

## UTC002 – MicroTCA Carrier Hub (MCH), 2<sup>nd</sup> Generation

2<sup>nd</sup> Generation MCH



### KEY FEATURES

- Single module, full size per AMC.0
- 400 MHz CPU with 64 MB DDR for MCMC (MicroTCA Carrier Management Controller) and Shelf Manager
- Redundant boot system to ensure fail-safe upgrades
- Automatic fail-over with dual UTC002
- Layer 2 managed GbE to each AMC (optional)
- SAS/SATA to each AMC (optional)
- Non-blocking PCIe Gen 3 (x4), to each slot with option for SRIO or 10 GbE (Layer 2 managed)
- Telecom/GPS clock (Stratum-3)
- Fabric clock with spread spectrum capability
- Linux 2.6 embedded OS
- HPM.1 compliant
- IPMI 2.0 compliant
- RoHS compliant

### Benefits of Choosing VadaTech

- Versatile fabric options of 10 GbE, PCIe Gen 3, or SRIO
- Forward compatible with VadaTech's Gen 3 MCH
- Interoperability tested with wide range of industry products
- Full ecosystem of front and rear boards, enclosures, specialty modules, and test/dev products from one source
- AS9100 and ISO9001 certified company

The VadaTech UTC002 is a feature-rich MCH (MicroTCA Carrier Hub) for the  $\mu$ TCA 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  $\mu$ TCA chassis. It manages and provides access to the on-board fabric interfaces. The module is available with PCIe, SRIO, 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 which allows 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.

## 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 Version 2.0 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 and power management / Automatic fail-over/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 RJ45 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 2.5/5/8Gbps 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)
  - 1024Gbps aggregate bandwidth / non-blocking / cut-through architecture
- SRIO x4 Switch with front QSFP+ expansion/uplink port
  - Supports 1.25/2.5/3.125/5/6.25Gbps per lane
  - 240Gbps aggregate bandwidth / non-blocking / cut-through architecture
- Crossbar Switch (CBS) Fabric
  - 6.5Gbps NRZ per-channel data rate and non-blocking switch matrix with multicast and output striping programming modes
  - 468Gbps aggregate bandwidth in a single chip
  - Port frequency independent

## FABRIC CLOCK OPTION

The UTC002 has the capability to provide a 100MHz 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  $\mu$ TCA 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

## INTEGRATION SERVICES AND APPLICATION-READY PLATFORMS

VadaTech has a full ecosystem of ATCA and  $\mu$ TCA products including chassis platforms, shelf managers, AMC modules, Switch and Payload Boards, Rear Transition Modules (RTM), 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.

## BLOCK DIAGRAM

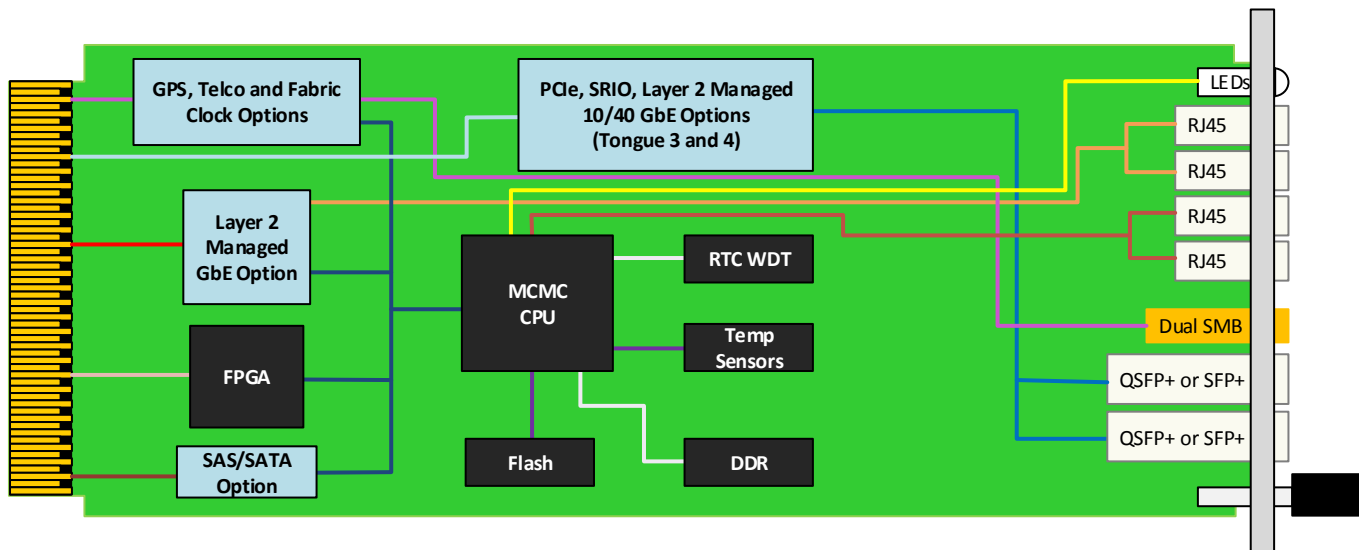
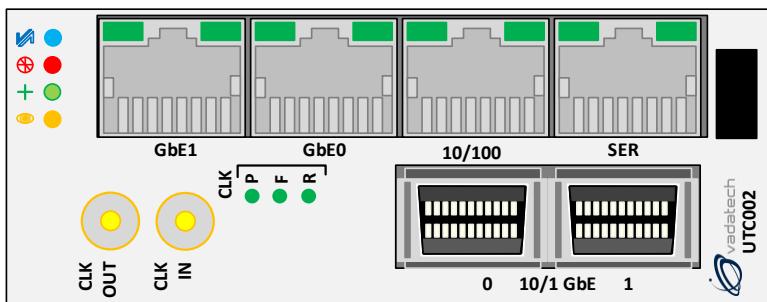


Figure 1: UTC002 Functional Block Diagram (SFP+ is used for 10GbE and QSFP+ for PCIe/SRIO)

## FRONT PANEL DIAGRAM



## SPECIFICATIONS

Architecture		
Physical	Dimensions	Width: 2.89" (73.5 mm)
		Depth: 7.11" (180.6 mm)
Type	Controller	µTCA Carrier Hub (MCH)
Standards		
µTCA	Type	µTCA.0 Revision 1
AMC	Type	AMC.0 Revision 1
ATCA	Type	PICMG 3.0 Revision 2.0
Module Management	IPMI	IPMI Version 2.0
	HPM	HPM.1 Revision 1.0
Configuration		
Power	UTC002	Option load dependent (as the MCMC and Shelf only < 3 W)
Environmental	Temperature	Operating temperature: -5° to 55° C (air flow requirement of >400 LFM), industrial versions also available (See <a href="#">environmental spec sheet</a> )
		Storage Temperature: -40° to +85° C
	Vibration	1G, 5 to 500 Hz on each axis
	Shock	30Gs each axis
	Relative Humidity	5 to 95 percent, non-condensing
	Front Panel	Interface Connectors
		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, Green
		LNK/ACT, OOB PCIe error, ACTIVE MCMC, Clock: Ref Good, Frequency Lock, Phase Lock, additional LEDs per each fat pipes fabric type
	Mechanical	Hot-swap switch input with +/-15KV 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	
Standards	VadaTech is certified to both the ISO9001:2000 and AS9100B:2004 standards	
Warranty	Two (2) years	
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	

## ORDERING OPTIONS

### UTC002 – ABC – DEF – GHJ

#### A = Management Software

- 1 = MCMC
- 2 = MCMC and Shelf Manager
- 3 = Reserved

#### B = GbE Switch

- 0 = None
- 1 = Managed Layer 2 GbE

#### C = SAS/SATA

- 0 = None
- 1 = SAS/SATA

#### D = Fabric Switch

- 0 = None
- 1 = Reserved
- 2 = SRIO
- 3 = Reserved
- 4 = Layer 2 Light Managed 10GbE
- 5 = PCIe<sup>1</sup> with virtual switch
- 6 = Cross Bar Switch (CBS)
- 7 = SRIO Gen2
- 8 = PCIe<sup>1</sup> Gen3

#### E = Telecom/GPS Clock

- 0 = None
- 1 = Telecom TCXO<sup>2</sup>
- 2 = GPS VCTCXO<sup>2</sup> (30.72 MHz)<sup>3</sup>
- 3 = GPS VCTCXO<sup>2</sup> (10.00 MHz)<sup>3</sup>
- 4 = Clock distribution only
- 5 = GPS VCTCXO<sup>2</sup> (50.00 MHz)<sup>3</sup>
- 6 = Reserved

#### F = Fabric Clock

- 0 = None
- 1 = Fabric 100 MHz HCSL
- 2 = Reserved
- 3 = Reserved
- 4 = Reserved
- 5 = Reserved
- 6 = Reserved

#### G = Fabric Ports Configuration

- 0 = None
- 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

#### H = SFP+ Transceiver 10GbE/GbE or QSFP+ for PCIe/SRIO

- 0 = None
- 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+

#### J = Temperature & Coating

- 0 = Commercial Temp
- 1 = Industrial Temp
- 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:

- 1) 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.
- 2) The Crystal Oscillator is Stratum-3; for lower cost solution contact VadaTech Sales.
- 3) Frequencies from 8MHz to 52MHz are available.

## CONTACT US

#### VadaTech Corporate Office

198 N. Gibson Rd,  
Henderson, NV 89014  
Email: [info@vadatech.com](mailto:info@vadatech.com)  
Telephone: +1 702 896-3337  
Fax: +1 702 896-0332

#### Asia Pacific Sales Office

7 Floor, No. 2, Wenhua Street, Neihu District,  
Taipei 114, Taiwan  
Email: [info@vadatech.com](mailto:info@vadatech.com)  
Telephone: +886-2-2627-7655  
Fax: +886-2-2627-7792

#### VadaTech European Sales Office

VadaTech House, Bulls Copse Road, Southampton,  
SO40 9LR  
Email: [info@vadatech.com](mailto:info@vadatech.com)  
Telephone: +44 2380 016403