

BL50S

Rugged Box PC for Transportation with AMD G-Series Railway & Automotive Embedded Computer for Storage Control

- » **AMD Embedded G-Series APU**
- » **RAID 0/1, hot-pluggable on 2 HDD/SSD shuttles**
- » **4-port Gb Ethernet switch with PoE**
- » **1 Gb Ethernet uplink**
- » **1 PCI Express Mini Card slot with 2 SIM slots for WLAN, GSM (2G), UMTS (3G), LTE (4G), GPS or GLONASS functionality**
- » **2 slots for IBIS, RS232, RS485, RS422**
- » **24 and 36 VDC nom. class S2 PSU, with 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 BL50S is a maintenance-free fanless box computer that has been designed for embedded storage applications such as content servers or video recorders. It offers two external SATA shuttles with hot-plugging support.

On the front of the rugged BL50S as many as 5 Gigabit Ethernet interfaces are accessible. Four of these ports share one Gigabit Ethernet port from the chipset via a switch, while one port is used exclusively as Gigabit Ethernet uplink. The four ports routed over the switch support Power-over-Ethernet.

One PCI Express Mini Card slot with two SIM card slots offers the possibility to implement the wide range of functionality available on this form factor. This includes for example mobile service standards GSM (2G), UMTS (3G), LTE (4G) and derivatives, wireless communication standards WLAN / Wi-Fi IEEE 802.11 and derivatives as well as positioning systems GPS or GLONASS.

The BL50S is powered by an AMD Embedded G-Series APU (Accelerated Processing Unit), the T48N, running at 1.4 GHz. The G-Series combines low-power CPUs and advanced GPUs, in this case an AMD Radeon HD 6310, into a single embedded device. The use of the Embedded

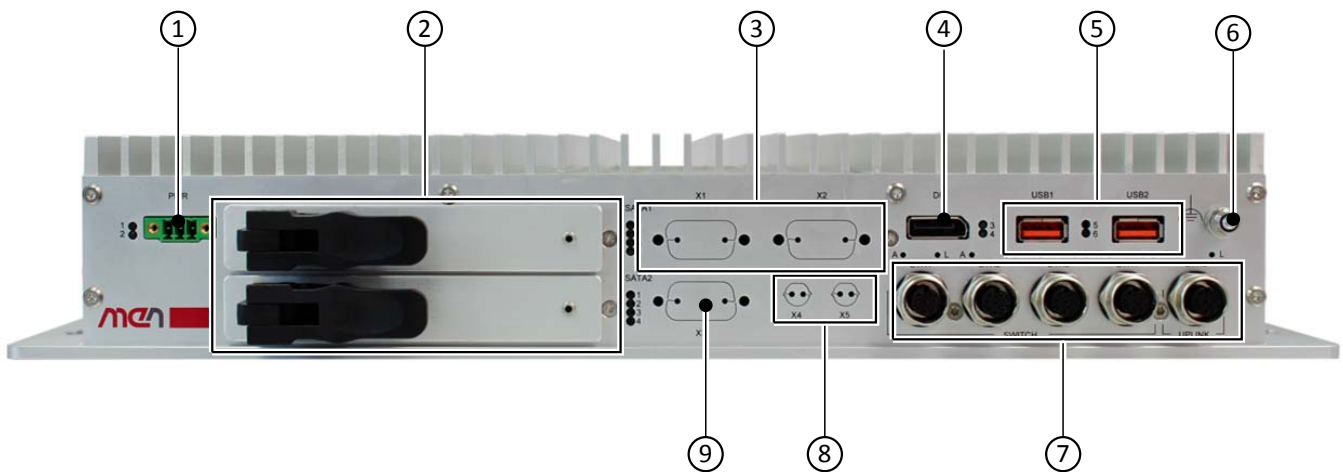
G-Series makes for high scalability in CPU (single/dual core) and graphics performance (various Radeon GPUs or none at all).

The BL50S is equipped with 2 GB of DDR3 SDRAM and offers SD card and mSATA slots. The system is designed for fanless operation at temperatures from -40 to +70°C (+85°C for up to 10 minutes), its special aluminum housing with cooling fins serves as a heatsink for the internal electronics and in this way provides conduction cooling.

The BL50S supports one DisplayPort interface with a resolution of 2560×1600. In addition, a multitude of other I/O is available at the front panel, including two USB 2.0 and variable slots for legacy serial I/O (e.g. RS232) or CAN bus.

The BL50S comes with its own integrated class S2 wide-range power supply with 24 and 36 VDC nominal input voltage and a power consumption of 30 W 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 combination of the various CPU/GPU options with the available selection of external interfaces makes for an extremely flexible system design that can quickly be



- ① PSU connector (10V-50.4V)
- ② 2 Hard Disk Shuttles
- ③ 2 SA-Adapter cutouts for RS232, RS485/422, CAN, IBIS master, IBIS slave or GPIO
- ④ 1 DisplayPort
- ⑤ 2 USB 2.0
- ⑥ Earthing Stud
- ⑦ 5 Gigabit Ethernet (4-port Ethernet switch and one uplink port)
- ⑧ 2 antenna connector cutouts for PCI Express Mini Card
- ⑨ Cutout for HD Audio

CPU

- The following CPU types are supported:
 - AMD T48N, 1.4 GHz Dual Core, 18 W, AMD Radeon HD 6310
 - AMD T56N, 1.65 GHz Dual Core, 18 W, AMD Radeon HD 6320 (on request)
 - AMD T56E, 1.65 GHz Dual Core, 18 W, AMD Radeon HD 6250 (on request)
 - AMD T48E, 1.4 GHz Dual Core, 18 W, AMD Radeon HD 6250 (on request)
 - AMD T40N, 1.0 GHz Dual Core, 9 W, AMD Radeon HD 6290 (on request)
 - AMD T40E, 1.0 GHz Dual Core, 6.4 W, AMD Radeon HD 6250 (on request)
 - AMD T52R, 1.5 GHz Single Core, 18 W, AMD Radeon HD 6310 (on request)
 - AMD T44R, 1.2 GHz Single Core, 9 W, AMD Radeon HD 6250 (on request)
 - AMD T40R, 1.0 GHz Single Core, 5.5 W, AMD Radeon HD 6250 (on request)
 - AMD T16R, 615 MHz Single Core, 4.5 W, AMD Radeon HD 6250 (on request)
 - AMD T48L, 1.4 GHz Dual Core, no GPU, 18 W (on request)
 - AMD T30L, 1.4 GHz Single Core, no GPU, 18 W (on request)
 - AMD T24L, 1000 MHz Single Core, no GPU, 5 W (on request)

Chipset

- AMD A55E

Memory

- System Memory
 - Soldered DDR3
 - 1 GB (on request), or
 - 2 GB, or
 - 4 GB (on request)

Mass Storage

- The following mass storage devices can be assembled:
 - Two 2.5" SATA HDD/SSD drives via external shuttles
 - One SD card
 - One mSATA disk

Graphics

- AMD Radeon GPU up to HD 6320
- Maximum resolution depending on GPU
 - 2560x1600 (all DisplayPort interfaces) with Radeon HD 6310 and 6320
 - 1920x1200 (all DisplayPort interfaces) with Radeon HD 6250 and 6290 (on request)
- 3D Graphics Acceleration
 - Full DirectX 11 support, including full speed 32-bit floating point per component operations
 - Shader Model 5
 - OpenCL 1.1 support
 - OpenGL 4.0 support
- Motion Video Acceleration
 - Dedicated hardware (UVD 3) for H.264, VC-1 and MPEG2 decoding
 - HD HQV and SD HQV support: noise removal, detail enhancement, color enhancement, cadence detection, sharpness, and advanced de-interlacing
 - Super up-conversion for SD to HD resolutions

Front Interfaces

- Video
 - One DisplayPort 1.1a, AUX channel and hot plug detection
- SATA
 - Two 2.5" SATA HDD/SSD shuttles, SATA Revision 2.x (3 Gbit/s), hot-pluggable (with independent devices)
 - Four status LEDs per channel
- USB
 - Two Type A connectors, USB 2.0 (480 Mbit/s)
- Ethernet
 - Five M12 connectors, 1000BASE-T (1 Gbit/s), 4-port Ethernet switch and one uplink, or
 - On request: Five M12 connectors, 100BASE-T (100 Mbit/s), 4-port Ethernet switch and one uplink, or
 - On request: Five M12 connectors, 100BASE-T (100 Mbit/s), 4-port Ethernet switch, 1000BASE-T (1 Gbit/s), one uplink
 - Two link and activity LEDs per channel
 - Power over Ethernet PSE support on all ports, for four powered devices total
- Antenna connections
 - Two antenna connector cutouts, linked to PCI Express Mini Card, for various types (SMA, reverse SMA, QMA, FME...)
- Legacy serial I/O
 - Two SA-Adapter cutouts for:
 - RS232, not optically isolated, -40..+85°C screened, conformal coating
 - RS422/485, full duplex, optically isolated, -50..+85°C screened, conformal coating
 - RS232, optically isolated, -40..+85°C screened, conformal coating
 - CAN bus ISO high-speed, optically isolated, -40..+85°C screened, conformal coating
 - 8 digital I/O channels, -50..+85°C with qualified components, conformal coating, no RoHS
 - IBIS slave interface, isolated, -40..+85°C screened, conformal coating
 - GPS receiver, SMA antenna, isolated, -40..+85°C qualified, conformal coating
- Additional status LEDs
 - Two for general system status
 - Four user LEDs
- Power supply
- Audio (on request)
 - None, or
 - One 9-pin D-Sub connector, HD Audio with stereo in/out and SPDIF out, including HD Audio codec

In-System Interfaces

- mSATA
 - One mSATA slot, SATA Revision 2.x (3 Gbit/s)
- PCI Express Mini Card
 - One slot, for mobile service, wireless communication, positioning or real-time Ethernet functions such as
 - GLONASS and GPS PCI Express MiniCard (full size), 3-axis Gyro sensor, -40..+85°C with qualified components
 - Audio interface for mobile wireless cards, with SIM card holder, -40..+85°C screened
 - PCI Express Mini Card, CANopen Slave or Master interface, Hilscher
 - PCI Express Mini Card, Real-Time Ethernet Slave or Master interface, Hilscher
 - PCI Express Mini Card, Profibus Slave or Master interface, Hilscher
 - PCI Express Mini Card, DeviceNET Slave or Master interface, Hilscher (on request)
 - WLAN PCI Express MiniCard DNXA-116, -40 to +85°C screened, storage temperature -40° to +85°C
 - MC7304 PCI Express MiniCard, full-size on USB: LTE, DC-HSPA+, HSPA+, HSDPA, HSUPA, WCDMA, GSM, GPRS, EDGE, and GNSS, -40 to +85°C
 - Two microSIM card slots (Dual SIM)
 - PCI Express and USB interface

Supervision and Control

- System controller
 - Two front-panel LEDs for system status
- 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 nominal input voltage according to EN 50155
 - 24 V nominal input voltage according to ISO 7637-2 (E-mark) requirements
 - Input voltages of 48V, 72V, 110V (on request)
 - EN 50155 power interruption class S2
 - Ignition signal at the front
- Power consumption
 - 14.4 W with T48N CPU with Windows 7 operating system and 1 Gb Ethernet connection (model 09BL50S00)

Mechanical Specifications

- Dimensions: Height 66 mm x Width 390 mm x Length 215 mm
- Weight: 4.25 kg (model 09BL50S00)

Environmental Specifications

- International Protection Rating:
 - IP20
 - 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
- Relative humidity (operation): max. 95% non-condensing
- Relative humidity (storage): max. 95% non-condensing
- 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

Reliability

- MTBF: 267 047 h @ 40°C according to IEC/TR 62380 (RDF 2000) (model 09BL50S00)

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

Software Support

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

BIOS

- InsydeH2O UEFI Framework

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