VadaTech VT81x - (x = 0, 1, 2, 3, 4, 5) MicroTCA.4 Chassis Series

Product Reference Guide

December 2023

Version 1.7

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Revision History

Revision	Description of Change	Revision Date
1.0	Initial release for VT81x Chassis	October 2013
1.1	Minor updated based on technical review comments	November 2013
1.3	Updated to include VT812, VT813 and VT814	September 2015
1.4	Updated to include VT815 information Updated JSM section	September 2016
1.5	Additional notes added for chassis AC power supply to sections 3.5 and 5.5	November 2017
1.6	Updated backplane speed	July 2019
1.7	Updated to include VT810 information	December 2023

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1 Introduction

1.1 Purpose

This document describes the VT81x series chassis based on the MicroTCA.4 specifications. The VT81x chassis can be used to build fully redundant MicroTCA systems that require 40 Gigabit backplane connectivity.

1.2 Applicable Products

- VT810
- VT811
- VT812
- VT813
- VT814
- VT815

1.3 Document References

1.3.1 Specifications

VT81x series is compliant with following specifications:

- *PICMG® MicroTCA.0 Base Specification*
- *PICMG® AMC.0 R2.0 Advanced Mezzanine Card Base Specification*
- *PICMG ® AMC.1 Advanced Mezzanine Card PCIe and Advanced Switching Environments Specifications*
- *PICMG® AMC.2 Advanced Mezzanine Card Ethernet Specification*
- *PICMG® AMC.3 Advanced Mezzanine Card Storage Specifications*
- *PICMG® AMC.4 Advanced Mezzanine Card Serial Rapid IO Port Specifications*

1.3.2 Related Documents

The following documents provide information related to VT81x series:

- *Datasheet for your device*
- *UTC007/8 User Manual*
- *VadaTech MicroTCA MCH Getting Started Guide*
- *VadaTech MicroTCA Shelf Command Line Interface Reference Manual*
- *VadaTech MicroTCA Carrier Command Line Interface Reference Manual*
- *VadaTech MicroTCA Management Interface Specification*
- *VadaTech MicroTCA Carrier SNMP Interface Reference Manual*

1.4 Acronyms Used in this Document

Table 1: Acronyms

Acronym	Description
AMC	Advanced Mezzanine Card
BSP	Board Support Package
CPU	Central Processing Unit
DIP	Dual In-line Package
ECC	Error Correction Coding
EMMC	Enhanced Module Management Controller
FRU	Field Replaceable Unit
GbE	Gigabit Ethernet
GHz	Gigahertz
GND	Ground
IPMB	Intelligent Platform Management Bus
IPMI	Intelligent Platform Management Interface
LED	Light Emitting Diode
MHz	Megahertz
MicroTCA or MTCA	Micro Telecommunications Computing Architecture
MMC	Module Management Controller
PCIe	Peripheral Component Interconnect Express
PICMG	PCI Industrial Computer Manufacturers Group
SCP	Secure Copy Protocol/Program
SSH	Secure Shell Protocol
SDR	Sensor Data Record
SerDes	Serializer-Deserializer
USB	Universal Serial Bus
XAUI	10 Gigabit Media Independent Interface

1.5 Conventions Used

The following conventions are used in this document:

WARNING - Important information, when ignored can cause harm. serious injury or death to the User is described next to this symbol

CAUTION - Important information, when ignored can cause serious damage to the device is described using this symbol

NOTE - Important information useful to the reader is described next to this symbol

`Command` ***Any CLI commands are described with this font style***

2 VT81x Overview

VT81x is a collection of MicroTCA.4 chassis offering various options for MCH, AMC and power modules. VT81x supports up to 12 mid-size, double width AMCs in the front and up to 12 mid-size, double width RTMs in the rear of the chassis.

VT81x chassis support full redundancy with dual MCH (VT814 only has a single MCH), up to 4 power modules and dual cooling unit options. VT81x can accept any AMC cards that are AMC.1, AMC.2, AMC.3 or AMC.4 compliant.

2.1 Features

The summary of VT81x chassis features.

- 40G* Backplane with no active components
- Clocks: FCLKA, TCLKA, TCLKB, TCLKC and TCLKD are available to each slot.
- Radial I2C bus to each AMC
- High speed routing on low tangent loss material, PCB
- High speed MicroTCA connectors (12.5 GHz)
- Direct point-to-point backplane connections between AMC slots on ports 2-3, 12-15 and 17-20
- AMC Tongue 2 connectors (**on VT815 only**)
- Redundant FRU information
- Redundant carrier locator
- Telco Alarms
- ESD jack at the top front
- JTAG Switch Module (JSM) slot (optional)
- RoHS compliant

Table 2: VT81x Product Comparison 1

Features	VT810	VT811	VT812
Dimensions	19″ x 7U x 14.9″	19″ x 8U x 14.9″	19″ x 2U x 14.2
AMC Slots	12 mid-size, double module AMCs	12 mid-size, double module AMCs	8 AMCs (Four mid-size and up to four standard single or double module AMCs)
Backplane Routing Layers	30	30	30
MCH Slots	2	2	2
PM Slots	4	4	2
Telco Alarm Module	DA200	DA200	DA232
Cooling Unit	VT091 x2	VT091 x2	VT102 x2
Cooling Type	Bottom to top	Front to back	Right to left
Power	Dual 1000W AC or 396/796 W DC	Dual 1000W AC	Dual 500W Universal AC or dual 796W DC
Compliant specifications	AMC.1, AMC.2, AMC.3 and/or AMC.4	AMC.1, AMC.2, AMC.3 and/or AMC.4	AMC.1, AMC.2, AMC.3 and/or AMC.4
Redundancy	Full redundancy	Full redundancy	Full redundancy

*Backplane designed for the usage of high speed protocol such as 40GbE / PCIe Gen3 / SRIO Gen 2. Backplane is agnostic and the protocol is defined by the switch modules and AMC modules.

Table 3: VT81x Product Comparison 2

Features	VT813	VT814	VT815
Dimensions	19" x 8U x 14.9"	19" x 2U x 14.2"	19" x 9U x 14.9"
AMC Slots	12 mid-size double modules in front with 12 mid-size, double-modules in the rear	6 mid-size, double module AMCs and RTMs	12 full size, double module AMCs and RTMs
Backplane Routing Layers	30	28	34
MCH Slots	2	1	2
PM Slots	4	2	3
Telco Alarm Module	DA200	DA232	DA200
Cooling Unit	VT101 x2	VT102 x2	VT103 x2
Cooling Type	Front to back	Right to left	Front to back
Power	Four 1100W AC	Dual 500W Universal AC or dual 796W DC	Triple 1100 W (n+1) 90 to 246 VAC, 47-63 Hz
Compliant specifications	AMC.1, AMC.2, AMC.3 and/or AMC.4	AMC.1, AMC.2, AMC.3 and/or AMC.4	AMC.1, AMC.2, AMC.3 and/or AMC.4
Redundancy	Full redundancy	Redundant PM and CU	Full redundancy
Additional features	-	–	Tongue2 connectivity for all AMC slots

2.2 Compatible Modules

2.2.1 VT81x Inclusive Modules

The following modules are shipped with the VT81x chassis.

- Cooling Units – VT81x chassis uses cooling units, in redundant configuration. The cooling unit fan trays are interchangeable.
- Telco alarm module.

2.2.2 Optional Modules

The following modules can be ordered with the VT81x chassis or purchased separately.

- Power Modules – VT81x chassis allows up to four Power Modules to be used, in redundant configuration. The optional power modules can be included with the VT81x, by selecting the correct ordering option (A).
- JSM – VT81x chassis can be used with a JTAG Switch Modules (JSM). A JSM can be ordered along with the VT81x chassis by selecting the appropriate ordering option, refer to the ***datasheet*** for correct ordering option.

2.2.3 Additional Modules

The following modules can be used with the VT81x and must be purchased separately.

- MCH – VT81x chassis allows up to two MCHs (except VT814), in redundant configuration. UTC001, UTC002, UTC004 or other third party MCH can be used with a VT81x chassis.

NOTE: The latest versions of the VT81x chassis can accept double width MCHs with RTM support.

- AMC – VT81x series will work with any AMC.x (where x = 0, 1, 2, 3 or 4) compliant AMCs. refer to ***Product Specific Description*** for exact number of AMC slots on each model.

3 Functional Description

3.1 IPMI LEDs

The IPMI LEDs follow AMC specifications. The colors and meanings of the IPMI LEDs are described in *Table 4*. The IPMI LEDs are found on all removable Field Replaceable Units (FRU) such as an AMC, Fan trays Power Module or Cooling Unit.

Figure 1: IPMI LEDs

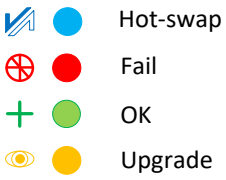


Table 4: IPMI Staus LEDs

Name	Color	Description
Hot Swap	Blue	Indicates the hot-swap state, per PICMG 3.1 specification. OFF: Module active ON: OK to remove the module BLINKING: Hot-swap/power transition in progress
Fail	Red	OFF: No fault ON: Non-recoverable fault, indicates that the IPMC has not detected a good power. BLINKING: Recoverable fault
OK	Green	OFF: No payload power ON indicates that the IPMC has enabled power and payload power OK BLINKING: Payload power OK, but held in reset (e-keying in process or failure)
Upgrade	Amber	OFF: Normal BLINKING: Firmware, SDR, or FRU upgrade is in progress

NOTE: At power-up, the hot swap handle state is closed. Pushing the Hot-swap button once toggles the handle state to open. Pushing the Hot-swap button again toggles the handle state to Closed. The cooling unit tray overlay provides labels to indicate the physical location of the front side modules such as AMCs, MCH and Power Modules.

3.2 Serial Port Access

3.2.1 RS-232 Micro USB Interface

The micro USB connectors to the RS-232 port provides a serial console connection to the Power Modules. A pre-made cable assembly that converts the micro USB form factor into a DB9 connector (VadaTech P/N: CBL-DB9MUSB1) is available for connecting to this port.

These ports operate with 115200-8N1-NOFLOW settings, and the port pinout is described in *Table 5*.

Table 5: RS-232 Port Pinout

Pin	Signal
1	Open
2	Receive
3	Transmit
4	Open
5	Signal GND
SHLD	Chassis GND

NOTE: Do not plug USB devices into the "RS-232" port as there may be a risk of damage. Even though the connector accepts micro USB cables, this port is not electrically compatible with USB devices.

3.3 Cooling Unit

The VT81x chassis uses two cooling units, in redundant configuration. One cooling unit is considered as the air intake unit and the second unit considered as the air exhaust unit. A chassis air filter is located near the intake fan tray to prevent dust from entering the chassis. There is a set of intake and the exhaust cooling fans over the RTM section as well. refer to *Product Specific Description*, for more information on Chassis airflow.

3.3.1 Sensors

The cooling units contain several sensors which are monitored by the carrier manager on the primary MCH used in the VT81x chassis. The following sensors are available with a VT81x.

3.3.1.1 Temperature Sensors

Each cooling unit includes up to 9 temperature sensors to monitor the operating conditions. The temperature sensors monitor the air temperature and the temperature difference between the intake and exhaust air temperature provides information about the amount of heat dissipated by the chassis. The temperature sensors distributed along the fan trays, indicate the hot and cold zones within the chassis.

The default operating conditions for the temperature sensors are:

- Lower non recoverable limit = –5°C
- Upper non critical limit = +65°C
- Upper critical limit = +80°C

NOTE: The default sensor limits can be updated by using the ScorpionWare™ system manager software but the updated values will be cleared on power cycle.

3.3.1.2 Filter Present Sensor

An optical sensor on the intake fan tray detects the presence/removal of the air intake filter. When there is no filter present the sensor detects this and creates a major alarm event. When the user issues a "`get_diagnostics`" command, the major alarm event will list the output and the major alarm indicator will turn ON.

3.3.1.3 Telco Active Sensor

Only one of the cooling units can manage the telco alarm. The telco active sensor determines which cooling unit (when two CU are used) is in control of the telco alarm.

3.3.1.4 Power Switch Sensor

The cooling unit controlling the telco alarm monitors the chassis power switch. The power switch can be used as a soft-shutdown to safely for the chassis.

3.3.2 Telco Support and Failover

Either cooling units (CU) can act as the Telco Device for the Carrier, but only one cooling unit will be active telco device. The active CU will respond to Telco requests from the Carrier, and will include the TELCO STATUS sensor record in its SDR. If the active CU is removed, the other CU will become active and will act as the Telco Device.

NOTE: Do not plug USB devices into the "CPU RS-232" port as there may be a risk of damage. Even though the connector accepts micro USB cables, this port is not electrically compatible with USB devices.

3.4 Telco Alarms

All VT81x chassis provides a Telco Alarm Module (TAM) to notify the user of any problems detected in the chassis. The VT81x chassis uses DA200 and DA232 daughter cards to implement the telecom alarm interface as described in *Table 2: VT81x Product Comparison 1*.

VT810, VT811, VT813 and VT815 uses DA200 for Telco Alarm module.

Figure 2: DA200 Front Panel

VT812 and VT814 uses DA232 for Telco Alarm Module.

Figure 3: DA232 Front Panel

3.4.1 Telco Alarm LEDs

- The "Active 1" and "Active 2" LEDs indicate which Cooling Unit is representing the Telco device to the Carrier Manager. Normally, "Active 1" will be ON, indicating that the lower CU is active
- The Critical, Major, and Minor Alarm LEDs indicate the state of the alarms. When an alarm is active, the corresponding LED will be ON
- The Power Good LED reflects the power state of the Telco Alarm Module
- The Chassis Power OFF indicator (Red LED) is ON, when the PWR switch is set to OFF position

3.4.2 Telco Alarm Switches

The TAM has two physical switches:

- The Soft Power Switch (PWR) is used to send a "Chassis Control" request to the Carrier Manager. This will cause a controlled power-down (or power-up) of all FRUs in the Carrier. For normal operation set this switch to ON position.
- The Telco Alarm Cutoff button (TEL in DA200 and ALARM RESET in DA232) is used to engage the Telco Cutoff, turning OFF the external Telco alarms. The alarm LEDs will not change, but the external alarm device if any, will be turned OFF. The Telco Cutoff can be disengaged using the Set Telco Alarm State ATCA Command. When disengaged, the external Telco alarms will turn back ON.

3.4.3 Telco Alarm Connector

This connector is used to drive an external alarm device.

Figure 4: Telco Alarm Connector

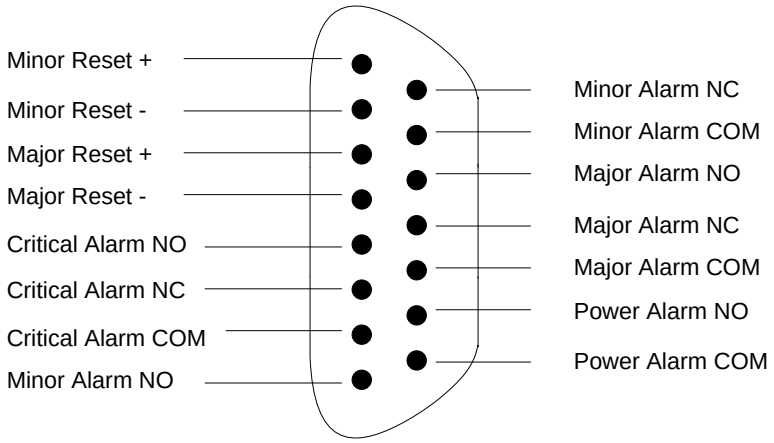


Table 6: Telco Alarm Connector Pinouts

Pin Name	Description
Minor Reset +	Minor alarm reset, positive polarity
Minor Reset -	Minor alarm reset, negative polarity
Major Reset +	Major alarm reset, positive polarity
Major Reset -	Major alarm reset, negative polarity
Critical Alarm NO	Critical alarm relay, normally open
Critical Alarm NC	Critical alarm relay, normally closed
Critical Alarm COM	Critical alarm relay, common path
Minor Alarm NO	Minor alarm relay, normally open
Minor Alarm NC	Minor alarm relay, normally closed
Minor Alarm COM	Minor alarm relay, common path
Major Alarm NO	Major alarm relay, normally open
Major Alarm NC	Major alarm relay, normally closed
Major Alarm COM	Major alarm relay, common path
Power Alarm NO	Power alarm relay, normally open
Power Alarm COM	Power alarm relay, common path

3.5 FRU Information

FRU information describes the chassis backplane topology to the chassis MCH controllers. The information is typically held in an EEPROM attached to the chassis Telco board or attached to the chassis backplane.

3.6 Power Module

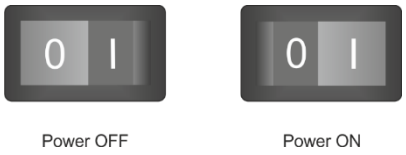
It is important to only apply AC power to a power module when it is firmly installed in a chassis. Applying AC power to a power module outside that chassis may cause equipment damage.

The Power Module (PM) gets its power from a swappable power supply, also called Power Entry Module or PEM. The PEM FRU Inventory is read when the power is first turned on to determine the PM power capability.

3.6.1 Power Switch

In order for the system to run, the PWR switch must be in the "ON" position. The Power Switch directly controls the removable power supplies. When the switch is in OFF position, the power is turned OFF to the entire Carrier, except for PM management power.

Figure 5: PWR Switch

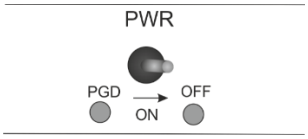


3.6.2 Soft Power Switch

The Soft Power Switch (PWR) on the Telco Alarm modules is used to send a "Chassis Control" request to the Carrier Manager. This will cause a controlled power-down (or power-up) of all the FRUs in the Carrier.

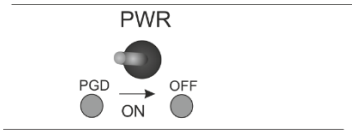
For normal operation, the soft Power switch is set to ON position. See arrow label for indication of ON position.

Figure 6: Soft Power Switch in ON position



To request a controlled shut-down of the chassis, toggle the switch to the OFF position. Note that the OFF LED indicator and label are on the right side of the switch but move the switch towards the **Left** to initiate a chassis shut-down.

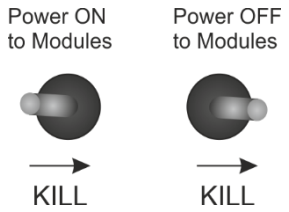
Figure 7: Soft Power Switch in OFF position



3.6.3 Kill Switch

Some chassis have a KILL switch. The KILL switch must be away from the direction of the arrow to supply power to the modules in the chassis. To shut down the power to the modules move the KILL switch towards the direction of the arrow as shown in *Figure 8*. When switch is in "KILL" direction, all power to the chassis is cut, except for management power for Power Module.

Figure 8: Kill Switch Usage



3.6.4 Power Module Command Line Interface

The integrated PM implements a Command Line Interface (CLI) to provide power and temperature status independently of the MCH. Access to this interface is provided by the serial RS232 port on the panel. The serial port is a female micro-USB connector. To connect this serial port to a standard DB9 connector, use the cable provided with the carrier, part number CBL-DB9MUSB1 (Use part number CBL-DB9MUSB2 for **VT815)**. The serial interface is RS-232, running at 115200 baud, 8 data bits, no parity, one stop bit (115200, N81).

The common CLI provided by VadaTech MicroTCA Power Modules is described in the VadaTech MicroTCA Power Module Command Line Interface Reference Manual. In addition to the common functions, this version of the CLI provides the status of the removable power supplies as shown in *Figure 9*.

Figure 9: Power Module Status

```
PEM 1:
  Present: Yes
  Temperature: OK.
  Fan: OK.
  AC Input: Present.
  DC Output: OK.

PEM 2:
  Present: Yes
  Temperature: Over Temp.
  Fan: Failed.
  AC Input: Present.
  DC Output: Bad.
```

The following status is shown for each Power Entry Module (PEM):

Table 7: Power Module Status Display

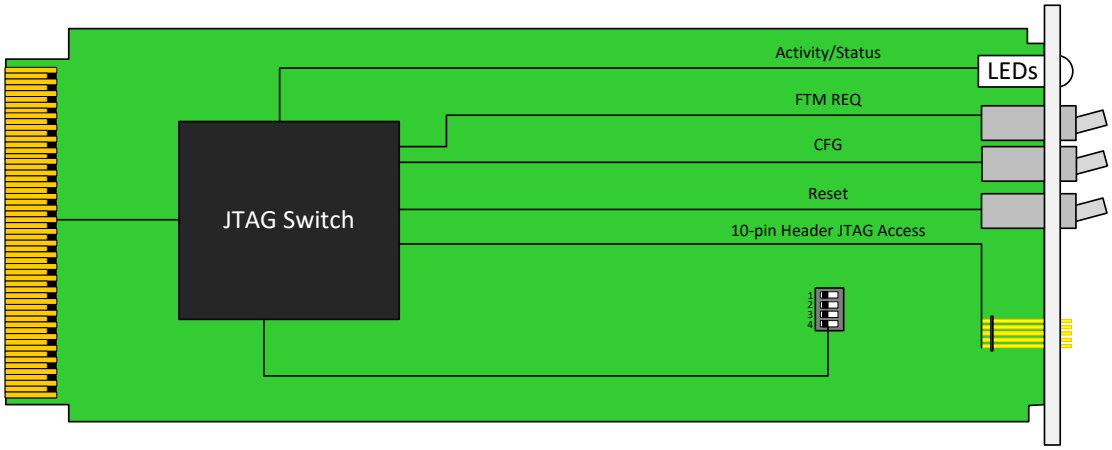
Status	Description
Present: Yes or No	If the PEM is not present, the remaining fields will not be displayed
Temperature: OK or Over Temp	This is the PEM's internal temperature status
Fan: OK or Failed.	This is the status of the PEM's internal fans
AC Input: Absent or Present	This is the status of the external power connector on the PEM
DC Output: OK or Bad	This is the status of the power between the PEM and the carrier. This status can be bad as a result of a temperature, fan or AC Input failure
Unknown	Indicates a failure of the PM's Management Controller.

The PM will report changes in PEM status as they occur, regardless of which screen is displayed.

3.7 JTAG Switch Module - JSM

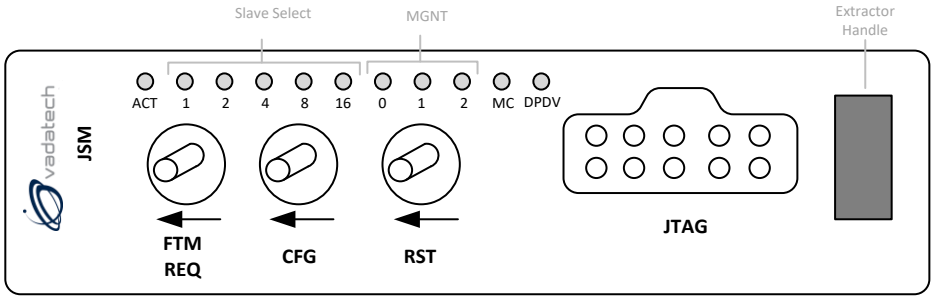
The VT81x chassis that provide an optional JTAG Switch Module (JSM) provides JTAG support to all JTAG-capable Modules in the system. Refer to the ***datasheet*** of your device for more information on JSM ordering options. The front connector is a standard 0.1 header which mates to most JTAG modules. The module provides transparent communication between the Master and a selected secondary port. All configuration modes use an IEEE1149.1 TAP controller. The JTAG can operate with a clock up to 50 MHz.

Figure 10: Functional Block Diagram of a JSM



3.7.1 JSM Front Panel

Figure 11: Example Front Panel of a JSM



NOTE: The JSM shown in Figure 11 is for illustration of ports and LEDs available on a VadaTech JSM. The actual layout and labels on your JSM front panel may be different.

3.7.1.1 JSM Toggle Switches

JSM modules have three toggle switches on their front panel

- The FTM REQ switch is used to request JTAG master access for the front connector.
- The CFG switch allows configuration of the JTAG. Turn ON to configure the JSM through the front connector.
- The RST switch resets the JTAG switch.

3.7.1.2 JSM LEDs

The LEDs present on the front panel of the JSM and their meanings are described in *Table 8*.

Table 8: JSM Front Panel LEDs

LED	OFF	ON
ACT	JSM is OFF	JSM is active
Slave Select 1, 2, 4, 8, 16	Slave port not selected	The combination of LEDs indicates the port is selected as slave for JTAG use
MGNT 0	-	Front or Rear connector
MGNT 1	-	MCH 1
MGNT 2	-	MCH 2
MC	No conflict	Indicates JSM Master conflict
DPDV	-	Bit for Deselect Port Data Value (DPDV) is set in the Device Configuration Register

For more information on detailed configuration of JSM, refer to the *JSM User Manual*.

NOTE: When a VT81x chassis is ordered without a JSM module, a removable filler panel is installed in the JSM slot to maintain the chassis air flow.

3.7.1.3 Header Pinout

The JSM provides a 10-pin header as described in *Table 9*.

Table 9: JSM Header Pinout

Pin	Description
1	TCK
2	GND
3	TDO
4	See *Table 10*
5	TMS
6	See *Table 10*
7	See *Table 10*
8	TRST
9	TDI
10	ND

3.7.2 Configuration

Each JSM has a 4-position DIP switch on the PCB, which can be used to configure the ports of the JSM, as described in *Table 10*.

Table 10: JSM DIP Configuration

SW	OFF	ON
1	Selects front panel connector as JTAG port	Selects rear AMC connector as JTAG port
2	No connection	Front panel pin 4 is set to +3.3 V
3	No connection	Front panel pin 6 is set to +3.3 V
4	No connection	Front panel pin 7 is set to +3.3 V

3.7.3 JSM Installation

The card is not hot swappable and should only be removed when the chassis is powered off.

To insert the card:

1. Pull out the handle until it stops.
2. Locate the JSM slot in the chassis.
3. Insert the card into the JSM slot guide rails and push on the front panel firmly until it is fully seated into the connector. If the card does not go fully in, do not force it and instead remove it and check for proper orientation or obstructions.
4. Once fully inserted the Active LED should go to solid red.

To remove the card

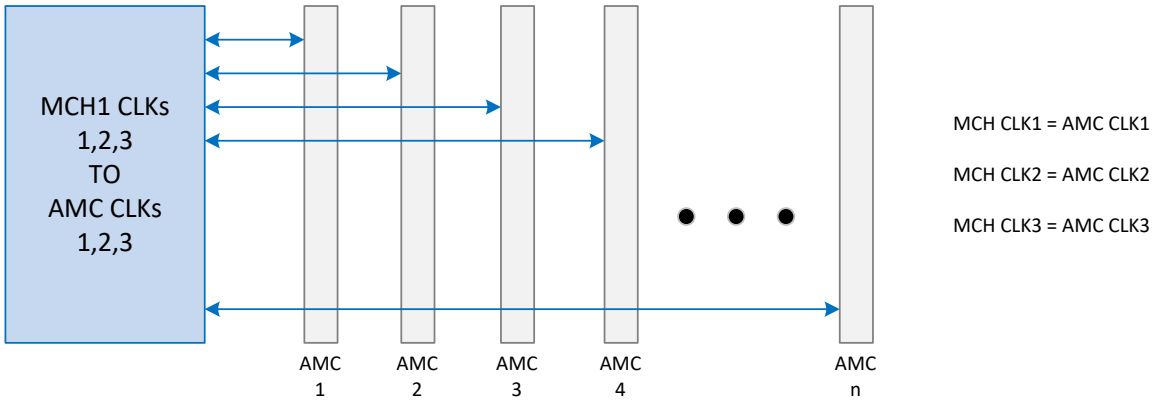
1. Power OFF the chassis.
2. Pull out the handle until it stops to unlatch the card from the carrier.
3. Continue to pull the handle straight out firmly to remove the card from the carrier.

3.8 Clock Options

The VT81x series provide non-redundant clock networks connecting MCH clocks CLK1, CLK2 and CLK3 to the AMC clocks CLK1, CLK2 and CLK3 using a dedicated line as shown in *Figure 12*.

CLK3 can be assigned as a Telco clock or a Fabric clock as per AMC.1 specification. When CLK3 is needed, Fabric B will be partially provided only on ports 1 – 6 and CLK3 is routed from Fabric B to ports 1 – 12.

Figure 12: Non-redundant Clock Topology



In redundant configuration CLK1 of MCH1 is connected (point-to-point) to each AMC CLK1 and CLK1 of MCH2 is connected (point-to-point) to each AMC CLK3.

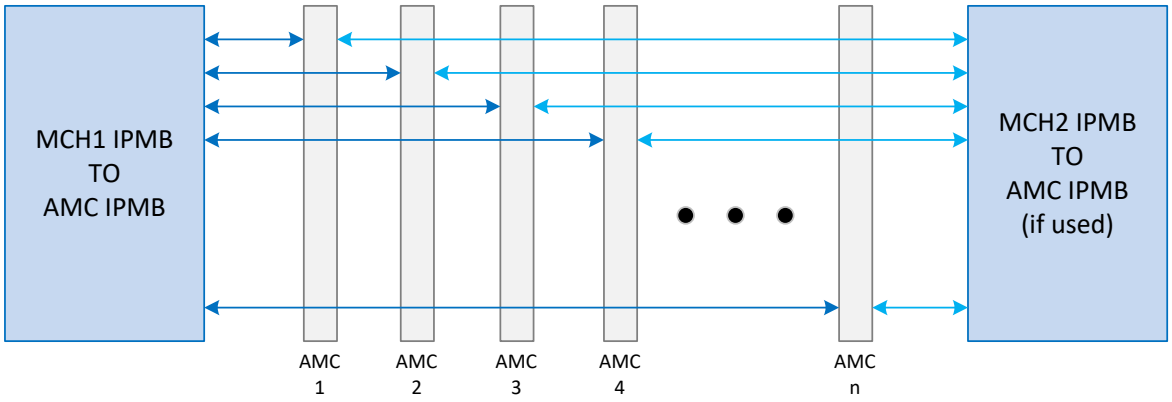
3.9 Backplane Topology

The generic backplane topology, common to VT81x series, is described in this section. Depending on the clock options selected, some fabrics may not be routed. Refer to ***datasheet*** of your device for more information on backplane routing options.

3.9.1 IPMB Bus

The VT81x provides a dual-redundant IPMB-0 bus among the MCH1, MCH2, CU1, CU2, PM1, and PM2 modules. The IPMB-L is a radial dual-star with each MCH connected to all AMCs using the I2C bus as shown in ***Figure 13***.

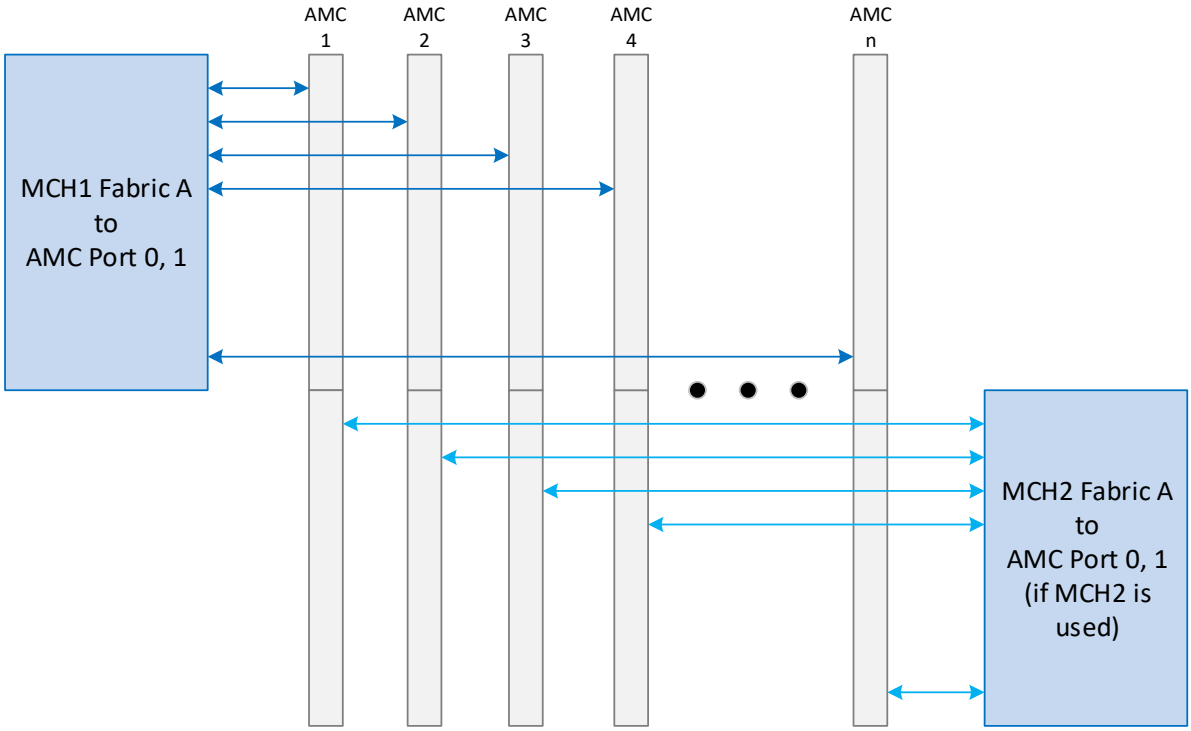
Figure 13: IPMB Topology



3.9.2 Fabric A

Fabric A from MCH1 is connected to port 0 of each AMC and Fabric A from MCH2 is connected to port 1 of each AMC as shown in *Figure 14*.

Figure 14: Fabric A Topology

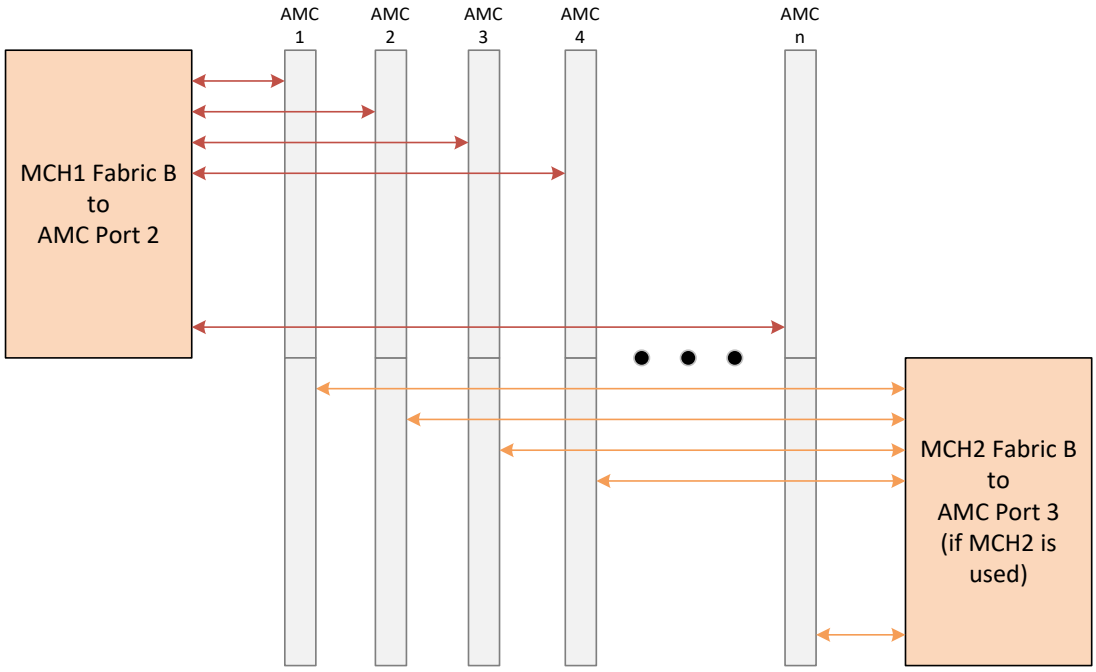


3.9.3 Fabric B

AMC ports 2 and 3 (SAS / SATA) are routed depending on the selected ordering option. For option with AMCs are connected directly together, see for information specific to your chassis.

For option with MCH1 Fabric B is connected to AMC port 2 of all AMCs, and MCH2 Fabric B is connected to AMC port 3 is shown in *Figure 15*.

Figure 15: Fabric B Topology

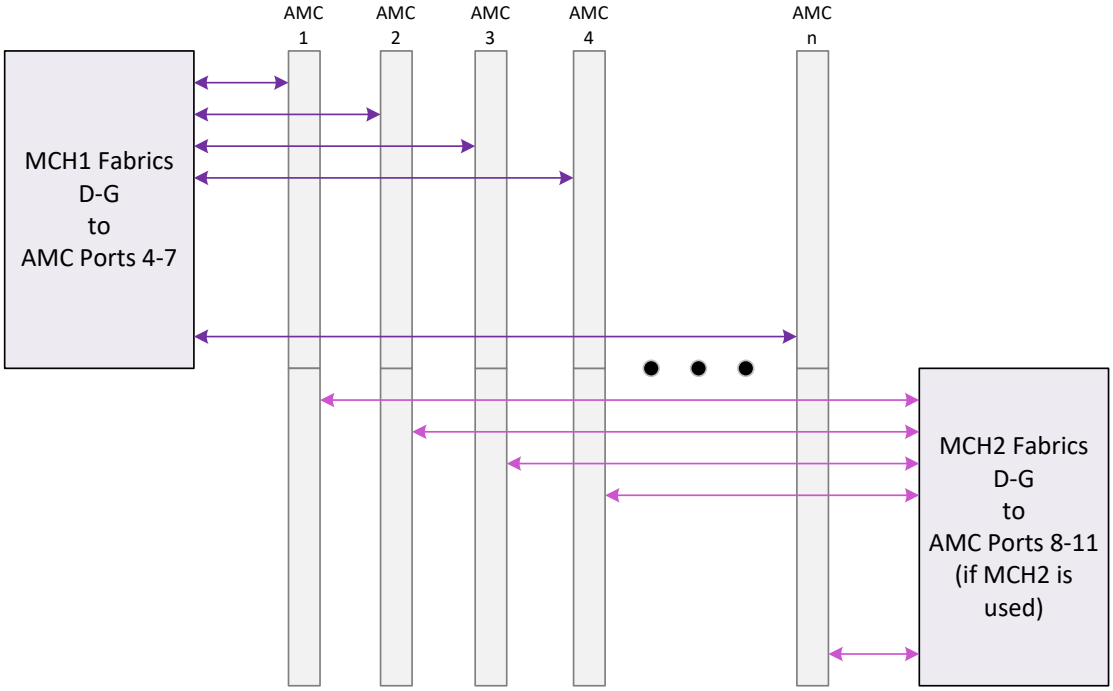


Port 2 and 3 configuration is denoted by "B" of the part number, refer to the "Ordering Options" section of the datasheet, for more information.

3.9.4 Fabrics D to G

In the fat pipes region, MCH1 Fabrics D, E, F, and G are connected to ports 4, 5, 6, and 7, respectively, on all AMCs. MCH2 Fabrics D, E, F, and G are connected to ports 8, 9, 10, and 11 respectively, on all AMCs as shown in *Figure 16*.

Figure 16: Fabrics D to G Topology



3.9.5 Extended Ports

The VT81x chassis provide direct point to point connection between AMC slots for ports 12-15 and 17-20, refer to *5 Product Specific Description* for more information on higher port routing on your device.

VT815 has a secondary connector to provide an additional 20 ports that are routed between AMC slots. AMCs with tongue 2 connectors can utilize these connectors. See for more information on backplane routing information of these additional ports.

4 Using the VT81x Chassis

4.1 Carrier Number Configuration

If multiple Carriers are configured with an external Shelf Manager, make sure that each Carrier has a unique Carrier number. To set the Carrier number, set the Chassis Locator switch according to *Table 11*.

Table 11: Carrier Number Configuration Reference

Carrier Number	Switch 4	Switch 3	Switch 2	Switch 1
1	ON	ON	ON	ON
2	ON	ON	ON	OFF
3	ON	ON	OFF	ON
4	ON	ON	OFF	OFF
5	ON	OFF	ON	ON
6	ON	OFF	ON	OFF
7	ON	OFF	OFF	ON
8	ON	OFF	OFF	OFF
9	OFF	ON	ON	ON
10	OFF	ON	ON	OFF
11	OFF	ON	OFF	ON
12	OFF	ON	OFF	OFF
13	OFF	OFF	ON	ON
14	OFF	OFF	ON	OFF
15	OFF	OFF	OFF	ON
16	OFF	OFF	OFF	OFF

When the Chassis Locator switch is not present on the front panel, locate the switch inside the chassis). On a redundant MCH configuration, there are two Chassis Locator Switches in the chassis and the switch setting must be identical.

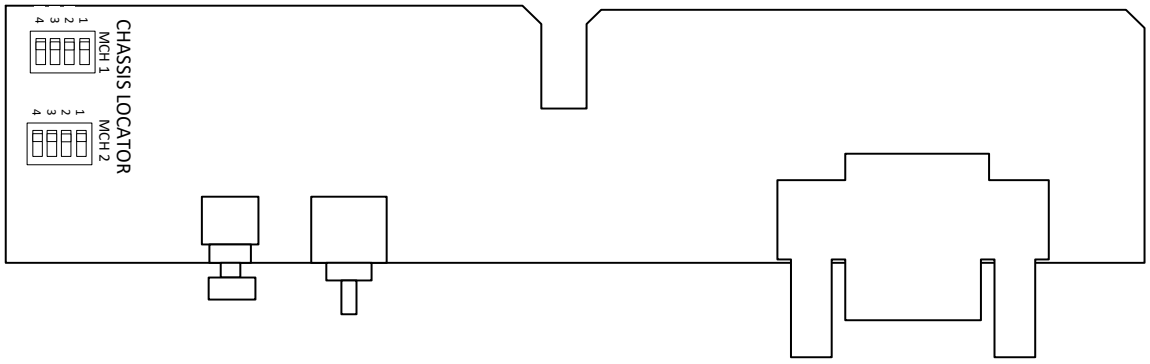
The software can override the physical Carrier Locator Switches using a Carrier number value that can be programmed in the backplane EEPROM. When this is set the physical Carrier Locator Switch setting is ignored and the programmed value is used. Refer to the MicorTCA.0 Base Specification regarding Carrier Locator Number Configuration.

Special attention should be paid whilst removal and re-installation of the telco alarm module, since the edge connectors on the telco alarm module should line up correctly with the backplane. Improper alignment and excessive force could damage the edge connector and also cause serious damage to the chassis backplane.

4.1.1 DA200

Chassis locator switches on the DA200 module is shown in *Figure 17*. The chassis locator switches can be configured to provide a carrier number ranging from 1 to 16 as shown in *Table 11: Carrier Number Configuration Reference*.

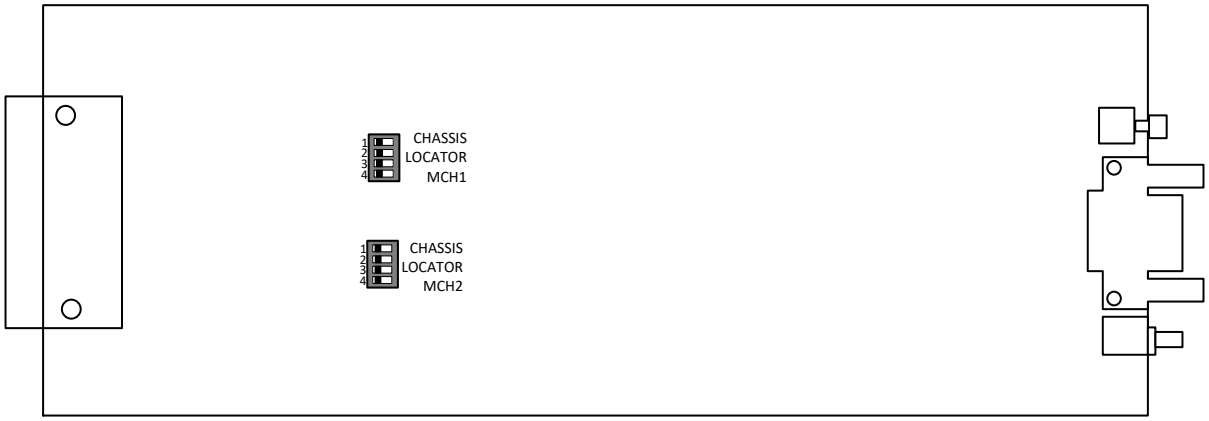
Figure 17: DA200 Chassis Locator Switch



4.1.2 DA232

Chassis locator switches on the DA232 module is shown in *Figure 18*. The chassis locator switches can be configured to provide a carrier number ranging from 1 to 16 as shown in *Table 11: Carrier Number Configuration Reference.*

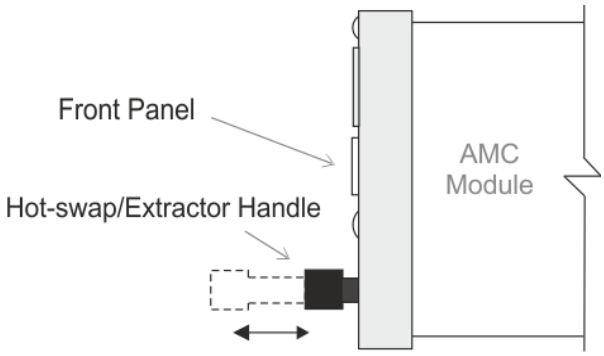
Figure 18: DA232 Chassis Locator Switch



4.2 How to Add/Remove a Card

The card should only be removed from a running carrier when the AMC Blue LED is solid ON. Removing the card before the blue LED is on may cause severe damage to the device.

Figure 19: AMC Hot-swap/Extractor Handle - Side View



4.2.1 Insert a Front Panel Card

When inserting single width cards into a VT81x slots, a divider should be used for correct alignment of the module with the chassis and avoid causing damage to the module and the backplane connectors. VT81x chassis are shipped with the dividers but if additional dividers are required, contact VadaTech sales team for purchasing options.

To insert a new field replaceable module, such as an AMC, into the chassis, follow the instructions below:

1. Pull out the hot-swap handle until it stops
2. Insert the card into the chassis guide rails making sure the hot swap handle is towards the lower side of the chassis and push the front panel firmly until it is fully seated into the connector. If the card does not go fully in, do not force it and instead remove it and check for proper orientation or obstructions.
3. Once fully inserted the Blue LED should go to solid ON.
4. Push in the handle to latch the card into the chassis, the Blue LED should blink for a short duration and then goes to solid OFF and the green LED would be expected to be solid ON to indicate that the payload power was applied.

4.2.2 Insert an RTM

To insert a new field replaceable module, such as AMC-RTM, into the chassis, follow the instructions below:

1. Pull out the hot-swap handle until it stops
2. Insert the card into the chassis guide rails and push the front panel firmly until it is fully seated into the connector. If the card does not go fully in, do not force it and instead remove it and check for proper orientation or obstructions.
3. Once fully inserted the Blue LED should go to solid ON.

4. Push in the handle to latch the card into the chassis, the Blue LED should blink for a short duration and then goes to solid OFF and the green LED would be expected to be solid ON to indicate that the payload power was applied.

4.2.3 Remove a Card

To remove a module such as an AMC, follow the instructions below:

1. Pull out the hot-swap handle until it stops (but do not pull hard enough to remove the card itself yet).
2. The Blue LED should blink for a short duration and then go solid ON.
3. Once the blue LED is ON, pull the hot-swap handle straight out firmly to remove the card from the chassis

4.3 How to Replace Cooling Unit Trays and Air Filter

The Cooling Units and Air Filters are hot-swappable but it is recommended to do so when system is OFF since when replacing the Air Filter the active fans may pull in dust particles that will affect overall system cleanliness.

If it is required to have the system operational when replacing the Air Filters, then enabling NEBS compliancy in the MCH will automatically turn OFF the fans while user is replacing the air filter and turn ON when the operation is completed. Refer to the MCH documentation on how to enable the NEBS compliancy mode in the MCH.

4.3.1 Replacing the Cooling Unit Tray

A fan tray must be replaced if any of its fans fail. Fan trays may also be replaced if more powerful or more efficient fans become available. Fan trays may be replaced during chassis operation, with two limitations. First, do not touch the fan blades when taking the fan tray out of the chassis. Second, put the new fan tray into the chassis quickly to prevent overheating.

Figure 20: Fan Tray Extraction

The mechanism used on VT811 and VT813 chassis uses a captive screw with a retention tab. Normally, the tab is pointing downward, as shown. Loosen the screw until the tab points to the right. Then pull on the screw to take the fan tray out of the chassis. To put a new fan tray into the chassis, make sure the tab is pointing to the right. Push the fan tray firmly into the chassis, then firmly hand-tighten the screw. The tab should be pointing down. The VT812 and VT814 use a slider lock mechanism.

4.3.2 Replacing the Air Filter

The chassis air filter must be replaced if dust has accumulated in the filter, reducing the cooling capacity of the chassis. The air filter may be replaced during normal chassis operation. The air filter is held in place by two captive screws, as shown. Loosen the screws, and then pull on the air filter to remove it from the chassis. Put the new air filter into the chassis, then firmly hand-tighten the screws.

Figure 21: Air Filter Location and Assembly

5 Product Specific Description

This section provides information specific to the individual chassis of the VT81x series.

5.1 VT810

The VT810 is a 7U µTCA chassis that provides 12 AMC mid-height double-module slots that can accept any AMC.1, AMC.2, AMC.3 and/or AMC.4.

- MCH – 2 slots
- Power Module – 4 slots
- Cooling Units – VT810 uses two VadaTech VT091 Cooling Units, cooling bottom to top
- Telco Alarm – VT810 uses DA200 as the Telecom Alarm Module
- JSM – VT810 can be purchased with a VadaTech UTC030 JSM module, access to JSM slot via rear of the chassis

5.1.1 Chassis Configuration

Figure 22: VT810 Chassis Front View

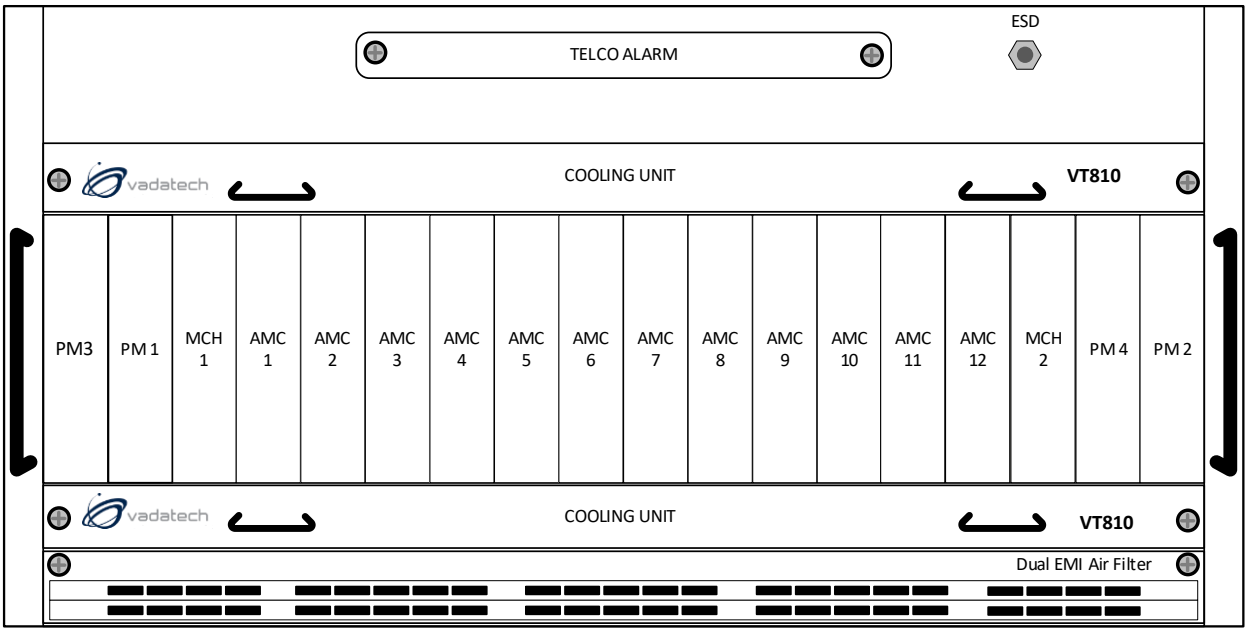
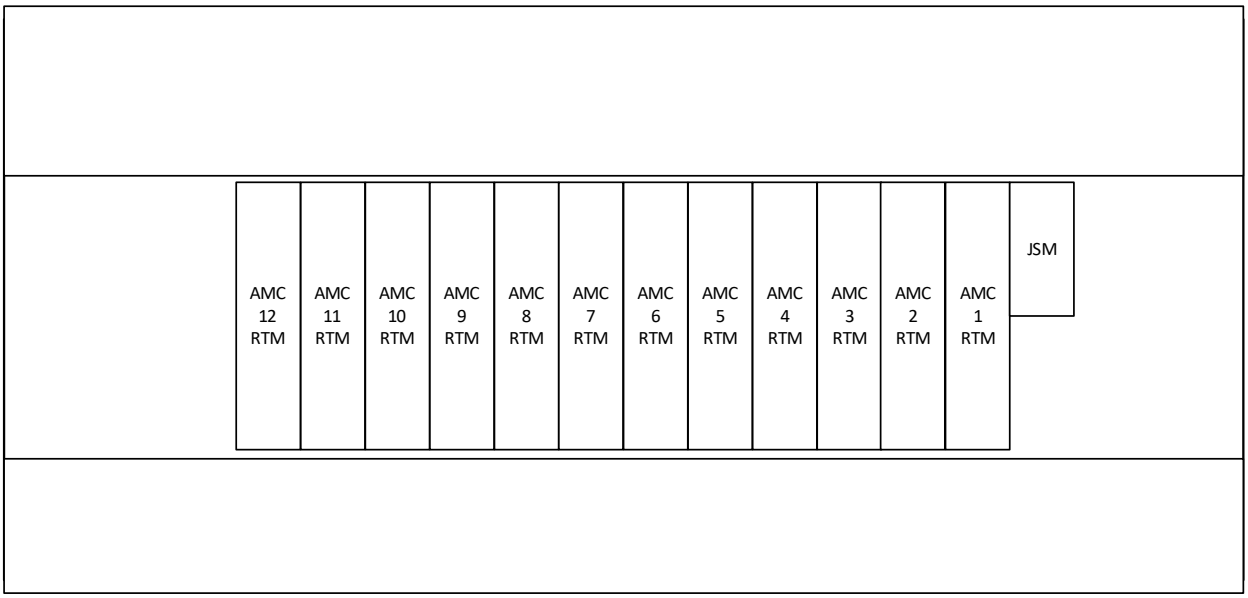
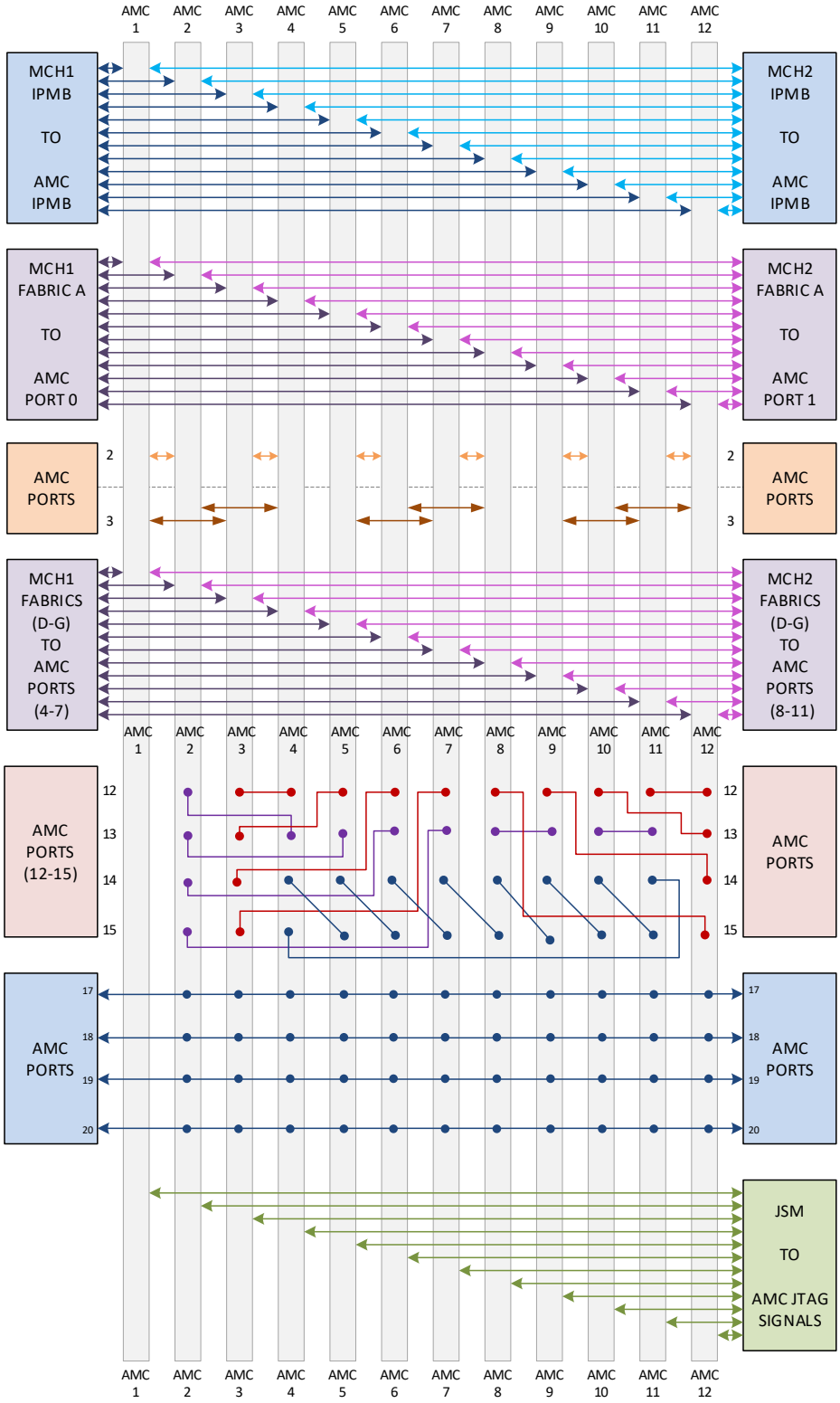


Figure 23: VT810 Chassis Rear View



5.1.2 Backplane Connections

Figure 24: VT810 Backplane Topology



5.2 VT811

The VT811 is an 8U µTCA.4 chassis that supports up to 12 AMC mid-size, double module slots that can accept any AMC.1, AMC.2, AMC.3 and/or AMC.4.

- MCH – 2 slots
- Power Module – 4 slots
- Cooling Units – VT811 uses two VadaTech VT091 Cooling Units, cooling front to back
- Telco Alarm – VT811 uses DA200 as the Telecom Alarm Module
- JSM – VT811 can be purchased with a VadaTech UTC030 JSM module, access to JSM slot via rear of the chassis

5.2.1 Chassis Configuration

Figure 25: VT811 Chassis Front View

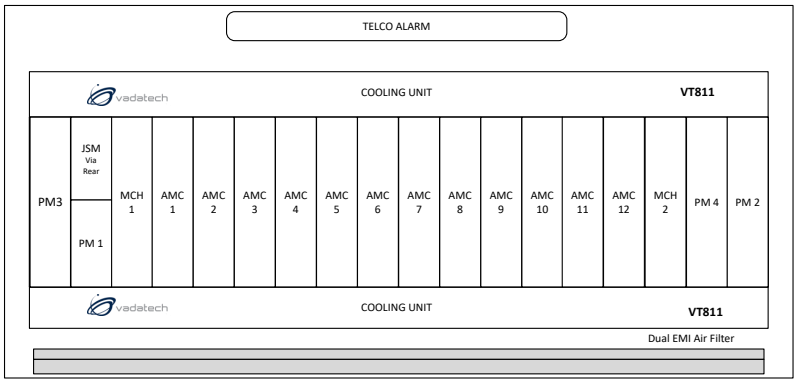
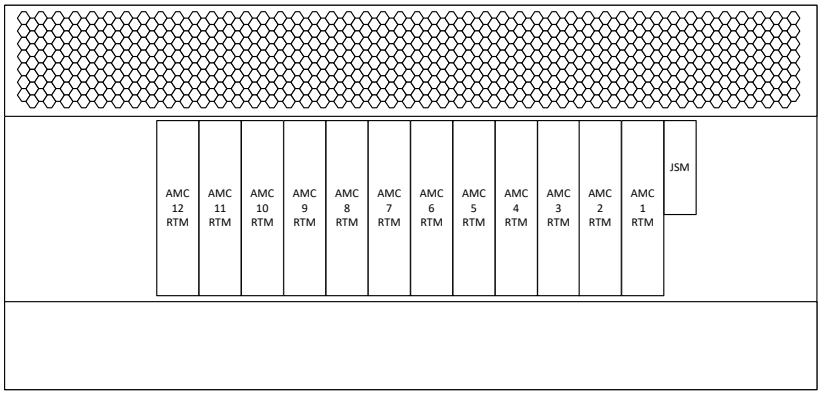
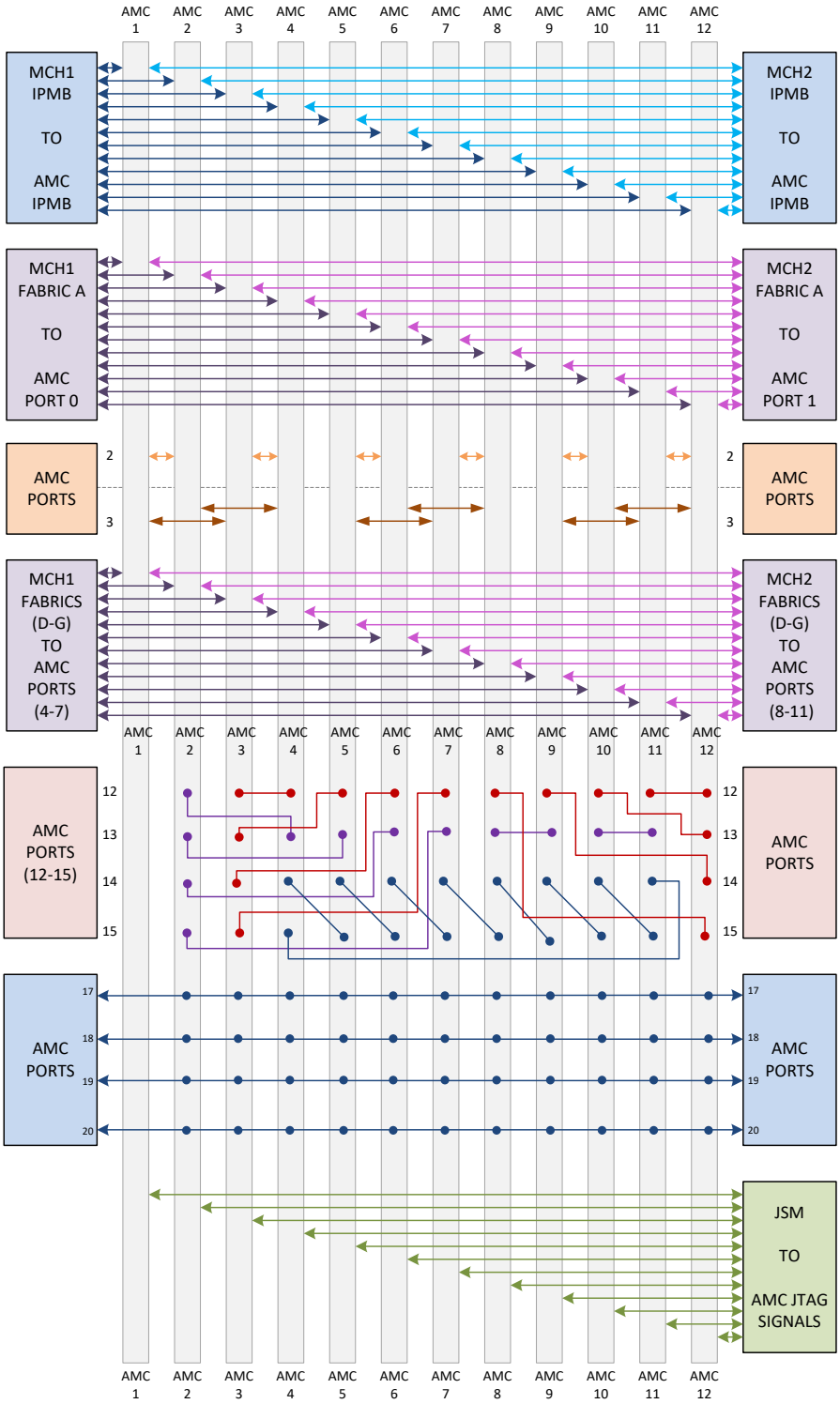


Figure 26: VT811 Chassis Rear View



5.2.2 Backplane Connections

Figure 27: VT811 Backplane Topology



5.3 VT812

The VT812 is a 19" x 2U x 14.2 µTCA.4 chassis that supports up to four µTC.0 AMCs plus four µTC.4 AMCs mid-size, double module slots that can accept any AMC.1, AMC.2, AMC.3 and/or AMC.4.

- MCH – 2 slots
- Power Module – Single or dual 500W AC Universal Power Module or dual 796W DC module
- Cooling Units – VT812 uses two VadaTech VT102 Cooling Units, cooling right to left
- Telco Alarm – VT812 uses DA232 as the Telecom Alarm Module
- JSM – VT812 can be purchased with a VadaTech DA237 JSM installed in the chassis

5.3.1 Chassis Configuration

Figure 28: VT812 Chassis Front View

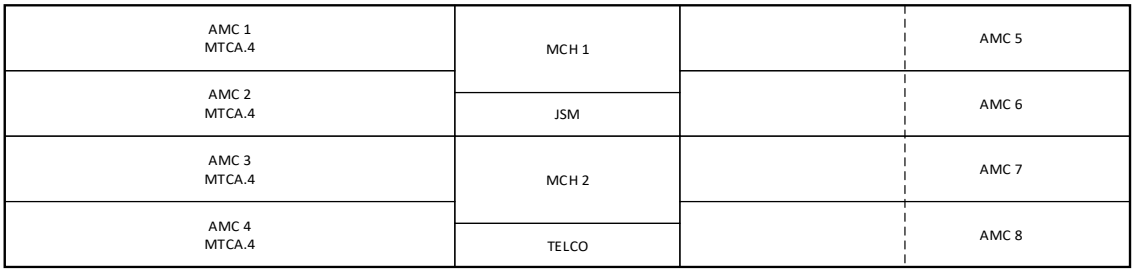
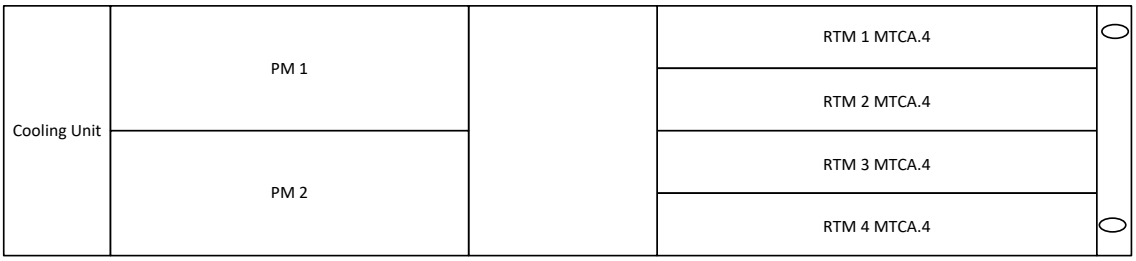
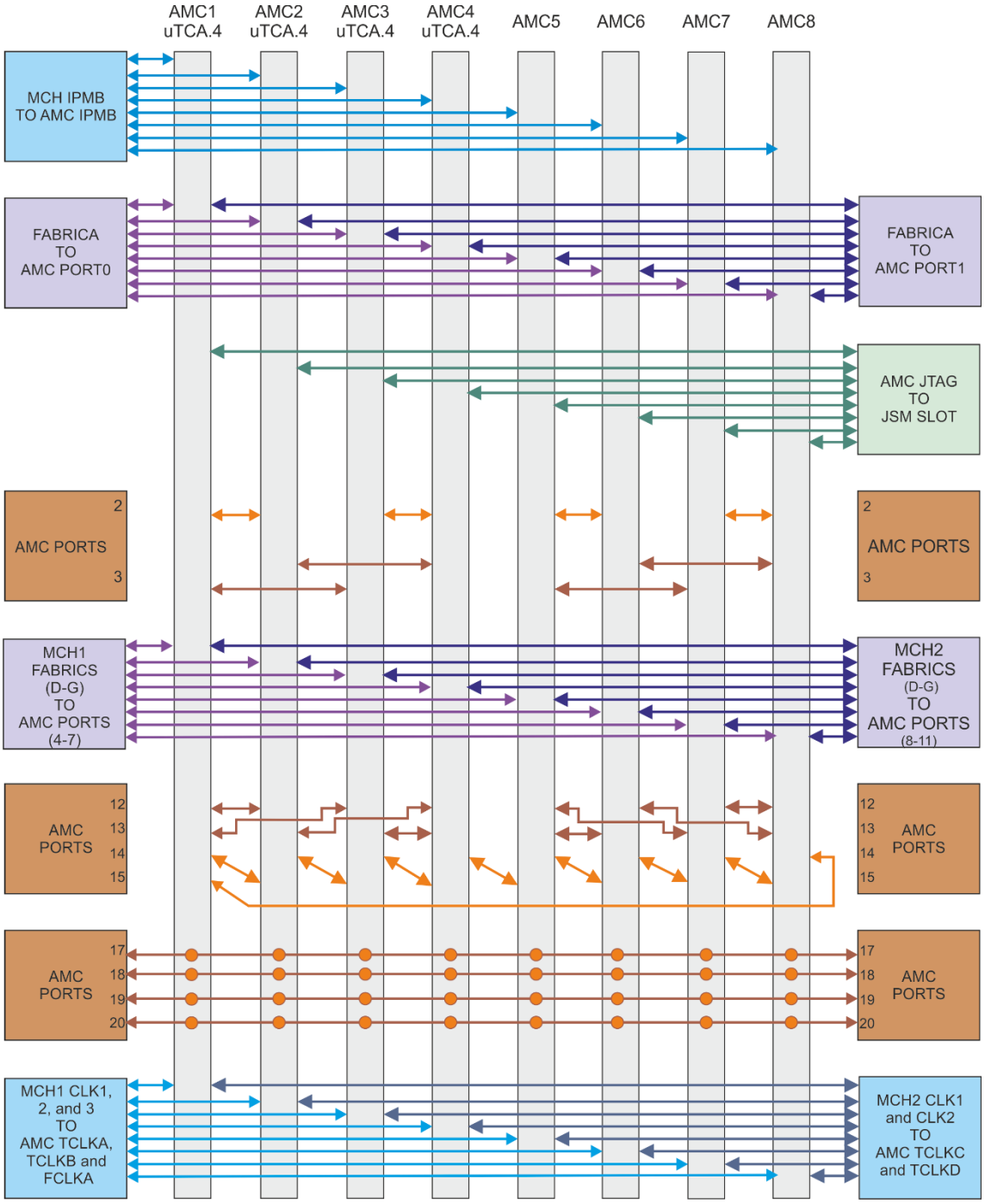


Figure 29: VT812 Chassis Rear View



5.3.2 Backplane Connections

Figure 30: VT812 Backplane Topology



5.4 VT813

The VT813 is a 19" x 8U x 14.9 µTCA.4 chassis that supports up to twelve AMCs: 12 mid-size double modules in front with 12 mid-size, double-module in the rear that can accept any AMC.1, AMC.2, AMC.3 and/or AMC.4.

- MCH – 2 slots
- Power Module – 4 slots
- Cooling Units – VT813 uses two VadaTech VT101 Cooling Units, cooling front to back
- Telco Alarm – VT813 uses DA200 as the Telecom Alarm Module
- JSM – VT813 can be purchased with a VadaTech UTC008 JSM installed in the chassis

5.4.1 Chassis Configuration

Figure 31: VT813 Chassis Front View

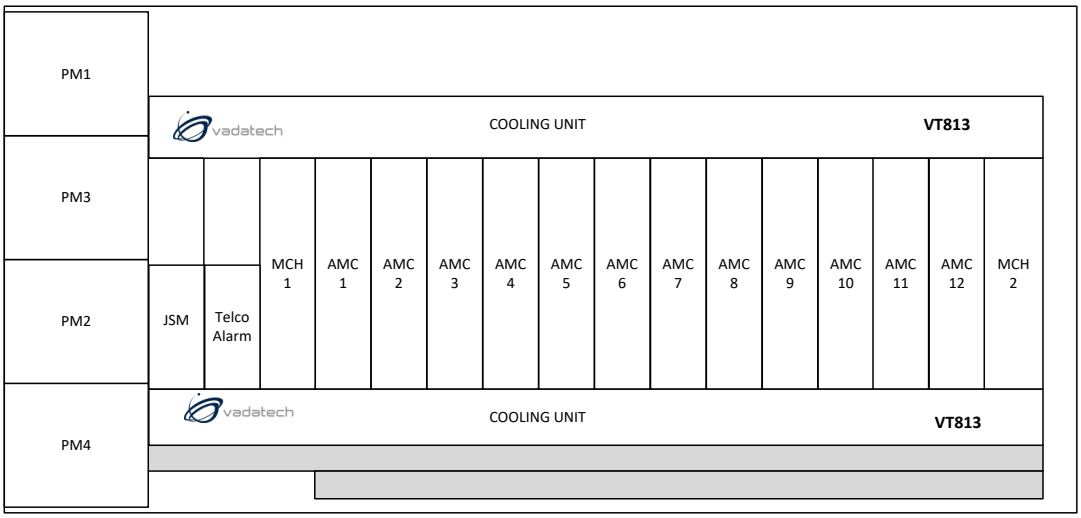
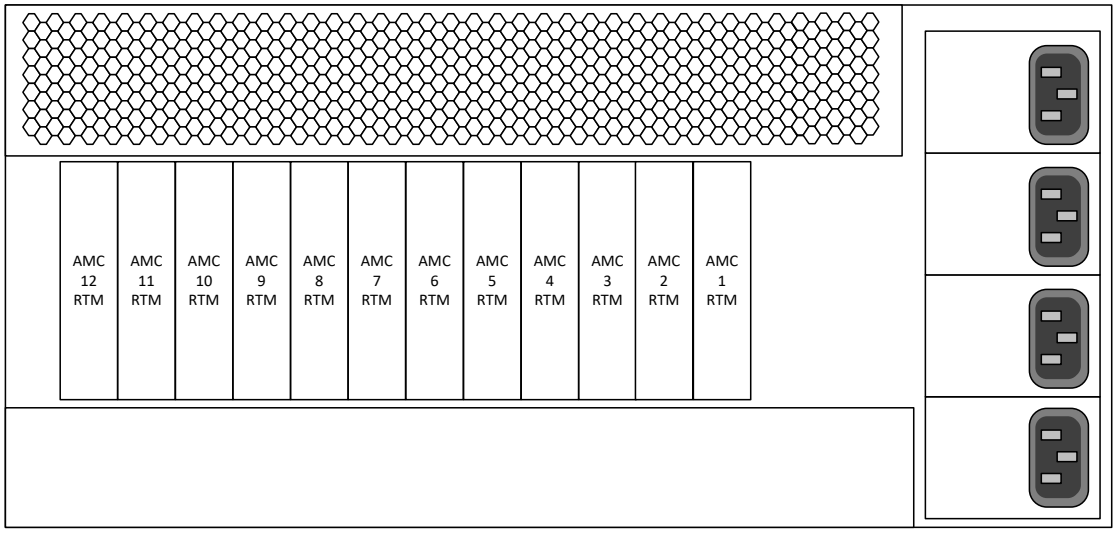
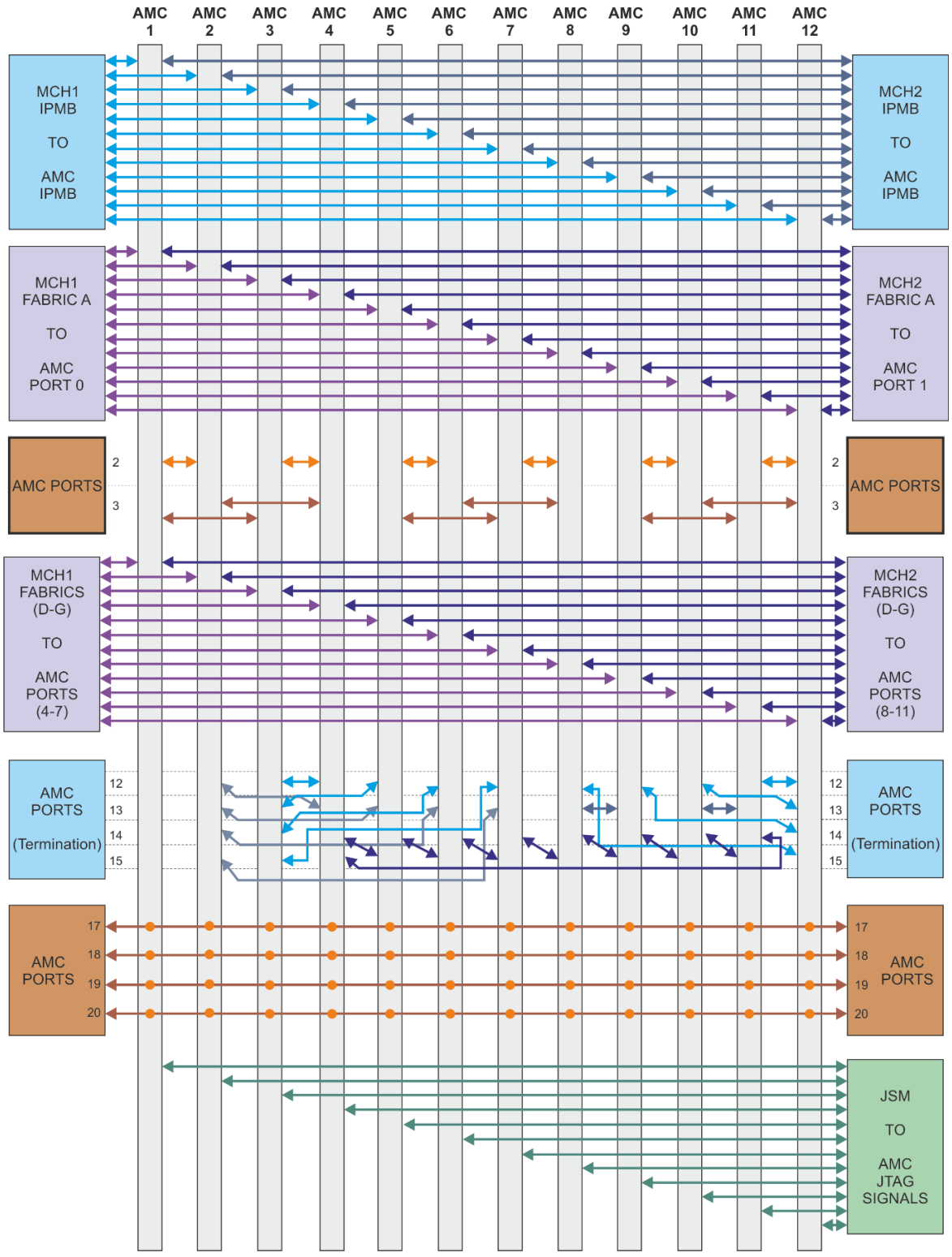


Figure 32: VT813 Chassis Rear View



5.4.2 Backplane Connections

Figure 33: VT813 Backlane Topology



5.5 VT814

The VT814 is a 19" x 2U x 14.2 µTCA.4 chassis that supports up to six µTCA.4 AMCs plus RTMs that can accept any AMC.1, AMC.2, AMC.3 and/or AMC.4.

- MCH – 1 slot
- Power Module – 2 slots
- Cooling Units – VT814 uses two VadaTech VT102 Cooling Units, cooling right to left
- Telco Alarm – VT814 uses DA232 as the Telecom Alarm Module
- JSM – VT814 can be purchased with a VadaTech DA136 JSM installed in the chassis

5.5.1 Chassis Configuration

Figure 34: VT814 Chassis Front View

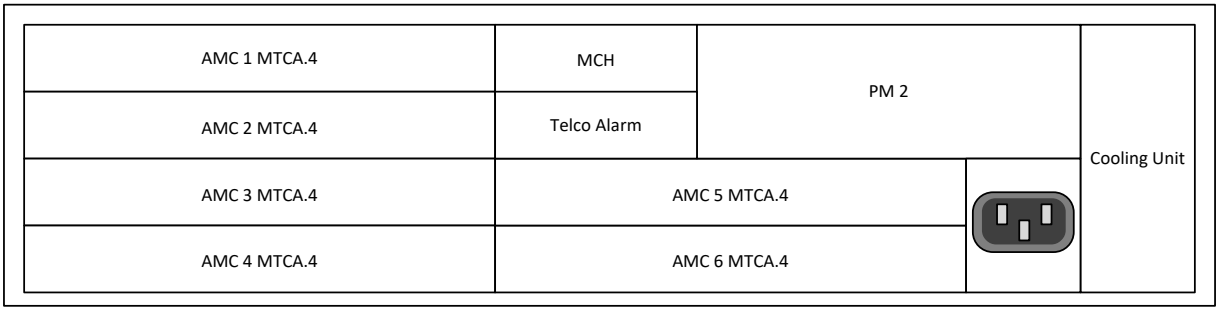
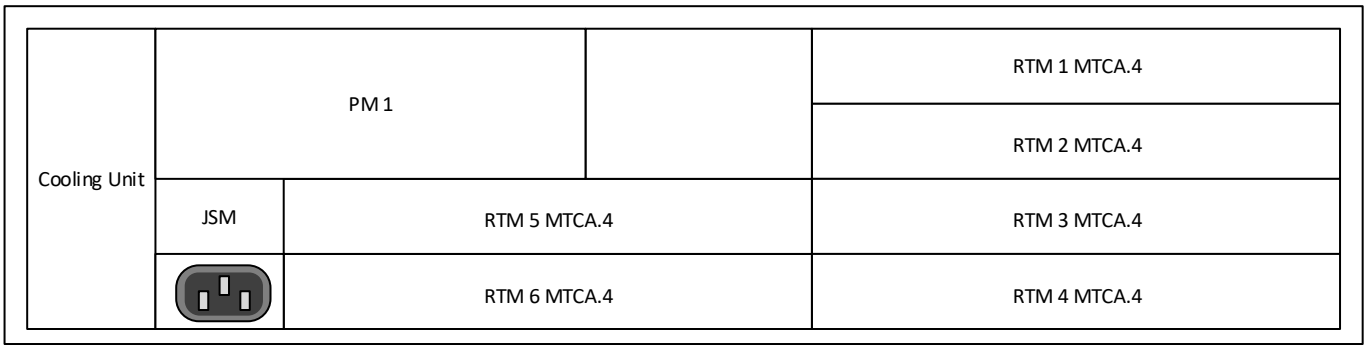
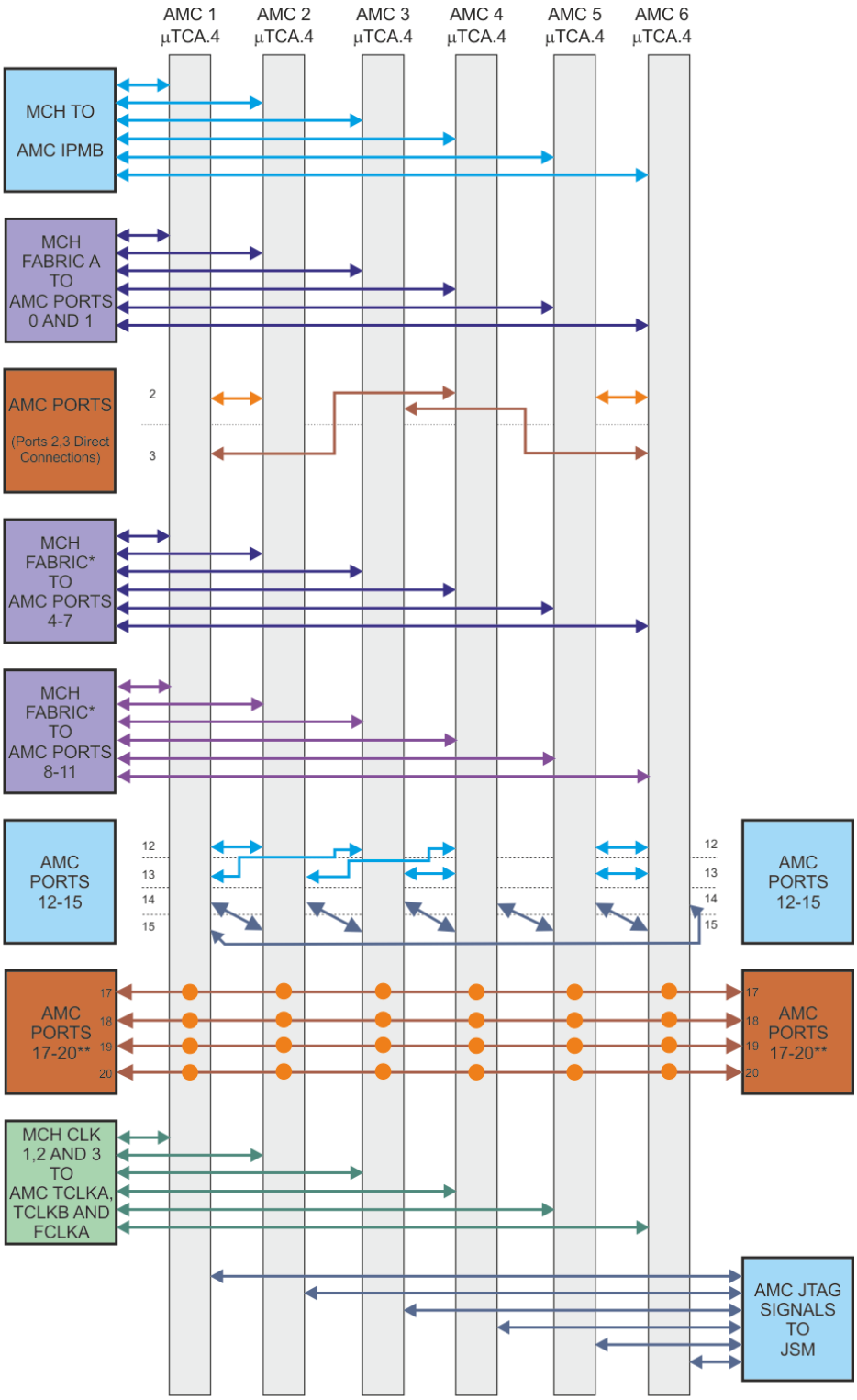


Figure 35: VT814 Chassis Rear View



5.5.2 Backplane Connections

Figure 36: VT814 Backplane Topology



5.6 VT815

The VT815 is a 19" x 9U x 14.9" chassis that supports up to 12 full size double module AMCs plus RTMs that can accept any AMC.1, AMC.2, AMC.3 and/or AMC.4. The RTM provision follows the µTCA.4 specifications but does not support the extended options region as they are reserved for FPGA and storage connectivity.

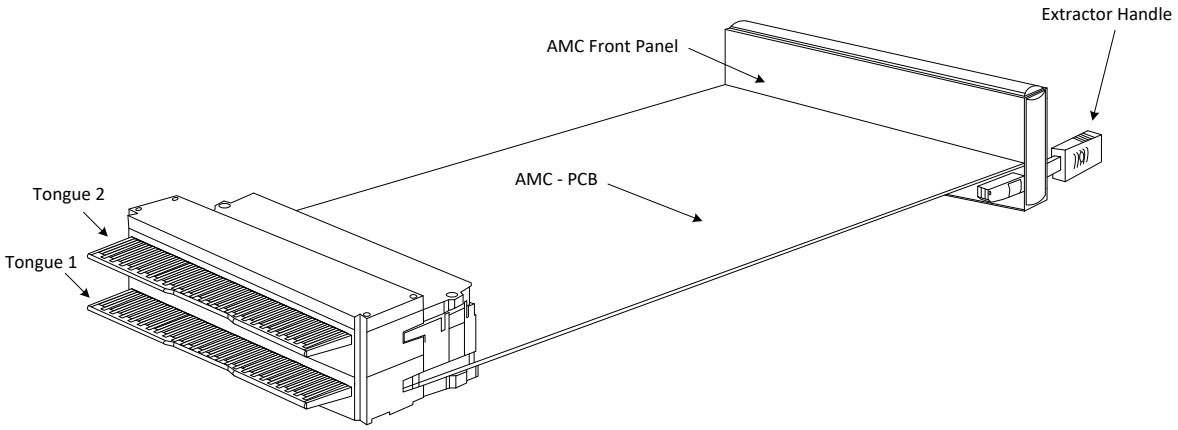
- MCH – 2 slots
- Power Module – 3 slots
- Cooling Units – VT815 uses two VadaTech VT103 Cooling Units, cooling is front to back
- Telco Alarm – VT815 uses DA200 as the Telecom Alarm Module
- JSM – VT815 can be purchased with a VadaTech UTC030 JSM installed in the chassis

It is important to only apply AC power to a power module when it is firmly installed in a chassis. Applying AC power to a power module outside that chassis may cause equipment damage

5.6.1 Tongue 2 Connectivity

The VT815 provides 20 ports secondary backplane connectors to every AMC slot that accept AMC tongue 2 connections (PinoutPlus) per µTCA.0 specifications. The chassis provides up to 120 W/slot for high power AMCs.

Figure 37: AMC Tongue 2 Connector



AMC Components and ports not shown for clarity

5.6.2 Chassis Configuration

Figure 38: VT815 Chassis Front View

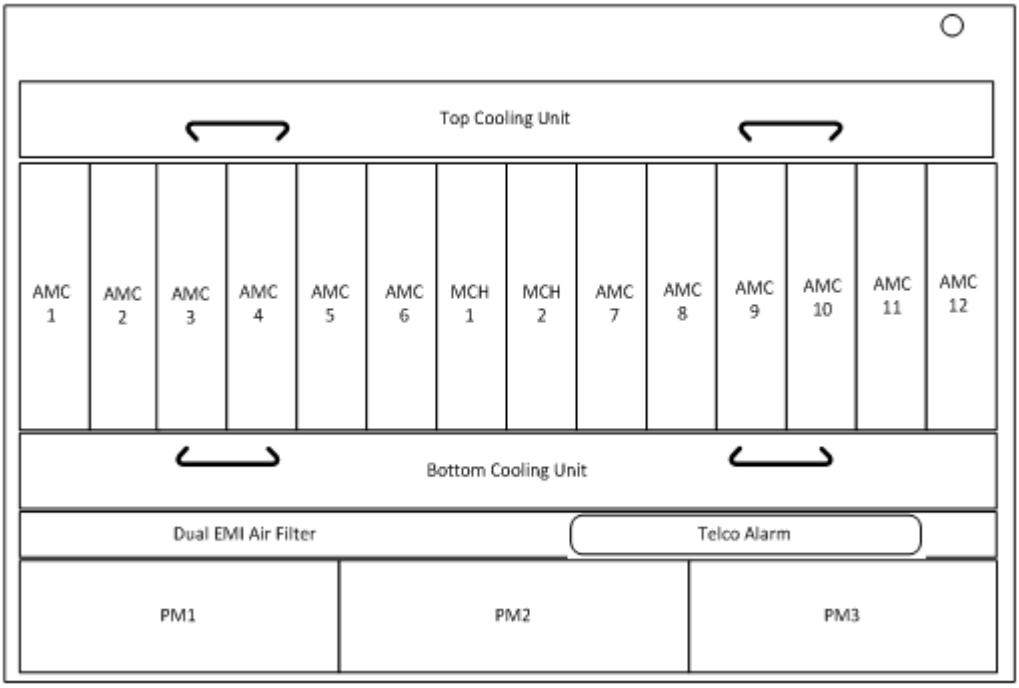
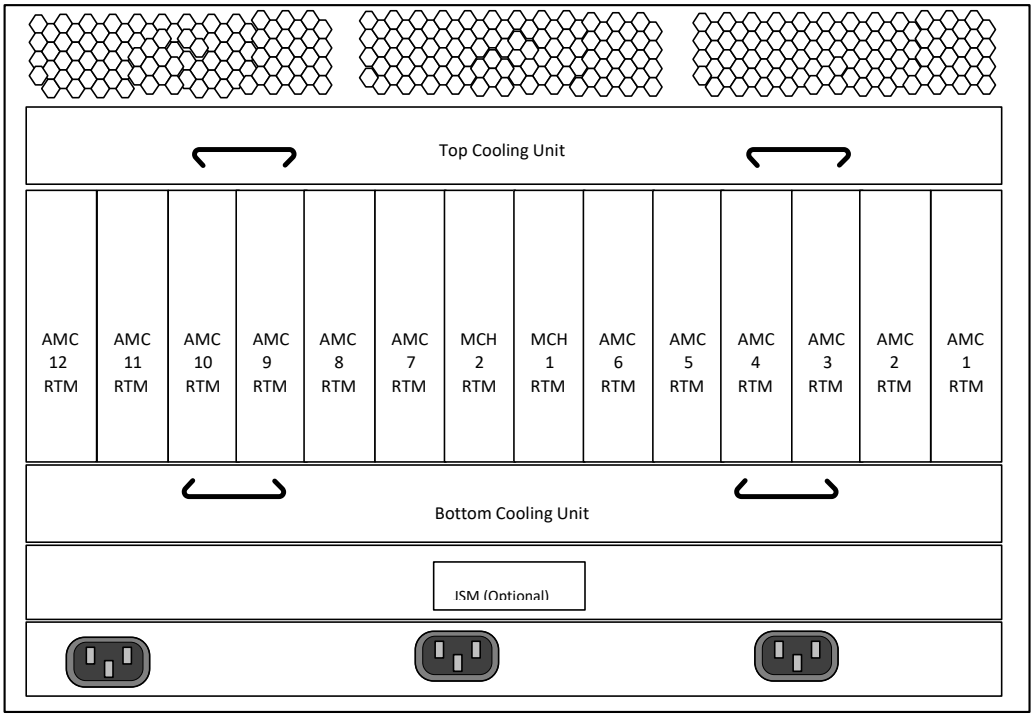
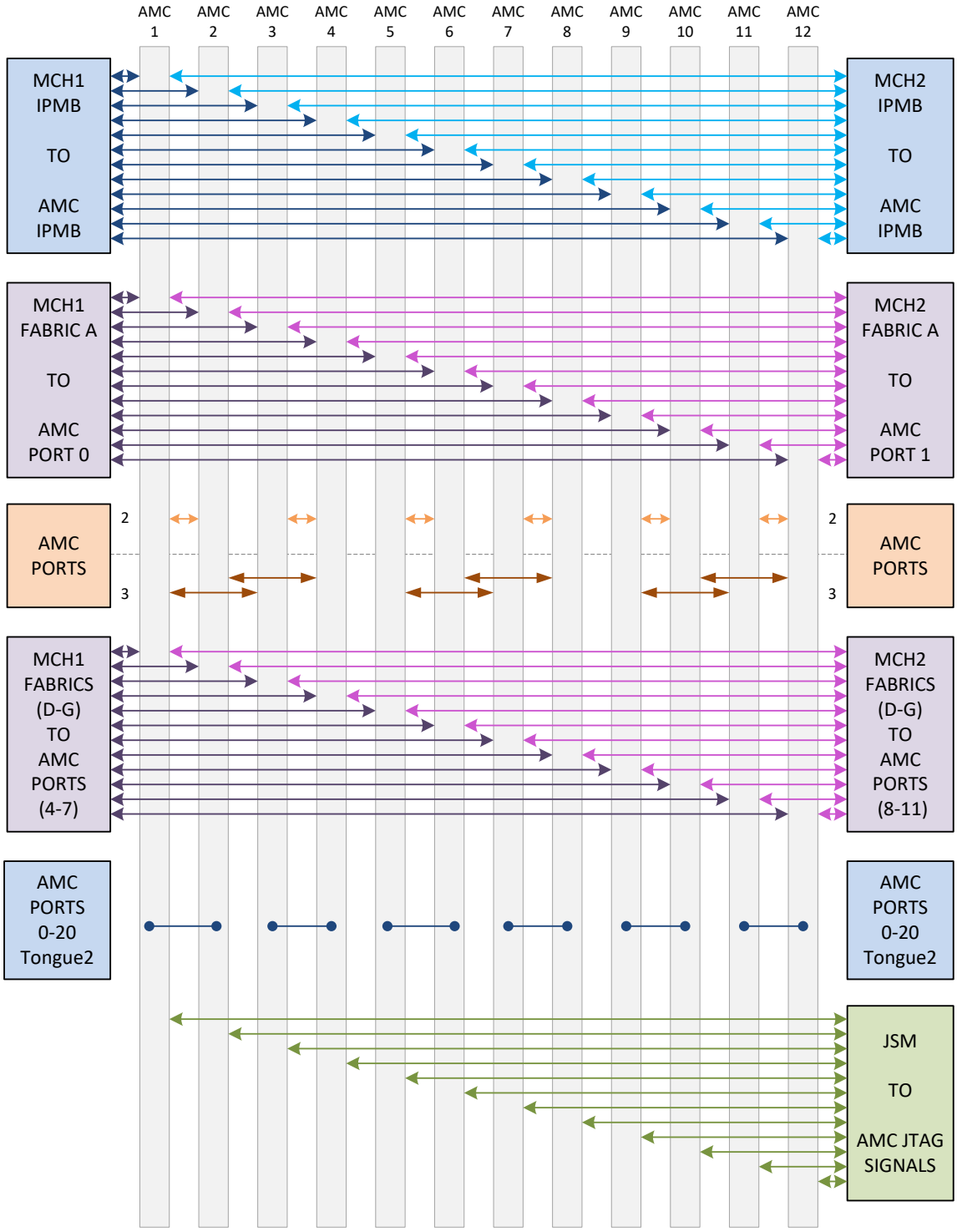


Figure 39: VT815 Chassis Rear View



5.6.3 Backplane Connections

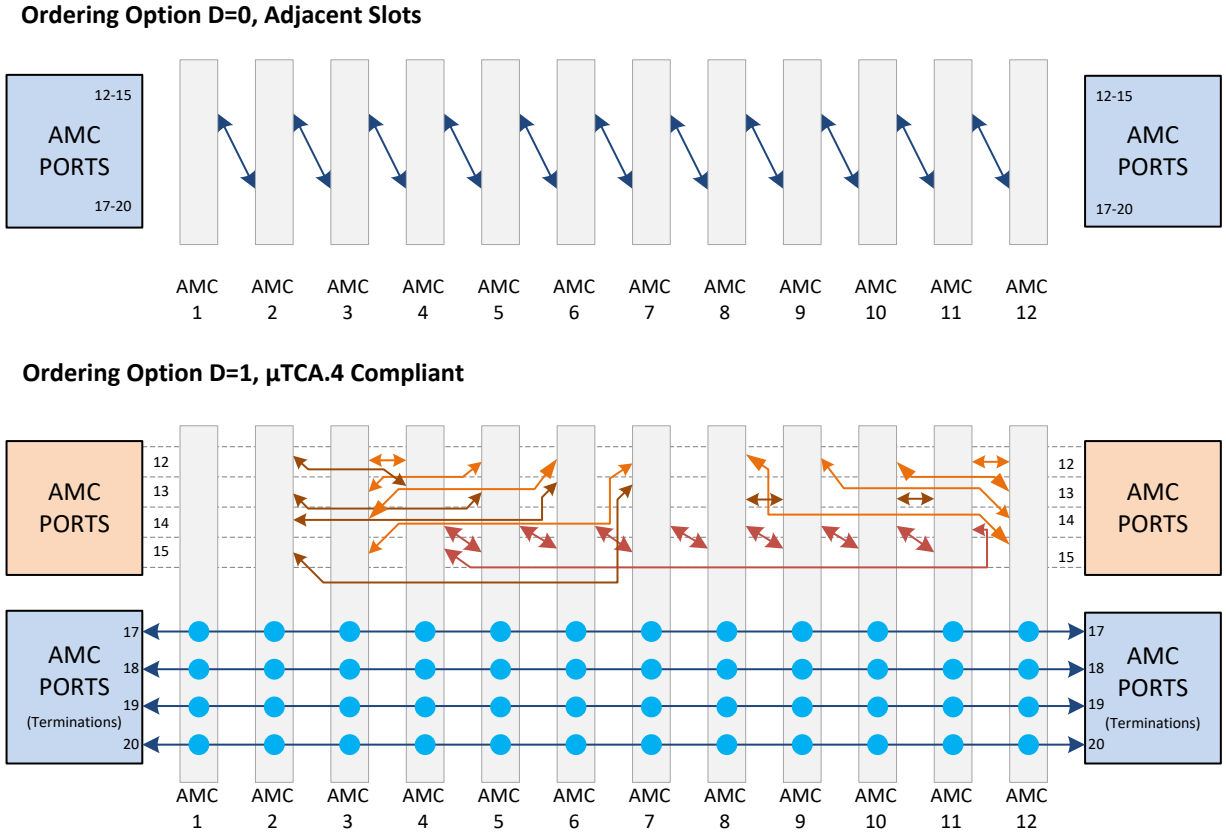
Figure 40: VT815 Backplane Topology



5.6.4 Higher Port Routing Options

The VT815 allows to two types of backplane routings for ports 12-15 and 17-20.

Figure 41: Ports 12-15/17-20 Routing Options



Notes

Contact VadaTech

Technical Support

If you have purchased the VadaTech product through our distributor network, contact your distributor for any technical assistance. If you require further technical support, you can contact VadaTech technical support team from VadaTech Customer Support site.

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