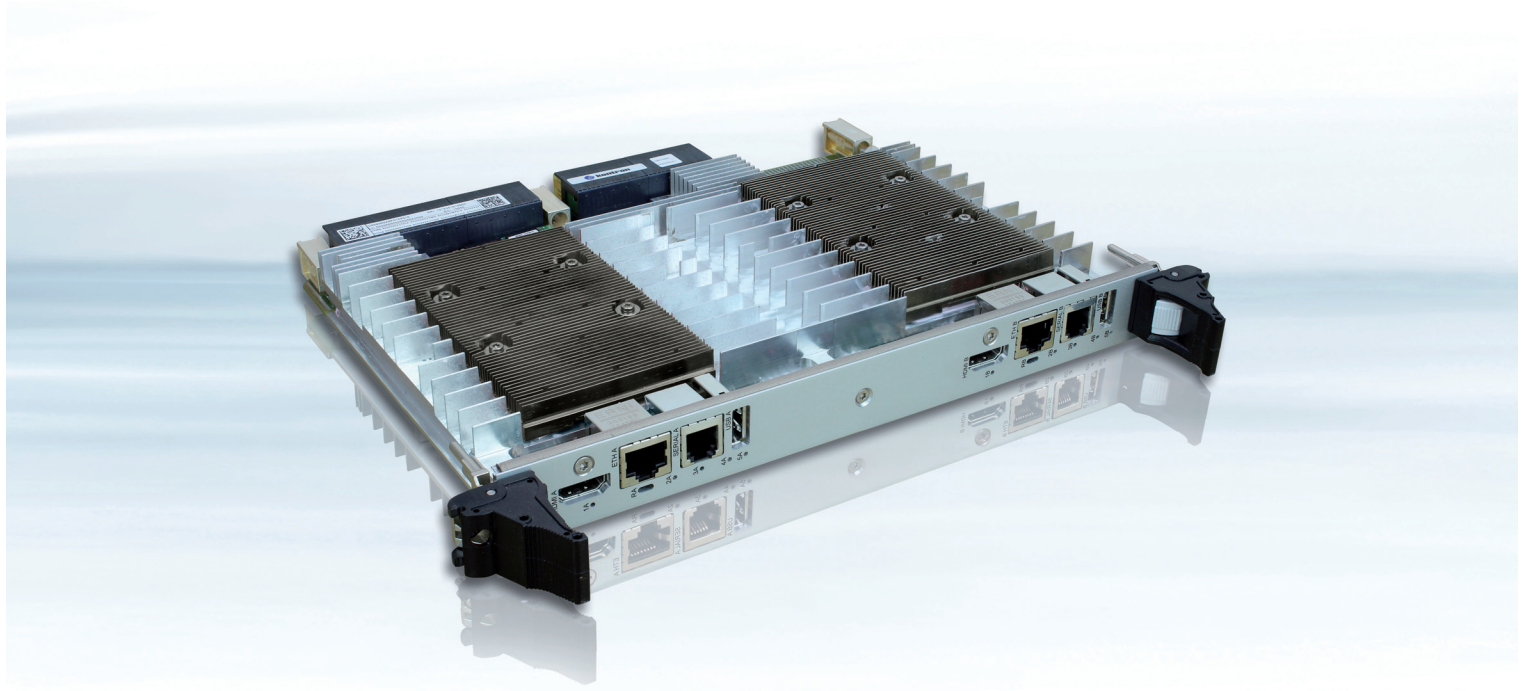


# VX6090

---



## 6U VPX MULTI-PROCESSING BOARD

Designed for Imaging, Radar and Embedded Server Applications

- ▶ Dual 8-Core Xeon® D 64-bit SoC at 2.0 GHz
- ▶ 16 GB DDR4 memory with ECC per SoC soldered on PCB
- ▶ Connectivity: Multiple 10 G & 1 G Ethernet Ports
- ▶ M.2 SATA III SSD Sockets
- ▶ Extended Life Cycle and Silicon Reliability

POSSIBILITIES START HERE



## VX6090 6U VPX MULTI-PROCESSING BOARD

Kontron's VX6090 is a high-performance, multi-purpose Single Board Computer (SBC) suitable for a wide range of demanding embedded deployments. Based on Intel's® Xeon-D® Octo Core™ server class processor, the VX6090 combines dense processing with rich standards-based communications fabric and I/O connectivity to form an ideal, flexible platform for tough SWaP-constrained missions - equally suitable for streaming signal or image processing and embedded server-type applications.

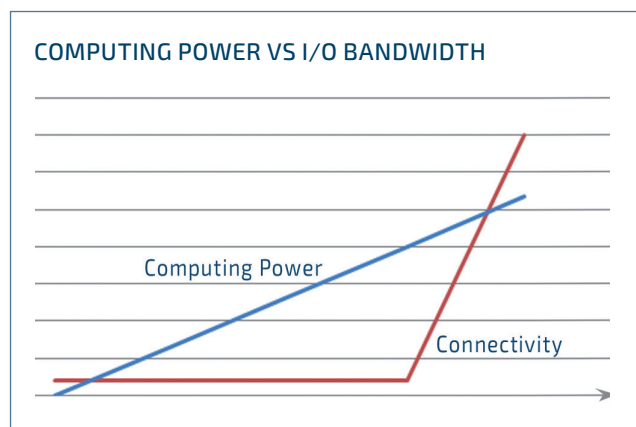
The 6U OpenVPX-compliant VX6090 features a dual-node architecture consisting of an 8-core new generation Intel® Xeon-D® processor (with AVX and AVX2 SIMD extensions for math-intensive operations), up to 32 GB of on-board soldered dual-channel DDR4 (with ECC), and an embedded graphics controller per node. The VX6090 also features dual M.2 slots per node, as well as an optional XMC site for I/O expansion.

Combined with extensive front- and rear-panel I/O, the VX6090 forms a processing engine ideal for applications with streaming sensor processing, data logging and storage, or human/machine interface requirements.

Available in standard commercial Air Cooled grade (SA) and in rugged Air Cooled (RA), the VX6090 offers the right balance of performance, scalability, and SWaP optimization for critical applications in the Military, Avionics and Transportation market spaces.

### OPTIMIZED SERVER PERFORMANCE

While computing power has been continuously increasing in the past, and I/O bandwidth did not, the balance of both is back again by Kontron VPX Single Board Computers featuring multiple 10G and 1G Ethernet ports and PCI-Express Gen 3 connectivity.



### FIT FOR VIRTUAL MACHINES AND HPEC APPLICATIONS

The server class Xeon® D platform is the basis for advanced server applications, built as virtual machines. All capital and operational efficiencies of using isolated workloads which dynamically share common resources will apply. The unchanged application can easily adapt to hardware evolution such as CPU count, memory, I/O availability, or even form factor. By virtualisation, embedded solutions become a future-proof investment.

VX6090 brings server class applications into the battlefield. Typical applications are:

- ▶ radar, sonar
- ▶ imaging systems & video servers
- ▶ airborne fighter and UAV radar
- ▶ long term programs in harsh environments

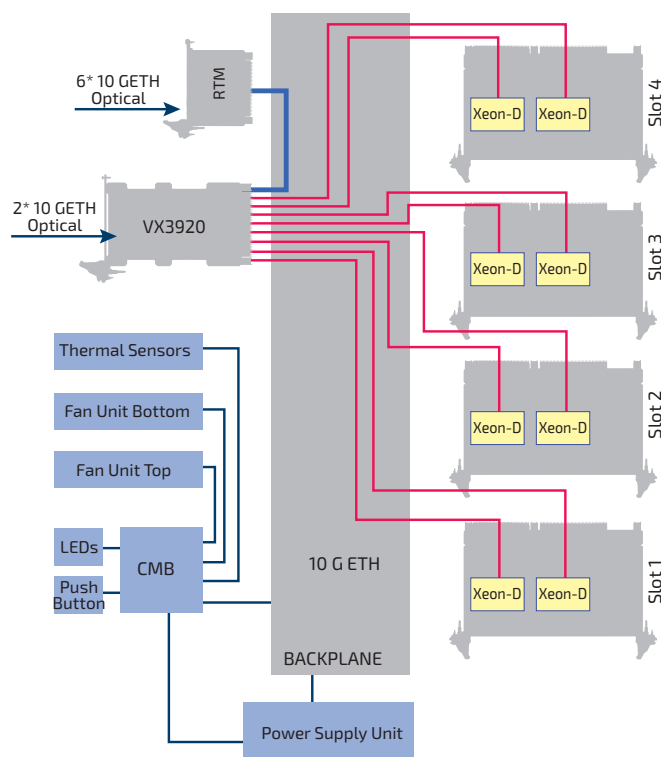
### LONG TERM PROGRAM: HIGH AVAILABILITY, LOW TCO

Kontron is providing outstanding elements to increase reliability and to lower Total-Cost-of-Ownership (TCO) for VX6090. Kontron provides a Long Term Supply program service (LTS) for over 15 years.

Intel Communications silicon reliability is 10 years. A comprehensive Health Management is optionally available to support easy field maintenance. All this makes the VX6090 the ideal candidate for long term programs.

### LEADING EDGE ARCHITECTURE FOR MULTI-PROCESSING VIDEO SERVERS

VX6090 provides two 10GBASE-KR ports per processor. A 10 Gigabit Ethernet switch can be complemented with a star data planes, for 10 GETH connectivity. A unique API with TCP/IP sockets makes it a powerful, leading edge Multi-CPU computing node architecture.



### CENTRALIZED HEALTH MANAGEMENT

A shelf manager is optionally available for centralized health management. Moreover, sequenced system power-up and Temperature/Power/Performance management are available. The Power-On Built-in Test (PBIT) option is a comprehensive package for board and system diagnosis.

### KONTRON VPX ECO-SYSTEM AND VALIDATED SYSTEMS

VX6090 boards are compatible with all Kontron 3U VPX and 6U VPX building blocks (payload boards, carriers, switches, backplanes, OS, and drivers) and offer backward compatibility with the previous product generations.

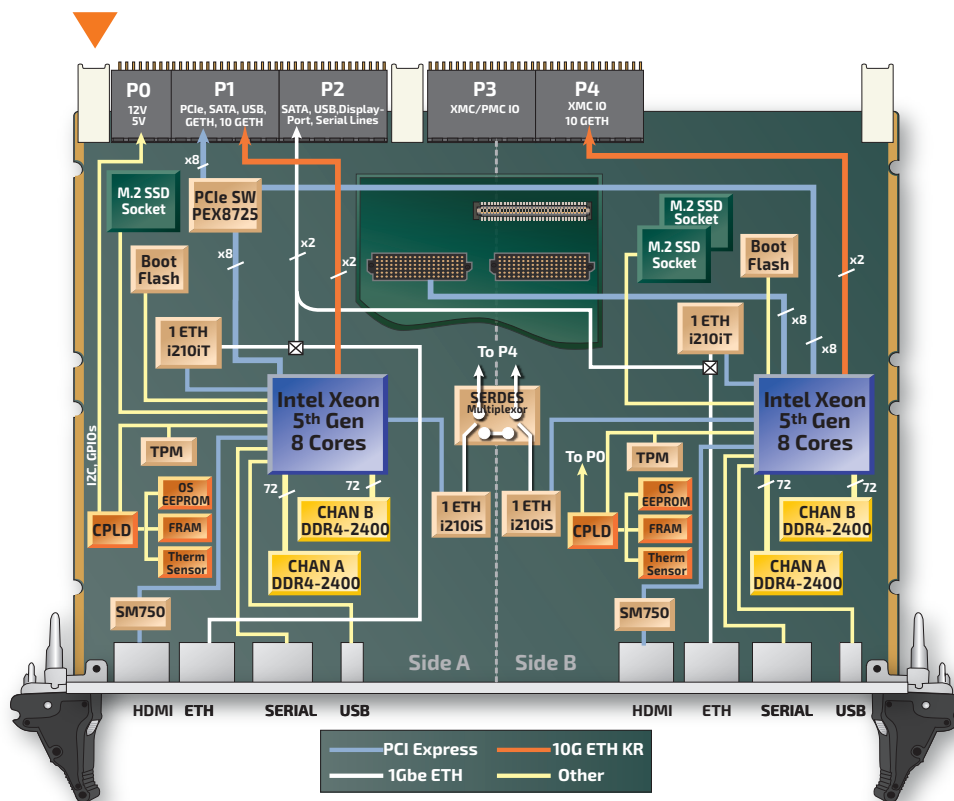
Reduce your time to market by starting with an already complete and validated platform, by use of StarVX turn key systems with off the shelf elements.

## ► TECHNICAL INFORMATION

|                           |   |   |
|---------------------------|---|---|
| ONBOARD FUNCTIONS         | Processor   | Fifth Generation Intel® Xeon® D Octo Core™, 45 W, 2.0 GHz (8 execution cores, 16 threads, 12 MB)  |
|                           | System DDR4 memory                                      | DDR4 dual channel memory with ECC.  |
|                           | RTC, Watchdog, Timer                                    | <ul style="list-style-type: none"> <li>▶ RTC: RV8564C2 device powered by onboard battery or backplane VBAT. Connected to SoC-SMBus.</li> <li>▶ Watchdog and Timer (integrated in CPLD): timeout ranging from 2 µs to 510s, IRQ, Reset, dual-stage</li> </ul>  |
|                           | F-RAM, boot and rescue Flash Devices, VPD and OS EEPROM | <ul style="list-style-type: none"> <li>▶ F-RAM: 1-Mbit serial I2C device. Connected to CPLD-I2CLOC bus.</li> <li>▶ Boot and rescue Flash Devices: 16-MByte devices. Connected to SoC SPI0 and SPI1 interfaces.</li> <li>▶ VPD and OS EEPROM: 256k-Byte devices. Connected to CPLD-I2CLOC bus.</li> </ul>                |
|                           | System CPLD   | The CPLD handles the I2C interfaces, poweron/poweroff controls and board resets, internal power-supplies sequencing and their monitoring, alerts, LEDs, GPIOs, onboard Ethernet multiplexors control, serial lines configuration. Configuration/status registers can be accessed from SoC LPC interface.                |
|                           | TPM   | TPM device v1.2 r116. Connected to SoC LPC interface.   |
| ONBOARD INTERFACES        | Top M.2 socket  | One M.2 socket 2242-D5-M H4.2. On side A the socket can also host 2260-D5-M, 2280-D5-M modules. Connected to SoC interface SATA[4]. Optionally connected to SoC PCI Express interface PCIE[1].  |
|                           | Bottom M.2 socket                                       | One M.2 socket 2242-D5-M H4.2 is available on bottom side of block B. Connected to SoC interface SATA[5].   |
| FRONT INTERFACES SHP (1") | 1000BASE-T port   | Intel i210IT controller. 10/100/1000BASE-T protocol with Auto-Negotiation. Auto-wire switching for crossed cables (Auto-MDI/X).   |
|                           | USB2.0 port   | USB2.0 port. Connection: from SoC USB interface USB[3] to front panel.  |
|                           | Serial port   | Two full duplex EIA-232 interfaces (default) or one full duplex EIA-485.<br>EIA-232 interface: simplified (TXD, RXD, GND), 115.200baud max,<br>EIA-485 interface: Fast slew rate (default).<br>Connection: from SoC UARTs, without hardware flow control, to transceivers and then to front RJ11 connector and rear P2. |
|                           | HDMI port   | HDMI (DVI) interface without audio. Connection: from SoC PCI Express gen2 interface PCIE[3] to SM750 graphic controller and front HDMI connector.   |
|                           | LEDs  | 5 bicolor LEDs reporting the board health status and activity. Handled by CPLD.   |
|                           | Reset   | Reset push button. Handled by CPLD.   |
| VPX BACKPLANE             | Slot profile  | VITA65 payload slot profile SLT6-PAY-2F2U2T-10.2.5  |
|                           | PCI Express gen3 port                                   | PCI Express 3.0 link, configurable as 1 x8, 2 x4, or 4 x2. Non-transparent capability.<br>Connection: from SoC PCI Express gen3 interface PE1[7:0] to PCI Express switch PEX8725 and P1.  |
|                           | PCI Express gen2 port (*)                               | PCI Express 2.0 link, fixed x1 configuration.<br>Connection: from SoCA PCI Express gen2 interface PCIE[8] to P2.  |
|                           | 10 GbE ports  | Dual 10G Ethernet controller integrated in SoC. Protocol: 10GBASE-KR, or 1000BASE-KX.<br>Connection: from SoC interface LAN0 and LAN1 to P1 and P4.   |
|                           | SATA ports  | SATA III, 6 Gb/s links. Connection: from SoC SATA interfaces SATA[0], SATA[1], SATA[2] to P1 and P2.  |
|                           | 1000BASE-T port   | Intel i210IT controller. 10/100/1000BASE-T protocol with Auto-Negotiation. Auto-wire switching for crossed cables (Auto-MDI/X). Connection: from SoC PCI Express gen3 interface PE1[12] (a PCI Express gen3 interface but used as PCI Express gen1 x1) to i210 controller, to LAN switch, magnetics and P1 or P2.       |
|                           | 1000BASE-KX port  | Intel i210IS controller. 1000BASE-KX protocol.<br>Connection: from SoC PCI Express interface PE1[8] to i210 controller, to SerDes multiplexor. From SerDes multiplexor, routed either to P4 or to the other SoC   |
|                           | USB3.0 port   | One USB Super Speed 3.0. Connection: from SoCA USB 3.0 interface USB3[1] to P1.   |
|                           | USB 2.0 ports   | Two USB 2.0 ports for each SoC.<br>Connection: from SoC USB 2.0 interface USB2[0] and USB2[1] to P1 and P2.   |
|                           | GPIOs and GDISCRETE1                                    | Five GPIOs shared by CPLD/A/B : GPIO1, GPIO2/MaskableReset*, GPIO3, GPIO4, GPIO5.<br>OpenVPX GDISCRETE1.  |
|                           | Serial  | Two EIA-232 or one EIA-485 interfaces. Connection: from SoC UARTs, without hardware flow control, to transceiver, front RJ11 connector and rear P2. On rear P2, COM1A & COM1B in EIA-485 are provisionnal; COM2A & COM2B in EIA-232 are provisional. Contact Kontron  |
|                           | XMC I/O (*)   | If optional XMC is equipped:<br><ul style="list-style-type: none"> <li>▶ XMC I/Os: VITA46.9 X12d+X38s from J16 to P3/P4.</li> <li>▶ or PMC I/Os: P64s from J14 to P3.</li> </ul>  |
|                           | Power Supplies  | On P0: VS1=12V; VS2 not used; VS3=5V not used; 3.3V_AUX optional, -12V_AUX for XMC(*) slot option only.   |
|                           |   |   |
| FORM FACTOR               | VITA 48.1 type  | Type 2.   |
|                           | Board outline   | As per IEEE 1101.1 6U outline:<br>Dimensions: 233.35 mm max x 170.60 mm max   |
|                           | Front panel   | SHP - 1 inch.   |
|                           | Overall envelope dimensions                             | As per VITA 48.1 / 1-inch plug-in units:<br>Plug-in unit thickness: 24.94 mm max.<br>Primary side of PCB to outside of heatsink: 16.76 mm max.<br>Primary side of PCB to outside of bottom cover: 7.87 mm max.  |
| OS SUPPORT                |   | Linux Fedora. Ask for Windows, VxWorks, PikeOS  |

(\*) Option on demand only. Contact Kontron.

## VX6090 BLOCK DIAGRAM AND FRONT PANEL



### ENVIRONMENTAL SPECIFICATIONS

|                            | SA - STANDARD COMMERCIAL<br>(1" single height passive module heat sink, forced air) | RUGGED AIR-COOLED        |
|----------------------------|---|--------------------------|
| CONFORMAL COATING          | Optional  | Standard                 |
| AIRFLOW                    | 30 CFM  | 30 CFM                   |
| COOLING METHOD             | Convection  | Convection               |
| OPERATING                  | 0°C to +55°C  | -25°C to +55°C           |
| STORAGE                    | -45°C to +85°C  | -45°C to +100°C          |
| VIBRATION SINE (OPERATING) | 20-500 Hz - 2 g   | 5-2,000 Hz - 3 g         |
| RANDOM                     | VITA 47-Class V1  | VITA 47-Class V2         |
| SHOCK (OPERATING)          | 20g/11 ms Half Sine   | 20 g/18 ms Half Sine     |
| ALTITUDE (OPERATING)       | -1,500 to 60,000 ft   | -1,500 to 60,000 ft      |
| RELATIVE HUMIDITY          | 90% without condensation  | 95% without condensation |

### ORDERING INFORMATION

| ARTICLE   | ORDER CODE        | DESCRIPTION  |
|-----------|-------------------|--|
| VX6090-SA | VX6090SA8G0150110 | Air cooled 6U VPX Single Board Computer, two 8-core Intel® Xeon® D processors, 2.0 GHz, TDP 45W, 16-GByte dualbank DDR4 per processor (32-Gbyte total), air cooled 0°C to +55°C, x8 PCIe Gen3 option, XMC Slot option. |
| VX6090-SA | VX6090SA8G0050010 | Air cooled 6U VPX Single Board Computer, two 8-core Intel® Xeon® D processors, 2.0 GHz, TDP 45W, 16-GByte dualbank DDR4 per processor (32-Gbyte total), air cooled 0°C to +55°C.                                       |
| VX6090-RA | VX6090RA8G0050010 | Rugged Air cooled 6U VPX Single Board Computer, two 8-core Intel® Xeon® D processors, 2.0 GHz, TDP 45W, 16-GByte dualbank DDR4 per processor (32-Gbyte total), air cooled -25°C to +55°C.                              |

For additional information, please contact [sales.KFR@kontron.com](mailto:sales.KFR@kontron.com)

### CORPORATE OFFICES

#### FRANCE

150 rue Marcelin Berthelot  
ZI de Toulon-Est - BP 244  
83078 TOULON CEDEX 9  
Tel.: +33 4 98 16 34 00  
Fax: +33 4 98 16 34 01  
[sales.KFR@kontron.com](mailto:sales.KFR@kontron.com)

#### HEAD OFFICE

Lise-Meitner-Str. 3-5  
86156 Augsburg  
Germany  
Tel.: +49 821 4086 0  
Fax: +49 821 4086 111  
[info@kontron.com](mailto:info@kontron.com)

#### NORTH AMERICA

14118 Stowe Drive  
Poway, CA 92064-7147  
USA  
Tel.: +1 888 294 4558  
Fax: +1 858 677 0898  
[info@us.kontron.com](mailto:info@us.kontron.com)

#### ASIA PACIFIC

1-2F, 10 Building, No. 8 Liangshuihe 2nd Street,  
Economiical & Technological Development Zone,  
Beijing, 100176, P.R.China  
Tel.: +86 10 63751188  
Fax: +86 10 83682438  
[info@kontron.cn](mailto:info@kontron.cn)