duagon

LEADING THE EMBEDDED FUTURE

BL74W

HIGH-PERFORMANCE RUGGED EMBEDDED BOX PC WITH 5G

- 13th Gen Intel Core Processor (Raptor Lake)
- Up to 96 GB soldered DDR5-5200 IBECC RAM
- Up to four 5G modems
- WLAN, high-precision GNSS
- Two 2.5'' SATA SSDs
- High-speed NVMe storage
- Board Management Controller, TPM 2.0
- 2× 2.5G + 2× 10G Ethernet M12, 10Gbps USB-A
- USB-C with DP Alt Mode, Serial, digital I/O
- -40 °C to +70 °C operating temperature
- Long-term availability

HIGH-PERFORMANCE RUGGED BOX PC

The BL74W is featuring 13th Gen Intel Core processors with up to 14 cores (6P+8E) and up to 96 GB of soldered dual-channel DDR5-5200 IBECC RAM. Introducing Intel's new hybrid architecture with a combination of Performance and Efficiency cores, the BL74W offers a scalable CPU performance with options ranging from 15 to 45 W TDP and a plenty of P/E core configurations to perfectly suit operational needs even in harsh ambient temperatures of up to +70 °C (+85 °C for 10 min.). The BL74W is an excellent choice for demanding data processing and communication applications including virtualization, passenger internet access and intelligent CCTV supported by AI inference.

PASSENGER INTERNET SUPPORTED BY 5G

Featuring up to four 5G modems, the BL74W is a great platform for deploying passenger internet access on rolling stock vehicles. By leveraging advanced network aggregation techniques, it is possible to connect to multiple 5G networks simultaneously and combine the throughput and deliver higher internet speeds to passengers. Distribution of network traffic is supported by two 2.5G and two 10G Ethernet interfaces.

GATEWAY TO EMBEDDED AI

The integrated Intel Iris Xe GPU with 96 Execution Units is AI-ready for a wide range of applications like intelligent CCTV with object and anomaly detection for improved passenger security. Intel OpenVINO toolkit, combined with the accessibility of pretrained models such as YOLO, serves as a robust foundation for seamless deployment of AI inference applications in real-world scenarios.

FANLESS OPERATION

The rugged aluminum housing is optimized for conduction cooled (fanless) operation in high ambient temperatures. Deep cooling fins help to generate hot air flow away from the housing in a chimney effect. This results in a homogeneous heat distribution without hot spots. The BL74W can dissipate up to 95 W of thermal power at +70 °C ambient.

COMPREHENSIVE MANAGEMENT

A versatile board management controller provides intelligent monitoring and supervision of all vital signals including supply and on-board voltages, temperatures, and a watchdog for the OS.

Additionally, the BL74W supports Intel AMT remote out-of-band management and holds a discrete TPM module for hardware based system security.

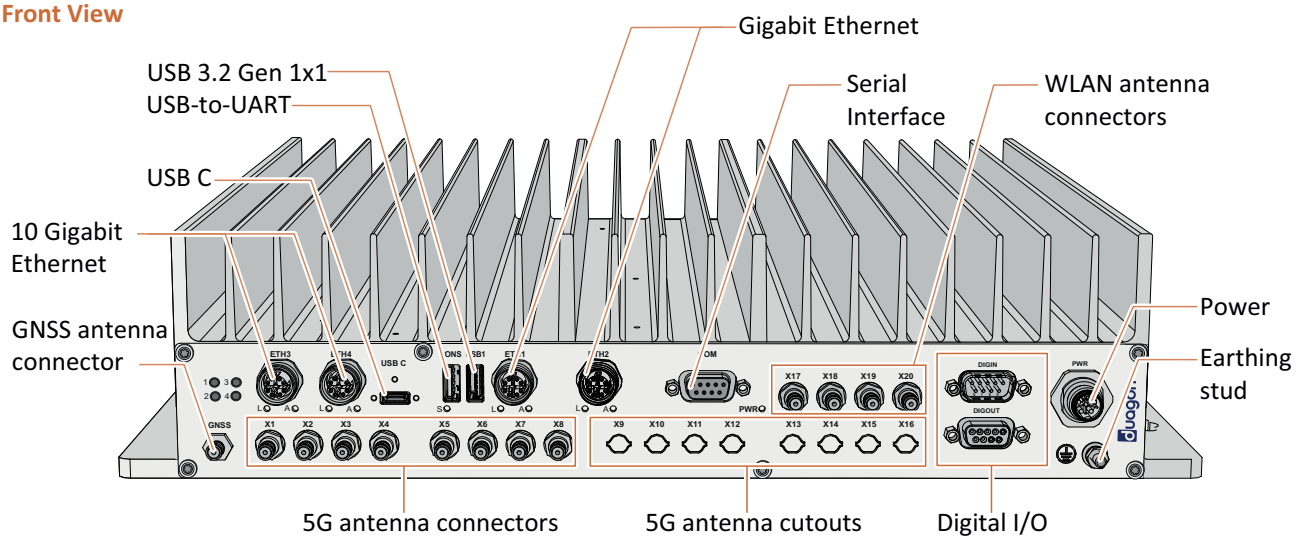
THIS PRODUCT IS COMING SOON

The BL74W will be available once conformity assessments are completed.

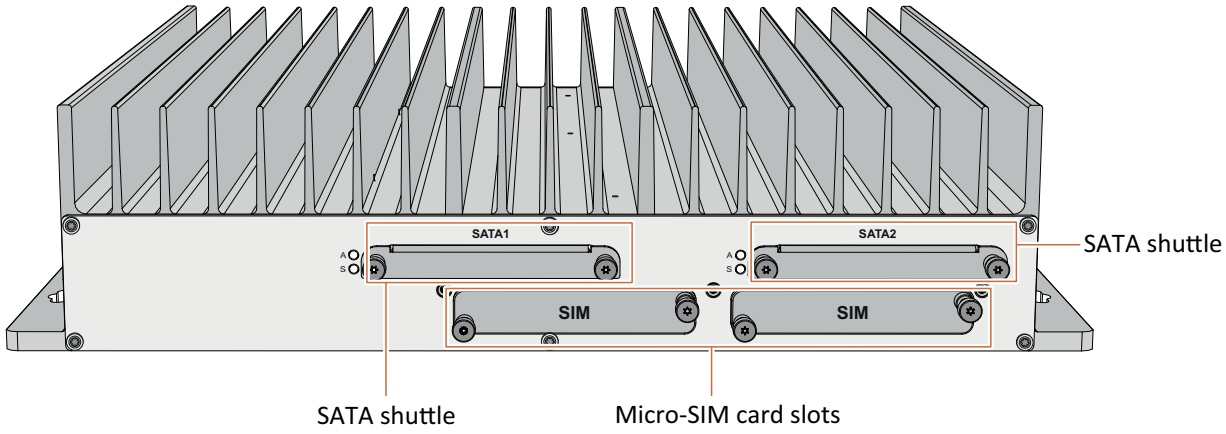
DATA SHEET | PRELIMINARY

BL74W | DIAGRAM

Front View



Rear View



PRELIMINARY

BL74W | TECHNICAL DATA

CPU

- The following CPU types are supported:
  - Intel Core i7-1370PRE, 14 cores (6P+8E), 20 threads, 1.9 GHz, 96 EU, 28 W, -40 °C to +100 °C
  - Intel Core i7-1370PRE, 14 cores (6P+8E), 20 threads, 2.0 GHz, 96 EU, 35 W, -40 °C to +100 °C

MEMORY

- System RAM
  - Soldered DDR5
  - 96 GB max.

MASS STORAGE

- SSD/HDD 2.5" (SATA); 960 GB
- SSD M.2 (NVMe); 160 GB
- NVMe (soldered); 120 GB
- The following mass storage devices can be assembled:
  - SSD/HDD 2.5" (SATA)

GRAPHICS

- Processor graphics

WIRELESS FUNCTIONALITY

- Possible functions:
  - 5G
  - WLAN
  - GNSS

INTERFACES

- This product includes interface options
  - Different wireless functions depending on assembled wireless interface cards
- SSD/HDD slot
  - 1 × SATA 2.5"; SATA Revision 3.x; externally accessible (shuttle)
  - 1 × SATA 2.5"; SATA Revision 3.x; externally accessible (shuttle)
  - 1 × M.2 2242/2260/2280 socket 3 Key M; NVMe (PCIe x4)
- Video
  - 1 × DisplayPort 1.4, USB Type-C
- USB
  - 1 × USB 3.2 Gen 2x1, Type-A
- Ethernet
  - 2 × 100/1000BASE-TX / 2.5GBASE-TX, M12, X-coded, receptacle
  - 2 × 100/1000BASE-TX / 2.5/5/10GBASE-TX, M12, X-coded, receptacle
- Wireless
  - 5G antenna connectors: 4 × QLS receptacles per module
  - WLAN antenna connectors: up to 4 × QLS receptacles
  - GNSS antenna connector: 1 × QLS receptacle
- M.2 Card
  - 5 × M.2 Card slot
  - Slot 1: M.2 3052 (5G) socket 2 Key B; PCIe x1, USB 3.2 Gen 1x1
  - Slot 2: M.2 3052 (5G) socket 2 Key B; PCIe x1, USB 3.2 Gen 1x1
  - Slot 3: M.2 3052 (5G) socket 2 Key B; PCIe x1, USB 3.2 Gen 1x1
  - Slot 4: M.2 3052 (5G) socket 2 Key B; PCIe x1, USB 3.2 Gen 1x1
  - Slot 5: M.2 2230 (WLAN/BT) socket 1 Key A-E; PCIe x1, USB 2.0
- SIM card
  - 12 × micro-SIM slot, externally accessible
- Digital I/O
  - 4 × digital input, isolated, D-Sub, 9-pin, plug
  - 1 × odometer input, isolated, D-Sub, 9-pin, plug
  - 4 × digital output, isolated, D-Sub, 9-pin, receptacle
- Serial
  - 1 × USB-to-UART, USB Type-A
  - 1 × RS232/RS422/RS485, isolated, D-Sub, 9-pin, receptacle

PRELIMINARY

- LED
  - Status: board status (BMC), power status
  - Ethernet: link, activity
  - User configurable: 4 ×
  - Mass storage: activity, user configurable
- Cutout
  - Antenna connector options: QLS receptacle
- Power
  - 1 × power in, M12, K-coded, plug
- Earthing connection
  - M4 stud

SUPERVISION AND MANAGEMENT

- Board management controller
- Temperature measurement
- System watchdog (BMC)
- Ignition watchdog
- Power Supply Monitoring
- Wireless Module Control
- Real-time clock, buffered by supercapacitor
- Trusted Platform Module 2.0

ELECTRICAL SPECIFICATIONS

- Supply voltage
  - 24 V DC to 48 V DC nom. (EN 50155)
  - 72 V DC to 110 V DC nom. (EN 50155)

MECHANICAL SPECIFICATIONS

- Dimensions: (W) 390 mm, (D) 305 mm, (H) 87 mm
- Mounting: Wall/flat surface
- Cooling
  - Conduction cooling
- Protection rating: IP20

PRODUCT COMPLIANCE: RAIL - ROLLING STOCK

- Operating temperature: -40 °C to +70 °C, +85 °C for 10 min (EN 50155:2021, class OT4, ST1)
- Equipment location
  - EN 50155:2021, location 1, closed electrical operating area
  - EN 50155:2021, location 2, cabin and interiors
- Rapid temperature variations: EN 50155:2021, class H1, no requirements
- Storage temperature: -40 °C (EN 50155:2021) 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 50155:2021)
- Shock: 30 ms @ 100 m/s² (EN 61373:2010/AC:2017-09, vehicle body, cat. 1, class B, double acceleration)
- 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, double acceleration)
- Power supply
  - Interruption of voltage supply: 10 ms (EN 50155:2021, class S2)
  - Supply change-over: 100 ms @ 0.6 x Un (EN 50155:2021, class C1)
- Electrical safety
  - EN 50155:2021
  - EN 50153:2014 + A1:2017 + A2:2020
  - EN 50124-1:2017
  - EN ISO 13732-1:2008
- Fire protection: EN 45545-2:2020, EL9, HL3
- EMC emission
  - EN 50121-3-2:2016 + A1:2019
  - Regelung Nr. EMV 06 :2019-05-09 (2.0), Anhang E: Messung an Geräten, Schutzklasse S1
  - Regelwerk 50.02.01 :2021-12-01, 12.3.2. EMV - Funk, prequalified according to electronic equipment tests defined by Deutsche Bahn EMV 06 standard, class S1, for risk minimization in finished vehicle test
- EMC immunity: EN 50121-3-2:2016 + A1:2019
- Protective coatings: EN 50155:2021, class PC2 (Any PCB protected on both sides)
- Useful life: 20 years (EN 50155:2021, class L4)

PRODUCT COMPLIANCE: RAIL - WAYSIDE NON-SAFETY RELATED

- Operating temperature: -25 °C to +70 °C (EN 50125-3:2003, class T1, control cabinet)
- Storage temperature: -40 °C (EN 60068-2-1:2007, Ab) to +85 °C (EN 60068-2-2:2007, Bb)

PRELIMINARY

- Altitude: +3000 m max. (EN 50125-3:2003, class AX)
- Pollution degree: EN 50124-1:2017, class PD2
- Humidity: +55 °C and +25 °C, 90 % to 100 % RH (EN 60068-2-30:2005, Db)
- 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 50121-4:2016
  - EN 61000-6-4:2007 + A1:2011
  - EN IEC 61000-6-4:2019
- EMC immunity: EN 50121-4:2016
- Restrictions: Service interfaces may only be used with a maximum cable length of 3 m for installations 10 m or less away from the track.

PRODUCT COMPLIANCE: INFORMATION TECHNOLOGY EQUIPMENT

- Operating temperature: 0 °C (EN 60068-2-1:2007, Ae, temperature value in compliance with 6.6 b) to +60 °C (EN 60068-2-2:2007, Be)
- Storage temperature: -40 °C (EN 60068-2-1:2007, Ab) to +85 °C (EN 60068-2-2:2007, Bb)
- Altitude: +3000 m max. (EN 62368-1:2014 + AC:2015)
- Humidity: +55 °C and +25 °C, 90 % to 100 % RH (EN 60068-2-30:2005, Db)
- 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)
- EMC immunity: EN 55035:2017 (multimedia equipment)

BIOS/BOOT LOADER

- AMI Aptio UEFI Firmware

SOFTWARE SUPPORT

- Linux

BL74W | ORDERING INFORMATION

STANDARD MODELS

09BL74W00 Intel Core i7-1370PRE, 1.9 GHz, 28 W, 32 GB DDR5 DRAM, 120 GB NVMe soldered, 160 GB M.2 NVMe, 1x Transcend 960 GB 3D TLC SSD, 4x Sierra Wireless EM9291, 1x Ublox ZED F9R, 1x Sparklan WNFQ-268AXI, 24 V DC to 48 V DC,-40 °C to +70 °C

09BL74W01 Intel Core i7-1370PRE, 1.9 GHz, 28 W, 32 GB DDR5 DRAM, 120 GB NVMe soldered, 160 GB M.2 NVMe, 1x Transcend 960 GB 3D TLC SSD, 4x Sierra Wireless EM9291, 1x Ublox ZED F9R, 1x Sparklan WNFQ-268AXI, 72 V DC to 110 V DC,-40 °C to +70 °C

09BL74W02 Intel Core i7-1370PRE, 2.0 GHz, 35 W, 32 GB DDR5 DRAM, 120 GB NVMe soldered, 160 GB M.2 NVMe, 1x Swissbit 1920 GB 3D TLC, 24 V DC to 48 V DC,-40 °C to +70 °C

09BL74W03 Intel Core i7-1370PRE, 2.0 GHz, 35 W, 32 GB DDR5 DRAM, 120 GB NVMe soldered, 160 GB M.2 NVMe, 1x Swissbit 1920 GB 3D TLC, 72 V DC to 110 V DC,-40 °C to +70 °C

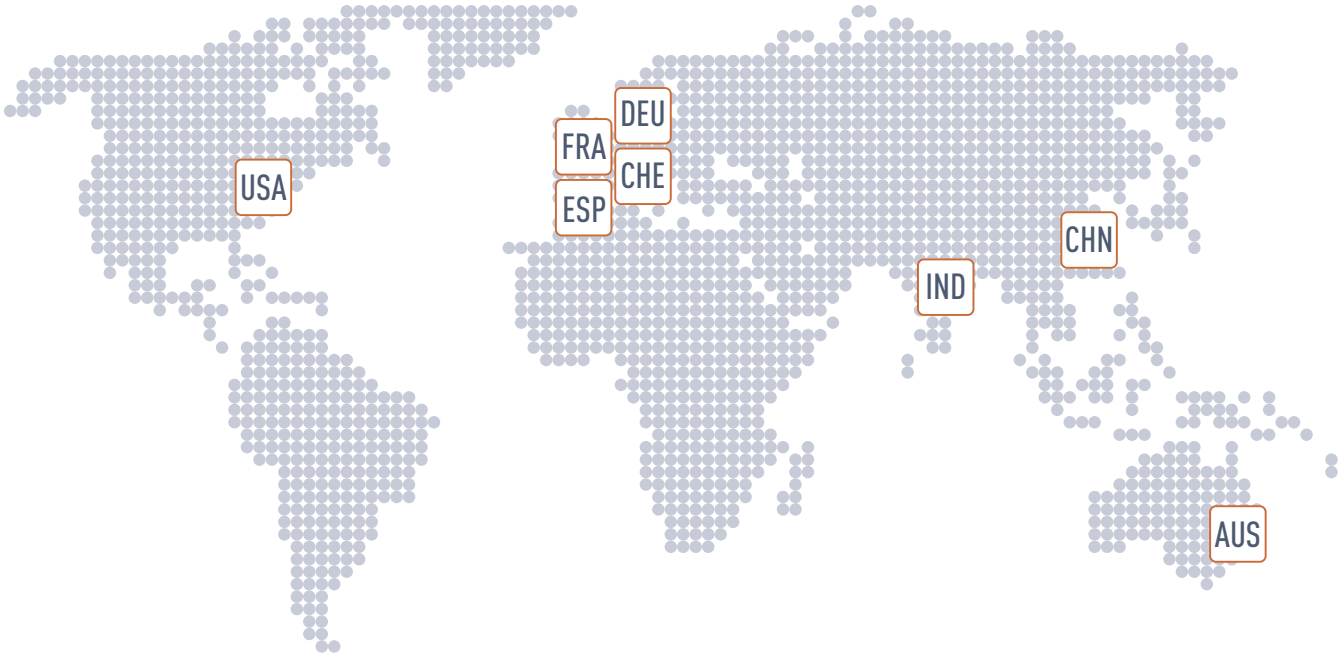
▶ **Contact duagon** for availability and lead times for product models not listed above.

PRELIMINARY

LEADING THE EMBEDDED FUTURE

duagon WORLDWIDE

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



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