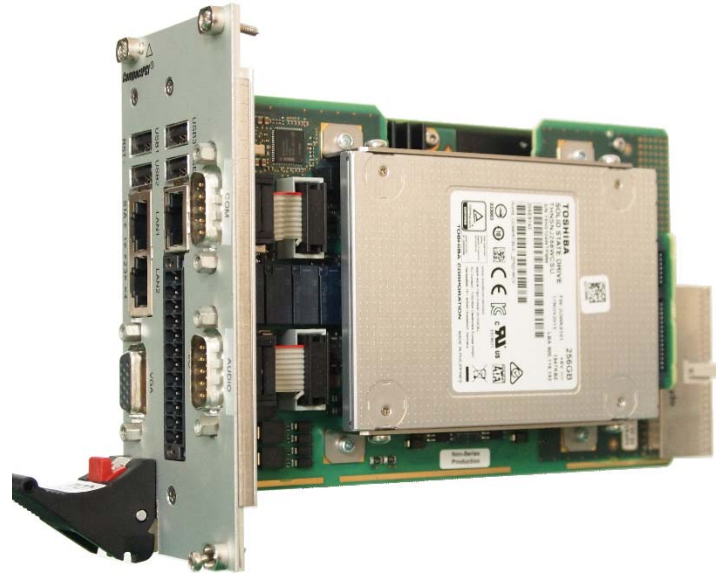


# 180145-00

## Intel Core 2 Duo CPU Board

### 3U CompactPCI PlusIO

- » **Intel® Core™ 2 Duo SP9300, 2.26 GHz**
- » **Dual-core 64-bit processor**
- » **32-bit 12HP system master (or stand-alone)**
- » **For CompactPCI® 2.0 systems or CompactPCI® PlusIO 2.30 hybrid systems (2.0 and CPCI-S.0)**
- » **Up to 4 GB DDR3 DRAM soldered**
- » **CompactFlash® and microSD™ card slots**
- » **Front I/O: VGA, 3 Gb Ethernet, 4 USB**
- » **Rear I/O: 4 PCIe®, 4 USB, 4 SATA, 1 Gb Ethernet**
- » **Ethernet**
- » **Other I/O (onboard, side card): SATA, SDVO, Mono audio 3.6W, Digital IO, UART**
- » **Board controller**
- » **-40 to +85°C screened version**



The 180145-00 versatile 12HP/3U single-board computer is a continuation of MEN's proven range of Intel® CPU boards. It is equipped with the Intel® Core™ 2 Duo processor SP9300 running at 2.26 GHz and offering multi-core processor architecture from Intel® with full

64-bit support. The CPU card delivers an excellent graphics performance and is designed especially for embedded systems which require high computing performance with low power consumption.

The 180145-00 offers a 32-bit/33-MHz CompactPCI® bus interface and can also be used without a bus system. It offers 4 USB 2.0 and 4 fast (3Gb/s) SATA interfaces as well as 4 PCI Express® x1 links and one Gigabit Ethernet on the J2 rear I/O connector which is compatible with the PICMG 2.30 CompactPCI® PlusIO specification.

A total of seven PCI Express® lanes for high-speed communication (such as Gigabit Ethernet) are supported on the 180145-00. 3 x1 PCIe® links are used for the three onboard Ethernet interfaces. 4 x1 PCIe® links are available via rear I/O or on a specific side card.

The 180145-00 is equipped with a fast DDR3 DRAM which is soldered to the 180145-00 to guarantee optimum shock and vibration resistance. A robust CompactFlash® and microSD™ card device which are connected via a USB interface offer nearly unlimited space for user applications.

The standard I/O available at the front panel of 180145-00 includes graphics on a VGA connector, three PCIe®-driven Gigabit Ethernet as well as four USB 2.0 ports.

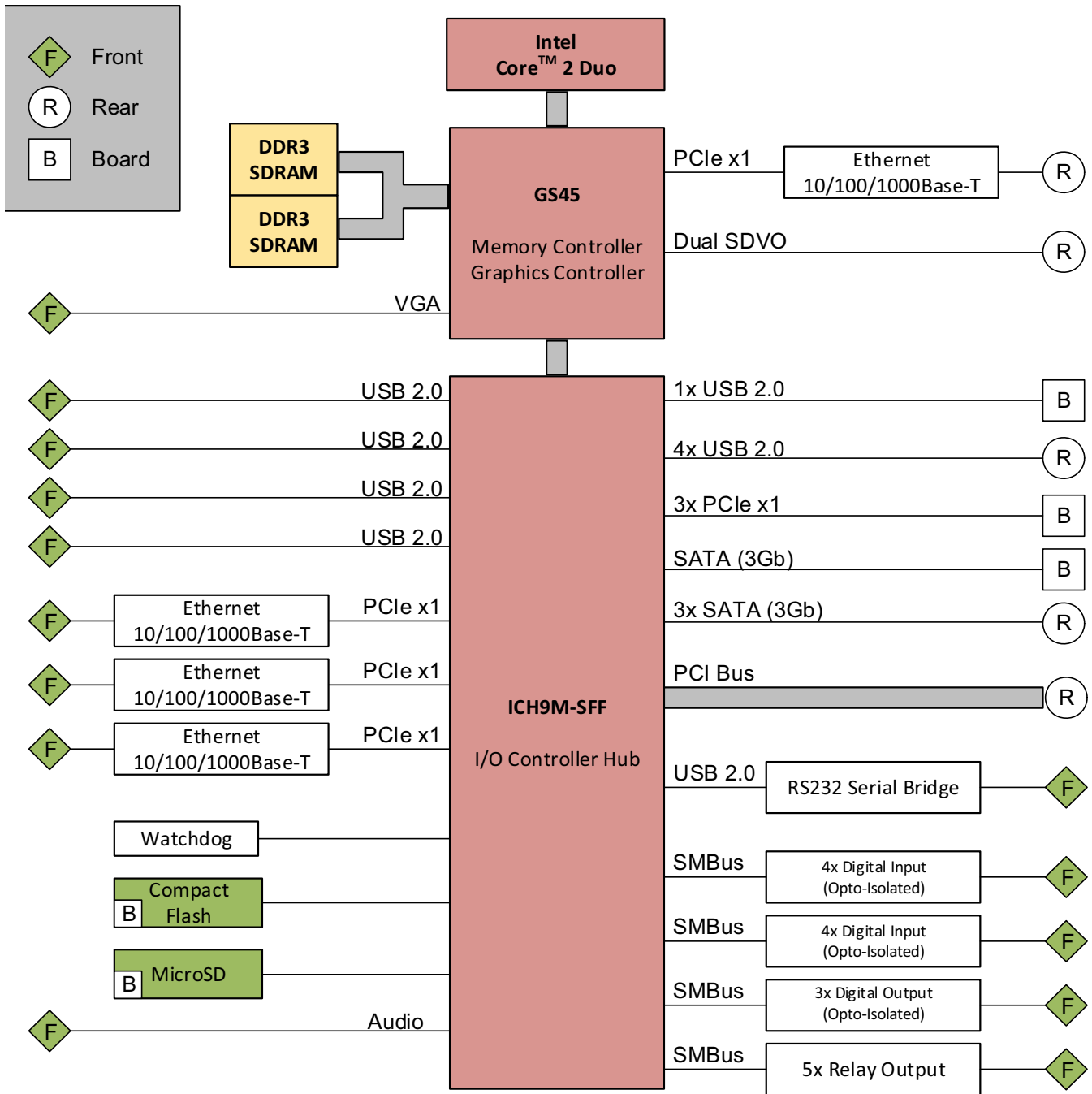
Thermal supervision of the processor and a watchdog for the operating system complete the functionality of the 180145-00.

The 180145-00 operates in Windows® and Linux environments as well as under real-time operating systems that support Intel®'s multi-core architecture. The InsydeH2O™ EFI BIOS was specially designed for embedded system applications.

Equipped with Intel® components exclusively from the Intel® Embedded Line, the 180145-00 has a guaranteed minimum standard availability of 7 years.

The 180145-00 is suited for a wide range of industrial applications, e.g. for monitoring, vision and control systems as well as test and measurement. The 180145-00 comes with a tailored passive heat sink within 12 HP height.

The robust design of the 180145-00 make the board especially suited for use in rugged environments with regard to shock and vibration according to applicable DIN, EN or IEC industry standards. The 180145-00 is also ready for coating so that it can be used in humid and dusty environments.



**CPU**

- Intel Core 2 Duo SP9300
  - Up to 2.26 GHz processor core frequency
  - 1066 MHz system bus frequency
- Chipset
  - Northbridge: Intel GS45
  - Southbridge: Intel ICH9M-SFF

**Memory**

- Up to 6 MB L2 cache integrated in Core 2 Duo
- Up to 4 GB DDR3 SDRAM system memory
  - Soldered
  - 800/1067 MHz memory bus frequency locked to the FSB frequency
- 16 Mbits boot Flash
- Serial EEPROM 2kbits for factory settings
- CompactFlash® card interface
  - Via USB
  - Type I
  - True IDE
  - DMA support
- MicroSD card interface
  - Via USB

**Mass Storage**

- CompactFlash®
  - Connected via USB
- MicroSD card
  - Connected via USB
- Serial ATA (SATA)
  - Four channels via rear I/O, one channel via side-card connector (switchable)
  - Transfer rates up to 3 Gbit/s
  - RAID level 0/1 support

**Graphics**

- Integrated in GS45 chipset
  - Up to 533 MHz graphics core
  - Maximum resolution: 2048 x 1536 pixels
- VGA connector at front panel
- Two SDVO ports available via side-card connector
  - Two additional DVI connectors at front panel optional via side card
  - Simultaneous connection of two monitors

**I/O**

- USB
  - Four USB 2.0 ports via Series A connectors at front panel
  - Four USB 2.0 ports via rear I/O
  - One USB for connection of CompactFlash®/MicroSD or USB NAND Flash
  - UHCI implementation
  - Data rates up to 480Mbit/s
- Ethernet
  - Three 10/100/1000Base-T Ethernet channels at the front
  - RJ45 connectors at front panel
  - Ethernet controllers are connected by two x1 PCIe® links from ICH9M
  - Onboard LEDs to signal activity status and connection speed
  - One 10/100/1000Base-T Ethernet channel via rear I/O
  - Ethernet controller is connected by one x1 PCIe® link from GS45
- High Definition (HD) audio
  - Accessible via side-card connector
- Digital I/O
  - Digital I/O voltage range of 24 VDC
  - 8x Digital Input (Opto-Isolated)
  - 8x Digital Output (5x Relay Output, 3x Digital Output (Opto-Isolated))

**Rear I/O**

- Four SATA
- Four USB
- One Gigabit Ethernet
- Four PCI Express® x1 links
- Compatible with PICMG 2.30 CompactPCI® PlusIO
  - 1PCI33/4PCIE2.5/4SATA3/4USB2/1ETH1G

**Miscellaneous**

- Board controller
- Real-time clock, buffered by a GoldCap or alternatively a battery (5 years life cycle)
- Watchdog timer
- Temperature measurement
- One user LED
- Reset button

**PCI Express®**

- Three x1 links to connect local 1000Base-T Ethernet controllers
  - Data rate 250 MB/s in each direction (2.5 Gbit/s per lane)
- Four x1 links for extension through or rear I/O
  - Data rate up to 1 GB/s in each direction (2.5 Gbit/s per lane)

**CompactPCI® Bus**

- Compliance with CompactPCI® Core Specification PICMG 2.0 R3.0
- System slot
- 32-bit/33-MHz CompactPCI® bus
- V(I/O): +3.3 V (+5 V tolerant)

**Busless Operation**

- Board can be supplied with +5 V only, all other voltages are generated on the board
- Backplane connectors used only for power supply

**Electrical Specifications**

- Supply voltage/power consumption with Celeron® M722 processor:
  - +5 V (-3%/+5%), 2.2 A typ., 2.7 A max.
  - +3.3 V (-3%/+5%), 1.4 A (2 Gb Ethernet), 1 A (1 Gb Ethernet)
  - +12 V (-10%/+10%), approx. 10 mA
  - If the board is supplied with 5 V only (typically without a bus connection), the 3.3 V are generated on the board and fed to the backplane (3 A max.)
- Supply voltage/power consumption with SP9300 processor:
  - +5 V (-3%/+5%), 4.9 A typ., 6.4 A max.
  - +3.3 V (-3%/+5%), 1.4 A (2 Gb Ethernet), 1 A (1 Gb Ethernet)
  - +12 V (-10%/+10%), approx. 10 mA
  - If the board is supplied with 5 V only (typically without a bus connection), the 3.3 V are generated on the board and fed to the backplane (3 A max.)

**Mechanical Specifications**

- Dimensions: conforming to CompactPCI® specification for 3U boards
- Front panel: 12HP with ejector
- Weight: 613 g

**Environmental Specifications**

- Temperature range (operation):
  - Depends on system configuration (CPU, hard disk, heat sink...)
  - Maximum: +85°C
  - Minimum: -40°C (all processors)
  - Conditions: airflow 1.5 m/s, typical power dissipation: 9.8 W (180145-00 version with Celeron® M722), 13.4W (180145-00 version with SP9300 Core 2 Duo) with Windows® XP operating system and 1 Gb Ethernet connection
- Temperature range (storage): -40..+85°C
- Relative humidity (operation): max. 95% non-condensing
- Relative humidity (storage): max. 95% non-condensing
- Altitude: -300 m to +2,000 m
- Shock: 50 m/s<sup>2</sup>, 30 ms
- Vibration (function): 1 m/s<sup>2</sup>, 5 Hz - 150 Hz
- Vibration (lifetime): 7.9 m/s<sup>2</sup>, 5 Hz - 150 Hz
- Conformal coating on request

**MTBF**

- 552,030h @ 40°C according to IEC/TR 62380 (RDF2000)

**Safety**

- PCB manufactured with a flammability rating of 94V-0 by UL recognized manufacturers

**EMC**

- Tested according to EN 55022 (radio disturbance), IEC 61000-4-3 (electromagnetic field immunity), IEC 61000-4-4 (burst), IEC 61000-4-5 (surge) and IEC 61000-4-6 (conducted disturbances)

**BIOS**

- InsydeH2O™ UEFI Framework
  - BIOS version 02F19P33 1.30

**Software Support**

- Note that 64-bit hardware technology can be used in an optimal way with 64-bit operating system support
- Windows® (Windows® XP, Windows® 7)
- Linux
  - tested/verified with: Ubuntu 10.04 (kernel 2.6.32-21) 32-bit and 64-bit versions
  - OpenSuse 11.3 32-bit and 64-bit versions
  - and: CentOS 5.5 (kernel 2.6.18) 32-bit and 64-bit versions
- VxWorks®
- QNX®
  - Sound driver version: Intel HD audio driver for QNX 6.3.2 v1.0
  - D I/O driver version: PCF8574 I2C IO expander driver for QNX 6.3.2 V1.0
- Intel® Virtualization Technology, allows a platform to run multiple operating systems and applications in independent partitions; one computer system can function as multiple "virtual" systems

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