BL50W – Rugged Box PC for Wireless Applications (AMD)

- **AMD Embedded G-Series APU**
- **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 BL50W 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 derivates and wireless communication standards WLAN / Wi-Fi IEEE 802.11 and derivates. A GNSS interface supporting positioning systems GPS and GLONASS complements the possibilities.

The rugged BL50W is powered by a dual-core 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 BL50W is equipped with 2 GB of DDR3 SDRAM and offers SD 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 aluminum housing with cooling fins serves as a heatsink for the internal electronics and in this way provides conduction cooling.

The BL50W 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 BL50W 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 combination of the various CPU/GPU 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
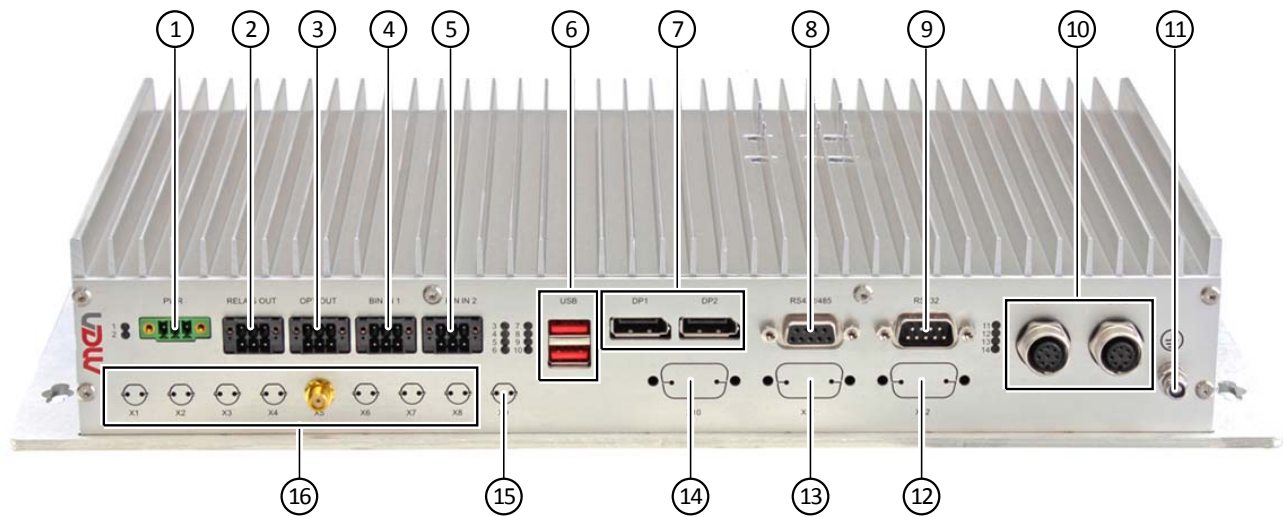
① PSU (10V-50.4V)	⑨ RS232 interface
② 2 relay outputs	⑩ 2 Gigabit Ethernet on M12 connectors
③ 2 photocoupler outputs	⑪ Earthing stud
④ 6 binary inputs	⑫ SA-Adapter connector for RS232, RS422/485 or IBIS
⑤ 1 odometer input, 1 IBIS slave, 1 binary input	⑬ SA-Adapter connector for RS232, RS422/485 or IBIS
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	■ AMD Embedded G-Series T48N
	  □ Dual-Core
	  □ 1.4 GHz processor core frequency
	  □ Accelerated Processing Unit (APU), also includes GPU (see Graphics)

Controller Hub	■ AMD A55E

Memory	■ 64 KB L1 and 512 KB L2 cache
	■ 2 GB DDR3 SDRAM system memory
	  □ Soldered
	  □ 1066 MT/s

Mass Storage	■ One SD 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)

Graphics	■ AMD Radeon HD 6310
	  □ Dual independent display support
	  □ Dual DisplayPort
	  □ Maximum resolution: 2560x1600 each port
	  □ Embedded in T48N APU
	■ 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

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 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 derivates
	□ Wireless communication: WLAN / WiFi IEEE 802.11 and derivates
	■ 2 microSIM card slots for each PCI Express Mini Card
	■ PCI Express and USB interface

Technical Data

Real-Time Clock	■ Buffered by supercapacitor for 12 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
	  □ 10 to 50.4 V input voltage range
	  □ EN 50155 power interruption class S2
	■ Power consumption: 14.4 W with T48N CPU with Windows 7 operating system and 1 Gb Ethernet connection

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/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 IP20

MTBF	■ 198 993 h @ 40°C according to IEC/TR 62380 (RDF 2000)

Safety	■ Flammability
	  □ UL 94V-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

APU	▪ AMD T56N, 1.65 GHz Dual Core, 18W, AMD Radeon HD 6320 ▪ AMD T56E, 1.65 GHz Dual Core, 18W, AMD Radeon HD 6250 ▪ AMD T48N, 1.4 GHz Dual Core, 18W, AMD Radeon HD 6310 ▪ AMD T48E, 1.4 GHz Dual Core, 18W, AMD Radeon HD 6250 ▪ AMD T40N, 1.0 GHz Dual Core, 9W, AMD Radeon HD 6290 ▪ AMD T40E, 1.0 GHz Dual Core, 6.4W, AMD Radeon HD 6250 ▪ AMD T52R, 1.5 GHz Single Core, 18W, AMD Radeon HD 6310 ▪ AMD T44R, 1.2 GHz Single Core, 9W, AMD Radeon HD 6250 ▪ AMD T40R, 1.0 GHz Single Core, 5.5W, AMD Radeon HD 6250 ▪ AMD T16R, 615 MHz Single Core, 4.5W, AMD Radeon HD 6250 ▪ AMD T48L, 1.4 GHz Dual Core, 18W ▪ AMD T30L, 1.4 GHz Single Core, 18W ▪ AMD T24L, 1000 MHz Single Core, 5W
Memory	▪ Up to 4 GB DDR3 SDRAM system memory ▪ SATA hard-disk/solid state drive (mounted within housing)

Graphics	▪ 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

I/O	▪ Ethernet
	   □ Two Fast Ethernet interfaces on two M12 connectors
	 ▪ 1 HD audio
	   □ 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
	 ▪ PX52, supporting the following Real-Time Ethernet communication (determined by firmware):
	   □ 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)

Miscellaneous	▪ Real-time clock □ 72 h buffer time
Electrical Specifications	▪ Input voltages of 48V, 72V and 110V can be implemented on request □ According to EN 50155 class S2

Configuration & Options

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.

Up-to-date information, documentation and ordering information:
www.men.de/products/bl50w/

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