

# VT950

## 1U Rugged Chassis Platform with 6 AMC Slots



VT950

### Key Features

- Compliant to MIL-STD-810F, MIL-STD-901D for shock/vibration
- Compliant to MIL-STD-461E for EMI
- Supports up to six single mid-size modules
- Front to back airflow
- Full Layer 2 or 3 managed Ethernet switch
- Dual x4 or single x8 PCIe Gen 3 per AMC slot
- Management can run as Shelf/MCMC or MicroTCA Carrier Management Controller (MCMC)
- AMC.1, AMC.2, AMC.3 and AMC.4 compliant

### Benefits

- Ruggedized 1U chassis in 19" rackmount
- Advanced GPS clocking/receiver options including IEEE 1588, SyncE, and NTP clocking
- Electrical, mechanical, software, and system-level expertise in house
- AS9100 and ISO9001 certified company
- Full system supply from industry leader



**vadatech**  
THE POWER OF VISION

**μTCA<sup>®</sup>**



# VT950

The VT950 is a rugged 1U chassis used in Mil/Aero or other applications that need to withstand shock/vibration. The lightweight aluminum construction provides 6 single module mid-size AMC slots. For front panel retention, a single MicroTCA.1 screw is fitted on the opposite side of the ejector handle of each module slot.

The front-to-rear cooled chassis utilizes the VadaTech 3rd generation MCH (UTC004 product) for its shelf manager, crossbar clocking for low jitter, GPS/IEEE1588/SyncE/NTP, etc. The VT950 has PCIe Gen3 x8 routed to each AMC slot. The x8 routing could run also as dual x4.

The VT950 backplane provides direct connection between adjacent AMC slots on Ports 2-3 and on Ports 12-20.

## Power Supplies

The VT950 has option for AC or DC input via the front panel. The module has a single power supply which is removable from the rear of the chassis.

## Cooling and Temperature Sensors

The VT950 has an intelligent Cooling Unit that is built into the removable power supply tray. The cooling airflow is from front to back. Temperature sensors fitted throughout the chassis monitor intake and outtake air temperature.

## Base/Fabric Channel Ethernet Switch

The VT950 provides a standard GbE base channel switch which includes two 10GbE uplink 100/1000/10G RJ45 ports. This switch is fully Layer 2 or Layer 3 managed enabling a comprehensive enterprise-grade routing and switching feature set. It supports Synchronous Ethernet (SyncE) and IEEE1588.

## Scorpion™ Software

VadaTech's Scorpionware software can be used to access information about the current state of the Shelf or the Carrier, obtain information such as the FRU population, or monitor alarms, power management, current sensor values, and the overall health of the Shelf. The software GUI is very powerful, providing a Virtual Carrier and FRU construct for a simple, effective interface.



Figure 1: VT950 Chassis Front View



Figure 2: VT950 Chassis Rear View

## GPS and General-Purpose Clocks

The MTCA specification defines a set of clocks for telecom and non-telecom applications. The VadaTech VT950 has the most sophisticated clocking distribution in the market to meet the most stringent requirements such as wireless infrastructure, high speed A/D, etc. The VT950 supports the following GPS and general-purpose clocking features:

- Low-jitter/low-skew backplane crossbar clock routing matrix for TCLKA(CLK1)/TCLKB(CLK2)/TCLKC/TCLKD for all AMCs
- FCLKA is provided as a 100 MHz HCSL clock
- Clock disciplining with arbitrary clock frequency output and holdover (Stratum-3 option) including 1PPS regeneration and holdover
- Flexible integration and synchronization between GPS, IEEE1588/SyncE, and NTP clocking enabling Grand Master clock functionality
- ‘Any Frequency’ high-quality clock generation/jitter cleaning for up to two user clocks
- Supports hitless automatic clock failover for improved reliability
- Optional built-in GPS receiver enables direct time/clock synchronization to the GPS satellite constellation.

The VT950 supports flexible front panel clock port ordering options:

- Two DC-coupled LVCMOS Inputs/Outputs, or two AC-coupled Sine-wave Inputs, or one of each
- Built-in GPS receiver for time/location/clock synchronization plus a DC-coupled LVCMOS Input/Output.

## GPS Receiver Enabled Features

The VT950 can be ordered with a GPS Receiver option. The receiver disciplines an onboard high-quality DLL which is phase/frequency aligned to the atomic clocks in the GPS satellite constellation. The onboard clock synthesis/jitter cleaning capability can be utilized to convert this frequency into any frequency desired while still remaining locked to the GPS atomic clocks.

When the GPS Receiver option is purchased the VT950 has the capability to re-transmit the incoming GPS data via Ethernet to other nodes in the network in the Trimble TSIP binary protocol format. This GPS data is also sent out the front panel GPS RS-232 serial port in the standard NMEA format for use by external equipment. When the GPS Receiver option provides a precision Time-stamping Engine capability via GbE on the backplane. This engine appears as a GbE device to the AMC card and a device driver is available which will allow the AMC card to read all GPS status including position, velocity, status, etc., in addition to precision timestamps, time trigger, and time event interrupt functionalities.

## IEEE1588 PTP and NTP Grand Master Clock

The VT950 can provide Ethernet time services to the chassis networks on both the GbE fabric. It can be subordinate to an external PTP or NTP master server or when the GPS receiver option is purchased can act as a Grand Master clock utilizing the precision timing information provided via the GPS receiver and onboard disciplined oscillator.

## Synchronous Ethernet

The VT950 provides a Synchronous Ethernet (SyncE) on the GbE fabric port. With this feature, ports on the 1G Ethernet switch can be designated as master or slave ports and the Ethernet fabrics within the chassis can be synchronized from end-to-end with external equipment. This feature utilizes advanced telecom-grade network synchronization PLLs to provide exceptional SyncE performance.

## JTAG Master/JTAG Via Ethernet Virtual Probe

The VT950 provides JTAG Master Capability to send out configuration data streams via the chassis JTAG Switch Module (JSM) to configure arbitrary JTAG Slave devices on AMC cards. Virtual Probe services are also available to provide JTAG via Ethernet for specific vendors such as Xilinx and Altera. This allows for standard development tools such as Xilinx iMPACT/ChipScope and Altera Programmer/SignalTap to treat the MCH/JSM combination as if it was a standard JTAG probe. This approach frees the developer from having to attach JTAG probes directly to the AMC or JSM which can be difficult when systems are already fully assembled. It also allows for remote debugging across long distances when required without the need to install additional JTAG equipment on-site. The Master test/configuration port is easily accessible via the front panel header.

## VadaTech Single Latching Flange (SLF) Design

The VadaTech SLF design is a space-saving solution for rugged environments and is compatible with the VT950. It provides one latching flange and screw on the opposite side of the standard AMC latching handle. This front panel solution provides improved retention strength and stability. MicroTCA.1 compliant AMCs have latching flanges on both sides of the board, providing up to 25g shock and 8g random vibration resistance. However, in horizontal-mount enclosures the dual flanges take up considerable space. The SLF design from VadaTech reduces the space utilized, allowing more performance density to be offered in specially-designed enclosures. The SLF solution's screw spacing is compatible with MicroTCA.1. Therefore, this design can be utilized in all of VadaTech's standard 3U to 5U horizontal-mount chassis that accept both MicroTCA.0 and MicroTCA.1 panels.



*Figure 3: Single Latching Flange Panel (example)*

There are also Latching Tabs available to provide extra secure mounting for standard MicroTCA.0 AMCs.



*Figure 4: Latching Tab for Standard MTCA.0 AMC*

# Block Diagram

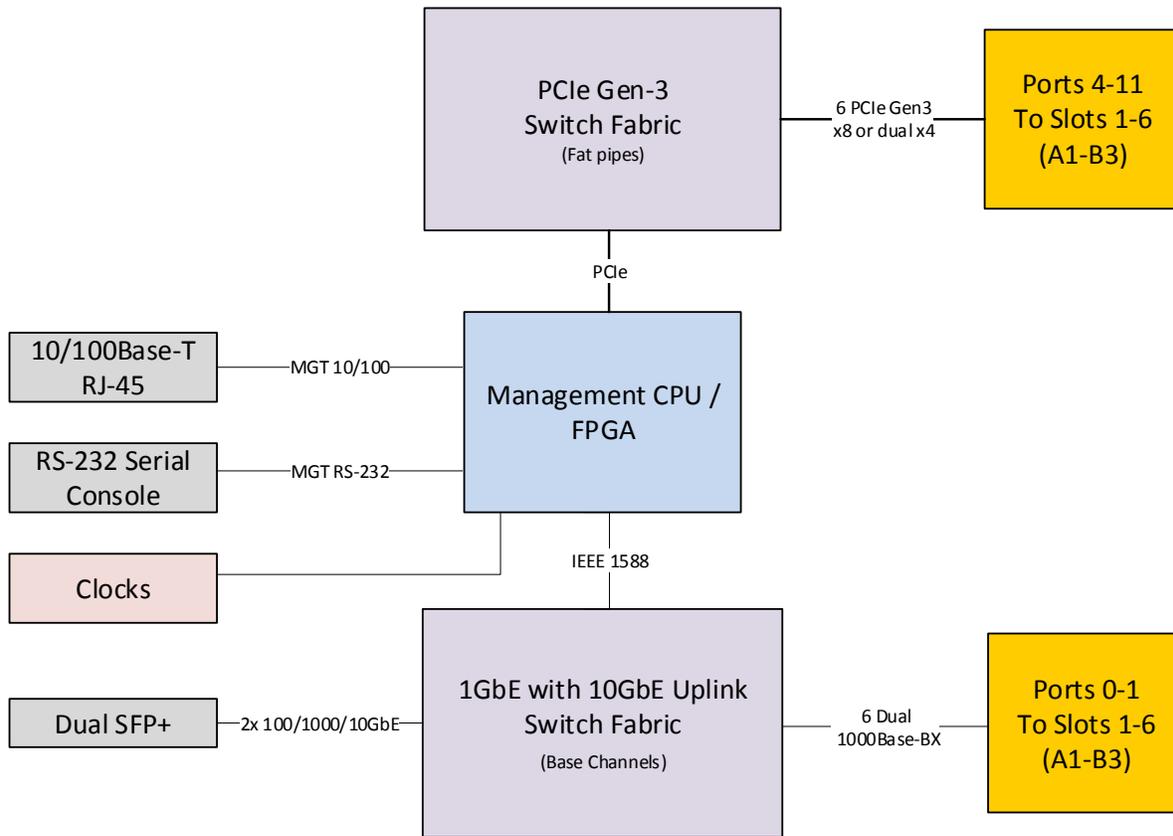


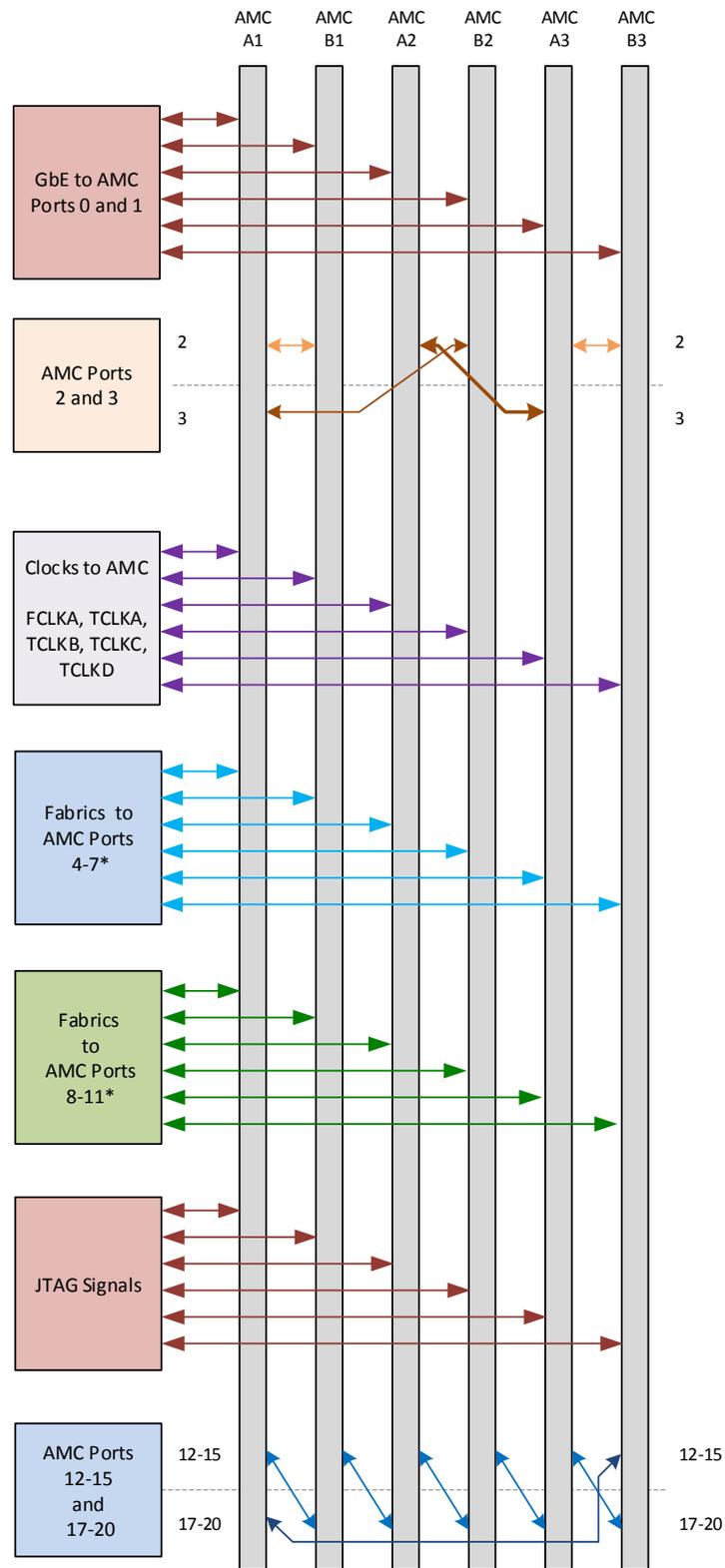
Figure 5: VT950 Block Diagram

# Chassis Layout



Figure 6: VT950 Front Panel

# Backplane Connections



\*PCIe Fabric can be configured to run as x8 bus (Ports 4-11)

Figure 7: VT950 Backplane Connections

# Specifications

Architecture	
<b>Physical</b>	<b>Dimensions</b> Width: 19"
	Depth: 18.50"
	Height: 1U
<b>Type</b>	<b>MTCA Chassis</b> 6 AMC.0 single module, (mid-size slots)
Standards	
<b>AMC</b>	<b>Type</b> AMC.0, AMC.1, AMC.2, AMC.3 and AMC.4
<b>MTCA</b>	<b>Type</b> PICMG 3.0 Rev 3.0
Configuration	
<b>Power</b>	<b>VT950</b> AC Universal 500W
	DC -36V to -75V (460W) or +18V to +36V (400W)
<b>Environmental</b>	<b>Temperature</b> See <a href="#">Ordering Options</a>
	Storage Temperature: -40° to +85°C
	<b>Altitude</b> 10,000 ft operating 40,000 ft non-operating
	<b>Relative Humidity</b> 5 to 95% non-condensing
<b>Cooling</b>	Front to Back
Other	
<b>MTBF</b>	MIL Hand book 217-F@ TBD hrs
<b>Certifications</b>	Designed to meet FCC, CE and UL certifications, where applicable
<b>Standards</b>	VadaTech is certified to both the ISO9001:2015 and AS9100D standards
<b>Warranty</b>	One (1) year, see <a href="#">VadaTech Terms and Conditions</a>

## INTEGRATION SERVICES AND APPLICATION-READY PLATFORMS

VadaTech has a full ecosystem of OpenVPX, ATCA and MTCA products including chassis platforms, shelf managers, AMC modules, Switch and Payload Boards, Rear Transition Modules (RTMs), Power Modules, and more. The company also offers integration services as well as pre-configured Application-Ready Platforms. Please contact VadaTech Sales for more information.

# Ordering Options

## VT950 – ABC-DE0-0HJ

<b>A = Power Supply</b> 0 = AC Universal 500W 1 = DC -36V to -75V (460W) 2 = DC 18V to 36V (400W)	<b>D = Clock Holdover Stability</b> 0 = Standard (XO) 1 = Stratum-3 (TCXO)	
<b>B = JSM</b> 0 = No JSM 1 = JSM	<b>E = JTAG Virtual Probe</b> 0 = No JTAG Virtual Probe 1 = JTAG Virtual Probe	<b>H = Temperature Range</b> 0 = Commercial 1 = Industrial
<b>C = Front Panel Clocking</b> 0 = No FP Clocking (Backplane Clocking only) 1 = Dual LVCMOS Clock In/Out 2 = Sine Wave In + LVCMOS In/Out 3 = Built-in GPS receiver + LVCMOS In/Out 4 = Dual Sine Wave In 5 = GPS receiver + Sine Wave In 6 = Sine Wave In (up to 17dBm) +TTL/LVCMOS In		<b>J = Conformal Coating</b> 0 = No coating 1 = Humiseal 1A33 polyurethane 2 = Humiseal 1B31 acrylic

## Related Products

VT872



- MTCA.3 Conduction Cooled System Platform
- Up to 6 mid-size AMCs
- High-speed routing on 26 layers

AMC515



- AMC FPGA carrier for FPGA Mezzanine Card (FMC) per VITA 57
- AMC Ports 4-11 are routed to FPGA (protocols such as PCIe, SRIO, XAUI, etc. are FPGA programmable)
- Xilinx Virtex-7 XC7V2000T in 1925 package

FMC223



- FMC per VITA 57
- Single module DAC 14-bit @ 2.5 GSPS (AD9739)
- 2 Vpp differential Analog output swing

# Contact

## VadaTech Corporate Office

198 N. Gibson Road, Henderson, NV 89014

Phone: +1 702 896-3337 | Fax: +1 702 896-0332

## Asia Pacific Sales Office

7 Floor, No. 2, Wenhui Street, Neihu District, Taipei 114, Taiwan

Phone: +886-2-2627-7655 | Fax: +886-2-2627-7792

## VadaTech European Sales Office

VadaTech House, Bulls Copse Road, Southampton, SO40 9LR

Phone: +44 2380 016403

info@vadatech.com | www.vadatech.com

# Choose VadaTech

## We are technology leaders

- First-to-market silicon
- Constant innovation
- Open systems expertise

## We commit to our customers

- Partnerships power innovation
- Collaborative approach
- Mutual success

## We deliver complexity

- Complete signal chain
- System management
- Configurable solutions

## We manufacture in-house

- Agile production
- Accelerated deployment
- AS9100 accredited



**vadatech**  
THE POWER OF VISION

## Trademarks and Disclaimer

The VadaTech logo is a registered trademark of VadaTech, Inc. Other registered trademarks are the property of their respective owners. AdvancedTCA™ and the AdvancedMC™ logo are trademarks of the PCI Industrial Computers Manufacturers Group. All rights reserved. Specification subject to change without notice.

© 2019 VadaTech Incorporated. All rights reserved.  
DOC NO. 4FM737-12 REV 01 | VERSION 3.3 – DEC/19