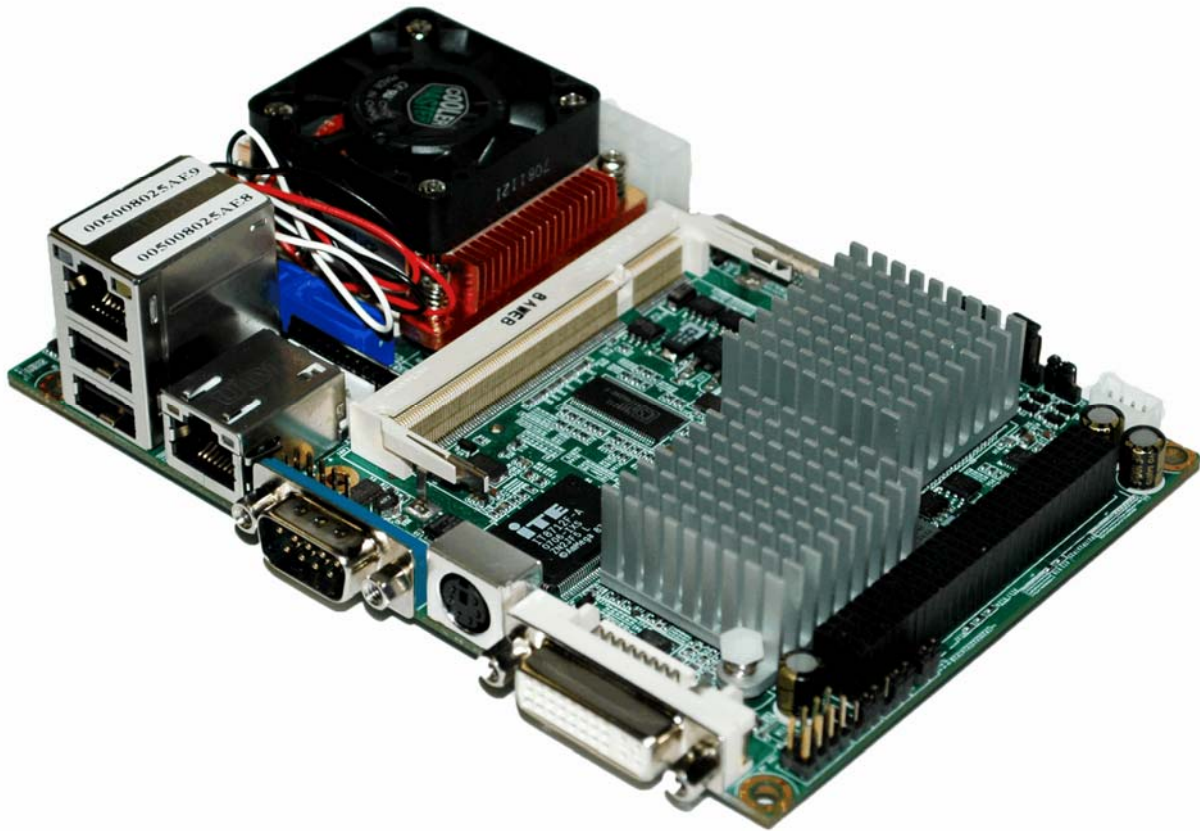


## ► Kontron User's Guide



## ► JRexplus-690

Document Revision 0.2

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# 1. User Information

## 1.1 About This Document

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## 1.4 Standards

Kontron Embedded Modules GmbH is certified to ISO 9000 standards.

## 1.5 Warranty

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

## 1.6 Technical Support

Technicians and engineers from Kontron Embedded Modules GmbH and/or its subsidiaries 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.

Please consult our website at <http://www.kontron.com/support> for the latest product documentation, utilities, drivers and support contacts. In any case you can always contact your board supplier for technical support.

## 2. Introduction

### 2.1 JREx Embedded Line Family

Each JREx is a member of the 3.5" SBC family of Kontron Embedded Modules GmbH.

JREx embedded line modules are characterized by the same surface pin-outs and interfaces for Reset logic and ATX power supply feature, 2 x USB, Fast LAN, PS/2 Keyboard and Mouse connector, Compact-Flash socket, VGA interface as well as one Serial Port. These embedded line family features allow to use of the same chassis over the whole product line and maximize design reuse.

JREx embedded line modules allow the use of standard laptop memories and full ATX power supplies.

These homogeneous features facilitate easy upgrades within the JREx embedded line product family. Connection of LCD panels is simplified when using the onboard standard JILI30 interface (Jumptec® Intelligent LVDS Interface).

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

### 2.2 JRExplus-690 Overview

Please refer to the following matrix to choose the product that suits your needs best.

| Article number  | CPU type           | CPU frequency |
|-----------------|--------------------|---------------|
| 02007-0000-10-1 | AMD Sempron™ 2100+ | 1.0 GHz       |
| 02007-0000-18-0 | AMD Turion™ 64 X2  | 1.8 GHz       |

---

**Attention:** As it is a socket CPU, the processor can be exchanged. By no means an Intel CPU may be used in the socket. In this case the board can permanently be damaged. If an AMD CPU is used, that is not certified by Kontron, all warranty claims are lost. The faultless function of the BIOS can not be guaranteed in this case.

---

## 3. Getting Started

Getting started with the JReplus-690 is very easy. Take the following steps:

- ❶ Connect the power supply to the JReplus's power supply connector.
- ❷ Plug a suitable DDR2-SDRAM memory module into the RAM socket.
- ❸ Connect the DVI or CRT monitor to the combined DVI interface or a LCD panel to the JILI30 interface by using the corresponding adapter cable.
- ❹ Plug a keyboard and/or mouse to the combined PS/2 connector by using a Y-cable.
- ❺ Plug a data cable to the hard disk interface. Attach the hard disk to the connector at the opposite end of the cable. If necessary, connect the power supply to the hard disk's power connector.
- ❻ Make sure all your connections have been made correctly. Turn on the power.
- ❼ Enter the BIOS by pressing the Del key during boot-up. Make all changes in the BIOS Setup. See the BIOS chapter of this manual for details.

## 4. Specifications

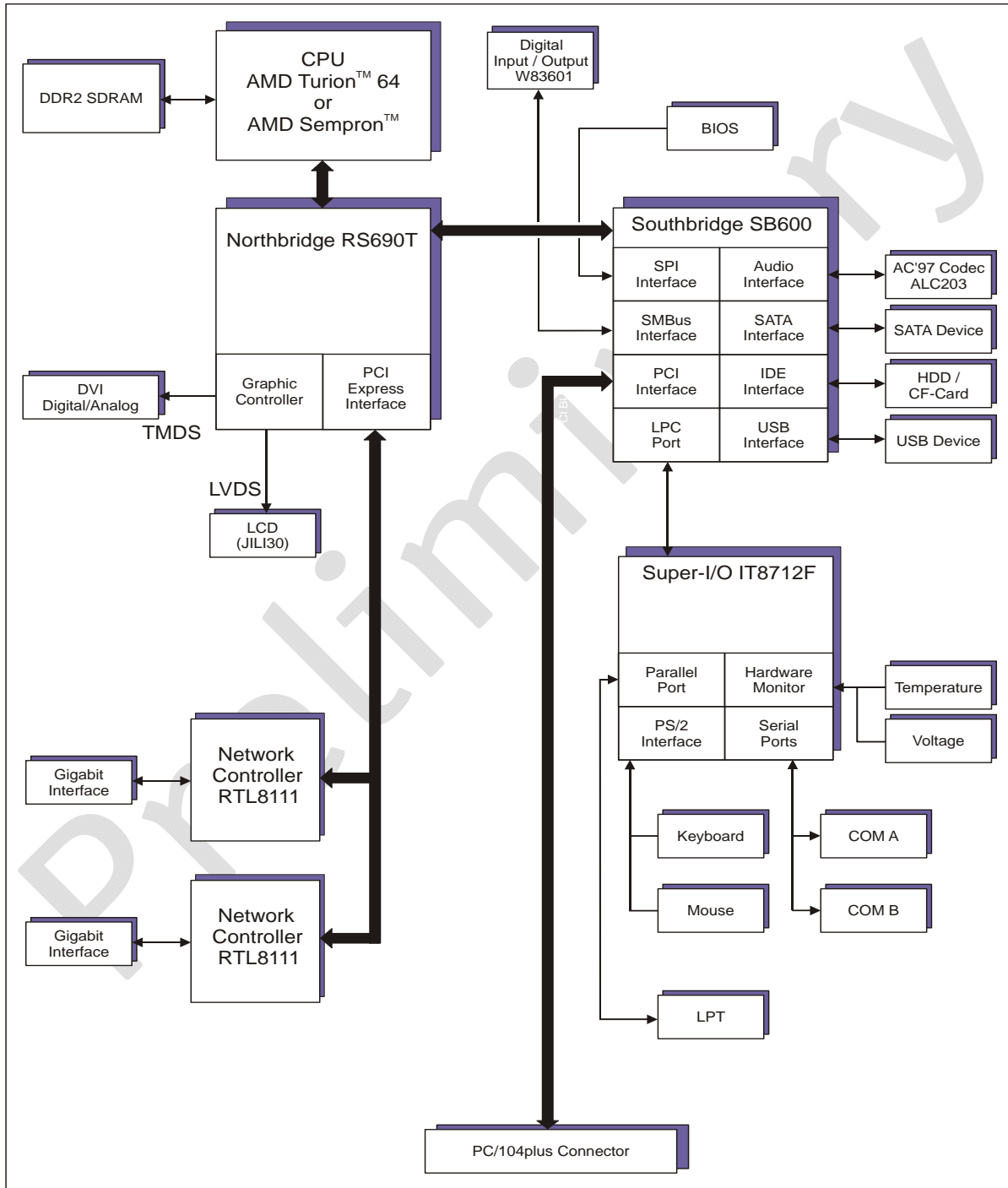
### 4.1 Functional Specifications

- **Processor**
  - AMD Turion™ 64 or Sempron™ processor
- **Cache**
  - 64 kB data and 64 kB instruction L1 cache
  - 256 kB L2 cache (Sempron™)
  - Up to 1 MB L2 cache (Turion™)
- **Chipset**
  - AMD/ATI RS690T (Northbridge)
  - AMD/ATI SB600 (Southbridge)
- **CPU/Chipset Buses**
  - Up to 800 MHz CPU bus (HyperTransport™)
  - Up to 800 MHz memory bus
  - 33 MHz 32 bit PCI bus
  - PCI Express port configurable as four x1 links or one x4 link
- **Power Supply**
  - Full ATX power supply support
  - Onboard power supply to low-voltage technology
- **Super I/O**
  - ITE IT8712F (LPC I/O)
- **Memory**
  - One SODIMM interface run with DDR2-400 to DDR2-800 unbuffered DDR-SDRAM, up to 2 GB
- **Two Serial Ports (COM A/B)**
  - COM1 and COM2 (RS-232 compatible)
- **One Parallel Port (LPT)**
  - Enhanced Parallel Port (EPP) and Extended Capabilities Port (ECP) with bidirectional capability
- **EIDE-Interface (P-ATA)**
  - UDMA Peripheral Component Interconnect (PCI) Bus Master IDE ports (up to two devices)
- **Compact Flash Socket**

- **S-ATA RAID Controller**
  - Supports RAID level 0, RAID level 1 and AHCI mode for up to two devices
  - Complies with Serial ATA specification Rev. 1.0a
- **Universal Serial Bus (USB)**
  - Six USB 2.0 ports (OHCI/EHCI)
  - USB legacy keyboard support
  - USB floppy boot support
- **Ethernet (LAN)**
  - Two Realtek RTL8111C 10/100/1000 Mbps PCI Gigabit Ethernet controllers
  - Fully compliant with IEEE 802.3, IEEE 802.3u and IEEE 802.3ab
- **Onboard Video Graphics Array (VGA)**
  - ATI Radeon™ X1200 integrated in AMD/ATI RS690T (Northbridge)
  - Up to 256 MB Video RAM (UMA)
  - Combined DVI-I interface (including CRT) and low voltage differential signaling (LVDS) LCD flatpanel interfaces
- **Audio**
  - 16 bit full duplex AC'97 Rev. 2.3 compatible audio codec
  - Supports Line Out, Line In and Microphone input
- **AMI BIOS, 1 MB Flash**
- **PS/2 Keyboard Controller**
- **PS/2 Mouse Controller**
- **Realtime Clock (requires battery)**
- **Digital I/O**
  - Four Inputs and four Outputs, 5V signal level
- **External PCI Bus**
  - 33 MHz PCI clock
  - 32 bit data bus width
  - 3.3V / 5V PCI cards supported

## 4.2 Block Diagram

### JRexplus-690



## 4.3 Mechanical Specifications

### 4.3.1 Module Dimensions

- 102 x 147 mm (4.0" x 5,8")

### 4.3.2 Height on Top

- Maximum approx. 33 mm

### 4.3.3 Height on Bottom

- Maximum approx. 6 mm

Preliminary

## 4.4 Electrical Specifications

### 4.4.1 Supply Voltage

The power supply connector (10 pins) requires +3.3V, +5V, +12V, -12V and +5V standby.

- +3.3V DC  $\pm 5\%$
- +5V DC  $\pm 5\%$
- $\pm 12V$  DC  $\pm 5\%$
- +5V DC standby  $\pm 5\%$

### 4.4.2 Supply Voltage Ripple

- 100 mV peak to peak 0 - 20 MHz

### 4.4.3 Supply Current (typical, DOS prompt)

Power consumption tests were executed during the DOS prompt with keyboard (PS/2), CF card and a DVI monitor attached to it. The board is equipped with a 512 MB DDR2 SDRAM modul (DDR2-667).

| Processor      | Full Load      |
|----------------|----------------|
| AMD Sempron™   | tbd A<br>tbd W |
| AMD Turion™ 64 | tbd A<br>tbd W |

### 4.4.4 Supply Current (typical, Windows XP SP3)

The tested board is equipped with mouse (USB), keyboard (PS/2), CF card and a DVI monitor. The power consumption tests were executed during Windows XP SP3 by using the tool (t.b.d.). The board is equipped with a 512 MB DDR2 SDRAM modul (DDR2-667).

| Processor      | Full Load      | Idle           | Standby S1     | Suspend S3     |
|----------------|----------------|----------------|----------------|----------------|
| AMD Sempron™   | tbd A<br>tbd W | tbd A<br>tbd W | tbd A<br>tbd W | tbd A<br>tbd W |
| AMD Turion™ 64 | tbd A<br>tbd W | tbd A<br>tbd W | tbd A<br>tbd W | tbd A<br>tbd W |

**Note:** It is difficult to test for all possible applications on the market. There may be an application that draws more power from the CPU than the measured values in the table above. This should be taken into consideration if you are on the limit of the thermal specification. If this is the case improvements to your thermal solution are recommended.

#### 4.4.5 RTC Battery

- Voltage range: 2.0 V - 3.6 V (typ. 3.0 V)
- Maximum current: 5  $\mu$ A @ 3.0 V

**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 durch den 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. Udskiftning må kun ske med 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 lattevalmistajan suosittelemaan tyyppiin. Havita käytetty 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. Therefore the safety instructions are only given in english, german, french, danish, finish and spanish language.

If the battery of this product however 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).

## 4.5 Environmental Specifications

### 4.5.1 Temperature

- Operating (with appropriate airflow):  $\pm 0$  to  $+55^{\circ}\text{C}$  <sup>(1)</sup>
- Non operating:  $-10$  to  $+85^{\circ}\text{C}$

---

**Note:** 1 *The maximum operating temperature is the maximum measurable temperature on any spot on a module's surface. You must maintain the temperature according to the above specification.*

---

### 4.5.2 Humidity

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

## 4.6 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  $40^{\circ}\text{C}$  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  $50^{\circ}\text{C}$ , so in that sense the following results are slightly conservative. The MTBF values shown below are for a  $40^{\circ}\text{C}$  in an office or telecommunications environment. Higher temperatures and other environmental stresses (extreme altitude, vibration, salt water exposure, etc.) lower MTBF values.

- System MTBF (hours) : tbd

---

**Note:** *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.*

---

## 5. CPU, Chipset and Super I/O

### 5.1 CPU

The central processing unit (CPU) has the following features:

- Support for SSE, SSE2, SSE3, MMX™ and 3DNow!™
- AMD64 technology instruction set extensions
- Two 64 kB (data/instruction) on-chip level 1 caches
- 256 kB (Sempron™) or up to 1 MB (Turion™) on-chip level 2 cache
- HyperTransport™ Interface (16 bit width up to 800 MHz)
- Integrated memory controller for DDR2-SDRAM

### 5.2 Chipset

The AMD/ATI chipset consists of:

- RS690T (Northbridge)
  - CPU HyperTransport™ Interface
  - One x4 A-Link Express II interface for connection to the Southbridge
  - High performance 2D and 3D (DirectX 9.0 support) graphics controller
  - Enhanced MPEG-2 hardware decode acceleration
  - Supports up to 1920x1200 @60Hz with pixel clock at 154 Mhz and reduced blanking timings for DVI output (single link)
  - Supports up to 2560x1440 @75Hz for VGA output
  - Supports up to 1920x1200x32 bpp at 60 Hz for TFT interface
  - A four port PCI Express interface compliant with PCI-E 1.1a specification, configurable to one of the following modes: four x1, two x2 and one x4 link(s). Only internal
  - Advanced system power management support
- SB600 (Southbridge)
  - One x4 Link Express II interface for connection to the Northbridge
  - Parallel PCI bus 32 bit width 33 MHz according to PCI 2.3 specification
  - Six integrated USB ports (OHCI/EHCI)
  - Integrated Enhanced-IDE controller (P-ATA) up to UDMA133
  - Integrated S-ATA II controller complying with the 1.0a specification (RAID / AHCI)
  - Integrated LPC port controller
  - System Management (SM) bus interface
  - Integrated AC link interface for AC'97 codecs (Rev. 2.3)
  - Advanced system power management support
  - Legacy device support (Timer, IRQ and DMA controller)
  - Internal Real-Time clock with CMOS RAM

## 5.3 Super I/O

The external Super I/O ITE W8712F offers the following features:

- Integrated PS/2 keyboard controller with PS/2 mouse support
- Two serial ports and one multi-mode parallel port
- Hardware monitoring of power supply voltages, temperatures and fan speeds
- Advanced system power management support

Preliminary

## 6. System Memory

The J*Rexplus*-690 uses only 200 pin Small Outline-Dual Inline Memory Modules (SO-DIMMs). One socket is available for 1.8 Volt unbuffered DDR2-400 to DDR2-800 of up to 2 GB.

The total amount of memory available on the SDRAM module is used for main memory and graphic memory on the J*Rexplus*-690. Shared Memory Architecture (SMA) manages the sharing of the system memory between graphic controller and processor. Therefore, the full memory size is not available for software applications. Up to 256 MB of system memory are used as graphic memory.

To find the location of the SDRAM socket on the J*Rexplus*-690 board, please see the Appendix "Connector Layout".

## 7. PCI Bus Expansion

A quad-row socket trough-hole connector with a 2 x 2 mm (0.79" x 0.79") pitch implements the standard 32 bit PCI bus signals. The PCI-104 bus is available through the standard connector X2.

A description of signals, including electrical characteristics and timings, is beyond the scope of this document. Please refer to the official PCI bus and PC/104-plus specifications for more details.

The jumper JP6 switches 3.3V or 5V to  $V_{I/O}$  (Default: 3.3V).



| Pins  | Signal |
|-------|--------|
| 1 - 2 | 3.3V   |
| 2 - 3 | 5V     |

- 
- Note:**
- 1 Some PCI-104 extension cards might interfere mechanically with the chipset cooler. To avoid this and to achieve the best possible cooling performance the usage of a PCI-104 spacer is recommended.
  - 2 The usage of a PCI-104 to PCI adapter or riser card is not generally recommended. Due to considerable differences in between these third party adapter cards (e.g. different circuit path routing) the signal integrity may suffer.
- 

To find the location of the PCI-104 connector and jumper JP6 on the JReplus-690 board, please see the Appendix "Connector Layout".

## 8. Graphics Interface

The graphics accelerator supports DVI/CRT monitors (combined DVI-I connector) and a variety of LCD panels with single/dual clock, color depths of 18/24 bit and up to resolutions of 1920x1200.

### 8.1 DVI-I Connector

The DVI/CRT monitor interface is available through the standard 29 pin D style DVI connector X8.

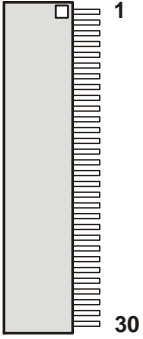
| Header | Pin              | Signal Name                  | Function                   |
|--------|------------------|------------------------------|----------------------------|
|        | 1                | <b>TMDS2-</b>                | TMDS data 2 (negative)     |
|        | 2                | <b>TMDS2+</b>                | TMDS data 2 (positive)     |
|        | 3                | <b>GND</b>                   | Signal ground              |
|        | 4                | <b>TMDS4-</b>                | TMDS data 4 (negative)     |
|        | 5                | <b>TMDS4+</b>                | TMDS data 4 (positive)     |
|        | 6                | <b>DDC_CLK</b>               | DDC clock                  |
|        | 7                | <b>DDC_DAT</b>               | DDC data                   |
|        | 8                | <b>VGA_VSYNC</b>             | Analog vertical sync (CRT) |
|        | 9                | <b>TMDS1-</b>                | TMDS data 1 (negative)     |
|        | 10               | <b>TMDS1+</b>                | TMDS data 1 (positive)     |
|        | 11               | <b>GND</b>                   | Signal ground              |
|        | 12               | <b>TMDS3-</b>                | TMDS data 3 (negative)     |
|        | 13               | <b>TMDS3+</b>                | TMDS data 3 (positive)     |
|        | 14               | <b>VCC <sup>(1)</sup></b>    | Power supply               |
|        | 15               | <b>GND</b>                   | Signal ground              |
|        | 16               | <b>TMDS_HPD</b>              | Hot plug detect            |
|        | 17               | <b>TMDS0-</b>                | TMDS data 0 (negative)     |
|        | 18               | <b>TMDS0+</b>                | TMDS data 0 (positive)     |
|        | 19               | <b>GND</b>                   | Signal ground              |
|        | 20               | <b>TMDS5-</b>                | TMDS data 5 (negative)     |
|        | 21               | <b>TMDS5+</b>                | TMDS data 5 (positive)     |
|        | 22               | <b>GND</b>                   | Signal ground              |
|        | 23               | <b>TMDSCLK+</b>              | TMDS clock (positive)      |
|        | 24               | <b>TMDSCLK-</b>              | TMDS clock (negative)      |
| C1     | <b>VGA_RED</b>   | Analog red (CRT)             |                            |
| C2     | <b>VGA_GREEN</b> | Analog green (CRT)           |                            |
| C3     | <b>VGA_BLUE</b>  | Analog blue (CRT)            |                            |
| C4     | <b>VGA_HSYNC</b> | Analog horizontal sync (CRT) |                            |
| C5     | <b>VGA_GND</b>   | Analog signal ground (CRT)   |                            |

To find the location of the DVI-I connector on the JRExplus-690 board, please see the Appendix “Connector Layout”.

## 8.2 LCD Panel Connector

The LVDS interface for the LCD panel is available through the X15 connector (30 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. A variety of cables for different display types are available from Kontron. Please refer to the actual cable list on the Kontron website for part numbers and cable names.

### 8.2.1 JILI30 Connector

| Header   | Pin     | Signal Name    | Function                                |
|--|---------|----------------|---|
|  | 1       | <b>FTX0-</b>   | First channel data output 0 (negative)  |
|  | 2       | <b>FTX0+</b>   | First channel data output 0 (positive)  |
|  | 3       | <b>FTX1-</b>   | First channel data output 1 (negative)  |
|  | 4       | <b>FTX1+</b>   | First channel data output 1 (positive)  |
|  | 5       | <b>FTX2-</b>   | First channel data output 2 (negative)  |
|  | 6       | <b>FTX2+</b>   | First channel data output 2 (positive)  |
|  | 7       | <b>GND</b>     | Signal ground                           |
|  | 8       | <b>FTXC-</b>   | First channel clock output (negative)   |
|  | 9       | <b>FTXC+</b>   | First channel clock output (positive)   |
|  | 10      | <b>FTX3-</b>   | First channel data output 3 (negative)  |
|  | 11      | <b>FTX3+</b>   | First channel data output 3 (positive)  |
|  | 12      | <b>STX0-</b>   | Second channel data output 0 (negative) |
|  | 13      | <b>STX0+</b>   | Second channel data output 0 (positive) |
|  | 14      | <b>GND</b>     | Signal ground                           |
|  | 15      | <b>STX1-</b>   | Second channel data output 1 (negative) |
|  | 16      | <b>STX1+</b>   | Second channel data output 1 (positive) |
|  | 17      | <b>GND</b>     | Signal ground                           |
|  | 18      | <b>STX2-</b>   | Second channel data output 2 (negative) |
|  | 19      | <b>STX2+</b>   | Second channel data output 2 (positive) |
|  | 20      | <b>STXC-</b>   | Second channel clock output (negative)  |
|  | 21      | <b>STXC+</b>   | Second channel clock output (positive)  |
|  | 22      | <b>STX3-</b>   | Second channel data output 3 (negative) |
|  | 23      | <b>STX3+</b>   | Second channel data output 3 (positive) |
|  | 24      | <b>GND</b>     | Signal ground                           |
|  | 25      | <b>SDA</b>     | I2C data line                           |
|  | 26      | <b>DATAENA</b> | Data enable output                      |
|  | 27      | <b>SCL</b>     | I2C clock line                          |
|  | 28 - 30 | <b>VCC (1)</b> | Power supply                            |

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**Note:** 1 To protect the external power lines of peripheral devices, make sure that

- the wires have the right diameter to withstand the maximum available current.
- to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

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**Attention:** Check jumper JP1 (Panel Power) for correct settings for your panel – not doing so might cause permanent damage to your panel.

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To find the location of the JILI30 connector on the JReplus-690 board, please see the Appendix “Connector Layout”.

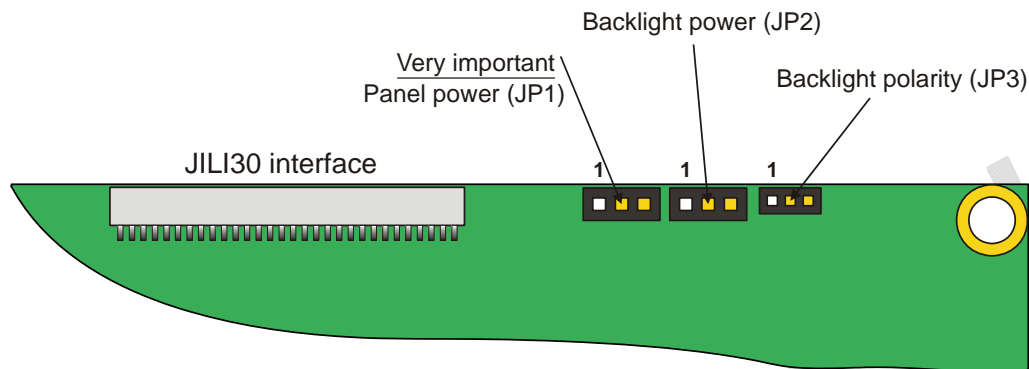
### 8.3 Connecting a LCD Panel

To determine whether your panel display is supported, check the Kontron website for panel lists. We regularly update the list of panels that have been tested with the JReplus-690.

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. Disconnect the power from your system.
- 2 Check Jumper JP1 for correct Panel voltage (**Pos. 1-2 = 3.3V 2-3 = 5V**).
- 3 Check Jumper JP2 for correct Backlight voltage (**Pos. 1-2 = 12V 2-3 = 5V**).
- 4 Check Jumper JP3 for correct Backlight on/off polarity (**Pos. 1-2 = High 2-3 = Low**).
- 5 Connect the cable to the LCD Panel connector X15 on the JReplus-690 and connect the other end to your display.
- 6 Connect the backlight converter.
- 7 Supply power to your system.
- 8 If no image appears on your display, connect a CRT or DVI monitor to the DVI-I connector.
- 9 If you still do not see improvement, consider contacting the dealer for technical support.

## 8.4 Summary of Panel Jumper



## 8.5 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.

### 8.5.1 Standard IBM-Compatible VGA Modes

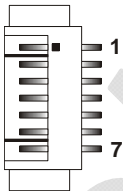
| Video Mode | Type     | Characters/Pixels | Colors |
|------------|----------|-------------------|--------|
| 00h/01h    | Text     | 40x25             | 16     |
| 02h/03h    | Text     | 80x25             | 16     |
| 04h/05h    | Graphics | 320x200           | 4      |
| 06h        | Graphics | 640x200           | 2      |
| 07h        | Text     | 80x25             | Mono   |
| 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    |

### 8.5.2 Extended VESA VGA Modes

| VESA Mode | Type     | Pixels    | Colors |
|-----------|----------|-----------|--------|
| 100h      | Graphics | 640x400   | 256    |
| 101h      | Graphics | 640x480   | 256    |
| 103h      | Graphics | 800x600   | 256    |
| 105h      | Graphics | 1024x768  | 256    |
| 107h      | Graphics | 1280x1024 | 256    |
| 10Eh      | Graphics | 320x200   | 64K    |
| 111h      | Graphics | 640x480   | 64K    |
| 114h      | Graphics | 800x600   | 64K    |
| 117h      | Graphics | 1024x768  | 64K    |
| 11Ah      | Graphics | 1280x1024 | 64K    |

## 8.6 Backlight Connector

Backlight is available through the X19 connector (7 pins). Backlight voltage and Backlight on/off polarity are controlled through the jumper JP2 and JP3.

| Header  | Pin | Signal Name | Function                     |
|---|-----|-------------|------------------------------|
|  | 1   | NC          | Not connected                |
|   | 2   | BKLTADJ     | Brightness control (0V - 5V) |
|   | 3   | GND         | Ground                       |
|   | 4   | VCC (1)     | 5V or 12V power supply       |
|   | 5   | VCC (1)     | 5V or 12V power supply       |
|   | 6   | GND         | Ground                       |
|   | 7   | BKLTON      | Backlight on/off             |

**Note:** 1 To protect the external power lines of peripheral devices, make sure that

- the wires have the right diameter to withstand the maximum available current.
- to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

To find the location of the backlight connector on the JReplus-690 board, please see the Appendix "Connector Layout".

## 8.7 DisplayID Specification (VESA)

Intended as a replacement for all previous EDID (Extended Display Identification Data) versions, DisplayID contains many new features. DisplayID is a structure with several well defined elements (tags). Not every element that is listed in the specification has to be part of the resulting data set (basic section).

Kontron has decided to use this selection of tags (mandatory presence):

| Tag        | Description   |
|------------|---|
| <b>00H</b> | Product Identification Data Block (Vendor ID, Product Code, Manufacturing Date ...) |
| <b>03H</b> | Type I Detailed Timing Data Block (Pixel Clock, Horizontal / Vertical Data ...)     |
| <b>0CH</b> | Display Device Data Block (Device Technology, Operating Mode, Color Depth ...)      |
| <b>0DH</b> | Interface Power Sequencing Data Block (Power On/Off Timing)                         |
| <b>0FH</b> | Display Interface Data Block (Interface Type, Interface Attribute ...)              |

For the creation of a new or modification of an existing DisplayID record Kontron provides a Windows tool (for WIN XP or Vista). Further informations on this can be gained from the implemented documentation of the DisplayID tool.

### 8.7.1 Summary of used DisplayID parameters

Only a part of the parameters used in the DisplayID Windows tool are interpreted by the JRExplus-690 board. The following table shows a summary of the used DisplayID parameters.

| Group             | Parameter              | Comment                             |
|-------------------|------------------------|-------------------------------------|
| Type I Timing     | Pixel Clock            |                                     |
| Type I Timing     | Horizontal Active      |                                     |
| Type I Timing     | Horizontal Blank       |                                     |
| Type I Timing     | Horizontal Sync Offset | Front porch                         |
| Type I Timing     | Horizontal Sync Width  |                                     |
| Type I Timing     | Vertical Active        |                                     |
| Type I Timing     | Vertical Blank         |                                     |
| Type I Timing     | Vertical Sync Offset   | Front porch                         |
| Type I Timing     | Vertical Sync Width    |                                     |
| Display Interf. 1 | Bits per Pixel         | Color depth (18 or 24 bit)          |
| Display Interf. 1 | Pixel per Clock        | Number of channels (single or dual) |
| Display Interf. 1 | 24 Bit Color Mapping   | FPDI or OpenLDI                     |
| Display Interf. 2 | Signal Polarity        | Only H-Sync and V-Sync active low   |
| Power Seq. 1      | T2 Value               | Delay Power -> Data on              |
| Power Seq. 1      | T5 Value               | Delay Data -> Backlight on          |
| Power Seq. 2      | T4 Value               | Power off time                      |

These values can be modified with the DisplayID Editor. Do not use the vendor ID 'KEM'. This vendor ID is allocated by Kontron Embedded Modules GmbH. Please use your own PnP-ID (allocation from Microsoft).

The DisplayID Editor saves the parameters in a intermediate file format. The file extension is 'KDD' (**K**ontron **D**isplayID **D**ata). This file format can not be used to program the onboard EEPROM.

For transferring this file format into the binary file format for the EEPROM apply the Converter.

### 8.7.2 Building a new DisplayID file

- ❶ Start the Windows tool *DisplayID.exe*
- ❷ Use the *Editor* if you want to modify an existing DisplayID file or select *New* to create a complete new record
- ❸ Change respectively enter new parameters
- ❹ Save the parameters in a file with the extension 'KDD'
- ❺ Open the saved 'KDD'-file using the *Converter*
- ❻ Save the binary file with the extension 'KDB'
- ❼ Program the EEPROM on the JREXplus board using the DOS tool B690-DID.EXE

### 8.7.3 Erasing a DisplayID record

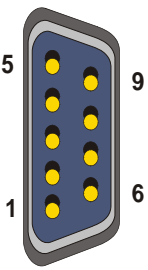
Programming the first 128 bytes in the EEPROM with the values 00H or FFH deletes a valid DisplayID record.

## 9. Serial-Port Interfaces

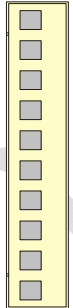
Two fully functional serial ports (COMA and COMB) provide asynchronous serial communications. COMA and COMB support RS-232 operation modes. They are 16550 high-speed UART compatible and support 16-byte FIFO buffers for transfer rates from 50 Baud to 115.2 Kbaud.

### 9.1 Connector

**COMA** is available through the standard DSUB9 connector X5 (9 pins).

| Header  | Pin | Signal Name | Function            | DSUB-25 |
|---|-----|-------------|---------------------|---------|
|  | 1   | <b>/DCD</b> | Data Carrier Detect | 8       |
|   | 2   | <b>RXD</b>  | Receive Data        | 3       |
|   | 3   | <b>TXD</b>  | Transmit Data       | 2       |
|   | 4   | <b>/DTR</b> | Data Terminal Ready | 20      |
|   | 5   | <b>GND</b>  | Signal ground       | 7       |
|   | 6   | <b>/DSR</b> | Data Set Ready      | 6       |
|   | 7   | <b>/RTS</b> | Request to Send     | 4       |
|   | 8   | <b>/CTS</b> | Clear to Send       | 5       |
|   | 9   | <b>/RI</b>  | Ring Indicator      | 22      |

**COMB** is available through the connector X6 (10 pins). A DSUB9 adapter cable is deliverable from Kontron (KAB-DSUB9-3, Part number 96061-0000-00-0).

| Header  | Pin | Signal Name    | Function            | DSUB-25 | DSUB-9 |
|---|-----|----------------|---------------------|---------|--------|
|  | 1   | <b>/DCD</b>    | Data Carrier Detect | 8       | 1      |
|   | 2   | <b>/DSR</b>    | Data Set Ready      | 6       | 6      |
|   | 3   | <b>RXD</b>     | Receive Data        | 3       | 2      |
|   | 4   | <b>/RTS</b>    | Request to Send     | 4       | 7      |
|   | 5   | <b>TXD</b>     | Transmit Data       | 2       | 3      |
|   | 6   | <b>/CTS</b>    | Clear to Send       | 5       | 8      |
|   | 7   | <b>/DTR</b>    | Data Terminal Ready | 20      | 4      |
|   | 8   | <b>/RI</b>     | Ring Indicator      | 22      | 9      |
|   | 9   | <b>GND</b>     | Signal ground       | 7       | 5      |
|   | 10  | <b>VCC (1)</b> | +5V                 | --      | --     |

**Note:** 1 To protect the external power lines of peripheral devices, make sure that

- the wires have the right diameter to withstand the maximum available current.
- to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

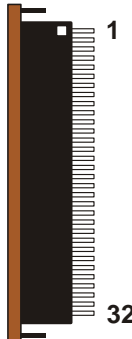
To find the location of the serial port connectors on the JReplus-690 board, please see the Appendix "Connector Layout".

# 10. Parallel-Port Interface

The JReplus-690 incorporates a parallel port that can be set to uni-/bidirectional and supports EPP/ECP operating modes.

## 10.1 Connector

The parallel port is available through the connector X18 (32 pins). A DSUB25 adapter cable is deliverable from Kontron (KAB-DSUB25-2, Part Number 61033).



| Header | Pin   | Signal Name        | Function      | DSUB-25 |
|--------|-------|--------------------|---------------|---------|
|        | 1     | VCC <sup>(1)</sup> | + 5V          | NC      |
|        | 12    | /AFD               | Autofeed      | 14      |
|        | 13    | /STB               | Strobe        | 1       |
|        | 14    | /ERR               | Error         | 15      |
|        | 15    | D0                 | Data 0        | 2       |
|        | 16    | /INIT              | Init          | 16      |
|        | 18    | D1                 | Data 1        | 3       |
|        | 19    | /SLIN              | Select in     | 17      |
|        | 20    | D2                 | Data 2        | 4       |
|        | 21    | D3                 | Data 3        | 5       |
|        | 23    | D4                 | Data 4        | 6       |
|        | 24    | D5                 | Data 5        | 7       |
|        | 25    | D6                 | Data 6        | 8       |
|        | 26    | D7                 | Data 7        | 9       |
|        | 28    | /ACK               | Acknowledge   | 10      |
|        | 29    | /BUSY              | Busy          | 11      |
|        | 30    | PE                 | Paper out     | 12      |
|        | 31    | /SLCT              | Select out    | 13      |
|        | 2,11  | GND                | Signal ground | 18 - 25 |
|        | 17,22 | GND                | Signal ground | 18 - 25 |
|        | 27,32 | GND                | Signal ground | 18 - 25 |

**Note:** 1 To protect the external power lines of peripheral devices, make sure that

- the wires have the right diameter to withstand the maximum available current.
- to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

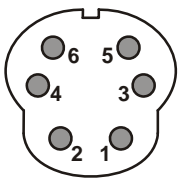
To find the location of the parallel port connector on the JReplus-690 board, please see the Appendix "Connector Layout".

# 11. PS/2 Keyboard and Mouse Interface

The Super-I/O of the JRExplus-690 supports a PS/2 keyboard and mouse. A PS/2 keyboard can be directly connected to this interface. If you intend to use a PS/2 mouse, connect a Y-cable to this interface. There are many different Y-cables available on the market. Some cables have reverse keyboard/mouse signals. If your keyboard and mouse do not work, connect the keyboard to the mouse side and vice versa.

## 11.1 Connector

The keyboard/mouse interface is available through the standard miniDIN connector X7 (6 pins).

|   | Pin | Signal Name    | Function       |
|---|-----|----------------|----------------|
|  | 1   | <b>KBDAT</b>   | Keyboard data  |
|   | 2   | <b>MSDAT</b>   | Mouse data     |
|   | 3   | <b>GND</b>     | Signal ground  |
|   | 4   | <b>VCC (1)</b> | +5V            |
|   | 5   | <b>KBCLK</b>   | Keyboard clock |
|   | 6   | <b>MSCLK</b>   | Mouse clock    |

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**Note:** 1 To protect the external power lines of peripheral devices, make sure that

- the wires have the right diameter to withstand the maximum available current.
- to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

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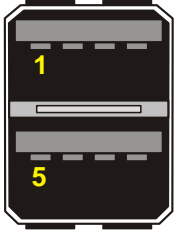
To find the location of the PS/2 connector on the JRExplus-690 board, please see the Appendix “Connector Layout”.

## 12. USB Interface

The USB interface comes with six USB ports, which follow the OHCI/EHCI specification and are USB 2.0 compliant. You can expand the amount of USB connections by adding external hubs. Two ports are available on a standard connector and four more ports on two pin strips.

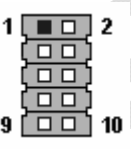
### 12.1 Standard Connector

Two USB ports are available through the standard USB connector X3 (8 pins).

|   | Pin | Signal Name        | Function              |
|---|-----|--------------------|-----------------------|
|  | 1   | VCC <sup>(1)</sup> | +5V                   |
|   | 2   | USB0-              | USB port 0 (negative) |
|   | 3   | USB0+              | USB port 0 (positive) |
|   | 4   | GND                | Signal ground         |
|   | 5   | VCC <sup>(1)</sup> | +5V                   |
|   | 6   | USB1-              | USB port 1 (negative) |
|   | 7   | USB1+              | USB port 1 (positive) |
|   | 8   | GND                | Signal ground         |

### 12.2 Pin Strips

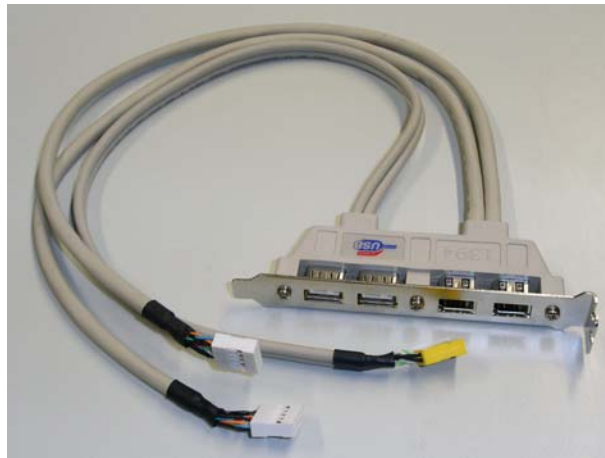
The other USB ports are available through the standard pin strip connectors X13 and X14 (10 pins).

|   | Pin | Signal Name        | Function              |
|---|-----|--------------------|-----------------------|
|  | 1   | VCC <sup>(1)</sup> | +5V                   |
|   | 2   | VCC <sup>(1)</sup> | +5V                   |
|   | 3   | USB2-              | USB port 2 (negative) |
|   | 4   | USB3-              | USB port 3 (negative) |
|   | 5   | USB2+              | USB port 2 (positive) |
|   | 6   | USB3+              | USB port 3 (positive) |
|   | 7   | GND                | Signal ground         |
|   | 8   | GND                | Signal ground         |
|   | 9   | Key (NC)           | Key pin               |
|   | 10  | GND                | Signal ground         |

**Note:** 1 To protect the external power lines of peripheral devices, make sure that

- the wires have the right diameter to withstand the maximum available current.
- to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

The following picture shows an example of a standard USB/Firewire slot adapter (10 pin USB connector with key).



To find the location of the USB connectors on the JReplus-690 board, please see the Appendix "Connector Layout".

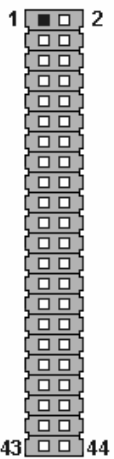
## 13. EIDE Interface

The JReplus-690 features one EIDE interface (Primary channel, up to UDMA133 mode) that can drive two hard disks. When two devices share a single adapter, they are connected in a master/slave, daisy-chain configuration. If only one drive is connected, you must set it as master. Alternatively the same interface can be used for Compact Flash Card applications (switchable as master/slave).

### 13.1 Connector

The EIDE interface is available through connector X11 (44 pins). This interface is designed in 2mm grid for optimal connectivity to a 2.5" hard disk.

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).

| Header   | Pin | Signal Name    | Function          | Pin | Signal Name     | Function       |
|--|-----|----------------|-------------------|-----|-----------------|----------------|
|  | 1   | <b>/RESET</b>  | Reset             | 2   | <b>GND</b>      | Signal ground  |
|  | 3   | <b>D7</b>      | Data 7            | 4   | <b>D8</b>       | Data 8         |
|  | 5   | <b>D6</b>      | Data 6            | 6   | <b>D9</b>       | Data 9         |
|  | 7   | <b>D5</b>      | Data 5            | 8   | <b>D10</b>      | Data 10        |
|  | 9   | <b>D4</b>      | Data 4            | 10  | <b>D11</b>      | Data 11        |
|  | 11  | <b>D3</b>      | Data 3            | 12  | <b>D12</b>      | Data 12        |
|  | 13  | <b>D2</b>      | Data 2            | 14  | <b>D13</b>      | Data 13        |
|  | 15  | <b>D1</b>      | Data 1            | 16  | <b>D14</b>      | Data 14        |
|  | 17  | <b>D0</b>      | Data 0            | 18  | <b>D15</b>      | Data 15        |
|  | 19  | <b>GND</b>     | Signal ground     | 20  | <b>Key (NC)</b> | Key pin        |
|  | 21  | <b>DRQ</b>     | DMA request       | 22  | <b>GND</b>      | Signal ground  |
|  | 23  | <b>/IOW</b>    | I/O write         | 24  | <b>GND</b>      | Signal ground  |
|  | 25  | <b>/IOR</b>    | I/O read          | 26  | <b>GND</b>      | Signal ground  |
|  | 27  | <b>IOCHRDY</b> | I/O channel ready | 28  | <b>CSEL (2)</b> | Cable select   |
|  | 29  | <b>/DACK</b>   | DMA acknowledge   | 30  | <b>GND</b>      | Signal ground  |
|  | 31  | <b>IRQ</b>     | Interrupt         | 32  | <b>NC</b>       | Not connected  |
|  | 33  | <b>SA1</b>     | Address 1         | 34  | <b>ATAD</b>     | UDMA detection |
|  | 35  | <b>SA0</b>     | Address 0         | 36  | <b>SA2</b>      | Address 2      |
|  | 37  | <b>/CS1</b>    | Chip select 1     | 38  | <b>/CS3</b>     | Chip select 3  |
|  | 39  | <b>ACT</b>     | Drive activity    | 40  | <b>GND</b>      | Signal ground  |
|  | 41  | <b>VCC (1)</b> | +5V               | 42  | <b>VCC (1)</b>  | +5V            |
|  | 43  | <b>GND</b>     | Signal ground     | 44  | <b>NC</b>       | Not connected  |

- 
- Note:**
- 1 To protect the external power lines of peripheral devices, make sure that
    - the wires have the right diameter to withstand the maximum available current.
    - to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.
  - 2 Pin 28 is connected with  $470\Omega$  to Ground for Cable Select IDE devices.
- 

To find the location of EIDE interface on the JReplus-690 board, please see the Appendix “Connector Layout”.

## 13.2 Compact Flash Card Interface

The same primary IDE channel is realized as a CF-Card interface, also capable of UDMA. The interface has jumper options to be either a master or slave device. If for example the Compact Flash Card is set to master only a slave device can be connected to the 44pin IDE connector.

The CF-Card interface is available through the standard CF-connector X17 (50 pins).

| Pin | Signal Name    | Function       | Pin | Signal Name    | Function          |
|-----|----------------|----------------|-----|----------------|-------------------|
| 1   | <b>GND</b>     | Signal ground  | 2   | <b>D3</b>      | Data 3            |
| 3   | <b>D4</b>      | Data 4         | 4   | <b>D5</b>      | Data 5            |
| 5   | <b>D6</b>      | Data 6         | 6   | <b>D7</b>      | Data 7            |
| 7   | <b>/CS1</b>    | Chip select 1  | 8   | <b>GND</b>     | Signal ground     |
| 9   | <b>GND</b>     | Signal ground  | 10  | <b>GND</b>     | Signal ground     |
| 11  | <b>GND</b>     | Signal ground  | 12  | <b>GND</b>     | Signal ground     |
| 13  | <b>VCC (1)</b> | +5V            | 14  | <b>GND</b>     | Signal ground     |
| 15  | <b>GND</b>     | Signal ground  | 16  | <b>GND</b>     | Signal ground     |
| 17  | <b>GND</b>     | Signal ground  | 18  | <b>SA2</b>     | Address 2         |
| 19  | <b>SA1</b>     | Address 1      | 20  | <b>SA0</b>     | Address 0         |
| 21  | <b>D0</b>      | Data 0         | 22  | <b>D1</b>      | Data 1            |
| 23  | <b>D2</b>      | Data 2         | 24  | <b>NC</b>      | Not connected     |
| 25  | <b>GND</b>     | Signal ground  | 26  | <b>GND</b>     | Signal ground     |
| 27  | <b>D11</b>     | Data 11        | 28  | <b>D12</b>     | Data 12           |
| 29  | <b>D13</b>     | Data 13        | 30  | <b>D14</b>     | Data 14           |
| 31  | <b>D15</b>     | Data 15        | 32  | <b>/CS3</b>    | Chip select 3     |
| 33  | <b>GND</b>     | Signal ground  | 34  | <b>/IOR</b>    | I/O read          |
| 35  | <b>/IOW</b>    | I/O write      | 36  | <b>VCC (1)</b> | +5V               |
| 37  | <b>IRQ</b>     | Interrupt      | 38  | <b>VCC (1)</b> | +5V               |
| 39  | <b>GND</b>     | Signal ground  | 40  | <b>NC</b>      | Not connected     |
| 41  | <b>/RESET</b>  | Reset          | 42  | <b>IOCHRDY</b> | I/O channel ready |
| 43  | <b>/DRQ</b>    | DMA request    | 44  | <b>/DACK</b>   | DMA acknowledge   |
| 45  | <b>ACT</b>     | Drive activity | 46  | <b>NC</b>      | Not connected     |
| 47  | <b>D8</b>      | Data 8         | 48  | <b>D9</b>      | Data 9            |
| 49  | <b>D10</b>     | Data 10        | 50  | <b>GND</b>     | Signal ground     |

Jumper JP4 allows the configuration for master/slave mode.



| Pins  | Signal |
|-------|--------|
| 1 - 2 | Master |
| 2 - 3 | Slave  |

---

**Note:** 1 To protect the external power lines of peripheral devices, make sure that

- the wires have the right diameter to withstand the maximum available current.
- to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

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**Warning:** Inserting or removing the Compact Flash Card while in operation can cause serious damage and must be avoided.

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To find the location of CF-Card socket on the JRExplus-690 board, please see the Appendix "Connector Layout".

## 13.3 Chipdisk Support

Due to mechanical restrictions Kontron chipdisks can't be directly mounted on the JRExplus-690. A very high stand-off extension for the pingrid is needed to connect the chipdisk properly.

## 13.4 Problems with CF-Card Support

Fewest problems will be determined using a CF-Card that is set as an "IDE-fixed" device. With CF-Cards that are not configured as a IDE fixed device long waiting times of a few minutes will occur during WIN XP SP2 start after the installation. By pressing the buttons CTRL+ALT+DEL you can easily access the operating system during this waiting time. The delay when starting XP can be avoided by disabling the virtual RAM in the system control panel (using "No Paging File"). Without the paging file there are no delays during bootup of Windows.

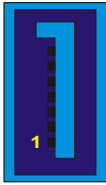
The combination of a CF-Card, that supports UDMA modes, and one or two further EIDE drive(s) can lead to boot problems. This depends on the used devices. Detailed informations can be found in the **CF-Card Test Report**. One possibility to avoid these problem is to deactivate UDMA for both devices. An exchange of the cable might also lead to an improvement.

## 14. S-ATA Interface

The JReplus-690 has realized two S-ATA II ports. Serial-ATA connections boost the data rate theoretically up to 300 MB/sec. In addition, it changes the parallel interface requiring 40 separate wires to a serial interface requiring only 6 wires. A RAID (Redundant Array of Independent Disks) configuration is possible.

### 14.1 Connector

The S-ATA interface is available through the standard L-type connectors X9 and X10 (7 pins).

|   | Pin | Signal Name | Function            |
|---|-----|-------------|---------------------|
|  | 1   | <b>GND</b>  |                     |
|   | 2   | <b>TX+</b>  | Transmit (positive) |
|   | 3   | <b>TX-</b>  | Transmit (negative) |
|   | 4   | <b>GND</b>  |                     |
|   | 5   | <b>RX-</b>  | Receive (negative)  |
|   | 6   | <b>RX+</b>  | Receive (positive)  |
|   | 7   | <b>GND</b>  |                     |

To find the location of the S-ATA connector on the JReplus-690 board, please see the Appendix “Connector Layout”.

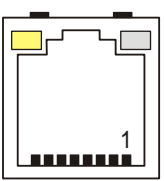
# 15. Ethernet Controller

The J**R**ex**pl**us-690 uses two Realtek RTL8111C Gigabit PCI Express LAN controller. The network controllers support 10/ 100/1000 Base-T interfaces. The devices auto-negotiate the use of a 10, 100 or 1000 Mbit/sec connection.

Additionally it is possible to enable the LAN PXE Boot in the BIOS Setup to allow the system to boot up via a network connection from a PXE server.

## 15.1 Connector

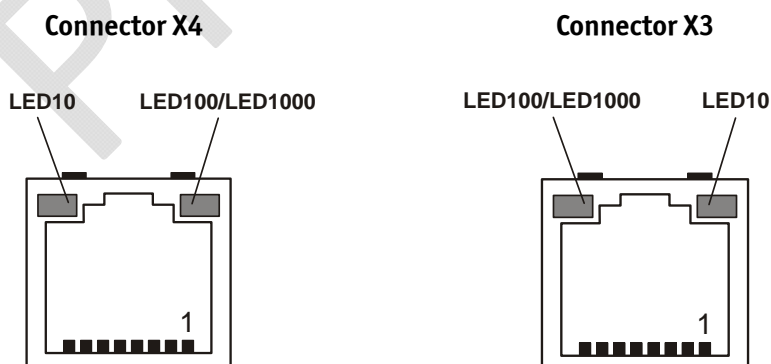
The Ethernet interface is available through the standard RJ45 connector X4 or the upper half of X3 (always 8 pins).

|   | Pin | Signal Name          | Function                                 |
|---|-----|----------------------|--|
|  | 1   | <b>TXD+ / BI_D1+</b> | 10/100 transmit / 1000 pair 1 (positive) |
|   | 2   | <b>TXD- / BI_D1-</b> | 10/100 transmit / 1000 pair 1 (negative) |
|   | 3   | <b>RXD+ / BI_D2+</b> | 10/100 receive / 1000 pair 2 (positive)  |
|   | 4   | <b>BI_D3+</b>        | 1000 pair 3 (positive)                   |
|   | 5   | <b>BI_D3-</b>        | 1000 pair 3 (negative)                   |
|   | 6   | <b>RXD- / BI_D2-</b> | 10/100 receive / 1000 pair 2 (negative)  |
|   | 7   | <b>BI_D4+</b>        | 1000 pair 4 (positive)                   |
|   | 8   | <b>BI_D4-</b>        | 1000 pair 4 (negative)                   |

To find the location of the Ethernet connectors on the J**R**ex**pl**us-690 board, please see the Appendix “Connector Layout”.

## 15.2 Connector LED Definition

The network transmission rate and activity are indicated by two LEDs. LED10 (10 Mbit; single color LED) and LED100/LED1000 (100 Mbit respectively 1 Gbit; two color LED).



## 16. Audio Interface


The JReplus-690 supports an AC'97 V2.3 audio codec with 16 bit resolution. The interface includes LINE OUT, LINE IN and MICROPHONE IN.

The AC'97 specification provides low cost, high quality sound. This is done by embedding half of the required technology in the Southbridge and the other half in a separate chip from an OEM supplier.

For signal levels see the AC'97 component specification (INTEL).

### 16.1 Connector

The audio interface is available through the connector X12 (6 pins). A prototype adapter cable (open ended) is deliverable from Kontron (KAB-SOUND-CMP-2, Part Number 96063-0000-00-1).

|  | Pin | Signal Name       | Function          |
|--|-----|-------------------|-------------------|
|  | 1   | <b>LINE_OUT_R</b> | Line output right |
|  | 2   | <b>GND</b>        | Signal ground     |
|  | 3   | <b>LINE_OUT_L</b> | Line output left  |
|  | 4   | <b>LINE_IN_R</b>  | Line input right  |
|  | 5   | <b>MIC_IN</b>     | Microphone input  |
|  | 6   | <b>LINE_IN_L</b>  | Line input left   |

To find the location of the audio connector on the JReplus-690 board, please see the Appendix "Connector Layout".

# 17. Digital Interface

The JR*explus*-690 features four digital inputs and four digital outputs. All inputs/outputs are TTL compatible.

## 17.1 Electrical Specifications

### 17.1.1 Digital Inputs

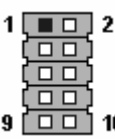
| Parameter          | Min. | Typ. | Max. | Units |
|--------------------|------|------|------|-------|
| Input LOW voltage  |      |      | 0.8  | V     |
| Input HIGH voltage | 2.0  |      | 5.25 | V     |

### 17.1.2 Digital Outputs

| Parameter           | Min. | Typ. | Max. | Units |
|---------------------|------|------|------|-------|
| Output LOW voltage  |      |      | 0.55 | V     |
| Output HIGH voltage | 2.4  |      | 5.0  | V     |
| Output HIGH current |      |      | 12   | mA    |

## 17.2 Connector

The digital interface is available through the connector X16 (10 pins).

|   | Pin | Signal Name    | Function         |
|---|-----|----------------|------------------|
|  | 1   | <b>OUT1</b>    | Digital output 1 |
|   | 2   | <b>IN1</b>     | Digital input 1  |
|   | 3   | <b>OUT2</b>    | Digital output 2 |
|   | 4   | <b>IN2</b>     | Digital input 2  |
|   | 5   | <b>OUT3</b>    | Digital output 3 |
|   | 6   | <b>IN3</b>     | Digital input 3  |
|   | 7   | <b>OUT4</b>    | Digital output 4 |
|   | 8   | <b>IN4</b>     | Digital input 4  |
|   | 9   | <b>VCC (1)</b> | +5V              |
|   | 10  | <b>GND</b>     | Signal ground    |

**Note:** 1 To protect the external power lines of peripheral devices, make sure that

- the wires have the right diameter to withstand the maximum available current.
- to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

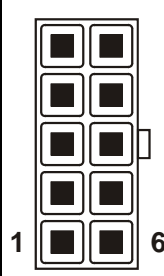
To find the location of the digital interface connector on the JR*explus*-690 board, please see the Appendix "Connector Layout".

## 18. Power Supply

The JReplus-690 supports only the ATX power supply mode with five required voltages (+3.3V, +5V, +5VSB, +12V and -12V). The -12V supply voltage is only needed for the PCI bus extension connector.

### 18.1 Power Connector

The power connector is available as X21 (10 pins). A adapter cable is deliverable from Kontron (KAB-ATX-20T010, Part Number 96072-0000-00-0).

| Header  | Pin | Signal Name | Function            |
|---|-----|-------------|---------------------|
|  | 1   | PS_ON       | Power supply on     |
|   | 2   | GND         | Ground              |
|   | 3   | GND         | Ground              |
|   | 4   | VCC12 (1)   | +12V                |
|   | 5   | VCC3 (1)    | +3.3V               |
|   | 6   | VCC5SB (1)  | +5V Standby voltage |
|   | 7   | VCC5 (1)    | +5V                 |
|   | 8   | VCC5 (1)    | +5V                 |
|   | 9   | VCC12# (1)  | -12V                |
|   | 10  | GND         | Ground              |

---

**Note:** 1 To protect the external power lines of peripheral devices, make sure that

- the wires have the right diameter to withstand the maximum available current.
- to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

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To find the location of the power connectors on the JReplus-690 board, please see the Appendix “Connector Layout”.

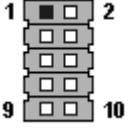
### 18.2 Power Pins

Every power pin on the power connector supplement is limited to a maximum current and the following limitations apply:

| Power      | Number of Pins | Max. Current |
|------------|----------------|--------------|
| VCC3, VCC5 | 3              | 5A           |
| VCC12      | 1              | 1A           |

## 18.3 Power Front Panel Pins

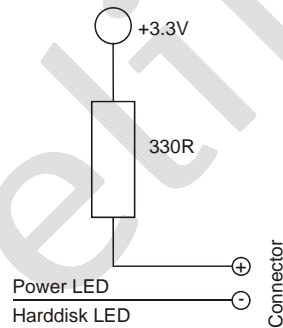
The power button and other power signals are available through the pin strap FP2 (10 pins).

|   | Pin | Signal Name     | Function                |
|---|-----|-----------------|-------------------------|
|  | 1   | <b>PWR_LED+</b> | Power LED (positive)    |
|   | 2   | <b>PWR_BTN+</b> | Power button (positive) |
|   | 3   | <b>NC</b>       | Not connected           |
|   | 4   | <b>PWR_BTN-</b> | Power button (negative) |
|   | 5   | <b>PWR_LED-</b> | Power LED (negative)    |
|   | 6   | <b>NC</b>       | Not connected           |
|   | 7   | <b>RSVD</b>     | Reserved                |
|   | 8   | <b>RSVD</b>     | Reserved                |
|   | 9   | <b>GND</b>      | Signal ground           |
|   | 10  | <b>RSVD</b>     | Reserved                |

To find the location of the Power Front Panel pins on the JReplus-690 board, please see the Appendix "Connector Layout".

### 18.3.1 Power LED

The following picture illustrates the onboard wiring.

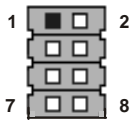


# 19. Common Front Panel Pins

The Common Front Panel provides some special functions (e.g. Reset button and Speaker).

## 19.1 Pin Strap

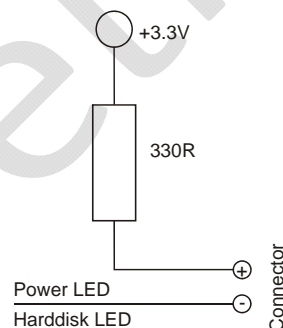
The Common Front Panel is available through the pin strap FP1 (8 pins).

| Header  | Pin | Signal Name     | Function                |
|---|-----|-----------------|-------------------------|
|  | 1   | <b>RST_BTN+</b> | Reset button (positive) |
|   | 2   | <b>SPKR+</b>    | Speaker (positive)      |
|   | 3   | <b>RST_BTN-</b> | Reset button (negative) |
|   | 4   | <b>NC</b>       | Not connected           |
|   | 5   | <b>HDD_LED+</b> | Harddisk LED (positive) |
|   | 6   | <b>NC</b>       | Not connected           |
|   | 7   | <b>HDD_LED-</b> | Harddisk LED (negative) |
|   | 8   | <b>SPKR-</b>    | Speaker (negative)      |

To find the location of the Common Front Panel pins on the JRExplus-690 board, please see the Appendix "Connector Layout".

### 19.1.1 Harddisk LED

The following picture illustrates the onboard wiring.



## 20. Setup Guide

The AMI BIOS Setup Utility changes system behavior by modifying the BIOS configuration. The setup program uses a number of menus to make changes and turn features on or off.

Whenever you contact technical support about BIOS issues, providing a BIOS version <B690R??> is especially helpful.

### 20.1 Start AMI BIOS Setup Utility

To start the AMI BIOS Setup Utility, press the <DEL> key when the following string appears during boot up.

Press <DEL> to run Setup

The Main Menu then appears.

### 20.2 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                | Right side Bottom | Lists setup navigation keys           |
| Item Specific Help Window | Right side Top    | Help for selected item                |
| Menu Window               | Left Center       | Selection fields for current 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.

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

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## 20.3 Menu Bar

| Feature  | Description   |
|----------|---|
| Main     | Define time and date and show service information                       |
| Advanced | Configuration of all onboard devices (e.g. CPU, IDE, LAN, USB, Display) |
| PCIPnP   | Define PCI/Legacy IRQs and other PnP settings                           |
| Boot     | Define the boot sequence and special boot settings                      |
| Security | Change, set or disable supervisor/user passwords                        |
| Exit     | Exit setup with/without saving or set default values                    |

## 20.4 Main Menu

| Feature             | Option     | Description                         |
|---------------------|------------|-------------------------------------|
| BIOS Version        | N/A        | Show the actual BIOS release        |
| Build Date          | N/A        | Show the BIOS build date            |
| ▸ Board Information | Submenu    | Show additional service information |
| Time                | HH:MM:SS   | Set the system time                 |
| Date                | MM/DD/YYYY | Set the system date                 |

### 20.4.1 Board Information Submenu

| Feature            | Option | Description  |
|--------------------|--------|--|
| Board Name         | N/A    | Show the Kontron specific board name                         |
| Board Class        | N/A    | Show the Kontron specific board class                        |
| Serial Number      | N/A    | Show the Kontron specific serial number                      |
| Manufacturing Date | N/A    | Show the Kontron specific manufacturing date                 |
| Hardware Revision  | N/A    | Show the Kontron specific hardware revision                  |
| Boot Counter       | N/A    | Display the boot counter                                     |
| Processor Name     | N/A    | Show the processor identifier                                |
| Processor Speed    | N/A    | Show the actual CPU boot speed                               |
| Processor Count    | N/A    | Show the number of CPUs (single or dual core)                |
| System Memory Size | N/A    | Display amount of conventional memory detected during bootup |

## 20.5 Advanced Menu

| Feature                        | Option  | Description  |
|--------------------------------|---------|--|
| ▸ CPU Configuration            | Submenu | Configure special CPU features   |
| ▸ Onboard Device Configuration | Submenu | Configure most onboard devices (e.g. IDE, LAN, USB and legacy devices) |
| ▸ Display Configuration        | Submenu | Set the display features (including panel parameters)                  |
| ▸ ACPI Configuration           | Submenu | Set some ACPI defaults   |
| ▸ Miscellaneous                | Submenu | Configure additional important settings                                |

### 20.5.1 CPU Configuration Submenu

| Feature                       | Option                 | Description   |
|-------------------------------|------------------------|---|
| Processor Name                | N/A                    | Show the processor identifier   |
| CPU Cores                     | N/A                    | Show the number of CPUs   |
| Cache L1                      | N/A                    | Size of L1 cache (data / instruction)   |
| Cache L2                      | N/A                    | Size of L2 cache  |
| CPU Speed                     | N/A                    | Show the actual CPU boot speed  |
| Current FSB Multiplier        | N/A                    | Show the current Front Side Bus multiplier  |
| Maximum FSB Multiplier        | N/A                    | Show the maximal Front Side Bus multiplier  |
| Secure Virtual Machine Mode   | Disabled<br>Enabled    | Enable or disable the Secure Virtual Machine Mode (SVM)   |
| C-States Support              | Disabled<br>C-State C2 | If enabled C-state C2 is active during idle mode (Windows / Linux)  |
| Runtime Legacy PSB            | Disabled<br>Enabled    | Enable or disable the generation of Power State Block for use of PowerNow™ driver in a single core system |
| Maximum Frequency During POST | Disabled<br>Enabled    | If disabled the CPU will be transitioned to its minimum P-state   |

### 20.5.2 Onboard Device Configuration Submenu

| Feature                     | Option  | Description  |
|-----------------------------|---------|--|
| ▸ Northbridge Configuration | Submenu | Set options for the Northbridge (memory configuration) |
| ▸ Southbridge Configuration | Submenu | Set options for the Southbridge (audio configuration)  |
| ▸ IDE Configuration         | Submenu | Configure the IDE devices                              |
| ▸ LAN Configuration         | Submenu | Configure the PCI Express LAN controller               |
| ▸ USB Configuration         | Submenu | Configure the USB support                              |
| ▸ Super-I/O Configuration   | Submenu | Configure legacy devices (COM, LPT)                    |

### 20.5.3 Northbridge Configuration Submenu

| Feature              | Option  | Description  |
|----------------------|---|--|
| Memory Type          | N/A   | Show memory type and speed   |
| CAS Latency          | N/A   | See datasheet for more details   |
| RAS/CAS Delay        | N/A   | See datasheet for more details   |
| Min Active RAS       | N/A   | See datasheet for more details   |
| Row Precharge Time   | N/A   | See datasheet for more details   |
| RAS/RAS Delay        | N/A   | See datasheet for more details   |
| Row Cycle            | N/A   | See datasheet for more details   |
| Asynchronous Latency | N/A   | See datasheet for more details   |
| Memory Clock Mode    | <b>Auto</b><br>Limit<br>Manual                      | Select the DRAM frequency programming method. If <b>Auto</b> the speed will be based on SPD. If <b>Limit</b> the speed will not exceed the specified value. If <b>Manual</b> the speed will be programmed regardless of other settings |
| Memory Type          | <b>DDR2 400</b><br>DDR2 533<br>DDR2 667<br>DDR2 800 | Only visible if Memory Clock Mode is set to <b>Limit</b> or <b>Manual</b>  |
| Bank Interleaving    | Disabled<br><b>Auto</b>                             | If <b>Auto</b> the memory will be checked if it executes 64 or 128 bit mode  |
| Power Down Control   | <b>Auto</b><br>Disabled                             | Allow DRAM to enter power down mode by deasserting the clock enable signal when not in use   |

### 20.5.4 Southbridge Configuration Submenu

| Feature            | Option                  | Description   |
|--------------------|-------------------------|---|
| AC'97 Audio Device | <b>Auto</b><br>Disabled | Set the option to <b>Auto</b> the audio functionality will be enabled if an external codec is present |

## 20.5.5 IDE Configuration Submenu

| Feature                       | Option  | Description   |
|-------------------------------|---|---|
| Parallel-ATA Controller       | Disabled<br><b>Enabled</b>  | Enable or disable the Parallel-ATA controller   |
| Serial-ATA Controller         | Disabled<br><b>Enabled</b>  | Enable or disable the Serial-ATA controller   |
| Serial-ATA Type               | <b>Native IDE</b><br>RAID<br>AHCI<br>IDE->AHCI                                    | Define the basic Serial-ATA mode.<br>If <b>Native IDE</b> the drive will operate in legacy IDE mode (no driver required). If <b>RAID</b> (Redundant Arrays of Independent Disks) two drives are necessary for extremely save operation. If <b>AHCI</b> (Advanced Host Controller Interface) special features can be used (e.g. Hotplug or NCQ). |
| ▸ Parallel-ATA Master         | Submenu   | Configure the Parallel-ATA master   |
| ▸ Parallel-ATA Slave          | Submenu   | Configure the Parallel-ATA slave  |
| ▸ Serial-ATA Drive #1         | Submenu   | Configure the Serial-ATA drive #1   |
| ▸ Serial-ATA Drive #2         | Submenu   | Configure the Serial-ATA drive #2   |
| Hard Disk Write Protect       | <b>Disabled</b><br>Enabled  | Enable or disable drive write protection  |
| ATA(PI) Detect Time Out       | 0 Sec., 5 Sec.<br>10 Sec., 15 Sec.<br>20 Sec., 25 Sec.<br>30 Sec., <b>35 Sec.</b> | Select the timeout value for detecting ATA/ATAPI devices  |
| ATA(PI) 80Pin Cabel Detection | <b>Host&amp;Device</b><br>Host<br>Device  | Select the mechanism for detecting 80pin ATA(PI) cable  |

## 20.5.6 IDE P-ATA/S-ATA Submenus

| Feature                       | Option   | Description   |
|-------------------------------|--|---|
| Device                        | N/A  | Show the type of the IDE drive<br>ARMD = ATAPI Removable Media Device                   |
| Vendor                        | N/A  | Show the IDE drive manufacturer and drive name  |
| Size                          | N/A  | Display the calculated size of the drive  |
| LBA Mode                      | N/A  | Show whether a disk uses LBA  |
| Block Mode                    | N/A  | Display the block size (in sectors)   |
| PIO Mode                      | N/A  | Display the highest supported PIO mode  |
| Async DMA                     | N/A  | Display the highest supported Async DMA mode  |
| Ultra DMA                     | N/A  | Display the highest supported Ultra DMA mode  |
| S.M.A.R.T.                    | N/A  | Show whether a disk uses S.M.A.R.T (Self Monitoring, Analysis and Reporting Technology) |
| Type                          | Not Installed<br><b>Auto</b><br>CD/DVD<br>ARMD       | Define the type of the IDE drive  |
| LBA/Large Mode                | Disabled<br><b>Auto</b>                              | LBA causes Logical Block Addressing   |
| Block (Multi-Sector Transfer) | Disabled<br><b>Auto</b>                              | Block mode enable Multi-Sector transfer and increase the performance                    |
| PIO Mode                      | <b>Auto</b><br>0, 1, 2, 3, 4                         | Define the PIO mode if DMA not possible. <b>Auto</b> select the optimum transfer mode   |
| DMA Mode                      | <b>Auto</b><br>SWDMA0 - 2<br>MWDMA0 - 2<br>UDMA0 - 6 | Define the Async or Ultra DMA mode. <b>Auto</b> select the optimum transfer mode        |
| S.M.A.R.T.                    | <b>Auto</b><br>Disabled<br>Enabled                   | Show if the device is capable of using the error prediction tool                        |
| 32Bit Data Transfer           | <b>Disabled</b><br>Enabled                           | Enable 32-bit communication between CPU and IDE controller                              |

### 20.5.7 LAN Configuration Submenu

| Feature                   | Option                     | Description  |
|---------------------------|----------------------------|--|
| Controller 1 MAC Address  | N/A                        | Show the programmed MAC address  |
| Controller 2 MAC Address  | N/A                        | Show the programmed MAC address  |
| LAN Controller 1          | <b>Enabled</b><br>Disabled | Enable or disable the onboard LAN controller 1                                   |
| LAN Controller 2          | <b>Enabled</b><br>Disabled | Enable or disable the onboard LAN controller 2                                   |
| Controller 1 PXE LAN Boot | Enabled<br><b>Disabled</b> | Enable or disable the option ROM to allow LAN boot functionality of controller 1 |
| Controller 2 PXE LAN Boot | Enabled<br><b>Disabled</b> | Enable or disable the option ROM to allow LAN boot functionality of controller 2 |

### 20.5.8 USB Configuration Submenu

| Feature                                 | Option                             | Description   |
|---|------------------------------------|---|
| USB Devices Enabled                     | N/A                                | Show detected USB devices   |
| USB 1.1 Controller                      | Disabled<br><b>Enabled</b>         | Enable or disable the USB 1.1 controller (OHCI)   |
| USB 2.0 Controller                      | Disabled<br><b>Enabled</b>         | Enable or disable the USB 2.0 controller (EHCI)   |
| Legacy USB Support                      | Disabled<br><b>Enabled</b><br>Auto | Enable support for legacy USB devices, e.g. keyboard and mouse. <b>Auto</b> disables legacy mode if no USB devices are connected  |
| USB 2.0 Controller Mode                 | <b>FullSpeed</b><br>HiSpeed        | Set the USB 2.0 controller to <b>HiSpeed</b> (480 Mbps) or <b>FullSpeed</b> (12 Mbps) for legacy mode   |
| BIOS USB 2.0 Hand-Off                   | Disabled<br><b>Enabled</b>         | This patch must be allied for operating systems before WIN XP which have problems gaining control over USB 2.0 ports. If enabled this provides a simple semaphore based mechanism for exchanging EHCI ownership |
| ▸ USB Mass Storage Device Configuration | Submenu                            | Display the status of USB mass storage devices  |

### 20.5.9 USB Mass Storage Device Configuration Submenu

| Feature                      | Option  | Description   |
|------------------------------|---|---|
| USB Mass Storage Reset Delay | 10 Sec., <b>20 Sec.</b><br>30 Sec., 40 Sec.               | Set the initialization delay time   |
| Device                       | N/A   | Show the device identifier  |
| Emulation Type               | <b>Auto</b><br>Floppy<br>Forced FDD<br>Hard Disk<br>CDROM | Define the emulation type. Forced FDD can be used to force a HDD formatted drive to boot as FDD |

### 20.5.10 Super-I/O Configuration Submenu

| Feature               | Option  | Description   |
|-----------------------|---|---|
| Serial Port 1 Address | Disabled<br><b>3F8/IRQ4</b><br>3E8/IRQ4<br>2E8/IRQ3 | Define the serial port 1 base address and interrupt   |
| Serial Port 2 Address | <b>Disabled</b><br>2F8/IRQ3<br>3E8/IRQ4<br>2E8/IRQ3 | Define the serial port 2 base address and interrupt   |
| Parallel Port Address | <b>Disabled</b><br>378<br>278<br>3BC                | Define the parallel port base address   |
| Parallel Port Mode    | <b>Normal</b><br>EPP<br>ECP<br>EPP+ECP              | Select the parallel port mode. If <b>Normal</b> the interface will work bidirectional, if <b>EPP</b> (Enhanced Parallel Port) speed increases and if <b>ECP</b> (Extended Capability Port) the interface will use DMA to provide even faster data transfer than EPP |
| ECP Mode DMA Channel  | DMA0<br>DMA1<br><b>DMA3</b>                         | Select the ECP DMA channel  |
| Parallel Port IRQ     | IRQ5<br><b>IRQ7</b>                                 | Select the parallel port IRQ  |
| PS/2 Mouse Support    | Disabled<br>Enabled<br><b>Auto</b>                  | Enable support for PS/2 mouse. <b>Auto</b> disables legacy mode if no mouse is connected  |

### 20.5.11 Display Configuration Submenu

| Feature                  | Option   | Description  |
|--------------------------|--|--|
| Graphic Adapter Priority | <b>PCI/Onboard</b><br>Onboard/PCI  | Select which graphic controller is used as primary boot device   |
| Frame Buffer Size        | 32 MB<br><b>64 MB</b><br>128 MB<br>256 MB  | Select the amount of system memory used by the onboard graphic controller  |
| Boot Display Device      | <b>Auto</b><br>LCD<br>CRT<br>DVI<br>CRT+LCD<br>LCD+DVI<br>CRT+DVI  | Control the boot display. If <b>Auto</b> the onboard graphic controller is searching automatically a connected display   |
| Flat Panel Type          | VGA 640x480 1x18<br>SVGA 800x600 1x18<br>XGA 1024x768 1x18<br>XGA 1024x768 1x24<br>SXGA 1280x1024 2x18<br>SXGA 1280x1024 2x24<br>UXGA 1600x1200 2x18<br>UXGA 1600x1200 2x24<br>PAID<br>FPID<br><b>Auto</b> | Select a predefined flat panel resolution. Use <b>PAID</b> (Panel Adapter ID) or <b>FPID</b> (Flat Panel ID) to manually enter a panel record (Kontron specific). If <b>Auto</b> the board is searching for a JILI3 (Kontron) or DisplayID (VESA) record |
| Flat Panel Scaling       | Centered<br><b>Stretched</b>   | <b>Stretched</b> display the screen content at the maximum size, otherwise the content is centered   |
| Backlight Value          | 0 % ... <b>50 %</b> ... 100%   | Set the backlight value (0% = 0V, 100% = +5V)  |

### 20.5.12 ACPI Configuration Submenu

| Feature        | Option                                  | Description  |
|----------------|---|--|
| ACPI Version   | ACPI 1.0<br>ACPI 2.0<br><b>ACPI 3.0</b> | Select the desired ACPI specification (OS depending)   |
| Suspend Mode   | S1 (POS)<br><b>S3 (STR)</b>             | Define the power down mode (POS = Power On Suspend and STR = Suspend to RAM)   |
| APIC Support   | Disabled<br><b>Enabled</b>              | APIC supports more IRQs and faster interrupt handling  |
| AMI OEMB Table | Disabled<br><b>Enabled</b>              | Include the AMI OEMB table pointer. The OEMB table is used to fill in POST data in AML code during ACPI OS operations. This option should only be disabled if ACPI 1.0 is used |
| Headless Mode  | <b>Disabled</b><br>Enabled              | Indicate support for headless operation, that means without keyboard, mouse and/or monitor. The OS must support the headless mode  |

### 20.5.13 Miscellaneous Submenu

| Feature                       | Option  | Description                     |
|-------------------------------|---------|---------------------------------|
| ▸ Remote Access Configuration | Submenu | Configure the remote connection |

### 20.5.14 Remote Access Configuration Submenu

| Feature                     | Option   | Description                                    |
|-----------------------------|--|--|
| Remote Access               | <b>Disabled</b><br>Enabled   | Enable or disable the remote connection        |
| Serial Port                 | <b>COM1</b>  | Select the serial port for console redirection |
| Serial Port Mode            | <b>115200 8,N,1</b><br>57600 8,N,1<br>36400 8,N,1<br>19200 8,N,1<br>9600 8,N,1 | Select the serial port settings                |
| Flow Control                | <b>None</b><br>Hardware<br>Software  | Select the flow control mode                   |
| Redirection After BIOS POST | Disabled<br>Boot Loader<br><b>Always</b>                                       | Define the redirection order                   |
| Terminal Type               | <b>ANSI</b><br>VT100   | Define the terminal type                       |

## 20.6 PCIPnP Menu

| Feature  | Option  | Description   |
|--|---|---|
| Clear NVRAM  | <b>No</b><br>Yes                              | Clear NVRAM (None Volatile RAM) during system boot  |
| PCI Latency Timer                                      | 32, <b>64</b> , 96, 128<br>160, 192, 224, 248 | Set this value to allow the master latency timer to be adjusted. This option sets the latency of most PCI devices                             |
| PCI IDE BusMaster                                      | Disabled<br><b>Enabled</b>                    | If enabled improves the performance of the IDE interface for some operating systems (e.g. DOS)  |
| IRQ3<br>IRQ4<br>IRQ5<br>IRQ7<br>IRQ9<br>IRQ10<br>IRQ11 | <b>Available</b><br>Reserved                  | <b>Reserved</b> means that this interrupt is a legacy IRQ (not shared). <b>Available</b> defines that this interrupt can be used as a PCI IRQ |

## 20.7 Boot Menu

| Feature                       | Option  | Description                       |
|-------------------------------|---------|-----------------------------------|
| ▸ Boot Settings Configuration | Submenu | Define some special boot settings |
| ▸ Boot Device Priority        | Submenu | Specify the boot order            |
| ▸ Hard Disk Devices           | Submenu | Boot order for hard disks         |
| ▸ Removable Drives            | Submenu | Boot order for removable drives   |
| ▸ CD/DVD Drives               | Submenu | Boot order for CD/DVD drives      |

### 20.7.1 Boot Settings Configuration Submenu

| Feature                   | Option                                     | Description   |
|---------------------------|--|---|
| Quick Boot                | Disabled<br><b>Enabled</b>                 | <b>Enabled</b> allows the BIOS to skip certain tests during system boot   |
| Dark Boot                 | <b>Disabled</b><br>Enabled                 | If disabled the BIOS generates the normal messages, otherwise an OEM logo can be displayed  |
| Restore on AC Power Loss  | <b>Power Off</b><br>Power On<br>Last State | Select behavior after AC power loss   |
| AddOn ROM Display Mode    | <b>Force BIOS</b><br>Keep Current          | <b>Keep Current</b> keeps the current display mode. <b>Force BIOS</b> switches to BIOS mode before an AddOn ROM is called   |
| Bootup Num-Lock           | Off<br><b>On</b>                           | <b>Off</b> doesn't enable the keyboard Num-Lock automatically   |
| Wait For 'F1' If Error    | Disabled<br><b>Enabled</b>                 | <b>Enabled</b> allows the BIOS to wait for any error. If an error is detected, pressing <F1> will enter the setup and the BIOS settings can be adjusting to fix the problem |
| Hit 'DEL' Message Display | Disabled<br><b>Enabled</b>                 | <b>Enabled</b> allows the BIOS to display the message <i>Hit DEL to run Setup</i> after memory initialization. <b>Disabled</b> suppresses this message                      |
| Interrupt 19 Capture      | <b>Disabled</b><br>Enabled                 | If enabled AddOn ROMs can be trapped interrupt 19h (Boot IRQ). This option would make sense when using network boot (PXE ROM)   |

## 20.8 Security Menu

| Feature                      | Option                     | Description   |
|------------------------------|----------------------------|---|
| Supervisor Password          | N/A                        | Show state of supervisor password   |
| User Password                | N/A                        | Show state of user password   |
| Change Supervisor Password   | N/A                        | Select this option and press Enter to change the supervisor password                        |
| Change User Password         | N/A                        | Select this option and press Enter to change the user password                              |
| Boot Sector Virus Protection | <b>Disabled</b><br>Enabled | If a program or a virus accesses the boot sector a warning appears if the option is enabled |

## 20.9 Exit Menu

| Feature                  | Option              | Description  |
|--------------------------|---------------------|--|
| Save Changes and Exit    | <b>Ok</b><br>Cancel | Save selections and exits setup. The next time the system boots, the BIOS configures the system according to the Setup selection stored in CMOS                    |
| Discard Changes and Exit | <b>Ok</b><br>Cancel | Exit Setup without storing in CMOS any new selections you may have made  |
| Discard Changes          | <b>Ok</b><br>Cancel | 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 |
| Load Optimal Defaults    | <b>Ok</b><br>Cancel | Load the optimal default values  |
| Load Failsafe Defaults   | <b>Ok</b><br>Cancel | Load the failsafe default values   |

# Appendix A: System Ressourcen

## A.1 Interrupt Request (IRQ) Lines

Please ensure that the chosen interrupt is not already in use by PCI devices. This table is only valid in legacy mode (e.g. DOS) - most operating systems are using the APIC assignment.

| IRQ # | Use           | Available | Comment                                |
|-------|---------------|-----------|--|
| 0     | Timer0        | No        |  |
| 1     | Keyboard      | No        |  |
| 2     | Cascade       | No        |  |
| 3     | COM2          | Yes       | BIOS default: disabled <i>Note (1)</i> |
| 4     | COM1          | No        | <i>Note (1)</i>                        |
| 5     | Free          | for PCI   | Dynamic (BIOS default)                 |
| 6     | FDC           | No        | Reserved                               |
| 7     | LPT1          | Yes       | BIOS default: disabled <i>Note (1)</i> |
| 8     | RTC           | No        |  |
| 9     | ACPI          | No        | <i>Note (2)</i>                        |
| 10    | Free          | for PCI   | Dynamic (BIOS default)                 |
| 11    | Free          | for PCI   | Dynamic (BIOS default)                 |
| 12    | PS/2 Mouse    | No        | <i>Note (1)</i>                        |
| 13    | FPU           | No        |  |
| 14    | Primary IDE   | No        | <i>Note (1)</i>                        |
| 15    | Secondary IDE | Yes       | <i>Note (3)</i>                        |

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**Note:** 1 If the „used for“ device is disabled in setup, the corresponding interrupt is available for other devices.  
 2 Not available if ACPI is used.  
 3 Not usable in Windows, since a PCI IDE controller uses always two channels.

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## A2 Direct Memory Access (DMA) Channels

| DMA # | Used for | Available | Comment         |
|-------|----------|-----------|-----------------|
| 0     | (LPT1)   | Yes       | <i>Note (1)</i> |
| 1     | (LPT1)   | Yes       | <i>Note (1)</i> |
| 2     | FDC      | No        | Reserved        |
| 3     | (LPT1)   | Yes       | <i>Note (1)</i> |
| 4     | Cascade  | No        |                 |
| 5 - 7 |          | Yes       | 16 bit channels |

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**Note:** 1 Possible setting for LPT1 if configured for ECP mode

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## A.3 I/O Address Map

The I/O-port addresses of the JReplus-690 are functionally identical to a standard PC/AT. All addresses not mentioned in this table should be available. We recommend that you do not use I/O addresses below 0100h with additional hardware for compatibility reasons, even if available.

| I/O Address (h) | Use  | Available | Comment   |
|-----------------|--|-----------|---|
| 0000 - 00FF     | DMA controller, Interrupt controller, Timer, Keyboard controller, Math coprocessor and other devices | No        | Fixed   |
| 01F0 - 01F7     | Fixed disk   | No        | Fixed   |
| 0278 - 027F     |  | Yes       | Possible address of LPT2                            |
| 02E8 - 02EF     |  | Yes       | Possible address of COM4                            |
| 02F8 - 02FF     | Serial port 2  | No        | Default for COM2, free with different configuration |
| 0378 - 037F     | Parallel port 1  | No        | Default for LPT1; free with different configuration |
| 03BC - 03C4     |  | Yes       | Possible address of LPT3                            |
| 03B0 - 03DF     | VGA  | No        | Fixed   |
| 03E8 - 03EF     |  | Yes       | Possible address of COM3                            |
| 03F8 - 03FF     | Serial port 1  | No        | Default for COM1, free with different configuration |
| 0408 - 040F     | DMA extension  | No        | Fixed   |
| 04D0 - 04D7     | PIC extension  | No        | Fixed   |
| 0800 - 083F     | Power management   | No        | Fixed   |
| 0B00 - 0B1F     | SMBus interface  | No        | Fixed   |
| 0C00 - 0CF7     | Southbridge extension  | No        | Fixed   |
| 0CF8 - 0CFF     | PCI configuration  | No        | Fixed   |
| 0E80 - 0E87     | Hardware monitor   | No        | Fixed   |
| 0F40 - 0F47     | GPIO (Super-I/O)   | No        | Fixed   |
| 6000 - 600F     | PCI S-ATA controller   | No (Yes)  | Dynamic (BIOS default address)                      |
| 7000 - 7007     | PCI S-ATA controller   | No (Yes)  | Dynamic (BIOS default address)                      |
| 8000 - 8007     | PCI S-ATA controller   | No (Yes)  | Dynamic (BIOS default address)                      |
| 9000 - 9007     | PCI S-ATA controller   | No (Yes)  | Dynamic (BIOS default address)                      |
| A000 - A007     | PCI S-ATA controller   | No (Yes)  | Dynamic (BIOS default address)                      |
| B000 - B0FF     | PCI VGA controller   | No (Yes)  | Dynamic (BIOS default address)                      |
| C800 - C8FF     | PCI LAN controller 1   | No (Yes)  | Dynamic (BIOS default address)                      |
| D800 - D8FF     | PCI LAN controller 2   | No (Yes)  | Dynamic (BIOS default address)                      |
| FE00 - FE1F     | Power management   | No        | Fixed   |
| FF00 - FF07     | IDE interface  | No        | Fixed   |

## A.4 Memory Map

The JRExplus-690 can support up to 2 GB memory modules. The first 640 kB of DRAM are used as main memory.

Using DOS, you can address 1 MB of memory directly. Memory area above 1 MB (high memory, extended memory) is accessed under DOS via special drivers such as 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 |
| C0000h – CFFFFh | VGA BIOS    | No        | Used by onboard extension ROM        |
| D0000h – DFFFFh |             | Yes       |                                      |
| E0000h – FFFFFh | System BIOS | No        | Fixed                                |

## A.5 PCI Devices

All devices follow the Peripheral Component Interconnect 2.3 (PCI 2.3) specification. The BIOS and OS control memory and I/O resources. Please see the PCI 2.3 specification for details.

| PCI Device (IDSEL)              | PCI IRQ | Comment                 |
|---------------------------------|---------|-------------------------|
| Host Bridge                     | None    | Integrated in chipset   |
| PCI-to-PCI Bridge               | None    | Integrated in chipset   |
| PCI-to-PCI Bridge (PCI Express) | None    | Integrated in chipset   |
| PCI-to-PCI Bridge (PCI Express) | None    | Integrated in chipset   |
| PCI-to-PCI Bridge (PCI Express) | None    | Integrated in chipset   |
| IDE Controller (Serial-ATA)     | INTA#   | Integrated in chipset   |
| USB 1.1 Controller 1            | INTA#   | Integrated in chipset   |
| USB 1.1 Controller 2            | INTB#   | Integrated in chipset   |
| USB 1.1 Controller 3            | INTC#   | Integrated in chipset   |
| USB 2.0 Controller              | INTD#   | Integrated in chipset   |
| SMBus / ACPI                    | None    | Integrated in chipset   |
| IDE Controller (Parallel-ATA)   | INTA#   | Integrated in chipset   |
| ISA Bridge                      | None    | Integrated in chipset   |
| PCI-to-PCI Bridge (PCI)         | None    | Integrated in chipset   |
| Audio Controller                | INTB#   | Integrated in chipset   |
| Host Bridge (HyperTransport™)   | None    | Integrated in processor |
| Host Bridge (Address Map)       | None    | Integrated in processor |
| Host Bridge (DRAM Controller)   | None    | Integrated in processor |
| Host Bridge (Miscellaneous)     | None    | Integrated in processor |
| VGA Controller                  | INTA#   | Integrated in chipset   |
| Network Controller 1            | INTA#   | PCI Express             |
| Network Controller 2            | INTA#   | PCI Express             |

## A.5 SMBus Devices

The JReplus-690 uses an onboard System Management (SM) Bus. This bus is not available on an peripheral connector and therefore cannot be used for external SMBus devices.

| SMBus Address | Device          | Comment                       |
|---------------|-----------------|-------------------------------|
| 30h/31h       | GPIO Controller | Winbond I/O Controller W83601 |
| A0h/A1h       | SPD EEPROM      | Part of the DDR RAM module    |

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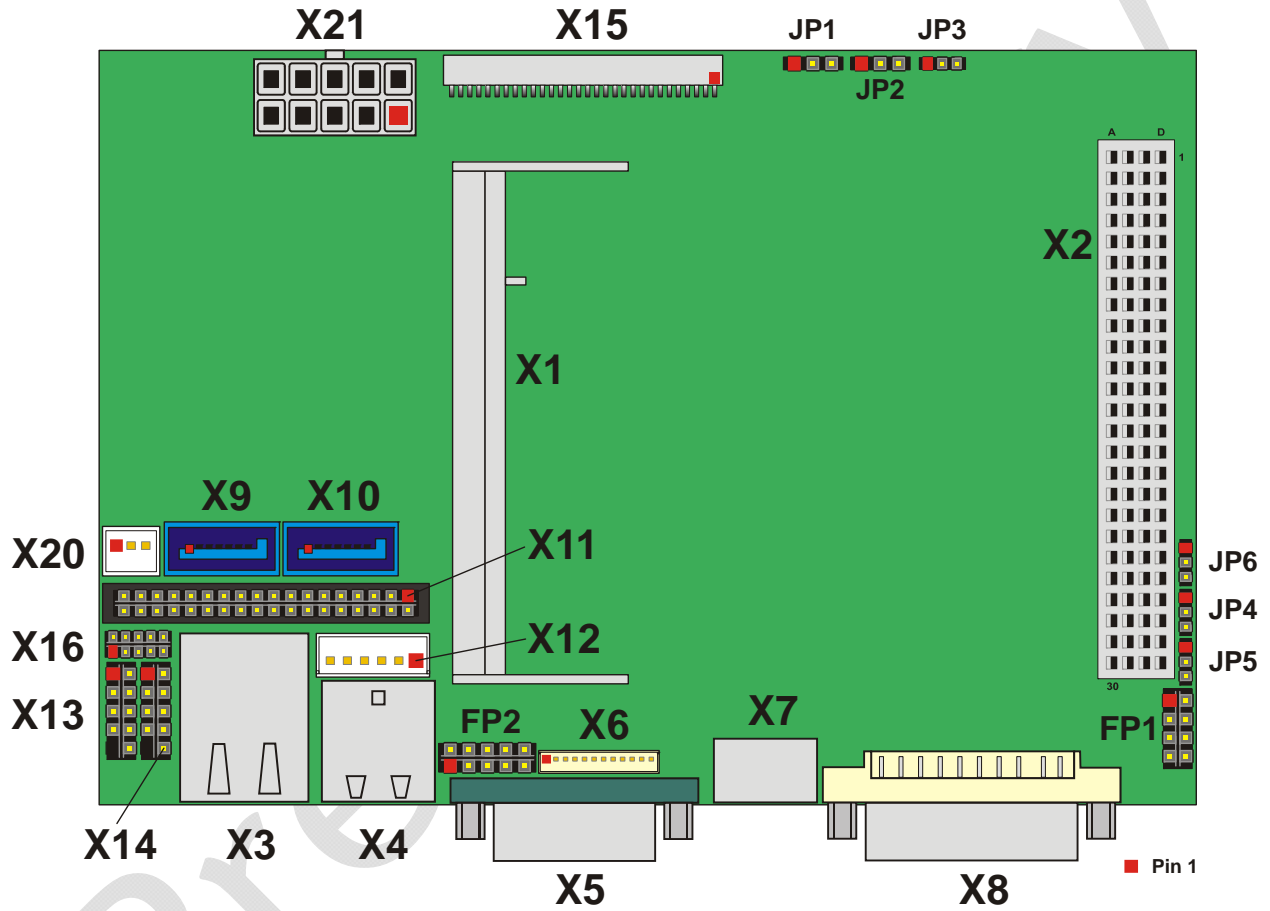
**Note:** *There are more devices connected to the SMBus than listed in this table, but access to these devices is not permitted. Don't access any other device addresses except those listed above.*

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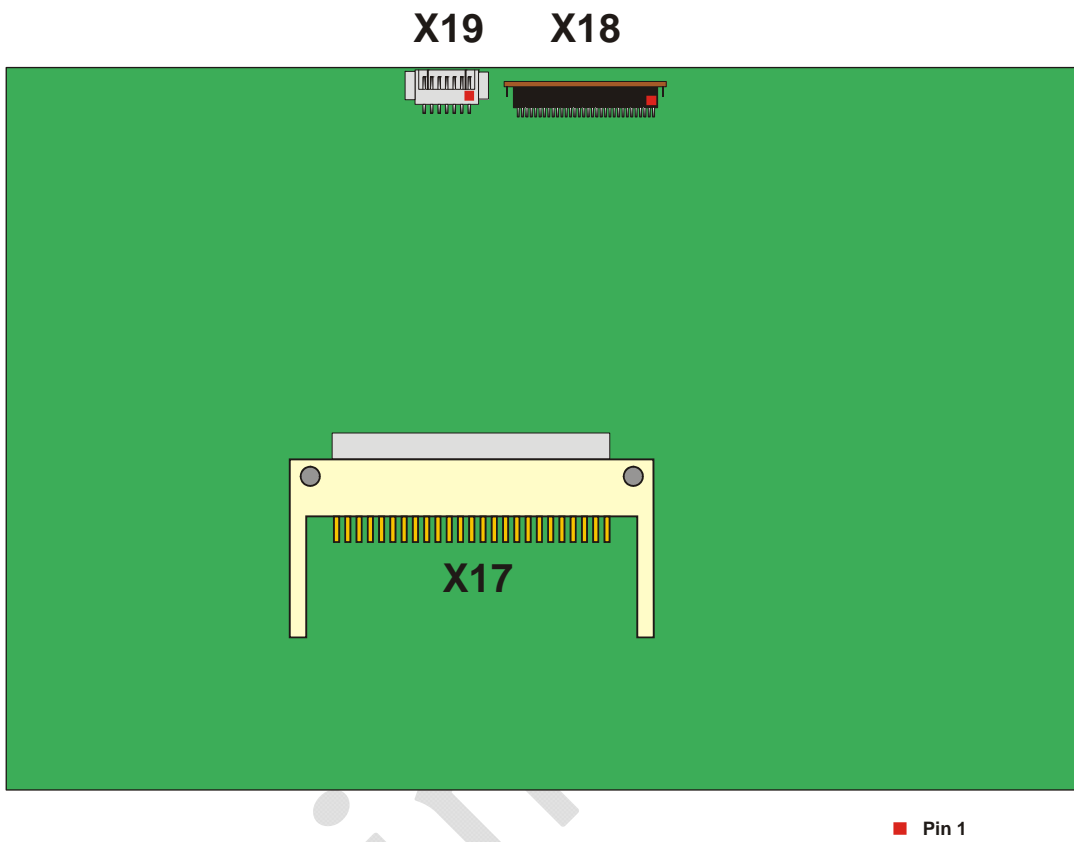
# Appendix B: Connector Layout

## B.1 Connector Locations

### B.1.1 Top Side



### B.1.2 Bottom Side



Preliminary

## B.2 Connector Functions & Mating Connectors

The table notes connector functions as well as mating connectors.

| Connector  | Function                   | Mating Connector                                     | Description  |
|------------|----------------------------|--|--|
| <b>X6</b>  | Serial port 2 connector    | 1.25 mm 10 pos<br>(MOLEX 50058-8000 or comp.)        | for standard DSUB-9 adaptation                       |
| <b>X12</b> | Audio connector            | 2.50 mm 6 pos<br>(JST SXH-002T-P0.6 or comp.)        | for audio support (Line In, Line Out and Microphone) |
| <b>X15</b> | JILI30 interface connector | Flat-foil-cable                                      | for Kontron JILI cables (KAB-JILI-????)              |
| <b>X19</b> | Backlight connector        | 1.25 mm 7 pos<br>(MOLEX 51021-0700 or comp.)         | for Kontron backlight cables                         |
| <b>X18</b> | Parallel port connector    | Flat-foil-cable                                      | for standard DSUB-25 adaptation                      |
| <b>X21</b> | ATX connector              | 10 pos<br>(MOLEX 39-00-0039 Mini Fit™ or compatible) | for ATX support                                      |

## B.3 Pinout Tables

| Pin | PCI-104 (A)          | PCI-104 (B)          | PCI-104 (C)          | PCI-104 (D)          |
|-----|----------------------|----------------------|----------------------|----------------------|
| 1   | GND                  | NC                   | VCC5 (1)             | AD0                  |
| 2   | V <sub>I/O</sub> (1) | AD2                  | AD1                  | VCC5 (1)             |
| 3   | AD5                  | GND                  | AD4                  | AD3                  |
| 4   | C/BE0                | AD7                  | GND                  | AD6                  |
| 5   | GND                  | AD9                  | AD8                  | GND                  |
| 6   | AD11                 | V <sub>I/O</sub> (1) | AD10                 | Reserved             |
| 7   | AD14                 | AD13                 | GND                  | AD12                 |
| 8   | VCC3 (1)             | C/BE1                | AD15                 | VCC3 (1)             |
| 9   | SERR                 | GND                  | Reserved             | PAR                  |
| 10  | GND                  | PERR                 | VCC3 (1)             | Reserved             |
| 11  | STOP                 | VCC3 (1)             | LOCK                 | GND                  |
| 12  | VCC3 (1)             | TRDY                 | GND                  | DEVSEL               |
| 13  | FRAME                | GND                  | IRDY                 | VCC3 (1)             |
| 14  | GND                  | AD16                 | VCC3 (1)             | C/BE2                |
| 15  | AD18                 | VCC3 (1)             | AD17                 | GND                  |
| 16  | AD21                 | AD20                 | GND                  | AD19                 |
| 17  | VCC3 (1)             | AD23                 | AD22                 | VCC3 (1)             |
| 18  | IDSELO (AD20)        | GND                  | IDSEL1 (AD21)        | IDSEL2 (AD22)        |
| 19  | AD24                 | C/BE3                | V <sub>I/O</sub> (1) | IDSEL3 (AD23)        |
| 20  | GND                  | AD26                 | AD25                 | GND                  |
| 21  | AD29                 | VCC5 (1)             | AD28                 | AD27                 |
| 22  | VCC5 (1)             | AD30                 | GND                  | AD31                 |
| 23  | REQ0                 | GND                  | REQ1                 | V <sub>I/O</sub> (1) |
| 24  | GND                  | REQ2                 | VCC5 (1)             | GNT0                 |
| 25  | GNT1                 | V <sub>I/O</sub> (1) | GNT2                 | GND                  |
| 26  | VCC5 (1)             | CLK0                 | GND                  | CLK1                 |
| 27  | CLK2                 | VCC5 (1)             | CLK3                 | GND                  |
| 28  | GND                  | INTD                 | VCC5 (1)             | RST                  |
| 29  | +12V (1)             | INTA                 | INTB                 | INTC                 |
| 30  | -12 (1)              | NC                   | NC                   | GND                  |

| Pin | IDE X11  | CF-Card X17 | LPT X18 | DVI X8    | J1130 X15 |
|-----|----------|-------------|---------|-----------|-----------|
| 1   | /RESET   | GND         | VCC (1) | TMDS2-    | FTX0-     |
| 2   | GND      | D3          | GND     | TMDS2+    | FTX0+     |
| 3   | D7       | D4          | NC      | GND       | FTX1-     |
| 4   | D8       | D5          | NC      | TMDS4-    | FTX1+     |
| 5   | D6       | D6          | NC      | TMDS4+    | FTX2-     |
| 6   | D9       | D7          | NC      | DDC_CLK   | FTX2+     |
| 7   | D5       | /CS1        | NC      | DDC_DAT   | GND       |
| 8   | D10      | GND         | NC      | VGA_VSYNC | FTXC-     |
| 9   | D4       | GND         | NC      | TMDS1-    | FTXC+     |
| 10  | D11      | GND         | NC      | TMDS1+    | FTX3-     |
| 11  | D3       | GND         | GND     | GND       | FTX3+     |
| 12  | D12      | GND         | /AFD    | TMDS3-    | STX0-     |
| 13  | D2       | VCC (1)     | /STB    | TMDS3+    | STX0+     |
| 14  | D13      | GND         | /ERR    | VCC (1)   | GND       |
| 15  | D1       | GND         | D0      | GND       | STX1-     |
| 16  | D14      | GND         | /INIT   | TMDS_HPD  | STX1+     |
| 17  | D0       | GND         | GND     | TMDS0-    | GND       |
| 18  | D15      | SA2         | D1      | TMDS0+    | STX2-     |
| 19  | GND      | SA1         | /SLIN   | GND       | STX2+     |
| 20  | KEY (NC) | SA0         | D2      | TMDS5-    | STXC-     |
| 21  | DRQ      | D0          | D3      | TMDS5+    | STXC+     |
| 22  | GND      | D1          | GND     | GND       | STX3-     |
| 23  | /IOW     | D2          | D4      | TMDSCLK+  | STX3+     |
| 24  | GND      | NC          | D5      | TMDSCLK-  | GND       |
| 25  | /IOR     | GND         | D6      | VGA_RED   | SDA       |
| 26  | GND      | GND         | D7      | VGA_GREEN | DATAENA   |
| 27  | IOCHRDY  | D11         | GND     | VGA_BLUE  | SCL       |
| 28  | CSEL     | D12         | /ACK    | VGA_HSYNC | VCC (1)   |
| 29  | /DACK    | D13         | /BUSY   | VGA_GND   | VCC (1)   |
| 30  | GND      | D14         | PE      |           | VCC (1)   |
| 31  | IRQ      | D15         | /SLCT   |           |           |
| 32  | NC       | /CS3        | GND     |           |           |
| 33  | SA1      | GND         |         |           |           |
| 34  | ATAD     | /IOR        |         |           |           |
| 35  | SA0      | /IOW        |         |           |           |
| 36  | SA2      | VCC (1)     |         |           |           |
| 37  | /CS1     | IRQ         |         |           |           |
| 38  | /CS3     | VCC (1)     |         |           |           |
| 39  | ACT      | GND         |         |           |           |
| 40  | GND      | NC          |         |           |           |
| 41  | VCC (1)  | /RESET      |         |           |           |
| 42  | VCC (1)  | IOCHRDY     |         |           |           |
| 43  | GND      | /DRQ        |         |           |           |
| 44  | NC       | /DACK       |         |           |           |
| 45  |          | ACT         |         |           |           |
| 46  |          | NC          |         |           |           |
| 47  |          | D8          |         |           |           |
| 48  |          | D9          |         |           |           |
| 49  |          | D10         |         |           |           |
| 50  |          | GND         |         |           |           |

| Pin | PS/2 KBD<br>Mouse<br>X7 | COM A<br>X5 | COM B<br>X6 | USB A<br>X3 | USB B<br>X13 / X14 |
|-----|-------------------------|-------------|-------------|-------------|--------------------|
| 1   | KBDAT                   | /DCD        | /DCD        | VCC (1)     | VCC (1)            |
| 2   | MSDAT                   | RXD         | /DSR        | USB0-       | VCC (1)            |
| 3   | GND                     | TXD         | RXD         | USB0+       | USB2-              |
| 4   | VCC (1)                 | /DTR        | /RTS        | GND         | USB3-              |
| 5   | KBCLK                   | GND         | TXD         | VCC (1)     | USB2+              |
| 6   | MSCLK                   | /DSR        | /CTS        | USB1-       | USB3+              |
| 7   |                         | /RTS        | /DTR        | USB1+       | GND                |
| 8   |                         | /CTS        | /RI         | GND         | GND                |
| 9   |                         | /RI         | GND         |             | KEY (NC)           |
| 10  |                         |             | VCC (1)     |             | GND                |

| Pin | Backlight<br>X19 | S-ATA<br>X9 / X10 | Ethernet<br>X3 / X4 | Audio<br>X12 | Digital I/O<br>X16 |
|-----|------------------|-------------------|---------------------|--------------|--------------------|
| 1   | NC               | GND               | TXD+ / BI_D1+       | LINE_OUT_R   | OUT1               |
| 2   | BKLTADJ          | TX+               | TXD- / BI_D1-       | GND          | IN1                |
| 3   | GND              | TX-               | RXD+ / BI_D2+       | LINE_OUT_L   | OUT2               |
| 4   | VCC (1)          | GND               | BI_D3+              | LINE_IN_R    | IN2                |
| 5   | VCC (1)          | RX-               | BI_D3-              | MIC_IN       | OUT3               |
| 6   | GND              | RX+               | RXD- / BI_D2-       | LINE_IN_L    | IN3                |
| 7   | BKLTON           | GND               | BI_D4+              |              | OUT4               |
| 8   |                  |                   | BI_D4-              |              | IN4                |
| 9   |                  |                   |                     |              | VCC (1)            |
| 10  |                  |                   |                     |              | GND                |

| Pin | Common<br>Front<br>Panel<br>FP1 | Power<br>Front<br>Panel<br>FP2 | Main<br>Power<br>X21 |
|-----|---------------------------------|--------------------------------|----------------------|
| 1   | RST_BTN+                        | PWR_LED+                       | /PS_ON               |
| 2   | SPKR+                           | PWR_BTN+                       | GND                  |
| 3   | RST_BTN-                        | NC                             | GND                  |
| 4   | NC                              | PWR_BTN-                       | VCC12 (1)            |
| 5   | HDD_LED+                        | PWR_LED-                       | VCC3 (1)             |
| 6   | NC                              | NC                             | VCC5SB (1)           |
| 7   | HDD_LED-                        | KBD_LOCK                       | VCC5 (1)             |
| 8   | SPKR-                           | RSVD                           | VCC5 (1)             |
| 9   |                                 | GND                            | VCC12# (1)           |
| 10  |                                 | RSVD                           | GND                  |

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- Note:** 1 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 conditions of IEC/EN 60950.
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Preliminary

# Appendix C: Literature Hints

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

## C.1 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

## C.2 Buses

- *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

## C.3 Ports

### C.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 website

### C.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.

### C.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

## C.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

## Appendix D: Revision History

| Revision | Date       | Edited by   | Changes                      |
|----------|------------|-------------|------------------------------|
| 0.1      | 01/22/2009 | M. Hüttmann | First revision               |
| 0.2      | 08/05/2009 | M. Hüttmann | Change operating temperature |

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