Deploy Data-Rich Applications Anywhere

with High Performance and AI at the Edge

Powered by 11th Gen Intel® Core™ vPro® and Intel® Xeon® W-11000E Series processors, the Kontron COM Express® Basic Type 6 module delivers the high performance edge computing needed to process AI, graphics, and other data-intensive applications anywhere.

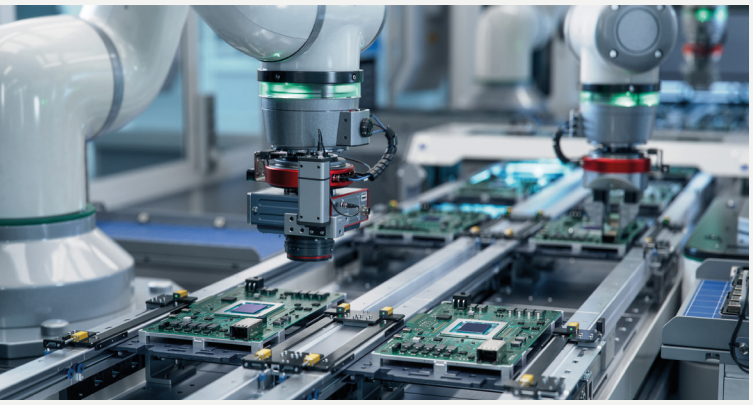
intel partner Titanium IoT Solutions

From graphics and video to AI and robotics, data-intensive applications are revolutionizing the way business is done. To thrive in today's fast-paced economy, original equipment manufacturers (OEMs) and their customers must offer high performance edge computing solutions that quickly capture, store, and transmit data at the point of generation. Take, for example, modern healthcare technologies such as X-ray and MRI systems that rely on near-real-time image processing wherever hospitals and clinics are located. Or the increasing use of AI and robotics in manufacturing and warehouse automation worldwide. Demand for digital signage is rising as well, requiring data-intensive video and graphics to be streamed around the clock and often in outdoor settings such as stadiums and shopping malls.

Challenges: Real-time data and heavy workloads require high-compute performance at the edge

To maintain their competitive advantage, OEMs must bring new products to market faster. This requires highly flexible extensible edge compute solutions that can be tailored for the full range of applications and industries they serve. It also requires OEMs and systems architects to navigate a host of business challenges, including:

- The need for more compute performance to support workload consolidation at the edge
- Growing demand for real-time computing and AI in numerous industries
- The need for reliable performance in harsh environments and extreme temperatures, ranging from -40° to 85°C
- Advancing security requirements to protect systems, applications, and data from malware and other cyber threats



> With industrial Computer-on-Modules from Kontron and the latest Intel® CPU technology, integration in healthcare, industrial automation, and other data-intensive applications is now greatly simplified, making it easier than ever to enable deterministic high-speed machine-to-machine communications.
>
> Peter Müller, Vice President of Product Center Modules for Kontron

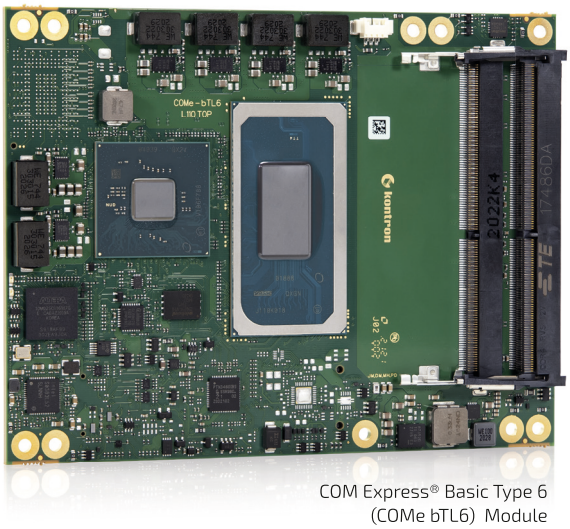
The solution: Kontron COM Express® Basic Type 6 with 11th Gen Intel® Core™ and Intel® Xeon® W-11000E Series processors

Kontron's COM Express® Basic Type 6 (COMe-bTL6) with 11th Gen Intel® Core™ vPro® and Intel® Xeon® W-11000E Series processors is ideally suited for the most-complex, data-intensive systems and applications. This module delivers the secure, high performance edge computing and rugged durability needed to place computing power directly in the hands of professionals and consumers. 11th Gen Intel® Core™ and Intel® Xeon® W-11000E Series processors expand the capabilities of COM-HPC® carrier boards with up to eight CPU cores, integrated graphics and AI acceleration, faster interfaces real time computing and design-ready support for functional safety.

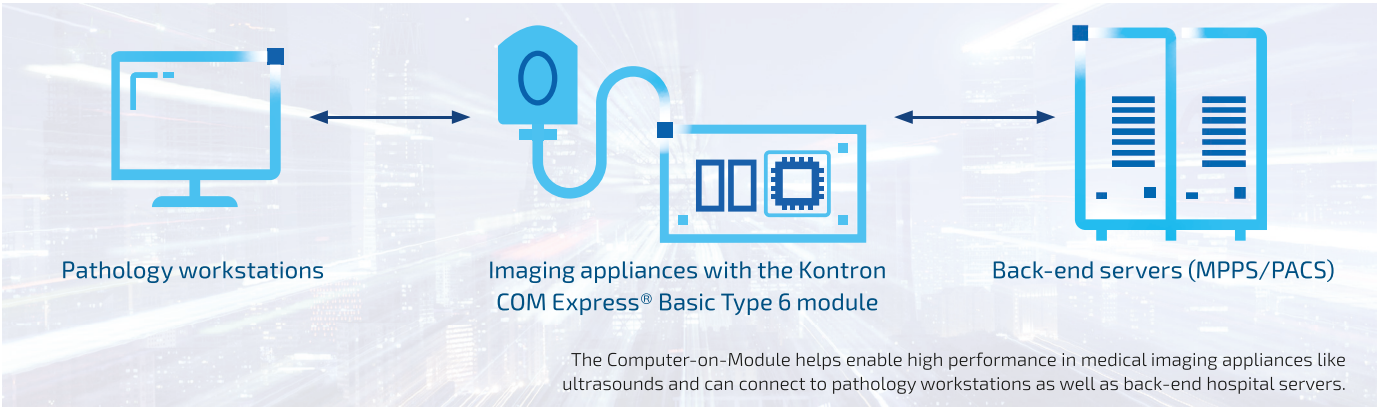
How it works

Kontron's COM Express® Basic Type 6 module enables high performance edge computing with up to 64 GB DDR4 memory (32 GB DDR4 memory down), support for 2.5 Gb Ethernet, and support for Time-Sensitive Networking (TSN), which helps enable real-time operations. An optional onboard nonvolatile memory express solid-state drive (NVMe SSD) is supported as well. The Kontron COM Express Basic Type 6 module is highly extensible and can be easily customized with new components to address several use cases, including:

- Industrial automation
- Healthcare
- Public sector applications
- Avionics
- Transportation
- Digital signage
- Gaming



COM Express® Basic Type 6 (COMe bTL6) Module



The Computer-on-Module helps enable high performance in medical imaging appliances like ultrasounds and can connect to pathology workstations as well as back-end hospital servers.

Driving data-intensive healthcare applications

From smart ultrasound machines to medical carts and endoscopy, the Kontron COM Express® Basic Type 6 module powers the high-resolution displays and AI-driven systems deployed by healthcare providers. Near-real-time processing of healthcare imaging and robotics applications and expedites diagnostics and procedures for responsive patient care. The high performance and high bandwidth enabled by 11th Gen Intel Core vPro and Intel Xeon W11000E Series processors accelerate data-intensive applications driving business processes as well, allowing healthcare providers to realize new levels of productivity and cos efficiencies.

Intel® processors enable superior performance and edge acceleration anywhere

Kontron's COM Express® Basic Type 6 module is powered by 11th Gen Intel Core processors. These processors boast significant gen-over-gen performances gains, including up to a 32 percent gain in single-thread performance up to a 65 percent gain in multithread performance and up to 70 percent faster graphics performance.

How the Kontron COMe bTL6 helps accelerate healthcare workflows

- Process high-resolution images faster with next-generation CPU architecture
- Combine accelerated deep learning inference with ultrasounds, MRIs, and other medical imaging devices
- Support rich visualizations with up to four 4K displays or one 8K display

How Intel-enabled AI in appliances can extend the capabilities of healthcare professionals

- Spot anomalies in medical images and flag them for review
- Augment visibility during procedures by identifying physical structures
- Automate fetal measurements during ultrasounds

These gains, and especially the boost in multithread performance, significantly accelerate processing for AI, graphics and other data-intensive applications. For example, in the healthcare industry, improved graphics help ensure that medical imaging data is displayed at the highest resolutions. In public sector applications, access to real-time graphics and video data from the field informs operations and aids in critical decision making.

Infotainment systems deployed on trains and other forms of public transportation require real-time processing of graphics and video as well, often operating in high-impact environments that need resilience and rugged durability.

Integrated video processing and AI acceleration
Intel® Advanced Vector Extensions 512 (Intel® AVX-512), exclusive to Intel® processors, accelerates AI workloads for image analysis, audio/video processing, and cryptography. Intel® Deep Learning Boost (Intel® DL Boost) further extends Intel AVX-512 with a new instruction set that increases inference performance on lower-precision data types, such as those used in workloads for image classification, speech recognition, and object detection.

Other new performance enhancements featured in the 11th Gen Intel Core vPro and Intel Xeon W-11000E Series processors include:

- Third-generation Intel® 10nm SuperFin technology, up to eight CPU cores, and up to 4.7 GHz frequency
- Intel® UHD Graphics with up to 32 execution units (EUs), 4x4K or 1x8K displays, up to two VDboxes
- Intel® Time Coordinated Computing (Intel® TCC) and TSN for real-time computing
- Intel® Functional Safety Essential Design Package (Intel®FSEDP) to facilitate platform certification
- Embedded and extended temperature industrial-rated SKUs
- Integrated Thunderbolt™ 4/USB4, 20 lanes of PCIe Gen 4.0, discrete Intel® Wi-Fi 6E/Bluetooth 5.2
- Hardware-based security with Intel® Total Memory Encryption (Intel® TME) and device management with Intel vPro®
- Supported by Intel® oneAPI Toolkits, Intel® Distribution of OpenVINO™ Toolkit, and Intel TCC tools
- Support for both commercial and open source operating systems, real-time OS and hypervisors

Supporting real-time applications
Intel TCC helps enable TSN and near-real-time use cases, providing tools, libraries, and APIs that simplify real-time tuning for proprietary and open source systems. Supported real-time hypervisors and operating systems include ACRN, Wind River VxWorks, and Real-Time Systems. With Intel TCC, OEMs and system architects can deploy the Kontron COM Express® Basic Type 6 module in logistics, manufacturing, and other time-sensitive applications to help streamline the operation of multiple devices or appliances on the shop floor.

Support documentation for Functional Safety (FuSa) applications
For systems and applications that must comply with FuSa standards, the Kontron COM Express Basic Type 6 module uses the Intel Functional Safety Essential Design Package (Intel FSEDP) to provide the technical documentation needed to speed up both the development and certification of functional safety applications.

Less is more

To prevent IT and OT systems from being compromised, a high level of mechanical security is also necessary, because once a malicious code has been infiltrated into a system, the entire IT infrastructure of the affected network segment can be disrupted. For this reason, accessible interfaces on the enclosure must be reduced to what is necessary and protected from improper use.

Finally, it is mandatory that the latest security updates are continuously provided. For example, AMD recently published a new chipset driver for AMD Ryzen™. As a highlight, the driver team mentioned the prevention of a downgrade in the PSP driver (Platform Security Processor), which is a security-relevant issue. System providers should also proactively communicate such updates to their end users and support upgrade procedures in the long term.

Layers of advanced, Intel-enabled security

Many IoT solutions emerging today are capturing sensitive consumer, business, and public sector data and are subject to the world's most stringent security protocols and regulations. 11th Gen Intel Core vPro and Intel Xeon W-11000E Series processors meet these high demands by delivering hardware enabled security features that help protect data all the way down to the chip level:

- **Intel Total Memory Encryption (Intel TME)** enables full physical memory encryption. This helps defend against hardware-level attacks such as cold boot, freeze spray, and DIMM removal
- **Intel® Boot Guard** and **Intel® Trusted Execution Technology (Intel® TXT)** help establish a secure boot and provide the foundation for safe computing
- **Intel® Key Locker** helps protect encrypted keys and decrypts/encrypts operations

Kontron services team helps expedite product development cycle

With the Kontron COM Express® Basic Type 6 module, product development processes are simplified for OEMs because Kontron has already completed the initial engineering work for them. This means OEMs and their customers can concentrate on developing their applications instead of having to navigate CPU design issues that may not be their core competency.
These and other important software support issues are also addressed by the Kontron module:

- As a part of Kontron's customer service approach, assistance with OS migrations an OS driver development is provided when switching from Windows to Linux in real time
- Implementing Microsoft Azure Machine Learning and Microsoft Cognitive Services analytics applications with cloud solution providers that are Microsoft Azure partners
- Business process integration with enterprise resource planning (ERP) systems through embedded suppliers that can also provide, for example, SAP S/4HANA cloud partner expertise

> As a result of the partnership between Intel and Kontron, integrators and OEMs are achieving the highest levels of edge computing performance and security while bringing their products to market faster than ever.
>
> Peter Müller, Vice President of Product Center Modules for Kontron

OEM design and white-glove services

In addition to the COM Express® Basic Type 6 module, Kontron provides an extensive array of supplemental design services that OEMs can leverage. From BIOS and software adaptation to carrier and mechanical design, Kontron provides the services OEMs frequently need to customize hardware so they can bring innovations to market faster. Kontron OEM services include:

- Comprehensive training and documentation for best-practice design samples and support that leaves no questions unanswered
- Accompanying services that allow customer designs to be put through their paces, so bugs are eliminated even before the first prototype is produced
- Debugging services and carrier compliance measurements for high-speed interfaces such as PCIe or USB 3.1 Gen 2, widely used in prototypes
- Thermal design support to optimize the cooling concept,including the RAM (this is vitally important because RAM is increasing in performance and becoming another system hotspot)
- Implementation support for Trusted Platform Module (TPM) and chip licensing

Kontron teams are also available to help OEMs manage complete carrier board configurations for a partner, if needed, and to develop customer-specific system implementations based on either a comprehensive portfolio of standard system solutions or the exclusive use of customer-specific housings. Kontron services extend all the way through individual injection molding design phases, enabling OEMs to confidently move forward with cos-efficient, large-scale series production.

Conclusion: Unleashing innovation with Intel & Kontron

With new AI, graphics, robotics, and other data-intensive applications driving modern products, services and consumer experiences. The demand for secure, high performance edge computing has never been greater. Kontron's COM Express® Basic Type 6 module harnesses all the robust performance and security of 11th Gen Intel Core vPro and Intel Xeon W-11000E Series processors to help meet the needs of a rapidly evolving global economy. The ability to accelerate data-rich applications at the edge means advanced IoT devices and applications can be developed anywhere they are needed. Because the Kontron module is designed for optimum flexibility and backed by the company's expert design service teams, OEMs and their customers have all the levels of support they need to expedite product development cycles and bring products to market faster. Together Kontron and Intel are delivering on the promise of edge computing by bringing high-caliber performance and security to the most complex IoT applications.

Learn more:
Kontron COM Express® Basic Type 6 module
11th Gen Intel Core vPro/Intel Xeon W11000E Series

About Kontron

Kontron is a global leader in IoT/Embedded Computing Technology (ECT) and offers individual solutions in the areas of Internet of Things (IoT) and Industry 4.0 through a combined portfolio of hardware, software and services. With its standard and customized products based on highly reliable state-of-the-art technologies, Kontron provides secure and innovative applications for a wide variety of industries. As a result, customers benefit from accelerated time-to-market, lower total cost of ownership, extended product lifecycles and the best fully integrated applications.

For more information, please visit: **www.kontron.com**

About the Intel® Partner Alliance

From modular components to market-ready systems, Intel and the over 1,000+ global member companies of the Intel® Partner Alliance provide scalable, interoperable solutions that accelerate deployment of intelligent devices and end-to-end analytics. Close collaboration with Intel and each other enables Alliance members to innovate with the latest IoT technologies, helping developers deliver first-in-market solutions.

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