Sensor-Based Processing for
Military & Aerospace

vadatech
THE POWER OF VISION
Leveraging Modular Open Systems Approach (MOSA)

VadaTech is a world leader in high performance embedded computing platforms and leverages its portfolio of innovative solutions to offer a large choice of platforms and data acquisition modules ideal for a range of applications. We use open standard platforms to minimize SWaP-C (Size, Weight, Power, and Cost) in your application, for modularity and scalability, and to lower your CAPEX, OPEX and risk. We focus on MicroTCA, AdvancedTCA and OpenVPX which are the standard MOSA platforms of choice.

At a time when product complexity and reliability demands are increasing, MOSA fosters open architectures that are generated and controlled through trade associations including PICMG and VITA. MOSA ensures reduced development expense, design cycle time and manufacturing cost. It creates:

- Efficiency by cutting acquisition/development cycle time, enhancing supportability and reducing life-cycle costs
- Closer cooperation between commercial and military electronics industries
- Interoperability and reuse of components among systems
- Access to cutting-edge technologies for rapid upgrades

**Deployed Systems**

**Small Form Factor**
- Land-mobile and UAV applications
  - Compact, fully conduction-cooled
  - Sensor processing from ADC to network
  - Simple, flexible configuration choices

**Rugged Rackmount**
- Land-mobile and sub-surface naval
  - Network-centric processing sub-system
  - Fast acquisition with precision timing
  - Full platform management

**Rackmount Microserver**
- Controlled and ground-fixed environments
  - Compact, fully conduction-cooled
  - Sensor processing from ADC to network
  - Simple, flexible configuration choices

**ATR**
- Fixed- and rotary-wing installations
  - Compact, fully conduction-cooled
  - System health monitoring
  - Fast port from development to deployment

**Rugged ATCA**
- Naval and wide-body airborne
  - 40G networking
  - High-end processing
  - MIL-STD-810F/461E

VadaTech’s world class leading high performance embedded computing solutions meet the high-reliability requirements of electronic warfare, communications, radar/sonar, simulators and other military & aerospace applications.

We have built a reputation for creating innovative solutions to our customers’ business problems; whether they are technical challenges, time-to-market issues, life cycle management, or the need to completely outsource platform production. Our flexibility, technical strength, and ability to quickly engage both engineering and commercial functions, all help our customers to generate and seize new opportunities.
VadaTech is a trusted supplier of SIGINT modules to global military and aerospace industry leaders. With the VITA57 FMC, you benefit from mechanical and electrical flexibility as well as interoperability. FMCs are integrated into the FPGA architecture of your choice. The AD/DA functions can also be directly integrated on the FPGA module. VadaTech selects each component to provide high RF performances from RF connector to AD/DA silicon.

Connect to your sensor or analog front-end and take advantage of a wideband capability in the VUHF frequency bands. Cover most licensed and unlicensed bands in your transceiver applications.

**High Performance FPGA Carriers**

- Selection of latest generation FPGA
- Designed for high performance signal processing
- Compatible with DAQ Series’ Signal Processing Development Kit
- From 2GB to 20GB external memory
- High speed PCIe Gen3 DMA engine
- Utilize virtual JTAG probe for remote programming and upgrade
- Distributed architecture with onboard PowerPC
- Flexible clock/trigger routing

**Specialty FMCs and Timing**

Synchronization, reliability and compatibility are key factors when approaching the system level in land, airborne or navy application. VadaTech customers have been successful in adopting specialty FMCs and AMCs dedicated to timing and synchronization of remote systems.

**FPGA Carriers**

- **AMC517**
  - Kintex-7 410T, 2GB DDR3, Freescale PPC2040

- **AMC516**
  - Virtex-7 690T, 2GB DDR3, Freescale PPC2040

- **AMC592**
  - Kintex UltraScale™ XCKU115, 20GB DDR4

- **AMC593**
  - Dual FMC Carrier, Kintex UltraScale™ XCKU115, Freescale PPC2040

**PCI516**

PCIe FPGA Carrier for FMC, Virtex-7
Networking Storage IO PCIe/XMC/PMC Modular Building Blocks

Storage SATA & SSD in Raid 0, 1, 10

Optical Fiber FMCs for custom protocol network applications

XMC/PMC and PCIe carrier for Non MTCA form factor compatibility

Digital and Serial IO for full control of your system

• Conduction cooled chassis and modules
• Hardware Platform Management
• The clamshell encases the functional AMC module in an electrically conductive shell providing ESD protection for a 15 kV half-inch ball test
• MTCA and VPX small form factor both use PWB edge pads for high speed interconnect
• MTCA 3 backplane connector system qualification test summary includes:
  • 50G mechanical shock
  • Random vibration/halt 12Grms, 50 -2kHz
  • Bench handling/vibration over temperature
  • Thermal cycling humidity
  • Insulation resistance
  • Dielectric withstanding voltage
  • Durability @ std environment
  • Engaging/separating force
  • Salt fog/SO2 (2 days), salt fog
  • Sand and dust
  • 15kV ESD
  • MTCA 500 hours vs. VPX 250 hours
• MIL-CC2, MIL-CC3 and MIL-CC4 and based upon ANSI/VITA47, MIL-STD-810 requirements

Rugged MTCA.3

Acquisition, Transmission & Storage

AMC526C
AMC Dual ADC, Virtex-7, 12-Bit @ 2.6 GSPS

AMC635
AMC Carrier for JBOD, 8 mSATA Disk

AMC720C
Xeon E3-1125 Processor AMC, PCIe

<table>
<thead>
<tr>
<th>Application Ruggedization Level</th>
<th>MTCA.0</th>
<th>MTCA.1</th>
<th>MTCA.3</th>
</tr>
</thead>
<tbody>
<tr>
<td>Telco/Industrial (Telco-centric)</td>
<td>15g</td>
<td>25g</td>
<td>40g</td>
</tr>
<tr>
<td>Telco/Industrial (Telco-centric)</td>
<td></td>
<td></td>
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<tr>
<td>Telco/Military (MIL-centric)</td>
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<tr>
<td>Max Operating Shock</td>
<td>15g</td>
<td>25g</td>
<td>40g</td>
</tr>
<tr>
<td>Max Operating Vibration</td>
<td>1g</td>
<td>8g</td>
<td>12g</td>
</tr>
<tr>
<td>Operating Temperature</td>
<td>5°C to 55°C</td>
<td>-40°C to 85°C</td>
<td>-40°C to 85°C</td>
</tr>
</tbody>
</table>

MicroTCA Ruggedization Standard
DAQ Series Software Package

Setup the clock and trigger source, set the acquisition sequence, visualize the acquisition and timestamping data in real time. Support your application long term with source code based on open standards.

Complete solution
- Realtime acquisition, recording, display
- System control
- System status

Fast development / verification of custom signal processing algorithms
- Create your algorithms in MATLAB/Simulink
- Integrate your algorithms on FPGA with Xilinx System Generator

Highly customizable
- Open source
- Source code / netlists provided
- Common API for all VadaTech DAQ products

High performance
- Simultaneous acquisition / data transfer to Linux server
- From 2GB to 20GB on-board snapshot buffer
- High speed DMA transfer to Linux server

Real time system monitoring
- Buffer level
- PCle speed
- Hardware status

High accuracy timestamping
- Slot-to-slot timestamp synchronization
- Nanosecond timestamp accuracy

Flexible acquisition sequencing
- Rising/falling trigger detection
- User defined trigger function
- Continuous/stepped triggering mode

Real time display
- Spectrum analyzer
- Oscilloscope

Setup your clock and trigger source, set your sequence and visualize the digitized data.

Modify the source code and GUI to match your application needs.

Simulation of PSK modulation. Develop your signal processing functions before you receive your hardware.

Load the IP created during the simulation phase into your FPGA project with DAQ Series. Visualize the result of PSK modulation on FMC225 and compare to the preliminary simulation results.

SIGINT
- High density acquisition platform: 7 ADC (4GSPS, 12bit), 1 DAC (2.8GSPS, 14 bits) in 1U chassis
- Large Signal Processing capabilities: 4 Virtex 7 FPGA with 8GB of DDR3
- High speed interconnect: 12GB/s DMA engine from FPGA to CPU
- High performance computing: Intel Broadwell DE, 32GB DDR4, RedHat, Fedora
- Flexible reference clock/trigger/timestamp capabilities
  - Front panel clock/trigger
  - GPS triggering and synchronized clock
  - Clock/trigger to all AMC through the backplane
  - PTP compatible
- Complete software solution
  - DAQ Series

Synchronized multi-channel acquisition platform for VUHF

Fast implementation of FFT, filters, narrowband or wide band DDC in DAQ Series:

Pulse and Burst acquisition:
- High performance computing: Intel Broadwell DE, 32GB DDR4, RedHat, Fedora
- Flexible reference clock/trigger/timestamp capabilities
- Front panel clock/trigger
- GPS triggering and synchronized clock
- Clock/trigger to all AMC through the backplane
- PTP compatible
- Complete software solution
  - DAQ Series
System Health Management

Military and aerospace systems integrators are leveraging Intelligent Platform Management Interface (IPMI) in open architectures such as VPX, AdvancedTCA (ATCA) and MicroTCA (MTCA) to improve their system performance while reducing costs.

The shelf manager monitors and controls the payload blades and other field replaceable units (FRUs) in a system, such as fans and power supplies. The shelf manager can take action or report a situation to the system manager, according to the rules set by the system designer.

As these standards were originally defined for the telecom industry, VadaTech has developed key features, which are typically not required in commercial environments, to address the harsh conditions faced by soldiers, sailors and pilots.

**Shelf Manager**
- Exchange commands and status with FRUs
- Manage system and FRU configuration
- Provide fault tolerance and hotswap control

**Battle Short**
- Temporary bypass of system safety thresholds
- Restore safety features after mission completion
- Prevents interruption during critical events

**Cold Start**
- System preheat used to prevent component damage
- System power-on based on temperature threshold
- Lower system costs with COTS components

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**About VadaTech**

VadaTech is a dynamic company, pushing technology to new limits. Focused on embedded computing applications, our vision transforms technology into innovative solutions for a variety of markets. Rapidly evolving technologies require our customers to adopt open systems based hardware platforms to meet the demands of their markets which are many times uncertain and unstable thus demanding a nimble response. With a focus based on VITA and PICMG open standards, we offer unmatched product selection and expertise, especially in the areas of data acquisition, signal processing, rugged systems, and other cutting edge embedded technologies.

At VadaTech, we differentiate ourselves from other embedded computer manufacturing companies by incorporating our customers’ vision into the product specification and development process; all the way through to deployment. Our partnership philosophy with our customers expands their engineering resources, increasing their value and reducing their time to market.

Throughout each project, we work closely with our clients to ensure that a high level of support and communication is provided from development through to successful deployment. Our collaborative approach to product development enables us to share ‘the power of vision’ with our customers.
Choose VadaTech

We are technology leaders
• First-to-market silicon
• Continuous innovation
• Open systems expertise

We commit to our customers
• Partnerships power innovation
• Collaborative approach
• Mutual success

We deliver complexity
• End-to-end Processing
• System management
• Configurable solutions

We manufacture in-house
• Agile production
• Accelerated deployment
• AS9100 accredited

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