

BL51E

Rugged Box PC for Transportation with Intel Apollo Lake I Railway & Automotive Embedded Computer for Communication & Control

- » Intel Atom E3900 series
- » Up to 8 GB DDR3 DRAM soldered, ECC
- » 1 HDD/SSD shuttle
- » 4 Gb Ethernet ports, 2 ports with PoE
- » 4 PCI Express Mini Card slots with micro-SIM slots
- » WLAN, 4G LTE, GPS or GLONASS
- » 2 USB 2.0, 2 DisplayPort, 1 CAN, 4 UARTs
- » 24 and 36 VDC nom. class S2 PSU, with ignition
- » -40°C to +85°C, fanless
- » Conformal coating of internal components
- » EN 50155 compliant (railways)
- » ISO 7637-2 compliant (E-mark for automotive)



For IoT or Storage-Intensive Applications

The BL51E is a fanless, maintenance-free box computer for embedded applications in transportation, e.g., in trains, buses or commercial vehicles. Its HDD/SSD shuttle provides the storage capacity necessary for entertainment servers or video surveillance systems. A vast number of I/O functions and options seamlessly link the BL51E to the IoT, making vehicles smart.

A Multi-Talent for Wireless Communication

The BL51E can take over typical on-board wireless functions, whether it is an Internet connection for passengers or locating the vehicle. Four PCI Express Mini Card slots each with two micro-SIM slots and dual SIM support provide maximum flexibility in implementing mobile service standards up to 4G LTE or WLAN/WLAN IEEE 802.11, and derivatives. A GNSS positioning interface supporting GPS and GLONASS rounds out the options.

Solid Processing Performance

The BL51E is powered by an Intel Atom E3950 running at 1.6 GHz. Other dual/quad core processors of the Intel Atom E3900 series can be used, giving high scalability in CPU performance.

The box PC features 8 GB DDR3 SDRAM and offers an SD card and a SATA HDD/SSD shuttle both accessible at the rear, plus in-system eMMC memory.

Fanless Operation for Mobile Applications

The system is designed for fanless operation at temperatures from -40°C to +70°C (+85°C for up to 10 minutes). Its rugged aluminum housing with cooling fins serves as a heat sink for the internal electronics and provides conduction cooling.

A Multitude of I/O

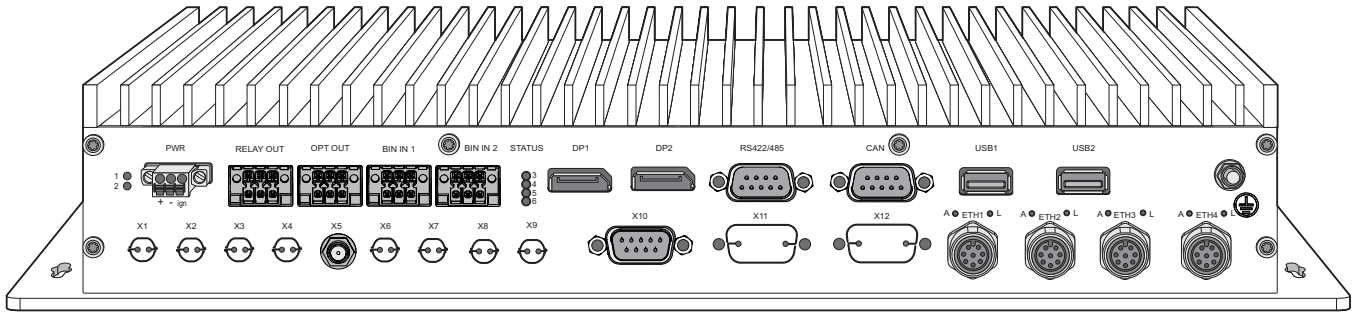
The BL51E supports two DisplayPort interfaces with maximum 4K resolution. A multitude of other I/O is available at the front, including four Gigabit Ethernet, two of them with PoE support, two USB 2.0, one slot for legacy serial I/O (RS232) and one CAN bus, general purpose inputs and relay outputs.

Railway-Compliant PSU with Ignition Function

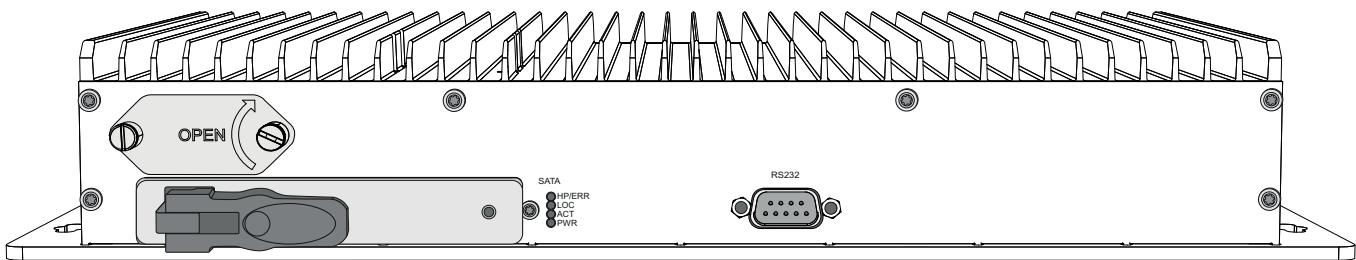
The BL51E comes with its own integrated class S2 wide range power supply and is in compliance with EN 50155 and ISO 7637-2 (E-mark for automotive). Standard versions support 30 W with 24 VDC nom. (10 V to 50.4 V), and 110 VDC nom. is available as an option.

The power can be switched on and off using an ignition signal on the power connector,

Front View



Rear View



CPU

- The following CPU types are supported:
 - Intel Atom x5-E3930, dual core, 1.3 GHz, 6.5 W (on request)
 - Intel Atom x5-E3940, quad core, 1.6 GHz, 9.5 W (on request)
 - Intel Atom x7-E3950, quad core, 1.6 GHz, 12 W

Memory

- System Memory
 - Soldered DDR3, ECC support
 - 2 GB (on request), 4 GB (on request), or 8 GB

Mass Storage

- The following mass storage devices can be assembled:
 - 2.5" SATA HDD/SSD drive via external shuttle
 - SD card
 - eMMC device, soldered; 16 GB assembled by default; other sizes available on request

Graphics

- Integrated in processor and chipset
- Maximum resolution: 4096x2160 pixels @ 60 Hz, 24 bpp (DisplayPort 1.2a)

Front Interfaces

- Video
 - Two DisplayPort connectors
- Audio
 - One 9-pin D-Sub connector, HD Audio with stereo in/out and SPDIF out, including HD Audio codec
- USB
 - Two Type A connectors, host, USB 2.0
- Ethernet
 - Four M12 connectors, 1000BASE-T
 - Two link and activity LEDs per channel
 - Two ports with Power Over Ethernet (PoE) (optional)
- 7 general purpose inputs
 - Input voltage range: 0 V to 50.4 VDC, independent of the power supply input voltage
 - Input signal frequency: 10 Hz max.
- 2 relay outputs
 - Electrically isolated
- 2 photocouplers (shutters)
 - Maximum current: 200mA (+/-30%) continuous (1A for 5ms)
- 1 odometer input (optional)
 - For counting odometer pulses of a maximum frequency of 2 kHz
- 1 IBIS slave interface (optional)
 - Baud rate up to 19.2 kBaud
 - Electrically isolated
- GNSS interface (optional)
- Antenna connections
 - Two antenna connector cutouts for each PCI Express Mini Card, for various types (SMA, reverse SMA, QMA)
- Legacy serial I/O
 - Two SA-Adapter cutouts for RS232, RS422/485, CAN bus, IBIS master, IBIS slave, GPIO
- RS422/485
 - One 9-pin D-Sub connector
 - Full or half duplex
 - Electrically isolated
- CAN bus
 - One 9-pin D-Sub connector, one CAN bus channel
- Additional status LEDs
 - Two for general system status
 - Four user LEDs

In-System Interfaces

- mSATA
 - One mSATA slot, SATA Revision 2.x (3 Gbit/s)
- PCI Express Mini Card
 - Four slots, for functions such as mobile service, wireless communication or positioning
 - Four micro-SIM card slots (dual SIM) with PCI Express and USB interface
 - Four micro-SIM card slots (dual SIM) with USB interface only

Rear Interfaces

- SATA
 - One 2.5" SATA HDD/SSD shuttle, SATA Revision 2.x, hot-pluggable
 - Four status LEDs per channel
- SD card slot
- RS232
 - One 9-pin D-Sub connector
 - Non-isolated

Supervision and Control

- System controller
- Real-time clock with supercapacitor backup
 - Data retention of supercapacitor: 72 h

Electrical Specifications

- Isolation voltage: 1500 VDC against shield
- Supply voltages
 - 24 V and 36 V nom. input voltage according to EN 50155
 - 24 V nom. input voltage according to ISO 7637-2 (E-mark)
 - 110 V nom. input voltage (optional)
 - 48 V or 72 V nom. input voltage (on request)
 - EN 50155 power interruption class S2
 - Ignition signal at the front

Mechanical Specifications

- Dimensions: 66 mm x 390 mm x 215 mm
- Weight:
 - Approx. 4.25 kg (box PC in standard housing)
 - Approx. 5.5 kg (box PC in 19" insertion frame)

Environmental Specifications

- Protection rating
 - IP20 (IEC 60529)
 - Other IP protection classes possible on request
- 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°C to +85°C
- Humidity: EN 50155:2007 (+25/+55 °C, 90-100 %)
- Altitude: -300 m to +3000 m
- Shock: 50 m/s², 30 ms (EN 61373)
- Vibration (function): 1 m/s², 5 Hz to 150 Hz (EN 61373)
- Vibration (lifetime): 7.9 m/s², 5 Hz to 150 Hz (EN 61373)
- Conformal coating of internal components

Safety

- Fire Protection
 - EN 45545-2, hazard level HL3 (railway)
 - ECE R118 (automotive)
- Electrical Safety
 - EN 50153
 - EN 50155

EMC (Railway)

- EN 50121-3-2

EMC (Automotive)

- ECE R10 (E-mark)

BIOS

- InsydeH2O UEFI Framework

Software Support

- Windows
 - Windows 10 IoT Enterprise
- Linux
- For more information on supported operating system versions and drivers see Software.

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Up-to-date information, documentation and ordering information:

www.men.de/products/bl51e/

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