

UTC002

MicroTCA Carrier Hub, 2nd Generation



UTC002

Key Features

- 400 MHz CPU with 64 MB DDR for MCMC (MicroTCA Carrier Management Controller) and Shelf Manager
- Layer 2 managed GbE to each AMC (optional)
- Non-blocking PCIe Gen 3 (x4), to each slot with option for SRIO or 10GbE (Layer 2 managed)
- Redundant boot system to ensure fail-safe upgrades
- Automatic fail-over with dual UTC002
- SAS/SATA to each AMC (optional)
- Telecom/GPS clock (Stratum-3)
- Fabric clock with spread spectrum capability
- Single module, full size per AMC.0
- HPM.1 and IPMI 2.0 compliant

Benefits

- Versatile fabric options of 10GbE, PCIe Gen3, or SRIO
- Forward compatible with VadaTech's 3rd Gen MCH
- Interoperability tested with wide range of industry products
- Electrical, mechanical, software, and system-level expertise in house
- Full system supply from industry leader
- AS9100 and ISO9001 certified company

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UTC002

The VadaTech UTC002 is a feature-rich MicroTCA Carrier Hub (MCH) for the MTCA chassis. Its management software is based on VadaTech's robust Carrier Manager and Shelf Manager which have been deployed for many years with proven results. The MCMC manages power modules, 2 Cooling Units and 12 AMCs within the MTCA chassis. It manages and provides access to the on-board fabric interfaces. The module is available with PCIe, SRIIO, 10GbE/GbE (Layer 2 managed), and SAS fabric interfaces.

The UTC002 runs Linux 2.6 on its MCMC CPU and is hot-swappable. It is fully redundant when used in conjunction with a second instance of the module. The firmware is HPM.1 compliant enabling easy upgrades.

The UTC002 has sophisticated clocking features. It has options for Telecom, GPS and/or Fabric clocks. Stratum-3 TCXO and VCTCXO is the default configuration. The board has a user-selectable option for protocol analyzer mode.



Figure 1: UTC002

Block Diagram

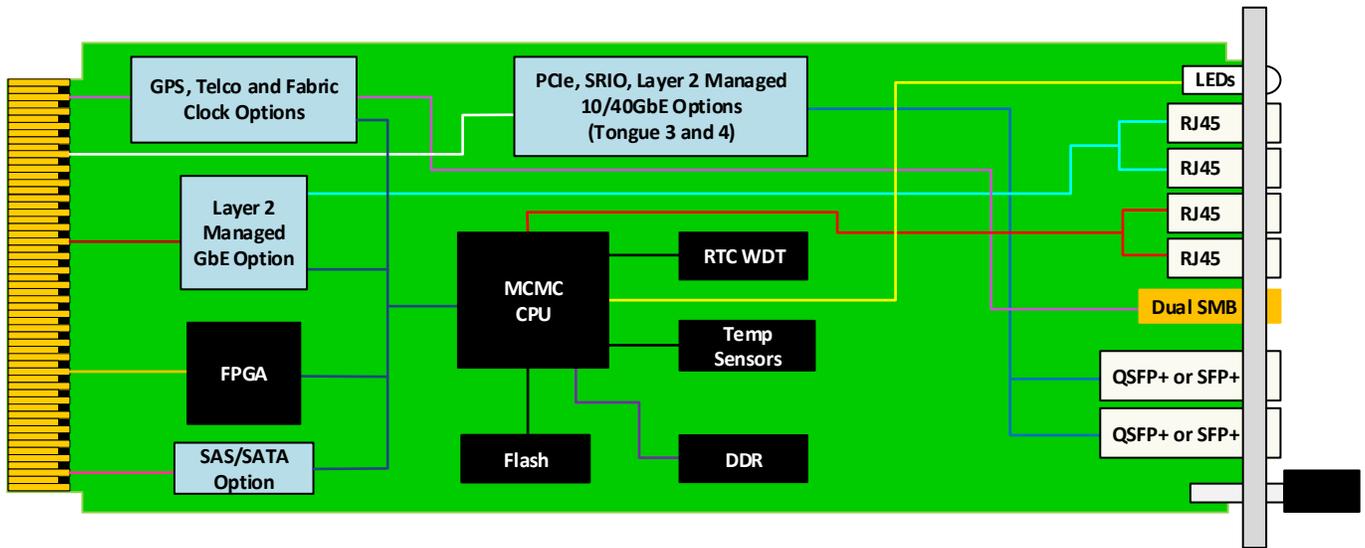


Figure 2: UTC002 Functional Block Diagram (SFP+ is used for 10GbE and QSFP+ for PCIe/SRIO)

Front Panel

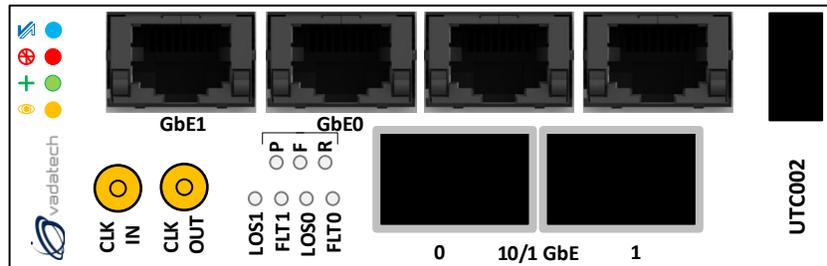


Figure 3: UTC002 Front Panel

Architecture

IPMI Carrier Manager/Shelf Manager/Protocol Analyzer

The UTC002 utilizes the same proven standards-compliant IPMI management stack that has been utilized successfully in our previous generation MCH products. It supports carrier manager, shelf manager, and protocol analyzer operations to help facilitate a seamless chassis integration experience. The IPMI stack enables a rich feature set including:

- IPMI v2.0 with IPMI v1.5 compatibility
- SDR, FRU, and SEL storage interfaces (SEL stored in MRAM for high-speed/non-volatile/no-wear-out access)
- Intelligent temperature, voltage, and current sensing
- Shelf cooling policy
- Shelf activation, power management, Automatic fail-over, and redundancy management
- Alarm controls
- Event notification and flexible alerting policies
- Backplane E-Keying
- CLI, SNMP, RMCP+, HTTP, and HPI
- IPMB Protocol Analyzer GUI for use on PC (available separately)
- ScorpionWare GUI system manager integration tool on PC (available separately)

Base Channel Ethernet Switch

The UTC002 provides an optional 1GbE base channel switch via RJ-45 ports. This switch is fully Layer 2 managed.

FAT Pipes Fabrics

The UTC002 provides options for various fat pipes fabric options:

10GbE Switch with dual SFP+

- Full Layer 2 management enabling enterprise-grade protocol layer data transport

PCIe Gen2/3 Switch with front QSFP+

- Automatic speed negotiation for 2.5/5/8 Gbps per lane
- Virtual Switch/Multiple domain/Non-transparent port support to enable partitioning of the system with multiple root complexes
- Includes an extra internal port which enables the GPS precision time-stamping engine (accessible from an AMC root complex board)
- 1024 Gbps aggregate bandwidth/non-blocking/cut-through architecture

SRIO x4 Switch with front QSFP+ expansion/uplink port

- Supports 1.25/2.5/3.125/5/6.25 Gbps per lane
- 240 Gbps aggregate bandwidth/non-blocking/cut-through architecture

Crossbar Switch (CBS) Fabric

- 6.5 Gbps NRZ per-channel data rate and non-blocking switch matrix with multicast and output striping programming modes
- 468 Gbps aggregate bandwidth in a single chip
- Port frequency independent

Fabric Clock Option

The UTC002 has the capability to provide a 100 MHz HCSL PCIe Gen3 compliant fabric clock to each AMC. This option enables the recommended synchronous PCIe clocking approach within the chassis when used in combination with the PCIe fabric.

GPS and General-Purpose Clocks

The MTCA specification defines a set of clocks for telecom and non-telecom applications. The VadaTech UTC002 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 UTC002 supports the following GPS and general-purpose clocking features:

- MicroTCA.4-compliant low-jitter/low-skew backplane crossbar clock routing matrix for CLK1/CLK2/CLK3 for all AMCs
- Clock disciplining with arbitrary clock frequency output and holdover (Stratum-3 option) including 1PPS regeneration and holdover
- High-quality clock generation/jitter cleaning for up to two user clocks
- Supports hitless automatic clock failover for improved reliability

The UTC002 supports flexible front panel clock port ordering options:

- Two DC-coupled LVCMOS Inputs/Outputs
- One AC-coupled Sine-wave Input plus a DC-coupled LVCMOS Input/Output

Specifications

Architecture	
Physical	Dimensions Single module, full-size Width: 2.89" (73.5 mm) Depth 7.11" (180.6 mm)
Type	Controller MTCA Carrier Hub (MCH)
Standards	
MTCA	PICMG MicroTCA.0 Revision 1.0
ATCA	PICMG 3.0 Revision 2.0 (AdvancedTCA)
AMC	AMC.0
Module Management	HPM HPM.1 Revision 1.0 IPMI IPMI v2.0
Configuration	
Power	UTC002 Option load dependent (as the MCMC and Shelf only < 3W)
Environmental	Temperature See ordering options and environmental spec sheet Storage Temperature: -40° to +85°C Altitude 40,000 ft non-operating Vibration Operating 9.8 m/s ² (1G), 5 to 500 Hz on each axis Shock Operating 30Gs on each axis Relative Humidity 5 to 95% non-condensing
Front Panel	Interface Connectors RS-232 port (RJ-45) for serial console Out-of-band LAN 10/100 from MCMC/Shelf Manager (RJ-45) Two in-band 100/1000 from Base Switch Fabric (RJ-45) External reference clock (SMB) Fabric – PCIe Gen 3, SRIO or XAUI (QSFP+ or SFP+) LEDs IPMI management control (Blue, Red, Amber and Green) LNK/ACT, OOB PCIe error, ACTIVE MCMC, Clock: Ref Good, Frequency Lock, Phase Lock, additional LEDs for each fat pipe fabric type Mechanical Hot swap ejector handle with +/-15 KV ESD protection Temperature Sensor Multiple temperature sensors on-board
Other	
MTBF	MIL Hand book 217-F@ TBD hrs
Certifications	Designed to meet FCC, CE and UL certifications, where applicable
Compliance	RoHS
Standards	VadaTech is certified to both the ISO9001:2000 and AS9100B:2004 standards
Warranty	Two (2) years

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

UTC002 – ABC-DEF-GHJ-0L0

A = Management Software	D = Fabric Switch	G = Fabric Port Configuration	
1 = MCMC 2 = MCMC and Shelf Manager 3 = Reserved	0 = No Fabric Switch 1 = Reserved 2 = SRIO 3 = Reserved 4 = Layer 2 Light Managed 10GbE 5 = PCIe with virtual switch* 6 = Cross Bar Switch (CBS) 7 = SRIO Gen2 8 = PCIe Gen3*	0 = No Port configuration 1 = Fabric Clock shared with Fabric B (SAS) 2 = Telecom Clock shared with Fabric B (SAS) 3 = No Clocks – all Fabric B (SAS) 4 = Reserved 5 = Reserved	
B = GbE Switch	E = Telecom/GPS Clock	H = SFP+ TXCVR 10GbE/GbE or QSFP+ for PCIe/SRIO	L = MTCA Specification
0 = No GbE Switch 1 = Managed Layer 2 GbE	0 = No Telecom/GPS Clock 1 = Telecom TCXO** 2 = GPS VCTCXO** (30.72 MHz)*** 3 = GPS VCTCXO** (10.00 MHz)*** 4 = Clock distribution only 5 = GPS VCTCXO** (50.00 MHz)*** 6 = Reserved	0 = No TXCVR or QSFP+ 1 = 10GBASE-SR 2 = Reserved 3 = 10GBASE-LR 4 = 1Gb LC/SX (850 nm) 5 = 1Gb LC/LX (1310 nm) 6 = Copper 1000 Mbit 7 = Reserved 8 = QSFP+	0 = MTCA.0 1 = MTCA.1 (captive screws)
C = SAS/SATA	F = Fabric Clock	J = Temperature Range and Conformal Coating	
0 = No SAS/SATA 1 = SAS/SATA	0 = No Fabric Clock 1 = Fabric 100 MHz HCSL 2 = Reserved 3 = Reserved 4 = Reserved 5 = Reserved 6 = Reserved	0 = Commercial (No coating) 1 = Industrial (No coating) 2 = Commercial Temp with Humiseal 1A33 Polyurethane 3 = Commercial Temp with Humiseal 1B31 Acrylic 4 = Industrial Temp with Humiseal 1A33 Polyurethane 5 = Industrial Temp with Humiseal 1B31 Acrylic	

Notes: *When PCIe with expansion to the front is needed the second AMC slot will not have PCIe, if QSFP+ is utilized. With the PCIe Gen3 switch all slots are available.

**The Crystal Oscillator is Stratum-3; for lower cost solution contact VadaTech Sales.

***Frequencies from 8 MHz to 52 MHz are available.

Related Products

AMC610



- AMC.1 and AMC.3
- 4x Gigabit Ethernet ports via RJ-45
- On board 2.5" disk with direct connect to Ports 2 and 3

AMC720



- Intel® Xeon™ E3 processor
- Up to 16 GB of DDR3 with ECC and 32 GB Flash
- PCIe Gen2

UTC010



- Dual -36V DC to -75V DC input, 792W (available in 396W)
- Hot swappable with support for power module redundancy
- Dual IPMI bus

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