

BL70W – Rugged Box PC for Wireless Applications (Intel®)

- 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. (10 to 50.4 V) 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

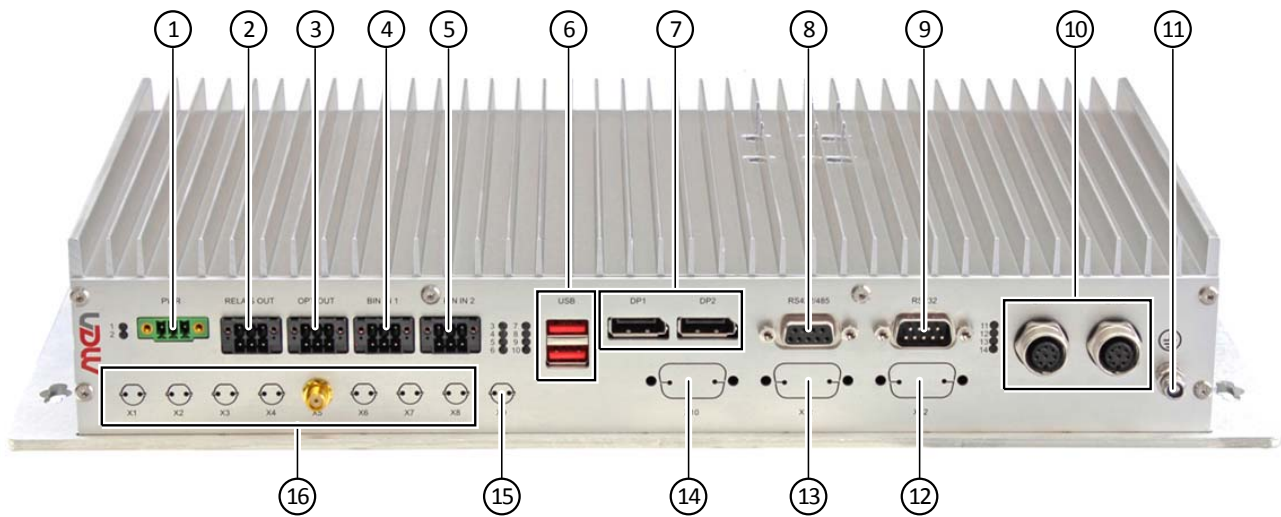
fanless operation at temperatures from -40 to +70°C (+85°C for up to 10 minutes), its special rugged aluminum housing with cooling fins serves as a heatsink for the internal electronics and in this way provides conduction cooling.

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. (10 to 50.4 V) 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.

Diagram



- | | |
|--|--|
| 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 |

Technical Data

CPU	<ul style="list-style-type: none">■ Intel® Core™ i7-3517UE<ul style="list-style-type: none">□ 1.7 GHz processor core frequency□ 2.8 GHz maximum turbo frequency■ Chipset<ul style="list-style-type: none">□ QM77 Platform Controller Hub (PCH)
Memory	<ul style="list-style-type: none">■ 4 MB last level cache integrated in i7 processor■ 4 GB SDRAM system memory<ul style="list-style-type: none">□ Soldered□ DDR3 with ECC support□ Up to 1066 MHz memory bus frequency
Mass Storage	<ul style="list-style-type: none">■ One microSD™ card slot<ul style="list-style-type: none">□ Via USB 2.0■ One mSATA slot<ul style="list-style-type: none">□ SATA Revision 2.x support□ Transfer rates up to 300 MB/s (3 Gbit/s)■ Serial ATA (SATA)<ul style="list-style-type: none">□ 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)
Graphics	<ul style="list-style-type: none">■ Integrated in processor and chipset■ Maximum resolution: 2560 x 1600 pixels■ Via two DisplayPort® interfaces

Technical Data

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 Series 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
- 2 SIM card slots for each PCI Express® Mini Card
- PCI Express® and USB interface

Technical Data

Real-Time Clock	<ul style="list-style-type: none"> ■ Buffered by Gold Cap for up to 72 h
Electrical Specifications	<ul style="list-style-type: none"> ■ Supply voltage: <ul style="list-style-type: none"> □ 24V and 36V nominal input voltage according to EN50155 □ 24V nominal input voltage according to ISO 7637-2 (E-mark) requirements □ 10 to 50.4 V input voltage range □ EN 50155 power interruption class S2 ■ Power consumption: 24 W typ.
Mechanical Specifications	<ul style="list-style-type: none"> ■ Dimensions: Height 66 mm x Width 390 mm x Length 215 mm ■ Weight: approx. 3 kg
Environmental Specifications	<ul style="list-style-type: none"> ■ Temperature range (operation): <ul style="list-style-type: none"> □ -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/s², 30 ms (EN 61373) ■ Vibration (function): 1 m/s², 5 Hz - 150 Hz (EN 61373) ■ Vibration (lifetime): 7.9 m/s², 5 Hz - 150 Hz (EN 61373) ■ Conformal coating of internal components ■ Compliant to protection class IP43 according to DIN60529 when mounted with connectors down
MTBF	<ul style="list-style-type: none"> ■ 198 000 h @ 40°C according to IEC/TR 62380 (RDF 2000)
Safety	<ul style="list-style-type: none"> ■ Flammability <ul style="list-style-type: none"> □ UL 94V-0 ■ Fire Protection <ul style="list-style-type: none"> □ EN 45545-2 ■ Electrical Safety <ul style="list-style-type: none"> □ EN 50153 □ EN 50155
EMC Conformity (Automotive)	<ul style="list-style-type: none"> ■ ECE R10 (E-mark) ■ ISO 10605 (ESD)
EMC Conformity (Railway)	<ul style="list-style-type: none"> ■ EN 50121-3-2
BIOS	<ul style="list-style-type: none"> ■ InsydeH2O™ UEFI Framework
Software Support	<ul style="list-style-type: none"> ■ Windows® 7 ■ Windows® Embedded Standard 7 ■ Linux ■ For more information on supported operating system versions and drivers see Downloads.

Configuration & Options

Options

CPU	<ul style="list-style-type: none"> ■ Intel® Core™ i7-3517UE <ul style="list-style-type: none"> □ Dual Core, 1.7 GHz, 4 MB Cache, 17 W ■ Intel® Core™ i3-3217UE <ul style="list-style-type: none"> □ Dual Core, 1.6 GHz, 3 MB Cache, 17 W ■ Intel® Celeron® 1047UE <ul style="list-style-type: none"> □ Dual Core, 1.4 GHz, 2 MB Cache, 17 W ■ Intel® Celeron® 927UE <ul style="list-style-type: none"> □ Single Core, 1.5 GHz, 1 MB Cache, 17 W ■ Intel® Celeron® 827E <ul style="list-style-type: none"> □ Single Core, 1.4 GHz, 1.5 MB Cache, 17 W
Memory	<ul style="list-style-type: none"> ■ System RAM <ul style="list-style-type: none"> □ 2 GB, 4 GB, 8 GB or 16 GB ■ SATA hard-disk/solid state drive (mounted within housing)
I/O	<ul style="list-style-type: none"> ■ Ethernet <ul style="list-style-type: none"> □ Two Fast Ethernet interfaces on two M12 connectors ■ 1 HD audio <ul style="list-style-type: none"> □ 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 <ul style="list-style-type: none"> □ For functions like Wi-Fi, WIMAX, GSM/GPRS, UMTS, LTE in combination with PCI Express® Mini Card(s) □ Reverse SMA connector ■ SA-Adapter <ul style="list-style-type: none"> □ Two (when audio is used) or three slots for RS232, RS422/485, IBIS master or CAN bus
Fieldbusses	<ul style="list-style-type: none"> ■ 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): <ul style="list-style-type: none"> □ DeviceNet Master □ DeviceNet Slave ■ PX52, supporting the following Real-Time Ethernet communication (determined by firmware): <ul style="list-style-type: none"> □ EtherCAT Master, EtherCAT Slave □ EtherNet/IP Scanner (Master), EtherNet/IP Adapter (Slave) □ Open Modbus/TCP □ POWERLINK Controlled Node/Slave □ PROFINET IO-Controller (Master), PROFINET IO-Device (Slave) □ sercos Master, sercos Slave □ VARAN Client (Slave)
Electrical Specifications	<ul style="list-style-type: none"> ■ Input voltages of 48V, 72V and 110V can be implemented on request <ul style="list-style-type: none"> □ According to EN 50155 class S2

As 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. Please note that some of these options may only be available for large volumes.

Ordering Information

Standard BL70W Models	09BL70W00	Box computer with 4 PCI Express® Mini card slots and 8 microSIM card sockets and 1 GPS/GLONASS interface, 24 and 36VDC PSU, Intel® Dual Core i7-3517UE, 1.7 GHz, 4 GB DDR3 RAM, µSD card slot, mSATA slot, 2x DisplayPort®, 2x Gb Ethernet, 2x USB, 1x RS232, 1x RS422/485, 1 IBIS slave interface, 1 odometer input, 2 SA-Adapter slots (UARTs, fieldbuses), -40..+70(+85)°C screened, conformal coating, IP40 (front IP20), EN 50155, prepared for E1
Related Hardware	08AE63-00	DisplayPort® to LVDS converter, temperature sensor, ambient light, touch input, key control, input voltage 12V..24V, -40°..+85°C screened
	09BL50W00	Box computer with 4 PCI Express® Mini card slots and 8 microSIM card sockets and 1 GPS/GLONASS interface, 24 and 36 VDC PSU, AMD Dual Core T48N, 1.4 GHz, 2 GB RAM, SD card slot, mSATA slot, 2x DisplayPort®, 2x Gb Ethernet, 2x USB, 1x RS232, 1x RS422/485, 1 IBIS slave interface, 1 odometer input, 2 SA-Adapter slots (UARTs, fieldbuses), -40..+70(+85)°C screened, conformal coating, IP40, EN 50155, ISO 7637-2 (E-mark)
Memory	0751-0051	SSD mSATA, 8 GB, -40..+85°C
PCI Express® Mini Cards	0799-0006	WLAN PCI Express® MiniCard DNXA-116, operating temperature -40..+85°C (screened), storage temperature -40°..+85°C Note: when using wireless modules the R&TTE Guideline of the EU has to be observed. See the R&TTE website For the module's driver contact MEN's support team
	0799-0007	MC7304 PCI Express® MiniCard, full-size on USB: LTE, DC-HSPA+, HSPA+, HSDPA, HSUPA, WCDMA, GSM, GPRS, EDGE, and GNSS, -40°..+85°C operation temperature Note: when using wireless modules the R&TTE Guideline of the EU has to be observed. See the R&TTE website For the module's driver contact MEN's support team
	15PX04-01	Audio interface for mobile wireless cards, with SIM card holder, -40..+85°C screened, conformal coating
	15PX50-00	PCI Express® Mini Card, CANopen Slave interface, Hilscher
	15PX53-00	PCI Express® Mini Card, Profibus Slave interface, Hilscher
SA-Adapters	08SA01-11	RS232, not optically isolated, -40..+85°C screened, conformal coating
	08SA02-27	RS422/485, full duplex, optically isolated, -50°..+85°C screened, conformal coating
	08SA03-15	1 RS232, optically isolated, -40..+85°C screened, conformal coating
	08SA08-04	1 CAN interface, D-Sub connector, optically isolated, -40..+85° screened, conformal coating
	08SA22-04	1 IBIS slave interface, isolated, -40..+85°C screened, conformal coating
	08SA24-03	1 intelligent IBIS master interface (extended format), isolated, -40..+85°C screened, conformal coating
	08SA25-01	GPS receiver, SMA antenna, isolated, -40..+85°C with qualified components, conformal coating

Ordering Information

Miscellaneous Accessories

05BC00-00	Starter Kit for BoxPC: 1x AC/DC power supply, 1x DisplayPort® to DVI adapter (active), 2x M12 to RJ45 Gbit Ethernet cable, 4x HF cable with U.FL plug to RP-SMA plug
05BL01-00	19" insertion frame for Box PCs (BL)
0780-0005	DisplayPort® to DVI-D adapter, 20 cm
0780-0006	Active DisplayPort® (DP) to single link DVI-D adapter, 20cm, max. resolution 1920x1200, AMD / ATI Eyefinity technology
0781-0002	HF antenna cable with U.FL connector to RP-SMA connector, 200 mm

Software: Linux

This product is designed to work under Linux. See below for all available separate software packages.

13MD05-90	MDISS System (and Device Driver) Package (MEN) for Linux. This software package includes most standard device drivers available from MEN.
13MM02-90	Linux driver (MEN) for RX8581 real-time clock for CB70C, F75P, MM2, SC24, SC25, BC50M, BC50I, BL50W, BL50S, BL70W and BL70S. Please note that this driver is already included in upstream Linux kernels starting from 3.14!
13SC24-91	Linux tool (MEN) for UART mode setting for SC24, SC25, BC50M, BC50I, BL50W, BL50S, BL70W and BL70S
13Z016-06	MDISS driver (MEN) for 16Z029_CAN (CANopen master)
13Z100-91	Linux FPGA update tool (MEN)

Software: Windows®

This product is designed to work under Windows®. See below for all available separate software packages.

10Y000-78	Windows® Embedded Standard 7 BSP for F19P, F21P, F22P, F23P, G20, G22, CB70C, CB70, XM2, MM2, BC50M, BC50I, BL50W, BL50S, BC70M, BL70S, BL70W, BL70E, DC2, DC13, F205, F206, F210, F215, F216, G215, P506, P507 and P511
13SC24-77	Windows® Installset (MEN) for SC24, SC25, BC50M, BC50I, BL50W, BL50S, BL70W and BL70S (Includes all free drivers developed by MEN for the supported hardware.)
13T010-70	Windows® 32-bit network driver (Intel®) for XM1, XM1L, XM2, MM2, CB70C, F11S, F18, F18E, F19P, F21P, F22P, G20, G22, GM1, GM2, GM3, G211, G211F, SC24, BC50I, BC50M, BL50W, BL50S, BL70W and BL70S
13T020-70	Windows® 64-bit network driver (Intel®) for F18, F18E, F19P, F21P, F22P, G20, G22, GM1, GM2, GM3, G211, G211F, XM2, CB70C, SC24, BC50I, BC50M, BL50W, BL50S, BL70W and BL70S
13T034-70	Windows® 7/8 32-bit graphics driver (Intel®) for F22P, G22, CB70C, SC25, BL70W and BL70S
13T035-70	Windows® 7/8 64-bit graphics driver (Intel®) for F22P, G22, CB70C, SC25, BL70W and BL70S
13T037-70	HD Audio Driver (VIA) for SC24, SC25, BC50M, BL50W, BL50S, BL70W and BL70S
13Y018-70	Windows® 64-bit FPGA update tool (MEN)
13Y021-70	Windows® ERTC/SMB support package

For operating systems not mentioned here [contact MEN sales](#).

Documentation

Compare Chart Standard and Custom Box PCs » [Download](#)

20BL70W00	BL70W User Manual
20BL70WER	BL70W Errata

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