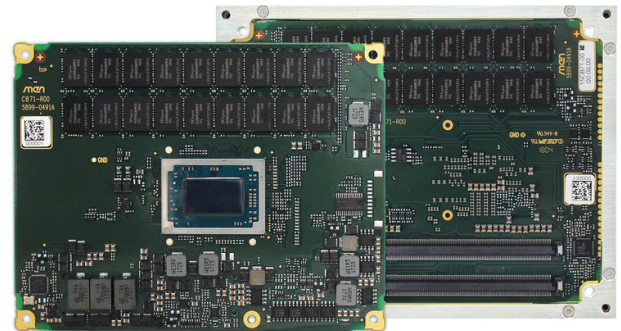


RUGGED COM EXPRESS MODULE WITH AMD RYZEN EMBEDDED



- AMD Ryzen Embedded V1000/R1000 APU
- Up to 32 GB DDR4 RAM with ECC
- Up to 4 Digital Display Interfaces (DP, eDP, HDMI, DVI)
- Hardware memory encryption
- Board management controller with safety-related supervision functions
- Virtualization-ready
- Excellent price-performance ratio
- -40 °C to +85 °C Tcase, depending on processor
- Conduction cooling
- Compliant with COM Express Basic, type 6
- PICMG COM.0 and Ultra-Rugged COM versions



TRULY RUGGED COM EXPRESS MODULE

The CB71 is a rugged COM Express module with Type 6 Pin-Out for demanding applications in the railway, public transportation and industrial markets. Its high-performance features match the requirements of applications like data acquisition, infotainment, transcoding or live 3D. The rugged CB71 is designed for operation from -40 °C to +85 °C. To withstand serious shock and vibration, only soldered-down components are used. The design is optimized for conformal coating.

ALSO FOR EXTREMELY HARSH ENVIRONMENTS

For applications that need reliable operation even under the harshest environmental conditions, a specially hardened version is available - the CB71C. CB71C modules are embedded in a closed aluminum frame that ensures optimum EMC protection and efficient conduction cooling. Direct air cooling is possible by placing a heat sink on the cover. The innovative mechanical design around the COM.0 electronics makes it an ultra-rugged module.

POWERFUL PROCESSING AND GRAPHICS ON A SINGLE CHIP

The CB71 is based on the AMD Ryzen Embedded V1000/R1000 APU family. It comes with a Radeon Vega next-generation 3D graphics engine and supports up to four displays with up to 4k resolution, without the need for additional graphics hardware. With two (R1000) or four (V1000) high-performance processor cores and AMD-V extension, the CB71 is also suitable for virtualization.

EXCELLENT PRICE/PERFORMANCE & FLEXIBILITY

The CB71 can be equipped with an R1000 dual-core APU or a V1000 quad-core APU offering long-term availability and scalable performance and supporting ECC. Passive cooling is possible with low-power versions.

SAFETY AND SECURITY

The board management controller has supervision functions (onboard voltages, temperature etc.) that make the board suitable for safety-related applications. In addition, the CB71 has a Trusted Platform Module and supports hardware memory encryption, providing protection against both physical and inter-VM storage attacks. This is essential for security-critical applications such as payment and ticketing terminals, fleet management or monitoring.

MEMORY AND I/O

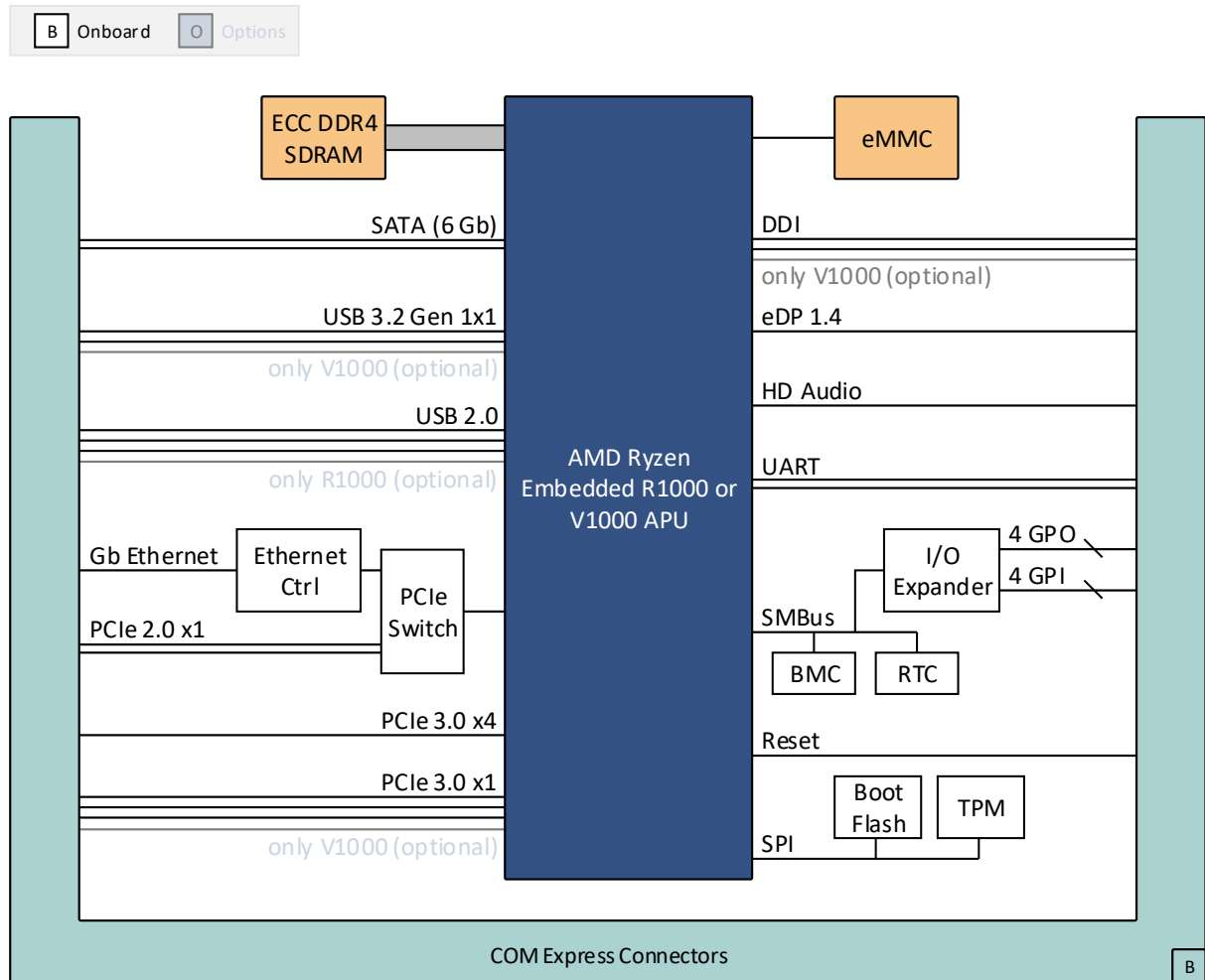
The CB71 can be equipped with up to 32 GB of directly soldered DDR4 main memory and up to 64 GB eMMC. Available high-speed interfaces include PCI Express 3.0 links, DDI (DP, eDP, HDMI), SATA 3.0, Gigabit Ethernet and USB 3.2 Gen 1x1.



www.duagon.com/products/cb71/

DATA SHEET

CB71 | DIAGRAM



CB71 | TECHNICAL DATA

CPU

- The following CPU types are supported:
 - AMD V1404I, 4 cores, 8 threads, 2.0 GHz base, 12-25 W, 2 MB cache, Vega GPU with 8 CUs, iTemp
 - AMD V1807B, 4 cores, 8 threads, 3.35 GHz, 35-54 W, 2 MB cache, Vega GPU with 11 CUs
 - AMD R1606G, 2 cores, 4 threads, 2.6 GHz, 12-25 W, 1 MB cache, Vega GPU with 3 CUs

MEMORY

- System RAM
 - Soldered DDR4, ECC
 - 32 GB max.

SECURITY

- Trusted Platform Module 2.0

MASS STORAGE

- eMMC (soldered); 16 GB



GRAPHICS

- Processor graphics
- Maximum resolution: 4096 × 2160 pixels @ 60 Hz, 36 bpp

INTERFACES

- This product includes interface options
 - Available interfaces depend on the processor type
- SATA
 - 2 × SATA Revision 3.x, board to board
- Video
 - 3 × DDI, board to board
 - 1 × eDP 1.4, board to board
- Audio
 - 1 × board to board
 - HD Audio
- USB
 - 3 × USB 3.2 Gen 1x1, board to board
 - 3 × USB 2.0, board to board
- Ethernet
 - 1 × 10/100/1000BASE-T, board to board
- PCI Express
 - 1 × PCIe 3.0, x4, board to board
 - 4 × PCIe 3.0, x1, board to board
 - 2 × PCIe 2.0, x1, board to board
- Serial
 - 2 × UART, board to board
 - Physical interfaces, e.g., RS232 or RS422/RS485, depending on implementation on carrier board
- GPIO
 - 4 × GPI non-isolated, board to board
 - 4 × GPO non-isolated, board to board
- SMB
 - 1 × board to board
- Reset
 - 1 × board to board

SUPERVISION AND CONTROL

- Board management controller
- Temperature measurement
- Watchdog timer
- Real-time clock

PRODUCT STANDARD

- Basic, Type 6, PICMG COM.0 COM Express Module Base Specification
- Basic, Type 6, Ultra-Rugged COM

ELECTRICAL SPECIFICATIONS

- Supply voltage: +12 V (9.5 V to 15.5 V)
- Power consumption: 6 W to 65 W max., depending on processor type and load

MECHANICAL SPECIFICATIONS

- Dimensions
 - COM Express Basic: (W) 125 mm, (D) 95 mm
 - Ultra-Rugged COM Basic with cover and frame: (W) 135 mm, (D) 105 mm, (H) 18 mm
- Weight: 70 g (COM Express model 15CB71-00); 480 g (Ultra-Rugged COM models, approx.)
- Cooling: Conduction cooling

PRODUCT COMPLIANCE: RAIL - ROLLING STOCK

- Compliance level: This product is prepared for use in EN 50155:2017 systems. Some parameters are system-dependent and are specified on system level.
- Operating temperature: -40 °C to +85 °C (EN 50155:2017, Tmax/PCB = +85 °C; designed for use in OT4+ST1 systems)
- Rapid temperature variations: EN 50155:2017, class H1, no requirements
- Storage temperature: -40 °C (EN 50155:2017) to +85 °C (EN 60068-2-2, Bb)
- Altitude: +3000 m max. (EN 50125-1:2014, class AX)
- Pollution degree: EN 50124-1:2017, class PD2
- Humidity: +55 °C and +25 °C, 100 % RH max. (EN 50155:2017)
- Shock: 30 ms @ 50 m/s² (EN 61373:2010/AC:2017-09, vehicle body, cat. 1, class B)



- Vibration: 10 min @ 2.02 m/s² (functional) and 5 h @ 11.44 m/s² (long-life) (EN 61373:2010/AC:2017-09, vehicle body, cat. 1, class B x 2)
- Electrical safety
 - EN 50155:2017
 - EN 50153:2014 + A1:2017
 - EN 50124-1:2017
- Fire protection: EN 45545-2:2013 + A1:2015, HL3
- EMC emission: EN 50121-3-2:2016
- EMC immunity: EN 50121-3-2:2016
- Protective coatings: EN 50155:2017, class PCX (As agreed between user and supplier)
- Useful life: 20 years (EN 50155:2017, class L4)

PRODUCT COMPLIANCE: ROAD VEHICLE

- EMC emission: ECE R10 Rev.5
- EMC immunity: ECE R10 Rev.5

RELIABILITY

- MTBF: 363 958 h predicted @ 40 °C according to IEC/TR 62380 (RDF 2000) (model 15CB71C00)

BIOS/BOOT LOADER

- AMI Aptio UEFI Firmware

SOFTWARE SUPPORT

- Linux
 - Supported kernel: 4.14.71
 - Driver support
 - Tool support
 - Yocto BSP
 - Tested with: Yocto BSP (Sumo 2.5, Linux kernel 4.14.71)
- Windows
 - Windows 10 IoT Enterprise 64-bit
 - Driver support
 - Tool support
 - Not all functions are supported

- ▶ See the product User Manual for details on software support: www.duagon.com/products/cb71/#doc
- ▶ See also **Application Note Recommendations for a Robust Software Setup**
- ▶ See section Software on the product web page for available packages: www.duagon.com/products/cb71/#downl

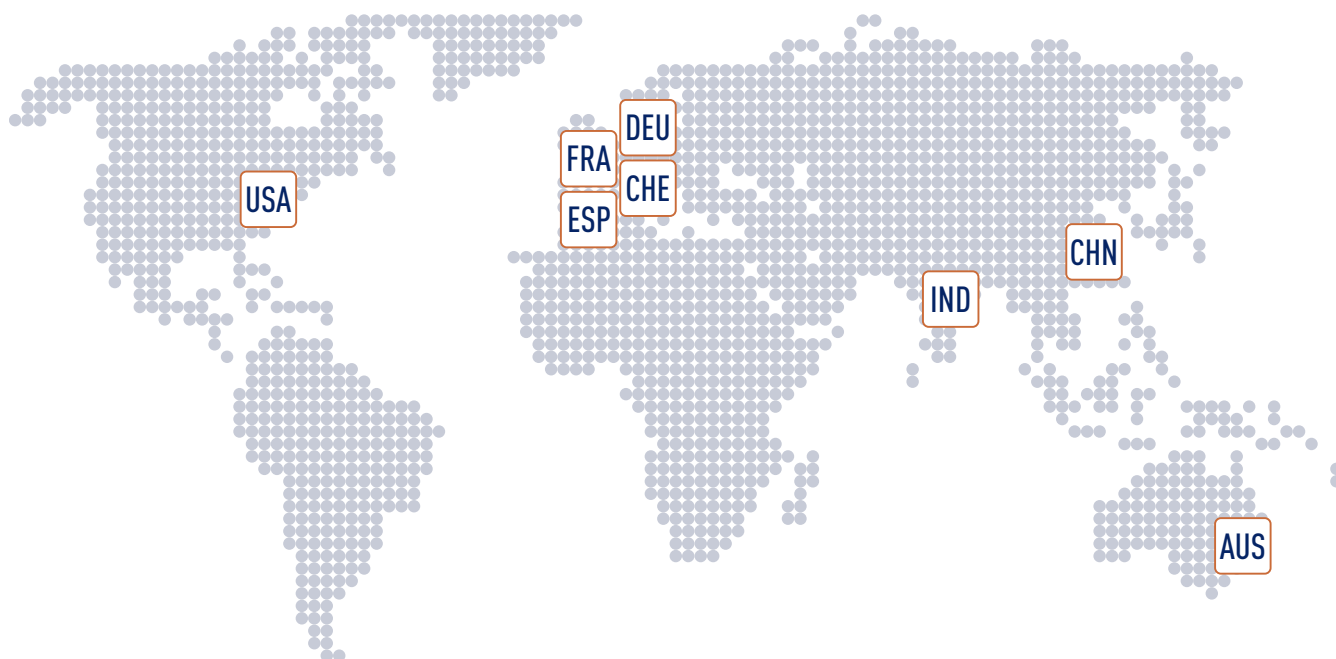
CB71 | ORDERING INFORMATION

STANDARD MODELS

15CB71-00	COM Express "Basic", type 6, AMD V1404I, 2 GHz, 16 GB RAM, 3x USB 3.1, 3x USB 2.0, 1x PCIe x4, 6x PCIe x1, -40 °C to +75 °C (10 min +85 °C), without conduction cooling frame
15CB71C00	Ultra-Rugged COM Express "Basic", type 6, AMD V1807B, 3.35 GHz, 32 GB RAM, 3x USB 3.1, 3x USB 2.0, 1x PCIe x4, 6x PCIe x1, -40 °C to +85 °C Tcase, with conduction cooling frame



LEADING THE EMBEDDED FUTURE



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duagon has a global presence with support and sales representatives across 8 countries. With three decentralized engineering and production sites, our customers take advantage of the added competence and flexibility.

www.duagon.com

SWITZERLAND (HQ)

Dietikon
Phone +41 44 743 73 00
sales@duagon.com

AUSTRALIA

Artarmon
Phone +61 2 9966 9424
sales-aus@duagon.com

CHINA

Shanghai
Phone +86 159 0077 2985
sales-chn@duagon.com

FRANCE

Gaillard
Phone +33 450 955 312
sales-fra@duagon.com

GERMANY

Nuremberg
Phone +49 911 99 335 0
sales-deu@duagon.com

INDIA

New Delhi
Phone +91 11 41 61 12 48
sales-ind@duagon.com

SPAIN

Madrid
Phone +34 917 880 610
sales-esp@duagon.com

USA

Blue Bell
Phone +1 215 542 9575
sales-usa@duagon.com