

EMBEDDED SINGLE BOARD COMPUTER WITH 11TH GENERATION INTEL CORE AND XEON W-11000 PROCESSORS

- Intel Xeon W processor
- Up to 64 GB DDR4 RAM soldered, ECC
- Board management controller
- Two 10 GbE interfaces (optional)
- Front I/O: 3x 1 Gb Ethernet RJ45, 1x USB 3.2 Gen 2x1, 1x DisplayPort
- Rear I/O: 1Gb Ethernet, PCIe, USB 3.2 Gen 2x1, SATA
- -5 °C to +60 °C (system ambient) operating temperature
- Long-term available



HIGH PERFORMANCE CPU FOR EMBEDDED APPLICATIONS

The duagon G28I is a 3U CompactPCI Serial CPU board featuring the 11th generation Intel Core and Intel Xeon W-11000E Series/ Tiger Lake-H (TGL-H) CPUs. With up to 8 cores and up to 64 GB dual channel DDR4 RAM the G28I is well suited for high-end embedded computing in wayside railway applications or in industrial applications. As part of a rail wayside server system, the single board computer can be used for condition monitoring. The G28I offers reliable computing performance for medical applications, e.g., surgical robots as well as for factory automation, motion control and robotics in industrial automation.

PERFORMANCE SCALABILITY

CPU scalability from 25 W to 45 W TDP and 4 to 8 cores allows operation in harsh ambient temperatures of up to +60 °C system ambient temperature.

SYSTEM SECURITY AND BOARD MANAGEMENT

A board management controller provides thermal supervision of the processor, a watchdog for the operating system and monitoring of onboard voltages. For system security, a Trusted Platform Module is assembled on the board.

RUGGEDIZED MEMORY

The G28I includes a dual-channel 64 GB DDR4 DRAM with ECC and a transfer rate of up to 3200 MT/s which is soldered to the board to guarantee optimum shock and vibration resistance. An onboard 120 GB NVMe storage module is available on all models.

FLEXIBLE FRONT I/O

The G28I features three RJ45 (single-slot) Ethernet front connectors making it more cost-effective by reducing the need for extra modules. Other front I/O include one USB 3.2 Gen 2x1 connector and one USB-C connector supporting up to USB 3.2 Gen2x1 speed and DP Alternate Mode. An 8 HP board version with two 10 Gb Ethernet interfaces for high data throughput and direct connection to the network backbone is planned.

FOR EMBEDDED AND HARSH ENVIRONMENTS

The G28I operates in Linux and Windows environments as well as under real-time operating systems that support Intel's multi-core architecture.

The G28I comes with a tailored heat sink. All components are soldered for protection against shock and vibration according to applicable DIN, EN or IEC industry standards. For added protection, coating and underfilling is available as an option.

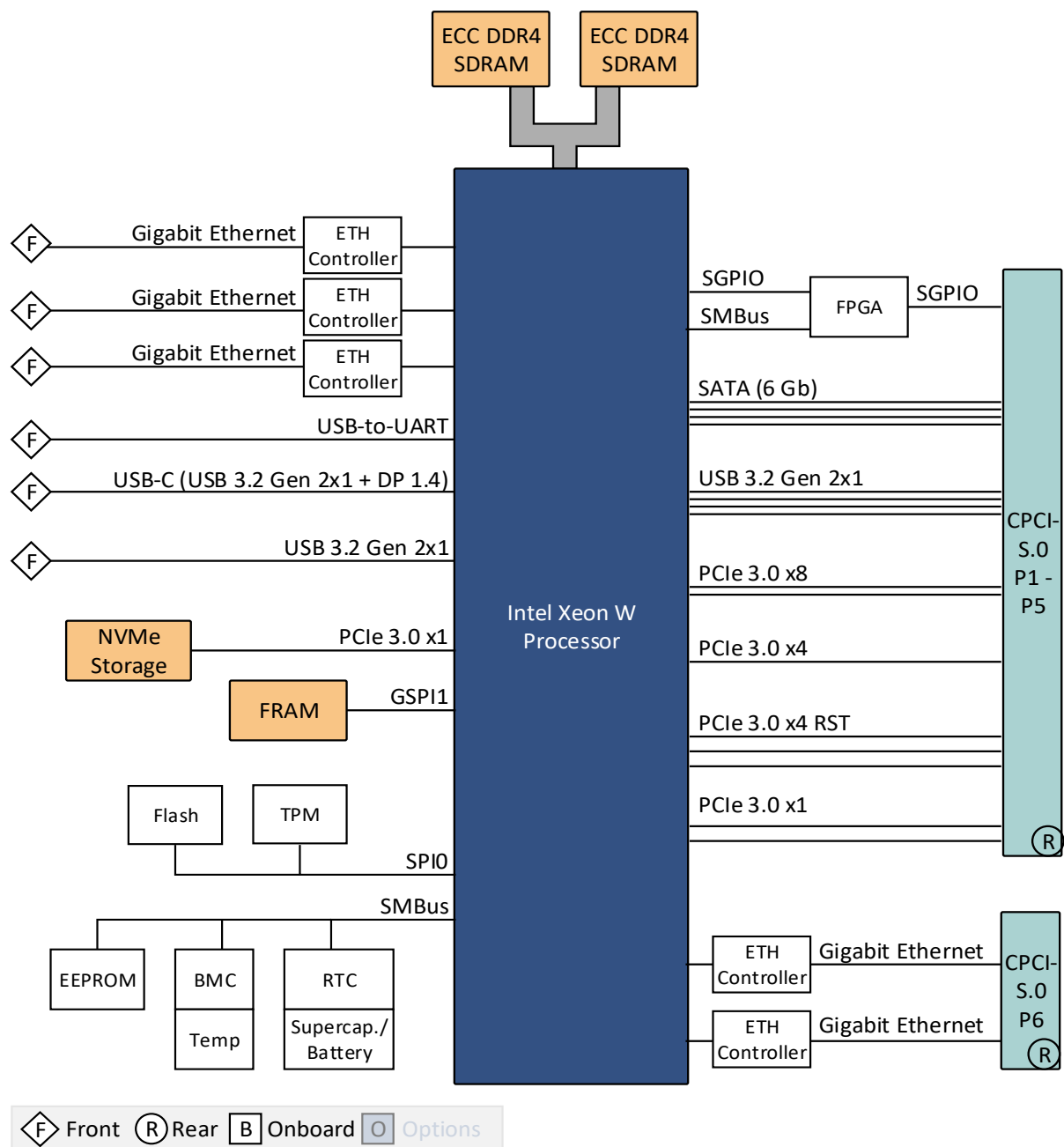
Long-term availability ensures an extended product life and future-safety. The G28I is backwards compatible to predecessors G25A (planned G28I 8 HP product version with 10 GbE interfaces), G23.



www.duagon.com/products/g28i/

DATA SHEET

G28I | DIAGRAM





G28I | TECHNICAL DATA

CPU

- The following CPU types are supported:
 - Intel Xeon W-11865MRE, 8 cores, 16 threads, 2.6 GHz, 45 W, -40 °C to +100 °C
 - Intel Xeon W-11865MRE, 8 cores, 16 threads, 2.1 GHz, 35 W, -40 °C to +100 °C
 - Intel Xeon W-11555MRE, 6 cores, 12 threads, 2.6 GHz, 45 W, -40 °C to +100 °C
 - Intel Xeon W-11555MRE, 6 cores, 12 threads, 2.1 GHz, 35 W, -40 °C to +100 °C
 - Intel Xeon W-11155MRE, 4 cores, 8 threads, 2.4 GHz, 45 W, -40 °C to +100 °C
 - Intel Xeon W-11155MRE, 4 cores, 8 threads, 1.9 GHz, 35 W, -40 °C to +100 °C
 - Intel Xeon W-11865MLE, 8 cores, 16 threads, 1.5 GHz, 25 W, 0 °C to +100 °C
 - Intel Xeon W-11555MLE, 6 cores, 12 threads, 1.9 GHz, 25 W, 0 °C to +100 °C
 - Intel Xeon W-11155MLE, 4 cores, 8 threads, 1.8 GHz, 25 W, 0 °C to +100 °C
 - Other processor types are available on request

MEMORY

- System RAM
 - Soldered DDR4, ECC
 - 64 GB max.
- Non-volatile RAM (NVRAM): 64 kB FRAM

MASS STORAGE

- NVMe (soldered); 120 GB (standard)

GRAPHICS

- Processor graphics

INTERFACES

- SATA
 - 4 × SATA Revision 3.x, backplane
- Video
 - 1 × DisplayPort 1.4, USB Type C, for service

- USB
 - 1 × USB 3.2 Gen 2x1, Type A, for service
 - 1 × USB 3.2 Gen 2x1, Type C, for service
 - 1 × USB-to-UART, Type A, client port, for service
 - 4 × USB 3.2 Gen 2x1, backplane
- Ethernet
 - 3 × 10/100/1000BASE-T, RJ45
 - 2 × 10/100/1000BASE-T, backplane
- PCI Express
 - 2 × PCIe 3.0, x8, backplane
 - 1 × PCIe 3.0, x4, backplane
 - 3 × PCIe 3.0, x4, backplane
 - 2 × PCIe 3.0, x1, backplane
- I2C
 - 1 × backplane
- LED
 - Status: board status (BMC)
 - Ethernet: activity, link
 - CPCI hot-plug

SUPERVISION AND MANAGEMENT

- Board management controller
- Temperature measurement
- System watchdog (BMC)
- Real-time clock, buffered by supercapacitor or battery
- Trusted Platform Module 2.0

PRODUCT STANDARD

- CompactPCI Serial: CompactPCI Serial PICMG CPCI-S.0 Specification

ELECTRICAL SPECIFICATIONS

- Supply voltage: +12 V (9.5 V to 15.5 V)

MECHANICAL SPECIFICATIONS

- Dimensions: 3U, 4 HP
- Cooling: Air cooling, forced convection, airflow 1.5 m/s



PRODUCT COMPLIANCE: RAIL - WAYSIDE NON-SAFETY RELATED

- Operating temperature: -5°C to +60°C (EN 50125-3:2003, class T1, shelter N.T.C.), extended by +5 °C
- Storage temperature: -40 °C (EN 60068-2-1:2007, Ab) to +85 °C (EN 60068-2-2:2007, Bb)
- Altitude: +3000 m max. (EN 50125-1:2014, class AX) +4000 m max. (isolation only)
- Humidity: 95 % RH max. (EN 50125-3:2003, building N.C.C., class T1)
- Pollution degree: EN 50124-1:2017, class PD2
- Shock: 11 ms @ 20 m/s² (EN 50125-3:2003, in a switch cabinet 1 m to 3 m from the track)
- Vibration: 2.3 m/s² (EN 50125-3:2003, in a switch cabinet 1 m to 3 m from the track)
- Electrical safety
 - EN 50124-1:2017
 - EN 62368-1:2014 + AC:2015
- EMC emission: EN 61000-6-4:2007 + A1:2011
- EMC immunity: EN 61000-6-2:2005

PRODUCT COMPLIANCE: INFORMATION TECHNOLOGY EQUIPMENT

- Operating temperature: -5 °C to +60 °C (product model 02G028I00); 0 °C to +40 °C (product model 02G028I01)
- Electrical safety: EN 62368-1:2014 + AC:2015
- Flammability (PCBs): UL 94 V-0

- EMC emission
 - EN 55032:2015 (multimedia equipment), class A (industrial environments)
 - EN IEC 61000-6-4:2019 (generic standard, industrial environments)
- EMC immunity
 - EN 55035:2017 (multimedia equipment)
 - EN 61000-6-2:2005 (generic standard, industrial environments)

RELIABILITY

- MTBF: 236 581 h predicted @ 40 °C according to IEC/TR 62380 (RDF 2000)

BIOS/BOOT LOADER

- AMI Aptio UEFI Firmware

SOFTWARE SUPPORT

- Linux
 - duagon Yocto BSP in preparation
 - Tested with Ubuntu 22.04, Yocto (Dunfell)
 - Supported kernel: 5.10 or higher
- Windows
 - Windows 10 IoT Enterprise 64-bit
- Further Resources
 - See the product User Manual for details on software support: www.duagon.com/products/g28i/#doc
 - See also Application Note *Recommendations for a Robust Software Setup*

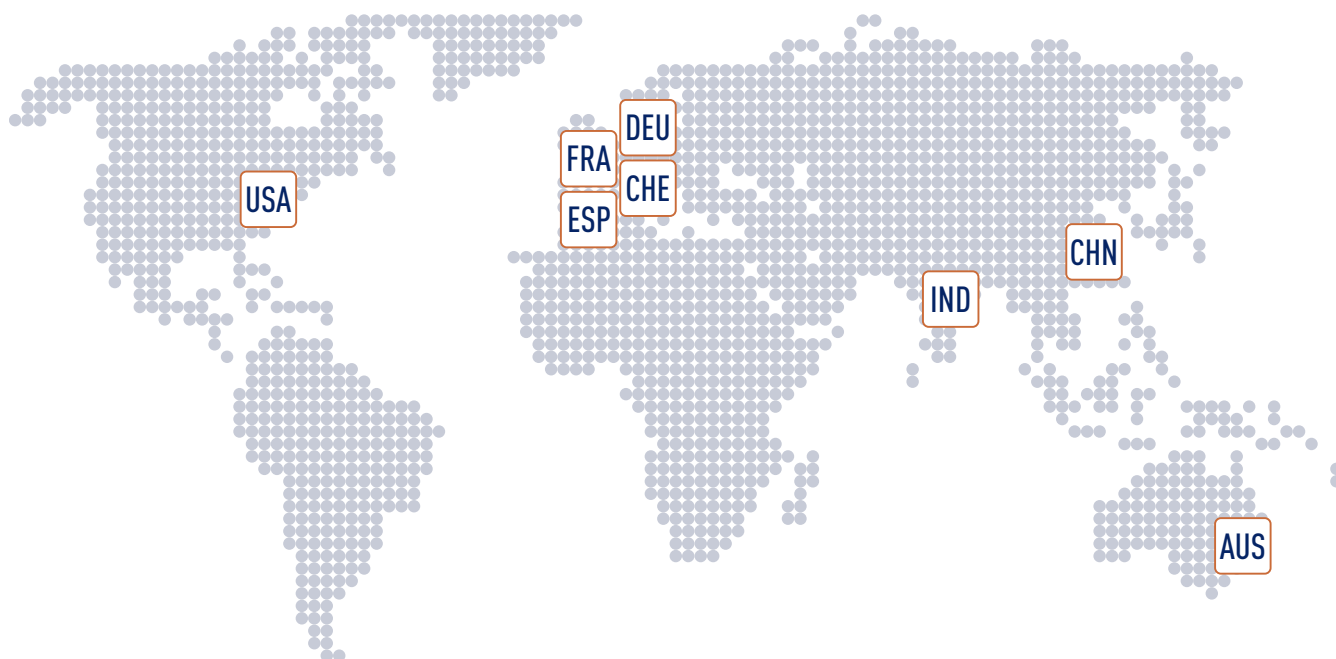
G28I | ORDERING INFORMATION

STANDARD MODELS

02G028I00	3U CPCI Serial, 4 HP, Intel Xeon W-11155MLE, 4 cores, 8 threads, 2.6 GHz, 25 W TDP, 16 GB DDR4 (ECC) RAM, 120 GB NVMe, 3x 1Gb Ethernet RJ45, 1x USB 3.2 Gen 2x1, 1x USB 3.2 Gen 2x1 and DisplayPort combined on USB type C, 1x console redirection via USB, 0°C to +60°C
02G028I01	3U CPCI Serial, 4 HP, Intel Xeon W-11865MRE, 8 cores, 16 threads, 2.6 GHz, 45 W TDP, 64 GB DDR4 (ECC) RAM, 120 GB NVMe, 3x 1 Gb Ethernet RJ45, 1x USB 3.2 Gen 2x1, 1x USB 3.2 Gen 2x1 and DisplayPort combined on USB type C, 1x Console Redirection via USB, 0°C to +40°C



LEADING THE EMBEDDED FUTURE



duagon | WORLDWIDE

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.

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