

DC1 – Rugged 15" Panel PC

- **15" 4:3 TFT LCD panel**
- **1024 x 768 pixels resolution**
- **Intel® Atom™ processor**
- **2 Fast Ethernet, 2 USB**
- **Wide-range PSU 24 VDC nom. (14.4 to 33.6 V)**
- **-40 to +85°C operating temperature**
- **Rugged aluminum enclosure**
- **Fanless and maintenance-free design**
- **IP 54 compliant (front)**
- **EN 50155 compliant (railways)**
- **Windows® XP Embedded image (120-day trial version)**



The display computer DC1 is a rugged, fanless and maintenance-free panel PC for harsh, mobile and mission-critical applications. Its robust stainless enclosure is protected against violent impacts and designed for, e.g., infotainment purposes in trains, public buses or airplanes.

The DC1 is controlled by the Intel® Atom™ Z530 running at 1.6 GHz. It comes with 1 GB of DDR2 SDRAM and 4 GB of USB-driven Flash disk. The standard interfaces comprise 2 Fast Ethernet and 2 USB ports as well as four binary inputs (with a fifth used for key input functionality). The two Ethernet interfaces have switch functionality to provide Ethernet connection also to subsequent intelligent displays. A temperature sensor monitors and controls the display.

All I/O signals are concentrated at the bottom side of the DC1. The whole unit can be directly mounted to a VESA mount or side-by-side with a second display. The standard version of the DC1 complies with the EN 50155, class Tx railway standard. It is thus for example equipped with an internal 24 VDC nom. wide-range power supply and able to operate in a -40 to +70°C environment (+85°C for 10 minutes; -30 to +70°C for the display panel with automatic switch-off at excess temperatures).

The control electronics are directly attached to the back of the screen, supporting 19", 17", 15", 12" and optionally even smaller display and housing sizes. The computer unit itself builds on the Intel® ultra-mobile low-power processor family starting with the Intel® Atom™ Z530 at 1.6 GHz or Z510 at 1.1 GHz.

On request a serial interface can be added and the USB interfaces can be individually configured up to a maximum of 5 ports (alternatively serial interfaces), one of which a client port. A connection for a secondary display (onboard via LVDS or external via DVI-D) can be made accessible, with then two displays able to provide different and equal content at the same time. Additional I/O may optionally comprise HD audio or field bus functions like IBIS.

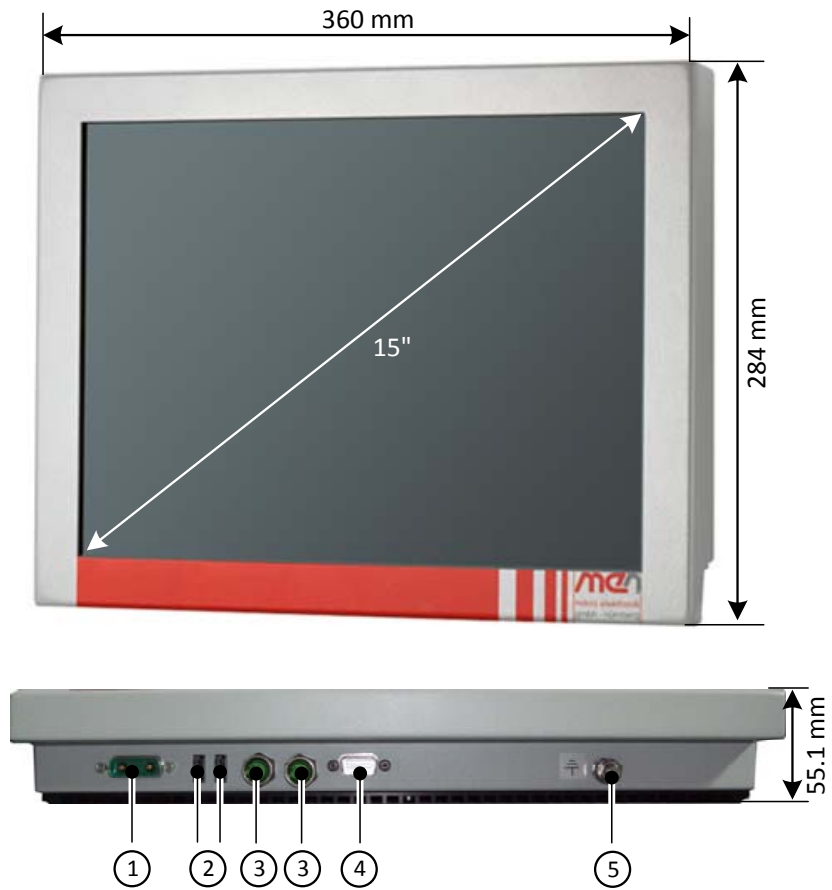
A PCI Express® Mini Card slot combined with an external antenna can be used to incorporate wireless functions like Wi-Fi, GSM/GPRS, etc. The concept also allows to use different input voltage ranges of the PSUs, for example 24 VDC nom. (28.8 to 67.2 V), 72 VDC nom. (43.2 to 100.8 V) or 110 VDC nom. (66 to 154 V) for railway applications. With a typical power consumption of only 20 Watts for the total system the design is always realized without fans, using conductive cooling between the electronics and the display to spread the dissipated heat to the outside of the housing.

All electronic components are soldered to withstand shock and vibration and prepared for conformal coating.



Diagram

- ① Power input connector
- ② USB connectors
- ③ Ethernet connectors
- ④ Serial interface (optional)
- ⑤ Earthing stud



Technical Data

CPU	<ul style="list-style-type: none">■ Intel® Atom™ Z530<ul style="list-style-type: none">□ 1.6 GHz processor core frequency□ 533 MHz system bus frequency■ Chipset<ul style="list-style-type: none">□ Intel® system controller hub US15W
Display	<ul style="list-style-type: none">■ Screen size: 15"■ Resolution: 1024 x 768 (XGA) with aspect ratio 4:3■ Luminance: 450 cd/m²■ Contrast: 700:1 typ.■ Viewing angle: 160°/160° (preferred viewing angle 6 o'clock)■ Backlight with brightness control: 2 CCFL min. 50 000 hours■ Interface: LVDS■ Monitored and controlled by a temperature sensor (display is turned off at extreme temperatures)
Memory	<ul style="list-style-type: none">■ 1 GB DDR2 SDRAM system memory<ul style="list-style-type: none">□ Soldered□ 533 MHz memory bus frequency■ 4 GB Flash
I/O	<ul style="list-style-type: none">■ All I/O available at bottom of housing<ul style="list-style-type: none">□ Invisible from the front□ Recessed within the housing■ USB<ul style="list-style-type: none">□ Two USB 2.0 host ports□ Accessible via Series A connectors□ UHCI implementation□ Data rates up to 480 Mbit/s■ Ethernet<ul style="list-style-type: none">□ Two 10/100Base-T Ethernet channels□ Accessible via M12 connectors□ Switch functionality■ 5 binary inputs via mixed 7W2 D-sub power connector<ul style="list-style-type: none">□ 1 for key input functionality□ 4 universal inputs, e.g., for geographical addressing
Electrical Specifications	<ul style="list-style-type: none">■ Isolation voltage: 1500 VDC between isolation groups■ Power consumption: 20 W typ.■ Supply voltage: 24 VDC nom. (14.4 to 33.6 V) according to EN 50155■ Key input functionality■ External power supply: 100..240 VAC in, 24 VDC out
Mechanical Specifications	<ul style="list-style-type: none">■ Dimensions: 360 mm x 284 mm x 55.1 mm■ Weight: 5.2 kg■ Display covered with laminated glass■ Aluminum enclosure■ Prepared for wall mounting■ Front, sides and top protected according to IP54■ Back and bottom protected according to IP21

Technical Data

Environmental Specifications	<ul style="list-style-type: none">■ Temperature range (operation):<ul style="list-style-type: none">□ -30 to +70°C for the display panel (with automatic switch-off of the display at excess temperatures)□ -40°C to 70°C, with up to 85°C for 10 minutes according to class Tx (EN50155), for the computer□ Conductive cooling□ 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 + 3000 m■ Shock: according to EN 50155 (10.2.11)■ Vibration: according to EN 50155 (10.2.11)
MTBF	<ul style="list-style-type: none">■ 36 130 h @ 40°C according to IEC/TR 62380 (RDF 2000)
Safety	<ul style="list-style-type: none">■ PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers■ Insulation according to EN 50155 (10.2.9.1)■ Voltage withstand according to EN 50155 (10.2.9.1)■ No edges and burrs■ Temperature gradient between housing and environment smaller than 15°C
EMC	<ul style="list-style-type: none">■ Conforming to EN 50155, EN 50121-3-2/EN 61000-4-5
Software Support	<ul style="list-style-type: none">■ Windows® XP Embedded image included (120-day trial version)■ Linux■ For more information on supported operating system versions and drivers see Downloads.

Configuration & Options

Standard Configurations

Article No.	Display	Size	PSU	Processor	Memory	Interfaces
09DC01-00	15"	262mm x 333mm x 55.1mm	9-36VDC	Z530	1GB RAM, 4GB Flash	2 Ethernet, 2 USB, 5 binary inputs

Options

CPU	<ul style="list-style-type: none"> ■ Intel® Atom™ Z530, 1.6 GHz ■ Intel® Atom™ Z510, 1.1 GHz
Display	<ul style="list-style-type: none"> ■ Secondary display side-by-side or back-to-back with the first via SDVO-to-LVDS converter (same computer) ■ Secondary display via SDVO-to-DVI converter for remote operation ■ Screen size 12", 15", 17" or 19" ■ Other aspect ratios (e.g. 16:10, 15:9) ■ Higher resolutions
I/O	<ul style="list-style-type: none"> ■ Up to 6 USB 2.0 host ports (or 5 host ports and 1 client port) <ul style="list-style-type: none"> □ If all USBs are used some functions are not available (Serial interface and Flash disk) ■ HD audio ■ DVI-D for remote display ■ Serial interface <ul style="list-style-type: none"> □ 1 serial interface realized via SA-Adapter™, e.g. RS232 or RS422, isolated or not, IBIS, GPS
PCI Express® Mini Card slot	<ul style="list-style-type: none"> ■ For functions like Wi-Fi, WIMAX, GSM/GPRS, UMTS ■ PCI Express® and USB interface ■ Accessible via, e.g., a reverse SMA connector
Electrical Specifications	<ul style="list-style-type: none"> ■ Different input voltage ranges <ul style="list-style-type: none"> □ 48 VDC nom. (28.8..67.2 V), 35 W according to EN50155 □ 72 VDC nom. (43.2..100.8 V), 35 W according to EN50155 □ 110 VDC nom. (66..154 V), 35 W according to EN50155
Safety	<ul style="list-style-type: none"> ■ Completely vandal-proof

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 DC1 Models	09DC01-00	15" display, 9..36V DC input, Intel® Atom™ 1.6GHz, 1GB RAM, 4GB Flash Disk, 2 Fast Ethernet, 2 USB, -40..+70(+85)°C screened, EN50155 compliant
<p>Software: Linux</p> <p>This product is designed to work under Linux. See below for potentially available separate software packages from MEN.</p> <p>For a Linux driver package supporting the Micrel KSZ8842-PMQLI Ethernet controller used in the XC2 and the DC1, please refer to www.micrel.com/index.php/en/products/lan-solutions/controllers/article/15-ksz8842-pmql.html. We highly recommend a kernel newer than 2.6.32.</p> <p>13XC02-06 MDISS™ low level driver sources (MEN) for XC2 PSU Control via SMBus (also used in DC1, DC2, SC21)</p>		
<p>Software: Windows®</p> <p>This product is designed to work under Windows®. See below for potentially available separate software packages from MEN.</p> <p>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</p> <p>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</p> <p>For a Windows® driver package supporting the Micrel KSZ8842-PMQLI Ethernet controller used in the XC2 and the DC1, please refer to www.micrel.com/index.php/en/products/lan-solutions/controllers/article/15-ksz8842-pmql.html.</p> <p>13XM01-77 Windows® Installset (MEN) for XM1, XM1L, DC1, DC2 and SC21. (Includes all free drivers developed by MEN for the supported hardware.)</p>		
<p>Software: Miscellaneous</p> <p>Intel® software development products such as analyzers, compilers, threading tools etc. can be downloaded under www.intel.com/cd/software/products/asm-na/eng/index.htm. IA-32 Intel® Architecture Software Developer's Manuals are available under www.intel.com/products/processor/manuals/index.htm.</p>		
<p>For operating systems not mentioned here contact MEN sales.</p>		
<p>Documentation</p> <p>Compare Chart Standard and Custom Panel PCs » Download</p> <p>20DC01-00 DC1 User Manual</p>		

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