

AMD
RYZEN
EMBEDDED
V1605B / R1606G Processor



Fanless Mini PC for Industrial Edge IoT

BCO-2000-RYZ Series with AMD Ryzen™ Embedded V1605B/R1606G Processor

In recent years, we have witnessed a paradigm shift in the world of computing, where edge AI has emerged as a major technological trend. The rise of edge AI has been driven by the massive development of smaller and more efficient, powerful hardware, combined with more optimized AI models. As more applications need to process massive amounts of data closer to their source, today's edge AI offers unprecedented levels of efficiency, automation, and innovation.

Delivering robust performance and efficiency at the rugged edge, C&T now introduces its latest BCO-2000-RYZ Fanless Mini Computer Series with AMD Ryzen Embedded processors. The BCO-2000-RYZ Series is a full rugged solution that combines C&T's 3.5" SBC with AMD processors in a fanless, ruggedized enclosure. Therefore, by leveraging the x86 AMD Ryzen Embedded Processor, the BCO-2000-RYZ Series is reshaping the future of the industrial landscape, offering unprecedented levels of efficiency, graphic performances, and ultra-low-latency connectivity.

Key Applications



Digital
Signage



Smart
Retail and
Kiosks



Casino &
Gaming
Machines



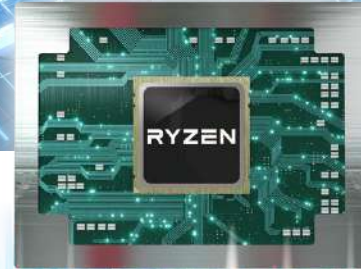
IIoT &
Robotics



In-Vehicle
Infotainment



Smart
City



Compact and Fanless BCO-2000-RYZ with AMD Ryzen Embedded Processors

(BCO-2000-RYZ-V1605B & BCO-2000-RYZ-R1606G)



C&T's new BCO-2000-RYZ Series now supports AMD Ryzen™ Embedded SoCs (System on Chip) that provide a new class of performance in a seamlessly integrated single-board solution. The BCO-2000-RYZ series comes in two configurations, the BCO-2000-RYZ-V1605B with the AMD V1000 Series and the BCO-2000-RYZ-R1606G with the AMD R1000 Series. The BCO-2000-RYZ with AMD CPU now delivers low power consumption, high-performance, and advanced security features for rugged edge AI deployments.

Introducing AMD Ryzen™ Embedded SoCs

The AMD Ryzen™ Embedded processor integrates the breakthrough performance of the "Zen" CPU and "Vega" GPU architectures in a single SoC solution that sets a new standard in processing power for next-generation embedded designs.

The Ryzen Embedded CPUs bring multi-threaded performance to the single-chip solution. In addition, delivering discrete-GPU caliber graphics and multimedia processing allows our SBCs to achieve new levels of processing efficiency and design versatility.





Benefits: AMD Ryzen Embedded SoCs

- Low-Power TDP Designs (12-25 watt)
- Next Generation x86 “Zen” Cores (2 and 4 Core options)
- Multiple 4K Displays with Integrated Graphics in “Vega” GPU
- Up to dual-channel 64-bit DDR4 Up to 2400 MT/s
 - ECC Memory Support
- AMD Secure Processor (PSP) for data security and encryption
- 10-year embedded long-life and availability

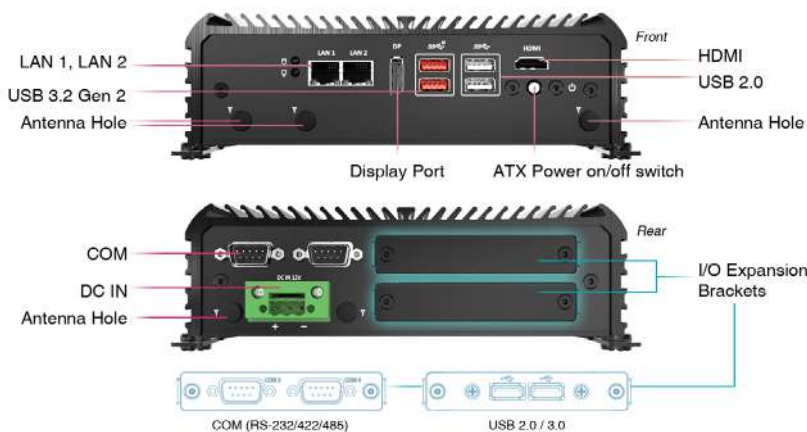
Top-Level Feature Comparison Between R1606G vs. V1605B

Model	TDP Range	CPU Core/Thread Count	CPU Base Freq. GHz	1T Boost Freq. GHz (up to)	Graphics Computing Units (SIMD)	GPU Freq. GHz (up to)	L2 Cache	Package	Max DDR4 Rate (MT/s)	Junction Temperature Range (°C)
R1606G	12-25W	2 / 4	2.6	3.5	3	1.2	1MB	FP5	2,400	0°~105°
V1605B	12-25W	4 / 8	2	3.6	8	1.1	2MB	FP5	2400	0°~105°

Low-Power. Robust Performance. BCO-2000-RYZ-V1605B & R1606G

The BCO-2000-RYZ Series now features groundbreaking AMD Ryzen™ Embedded R1606G & V1605B SoCs and two DDR4 SO-DIMM slots with up to 32GB of ECC/non-ECC memory to handle powerful data processing and smooth multitasking from various IoT sensors and devices at the rugged edge.

The BCO-2000-RYZ-V1605B also supports rich I/O configurations and expandability on a compact, fanless enclosure. The computer is configured with various I/Os, multiple 4K resolution display ports, SATA, mPCIe, and M.2 expansion slots to ensure compatibility and expandability. The BCO-2000-RYZ-V1605B is ideal for numerous embedded applications due to its form factor that is small enough to fit into tight spaces while hosting powerful feature-rich I/O ports, rich displays, and additional expansion slots.



Key features:

- AMD Ryzen™ Embedded R1000/V1000 (12-25W TDP)
- 2x DDR4 2400 SO-DIMM Up to 32GB (ECC/non-ECC)
- 1x SIM Card Slot for 4G/LTE or 5G Cellular
- Dual Independent Displays: 4K HDMI, 4K DP
- I/O: 2x GbE LAN, 2x USB 3.2 (10GB), 2x USB 2.0
- 2x Expandable I/O: 2x COM, 2x USB 2.0/3.0
- Wide Operating Temperature: -20°C to 55°C
- Expansion: 1x M.2, 1x mPCIe, 1x SATA
- Wireless Support: Wi-Fi 6, and Bluetooth 5
- TPM 2.0



Dual Ultra-High-Resolution 4K Displays

With AMD Ryzen™ Embedded SoC processor, the BCO-2000-RYZ-V1605B can support two independent ultra-high-resolution 4K displays, 1x HDMI 2.0b and 1x DP 1.4, DP++. With the dual 4K displays capability, the BCO-2000-RYZ-V1605B can deliver rich and vibrant multimedia for more immersive displays at the rugged edge.



UHD 4K Display	1x DisplayPort 1.4 (DP++)	3840 x 2160	60Hz
UHD 4K Display	1x HDMI 2.0b	3840 x 2160	60Hz



Blazing Fast 5G Connectivity

The BCO-2000-RYZ-V1605B now supports 5G cellular connectivity with a built-in SIM card slot for uncompromising wireless connectivity at the edge. With a built-in SIM card slot, the fanless computer can support 4G LTE or 5G cellular connectivity through its plug-and-play M.2 module. Moreover, the BCO-2000-RYZ-V1605B also supports Bluetooth 5 and Wi-Fi 6 for high-speed wireless connectivity.

Expandable I/O Modules

When more I/O ports are required for workload consolidation, the BCO-2000-RYZ-V1605B can leverage its mPCIe/M.2 Slots for additional I/O modules that can be connected to the front I/O brackets. The BCO-2000-RYZ-V1605B is built with 2x expandable I/O brackets that allow the system to be configured with additional 2x COM and 2x USB modules. This allows the computer to manage and communicate with more IoT sensors and embedded devices at the rugged edge.





Reliable ECC Memory Support

The BCO-2000-RYZ-V1605B supports Error Correcting Code (ECC) memory for mission-critical deployments that require high-performance systems to operate reliably 24/7. With ECC memory, the system can detect and correct common memory errors on the RAM. ECC RAM can immediately detect and fix memory errors before they can cause data corruption or event system crashes.



Optimal Security and Encryption

With the AMD Ryzen™ Embedded SoC, the system is equipped with a next-generation AMD Secure Processor (PSP) to ensure optimal security and encryption, which includes:

- fTPM2.0, crypt-offload, platform secure boot, integrated DRM
- Field Programmable Keys
- Secure Memory Encryption Support (SME).

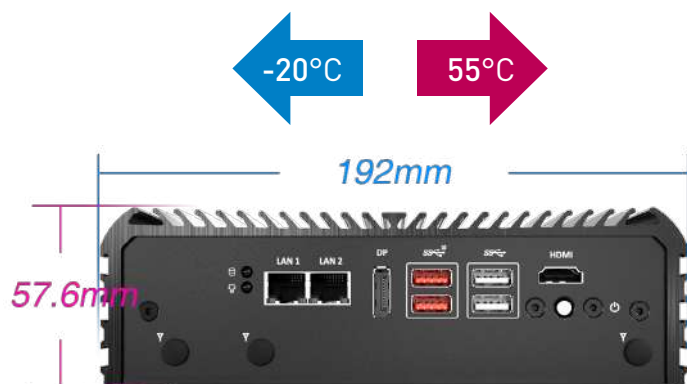
Moreover, there is an additional TPM 2.0 chipset for additional hardware encryption for an even higher level of security.

Compact and Industrial Grade Design

The BCO-2000-RYZ-V1605B is designed, tested, and built for outstanding durability amid extreme industrial deployments. The system is built out of industrial-grade materials from its motherboard, chipsets, power chokes, I/Os, resistors, and capacitors are all selectively chosen for the best industrial performance. Measuring in 140 (D), 192 (W), 57.6 (H) mm, the BCO-2000-RYZ-V1605B can be deployed around tight space edge applications.

The BCO-2000-RYZ-V1605B Rugged Edge Features:

- Operating Temperature: -20°C to 55°C
- 20G Shock and 3 Grms Vibration Resistance
- Certification Ready: UL, CE, FCC Class A
- Wall Mount / DIN-Rail Mounting (Optional)



We Create World-Class Edge Computers For Your Industry-Leading Solutions

NEW

BCO-2000-RYZ SERIES



BCO-2000-RYZ-V1605B / BCO-2000-RYZ-R1606G

Fanless Mini Computer with AMD Ryzen™ Embedded V1605B / R1606G, 2x LAN, 4x USB

- Processor
- Support AMD Ryzen™ Embedded V1605B / R1606G Series
- AMD Ryzen™ Embedded V1605B with Radeon™ Vega 8 Graphics, 4M Cache, 4 Cores, 8 Threads, Up to 3.6 GHz
 - AMD Ryzen™ Embedded R1606G with Radeon™ Vega 3 Graphics, 4M Cache, 2 Cores, 4 Threads, Up to 3.5 GHz (Optional)

Memory 2x 260-Pin DDR4 2400 MHz SODIMM. Max 32 GB (ECC/non-ECC)

Display Triple Display, 1x DisplayPort 1.4, DP++,
1x HDMI 2.0b,
1x 24-bit dual channel LVDS

Storage 1x M.2 B Key, 3042, Support SATA
1x Internal SIM socket
1x Internal 2.5" SATA HDD Bay (support H=9.5mm)

Internal Expansion Slot 1x Full-Size Mini PCIe for expansion modules

I/O 2x USB 3.2 Gen 2 (10 Gbps)
4x USB 2.0 (2x internal)
2x RS-232/422/485, 2x RJ45, 4 in / 4 out (Isolated)

Power AT, ATX 12VDC

Operating Temperature -20°C to 55°C

Certification CE, FCC Class A

Dimensions (W x D x H) 140 x 192 x 57.6 mm