High-End CPU for Test and Application
- Freescale™ PowerPC QorIQ T1022, 1.2 GHz, 64-bit architecture, Double Precision Floating Point Unit, Ethernet, ECC-RAM
- Xilinx® FPGA Artix 7 (XC7A75T) for local applications
- RTC
- 2x GB-Ethernet, 1x USB 2.0 (Host)
- 62 I/Os at connector PMC-P14 configurable via FPGA as single ended (LVTTL) or 31 LVDS pairs

Health Features and Fallback Flash
- Local voltage and temperature monitoring
- Fail save firmware update by means of fallback Flash
- Watchdog
- Over temperature protection

Wide Range of Software Support
- OS-9, QNX®, VxWorks® and Linux® BSPs available
- Example source code for the FPGA included in the BSPs
- Universal boot loader: U-Boot
- EtherCAT® master available

Customization on Request
- QorIQ T1014 or T1024 or T1042 are applicable
- Additional connector P16 with (e.g.) 73 LVTTL or 34 LVDS I/Os
- MRAM (512 Kbyte)
- Console RS-232 via P14
- CAN (with IRIG-B timestamp) via P14

64-Bit XMC PowerPC Host CPU
The XMC-CPU/T10 is equipped with a PMC and an XMC interface.
The Freescale 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 XMC-CPU/T10 is equipped with a second 16 Mbyte 'fallback' SPI Flash that is used for system recovery, if a system crash occurs during a firmware update.

FPGA for Local Applications
The Xilinx FPGA Artix 7 FPGA is connected to the CPU by local bus for low latency data exchange. For high bandwidth data exchange the FPGA is additionally connected via PCI Express to the CPU. 62 LVTTTL-I/Os of the FPGA are routed to the PMC-P14 connector.

XMC/PMC Interfaces
The XMC interface comes with 4-lane PCIe bus and is designed according to VITA 42.3. The PMC interface supports 32 bit / 66 MHz PCI bus according to PCI Local Bus Specification 3.0.

Gigabit Ethernet
The XMC-CPU/T10 is equipped with two Gigabit Ethernet interfaces accessible at the front panel, which give an excellent base for EtherCAT® applications.

USB
The USB host port supports USB 2.0.

Software Support
The Flash memory carries the standard boot program U-Boot and enables the XMC-CPU/T10 to boot various operating systems from on-board Flash, network or USB. BSPs are available for OS-9, QNX, Linux and VxWorks. Example source code for the FPGA is included in the BSPs. The esd EtherCAT master is available and is implemented for VxWorks.

Customization on Request
A CAN IP-core (CAN esdACC) is available on request, implemented in a customized configuration (number of CAN nodes, routing FPGA ↔ P14). Additional 73 LVTTL I/Os at connector P16 or 34 LVDS I/Os are available. Other CPU-types (T1014, T1024, T1042) are applicable, also an additional MRAM and the Console (RS-232) via P14.

(This product is under development. It will be available Q4 2016.)
Technical Specifications:

Microcontroller and Memory:

Microcontroller: Freescale PowerPC™ QorIQ T1022, 64-bit, 1.2 GHz, Double Precision Floating Point Unit

Memory: 512 Mbyte DDR3 RAM, 64 bits wide + 8 bit ECC, 32 Mbyte Flash for boot loader with health controller, 32 Kbit I²C EEPROM for U-Boot environment, 32 Kbit I²C EEPROM for Bootstrapping, 4 Kbit I²C EEPROM for SPD info DDR RAM

Real Time Clock: RTC with Gold Cap, backup time min. 7 days

Bus Interfaces:

XMC: XMC according to VITA 42.3, 4-lane PCI EXPRESS® acc. to PCIe 1.1 (with T1022, T1042)

PMC: PMC according to IEEE Std 1386-2001, connectors: P11, P12, P14

PCI bus according to PCI Local Bus Specification 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

Health:

Temperature monitor: For all internal voltages and temperatures

Watchdog: CPU watchdog

Interfaces:

Ethernet: 2x Gigabit Ethernet, 1000BaseT, IEEE802.3 at RJ45-connections in front panel

USB host: USB 2.0 Full Speed (480 Mbit/s), Mini USB socket type AB in front panel

Console (serial): 1x Via bus powered USB device interface at Mini USB socket type-B in front panel

Interfaces (continued):

Digital I/O: 62x single ended LVTTL-I/O (3.3V only) at PMC-P14 or (configurable via FPGA)

I²C: 1x I²C at PMC-P14

General:

Cooling method: Convection cooling

Operating temperature: 0 °C ... 55 °C ambient

Storage temperature: 0 °C ... 55 °C ambient

Relative humidity: 0% ... 90% (non-condensing)

Power supply voltage: 3.3 V, 5 V or 12 V from XMC, $P_{23+5V}$ max. 15 W

Dimensions: 149 mm x 74 mm x 10 mm

Order Information:

Hardware: XMC-CPU/T10

Order No.: XMC QorIQ T1022 PowerPC CPU Board, 1.2 GHz, 512 Mbyte RAM

V.2030.01

Accessories:

XMC-CPU-ADAPTER-BDI: Interface to connect the Abatron BDI3000

V.2029.02

XMC-CPU-ADAPTER-FPGA: Interface to connect the Tool XILINX ChipScope

V.2029.03

XMC-CPU-ADAPTER-NXP: Interface to connect NXP (Health controller)

V.2029.04

Software Support:

XMC-CPU/T10-OS9: OS-9 BSP

V.2030.56

XMC-CPU/T10-QNX: QNX BSP

V.2030.55

XMC-CPU/T10-Linux: Linux BSP

V.2030.57

XMC-CPU/T10-VxW: VxWorks BSP

V.2030.58

EtherCAT Master-VxW 6.x/PPC: Object code P.4500.20

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