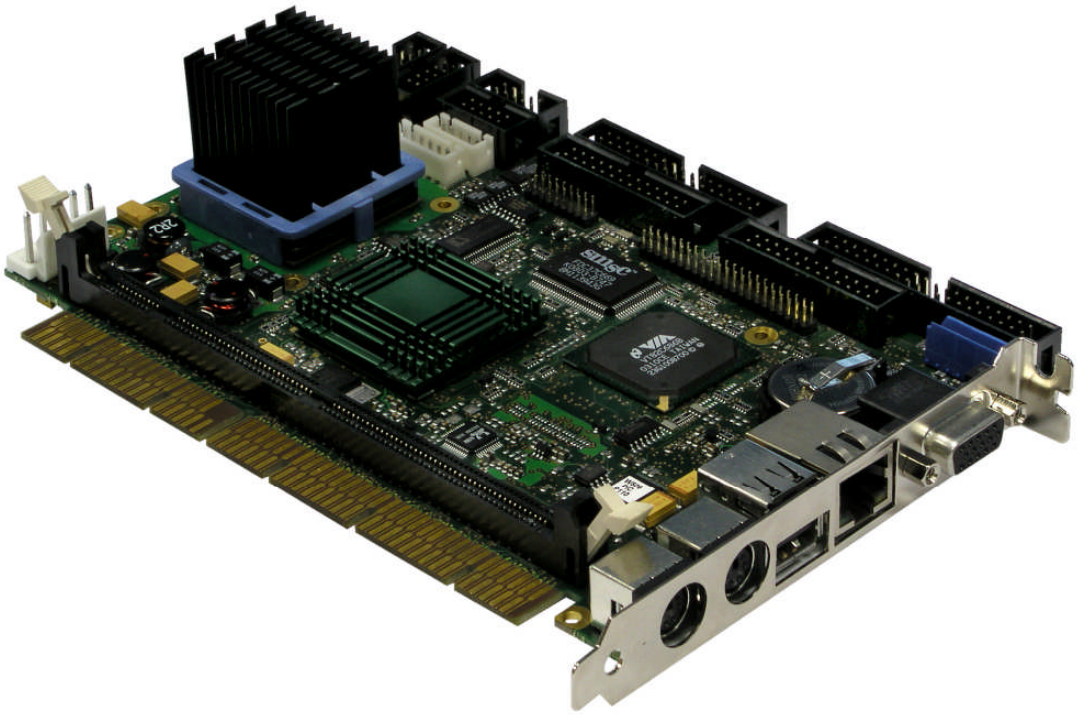

coolMONSTER/VC

coolMONSTER/VE

User's Guide

Document Revision 1.7

kontron

CONTENTS

1. USER INFORMATION

1.1 About This Manual

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For the circuits, descriptions and tables indicated, KONTRON assumes no responsibility as far as patents or other rights of third parties are concerned.

1.2 Copyright Notice

JUMP*tec* Industrielle Computertechnik AG and KONTRON Embedded Computers AG merged in July 2002. JUMP*tec* is now known as KONTRON Embedded Modules GmbH. Products labeled and sold under the KONTRON Embedded Modules name (formerly JUMP*tec*) are now considered KONTRON products for all practical purposes, including warranty and support.

1.3 Trademarks

The following lists the trademarks of components used in this board.

- IBM, XT, AT, PS/2 and Personal System/2 are trademarks of International Business Machines Corp.
- Microsoft is a registered trademark of Microsoft Corp.
- Intel is a registered trademark of Intel Corp.
- All other products and trademarks mentioned in this manual are trademarks of their respective owners.

1.4 Standards

KONTRON Embedded Modules is certified to ISO 9000 standards.

1.5 Warranty

This KONTRON Embedded Modules product is warranted against defects in material and workmanship for the warranty period from the date of shipment. During the warranty period, KONTRON Embedded Modules will at its discretion decide to repair or replace defective products.

Within the warranty period, the repair of products is free of charge as long as warranty conditions are observed.

The warranty does not apply to defects resulting from improper or inadequate maintenance or handling by the buyer, unauthorized modification or misuse, operation outside of the product's environmental specifications or improper installation or maintenance.

KONTRON Embedded Modules will not be responsible for any defects or damages to other products not supplied by KONTRON Embedded Modules that are caused by a faulty KONTRON Embedded Modules product.

1.6 *Technical Support*

Technicians and engineers from KONTRON Embedded Modules and/or its subsidiaries and official distributors are available for technical support. We are committed to making our product easy to use and will help you use our products in your systems.

Before contacting KONTRON Embedded Modules technical support, please consult our Web site for the latest product documentation, utilities, and drivers. If the information does not help solve the problem, contact us by telephone.

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Kontron Asia Inc.	Kontron Embedded Modules GmbH	Kontron America
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2. INTRODUCTION

2.1 coolMONSTER/VC and coolMONSTER/VE

coolMONSTER/VC and coolMONSTER/VE component SBC modules support the VIA Eden Embedded System Platform and VIA C3 processor. The coolMONSTER/VC and coolMONSTER/VE (fanless) feature a VIA VT8606/VT82C686B core chip set and provide ProSavage 4 AGP4x graphics and VIA-enhanced audio.

The coolMONSTER/VC and coolMONSTER/VE support up to 512MB SDRAM, 10/100Base-TX Ethernet, keyboard/mouse controllers, a real-time clock, and a watchdog timer.

The coolMONSTER/VC and coolMONSTER/VE are designed in the PISA format, which provides the functionality of the PCI and ISA bus on one well-defined bus. To connect a backplane with a PISA board, you only need to use one EISA-like edge card connector. The pin-out of the upper row of the PISA bus connector corresponds to the pin-out of the ISA bus connector. The lower row provides PCI signals, which makes it easy to design backplanes with up to four PCI slots and additional ISA slots.

2.2 The coolMONSTER PISA® Family

coolMONSTER products represent the best scaleable half-size Slot SBC family. Each coolMONSTER module is characterized by the same mechanical and electrical pin-out for the Keyboard, COM A-D, Sound, IrDA, EIDE 40pin and 44pin, LPT, LAN, VGA, USB, and Floppy. These homogeneous features facilitate easiest upgrades within the Kontron Embedded Modules GmbH coolMONSTER product family.

PISA® is the proven space saving concept that provides full PCI and ISA Bus signals on just half-size Slot boards. The ancestors were full-sized PICMG boards that have the PCI and ISA card edges in a row - PISA squeezed them to just half-size, still serving full PCI and ISA busses. Smaller and cheaper enclosures were possible that way - while all PCI and ISA periphery is maintained.

Whenever a LCD panel is required, coolMONSTER products with onboard graphics controllers serve as the right choice. Display connections are simplified when using these units, which come with a JUMPtec Intelligent LVDS Interface (JILI) or JUMPtec Intelligent Display Adaption (JIPA). The interface can recognize which display is connected and then independently set all video parameters.

As part of the standard features package, all coolMONSTER modules come with a JUMPtec Intelligent Device Architecture (JIDA) interface, which is integrated into the BIOS of the SBC modules. This interface enables hardware independent access to the coolMONSTER features that cannot be accessed via standard APIs. Functions such as watchdog timer, brightness and contrast of LCD backlight and user bytes in the EEPROM can be configured with ease by taking advantage of this standard coolMONSTER module feature.

3. GETTING STARTED

The easiest way to get the coolMONSTER/VC or coolMONSTER/VE board running is to use a PISA baseboard from Kontron Embedded Modules GmbH. Take the following steps:

1. Turn off the power supply.
2. Connect the power supply to the baseboard or the coolMONSTER.
3. Plug a memory module into the memory socket of the coolMONSTER.
4. Plug the coolMONSTER to the PISA baseboard.
5. Connect the CRT monitor to the CRT interface or a LCD panel to the JILI interface by using the corresponding adapter cable.
6. Plug the keyboard to the PS/2 keyboard connector and the mouse to the PS/2 mouse connector.
7. Connect the floppy drive cable to the coolMONSTER floppy interface. Attach the floppy drive to the connector at the opposite end of the cable.
8. Connect the power supply to the floppy's power connector.
9. Plug a hard-drive data cable to one of the coolMONSTER hard-disk interfaces. Attach the hard disk to the connector at the opposite end of the cable.
10. If necessary, connect the power supply to the hard disk's power connector.
11. Make sure all your connections have been made correctly.
12. Turn on power.
13. Enter the BIOS by pressing the F2 key during boot-up. Make all changes in the BIOS setup. See the BIOS chapter of this manual for details.

4. SPECIFICATIONS

4.1 *Functional Specifications*

- **Processor**
  - VIA Eden Embedded System Platform Processor
  - VIA C3 Processor
- **Bus**
  - 100/133MHz CPU bus (depends on product; please contact KONTRON Sales)
  - Up to 133MHz memory bus
- **Chipset**
  - VIA VT8606/VT82C686B (north bridge/south bridge)
- **Power Supply**
  - 5V only supply
  - Onboard power supply to low voltage technology
- **Super I/O**
  - Integrated in VIA VT82C686B (south bridge)
- **Cache**
  - On-die second level 64kb
- **Memory**
  - DRAM interface runs synchronous (133/133) mode and in pseudo-synchronous (133/100) mode with FSB133 3.3V PC-133 or PC-100 unbuffered SDRAM, up to 512MB
- **Four Serial Ports (COM A, COM B, COM C and COM D)**
  - Three standard RS232C serial ports, 16550 compatible (COM A, COM B and COM C)
  - One serial port as RS232 or RS485 (COM D)
  - One serial port as RS232 or IRDA (COM B)
- **Infrared Device Association (IrDA) Interface**
- **One Parallel Port (LPT1)**
  - Enhanced Parallel Port (EPP) and Extended Capabilities Port (ECP) with bi-directional capability
- **Floppy Interface**
- **System Monitor Controller for Temperature and Fan**

Enhanced Intelligent Drive Electronics (EIDE)

- Two UDMA Peripheral Component Inter-connect (PCI) Bus Master IDE ports (up to four devices)

Universal Serial Bus (USB)

- Two USB 1.1 ports (UHCI)
- USB legacy keyboard support
- USB floppy-boot support

Ethernet

- DAVICOM DM9102A 10/100 Mbps PCI Fast Ethernet controller
- Follows the common criteria of the embedded technology market segment

Onboard Video Graphics Array (VGA)

- Integrated in VIA VT8606 (north bridge)
- 4x AGP, ProSavage 4 controller
- Up to 32MB Video RAM (UMA)
- Cathode ray tube (CRT) and low voltage differential signaling (LVDS) LCD/flat-panel interfaces

Audio

- Integrated in VIA VT82C686B (south bridge)

SoundBlaster™ AC97, Windows Sound System™ Compatible

Phoenix BIOS, 512KB Flash BIOS

NV-EEPROM for CMOS Setup Retention without Battery

PS/2 Keyboard Controller

PS/2 Mouse Controller

Watchdog timer (WDT) with PIC

Real-time Clock with Onboard Battery Supply

4.2 *Mechanical Specifications*

4.2.1. PISA Bus Connector

- Edge card connector, EISA standard, AMP 650226-1 (or compatible)

4.2.2. Dimensions

- Length x Width: 176 mm x 125mm (6.9" x 4.9")

4.2.3. Height on Top

- Ca 40 mm (1.6")
- Height is depending upon SDRAM module and CPU cooler/fan. This can block PCI or ISA slots on some backplanes.

4.2.4. Height on Bottom

- Maximum 4 mm (0.16")

4.2.5. Weight

- 280g (full featured version without SDRAM)

4.3 *Electrical Specifications*

4.3.1. Supply Voltage

- 5V DC +/- 5%

4.3.2. Supply Voltage Ripple

- 100 mV peak to peak 0 - 20 MHz

4.3.3. Supply Current (typical)

Power-consumption tests were executed during the DOS prompt. The tested boards were equipped with 512MB SDRAM and a 48MB chipDISK.

CPU	EDEN ESP3000 (300 MHz)			EDEN ESP6000 (600 MHz)			C3 Low Power 1GHz		
Mode	Normal	Standby	Suspend	Normal	Standby	Suspend	Normal	Standby	Suspend
Power Consumption	2.20 A	1.74 A	0.93 A	2.83 A	1.82 A	0.99 A	3.95 A	2.30 A	1.26 A

4.3.4. Supply Current (maximum)

CPU	EDEN ESP3000 (300 MHz)	EDEN ESP6000 (600 MHz)	C3 Low Power 1GHz
Power Consumption	4.77A	5.27A	6.67A

(calculated theoretical values from all components maximum supply currents)

4.3.5. Real-time Clock (RTC) Battery

- Voltage range: 3.0V-3.6V
- Max current: 10µA

English:
CAUTION ! Danger of explosion if battery is incorrectly replaced. Replace only with the same or equivalent type recommended by the manufacturer. Dispose of used batteries according to the manufacturer's instructions.

Deutsch:
VORSICHT ! Explosionsgefahr bei unsachgemäßem Austausch der Batterie. Ersatz nur durchden selben oder einen vom Hersteller empfohlenen gleichwertigen Typ. Entsorgung gebrauchter Batterien nach Angaben des Herstellers.

French:
ATTENTION ! Risque d'explosion avec l'échange inadéquat de la batterie. Remplacement seulement par le même ou un type équivalent recommandé par le producteur. L'évacuation des batteries usagées conformément à des indications du fabricant.

Danish:
ADVARSEL ! Lithiumbatteri – Eksplosionsfare ved fejlagtig Håndtering. Udskifting må kun skemed batteri af samme fabrikant og type. Lever det brugte batteri tilbage til leverandØren.

Finnish:
VAROITUS ! Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laltevalmistajan suosittelmaan tyyppiln. Havita kaytetty paristo valmistajan ohjeiden mukaisesti.

Spanish:
Precaución ! Peligro de explosión si la batería se sustituye incorrectamente. Sustituya solamente por el mismo o tipo equivalente recomendado por el fabricante. Disponga las baterías usadas según las instrucciones del fabricante.

The battery of this product is not considered to be accessible by the end user. Safety instructions are given only in English, German, French, Danish, Finish and Spanish. If the battery is accessible by the end user, it is in the responsibility of the customer to give the corresponding safety instructions in the required language(s).

4.4 MTBF

The following MTBF (Mean Time Between Failure) values were calculated using a combination of manufacturer's test data, if the data was available, and a Bellcore calculation for the remaining parts. The Bellcore calculation used is "Method 1 Case 1". In that particular method the components are assumed to be operating at a 50 % stress level in a 40° C ambient environment and the system is assumed to have not been burned in. Manufacturer's data has been used wherever possible. The manufacturer's data, when used, is specified at 50° C, so in that sense the following results are slightly conservative. The MTBF values shown below are for a 40° C office or telecommunications environment. Higher temperatures and other environmental stresses (extreme altitude, vibration, salt water exposure, etc.) will lower the MTBF values.

- System MTBF (hours) : 185.424

Notes: Fans usually shipped with Kontron Embedded Modules GmbH products have 50,000-hour typical operating life. The above estimates assume no fan, but a passive heat sinking arrangement.
Estimated RTC battery life (as opposed to battery failures) is not accounted for in the above figures and need to be considered for separately. Battery life depends on both temperature and operating conditions. When the Kontron unit has external power; the only battery drain is from leakage paths.

4.5 Environmental Specifications

4.5.1. Temperature

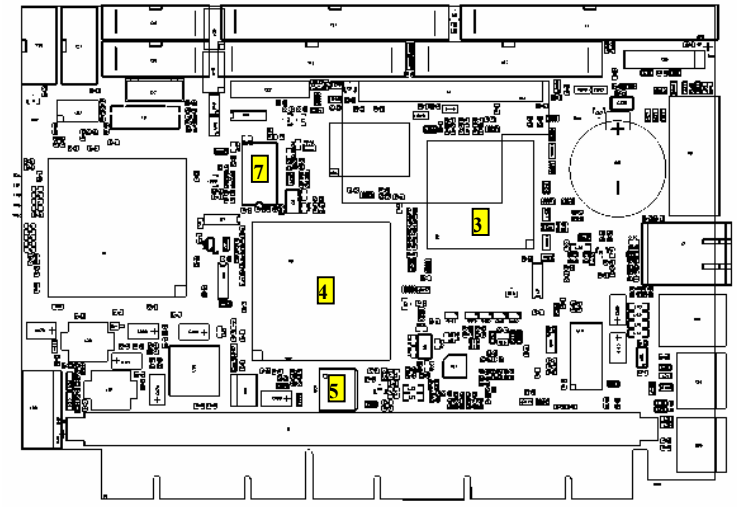
The VIA EDEN CPU is specified for proper operation when the junction temperature is within the specified range of 5°C to 90°C. The system controller can measure the temperature.

VIA C3 CPU is specified for proper operation when the junction temperature is within the specified range of 0°C to 85°C. The system controller can measure the temperature.

- Operating: 0 to +60 C (*) (with appropriate airflow)
- Non-operating: -10 to +85 °C (non-condensing)

Note: (*) The maximum operating temperature is the maximum measurable temperature on any spot on the module's surface. You must maintain the temperature according to the above specification.

For devices that are specified for higher temperatures, please see the following table and drawing.



Measure point	Device	Max. operating temperature of the device
1	MOSFET SI4410	+ **110°C**
2	LTC1702	+ **85°C**
3	SB VT82C686B	+ **85°C**
4	NB PN133T	+ **85°C**
5	LX8580A	+ **85°C**
6	FAN1084	+ **85°C**
7	ICS 9248-39	+ **115°C**

4.5.2. Humidity

- Operating: 10% to 90% (non-condensing)
- Non-operating: 5% to 95% (non-condensing)

5. CPU, CHIPSET, AND SUPER I/O

5.1 CPU

The central processing unit (CPU) consists of either a VIA Eden Embedded System Platform (ESP) processor or a VIA C3 processor with Padlock Engine, which contains 64kB of integrated L2 cache. All versions share the following common features:

- Low power dissipation
- MMX compatible instruction set
- Two 64KB on-chip level 1 caches
- 64KB level 2 victim cache
- Two 128 entry TLBs with two page directory caches

5.2 Chipset

The VIA Technologies' Twister-T chipset consists of:

- VT8606 controller (north bridge)
  - High performance SMA North Bridge
  - Integrated VIA Pro133A and S3 ProSavage4™ in a single chip
  - 133/100MHz CPU Front Side Bus (FSB)
  - Advanced High-Performance 64bit DRAM controller
  - DRAM interface runs synchronous mode or pseudo-synchronous mode with FSB
  - Concurrent CPU, AGP and PCI access
  - Supports standard PC133 and PC100 SDRAM memory types
  - PCI 2.2 compliant bus controller
  - 32bit 3.3V PCI interface with 5V tolerant inputs
  - Advanced system power management support
  - ACPI support
- VT82C686B controller (south bridge)
  - PCI 2.2 compliant PCI to ISA bridge with DMA, timer and interrupt controller
  - Integrated keyboard controller with PS/2 mouse support
  - Integrated Real Time Clock (RTC)
  - Integrated USB controller
  - Integrated Enhanced-IDE controller
  - Integrated Super-I/O controller
  - System Management (SM) bus interface

5.3 Super I/O

The super I/O device is integrated in the south bridge of the VIA chipset, the VT82C686B. It offers the following features:

- Two serial ports
- One Multi-Mode Parallel Port
- Floppy Disk Controller

An additional SMsC FD37C669 offers two more serial interfaces.

5.4 CPU, Chipset and Super-I/O Configuration

See the Advanced Menu and its submenus section of the Appendix B: BIOS chapter for information on possible settings.

6. SYSTEM MEMORY

The coolMONSTER/VC and coolMONSTER/VE use only Dual Inline Memory Modules (DIMMs). One socket is available for 3.3 Volt (power level) unbuffered Synchronous Dynamic Random Access Memory (SDRAM) of up to 512MB.

The total amount of memory available on the SDRAM module is used for main memory and graphic memory on the coolMONSTER/VC and coolMONSTER/VE. Shared Memory Architecture (SMA) manages the sharing of the system memory between graphic controller and processor. Therefore, the full system memory size is not available for software applications. Up to 32MB of system memory are used as graphic memory.

The height of the SDRAM-DIMM module can block PCI or ISA slots on some backplanes.

7. PISA BUS

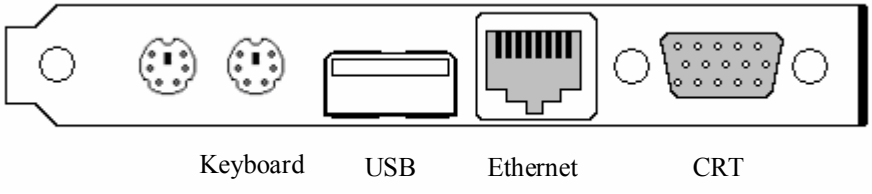
PISA® is the proven space saving concept that provides full PCI and ISA Bus signals on just half-size Slot boards. The edge card connector provides the ISA signals on the upper row and the PCI signals on the lower row and uses the same connector known from EISA systems.

A detailed description of the signals and its timing characteristics is beyond the scope of this document. Refer to the PISA specification PISAD??? (the three questionmarks holding the revision number) available on the Kontron web sites and the official ISA- and PCI-specifications for further details.

8. FRONT PANEL

The coolMONSTER/VC and coolMONSTER/VE come with a front panel interface that provides the following connectivity:

- CRT interface
- Ethernet interface
- USB interface
- PS/2 keyboard connector
- PS/2 mouse connector



9. KEYBOARD AND MOUSE INTERFACES

The mouse connector is available through Connector X15 (6 pins). The keyboard connector is available through Connector X16 (6 pins).

9.1 *Keyboard Connector*

The following table shows the pin-out of the PS/2 keyboard connector on the front panel.

Header	Pin	Signal Name	Function
	1	KBDAT	PS/2 Keyboard data (bi-directional I/O)
	2	MSDAT	PS/2 Mouse data
	3	KEYGND	Ground (filtered)
	4	KEYVCC *	+5V (filtered)
	5	KBCLK	PS/2 Keyboard clock (bi-directional I/O)
	6	MSCLK	PS/2 Mouse clock

9.2 *Mouse Connector*

The following table shows the pin-out of the PS/2 mouse connector on the front panel.

Header	Pin	Signal Name	Function
	1	MSDAT	PS/2 Mouse data
	2	NC	Not connected
	3	KEYGND	Ground (filtered)
	4	KEYVCC *	+5V (filtered)
	5	MSCLK	PS/2 Mouse clock
	6	NC	Not connected

Notes: (*) To protect the external power lines of peripheral devices, make sure that:
-- the wires have the right diameter to withstand the maximum available current
-- the enclosure of the peripheral device fulfils the fire-protecting requirements of
-- IEC/EN 60950.

To find the location of the keyboard and mouse connectors, please see the Appendix E: Connector Layout chapter.

9.3 *Configuration*

Refer to the Keyboard Features submenu and the I/O Device Configuration submenu in the Appendix B: BIOS chapter for information on configuration.

10. USB INTERFACE

The chipset of the coolMONSTER/VC or coolMONSTER/VE features two USB host controllers with integrated root hub. Controller 0 serves USB port 0 and 1, while controller 1 serves Ports 2 and 3. However, only two Universal Serial Bus ports - Port 1 and Port 2 – are provided in standard products. Port 1 can be accessed at the USB connector in the front and Port 2 at the feature connector. You can disable the second USB controller from the BIOS Setup Utility.

For further information, please see Appendix F: PC Architecture Information.

10.1 *Connector*

The USB interface is available through the X13 connector (4 pins).

The following table shows the pin-out of the USB connector on the front panel.

Header	Pin	Signal Name	Function
	1	USB_5V *	USB-supply (max. 500mA)
	2	USB1-	Universal serial bus port 1 (-) of controller 0
	3	USB1+	Universal serial bus port 1 (+) of controller 0
	4	USB_GND	USB Ground

Notes: (*) To protect the external power lines of peripheral devices, make sure that:
-- the wires have the right diameter to withstand the maximum available current
-- the enclosure of the peripheral device fulfils the fire-protecting requirements of
-- IEC/EN 60950.

10.2 *Configuration*

You can disable or enable the legacy USB support or the on chip second USB device from the I/O Device Submenu in the BIOS Setup Utility. For more information, see the I/O Device Submenu section in Appendix B: BIOS Operation.

11. ETHERNET INTERFACE

11.1 *Ethernet Controller*

The coolMONSTER/VC and coolMONSTER/VE Ethernet interface use a Davicom DM9102A PCI Fast Ethernet controller. The network controller supports a 10/100Base-T interface. The device auto-negotiates the use of a 10Mbit/sec or 100Mbit/sec connection.

All major network-operating systems and several real-time and embedded operating systems support the interface.

The DM9102A provides:

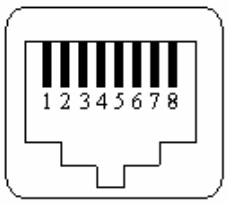
- Integrated fast Ethernet MAC, physical layer, and transceiver in one chip
- Compliance with PCI Specification 2.2
- PCI bus-master architecture
- EEPROM 93C46 interface supports node-ID, access-configuration information
- Compliance with IEEE 802.3u 100Base-TX and 802.3 10Base-T
- Compliance with IEEE 802.3u auto-negotiation protocol for automatic link-type selection
- Full-duplex/half-duplex capability
- Supports IEEE 802.3x full duplex flow control
- Digital-clock recovery circuit using advanced digital algorithm to reduce jitter
- High-performance 100Mbps-clock generator and data-recovery circuit
- Provides loopback mode for easy system diagnostics

Note: The Ethernet interface works according to the common criteria of the embedded technology market segment.

11.2 Connector

The 10/100Base-T connector is a standard 8-pin RJ45 jack.

The following table shows the pin-out of the Ethernet connector on the front panel.

Header	Pin	Signal Name	Function	In/Out
	1	TXD+	100/10BASE-T Transmit	Differential Output
	2	TXD-	100/10BASE-T Transmit	Differential Output
	3	RXD+	100/10BASE-T Receive	Differential Input
	4	NC **	For internal use only	
	5	NC **	For internal use only	
	6	RXD-	100/10BASE-T Receive	Differential Input
	7	NC **	For internal use only	
	8	NC **	For internal use only	

NOTE: (**) Do not connect anything to these pins!

To find the location of the Ethernet interface, please see the Appendix E: Connector Layout chapter.

11.3 Configuration

The onboard Davicom DM9102A Ethernet controller can be enabled or disabled in BIOS setup utility. Refer to the I/O Device Configuration Submenu in the Appendix B: BIOS Operation chapter for additional information on configuration.

You can download available drivers from the Kontron Web site. For further information read the read-me file or contact technical support.

11.4 Ethernet Technical Support

If any problems occur, you can solve some of them by using the latest drivers for the Davicom DM9102A controller. Kontron provides you with the latest Kontron-tested drivers, which can differ from newer ones. For further technical support, contact either Kontron or get support information and downloadable software updates from Davicom.

12. GRAPHIC INTERFACES

12.1 *Video Controller*

The coolMONSTER/VC and coolMONSTER/VE use the S3 Savage 4 chip, a high-speed video controller, which is contained in the VIA Twister T chipset (north bridge).

- Full internal AGP 4x performance
- Optimized Shared Memory Architecture (SMA)
- 8 / 16 / 32 MB frame buffer using system memory
- Floating point triangle setup engine
- Significant internal architectural upgrades
- Single cycle 128-bit 3D architecture
- 8M triangles/second setup engine
- 140M pixels/second trilinear fill rate
- Microsoft Direct X texture compression
- Next generation, 128-bit 2D graphics engine
- Flat panel monitor support
- 2D/3D resolutions up to 1920x1440
- 3D rendering features
- 2D hardware acceleration features
- Motion video architecture
- Extensive LCD support
- Integrated 2-channel 110 MHz LVDS interface
- Support for all resolutions up to 1600x1200

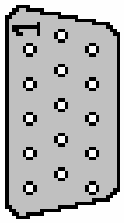
The controller drives two interfaces on the coolMONSTER/VC and coolMONSTER/VE.

- Cathode Ray Tube (CRT) interface
- Low Voltage Differential Signaling (LVDS) interface

12.2 CRT Connector

The CRT (Cathode Ray Tube) interface is available through the standard DSUB15 connector X9.

The following table shows the pin-out of the Ethernet connector on the front panel.

Header	Pin	Signal Name	Function
	1	RED	Red Video
	2	GRN	Green Video
	3	BLU	Blue Video
	4	NC	Not connected
	5	GND	Ground
	6	GND	Ground
	7	GND	Ground
	8	GND	Ground
	9	NC	Not connected
	10	GND	Ground
	11	NC	Not connected
	12	DDA	DDC Serial Data Line
	13	HSYNC	Horizontal Sync
	14	VSYNC	Vertical Sync
	15	DCK	DDC Data Clock Line

To find the location of the CRT interface, please see the Appendix E: Connector Layout chapter.

12.3 Flat Panel LVDS Interface (JILI) Connector

The interface for the LCD Panel is available through the X10 connector (40 pins) on the top side of the board. This connector represents the JILI interface (**J**UMPtec **I**ntelligent **L**VDS **I**nterface). The implementation of this subsystem complies with the JILI Specification of Kontron Embedded Modules GmbH. This coolMONSTER already supports the JILI3 implementation. A variety of cables for different display types are available from Kontron. Please refer to the actual cable list on the Kontron Web site for part numbers and cable names. A detailed description of the JILI interface standard also is available in a separate document JILIM???.PDF. The three question marks represent the documents revision number. You can download this document from the Kontron Web site, or contact your local Kontron technical support to receive it.

To find the location of the LCD Panel interface connector , please see the Appendix E: Connector Layout chapter.

12.4 Display Power Considerations

When using a LCD Panel, additional voltages may be required to drive the displays logic, supply the backlight converter and the display's contrast voltage.

The display logic may require +5V for standard or +3.3V for low-power LCDs. Contrast voltages for passive displays are normally very different and can range from –30V to +30V. Backlight converters usually are +5V or +12V types. When using a Kontron JILI cable, you do not need to determine such configurations. Display logic voltage and contrast voltage come preconfigured on the JILI cable. On occasion, backlight voltage has to be adjusted on the cable.

Even though the coolMONSTER/VC and coolMONSTER/VE area +5V-only boards, you need to supply the +12V for the backlight converter additionally when using such a converter type.

The onboard 3.3V-circuitry of the coolMONSTER/VC and coolMONSTER/VE and the +3.3V logic voltage of low-voltage panels are powered by separate voltage regulators. The one for the LCD is mounted on the JILI adapter cable.

12.5 Connecting a LCD Panel

To determine whether your panel display is supported, check the Kontron Web site for panel lists. We regularly update the list of panels that have been tested with our boards.

Many panel adapters for a wide spread variety of displays are available through Kontron. If you use one of those adapters supplied by Kontron, configuration is easy:

1. Check whether you have the correct adapter and cable for the panel you plan to use. Inspect the cable for damages.
2. Disconnect the power from your system.
3. Connect the panel adapter to the LCD Panel connector (JILI interface) on the coolMONSTER.
4. Connect the other end of the cable to your display.
5. Connect the backlight converter.
6. Supply power to your system.
7. If no image appears on your display, connect a CRT monitor to the CRT connector.
8. If necessary program the EEPROM on the JILI cable with the matching configuration data.
9. If you still do not see improvement, consider contacting the dealer for technical support.

12.6 Configuration

You can set the general configuration for the graphic controller in the BIOS setup utility. Refer to the Advanced Chipset Control submenu and the Display Control submenu in the Appendix B: BIOS Operation chapter for more configuration information.

You can download available drivers for the graphics controller from the Kontron Web site. For further information read the read-me or help files or contact technical support.

12.7 Graphics Technical Support

If problems occur, you can solve some of them by using the latest drivers for the graphics controller. Kontron provides you with the latest tested drivers, which can differ from newer ones. For further technical support, contact either Kontron, or obtain support information and downloadable software updates from VIA Technologies or S3.

12.8 Available Video Modes

The following list shows the video modes supported by the graphics controller with maximum frame buffer size. When configured for smaller frame buffers and/or using a LCD panel on the JILI interface, not all of the video modes listed below may be available. Capability depends on system configuration and on display capabilities. Different operating systems also may not support all listed modes by the available drivers.

12.8.1. Standard IBM-Compatible VGA Modes

Video Mode	Type	Characters/Pixels	Colors/Gray val.
00h/01h	Text	40x25	16
02h/03h	Text	80x25	16
04h/05h	Graphics	320x200	4
06h	Graphics	640x200	2
0Dh	Graphics	320x200	16
0Eh	Graphics	640x200	16
0Fh	Graphics	640x350	Mono
10h	Graphics	640x350	16
11h	Graphics	640x480	2
12h	Graphics	640x480	16
13h	Graphics	320x200	256

12.8.2. Extended VESA VGA Modes

VESA	Display	Pixels	Colors
100h	Graphics	640x400	256
101h	Graphics	640x480	256
102h	Graphics	800x600	16
103h	Graphics	800x600	256
105h	Graphics	1024x768	256
107h	Graphics	1280x1024	256
10Eh	Graphics	320x200	64K
10Fh	Graphics	320x200	16M
111h	Graphics	640x480	64K
112h	Graphics	640x480	16M
114h	Graphics	800x600	64K
115h	Graphics	800x600	16M
117h	Graphics	1024x768	64K
118h	Graphics	1024x768	16M
11Ah	Graphics	1280x1024	64K
11Bh	Graphics	1280x1024	16M
11Dh	Graphics	640x400	64K
11Eh	Graphics	640x400	16M
120h	Graphics	1600x1200	256
122h	Graphics	1600x1200	64K
124h	Graphics	1600x1200	16M
12Eh	Graphics	320x200	256
131h	Graphics	320x240	256
133h	Graphics	320x240	64K
134h	Graphics	320x240	16M
13Bh	Graphics	1400x1050	256
13Ch	Graphics	1400x1050	64K
13Eh	Graphics	1400x1050	16M
141h	Graphics	400x300	256
143h	Graphics	400x300	64K
144h	Graphics	400x300	16M
151h	Graphics	512x384	256
153h	Graphics	512x384	64K
154h	Graphics	512x384	16M

13. SERIAL-COMMUNICATION INTERFACES

13.1 *Serial Ports COMA-D*

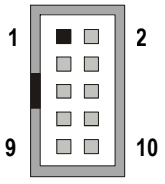
Four fully functional serial ports (COMA, COMB, COMC, and COMD) provide asynchronous serial communications. The serial ports support RS-232 operation modes and are compatible with the serial-port implementation used on the IBM Serial Adapter. You also can use COM D (Connector X17) for RS-485 purposes and COM B for IRDA connectivity. The ports are 16550 high-speed UART compatible and support 16-byte FIFO buffers for transfer rates up to 115.2Kbaud.

13.2 *RS-232 Connectors*

COM A is available through the X18 connector (10 pins) and COM B through the X19 connector (10 pins). COM C is available through the X20 connector (10 pins) and COM D through either the X21 connector (10 pins) for RS-232 or the X17 connector for RS-485. If COM B is configured for IRDA modes, use connector X25.

To have the signals available on the standard serial interface connectors DSUB9 or DSUB25, an adapter cable is required. A 9-pin DSUB cable is available from KONTRON (KAB-DSUB9-2, Part Number 96017-0000-00-0).

The following table shows the pin-outs for COM A, COM B, COM C, and COM D (all RS-232) as well as necessary connections for the DSUB adapters.

Header	Pin	Signal Name	Function	In / Out	DSUB-25	DSUB-9
	1	DCD1/2/3/4	Data Carrier Detect	In	8	1
	2	DSR1/2/3/4	Data Set Ready	In	6	6
	3	SIN1/2/3/4	Receive Data	In	3	2
	4	RTS1/2/3/4	Request to Send	Out	4	7
	5	SOUT1/2/3/4	Transmit Data	Out	2	3
	6	CTS1/2/3/4	Clear to Send	In	5	8
	7	DTR1/2/3/4	Data Terminal Ready	Out	20	4
	8	RI1/2/3/4	Ring Indicator	In	22	9
	9	GND	Signal Ground	--	7	5
	10	VCC *	+5V	--	--	--

Notes: (*) To protect the external power lines of peripheral devices, make sure that:
-- the wires have the right diameter to withstand the maximum available current
-- the enclosure of the peripheral device fulfils the fire-protecting requirements of
-- IEC/EN 60950.

To find the location of the serial ports on the board, please see the Appendix E: Connector Layout chapter.

13.3 Configuration

You can set all serial input/output interfaces to base I/O-addresses 3F8h, 2F8h, 3E8h, or 2E8h. The modes range from disabled, enabled, and AUTO. You can set COM A and COM B interrupts to IRQ3 or IRQ4. You can set COM C and COM D interrupts to IRQ 10 and IRQ 11. All settings are changeable from the BIOS menu. For COM D, your choice of interface includes RS232 (default setting) or RS485. Refer to the I/O Device Configuration submenu in the Appendix B: BIOS Operation chapter for information on configuration.

13.4 RS-485 Connector

You can use Connector X17 (COM D) for RS-485 purposes.

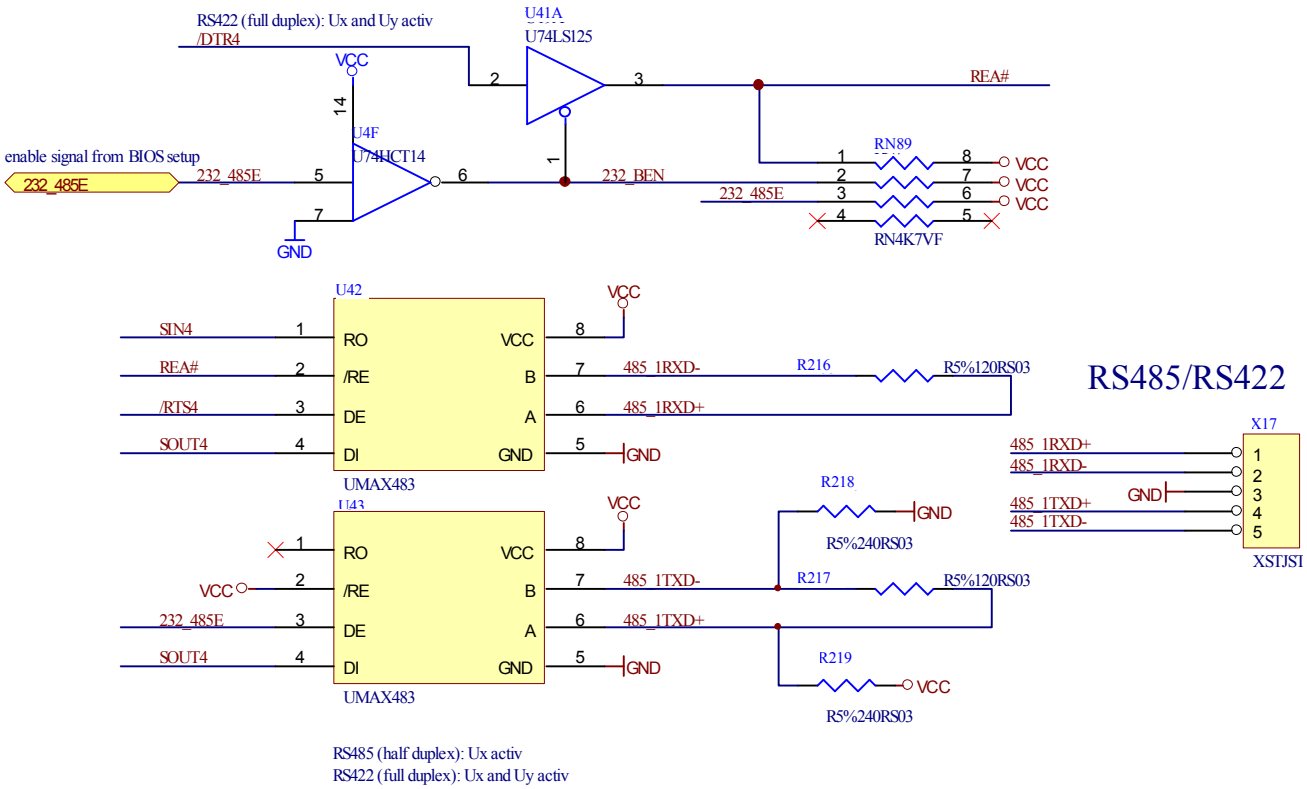
Header	Pin	Signal Name	Function
	1	485_1RXD+	Channel A positive terminal
	2	485_1RXD-	Channel A negative terminal
	3	GND	Ground
	4	485_1TXD+	Channel B positive terminal
	5	485_1TXD-	Channel B negative terminal

The connector for connecting RS485 to COOLMONSTER/VC or COOLMONSTER/VE is from manufacturer JST. To find the location of the connector and for mating connector information see Appendix E: Connector Layout.

13.5 Configuration

You can choose IRQ 10 or 11 for COM D (RS-485). You can set COM D to one of the following base I/O-addresses: 3F8h, 2F8h, 3E8h, or 2E8h. Refer to the I/O Device Configuration submenu in the Appendix B: BIOS Operation chapter for additional information on configuration.

13.5.1. RS-485 Diagram



for informations about MAX483 pls. refer www.maxim-ic.com

14. IRDA INTERFACE

IrDA (named after the standardizing group "InfraRed Data Association") defines a standard for high-speed infrared data transfer over distances of about 1 meter.

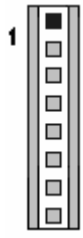
14.1 *IrDA SIR Mode*

This is an operation mode similar to Sharp-IR. The IrDA 1.0 SIR allows serial communication at baud rates up to 115.2K Baud. The data format is the same as Sharp-IR mode except no parity bit is needed. Sending a single infrared pulse signals a zero. A one is signaled by not sending a pulse. The width of each pulse is 3/16ths of a single bit time. The device operation in IrDA 1.0 SIR mode is similar to the operation in UART. The main difference is that the data transfer is normally performed in half duplex fashion, and the modem control and status signals are not used. The transfer signals rout to IRRX and IRTX.

For the infrared feature to be available, you must connect an infrared module to the IrDA connector and configure the infrared settings in BIOS Setup Utility. The IrDA connector supports the optional wireless transmitting and receiving infrared module.

14.2 *Connector*

The IrDA is available through the X25 connector (8 pins).

Header	Pin	Signal Name	Function
	1	NC **	For internal use only
	2	NC **	For internal use only
	3	IRTX	Infrared transmit (serial data output signal)
	4	GND	Ground
	5	IRRX	Infrared receive (serial data input signal)
	6	VCC *	+5V
	7	NC **	For internal use only
	8	NC **	For internal use only

Notes: (*) To protect the external power lines of peripheral devices, make sure that:
-- the wires have the right diameter to withstand the maximum available current
-- the enclosure of the peripheral device fulfils the fire-protecting requirements of
-- IEC/EN 60950.
(**) Do not connect anything to these pins.

The connector used on COOLMONSTER/VC or COOLMONSTER/VE for connecting an infrared module is from manufacturer BERG. To find the location of the connector and for mating connector information see Appendix E: Connector Layout.

14.2.1. Configuration

You can set IrDA for COM B. Choices for mode of operation include Normal, IrDA, and ASK-IR. You can make your choices in the I/O Device Configuration Submenu in the BIOS Setup Utility.

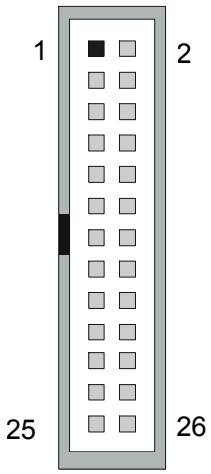
15. PARALLEL-PORT INTERFACE

The COOLMONSTER/VC and COOLMONSTER/VE incorporate an IBM XT/AT compatible parallel port. It supports unidirectional, EPP and ECP operating modes.

15.1 *Connector*

The parallel port is available through the X11 connector (26 pins). To have the signals available on a standard, parallel-interface connector DSUB-25, an adapter cable is required, which is available from KONTRON (KAB-DSUB25-1, Part Number 96015-0000-00-0).

The following table shows the pin-out as well as necessary connections for a DSUB-25 adapter.

Header	Pin	Signal Name	Function	In / Out	DSUB-25
	1	/STB	Strobe	Out	1
	3	PD0	Data 0	I/O	2
	5	PD1	Data 1	I/O	3
	7	PD2	Data 2	I/O	4
	9	PD3	Data 3	I/O	5
	11	PD4	Data 4	I/O	6
	13	PD5	Data 5	I/O	7
	15	PD6	Data 6	I/O	8
	17	PD7	Data 7	I/O	9
	19	/ACK	Acknowledge	In	10
	21	/BUSY	Busy	In	11
	23	PE	Paper out	In	12
	25	/SLCT	Select out	In	13
	2	/AFD	Autofeed	Out	14
	4	/ERR	Error	In	15
	6	/INIT	Init	Out	16
	8	/SLIN	Select in	Out	17
	26	VCC *	+ 5 V	--	NC
	10,12	GND	Signal Ground	--	18 - 25
	14,16	GND	Signal Ground	--	18 - 25
	18,20	GND	Signal Ground	--	18 - 25
	22,24	GND	Signal Ground	--	18 - 25

Notes: (*) To protect the external power lines of peripheral devices, make sure that:
-- the wires have the right diameter to withstand the maximum available current
-- the enclosure of the peripheral device fulfils the fire-protecting requirements of
-- IEC/EN 60950.

To find the location of the parallel port, please see the Appendix E: Connector Layout chapter.

15.2 *Configuration*

The parallel-port mode, I/O addresses, and IRQs are changeable from the BIOS Setup Utility. You can program the base I/O-address 378h (default), 3BCh or 278h. You can set the parallel port mode to disable, enable or AUTO (default). You can choose IRQ5 or IRQ7 as the parallel-port interrupt.

Refer to the I/O Device Configuration Submenu in the Appendix B: BIOS Operation chapter for additional information on configuration.

16. EIDE INTERFACES

The COOLMONSTER/VC and COOLMONSTER/VE feature UDMA IDE controller interfaces with on-chip decode and select logic compatible with IBM PC/XT and PC/AT embedded hard-disk drives. The board can support up to four IDE drives such as hard disks and a CD-ROM in a master/slave configuration. If you only use one drive, you must set it as the master.

16.1 *Connector*

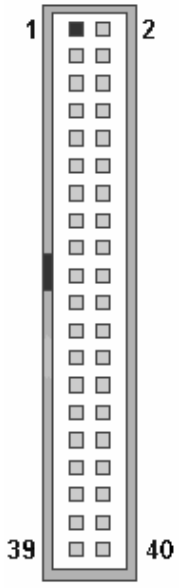
IDE interface 1 is available through Connector X4 (40 pins). This interface is designed in 0.1" grid for optimal connectivity to a 3.5" hard drive. IDE interface 2 is available through Connector X6 (44 pins.) It is designed in a 2mm grid for optimal connectivity to a 2.5" hard drive.

There are several accessories available for IDE interface 2 connectivity.

You can use two cables to directly connect a hard disk in a 2.5" form factor (KAB-IDE-2MM, Part Number 96021-0000-00-0) or a 3.5" form factor (KAB-IDE-25, Part Number 96020-0000-00-0).

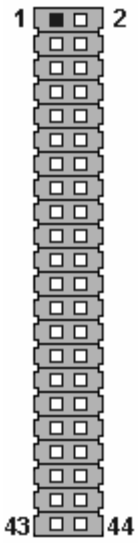
You can plug a KONTRON chipDISK, which is an EIDE hard disk that uses Flash technology, into the 2mm IDE interface and mechanically mount it by using a mini spacer on the chipDISK hole. You also can use a chipDISK adapter (chipDISK-ADA1, Part Number 96004-0000-00-0) or compact Flash adapter (CFC-ADA1, Part Number 96004-0000-00-2) for more disk support.

16.1.1. Primary EIDE Pin-out

Header	Pin	Signal Name	Function
	1	HDRSTJ	Reset
	2	GND	Ground
	3-18	PIDE_D1..D15	Primary IDE ATA data bus
	19	GND	Ground
	20	NC	Not connected
	21	PIDE_DRQ	Primary IDE DMA Request for IDE master
	22	GND	Ground
	23	PIDE_IOWJ	Primary IDE IOWJ Command
	24	GND	Ground
	25	PIDE_IORJ	Primary IDE IORJ Command
	26	GND	Ground
	27	PIDE_RDY	Primary IDE ready
	28	PRI_PD1	IDE1 Cable Select (470Ω to Ground)
	29	PIDE_AKJ	Primary IDE DACKJ for IDE master
	30	GND	Ground
	31	SIRQI	IDE IRQ Primary
	32	NC	Not connected
	33	PIDE_A1	Primary IDE ATA address bus
	34	CBLID	UDMA detection
	35	PIDE_A0	Primary IDE ATA address bus
	36	PIDE_A2	Primary IDE ATA address bus
	37	PIDE_CS1J	IDE chipselect 1 for primary channel 0
	38	PIDE_CS3J	IDE chipselect 2 for primary channel 1
	39	DASP_P	Primary master/slave select
	40	GND	Ground

To find the location of EIDE-controller interfaces 1, please see the Appendix E: Connector Layout chapter.

16.1.2. Secondary EIDE Pin-out

Header	Pin	Signal Name	Function
	1	HDRSTJ	Reset
	2	GND	Ground
	3-18	SIDE_D1..D15	Secondary IDE ATA data bus
	19	GND	Ground
	20	NC	Not connected
	21	SIDE_DRQ	Secondary IDE DMA Request for IDE master
	22	GND	Ground
	23	SIDE_IOWJ	Secondary IDE IOWJ Command
	24	GND	Ground
	25	SIDE_IORJ	Secondary IDE IORJ Command
	26	GND	Ground
	27	SIDE_RDY	Secondary IDE ready
	28	SEC_PD1	IDE2 Cable Select (470Ω to Ground)
	29	SIDE_AKJ	Secondary IDE DACKJ for IDE master
	30	GND	Ground
	31	SIRQII	IDE IRQ Secondary
	32	NC	Not connected
	33	SIDE_A1	Secondary IDE ATA address bus
	34	NC	Not connected
	35	SIDE_A0	Secondary IDE ATA address bus
	36	SIDE_A2	Secondary IDE ATA address bus
	37	SIDE_CS1J	IDE chipselect 1 for secondary channel 0
	38	SIDE_CS3J	IDE chipselect 2 for secondary channel 1
	39	DASP_S	Secondary master/slave select
	40	GND	Ground
	41	VCC *	+5V
	42	VCC *	+5V
	43	GND	Ground
	44	NC	Not connected

Notes: (*) To protect the external power lines of peripheral devices, make sure that:
-- the wires have the right diameter to withstand the maximum available current
-- the enclosure of the peripheral device fulfils the fire-protecting requirements of
-- IEC/EN 60950.

To find the location of EIDE-controller interfaces 2, please see the Appendix E: Connector Layout chapter.

16.2 *Signal Descriptions*

HDRSTJ (Reset)

- The reset signal is active low during power up and inactive thereafter.

DASP_P, DASP_S (Primary, secondary master/slave select)

- This signal drives a LED whenever a connected hard disk is being accessed or when a second drive is present. This signal is active low when the hard disk is busy.

16.3 *Configuration*

The EIDE interfaces offer several configuration settings. Refer to the Main Menu and I/O Device Configuration Submenu and the Master or Slave Submenu in the Appendix B: BIOS Operation chapter for additional information on configuration.

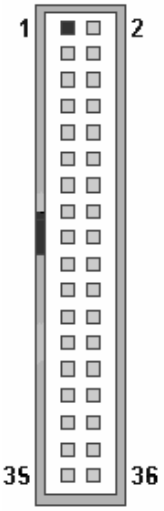
17. FLOPPY INTERFACE

The floppy-drive controller can support two floppy drive disk drives (3.5" and 5.25") and densities that range from 360kB to 2.88MB. The controller is 100% IBM compatible.

17.1 *Connector*

The floppy disk interface is available on Connector X14 (34 pins).

The following table shows the connector pin-out.

Header	Pin	Signal Name	Function	Pin	Signal Name	Function
	1	GND	Ground	2	RPM	Density select
	3	GND	Ground	4	NC	Not connected
	5	GND	Ground	6	NC	Not connected
	7	GND	Ground	8	INDEXJ	Index
	9	GND	Ground	10	MTR0J	Motor on 0
	11	GND	Ground	12	DR1J	Drive select 1
	13	GND	Ground	14	DR0J	Drive select 0
	15	GND	Ground	16	MTR1J	Motor on 1
	17	GND	Ground	18	FDIR	Direction
	19	GND	Ground	20	STEPJ	Step
	21	GND	Ground	22	WDATAJ	Write data
	23	GND	Ground	24	WGATEJ	Write gate
	25	GND	Ground	26	TRK0J	Track 0
	27	GND	Ground	28	WRTPRTJ	Write protect
	29	GND	Ground	30	RDATAJ	Read data
	31	GND	Ground	32	HDSEL	Head select
	33	GND	Ground	34	DSKCHG	Disk change

To find the location of floppy-drive interface, please see the Appendix E: Connector Layout chapter.

17.2 *Configuration*

You can configure floppy drive settings from the BIOS Setup Utility, using the I/O Device Configuration Submenu and the Main Menu. Density options range from 360 kilobits to 2.88MB. The default density is 1.44/1.25MB 3.5". See Appendix B: BIOS Operation for more information.

18. SOUND INTERFACE

The COOLMONSTER/VC and COOLMONSTER/VE use a Realtek ALC650 sound codec, which is built into the south bridge. The ALC650 is an 18-bit, full duplex AC'97 2.2 compatible stereo audio CODEC designed for PC multimedia systems, including host/soft audio and AMR/CNR based designs. The ALC650 incorporates proprietary converter technology to achieve a high SNR, greater than 90 dB.

All major operating systems support the interface.

The ALC650 provides:

- High-performance CODEC with high S/N ratio (>90 dB)
- 18-bit ADC and 20-bit DAC resolution
- Compliant with AC'97 2.2 Specifications
- 18-bit stereo full-duplex CODEC with independent and variable sampling rate
- One analog line-level stereo input with 5-bit volume control: LINE_IN, (CD_IN is possible)
- Stereo Output with 5-bit volume control
- MIC input
- Power management capabilities
- Embedded 50mW/20ohm OP at front LINE output

18.1 Connector

The sound connector is available through Connector X8 (6 pins).

The following table shows the pin-out of the connector.

Header	Pin	Signal Name	Function
	1	RECHTS	Line-level stereo output right.
	2	ASGND	Analog ground.
	3	LINKS	Line-level stereo output left.
	4	AUXAR_C	Auxiliary A input right. Normally intended for connection to an internal or external CD-ROM analog output.
	5	MIC_C	Mono Microphone input.
	6	AUXAL_C	Auxiliary A input left. Normally intended for connection to an internal or external CD-ROM analog output.

To find this connector on the board and for mating connector information see Appendix E: Connector Layout.

18.2 Configuration

From the BIOS Setup Utility in the I/O Device Configuration Submenu, you can set the onboard legacy audio to Disabled (default) or Enabled. You can enable legacy Sound Blaster compatibility mode or MPU-401 legacy MIDI support. Several configurations for I/O-addresses, interrupts and DMA-channels are possible. Refer to the Appendix B: BIOS operation for more details.

19. FEATURE INTERFACE

19.1 *Connector*

The feature connector is available through the X12 connector (26 pins) and controls functions such as the PS/2 keyboard clock and data, hard-disk LED, USB serial bus ports, and various ATX power signals.

The following table shows the pin-out of the connector.

Pin	Signal Name	Function	Pin	Signal Name	Function
1	KBCLK	PS/2 Keyboard clock	2	MSCLK	PS/2 Mouse clock
3	KBDAT	PS/2 Keyboard data	4	MSDAT	PS/2 Mouse data
5	VCC *	+5V	6	-5V *	-5V
7	-12V *	-12V	8	GND	Ground
9	H_LED	Hard-disk LED	10	NC	For internal use only!
11	NC	For internal use only!	12	SPEAKER	Speaker out
13	NC	For internal use only!	14	NC	For internal use only!
15	GND	Ground	16	RESIN	Reset input
17	NC	For internal use only!	18	NC	For internal use only!
19	5V_SB	ATX standby supply	20	LILED	Link integrity LED
21	PS-ON	ATX power on signal	22	SPEEDLED	Speed LED
23	PWRBTN	ATX power button	24	ACTLED	Activity LED
25	USB2-	Universal serial bus port 2 (-)	26	USB2+	Universal serial bus port 2 (+)

Notes: (*) To protect the external power lines of peripheral devices, make sure that:
-- the wires have the right diameter to withstand the maximum available current
-- the enclosure of the peripheral device fulfils the fire-protecting requirements of
-- IEC/EN 60950.
The current of the pins on this connector is limited to 0.5A.

19.2 *Configuration*

You cannot configure the Feature interface from the BIOS Setup Utility.

19.3 *Signal Description*

KBCLK/KBDAT/MSCLK/MSDAT

Keyboard and PS/2 mouse data and clock signal.
Do not use the keyboard and the mouse signals at the same time as the signals on the front bracket.

H_LED (Hard-disk LED)

Signal shows activity on primary and secondary IDE drive. Connect the cathode of the LED to the H_LED pin and the anode of the LED to the VCC supply voltage pin. The required 470R resistor is already mounted on board of the coolMONSTER/VC and coolMONSTER/VE.

SPEAKER (Speaker Out)

This pin controls the speaker output. Connect the loudspeaker between this pin and GND.

RESIN (Reset Input)

You can use this pin as a low active hardware reset.
Connect with GND to force a system hard reset condition.

LILED (Link Integrity LED)

This pin indicates link integrity on the LAN. If the link is valid in either 10 or 100 MPS, the LED is on; if link is invalid, the LED is off. Connect the LILED pin with the cathode of a LED. Connect the anode of the LED via a 470R resistor to VCC supply voltage. The 470R resistor is not onboard of the coolMONSTER/VC and coolMONSTER/VE.

SPEEDLED (Speed LED)

This pin indicates the speed of the LAN. The LED will be on at 100MPS and off at 10MPS.
Connect the SPEEDLED pin with the cathode of a LED. Connect the anode of the LED via a 470R resistor to VCC supply voltage. The 470R resistor is not onboard of the coolMONSTER/VC and coolMONSTER/VE.

ACTLED (Activity LED)

This pin indicates either transmit or receive activity. When activity is present, the activity LED is on; when no activity is present, the LED is off. Connect the ACTLED pin with the cathode of a LED. Connect the anode of the LED via a 470R resistor to VCC supply voltage. The 470R resistor is not onboard of the coolMONSTER/VC and coolMONSTER/VE.

USB2-/USB2+ (Universal Serial Bus Port 2 -/+)

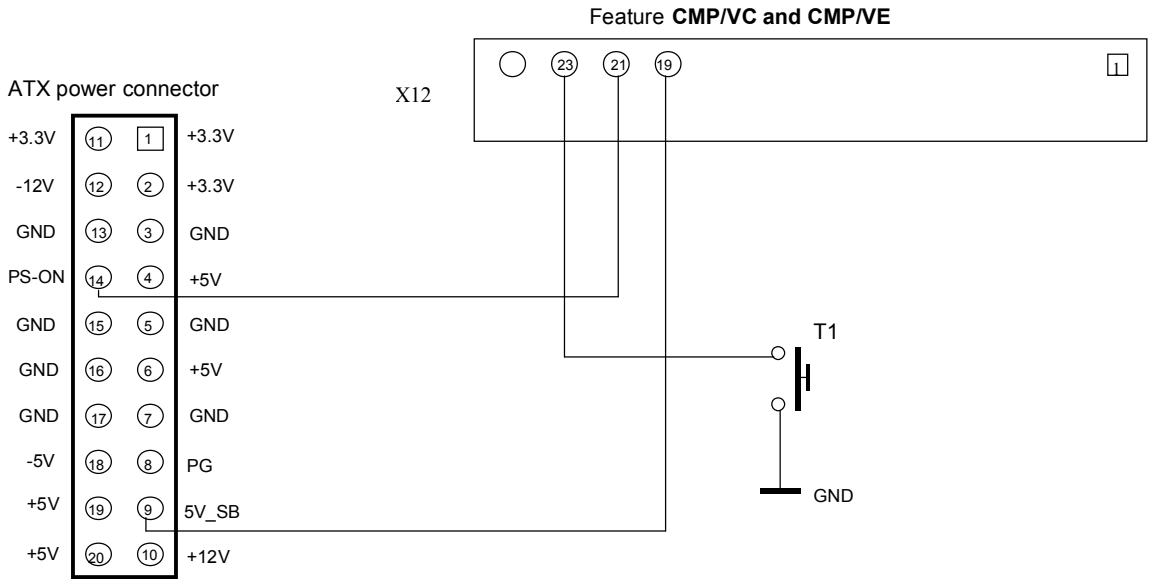
This is the serial data pair for USB Port 2 (controller 1).

5V_SB, PS-ON, PWRBTN (ATX Power Support Signals)

For ATX support please connect the signals in the following manner:

- Connect Pin 19 of feature connector X12 with Pin 9 of ATX power connector (5V standby).
- Connect Pin 21 of feature connector X12 with Pin 14 of ATX power connector (power supply on).

When connected in the following manner, (Pin 23 of feature connector X12 – Button power on), you can switch the board on with the key T1 and switch it off by using the power down option implanted in the particular OS such as Windows 9X.



19.3.1. NC (Internal Use Only!)

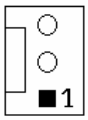
Do not connect any connector to this pin. Otherwise you could create a hazard to system, make the system unstable, or even destroy it.

20. FAN INTERFACE

Use the fan interface to connect a fan to cool the CPU. The connector and onboard system controller support the speed monitoring of the fan. This connector supports 5V fans.

20.1 *Connector*

The fan interface is available on connector X24 (3 pins).

Header	Pin	Signal Description	Function
	1	Sense	Speed Monitoring
	2	5V *	+5V
	3	GND	Ground

Notes: (*) To protect the external power lines of peripheral devices, make sure that:
-- the wires have the right diameter to withstand the maximum available current
-- the enclosure of the peripheral device fulfils the fire-protecting requirements of
-- IEC/EN 60950.

For the location of the fan connector see Appendix E: Connector Layout.

20.2 *Configuration*

You do not need to configure this feature.

21. POWER INTERFACE

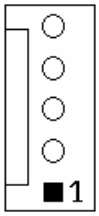
The coolMONSTER/VC and coolMONSTER/VE are not a replacement for a power supply. They are +5V only boards. Additional voltages (+12V, -12V, and -5V as well as +3.3V for external PCI-devices) are not generated onboard. If peripheral devices require these voltages, they have to be supplied through the backplane and the PISA bus.

In some applications, the COOLMONSTER/VC and COOLMONSTER/VE are intended for use as stand-alone modules without a backplane. You need to have a power connector available on the boards for direct power supply.

Power signals on the feature connector (X12) are not meant for power supply purpose.

21.1 *Connector*

The power connector is available through the X23 connector (5 pins) and allows to supply +5V and +12V to the system. For ATX power supply signals refer to additional information in the Feature Connector section.

Header	Pin	Signal Name	Function
	1	+12V	+12V
	2	VCC *	+5V
	3	VCC *	+5V
	4	GND	Ground
	5	GND	Ground

Notes: (*) To protect the external power lines of peripheral devices, make sure that:
-- the wires have the right diameter to withstand the maximum available current
-- the enclosure of the peripheral device fulfils the fire-protecting requirements of
-- IEC/EN 60950.
The current of the pins on this connector is limited to 7A/pin.

The connector is from manufacturer MOLEX. To find the location of the connector and get information about mating connector see Appendix E: Connector Layout.

21.2 *Configuration*

The coolMONSTER/VE and coolMONSTER/VC are equipped with a power management system. You can configure lots of options for power-saving states such as standby state with partial power reduction and suspend state with full-power reduction. You can specify wake-up events that bring the system back to full-on state. Please refer to the Power menu section in the Appendix B: BIOS Operation chapter for more information about power savings.

22. WATCHDOG TIMER

The watchdog timer is integrated in an onboard PIC controller of the coolMONSTER/VE and the coolMONSTER/VC and can issue a reset to the system or generate a nonmaskable interrupt (NMI). The watchdog timer circuit has to be triggered within a specified time by the application software. If the watchdog is not triggered because proper software execution fails or a hardware malfunction occurs, it will reset the system or generate the NMI.

22.1 *Configuration*

You can set the watchdog timer to disabled, reset or NMI mode. You can specify the delay time from 1 second to 30 minutes and timeout (trigger period) from 0.4 second up to 10 minutes. The delay time is the time after first initialization before the trigger period starts. The timeout is the time the watchdog has to be triggered within. You can make the initialization settings in the BIOS setup. Refer to the Watchdog Settings Submenu in the Appendix B: BIOS Operation chapter for information on configuration.

22.2 *Programming*

22.2.1. Initialization

You can initialize the watchdog timer from the BIOS setup. You also can set up the initialization from the application software with help of the JIDA (Jumptec Intelligent Device Architecture) programmer's interface or by using low-level programming.

22.2.2. Trigger

The watchdog needs to be triggered out of the application software within a specified timeout period. You can only do this in the application software by using low-level programming or with help of the JIDA programmer's interface.

For information about low-level programming for the watchdog timer, refer to Application Note WdogLEUE_E???.DOC, which you can request from Kontron technical support.

For information about the JIDA programmer's interface refer to the JIDA BIOS extension section in the Appendix B: BIOS chapter and separate documents available in the JIDA software packages on the Kontron Web site.

23. SYSTEM CONTROLLER

National Semiconductor's LM84 monitors several critical hardware parameters of the system, including power-supply voltages, fan speeds, and temperatures, which are very important for a high-end computer system to remain stable and properly. The LM84 is connected via the system management (SM) bus to the south bridge.

The following parameters are monitored:

- +3.3V from onboard DC/DC
- Gun Transceiver Logic (GTL) voltage
- CPU core voltage
- +2.5 onboard voltage
- +5V
- LM84 local temperature
- CPU temperature with on-die diode
- CPU fan speed

23.1 *Configuration*

You can use the Hardware Monitor submenu in the BIOS Setup Utility to obtain information on power plane voltages and to check the temperatures on the LM84 sensor and the CPU die. For more information on this submenu, see the Appendix B: BIOS Operation chapter in this manual.

To monitor the parameters of this feature from your operating system, Kontron recommends that you use the 32-bit protected mode JUMP*tec*'s Intelligent Device Architecture 32-bit driver (JIDA 32) with the test and demo application for Windows 95/98/ME/NT/2000/XP, which is available on the KONTRON Web site.

There are several monitoring programs on the market that can work with SM-Bus controllers like the LM84 (e.g. MBM Motherboard Monitor or Hardware Monitor), too. Please search the Web for such monitoring programs. KONTRON does not provide support for these tools, because they are not sold by us.

24. APPENDIX A: SYSTEM-RESOURCE ALLOCATION

24.1 Interrupt Request (IRQ) Lines

IRQ #	Use	Available	Comment
0	Timer0	No	
1	Keyboard	No	
2	Slave 8259	No	
3	COM2	No	Note (1)
4	COM1	No	Note (1)
5	-	Yes	Note (2), (4)
6	FDC	No	Note (1)
7	LPT1	No	Note (1), (4)
8	RTC	No	
9	SCI	Yes	Note (3)
10	COM4	No	Note (1)
11	COM3	No	Note (1)
12	PS/2 Mouse	No	Note (1)
13	FPU	No	
14	IDE0	No	Note (1)
15	IDE1	No	Note (1)

Notes: (1) If the „used for“ device is disabled in setup, the corresponding interrupt is available for other devices.
(2) Possible setting for LPT1. IRQ7 is the default setting.
(3) Available in default configuration. IRQ 9 is used as SCI, if ACPI is enabled.
(4) Possible setting for legacy audio device.

24.2 Direct Memory Access (DMA) Channels

DMA #	Use	Available	Comment
0		Yes	Note (3)
1		Yes	Note (2), (3)
2	FDC	No	Note (1), (3)
3		Yes	Note (2), (3)
4	Cascade	No	
5		Yes	
6		Yes	
7		Yes	

Notes: (1) If the „used for“ device is disabled in setup, the corresponding DMA channel is available for other devices.
(2) Possible setting for LPT1 if configured for ECP mode.
(3) Possible setting for legacy audio device

24.3 *Memory Map*

The coolMONSTER/VC and coolMONSTER/VE processor modules can support up to 512MB of memory. The first 640KB of DRAM are used as main memory.

Using DOS, you can address 1MB of memory directly. Memory area above 1MB (high memory, extended memory) is accessed under DOS via special drivers such as HIMEM.SYS and EMM386.EXE, which are part of the operating system. Please refer to the operating system documentation or special textbooks for information about HIMEM.SYS and EMM386.EXE.

Other operating systems (Linux or Windows versions) allow you to address the full memory area directly.

Upper Memory	Use	Available	Comment
A0000h – BFFFFh	VGA Memory	No	Mainly used by graphic adapter cards. If a PCI graphic card is in the system this memory area is mapped to the PCI bus.
C0000h – CFFFFh	VGA BIOS	No	
D0000h – DFFFFh		Yes	Free for ISA bus or shadow RAM in standard configurations. If onboard LAN RPL ROM is enabled, a 16K block is shadowed for BIOS extension, starting with first free area at D0000h, D4000h, D8000hor DC000h. (BIOS extensions do not use the whole shadow block.). UHCI Data Area in USB Legacy Support is starting at DC000h by default setting.
E0000h – F0000h	System BIOS	No	

24.3.1. Using Expanded Memory Managers

coolMOSTER/VC or coolMONSTER/VE extension BIOSes may be mapped to an upper memory area. (See the previous table.). Some add-on boards also have optional ROMs or use drivers that communicate with their corresponding devices via memory mapped I/O such as dual-ported RAM. These boards have to share the upper memory area with the Expanded Memory Manager's EMS frame. This often causes several problems in the system.

Most EMMs scan the upper memory area for extension BIOSes (optional ROMs) and choose a free memory area for their frame if it is not explicitly set. Normally, they are not always capable of detecting special memory-mapped I/O areas. You need to tell the EMM which memory areas are not available for the EMS frames, which is most of the time done by using special exclusion parameters.

If the Expanded Memory Manager you use cannot detect extension BIOSes (optional ROMs), make sure you excluded all areas in the upper memory, which are used by extension BIOSes, too. Your instruction in the CONFIG.SYS concerning the Expanded Memory Manager should look like this: (question marks for location of extension BIOS).

MS-DOS Example

```
DEVICE=EMM386.EXE X=????-???? X=E000-FFFF
```

Note: When booting up your system using this configuration under MS-DOS, the exclusion of area F000 to FFFF causes a warning. Microsoft reports that this message will always appear when the F000 segment lies in the shadow RAM. This is a bug of EMM386, not the coolMONSTER.

Please read the technical manuals of add-on cards used with the coolMONSTER for the memory areas they use. If necessary, also exclude their memory locations to avoid a conflict with EMM386.

24.4 I/O Address Map

The I/O-port addresses of the COOLMONSTER/VC and COOLMONSTER/VE are functionally identical with a standard PC/AT. All addresses not mentioned in this table should be available. Do not use I/O addresses below 0110hex with additional hardware for compatibility reasons, even if available.

Address (h)	Use	Available	Comment
0000 - 001F	DMA Controller 1	No	Fixed
0010	System Control	No	Fixed
0020 - 003F	Interrupt Controller 1	No	Fixed
0040 - 005F	Timer, Counter	No	Fixed
0060 - 006F	Keyboard controller	No	Fixed
0070	NMI Enable Register	No	Fixed
0070 - 0077	Real Time Clock and CMOS Registers	No	Fixed
0080	BIOS POST	No	Fixed
0081 - 008F	DMA Page Register	No	Fixed
0092	System Control	No	Fixed
00A0 00BF	Interrupt Controller 2	No	Fixed
00C0 - 00DF	DMA Controller 2	No	Fixed
00E0 - 00EF	System Control	No	Fixed
00F0 - 00FF	Math Coprocessor	No	Fixed
0100 - 010F	General Purpose I/O	No	Kontron Control Port, Fixed
0170 - 0177	2nd Hard Disk Drive	No	Available if IDE port 2 is disabled
01F0 - 01F7	1st Hard Disk Drive	No	Available if IDE port 1 is disabled
0220 - 022F	Sound Blaster	Yes	Possible address for legacy audio
0240 - 24F0	Sound Blaster	Yes	Possible address for legacy audio
0260 - 026F	Sound Blaster	Yes	Possible address for legacy audio
0278 - 027F	LPT	Yes	Possible address for LPT
0280 - 028F	Sound Blaster	Yes	Possible address for legacy audio
02E8 - 02EF	COM4	No	Available if COM4 is disabled
02F8 - 02FF	COM2	No	Available if COM2 is disabled
0300 - 0303	MPU-401	Yes	Possible address for legacy audio
0310 - 0313	MPU-401	Yes	Possible address for legacy audio
0320 - 0323	MPU-401	Yes	Possible address for legacy audio
0330 - 0333	MPU-401	Yes	Possible address for legacy audio
0370 - 0377	Configuration SMC controller	No	
0378 - 037F	LPT	No	Available if LPT is disabled
03BC - 03C3	LPT	Yes	Possible address for LPT
03B0 - 03DF	VGA	No	These addresses are 10bit decoded (mirrored every 400hex)
03E8 - 03EF	COM3	No	Available if COM3 is disabled
03F8 - 03FF	COM1	No	Available if COM1 is disabled
04D0 - 04D1	Interrupt Select	No	Fixed
0678 - 067A	LPT ECP Extension	Yes	Free in standard configuration, but possible adresses for ECP mode
0778 - 077A	LPT ECP Extension	No	Free, if LPT not used in ECP mode
07BC - 07C3	LPT ECP Extension	Yes	Possible addresses for ECP mode
0CF8 - 0CFF	PCI Configuration	No	Fixed
1000 - 10FE	Ethernet Controller	No	Available if Ethernet controller is disabled
1400 - 14FE	IDE Controller	No	Available if both DIE interfaces are disabled
1800 - 181E	USB Controller Port 0/1	No	
1C00 - 1C1E	USB Controller Port 2/3	No	Available if USB controller 2 disabled.
2800 - 28FF	AC97 Audio Controller	No	Available if audio controller disabled.
6800 - 687F	Hardware Monitoring	No	
8000 - 807F	Power Management Unit	No	
8100 - 810F	System Management Bus Controller	No	

24.5 Peripheral Component Interconnect (PCI) Devices

All devices follow the PCI 2.1 specification. The BIOS and OS control memory and I/O resources. Please refer to the PCI 2.1 specification for details.

PCI Device (IDSEL)	PCI IRQ	REQ/ GNT	Comment
AGP Graphic	INTA#	-	Integrated in VIA chipset
Ethernet (AD13)	INTD#	Discrete channel for Ethernet	PISA specification allows 4 external masters: (REQ0, REQ1, REQ2, REQ3)
Sound	INTC#	-	Integrated in VIA chipset.
1st and 2nd USB Controller	INTD#	-	Integrated in VIA chipset.

24.6 SM-Bus Devices

The coolMONSTER/VE and coolMONSTER/VC use an onboard System Management (SM) Bus. This bus is not available on an peripheral connector and therefore cannot be used for external SM-Bus devices.

SM Bus Address	SM Device	Comment
9Ch/9Dh	Temp. Sensor (LM84)	Onboard temperature sensor.

Note: There are more devices connected to the SM-Bus than listed in this table, but access to these devices in not permitted. Don't access any other device addresses except those listed above.

25. APPENDIX B: BIOS OPERATION

The COOLMONSTER/VC and COOLMONSTER/VE come with Phoenix BIOS 4.0, Release 6.0, which is located in the onboard Flash EEPROM in compressed from. The device has an 8-bit access. The shadow RAM feature offers faster access (16 bit). You can update the BIOS using a Flash utility. For complete Phoenix BIOS 4.0 information, visit the Phoenix Technologies Web site.

25.1 *Determining the BIOS Version*

To determine the BIOS version of the coolMONSTER/VC and coolMONSTER/VE, immediately press the **<Pause/Break>** key on your keyboard as soon as you see the following text display in the upper left corner of your screen:

```
PhoenixBIOS 4.0 Release 6.0
Copyright 1985-2002 Phoenix Technology Ltd.
All Rights Reserved
Kontron(R) BIOS Version <LEUER111>
(C)Copyright 2003 Kontron Embedded Modules GmbH
```

Whenever you contact technical support about BIOS issues, providing a BIOS version <LEUER???> is especially helpful.

The system BIOS provides additional information about the board's serial number, CPU, and memory information by displaying information similar to the following:

```
S/N: YW3320011

CPU = VIA C3 - 600AMHz
639K System RAM Passed
127M Extended RAM Passed
System BIOS shadowed
Video BIOS shadowed

UMB upper limit segment address: E510
```

The board's serial number has value to technical support. CoolMONSTER/VC and coolMONSTER/VE serial numbers always start with YW and are followed by six or seven digits. The first digit represents the year of manufacturing, the next two digits stand for the lot number, and the last three or four digits are the number of the board in that lot.

In the example above, the board with the serial number YW3320011 was manufactured in year 2003, lot 32 of that year, and is board number 11 of that lot.

25.2 *Configuring the System BIOS*

The PhoenixBIOS setup utility allows you to change system behavior by modifying the BIOS configuration. Setup-utility menus allow you to make changes and turn features on or off.

BIOS setup menus represent those found in most models of the COOLMONSTER/VC and COOLMONSTER/VE. The BIOS setup utility for specific models can differ slightly.

Note: Selecting incorrect values can cause system boot failure. Load setup-default values to recover by pressing <**F9**>.

25.2.1. Start Phoenix BIOS Setup Utility

To start the Phoenix BIOS Setup Utility, press the <**F2**> key when the following string appears during boot up.

```
Press <F2> to enter Setup
```

The Main Menu then appears.

25.2.2. General Information

The **Setup Screen** is composed of several sections:

Setup Screen	Location	Function
Menu Bar	Top	Lists and selects all top-level menus.
Legend Bar	Bottom	Lists setup navigation keys.
Item Specific Help Window	Right	Help for selected item.
Menu Window	Left Center	Selection fields for current menu.
General Help Window	Overlay (center)	Help for selected menu.

Menu Bar

The menu bar at the top of the window lists different menus. Use the left/right arrow keys to make a selection.

Legend Bar

Use the keys listed in the legend bar on the bottom to make your selections or exit the current menu. The table below describes the legend keys and their alternates.

Key	Function
<F1> or <Alt-H>	General Help window.
<Esc>	Exit menu.
← or → Arrow key	Select a menu.
↑ or ↓ Arrow key	Select fields in current menu.
<Tab> or <Shift-Tab>	Cycle cursor up and down.
<Home> or <End>	Move cursor to top or bottom of current window.
<PgUp> or <PgDn>	Move cursor to next or previous page.
<F5> or <->	Select previous value for the current field.
<F6> or <+> or <Space>	Select next value for the current field.
<F9>	Load the default configuration values for this menu.
<F10>	Save and exit.
<Enter>	Execute command or select submenu.
<Alt-R>	Refresh screen.

Selecting an Item

Use the ↑ or ↓ key to move the cursor to the field you want. Then use the + and - keys to select a value for that field. **Save Value** commands in the **Exit** menu save the values displayed in all menus.

Displaying Submenus

Use the ← or → key to move the cursor to the submenu you want. Then press <**Enter**>. A pointer (▸) marks all submenus.

Item Specific Help Window

The Help window on the right side of each menu displays the Help text for the selected item. It updates as you move the cursor to each field.

General Help Window

Pressing <**F1**> or <**ALT-F1**> on a menu brings up the General Help window that describes the legend keys and their alternates. Press <**Esc**> to exit the General Help window.

25.3 *Main Menu*

Feature	Option	Description
System Time	HH:MM:SS	Sets system time. Press <Enter> to move to MM or SS.
System Date	MM/DD/YYYY	Sets the system date. Press <Enter> to move to DD or YYYY.
Legacy Diskette A	360 Kb, 5 ¼ " 1.2 MB, 5 ¼ " 720 Kb, 3 ½ " **1.44/1.25 MB, 3 ½ "** 2.88 MB, 3 ½ " Disabled	Select the type of floppy disk drive.
Legacy Diskette B	360 Kb, 5 ¼ " 1.2 MB, 5 ¼ " 720 Kb, 3 ½ " 1.44/1.25 MB, 3 ½ " 2.88 MB, 3 ½ " **Disabled**	Select the type of floppy disk drive.
▸ Primary Master	Autodetected drive	Displays result of PM autotyping.
▸ Primary Slave	Autodetected drive	Displays result of PS autotyping.
▸ Secondary Master	Autodetected drive	Displays result of SM autotyping.
▸ Secondary Slave	Autodetected drive	Displays result of SS autotyping.
▸ Memory Shadow	Submenu	Opens Memory Shadow submenu.
▸ Memory Cache	Submenu	Opens Memory Cache submenu.
System Memory	N/A	Displays amount of conventional memory detected during bootup.
Extended Memory *	N/A	Displays amount of extended memory detected during bootup.

Notes: In the Option column, bold shows default settings.
(*) Extended Memory = capacity of memory module – selected frame buffer memory size

25.3.1. Master or Slave Submenus

Feature	Option	Description
Type	None User **Auto** CD-ROM IDE Removable ATAPI Removable Other ATAPI	None = Autotyping is not able to supply the drive type or end user has selected None, disabling any drive that may be installed. User = End user supplies hdd information. Auto = Autotyping. The drive itself supplies the information. CD-ROM = CD-ROM drive. ATAPI Removable = Read- and writeable media e.g. LS120 and USB-ZIP Other ATAPI = for ATAPI devices not supported by other HDD features.
Cylinders	1 to 65,536	Number of cylinders.
Heads	1 to 256	Number of read/write heads.
Sectors	1 to 63	Number of sectors per track.
Maximum Capacity	N/A	Displays the calculated size of the drive in CHS.
Total Sectors	N/A	Number of total sectors in LBA mode.
Maximum Capacity	N/A	Displays the calculated size of the drive in LBA.
Multi-Sector Transfer	**Disabled** 2 sectors 4 sectors 8 sectors 16 sectors	Any selection except Disabled determines the number of sectors transferred per block. The standard is one sector per block.
LBA Mode Control	**Disabled** Enabled	Enabling LBA causes Logical Block Addressing to be used in place of CHS.
32-Bit I/O	**Disabled** Enabled	Enables 32-bit communication between CPU and IDE card. Requires PCI or local bus.
Transfer Mode	**Standard** Fast PIO 1 Fast PIO 2 Fast PIO 3 Fast PIO 4 FPIO 3 / DMA 1 FPIO 4 / DMA 2	Selects the method for transferring the data between the hard disk and system memory.
Ultra DMA Mode *	Disabled MOD0 MOD1 MOD2 MOD3 MOD4 MOD5	Selects the UDMA mode to move data to/from the drive. Autotype the drive to select the optimum transfer mode. This feature is autodetected.
SMART Monitoring	Disabled Enabled	Shows whether a disk supports SMART.

Note: In the Option column, bold shows default settings.
(*) The 44 pin IDE interface is only capable of running up to UDMA2 mode with 33MHz. On the 40 pin IDE interface a 80line UDMA 100 cable is required for proper operation in modes UDMA 3 and higher.

25.3.2. Memory Shadow Submenu

Feature	Option	Description
D000 – D3FF	**Disabled** Enabled	Accesses to this upper memory region go to the ISA bus if Disabled or to local memory if Enabled.
D400 – D7FF	**Disabled** Enabled	See above.
D800 – DBFF	**Disabled** Enabled	See above.
DC00 – DFFF	**Disabled** Enabled	See above.

Note: In the Option column, bold shows default settings.

25.3.3. Memory Cache Submenu

Feature	Option	Description
Memory Cache	Disabled **Enabled**	Enables or Disables L2 cache.
Cache System BIOS area	Uncached **Write Protected**	Controls caching of System BIOS area.
Cache Video BIOS area	Uncached **Write Protected**	Controls caching of Video BIOS area.
Cache Extended Memory area	Uncached Write Through Write Protected **Write Back**	Controls caching of system memory above 1MB.
D000 - D3FF D400 - D7FF D800 - DBFF DC00 - DFFF	**Disabled** Write Through Write Protected Write Back	Disabled: block is not cached. Write Through: Write are cached and sent to main memory at once. Write Protect: Writes are ignored. Write Back: Writes are cached but not sent to main memory until necessary.

Note: In the Option column, bold shows default settings.

25.4 *Advanced Menu*

Feature	Option	Description
‣ Advanced Chipset Control	Submenu	Opens Advanced Chipset Control submenu.
Plug & Play (PNP) OS Installed	Yes **No**	If your system has a PNP OS, such as Win98, select Yes to let the OS configure PNP devices not required for boot. Selecting No makes the BIOS configure them.
Reset Configuration Data	**No** Yes	Yes erases all configuration data in Extended System Configuration Data (ESCD), which stores the configuration settings for plug-in devices. Select Yes when required to restore the manufacturer's defaults.
Secured Setup Configuration	**Yes** No	Yes prevents a Plug and Play OS from changing system settings.
‣ PCI Configuration	Submenu	Opens PCI Advanced submenu.
PS/2 Mouse	**Auto Detect** Enabled Disabled	Disabled prevents installed PS/2 mouse from functioning but frees up IRQ12. Enabled forces the PS/2 mouse port to be enabled regardless if a mouse is present. Autodetect enables the PS/2 mouse only if present.
‣ Keyboard Features	Submenu	Opens keyboard features submenu.
‣ I/O Device Configuration	Submenu	Opens I/O Device Configuration submenu.
‣ Hardware Monitor	Submenu	Opens Hardware Monitor submenu.
Large Disk Access Mode	**DOS** Other	Select DOS if you have DOS. Select Other if you have another OS, such as UNIX. A large disk has more than 1024 cylinders, more than 16 heads, or more than 63 sectors per track.
Halt On Errors	**Yes** No	Determines if errors detected during boot up cause system to halt.

Note: In the Option column, bold shows default settings.

25.4.1. Advanced Chipset Control Submenu

Feature	Option	Description
PCI Delay Transaction	**Enabled** Disabled	Latches PCI-to-ISA cycles into buffer to free the PCI bus.
Aperture Size	2M, 4M, 8M, 16M, 32M, **64M**, 128M, 256M	Select size of AGP graphics aperture. Half of installed system memory is normally the best choice.
Frame Buffer Size	None, **8 MB**, 16 MB, 32 MB	Select size of VGA SMA frame buffer. None uses the minimum size for the onboard graphic to function correctly.
Enable Memory Gap	**Disabled** Conventional Extended	Turns system RAM off and frees address space (512kB-640kB or 15MB-16MB) for use with an option card.
Spread Spectrum Modulation	**Disabled** 0.25% 0.5%	Enables spread spectrum modulation of clock synthesizer.

Note: In the Option column, bold shows default settings.

25.4.2. PCI Configuration Submenu

Feature	Option	Description
‣ PCI Device, Slot #x	Submenu	Opens submenu to configure slot x PCI device.
PCI IRQ Line 1	Disabled **Auto** IRQ3, 4, 5, 7, 9, 10, 11, 12, 14, 15	Select IRQ for PCI interrupt INT A/B/C/D. Select Auto to let BIOS assign IRQ.
PCI IRQ Line 2	Disabled **Auto** IRQ3, 4, 5, 7, 9, 10, 11, 12, 14, 15	Select IRQ for PCI interrupt INT A/B/C/D. Select Auto to let BIOS assign IRQ.
PCI IRQ Line 3	Disabled **Auto** IRQ3, 4, 5, 7, 9, 10, 11, 12, 14, 15	Select IRQ for PCI interrupt INT A/B/C/D. Select Auto to let BIOS assign IRQ.
PCI IRQ Line 4	Disabled **Auto** IRQ3, 4, 5, 7, 9, 10, 11, 12, 14, 15	Select IRQ for PCI interrupt INT A/B/C/D. Select Auto to let BIOS assign IRQ.
‣ PCI/PNP ISA UMB Region Exclusion	Submenu	Opens UMB Region Exclusion submenu.
‣ PCI/PNP ISA IRQ Resource Exclusion	Submenu	Opens IRQ Exclusion submenu.
Default Primary Video Adapter	**AGP** PCI	In a system with an AGP and a PCI video adapter, user can select adapter that BIOS initializes.
Assign IRQ to PCI VGA	No **Yes**	Determines if a PCI VGA device is assigned an IRQ. Win98SE has shutdown problems if a PCI VGA does not have an IRQ assigned.
PCISA PIRQ Routing *	**Disabled** Enabled	Select Disabled if you use a PISA backplane. Select Enabled if you use a PCISA backplane. PCISA backplanes don't follow PCI 2.1 specification in interrupt routing!

Notes: In the Option column, bold shows default settings.
(*) Available since BIOS version LEUER111.

25.4.3. PCI Device, Slot # x Submenu

Feature	Option	Description
Option ROM Scan	Disabled **Enabled**	Initialize device expansion ROM.
Enable Master	**Disabled** Enabled	Enables device in slot as a PCI bus master, not every device can function as a master. Check device documentation.
Latency Timer	20h, **40h**, 60h, 80h, A0h, C0h, E0h	Minimum guaranteed time slice allocated for bus master in units of PCI bus clocks. A high-priority, high-throughput device may benefit from a greater value.

Note: In the Option column, bold shows default settings.

25.4.4. PCI/PNP ISA UMB Region Exclusion Submenu

Feature	Option	Description
D000 – D3FF	**Available** Reserved	Reserves the specified block of upper memory for use by legacy ISA devices.
D400 – D7FF	**Available** Reserved	Reserves the specified block of upper memory for use by legacy ISA devices.
D800 - DBFF	**Available** Reserved	Reserves the specified block of upper memory for use by legacy ISA devices.
DC00 - DFFF	**Available** Reserved	Reserves the specified block of upper memory for use by legacy ISA devices.

Note: In the Option column, bold shows default settings.

25.4.5. PCI/PNP ISA IRQ Resource Exclusion Submenu

Feature	Option	Description
IRQ3	**Available** Reserved	Reserves the specified IRQ for use by legacy ISA devices.
IRQ4	**Available** Reserved	See above.
IRQ5	**Available** Reserved	See above.
IRQ7	**Available** Reserved	See above.
IRQ9 *	**Available** Reserved	See above.
IRQ10	**Available** Reserved	See above.
IRQ11	**Available** Reserved	See above.
IRQ12	**Available** Reserved	See above.
IRQ14	**Available** Reserved	See above. (Visible only if primary IDE disabled.)
IRQ15	**Available** Reserved	See above. (Visible only if secondary IDE disabled.)

Notes: In the Option column, bold shows default settings.
(*) IRQ9 is used for SCI in ACPI mode. Do not use IRQ9 for legacy ISA devices when ACPI enabled.

25.4.6. Keyboard Features Submenu

Feature	Option	Description
Numlock	**Auto** On Off	On or Off turns NumLock on or off at bootup. Auto turns NumLock on if it finds a numeric key pad.
Key Click	**Disabled** Enabled	Turns audible key click on.
Keyboard auto-repeat rate	**30/sec**, 26.7/sec, 21.8/sec, 18,5/sec, 13.3/sec, 10/sec, 6/sec, 2/sec	Sets the number of times to repeat a keystroke per second if you hold the key down.
Keyboard auto-repeat delay	¼ sec, ½ **sec**, ¾ sec, 1 sec	Sets the delay time after the key is held down before it begins to repeat the keystroke.

Note: In the Option column, bold shows default settings.

25.4.7. I/O Device Configuration Submenu

Feature	Option	Description
Local Bus IDE adapter	**Both,** Primary Secondary, Disabled	Enables onboard PCI IDE devices.
Floppy Disk controller	Auto, Disabled **Enabled**	Enables onboard FDC controller.
Serial Port A Serial Port B	Disabled Enabled **Auto**	Disabled turns off port. Enabled requires user to enter base I/O address and IRQ. Auto makes BIOS configure port.
Serial Port C Serial Port D	**Disabled** Enabled Auto	Disabled turns off port. Enabled requires user to enter base I/O address and IRQ. Auto makes BIOS configure port.
Base I/O address	**3F8h, 2F8h**, 3E8h, 2E8h	Select I/O base of port.
IRQ (Port A and B)	**IRQ 3, IRQ 4**	Select IRQ of Port A and B
IRQ (Port C and D)	**IRQ 10, IRQ 11**	Select IRQ of Port C and D
Mode (Port B)	**Normal,** IrDA, ASK-IR	Sets mode for Serial Port D.
Interface (Port D)	**RS232**, RS485	Select weather this port operates in RS232 or RS485/RS422 operation
Parallel Port	Disabled Enabled **Auto**	Disabled turns off port. Enabled requires user to enter base I/O address and IRQ. Auto makes BIOS configure port.
Mode	**Unidirectional,** EPP, ECP	Sets the mode for parallel port.
Base I/O address	**378h**, 278h, 3BCh	Select I/O base of port.
IRQ	IRQ 5, **IRQ 7**	Select IRQ of parallel port.
DMA	DMA1, **DMA3**	Select DMA channel of port if in ECP mode.
Onboard Ethernet	**Enabled,** Disabled	Enables onboard Ethernet controller
Legacy USB Support *	**Disabled** Enabled	Enable or disable support for USB keyboard and mouse. Enable for use with non-USB aware OSes such as UNIX and DOS.
Onchip USB 2 Device	**Enabled** Disabled	Enables second onboard USB device. Enable for the use of the USB port on the feature connector.
Onboard Legacy Audio	Enabled **Disabled**	Enables legacy audio device for user configuration.
Sound Blaster	Enabled, **Disabled**	Enables Sound Blaster compatibility mode
Base I/O address	**220h**, 240h, 260h, 280h	Select I/O base of Sound Blaster.
Interrupt	**IRQ 5**, IRQ 7	Select IRQ of Sound Blaster.
8-bit DMA channel	DMA0, **DMA1**, DMA2, DMA3	Select DMA channel for Sound Blaster mode.
MPU-401	Enabled, **Disabled**	Enable MPU-401 BIOS support
MPU I/O address	300h, 310h, 320h, **330h**	Select I/O base of MPU-401
‣ Watchdog Settings	Submenu	Opens Watchdog Settings submenu.

Notes: In the Option column, bold shows default settings.
(*) If you want to use the USB boot feature, enable USB BIOS Legacy Support. A 16kb UMB area (most likely DC000h-DFFFFh) is used for USB BIOS Legacy Support.

25.4.8. Watchdog Settings Submenu

Feature	Option	Description
Mode	**Disabled** Reset NMI	Select watchdog operation mode.
Delay	1s, 5s, 10s, **30s**, 1min, 5min, 10min, 30min	The time until the watchdog counter starts counting. Useful to handle longer boot times.
Timeout	0.4s, 1s, 5s, 10s, **30s**, 1min, 5min, 10min	Max. trigger period.

Note: In the Option column, bold shows default settings.

25.4.9. Hardware Monitor Submenu

This submenu shows the current voltages and temperatures of the system.

Voltage/Temperature	Explanation
V(3.3)	3.3V power plane
Vgtl	GTL (Gunning Transceiver Logic) bus voltage (~1.50V)
Vcore	Core voltage ~ 1.05V for EDEN 300 MHz ~ 1.20V for EDEN 600 MHz ~ 1.25V for C3 1GHz
V(2.5)	2.5V power plane
V(5)	5V power plane
T(lm84)	Temperature of onboard LM84 sensor (local temp)
T(cpu)	Temperature of CPU die (LM84 remote temp)
CPU Fan 1 Speed	Speed of the fan (RPM) (for C3 1GHz only)

25.5 *Security Menu*

Feature	Option	Description
Supervisor Password is	**Clear** Set	Displays whether password is set.
User Password is	**Clear** Set	Displays whether password is set.
Set User Password *	Up to seven alphanumeric characters	Pressing <Enter> displays the dialog box for entering the user password. In related systems, this password gives restricted access to setup.
Set Supervisor Password *	Up to seven alphanumeric characters	Pressing <Enter> displays the dialog box for entering the user password. In related systems, this password gives full access to setup.
Diskette access	User **Supervisor**	Enabled requires supervisor password to access floppy disk.
Fixed disk boot sector	**Normal** Write protected	Write protect the boot sector on the hard disk for virus protection. Requires a password to format or Fdisk the hard disk.
Virus check reminder	**Disabled** Daily Weekly Monthly	Displays a message during bootup asking (Y/N) if you backed up the system or scanned for viruses. Message returns on each boot until you respond with Y. Daily displays the message on the first boot of the day, Weekly on the first boot after Sunday, and monthly on the first boot of the month.
System backup reminder	**Disabled** Daily Weekly Monthly	Displays a message during bootup asking (Y/N) if you backed up the system or scanned for viruses. Message returns on each boot until you respond with Y. Daily displays the message on the first boot of the day, Weekly on the first boot after Sunday, and monthly on the first boot of the month.
Password on boot	**Disabled** Enabled	Enabled requires a password on boot. Requires prior setting of the supervisor password. If supervisor password is set and this option is disabled, BIOS assumes user is booting.

Notes: In the Option column, bold shows default settings.
(*) Enabling Supervisor Password requires a password for entering Setup. Passwords are not case sensitive.
User and Supervisor passwords are related. A User password is possible only if a Supervisor password exists.

25.6 *Power Menu*

In the BIOS Setup Utility, you can set up an Advance Power Management system (APM 1.2) to reduce the amount of energy used after specified periods of inactivity. The setup menu supports:

- Full On State
- Standby State with Partial Power Reduction
- Suspend State with Full Power Reduction

In addition you can enable an ACPI 1.0 support in the BIOS setup utility, if you intend to use an operating system supporting the Advanced Configuration and Power Management Interface. For logical reasons it is required to use an ATX power supply with the ACPI feature.

The following states are supported from the system:

- S0 (Working)
- S1 (Sleeping with processor context maintained)
- S5 (Soft off)

The state S2 (sleeping with processor context not maintained) and S3 (Save to RAM) is not supported. The state S4 (Save to Disk) is a matter of the used operating system.

Use the Wake Up Events submenu to specify whether an activity can terminate a power saving state and restore Full On.

Feature	Option	Description
Power Savings	**Disabled** Customized Maximum Power Saving Maximum Performance	Maximum options select predefined values. Select Customized to make your own selections from the following fields. Disabled turns off all power management.
Enable ACPI	**No** Yes	Enables or disables the ACPI function.
‣ Wake Up Events	Submenu	Opens IRQ Activity Monitoring submenu.
Idle Mode	**Off** On	Idle mode slows down the CPU during brief periods of inactivity.
Standby Timeout	**Off**, 1min, 2min, 4min, 6min, 8min, 12min, 16min	Inactivity period required to put system in Standby mode (partial power shutdown).
Auto Suspend Timeout	**Off**, 5min, 10min, 15min, 20min, 30min, 40min, 60min	Inactivity period required after Standby to Suspend mode (maximum power shutdown).
Hard Disk Timeout	**Disabled**, 10 sec – 15 min	Inactivity period of hard disk required before standby (motor off).
Video Timeout	**Disabled**, 10 sec – 15 min	Inactivity period of user input device before the screen is turned off.
Resume on Modem Ring	**Off** On	On wakes the system on incoming calls detected by mode (RI).
Resume on Time	**Off** On	On wakes the system at a specific time.
Resume Time	00:00:00	Specifies when system wakes.

Notes: In the Option column, bold indicates default setting.

25.6.1. Wake Up Events Submenu

This menu allows the user to enable or disable IRQs as activities and resume event.

Feature	Option	Description
IRQ1	**Yes** No	Wakes up system on IRQ1 (Keyboard).
IRQ12	**Yes** No	Wakes up system on IRQ12 (PS/2 Mouse).
IRQ3, 4, 5, 7, 9, 10,. 11	Yes **No**	Wakes up system on IRQ if set to Yes.

Note: In the Option column, bold shows default settings.

25.7 Boot Menu and Utilities

Feature	Option	Description
Floppy Check	**Disabled** Enabled	Enabled verifies floppy type on boot; disabled speeds boot.
Summary Screen	**Disabled** Enabled	If enabled, a summary screen is displayed just before booting the OS to let the user see the system configuration.
QuickBoot Mode	Disabled **Enabled**	Allows the system to skip certain tests while booting. This will decrease the time needed to boot the system.
Dark Boot	**Disabled** Enabled	If enabled, system comes up with a blank screen instead of the diagnostic screen during bootup.
ATX AC Power On Mode *	Server **Desktop**	Select Server Mode if you want the board to boot immediately when AC power is supplied. Selecting Desktop Mode will require the power button to be pressed.
Onboard LAN PXE ROM	**Disabled** Enabled	Enables PXE ROM of the onboard LAN controller. Supports Intel PXE. Check the Intel Web site for more information.
‣ Boot Device Priority	Submenu	Opens boot device priority submenu.
‣ Display Control	Submenu	Opens display control submenu.

Notes: In the Option column, bold represents default settings.
(*) A CMOS battery backup must be present for this selection to work properly.

25.7.1. Dark Boot

After you turn on or reset the computer, Dark Boot displays a graphical logo (default is a blank screen) instead of the text based POST screen, which displays a number of PC diagnostic messages.

The graphical logo stays up until just before the OS loads unless:

- You press <Esc> to display the POST screen
- You press <F2> to enter Setup
- POST issues an error message
- The BIOS or an option ROM requests keyboard input

25.8 *MultiBoot*

MultiBoot is a boot utility integrated in the PhoenixBIOS 4.0. The coolMONSTER/VC and coolMONSTER/VE provide different versions of this feature depending on the BIOS revision:

- MultiBoot 3 (available up to BIOS version LEUER110)
- MultiBoot XP (available since BIOS version LEUER111)

25.8.1. MultiBoot 3

MultiBoot 3 expands your boot options by letting you choose your boot device—a hard disk, floppy disk, CD-ROM or network card. You can select your boot device in Setup, or you can choose a different device each time you boot by selecting your boot device in the Boot First Submenu.

Multiboot 3 allows you to boot from the following devices:

- Hard Drives
- USB devices: floppy, LS-120, ZIP, CD-ROM
- Zip
- LS-120
- CD-ROM

MultiBoot 3 consists of the following submenus:

- Boot Device Priority
- Removable Devices
- Hard Drive Priority
- Network Boot Priority
- Boot First

Boot Device Priority Submenu

This submenu allows you to select the order of devices from which the BIOS will attempt to boot the OS. During POST, if BIOS is unsuccessful at booting from one device, it will try the next one.

The selections on this menu each may represent the first of a class of items. For example, if there is more than one hard disk drive, Hard Drive represents the first of such drives as specified in the Hard Drive menu described below.

To change the order, select the device to change and press <-> to decrease or <+> to increase priority.

Feature	Option	Description
▸ Hard Drives	Boot priority & submenu.	Sets boot priority of Hard Disks as described in the respective submenu.
▸ Removable Devices	Boot priority & submenu.	Sets boot priority of Removable Devices as described in the respective submenu.
CD-ROM Drive	Boot priority.	Sets boot priority of ATAPI CD:ROM drives.
▸ Network Boot	Boot priority & submenu.	Sets boot priority of Network Adapters as described in the respective submenu.

Removable Devices Submenu

If there is more than one Removable Media drive, select Removable Devices and press <Enter> to display the Removable Media menu and choose which drive is represented in the boot-order menu.

Note: The standard 1.44MB floppy drive is referenced as Legacy Floppy Drives.

Hard Drive Priority Submenu

If there is more than one bootable hard drive, select Hard Drive and press <Enter> to display the Fixed Disk Menu and choose a boot priority.

Network Boot Priority Submenu

If there is more than one bootable network adapter in the system, select Network Boot and press <Enter> to display available network adapters and choose the boot priority.

25.8.2. MultiBoot XP

MultiBoot XP comes with a complete new look of the Boot Device Priority submenu. This submenu is now separated into two sections:

- Boot Priority Order
- Excluded from Boot Order

It can display the setup menus by each kind of device type and arrange the boot priority order with any sequence of devices. MultiBoot XP meets the requirements of PC 98 and accommodates more devices that are bootable. It employs a boot scheme that is generic and flexible enough to boot from any current device. You can select your boot device in Setup, or you can choose a different device each time you boot by selecting your boot device in the Boot First Submenu.

An available bootable device can be easily switched between the two sections by just highlighting the device and then pressing <X>. To change the order, select the device to change and press <-> to decrease or <+> to increase priority. You can also choose between four default configurations for the boot order <1>-<4>.

Boot Priority Order

This section shows eight configuration entries for up to eight devices that can be arranged in boot priority order (1: highest priority, 8: lowest priority).

Excluded from Boot Order

This section shows all devices that are excluded from the boot order. Any device listed here will never be used as boot device and not appear in the Boot First Submenu.

The following table shows a list of supported devices:

Device	Description
IDE 0	Primary master IDE hard drive
IDE 1	Primary slave IDE hard drive
IDE 2	Secondary master IDE hard drive
IDE 3	Secondary slave IDE hard drive
Legacy Floppy Drives	Standard Legacy Diskette Drives
USB FDC	USB Diskette Drive
USB HDD	USB Hard Drive and memory sticks that follow MMS specification
USB CDROM	USB CD-ROM Drive
USB ZIP	USB ZIP Drive
USB LS120	USB LS120 Drive
PCI LAN	Ethernet Controller on the PCI Bus with LAN Boot ROM
PCI SCSI	SCSI Controller on the PCI Bus with SCSI BIOS ROM
Legacy Network Card	Ethernet Controller on the ISA Bus with LAN Boot ROM

25.8.3. Boot First Submenu

Display the Boot First Menu by pressing <Esc> during POST. In response, the BIOS displays the message Entering Boot Menu and then displays the Boot Menu at the end of POST. With the MultiBoot XP feature only devices detected during boot up are displayed.

Use the menu to select a following option:

- Override the existing boot sequence (for this boot only) by selecting another boot device. If the specified device does not load the OS, the BIOS reverts to the previous boot sequence.
- Enter Setup.
- Press <Esc> to continue with the existing boot sequence.

25.8.4. Display Control Submenu

Feature	Option	Description
JDA Revision		Shows the actual revision of used JDA (JILI Data Area).
Display Mode	CRT only LCD only **CRT+LCD**	Selects display boot devices. CRT+LCD is the simultaneous mode.
Flat Panel Type	**Auto Detect** VGA, SVGA, XGA,SXGA UXGA * Enter PAID Enter FPID	Select Auto Detect whenever using a JILI cable on the LCD interface. VGA, SVGA, XGA, SXGA, UXGA provide standard timings for LCD panel resolutions. You can enter the Panel Adapter ID (PAID) or the Flat Panel ID (FPID) manually.
LCD Backlight **	0 – 255	Enter a value to adjust backlight of the LCD.
LCD Contrast ***	0 – 63	Enter a value to adjust contrast of the LCD.

Note: In the Option column, bold shows default settings.

(*) Standard timings for VGA to UXGA panels cannot drive all available displays of that type that are on the market. Use a JILI cable whenever possible.

(**) Only visible if the panel adapter is equipped with a MAX5362 DAC for backlight control.

(***) Only visible if the panel adapter is equipped with a Xicore X9429 digital potentiometer for contrast control.

25.9 *Exit Menu*

The following sections describe the five options in Exit Menu. Pressing <Esc> does not exit this menu. You must select an item from the menu to exit.

Feature	Option	Description
Exit Saving Changes	Saves selections and exits setup. The next time the system boots, the BIOS configures the system according to the Setup selection stored in CMOS.	Exit saving changes.
Exit Discarding Changes	Exits Setup without storing in CMOS any new selections you may have made. The selections previously in effect remain in effect.	Exit discarding changes.
Load Setup Defaults	Displays default values for all the Setup menus.	Load setup defaults.
Discard Changes	If, during a Setup session, you change your mind about changes you have made and have not yet saved the values to CMOS, you can restore the values you saved to CMOS.	Discard changes.
Save Changes	Saves all the selection without exiting Setup. You can return to the other menus to review and change your selection.	Save changes.

25.10 *Kontron BIOS Extensions*

Besides the Phoenix System BIOS, the coolMONSTER/VC and coolMONSTER/VE come with a few BIOS extensions that support special features. All extensions are located in the onboard flash EEPROM. Some extensions are permanently available; some are loaded if required during boot up. Supported features include:

- JIDA standard
- Onboard LAN RPL ROM

All enabled BIOS extensions require shadow RAM. They will be loaded into the same 32K shadowed memory block, if possible. However, if the system memory cannot find free memory space because all the memory is already used for add-on peripherals, the BIOS extensions do not load.

25.10.1. JIDA BIOS extension

The JUMPtec Intelligent Device Architecture (JIDA) BIOS extension is not a true extension BIOS. It is part of the system BIOS and is located in the system BIOS segments after boot up. It is permanently available and supports the JIDA 16-bit and JIDA 32-bit standard.

The JIDA 16-bit standard is a software interrupt 15hex driven programmers interface and offers lots of board information functions. For detailed information about programming, refer to the JIDA specification and a source code example (JIDAI???.ZIP), which you can find at the Kontron Web site. The three question marks represent the revision number of the file. You also can contact technical support for this file.

For other operating systems, special 32-bit drivers (JIDAIA??.ZIP) are available. You can download the zip file from the Kontron Web site.

25.10.2. LAN PXE ROM

If the onboard LAN PXE ROM is enabled in the system BIOS setup, a special optional ROM for the Ethernet controller loads into memory during boot up. This optional ROM allows you to boot the coolMONSTER/VC and coolMONSTER/VE over an Ethernet connection. A server with Intel PXE boot support is required on the other side of the Ethernet connection. The setup and configuration of the server, including PXE support, is not the responsibility of Kontron.

The PXE ROM extension is loaded into the first free memory area between C0000hex and D8000hex and a 32K block of memory is shadowed.

25.11 *Updating or Restoring BIOS Using PhoenixPhlash*

PhoenixPhlash allows you to update the BIOS by using a floppy disk without having to install a new ROM chip. PhoenixPhlash is a utility used to flash a BIOS to the Flash ROM installed on the coolMONSTER/VC and coolMONSTER/VE.

Use PhoenixPhlash to:

- Update the current BIOS with a newer version
- Restore a corrupt BIOS

25.11.1. Flashing a BIOS

Use the following procedure to update or restore a BIOS.

1. Download the Phoenix Phlash compressed file, CRDxLEUE.ZIP, from the KONTRON Embedded Modules Web site or contact your local technical support for it. It contains the following files:

File	Purpose
MAKEBOOT.EXE	Creates the custom boot sector on the Crisis Recovery Diskette.
CRISBOOT.BIN	Serves as the Crisis Recovery boot sector code.
MINIDOS.SYS	Allows the system to boot in Crisis Recovery Mode.
PHLASH.EXE	Programs the flash ROM.
WINCRISIS.EXE	Creates the Crisis Recovery Diskette from Windows.
WINCRISIS.HLP	Serves as the help file of WINCRISES.EXE.
PLATFORM.BIN	Performs platform-dependent functions.
BIOS.ROM	Serves as the actual BIOS image to be programmed into Flash ROM.

2. Install Phoenix Phlash on a hard disk by unzipping the content of CRDxLEUE.ZIP into a local directory such as C:\PHLASH.

3. Create a Crisis Recovery Diskette by inserting a blank diskette into Drive A: or B: and execute WINCRISIS.EXE. This copies four files onto the diskette.

File	Purpose
MINIDOS.SYS	Allows the system to boot in Crisis Recovery Mode.
PHLASH.EXE	Programs the flash ROM.
PLATFORM.BIN	Performs platform-dependent functions.
BIOS.ROM	Serves as the actual BIOS image to be programmed into Flash ROM.

4. If the BIOS image (BIOS.ROM) changes due to an update or bug fix, copy the new BIOS onto the diskette an name it BIOS.ROM.

   Phoenix Phlash runs in either command line mode or crisis recovery mode.

5. Use the command line mode to update or replace a BIOS. To execute Phlash in this mode, move to the Crisis Recovery Disk and type:

   ```
   PHLASH <bios name>      (Example: PHLASH LEUER110.ROM)
   ```

   PhoenixPhlash will update the BIOS. PhoenixPhlash can fail if the system uses memory managers. If this occurs, the utility displays the following message:

   ```
   Cannot flash when memory manager are present.
   ```

   If you see this message after you execute Phlash, disable the memory manager or use parameter /x for Phlash.exe.

   ```
   PHLASH /X <bios name>
   ```

25.11.2. Preventing Problems When Updating or Restoring BIOS

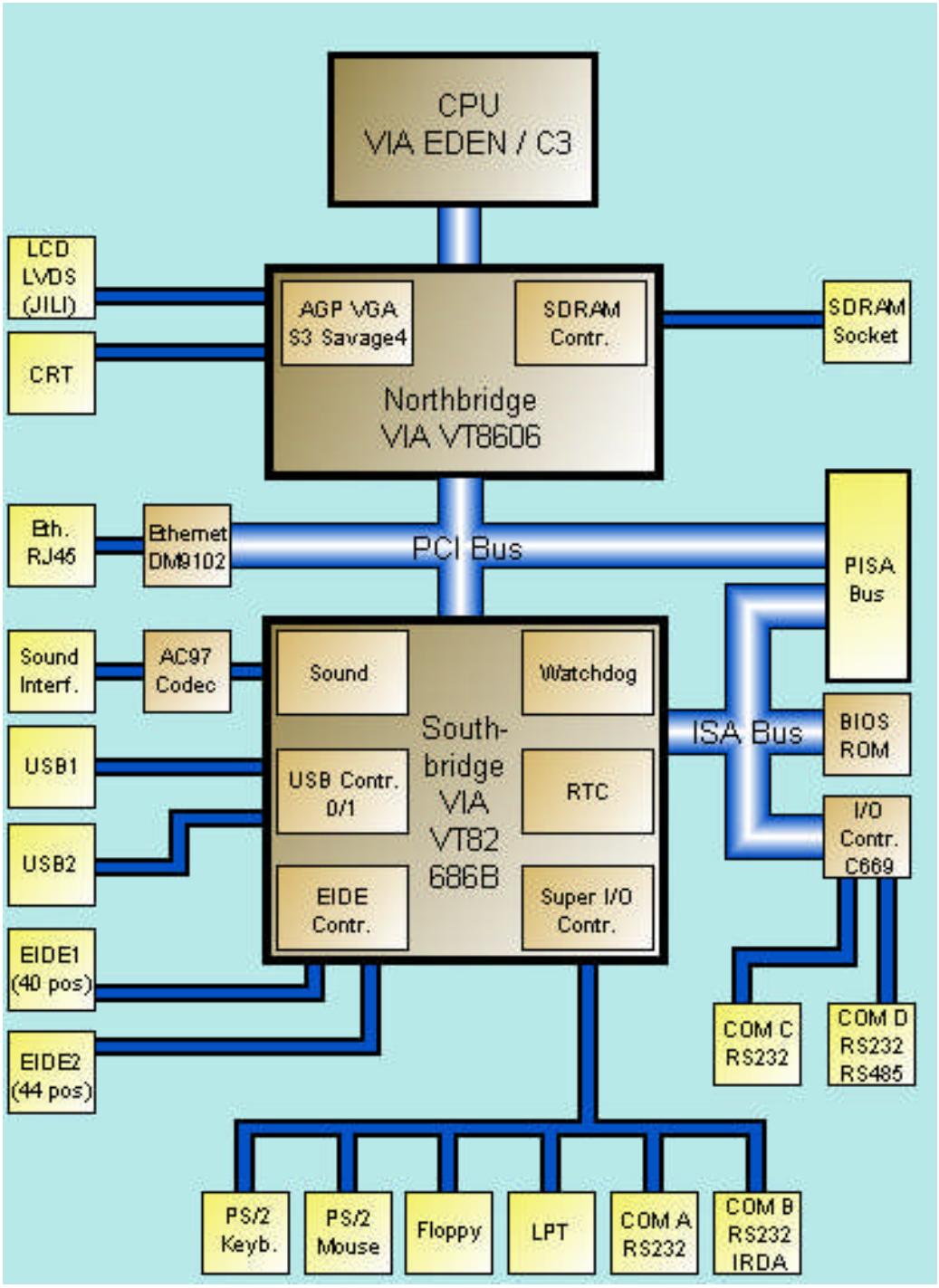
Updating the BIOS represents a potential hazard. Power failures or fluctuations can occur when you update the Flash ROM can damage the BIOS code, making the system unbootable.

To prevent this hazard, many systems come with a boot-block Flash ROM. The boot-block region contains a fail-safe recovery routine. If the boot-block code finds a corrupted BIOS (checksum fails), it boots into the crisis recovery mode and loads a BIOS image from a crisis diskette (see above).

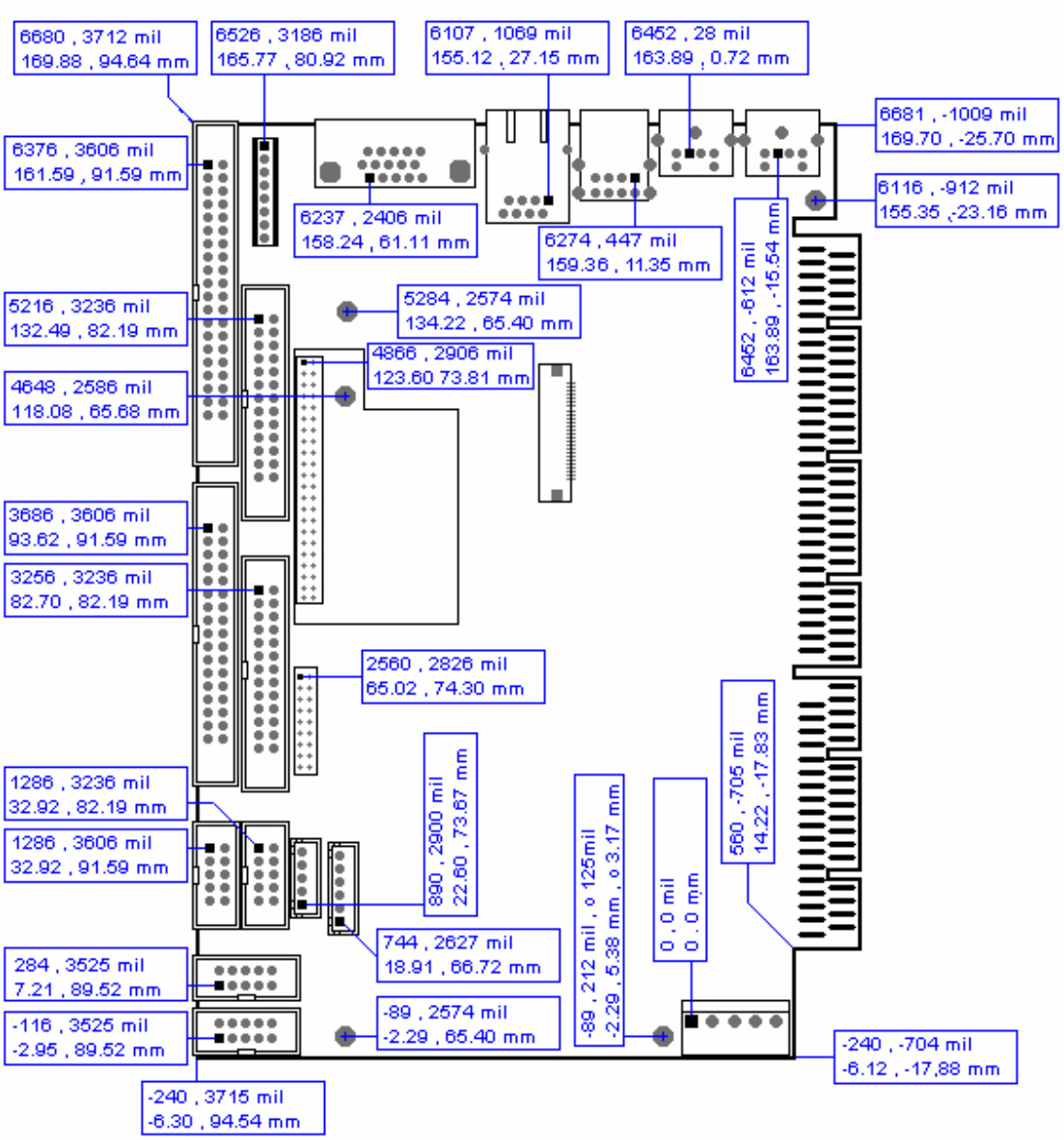
Additionally, the end user can insert an update key into the parallel port (LPT) to force initiating the boot block recovery routine.

For further information on the update key and the crisis diskette, see the Application Note PHLASH_SCE???, which is available from the KONTRON Embedded Modules Web site. The three question marks stand for the revision number of the file.

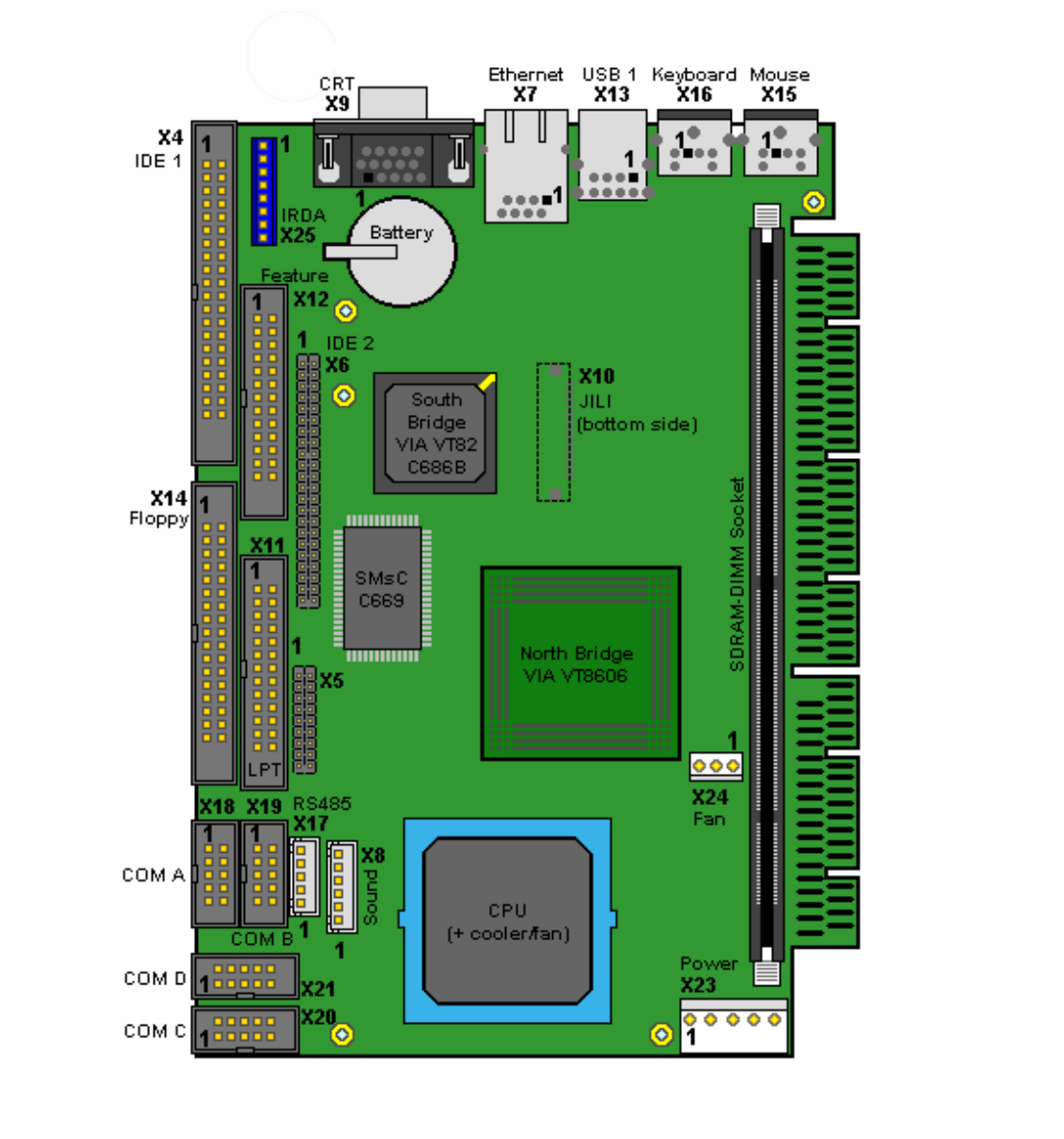
26. APPENDIX C: BLOCK DIAGRAM



27. APPENDIX D: MECHANICAL DIMENSIONS



28. APPENDIX E: CONNECTOR LAYOUT



Notes: The position of Pin 1 is marked with a quadratic pad on the PCB.

28.1 Connector Functions and Interface Cables

The table notes connector functions, as well as mating connectors and available cables.

Connector	Function	Mating Connector	Available Cable	Cable Description
X4	Primary IDE Hard Disk Interface Connector	2.54mm 40 pos. (AMP 4-215882-0 or compatible)	KAB-IDE-1 (PN 96022-0000-00-0)	For 3.5" HDD
X6	Secondary IDE Hard Disk Interface Connector	2mm 44 pos. (Berg 89361-144 or compatible)	KAB-IDE-25 (PN 96020-0000-00-0) or KAB-IDE-2MM (PN 96021-0000-00-0)	For 3.5" HDD or 2.5" HDD.
X8	Sound Connector	2.54mm 6 pos. (JST XHP-6 with crimp contacts JST SXH-001T-PO.6 Or JST SXH-002T-PO.6)	KAB-SOUND-CMP (PN96063-0000-00-0)	Cable with open ends
X11	Parallel Interface LPT Connector	2.54mm 26 pos. (AMP 2-215882-6 or compatible)	KAB-DSUB25-1 (PN 96015-0000-00-0)	For DSUB 25 adaptation.
X12	Feature	2.54mm 26 pos. (AMP 2-215882-6 or compatible)		
X14	Floppy Drive Interface Connector	2.54mm 34 pos. (AMP 3-215882-4 or compatible)	KAB-FLOPPY-1 (PN 96018-0000-00-0)	For 3.5" floppy
X17	RS485 Interface Connector (COM D)	2.54mm 5 pos. (JST XHP-5 with crimp contacts JST SXH-001T-PO.6 or JST SXH-002T-PO.6)		
X18, X19, X20, X21	Serial Interface Connectors (COM A - COM D)	2.54mm 10 pos. (AMP 1-215882-0 or compatible)	KAB-DSUB9-2 (PN 96017-0000-00-0)	For DSUB 9 adaptation.
X23	Power Connector	3.96mm 5 pos. (Molex SPOX 09-50-1051 with crimp contacts MOLEX SPOX 08-70-1028)		
X25	IrDA Connector	2.54mm 8 pos. (BERG DUBOX 65240-008 with crimp contacts BERG DUBOX 76357-301)		

28.2 *Pin-out Table*

Pin	COM A – COM D	COM D RS485	LPT	Floppy	Primary IDE	Secondary IDE	Feature	CRT
	X18-X21	X17	X11	X14	X4	X6	X12	X9
1	DCD	485_1RXD+	/STB	GND	HDRSTJ	HDRSTJ	KBCLK	RED
2	DSR	485_1RXD-	/AFD	RPM	GND	GND	MSCLK	GRN
3	SIN	GND	PD0	GND	PIDE_D7	SIDE_D7	KBDAT	BLU
4	RTS	485_1TXD+	/ERR	NC	PIDE_D8	SIDE_D8	MSDAT	NC
5	SOUT	485_1TXD-	PD1	GND	PIDE_D6	SIDE_D6	VCC *	GND
6	CTS		/INIT	NC	PIDE_D9	SIDE_D9	-5V *	GND
7	DTR		PD2	GND	PIDE_D5	SIDE_D5	-12V *	GND
8	RI		/SLIN	INDEXJ	PIDE_D10	SIDE_D10	GND	GND
9	GND		PD3	GND	PIDE_D4	SIDE_D4	H_LED	NC
10	VCC *		GND	MTR0J	PIDE_D11	SIDE_D11	internal use!	GND
11			PD4	GND	PIDE_D3	SIDE_D3	internal use!	NC
12			GND	DR1J	PIDE_D12	SIDE_D12	SPEAKER	DDA
13			PD5	GND	PIDE_D2	SIDE_D2	Not used	HSYNC
14			GND	DR0J	PIDE_D13	SIDE_D13	Not used	VSYNC
15			PD6	GND	PIDE_D1	SIDE_D1	GND	DCK
16			GND	MTR1J	PIDE_D14	SIDE_D14	RESIN	
17			PD7	GND	PIDE_D0	SIDE_D0	internal use!	
18			GND	FDIR	PIDE_D15	SIDE_D15	internal use!	
19			/ACK	GND	GND	GND	5V SB	
20			GND	STEPJ	NC	NC	LILED	
21			/BUSY	GND	PIDE_DRQ	SIDE_DRQ	PS_ON	
22			GND	WDATAJ	GND	GND	SPEEDLED	
23			PE	GND	PIDE_IOWJ	SIDE_IOWJ	PWRBTN	
24			GND	WGATEJ	GND	GND	ACTLED	
25			/SLCT	GND	PIDE_IORJ	SIDE_IORJ	USB2-	
26			VCC *	TRK0J	GND	GND	USB2+	
27				GND	PIDE_RDY	SIDE_RDY		
28				WRTPRTJ	PRI_PD1	SEC_PD1		
29				GND	PIDE_AKJ	SIDE_AKJ		
30				RDATAJ	GND	GND		
31				GND	SIRQI	SIRQII		
32				HDSEL	NC	NC		
33				GND	PIDE_A1	SIDE_A1		
34				DSKCHG	CBLID	NC		
35					PIDE_A0	SIDE_A0		
36					PIDE_A2	SIDE_A2		
37					PIDE_CS1J	SIDE_CS1J		
38					PIDE_CS3J	SIDE_CS3J		
39					DASP_P	DASP_S		
40					GND	GND		
41						VCC *		
42						VCC *		
43						GND		
44						NC		

Pin	Ethernet	IRDA	Sound	PS/2 Keyboard	PS/2 Mouse	USB 1	Power	Fan
	X7	X25	X8	X16	X15	X13	X23	X24
1	TXD+	NC **	RECHTS	KBDAT	MSDAT	USB_5V	+12V *	Sense
2	TXD-	NC **	ASGND	MSDAT	NC	USB1-	VCC *	5V *
3	RXD+	IRTX	LINKS	KEYGND	KEYGND	USB1+	VCC *	GND
4	NC **	GND	AUXAR_C	KEYVCC *	KEYVCC *	USB_GND	GND	
5	NC **	IRRX	MIC_C	KBCLK	MSCLK		GND	
6	RXD-	VCC *	AUXAL_C	MSCLK	NC			
7	NC **	NC **						
8	NC **	NC **						

Notes: (*) To protect the external power lines of peripheral devices, make sure that:
-- the wires have the right diameter to withstand the maximum available current
-- the enclosure of the peripheral device fulfils the fire-protecting requirements of
-- IEC/EN 60950.
(**) Do not connect anything to these signals.

29. APPENDIX F: PC ARCHITECTURE INFORMATION

The following sources of information can help you better understand PC architecture.

29.1 *Buses*

29.1.1. PISA

- PISA Bus Specification Version 1.7 June 1997

29.1.2. ISA, Standard PS/2 - Connectors

- AT Bus Design: Eight and Sixteen-Bit ISA, E-ISA and EISA Design, Edward Solari, Annabooks, 1990, ISBN 0-929392-08-6
- AT IBM Technical Reference Vol 1&2, 1985
- ISA & EISA Theory and Operation, Edward Solari, Annabooks, 1992, ISBN 0929392159
- ISA Bus Specifications and Application Notes, Jan. 30, 1990, Intel
- ISA System Architecture, Third Edition, Tom Shanley and Don Anderson, Addison-Wesley Publishing Company, 1995, ISBN 0-201-40996-8
- Personal Computer Bus Standard P996, Draft D2.00, Jan. 18, 1990, IEEE Inc
- Technical Reference Guide, Extended Industry Standard Architecture Expansion Bus, Compaq 1989

29.1.3. PCI/PC-104

- Embedded PC 104 Consortium
  The consortium provides information about PC/104 and PC/104-Plus technology. You can search for information about the consortium on the Web.
- PCI SIG
  The PCI-SIG provides a forum for its ~900 member companies, who develop PCI products based on the specifications that are created by the PCI-SIG. You can search for information about the SIG on the Web.
- PCI & PCI-X Hardware and Software Architecture & Design, Fifth Edition, Edward Solari and George Willse, Annabooks, 2001, ISBN 0-929392-63-9.

- PCI System Architecture, Tom Shanley and Don Anderson, Addison-Wesley, 2000, ISBN 0-201-30974-2.

29.2 General PC Architecture

- Embedded PCs, Markt&Technik GmbH, ISBN 3-8272-5314-4 (German)
- Hardware Bible, Winn L. Rosch, SAMS, 1997, 0-672-30954-8
- Interfacing to the IBM Personal Computer, Second Edition, Lewis C. Eggebrecht, SAMS, 1990, ISBN 0-672-22722-3
- The Indispensable PC Hardware Book, Hans-Peter Messmer, Addison-Wesley, 1994, ISBN 0-201-62424-9
- The PC Handbook: For Engineers, Programmers, and Other Serious PC Users, John P. Choisser and John O. Foster, Annabooks, 1997, ISBN 0-929392-36-1

29.3 Ports

29.3.1. RS-232 Serial

- EIA-232-E standard
  The EIA-232-E standard specifies the interface between (for example) a modem and a computer so that they can exchange data. The computer can then send data to the modem, which then sends the data over a telephone line. The data that the modem receives from the telephone line can then be sent to the computer. You can search for information about the standard on the Web.
- RS-232 Made Easy: Connecting Computers, Printers, Terminals, and Modems, Martin D. Seyer, Prentice Hall, 1991, ISBN 0-13-749854-3
- National Semiconductor
  The Interface Data Book includes application notes. Type “232” as a search criteria to obtain a list of application notes. You can search for information about the data book on National Semiconductor’s Web site.

29.3.2. ATA

AT Attachment (ATA) Working Group
This X3T10 standard defines an integrated bus interface between disk drives and host processors. It provides a common point of attachment for systems manufacturers and the system. You can search for information about the working group on the Web.
We recommend you also search the Web for information on *4.2 I/O cable*, if you use hard disks in a DMA3 or PIO4 mode.

29.3.3. USB

USB Specification
USB Implementers Forum, Inc. is a non-profit corporation founded by the group of companies that developed the Universal Serial Bus specification. The USB-IF was formed to provide a support organization and forum for the advancement and adoption of Universal Serial Bus technology. You can search for information about the standard on the Web.

29.4 *Programming*

- C Programmer's Guide to Serial Communications, Second Edition, Joe Campbell, SAMS, 1987, ISBN 0-672-22584-0
- Programmer's Guide to the EGA, VGA, and Super VGA Cards, Third Edition, Richard Ferraro, Addison-Wesley, 1990, ISBN 0-201-57025-4
- The Programmer's PC Sourcebook, Second Edition, Thom Hogan, Microsoft Press, 1991, ISBN 1-55615-321-X
- Undocumented PC, A Programmer's Guide to I/O, CPUs, and Fixed Memory Areas, Frank van Gilluwe, Second Edition, Addison-Wesley, 1997, ISBN 0-201-47950-8

30. APPENDIX G: DOCUMENT REVISION HISTORY

Version	Date	Edited by	Changes
LEUEM101	15.10.2003	KFR and JL	Created manual.
LEUEM110	28.10.2003	KFR and JL	Official release.
LEUEM111	12.02.2004	KFR and JL	Clarified information in EIDE interfaces chapter.
LEUEM112	10.03.2004	BHO and JL	Added drawings, information, and minor corrections.
LEUEM113	21.10.2004	BHO	Added Chipset, Memory and Graphic Controller information. Completed I/O-Map. Minor changes. Added information about NC signals.
LEUEM114	28.10.2004	BHO	Added PISA Bus chapter, added +3.3V power information.
LEUEM115	24.03.2005	BHO	Added MTBF value, minor changes
LEUEM116	15.09.2005	BHO	Added Ethernet note, new connector drawings, minor corrections
LEUEM117	06.12.2005	BHO	New Kontron Logo, added mirror-information for graphic I/O-addresses, changed Kontron Embedded Technology to Kontron Asia