» User Guide «

CP308

3U CompactPCI Processor Board based on the Intel® Core™2 Duo Processor with the Mobile Intel® GS45 Express Chipset

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Explanation of Symbols



Caution, Electric Shock!

This symbol and title warn of hazards due to electrical shocks (> 60V) when touching products or parts of them. Failure to observe the precautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your material.

Please refer also to the section “High Voltage Safety Instructions” on the following page.



Warning, ESD Sensitive Device!

This symbol and title inform that electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.

Please read also the section “Special Handling and Unpacking Instructions” on the following page.



Warning!

This symbol and title emphasize points which, if not fully understood and taken into consideration by the reader, may endanger your health and/or result in damage to your material.



Note ...

This symbol and title emphasize aspects the reader should read through carefully for his or her own advantage.

For Your Safety

Your new Kontron product was developed and tested carefully to provide all features necessary to ensure its compliance with electrical safety requirements. It was also designed for a long fault-free life. However, the life expectancy of your product can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and of the correct operation of your new Kontron product, you are requested to conform with the following guidelines.

High Voltage Safety Instructions



Warning!

All operations on this device must be carried out by sufficiently skilled personnel only.



Caution, Electric Shock!

Before installing a not hot-swappable Kontron product into a system always ensure that your mains power is switched off. This applies also to the installation of piggybacks.

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Special Handling and Unpacking Instructions



ESD Sensitive Device!

Electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.

Do not handle this product out of its protective enclosure while it is not used for operational purposes unless it is otherwise protected.

Whenever possible, unpack or pack this product only at EOS/ESD safe work stations. Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools. This is most easily done by touching a metal part of your system housing.

It is particularly important to observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings etc. If the product contains batteries for RTC or memory backup, ensure that the board is not placed on conductive surfaces, including anti-static plastics or sponges. They can cause short circuits and damage the batteries or conductive circuits on the board.

General Instructions on Usage

In order to maintain Kontron's product warranty, this product must not be altered or modified in any way. Changes or modifications to the device, which are not explicitly approved by Kontron and described in this manual or received from Kontron's Technical Support as a special handling instruction, will void your warranty.

This device should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This applies also to the operational temperature range of the specific board version, which must not be exceeded. If batteries are present, their temperature restrictions must be taken into account.

In performing all necessary installation and application operations, please follow only the instructions supplied by the present manual.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the board, please re-pack it as nearly as possible in the manner in which it was delivered.

Special care is necessary when handling or unpacking the product. Please consult the special handling and unpacking instruction on the previous page of this manual.

Two Year Warranty

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Kontron warrants their own products, excluding software, to be free from manufacturing and material defects for a period of 24 consecutive months from the date of purchase. This warranty is not transferable nor extendible to cover any other users or long-term storage of the product. It does not cover products which have been modified, altered or repaired by any other party than Kontron or their authorized agents. Furthermore, any product which has been, or is suspected of being damaged as a result of negligence, improper use, incorrect handling, servicing or maintenance, or which has been damaged as a result of excessive current/voltage or temperature, or which has had its serial number(s), any other markings or parts thereof altered, defaced or removed will also be excluded from this warranty.

If the customer's eligibility for warranty has not been voided, in the event of any claim, he may return the product at the earliest possible convenience to the original place of purchase, together with a copy of the original document of purchase, a full description of the application the product is used on and a description of the defect. Pack the product in such a way as to ensure safe transportation (see our safety instructions).

Kontron provides for repair or replacement of any part, assembly or sub-assembly at their own discretion, or to refund the original cost of purchase, if appropriate. In the event of repair, refunding or replacement of any part, the ownership of the removed or replaced parts reverts to Kontron, and the remaining part of the original guarantee, or any new guarantee to cover the repaired or replaced items, will be transferred to cover the new or repaired items. Any extensions to the original guarantee are considered gestures of goodwill, and will be defined in the "Repair Report" issued by Kontron with the repaired or replaced item.

Kontron will not accept liability for any further claims resulting directly or indirectly from any warranty claim, other than the above specified repair, replacement or refunding. In particular, all claims for damage to any system or process in which the product was employed, or any loss incurred as a result of the product not functioning at any given time, are excluded. The extent of Kontron liability to the customer shall not exceed the original purchase price of the item for which the claim exists.

Kontron issues no warranty or representation, either explicit or implicit, with respect to its products' reliability, fitness, quality, marketability or ability to fulfil any particular application or purpose. As a result, the products are sold "as is," and the responsibility to ensure their suitability for any given task remains that of the purchaser. In no event will Kontron be liable for direct, indirect or consequential damages resulting from the use of our hardware or software products, or documentation, even if Kontron were advised of the possibility of such claims prior to the purchase of the product or during any period since the date of its purchase.

Please remember that no Kontron employee, dealer or agent is authorized to make any modification or addition to the above specified terms, either verbally or in any other form, written or electronically transmitted, without the company's consent.

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Chapter 1

Introduction

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1. Introduction

1.1 Board Overview

1.1.1 Board Introduction

The CP308 is a highly integrated 3U, 4HP CompactPCI system controller board optionally expandable to 8HP and available either as a front I/O version or as a rear I/O version. It has been designed to support the small form factor (SFF) Intel® Core™2 Duo mobile processor and the high-performance, small form factor Mobile Intel® GS45 Express Chipset with the Intel® 82801IUX I/O Controller Hub (ICH9M-SFF). The CP308 uses Aptio®, AMI's next generation BIOS firmware based on the Unified Extensible Firmware Interface (uEFI) specification and the Intel® Platform Innovation Framework for EFI.

The board supports the Intel® Core™2 Duo processors ranging from 1.2 GHz to 2.26 GHz processor speed built on 45-nm process technology and in a 956-ball Micro-FCBGA package providing 64 kB L1 and up to 6 MB L2 cache as well as up to 1066 MHz front side bus (FSB) speed.

The CP308 utilizes the Intel® GS45 Graphics Memory Controller Hub (GS45 GMCH) and the ICH9M-SFF I/O Controller Hub.

Two SO-DIMM sockets are available on the CP308 to provide up to 8 GB dual-channel, third-generation Double Data Rate (DDR3) memory without Error Checking and Correcting running at 800/1066 MHz.

The CP308 comes with two Gigabit Ethernet ports with Wake-on-LAN support (available on front I/O and switchable to rear I/O), one high-resolution VGA interface (CRT), two COM ports, one High-Definition Audio (HDA) interface, one PS/2 interface as well as onboard connectors such as one high-speed graphics extension connector (PCIe x16) and one high-speed I/O extension connector for flexible 8HP expandability. In addition, four SATA interfaces, two for the onboard SATA connectors and two for the high-speed I/O extension connector or rear I/O are provided. Further interfaces include up to eight USB 2.0 ports, two on front I/O, two on rear I/O, three for the onboard high-speed I/O extension connector and one on the onboard USB 2.0 connector. The CP308 provides support for one USB 2.0 NAND Flash module, two 8HP I/O expansion modules, and one rear I/O module.

The board supports one 32-bit/33 MHz CompactPCI interface. When installed in the system slot, the interface is enabled, and when installed in a peripheral slot, the CP308 is isolated from the CompactPCI bus.

The CP308 provides safety and security via an Integrated Trusted Platform Module (iTPM) 1.2 included in the chipset. System management control is provided through a dedicated onboard System Management Controller (SMC).

Designed for stability and packaged in a rugged format, the board fits into all applications situated in industrial environments, including I/O intensive applications where only one slot is available for the CPU, making it a perfect core technology for long-life applications. Components which have high temperature tolerance have been selected from embedded technology programs, and therefore offer long-term availability.

There are various operating systems available for the CP308. For detailed information, please contact Kontron.

1.1.2 Board-Specific Information

The CP308 is a CompactPCI single-board computer based on the Intel® Core™2 Duo processor built on 45-nm process technology and specifically designed for use in highly integrated platforms with solid mechanical interfacing for a wide range of industrial environment applications.

Some of the CP308's outstanding features are:

- Support for the following small form factor processors:
  - Intel® Core™2 Duo processor SU9300 (ULV), 1.2 GHz, 800 MHz FSB, 3 MB L2 cache
  - Intel® Core™2 Duo processor SL9400 (LV), 1.86 GHz, 1066 MHz FSB, 6 MB L2 cache
  - Intel® Core™2 Duo processor SP9300 (SV), 2.26 GHz, 1066 MHz FSB, 6 MB L2 cache
- 956-ball Micro-FCBGA package
- 64 kB L1 and up to 6 MB L2 cache on-die, running at CPU speed
- Mobile Intel® GS45 Express Chipset with 82801IUX (ICH9M-SFF)
- Up to 8 GB DDR3 SDRAM memory without ECC running at 800/1066 MHz
- Integrated 3D high performance VGA controller
- Analog display support for up to QXGA (2048 x 1536 pixels) resolution
- Two Gigabit Ethernet interfaces with Wake-on-LAN support (Intel® 82574L), switchable to rear I/O
- Four Serial ATA (SATA) interfaces:
  - Two SATA interfaces for the standard SATA onboard connectors for installing Serial ATA 2.5” Hard Disk Drives (HDD) or Solid State Drives (SSD)
  - Two SATA interfaces switchable either to the high-speed I/O extension connector or to rear I/O
- Eight USB ports:
  - Two USB 2.0 on front I/O
  - Two USB 2.0 on rear I/O
  - Three USB 2.0 interfaces for the onboard high-speed I/O extension connector
  - One onboard USB 2.0 port for the USB 2.0 NAND Flash module
- One USB 2.0 NAND Flash module either on the 4HP or on the 8HP version
- One PS/2 interface available on the high-speed I/O extension connector
- Compatible with CompactPCI Specification PICMG 2.0 Rev. 3.0 and usable in the system controller slot as well as in a peripheral slot (the PCI interface is isolated in peripheral slot)
- TCG 1.2-compliant Integrated Trusted Platform Module (iTPM)
- Two SPI Flash chips for redundant uEFI BIOS
- System Management Controller (SMC) for system control and hardware monitoring
- Watchdog timer
- Real-time clock
- Two COM ports:
  - One COM port either on the front panel or on the rear I/O
  - One COM port on the rear I/O
- Peripheral extension connectors:
  - High-speed I/O extension connector
  - High-speed graphics extension connector
  - SPI extension connector
- 4HP or 8HP, 3U CompactPCI
- Several rear I/O configurations
- Power-up sequencing and in-rush current optimized design
- Passive heat sink solution for forced airflow cooling
- AMI Aptio®, a uEFI-compliant platform firmware (AMIBIOS8 successor)

1.2 System Expansion Capabilities

1.2.1 CP308-HDD Module

The CP308-HDD module for the 8HP CP308 version provides legacy PC I/O ports. It includes one digital DVI port, two USB 2.0 ports, one COM port, a PS/2 keyboard and mouse port, one USB 2.0 NAND Flash connector, and one CompactFlash card socket. A SATA hard disk interface is also available for installing a Serial ATA 2.5” HDD or SSD.

For further information concerning the CP308-HDD module, refer to Appendix A.

1.2.2 CP308-MEDIA Module

The CP308-MEDIA module for the 8HP CP308 version provides multimedia I/O ports. It includes two DisplayPort interfaces, one S/P-DIF-Out port, one triple audio jack (Mic-In, Line-In and Line-Out), one CD-In port, one internal line-out mono port, one COM port, one PCI Express Mini Card connector, one SD/SDHC card socket, and one CompactFlash card socket. A SATA hard disk interface is also available for installing a Serial ATA 2.5” HDD or SSD.

For further information concerning the CP308-MEDIA module, refer to Appendix B.

1.2.3 CP-RIO3-04 Rear I/O Module

The CP-RIO3-04 rear I/O module has been designed for use with the CP308 board from Kontron and provides comprehensive rear I/O functionality.

For further information concerning the CP-RIO3-04 rear I/O module, refer to Appendix C.

1.2.4 USB 2.0 NAND Flash Module

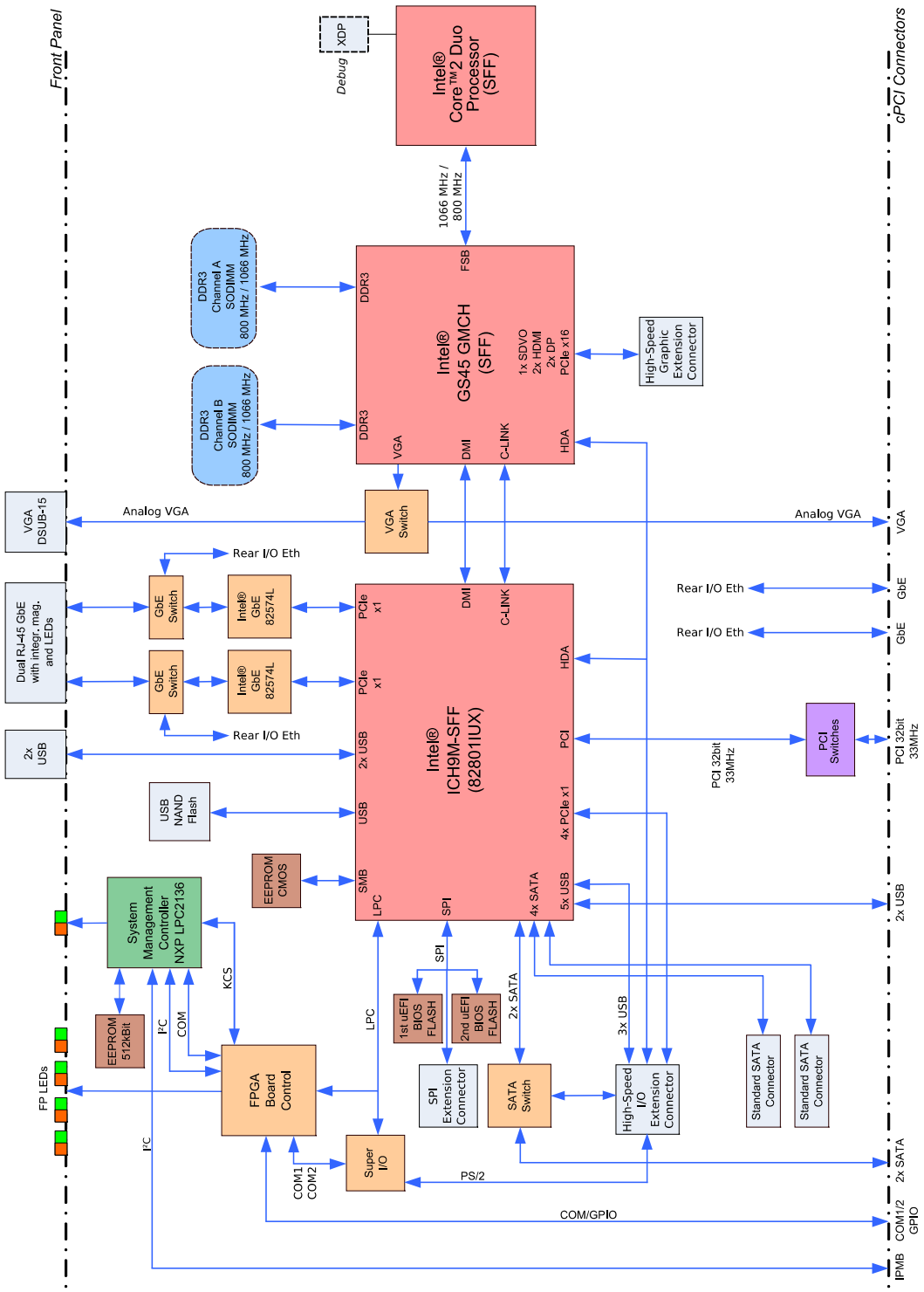
The CP308 provides support for one optional USB 2.0 NAND Flash module. For further information, refer to chapter 2.2.6, "USB 2.0 NAND Flash Module".

1.3 Board Diagrams

The following diagrams provide additional information concerning board functionality and component layout.

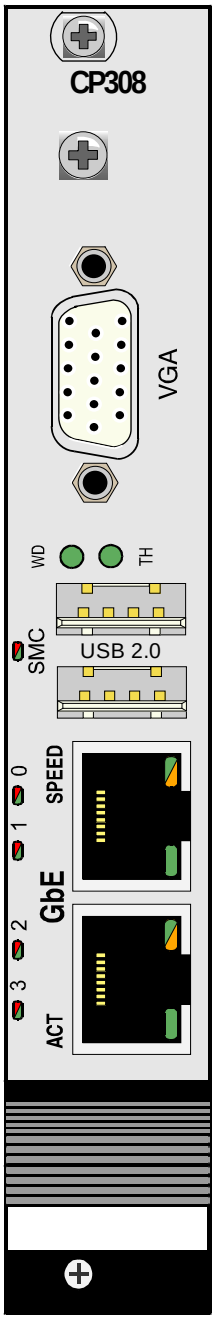
1.3.1 Functional Block Diagram

Figure 1-1: CP308 Functional Block Diagram



1.3.2 Front Panel

Figure 1-2: 4 HP CP308 Front Panel



LEGEND:

Watchdog and Overtemperature Status LEDs:

WD (green):	Watchdog Status
TH (green):	Overtemperature Status

System Management Controller LED:

SMC LED (red/green/red+green):	System Management Controller Status

General Purpose LEDs:

LED 0..3 (red/green/red+green):	General Purpose/POST Code

Note ...

If the General Purpose LEDs LED 0..3 are lit red during boot-up, a failure is indicated before the uEFI BIOS has started.

For further information, please contact Kontron.

Integral Ethernet LEDs:

ACT (green):	Ethernet Link/Activity
SPEED (green/orange):	Ethernet Speed
SPEED ON (orange):	1000 Mbit
SPEED ON (green):	100 Mbit
SPEED OFF:	10 Mbit

Note ...

For information regarding the front panel of an 8HP CP308, refer to Appendix A, CP308-HDD Module and Appendix B, CP308-MEDIA Module.

1.3.3 Board Layout

Figure 1-3: 4HP CP308 Board Layout (Top View)

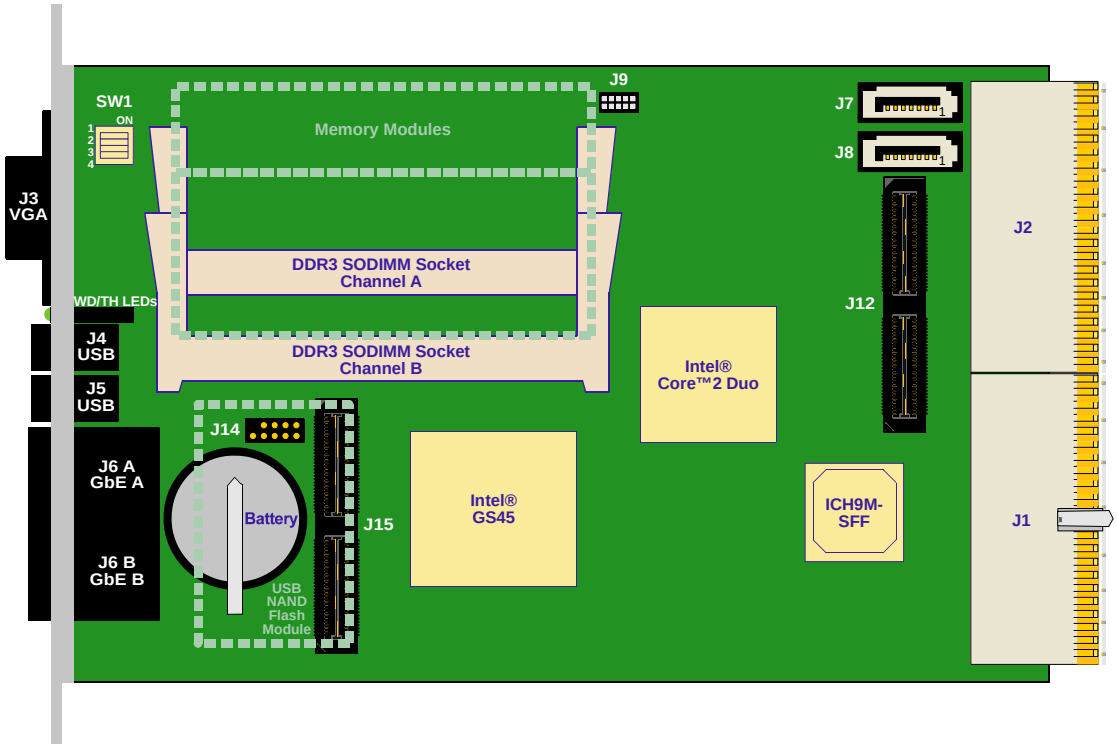
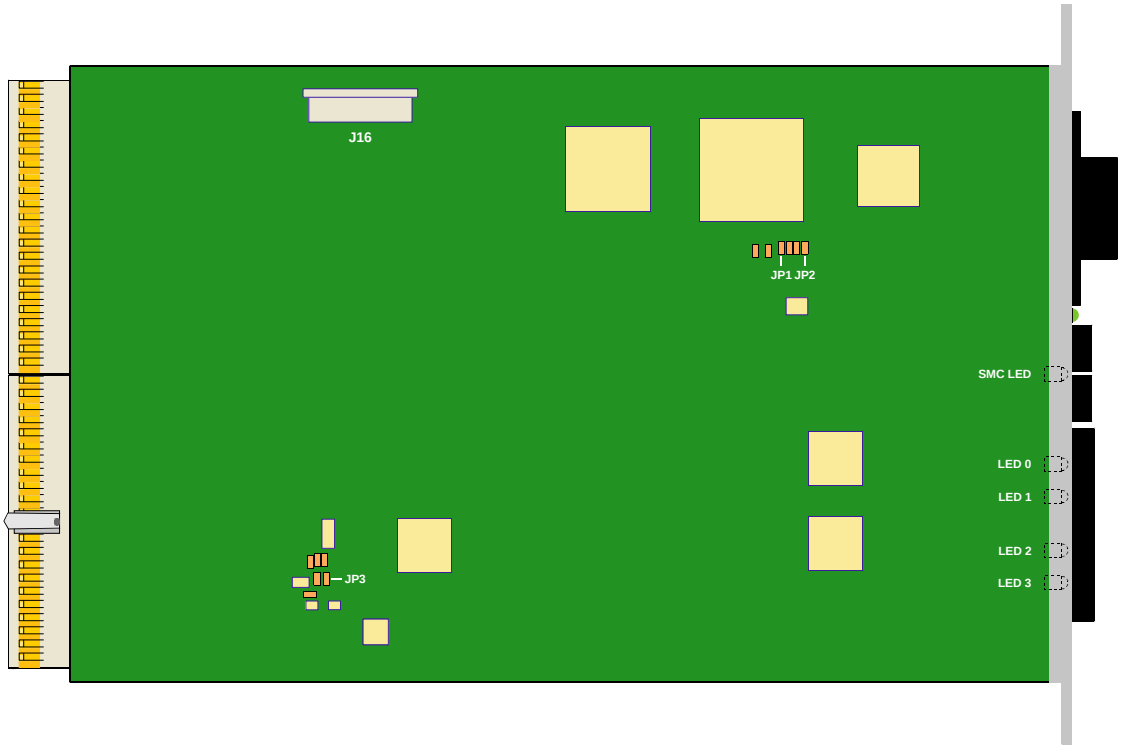


Figure 1-4: 4HP CP308 Board Layout (Bottom View)



1.4 Technical Specification

Table 1-1: 4HP CP308 Main Specifications

CP308		SPECIFICATIONS
Processor and Memory	CPU	The CP308 supports the following 45-nm microprocessors: • Intel® Core™2 Duo processor SU9300 (ULV), 1.2 GHz, 800 MHz FSB, 3 MB L2 cache • Intel® Core™2 Duo processor SL9400 (LV), 1.86 GHz, 1066 MHz FSB, 6 MB L2 cache • Intel® Core™2 Duo processor SP9300 (SV), 2.26 GHz, 1066 MHz FSB, 6 MB L2 cache All microprocessors are provided in a 956-ball Micro-FCBGA package.

	Memory	Main Memory:
		• Up to 8 GB Dual-Channel DDR3 SDRAM memory on two SODIMM sockets
		• 800/1066 MHz memory bus
		• Error Checking and Correction (ECC) not provided
		Cache structure:
		• 64 kB L1 on-die full-speed processor cache
		  • 32 kB for instruction cache
		  • 32 kB for data cache
		• Up to 6 MB L2 on-die full speed processor cache
		FLASH Memory:
		• Two SPI Flash chips for redundant uEFI BIOS
		• USB 2.0 NAND Flash memory optionally available
		Serial EEPROM:
		• 24LC64 (64 kbit)

Table 1-1: 4HP CP308 Main Specifications (Continued)

CP308		SPECIFICATIONS
Chipset	Intel® GS45 GMCH	Intel® GS45 Graphics Memory Controller Hub (GS45 GMCH): • Support for a single Core™2 Duo microprocessor • 64-bit AGTL/AGTL+ based System Bus interface up to 1066 MHz • System Memory interface with optimized support for dual-channel DDR3 SDRAM memory at 800/1066 MHz without ECC • DMI interface to ICH9M-SFF • Integrated 2D and 3D Graphics Engines or PCIe x16 port • HDA interface support • C-LINK interface to ICH9M-SFF • TCG 1.2-compliant Integrated Trusted Platform Module (iTPM)

	Intel® ICH9M-SFF	82801IUX I/O Controller Hub (ICH9M-SFF):
		• PCI Rev. 2.3 compliant with support for 32-bit/33 MHz PCI operations
		• Power management logic support
		• Enhanced DMA controller, interrupt controller, and timer functions
		• USB 2.0 host interface with up to eight USB ports available on the CP308
		• SATA Host Controller with four ports, 3 Gbit/s transfer rate and RAID 0/1 support
		• Six x1 PCI Express ports:
		  • Two are used for Gigabit Ethernet
		  • Four are used for 8HP I/O expansion (configurable either to 4 x1 PCIe or 1 x4 PCIe)
		• System Management Bus (SMBus) compatible with most I²C™ devices
		• Low Pin Count (LPC) interface
		• SPI Flash interface support
		• HDA interface support
		• DMI interface to GS45 GMCH
		• C-LINK interface to GS45 GMCH
		• RTC controller

Table 1-1: 4HP CP308 Main Specifications (Continued)

CP308		SPECIFICATIONS
Interfaces	CompactPCI	Compliant with CompactPCI Specification PICMG® 2.0 R 3.0: • System master operation • 32-bit/33 MHz master interface • 3.3 V or 5 V (universal PCI interface) The CP308 is not equipped either with a handle microswitch or with a blue LED and has no PCI signal precharge. When installed in a peripheral slot, the CP308 is isolated from the CompactPCI bus. It receives power from the back-plane and supports rear I/O. CP308 removal under power: When installed in a peripheral slot, the CP308 supports hot plugging on the power interface through a dedicated power controller, but not on the PCI interface. Hot swapping of peripheral boards controlled by the CP308: When installed in the system controller slot, the CP308 supports the hot swap-ping of other boards. Individual clocks for each slot and Enum signal handling are in compliance with the PICMG 2.1 Hot Swap Specification. The CP308 itself, however, is not hot swappable. When installed in the system controller slot, the system must be powered down in order to replace the board.
	Rear I/O	The following interfaces are routed to the rear I/O connector J2: • COM1 and COM2 (3.3V TTL signaling) • 2 x USB 2.0 • VGA (analog) • 2x Gigabit Ethernet • 2x SATA • System management signals • General purpose signals
	VGA	Built-in Intel 3D Graphics accelerator for enhanced graphics performance: • Supports resolutions up to QXGA (2048 x 1536 pixels) • CRT hot plug support • Dynamic Video Memory Technology (DVMT5.0)
	Gigabit Ethernet	Two 10 Base-T/100 Base-TX/1000 Base-T Gigabit Ethernet interfaces based on the Intel® 82574L Ethernet PCI Express bus controller individu-ally switchable to front I/O or rear I/O: • Dual RJ-45 connector on the front panel • Automatic mode recognition (Auto-Negotiation) • Automatic cabling configuration recognition (Auto-MDI/X) • Wake-on-LAN support Cabling requirement: Category 5, UTP, four-pair cabling

Table 1-1: 4HP CP308 Main Specifications (Continued)

CP308		SPECIFICATIONS
Interfaces	USB	Eight USB ports supporting UHCI (USB 1.1) and EHCI (USB 2.0): • Two USB 2.0 ports on the front I/O • Two USB 2.0 ports on the rear I/O interface • Three USB 2.0 interfaces for the onboard high-speed I/O extension connector • One onboard USB 2.0 port for the USB 2.0 NAND Flash module
	Serial	Two 16C550-compatible UARTs: • COM1 available on the I/O expansion module or on rear I/O • COM2 available on rear I/O only
	Keyboard and Mouse	USB keyboard and mouse support

	I/O Expansion Interfaces	I/O expansion to 8HP board version:
		• 2x SATA
		• Graphics ports either:
		  • PCIe x16 or
		  • SDVO (Serial Digital Video Output), HDMI (High-Definition Multimedia Interface), and DP (DisplayPort)
		• 3x USB2.0
		• 4 x1 PCIe or 1 x4 PCIe
		• HDA
		• PS/2
		• SPI
		• COM
		• Monitor and control signals

	Mass Storage	Onboard USB 2.0 NAND Flash:
		• Onboard USB 2.0 NAND Flash module supported on J14
		SATA: Integrated Serial ATA Host Controllers
		• Provide independent DMA operation on four ports:
		  • Two onboard SATA interfaces
		  • Two SATA interfaces switchable to rear I/O or to the 8HP expansion module
		• Data transfer rates up to 3 Gbit/s
		• High-performance RAID 0/1 functionality on all SATA ports

Sockets	Front Panel Connectors	• VGA: 15-pin D-Sub connector • USB: two 4-pin, type A connectors • Ethernet: dual RJ-45 connector
	Onboard Connectors	• Two 7-pin, L-form standard SATA II connectors • One USB 2.0 NAND Flash connector • High-speed graphics extension connector • High-speed I/O extension connector • SPI extension connector • Two 204-pin DDR3 SODIMM sockets • CompactPCI Connectors J1 and J2

Table 1-1: 4HP CP308 Main Specifications (Continued)

CP308		SPECIFICATIONS
HW Monitoring	LEDs	Watchdog and Overtemperature Status LEDs: • WD (green) Watchdog Status • TH (green) Overtemperature Status System Management Controller LED: • SMC LED (red/green/red+green): System Management Controller Status General Purpose LEDs: • LED 0..3 (red/green/red+green): General Purpose / POST Code Integral Ethernet LEDs: • ACT (green) Network / Link Activity • SPEED (green/orange) Network Speed
	Watchdog	Software-configurable Watchdog generates an IRQ or a hardware reset.
	Thermal Management	CPU overtemperature protection is provided by: • Internal processor temperature control unit • CPU shut down via hardware monitor • Standard heat sink
	System Management Controller	System Management Control with the NXP LPC2136 32-bit microcontroller for monitor and control of: • Several system power voltages • One fan speed input • One fan PWM output • Processor, memory, and board temperature • Further CompactPCI boards installed in the system via the IPMB bus on the J1 CompactPCI Connector
Software	uEFI BIOS	AMI Aptio®, AMI's next-generation BIOS firmware based on the uEFI Specification and the Intel Platform Innovation Framework for EFI. • LAN boot capability for diskless systems (standard PXE) • Redundant image; automatic fail-safe recovery in case of a damaged image • Non-volatile storage of setting in the SPI Flash (battery only required for the RTC) • Compatibility Support Module (CSM) providing legacy BIOS compatibility based on AMIBIOS8 • Command shell for diagnostics and configuration • EFI shell commands executable from mass storage device in a Pre-OS environment (open interface) • SMC support in the command shell
	Operating Systems	There are various operating systems available for the CP308. For detailed information, please contact Kontron.

Table 1-1: 4HP CP308 Main Specifications (Continued)

CP308		SPECIFICATIONS
General	Mechanical	3U, 4HP, CompactPCI-compliant form factor
	Power Consumption	See Chapter 5 for details.
	Temperature Range	Operational: 0°C to +60°C Standard (depending on processor version and airflow in the system) -40°C to +85°C Extended (CP308 with the ULV processor Intel® Core™2 Duo, SU9300, 1.2 GHz) Storage: -55°C to +85°C Without hard disk and without battery *Note ...* When a battery is installed, refer to the operational specifications of the battery as this determines the storage temperature of the CP308 (See "Battery" below). *Note ...* When additional components are installed, refer to their operational specifications as this will influence the operational and storage temperature of the CP308.
	Battery	3.0V lithium battery for RTC with battery socket. Recommended type: UL-approved CR2025 Temperature ranges: Operational (load): -20°C to +70°C typical (refer to the battery manufacturer's specifications for exact range) Storage (no load): -55°C to +70°C typical (no discharge)
	Climatic Humidity	93% RH at 40°C, non-condensing (acc. to IEC 60068-2-78)
	Dimensions	100 mm x 160 mm
	Board Weight	460 grams (4 HP CP308 with heat sink, front panel, two 2 GB SODIMM memory modules, and battery but without USB NAND Flash module)

Note ...

For a description of the additional 8HP version interfaces, refer to Appendix A, CP308-HDD Module and Appendix B, CP308-MEDIA Module.

1.5 Kontron Software Support

Kontron is one of the few CompactPCI and VME vendors providing inhouse support for most of the industry-proven real-time operating systems that are currently available. Due to its close relationship with the software manufacturers, Kontron is able to produce and support BSPs and drivers for the latest operating system revisions thereby taking advantage of the changes in technology.

1.6 Standards

This product complies with the requirements of the following standards:

Table 1-2: Standards

TYPE	ASPECT	STANDARD
CE	Emission	EN55022 EN61000-6-3
	Immission	EN55024 EN61000-6-2
	Electrical Safety	EN60950-1
Mechanical	Mechanical Dimensions	IEEE 1101.10
Environmental	Climatic Humidity	IEC60068-2-78 (see note below)
	WEEE	Directive 2002/96/EC Waste electrical and electronic equipment
	RoHS	Directive 2002/95/EC Restriction of the use of certain hazardous substances in electrical and electronic equipment



Note ...

Kontron performs comprehensive environmental testing of its products in accordance with applicable standards.

Customers desiring to perform further environmental testing of Kontron products must contact Kontron for assistance prior to performing any such testing. This is necessary, as it is possible that environmental testing can be destructive when not performed in accordance with the applicable specifications.

In particular, for example, boards **without conformal coating** must not be exposed to a change of temperature exceeding 1K/minute, averaged over a period of not more than five minutes. Otherwise, condensation may cause irreversible damage, especially when the board is powered up again.

Kontron does not accept any responsibility for damage to products resulting from destructive environmental testing.

In addition, boards ordered with the ruggedized service comply with the following standards as well.

Table 1-3: Additional Standards for Boards Ordered with Ruggedized Service

TYPE	ASPECT	STANDARD	REMARKS
Environmental	Vibration (Sinusoidal)	IEC60068-2-6	Ruggedized version test parameters: • 10-300 (Hz) frequency range • 2 (g) acceleration • 1 (oct/min) sweep rate • 10 cycles/axis • 3 axis
	Single Shock	IEC60068-2-27	Ruggedized version test parameters: • 30 (g) acceleration • 9 (ms) shock duration half sine • 3 number of shocks per direction (total: 18) • 6 directions • 5 (s) recovery time
	Permanent Shock	IEC60068-2-29	Ruggedized version test parameters: • 15 (g) acceleration • 11 (ms) shock duration half sine • 500 number of shocks per direction • 6 directions • 5 (s) recovery time

1.7 Related Publications

The following publications contain information relating to this product.

Table 1-4: Related Publications

PRODUCT	PUBLICATION
CompactPCI Systems and Boards	CompactPCI Specification PICMG 2.0, Rev. 3.0 CompactPCI System Management Specification PICMG 2.9 Rev. 1.0 CompactPCI Hot Swap Specification PICMG 2.1 Rev. 2.0
	Kontron's CompactPCI System Manual, ID 19954
Serial ATA	Serial ATA 1.0a Specification
Platform Firmware	Unified Extensible Firmware Interface (uEFI) specification, version 2.1
All Kontron products	Product Safety and Implementation Guide, ID 1021-9142