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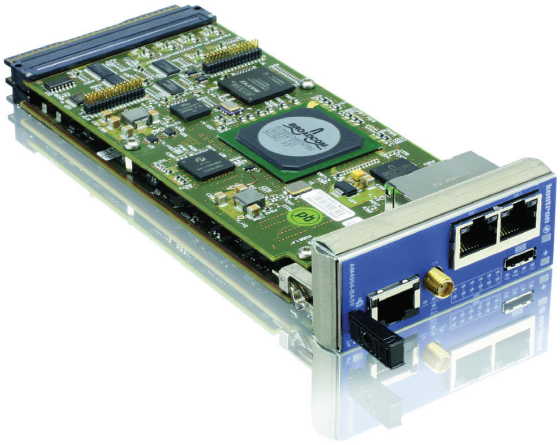
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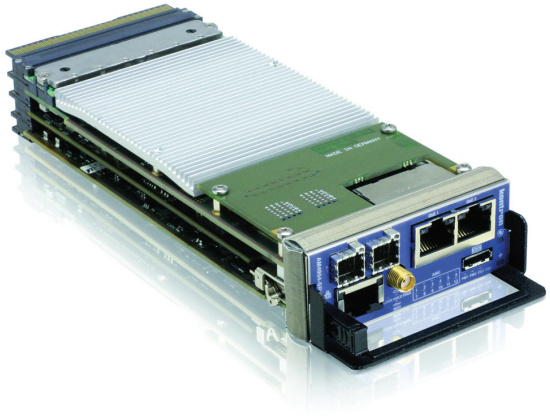
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Find the *Kontron 1016-6698* at our website: ***Click HERE***

» AM4904-Series / AM4910 «





High-End MicroTCA Carrier Hub (MCH) with Enterprise Class Ethernet Switching

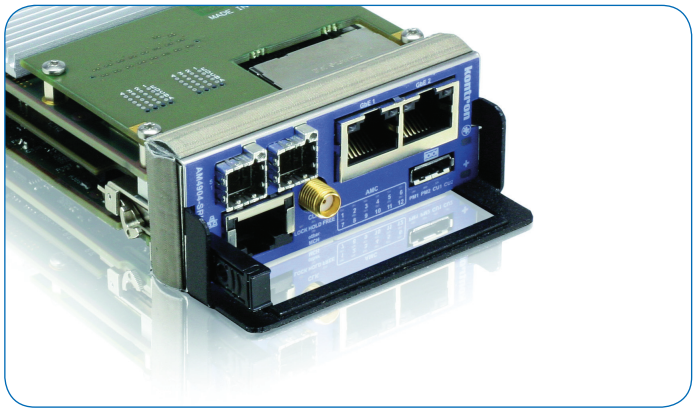
» **Highly sophisticated, fully featured MCH**
» **Supports all popular Fabric implementations** for MicroTCA: GbE standalone or combined with 10 GbE or PCIe or sRIO switching
» **Powerful Enterprise Class L2 non-blocking managed GbE and 10 GbE switching capabilities** (L3 option on both Fabrics)
» Linux-based **high-performance PowerPC CPU** for Management Functionality
» Support of Rear I/O according to MTCA.4

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Kontron is extending the MicroTCA/AdvancedMC portfolio by providing a fully featured high-end MCH solution. The Kontron MCH is introduced in four flavors to meet exactly the different switching requirements of the various application needs.

» AM4904-BASE MCH Management Functions + 1 GbE Switching
» AM4904-SRIO MCH Management Functions + 1 GbE + sRIO Switching
» AM4904-PCI MCH Management Functions + 1 GbE + PCIe Switching
» AM4910 MCH Management Functions + 1 GbE + 10 GbE Switching

» Industry-standard Ethernet switch management interface
» Full set of switch management and protocol functions
» Industry standard command line, SNMP and web-based management interfaces
» **Full set of standard defined IPMI** and MicroTCA management functions
» **Comprehensive clock generation** and distribution module (PCIexpress clock with SSC, TELCO clocks, Synchronous Ethernet Support, Stratum3 PLL)
» **Broad set of front panel interfaces:** uplink ports and management port, clock input, control LEDs
» FPGA based IPMI subsystem for accelerated management communication with AMCs
» Support for up to 12 AMCs and 12 RTMs, 2 cooling units (CU) - front and rear fans, 2 power modules (PM)
» MCH update and cross-over Channel, for redundant applications
» Supply voltages, currents and temperatures monitored via IPMI
» IPMI transaction monitoring/debugging features



The 4-tongue versions AM4904-SRIO, AM4904-PCIE and AM4910 are equipped with a smart handle at the front panel for smooth extraction of the MCH from the MicroTCA system.

Target Applications

» High-performance computing for telecom applications
  » IPTV, Media Server
  » Gateways, Conferencings
  » TETRA/P25/WiMAX switches and base stations
  » Test Equipment (LTE, Network)
  » Base Stations
  » RNC
  » Routers, Switches

» Multi-Processor systems for defense applications
  » Communication Systems
  » Radar
  » Sonar

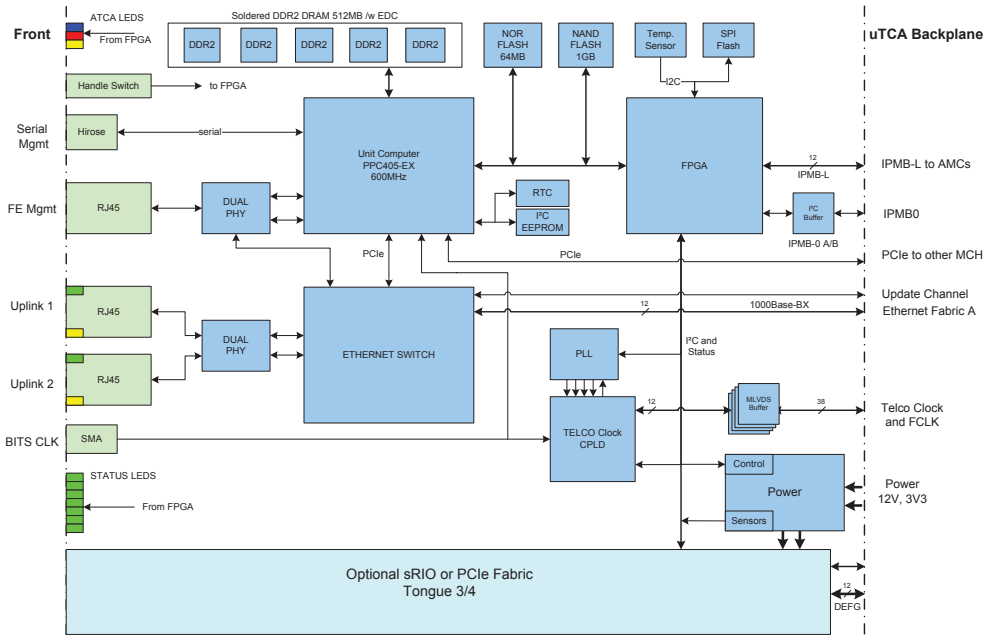
» Industrial and science applications such as high energy accelerators

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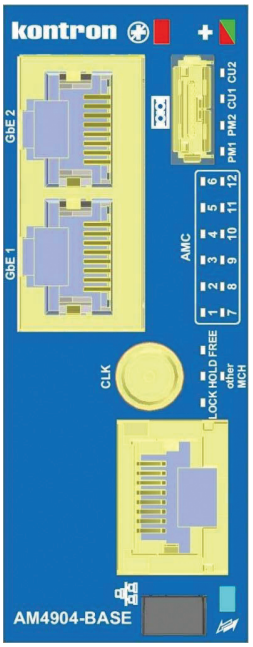
AM4904-BASE Details

» Standard conforming MicroTCA Carrier Hub functions and Shelf management capabilities
» Fully managed Layer 2 wirespeed Gigabit Ethernet switching on Fabric a including 2 1000/100/10BASE-T uplink ports
» Telecom clocking and PCI Express Fabric Clock support

Block Diagram



Front Panel



Hardware Feature List

Processor for MCMC functionality and Switching management	
Processor	PowerPC 405EX 600 MHz
Memory / Storage	» 512 MB DDR2 400 MHz with ECC » 64 MB NOR Flash for firmware, firmware configuration, FRU data 2x Firmware images for roll-over functionality » 1 GB NAND Flash » I²C EPROM for PPC405 configuration data
Ethernet Switch	16x 1 GbE port Broadcom BCM56227 Ethernet switch » 12 ports connected to the Fabric [A] » 1 port connected to the MCH update channel » 2 ports connected to the uplink ports on the front panel » 1 port routed to PPC Unit processor 16K Layer2 Table, 2K Filter Processor memory, 1K Layer 2 Multicast Tables
Front Panel Interfaces	
GbE Uplink ports	2x 10/100/1000BASE-T on RJ-45 connector
Management port	1x 10/100/1000BASE-T on RJ-45 connector
Serial Port	Serial debug port with RS-232 signaling on 10-pin Hirose mini connector
Clock Input	SMA connector. Supports multiple input frequencies: 1PPS, 10MHz, 8kHz, 2.048 MHz, 1.544MHz, 19.44MHz, 25Mhz
LEDs	12 Link LEDs (green) for each port on the Fabric[A] 1 Link LED (green) for the MCH update Channel 3 LEDs (green) for clock synchronization status/control purpose 2 LEDs (green) for Power Module status 2 LEDs (green) for Cooling Unit status 3 AMC management LEDs (Hot Swap, Out-of-Service, Health)
Clock Functionality	
Clock Distribution	Serves one or two TCLKx Clock Signals to all AMCs Receives TCLK Signals from selected AMCs Front panel BITS clock Input (SMA) Provides SONET/SDH clocks to the backplane Stratum 3 accuracy and holdover Synchronous Ethernet support (optional) Cross Sync line between 2 MCHs for redundancy support

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Hardware Feature List

System Interconnect Tongue 1		
Gigabit Ethernet	12x 1000BASE-BX (SerDes) on Fabric[A] 1x 1000BASE-BX (SerDes) on MCH update Channel	
I2C	12x IPMB-L to AMC Modules 2x IPMB-0 [A:B] redundant to Power Modules and Cooling Units	1x IPMB-L inter-MCH 1x I2C to carrier FRU
Cross-Over Channel	PCIe interlink, Specific MCH-MCH interlink for redundant applications	
System Interconnect Tongue 2		
CLK1	12x CLK1 inputs/outputs to/from AMCs, MLVDS	
CLK2	12x CLK2 inputs/outputs to/from AMCs, MLVDS	
CLK3 (PCIe Fabric Clock)	12x CLK3 100 MHz FCLKA to AMCs. HCSL, PCIe GEN2 specified, SSC capable	
MCH Interconnect	2x CLK input/output to/from 2nd MCH (CLK1:RX/TX; CLK3_RX/TX), MLVDS	
Compliancy		
MicroTCA	PICMG MTCA.0 R1.0, MTCA.4	
CE	EN55022, EN55024, EN61000-6-2/-6-3, EN300386, EN60950-1	
Vibration/Shock	IEC60068-2-6 / IEC60068-2-27	
WEEE	Directive 2002/96/EC	
RoHS	Directive 2002/95/E	
Environmental		
Temperature Range	Operational: -5°C to +55°C, Storage: -40°C to +70°C, no module heat sink, forced system airflow	
Humidity	93% RH at 40°C, non-condensing	
Vibration (operating)	» 5 Hz to 200Hz 0.2G, 5mm/s (sinusoidal) » 5 Hz to 100Hz: 0.1G @ 0.1 Octave/minute (sinusoidal) » 5 Hz to 100Hz: 1G @0.1 Octave/minute (sinusoidal)	» 0,02 m²/s³ ASD, 5-10Hz +12dB/oct, 10-50Hz 0dB/oct, 50-100Hz -12dB/oct random)
Shock (operating)	3 [g] acceleration, 11 [ms] pulse duration	
Safety	Designed to meet » UL 60950, 3rd edition (US and Canada » EN 60950 (Europe) » LVD 73/23/EEC (Europe)	» Denan Law (Japan Safety) » UL 94V-0/1 with Oxygen index of 28% or greater material
Misc		
Dimensions	Single, Full-Size MCH module, 181.5 x 73.5 x 28.95 mm	
Power Supply	12 V Payload Power, 3.3 V Management Power	
Power Consumption	Typ. 22 W	
Board Weight	215 g	
MTBF	Min. 130,000h @ 40°C, calculations based on Telecordia SR-332 Issue 1	
Mechanics	Robust handle at the front panel for easy MCH extraction	

Software Feature List

MCMC	MCMC with redundancy support including active Carrier Manager election and re-discovery of active system » Dual redundant protected firmware images with automatic rollback » Support for dual-redundant Power Modules » Support for dual-redundant MCH » Cooling Management » LED Controls	» AMC Management » Radial IPMB-L » Support for 12 AMCs and 12 RTMs » AMC Payload Control » Electronic Keying » Power and Cooling Management » IPMI 1.5 compatibility with IPMI 2.0 extensions
Shelf Management Functions	Shelf manager implementation for local management of single MicroTCA chassis » Dedicated Command Line Interface (CLI) » Sensor monitoring and alerting » Active monitoring of local and remote temperature, voltage and current sensors on the shelf FRUs	» Access to raw and fully decoded sensor readings » Logging of all critical events reported by shelf FRUs » Capability to reset major/minor alarms with timeout » Control of remote alarm LEDs » IPMB-L real-time monitoring and capture support
Shelf Management Interface	Command Line Interface (CLI) » CLI gives access to the Shelf Manager and the boards in the shelf » Access via Telnet, SSH or serial port » Access to shelf and board information via SNMP	» Commands provide complete access to information such as the current state of the system, sensor values, events, health, fan speeds, FRU storage, etc. » Optional machine readable CLI output
GbE managed L2 Switch Functions	» Non-blocking on all ports » Full Layer 2 switching and Multicast support including: VLAN, Link aggregation, Multiple/Rapid Spanning Tree, GARP, GVMRP, GMRP, Port Authentication, Flow control, IGMP snooping, double VLAN tagging, full 4K VLANs, jumbo frames, Port Mirroring, Internet Group Multicast Protocol Snooping (IGMP snooping), Port Trunking, Broadcast Storm Control,	» Extensive Quality Of Service (QoS) support including: Differentiated Services (DiffServ) architecture, weighted and strict priority based queueing, bandwidth shaping, Access Control Lists, Traffic Priorization » Simple Network Management Protocol (SNMP) » Industry standard CLI » Simple WEB interface for easy first time setup and lab usage » Remote Monitoring (RMON)

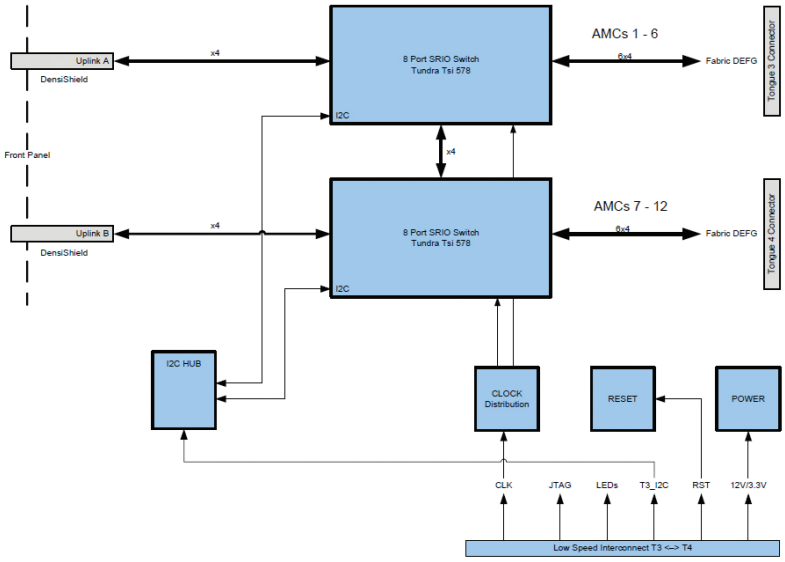
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AM4904-SRIO Details

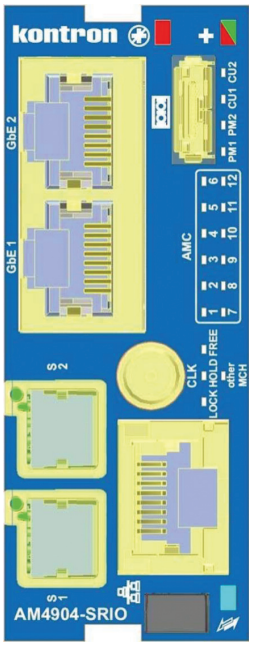
» Standard Conform MCH Carrier and Shelf management capabilities
» Fully managed L2 GbE switching functionality
» Telcom clocking and Fabric Clock support
» **sRIO Fabric [DEFG] switching** functionality (x4 to 12 AMCs + 2 uplinks x4)

The **AM4904-SRIO** is based on the **AM4904-BASE** plus a mezzanine for the sRIO switching capabilities.

Block Diagram



Front Panel



Hardware Feature List

sRIO switch	2x Tundra Tsi578 with 8 ports x4 offering 80Gbps switching bandwidth » 12 ports x4 lanes connected to the Fabric [DEFG]	» 2 ports x4 lanes connected to the uplink ports on the front panel » 1 port x4 lanes on-board interconnect between switches Each port can operate at 1.25, 2.5 or 3.125 (default) Gbaud
Front Panel Interfaces		
sRIO Uplink ports	2x FCI DensiShield connectors (x4 lanes each)	
System Interconnect Tongue 3		
sRIO ports	6x sRIO x4 on Fabric [DEFG] for AMCs 1-6	
System Interconnect Tongue 4		
sRIO ports	6x sRIO x4 on Fabric [DEFG] for AMCs 7-12	
Misc		
sRIO Interlink	x4 link between sRIO switches	
Power Consumption	Typ. 31 W	
Board Weight	445 g	
MTBF	Min. 130,000h @ 40°C, calculations based on Telecordia SR-332 Issue 1.	
Mechanics	Robust handle at the front panel for easy MCH extraction	

Software Feature List

Configuration		
Startup Config	Power On settings for SRIO switch fabric can be modified as needed by onboard EEPROM for automatic loading and via configuration file settings	
Monitoring	Provides an easy way to display the current status of all ports: » Access to all SRIO fabric switch registers via command line interface » Settings stored in config file	Includes access to: » Switch fabric power up configuration setting » SRIO switch fabric port link status » Port statistics

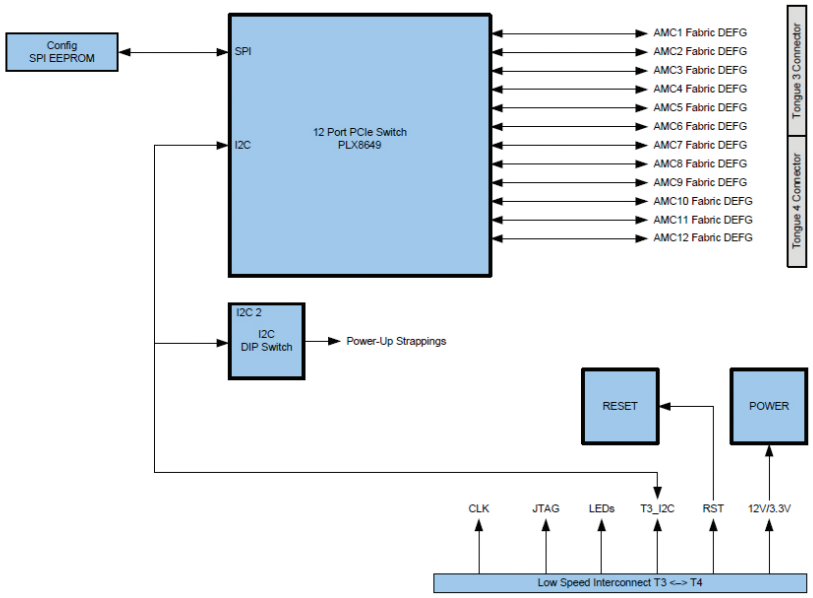
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AM4904-PCIE Details

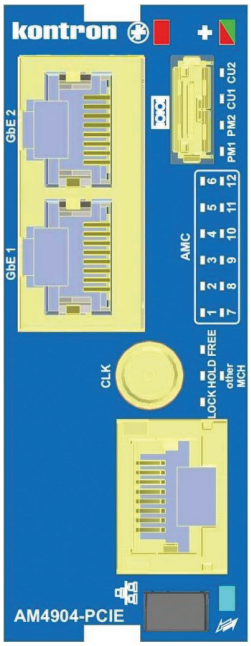
» Standard Conform MCH Carrier and Shelf management capabilities
» Fully managed L2 GbE switching functionality
» Telecom clocking and PCI Express Fabric Clock support
» **PCIe GEN2 Fabric [DEFG] switching** functionality (x4 to 12 AMCs)

The **AM4904-PCIE** is based on the **AM4904-BASE** plus the mezzanine for the PCIe switching capabilities. Therefore the paragraph is describing the functionality in addition to AM4904-BASE.

Block Diagram



Front Panel



Hardware Feature List

PCIe switch	1x PLX 8649 12-port 48-Lane PCIe Gen2 Multi-Root Switch for 12 x4 port mode 12 ports connected to the Fabric [DEFG] » Vitual Switch support (up to 4 Root Complexes possible) » Fully non-blocking » Dynamic speed negotiation (2.5 or 5.0 Gbps) » Dynamic link width negotiation	» Non-Transparent bridging capability » Multi-Root/Host capability to enable sub-sections in the MicroTCA environment (up to 4 Hosts) » Host-Fail-over capability » 480 GT/s aggregated bandwidth » Cut-Thru packet latency of less then 140ns
System Interconnect Tongue 3		
PCIe ports	6x PCIe x4 on Fabric [DEFG] for AMCs 1-6	
System Interconnect Tongue 4		
PCIe ports	6x PCIe x4 on Fabric [DEFG] for AMCs 7-12	
Misc		
Power Consumption	Typ. 34 W	
Board Weight	440 g	
MTBF	Min. 130,000h @ 40°C, calculations based on Telecordia SR-332 Issue 1	
Mechanics	Robust handle at the front panel for easy MCH extraction	

Software Feature List

Configuration		
Startup Config	Power-On settings for PCIe switch fabric can be modified as needed by onboard EEPROM for automatic loading and via configuration file settings	
Monitoring	Provides easy way to display current status of all ports: » Access to all PCIe switch fabric registers via command line interface » Settings stored in Serial EEPROM	Includes access to: » Switch power up configuration settings » Port statistics » Link status

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AM4910 Details

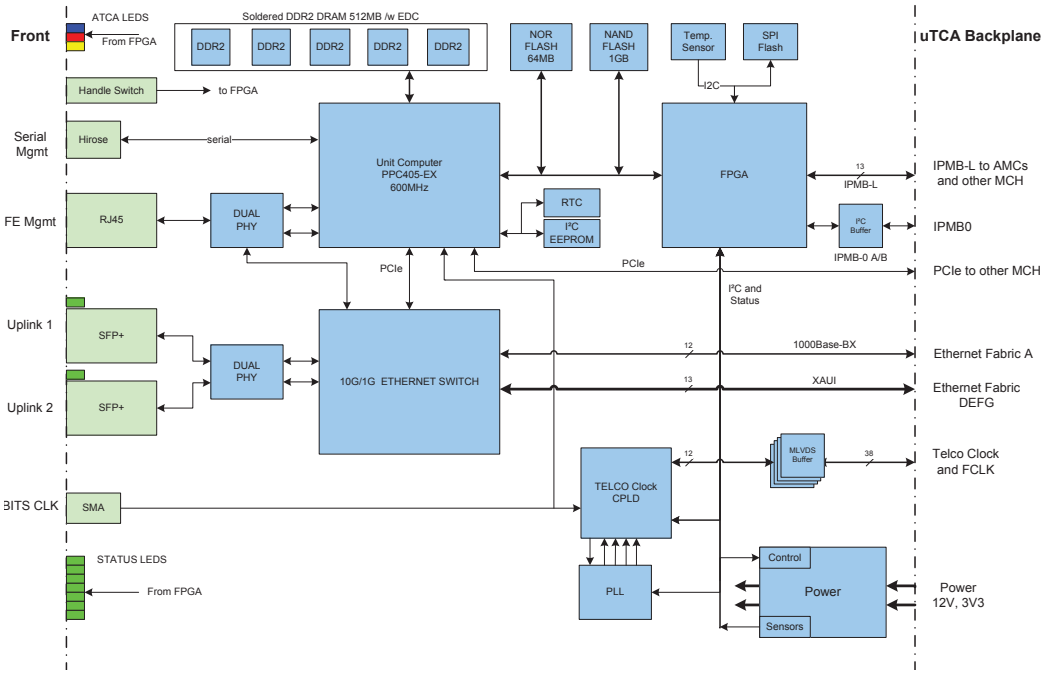
» Standard conform MicroTCA Carrier Hub functions and shelf management capabilities
» Fully managed Layer 2 wirespeed Gigabit Ethernet switching on Fabric A and DEFG including 2 SFP+ 10GBASE-X uplink ports (Layer 3 routing option)
» **10GbE Fabric [DEFG]** (XAUI to 12 AMCs + 2 uplinks, SFP+)
» Telecom clocking and PCI Express Fabric Clock support

The **AM4910** is based on the AM4904-BASE implementation (without the Gb Ethernet switch) plus a 10GbE switch mezzanine.

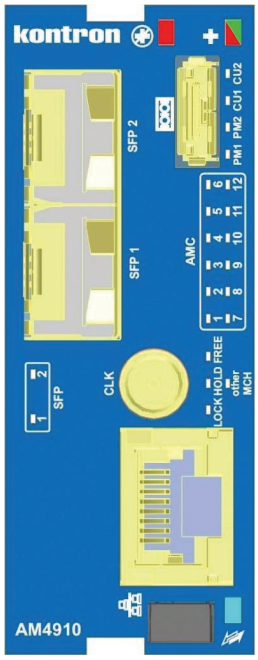
The complete Ethernet switching for GbE Fabric [A] and 10 GbE Fabric [DEFG] is implemented on the 10G switch mezzanine using a latest generation Broadcom 10Gb Ethernet switching silicon integrated on the mezzanine for Tongue 3 and 4.

This paragraph is describing the added functionality in comparison to the **AM4904-BASE**.

Block Diagram



Front Panel



Hardware Feature List

GbE/10 GbE switch	Broadcom BCM56820 24 Port 10GbE plus 4 Port 1GbE Multilayer Switch 12x 1 GbE ports connected to Fabric [A] 12x 10 GbE ports connected to Fabric [DEFG]]
System Interconnect Tongue 3	
10 GbE ports	6x 10 GbE on Fabric [DEFG] for AMCs 1-6 1x 10GbE update channel to Fabric [DE]
System Interconnect Tongue 4	
10 GbE ports	6x 10 GbE on Fabric [DEFG] for AMCs 7-12 1x 10GbE update channel to Fabric [FG]
Misc	
Power Consumption	Typ. 53 W
Board Weight	425 g
MTBF	Min. 130,000h @ 40°C, calculations based on Telecordia SR-332 Issue 1

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The SW implementation is quasi identical to the 1GBE-Base version. Please refer to the SW Features list of the AM4904-Base version.

All 10GBASE-X ports on fabric DEFG can down-negotiate to 1000BASE-X Front board SFP+ 10GBASE-X ports can be used with 1000BASE-X SFP transceivers via startup configuration option.

Supported Standards - MCH Managed Switch

Management		
RFC 854 Telnet	all	yes
RFC 855 Telnet option specifications	all	yes
RFC 1155 SMI v1	all	yes
RFC 1157 SNMP	all	yes
RFC 1212 Concise MIB definitions	all	yes
RFC 1867 HTML/2.0 forms with file upload extensions	all	yes
RFC 1901 Community-based SNMP v2	all	yes
RFC 1908 Coexistence between SNMP v1 and SNMP v2	all	yes
RFC 2068 HTTP/1.1 protocol as updated by draft-ietf-http-v11-spec-rev-03	all	yes
RFC 2271 SNMP framework MIB	all	yes
RFC 2295 Transparent content negotiation	all	yes
RFC 2296 Remote variant selection; RSVA/1.0 state management .cookies. draft-ietf-http-state-mgmt-05	all	yes
RFC 2576 Coexistence between SNMP v1, v2, and v3	all	yes
RFC 2578 SMI v2	all	yes
RFC 2579 Textual conventions for SMI v2	all	yes
RFC 2580 Conformance statements for SMI v2	all	yes
RFC 3410 - Introduction and Applicability Statements for Internet Standard Management Framework	all	yes
RFC 3411 - An Architecture for Describing SNMP Management Frameworks	all	yes
RFC 3412 - Message Processing & Dispatching	all	yes
RFC 3413 - SNMP Applications	all	yes
RFC 3414 - User-Based Security Model	all	yes
RFC 3415 - View-based Access Control Model	all	yes
RFC 3416 - Version 2 of SNMP Protocol Operations	all	yes
RFC 3417 - Transport Mappings	all	yes
RFC 3418 - Management Information Base (MIB) for the Simple Network Management Protocol (SNMP)	all	yes
SSL 3.0 and TLS 1.0	all	yes
RFC 2246: The TLS protocol, version 1.0	all	yes
RFC 2346: AES cipher suites for Transport layer security	all	yes
RFC 2818: HTTP over TLS	all	yes
SSH 1.5 and 2.0	all	yes
RFC 4253 - SSH transport layer protocol	all	yes
RFC 4252 - SSH authentication protocol	all	yes
RFC 4254 - SSH connection protocol	all	yes
RFC 4251 - SSH protocol architecture	all	yes
RFC 4716 - SECSH public key file format	all	yes
RFC 4419 - Diffie-Hellman group exchange for the SSH transport layer protocols	all	yes
HTML 4.0 specification, December 1997	all	yes
Java® Plug-in and Java Script. 1.3	all	yes
Switching		
IEEE 802.1AB Link level discovery protocol	all	yes
IEEE 802.1D Spanning tree	all	yes
IEEE 802.1p Ethernet priority with user provisioning and mapping	all	yes
IEEE 802.1Q Virtual LANs w/ port-based VLANs	all	yes
IEEE 802.1S Multiple spanning tree compatibility	all	yes
IEEE 802.1v Protocol-based VLANs	all	yes
IEEE 802.1W Rapid spanning tree	all	yes
IEEE 802.1AB LLDP	all	yes
IEEE 802.1X Port-based authentication	all	yes
IEEE 802.3 10BASE-T	all	yes
IEEE 802.3u 100BASE-T	all	yes
IEEE 802.3ab 1000BASE-T	all	yes
IEEE 802.3ac VLAN tagging	all	yes
IEEE 802.3ad Link aggregation	all	yes
IEEE 802.3ae 10 GbE	all	yes
IEEE 802.3x Flow control	all	yes

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Supported Standards - MCH Managed Switch

ANSI/TIA-1057 LLDP-MED	all	yes
GARP Generic Attribute Registration Protocol: clause 12, 802.1D-2004	all	yes
GMRP Dynamic L2 multicast registration: clause 10, 802.1D-2004	all	yes
GVRP Dynamic VLAN registration: clause 11.2, 802.1Q-2003	all	yes
RFC 4541 IGMP snooping and MLD snooping	all	yes
RFC 768 UDP	all	yes
RFC 783 TFTP	all	yes
RFC 791 IP	all	yes
RFC 792 ICMP	all	yes
RFC 793 TCP	all	yes
RFC 826 ARP	all	yes
RFC 951 BootP	all	yes
RFC 1321 Message digest algorithm	all	yes
RFC 1534 Interop. between BootP and DHCP	all	yes
RFC 2030 Simple Network Time Protocol (SNTP) V4 for IPv4, IPv6, and OSI	all	yes
RFC 2131 DHCP Client/Server	all	yes
RFC 2132 DHCP options and BootP vendor ext.	all	yes
RFC 2865 RADIUS client	all	yes
RFC 2866 RADIUS accounting	all	yes
RFC 2868 RADIUS attributes for tunnel protocol support	all	yes
RFC 2869 RADIUS extensions	all	yes
rfc28869bis RADIUS support for Extensible Authentication Protocol (EAP)	all	yes
RFC 3164 The BSD syslog protocol	all	yes
RFC 3580 802.1X RADIUS usage guidelines	all	yes
Switching MIBs (via Management Module)	all	yes
IEEE 802.1X MIB (IEEE 802.1-PAE-MIB)	all	yes
IEEE 802.1AB LLDP MIBb	all	yes
ANSI/TIA 1057 LLDP-MED MIB	all	yes
RFC 1213 MIB II	all	yes
RFC 1493 Bridge MIB	all	yes
RFC 1643 Definitions of managed objects for the Ethernet-like interface types	all	yes
RFC 2233 Interfaces group MIB using SMI v2	all	yes
RFC 2618 RADIUS authentication client MIB	all	yes
RFC 2620 RADIUS accounting MIB	all	yes
RFC 2674 VLAN MIB	all	yes
JRFC 2819 RMON groups 1, 2, 3, and 9	all	yes
RFC 2737 Entity MIB version 2	all	yes
MIBs supporting switching features	all	yes

Supported Standards - MCH Managed Switch

DiffServ	all	yes
RFC 2474 Definition of the differentiated services field (DS Field) in the IPv4 and IPv6 headers	all	yes
RFC 2475 An architecture for differentiated services	all	yes
RFC 2597 Assured forwarding PHB group	all	yes
RFC 3246 An expedited forwarding PHB (Per-Hop Behavior)	all	yes
RFC 3260 New terminology and clarifications for DiffServ	all	yes
Access Control Lists (ACL)	all	yes
Interface traffic shaping	all	yes
Quality of Service MIBs (via Management Module)	all	yes
RFC 3289 Management Information Base for the DiffServ architecture (read-only)	all	yes
Private MIBs for full configuration of DiffServ, ACL, and CoS functionality	all	yes

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System Platforms with AM4904/AM4910

The customer can you choose from Kontron's wide range of MicroTCA platforms. Sample systems are shown below.



OM6040



OM6120

Ordering Information

Article	Description
AM4904-BASE	Tongue1: Managed GbE Switch for 12 AMCs Tongue2: Clock distribution
AM4904-PCIE	Tongue1: Managed GbE Switch for 12 AMCs Tongue2: Clock distribution Tongue3/4: PCIe Switch for 12 AMCs
AM4904-SRIO	Tongue1: Managed GbE Switch for 12 AMCs Tongue2: Clock distribution Tongue 3/4: sRIO Switch for 12 AMCs
AM4910	Tongue1: Managed GbE Switch for 12 AMCs Tongue2: Clock distribution Tongue 3/4: Managed 10 GbE Switch for 12 AMCs

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