

Solution Brief

MICROTCA CHOSEN FOR SIGNAL PROCESSING OF NAVAL TOWED SONAR ARRAY

A prime military contractor has chosen MicroTCA over OpenVPX for its naval computing application. The company was looking for a system for the signal processing of SONAR data from towed arrays or other sensors on the board. The requirement included a rugged front-to-rear cooled rackmount design for above and below-surface vessels with capability for a multi-gigabit backplane data transfer and failover options. VadaTech develops a 1U solution that would provide vibration and shock resistance in an isolated rack. The chassis meets MIL-STD-901D and 167A for shock/vibration and to MIL-STD-461 for EMI.

SYSTEM REQUIREMENTS

For the signal processing, VadaTech utilized a high-performance Xilinx FPGA Carrier in the AMC (Advanced Mezzanine Card) form factor. The part accepts one FMC (FPGA Mezzanine Card) for versatility and scalability. In this application, a customized FMC for beam-forming was utilized.

The chassis system routed x8 PCIe Gen 3 to each of the 6 slots, providing high-speed connectivity between the AMCs. The system provides precision clocking with GPS/IEEE1588/SyncE, including a hold-over crystal for maintaining time while out of range/sight of the network.

VT950 RUGGED 1U CHASSIS

Figure 1 shows VadaTech VT950 rugged chassis with a lightweight aluminum construction. It includes an integrated shelf manager and 6 AMC slots in a rugged 1U chassis platform. 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. There is also a 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. The VT950 can provide Ethernet time services to the chassis networks on both the GbE and 40GbE fabrics. 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 on-board disciplined oscillator.

The lightweight aluminum chassis has a ribbed construction and screw-down front panel tabs to meet the ruggedization requirements. Similar applications may utilize VadaTech's ATR-based MicroTCA solutions compliant to MicroTCA.3 for hardened conduction-cooled systems. They come in 1/2 and 3/4 ATR sizes or can be offered in rackmount formats. The company is also developing MicroTCA.2 design for hybrid air/conduction cooling in a heat-exchanged chassis.



ABOUT VADATECH

VadaTech provides innovative embedded computing solutions from board-level products, chassis-level platforms, to configurable application-ready systems. With a focus on MicroTCA and AdvancedTCA solutions, the company offers unmatched product selection and expertise in the full xTCA ecosystem. With our unique combination of electrical, mechanical, software, and system-level expertise, VadaTech can provide customized commercial or rugged computing solutions to meet the most complex customer requirements. VadaTech also offers specialized product solutions for VPX/VME, CompactPCI, and other architectures. A member of PICMG and VITA, VadaTech is headquartered in Henderson, NV with offices in Europe and Asia Pacific.



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