

BC50R – IP65 Box PC for In-Vehicle Applications (AMD)

- **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 onboard**
- **24 VDC and 36 VDC nom. (10 to 50.4 V) 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. (10 to 50.4 V) 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.

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 ■ One mSATA slot <ul style="list-style-type: none"> □ SATA Revision 2.x support □ Transfer rates up to 300 MB/s (3 Gbit/s)
Front I/O	<ul style="list-style-type: none"> ■ Positioning: GPS, GLONASS <ul style="list-style-type: none"> □ Via one SMA antenna connector at the front □ 1 status LED on front ■ Ethernet <ul style="list-style-type: none"> □ 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 <ul style="list-style-type: none"> □ One USB 2.0 client port □ M12 connector at front panel □ EHCI implementation □ One status LED at front panel ■ CAN bus <ul style="list-style-type: none"> □ Two CAN bus channels □ Two M12 connectors at front panel □ 1 LED at front panel for each CAN port ■ Two RS232 UART (COM1/2) <ul style="list-style-type: none"> □ 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 <ul style="list-style-type: none"> □ 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	<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 ■ 2 SIM card slots ■ PCI Express® and USB interface
Real-Time Clock	<ul style="list-style-type: none"> ■ Buffered by Gold Cap for up to 72 h
Electrical Specifications	<ul style="list-style-type: none"> ■ Supply voltage: <ul style="list-style-type: none"> □ 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: up to 30 W

Technical Data

Mechanical Specifications	<ul style="list-style-type: none"> ■ Dimensions: approx. 250 mm x 220 mm x 48.1 mm ■ Weight: 1.8 kg ■ Front protected according to IP65
Environmental Specifications	<ul style="list-style-type: none"> ■ Temperature range (operation): <ul style="list-style-type: none"> □ 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	<ul style="list-style-type: none"> ■ 262,804 h @ 40°C according to IEC/TR 62380 (RDF 2000)
Safety	<ul style="list-style-type: none"> ■ Flammability <ul style="list-style-type: none"> □ UL 94V-0 ■ Fire Protection <ul style="list-style-type: none"> □ EN 45545-2 ■ Electrical Safety <ul style="list-style-type: none"> □ EN 50153 □ EN 50155
EMC Compliance (Automotive)	<ul style="list-style-type: none"> ■ ECE R10 (E-mark)
EMC Compliance (Railway)	<ul style="list-style-type: none"> ■ EN 50121-3-2
EMC Compliance (Ship)	<ul style="list-style-type: none"> ■ EN 60945
BIOS	<ul style="list-style-type: none"> ■ InsydeH2O™ UEFI Framework
Software Support	<ul style="list-style-type: none"> ■ Windows® 7 ■ Windows® Embedded Standard 7 ■ Linux ■ For more information on supported operating system versions and drivers see Software.

Ordering Information

Standard BC50R Models	09BC50R00	BoxPC, PSU for 24VDC input voltage, CPU AMD G-Series T48L 1.4 GHz dual core, 2GB DDR3 RAM, 2x 1Gbit/s Ethernet, 1x USB, 2x CAN (high speed), 2x RS232, 2x PCIeMiniCard socket, 4x µSIM card socket, 1x SATA socket (for AE84), 1x mSATA socket, 1x SD-Card slot, -40°C..+70°C (screened)
Memory	0751-0047	SD card, 4GB, -40..+85°C
	0751-0051	SSD mSATA, 8 GB, -40..+85°C
PCI Express® Mini Cards	0799-0006	WLAN PCI Express® MiniCard DNXA-116, operating temperature -40..+85°C (screened), storage temperature -40..+85°CNote: when using wireless modules the R&TTE Guideline of the EU has to be observed. See the R&TTE website For the module's driver contact MEN's support team
	0799-0007	MC7304 PCI Express® MiniCard, full-size on USB: LTE, DC-HSPA+, HSPA+, HSDPA, HSUPA, WCDMA, GSM, GPRS, EDGE, and GNSS, -40..+85°C operation temperatureNote: when using wireless modules the R&TTE Guideline of the EU has to be observed. See the R&TTE website For the module's driver contact MEN's support team
Miscellaneous Accessories	0781-0002	HF antenna cable with U.FL connector to RP-SMA connector, 200 mm
Software: Linux	This product is designed to work under Linux. See below for all available separate software packages.	
	13MD05-90	MDISS System (and Device Driver) Package (MEN) for Linux. This software package includes most standard device drivers available from MEN.
	135C24-90	Linux I2C controller driver (MEN) for SC24, AE51, BC50M, BC50I, BL50W and BL50S
	135C24-91	Linux tool (MEN) for UART mode setting for SC24, SC25, BC50M, BC50I, BL50W, BL50S, BL70W and BL70S
	13T026-90	Linux GPU and chipset driver (AMD) for BC50M, BC50I, BL50W, BL50S, SC24 and G214
	13Z016-06	MDISS driver (MEN) for 16Z029_CAN (CANopen master)
	13Z100-91	Linux FPGA update tool (MEN)

Ordering Information

Software: Windows®

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

10Y000-78	Windows® Embedded Standard 7 BSP for F19P, F21P, F22P, F23P, G20, G22, CB70C, CB70, XM2, MM2, BC50M, BC50I, BL50W, BL50S, BC70M, BL70S, BL70W, BL70E, DC2, DC13, F205, F206, F210, F215, F216, G215, P506, P507 and P511
13SC24-77	Windows® Installset (MEN) for SC24, SC25, BC50M, BC50I, BL50W, BL50S, BL70W and BL70S (Includes all free drivers developed by MEN for the supported hardware.)
13T010-70	Windows® 32-bit network driver (Intel®) for XM1, XM1L, XM2, MM2, CB70C, F11S, F18, F18E, F19P, F21P, F22P, G20, G22, GM1, GM2, GM3, G211, G211F, SC24, BC50I, BC50M, BL50W, BL50S, BL70W and BL70S
13T020-70	Windows® 64-bit network driver (Intel®) for F18, F18E, F19P, F21P, F22P, G20, G22, GM1, GM2, GM3, G211, G211F, XM2, CB70C, SC24, BC50I, BC50M, BL50W, BL50S, BL70W and BL70S
13T025-70	Windows® XP GPU and chipset driver (AMD) for BC50M, BC50I, BL50W, BL50S and SC24
13T026-70	Windows® Vista™/7/8 GPU and Chipset Driver (AMD) for BC50M, BC50I, BL50W, BL50S, SC24 and G214
13T037-70	HD Audio Driver (VIA) for SC24, SC25, BC50M, BL50W, BL50S, BL70W and BL70S
13Y018-70	Windows® 64-bit FPGA update tool (MEN)
13Y021-70	Windows® ERTC/SMB support package

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

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