

DC1 - Display Computer



- **15" 4:3 TFT LCD panel**
- **Rugged aluminium enclosure**
- **Fanless and maintenance-free design**
- **Intel® Atom processor 1.6 GHz**
- **1 GB RAM, 4 GB Flash Disk**
- **2 Fast Ethernet, 2 USB**
- **Embedded Windows® XP image**
- **Wide-range PSU 9V..36VDC 35W**
- **-40 to +70(+85)°C operation temperature**
- **IP 54 compliant (front)**
- **EN 50155 compliant**

The display computer DC1 is a rugged, fanless and maintenance-free panel PC for harsh, mobile and mission-critical applications in transportation, avionics, medical engineering and industrial automation. Its robust stainless enclosure is protected against violent impacts and designed for a safeguarded use in direct contact with humans, e.g. for infotainment purposes in trains, public buses or airplanes.

The DC1 is controlled by the Intel® Atom Z530 running at 1.6 GHz with a performance comparable to a Celeron® M 1 GHz and higher. 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 five binary inputs. The two Ethernet interfaces have repeater 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 any type of device or side-by-side or back-to-back with a second display.

The standard version of the DC1 complies with the EN 50155, class Tx railway standard (prepared for coating). It is thus for example equipped with a 9V to 36V wide-range power supply and able to operate in a -40 to +70°C (+85°C for 15 minutes) environment. The DC1 is the first member of a whole family of display computers based on a flexible modular

configuration concept. The control electronics is 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 brand new Intel® ultra-mobile low-power processor family starting with the Intel® Atom Z530 at 1.1 GHz or Z510 at 1.6 GHz. On request a UART interface can be added and the USB interfaces can be individually configured up to a maximum of 5 ports, one of which a client port (alternatively UARTs). A connection for a secondary display (on-board 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 or CAN bus. A MiniPCI Express® card slot in combination with an external antenna can be used to incorporate wireless functions like WIFI, WIMAX, GSM/GPRS, UMTS etc. The concept also allows to use different input voltage ranges of the PSUs, for example 18 to 72V or 36 to 140V up to 154V 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. The housing can be delivered vandal-proof. This display computer series can be qualified according to the applicable quality and security standards of the different markets it has been designed for.

Technical Data

CPU

- Intel® Atom™ Z530 or Z510
 - Up to 1.6GHz processor core frequency
 - 400MHz or 533MHz system bus frequency
- Chipset
 - Intel® system controller hub US15W

Display

- Screen size
 - 15"
- Resolutions
 - 1024 x 768 (XGA) with aspect ratio (4:3)
- Luminance (cd/m²)
 - 450 cd/m²
- Contrast
 - 700 typ.
- Viewing angle
 - 160°/160° (preferred viewing angle 6 o'clock)
- Backlight with brightness control
 - 2 CCFL min. 50,000 hours
- Interface
 - LVDS
- Supply voltage
 - 3.3V
- Dimensions (L/W/D)
 - 326.5 x 253.5 x 14.35 mm (D=max.)
- Monitored and controlled by a temperature sensor

Memory

- Up to 1GB DDR2 SDRAM system memory
 - Soldered
 - 400/533MHz memory bus frequency locked to the FSB frequency
- 4GB Flash

I/O

- All I/O available at bottom of housing
 - Invisible from the front
 - Recessed within the housing
- USB
 - Two USB 2.0 host ports
 - Accessible via Series A connectors
 - UHCI implementation
 - Data rates up to 480Mbits/s
 - External PHY
- Ethernet
 - Two 10/100Base-T Ethernet channels
 - Accessible via M12 connectors
 - Repeater functionality
- 5 binary inputs

Electrical Specifications

- Isolation voltage:
 - 1500V DC between isolation groups
- Power consumption:
 - 20W typ.
- Supply voltage
 - 24VDC (+/- 40%) according to EN50155
- Key input functionality

Mechanical Specifications

- Dimensions: 262mm x 333mm x 55.1mm
- Weight: tbd
- Display covered with laminated glass
- Aluminium enclosure
- Wall-mounted
- Front protected according to IP54
- Housing protected according to IP21

Environmental Specifications

- Temperature range (operation):
 - -40°C to 70°C, with up to 85°C for 15 minutes according to class Tx (EN50155)
 - Conductive cooling
 - Fanless operation
- Temperature range (storage): -40...+85°C
- Relative humidity (operation): max. 95% non-condensing (tbd)
- Relative humidity (storage): max. 95% non-condensing (tbd)
- Altitude: -300m to + 3,000m (tbd)
- Shock: according to EN 50155 (10.2.11)(tbd)
- Vibration: according to EN 50155 (10.2.11)(tbd)

MTBF

- tbd @ 40°C according to IEC/TR 62380 (RDF 2000)

Safety

- 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 (minimum radius on any edge and border min. 7mm)
- Temperature gradient between housing and environment smaller than 15°C

EMC

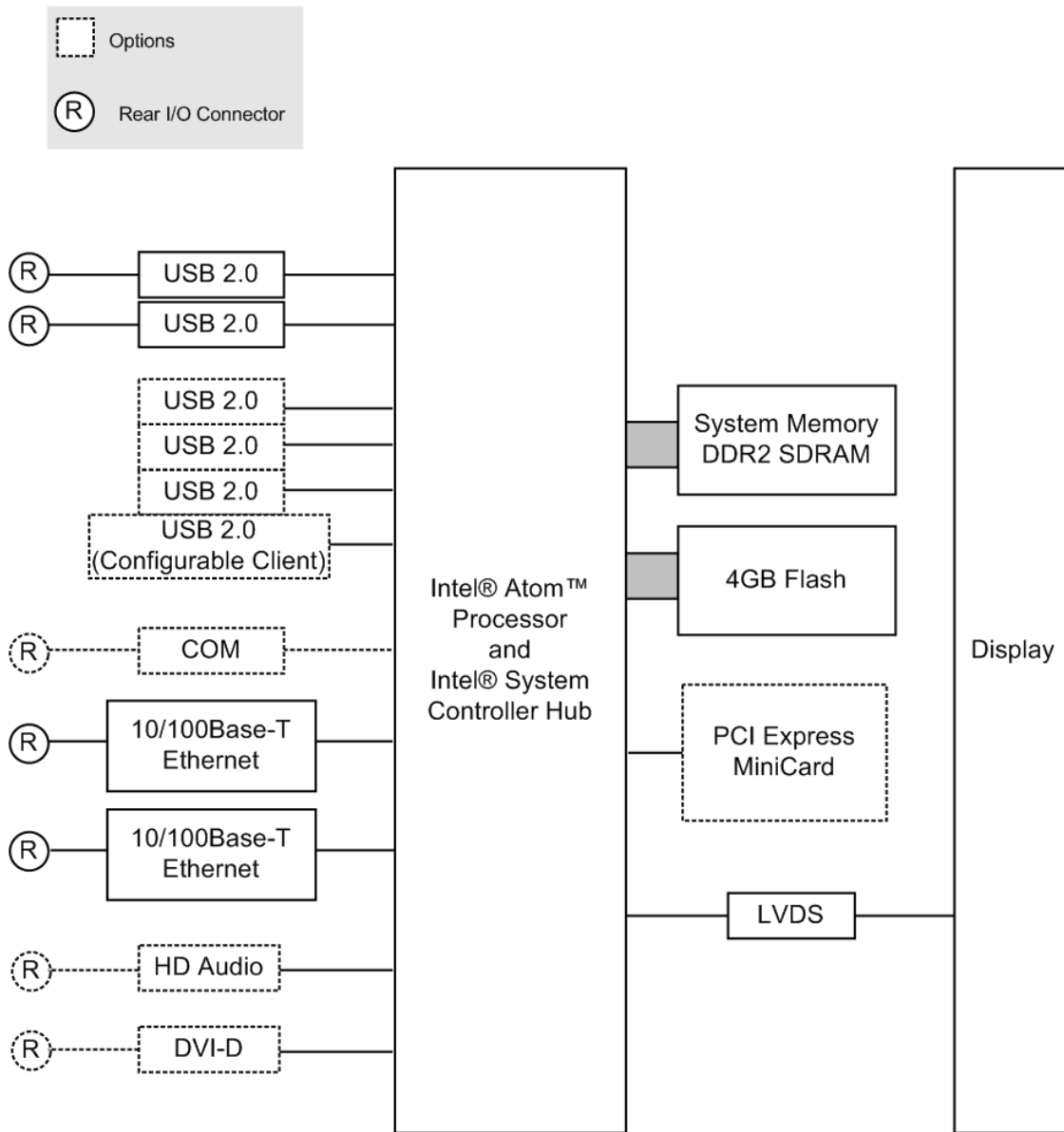
- Conforming to EN 55011 (radio disturbance), IEC1000-4-2 (ESD) and IEC1000-4-4 (burst) with regard to CE conformity

Technical Data

Software Support

- Windows® XP embedded image included
- For more information on supported operating system versions and drivers see Software.

Diagram



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

- Intel® Atom™ Z530, 1.6GHz
- Intel® Atom™ Z510, 1.1GHz

Display

- Secondary display side-by-side or back-to-back with the first via LVDS (same computer)
- Secondary display via DVI-D for remote operation
- Screen size 12", 15", 17" or 19"
- Other aspect ratios (e.g. 16:10, 15:9)
- Higher resolutions

I/O

- Up to 6 USB 2.0 host ports (or 5 host ports and 1 client port)
 - If all USBs are used some functions are not available (UART and Flash disk)
- HD audio
- DVI-D for remote display
- UART (COM)
 - One interface using SA-Adapter™
 - RS232 or RS422, isolated or not, IBIS
 - Data rates up to 230.4kbits/s
 - 16-byte transmit/receive buffer
 - Handshake lines: lines depend on SA-Adapters™

Mini PCI Express® card slot

- For functions like WIFI, WIMAX, GSM/GPRS, UMTS
- PCI Express® or USB interface
- Accessible via Reverse SMA connector

Electrical Specifications

- Different input voltage ranges
 - 18..72VDC, 35W
 - 36..154V DC, 35W

Safety

- Completely vandal-proof

Software

- Linux

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 Hardware

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

For the most up-to-date ordering information and direct
links to other data sheets and downloads, see the DC1
online data sheet under » www.men.de.



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