DC2 – Rugged 10.4" Touch Panel PC

- **10.4" 4:3 TFT LCD with capacitive touch panel**
- **1024 x 768 pixels resolution**
- **Intel® Atom™ processor**
- **2 Fast Ethernet, 2 USB**
- **Wide-range PSU, 12/24 VDC nom.**
- **-40 to +85°C operating temperature**
- **Fanless and maintenance-free design**
- **Prepared for e1 (automotive), IP65 (front), IP20 (rear)**
- **Windows® XP Embedded image (120-day trial version)**

The panel PC DC2 is a rugged, fanless and maintenance-free human-machine interface (HMI) for interactive applications in transportation and industrial automation. It is designed for panel mounting and equipped with a 10.4" 4:3 LCD TFT display with a capacitive touch panel.

The DC2 is controlled by the Intel® Atom™ XL Z520PT running at 1.33 GHz and comes with 1 GB of DDR2 SDRAM and a built-in 2-GB microSD™ card. The standard interfaces comprise 2 Fast Ethernet (via RJ45 connectors) and 2 USB ports as well as four binary inputs (via the 10-pin power supply connector).

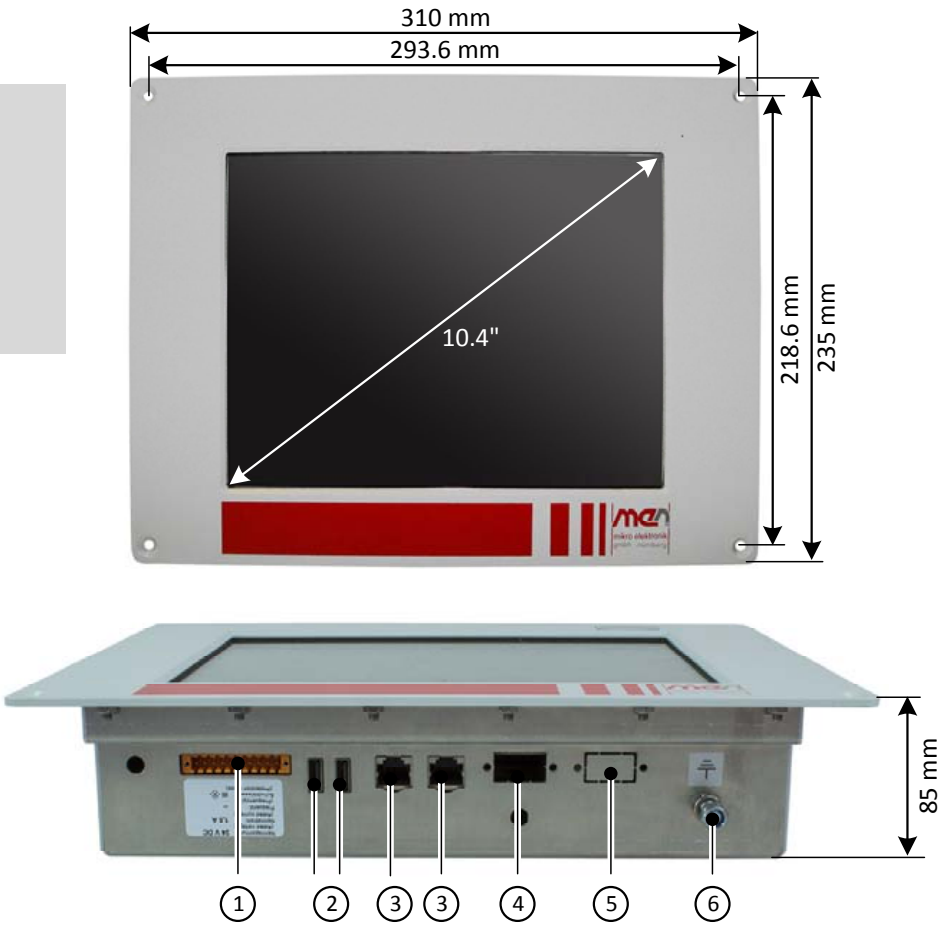
The two Ethernet interfaces have switch functionality to provide Ethernet connection to subsequent intelligent displays. A temperature sensor is provided to monitor and control the display. All I/O signals are concentrated at the bottom of the unit.

The DC2 is equipped with an internal 9 to 36 V (12 VDC nom. or 24 VDC nom.) wide-range power supply and able to operate in a -40 to +70°C environment (+85°C for 10 minutes). It complies with the EN 50155, class Tx railway standard when used with an optional includable PSU suited for railway applications. All electronic components are soldered to withstand shock and vibration and prepared for conformal coating.

The unit's control electronics are directly attached to the back of the display, hence bigger screen sizes or other aspect ratios can be realized easily. Further options include other types of the Intel® Atom™ XL processor, M12 connectors for the Ethernet interfaces, a serial interface or GPS adapter that can be added via an SA-Adapter™, HD audio via a D-Sub connector and an antenna connector. A PCI Express® Mini card slot (with a SIM card slot) in combination with an external antenna can be used to incorporate wireless functions like GPS, GLONASS, Wi-Fi, WIMAX, GSM/GPRS, UMTS, HSDPA and LTE.

Diagram

1. Power input connector
2. USB connectors
3. Ethernet connectors
4. Optional serial interface
5. Optional audio interface
6. Earthing stud



Technical Data

CPU	■ Intel® Atom™ Z520PT □ 1.33 GHz processor core frequency □ 533 MHz system bus frequency ■ Chipset □ Intel® system controller hub US15W
Display	■ Screen size: 10.4" ■ Resolution: 1024 x 768 (XGA) with aspect ratio 4:3 ■ Luminance: 350 cd/m² ■ Contrast: 1200:1 ■ Response time: Ton+Toff average 25 ms ■ Viewing angle: 176°(H)/176°(V) ■ Backlight with brightness control ■ Interface: LVDS ■ Monitored and controlled by a board management controller (display is turned off at extreme temperatures)
Touch functionality	■ Capacitive touch panel ■ USB-driven touch interface ■ Anti-glare layer
Memory	■ 1 GB DDR2 SDRAM system memory □ Soldered □ 533 MHz memory bus frequency ■ microSD™ card slot □ 2 GB microSD™ card
I/O	■ USB □ Two USB 2.0 host ports □ Accessible via Series A connectors □ UHCI implementation □ Data rates up to 480 Mbit/s ■ Ethernet □ Two 10/100Base-T Ethernet channels □ Accessible via RJ45 connectors □ Switch functionality ■ Binary inputs □ Four universal binary inputs via 10-pin power connector, e.g., for geographical addressing
Intelligent Power Supply with Controller	■ Input voltage supervision ■ Temperature supervision via LM50 sensor ■ Backlight control (turns off display at configurable temperatures) ■ Buffer functionality for RTC and BIOS CMOS ■ Reset of CPU board possible ■ Wake on time ■ Watchdog ■ Accessible via SMBus
Electrical Specifications	■ Supply voltage: 12 VDC nom. or 24 VDC nom. (9 to 36 V) ■ Power consumption: 12 W typ.
Mechanical Specifications	■ Dimensions: 267 mm x 187.7 mm x 85 mm (electronics), 310 mm x 235 mm (display frame) ■ Weight: 2.3 kg ■ Designed for panel mounting ■ Front protected according to IP65 ■ Rear protected according to IP20

Technical Data

Environmental Specifications	■ Temperature range (operation): □ -20..+70°C for the display panel (with automatic switch-off of the display at excess temperatures) □ -40..+70°C, with up to +85°C for 10 minutes according to class Tx (EN 50155) for the computer □ Display is turned off at extreme temperatures □ 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	■ 85 051 h @ 40°C according to IEC/TR 62380 (RDF 2000)
EMC	■ Conforming to EN 50155, EN 50121-3-2/EN 61000-4-5 ■ e1 certified by the German Federal Motor Transport Authority
Software Support	■ 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
09DC02-00	10.4"	267 mm x 187.7 mm x 85 mm (electronics), 310 mm x 235 mm (display frame)	12/24 VDC nom. (9-36 VDC)	Z520PT, 1.33 GHz	1GB RAM, 2GB MicroSD card	2 Ethernet (RJ45), 2 USB, 4 binary inputs

Options

CPU	■ Intel® Atom™ Z530P, 1.6 GHz, 533 MHz FSB ■ Intel® Atom™ Z510P, 1.1 GHz, 400 MHz FSB ■ Intel® Atom™ Z520PT, 1.33 GHz, 533 MHz FSB ■ Intel® Atom™ Z510PT, 1.1 GHz, 400 MHz FSB
Display	■ Screen size 12", 15", 17" or 19" ■ Other aspect ratios (e.g. 16:10, 15:9) ■ Various resolutions up to 1900x1200 ■ Backlight control via brightness sensor
Memory	■ SATA hard disk drive or solid-state drive ■ USB Flash solid-state drive ■ 2nd microSD™ card slot
I/O	■ Ethernet □ 2 Fast Ethernet on M12 connectors ■ HD audio □ HD audio codec □ Audio stereo in □ Audio stereo out □ SPDIF out □ All available via 9-pin D-Sub connector ■ Serial interface □ 1 serial interface realized via SA-Adapter™, e.g., RS232 or RS422, isolated or not, IBIS, GPS
PCI Express® Mini card slot	■ For functions like Wi-Fi, WIMAX, GSM/GPRS, UMTS ■ PCI Express® or USB interface ■ Accessible via, e.g., a reverse SMA connector
Electrical Specifications	■ Additional includable PSU suited for railway applications (EN 50155 compliant)
Mechanical Specifications	■ Front protected according to IP67 ■ Rear protected according to IP40

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 DC2 Models	**09DC02-00**	10.4" display and capacitive touch, 9..36V DC input, Intel® Atom™ 1.3GHz, 1GB RAM, 2GB Flash Disk, 2 Fast Ethernet, 2 USB, prepared for UART or fieldbus extension via SA-Adapter™, prepared for wireless extensions, -40..+70(+85)°C screened, prepared for e1 certification
Software: Linux	This product is designed to work under Linux. See below for potentially available separate software packages from MEN. For a Linux driver package supporting the Micrel KSZ8842-PMQLI Ethernet controller used in the SC21 and the DC2, 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.	
	13XC02-06	MDIS5™ low level driver sources (MEN) for XC2 PSU Control via SMBus (also used in DC1, DC2, SC21)
	13XM01-06	MDIS5™ low-level driver sources (MEN) for XM1, XM1L, MM1, MM2, XM2, F11S, F19P, F21P, F22P, G20, G22, SC21, SC27 and DC2 board controller
Software: Windows®	This product is designed to work under Windows®. See below for potentially available separate software packages from MEN.	
	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
	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
	For a Windows® driver package supporting the Micrel KSZ8842-PMQLI Ethernet controller used in the SC21 and the DC2, please refer to www.micrel.com/index.php/en/products/lan-solutions/controllers/article/15-ksz8842-pmql.html.	
	13XM01-77	Windows® Installset (MEN) for XM1, XM1L, DC1, DC2 and SC21. (Includes all free drivers developed by MEN for the supported hardware.)
For operating systems not mentioned here contact MEN sales.		
Documentation	Compare Chart Standard and Custom Panel PCs » Download	
	20DC02-00	DC2 User Manual

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