BC50R

Rugged IP65 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 °C to +70 °C (+85 °C), fanless**

» **Compliant to EN 50155 (railways)**

» **Compliant to ISO 7637-2 (E-mark for automotive)**

» **Compliant to EN 60945 (ship)**

Rugged and Maintenance-Free

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.

Ready for Wireless Functions

On the inside, the system offers two PCI Express Mini card slots with two SIM card slots for WLAN or 3G/4G functionality. The necessary antenna connectors can be made available at the front panel. A GNSS interface is already provided at an antenna at the front.

Solid Performance, Solid Housing

The BC50R 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
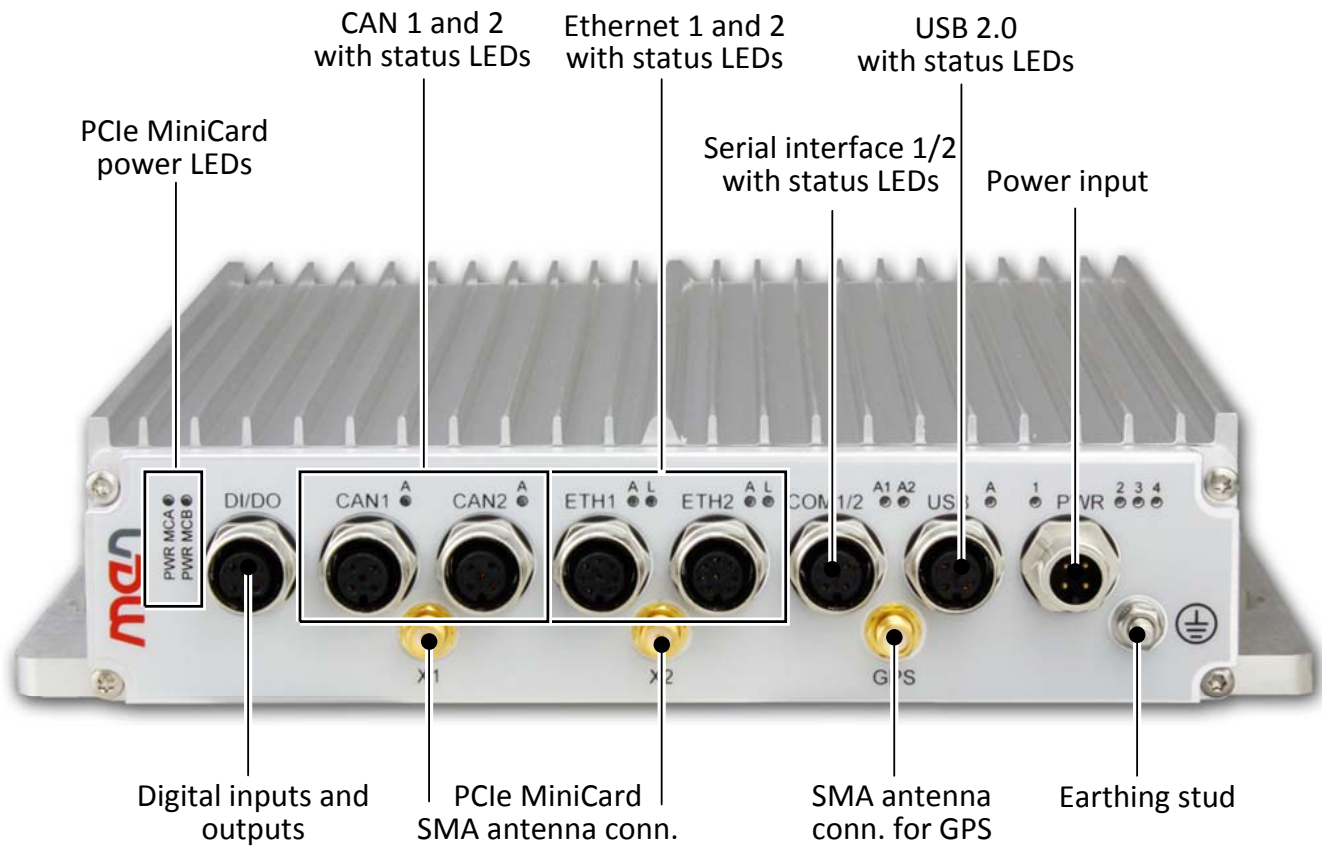
high scalability in CPU (single/dual core) performance. It is equipped with 2 GB of DDR3 SDRAM and offers SD card and mSATA slots. The system is designed for fanless operation at temperatures from -40 to +70°C (+85°C for up to 10 minutes), its special aluminum housing with cooling fins serves as a heat sink for the internal electronics and in this way provides conduction cooling.

Designed for In-Vehicle Operation

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 ignition signal can be adjusted by software.

Flexible and Scalable

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

CAN 1 and 2
with status LEDs

Ethernet 1 and 2
with status LEDs

USB 2.0
with status LEDs

PCIe MiniCard
power 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	■ The following CPU types are supported:
	□ AMD T48N, 2 cores, 1.4 GHz, 18 W, AMD Radeon HD 6310
	□ AMD T56N, 2 cores, 1.65 GHz, 18 W, AMD Radeon HD 6320 (on request)
	□ AMD T56E, 2 cores, 1.65 GHz, 18 W, AMD Radeon HD 6250 (on request)
	□ AMD T48E, 2 cores, 1.4 GHz, 18 W, AMD Radeon HD 6250 (on request)
	□ AMD T40N, 2 cores, 1.0 GHz, 9 W, AMD Radeon HD 6290 (on request)
	□ AMD T40E, 2 cores, 1.0 GHz, 6.4 W, AMD Radeon HD 6250 (on request)
	□ AMD T52R, 1 core, 1.5 GHz, 18 W, AMD Radeon HD 6310 (on request)
	□ AMD T44R, 1 core, 1.2 GHz, 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, 1 core, 615 MHz, 4.5 W, AMD Radeon HD 6250 (on request)
	□ AMD T48L, 2 cores, 1.4 GHz, 18 W (on request)
	□ AMD T30L, 1 core, 1.4 GHz, 18 W (on request)
	□ AMD T24L, 1 core, 1000 MHz, 5 W (on request)

Chipset	■ AMD A55E Controller Hub

Memory	■ System RAM
	□ Soldered DDR3
	□ 4 GB max.

Mass Storage	■ The following mass storage devices can be assembled:
	□ mSATA
	□ SD card
	□ SSD/HDD 2.5" (SATA, on request)

Wireless Functionality	■ Possible wireless functions:
	□ GNSS
	□ LTE
	□ WLAN

Technical Data

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Interfaces

- USB
  - 1x USB 2.0, M12, A-coded, receptacle
- Ethernet
  - 2x 1000BASE-T, M12, A-coded, receptacle
- Wireless
  - GNSS antenna connector: 1x, SMA receptacle
- PCI Express Mini Card
  - 2x PCI Express Mini Card slot
  - Slot A: PCIe Full-Mini; PCIe x1, USB 2.0
  - Slot B: PCIe Full-Mini; PCIe x1, USB 2.0
- SIM card
  - 4x micro-SIM card slot, internally accessible
- Digital I/O
  - 2x digital input, isolated, M12, B-coded, receptacle
  - 2x digital output, isolated, M12, B-coded, receptacle
- Serial
  - 2x RS232, isolated, M12, A-coded, receptacle
- CAN bus
  - 2x, isolated, M12, A-coded, receptacle
- LED
  - Status: board status, power status
  - USB: activity
  - Ethernet: link, activity
  - CAN: activity
  - COM: activity
  - PCI Express Mini Card: power
  - User configurable: 2x
- Cutout
  - Antenna connector: RP-SMA receptacle, RP-SMA plug, QMA receptacle, QMA plug
- Power
  - 1x power inlet
  - Ignition input
  - Earthing connection

Supervision and Control

- Board management controller
- Watchdog timer
- Temperature measurement
- Real-time clock, buffered supercapacitor (12 h, 72 h on request)

Electrical Specifications

- Supply voltage
  - 24 V DC to 36 V DC nom. (EN 50155)
  - 24 V DC nom. (ISO 7637-2)
  - EN 50155 power interruption class S2
- Power consumption: 30 W max.

Mechanical Specifications

- Dimensions: (W) 250 mm, (D) 220 mm, (H) 48.1 mm
- Weight: 2.6 kg
- Cooling
  - Air cooling, natural convection, airflow 0.4 m/s
- Protection rating
  - IP65

Technical Data

Environmental Specifications
- Temperature range (operation):
  □ Depends on system configuration (CPU, PCIeMiniCards, Ethernet, USB, ...)
  □ Maximum: +70°C (+85°C for 10 minutes) according to EN 50155 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

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

Safety
- Fire Protection
  □ EN 45545-2:2013 + A1:2015, HL3 (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/Boot Loader
- 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

Germany

MEN Mikro Elektronik GmbH

Neuwieder Straße 1-7
90411 Nuremberg
Phone +49-911-99 33 5-0

sales@men.de
www.men.de

USA

MEN Micro Inc.

860 Penllyn Blue Bell Pike
Blue Bell, PA 19422
Phone 215-542-9575

sales@menmicro.com
www.menmicro.com

France

MEN Mikro Elektronik SAS

18, rue René Cassin
ZA de la Châtelaine
74240 Gaillard
Phone +33-450-955-312

sales@men-france.fr
www.men-france.fr

China

MEN Mikro Elektronik Co., Ltd.

Room 1212, #993 West Nanjing Road
Shanghai 200041
Phone +86-21-5058-0963

sales@men-china.cn
www.men-china.cn

Up-to-date information, documentation and ordering information:
www.men.de/products/bc50r/

Contact Information