High-End Processor AMC based on Freescale™ QorIQ™ P5 Technology

» Outstanding Performance
  Freescale QorIQ™ Dual-Core P5020/64bit up to 2.2 GHz

» Impressive Capacity
  Up to 8 GB ECC Memory DDR3 1300 MHz, up to 32 GB SATA NAND Flash Module

» Comprehensive Connectivity
  Up to 5x GbE, 2x sRIO (1.3 and 2.1) x4 or 2x PCIe x4
  SATA to Backplane and onboard Flash Module
AM4150
Control plane 64bit Dual Core QorIQ™ AMC module

» High-performance processing
The AM4150 is a control plane CPU board implemented as Single Mid-Size Advanced Mezzanine Card (AMC) for MicroTCA and ATCA applications. The design is based on the Freescale™ QorIQ™ P5020 Dual Core processor, with cores based on the 64bit e5500 Power Architecture®. Due to the P5020 processor, the AM4150 meets highest demands in multi-threaded processing: in combination with high-speed fabrics and frame handlers, the multi-core architecture allows high throughputs, as well as low latencies. To match demands on high-performance, the AM4150 provides a high-speed dual-channel memory with up to 8 GB ECC-RAM. In order to grant reliability of the application, the AM4150 features redundant Boot flashes.

» High-speed fabrics
The Kontron AM4150 provides flexible configuration of high-speed fabrics. On AMC ports 4-7, 4x SERDES lines can be configured either as PCI Express (root complex or end point) or Serial Rapid IO (host or agent), primarily for applications which require close programming to the chip without extensive overhead and with minimum latencies. AMC ports 8-11 may be configured either for Serial Rapid IO or PCI Express or up to 3x GbE. In addition, the Kontron AM4150 supports three Gigabit Ethernet channels. Either 2x GbE on AMC ports 0,1 plus 1x GbE at the front or 2xGbE at the front and port 0 on the backplane. Depending on the application, the AM4150 supports usage in systems with MCH or without MCH in order to reduce costs and speed up system development.

» Longevity
The AM4150 meets highest demands regarding longevity due to the careful component selection and a Micro SDHC card socket to be not affected by regular flash discontinuation. With up to 8 GbE DDR-3 ECC memory the AM4150 is well equipped for future demands. This QorIQ™ processor module is therefore suitable for telecommunication, military communications, as well as image processing in industrial and medical environments. The AM4150 supports different options of booting the OS, either from the Micro SDHC card, the NOR or the NAND Flash (for rugged applications). In terms of operating systems, the AM4140 supports VxWorks 6.9, WindRiver Linux.

» MicroTCA Platforms
Kontron also offers a choice of AMC systems for the AM4150. For instance the OM6060 can be used as entry level platform for operating the AM4150 with point to point fabrics PCIe and SRIO in combination with the AM4901 basic MCH which provides Ethernet connectivity to all AMC slots. In this system, the AM4150 can be combined with I/O cards, DSP cards and different processor boards. For higher demands, the OM6120 system provides multiple sRIO connections for up to 12 AMCs in combination with the AM4904–SRIO MCH. The system also allows switching PCIe fabrics in combination with the AM4904-PCIE MCH. It can be operated with dual MCHs.

AM4150 SINGLE-WIDTH, MID-SIZE AMC MODULE
## AM4150

### Technical Information

| **Form Factor** | Single width, mid-size module (full size on project request) |
| **CPU and PCH** | Freescale P5020/64bit @2.0GHz (2.2GHz depending on availability from Freescale) |
| **Memory** | 2x 2GB and 2x 4GB RAM with ECC standard  
2x 2MB SPI NOR (for Bootloader, fallback configuration)  
1x 8MB NOR (for VxWorks)  
1GB NAND Flash standard or not assembled, up to 2GB on project request  
MicroSD card socket  
Up to 64 GB SLC NAND Flash on a dedicated SATA NAND Flash module |
| **System Interconnection** | Port 0: 1xGE  
Port 1: 1xGE (routable to front plate, software selectable, default: port 1)  
Ports 4-7: 1xGx4 or PCIe x4  
Ports 8-11: SRD x4 or PCIe x4 or max. 3xSGMII(1GE)  
Port 14: Debug  
Port15: COM2, 3.3V TTL  
FCLKA: bidirectional PCIe clock configuration  
Power supply: 3.3V management power, 12V payload power |
| **Front Panel Interfaces** | 1x GbE  
1x GbE (routable to Port 1, software selectable, default port 1)  
COM1, RS232  
4x LEDs: control and status, bi-color (red/green LEDs)  
3x LEDs: connected to MMC (healthy, hot swap, out of service) |
| **Miscellaneous** | Watchdog, timeout 125ms to 4096s in 16 steps  
RTC (not buffered) |
| **Software** | IPMI  
VxWorks BSP  
WindRiver Linux BSP |
| **Compliancy** | MicroTCA: PICMG MCA.0 Micro Telecommunications Comp. Architecture R1.0  
PCI Express: PCI Express Base Specification Revision 2.0  
Serial Rapid IO: RapidIO Interconnect Specification, Revision 2.1  
AMC: PICMG AMC.0: Advanced Mezzanine Card Specification R2.0  
PICMG AMC.1: PCI Express and Advanced Switching R1.0  
PICMG AMC.2: Gigabit Ethernet R1.0  
PICMG AMC.3: SATA  
PICMG AMC.4: Serial Rapid IO (1.3 and 2.1)  
IPMI: IPMI Intelligent Platform Management Interface Spec. V2.0 |
| **Environmental** | Operating Temperature: -5°C to +55°C  
Humidity Operating: 93% RH at 40°C, non condensing  
Vibration (sinusoidal): 5Hz to 1500Hz, 1g  
Shock: 15g / 11ms  
EMC: Immunity: acc. to EN 55024 and 61000-6-2  
Safety: IEC 60950-1 |
### Article Description

<table>
<thead>
<tr>
<th>Article Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AM4150-SA-2.0D-8-M-N1</td>
</tr>
<tr>
<td>PS020 64bit 2.0GHz dual core, 8GB RAM with ECC, 1GB NAND Flash</td>
</tr>
<tr>
<td>AM4150-SA-2.0D-4-M-N1</td>
</tr>
<tr>
<td>PS020 64bit 2.0GHz dual core, 4GB RAM with ECC, 1GB NAND Flash</td>
</tr>
<tr>
<td>VXW-BSP-AM4150-6.9.2</td>
</tr>
<tr>
<td>WindRiver VxWorks BSP</td>
</tr>
</tbody>
</table>

Note: All AM4150 boards provide a microSD card socket.