

# BC50I – Box PC for Industrial Applications

- **AMD Embedded G-Series Dual-Core APU**
- **2 Gigabit Ethernet**
- **2 USB 2.0**
- **2 DisplayPort® outputs, full HD with each display**
- **WLAN, GSM (2G), UMTS (3G), LTE (4G), GPS or GLONASS via 1 PCI Express® Mini Card slot**
- **2 Slots for IBIS, GPS, RS232, RS485, RS422**
- **1 CAN Bus interface optional**
- **24 VDC nom. (16 to 36 V)**
- **-40 to +70°C operating temperature**
- **Fanless and maintenance-free design**



The BC50I is a maintenance-free box computer that has been designed for independent use or as display computer electronics for use in industrial applications, e.g. for machine control, surveillance or commercial vehicles or robotics.

It 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 BC50I 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, its special aluminum housing with cooling fins serves as a heat sink for the

internal electronics and in this way provides conduction cooling.

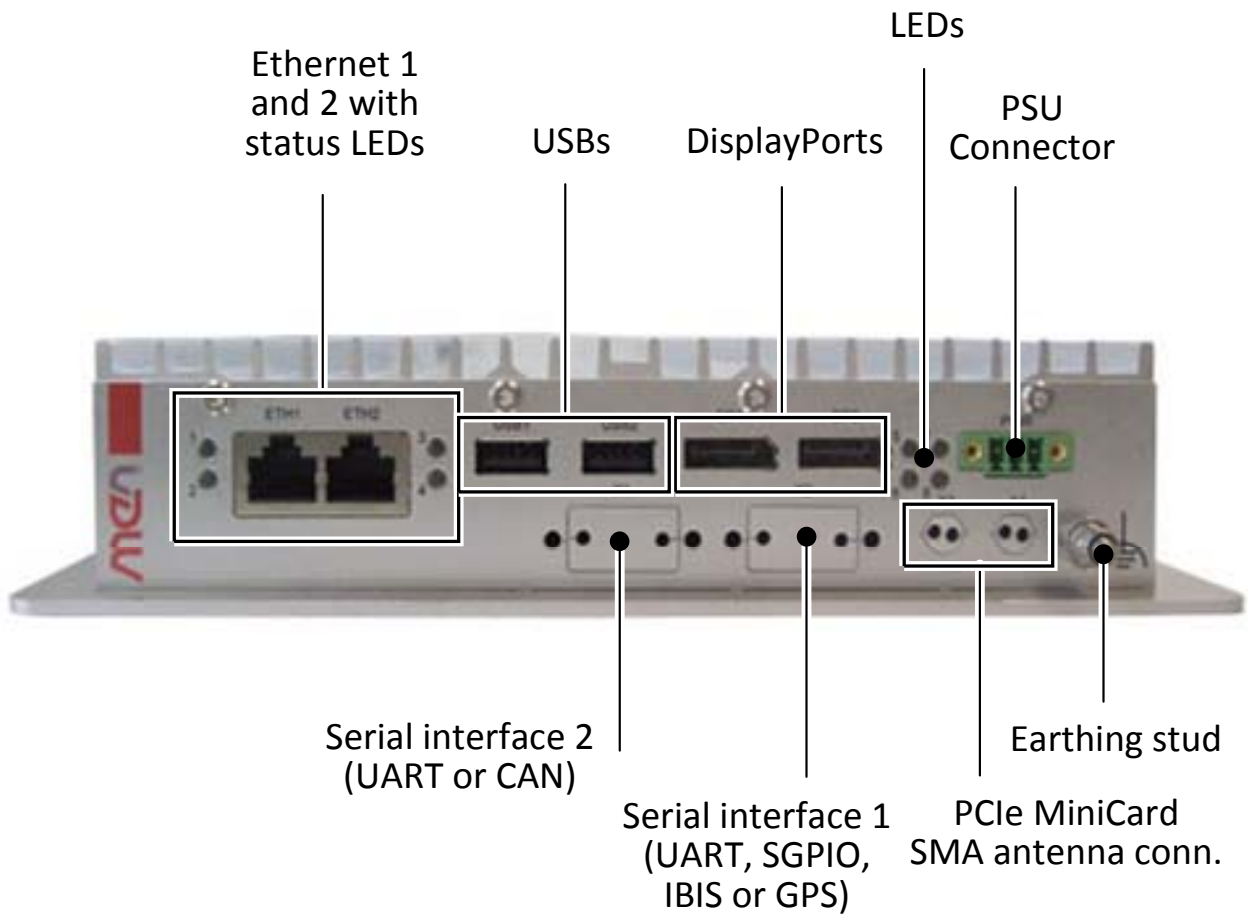
The BC50I supports up to two DisplayPort® interfaces with a maximum resolution of 2560x1600 each. The DisplayPort® interfaces and all other I/O are available at the unit's front panel on standard connectors like USB, 9-pin D-Sub (optional serial I/O), RJ45 (Gigabit Ethernet) and DisplayPort®.

On the inside, the system offers one PCI Express® Mini card slot with a SIM card slot. The necessary antenna connectors can be made available at the front panel.

The BC50I comes with its own integrated 24 VDC nom. (16 to 36 V) power supply.

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



## Technical Data

<b>CPU</b>	<ul style="list-style-type: none"> <li>■ AMD Embedded G-Series T48N <ul style="list-style-type: none"> <li>□ Dual-Core</li> <li>□ 1.4 GHz processor core frequency</li> <li>□ 1066 MT/s DDR3 Speed</li> <li>□ Accelerated Processing Unit (APU), also includes GPU (see Graphics)</li> </ul> </li> </ul>
<b>Controller Hub</b>	<ul style="list-style-type: none"> <li>■ AMD A55E</li> </ul>
<b>Memory</b>	<ul style="list-style-type: none"> <li>■ 64 KB L1 and 512 KB L2 cache</li> <li>■ 2 GB DDR3 SDRAM system memory <ul style="list-style-type: none"> <li>□ Soldered</li> </ul> </li> </ul>
<b>Mass Storage</b>	<ul style="list-style-type: none"> <li>■ One SD card slot <ul style="list-style-type: none"> <li>□ Via USB</li> </ul> </li> <li>■ One mSATA slot <ul style="list-style-type: none"> <li>□ SATA Revision 3.x support</li> <li>□ Transfer rates up to 600 MB/s (6 Gbit/s)</li> </ul> </li> <li>■ Serial ATA (SATA) <ul style="list-style-type: none"> <li>□ One port for hard-disk/solid-state drive mounted within the unit's housing</li> <li>□ SATA Revision 3.x support</li> <li>□ Transfer rates up to 600 MB/s (6 Gbit/s)</li> </ul> </li> </ul>
<b>Graphics</b>	<ul style="list-style-type: none"> <li>■ AMD Radeon™ HD 6310 <ul style="list-style-type: none"> <li>□ Dual independent display support</li> <li>□ Dual DisplayPort®</li> <li>□ Maximum resolution: 2560x1600</li> <li>□ Embedded in T48N APU</li> </ul> </li> <li>■ 3D Graphics Acceleration <ul style="list-style-type: none"> <li>□ Full DirectX® 11 support, including full speed 32-bit floating point per component operations</li> <li>□ Shader Model 5</li> <li>□ OpenCL™ 1.1 support</li> <li>□ OpenGL® 4.0 support</li> </ul> </li> <li>■ Motion Video Acceleration <ul style="list-style-type: none"> <li>□ Dedicated hardware (UVD 3) for H.264, VC-1 and MPEG2 decoding</li> <li>□ HD HQV and SD HQV support: noise removal, detail enhancement, color enhancement, cadence detection, sharpness, and advanced de-interlacing</li> <li>□ Super up-conversion for SD to HD resolutions</li> </ul> </li> </ul>
<b>Front I/O</b>	<ul style="list-style-type: none"> <li>■ 2 DisplayPort® 1.1a interfaces <ul style="list-style-type: none"> <li>□ AUX channels and hot plug detection</li> </ul> </li> <li>■ 2 Gigabit Ethernet <ul style="list-style-type: none"> <li>□ Via RJ45 connectors</li> </ul> </li> <li>■ 2 USB 2.0 <ul style="list-style-type: none"> <li>□ Via Series A connector</li> </ul> </li> <li>■ 2 SA-Adapter™ slots for serial I/O <ul style="list-style-type: none"> <li>□ RS232, RS485, RS422, IBIS or GPS possible on both slots</li> <li>□ SGPIO switchable by software on one slot</li> <li>□ CAN bus optional on one slot</li> </ul> </li> <li>■ 8 LEDs <ul style="list-style-type: none"> <li>□ 4 for Ethernet link and activity status</li> <li>□ 2 user LEDs</li> <li>□ 1 status LED</li> <li>□ 1 power OK LED</li> </ul> </li> </ul>
<b>1 PCI Express® Mini Card slot</b>	<ul style="list-style-type: none"> <li>■ For functions such as <ul style="list-style-type: none"> <li>□ Mobile service standards: GSM (2G), UMTS (3G), LTE (4G) and derivatives</li> <li>□ Wireless communication: WLAN / WiFi IEEE 802.11 and derivatives</li> <li>□ Positioning: GPS, GLONASS, GALILEO</li> </ul> </li> <li>■ 1 SIM card slot</li> <li>■ PCI Express® and USB interface</li> </ul>

## Technical Data

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<b>Real-Time Clock</b>	<ul style="list-style-type: none"><li>■ Buffered by Gold Cap for up to 12 h<ul style="list-style-type: none"><li>□ 72 h as an option</li></ul></li></ul>
<b>Electrical Specifications</b>	<ul style="list-style-type: none"><li>■ Supply voltage:<ul style="list-style-type: none"><li>□ 24 VDC nom. (16 to 36 V)</li><li>□ Run-down time after power-off</li></ul></li><li>■ Power consumption: up to 35 W (with PCI Express® Mini Card)</li></ul>
<b>Mechanical Specifications</b>	<ul style="list-style-type: none"><li>■ Dimensions: approx. 250 mm x 220 mm x 44.1 mm</li><li>■ Weight: 1.8 kg</li><li>■ Front protected according to IP20</li></ul>
<b>Environmental Specifications</b>	<ul style="list-style-type: none"><li>■ Temperature range (operation):<ul style="list-style-type: none"><li>□ -40°C to 70°C</li><li>□ Fanless operation</li></ul></li><li>■ Temperature range (storage): -40..+85°C</li><li>■ Relative humidity (operation): max. 95% non-condensing</li><li>■ Relative humidity (storage): max. 95% non-condensing</li><li>■ Altitude: -300 m to +3,000 m</li><li>■ Shock: 50 m/s<sup>2</sup>, 30 ms</li><li>■ Vibration (function): 1 m/s<sup>2</sup>, 5 Hz - 150 Hz</li><li>■ Vibration (lifetime): 7.9 m/s<sup>2</sup>, 5 Hz - 150 Hz</li><li>■ Conformal coating of internal components on request</li></ul>
<b>MTBF</b>	<ul style="list-style-type: none"><li>■ tbd @ 40°C according to IEC/TR 62380 (RDF 2000)</li></ul>
<b>Safety</b>	<ul style="list-style-type: none"><li>■ PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers</li></ul>
<b>EMC</b>	<ul style="list-style-type: none"><li>■ Conforming to EN 55022 (radio disturbance), IEC 61000-4-2 (ESD) and IEC 61000-4-4 (burst)</li></ul>
<b>BIOS</b>	<ul style="list-style-type: none"><li>■ InsydeH2O™ UEFI Framework</li></ul>
<b>Software Support</b>	<ul style="list-style-type: none"><li>■ Windows® 7</li><li>■ Windows® Embedded Standard 7</li><li>■ Windows® XP Embedded</li><li>■ Linux</li><li>■ <a href="#">For more information on supported operating system versions and drivers see Downloads.</a></li></ul>

## Configuration & Options

### Standard Configurations

Article No.	APU	Graphics	Memory	Input Voltage	Antenna Connectors	SATA HDD/SSD
09BC50I00	AMD T48N, 1.4 GHz Dual Core (18W)	AMD Radeon HD 6310	2 GB DDR3-1066, 64KB L1 cache, 512kB L2 cache	24 VDC nom.	No	No

### Options

<b>APU</b>	<ul style="list-style-type: none"> <li>■ AMD T56N, 1.65 GHz Dual Core, 18W, AMD Radeon™ HD 6320</li> <li>■ AMD T56E, 1.65 GHz Dual Core, 18W, AMD Radeon™ HD 6250</li> <li>■ AMD T48N, 1.4 GHz Dual Core, 18W, AMD Radeon™ HD 6310</li> <li>■ AMD T48E, 1.4 GHz Dual Core, 18W, AMD Radeon™ HD 6250</li> <li>■ AMD T40N, 1.0 GHz Dual Core, 9W, AMD Radeon™ HD 6290</li> <li>■ AMD T40E, 1.0 GHz Dual Core, 6.4W, AMD Radeon™ HD 6250</li> <li>■ AMD T52R, 1.5 GHz Single Core, 18W, AMD Radeon™ HD 6310</li> <li>■ AMD T44R, 1.2 GHz Single Core, 9W, AMD Radeon™ HD 6250</li> <li>■ AMD T40R, 1.0 GHz Single Core, 5.5W, AMD Radeon™ HD 6250</li> <li>■ AMD T16R, 615 MHz Single Core, 4.5W, AMD Radeon™ HD 6250</li> <li>■ AMD T48L, 1.4 GHz Dual Core, 18W</li> <li>■ AMD T30L, 1.4 GHz Single Core, 18W</li> <li>■ AMD T24L, 1000 MHz Single Core, 5W</li> </ul>
<b>Memory</b>	<ul style="list-style-type: none"> <li>■ Up to 4 GB DDR3 SDRAM system memory</li> <li>■ SATA hard-disk/solid state drive (mounted within housing)</li> </ul>
<b>Graphics</b>	<ul style="list-style-type: none"> <li>■ Maximum resolution depending on GPU                             <ul style="list-style-type: none"> <li>□ 2560x1600 (all DisplayPort® interfaces) with Radeon™ HD 6310 and 6320</li> <li>□ 1920x1200 (all DisplayPort® interfaces) with Radeon™ HD 6250 and 6290</li> </ul> </li> </ul>
<b>I/O</b>	<ul style="list-style-type: none"> <li>■ Antenna connectors                             <ul style="list-style-type: none"> <li>□ For functions like Wi-Fi, WIMAX, GSM/GPRS, UMTS, LTE in combination with PCI Express® Mini Card</li> <li>□ Reverse SMA connector</li> </ul> </li> </ul>
<b>Environmental Specifications</b>	<ul style="list-style-type: none"> <li>■ Temperature range (operation):                             <ul style="list-style-type: none"> <li>□ -40°C to 85°C (screened) with wider housing with additional cooling fins</li> </ul> </li> </ul>

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

<b>Standard BC50I Models</b>	<b>09BC50I00</b>	Industrial box computer with dual graphics connection, 24 VDC PSU, AMD Dual Core T48N, 1.4 GHz, 2 GB RAM, SD card slot, mSATA slot, 2x DisplayPort®, 2x Gb Ethernet RJ45, 2x USB, 2x SA-Adapter™ slot (UARTs, fieldbuses), 1x PCI Express® Mini card slot, 1x SIM card slot, -40..+70°C screened
<b>Related Hardware</b>	<b>15PX01-00</b>	GLONASS & GPS PCI Express® MiniCard (full size), 3-axis Gyro sensor, -40..+85°C with qualified components
<b>Memory</b>	<b>0751-0047</b>	SD card, 4GB, -40..+85°C
	<b>0751-0051</b>	SSD mSATA, 8 GB, -40..+85°C
	<b>0754-0007</b>	SSD SATA 256 GB, 2.5" MLC, 0..+70°C
<b>SA-Adapters™</b>	<b>08SA01-06</b>	RS232, not optically isolated, -40..+85°C screened
	<b>08SA02-07</b>	RS422/485, full duplex, optically isolated, -40..+85°C screened
	<b>08SA03-01</b>	1 RS232, optically isolated, -40..+85°C screened
	<b>08SA08-01</b>	CAN ISO high-speed, optically isolated, -40..+85°C screened
	<b>08SA15-00</b>	8 digital I/O channels, -40..+85°C with qualified components, no RoHS
	<b>08SA22-00</b>	IBIS master SA-Adapter™, -40..+85°C screened
	<b>08SA22-01</b>	IBIS slave SA-Adapter™, -40..+85°C screened
<b>Miscellaneous Accessories</b>	<b>05BC01-00</b>	19" insertion frame for Box PCs including 2 heat sinks <a href="#">More info</a>
	<b>0780-0005</b>	DisplayPort® to DVI-D adapter, 20 cm
	<b>0780-0006</b>	Active DisplayPort® (DP) to single link DVI-D adapter, 20cm, max. resolution 1920x1200, AMD / ATI Eyefinity technology
	<b>0781-0002</b>	HF antenna cable with U.FL connector to RP-SMA connector, 200 mm
	<b>0799-0003</b>	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 <a href="#">R&amp;TTE Guide of the EU</a> has to be observed. See <a href="#">the R&amp;TTE website</a> For the module's driver see <a href="#">Option's website</a>
	<b>0799-0004</b>	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 <a href="#">R&amp;TTE Guide of the EU</a> has to be observed. See <a href="#">the R&amp;TTE website</a> For the module's driver see <a href="#">Intel®'s website</a>

## Ordering Information

### Software: Linux

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

<b>13SC24-90</b>	Linux I2C controller driver (MEN) for SC24, AE51, BC50M, BC50I and BL50W
<b>13Y004-06</b>	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
<b>13Z010-06</b>	MDIS4™/2004 / MDIS5™ low-level driver sources (MEN) for 16Z076_QSPI
<b>13Z015-06</b>	MDIS5™ low-level driver sources (MEN) for 16Z029_CAN (MSCAN/Layer2)
<b>13Z016-06</b>	MDIS5™ driver (MEN) for 16Z029_CAN (CANopen master)
<b>13Z017-06</b>	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.

<b>10F014-78</b>	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
<b>10Y000-78</b>	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
<b>13SC24-77</b>	Windows® Installset (MEN) for SC24, BC50M, BC50I and BL50W (Includes all free drivers developed by MEN for the supported hardware.)
<b>13T010-70</b>	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
<b>13T020-70</b>	Windows® 64-bit network driver (Intel®) for F18, F18E, F19P, F21P, F22P, G20, G22, GM1, GM2, G211, G211F, XM2, SC24, BC50I, BC50M and BL50W
<b>13T025-70</b>	Windows® XP GPU and chipset driver (AMD) for BC50M, BC50I, BL50W and SC24
<b>13T026-70</b>	Windows® Vista™ / Windows® 7 GPU and chipset driver (AMD) for BC50M, BC50I, BL50W, SC24 and G214
<b>13Z010-70</b>	MDIS5™ Windows® driver (MEN) for 16Z076_QSPI devices
<b>13Z015-70</b>	MDIS4™/2004 / MDIS5™ Windows® driver (MEN) for 16Z029_CAN (MSCAN/Layer2)
<b>13Z016-70</b>	MDIS5™ Windows® driver (MEN) for 16Z029_CAN (CANopen master)
<b>13Z017-70</b>	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](#)

<b>20BC50IER</b>	BC50I Errata
<b>20BC50IOO</b>	BC50I User Manual

## Contact Information

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### Germany

MEN Mikro Elektronik GmbH  
Neuwieder Straße 3-7  
90411 Nuremberg  
Phone +49-911-99 33 5-0  
Fax +49-911-99 33 5-901

info@men.de  
www.men.de

### France

MEN Mikro Elektronik SA  
18, rue René Cassin  
ZA de la Châtelaine  
74240 Gaillard  
Phone +33 (0) 450-955-312  
Fax +33 (0) 450-955-211

info@men-france.fr  
www.men-france.fr

### USA

MEN Micro Inc.  
860 Penllyn Blue Bell Pike  
Blue Bell, PA 19422  
Phone (215) 542-9575  
Fax (215) 542-9577

sales@menmicro.com  
www.menmicro.com

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