



BCO-2000 Series Fanless Mini Computer

Introduction

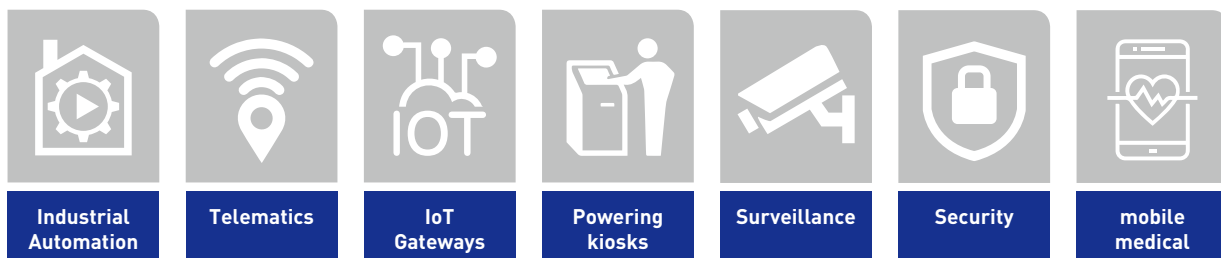
As the number of IoT and IIoT devices continues to increase, so does the need for powerful computing power and storage to be deployed at the edge close to the source of data generation. The BCO-2000 Series delivers blazing-fast performance thanks to the inclusion of multi-core processing from Intel's® 8th Generation Core® i3, i5, and Celeron® Processors. The BCO-2000 is based on a 3.5" SBC that delivers multi-core processing, memory, storage, rich I/O, and connectivity at the rugged edge, providing organizations with powerful computing power at a TDP of only 15 watts.

The BCO-2000 Series differentiates itself among other rugged mini PCs in the market by its ability to pull additional I/O ports directly from the motherboard itself. Most rugged mini PCs have fixed I/O's that limit their overall functionality for many IoT applications, especially those that require many I/O ports for sensors and IoT devices.

IoT integrators can now choose from a variety of plug and play kits that can expand the I/O ports on the BCO-2000 Series. Expansion module kits allow system integrators to quickly and easily add USB, Serial COM ports, PoE+, and additional RJ45 LAN ports based on their deployment requirements. The expansion capabilities of I/O ports are great for many IoT applications that require many I/O ports to connect to sensors, cameras, and other IoT devices that are common in industrial settings.

Key Applications

The BCO-2000 Series can be used for applications that include industrial automation, telematics, functioning as IoT gateways, powering kiosk machines, security and surveillance, and mobile medical applications. As processing, storage, and connectivity move closer to data generation, the BCO-2000 Series fanless mini computer balances both power-efficient processing and I/O flexibility for many enterprise IoT deployments at scale.



Powerful Processing Power

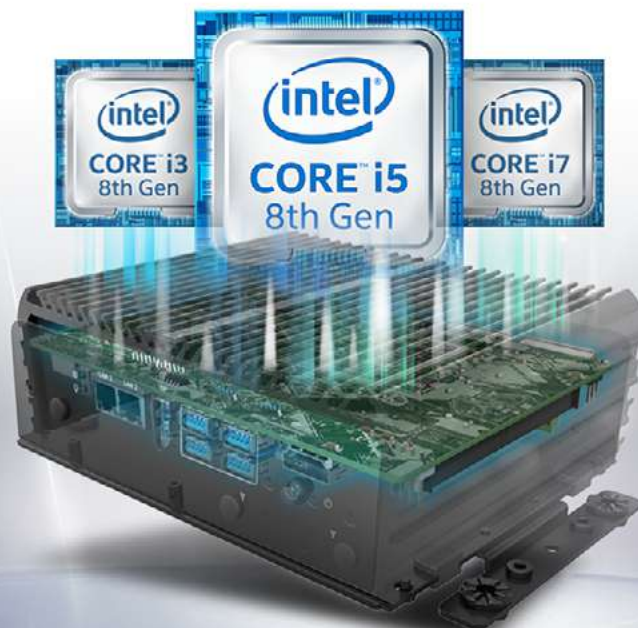
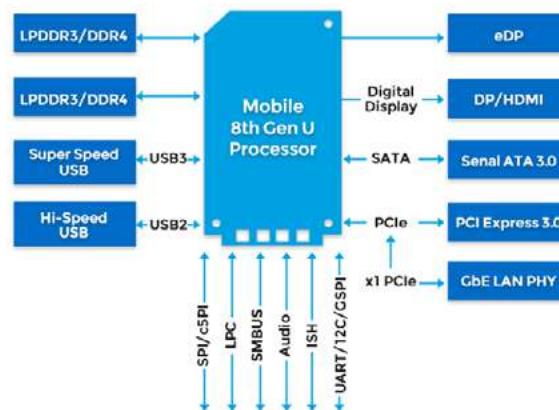
The BCO-2000 Series of fanless mini computers offers support for Intel's 8th Generation Core i3 and i5 processors, as well as Intel's Celeron processors, delivering powerful multi-core processing in a compact solution that does not sacrifice I/O availability and expandability. In fact, the BCO-2000 Series has rich and flexible I/O, which is a requirement for IoT connectivity.

For complex workloads that require powerful processing, the BCO-2000 Series can be configured using the Intel® Core® i5 8365UE that features four cores and eight threads, allowing eight-way multitasking thanks to Intel's® Hyperthreading® Technology. All of this performance is possible from a 15-watt TDP CPU.

For entry-level workloads that do not require a ton of processing power, the BCO-2000 Series can be configured using the Intel® Celeron® 4305UE Processor, featuring two cores clocked at 2.00 GHz and a TDP of 15 Watts, making it the ideal solution for entry-level workloads, such as functioning as a simple IoT gateway.

Rugged Mini PC Powered By a Proven 3.5" Industrial Motherboard

Powered by Intel 8th Gen Mobile-U Processor SoC (15W TDP)



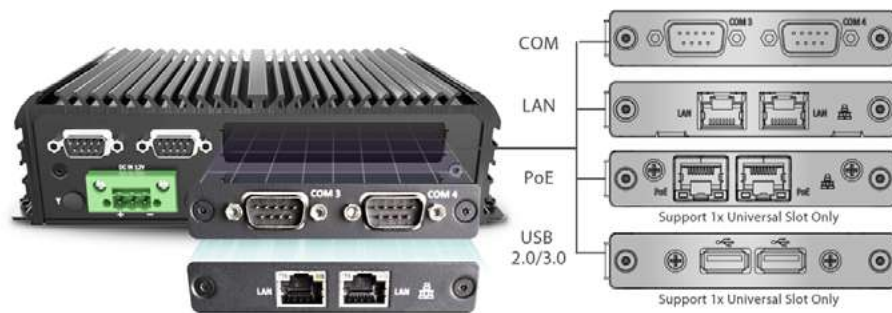
Ultra-Compact Form Factor

The BCO-2000 Series is ultra-compact, built around C&T's industrial-grade 3.5" SBC, making it compact enough to fit in the palm of your hand. The BCO-2000 Series comes in at 140 MM (D) X 192 MM (W) X 61 MM (H), which is very small for a system that provides the I/O expandability that it offers. Typically, small industrial computers sacrifice I/O ports to reduce their size; however, C&T did not take this route. Instead, C&T created a compact industrial computing solution that offers rich and expandable I/O for connectivity to both new and legacy technologies via USB Type-A, Ethernet, and Serial COM ports.



I/O Flexibility with Modularity

The BCO-2000 Series offers unparalleled flexibility and modularity when it comes to I/O ports. Here are all of the additional I/O ports that you can configure your system with:



- **PoE+**

The BCO-2000 Series can be configured with PoE+ ports for data and power through a single Ethernet cable. Many sensors, IoT devices, and cameras require power over ethernet, so we've enabled organizations to configure the BCO-2000 Series with up to two PoE+ ports via a Mini PCIe card. PoE+ can transmit up to 1,000 Mbps of data while providing a device up to 25.5 watts of power. So, if you have a sensor, IoT device, or camera that you want to power and connect to your fanless mini PC, the BCO-2000 supports such a configuration because PoE+ ports can be added to the system.

- **High-Speed USB Type-A Ports**

The BCO-2000 Series comes standard with four onboard USB 3.2 Gen 2 ports to accommodate sensors, cameras, and other peripherals that require high-speed data transmission. That said, organizations can configure the system with an additional two USB 2.0/3.0 Ports that are pulled directly from the motherboard, giving you a total of six USB ports in a small form factor.

- **Serial COM Ports RS-232/422/485**

The BCO-2000 Series of industrial PCs comes equipped with two Serial COM ports, with room for expansion for a total of six COM ports. Also, there is an additional COM port for CANBus, allowing organizations to leverage the CAN Bus Protocol for intelligent transportation systems, fleet management, process analytics, and vehicle ECU optimization. Serial COM ports are commonly used by organizations to connect to legacy factory equipment that still utilizes old communication protocols and standards.

- **LAN Ports**

The BCO-2000 Series comes standard with two onboard RJ45 LAN Ports for high-speed connectivity. That said, for system integrators that require additional LAN ports, the PC can be configured with an additional four LAN ports, bringing the total to six GigE LAN ports in a small form factor. Multiple LAN ports are useful because they allow the system to connect to up to six sensors, cameras, or other IoT devices.



Connectivity From the Rugged Edge

• Wireless and Cellular Connectivity

The BCO-2000 Series enables seamless wireless connectivity thanks to the inclusion of Wi-Fi 6, Bluetooth, and cellular connectivity through mini-pcie modules. Wi-Fi 6 allows the system to connect to the internet, as well as other devices that utilize Wi-Fi for high-speed wireless LAN connectivity. Bluetooth offers excellent, reliable connectivity to devices and sensors that are within close proximity of the device.

The BCO-2000 Series also comes equipped with cellular connectivity thanks to the inclusion of an internal SIM socket that provides 4G/LTE connectivity. Cellular connectivity is a major benefit for industrial PCs that are deployed in remote environments because it allows systems to offload critical data to the cloud when Wi-Fi and wired internet connectivity are not available, which is often the case in remote deployments.

• Wired RJ45 GigE LAN

The BCO-2000 Series of rugged industrial computers comes standard with two RJ45 GigE Ethernet ports (Intel I219-LM chipset) through its universal I/O bracket, offering support for Wake-on-LAN and PXE boot. Internet GigE ports enable high speed, low latency data transmission, which is a requirement for applications that require real-time data analysis and decision making.

Having Dual NICs on a mini PC is a major benefit for organizations because it enables link aggregation, load balancing, and redundancy. Link aggregation allows organizations to combine two or more Ethernet network connections in parallel, increasing the total bandwidth that a system can achieve.

Furthermore, load balancing allows organizations to ease network congestion by dividing incoming and outgoing traffic, resulting in a more effective use of internet bandwidth. The final benefit of having multiple Ethernet ports is that it offers redundancy. For example, if one of the Ethernet cables were to become loose, another cable can be plugged in to keep the PC connected to the internet. Redundancy is key for systems that are deployed in remote environments where accessing them is difficult, too time-consuming, or expensive.



Built Rugged For Extreme Deployments

- **Wide Operating Temperature Range**

The BCO-2000 Series has a wide operating temperature range, ranging from -20°C to 60°C, allowing the industrial computer to be deployed in extreme environments with challenging thermal conditions. For example, oil and gas production facilities can deploy the BCO-2000 Series in the middle of a desert where the temperature reaches 50 °C during the scorching hot summers, and the system will be able to operate optimally and reliably.

- **Shock & Vibration Resistance (20Gs of Shocks & 3GRMs Vibration Resistance)**

The BCO-2000 Series is engineered and built to withstand exposure to frequent shocks and vibrations, which are often present in industrial environments. For example, industrial computers that are deployed in a vehicle to collect and process vast amounts of vehicle data instantly must reliably operate even when exposed to jolts, shocks, and vibrations.

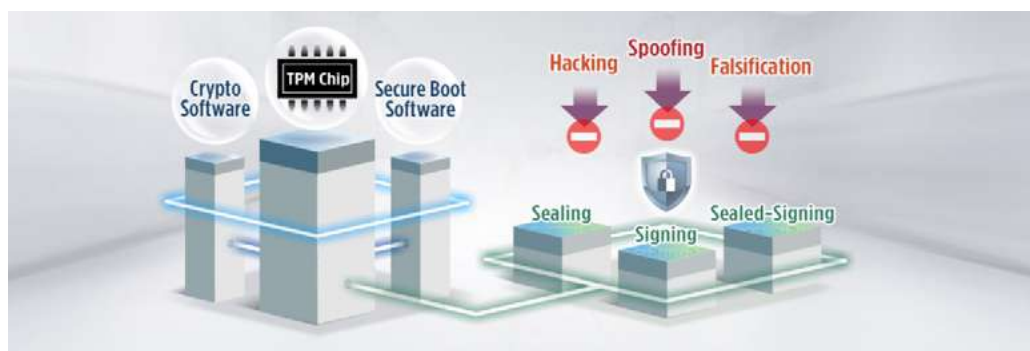
- **Fanless Design**

The BCO-2000 Series utilizes a fanless design that eliminates the use of fans throughout the system. The elimination of fans by passively cooling industrial PCs results in a fanless mini PC that's more reliable because fans are the chief failure point of most electronics. Also, the elimination of fans provides a closed computing system resistant to dust, debris, and other small particles.]

Hardware Security Encryptions

- **TPM 2.0**

The BCO-2000 Series is equipped with TPM 2.0 to safeguard the device, data, and transmissions from malicious actors. TPM 2.0 is an advanced crypto-processor that offers hardware-based protection that is tamper-resistant.



BCO-2000 SERIES



- Support 8th Gen. Intel® Core™ i5 & Intel® Celeron® Processor
- 1x 260-pin DDR4 2400 SO-DIMM. Max. up to 32GB
- 2x Intel® GbE (Support Wake-on-LAN and PXE)
- Dual Independent Display, 1x DP, 1x HDMI (optional)
- 2x Mini PCIe Gen3 with 1x SIM Slot
- 4x USB 3.2 Gen 2 (10Gbps), 4x RS-232/422/485 (w/ 2x internal)
- 1x Internal 2.5" SATA HDD Bay and 1x mSATA
- Watchdog timer, software programmable supports 1-225 sec. system reset
- TPM 2.0 Supported



	Basic Fanless System ideal for space-constrained applications					
Model	BCO-2000					
CPU Onboard	Support 8 th Gen. Intel® WL-UE Processor (15W TDP) Intel® Core™ i5-8365UE Processor 6M Cache, up to 4.10 GHz Intel® Celeron® Processor 4305UE 2M Cache, 2.00 GHz					
Memory	1x 260-Pin DDR4 2400MHz SO-DIMM, up to 32GB					
Graphic Output	1x DisplayPort, 1x HDMI (Optional)					
LAN	2x RJ45 GbE (Support Wake-on-LAN and PXE)					
Storage	1x mSATA (shared by 1x Mini PCIe) & 1x Internal 2.5" SATA HDD Bay					
Internal Expansion Slot	2x Full-size Mini-PCIe (1x shared with mSATA)					
Power	AT/ATX 12V Select, 3-pin Terminal Block					
Audio	Line-out / Mic-in Phone Jack					
Operating Temperature	-20°C to 60°C					
Dimensions (WxDxH)	140 x 192 x 61 mm					
Weight	1.4 kg					
Universal Expansion Slot	2					
Expansion (Option)	2x LAN	2x PoE (Support 1x Universal Slot Only)	2x COM	4x COM	2x USB 2.0 (Support 1x Universal Slot Only)	2x USB 3.0 (Support 1x Universal Slot Only)