

6-slot ATCA Shelf

User's Manual



Product Numbers:

11596-160/161

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|------|------------|------------------|
| R1.3 | March 2018 | Rebranding nVent |
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Schroff GmbH

Langenalber Str. 96 - 100
75334 Straubenhardt, Germany

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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 VDC 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)

- Pigeon Point Systems Shelf Manager User Guide (www.pigeonpoint.com)
- PICMG® 3.0 Revision 3.0 AdvancedTCA® Base Specification (www.picmg.com)
- User Manual Shelf Manager ACB-VI, Order-no.: 63972-331

1.4 Product Definition

The Schroff 11596-16x are 6 Slot AdvancedTCA Shelves for fault tolerant/high availability applications.

- Product Number 11596-160: Replicated Mesh Backplane, bused IPMB
- Product Number 11596-161: Replicated Mesh Backplane, radial IPMB

The Schroff 11596-16x are designed to work with two redundant Schroff Shelf Managers and a Schroff Shelf Alarm Panel (SAP), 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.

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 | Chassis Data Module |
| Chassis | Enclosure containing subrack, Backplane, boards, cooling devices, PEMs, same as Shelf |
| CMM | Chassis Management Module, same as Shelf Manager |
| ECN | Engineering Change Notice |
| 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 |
| PSU | Power Supply Unit |
| RTC | Real Time Clock |
| RTM | Rear Transition Module |
| SAP | Shelf Alarm Panel |
| Shelf | See Chassis |
| U | Unit of vertical pitch. 1 U = 1.75 inches = 44.45 mm |
| VRTN | Voltage Return |

1.6 Hardware Platform

- Compliant to PICMG 3.0 Revision 3.0 ATCA Base Specification
- Galvanized 5 U / 19" chassis with front card cage for ATCA boards and rear card cage for ATCA RTM boards
- 6 slot ATCA Backplane with replicated Mesh Fabric Interface, Dual Star Base Interface and bused or radial IPM interface, supporting four 8 U node board slots and two 8 U hub slots
- Mounting brackets for 19" racks and rear fixing points
- ESD Wrist Strap Terminals at the front and the rear
- Two dedicated Shelf Manager bays accepting Schroff Shelf Managers
- Push-Pull Fan Tray arrangement provides optimized cooling for ATCA blades with fault tolerant capability
- Two front pluggable, hot swappable Fan Trays
- Air inlet filter with presence monitoring
- Bay for front pluggable Shelf Alarm Panel (SAP):
Provides Alarm Status LEDs, Telco Alarm interface and serial interfaces for the Shelf Managers
- Two -48/-60 VDC hot swappable Power Entry Modules (PEMs) for redundancy
- Cooling and electrical capacity up to 350 W/slot



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

1.7 Shelf Front and Rear View

Figure 1: Shelf Front View



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- | | | | |
|---|--------------------------|---|--------------------------|
| 1 | Shelf Alarm Panel (SAP) | 5 | Slot for Shelf Manager 2 |
| 2 | Shelf Manager 1 | 6 | Air Filter |
| 3 | Fan Tray 1 | 7 | Fan Tray 2 |
| 4 | ESD Wrist Strap Terminal | | |

Figure 2: Shelf Rear View



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- | | | | |
|---|--------------------------|---|--------------------|
| 1 | PEM B | 4 | Rear fixing points |
| 2 | ESD Wrist Strap Terminal | 5 | Shelf FRU EEPROMs |
| 3 | Ground Terminal | 6 | PEM A |

1.8 ESD Wrist Strap Terminals



Danger of electrostatic discharge!

The Shelf contains static sensitive devices. To prevent static damage you must wear an ESD wrist strap.

One ESD Wrist Strap Terminal is located at the Shelf's upper front side, one ESD Wrist Strap Terminal is located at the left rear side of the Shelf.

2 ATCA Backplane




The 6-slot ATCA monolithic Backplane provides:

- Four ATCA Node slots
- Two ATCA Hub slots
- Two dedicated Shelf Manager slots
- Two PEM slots
- One Shelf Alarm Panel (SAP) slot
- Two Fan Tray slots

2.1 Logical to Physical Slot Mapping

The physical and logical slots are sequentially numbered from the lower to the upper side of the Shelf.

Table 2: 6-Slot ATCA Backplane physical to logical slot mapping

| | Physical Slot | Logical Slot | HW-Address (Hex) | IPMB-Address (Hex) | Update Channel Routing |
|----------|---------------|--------------|---------------------|-----------------------|---|
| Node | 6 | 6 | 46 | 8C |  |
| Node | 5 | 5 | 45 | 8A | |
| Node | 4 | 4 | 44 | 88 |  |
| Node | 3 | 3 | 43 | 86 | |
| Hub Slot | 2 | 2 | 42 | 84 |  |
| Hub Slot | 1 | 1 | 41 | 82 | |

2.2 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 (as per PICMG 3.0 R2.0: ECN 3.0-2.0-001). See [Chapter 2.9, "Shelf Manager Cross Connect"](#) for details.

Table 3: Base Interface Interconnections

| Connector | Base Ch. | Logical Slot | | | | | |
|-----------|----------|--------------|------|-----|-----|-----|-----|
| | | 1 | 2 | 3 | 4 | 5 | 6 |
| P23 | 1 | ShMC | ShMC | 1-3 | 1-4 | 1-5 | 1-6 |
| P23 | 2 | 2-2 | 1-2 | 2-3 | 2-4 | 2-5 | 2-6 |
| P23 | 3 | 3-1 | 3-2 | | | | |
| P23 | 4 | 4-1 | 4-2 | | | | |
| P23 | 5 | 5-1 | 5-2 | | | | |
| P23 | 6 | 6-1 | 6-2 | | | | |

2.3 Fabric Interface

The Fabric Interface in the ATCA Backplane is routed as triple replicated Full Mesh with 3 Channels (24 differential pairs total), interconnecting each ATCA slot. See PICMG® 3.0 AdvancedTCA® Base Specification for details.

Table 4: 6 Slot Triple Replicated Mesh Fabric Interconnections

| Connector | Fabric Channel | Logical Slot | | | | | | |
|-----------|----------------|--------------|------|------|------|------|------|-----------|
| | | 1 | 2 | 3 | 4 | 5 | 6 | |
| P20 | 15 | 6-11 | 6-12 | 6-13 | 6-14 | 6-15 | 5-15 | MESH 3 |
| P20 | 14 | 5-11 | 5-12 | 5-13 | 5-14 | 4-14 | 4-15 | |
| P20 | 13 | 4-11 | 4-12 | 4-13 | 3-13 | 3-14 | 3-15 | |
| P21 | 12 | 3-11 | 3-12 | 2-12 | 2-13 | 2-14 | 2-15 | |
| P21 | 11 | 2-11 | 1-11 | 1-12 | 1-13 | 1-14 | 1-15 | |
| P21 | 10 | 6-6 | 6-7 | 6-8 | 6-9 | 6-10 | 5-10 | MESH 2 |
| P21 | 9 | 5-6 | 5-7 | 5-8 | 5-9 | 4-9 | 4-10 | |
| P21 | 8 | 4-6 | 4-7 | 4-8 | 3-8 | 3-9 | 3-10 | |
| P22 | 7 | 3-6 | 3-7 | 2-7 | 2-8 | 2-9 | 2-10 | |
| P22 | 6 | 2-6 | 1-6 | 1-7 | 1-8 | 1-9 | 1-10 | |
| P22 | 5 | 6-1 | 6-2 | 6-3 | 6-4 | 6-5 | 5-5 | MESH 1 |
| P22 | 4 | 5-1 | 5-2 | 5-3 | 5-4 | 4-4 | 4-5 | |
| P22 | 3 | 4-1 | 4-2 | 4-3 | 3-3 | 3-4 | 3-5 | |
| P23 | 2 | 3-1 | 3-2 | 2-2 | 2-3 | 2-4 | 2-5 | |
| P23 | 1 | 2-1 | 1-1 | 1-2 | 1-3 | 1-4 | 1-5 | |

2.4 Synchronization Clocks

6 differential pairs of synchronization clocks are bused between all 8 ATCA slots and terminated at both ends with 80.6 Ohms between each differential pair.

2.5 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](#))

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

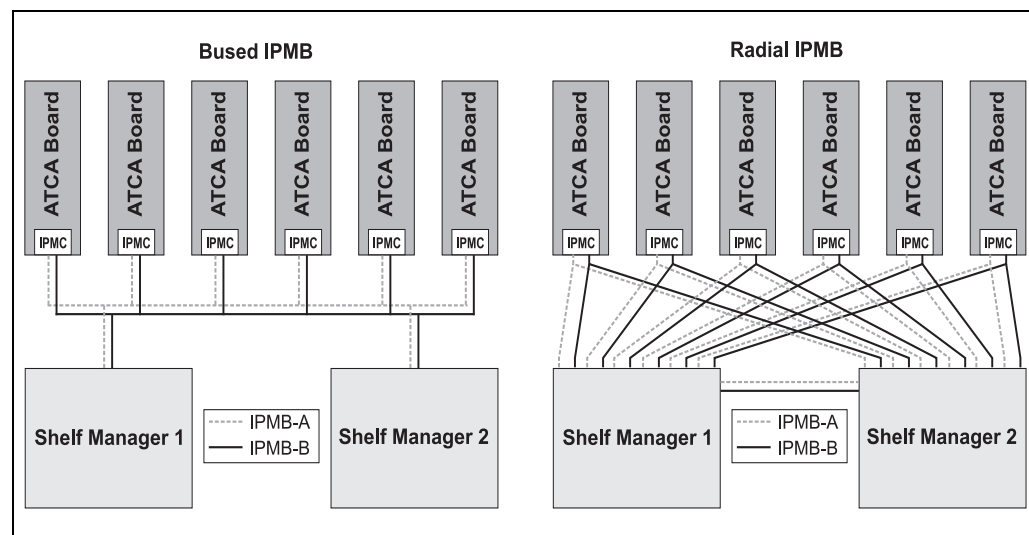
2.6 Intelligent Platform Management Bus (IPMB)

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: 11596-160)
- a radial configuration
(Product Number: 11596-161)

Figure 3: Bused and radial IPMB



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2.7 Shelf Manager Backplane Connectors

The front accessible Shelf Manager slots accept Schroff Shelf Managers. The Backplane Connectors are wired to:

- IPMB-A and IPMB-B (I2C) to the ATCA blades.
- Base Interface cross connections to the Hub Slots
- Presence connections to the SAP, Fan Trays and PEMs
- RS-232 connections to SAP
- Dedicated I2C to Shelf SEEPROMs

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

2.7.1 Fan Tray Connectors

For pin assignment see [Chapter 6.2, "Fan Tray Connectors and Indicators"](#).

2.7.2 SAP Connector

For pin assignment see [Chapter 5.11, "Shelf Alarm Panel Backplane Connector"](#).

2.8 Shelf SEEPROM

The Shelf SEEPROM is a repository of the shelf specific information, capabilities of the system and other user configurable options.

The SEEPROM contains as example:

- a list of which slots are connected together
- how the update channels are routed
- how many slots are in the system
- what the maximum power is to each slot
- the serial number of the Shelf
- the backplane topology etc.

The Shelf Managers use this information to provide functions such as electronic keying, controlling the power state of the system, etc.

The Shelf Managers cache the information that is stored in the SEEPROMs so that the SEEPROM is only needed when the Shelf Managers are first inserted or when the Shelf is first turned on.

The redundant SEEPROMs ensure that if one is corrupt or non-functional, the second can provide the necessary information. The Shelf Manager selects what set of information is correct and then synchronizes the two SEEPROMs from the internally cached copy of the SEEPROM information.

2.8.1 Shelf SEEPROM Location

The SEEPROMs are located at the rear side of the backplane.

2.8.2 Shelf SEEPROMs I²C addresses



The SEEPROMs have the same address but are on different I²C-Channels!

| CDM | I ² C-Channel | I ² C-bus address |
|----------|--------------------------|------------------------------|
| SEEPROM1 | Channel 1 | 0xa4 |
| SEEPROM2 | Channel 2 | 0xa4 |

2.9 Shelf Manager Cross Connect

The ATCA Backplane provides cross connect traces between the Base Hubs and the Shelf Managers.

Figure 4: Shelf Manager Cross Connect

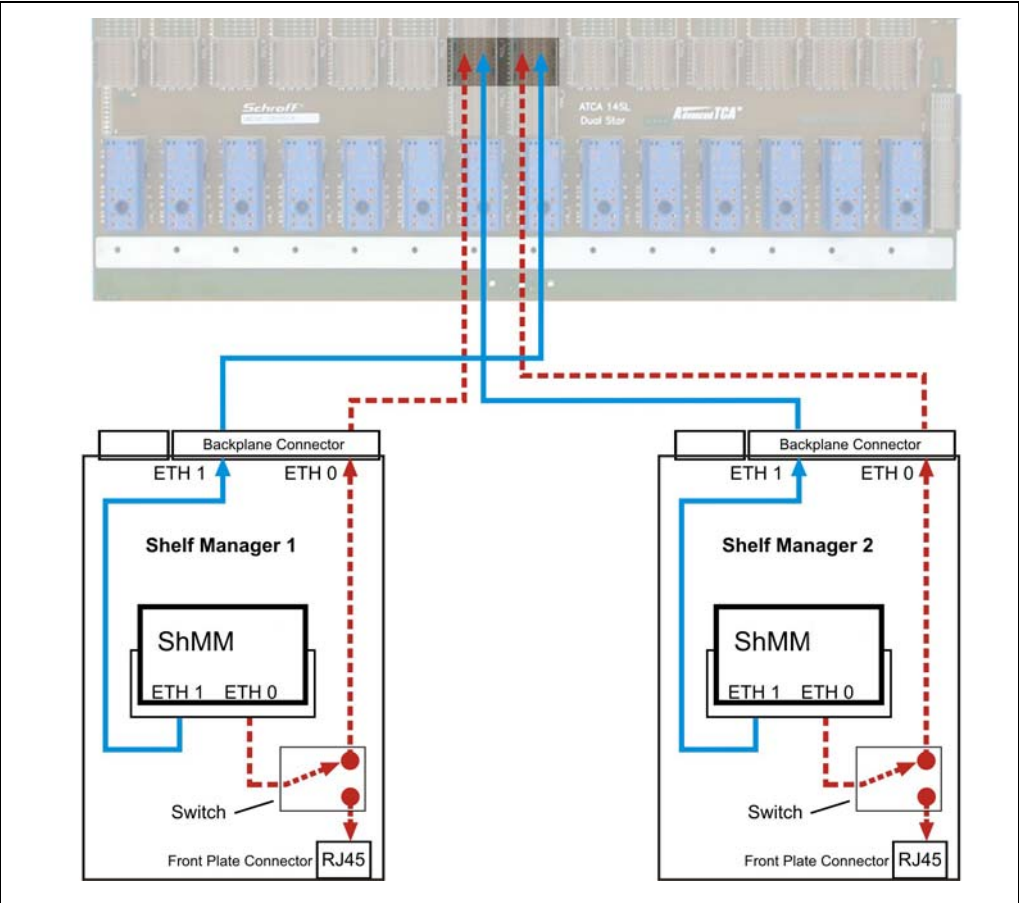
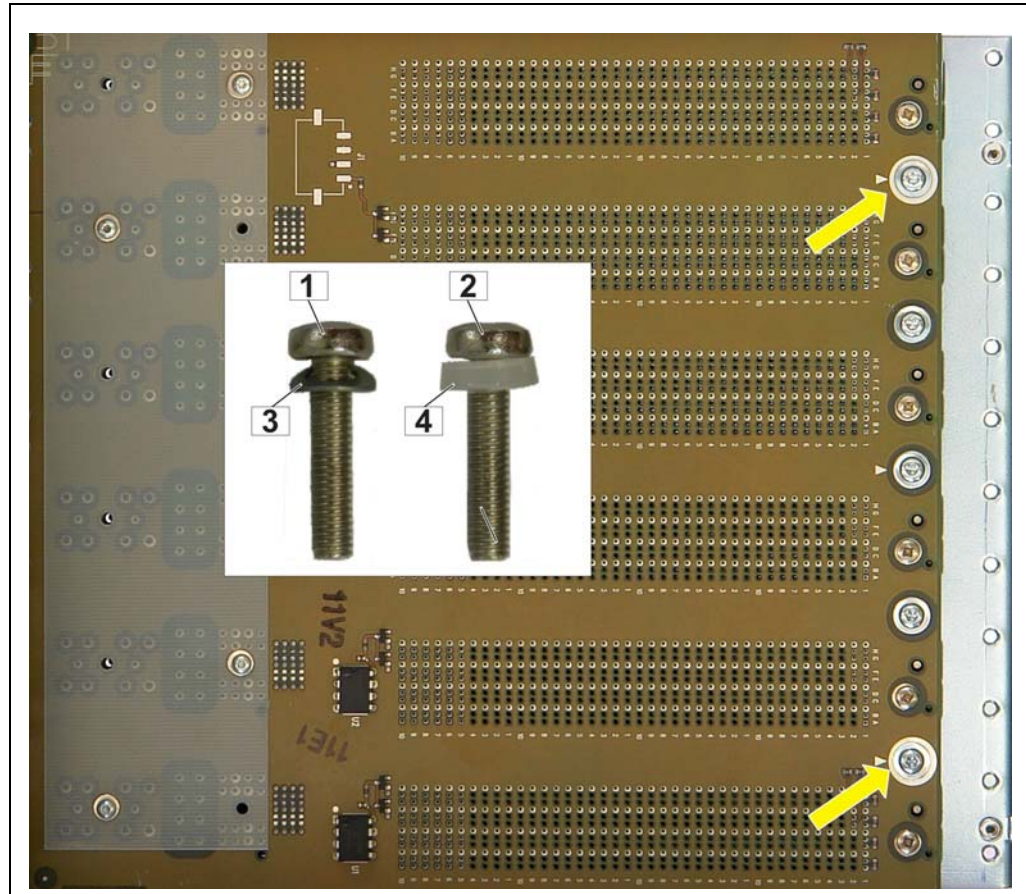


Table 5: Connector (P23) pin assignments for Shelf Manager Cross Connect

| 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 | | | |

2.10 Logic Ground

Figure 5: Logic Ground



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The ATCA Backplane provides a mechanism to connect Logic Ground and Shelf Ground.

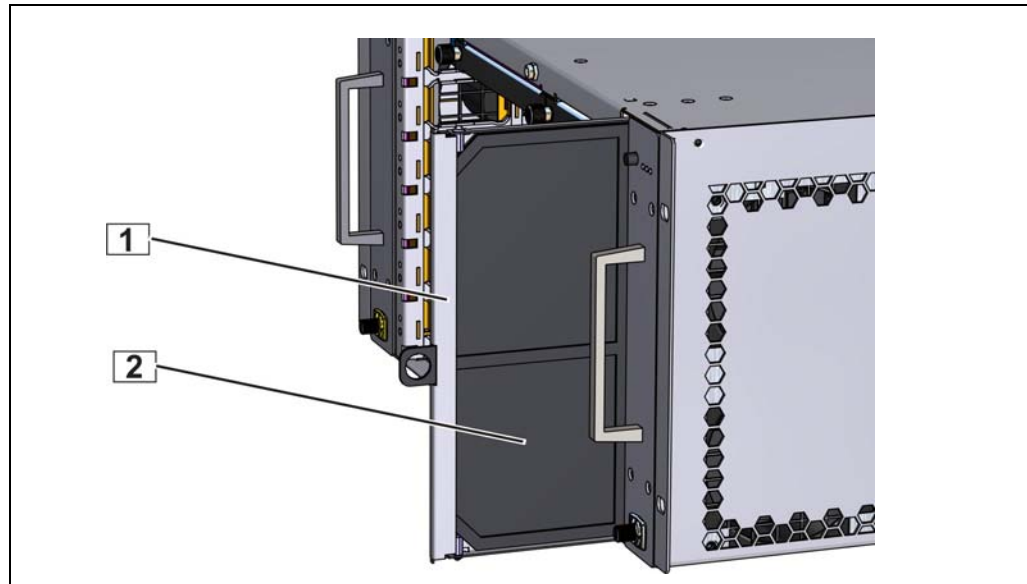
To connect Logic Ground and Shelf Ground the mounting screws at the positions marked by arrows must have metallic washers (3) instead of isolating plastic washers (4).



By default, Logic Ground and Shelf Ground is isolated, the chassis is shipped with the mounting screws with plastic washers at the marked positions.

3 Air Filter

Figure 6: Air Filter



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1 Air Filter Tray

2 Filter Element

3.1 Introduction

The ATCA Shelf provides a front replaceable air filter. The filter element is an open cell polyurethane foam special coating to provide improved fire retardation and fungi resistance.

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

3.2 Air Filter Presence Switch

The air filter presence is detected by a reed sensor on the backplane. The signal is routed to the Shelf Managers.

4 Shelf Ground Connection

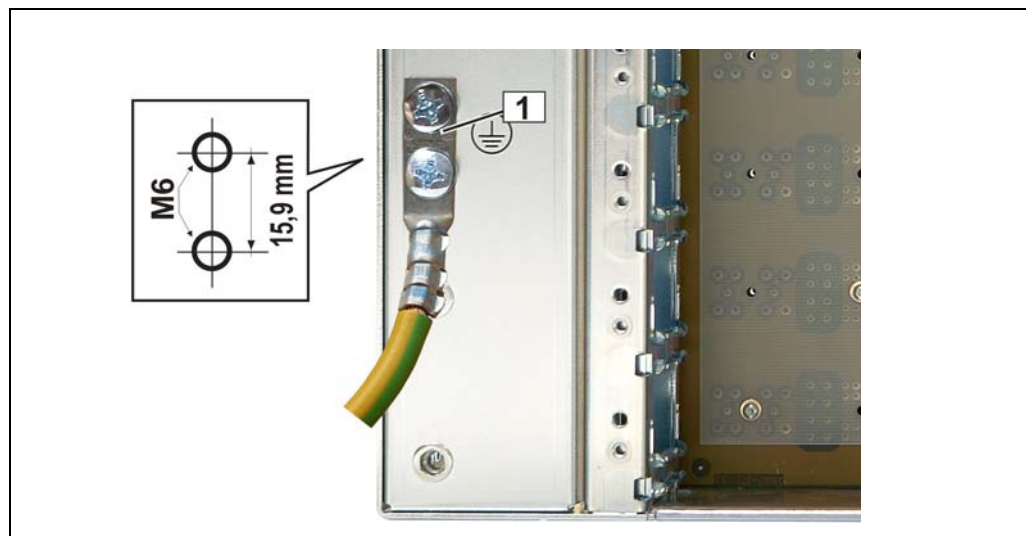


Hazardous voltage!

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 upper rear side. The Shelf ground terminal provides two threads (M6) with a 15.88 mm (5/8") spacing between thread centers to connect a two hole lug Shelf ground terminal cable.

Figure 7: Shelf Ground Terminal



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1 Ground Terminal

4.1 Specification for the Shelf Ground connection cable

Required wire size: AWG8

Required terminals: Use only two hole lug terminals.

5 Shelf Alarm Panel

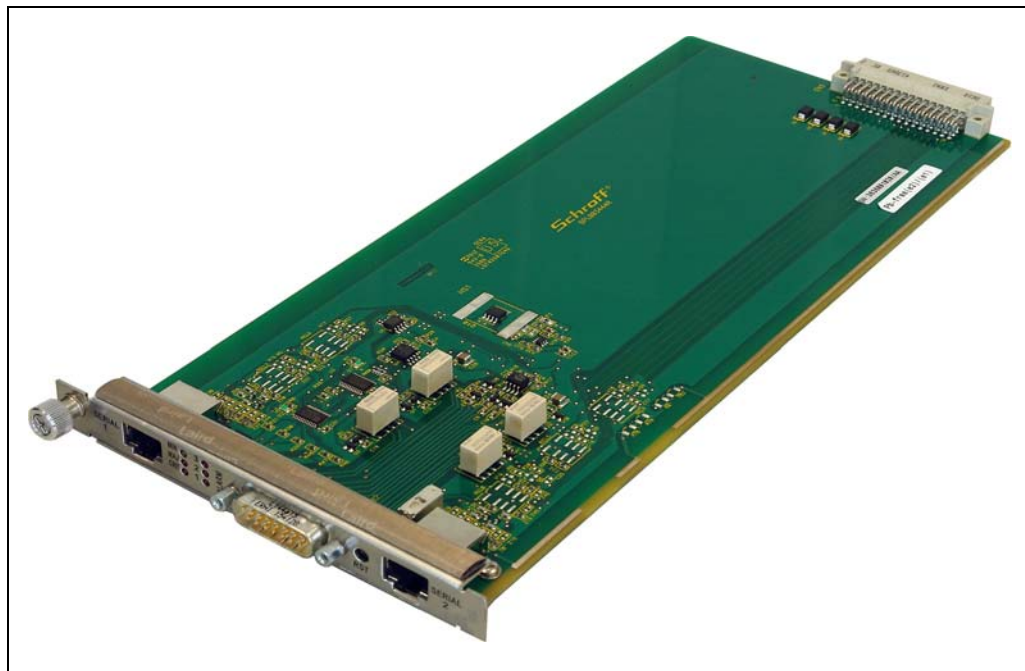
5.1 Introduction

Some I/O functions of the Schroff Shelf Manager have been moved to a separate board called Shelf Alarm Panel (SAP). The Shelf Alarm Panel is a FRU and provides:

- 3 Telco Alarm LEDs (MINOR, MAJOR, CRITICAL)
- 3 User definable LEDs
- The Telco Alarm connector (DB15-male)
- The Alarm Silence Push Button
- Serial console interfaces for Schroff Shelf Managers (RJ45 connectors)
- Temperature sensor (LM75)
- EEPROM for FRU information

The SAP is connected to the Schroff Shelf Manager by a I²C connection, the signals from the serial connectors are routed directly to serial console interface on the Shelf Manager.

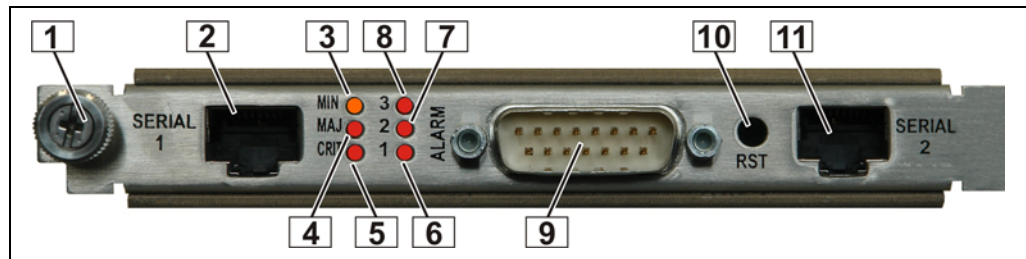
Figure 8: SAP



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5.2 SAP Front Panel

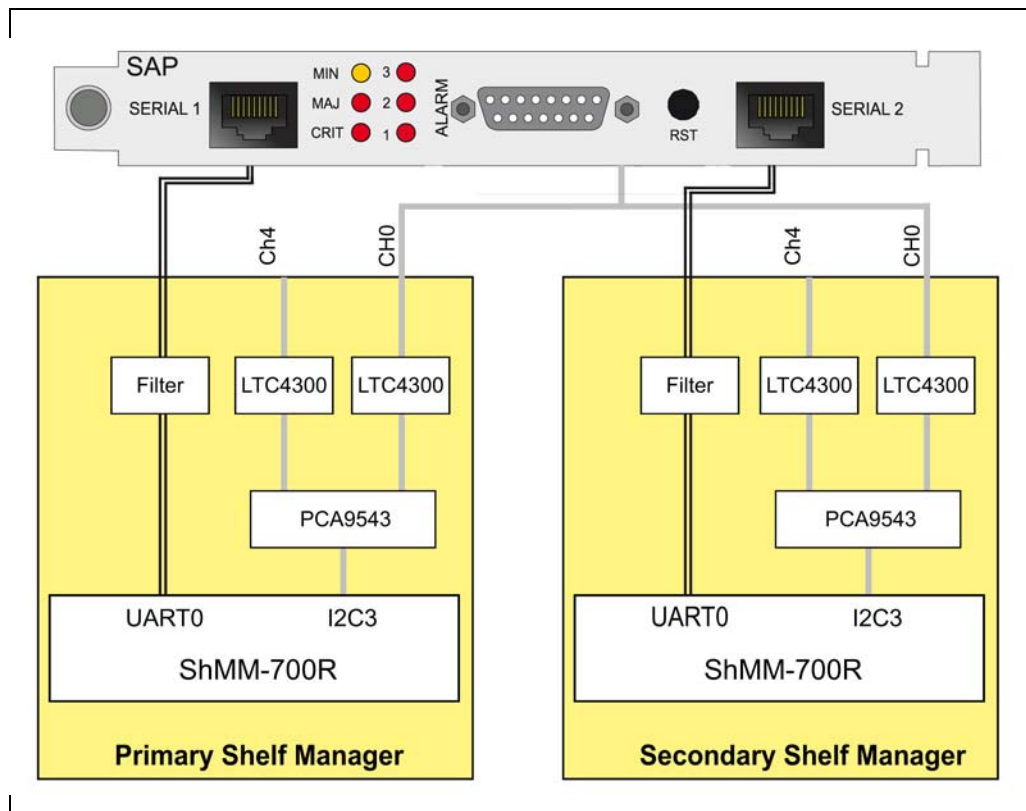
Figure 9: Front Panel SAP



12708813

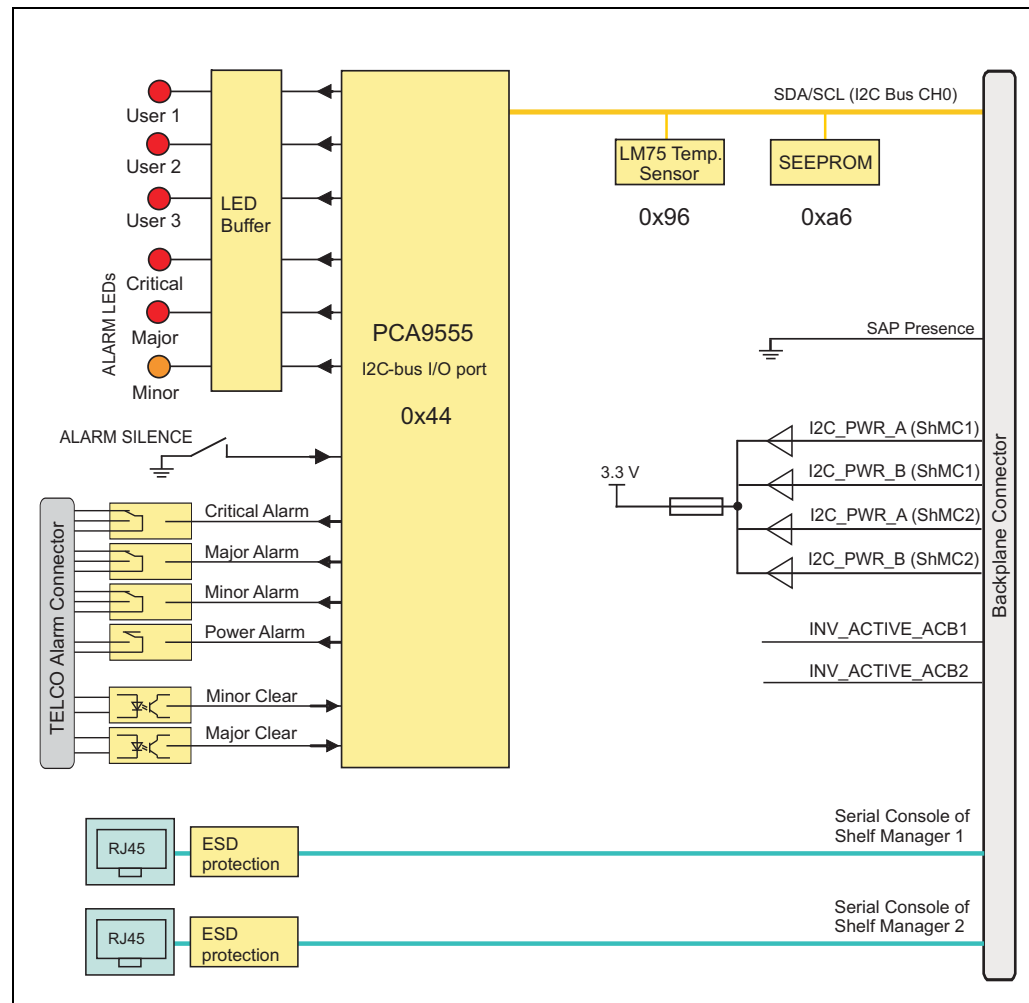
- | | |
|--|---|
| 1 Fixing screw | 7 LED USER 2 |
| 2 Serial Interface for Shelf Manager 1 | 8 LED USER 3 |
| 3 LED Minor Alarm (amber) | 9 Telco Alarm Connector |
| 4 LED Major Alarm (red) | 10 Alarm Silence button |
| 5 LED Critical Alarm (red) | 11 Serial Interface for Shelf Manager 2 |
| 6 LED USER 1 | |

Figure 10: Connection between Shelf Manager and SAP



5.3 SAP Block Diagram

Figure 11: SAP Block Diagram



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5.4 SAP SEEPROM

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

5.5 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.

5.6 SAP PCA9555

The PCA9555 device:

- controls the status of the LEDs
- reads the status of the Telco Alarm Cutoff push button (CLEAR)
- controls the Telco Alarm relays

Table 6: 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 |

5.7 SAP I²C Addresses

Table 7: SAP I²C Addresses

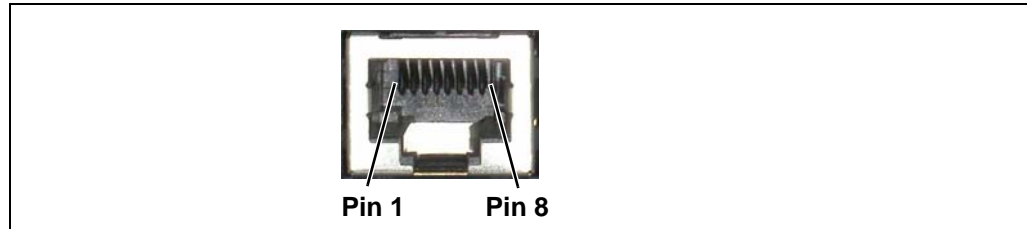
| LM75 | SEEPROM | PCA9555 |
|-----------|-----------|-----------|
| 0x96/0x4b | 0xa6/0x53 | 0x44/0x22 |

5.8 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.

5.9 RS-232 Serial Console Interfaces on SAP

Figure 12: RS-232 Serial Console Interface on Shelf Alarm Display



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The SAP provides two RS-232 serial console connector (SERIAL 1 and 2) for Shelf Manager 1 and 2. The connectors are 8-pin RJ45 modular receptacles.

A full set of RS-232 signals, including modem control, is provided. The serial interface is implemented on the Schroff Shelf Manager.



The serial console default configuration is:

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

Table 8: 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 |

5.10 SAP Console Cable for the Shelf Manger Serial Interface

Figure 13: RJ45 to DB9 Serial Console Cable



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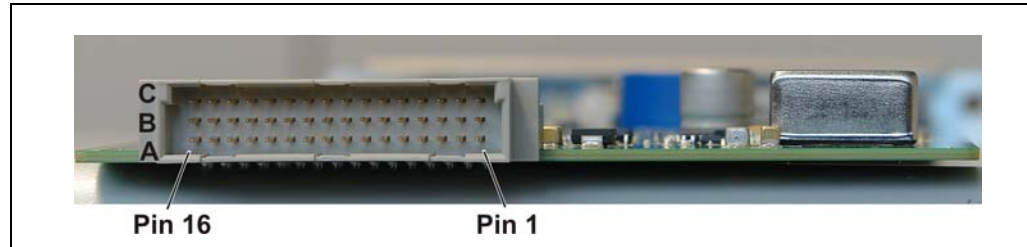
The connectors are shown with the cables pointing away.



Serial Console Cable sold separately, Schroff Catalog-No: 23204-187

5.11 Shelf Alarm Panel Backplane Connector

Figure 14: Shelf Alarm Panel Backplane Connector



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Table 9: Shelf Alarm Panel Backplane Connector Pin Assignment

| SAP ATCA Backplane Connector | | | | | | |
|------------------------------|-----------------|--------------------------------------|---------------|-------------------------------------|---------------|---------------------------------|
| Pin | A | Description | B | Description | C | Description |
| 1 | -48V_A | -48 V Feed A | -48V_B | -48 V Feed B | | |
| 2 | | | | | VRTN_A | Voltage return Feed A |
| 3 | | | | | VRTN_B | Voltage return Feed B |
| 4 | | | | | | |
| 5 | | | I2C_PWR_A (1) | 3.6 V from Shelf Manager 1 | I2C_PWR_B (1) | 3.6 V from Shelf Manager 1 |
| 6 | GND | Ground | GND | Ground | I2C_PWR_A (2) | 3.6 V from Shelf Manager 2 |
| 7 | SDA_CH0 | Data I ² C-bus Channel 0 | GND | Ground | I2C_PWR_B (2) | 3.6 V from Shelf Manager 2 |
| 8 | SCL_CH0 | Clock I ² C-bus Channel 0 | INT | | GND | |
| 9 | INV_ACTIVE_ACB2 | Active signal from Shelf Manager 2 | RXD0_ACB1 | Receive Data Shelf Manager 1 | RXD0_ACB2 | Receive Data Shelf Manager 2 |
| 10 | DSR_ACB1 | Data Set Ready Shelf Manager 1 | DTR_ACB1 | Data Terminal Ready Shelf Manager 1 | DSR_ACB2 | Data Set Ready Shelf Manager 2 |
| 11 | CD_ACB2 | Carrier Detect Shelf Manager 2 | DTR_ACB2 | Data Terminal Ready Shelf Manager 2 | CD_ACB1 | Carrier Detect Shelf Manager 1 |
| 12 | CTS_ACB1 | Clear To Send Shelf Manager 1 | CTS_ACB2 | Clear To Send Shelf Manager 2 | RTS_ACB1 | Request To Send Shelf Manager 1 |
| 13 | TXD0_ACB2 | Transmit Data Shelf Manager 2 | TXD0_ACB1 | Transmit Data Shelf Manager 1 | | |
| 14 | | | RTS_ACB2 | Request To Send Shelf Manager 2 | | |
| 15 | SAP_PRES | SAP Presence signal to Shelf Manager | | | | |
| 16 | INV_ACTIVE_ACB1 | Active signal from Shelf Manager 1 | | | SHELF_GND | Shelf Ground |

5.12 SAP Telco Alarms

5.12.1 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.

5.12.2 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 10: Telco Alarm LEDs

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

5.12.3 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.*

5.12.4 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.



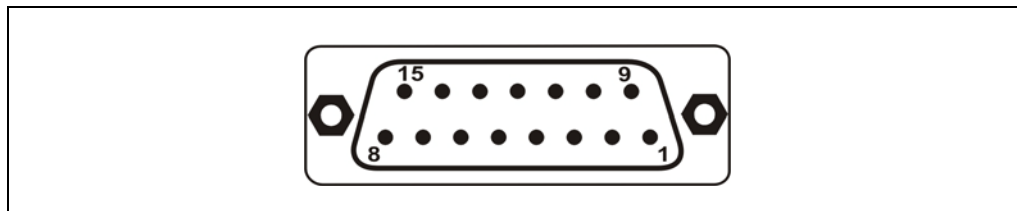
There is no hardware reset (reset input) for the Critical Alarm state.

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.

5.12.5 Telco Alarm Connector (DB15-male)

Figure 15: Telco Alarm Connector (DB15-male)



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Table 11: 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 Fan Trays

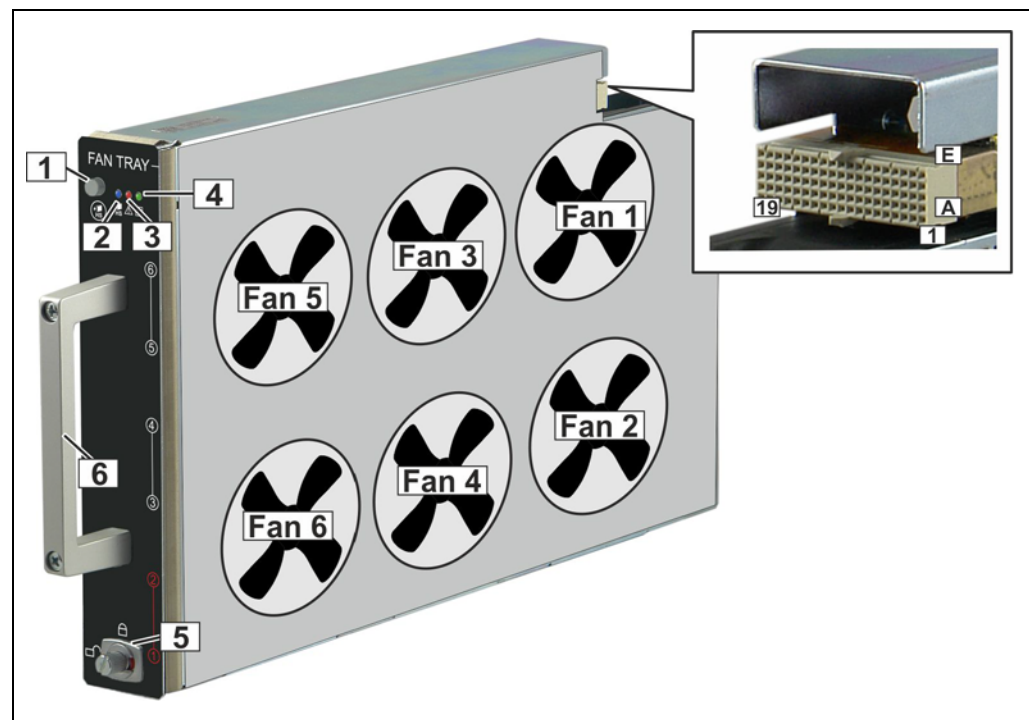
6.1 Introduction

The 6 Slot ATCA Shelf contains two hot-swappable Fan Trays arranged in a side to side configuration for maximum air flow. The Fan Trays are locked into the Shelf by a mini compression latch with indicator. A hot-swap push button is used to provide hot-swap functionality.

The Fan Trays are non-intelligent FRUs, monitored and controlled by the Shelf Managers through proprietary I²C connections.

The system is designed to run indefinitely with any single fan failure. When one fan fails, all other fans are increased to full speed. The Fan Tray has sufficient cooling capacity to keep the Shelf cooled with a single fan failure.

Figure 16: Fan Tray



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- | | | | |
|---|--------------------------|---|------------------------|
| 1 | Hot Swap Push Button | 5 | Mini Compression Latch |
| 2 | Hot Swap LED (blue) | 6 | Handle |
| 3 | Fan Tray Fault LED (red) | | |
| 4 | Fan Tray OK LED (green) | | |

6.2 Fan Tray Connectors and Indicators

The front panel includes a green and red status LED and a blue hot-swap LED.

The Hot-Swap push button indicates to the Shelf Managers that the Fan Tray is about to be removed. Its use is optional, but it is provided so that service personnel can be trained to look for a blue LED to be illuminated on any active component before removing it from the system. Once the operator pushes the Hot-Swap button, the Shelf Manager is informed of the pending extraction. When the Shelf Manager feels it is “safe” to remove the Fan Tray, the blue Hot-Swap LED illuminates solid.

Table 12: LEDs on Fan Tray front panel

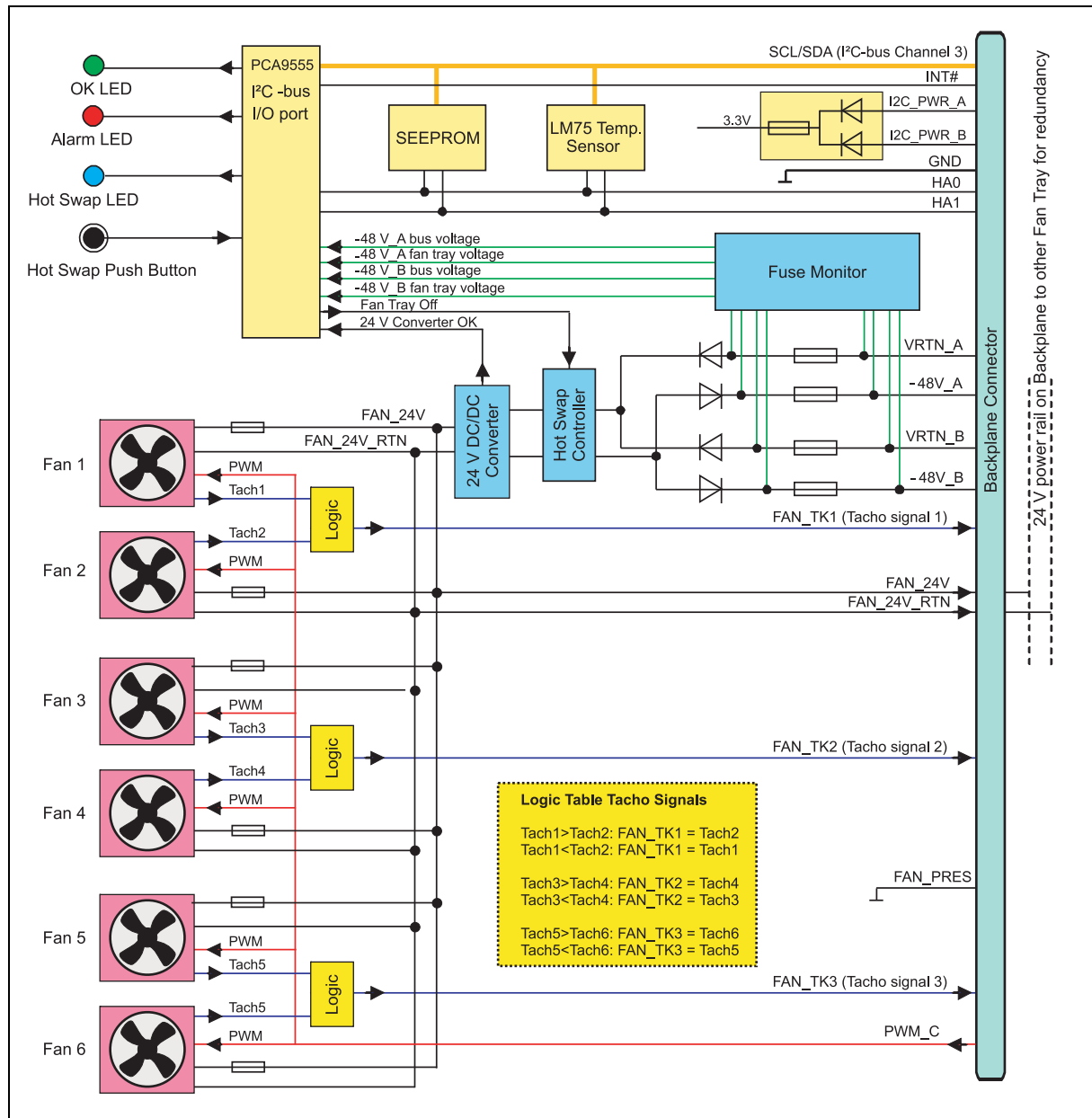
| Color | Description | Status | Condition |
|-------|--------------|----------------------------------|---|
| Green | OK LED | Off Solid green | No Power to the Fan Tray Normal Operation |
| Red | | Solid red | Attention Status (error condition) |
| Blue | Hot Swap LED | Off Short blink Solid blue | No Power to the Fan Tray or not OK to extract Fan Tray Preparing for extraction Ready to remove |

Table 13: Fan Tray Signal Connector pin assignment

| Pin # | Signal | Pin # | Signal | Pin # | Signal | Pin # | Signal | Pin # | Signal |
|-------|--------------|-------|-----------|-------|--------------|-------|-------------|-------|------------------|
| A1 | VRTN B | B1 | VRTN B | C1 | VRTN B | D1 | VRTN B | E1 | VRTN B |
| A2 | | B2 | | C2 | | D2 | | E2 | |
| A3 | VRTN A | B3 | VRTN A | C3 | VRTN A | D3 | VRTN A | E3 | VRTN A |
| A4 | | B4 | | C4 | | D4 | | E4 | |
| A5 | -48V B | B5 | -48V B | C5 | -48V B | D5 | -48V B | E5 | -48V B) |
| A6 | | B6 | | C6 | | D6 | | E6 | |
| A7 | -48V A | B7 | -48V A | C7 | -48V A | D7 | -48V A | E7 | -48V A |
| A8 | | B8 | | C8 | | D8 | | E8 | |
| A9 | FAN 24 V | B9 | FAN 24 V | C9 | FAN 24 V RTN | D9 | FAN SPEED | E9 | PWM_C |
| A10 | | B10 | | C10 | | D10 | | E10 | |
| A11 | FAN 24 V RTN | B11 | FAN TK1 | C11 | FAN TK2 | D11 | FAN TK3 | E11 | FAN TK4 |
| A12 | | B12 | | C12 | | D12 | | E12 | |
| A13 | GND-D | B13 | GND-D | C13 | GND-D | D13 | HA 0 | E13 | GND (FT_PRES) |
| A14 | GND-D | B14 | NSEAT | C14 | | D14 | HA 1 | E14 | AIR FILT PR |
| A15 | GND-D | B15 | INT# | C15 | INV_ACTIVE1 | D15 | INV_ACTIVE2 | E15 | PEM PRES |
| A16 | | B16 | | C16 | | D16 | | E16 | |
| A17 | SCL_FT_LOCAL | B17 | I2C_PWR_A | C17 | SCL_CH3 | D17 | SCL_A14_R | E17 | SCL_B14_R |
| A18 | SDA_FT_LOCAL | B18 | I2C_PWR_B | C18 | SDA_CH3 | D18 | SDA_A14_R | E18 | SDA_B14_R |
| A19 | GND-D | B19 | GND-D | C19 | GND-D | D19 | GND-D | E19 | GND-D |

6.3 Fan Tray Block Diagram

Figure 17: Fan Tray Block Diagram



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6.4 Fan Tray Signals

The Fan Tray provides signals for:

- Voltage monitoring
- Status of the Hot Swap Controller
- Fan Speed
- Temperature

These signals are controlled by the Shelf Manager via the I²C bus and proprietary signals.

6.5 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 14: Fan Tray PCA9555 pin assignment

| I/O pins | Function | State |
|----------|-----------------------------|----------------------------|
| 0.0 | -48A bus voltage | 0 = Voltage OK |
| 0.1 | -48A fan tray voltage | 0 = Voltage OK |
| 0.2 | -48B bus voltage | 0 = Voltage OK |
| 0.3 | -48B fan tray voltage | 0 = Voltage OK |
| 0.4 | 24 V converter OK | 0 = Voltage OK |
| 0.5 | Fan Tray 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.

6.6 Fan Tray Temperature Sensor

The temperature sensors (LM75) in the Fan Trays measure the input and exhaust temperatures of the Shelf.

6.7 Fan Tray Addresses

Geographic address pins (HA0, HA1) at the Fan Tray Backplane connector determine the hardware addresses of the devices.


Table 15:

| Fan Tray Location | SEEPROM | LM75 | PCA9555 |
|-------------------|-----------|-----------|-----------|
| #1 (Left) | 0xa8/0x54 | 0x98/0x4c | 0x48/0x24 |
| #2 (Right) | 0xac/0x56 | 0x9c/0x4e | 0x4c/0x26 |



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

7 Power Entry Module (PEM)

| | |
|---|---|
|  | <p>Hazardous voltage!</p> <p><i>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.</i></p> |
|---|---|



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 -60 VDC. The Shelf supports redundant power supplies but the two supplies should be independently powered.

7.1 Introduction

Two pluggable redundant Power Entry Modules (PEMs) are located at the rear top side of the Shelf. Each PEM provides power terminals for two 30 A power feeds. Each power feed consists of a -48 VDC cable and its corresponding return cable.

The two feeds (Feed A1 and A2, Feed B1 and B2) and protected by 30 A fused switches.

Each of the two power feeds supplies power to a hub slots, two node slots a Fan Tray and a Shelf Manager. This topology is used for safety reasons to keep the max. current per feed less the 30 A. The segmentation is shown in [Chapter 7.3. "PEM Power Branches"](#).

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

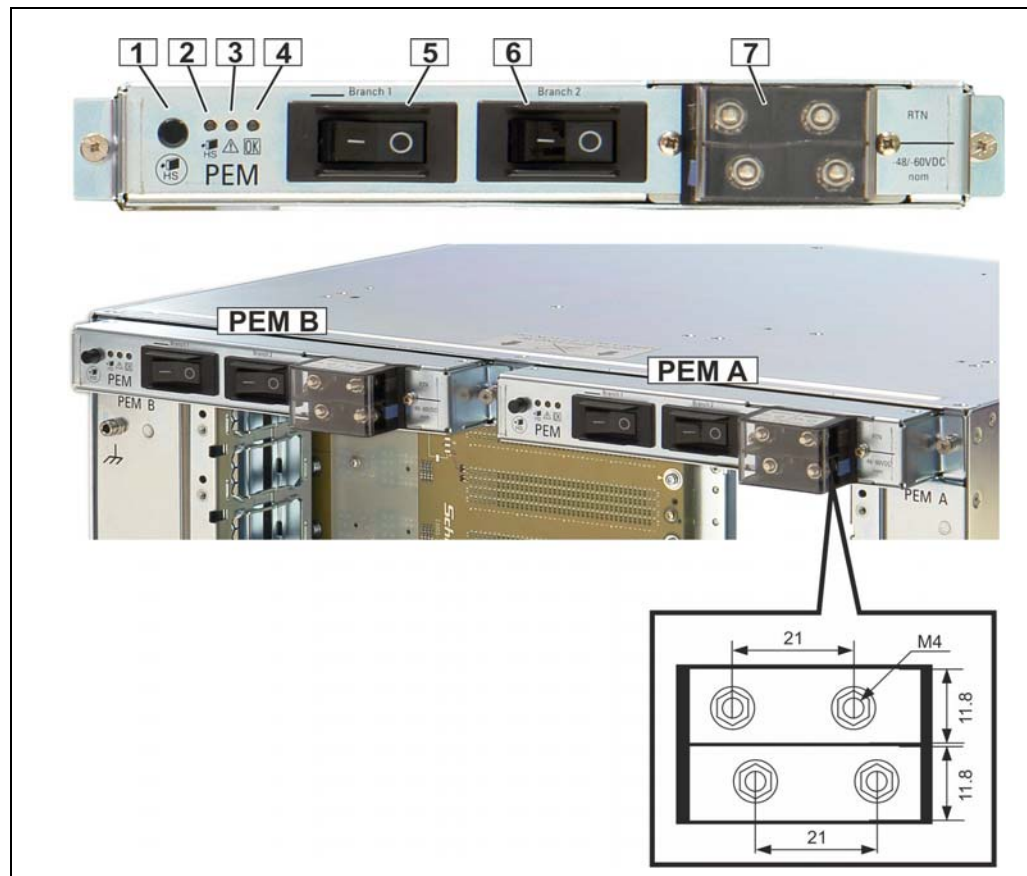
The input voltage range for the Shelf is from -40.5 VDC to -60 VDC.

To indicate the presence of the PEM, a PEM presence signal is grounded by the PEM.

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

7.2 PEM Components

Figure 18: PEM components

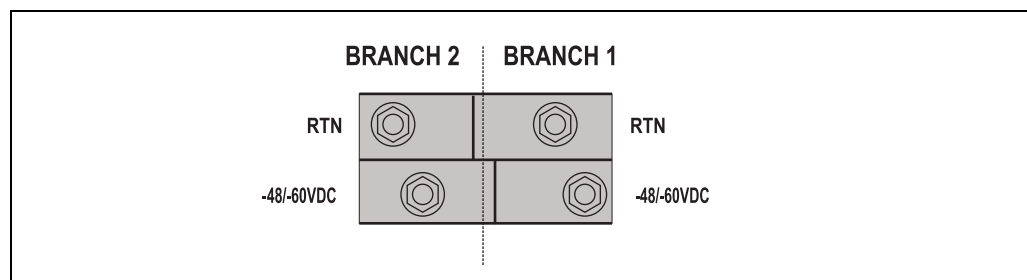


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- | | | | |
|---|----------------------|---|-----------------------|
| 1 | Hot Swap push button | 5 | Fused Switch Branch 1 |
| 2 | Hot Swap LED (blue) | 6 | Fused Switch Branch 2 |
| 3 | PEM Alarm LED (red) | 7 | Power Terminal |
| 4 | PEM OK LED (green) | | |

PEM input power feed connectors are protected against accidental touching with a plastic cover. Input power cables can be routed oriented either to the left or right.

Figure 19: Terminal block power connection

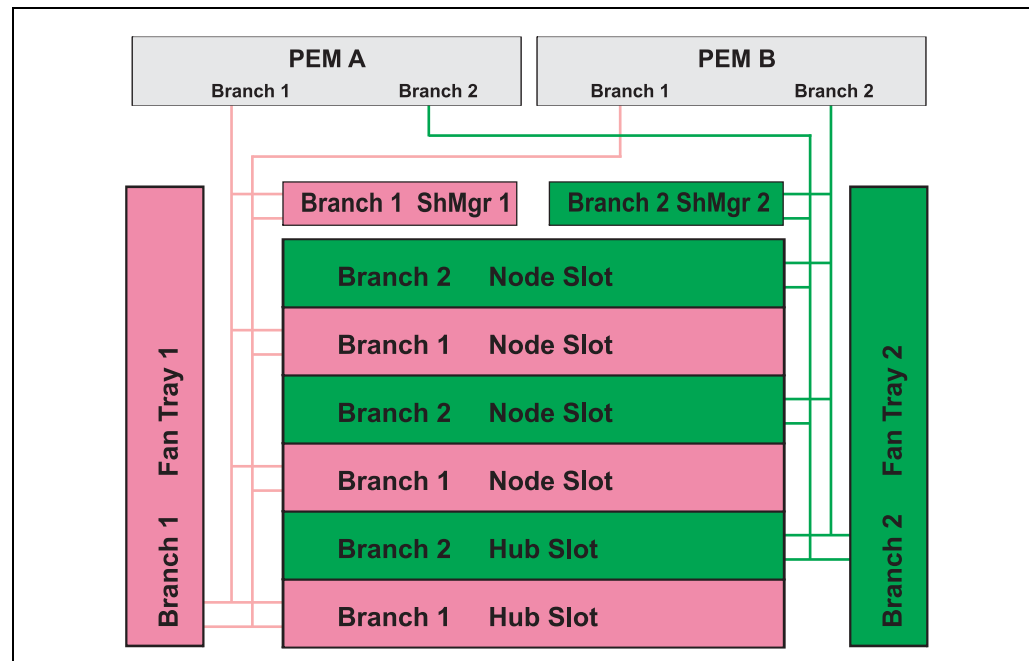


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7.3 PEM Power Branches

The ATCA Backplane is divided into two Power branches. Each of the PEM's two power feeds supplies power to a group of slots and a Fan Tray and a Shelf Manager. This topology is used to keep the max. current per branch less than 30 A.

Figure 20: Power distribution of the two Power Branches within the Shelf



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7.4 Power cable Requirements

We recommend two hole terminals, Schroff part no. 21990-155 (4 pcs)

Cable diameter AWG4

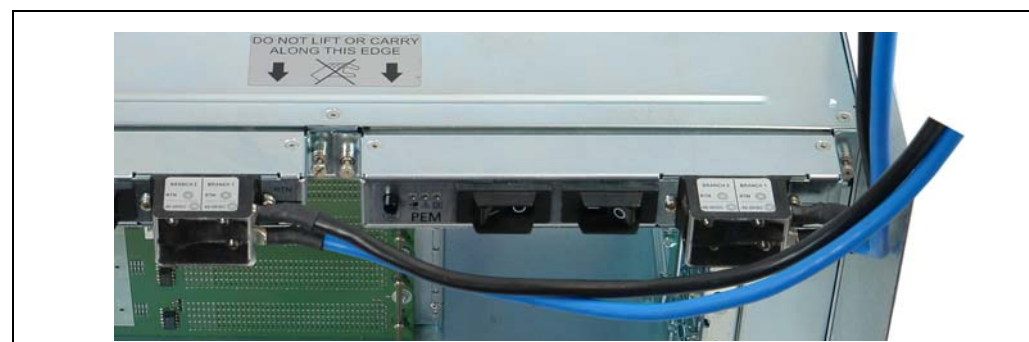
suitable for 60 A at 55° C ambient temperature.

or single hole ring terminals for M4

Cable diameter AWG8

suitable for 30 A at 55° C ambient temperature.

Figure 21: Cabling



7.5 Slot Power Calculation

Each branch supplies power to a Fan Tray, a Shelf Manager and a group of 3 slots.

The Shelf Manager calculates the maximum branch power by the minimum expected operating voltage (default 40.5 V) and the maximum branch current (30 A) stored in the Shelf's FRU file.

With the default settings the available branch power is calculated with 1215 W. With the power consumption of the Fan Tray and Shelf Manager is about 180 W, the remaining power for the 3 ATCA boards is 1035 W. Because the Shelf Manager reserves 10 W for the IPMC on each FRU, the actual remaining branch power is 1005 W.

If the Shelf is operated in an environment that allows a higher minimum voltage, the user can alter the settings for the minimum expected operating voltage in the FRU file to gain a higher branch power.

The power capability per slot is set to 300 W in the Shelf's FRU file by default. If you want to use a board with more than 300 W, you must modify the slot's power capability.

For more information refer to the Pigeon Point Shelf Manager External Interface Reference Manual (www.pigeonpoint.com).



If the joint power capability of all ATCA boards assigned to a branch is greater than the calculated branch power, the Shelf Manager will not power-on all boards. (The last plugged-in or the last in the power-up sequence.)

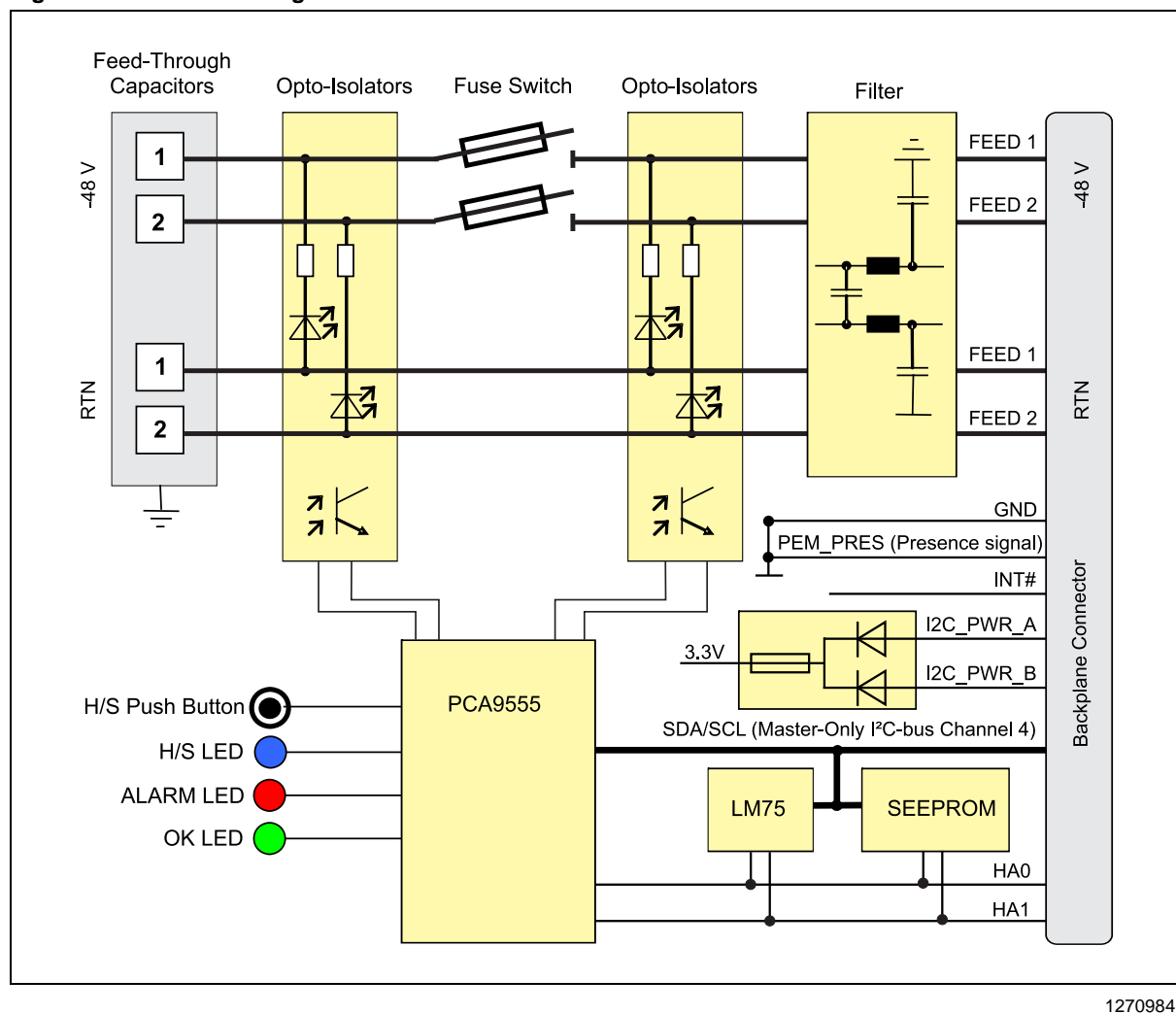
Table 16: Branch Power Capability

| Input Voltage | Max. Current/ Branch | Max. Power/ Branch | Power FT and ShMC | Slot Power (for 3 Slots) | Slot Power (average) | Max. Current/Slot | Max. Power/ single Slot |
|---------------|----------------------|--------------------|-------------------|--------------------------|----------------------|-------------------|-------------------------|
| 40.5 V | 30 A | 1215 W | 180 W | 1005 W | 335 W | 10.1 | 409.1 |
| 48 V | 30 A | 1440 W | 180 W | 1230 W | 410 W | 10.1 | 484.8 |
| 54 V | 30 A | 1620 W | 180 W | 1410 W | 470 W | 10.1 | 545.4 |

Note: You can modify the power capability of a FRU with the following CLI command: `clia shelf PwrCapability [hw-addr] [FRU-ID] [Power]`

7.6 PEM Block Diagram

Figure 22: PEM Block Diagram



7.7 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 17: 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 |

7.8 PEM I/O Device

The PEM I/O device (PCA9555):

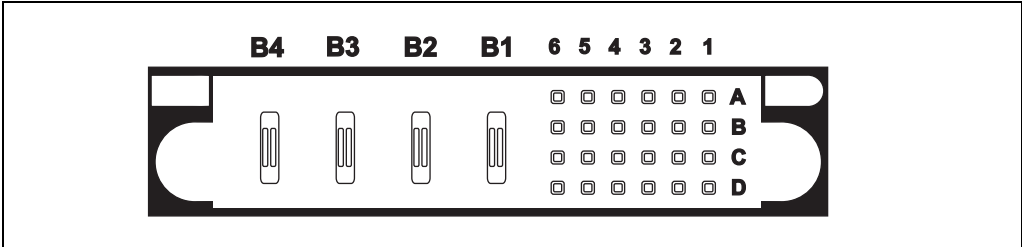
- controls the status of the LEDs
- reads the status of the Hot Swap push button
- reads the status of the -48 VDC inputs

Table 18: PEM PCA 9555 pin assignment

| PCA9555 I/O pin | Function | State |
|-----------------|--|--|
| 0.0 | Power Input 2 at Backplane connector 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 at Backplane connector 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 | 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 | 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 |

7.9 PEM Connectors

Figure 23: PEM Backplane Connector



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Table 19: PEM Backplane connector power contacts

| B1 | B2 | B3 | B4 |
|--------------|-------------|--------------|-------------|
| -48 V Feed 1 | VRTN Feed 1 | -48 V Feed 2 | VRTN Feed 2 |

Table 20: PEM Backplane connector signal contacts

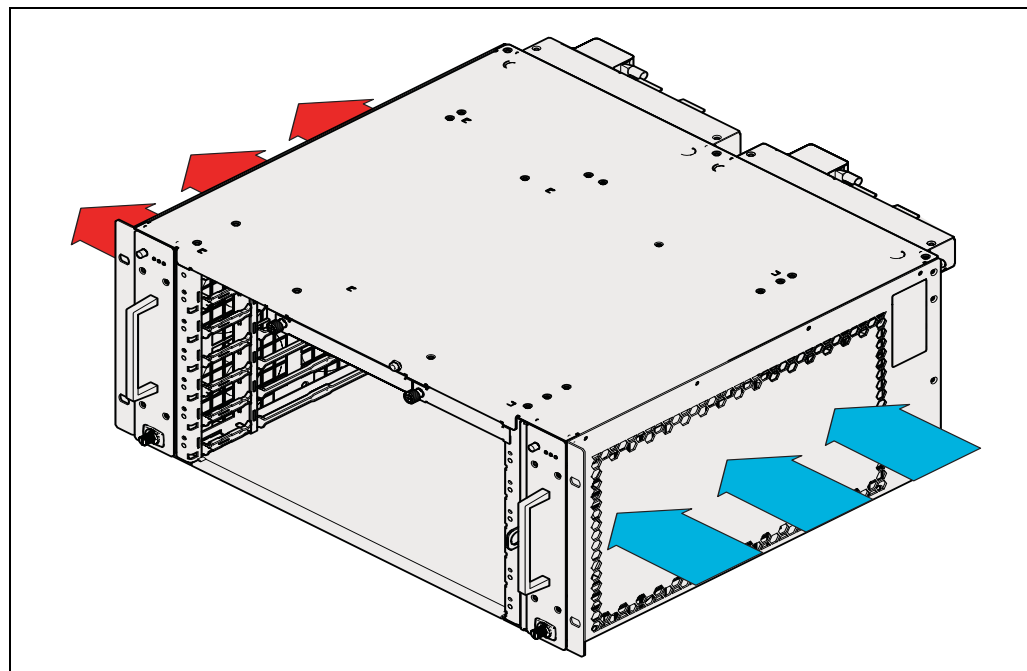
| Pin # | 1 | 2 | 3 | 4 | 5 | 6 |
|-------|---|---------|----------------|-----------|---|---|
| A | | SDA_CH4 | I2C_PWR_A | I2C_PWR_B | | |
| B | | SCL_CH4 | GND | GND | | |
| C | | HA0 | HA1 | | | |
| D | | INT# | PEM_PRES (GND) | | | |

8 Thermals

8.1 System Airflow Path

The Schroff 6 slot ATCA Shelf provides an airflow using two Fan Trays, one at each side of the Blade subrack. Each Fan Tray has 6 fans moving air from the right side to the left side of the Shelf in a push-pull arrangement. This arrangement provides excellent airflow as well as fault tolerance in the unlikely event of a fan failure.

Figure 24: General airflow path for the 5 U/ 6 slot ATCA Shelf



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8.2 Cooling Capacity

The maximum system airflow (all fans at full speed) is 719 m³/h (422 CFM).

The airflow is measured with with front and RTM test boards
(Front board impedance = 37 Pa pressure drop at 50 m³/h (30 CFM),
RTM board impedance = 24.9 Pa at 8.4 m³/h (5 CFM))

The maximum average per slot cooling capacity is:

- 390 W with $\Delta t = 10$ K
- 600 W with $\Delta t = 15$ K

9 Schroff Shelf Manager ACB-VI

This Chapter describes 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. 63972-331

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 Shelf Managers are not included with the Shelf

9.1 Introduction

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:

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

The Shelf management 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 the ACB-VI carrier board.

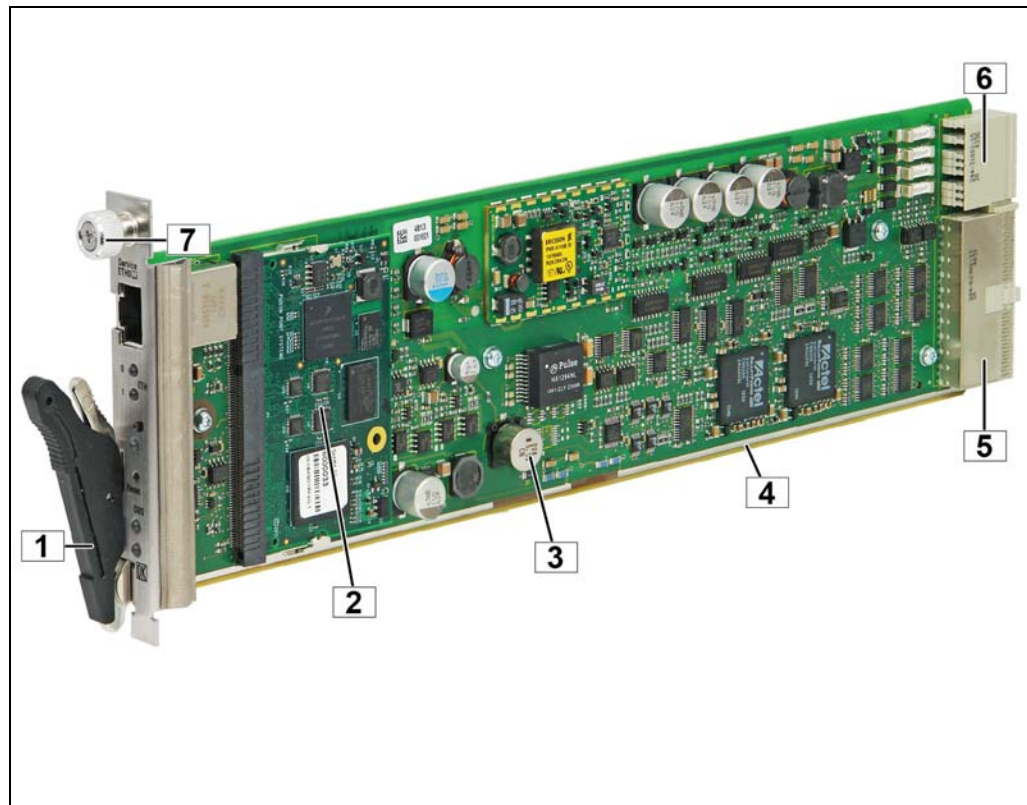
The ACB-VI carrier board includes several on-board devices that enable different aspects of Shelf management based on the ShMM-700. These facilities include I²C-based hardware monitoring/control and GPIO expander devices.

The ACB-VI 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.

To maximize availability, the Schroff ATCA Shelves are designed to work with two redundant Schroff ShMM-ACB-VI Shelf Managers.

Figure 25: Schroff Shelf Manager

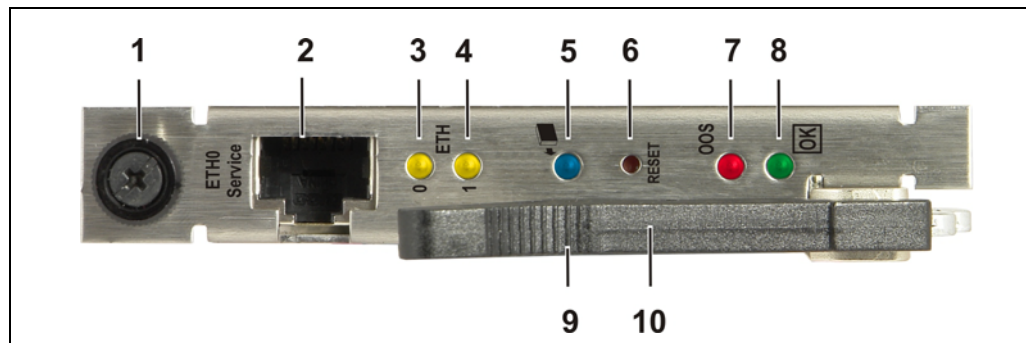


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- | | | | |
|---|----------------------|---|----------------------------|
| 1 | Extraction handle | 5 | Backplane Connector (X100) |
| 2 | ShMM-700R | 6 | Backplane Connector (X102) |
| 3 | RTC Backup Capacitor | 7 | Fixing screw |
| 4 | ACB-VI Carrier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

9.2 Front Panel Components

Figure 26: 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 |

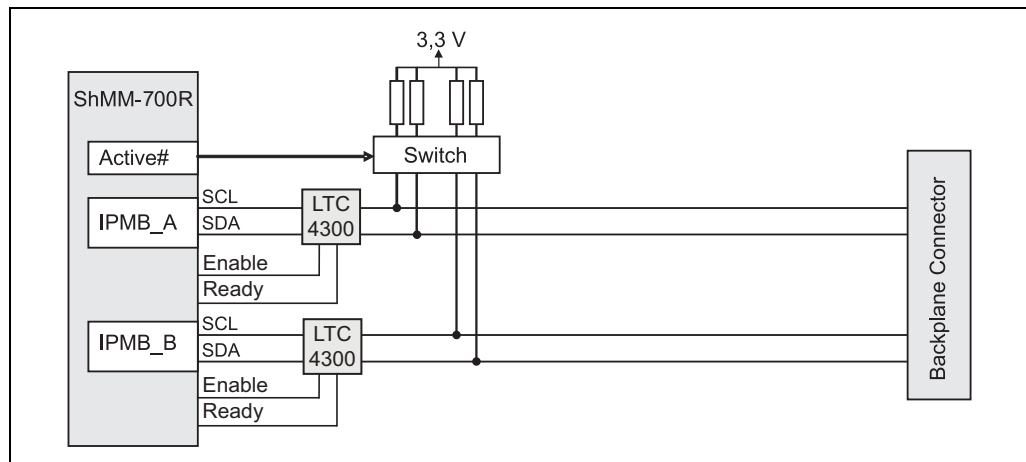
9.3 Bussed IPMB Interface

**Only Shelf Managers with Product Number: 21990-40 1
for Shelves 11596-160**

The ShMM-700R provides two IPMBs. The IPMB-A and IPMB-B from the ShMM-700R are routed directly to the Backplane connector. 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 27: Block diagram bused IPMB

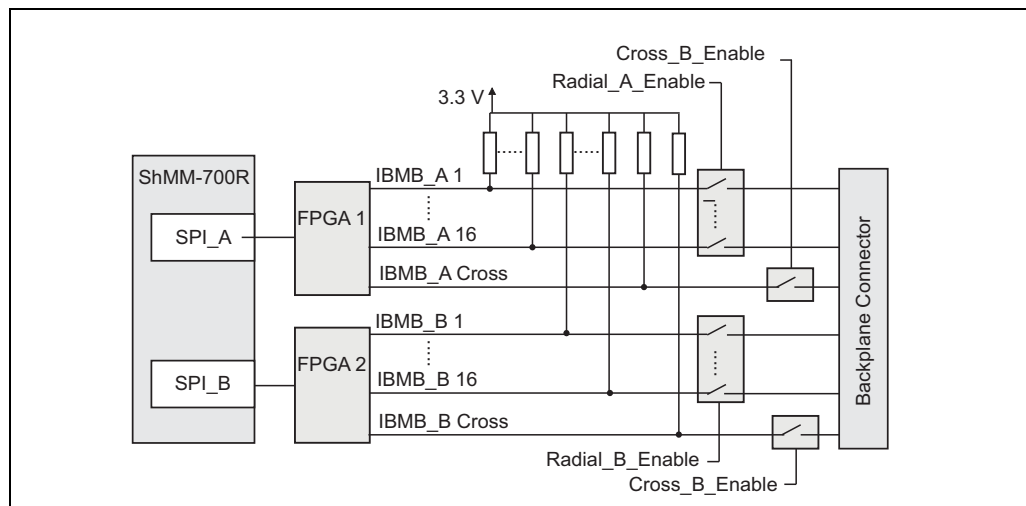


9.4 Radial IPMB Interface

**Only Shelf Managers with Product Number: 21990-402
for Shelves 11596-161**

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

Figure 28: Block diagram radial IPMB



9.5 Ethernet Channels

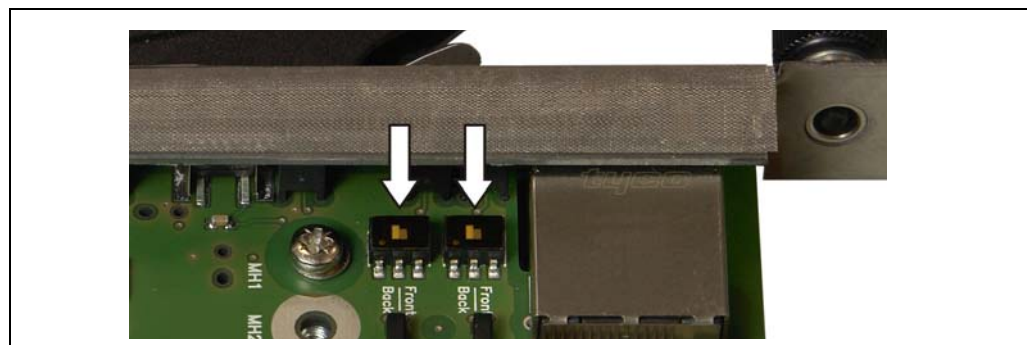
The front panel ETH0 Ethernet connector is intended for service use only or for debugging purposes in laboratory environment. The computer which is connected to this interface must be located nearby the shelf manager with an Ethernet cable that is not longer than 10 m.

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 29: Switches shown in default position

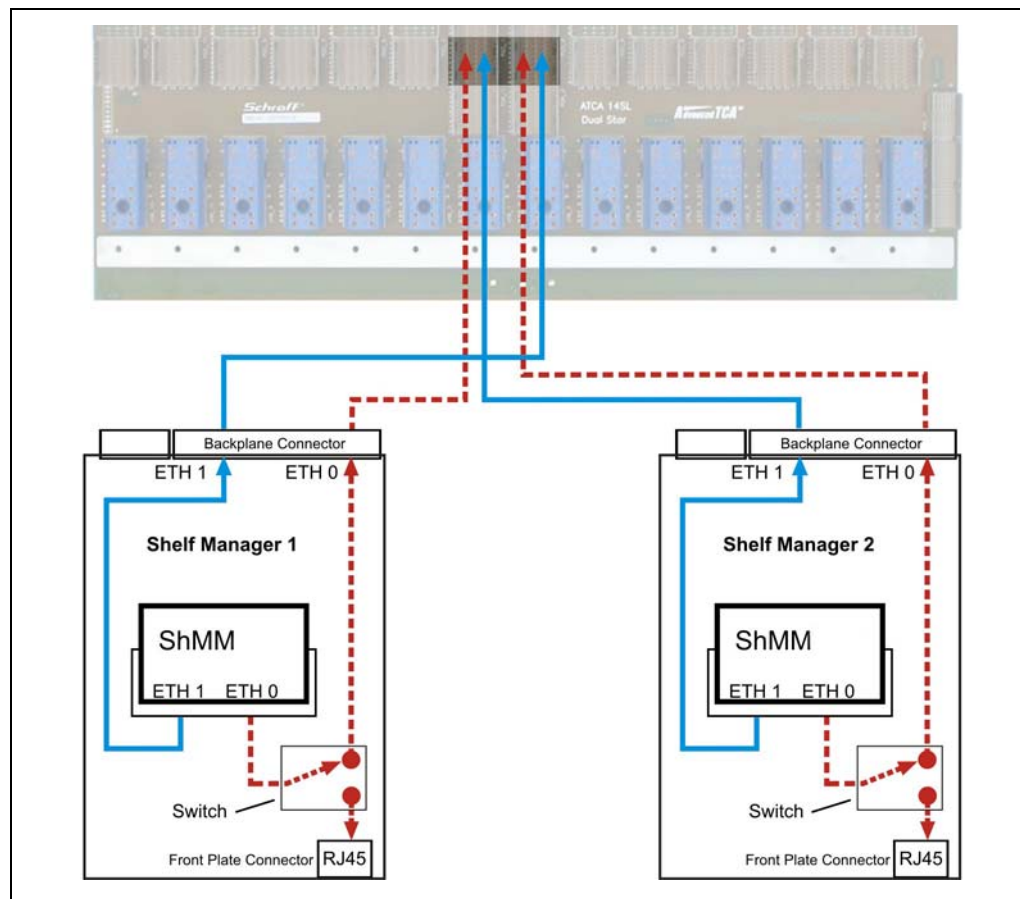


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9.6 Shelf Manager Cross Connect

The ATCA Backplane provides cross connect traces between the Base Hubs and the Shelf Managers according to PICMG 3.0 Base specification.

Figure 30: Shelf Manager Cross Connect



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Table 21: 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 | | | |

9.7 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 Shelf Alarm Panel.



The serial console default configuration is:

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

9.8 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

9.9 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

9.9.1 Hot Swap LED

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

9.10 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.

9.10.1 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.

9.11 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 datas you have to connect to the active Shelf Manager!

9.11.1 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
```

10 Technical Data

Table 22: Technical Data

| Physical Dimensions | |
|---|---|
| Height | 5 U |
| Width | 482.6 mm |
| Depth (with handles) | 464 mm |
| Weight | |
| Shipping weight completely assembled with packaging | 20 Kg |
| Shelf weight completely assembled | 15 Kg |
| Power | |
| Input voltage | -40.5 VDC -72 VDC |
| Input Power | 60 A per power feed (Feed A and Feed B) |
| Overcurrent Protection | 30 A Fused Switches on PEM |
| Cooling Capacity | |
| Front Boards | >300 W / Board |
| RTM | 30 W / Board |
| 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 B |
| Radiated Emissions | EN 55022 Class B |
| Safety | |
| Protected Earth Test | EN60950-1, test current 25 A, resistance <100mOhm |
| Hipot Test | EN60950-1, 1000 V |

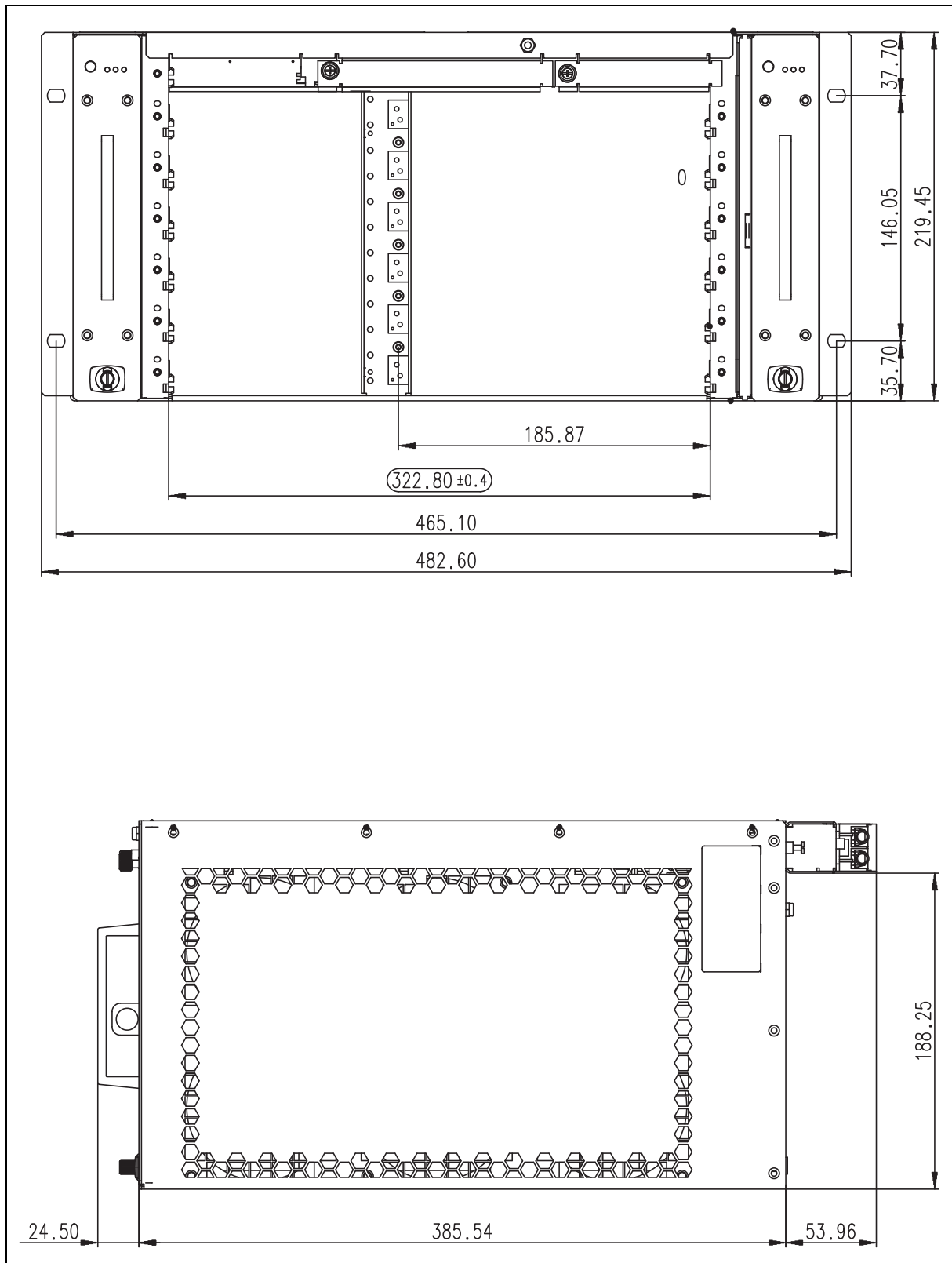
10.1 Part Numbers

Table 23: Part Numbers

| Number | Part |
|-----------|--|
| 11596-160 | 6-Slot ATCA Shelf, Replicated Mesh Backplane, bused IPMB |
| 11596-161 | 6-Slot ATCA Shelf, Replicated Mesh Backplane, radial IPMB |
| 21990-404 | Shelf Manager ShMM-ACB-VI with bused IPMB |
| 21990-405 | Shelf Manager ShMM-ACB-VI with radial IPMB |
| 21990-057 | Replacement Fan Tray |
| 21990-058 | Replacement PEM |
| 21990-059 | Air Filter Element |
| 21596-077 | Shelf Alarm Panel (SAP) |
| 21596-012 | Filler Panel (stainless steel) for empty Shelf Manager slot |
| 21591-079 | Filler Panel (stainless steel) with airflow baffle for empty front slots |
| 21596-008 | Filler Panel (Aluminium profile) with airflow baffle for empty front slots |
| 21591-099 | Filler Panel (stainless steel) with airflow baffle for empty RTM slots |
| 21591-107 | Filler Panel (Aluminium profile) with airflow baffle for empty RTM slots |

10.2 Dimensions

Figure 31: Dimensions



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Schroff GmbH

Langenalber Str. 96 - 100
75334 Straubenhardt, Germany
Tel +49.7082.794.0
Fax +49.7082.794.200