

# BL70W

## Rugged Box PC for Transportation with Intel Core i3 / i5 / i7 Railway & Automotive Embedded Computer for Wireless Connectivity

- » Intel Core i7, 3rd generation
- » Up to 16 GB DDR3 DRAM soldered, ECC
- » 4 PCI Express Mini Card slots each with dual SIM for GSM (2G), UMTS (3G), LTE (4G), WLAN, 9 antenna cut-outs
- » GPS/GLONASS interface
- » 2 Gigabit Ethernet, 2 USB 2.0, 2 DisplayPorts
- » 1 RS232, 1 RS422/485
- » 3 flexible slots for IBIS, RS232, RS422/485 or CAN
- » 24 VDC and 36 VDC nom. class S2 power supply, incl. ignition
- » -40 to +85°C operating temperature, fanless
- » Conformal coating of internal components
- » Compliant to EN 50155 (railways)
- » Compliant to ISO 7637-2 (E-mark for automotive)



The BL70W is a fanless, maintenance-free box computer that has been designed for independent use or as display computer electronics for embedded wireless applications in transportation, e.g. in trains, commercial vehicles, mobile machines or airplanes.

Four PCI Express Mini Card slots each with dual SIM make it possible to flexibly implement the whole range of wireless interfaces such as mobile service standards GSM (2G), UMTS (3G), LTE (4G) and derivatives and wireless communication standards WLAN / Wi-Fi IEEE 802.11 and derivatives. A GNSS interface supporting positioning systems GPS and GLONASS complements the possibilities.

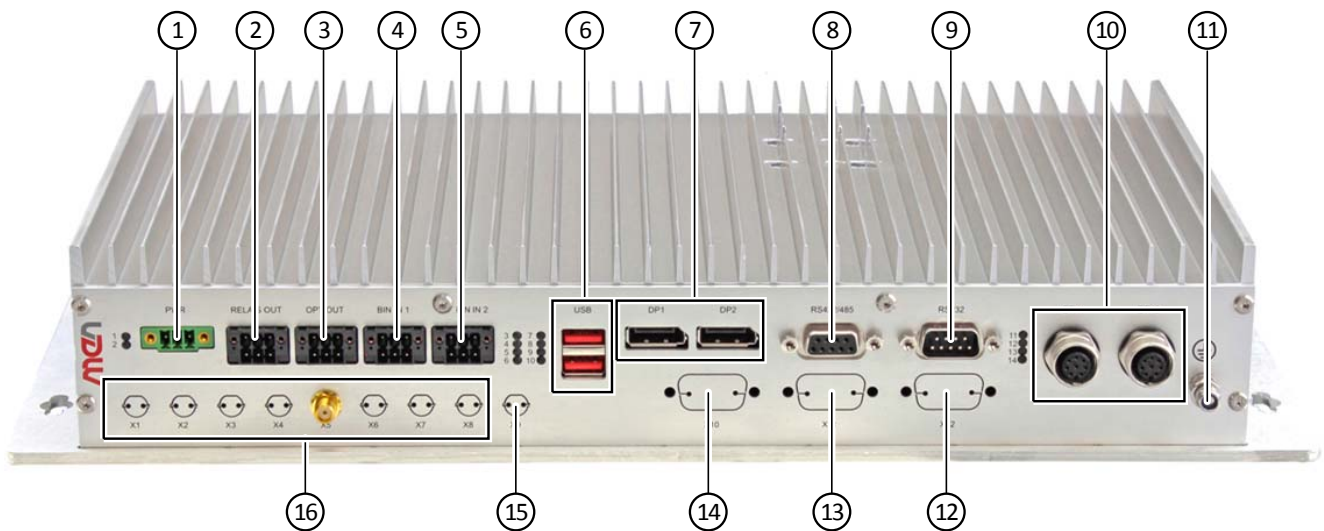
The BL70W is powered by an Intel Core i7-3517UE CPU, running at 1.7 GHz. Other processors of the 3rd generation Intel Core i7 family can be used which makes for high scalability in CPU (single/dual/quad core) performance.

The BL70W is equipped with 4 GB of DDR3 SDRAM and offers microSD card and mSATA slots. A SATA hard-disk/ solid-state drive can be installed within the housing as an

option. The system is designed for fanless operation at temperatures from -40 to +70°C (+85°C for up to 10 minutes), its special rugged aluminum housing with cooling fins serves as a heatsink for the internal electronics and in this way provides conduction cooling. The BL70W supports up to two DisplayPort interfaces with full HD resolution. In addition, a multitude of other I/O is available at the front panel, including two Gigabit Ethernet, two USB 2.0, variable slots for legacy serial I/O (e.g. RS232) or CAN bus, general purpose inputs and relay outputs.

The BL70W comes with its own integrated 30W 24 VDC nom. class S2 wide-range power supply and is in compliance with EN 50155 and ISO 7637-2 (E-mark for automotive). The power can be switched on and off using an ignition signal on the power connector, and a run-down time after switching off the power can be adjusted by software.

The various CPU options with the available selection of external interfaces (realized via separate graphics and I/O interface boards within the system) makes for an extremely flexible system design that can quickly be tailored to a vast number of applications.



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| ① PSU (10V-50.4V)                                | ⑨ RS232 interface  |
| ② 2 relay outputs                                | ⑩ 2 Gigabit Ethernet on M12 connectors                   |
| ③ 2 photocoupler outputs                         | ⑪ Earthing stud  |
| ④ 6 binary inputs                                | ⑫ SA-Adapter connector for RS232, RS422/485 or IBIS      |
| ⑤ 1 odometer input, 1 IBIS slave, 1 binary input | ⑬ SA-Adapter connector for RS232, RS422/485 or IBIS      |
| ⑥ 2 USB 2.0 interfaces                           | ⑭ SA-Adapter connector for RS232, RS422/485, IBIS or CAN |
| ⑦ 2 DisplayPorts                                 | ⑮ Antenna connector for GNSS                             |
| ⑧ RS422/485 interface                            | ⑯ Antenna connectors for PCI Express Mini Cards          |

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## **CPU**

- Intel Core i7-3517UE
  - 1.7 GHz processor core frequency
  - 2.8 GHz maximum turbo frequency
- Chipset
  - QM77 Platform Controller Hub (PCH)

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## **Memory**

- 4 MB last level cache integrated in i7 processor
- 4 GB SDRAM system memory
  - Soldered
  - DDR3 with ECC support
  - Up to 1066 MHz memory bus frequency

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## **Mass Storage**

- One microSD card slot
  - Via USB 2.0
- One mSATA slot
  - SATA Revision 2.x support
  - Transfer rates up to 300 MB/s (3 Gbit/s)
- Serial ATA (SATA)
  - One port for 2.5" hard-disk/solid-state drive mounted within the unit's housing
  - SATA Revision 2.x support
  - Transfer rates up to 300 MB/s (3 Gbit/s)

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## **Graphics**

- Integrated in processor and chipset
- Maximum resolution: 2560 x 1600 pixels
- Via two DisplayPort interfaces

## Front I/O

- 2 DisplayPort 1.1a interfaces
  - AUX channels and hot plug detection
- 2 Gigabit Ethernet
  - Via M12 connectors
  - Electrically isolated
- 2 USB 2.0
  - Via Type A connector
- 7 general purpose inputs
  - Input voltage range from 0 V up to 154 V independent of the power supply input voltage
  - Input signal frequency max. 10 Hz
- 2 relay outputs
  - Max. switching current 0..30 V: 2 A
  - Max. switching current 30..72 V: 0.9 A
  - Max. switching current 72..154 V: 0.3 A
  - Max. switching voltage: 154 V
  - Max. switching frequency: 1 Hz
  - Minimum life time @ 1A, 30V, 20 cpm: 100.000
  - Electrically isolated
- 2 photocouplers (shutters)
  - Max. switching voltage: 154 V
  - Max. current: 120 mA (switching and continuous)
- 1 odometer input
  - For counting odometer pulses of a maximum frequency of 2 kHz
- 1 IBIS slave interface
  - Baud rate up to 19.2 kBaud
  - Electrically isolated
- GNSS interface
  - Frequency band: GPS (L1), Glonass (L1, FDMA), Galileo (E1)
  - Standards: NMEA, RTCM 104
  - 32-channel GNSS architecture
  - Accuracy: 1.5 m
  - A-GPS
  - Time-To-First-Fix - cold start: lower than 35 s
  - Time-To-First-Fix - warm start / aided start: 1s
  - Odometer input for GNSS receiver
- RS232
  - D-Sub connector at front panel
  - Data rates up to 115 200 bit/s
  - 60-byte transmit/receive buffer
  - Handshake lines: RTS, CTS
  - Electrically isolated
- RS422/485
  - D-Sub connector at front panel
  - Full or half duplex
  - Electrically isolated
- 2 SA-Adapter slots for legacy serial I/O
  - For RS232, RS422/485 or IBIS master
- 1 SA-Adapter slot for RS232, RS422/485, IBIS or CAN
- 14 status LEDs
  - 4 for Ethernet link and activity status
  - 2 for general board status
  - 8 user LEDs

**4 PCI Express Mini Card slots**

- For functions such as
  - Mobile service standards: GSM (2G), UMTS (3G), LTE (4G) and derivatives
  - Wireless communication: WLAN / WiFi IEEE 802.11 and derivatives
  - Real-Time Ethernet functionality via Hilscher PCI Express Mini cards
- 2 microSIM card slots for each PCI Express Mini Card
- PCI Express and USB interface

**Real-Time Clock**

- Buffered by Gold Cap for up to 72 h

**Electrical Specifications**

- Supply voltage:
  - 24V and 36V nominal input voltage according to EN50155
  - 24V nominal input voltage according to ISO 7637-2 (E-mark) requirements
  - EN 50155 power interruption class S2
- Power consumption: 24 W typ.

**Mechanical Specifications**

- Dimensions: Height 66 mm x Width 390 mm x Length 215 mm
- Weight: approx. 3 kg

**Environmental Specifications**

- Temperature range (operation):
  - -40°C to 70°C (screened), with up to 85°C for 10 minutes according to class Tx (EN 50155)
  - Fanless operation
- Temperature range (storage): -40..+85°C
- Relative humidity (operation): max. 95% non-condensing
- Relative humidity (storage): max. 95% non-condensing
- Altitude: -300 m to +3,000 m
- Shock: 50 m/s<sup>2</sup>, 30 ms (EN 61373)
- Vibration (function): 1 m/s<sup>2</sup>, 5 Hz - 150 Hz (EN 61373)
- Vibration (lifetime): 7.9 m/s<sup>2</sup>, 5 Hz - 150 Hz (EN 61373)
- Conformal coating of internal components
- International Protection Rating: IP20

**MTBF**

- 198 000 h @ 40°C according to IEC/TR 62380 (RDF 2000)

**Safety**

- Flammability (PCBs)
  - UL 94 V-0
- Fire Protection
  - EN 45545-2 (Railway)
  - ECE-R118 (Automotive)
- Electrical Safety
  - EN 50153
  - EN 50155

**EMC Conformity (Automotive)**

- ECE R10 (E-mark)
- ISO 10605 (ESD)

**EMC Conformity (Railway)**

- EN 50121-3-2

**BIOS**

- InsydeH2O UEFI Framework

## Software Support

- Windows 7
- Windows Embedded Standard 7
- Linux
- For more information on supported operating system versions and drivers see Software.

# Configuration & Options

## Options

### CPU

- Intel Core i7-3517UE
  - Dual Core, 1.7 GHz, 4 MB Cache, 17 W
- Intel Core i3-3217UE (on request)
  - Dual Core, 1.6 GHz, 3 MB Cache, 17 W
- Intel Celeron 1047UE (on request)
  - Dual Core, 1.4 GHz, 2 MB Cache, 17 W
- Intel Celeron 927UE (on request)
  - Single Core, 1.5 GHz, 1 MB Cache, 17 W
- Intel Celeron 827E (on request)
  - Single Core, 1.4 GHz, 1.5 MB Cache, 17 W

### Memory

- System RAM
  - 4 GB
  - 16 GB (on request)
- SATA hard-disk/solid state drive (mounted within housing)

### I/O

- Ethernet
  - Two Fast Ethernet interfaces on two M12 connectors (on request)
- 1 HD audio (on request)
  - HD audio codec
  - Audio stereo in
  - Audio stereo out
  - SPDIF out
  - Available via 9-pin D-Sub connector instead of one SA-Adapter
- Antenna connectors
  - For functions like Wi-Fi, WIMAX, GSM/GPRS, UMTS, LTE in combination with PCI Express Mini Card(s)
  - Reverse SMA connector
- SA-Adapter
  - Two (when audio is used) or three slots for RS232, RS422/485, IBIS master or CAN bus

### Fieldbusses

- Additional Hilscher PCI Express Mini Cards, which allow further communication possibilities (as listed below), are available with this box PC, after minor modifications. Please contact our sales team for further information:
- **PX51, supporting the following communication (determined by firmware):**
  - DeviceNet Master
  - DeviceNet Slave

### Electrical Specifications

- Input voltages of 48V, 72V, 110V (on request)
  - According to EN 50155 class S2

### Other Options

- The product concept is very flexible, there are many other configuration possibilities.
- Please contact our sales team if you do not find your required function in the options.
- Some of these options may only be available for large volumes.

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[www.men.de/products/bl70w/](http://www.men.de/products/bl70w/)

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