BC50R

Rugged IP 65 Box PC for Transportation with AMD G-Series
Railway & Automotive Embedded Computer for Communication & Control

- » **AMD Embedded G-Series APU**
- » **IP65-protected housing**
- » **Ethernet, USB 2.0, CAN, Serial I/O at front**
- » **WLAN, GSM (2G), UMTS (3G), LTE (4G) via 2 PCI Express Mini Card slots**
- » **GPS or GLONASS**
- » **24 VDC and 36 VDC nom. class S2 power supply, incl. ignition**
- » **-40 to +85°C operating temperature, fanless**
- » **Compliant to EN 50155 (railways)**
- » **Compliant to ISO 7637-2 (E-mark for automotive)**
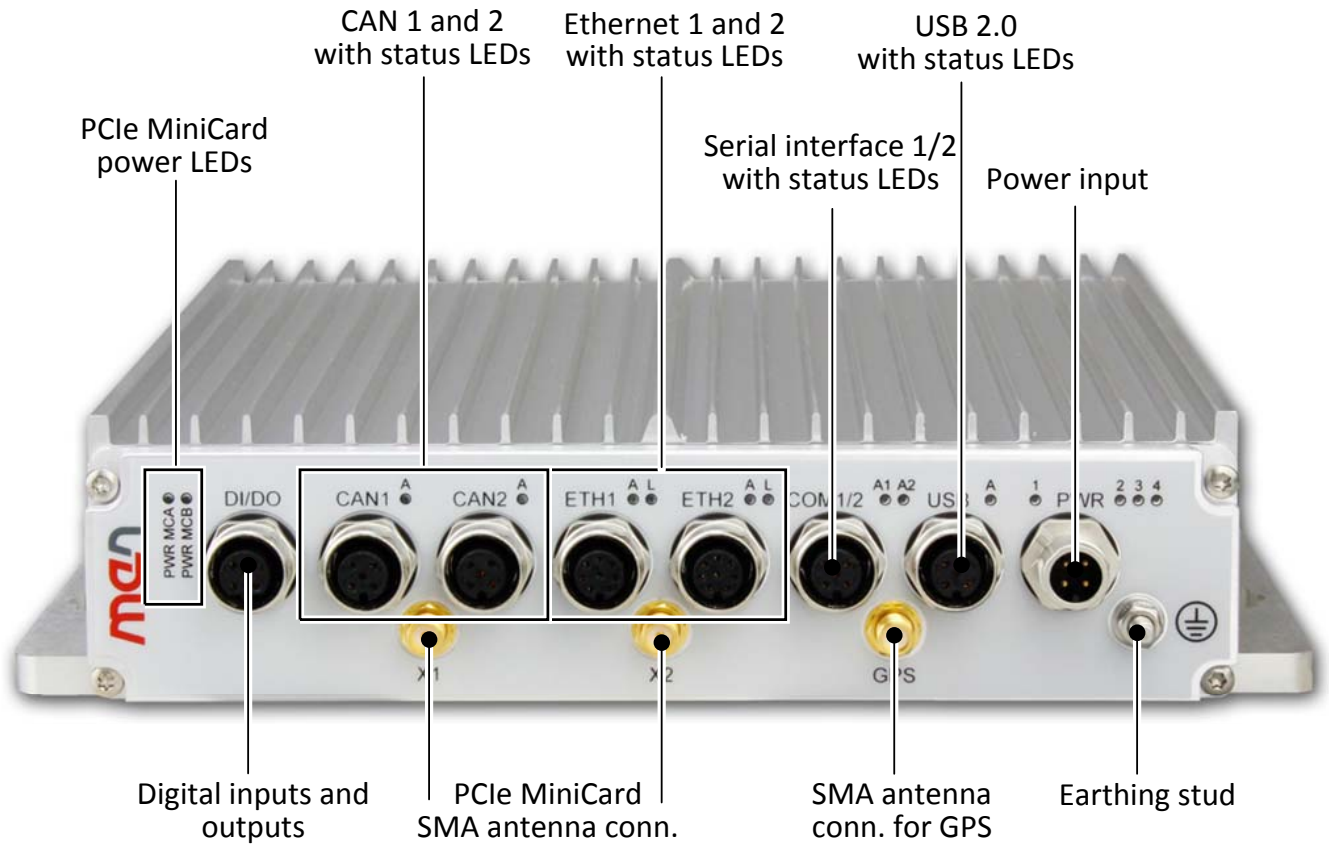- » **Compliant to EN 60945 (ship)**

The BC50R is a maintenance-free box computer that has been designed, e.g., for data acquisition applications in rugged environments in vehicles, e.g. in trains, commercial vehicles, mobile machines or ships.
All interfaces are implemented on rugged M12 connectors (USB, digital input and output, Gigabit Ethernet, CAN and legacy serial I/O). The housing is compliant to the IP65 protection class.
On the inside, the system offers two PCI Express Mini card slots with two SIM card slots for WLAN, GNSS or 3G/4G functionality. The necessary antenna connectors can be made available at the front panel.
It is powered by an AMD Embedded G-Series APU (Accelerated Processing Unit), the T48N, running at 1.4 GHz. The use of the Embedded G-Series makes for high scalability in CPU (single/dual core) performance.

The BC50R 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 heat sink for the internal electronics and in this way provides conduction cooling.
The BC50R supports a 24 VDC and 36 VDC nom. class S2 power supply in compliance with EN 50155 or power supplies which comply with ISO 7637-2 (E-mark for automotive) (nominal input voltage 24 V) or with EN 60945 (ship). The power can be switched on and off using an ignition signal on the power connector, and a shutdown-delay 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.

Data Sheet

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PCIe MiniCard
power LEDs

CAN 1 and 2
with status LEDs

Ethernet 1 and 2
with status LEDs

USB 2.0
with status LEDs

Serial interface 1/2
with status LEDs

Power input

Digital inputs and
outputs

PCIe MiniCard
SMA antenna conn.

SMA antenna
conn. for GPS

Earthing stud

Diagram

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
	■ One mSATA slot
	□ SATA Revision 2.x support
	□ Transfer rates up to 300 MB/s (3 Gbit/s)

Front I/O	■ Positioning: GPS, GLONASS
	□ Via one SMA antenna connector at the front
	□ 1 status LED on front
	■ Ethernet
	□ Two 10/100/1000Base-T Ethernet channels
	□ Two M12 connectors at front panel
	□ Four onboard LEDs to signal LAN link, activity status and connection speed
	■ USB
	□ One USB 2.0 client port
	□ M12 connector at front panel
	□ EHCI implementation
	□ One status LED at front panel
	■ CAN bus
	□ Two CAN bus channels
	□ Two M12 connectors at front panel
	□ 1 LED at front panel for each CAN port
	■ Two RS232 UART (COM1/2)
	□ One M12 connector at front panel
	□ Data rates up to 115 200 bit/s
	□ Handshake lines: none
	□ 1 LED at front panel for each COM port
	■ GPIO
	□ 2 digital inputs (GPI)
	□ 2 digital outputs (GPO)
	□ Optically isolated
	□ One M12 connector at front panel
	□ 1 status LED

2 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 SIM card slots
	■ PCI Express and USB interface

Real-Time Clock	■ Buffered by Gold Cap for 72 h

Technical Data

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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
	□ EN 50155 power interruption class S2
	■ Power consumption: up to 30 W

Mechanical Specifications	■ Dimensions: approx. 250 mm x 220 mm x 48.1 mm
	■ Weight: 1.8 kg
	■ Front protected according to IP65

Environmental Specifications	■ Temperature range (operation):
	□ Depends on system configuration (CPU, PCIeMiniCards, Ethernet, USB, ...)
	□ Maximum: +70°C (+85°C for 10 minutes) according to EN50155 Tx
	□ Minimum: -40°C (all processors)
	□ Conditions: typical power dissipation: 14.4 W (with 18W CPU T48N) with Windows 7 operating system and 1 Gb Ethernet connection
	□ 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
	■ Vibration (function): 1 m/s², 5 Hz - 150 Hz
	■ Vibration (lifetime): 7.9 m/s², 5 Hz - 150 Hz
	■ Conformal coating of internal components

MTBF	■ 262,804 h @ 40°C according to IEC/TR 62380 (RDF 2000)

Safety	■ Flammability (PCBs)
	□ UL 94 V-0
	■ Fire Protection
	□ EN 45545-2 (Railway)
	□ ECE-R118 (Automotive)
	■ Electrical Safety
	□ EN 50153
	□ EN 50155

EMC Compliance (Automotive)	■ ECE R10 (E-mark)

EMC Compliance (Railway)	■ EN 50121-3-2

EMC Compliance (Ship)	■ EN 60945

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.

Technical Data

Options

APU

- AMD T48N, 1.4 GHz Dual Core, 18W, AMD Radeon HD 6310
- AMD T56N, 1.65 GHz Dual Core, 18W, AMD Radeon HD 6320 (on request)
- AMD T56E, 1.65 GHz Dual Core, 18W, AMD Radeon HD 6250 (on request)
- AMD T48E, 1.4 GHz Dual Core, 18W, AMD Radeon HD 6250 (on request)
- AMD T40N, 1.0 GHz Dual Core, 9W, AMD Radeon HD 6290 (on request)
- AMD T40E, 1.0 GHz Dual Core, 6.4W, AMD Radeon HD 6250 (on request)
- AMD T52R, 1.5 GHz Single Core, 18W, AMD Radeon HD 6310 (on request)
- AMD T44R, 1.2 GHz Single Core, 9W, AMD Radeon HD 6250 (on request)
- AMD T40R, 1.0 GHz Single Core, 5.5W, AMD Radeon HD 6250 (on request)
- AMD T16R, 615 MHz Single Core, 4.5W, AMD Radeon HD 6250 (on request)
- AMD T48L, 1.4 GHz Dual Core, 18W (on request)
- AMD T30L, 1.4 GHz Single Core, 18W (on request)
- AMD T24L, 1000 MHz Single Core, 5W (on request)

Memory

- 2 GB DDR3 SDRAM system memory
- 4 GB DDR3 SDRAM system memory (on request)
- SATA hard-disk/solid state drive (mounted within housing)

Electrical Specifications

- Input voltages of 48V, 72V, 110V (on request)

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.

Configuration & Options

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