aTCA-80606PA

6U 6-Slot AC-Powered AdvancedTCA® Shelf

User's Manual



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Leading EDGE COMPUTING

Preface

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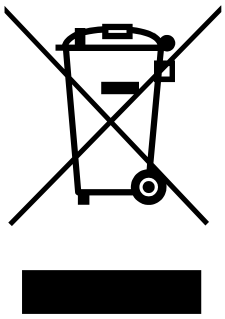
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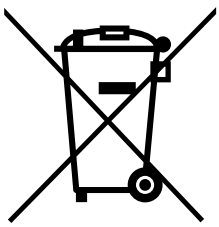
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Battery Labels (for products with battery)









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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.*

	**Risk 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.org).

1.3 Reference and Architecture Specifications

These documents contain information and specifications related to the requirements listed in this document.

- 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.org)

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1.4 Product Definition

The aTCA-80606PA is a 6 U / 6-Slot AdvancedTCA Shelf for fault-tolerant / high-availability applications.

- Dual-Star Backplane, bussed IPMB. It is designed to work with two redundant Shelf Managers. Fans controlled by the Shelf Manager or through autonomous via fan controller. AC Power Entry Modular.

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
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
RTC	Real Time Clock
RTM	Rear Transition Module
Shelf	See Chassis
SMM	Shelf Manager Module
VRTN	Voltage Return

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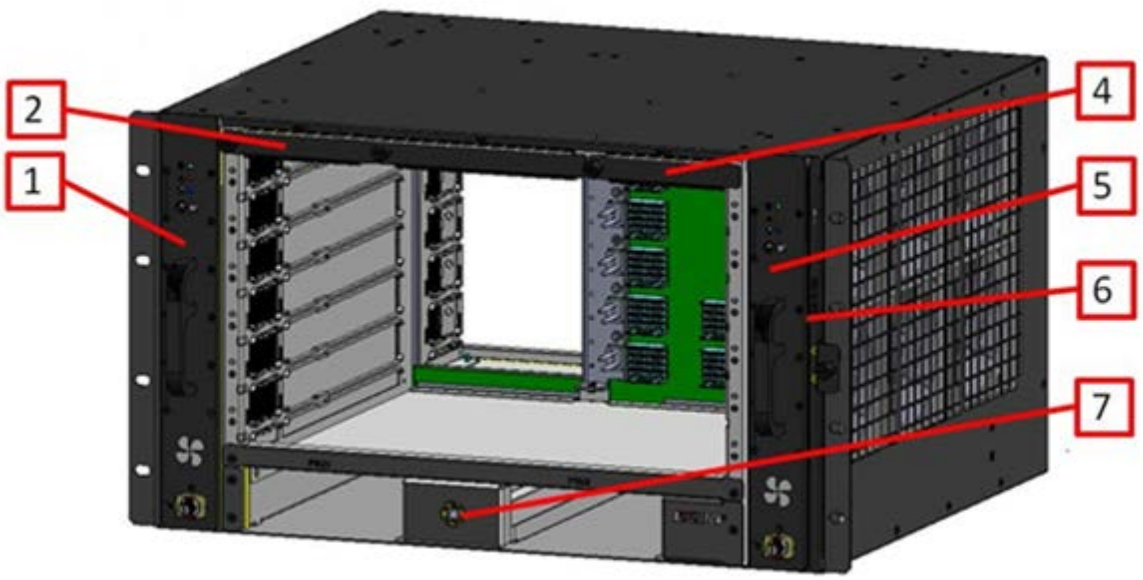
2 Hardware Platform

6U/19’’ chassis with front card cage for ATCA boards and rear card cage for ATCA RTM board. The chassis is designed for easy access of any Field-Replaceable Units (FRU).

- 6-slot ATCA backplane with dual star Fabric Interface, Dual Star Base Interface and bussed IPMB interface, supporting four 8U node board slots and two 8U hub board slots. providing 40Gb/s connectivity (4 lanes with 10Gb/s).
- Two Push-Pull Fan Tray arrangement provides optimized cooling for ATCA blades with fault-tolerant capability; front-pluggable, hot-swappable, with 6 high-speed fans per tray.
- Two dedicated Shelf Manager bays accepting Shelf Managers based on Pigeon Point ShMM-700.
- ESD Wrist Strap Terminals at the front and the rear.
- Removable air filter that meets the requirements of the Telcordia GR-78-CORE specification.
- Supports two front-pluggable AC Huawei PSUs, 1+1 redundant configured.

2.1 Shelf Front and Rear View

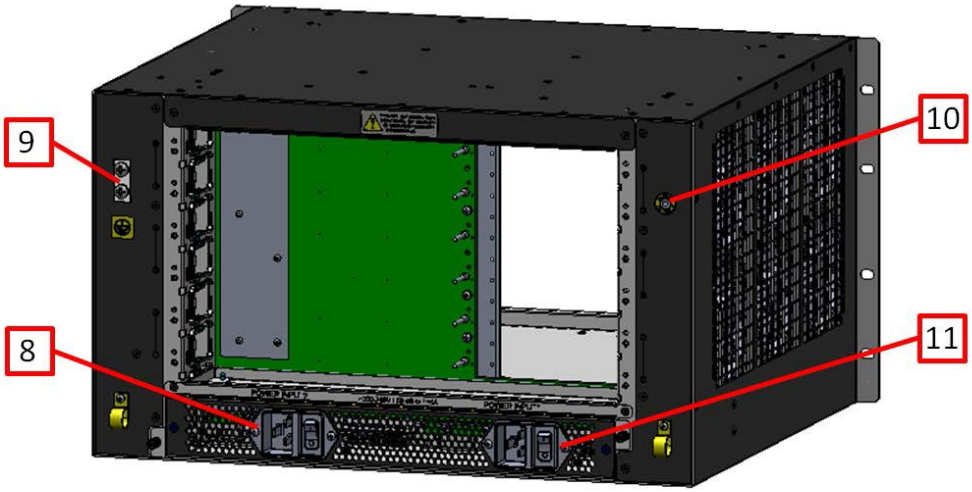
Figure 1: Front View



1. Fan Tray 1
2. ShMC 1 (optional)
4. ShMC 2 (optional)
5. Fan Tray 2
6. Air Filter
7. ESD Wrist Strap

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Figure 2: Rear View



8. Power input 2

9. Shelf Ground Terminal

10. ESD Wrist Strap

11. Power input 1

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3 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
- Two fan Tray slots

Within the Shelf, there is one fixed board-backplane. This board is completely passive and is not Field-Replaceable Units. The 6-slot ATCA monolithic backplane provides 40Gb/s connectivity (4 lanes with 10Gb/s).

3.1 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	

3.2 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).

3.3 Fabric Interface

The Fabric Interface in the ATCA Backplane is routed as dual star. See PICMG® 3.0 AdvancedTCA Base Specification for details. Triple replicated full Mesh interconnecting each ATCA slot is requested.

3.4 Synchronization Clocks

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

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3.5 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.

Table 3: Backplane topology for Dual Star

Connector		Channel	Logic slot #					
			1	2	3	4	5	6
P20	1	Sync Clk	Sync Clk	Sync Clk	Sync Clk	Sync Clk	Sync Clk	Sync Clk
	2							
	3	Update Channel	↔	↔	↔	↔	↔	↔
	4							
	5	Fabric Ch 15						
	6							
	7	Fabric Ch 14						
	8							
	9	Fabric Ch 13						
	10							
P21	1	Fabric Ch 12						
	2							
	3	Fabric Ch 11						
	4							
	5	Fabric Ch 10						
	6							
	7	Fabric Ch 9						
	8							
	9	Fabric Ch 8						
	10							
P22	1	Fabric Ch 7						
	2							
	3	Fabric Ch 6						
	4							
	5	Fabric Ch 5	6-1	6-2				
	6							
	7	Fabric Ch 4	5-1	5-2				
	8							
	9	Fabric Ch 3	4-1	4-2				
	10							
P23	1	Fabric Ch 2	3-1	3-2	2-2	2-3	2-4	2-5
	2							
	3	Fabric Ch 1	2-1	1-1	1-2	1-3	1-4	1-5
	4							
	5	Base Ch1	ShMC	ShMC	1-3	1-4	1-5	1-6
	6	Base Ch2	2-2	1-2	2-3	2-4	2-5	2-6
	7	Base Ch3	3-1	3-2				
	8	Base Ch4	4-1	4-2				
	9	Base Ch5	5-1	5-2				
	10	Base Ch6	6-1	6-2				

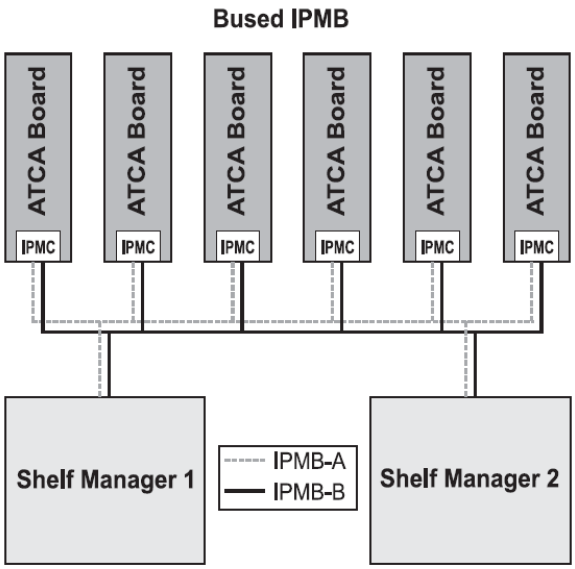
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3.6 Intelligent Platform Management Bus (IPMB)

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.

Figure 2: Bused IPMB



3.7 Shelf SEEPROM

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

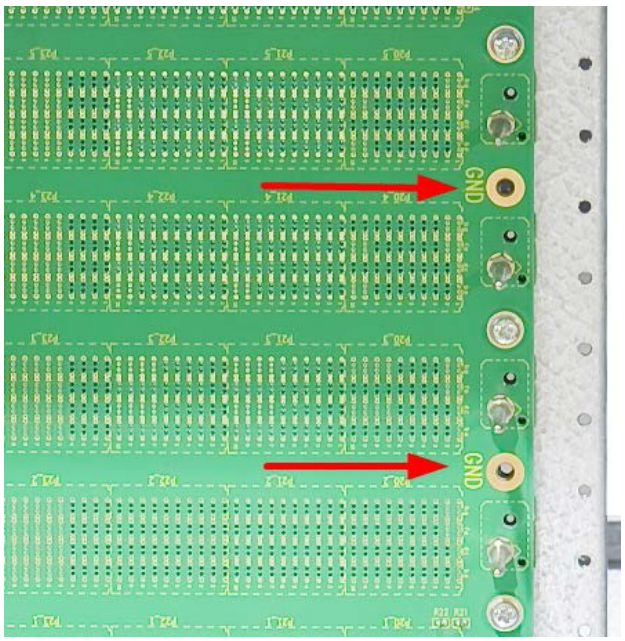
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3.8 Logic Ground

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 arrow must be fixed.

Figure 4: Logic Ground



By default, Logic Ground and Shelf Ground are isolated, the chassis is shipped without the mounting screws at the marked positions.

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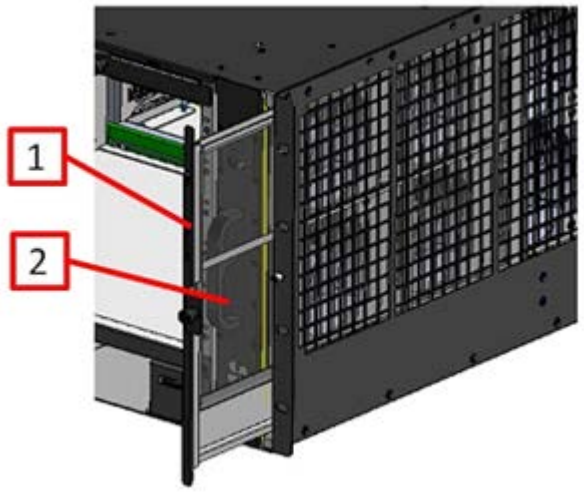
4 Air Filter

4.1 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.

Figure 3: Air Filter



1. Air Filter Tray *2. Filter Element*

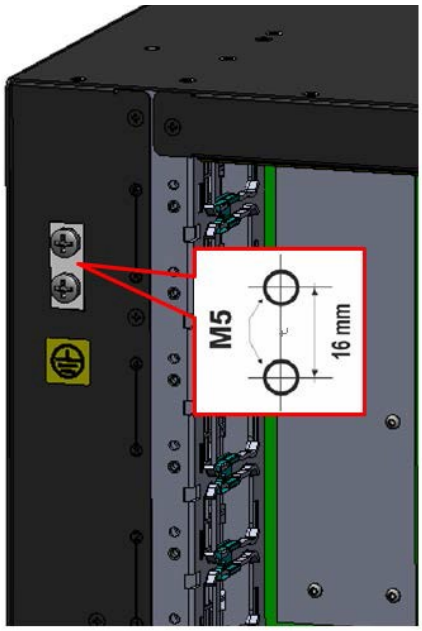
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5 Shelf Ground Connection

	**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 upper rear side. The Shelf ground terminal provides two threads (M5) with a 16.0mm spacing between thread centers to connect a two hole lug Shelf ground terminal cable.

Figure 4: Shelf Ground Terminal



Please note that in a typical telecom environment, the VRTN path of the -48V supply is grounded to Protective Earth (PE) of the building.

5.1 Specification of the Shelf Ground Connection Cable

Required wire size: AWG8

Required terminals: Use only two hole lug terminals. (Terminal used: *PANDUIT part no.* ***LCD8-14A-L***)

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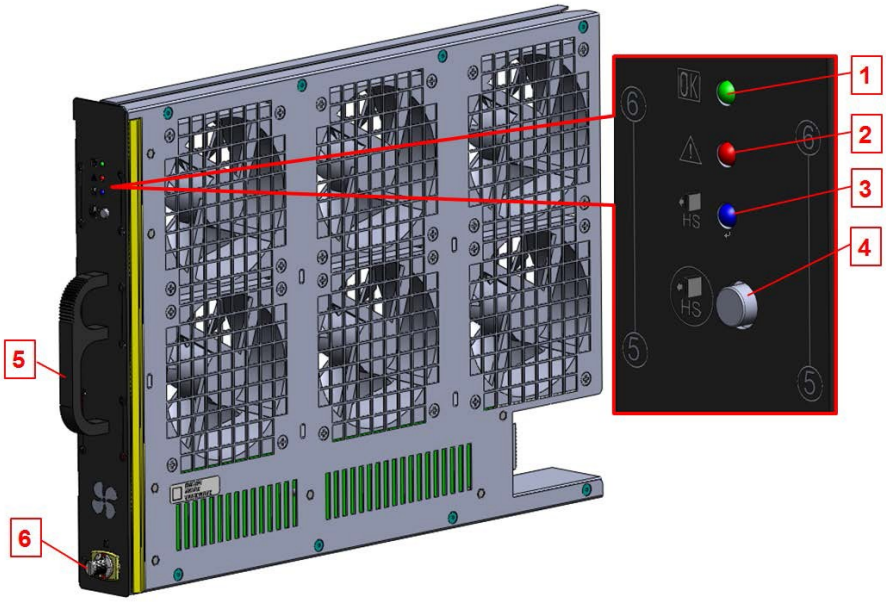
6 Fan Trays

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 intelligent FRUs and plugged in at the left and right front of the Shelf.

Each Fan Tray contains six 92mm fans (245m^3/h (146CFM) each). The Fan Tray is controlled via an onboard IPM controller.

Figure 5: Fan Tray



1. Fan Tray OK LED (green)

2. Fan Tray Fault LED (red)

3. Hot Swap LED (blue)

4. Hot Swap Push Button

5. Handle

6. Mini Compression Latch

6.2 Fan Control Model

The onboard IPM controller is located on the Fan Tray and has 2 operation modes:

6.2.1 Shelf Manager Mode

As soon as a Shelf Manager is plugged-in and becomes active, the IPM controller switches automatically into the Shelf Manager mode. The Shelf Manager performs management of the Fan Tray through the two independent bussed IPMB connections.

When the Fan Tray is first inserted into the system, the fans start at full speed and then decrease to the specified speed by Shelf Manager. The circuitry onboard the Fan Tray uses a PWM signal to control the speed of all the fans. Lower speeds reduce acoustic noise and power consumption and increase the lifetime of the fans.

The speed of each individual fan is monitored. If any of the fan speeds drops below the desired fan speed, a System Event Log (SEL) entry is logged by the Shelf Manager. The Shelf Manager then generates alerts and sets alarm conditions as necessary.

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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.

6.2.2 Autonomous Mode

When no Shelf Manager is present, the Fans are controlled by the IPM controller. The fan speed depends on the setting of DIP switch on board. With a Micro DIP switch you can select either the exhaust temperature from the left Fan Tray or the fixed fan speed as reference to control the fan speed.

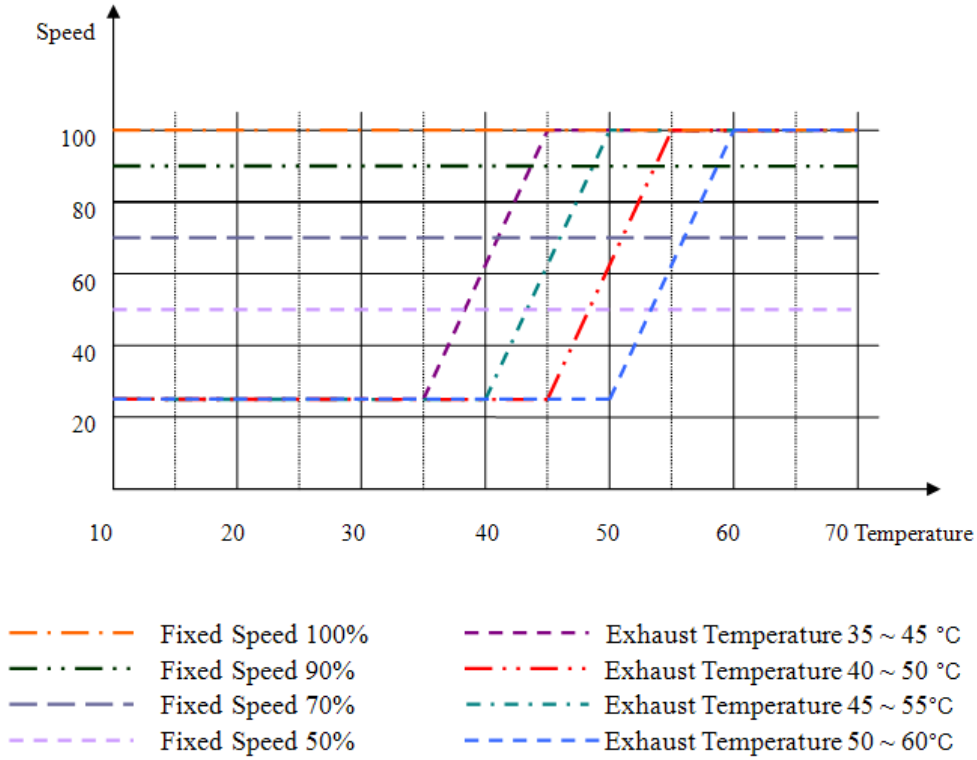
By default the fixed speed of 50% full speed is used to determine the fan speed. When setting up the DIP switch, "1" stands for on and "0" stands for off.



Table 4: Micro DIP switch settings

Bit1	Bit2	Bit3	Description
0	0	0	Fixed Speed, 50% of Full Speed
0	0	1	Fixed Speed, 70% of Full Speed
0	1	0	Fixed Speed, 90% of Full Speed
0	1	1	Fixed Speed, 100% of Full Speed
1	0	0	Exhaust Temperature 35 ~ 45 °C
1	0	1	Exhaust Temperature 40 ~ 50 °C
1	1	0	Exhaust Temperature 45 ~ 55 °C
1	1	1	Exhaust Temperature 50 ~ 60 °C

Figure 6: Fan Curves



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6.3 Fan Tray Signals

The Fan Tray provides signals for:

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

These signals are controlled by the IPM Controller devices on the Fan Tray PCB. The Shelf Manager has access to these signals via IPMB.

6.4 Fan Tray Indicators

The front panel includes a green Fan Tray OK LED, a red Fan Tray Fault 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 5: LEDs on Fan Tray front panel

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

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6.5 Fan Tray Connector Pin Assignment

Table 6: Fan Tray Connector Pin Assignment

Pin#	Signal	Description	Pin#	Signal	Description
A1	-48V_B	-48VDC Feed B	E1	-48V_A	-48VDC Feed A
A2	-48V_B	-48VDC Feed B	E2	-48V_A	-48VDC Feed A
A3	-48V_B	-48VDC Feed B	E3		
A4			E4		
A5	SCL_A	IPMB A Clock	E5	I2C_SCL_B	I2C B Clock
A6	SDA_A	IPMB A Data	E6	I2C_SDA_B	I2C B Data
A7	SCL_B	IPMB B Clock	E7	GND	Fan Tray Presence, connected to GND
A8			E8		
A9	VRTN_B	RTN Feed B	E9		
A10	VRTN_B	RTN Feed B	E10	VRTN_A	RTN Feed A
A11	VRTN_B	RTN Feed B	E11	VRTN_A	RTN Feed A
B1	-48V_B	-48VDC Feed B	F1	-48V_A	-48VDC Feed A
B2	-48V_B	-48VDC Feed B	F2	-48V_A	-48VDC Feed A
B3	-48V_B	-48VDC Feed B	F3		
B4			F4		
B5	I2C_B CONTROL	I2C B Line Busy Signal	F5	GND	Logic Ground
B6	SDA_B	IPMB B Data	F6	INT_I2C_A	Interrupt Signal of I2C A Line
B7	INT_I2C_B	Interrupt Signal of I2C B Line	F7	GND	Logic Ground
B8			F8	INT_ERROR	Check Error Signal
B9	VRTN_B	RTN Feed B	F9		
B10	VRTN_B	RTN Feed B	F10	VRTN_A	RTN Feed A
B11	VRTN_B	RTN Feed B	F11	VRTN_A	RTN Feed A
C1	-48V_B	-48VDC Feed B	G1	-48V_A	-48VDC Feed A
C2	-48V_B	-48VDC Feed B	G2	-48V_A	-48VDC Feed A
C3			G3		
C4			G4	SAP_PRESENT	Presence Signal of SAP
C5	PEM_PRESNET_L	Presence Signal of Left PEM	G5	I2C_SCL_A	I2C A Clock
C6	H2		G6	I2C_SDA_A	I2C A Data
C7	ERROR	Error Signal	G7	SHELF_PRESENT	Presence Signal of Shelf Manager
C8			G8	Monitor	Monitor Signal
C9			G9		
C10	VRTN_B	RTN Feed B	G10	VRTN_A	RTN Feed A
C11	VRTN_B	RTN Feed B	G11	VRTN_A	RTN Feed A
D1			H1	-48V_A	-48VDC Feed A
D2			H2	-48V_A	-48VDC Feed A
D3			H3		
D4			H4	INT_PCA9555_R	Interrupt Signal of Right PEM PCA9555
D5	INT_PCA9555_L	Interrupt Signal of Left PEM PCA9555	H5	+3.6V	
D6	PEM_PRESNET_R	Presence Signal of Right PEM	H6	I2C_A CONTROL	I2C A Line Busy Signal
D7	FAN_PRESENT	Presence Signal of Fan Tray	H7	INT_Monitor	Check Monitor Signal
D8			H8	FILTER_PRESENT	Presence Signal of Filter
D9			H9		
D10			**H10**	**VRTN_A**	**RTN Feed A**
D11			H11	VRTN_A	RTN Feed A

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6.6 Fan Tray IPMB Addresses

Geographic address pins H2 at the Fan Tray Backplane connector determine the hardware addresses of the devices.

Table 7: Fan Tray IPMB address

	HW-Addr.	IPMB-Addr.
Fan Tray Right	0x2D	0x5A
Fan Tray Left	0x2E	0x5C

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7 Power

	**Hazardous voltage!** *Before working ensure that the power is removed from the power connection cables.*

The Power Supplies are not included with the Shelf.

The Shelf accepts Huawei R4850 serial power supplies.

The Shelf can be powered with 230VAC line voltage or 240HVDC input depending on PSU type.

7.1 Introduction

Two pluggable AC power supplies are located at the front bottom side of the Shelf. The power supply units are plugged-in from the front side and are hot-swappable. To provide a redundancy they are arranged in a 1+1 configuration.

The Output voltage of the PSUs is 53.5V DC. Because the nominal supply voltage for ATCA systems acc. to the PICMG specification is 48V DC, all signal names in this Manual with exception of this chapter are related to 48V DC.

The PSUs are plugged into a Power Distribution Board (PDB) where the power is divided in 2 output branches towards the backplane.

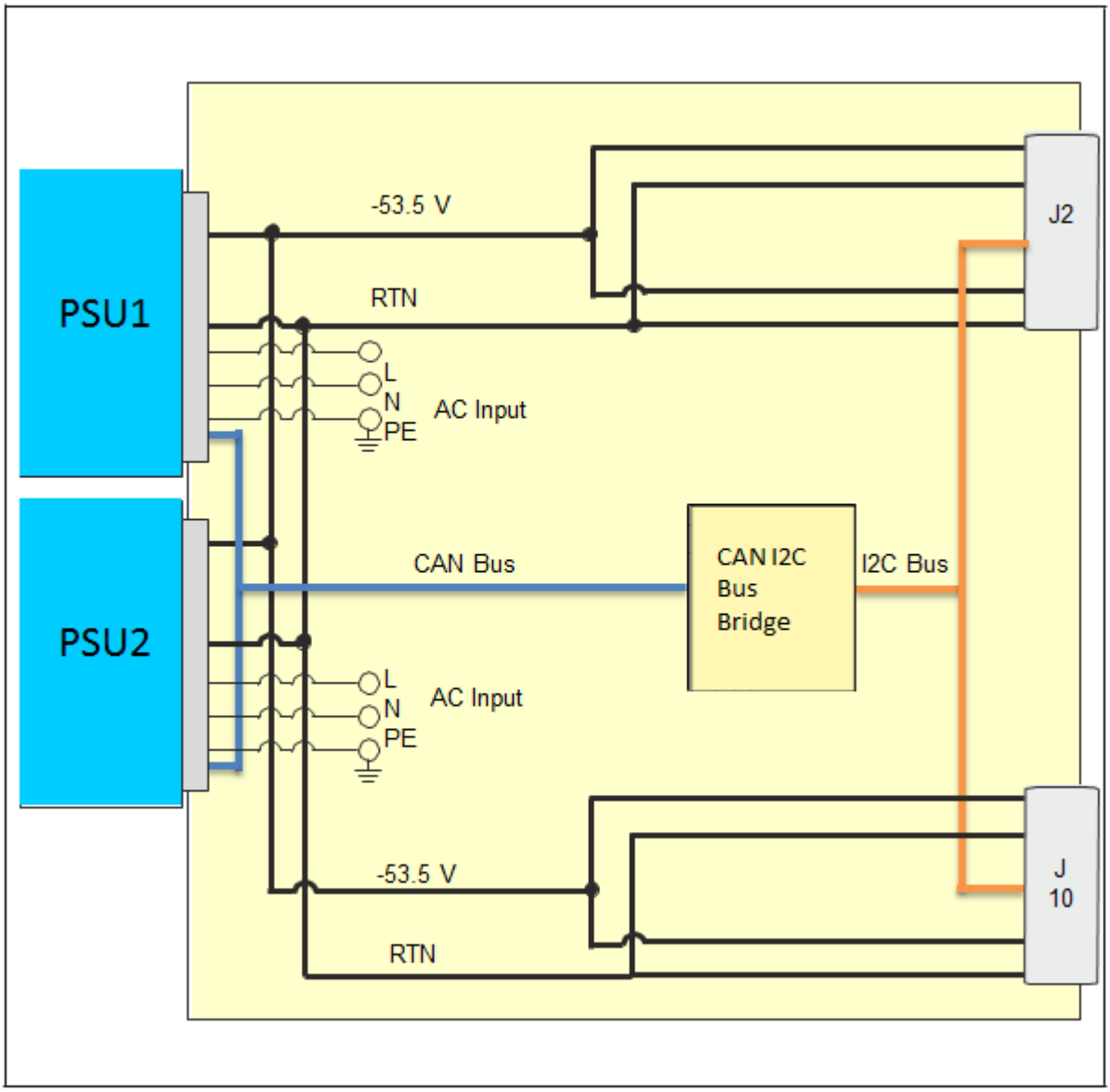
The power input is provided by an AC mains/line module with IEC 320-C20 connector with switch.

The R4850XX series PSU only support communication on the CAN bus, but not support communication on the I2C bus, on the Power Distribution Board, there is one functional modular to implement the CAN bus to I2C bus bridge so that the R4850XX series PSU can be managed through the I2C bus.

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7.2 Power Distribution

Figure 7: Power Distribution



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7.3 AC Power Supply Units (PSUs)

The AC PSUs with front-to-back airflow are hot-pluggable from the front side. The Shelf Manager can monitor the PSUs through the IPMC of the fan tray. The fan tray access the PSUs through an I2C bus to CAN bus bridge on the Power Distribution Board, since the PSUs only support CAN bus communication.

Table 8: Basic Specifications for the PSUs

230 V Operation	
Input Voltage nominal	230 VAC
Input Voltage Range max.	176V AC – 290V AC
Input Frequency Range	45 Hz - 66 Hz
Output Voltage	53.5V DC
Input Current	< 17 A
Output Power	3000 W
115 V Operation	
Input Voltage nominal	115 VAC
Input Voltage Range max.	85V AC – 175V AC
Input Frequency Range	45 Hz - 66 Hz
Output Voltage	53.5V DC
Output Current	< 17 A
Output Power	1250 W

See Huawei R4850XX Series Data Sheet for detailed information.

Figure 8: Power Supply Unit



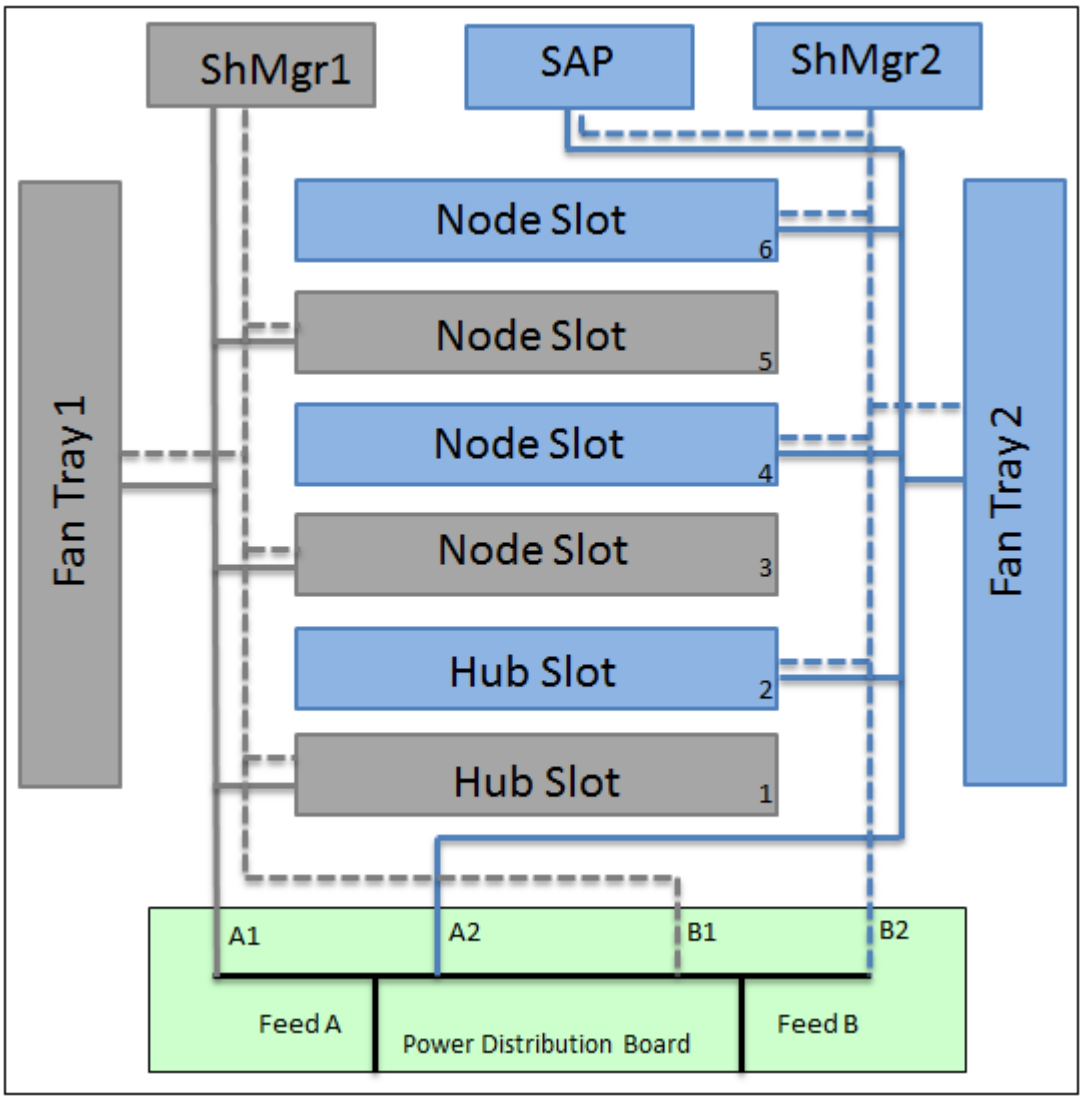
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7.4 Power Branches

Power branches within the Shelf originate from the PEM and powers all the blades, the Shelf Managers, and the Fan Trays. The Power is divided in 2 output branches towards the backplane.

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.)

Figure 9: Power Branches



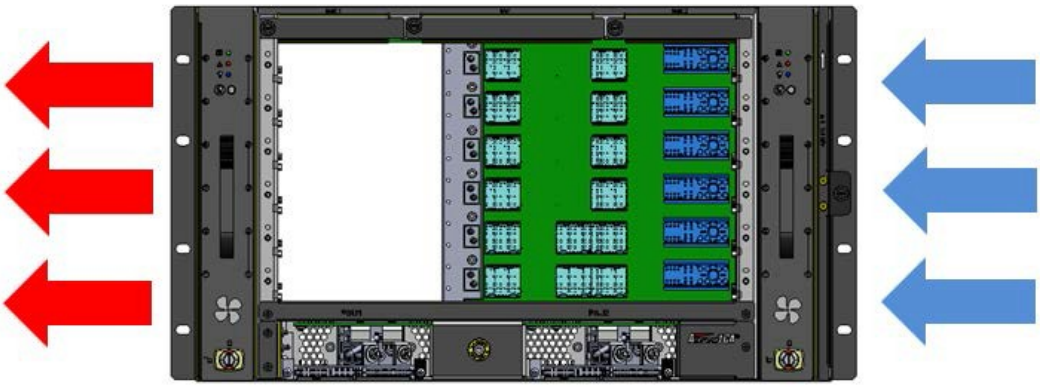
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8 Thermal

8.1 System Airflow Path

The 6 slots ATCA Shelf provides an airflow using two Fan Trays at right and left sides of the Shelf. 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 10: General airflow path for the 6U 6 slot ATCA Shelf



8.2 Cooling Capacity

The maximum system airflow (all fans at full speed) is 387.3 CFM.

The maximum air distribution is measured with front and RTM test boards. Front board impedance = 37 Pa pressure drop at 50 m³/h (30 CFM).

The maximum average per slot cooling capacity is:

- Front slot: 340 W with ΔT = 12 K
- Rear slot:35 W with ΔT = 12 K

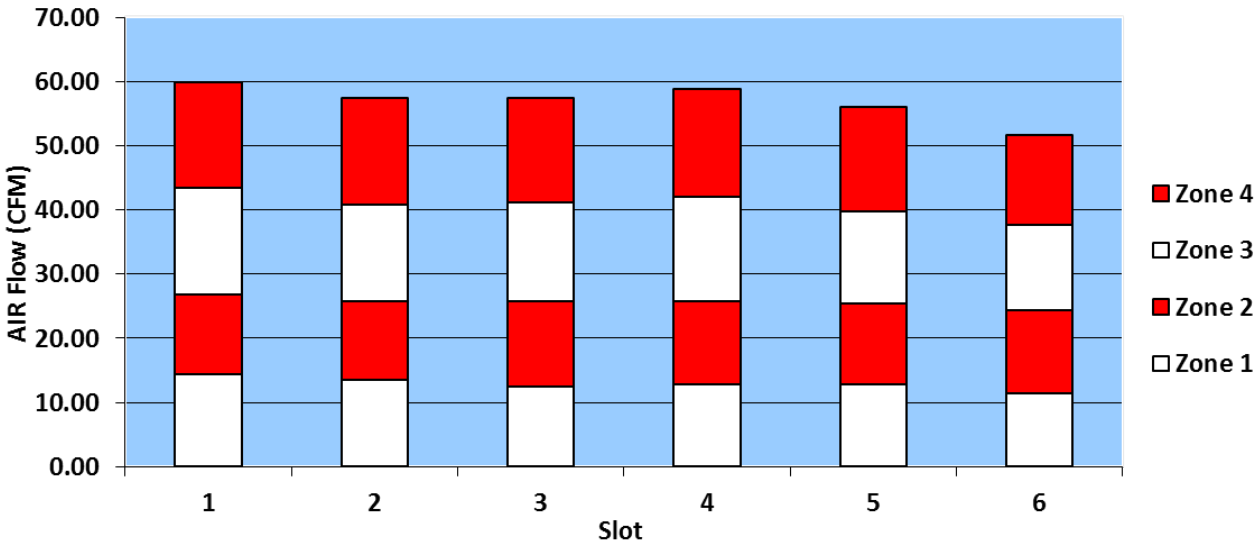
8.2.1 Front Board Air Distribution

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

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Chart 1: Front Boards - Slot Volumetric Flow

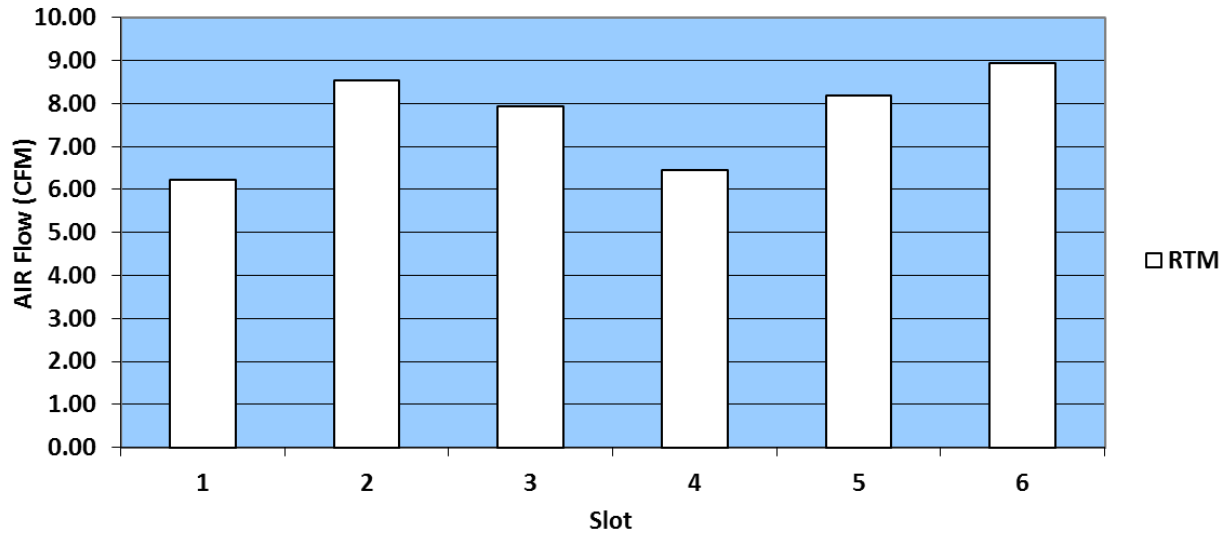


8.2.2 Rear Board Air Distribution

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

Chart 2: RTM's - Slot Volumetric Flow



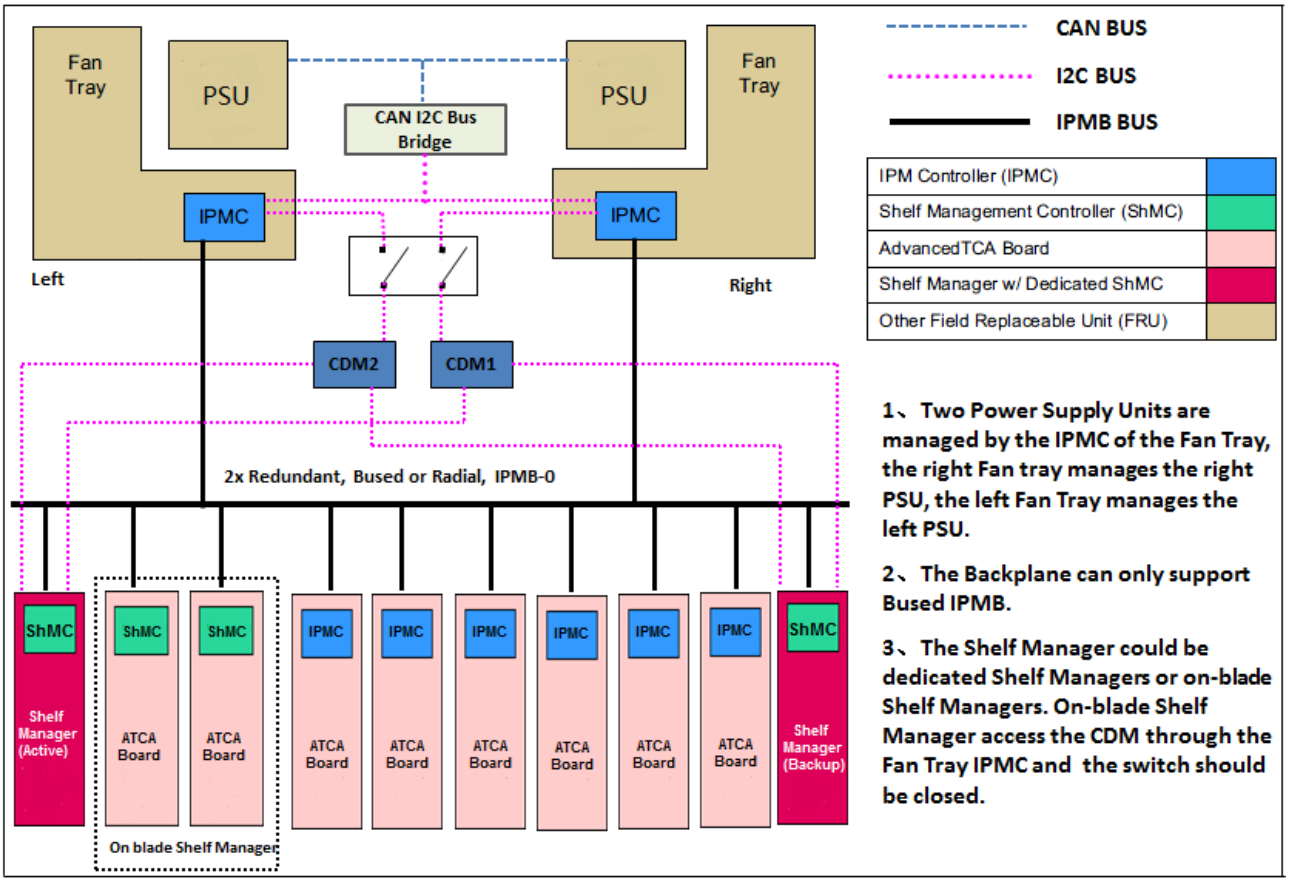
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9 Shelf Management

The ATCA Shelves are designed to work with two redundant Shelf Managers in dedicated Shelf Manager slots.

Upon request also a version with on-blade shelf management is available. With on-blade shelf management, the I²C components of the PEMs and the SEEPROM are connected to the internal I²C bus on the Fan Trays. The on-blade Shelf Manager has access to these components via the IPM controller of the Fan Trays.

Figure 11: Shelf Management



9.1 Shelf Managers

This section describes the Shelf Manager hardware. For explicit software documentation refer to:

- Pigeon Point Shelf Manager User Guide
- Pigeon Point Shelf Manager External interface Reference

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9.2 Introduction

The Shelf Manager is a 78mmX280mm board that fits into a dedicated Shelf Manager slot in an 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.

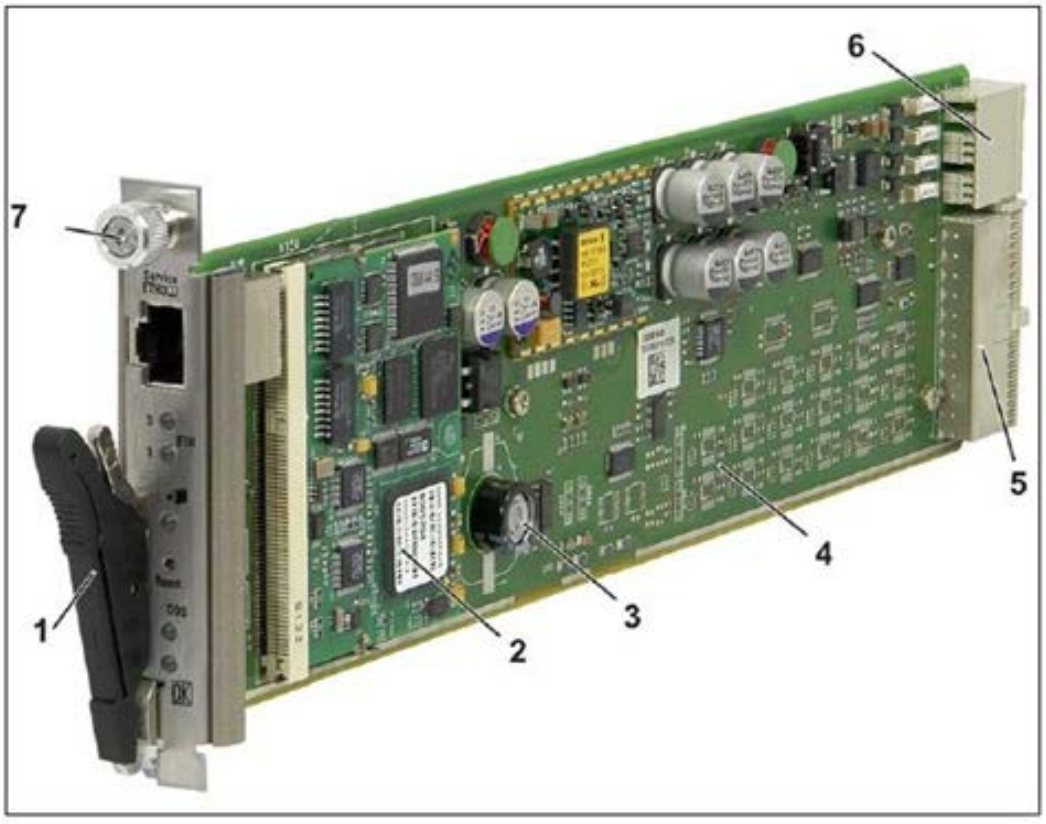
The Shelf management based on the Pigeon Point Shelf management solution for AdvancedTCA products.

The Shelf management software executes on the pigeon point Shelf Management Mezzanine 700 (ShMM-700), a compact SO-DIMM form-factor module, installed on the carrier board.

The carrier board includes several onboard 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.

To maximize availability, the ATCA Shelves are designed to work with two redundant Shelf Managers.

Figure 12: Shelf Manager

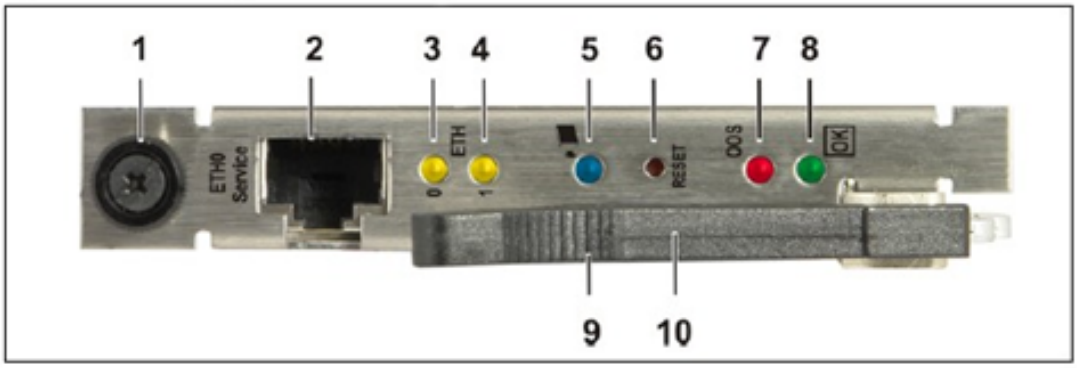


1	Extraction handle	5	Backplane Connector (J2)
2	ShMM-700	6	Backplane Connector (J1)
3	RTC Backup Capacitor	7	Fixing screw
4	Carrier Board		

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9.3 Front Panel Components

Figure 13: Shelf Manager Front Panel Components



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

9.4 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 (HA0, HA7) at the Backplane connector determine bit 0 and bit 7, bit 1...6 are hardware-coded on the Shelf Manager PCB.

Table 9: Hardware Address

	HW-Addr.	IPMB-Addr.
Primary Shelf Manager (left)	0x08	0x10
Secondary Shelf Manager (right)	0x09	0x12

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10 Technical Data

Table 10: Technical Data

Physical Dimensions	
Height	6U
Width	482.6 mm (19“)
Depth (w/o handles)	426.65 mm
Weight	
Shipping weight completely assembled with packaging	36 Kg
Shelf weight completely assembled	19 Kg
Power AC	
Input voltage nom.	115 VAC/230 VAC
Input voltage range	85....175 VAC / 176…. 290 VAC
Input Power Protection	< 17 A
Power and Cooling Capacity	
Front Boards	300 W/board
RTM	35 W/board
Environmental	
Ambient temperature	+5°C…+40°C (long term) -5°C…+55°C (short term)
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	EN50116 Mains Input primary - PE: 2200 VDC -48 V/RTN - PE: 700 VDC

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10.1 Shelf Mechanical Dimensions

All dimensions below are in mm.

Figure 14: Front View Dimensions

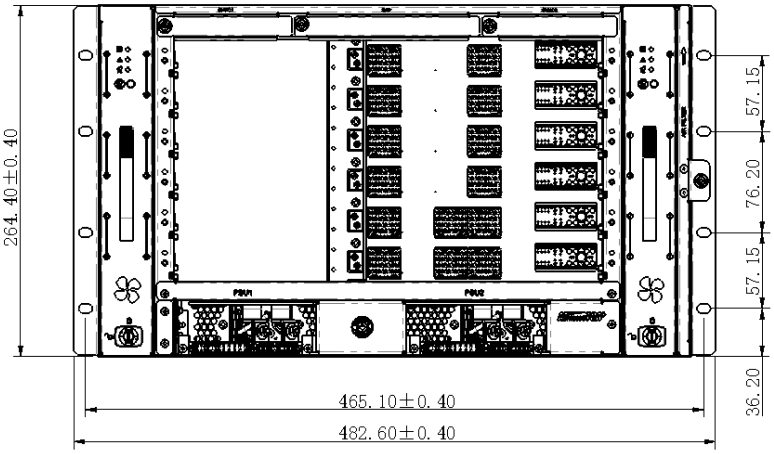
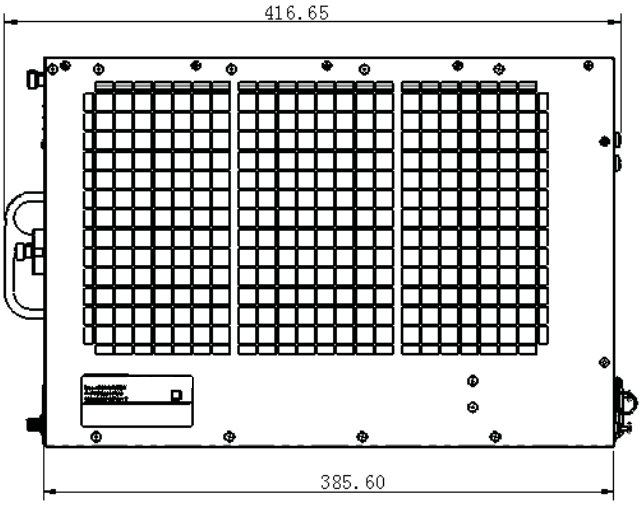


Figure 15: Side View Dimensions



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