

BL50W – Box PC for Wireless Applications

- **AMD Embedded G-Series APU**
- **4 PCI Express® Mini Card slots for WLAN, GSM (2G), UMTS (3G), LTE (4G), GPS or GLONASS functionality, 9 antenna cut-outs**
- **8 SIM card slots**
- **GPS interface**
- **2 Gigabit Ethernet, 2 USB 2.0, 2 DisplayPorts**
- **5 Slots for IBIS, RS232, RS485, RS422**
- **24 VDC and 36 VDC nom. (10 to 50.4 V) class S2 power supply, incl. ignition**
- **-40 to +85°C operating temperature**
- **Conformal coating**
- **Compliant to EN 50155 (railways)**
- **Prepared for E1 (automotive)**



The BL50W is a maintenance-free box computer that has been designed for independent use or as display computer electronics for wireless applications in transportation, e.g. in trains, commercial vehicles, mobile machines or airplanes.

Four PCI Express® Mini Card slots with eight SIM card slots 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 or GLONASS complements the possibilities.

The BL50W 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 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.

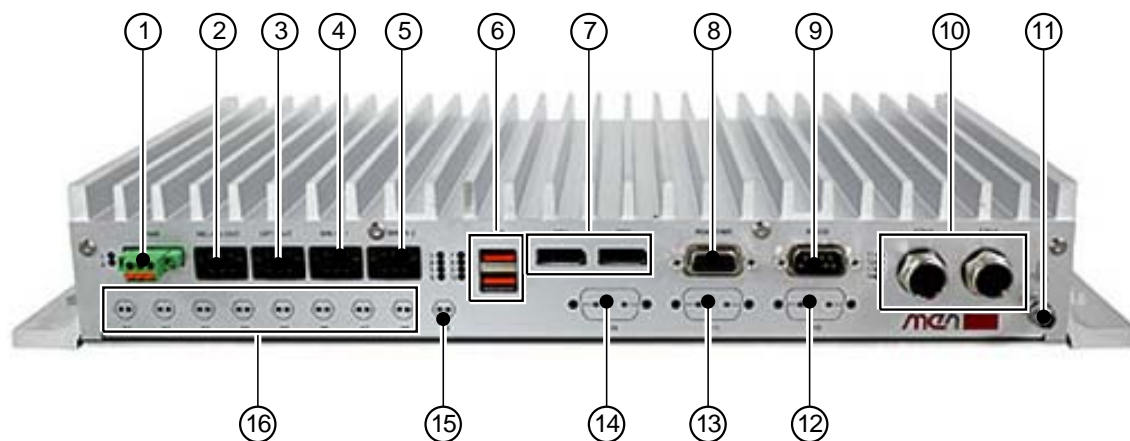
The BL50W supports up to two DisplayPort® interfaces with full HD resolution. In addition, a multitude of other I/O is available at the front panel, including two Gigabit Ethernet, two USB 2.0, variable slots for legacy serial I/O (e.g. RS232) or CAN bus, general purpose inputs and relay outputs.

The BL50W comes with its own integrated 30W 24 VDC nom. (10 to 50.4 V) class S2 wide-range power supply and is compliant with EN 50155 and prepared for E1 certification. 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



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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 photo coupler outputs | ⑪ Earthing Stud |
| ④ 6 binary inputs | ⑫ SA-Adapter connector for RS232, RS422/485 or IBIS |
| ⑤ 1 odometer input, 2 IBIS channels, 1 binary input | ⑬ SA-Adapter connector for RS232, RS422/485 or IBIS |
| ⑥ 2 USB 2.0 interfaces | ⑭ SA-Adapter connector for CAN |
| ⑦ 2 DisplayPorts | ⑮ Antenna connector for GPS |
| ⑧ RS422/485 interface | ⑯ Antenna connectors for PCI Express Mini Cards |

Technical Data

CPU	<ul style="list-style-type: none">■ AMD Embedded G-Series T48N<ul style="list-style-type: none">□ Dual-Core□ 1.4 GHz processor core frequency□ Accelerated Processing Unit (APU), also includes GPU (see Graphics)
Controller Hub	<ul style="list-style-type: none">■ AMD A55E
Memory	<ul style="list-style-type: none">■ 64 KB L1 and 512 KB L2 cache■ 2 GB DDR3 SDRAM system memory<ul style="list-style-type: none">□ Soldered□ 1066 MT/s
Mass Storage	<ul style="list-style-type: none">■ One SD card slot<ul style="list-style-type: none">□ Via USB 2.0■ One mSATA slot<ul style="list-style-type: none">□ Transfer rate up to 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 3.x support□ Transfer rates up to 600 MB/s (6 Gbit/s)
Graphics	<ul style="list-style-type: none">■ AMD Radeon™ HD 6310<ul style="list-style-type: none">□ Dual independent display support□ Dual DisplayPort®□ Maximum resolution: 2560x1600 for each port□ Embedded in T48N APU■ 3D Graphics Acceleration<ul style="list-style-type: none">□ 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<ul style="list-style-type: none">□ 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
- 1 HD audio
 - HD audio codec
 - Audio stereo in
 - Audio stereo out
 - SPDIF out
 - All available via 9-pin D-Sub connector
- 2 Gigabit Ethernet
 - Via M12 connectors
- 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 at least 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
- 2 photo couplers (shutters)
 - Input voltage: 154 V (absolute maximum)
 - Emitter-collector voltage: 0.3 V (absolute maximum)
 - Input current (high level): 8 mA
 - Input current (low level): 2 mA
- 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
- GPS/GLONASS interface
 - Accuracy: apx. 2.5 m
 - A-GPS
 - DGPS
 - Time-To-First-Fix - cold start: higher than 35 s
 - Time-To-First-Fix - warm start / aided start: lower than 1s
 - Optionally: Odometer input for GPS 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
- RS422/485
 - D-Sub connector at front panel
 - Full or half duplex
- 2 SA-Adapter™ slots for legacy serial I/O
 - Optionally for RS232, RS422/485 and IBIS master
- 1 SA-Adapter™ slot for CAN
 - Optionally for RS232, RS422/485 and IBIS master
- 14 status LEDs
 - 4 for Ethernet link and activity status
 - 2 for general board status
 - 8 user LEDs

Technical Data

4 PCI Express® Mini Card slots	<ul style="list-style-type: none"> ■ For functions such as <ul style="list-style-type: none"> □ Mobile service standards: GSM (2G), UMTS (3G), LTE (4G) and derivatives □ Wireless communication: WLAN / WiFi IEEE 802.11 and derivatives □ Positioning: GPS, GLONASS, GALILEO ■ 2 SIM card slots for each PCI Express® Mini Card ■ PCI Express® and USB interface
Real-Time Clock	<ul style="list-style-type: none"> ■ Buffered by Gold Cap for up to 12 h
Electrical Specifications	<ul style="list-style-type: none"> ■ Isolation voltage 1,500 VDC <ul style="list-style-type: none"> □ Ethernet port 1, Ethernet port 2, audio interface, power input, USB interface ■ Supply voltage: <ul style="list-style-type: none"> □ 24V and 36V nominal input voltage according to EN50155 □ 24V nominal input voltage according to E1 (automotive) □ 10 to 50.4 V input voltage range □ EN 50155 power interruption class S2 ■ Power consumption: tbd
Mechanical Specifications	<ul style="list-style-type: none"> ■ Dimensions: Height 60mm x Width 400mm x Length 240mm ■ Weight: tbd ■ Front protected according to IP20
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 on request
MTBF	<ul style="list-style-type: none"> ■ 198 993 h @ 40°C according to IEC/TR 62380 (RDF 2000)
Safety	<ul style="list-style-type: none"> ■ Flammability <ul style="list-style-type: none"> □ PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers ■ Electrical Safety <ul style="list-style-type: none"> □ Insulation measurement test according to EN 50155 (12.2.9.1) □ Voltage withstand test according to EN 50155 (12.2.9.2) □ Information technology equipment test according to EN 60950
EMC Conformity (Automotive)	<ul style="list-style-type: none"> ■ Radiated Emission: 2004/104/EC, 2005/83/EC, CISPR 25, CISPR 16 ■ Conducted Emission (Power Line): 2004/104/EC; 2005/83/EC; ISO7637-2 ■ Conductive Immunity (Power line): 2004/104/EC; 2005/83/EC; according to ISO7637-2 ■ ESD: according to ISO 10605 ■ Radiation Immunity: ISO11452-5 ■ Prepared for certification according to E1 requirements of the German Federal Motor Transport Authority
EMC Conformity (Railway)	<ul style="list-style-type: none"> ■ EN 55011 (radio disturbance) ■ IEC 61000-4-2 (ESD) ■ IEC 61000-4-3 (electromagnetic field immunity) ■ IEC 61000-4-4 (burst) ■ IEC 61000-4-5 (surge) ■ EN 50121-3-2 (conducted HF immunity)
BIOS	<ul style="list-style-type: none"> ■ InsydeH2O™ UEFI Framework

Technical Data

Software Support	<ul style="list-style-type: none"> ■ Windows® 7 ■ Windows® Embedded Standard 7 ■ Windows® XP Embedded ■ Linux ■ For more information on supported operating system versions and drivers see Downloads.
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Configuration & Options

Options

APU	<ul style="list-style-type: none"> ■ 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	<ul style="list-style-type: none"> ■ Up to 4 GB DDR3 SDRAM system memory ■ SATA hard-disk/solid state drive (mounted within housing)
Graphics	<ul style="list-style-type: none"> ■ Maximum resolution depending on GPU <ul style="list-style-type: none"> □ 2560x1600 (all DisplayPort® interfaces) with Radeon™ HD 6310 and 6320 □ 1920x1200 (all DisplayPort® interfaces) with Radeon™ HD 6250 and 6290
I/O	<ul style="list-style-type: none"> ■ Ethernet <ul style="list-style-type: none"> □ Two Fast Ethernet interfaces on two M12 connectors ■ 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 slots for RS232, RS422/485, IBIS master or CAN bus
Miscellaneous	<ul style="list-style-type: none"> ■ Real-time clock <ul style="list-style-type: none"> □ 72 h buffer time
Electrical Specifications	<ul style="list-style-type: none"> ■ Input voltages of 48V, 72V and 110V can be implemented on request

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 BL50W Models	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, 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
	15PX01-00	GLONASS & GPS PCI Express® MiniCard (full size), 3-axis Gyro sensor, -40..+85°C with qualified components
Memory	0751-0047	SD card, 4GB, -40..+85°C
	0751-0051	SSD mSATA, 8 GB, -40..+85°C
	0754-0007	SSD SATA 256 GB, 2.5" MLC, 0..+70°C
SA-Adapters™	08SA01-06	RS232, not optically isolated, -40..+85°C screened
	08SA02-07	RS422/485, full duplex, optically isolated, -40..+85°C screened
	08SA03-01	1 RS232, optically isolated, -40..+85°C screened
	08SA08-01	CAN ISO high-speed, optically isolated, -40..+85°C screened
	08SA22-00	IBIS master SA-Adapter™, -40..+85°C screened
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
	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
	0799-0003	UMTS PCIe® Mini Card GTM661W, half-size card with adapter for full-size slot, -10° C..+55°C operating temperature, -40° C..+85°C storage temperature Note: when using wireless modules the R&TTE Guide of the EU has to be observed. See the R&TTE website For the module's driver see Option's website
	0799-0004	WLAN PCIe® MiniCard 6205, 802.11n 2x2 MIMO, 2.4 GHz and 5 GHz, half-size card with adapter for full-size slot, operating temperature 0°C..+80°C, storage temperature -40°..+85°C Note: when using wireless modules the R&TTE Guide of the EU has to be observed. See the R&TTE website For the module's driver see Intel®'s website
	15PX01-00	GLONASS & GPS PCI Express® MiniCard (full size), 3-axis Gyro sensor, -40..+85°C with qualified components

Ordering Information

Software: Linux

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

13SC24-90	Linux I2C controller driver (MEN) for SC24, AE51, BC50M, BC50I and BL50W
13Y004-06	MDIS5™ low-level driver sources (MEN) for generic SMBus driver for F14, F15, F17, F18, F19P, F21P, F22P, G20, G22, D9, D601, F600 and F601, A19, A20, F217, SC24, BC50M, BC50I and BL50W
13Z010-06	MDIS4™/2004 / MDIS5™ low-level driver sources (MEN) for 16Z076_QSPI
13Z015-06	MDIS5™ low-level driver sources (MEN) for 16Z029_CAN (MSCAN/Layer2)
13Z016-06	MDIS5™ driver (MEN) for 16Z029_CAN (CANopen master)
13Z017-06	MDIS5™ low-level driver sources (MEN) for 16Z034_GPIO, 16Z037_GPIO and 16Z127_GPIO

Software: Windows®

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

10F014-78	Windows® XP Embedded BSP (MEN) for F11S, F14, F15, F17, F18, F19P, F21P, G20, XM1, XM1L, XM2, MM1, MM2, SC21, SC24, DC1, DC2, RC1, BC50I, BC50M and BL50W
10Y000-78	Windows® Embedded Standard 7 BSP for F11S, F19P, F21P, F22P, G20, G22, XM1L, XM2, MM1, MM2, SC21, SC24, SC27, BC50M, BC50I, BL50W, BL50S, F206, F210, F215, F216, G215, P506, P507 and P511
13SC24-77	Windows® Installset (MEN) for SC24, BC50M, BC50I and BL50W (Includes all free drivers developed by MEN for the supported hardware.)
13T010-70	Windows® 32-bit network driver (Intel®) for XM1, XM1L, XM2, MM2, F11S, F18, F18E, F19P, F21P, F22P, G20, G22, GM1, GM2, G211, G211F, SC24, BC50I, BC50M and BL50W
13T020-70	Windows® 64-bit network driver (Intel®) for F18, F18E, F19P, F21P, F22P, G20, G22, GM1, GM2, G211, G211F, XM2, SC24, BC50I, BC50M and BL50W
13T025-70	Windows® XP GPU and chipset driver (AMD) for BC50M, BC50I, BL50W and SC24
13T026-70	Windows® Vista™ / Windows® 7 GPU and chipset driver (AMD) for BC50M, BC50I, BL50W, SC24 and G214
13Z010-70	MDIS5™ Windows® driver (MEN) for 16Z076_QSPI devices
13Z015-70	MDIS4™/2004 / MDIS5™ Windows® driver (MEN) for 16Z029_CAN (MSCAN/Layer2)
13Z016-70	MDIS5™ Windows® driver (MEN) for 16Z029_CAN (CANopen master)
13Z017-70	MDIS4™/2004 / MDIS5™ Windows® driver (MEN) for 16Z034_GPIO devices

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

Documentation

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

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