog Number with packaging)

Shelf Manager with radial IPMB: 21990-402 (Product Number)

21990-405 (Catalog Number with packaging)

The Schroff Shelf Manager ACB-VI is a 78 mm x 280 mm board that fits into a dedicated Shelf Manager slot in a Schroff ATCA Shelf.

The Shelf Manager has two main responsibilities:

- Manage/track the FRU population and common infrastructure of a Shelf, especially the power, cooling and interconnect resources and their usage.
- Enable an external System Manager to join in management/tracking through the System Manager Interface, which is typically implemented over Ethernet.

The Shelf management is based on the Pigeon Point Shelf management solution for AdvancedTCA products.

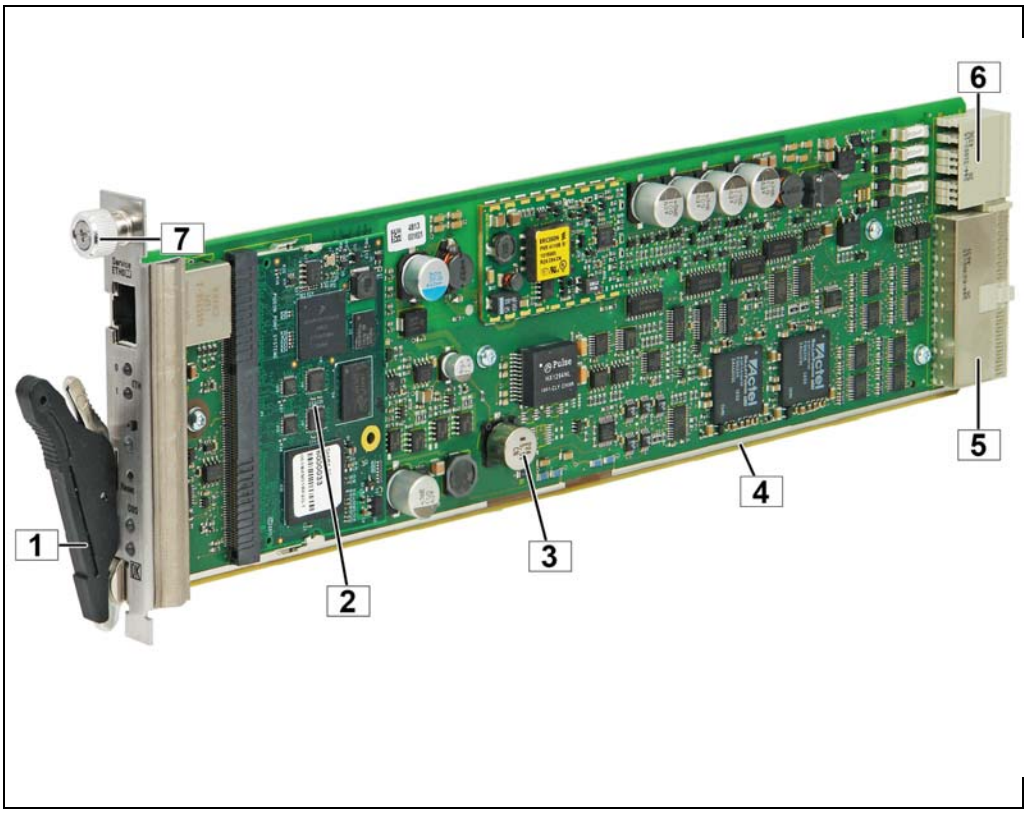
The Shelf management software runs on the Pigeon Point Shelf Management Mezzanine 700 (ShMM-700R), a compact 204-pin SO-DIMM form-factor module, installed on theACB-VI carrier board.

The ACB-VI carrier board includes several on-board devices that enable different aspects of Shelf management based on the ShMM-700R. These facilities include I²C-based hardware monitoring/control and GPIO expander devices.

The ACB-VI also provides the Fan Controller for up to 9 Fans and individual Ethernet connections to both Base Hubs (ShMC cross connect).

The Shelf Manager communicates inside the Shelf with IPM controllers over the Intelligent Platform Management Bus (IPMB). The Shelf Manager also provides an IPMB interface for the non-intelligent FRUs in a Schroff Shelf. The Shelf Manager communicates with the non-intelligent FRUs over I²C busses and expose the sensors for these FRUs at IPMB address 0x20.

Figure 32: Schroff Shelf Manager



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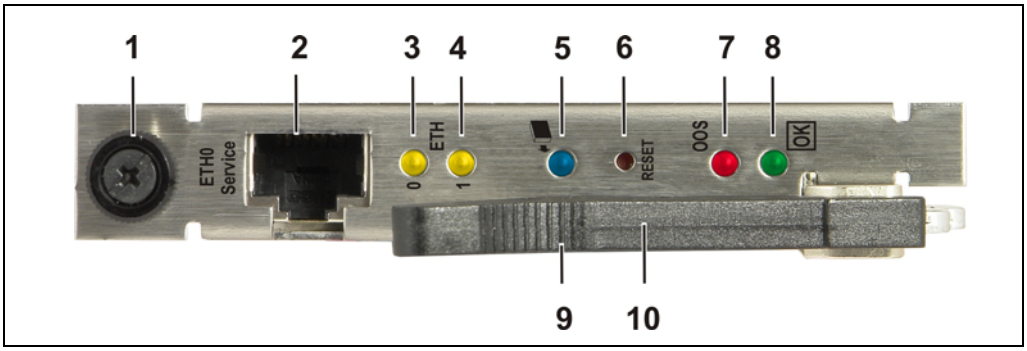
1	Extraction handle	5	Backplane Connector (X100)
2	ShMM-700R	6	Backplane Connector (X102)
3	RTC backup capacitor	7	Fixing screw
4	ACB-VI Carrier Board		

11.1 Front Panel Components

Figure 33: Shelf Manager Front Panel Components



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1	Fixing screw	6	RESET push button
2	ETH 0 Ethernet Service Connector (RJ45)	7	Shelf Manager Status LED (red) - Red = Out of Service (OOS)
3	ETH 0 Link/Activity LED (yellow) - On = Link - Off = No Link - Blinking = Activity	8	Shelf Manager Status LED (green) - Solid Green = in Service, active Shelf Manager - Blinking = in Service, Backup Shelf Manager
4	ETH 1 Link/Activity LED (yellow) - On = Link - Off = No Link - Blinking = Activity	9	Hot Swap Switch - Activated by extraction handle
5	Hot Swap LED (blue) - Solid Blue = ready to remove - Blinking = Hot Swap is requested - Off = No Hot Swap possible	10	Extraction handle

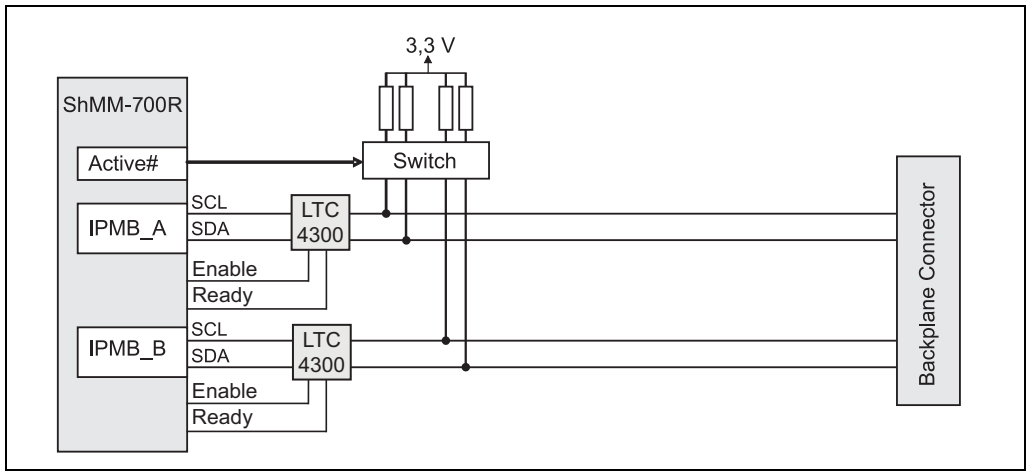
11.2 Bused IPMB Interface

Only Shelf Managers with Product Number: 21990-401-291

The ShMM-700R provides two IPMBs. The IPMB-A and IPMB-B from the ShMM-700R are routed to the Backplane connector through I2c buffers. The ATCA Backplane buses the two IPMBs to the ATCA boards.

The Active# signal of the ShMM-700R is used to switch on/off the pull-up resistors of the IPMBs.

Figure 34: Block diagram bused IPMB

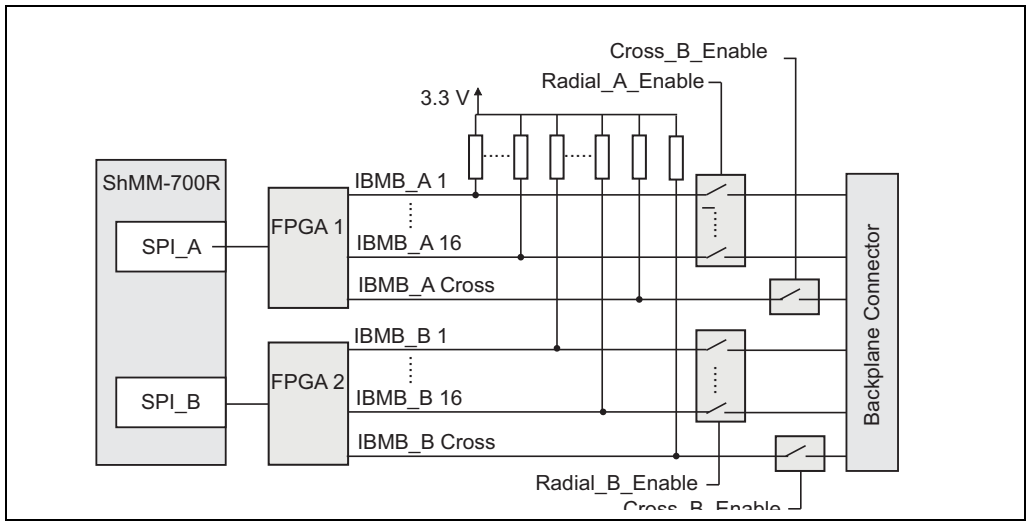


11.3 Radial IPMB Interface

Only Shelf Managers with Product Number: 21990-402

Radial IPMB is implemented by 2 FPGAs connected to the Serial Peripheral Interfaces (SPI) on the ShMM700R.

Figure 35: Block diagram radial IPMB



11.4 Ethernet Interfaces

The front panel ETH0 Ethernet connector is intended for service use only or for debugging purposes in laboratory environment. The computer which is connected to this interface must be located nearby the shelf manager with an Ethernet cable that is not longer than 10 m.

The front panel Ethernet connector MUST NOT be connected to a Telecommunication Network Circuit that leaves the building.

The ETH0 interface of the shelf manager can manually be switched between the front panel RJ45 connector (“Front”-position of the rocker-switches) and the backplane connector going to the hub board base interface (“Back”-position of the rocker-switches).

The ATCA specification requires a base channel interface between the shelf manager and the Hub board. The ETH0 rocker-switches MUST be in “Back”-position in normal operation of the shelf manager in an ATCA-shelf.

Figure 36: ETH Switches shown in default position

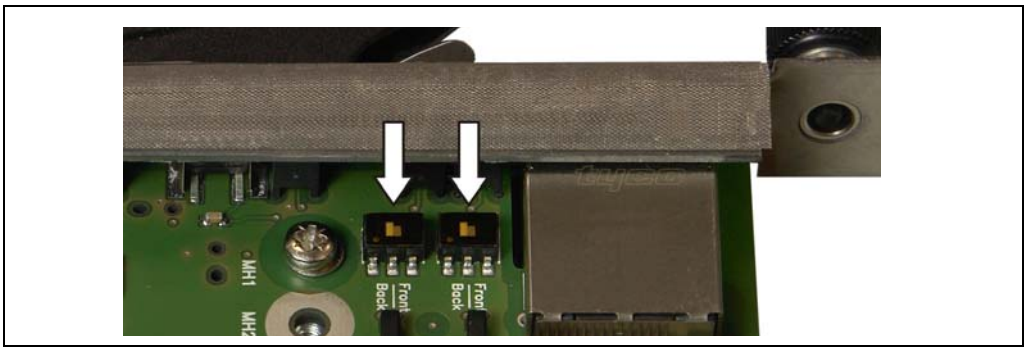


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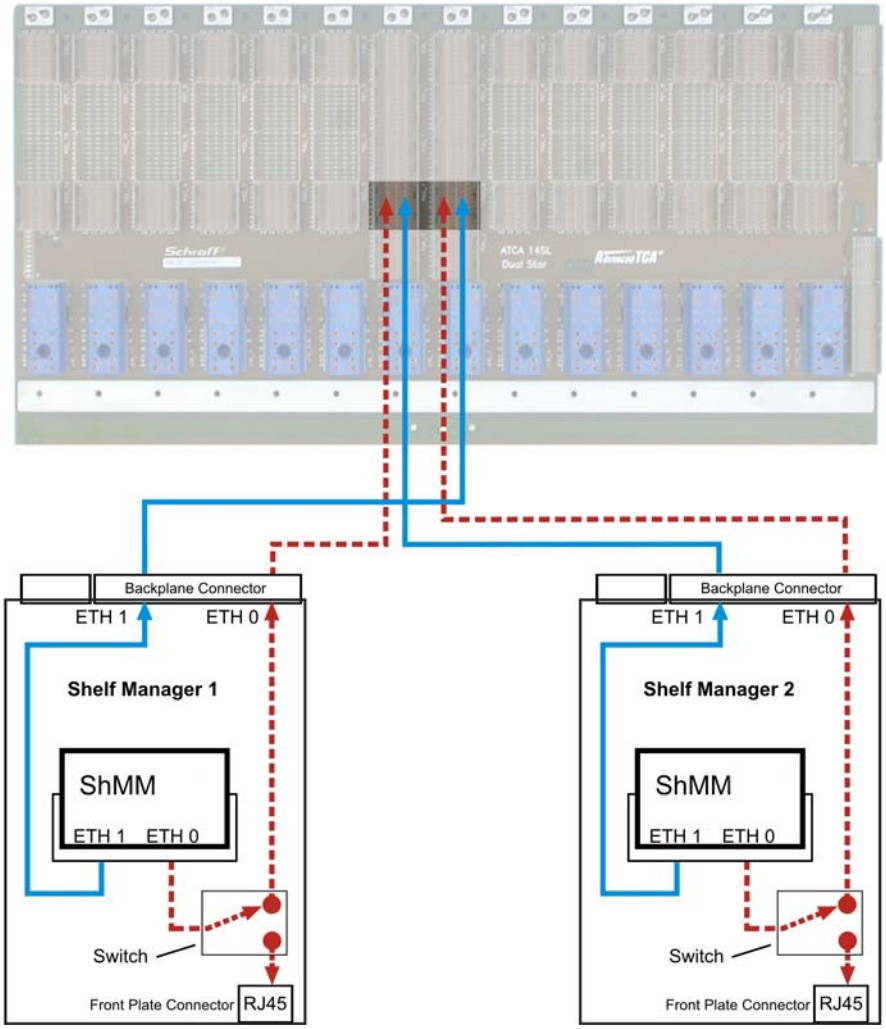
Figure 37: Shelf Manager Cross Connect



12709823

Table 25: Connector (P23) pin assignment for Shelf Manager Cross Connect

Row	Designation	ab		cd		ef		gh	
5	Shelf Manager Port with Shelf Manager Cross Connects	Tx1+	Tx1-	Rx1+	Rx1-	Tx2+	Tx2-	Rx2+	Rx2-
		Shelf Manager Cross Connect 1				Shelf Manager Cross Connect 2			

11.5 Shelf Manager RS-232 Console Serial Interface

The Shelf Manager provides an RS-232 console interface that provides a full set of RS-232 signals, including modem control. These signals are routed through the Shelf Manager backplane connector to a RJ45 connector on the front panel of the lower Fan Tray.

The serial console default configuration is:

- *115200 baud*
- *no parity*
- *8 data bits*
- *1 stop bit*

11.6 Front Panel RESET push button

The Shelf Manager provides a RESET push button on the front panel. It is connected to the ShMM-700's MRST_IN# signal.

Pushing the RESET button will reset the Shelf Manager

11.7 Hot Swap Interface

The Shelf Manager provides a Hot Swap interface allowing the Shelf Manager to be replaced without powering down the Shelf. The interface is composed of three components:

- Hot Swap switch at injector/ejector handle
- Presence signal indicating that the Shelf Manager is fully seated in its backplane connector
- Hot Swap LED

11.7.1 Hot Swap LED

The Shelf Manager provides a a blue Hot Swap LED. The LED indicates when it is safe to "remove" the Shelf Manager from a powered Shelf.

Table 26: Hot Swap LED

LED State	Condition
Off	The Shelf Manager is not ready to be removed/disconnected from the Shelf
Solid Blue	The Shelf Manager is ready to be removed/disconnected from the Shelf
Long-blink	The Shelf Manager is activating itself
Short-blink	Deactivation has been requested

11.8 Hardware Address

The Shelf Manager reads the hardware address and parity bit from the backplane connector of the Dedicated Shelf Manager slot. Geographic address pins (HA[0], HA7) at the Backplane connector determine bit 0 and bit 7, bit 1...6 are hardware-coded on the Shelf Manager PCB.

	HW-Addr.	IPMB-Addr.	HA[0]	HA7
Shelf Manager 1	0x08	0x10	GND	GND
Shelf Manager 2	0x09	0x12	n.c.	n.c.

11.9 Redundancy Control

The Shelf Manager supports redundant operation with automatic switchover using redundant Shelf Managers. In a configuration where two Shelf Manager are present, one acts as the active Shelf Manager and the other as a standby. The Shelf Managers monitor each other and either can trigger a switchover if necessary.

11.9.1 Hardware Redundancy Interface

The two Shelf Manager communicate over the TCP/IP based Software Redundancy Interface (SRI) which is implemented via a pair of USB links between the ShMM-700Rs. The active instance posts incremental state updates to the backup via this interface. As a result, the backup can quickly step into the active role if necessary.

The Hardware Redundancy Interface (HRI) between the two Shelf Manager instances enables the exchange of hardware level ShMM-700R state information, including the following:

- Presence: each Shelf Manager instance knows whether the other instance is present in the shelf.
- Health: each instance knows whether the other instance considers itself „healthy“.
- Switchover: the backup instance can force a switchover if necessary.

The ACB-VI Hardware Redundancy Interface supports the upgrade from ACB-V to ACB-VI in an ATCA System without interruption. For details see the firmware release note.

11.10 Command Line Interface (CLI)

The Command Line Interface (CLI) connects to and communicates with the IPM-devices of the Shelf, the boards, and the Shelf Manager.
The CLI is an IPMI-based library of commands, service personnel or system administrators can access the CLI through Telnet, SSH, or the Shelf Managers serial port on the SAP.
With the CLI, users can access information about the current system status including sensor values, threshold settings etc.
Users can also access and modify Shelf- and Shelf Manager configurations, perform actions on a FRU a.e. set fan speeds etc.

The default user account is "root" and there is no password.
The default IP address of the primary Shelf Manager is 192.168.0.2

To access all sensor data you have to connect to the active Shelf Manager!

11.10.1 Basic CLI Commands

Service personnel can read system information, FRU information and sensor datas with the following basic commands. For a full list of all CLI commands refer to the Pigeon Point Shelf Manager External Interface Reference Manual.

- **Change IP address of the primary Shelf Manager:**

```
clia setlanconfig channel ip value
```

Value represents the IP address in dotted decimal notation.

```
clia setlanconfig 1 ip 192.168.0.2
```

- **Display the Shelf Managers firmware version:**

```
clia version
```

Info: To get a complete list of all information just type in "`version`".

- **List all IPM Controllers in a Shelf:**

```
clia ipmc
```

- **List all boards in the Shelf:**

```
clia board
```

- **List all sensors on a board:**

```
clia sensor IPMI-address
```

- **List only sensors which are outside of established thresholds:**

```
clia sensor -t
```

- **Get data (value) from a sensor on a board:**

```
clia sensordata IPMI-address sensor-number
```

- **Display the FRU information in a board:**

  ```
  clia fruinfo IPMI-address FRU-id
  ```

- **Change the speed for a Fan Tray:**

  ```
  clia setfanlevel IPMI-address Fru-id speed
  ```

Info: The value for the speed is from 0 to 15.

- **Display the contents of the System Event Log (SEL):**

  ```
  clia sel
  ```

- **Clear the System Event Log (SEL):**

  ```
  clia sel clear
  ```

11.11 Sensor Table

IPMC	Nr.	LUN	Name	Type	Type-Code	Class	Description
10	0	0	FRU 0 HOT_SWAP	Hot Swap	0xf0	Discrete	This sensor returns the hot-swap states for FRU 0.
10	1	0	IPMB LINK	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link state.
10	2	0	Local Temp	Temperature	0x01	Threshold	This sensor measures the local temperature.
10	3	0	3V3_local	Voltage	0x02	Threshold	This sensor measures the local 3.3 V voltage in volts.
10	4	0	I2C_PWR_B	Voltage	0x02	Threshold	This sensor measures the 3.3 V power supply B voltage supplied to I2C devices in volts.
10	5	0	I2C_PWR_A	Voltage	0x02	Threshold	This sensor measures the 3.3 V power supply A voltage supplied to I2C devices in volts.
10	6	0	VBAT	Voltage	0x02	Threshold	This sensor measures the battery voltage in volts.
10	16	0	-48A Bus voltage	Entity Presence	0x25	Discrete	This sensor indicates the presence of the -48 V_A of fused on the local shelf manager.
10	17	0	-48B Bus voltage	Entity Presence	0x25	Discrete	This sensor indicates the presence of the -48 V_B of fused on the local shelf manager.
10	18	0	-48A ACB voltage	Entity Presence	0x25	Discrete	This sensor indicates the presence of the -48 V_A behind the shelf manager's main fuse.
10	19	0	-48B ACB voltage	Entity Presence	0x25	Discrete	This sensor indicates the presence of the -48 V_B behind the shelf manager's main fuse.
10	20	0	20V AUX	Entity Presence	0x25	Discrete	This sensor indicates the presence of 20 V on carrier shelf manager.
10	21	0	-48A ACB Fuse	Entity Presence	0x25	Discrete	This sensor indicates the state of -48 V_A on the shelf manager.
10	22	0	-48B ACB Fuse	Entity Presence	0x25	Discrete	This sensor indicates the state of -48 V_B on the shelf manager.
10	128	0	CPLD State	OEM reserved	0xde	Discrete	This sensor indicates the high-level redundancy state of the ShMM, along with the state of the low-level redundancy bits exposed by the CPLD, and redun-dancy-related exceptional conditions in the CPLD, if any.
10	129	0	Reboot Reason	OEM reserved	0xdd	Discrete	This sensor indicates the reason for the last reboot.
12	0	0	FRU 0 HOT_SWAP	Hot Swap	0xf0	Discrete	This sensor returns the hot-swap states for FRU 0.
12	1	0	IPMB LINK	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link state.
12	2	0	Local Temp	Temperature	0x01	Threshold	This sensor measures the local temperature.
12	3	0	3V3_local	Voltage	0x02	Threshold	This sensor measures the local 3.3 V voltage in volts.
12	4	0	I2C_PWR_B	Voltage	0x02	Threshold	This sensor measures the 3.3 V power supply B voltage supplied to I2C devices in volts.
12	5	0	I2C_PWR_A	Voltage	0x02	Threshold	This sensor measures the 3.3 V power supply A voltage supplied to I2C devices in volts.
12	6	0	VBAT	Voltage	0x02	Threshold	This sensor measures the battery voltage in volts.

IPMC	Nr.	LUN	Name	Type	Type-Code	Class	Description
12	16	0	-48A Bus voltage	Entity Presence	0x25	Discrete	This sensor indicates the presence of the -48 V_A of fused on the local shelf manager.
12	17	0	-48B Bus voltage	Entity Presence	0x25	Discrete	This sensor indicates the presence of the -48 V_B of fused on the local shelf manager.
12	18	0	-48A ACB voltage	Entity Presence	0x25	Discrete	This sensor indicates the presence of the -48 V_A behind the shelf manager's main fuse.
12	19	0	-48B ACB voltage	Entity Presence	0x25	Discrete	This sensor indicates the presence of the -48 V_B behind the shelf manager's main fuse.
12	20	0	20V AUX	Entity Presence	0x25	Discrete	This sensor indicates the presence of 20 V on carrier shelf manager.
12	21	0	-48A ACB Fuse	Entity Presence	0x25	Discrete	This sensor indicates the state of -48 V_A on the shelf manager.
12	22	0	-48B ACB Fuse	Entity Presence	0x25	Discrete	This sensor indicates the state of -48 V_B on the shelf manager.
12	128	0	CPLD State	OEM reserved	0xde	Discrete	This sensor indicates the high-level redundancy state of the ShMM, along with the state of the low-level redundancy bits exposed by the CPLD, and redun-dancy-related exceptional conditions in the CPLD, if any.
12	129	0	Reboot Reason	OEM reserved	0xdd	Discrete	This sensor indicates the reason for the last reboot.
20	0	0	FRU 0 HOT_SWAP	Hot Swap	0xf0	Discrete	This sensor returns the hot-swap states for FRU 0.
20	0	3	HPI Sys Event	OEM reserved	0xdb	Discrete	The purpose is to enhance the interaction between the shelf manager and Pigeon Point HPI implementa-tions: IntegralHPI and Pigeon Point OpenHPI. This sensor sends IPMI events in a special format to signal HPI implementations that changes have occurred within the shelf manager.
20	1	0	IPMB LINK	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link state. (Only systems with bussed IPM)
20	2	0	FRU 1 HOT_SWAP	Hot Swap	0xf0	Discrete	This sensor returns the hot-swap states for FRU 1.
20	3	0	FRU 2 HOT_SWAP	Hot Swap	0xf0	Discrete	This sensor returns the hot-swap states for FRU 2.
20	4	0	FRU 3 HOT_SWAP	Hot Swap	0xf0	Discrete	This sensor returns the hot-swap states for FRU 3.
20	5	0	FRU 4 HOT_SWAP	Hot Swap	0xf0	Discrete	This sensor returns the hot-swap states for FRU 4.
20	6	0	FRU 5 HOT_SWAP	Hot Swap	0xf0	Discrete	This sensor returns the hot-swap states for FRU 5.
20	7	0	FRU 6 HOT_SWAP	Hot Swap	0xf0	Discrete	This sensor returns the hot-swap states for FRU 6.
20	8	0	FRU 7 HOT_SWAP	Hot Swap	0xf0	Discrete	This sensor returns the hot-swap states for FRU 7.
20	9	0	FRU 8 HOT_SWAP	Hot Swap	0xf0	Discrete	This sensor returns the hot-swap states for FRU 8.
(Sensor 10 ...26 only systems with radial IPM)							
20	10	0	IPMB LINK 1	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 1 state.
20	11	0	IPMB LINK 2	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 2 state.
20	12	0	IPMB LINK 3	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 3 state.

IPMC	Nr.	LUN	Name	Type	Type-Code	Class	Description
20	13	0	IPMB LINK 4	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 4 state.
20	14	0	IPMB LINK 5	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 5 state.
20	15	0	IPMB LINK 6	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 6 state.
20	16	0	IPMB LINK 7	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 7 state.
20	17	0	IPMB LINK 8	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 8 state.
20	18	0	IPMB LINK 9	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 9 state.
20	19	0	IPMB LINK 10	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 10 state.
20	20	0	IPMB LINK 11	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 11 state.
20	21	0	IPMB LINK 12	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 12 state.
20	22	0	IPMB LINK 13	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 13 state.
20	23	0	IPMB LINK 14	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 14 state.
20	24	0	IPMB LINK 15	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 15 state.
20	25	0	IPMB LINK 16	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 16 state.
20	26	0	IPMB LINK 17	IPMB Link	0xf1	Discrete	This sensor returns the IPMB link 17 state.
20	119	0	TelcoAlarmInput	TELCO Alarm Input	0xf4	Discrete	Telco alarm input sensor.
20	120	0	Left Exhaust	Temperature	0x01	Threshold	This sensor measures the left outlet temperature.
20	121	0	Center Exhaust	Temperature	0x01	Threshold	This sensor measures the central out-let temperature.
20	122	0	Right Exhaust	Temperature	0x01	Threshold	This sensor measures the right outlet temperature.
20	123	0	SAP Temp	Temperature	0x01	Threshold	This sensor measures the shelf alarm panel temper-ature.
20	124	0	Temp_In Left	Temperature	0x01	Threshold	This sensor measures the left inlet temperature.
20	126	0	Temp_In Right	Temperature	0x01	Threshold	This sensor measures the right inlet temperature.
20	131	0	TELCO Alarms	OEM reserved	0xdf	Discrete	This sensor indicates the presence of critical, major and minor alarm of the Shelf Alarm Panel.
20	132	0	BMC Watchdog	Watchdog 2	0x23	Discrete	BMC watchdog sensor.
20	133	0	SYSTEM EVENT	System Event	0x12	Discrete	System event sensor.
20	135	0	FT Oper.Status	Management Sub-syst. Health	0x28	Discrete	This sensor monitors if all the fan trays are opera-tional or if some fan trays is not operation.
20	136	0	Cooling State	Management Sub-syst. Health	0x28	Discrete	This sensor monitors the cooling sta-tus.
20	137	0	Fans State	Management Sub-syst. Health	0x28	Discrete	This sensor monitors the fan status.
20	138	0	SHM Redundancy	Management Sub-syst. Health	0x28	Discrete	This sensor monitors the shelf man-ager redundancy status.
20	150	0	Air Filter	Entity Presence	0x25	Discrete	This sensor checks the presence of the air filter.
20	152	0	SAP	Entity Presence	0x25	Discrete	This sensor checks the presence of the shelf alarm panel.

IPMC	Nr.	LUN	Name	Type	Type-Code	Class	Description
20	160	1	PEM A Voltage	Voltage	0x02	Threshold	This sensor measures the input voltage of PEM A.
20	163	0	PEM A Input Pres	Entity Presence	0x25	Discrete	This sensor indicates the presence of the input voltage of PEM A.
20	164	0	PEM A Branch 1	Entity Presence	0x25	Discrete	This sensor indicates the presence of the voltage after the fuse on branch 1 of PEM A.
20	165	0	PEM A Branch 2	Entity Presence	0x25	Discrete	This sensor indicates the presence of the voltage after the fuse on branch 2 of PEM A.
20	166	0	PEM A Branch 3	Entity Presence	0x25	Discrete	This sensor indicates the presence of the voltage after the fuse on branch 3 of PEM A.
20	167	0	PEM A Branch 4	Entity Presence	0x25	Discrete	This sensor indicates the presence of the voltage after the fuse on branch 4 of PEM A.
20	170	1	PEM B Voltage	Voltage	0x02	Threshold	This sensor measures the input voltage of PEM B
20	173	0	PEM B Input Pres	Entity Presence	0x25	Discrete	This sensor indicates the presence of the input voltage of PEM B.
20	174	0	PEM B Branch 1	Entity Presence	0x25	Discrete	This sensor indicates the presence of the voltage after the fuse on branch 1 of PEM B.
20	175	0	PEM B Branch 2	Entity Presence	0x25	Discrete	This sensor indicates the presence of the voltage after the fuse on branch 2 of PEM B.
20	176	0	PEM B Branch 3	Entity Presence	0x25	Discrete	This sensor indicates the presence of the voltage after the fuse on branch 3 of PEM B.
20	177	0	PEM B Branch 4	Entity Presence	0x25	Discrete	This sensor indicates the presence of the voltage after the fuse on branch 4 of PEM B.
20	192	0	PEM A	Entity Presence	0x25	Discrete	This sensor checks the presence of the PEM A
20	193	0	PEM B	Entity Presence	0x25	Discrete	This sensor checks the presence of the PEM B
20	194	0	Shelf EEPROM 1	Entity Presence	0x25	Discrete	This sensor checks the presence of shelf EEPROM 1
20	195	0	Shelf EEPROM 2	Entity Presence	0x25	Discrete	This sensor checks the presence of shelf EEPROM 2
20	200	0	PEM A Temp	Temperature	0x01	Threshold	This sensor measures the temperature. of PEM A
20	201	0	PEM B Temp	Temperature	0x01	Threshold	This sensor measures the temperature. of PEM B
20	203	0	Fan Tray 0	Entity Presence	0x25	Discrete	This sensor checks the presence of fan tray 0.
20	204	0	Fan Tray 1	Entity Presence	0x25	Discrete	This sensor checks the presence of fan tray 1.
20	205	0	Fan Tray 2	Entity Presence	0x25	Discrete	This sensor checks the presence of fan tray 2.
20	208	0	24V FT 0	Entity Presence	0x25	Discrete	This sensor indicates the presence of the 24 V of fan tray 0.
20	209	0	-48A bus FT 0	Entity Presence	0x25	Discrete	This sensor indicates the presence of the –48 V_A of fan tray 0.
20	210	0	-48A FT 0	Entity Presence	0x25	Discrete	This sensor indicates the presence of the –48 V_A after fan tray 0's main fuse.
20	211	0	-48B bus FT 0	Entity Presence	0x25	Discrete	This sensor indicates the presence of the –48 V_B of fan tray 0.
20	212	0	-48B FT 0	Entity Presence	0x25	Discrete	This sensor indicates the presence of the –48 V_B after fan tray 0's main fuse.

IPMC	Nr.	LUN	Name	Type	Type-Code	Class	Description
20	213	0	-48A FT 0 Fuse	Entity Presence	0x25	Discrete	This sensor monitors the state of the –48 V_A fuse of fan tray 0.
20	214	0	-48B FT 0 Fuse	Entity Presence	0x25	Discrete	This sensor monitors the state of the –48 V_B fuse of fan tray 0.
20	215	0	24V FT 1	Entity Presence	0x25	Discrete	This sensor indicates the presence of the 24 V of fan tray 1.
20	216	0	-48A bus FT 1	Entity Presence	0x25	Discrete	This sensor indicates the presence of the –48 V_A of fan tray 1.
20	217	0	-48A FT 1	Entity Presence	0x25	Discrete	This sensor ndicates the presence of the –48 V_A after fan tray 1's main fuse.
20	218	0	-48B bus FT 1	Entity Presence	0x25	Discrete	This sensor indicates the presence of the –48 V_B of fan tray 1.
20	219	0	-48B FT 1	Entity Presence	0x25	Discrete	This sensor ndicates the presence of the –48 V_B after fan tray 1's main fuse.
20	220	0	-48A FT 1 Fuse	Entity Presence	0x25	Discrete	This sensor monitors the state of the –48 V_A fuse of fan tray 1.
20	221	0	-48B FT 1 Fuse	Entity Presence	0x25	Discrete	This sensor monitors the state of the –48 V_B fuse of fan tray 1.
20	222	0	24V FT 2	Entity Presence	0x25	Discrete	This sensor indicates the presence of the 24 V of fan tray 2.
20	223	0	-48A bus FT 2	Entity Presence	0x25	Discrete	This sensor indicates the presence of the –48 V_A of fan tray 2.
20	224	0	-48A FT 2	Entity Presence	0x25	Discrete	This sensor indicates the presence of the –48 V_A after fan tray 2's main fuse.
20	225	0	-48B bus FT 2	Entity Presence	0x25	Discrete	This sensor indicates the presence of the –48 V_B of fan tray 2.
20	226	0	-48B FT 2	Entity Presence	0x25	Discrete	This sensor indicates the presence of the –48 V_B after fan tray 2's main fuse.
20	227	0	-48A FT 2 Fuse	Entity Presence	0x25	Discrete	This sensor monitors the state of the –48 V_A fuse of fan tray 2.
20	228	0	-48B FT 2 Fuse	Entity Presence	0x25	Discrete	This sensor monitors the state of the –48 V_B fuse of fan tray 2.
20	240	0	Fan Tach. 0	Fan	0x04	Threshold	This sensor indicates the speed of the fan 0 (RPM).
20	241	0	Fan Tach. 1	Fan	0x04	Threshold	This sensor indicates the speed of the fan 1 (RPM).
20	242	0	Fan Tach. 2	Fan	0x04	Threshold	This sensor indicates the speed of the fan 2 (RPM).
20	243	0	Fan Tach. 3	Fan	0x04	Threshold	This sensor indicates the speed of the fan 3 (RPM).
20	244	0	Fan Tach. 4	Fan	0x04	Threshold	This sensor indicates the speed of the fan 4 (RPM).
20	245	0	Fan Tach. 5	Fan	0x04	Threshold	This sensor indicates the speed of the fan 5 (RPM).

11.12 Shelf Manager Front Panel and Backplane connectors

Table 27: Front Panel 10/100 Ethernet Service Connector

Pin #	Ethernet Signal
1	TX+
2	TX-
3	RX+
4, 5	n.c.
6	RX-
7, 8	n.c.

Figure 38: Backplane Connectors

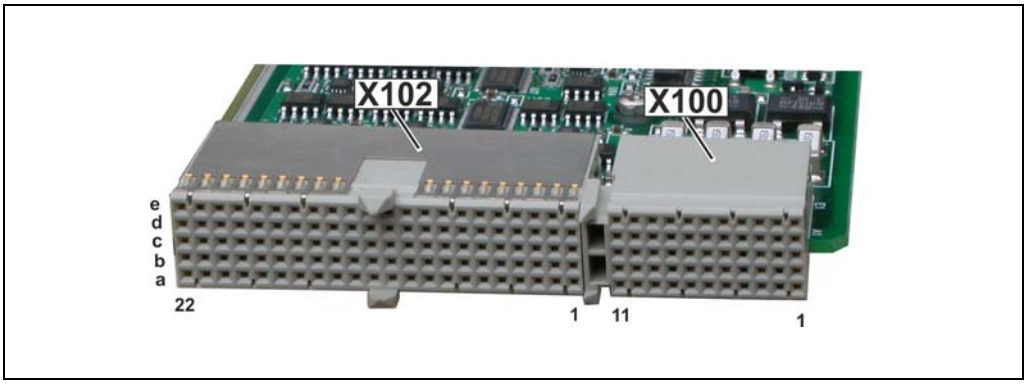


Table 28: Pin Staging (PS)

Pin#	length
A	**8.25 mm**
B	**9.75 mm**
C	**11.25 mm**

The Pin Staging (PS) is the length of the Pins of the connector at the Backplane not at the Shelf manager.

Table 29: Backplane Signal Connector (X100) pin assignment

	a	PS	b	PS	c	PS	d	PS	e	PS
1	-48 V_A	**B**	VRTN_A	**B**	NC	**B**	-48 V_B	**B**	VRTN_B	**B**
2	-		-		-		-		-	
3	SHELF_GND	**B**	SHELF_GND	**B**	SHELF_GND	**B**	SHELF_GND	**B**	SHELF_GND	**B**
4	-		-		-		-		-	
5	FAN_TACH0	**A**	FAN_TACH1	**A**	FAN_TACH2	**A**	FAN_TACH3	**A**	FAN_TACH4	**A**
6	FAN_TACH5	**A**	FAN_TACH6	**A**	FAN_TACH7	**A**	FAN_TACH8	**A**	PWM_C	**A**
7	FAN_SPEED	**A**	NC	**A**	FAN_24V	**A**	FAN_24V_RTN	**A**	PWM_E	**A**
8	-		-		-		-		-	
9	PEM_PRES_A	**A**	SAP_PRES	**A**	SWR_Input#	**A**	HLY_Input#	**A**	SWR_Output#	**A**
10	TX+	**A**	TX-	**A**	HS_EN	**A**	HLY_Output#	**A**	HA7	**A**
11	AIR_FILT_PR	**A**	PEM_PRES_B	**A**	RX+	**A**	RX-	**A**	PRES_1#	**A**

Table 30: Backplane Signal Connector (X102) pin assignment (Radial IPMB)

	a	PS	b	PS	c	PS	d	PS	e	PS	f	PS
1	FT0_PRES#	A	UART0_TXD	A	UART1_TXD	A	FT2_PRES#	A	INT#	A	GND	C
2	FT1_PRES#	A	UART0_DTR	A	Pres_GND	A	AUX_PRES#	A	UART0_DSR	A		C
3	UART0_CD	A	UART0_RTS	A	UART1_RXD	A	HA0	A	UART0_CTS	A	GND	C
4	UART0_RXD	A	I2C_SDA_CH1	A	ACTIVE	A	I2C_SDA_CH0	A	GND	A		C
5	I2C_SCL_CH1	A	I2C_SCL_CH0	A	UART0_RI	A	GND	A	I2C_SDA_CH3	A	GND	C
6	ETH0_TX+	A	ETH0_TX-	A	GND	B	USB1_DP	A	USB1_DM	A		C
7	ETH0_RX+	A	ETH0_RX-	A	GND	B	USB0_DP	A	USB0_DM	A	GND	C
8	I2C_SDA_CH4	A	I2C_SCL_CH4	A	I2C_SCL_CH3	A	I2C_SCL_CH2	A	I2C_PWR_B	A		C
9	IPMB_SCL_B15	A	IPMB_SDA_B15	A	IPMB_SCL_A15	A	IPMB_SDA_A15	A	I2C_SDA_CH2	A	GND	C
10	IPMB_SDA_B16	A	IPMB_SCL_B16	A	IPMB_SDA_A16	A	IPMB_SCL_A16	A	I2C_PWR_A	A		
11	IPMB_SDA_A3	A	IPMB_SDA_B3	A	IPMB_SCL_B3	A	IPMB_SDA_B8	A	IPMB_SCL_B8	A	GND	
12	IPMB_SCL_A3	A	IPMB_SDA_A5	A	IPMB_SCL_A5	A	IPMB_SDA_A8	A	IPMB_SCL_A8	A		
13	IPMB_SDA_A1	A	IPMB_SDA_B7	A	IPMB_SCL_A1	A	IPMB_SDA_A10	A	IPMB_SCL_A10	A	GND	
14	IPMB_SCL_B7	A	IPMB_SDA_A7	A	IPMB_SCL_A7	A	IPMB_SDA_A6	A	IPMB_SCL_A6	A		C
15	IPMB_SDA_A9	A	IPMB_SDA_B14	A	IPMB_SCL_B14	A	IPMB_SDA_B10	A	IPMB_SCL_B10	A	GND	C
16	IPMB_SCL_A9	A	IPMB_SDA_A4	A	IPMB_SCL_A4	A	IPMB_SDA_B6	A	IPMB_SCL_B6	A		C
17	CROSS_SDA_B	A	IPMB_SDA_B11	A	IPMB_SCL_B11	A	IPMB_SDA_B4	A	IPMB_SCL_B4	A	GND	C
18	CROSS_SCL_B	A	IPMB_SDA_A11	A	IPMB_SCL_A11	A	IPMB_SDA_A14	A	IPMB_SCL_A14	A		C
19	IPMB_SDA_A13	A	IPMB_SCL_A13	A	IPMB_SCL_B12	A	IPMB_SDA_B12	A	IPMB_SDA_B9	A	GND	C
20	IPMB_SDA_B1	A	IPMB_SCL_B1	A	CROSS_SCL_A	A	CROSS_SDA_A	A	IPMB_SCL_B9	A		C
21	IPMB_SDA_B13	A	IPMB_SDA_B5	A	IPMB_SCL_B5	A	IPMB_SDA_B2	A	IPMB_SCL_B2	A	GND	C
22	IPMB_SCL_B13	A	IPMB_SDA_A12	A	IPMB_SCL_A12	A	IPMB_SDA_A2	A	IPMB_SCL_A2	A		C

Table 31: Backplane Signal Connector (X102) pin assignment (Bused IPMB)

	a	PS	b	PS	c	PS	d	PS	e	PS	f	PS
1	FT0_PRES#	A	UART0_TXD	A	UART1_TXD	A	FT2_PRES#	A	INT#	A	GND	C
2	FT1_PRES#	A	UART0_DTR	A	Pres_GND	A	AUX_PRES#	A	UART0_DSR	A		C
3	UART0_CD	A	UART0_RTS	A	UART1_RXD	A	HA0	A	UART0_CTS	A	GND	C
4	UART0_RXD	A	I2C_SDA_CH1	A	ACTIVE	A	I2C_SDA_CH0	A	GND	A		C
5	I2C_SCL_CH1	A	I2C_SCL_CH0	A	UART0_RI	A	GND	A	I2C_SDA_CH3	A	GND	C
6	ETH0_TX+	A	ETH0_TX-	A	GND	B	USB1_DP	A	USB1_DM	A		C
7	ETH0_RX+	A	ETH0_RX-	A	GND	B	USB0_DP	A	USB0_DM	A	GND	C
8	I2C_SDA_CH4	A	I2C_SCL_CH4	A	I2C_SCL_CH3	A	I2C_SCL_CH2	A	I2C_PWR_B	A		C
9		A		A		A		A	I2C_SDA_CH2	A	GND	C
10		A		A		A		A	I2C_PWR_A	A		
11		A		A		A		A		A	GND	
12		A		A		A		A		A		
13		A		A		A		A		A	GND	
14		A		A		A		A		A		C
15		A	IPMB_SDA_B	A	IPMB_SCL_B	A		A		A	GND	C
16		A		A		A		A		A		C
17	CROSS_SDA_B	A		A		A		A		A	GND	C
18	CROSS_SCL_B	A		A		A	IPMB_SDA_A	A	IPMB_SCL_A	A		C
19		A		A		A	I	A		A	GND	C
20		A		A	CROSS_SCL_A	A	CROSS_SDA_A	A		A		C
21		A		A		A		A		A	GND	C
22		A		A		A		A		A		C

Table 32: Backplane connector (J1) and (J2) pin description

-48V_A	-48 VDC supply A
-48V_B	-48 VDC supply B
AIR_FILT_PR	Air filter presence (grounded by air filter presence switch to detect a missing air filter)
CROSS_SCL_A	Serial Clock of IPMB-A, cross-connected on Backplane to serial clock of IPMB-B of other Shelf Manager
CROSS_SCL_B	Serial Clock of IPMB-B, cross-connected on Backplane to serial clock of IPMB-A of other Shelf Manager
CROSS_SDA_A	Serial Data of IPMB-A, cross-connected on Backplane to serial data of IPMB-B of other Shelf Manager
CROSS_SDA_B	Serial Data of IPMB-B, cross-connected on Backplane to serial data of IPMB-A of other Shelf Manager
ETH0_RX(+-)	Ethernet interface (ETH0)
ETH0_TX(+-)	Ethernet interface (ETH0)
ETH1_RX(+-)	Ethernet interface (ETH1)
ETH1_TX(+-)	Ethernet interface (ETH1)
FAN_24V	Auxiliary 24 VDC (max. 100 mA) generated on Fan Trays (Voltage supply for opto-couplers on Shelf Manager)
FAN_24V_RTN	Return path (Ground reference) for the auxiliary 24 VDC, generated on Fan Trays, used also as reference ground for the fan control voltage
FAN_PRES[0...2]	Fan Tray present (grounded on Fan Tray when present)
FAN_SPEED	DC for Fan Speed Control (0 V to 10 V, 10 mA)
FAN_TACH[0...8]	Tachometer signals from Fan Trays
GND	logic ground
HA[0]	Hardware address of Shelf Manager - grounded: Shelf Manager IPMI address is 0x10 - open: Shelf Manager IPMI address is 0x12
HA7	Hardware address of Shelf Manager - grounded: Shelf Manager IPMI address is 0x10 - open: Shelf Manager IPMI address is 0x12
HLY_Input#	Health input Shelf Manager (proprietary signal cross-connected on Backplane to HLY_Output of other Shelf Manager)
HLY_Output#	Health output Shelf Manager (proprietary signal cross-connected on Back-plane to HLY_Input of other Shelf Manager)
HS_EN	Tells the Shelf Manager that it is plugged in (Grounded on Backplane)
I2C_PWR_A	3.6 V (max. 500 mA) generated on Shelf Manager, redundant path A for Shelf I^2C-devices on Fan Trays, PEMs and SAP
I2C_PWR_B	3.6 V (max. 500 mA) generated on Shelf Manager, redundant path B for Shelf I^2C-devices on Fan Trays, PEMs and SAP
INT#	External Interrupt request (Master Only I^2C-bus)
INV_ACTIVE	This ShMM is in active mode (inverted signal of ShMM)
I2C_SCL_CH0	Master Only-I^2C-bus Channel 0 to SAP
I2C_SCL_CH1	Master-Only I^2C-bus Channel 1
I2C_SCL_CH2	Master-Only I^2C-bus Channel 2
I2C_SCL_CH3	Master-Only I^2C-bus Channel 3

I2C_SCL_CH4	Master-Only I^2C-bus Channel 4
I2C_SDA_CH0	Master Only-I^2C-bus Channel 0 to SAP
I2C_SDA_CH1	Master-Only I^2C-bus Channel 1
I2C_SDA_CH2	Master-Only I^2C-bus Channel 2
I2C_SDA_CH3	Master-Only I^2C-bus Channel 3
I2C_SDA_CH4	Master-Only I^2C-bus Channel 4
IPMB_SCL_A_[1...16]	Serial Clock, IPMB-A
IPMB_SCL_B_[1...16]	Serial Clock, IPMB-B
IPMB_SDA_A_[1...16]	Serial Data, IPMB-A
IPMB_SDA_B_[1...16]	Serial Data, IPMB-B
NC	not connected
PEM_PRES_[A, B]	PEM [A, B] presence signal (grounded on PEM when present)
PRES_1#	ACB-VI: Only used for transition from ACB-V to ACB-VI in a live chassis Formerly used on the ACB-V: Shelf Manager board presence signal (proprietary signal cross-connected on Backplane to PRES_GND of other Shelf Manager)
PRES_GND#	ACB-VI: Only used for transition from ACB-V to ACB-VI in a live chassis Formerly used on the ACB-V: Shelf Manager presence ground (proprietary signal cross-connected on Backplane to PRES_1# of other Shelf Manager)
PWM_C	Opto isolated PWM signal for fan speed control, collector U_{CE0} = max. 70 V, I_{max} = 2 mA
PWM_E	Opto isolated PWM signal for fan speed control, emitter, connected to FAN_24V_RTN on Backplane
SAP_PRES	Presence signal of SAP (Grounded on SAP when present)
SHELF_GND	Shelf Ground
SWR_Input#	Switchover signal from the other Shelf Manager (proprietary signal cross-connected on Backplane to SWR_Output of other Shelf Manager)
SWR_Output#	Switchover signal to the other Shelf Manager (proprietary signal cross-connected on Backplane to SWR_Input of other Shelf Manager)
UART0_CD	Serial Interface 1 Carrier Detect
UART0_CTS	Serial Interface 1 Clear To Send
UART0_DSR	Serial Interface 1 Data Set Ready
UART0_DTR	Serial Interface 1 Data Terminal Ready
UART0_RI	Serial Interface 1 Ring Indication
UART0_RTS	Serial Interface 1 Request To Send
UART0_RXD	Serial Interface 1 Receive Data
UART0_TXD	Serial interface 1 Transmit Data
UART1_RXD	Serial Interface 2 Receive Data (not used in Schroff Shelves)
UART1_TXD	Serial interface 2 Transmit Data (not used in Schroff Shelves)
USB0_DP/DM	USB interface, cross-connected on Backplane toother Shelf Manager
USB1_DP/DM	USB interface, cross-connected on Backplane toother Shelf Manager
VRTN_A	Voltage return supply A
VRTN_B	Voltage return supply B

12 Technical Data

Table 33: Technical Data

Physical Dimensions	
Height	571.6 mm
Width	482.6 mm
Depth	506.54 mm (with cable trays)
Weight	
Shipping weight completely assembled with packaging	45 Kg
Shelf weight (w/o fan tray and w/o PEMs)	19 Kg
Shelf weight completely assembled	30.6 Kg
Power	
Input voltage	-40.5 VDC …. -72 VDC
Input Power	140 A per power feed
Overcurrent Protection	50 A Fuses on PEM
Environmental	
Ambient temperature (long term)	+5°C…+40°C (41°F to 104°F)
Ambient temperature (short term)	-5°C…+55°C (23°F to 131°F)
Humidity	+5%...+85%, no condensation
EMI	
Conducted Emissions	EN 55022 Class A
Radiated Emissions	EN 55022 Class A
Safety	
Protected Earth Test	EN50514, test current 25 A, resistance <100 mOhm
Hipot Test	EN60950-1, 1000 VDC

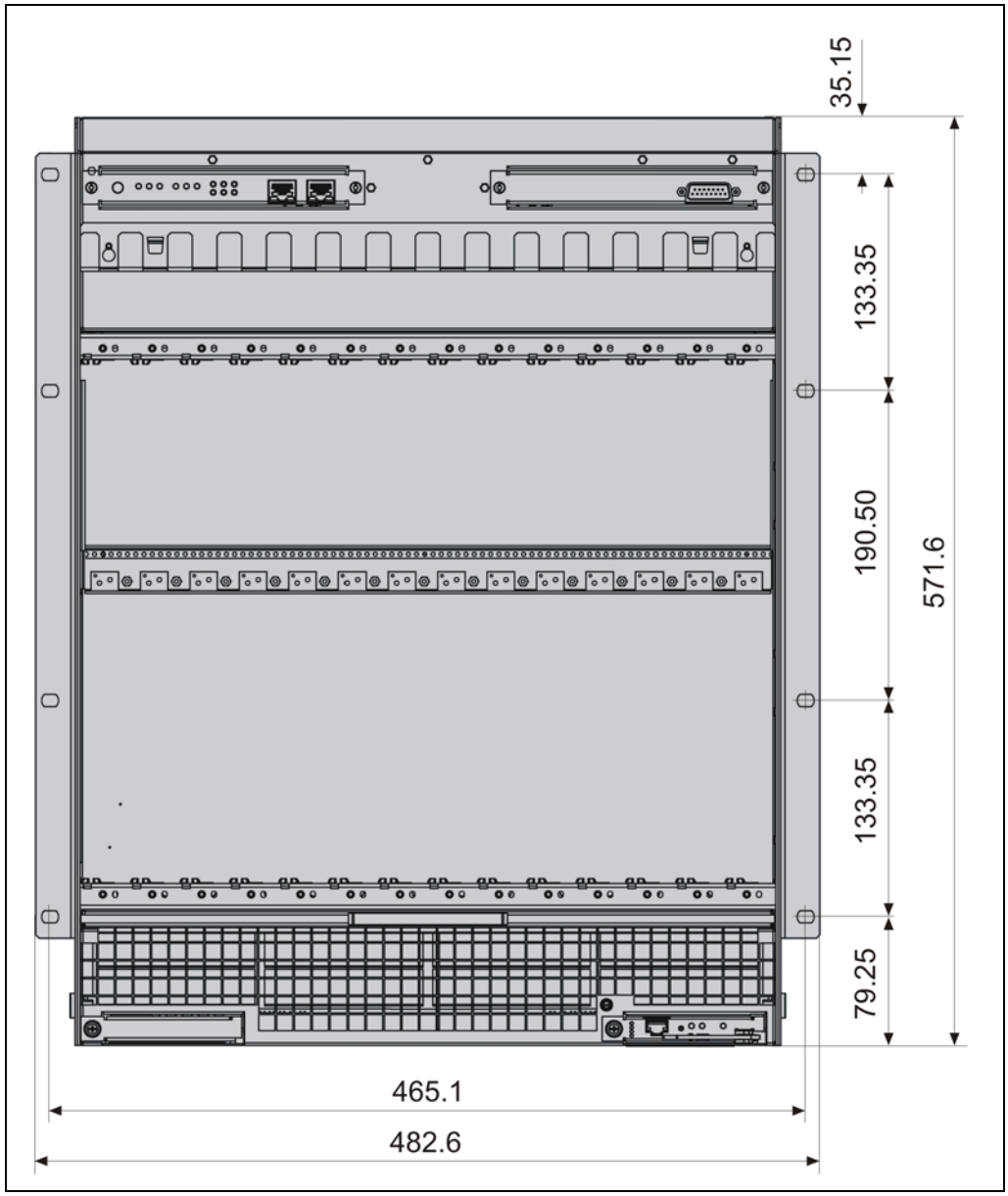
12.1 Part Numbers

Table 34: Part Numbers

Number	Part
11990-600	14-Slot ATCA Shelf, Dual Star Backplane, bused IPMB
11990-601	14-Slot ATCA Shelf, Dual Star Backplane, radial IPMB
11990-602	14-Slot ATCA Shelf, Full Mesh Backplane, bused IPMB
11990-603	14-Slot ATCA Shelf, Full Mesh Backplane, radial IPMB
21990-404	Shelf Manager ShMM-ACB-VI with bused IPMB
21990-405	Shelf Manager ShMM-ACB-VI with radial IPMB
21990-184	Replacement Fan Tray
21990-301	Replacement PEM
21596-138	Air Filter Element
21596-012	Filler Panel (stainless steel) for empty Shelf Manager slot
21591-079	Filler Panel (stainless steel) with airflow buffle for empty front slots
21596-008	Filler Panel (Aluminium profile) with airflow buffle for empty front slots
21591-107	Filler Panel (stainless steel) with airflow buffle for empty RTM slots
21591-099	Filler Panel (Aluminium profile) with airflow buffle for empty RTM slots

12.2 Shelf Mechanical Dimensions

Figure 39: Shelf dimensions, front view



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All dimensions are in millimeters (mm).

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