VME-CPU/T10

VME Master with 64-bit PowerPC™ T1022, XMC/PMC Slots

High-End PowerPC QorIQ CPU

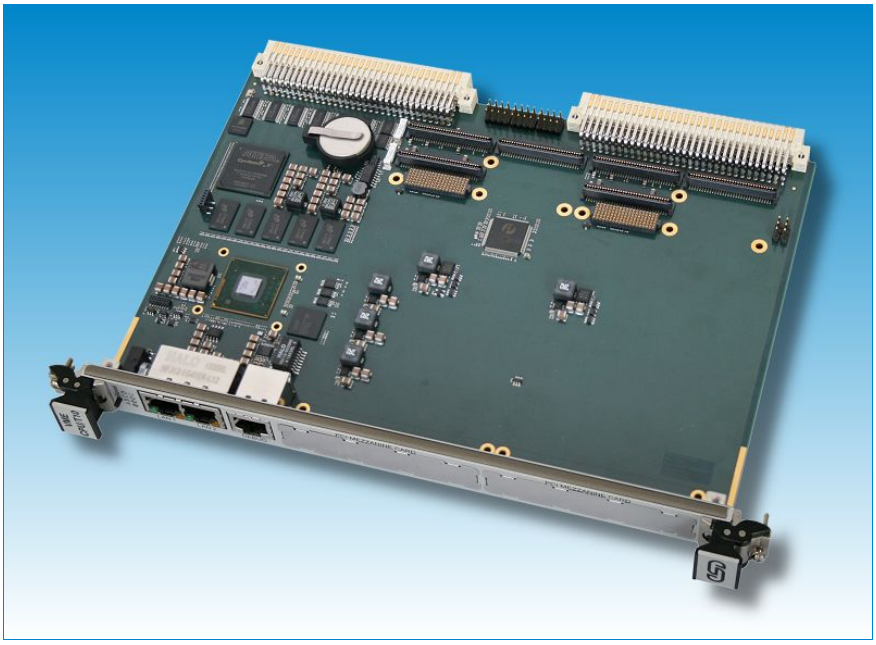
- VME master CPU A16/A24, D16/D8 (EO) and SGL arbiter
- NXP™ PowerPC QorIQ T1022, 1.2 GHz, 64-bit architecture, Double Precision Floating Point Unit, Ethernet, ECC-RAM
- Altera® Cyclone V FPGA for VME interface
- 2x XMC/PMC slots
- RTC with battery backup
- 2x GB-Ethernet, 1x RS-232
- I/O interfaces designed to be compatible with Motorola CPU MVME5110
- USB at 5-pin header

Wide Range of Software Support

- OS-9, QNX®, VxWorks® and Linux® BSPs available
- Universal boot loader: "Das U-Boot"
- EtherCAT® master available

Customization on Request

- Low power CPU QorIQ T1014 (one core)
- Extended MRAM (2 MB instead of 512 Kbyte)
- Additional serial MRAM (512 Kbyte)
- Extended DDR3 RAM (2 GB instead of 512 Mbyte)
- Extended Flash memory (2x 128 Mbyte instead of 2x 16 Mbyte)
- Health controller: local voltage and temperature monitoring, watchdog and over temperature protection
- Gold Cap (backup time 7 days) instead of battery
- Board version suitable for extended temperature range -40 °C ... +70 °C
- P0 (pinning according VITA 35 P4V0-64 or customized, e. g.: Ethernet, serial, PMC Slot2 J4)
- More customized solutions on request



64-Bit VME PowerPC Master CPU

The VME-CPU/T10 is a VMEbus CPU board with 2 XMC/PMC slots. The NXP PowerPC QorIQ T1022 with 1.2 GHz features two 64-bit e5500 Power Architecture® processor cores with high-performance data path acceleration architecture (DPAA) and network peripheral interfaces.
The local memory bus is 64 bits wide plus 8 bits ECC with an overall capacity of 512 Mbyte. 16 Mbyte SPI Flash for boot loader and 32 Kbit I²C EEPROM for U-Boot environment offer non-volatile memory spaces. The VME-CPU/T10 is equipped with a second 16 Mbyte backup SPI Flash selectable by jumper that can be used for system recovery, if a system crash occurs during a firmware update.

VMEbus Interfaced by FPGA

The Altera Cyclone V FPGA is connected to the CPU by local bus for low latency data exchange and by PCI Express® for high bandwidth data exchange. The VMEbus master interface offers a A16/A24, D16/D8 (EO) and an SGL arbiter. A VMEbus slave interface is not supported.

XMC/PMC Interfaces

The XMC1 interface comes with 1 lane PCIe bus and the XMC2 interface with 4 lane PCIe bus. They are designed according to VITA 42.3.
Both PMC interfaces support 32-bit/66 MHz PCI bus according to PCI Local Bus Specification 3.0.

Gigabit Ethernet

The VME-CPU/T10 is equipped with two Gigabit Ethernet interfaces accessible at the front panel. One of the Ethernet interfaces can be routed to VME P2 (100 Mbit/s only).

Console (Serial)

An RS-232 interface is accessible via an RJ45 connector at the front panel and additionally via VME P2 connector.

Software Support

The Flash memory carries the standard boot program "Das U-Boot" and enables the VME-CPU/T10 to boot various operating systems from on-board Flash or network. BSPs from esd are available for OS-9, QNX, Linux and VxWorks.
The esd EtherCAT master stack is available for all supported operating systems.

Customization on Request

CPU Type

The VME-CPU/T10 is also available with the power saving single core QorIQ CPU T1014 with 1 lane PCIe (therefore only one XMC interface) on request.

Memory

The memory can be extended with larger MRAM, DDR3 RAM and Flash. An additional serial MRAM is also available. Instead of the battery a Gold Cap can be equipped.

Extended Temperature Range

If an extended temperature range is requested please ask for the -40 °C … +70 °C version of the VME-CPU/T10.

Special P0 Pin Routing

A special P0 pin routing according to VITA 35 P4V0-64 or customized routings, e.g. Ethernet, serial or PMC Slot2 J4 are available on request.

Health Controller

On request a health controller is available for monitoring of the board's status, as voltages, temperature and board type. Additionally a watchdog can be used.

All these options are available for customized serial production in reasonable quantities. Please contact our sales team for detailed information.

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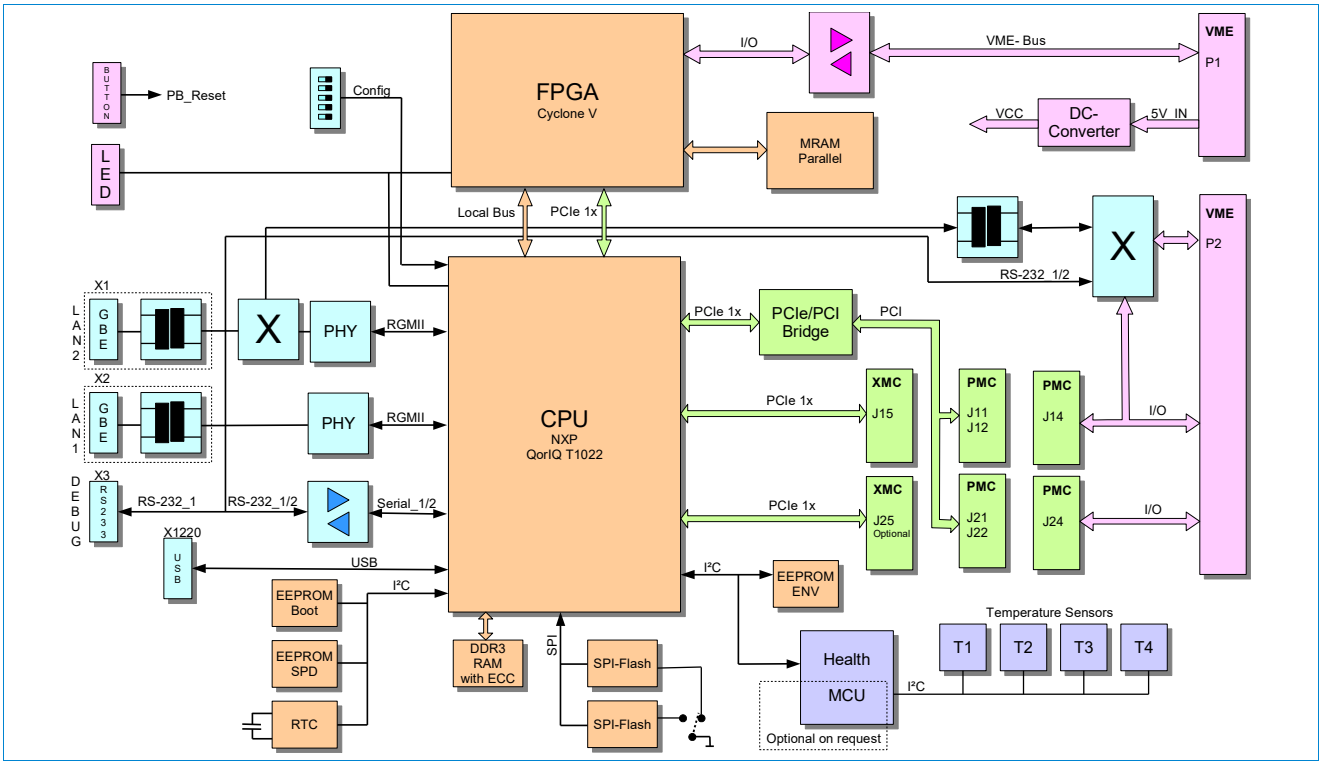

Technical Specifications:

Microcontroller and Memory:	
Microcontroller	*NXP PowerPC™ QorIQ T1022, 64-bit, Dual Core e5500, 1.2 GHz, Double Precision FPU*
Memory	*512 Mbyte DDR3 RAM, 64 bits wide + 8 bit ECC, 2x 16 Mbyte Flash for boot loader, 512 Kbyte MRAM, 32 Kbit I²C EEPROM for U-Boot, 32 Kbit I²C EEPROM for Bootstrapping, 4 Kbit I²C EEPROM for SPD info DDR RAM*
Real Time Clock	*RTC with battery, backup time min. 5 years*
Bus Interfaces	
VME	*Master A16/A24 D16/D8 (EO), SGL Arbiter, IEEE 1014 Rev. D*
XMC	*2x XMC according to VITA 42.3, 1-lane PCI EXPRESS® acc. to PCIe 1.1*
PMC	*2x PMC according to IEEE Std 1386-2001, Connectors: J11, J21, J14, J12, J22, J24 I/O routing to VME: P4V2-64ac and P4V2-46dz, PCI bus acc. to PCI Local Bus Spec. 3.0, 32 bit 33/66 MHz, 3.3 V (5 V tolerant), PCI bus master capability*
Voltage level	*3.3 V (signal level), 5 V tolerant*
Interfaces:	
Ethernet	*2x Gigabit Ethernet, 1000BaseT, IEEE802.3 at RJ45 in front panel or 1x 100BaseT at VME P2 (selectable via jumper and multiplexer)*
USB host	*USB 2.0 Full Speed, onboard 5-pin header*
Console (serial)	*RS-232, Rx/Tx only, up to 115 kbaud, RJ45 connector (compatible to MVME5110)*
General:	
Cooling method	*Convection cooling*
Operating temperature	*0 °C ... +55 °C ambient*
Storage temperature	*-20 °C ... +70 °C ambient*

General(continued):	
Relative humidity	*0% ... 90 % (non-condensing)*
Power supply voltage	*VME 5 V, $P_{IN\_5V\_MAX}$ = 15 W, 3.3 V for XMC/PMC slots (if supported by VME 3.3V, otherwise generated from VME 5 V): $P_{OUT\_3.3V\_MAX}$ = 2 x 10 W*
Dimensions	*4 HP / 6 U*

Order Information:

Hardware		*Order No.*
VME-CPU/T10	*VME QorIQ T1022 PowerPC CPU Board, 1.2 GHz, 512 Mbyte RAM, 2x XMC/PMC*	*V.1940.01*

Accessories

CPU-ADAPTER-BDI	*Interface for Abatron BDI3000*	*V.2029.02*
CPU-ADAPTER-NXP	*Interface for NXP health controller*	*V.2029.04*
VME-CPU/T10-P2ADA-Angled	*Ethernet Adapter 90°*	*V.1940.10*
VME-CPU/T10-P2ADA-Straight	*Ethernet Adapter 0°*	*V.1940.11*

Board Support Packages for Realtime OS

VME-CPU/T10-Linux-BSP	*incl. 12 months support*	*V.1940.57*
VME-CPU/T10-QNX-BSP	*incl. 12 months support*	*V.1940.55*
VME-CPU/T10-OS9-BSP	*incl. 12 months support*	*V.1940.56*
VME-CPU/T10-VxW-BSP	*incl. 12 months support*	*V.1940.58*

Support for BSP

VME-CPU/T10-Linux-Support	*12 months Linux support*	*V.1940.67*
VME-CPU/T10-QNX-Support	*12 months QNX support*	*V.1940.65*
VME-CPU/T10-OS9-Support	*12 months OS9 support*	*V.1940.66*
VME-CPU/T10-VxW-Support	*12 months VxW support*	*V.1940.68*

EtherCAT Master Stacks (runtime license for a single site)

EtherCAT Master-Linux/PowerPC	*Object code*	*P.4500.03*
EtherCAT Master-QNX 6.x/PowerPC	*Object code*	*P.4500.10*
EtherCAT Master-OS-9 5.2/PowerPC	*Object code*	*P.4500.40*
EtherCAT Master-VxW/PowerPC	*Object code*	*P.4500.20*

All data are subject to change without prior notice.

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