

» Kontron User's Guide «



JReplus-DC

KTD-S0008-F

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1 User Information

1.1 About This Document

This document provides information about products from KONTRON Technology A/S and/or its subsidiaries. No warranty of suitability, purpose or fitness is implied. While every attempt has been made to ensure that the information in this document is accurate the information contained within is supplied 'as-is' - no liability is taken for any inaccuracies. Manual is subject to change without prior notice.

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

1.2 Copyright Notice

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No part of this document may be reproduced or transmitted in any form or by any means, electronically or mechanically, for any purpose without the express written permission of KONTRON Technology A/S.

1.3 Trademarks

Brand and product names are trademarks or registered trademarks of their respective owners.

1.4 Standards

KONTRON Technology A/S is certified to ISO 9000 standards.

1.5 Warranty

This product is warranted against defects in material and workmanship for the warranty period from the date of shipment. During the warranty period KONTRON Technology A/S 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 Technology A/S will not be responsible for any defects or damages to third party products that are caused by a faulty KONTRON Technology A/S product.

1.6 Life Support Policy

KONTRON Technology's products are not for use as critical components in life support devices or systems without express written approval of the general manager of KONTRON Technology A/S.

As used herein:

Life support devices or systems are devices or systems which

- a) are intended for surgical implant into body or
- b) support or sustain life and whose failure to perform, when properly used in accordance with instructions for use provided in the labelling, can be reasonably expected to result in significant injury to the user.

A critical component is any component of a life support device or system whose failure to perform can be reasonably expected to cause the failure of the life support device or system or to affect its safety or effectiveness.

1.7 Technical Support

Please consult our web site at <http://www.kontron.com/support> for the latest product documentation, utilities, drivers and [support contacts](#) or use the special e-mail address sbc-support@kontron.com for a technical problem. In any case you can always contact your board supplier for technical support.

Before contacting support please be prepared to provide as much information as possible:

Board identification:

- ☐ Type
- ☐ Part number (find PN on label)
- ☐ Serial number (find SN on label)

Board configuration:

- ☐ DRAM type and size
- ☐ BIOS revision (find in the BIOS Setup)
- ☐ BIOS settings different than default settings (refer to the BIOS Setup section)

System environment:

- ☐ O/S type and version
- ☐ Driver origin and version
- ☐ Attached hardware (drives, USB devices, LCD panels ...)

2 Introduction

2.1 JReX Embedded Line Family

Each JReX is a member of the 3.5" SBC family of KONTRON Technology A/S.

JReX embedded line modules are characterized by the same surface pinouts and interfaces for reset logic and ATX power supply feature, 2 x USB, Fast LAN, PS/2 keyboard and mouse connector, Compact-Flash socket, CRT interface as well as one serial port. These embedded line family features allow the use of the same chassis over the whole product line and maximize design reuse. JReX 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.

As part of the standard features package all JReX modules come with a JIDA interface 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-DC Overview

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

Article Number	Active Cooling	Passive Cooling
02008-0000-16-0	✓	
02008-0000-16-3		✓



02008-0000-16-0



02008-0000-16-3

3 Specifications

3.1 Functional Specifications

Processor: Intel® ATOM™ N270

- ❑ 512 kB L2 cache
- ❑ 1.6 GHz clock frequency

Northbridge: Intel® 945GSE

- ❑ 533 MHz Front Side Bus (FSB)
- ❑ One DDR2-533 unbuffered DDR-SDRAM (SODIMM form factor) up to 2 GB
- ❑ Integrated Intel® GMA950 graphic controller with dual independent display support

Southbridge: Intel® ICH7M

- ❑ Two channel Serial-ATA interface
- ❑ Parallel-ATA PCI IDE controller
- ❑ Eight USB channels (UHCI/EHCI) (seven channels available, one channel as PCI Express MiniCard interface)
- ❑ One LAN controller with LAN Connect Interface (LCI)
- ❑ Two PCI Express ports (x1 lanes)
- ❑ Integrated Intel® High Definition audio controller (HD audio)
- ❑ External PCI bus with 32 bit / 33 MHz operation (PCI V2.3 compliant)

Onchip Video Graphics Array (VGA): Intel® GMA950

- ❑ Intel® Gen 3.5 graphics engine
- ❑ Dynamic Video Memory Technology (DVMT 3.0)
- ❑ DirectX 9.0c support
- ❑ Low Voltage Differential Signaling (LVDS) 18 bit dual channel interface up to UXGA display resolution
- ❑ Intel® Serial Digital Video Out (SDVO) with DVI monitor interface (maximal 160 MHz pixel clock)
- ❑ Analogue Video Graphics Array output (VGA/CRT) up to WUXGA resolution (DVI-I connector)

Onchip Parallel-ATA (P-ATA)

- ❑ Supports PIO mode, Multiword DMA and Ultra DMA up to UDMA5
- ❑ Compact Flash (CF) socket useable as master or slave

Onchip Serial-ATA (S-ATA)

- ❑ Complies with Serial-ATA specification rev. 1.0a (Serial-ATA II)

Onchip Universal Serial Bus (USB)

- ❑ Six ports are capable to handle USB 1.1 (UHCI) and USB 2.0 (EHCI)

Onchip High Definition Audio

- ❑ Up to 24 bit sample resolution with 192 kHz sample rate
- ❑ Onboard HD audio codec ALC888 (Realtek)
- ❑ Supports LINE OUT, LINE IN, MICROPHONE IN and S/PDIF output

Onchip Fast Ethernet: Phy Intel® 82562ET

- ❑ Fully compatible with IEEE 802.3

Gigabit Ethernet (PCI Express): Intel® 82574L

- ❑ Full duplex operation at 10/100/1000 Mbps
- ❑ Fully compliant with IEEE 802.3, IEEE 802.3u and IEEE 802.3ab

PCI Express MiniCard

- ❑ One PCIe MiniCard slot on the bottom of the board allows the use of similar add-on devices (PCI Express and USB interface)

PCI-104 Interface

- ❑ 33 MHz PCI clock and 32 bit data bus width
- ❑ Only 3.3V PCI cards are supported

Super I/O (LPC): Winbond W83627EHG

- ❑ One onchip thermal sensor and one remote temperature sensor (CPU)
- ❑ One parallel port configurable as enhanced parallel port (EPP) and extended capabilities
- ❑ One PS/2 keyboard and mouse controller
- ❑ Two serial ports (RS232) COM1 and COM2
- ❑ First serial port optionally as RS-422 or RS-485
- ❑ Fan controller
- ❑ Watchdog timer

Trusted Platform Module (LPC): Infineon SLB9635TT

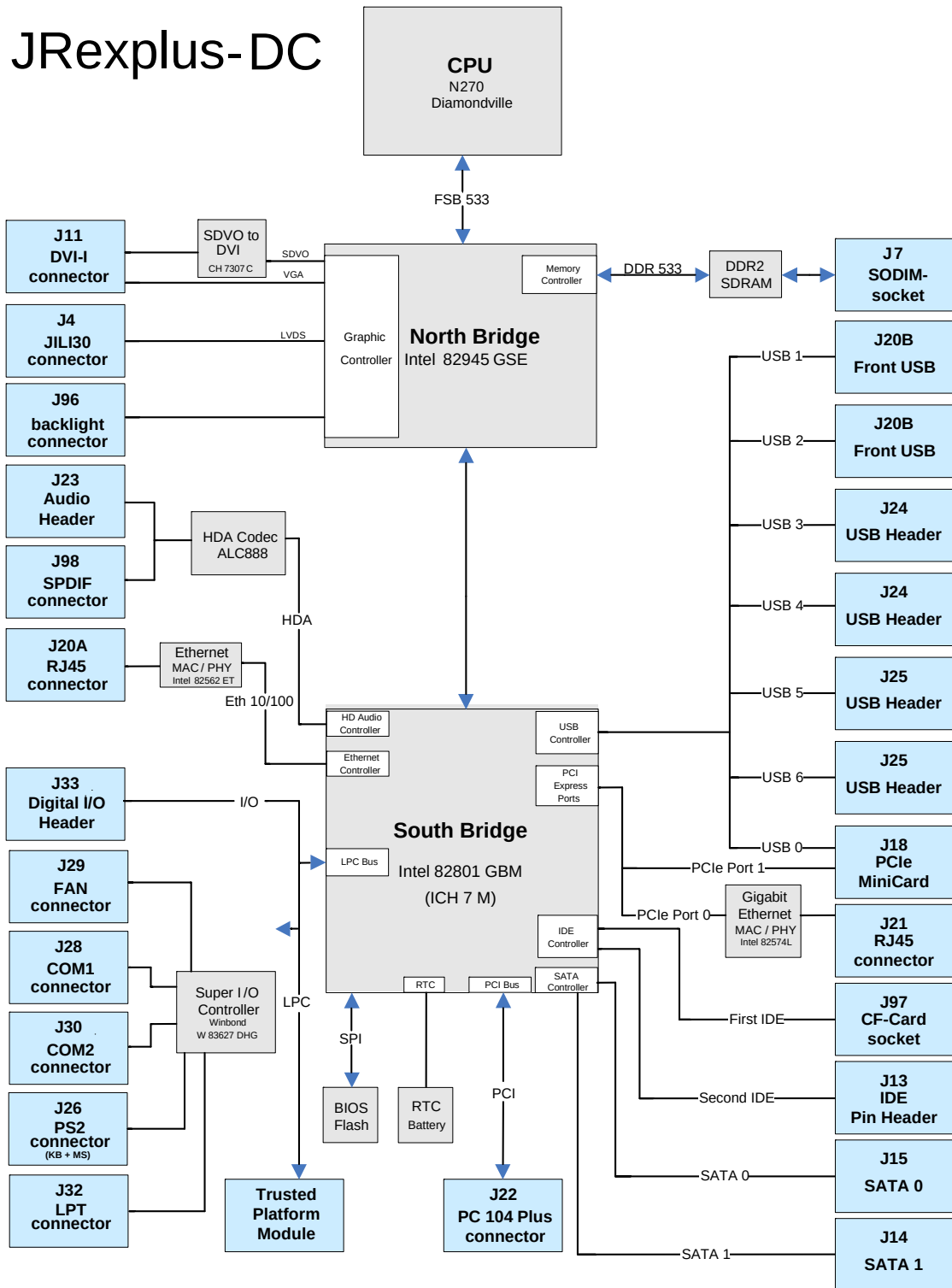
- ❑ Chipset LPC bus supports TPM 1.2 devices

Digital I/O (CPLD)

- ❑ Eight bidirectional I/O lines, +3.3V signal level

BIOS: AMI[®], 1 MB Flash BIOS**Real-Time Clock (RTC) with CMOS RAM and Battery**

3.2 Block Diagram



3.3 Mechanical Specifications

Dimensions

- 102 x 147 mm (4.0" x 5,8")
- Height on top approx. 31 mm
- Height on bottom approx. 6 mm

3.4 Electrical Specifications

Supply Voltage

The power supply connector (10 pins) requires +5V, +12V and +5V standby - alternative +5V only mode is possible.

- +5V DC $\pm 5\%$
- +12V DC $\pm 5\%$ (only necessary for LCD panel)
- +5V DC standby $\pm 5\%$

Supply Voltage Ripple

- Maximum 100mV peak to peak 0 – 20 MHz

Supply Current (DOS prompt)

Power consumption tests were executed during the DOS prompt with 1 GB DDR2 SDRAM, DVI monitor, USB keyboard and CF card as boot device (default BIOS settings). The +12VDC line was not measured as this voltage is only used to supply backlights through the backlight connector J96.

🔗 Article number **02008-0000-16-0**

Supply voltage 5V

DOS Prompt		Soft Off S5	
[A]	[W]	[A]	[W]
1,74	8,7	0,15	0,76

Supply Current (Windows® XP SP3)

The power consumption tests were executed during Windows® 7 by using a tool to stress the CPU (100% load) and extensive 3D graphic. The test was performed with 1 GB DDR2 SDRAM, DVI monitor, USB keyboard & mouse and a S-ATA harddrive as boot device (default BIOS settings). The harddrive power consumption was not measured within this test.

🔧 Article number **02008-0000-16-0**

Supply voltage 5V

Full Load		Idle		Standby S3	
[A]	[W]	[A]	[W]	[A]	[W]
2,5	12,5	1,7	8,5	0,25	1,25

3.5 Real-Time Clock Battery

- Voltage range: +2.4V - +3.6V (typ. +3.0V)
- Maximum current 5µA @ +3.0V

Lithium battery precautions

CAUTION! Danger of explosion if battery is incorrectly replaced. Replace only with same or equivalent type recommended by manufacturer. Dispose of used batteries according to the manufacturer's instructions.	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.
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.	PRECAUCION! 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.
ADVARSEL! Lithiumbatteri – Eksplosionsfare ved fejlagtig håndtering. Udskiftning må kun ske med batteri af samme fabrikat og type. Levér det brugte batteri tilbage til leverandøren.	ADVARSEL! Ekspløsjonsfare ved feilaktig skifte av batteri. Benytt samme batteritype eller en tilsvarende type anbefalt av apparatfabrikanten. Brukte batterier kasseres i henhold til fabrikantens instruksjoner.
WARNING! Explosionsfara vid felaktigt batteribyte. Använd samma batterityp eller en ekvivalent typ som rekommenderas av apparattillverkaren. Kassera använt batteri enligt fabrikantens instruktion.	VAROITUS! Paristo voi räjähtää, jos se on virheellisesti asennettu. Vaihda paristo ainoastaan laitevalmistajan suosittelemaan tyyppiin. Hävitä käytetty paristo valmistajan ohjeiden mukaisesti.

3.6 Environmental Specifications

Temperature

Operating:

- Ambient temperature: 0 to +40°C (passive cooler with no airflow)
- Ambient temperature: 0 to +60°C ¹⁾ (active cooler with appropriate airflow)

Non operating:

- Ambient temperature: -10 to +85°C

Note: 1) It is the customer's responsibility to provide sufficient airflow around each of the components to keep them within the allowed temperature range.

Humidity

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

3.7 MTBF

The following MTBF (Mean Time Before Failure) values were calculated using a combination of manufacturer's test data, if the data was available, and the Telcordia (Bellcore) issue 2 calculation for the remaining parts. The Telcordia calculation used is "Method 1 Case 3" in a ground benign, controlled environment (GB,GC). This particular method takes into account varying temperature and stress data and the system is assumed to have not been burned in. Figure 1 below shows MTBF de-rating for the E1 temperature range in an office or telecommunications environment. Other environmental stresses (extreme altitude, vibration, salt water exposure etc.) lower MTBF values.

»System MTBF(hours) = 227228 @ 40°C

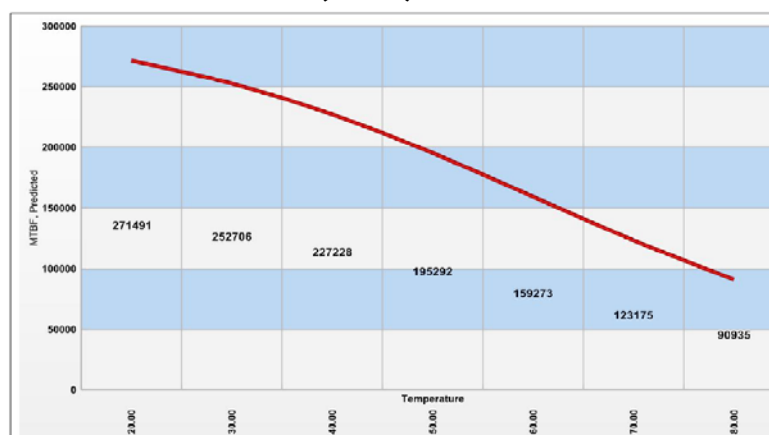


Figure 1. MTBF temperature de-rating.

Fans usually shipped with KONTRON Technology A/S 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 figure and needs 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.

All data is for information purposes only and not guaranteed for legal purposes. Subject to change without notice. Information in this datasheet has been carefully checked and is believed to be accurate; however, no responsibility is assumed for inaccuracies.

4 Getting Started

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

- ❶ Connect the ATX-adapter (KAB-ATX-10) or the delivered 5V adapter (KAB-ADAPT-ATXto5V) to the JReplus-DC 10pin ATX power connector J35. The location of connector J35 can be found in the Appendix B.
- ❷ Plug a suitable DDR2-SDRAM memory module into the RAM socket.
- ❸ Connect a DVI monitor to the DVI connector (the use of a VGA monitor with a DVItoVGA adapter is also possible).
- ❹ Plug a keyboard and/or mouse to the PS/2 or USB connector(s).
- ❺ Plug a Compact Flash card into the CF socket on the bottom of the board.
- ❻ Connect an ATX power supply
- ❼ Make sure all your connections have been made correctly. Turn on the power by shortening the power button pins on the Front Panel Pin Header 1 (J36).
- ❽ Enter the BIOS by pressing the Del key during boot-up. Make all changes in the BIOS Setup. See the BIOS Setup chapter of this manual for details.

5 System Memory

The JReplus-DC uses only 200 pin Small Outline Dual Incline Memory Modules (SODIMMs). One socket is available for 1.8V unbuffered DDR2-533 SDRAM of up to 2 GB.

Memory modules with 667 MHz clock frequency can also be used. In this case the memory module is driven with 533 MHz. It is recommended to use RAM modules which have been approved by KONTRON. Please contact the board vendor to receive a list of approved memory modules.

The total amount of memory available on the SDRAM module is used for main memory and graphic memory on the JReplus-DC. Shared Memory Architecture (SMA) manages the sharing of system memory between graphic controller and processor. Therefore the full memory size is not available for software applications. Up to 128 MB of system memory are used as graphic memory. Depending on system memory the graphic driver may allocate more.

Attention: *KONTRON Technology A/S can't guarantee the correct functionality of the JReplus-DC when a DDR2-module with another frequency than 533 Mhz is used.*

6 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 J22.

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.

Under no circumstances 5V PCI cards may be used on the JReplus-DC board. Only Universal and 3.3V add-on cards are permitted. $V_{I/O}$ is set to 3.3V on the PCI bus. 5V PCI add-on cards can irretrievably damage the JReplus board due to a short circuit with $V_{I/O}$. Before using a PCI add-on card please make absolutely sure that this card is conform to these requirements.

Note: Some PCI-104 extension cards might interfere mechanically with the CPU cooler. To avoid this and to achieve the best possible cooling performance the usage of a PCI-104 spacer is recommended.

Note: 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.

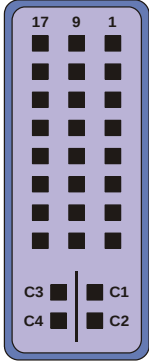
Attention: *5V PCI expansion cards can damage the board.*

7 Graphics Interface

The graphics interface supports DVI or CRT monitors and a variety of LCD panels with dual channels, color depth of 18 bit and resolutions up to 1920x1200 for DVI/CRT and UXGA (1600x1200) for LCD.

7.1 DVI or CRT Connector

The DVI and CRT interface are available through the standard 29 pin I style DVI connector J11.

Header	Pin	Signal Name	Function
	1	TMDS2-	TMDS data 2 (negative)
	2	TMDS2+	TMDS data 2 (positive)
	3	GND	Ground
	4	N.C.	Not connected
	5	N.C.	Not connected
	6	DDC_CLK	DDC clock
	7	DDC_DATA	DDC data
	8	VSYNC	Analog vertical sync
	9	TMDS1-	TMDS data 1 (negative)
	10	TMDS1+	TMDS data 1 (positive)
	11	GND	Ground
	12	N.C.	Not connected
	13	N.C.	Not connected
	14	VCC ¹⁾	Power +5V
	15	GND	Ground
	16	TMDS_HPD	Hot plug detect
	17	TMDS0-	TMDS data 0 (negative)
	18	TMDS0+	TMDS data 0 (positive)
	19	GND	Ground
	20	N.C.	Not connected
	21	N.C.	Not connected
	22	GND	Ground
	23	TMDS_CLK+	TMDS clock (positive)
	24	TMDS_CLK-	TMDS clock (negative)
	C1	RED	Analog red
	C2	GRN	Analog green
	C3	BLU	Analog blue
	C4	HSYNC	Analog horizontal sync
	C5	GND	Analog ground

7.2 DDC Interpretation

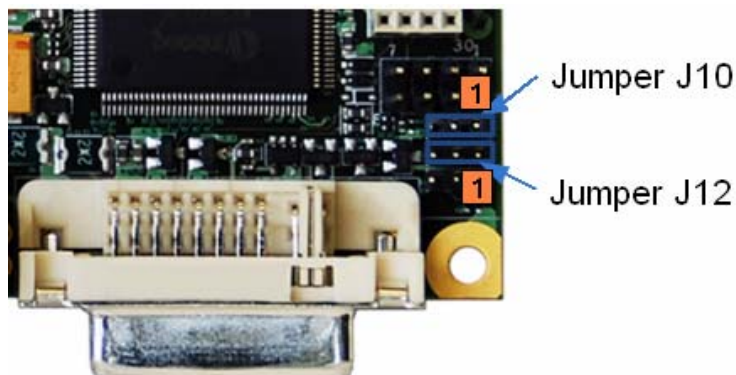
Depending on the jumper settings of J10 and J12 the DDC data delivered by the display is either interpreted for the CRT channel or for the DVI channel.

Important: Both jumpers (J10 and J12) must be set to the same position.

1

Pins	DDC Signal
1 - 2	DVI
2 - 3	CRT

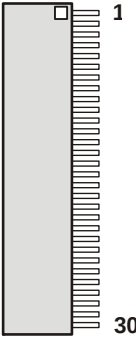
7.2.1 Jumper Setting



7.3 Flat Panel Connector

The LVDS interface for the flat panel is available through the JILI30 connector (30 pins) J4 on the bottom side of the board. This connector represents the JILI interface. The implementation of this subsystem complies with the JILI specification of KONTRON Technology A/S. A variety of cables for different display types are available from KONTRON.

7.3.1 JILI30 Connector

Header	Pin	Signal Name	Function
	1	FTX0-	First channel data output 0 (negative)
	2	FTX0+	First channel data output 0 (positive)
	3	FTX1-	First channel data output 1 (negative)
	4	FTX1+	First channel data output 1 (positive)
	5	FTX2-	First channel data output 2 (negative)
	6	FTX2+	First channel data output 2 (positive)
	7	GND	Ground
	8	FTXC-	First channel clock output (negative)
	9	FTXC+	First channel clock output (positive)
	10	FTX3-	First channel data output 3 (negative)
	11	FTX3+	First channel data output 3 (positive)
	12	STX0-	Second channel data output 0 (negative)
	13	STX0+	Second channel data output 0 (positive)
	14	GND	Ground
	15	STX1-	Second channel data output 1 (negative)
	16	STX1+	Second channel data output 1 (positive)
	17	GND	Ground
	18	STX2-	Second channel data output 2 (negative)
	19	STX2+	Second channel data output 2 (positive)
	20	STXC-	Second channel clock output (negative)
	21	STXC+	Second channel clock output (positive)
	22	STX3-	Second channel data output 3 (negative)
	23	STX3+	Second channel data output 3 (positive)
	24	GND	Ground
	25	SDA	I2C data line
	26	DATAENA	Data enable output
	27	SCL	I2C clock line
	28 - 30	VCC¹⁾	Power +3.3V or +5V

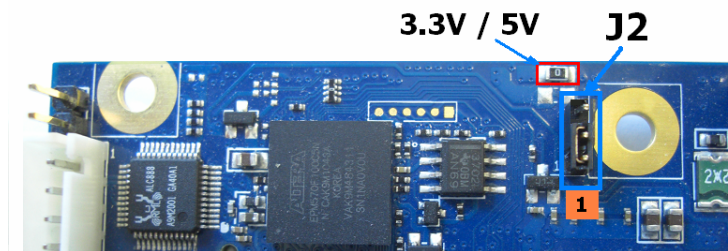
Note: 1) To protect the external power lines of peripheral devices make sure that

- 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.

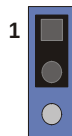
Warning: Check jumper J2 (panel power) for correct settings for your panel – not doing so might cause permanent damage to your panel.

7.4 Panel Power

The panel power jumper J2 sets the panel supply voltage. For this setting a solder jumper is important. The board is delivered with the solder jumper equipped as shown on the following picture.

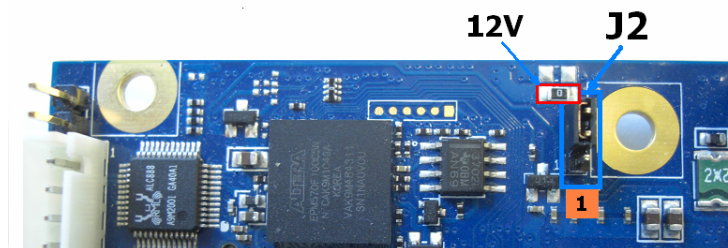


In this case the board is configured so that 3.3V or 5V panel supply voltage can be selected with jumper J2.



Pins	Supply Voltage
1 - 2	5V
2 - 3	3.3V

When a panel supply voltage of 12V is needed the solder jumper has to be set to the red marked position of the following picture. It is important that only one of those two solder jumpers is equipped. When the 12V solder jumper is set the 3.3V solder jumper has to be removed.



In this case the jumper setting (2-3) for 3.3V leads to a panel supply voltage of 12V.

Note: All soldering works must be done in a professional production environment. To avoid losing the guarantee for your product please contact the board vendor before you make any solder modification on the JRExplus-DC.

7.5 Connecting a Flat Panel

To determine whether your flat panel is supported check the KONTRON website for panel lists. We regularly update the list of panels that have been tested with the JRExplus-DC.

If you use one of those adapters supplied by KONTRON configuration is easy:

- ❶ 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.
- ❷ Check jumper J2 for correct panel voltage.
- ❸ Check jumper J5 for correct backlight voltage.
- ❹ Check jumper J3 for correct backlight on/off polarity.
- ❺ Connect the cable to the flat panel connector J4 on the JRExplus-DC and connect the other end to your display.
- ❻ Connect the backlight converter.
- ❼ Supply power to your system.
- ❽ If no image appears on your display connect a DVI monitor to the DVI connector.
- ❾ If you still do not see improvement consider contacting the dealer for technical support.

7.6 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 flat panel on the JILI30 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.

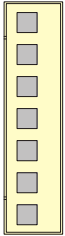
Video Mode	Type	Characters/Pixels	Colors
00h/01h	Text	40 x 25	16
02h/03h	Text	80 x 25	16
04h/05h	Graphic	320 x 200	4
06h	Graphic	640 x 200	2
07h	Text	80 x 25	2
0Dh	Graphic	320 x 200	16
0Eh	Graphic	640 x 200	16
0Fh	Graphic	640 x 350	2
10h	Graphic	640 x 350	4
11h	Graphic	640 x 480	2
12h	Graphic	640 x 480	16
13h	Graphic	320 x 200	256

7.7 Extended VESA Modes

VESA Mode	Type	Pixels	Colors
101h	Graphic	640 x 480	256
103h	Graphic	800 x 600	256
105h	Graphic	1024 x 768	256
107h	Graphic	1280 x 1024	256
111h	Graphic	640 x 480	64k
112h	Graphic	640 x 480	16M
114h	Graphic	800 x 600	64k
115h	Graphic	800 x 600	16M
117h	Graphic	1024 x 768	64k
118h	Graphic	1024 x 768	16M
11Ah	Graphic	1280 x 1024	64k
11Bh	Graphic	1280 x 1024	16M

7.8 Backlight Connector

Backlight is available through the J96 connector (7 pins). Backlight voltage and backlight on/off polarity are controlled through the jumper J5 and J3. The backlight brightness (adjust voltage) can be set in the BIOS Setup.

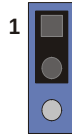
Header	Pin	Signal Name	Function
1 	1	N.C.	Not connected
	2	BKLTADJ	Brightness control (0V - 5V)
	3	GND	Ground
	4	VCC ¹⁾	Power +5V or +12V
	5	VCC ¹⁾	Power +5V or +12V
	6	GND	Ground
	7	BKLTON	Backlight on/off

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

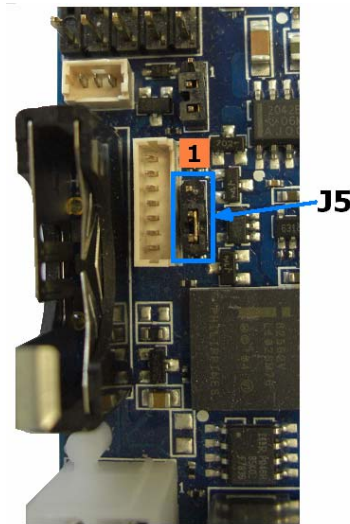
- the wires have the right diameter to withstand the maximum available current.
- to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

7.8.1 Jumper Settings

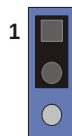
The jumper J5 can be used to set the backlight supply voltage to 5V or 12V.



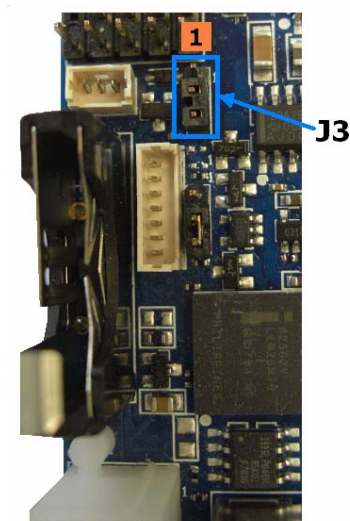
Pins	Backlight Voltage
1 - 2	5V
2 - 3	12V



The jumper J3 can be used to invert the backlight-on signal of the backlight inverter.



Pins	Backlight-On
1 - 2	High
2 - 3	Low



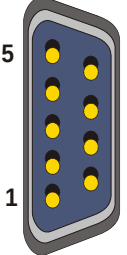
8 Serial Port Interfaces

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. A programmable baud rate generator allows transfer rates up to 1 MBaud.

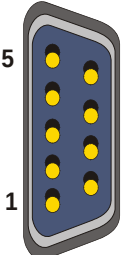
One serial port is available as RS-232 on the JReX front panel and can be used as well as RS-422 or RS-485 interface, the second serial port COMB is available through a 10 pin header.

8.1 Connectors

COMA is available through the standard DSUB9 connector J28 (9 pins).

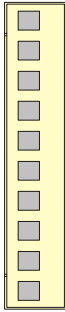
Header	Pin	Signal Name	Function	DSUB25
	1	/DCD	Data carrier detect	8
	2	RXD	Receive data	3
	3	TXD	Transmit data	2
	4	/DTR	Data terminal ready	20
	5	GND	Ground	7
	6	/DSR	Data set ready	6
	7	/RTS	Request to send	4
	8	/CTS	Clear to send	5
	9	/RI	Ring indicator	22

The same connector J28 can be used as a RS-422 or RS-485 interface. The configuration is changeable in the BIOS Setup.

Header	Pin	RS-422	RS-485	Function
	1	TX-	TX- / RX-	Transmit data - / Receive data -
	2	N.C.	N.C.	Not connected
	3	TX+	TX+ / RX+	Transmit data + / Receive data +
	4	N.C.	N.C.	Not connected
	5	GND	GND	Ground
	6	RX+	N.C.	Receive data + / Not connected
	7	N.C.	N.C.	Not connected
	8	RX-	N.C.	Receive data - / Not connected
	9	N.C.	N.C.	Not connected

Attention: A RS-422/RS-485 terminating resistor is not equipped on the JReXplus-DC.

COMB is available through the connector J30 (10 pins). A DSUB9 adapter cable is deliverable from KONTRON (KAB-DSUB9-3, part number 96061-0000-00-0).

Header	Pin	Signal Name	Function	DSUB9
	1	/DCD	Data carrier detect	1
	2	/DSR	Data set ready	6
	3	RXD	Receive data	2
	4	/RTS	Request to send	7
	5	TXD	Transmit data	3
	6	/CTS	Clear to send	8
	7	/DTR	Data terminal ready	4
	8	/RI	Ring indicator	9
	9	GND	Ground	5
	10	VCC ¹⁾	Power +5V	---

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

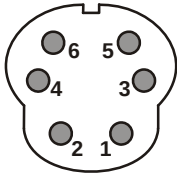
- the wires have the right diameter to withstand the maximum available current.
- to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

9 PS/2 Keyboard and Mouse Interface

The Super-I/O of the JReplus-DC 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.

9.1 Connector

The keyboard/mouse interface is available through the standard miniDIN connector J26 (6 pins). A Y-cable is deliverable from KONTRON (KAB-PS/2Y-1, part number 96001-0000-00-4)

Header	Pin	Signal Name	Function
	1	KBDAT	Keyboard data
	2	MSDAT	Mouse data
	3	GND	Ground
	4	VCC ¹⁾	Power +5V (fused)
	5	KBCLK	Keyboard clock
	6	MSCLK	Mouse clock

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

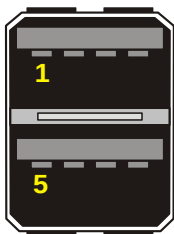
- the wires have the right diameter to withstand the maximum available current.
- to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

10 USB Interface

The USB interface comes with six USB ports which follow the UHCI/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.

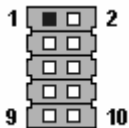
10.1 Standard Connector

Two USB ports are available through the standard USB connector J20 (8 pins).

Header	Pin	Signal Name	Function
	1	VCC ¹⁾	Power +5V
	2	USB1-	USB port 1 (negative)
	3	USB1+	USB port 1 (positive)
	4	GND	Ground
	5	VCC ¹⁾	Power +5V
	6	USB2-	USB port 2 (negative)
	7	USB2+	USB port 2 (positive)
	8	GND	Ground

10.2 Extension Connectors

The other USB ports are available through the standard pin strip connectors J24 and J25 (10 pins).

Header	Pin	Signal Name	Function
	1	VCC ¹⁾	Power +5V
	2	VCC ¹⁾	Power +5V
	3	USB3/5-	USB port 3 or 5 (negative)
	4	USB4/6-	USB port 4 or 6 (negative)
	5	USB3/5+	USB port 3 or 5 (positive)
	6	USB4/6+	USB port 4 or 6 (positive)
	7	GND	Ground
	8	GND	Ground
	9	KEY (N.C.)	Key pin
	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.

An USB interface cable is available from KONTRON (KAB-DUSB, part number 821401).



10.3 USB Limitations

The power contacts for USB devices are protected. They are suitable to supply connected USB devices with a maximum current of 500 mA. Do not supply external USB devices with higher power consumption through these pins.

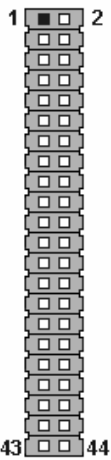
11 EIDE Interface (P-ATA)

The JReplus-DC features one EIDE interface (up to UDMA5 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.

Note: The connector of the JReplus-DC was intended for the use with a cable link. When a KONTRON chip-disk or a CF card adapter is used the PCB's of these components point away from the board.

11.1 Connector

The EIDE interface is available through connector J13 (44 pins). It is designed in 2 mm grid for connectivity to a 2.5" hard disk. You can use two cables to directly connect a 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	/RESET	Reset	2	GND	Ground
	3	D7	Data 7	4	D8	Data 8
	5	D6	Data 6	6	D9	Data 9
	7	D5	Data 5	8	D10	Data 10
	9	D4	Data 4	10	D11	Data 11
	11	D3	Data 3	12	D12	Data 12
	13	D2	Data 2	14	D13	Data 13
	15	D1	Data 1	16	D14	Data 14
	17	D0	Data 0	18	D15	Data 15
	19	GND	Ground	20	Key (N.C.)	Key pin
	21	DRQ	DMA request	22	GND	Ground
	23	/IOW	I/O write	24	GND	Ground
	25	/IOR	I/O read	26	GND	Ground
	27	IOCHRDY	I/O channel ready	28	CSEL ²⁾	Cable select
	29	/DACK	DMA acknowledge	30	GND	Ground
	31	IRQ	Interrupt request	32	N.C.	Not connected
	33	SA1	Address 1	34	ATAD	UDMA detection
	35	SA0	Address 0	36	SA2	Address 2
	37	/CS1	Chip select 1	38	/CS3	Chip select 3
	39	ACT	Drive activity	40	GND	Ground
	41	VCC ¹⁾	Power +5V	42	VCC ¹⁾	Power +5V
	43	GND	Ground	44	N.C.	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 470Ω to Ground for Cable Select IDE devices.

11.2 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 44 pin IDE connector.

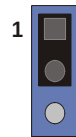
11.2.1 Connector

The CF card interface is available through the standard CF connector J97 (50 pins).

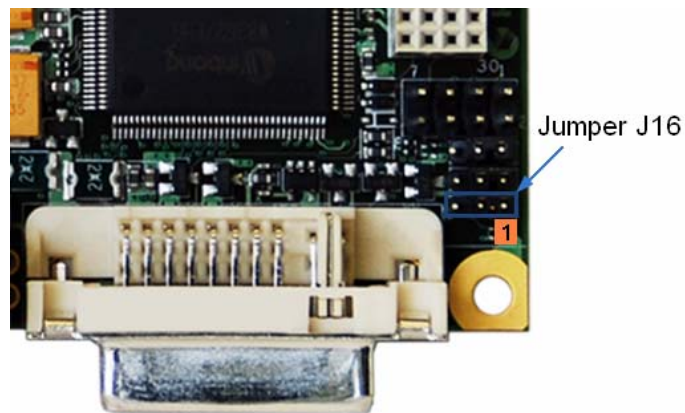
Pin	Signal Name	Function	Pin	Signal Name	Function
1	GND	Ground	2	D3	Data 3
3	D4	Data 4	4	D5	Data 5
5	D6	Data 6	6	D7	Data 7
7	/CS1	Chip select 1	8	GND	Ground
9	GND	Ground	10	GND	Ground
11	GND	Ground	12	GND	Ground
13	VCC3 ¹⁾	Power +3.3V	14	GND	Ground
15	GND	Ground	16	GND	Ground
17	GND	Ground	18	SA2	Address 2
19	SA1	Address 1	20	SA0	Address 0
21	D0	Data 0	22	D1	Data 1
23	D2	Data 2	24	N.C.	Not connected
25	GND	Ground	26	GND	Ground
27	D11	Data 11	28	D12	Data 12
29	D13	Data 13	30	D14	Data 14
31	D15	Data 15	32	/CS3	Chip select 3
33	GND	Ground	34	/IOR	I/O read
35	/IOW	I/O write	36	VCC3 ¹⁾	Power +3.3V
37	IRQ	Interrupt	38	VCC3 ¹⁾	Power +3.3V
39	GND	Ground	40	N.C.	Not connected
41	/RESET	Reset	42	IOCHRDY	I/O channel ready
43	/DRQ	DMA request	44	/DACK	DMA acknowledge
45	ACT	Drive activity	46	ATAD	UDMA detection
47	D8	Data 8	48	D9	Data 9
49	D10	Data 10	50	GND	Ground

11.2.2 Jumper Setting

Jumper J16 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.

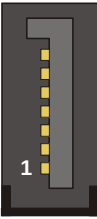
Warning: Inserting or removing the Compact Flash card while in operation can cause serious damage and must be avoided.

12 Serial-ATA Interface (S-ATA)

The JReplus-DC has two S-ATA 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 **not** possible.

12.1 Connector

The S-ATA interface is available through the standard L-type connectors J14 and J15 (7 pins).

Header	Pin	Signal Name	Function
	1	GND	Ground
	2	TX+	Transmit (positive)
	3	TX-	Transmit (negative)
	4	GND	Ground
	5	RX-	Receive (negative)
	6	RX+	Receive (positive)
	7	GND	Ground

13 LAN Controllers

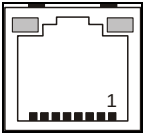
The JReplus-DC supports a Fast LAN PCI and a Gigabit PCI Express LAN controller.

13.1 Gigabit LAN Controller

The Gigabit LAN interface uses an Intel® 82574L PCI Express LAN controller. The controller support 10/100/1000 Base-T interfaces. The device auto-negotiates the use of a 10, 100 or 1000 Mbps 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.

13.1.1 Connector

The LAN interface is available through the standard RJ45 connector J21 (8 pins).

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

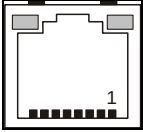
13.2 Fast LAN Controller

The Fast LAN interface uses the ICH7 integrated PCI LAN controller in combination with the Intel® 82562V LAN connect device. The controller support 10 and 100 Base-T interfaces. The devices auto-negotiates the use of a 10 and 100 Mbps 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.

13.2.1 Connector

The LAN interface is available through the RJ45 connector J20 (8 pins) that is combined with USB port 1/2.

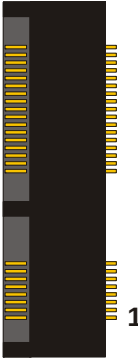
Header	Pin	Signal Name	Function
	1	TXD+	10/100 transmit (positive)
	2	TXD-	10/100 transmit (negative)
	3	RXD+	10/100 receive (positive)
	4	GND	Ground
	5	GND	Ground
	6	RXD-	10/100 receive (negative)
	7	GND	Ground
	8	GND	Ground

14 PCI Express MiniCard

PCI Express MiniCard (also known as Mini PCI Express, Mini PCIe and Mini PCI-E) is a replacement for the Mini PCI form factor based on PCI Express. It is developed by the PCI-SIG. The host device supports both PCI Express and USB 2.0 connectivity.

14.1 Connector

The interface is available through the standard PCI Express MiniCard connector J18 (52 pins).

Header	Pin	Signal Name	Function	Pin	Signal Name	Function
	1	/WAKE	Wake event	2	VCC3 ¹⁾	Power +3.3V
	3	N.C.	Not connected	4	GND	Ground
	5	N.C.	Not connected	6	VCC1 ¹⁾	Power +1.5V
	7	/CLKREQ	PCIe clock request	8	N.C.	Not connected
	9	GND	Ground	10	N.C.	Not connected
	11	REFCLK-	PCIe clock (neg.)	12	N.C.	Not connected
	13	REFCLK+	PCIe clock (pos.)	14	N.C.	Not connected
	15	GND	Ground	16	N.C.	Not connected
	17	N.C.	Not connected	18	GND	Ground
	19	N.C.	Not connected	20	/W_DISABLE	Wireless disable
	21	GND	Ground	22	/PERST	PCIe reset
	23	PERn0	PCIe receive (neg.)	24	VCC3AUX ¹⁾	Power +3.3V aux
	25	PERp0	PCIe receive (pos.)	26	GND	Ground
	27	GND	Ground	28	VCC1 ¹⁾	Power +1.5V
	29	GND	Ground	30	SMB_CLK	SMBus clock
	31	PETn0	PCIe transmit (neg.)	32	SMB_DATA	SMBus data
	33	PETp0	PCIe transmit (pos.)	34	GND	Ground
	35	GND	Ground	36	USB-	USB port 0 (neg.)
	37	GND	Ground	38	USB+	USB port 0 (pos.)
	39	VCC3 ¹⁾	Power +3.3V	40	GND	Ground
	41	VCC3 ¹⁾	Power +3.3V	42	/LED_WWAN	LED output
	43	GND	Ground	44	/LED_WLAN	LED output
	45	N.C.	Not connected	46	/LED_WPAN	LED output
	47	N.C.	Not connected	48	VCC1 ¹⁾	Power +1.5V
	49	N.C.	Not connected	50	GND	Ground
	51	N.C.	Not connected	52	VCC3 ¹⁾	Power +3.3V

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.

15 Audio Interface

The JReplus-DC supports a HD audio codec with 24 bit resolution and 192 kHz sample rate. The interface includes LINE OUT, LINE IN, MICROPHONE IN and a digital S/PDIF output. The HD audio controller is a bus mastering PCI device which is physically connected to one or more codecs via the HD Audio link. It contains one or more DMA engines. For signal levels see the High Definition audio specification (Intel®).

15.1 Hardware Features

Parameter	Values	Units
Output resolution (LINE OUT, S/PDIF)	16/20/24	bit
Output sample rate (LINE OUT, S/PDIF)	44.1/48/96/192	kHz
Output Signal-to-Noise Ratio (LINE OUT)	97	dB
Output current (S/PDIF)	12 @ 75Ω	mA
Input resolution (LINE IN)	16/20	bit
Input sample rate (LINE IN)	44.1/48/96	kHz
Input Signal-to-Noise Ratio (LINE IN)	90	dB

15.2 Connector

The analog audio interface is available through the connector J23 (6 pins). A prototype adapter cable (open ended) is deliverable from KONTRON (KAB-SOUND-CMP-2, part number 96063-0000-00-1).

Header	Pin	Signal Name	Function
	1	LINE_OUT_R	Line output right
	2	GND	Ground
	3	LINE_OUT_L	Line output left
	4	LINE_IN_R	Line input right
	5	MIC_IN	Microphone input
	6	LINE_IN_L	Line input left

15.3 Digital Connector (S/PDIF)

The digital audio output is available through the pin strip J98 (2 pins).

Header	Pin	Signal Name	Function
	1	SPDIF_OUT	S/PDIF output
	2	GND	Ground

16 Digital I/O Interface

The *JRexplus-DC* features eight bidirectional I/O lines. All I/O lines are TTL tolerant. Inputs can be driven from either +3.3V or +5V devices. This feature allows a mixed +3.3V / +5V system environment.

16.1 Electrical Specifications

Digital Inputs

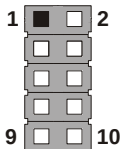
Parameter	Min.	Typ.	Max.	Units
Input LOW voltage			+0.8	V
Input HIGH voltage	+1.7		+5.5	V
Input rate (direct access)			100	kHz

Digital Outputs

Parameter	Min.	Typ.	Max.	Units
Output LOW voltage			+0.45	V
Output HIGH voltage	+2.4		+3.3	V
Output LOW/HIGH current			16	mA
Switching rate (direct access)			100	kHz

16.2 Connector

The digital I/O interface is available through the connector J33 (10 pins).

Header	Pin	Signal Name	Function
	1	VCC ¹⁾	Power +3.3V
	2	GPI00	Bidirectional I/O 0
	3	GPI01	Bidirectional I/O 1
	4	GPI02	Bidirectional I/O 2
	5	GPI03	Bidirectional I/O 3
	6	GPI04	Bidirectional I/O 4
	7	GPI05	Bidirectional I/O 5
	8	GPI06	Bidirectional I/O 6
	9	GPI07	Bidirectional I/O 7
	10	GND	Ground

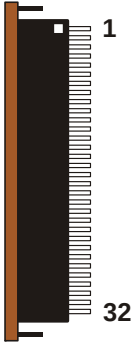
- Note:**
- 1) To protect the external power lines of peripheral devices make sure that
 - the wires have the right diameter to withstand the maximum available current.
 - to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.
 - 2) The voltage level is not specified by the manufacturer

17 Parallel Port Interface

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

17.1 Connector

The parallel port is available through the connector X20 (32 pins). A DSUB25 adapter cable is deliverable from KONTRON (KAB-DSUB25-2, part number 61033).

Header	Pin	Signal Name	Function	DSUB25
	1	VCC ¹⁾	Power +5V	N.C.
	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	Ground	18 - 25
	17, 22	GND	Ground	18 - 25
	27, 32	GND	Ground	18 - 25

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

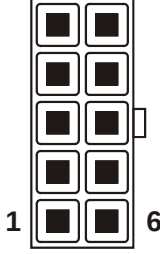
- the wires have the right diameter to withstand the maximum available current.
- to enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

18 Power Supply

The JReplus-DC supports the ATX power supply mode and 5V only mode.

18.1 Connector

The power connector is available as J35 (10 pins). For both the ATX and the 5V only mode an adapter cable is deliverable from KONTRON. For the ATX mode this is KAB-ATX-10 (part number 96072-0000-00-0). For the 5V only mode the adapter cable KAB-ADAPT-ATXto5V (P/N96072-0000-05-2) can be used. This cable is delivered with every JReplus-DC. This cable allows to supply the board with 5V and 12V DC.

Header	Pin	Signal Name	Function
	1	PS_ON	Power supply on
	2	GND	Ground
	3	GND	Ground
	4	VCC12 ¹⁾	+12V
	5	NC	Not connected
	6	VCC5SB ¹⁾	+5V standby
	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.

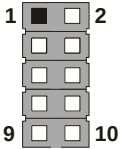
18.2 Power Pins

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 per Pin
VCC5	2	Tbd
VCC12	1	Tbd
VCC5SB	1	Tbd

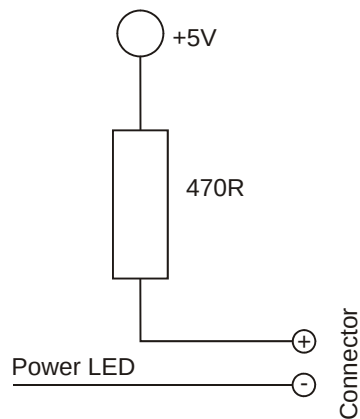
18.3 Power Front Panel Header

The power button and other power signals are available through the pin strip J36 (10 pins).

Header	Pin	Signal Name	Function
	1	PWR_LED+	Power LED (positive)
	2	PWR_BTN+	Power button (positive)
	3	N.C.	Not connected
	4	PWR_BTN-	Power button (negative)
	5	PWR_LED-	Power LED (negative)
	6	N.C.	Not connected
	7	KBD_LOCK	Keyboard lock
	8	RSVD	Reserved
	9	GND	Ground
	10	RSVD	Reserved

17.3.1 Power LED

The following picture illustrates the onboard wiring.

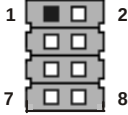


19 Common Front Panel Pins

The Common Front Panel provides some special functions (e.g. reset button and speaker).

19.1 Pin Strip

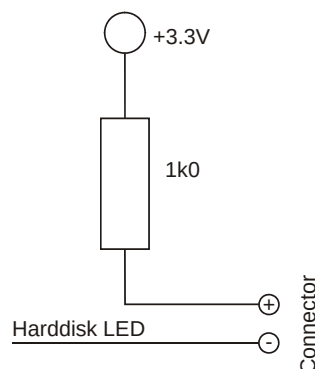
The Common Front Panel is available through the pin strip J37 (8 pins).

Header	Pin	Signal Name	Function
	1	RST_BTN+	Reset button (positive)
	2	SPKR+	Speaker (positive)
	3	RST_BTN-	Reset button (negative)
	4	N.C.	Not connected
	5	HDD_LED+	Harddisk LED (positive)
	6	N.C.	Not connected
	7	HDD_LED-	Harddisk LED (negative)
	8	SPKR-	Speaker (negative)

The reset signal of the JReplus-DC is edge-controlled. This means the board can not be hold within the reset.

18.1.1 Harddisk LED

The following picture illustrates the onboard wiring.

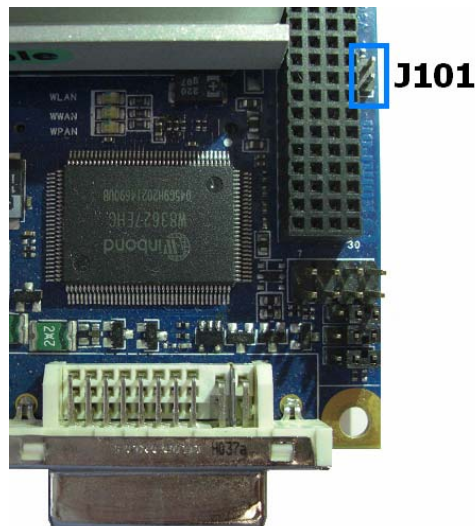


20 Crisis Management

Modifying parameters in the BIOS Setup implies the risk of leaving your system in an unbootable state. In case this happens one jumper exists to reset the settings to 'Fail-Safe' values.

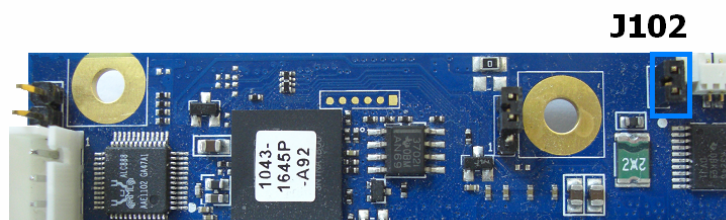
To Reset to 'Fail-Safe' values please take the following steps:

- ❶ Power down the board
- ❷ Jumper J101 must be set
- ❸ Power up the board - BIOS Setup enters automatically
- ❹ Before saving your new settings with '*Save Changes and Exit*' remove the jumper
- ❺ The board should be functional again now



21 Autostart Function

When the JReXplus-DC should start directly when the power is applied (without a power button signal) the autostart jumper J102 must be set.



22 Power and Thermal Management

22.1 SpeedStep Technology

The Intel® Atom processor offers the Intel® Enhanced SpeedStep™ technology that automatically switches between maximum performance mode and battery optimized mode depending on the needs of the application being run. When powered by a battery or running in idle mode the processor drops to lower frequencies conserving battery life while maintaining a high level of performance. The previous frequency is set back automatically when the operating mode changes.

22.2 C-State Control

The Intel® chipset has been implemented the control for dynamically starting and stopping system clocks and power. The states are passing through C0 (full on) to C4 one after another. The C-state ends when a break event occurs (e.g. an IRQ or SMI).

22.3 Hyper-Threading Technology

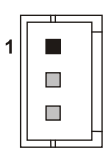
Intels® Hyper-Threading technology boosts system performance without higher clock rates or adding more processors which is also an optimization of the power consumption. Hyper-Threading works by duplicating instructions streams, called threads. This allows a CPU to pretend to be two logical processors on the operating system which must support this technology. Individually the logical processors can be halted or interrupted or can execute a thread independently of the other logical unit.

22.4 Fan Interface

If a fan is added use this interface to connect a fan to cool off the CPU. The connector only supports 5V fans. A three pin fan includes a pulse output (sense) which allows the control of fan speed.

22.4.1 Connector

The fan interface is available through connector J29.

Header	Pin	Signal Name	Function
	1	SENSE	Speed monitoring
	2	VCC ¹⁾	Power +5V
	3	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.
- the enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

23 Setup Guide

The module is equipped with AMI® BIOS which is located in an onboard flash memory. You can update the BIOS using a flash utility.

23.1 Determining the BIOS Version

Whenever you contact technical support about BIOS issues providing a BIOS version <BDCPR??> is especially helpful. To determine the AMI® BIOS version press the DEL key on your keyboard during boot-up and looks at main menu (additional information are available with submenu [Module Info](#)):

Bios Info

BIOS Version : BDCPR???

Build Date : ??/??/??

23.2 Start AMI® BIOS Setup Utility

To start the AMI® BIOS Setup utility press <DEL> when the following string appears during boot-up.

Press <DEL> to run Setup

The main menu then appears.

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
General Help Window	Overlay (center)	Help for selected menu

Menu Bar

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

Legend Bar

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

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

Selecting an Item

Use the ↑ or ↓ key to move the cursor to the field you want. Then use the + and – keys to select a value for that field.

Displaying Submenus

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

Item Specific Help Window

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

General Help Window

Pressing <F1> or <Alt-F1> on a menu brings up the general help window that describes the legend keys and their alternates. Press <Esc> to exit the general help window.

23.3 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

23.4 Main Menu

Feature	Option	Description
BIOS Version	N / A	Show the actual BIOS release
AMI Core8 Version	N / A	Show the AMI® core version
Build Date	N / A	Show the BIOS build date
► Module Info	Submenu	Show additional service information
System Time	HH:MM:SS	Set the system time
System Date	MM/DD/YYYY	Set the system date

22.4.1 Module Info 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 Version	N / A	Show the KONTRON specific hardware version
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 CPU's
CPU Stepping	N / A	Show the CPU silicon stepping
CPU Microcode Rev.	N / A	Show the CPU microcode revision
System Memory Size	N / A	Display amount of conventional memory detected during boot-up
NB Stepping	N / A	Show the <u>N</u> orth <u>B</u> ridge (945GSE) silicon stepping
SB Stepping	N / A	Show the <u>S</u> outh <u>B</u> ridge (ICH7M) silicon stepping

23.5 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)
▶ Display Control	Submenu	Set the display features (including panel parameters)
▶ ACPI Configuration	Submenu	Set some ACPI defaults
▶ Miscellaneous Configuration	Submenu	Configure additional important settings

22.5.1 CPU Configuration Submenu

Feature	Option	Description
Manufacturer	N / A	Show the processor manufacturer
Processor Name	N / A	Show the processor identifier
Frequency	N / A	Show the actual CPU boot speed
FSB Speed	N / A	Show the speed of the Front Side Bus
Cache L1	N / A	Show the L1 cache size
Cache L2	N / A	Show the L1 cache size
Ratio Actual Value	N / A	Show the actual CPU ratio
Max CPUID Value Limit	Disabled Enabled	Limit CPUID functions
Execute-Disable Bit Capability	Disabled Enabled	This option can help to prevent certain classes of buffer overflow errors (AMD® NX-bit or Intel® XD-bit)
Hyper-Threading Technology	Disabled Enabled	Enable or disable the two logical processor mode
DTS-based Thermal Management	Disabled Enabled	Enable or disable the thermal management utilizing the CPU Digital Thermal Sensor
DTS Calibration	Disabled Enabled	During POST the BIOS calibrate the Digital Thermal Sensor
Intel(R) SpeedStep(tm) tech	Disabled Enabled	Let customize performance computing. The processor can drop to a lower frequency and voltage
Intel(R) C-STATE tech	Disabled Enabled	Enable or disable power saving modes (a C-STATE is an idle state). C0 is the operational state, C1 to C4 represents the saving modes
Enhanced C-States	Disabled Enabled	Enable or disable the enhanced power saving modes (C1E to C4E)

22.5.2 Onboard Device Configuration Submenu

Feature	Option	Description
▶ North Bridge Configuration	Submenu	Configure the North Bridge (945GSE) features
▶ South Bridge Configuration	Submenu	Configure the South Bridge (ICH7M) features
▶ PCI Express Configuration	Submenu	Configure the PCI Express support
▶ IDE Configuration	Submenu	Configure the IDE devices (P-ATA, S-ATA)
▶ Ethernet Configuration	Submenu	Configure the LAN controllers
▶ USB Configuration	Submenu	Configure the USB support
▶ SuperIO Configuration	Submenu	Configure the Super-I/O (PS/2, serial and parallel port)
▶ Trusted Computing	Submenu	Configure the Trusted Computing (TPM)

22.5.2.1 North Bridge Submenu

Feature	Option	Description
DRAM Frequency	Auto , 400 MHz 533 MHz	Define the maximum memory speed (DDR2-400 or DDR2-533)
Configure DRAM Timing by SPD	Disabled Enabled	Disabled allows the manual configuration of DRAM timing
DRAM CAS# Latency	5 , 4, 3	Configure the DRAM CAS latency
DRAM RAS# to CAS# Delay	2 DRAM Clocks 3 DRAM Clocks 4 DRAM Clocks 5 DRAM Clocks 6 DRAM Clocks 7 DRAM Clocks	Configure the DRAM RAS to CAS delay and the DRAM RAS pre-charge value
DRAM RAS# Precharge		
DRAM RAS# Activate to Precharge	4 DRAM Clocks to 15 DRAM Clocks	Configure the DRAM RAS activate to precharge value
Memory Hole	Disabled 15MB-16MB	Enable or disable the memory hole at 15 MB
Chipset Thermal Throttling	Disabled Enabled	Enable or disable the thermal throttling. Initialize thermal management with default trip point temperatures
DT in SPD	Disabled Enabled	Support the <u>D</u> elta <u>T</u> emperature in the DRAM SPD thermal management algorithm
TS on DIMM	Disabled Enabled	Support the <u>T</u> hermal <u>S</u> ensor on DIMM thermal management functionality

22.5.2.2 South Bridge Submenu

Feature	Option	Description
Audio Controller	Auto Azalia AC'97 Audio and Modem All Disabled	Allow the fixed selection of 24 bit HD audio (Azalia) or 16 bit AC'97 audio
SMBUS Controller	Enabled Disabled	Enable or disable the SMBus controller (interact with digital I/O and DRAM SPD)
Reserved Page Route	PCI LPC	Determine the route of port 80h, 84h-86h, 88h and 8Ch-8Eh to LPC or PCI
SLP_S4# Min. Assertion Width	4 to 5 Seconds 3 to 4 Seconds 2 to 3 Seconds 1 to 2 Seconds	Power management feature
Restore on AC Power Loss	Power Off Power On Last State	Power management feature. Select behavior after AC power loss

22.5.2.3 PCI Express Submenu

Feature	Option	Description
Active State Power Management	Disabled Enabled	Enable or disable PCI Express L0s and L1 link power state
PCIE Port 0 PCIE Port 1	Auto Enabled Disabled	Enable or disable PCI Express ports and the associated devices
PCIE Port 0 IOxAPIC Enable PCIE Port 1 IOxAPIC Enable	Disabled Enabled	Enable or disable the I/O APIC feature

22.5.2.4 IDE Configuration Submenu

Feature	Option	Description
ATA/IDE Configuration	Disabled Compatible Enhanced	The entry 'Enhanced' allow more detailed SATA settings
Legacy IDE Channels	SATA Only SATA Pri, PATA Sec PATA Only	Only visible if 'ATA/IDE Configuration' is set to 'Compatible'. Enable or disable the PATA or SATA controller
Configure SATA as	Disabled RAID	Only visible if 'Legacy IDE Channels' is set to 'PATA Only'
Configure SATA as	IDE RAID AHCI	Only visible if 'ATA/IDE Configuration' is set to 'Enhanced'. Configure the SATA controller in native (IDE), RAID or AHCI mode
Configure SATA Channels	Before PATA Behind PATA	Only visible if 'ATA/IDE Configuration' is set to 'Enhanced' and 'Configure SATA as' is set to 'IDE'. Define the detection order
▸ Primary IDE Master	Submenu	Display the status of autodetection
▸ Primary IDE Slave	Submenu	Display the status of autodetection
▸ Secondary IDE Master	Submenu	Display the status of autodetection
▸ Secondary IDE Slave	Submenu	Display the status of autodetection
▸ Third IDE Master	Submenu	Display the status of autodetection
▸ Third IDE Slave	Submenu	Display the status of autodetection
Hard Disk Write Protect	Disabled Enabled	Allow the write protection of harddisk devices. Only valid if the device is accessed through the BIOS
IDE Detect Time Out (Sec)	0, 5, 10, 15 20, 25, 30, 35	Select the time out value for the detection of ATA(PI) devices
ATA(PI) 80Pin Cable Detection	Host&Device Host Device	Select the mechanism for detecting 80 pin cable

22.5.2.4.1 Primary/Secondary/Third Master/Slave Submenu

Feature	Option	Description
Device	Not Detected Hard Disk ATAPI CDROM ARMD	Show the type of IDE drive ARMD = <u>A</u> TAPI <u>R</u> emovable <u>M</u> edia <u>D</u> evice
Vendor	N / A	Show the IDE drive manufacturer and drive name
Size	N / A	Display the calculated size of the drive
LBA Mode	Supported Not Supported	Show whether a disk uses LBA
Block Mode	N / A	Display the block size (in sectors) or 'Not Supported'
PIO Mode	Not Supported, 0, 1, 2, 3, 4	Display the highest supported PIO mode
Async DMA	Not Supported SingleWord DMA0 - 2 MultiWord DMA0 - 2	Display the highest supported Async DMA mode
Ultra DMA	Not Supported Ultra DMA0 - 6	Display the highest supported Ultra DMA mode
S.M.A.R.T.	Supported Not Supported	Show whether a disk uses S.M.A.R.T. (<u>S</u> elf <u>M</u> onitoring, <u>A</u> nalysis and <u>R</u> eporting <u>T</u> echnology)
Type	Not Installed, Auto CD/DVD, ARMD	Define the type of the IDE drive
LBA/Large Mode	Disabled Auto	LBA causes <u>L</u> ogical <u>B</u> lock <u>A</u> ddressing
Block (Multi-Sector Transfer)	Disabled Auto	Block mode enables multi-sector transfer and increase the performance
PIO Mode	Auto 0, 1, 2, 3, 4	Define the PIO mode if DMA not possible. Auto selects the optimum transfer mode
DMA Mode	Auto SWDMA0 - 2 MWDMA0 - 2, UDMA0 - 6	Define the Async or Ultra DMA mode. Auto selects the optimum transfer mode
S.M.A.R.T.	Auto Disabled Enabled	Show if the device is capable of using the error prediction tool
32Bit Data Transfer	Disabled Enabled	Enable 32 bit communication between CPU and IDE controller

22.5.2.5 Ethernet Configuration Submenu

Feature	Option	Description
Gigabit Ethernet Port	Enabled Disabled	Enable or disable the Gigabit Ethernet controller
Fast Ethernet Port	Enabled Disabled	Enable or disable the Fast Ethernet controller
Enable GbE Ethernet PXE Rom	Enabled Disabled	Enable or disable the option ROM to allow LAN boot functionality for the Gigabit Ethernet controller
Enable Fast Ethernet PXE Rom	Enabled Disabled	Enable or disable the option ROM to allow LAN boot functionality for the Fast Ethernet controller

22.5.2.6 USB Configuration Submenu

Feature	Option	Description
Module Version	N / A	Show USB module version
USB Devices Enabled	N / A	Show detected USB devices
USB Functions	Disabled 2 USB Ports 4 USB Ports 6 USB Ports 8 USB Ports	Enable or disable the USB ports
USB 2.0 Controller	Enabled Disabled	Enable or disable the USB 2.0 controller (EHCI)
Legacy USB Support	Disabled Enabled Auto	Enable support for legacy USB devices (e.g. keyboard and mouse). 'Auto' disables legacy support if no devices are connected
Port 64/60 Emulation	Disabled Enabled	Allow the complete USB keyboard legacy support
USB 2.0 Controller Mode	FullSpeed HiSpeed	Set the USB 2.0 controller to HiSpeed (480 Mbps) or Full-Speed (12 Mbps) for legacy mode
BIOS EHCI Hand-Off	Disabled Enabled	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
Hotplug USB FDD Support	Disabled Enabled Auto	A dummy FDD device is created that will be associated with a hot-plugged FDD later. 'Auto' creates this device only if there is no USB FDD present
► USB Mass Storage Device Configuration	Submenu	Display the status of USB mass storage devices

22.5.2.6.1 USB Mass Storage Device Configuration Submenu

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

22.5.2.7 SuperIO Configuration Submenu

Feature	Option	Description
Serial Port1 Address	Disabled 3F8/IRQ4 3E8/IRQ4 2E8/IRQ3	Select I/O base and IRQ of serial port 1
Serial Port1 Mode	RS232 RS422 RS485	The first serial port supports three different interfaces RS422 = four wire differential interface RS485 = two wire differential interface
Serial Port2 Address	Disabled 2F8/IRQ3 3E8/IRQ4 2E8/IRQ3	Select I/O base and IRQ of serial port 2
Parallel Port Address	Disabled 378 278	Select I/O base and IRQ of parallel port
Parallel Port Mode	Normal Bi-Directional ECP, EPP ECP & EPP	Select the parallel port mode EPP = <u>E</u> nhanced <u>P</u> arallel <u>P</u> ort specification ECP = <u>E</u> xtended <u>C</u> apabilities <u>P</u> ort specification
Parallel Port IRQ	IRQ5 IRQ7	Select the parallel port IRQ
EPP Version	1.9 , 1.7	Select the EPP specification
ECP Mode DMA Channel	DMA0, DMA1 DMA3	Select the DMA channel for ECP specification
PS/2 Mouse Support	Disabled Enabled Auto	Enabled forces the mouse port to be enabled regardless if a mouse is present. 'Auto' frees IRQ12 if no mouse is present.

22.5.2.8 Trusted Computing Submenu

Feature	Option	Description
TCG/TPM Support	No Yes	Enable or disable TPM (Trusted Platform Module) support
Execute TPM Command	Don't change Disabled Enabled	Enable or disable the TPM activation
Clearing the TPM	Press Enter	Initiate a process of returning the TPM to factory defaults
TPM Enable/Disable Status	N / A	Show the TPM status
TPM Owner Status	N / A	Show the TPM owner status

22.5.3 Display Control Submenu

Feature	Option	Description
JDA Revision	N / A	Show the JDA revision (JILI Data Area)
VBIOS Revision	N / A	Show the VGA BIOS revision
Boots Graphic Adapter Priority	IGD PCI/IGD	Define the search strategy for the primary graphic controller
Internal Graphics Mode Select	Disabled Enabled, 1MB Enabled, 8MB	Select the amount of system memory used by the onchip graphic controller
DVMT Mode Select	Fixed Mode DVMT Mode Combo Mode	DVMT (Dynamic Video Memory Technology) is an enhancement of the UMA concept - ensures the most efficient use of available memory. Fixed mode disables dynamic allocation
DVMT/FIXED Memory	64MB 128MB Maximum DVMT	Maximum DVMT dynamically allocates the maximum amount of memory that may need, more than the usual 128MB of graphics memory
Boot Display Device	CRT, DVI CRT + DVI LVDS, CRT + LVDS DVI + LVDS	Control the boot display
Flat Panel Mode	Auto Fixed Mode PAID FPID	Use PAID (Panel Adapter ID) or FPID (Flat Panel ID) to manually enter a panel record (KONTRON specific). If Auto the board is searching for a JILI3 (KONTRON), EDID (VESA) or a DisplayID (VESA) record
Flat Panel Type	VGA 640x480 SVGA 800x600 XGA 1024x768 SXGA 1280x1024	Select a predefined flat panel resolution

	UXGA 1600x1200 WXGA 1280x768 WXGA+ 1440x900 WVGA 800x480 WXGA1366x768 WXGA 1280x800	
PAID/FPID	N / A	Enter the wanted number
Channels	Single Channel Dual Channel	Define the number of flat panel channels
Local Flat Panel Scaling	Centered Stretched Disabled	Stretched display the screen content at the maximum size otherwise the content is centered
Backlight Control Type	None/External I2C PWM	Define the backlight control interface
Backlight Brightness	0 ... 255	Set the backlight value (0 = 0V, 255 = +5V)

22.5.4 ACPI Configuration Submenu

Feature	Option	Description
▶ General ACPI Configuration	Submenu	Configure the general ACPI settings
▶ Advanced ACPI Configuration	Submenu	Configure the advanced ACPI settings
▶ Chipset ACPI Configuration	Submenu	Configure the South Bridge ACPI settings
▶ ACPI Cooling Options	Submenu	Configure the ACPI cooling options

22.5.4.1 General ACPI Configuration Submenu

Feature	Option	Description
Suspend Mode	S1 (POS) S3 (STR) Auto	Define the power down mode POS = <u>P</u> ower <u>O</u> n <u>S</u> tandby STR = <u>S</u> suspend <u>T</u> o <u>R</u> AM
Repost Video on S3 Resume	No Yes	Determine whether to invoke the VGA BIOS post on suspend event (resume)

22.5.4.2 Advanced ACPI Configuration Submenu

Feature	Option	Description
ACPI Version Features	ACPI V1.0 ACPI V2.0 ACPI V3.0	Select the desired ACPI specification (OS depending)
ACPI APIC Support	Disabled Enabled	APIC supports more IRQs and faster interrupt handling
AMI OEMB Table	Disabled Enabled	Include the AMI® OEMB table pointer to ACPI pointer lists
Headless Mode	Disabled Enabled	Indicate support for headless operation that means without keyboard, mouse and/or monitor. The OS must support the headless mode

22.5.4.3 Chipset ACPI Configuration Submenu

Feature	Option	Description
Energy Lake Feature	Enabled Disabled	Enables Intel® Energy Lake power management technology (e.g. the 'Consumer Electronics'-like device power behavior)
APIC ACPI SCI IRQ	Disabled Enabled	If disabled the ACPI SCI use IRQ9, otherwise any APIC IRQ is valid
USB Device Wakeup from S3/S4	Disabled Enabled	An USB device can wake up the operating system from S3 or S4
High Performance Event Timer	Disabled Enabled	Enables a set of timers (3 timer) that can be used by the operating system. Each timer can be configured to cause a separate interrupt
HPET Memory Address	FED0000h FED01000h FED02000h FED03000h	Define HPET (High Precision Event Timer) memory address

22.5.4.4 ACPI Cooling Options Submenu

Feature	Option	Description
Active Trip Point	Disabled 40°C ... 45°C ... 110°C	Determines the temperature of the ACPI active trip point - the point at which the OS will turn on/off the CPU fan
Passive Trip Point	Disabled 40°C ... 110°C	Determines the temperature of the ACPI passive trip point - the point at which the OS will turn on/off CPU clock throttling
Passive TC1 Value	1 , 2, 3, ... 15, 16	Determines the TC1 (temperature coefficient 1) value for the ACPI passive cooling formula
Passive TC2 Value	1, 2, 3, ... 5 , ... 15, 16	Determines the TC2 (temperature coefficient 2) value for the ACPI passive cooling formula
Passive TSP Value	2, 4, 6, 8, 10 , ... 28, 30	Determines the TSP (sampling period) value for the ACPI passive cooling formula
Critical Trip Point	40°C ... 110°C	This value controls the temperature of the ACPI critical trip point - the point at which the OS will shut off the system

22.5.5 Miscellaneous Configuration Submenu

Feature	Option	Description
▸ Hardware Health Configuration	Submenu	Show hardware health information
▸ Watchdog Configuration	Submenu	Configure the watchdog feature
▸ MPS Configuration	Submenu	Configure the <u>M</u> ulti <u>P</u> rocessor table
▸ SMBIOS Configuration	Submenu	Configure the <u>S</u> ystem <u>M</u> anagement <u>B</u> IOS
▸ Remote Access Configuration	Submenu	Configure remote access

22.5.5.1 Hardware Health Configuration Submenu

Feature	Option	Description
CPU Temperature	N / A	Show the CPU diode temperature
CPU Fan Voltage	12.5% ... 25% 87.5% ... 100%	Define CPU fan PWM duty cycle
Fan Speed Divisor	1, 2, 4, 8 , 16 32, 64, 128	Select the CPU fan divisor
CPU Fan Speed	N / A	Show the CPU fan speed
VcoreA	N / A	Show a system voltage
+1.05Vin	N / A	see above
+1.8Vin	N / A	see above
+3.3Vin	N / A	see above
+5.0VSB	N / A	see above
+3.3VSB	N / A	see above
VBAT	N / A	see above

22.5.5.2 Watchdog Configuration Submenu

Feature	Option	Description
Watchdog Mode	Disabled Enabled	Select operation mode
Initial Delay	Disabled 1s, 5s, 10s, 30s 1:00m, 5:30m 10:30m, 30:30m	Select time until the watchdog counter starts the counting. Useful to handle longer boot times
Trigger Timeout	Disabled 1s, 5s, 10s, 30s 1:00m, 5:30m 10:30m, 30:30m	Select maximum trigger period

22.5.5.3 MPS Configuration Submenu

Feature	Option	Description
MPS Revision	1.1 1.4	Select MPS (<u>M</u> ulti <u>P</u> rocessor <u>S</u> pecification) revision

22.5.5.4 SMBIOS Configuration Submenu

Feature	Option	Description
SMBIOS SMI Support	Disabled	SMI wrapper support for PnP function 50h-54h
	Enabled	

22.5.5.5 Remote Access Configuration Submenu

Feature	Option	Description
Remote Access	Disabled	Enable or disable the remote connection
	Enabled	
Serial Port Number	COM1 COM2	Select the serial port for console redirection
Base Address, IRQ	N / A	Show the actual port settings
Serial Port Mode	115200,8,n,1 57600,8,n,1 38400,8,n,1 19200,8,n,1 9600,8,n,1	Select the serial port settings
Flow Control	None Hardware Software	Select the flow control mode
Redirection after BIOS POST	Disabled Boot Loader Always	Disabled = turns off redirection after POST Boot Loader = redirection is enabled during POST and boot process Always = redirection is always enabled
Terminal Type	ANSI VT100 VT-UTF8	Define the target terminal type. VT-UTF8 adds some special ESC-sequences to VT100
VT-UTF8 Combo Key Support	Disabled Enabled	Support for ANSI/VT100 terminals
Sredir Memory Display Delay	No Delay Delay 1 Sec Delay 2 Sec Delay 4 Sec	Gives the delay to display memory information

23.6 PCIPnP Menu

Feature	Option	Description
Clear NVRAM	No Yes	Clear NVRAM during POST
Plug & Play OS	No Yes	'No' lets the BIOS configure all board devices, otherwise the operating system should do this configuration
PCI Latency Timer	32, 64, ..., 224, 248	Define the value for all PCI latency timer registers
Allocate IRQ to PCI VGA	Yes No	Assign an IRQ to a PCI VGA card
Palette Snooping	Disabled Enabled	Enabled informs the PCI devices that an ISA graphics card is installed
PCI IDE Busmaster	Disabled Enabled	Enables the IDE busmastering for read/write operations
Offboard PCI/ISA IDE Card	Auto PCI Slot1, ... PCI Slot6	Some PCI cards require this setting to be set the PCI slot. 'Auto' works for most applications
Offboard PCI IDE Primary IRQ	Disabled INTA, INTB INTC, INTD Hardwired	INTx = assign an IRQ to the interrupt pin used by this channel Hardwired = hardwires a fixed INTx into interrupt pin
Offboard PCI IDE Secondary IRQ		
IRQ3 IRQ4 IRQ5 IRQ7 IRQ9 IRQ10 IRQ11 IRQ14 IRQ15	Available Reserved	Reserved means that this interrupt is a legacy IRQ (not shared). Available defines that this interrupt can be used as a PCI IRQ
DMA Channel 0 DMA Channel 1 DMA Channel 3 DMA Channel 5 DMA Channel 6 DMA Channel 7	Available Reserved	Reserved means that this DMA channel is a legacy channel (not shared). Available defines that this DMA channel can be used as a PCI DMA
Reserved Memory Size	Disabled 16k, 32k, 64k	Memory size to reserve for legacy ISA devices
Reserved Memory Address	C0000, C4000 C8000, ... D8000, DC000	Base address of memory to reserve for legacy ISA devices

23.7 Boot Menu

Feature	Option	Description
► Boot Settings Configuration	Submenu	Define some special boot settings
1st Boot Device	N / A	Show the boot devices
2nd Boot Device		
...		
n Boot Device		

22.7.1 Boot Settings Configuration Submenu

Feature	Option	Description
Quick Boot	Disabled Enabled	Allow the BIOS to skip certain tests during POST
Quiet Boot	Disabled Enabled	If disabled the BIOS generates the normal messages otherwise an OEM logo can be displayed
Addon ROM Display Mode	Force BIOS Keep Current	Set the display mode for option ROMs
Bootup Num-Lock	Off On	Off doesn't enable the keyboard Num-Lock automatically
Wait For 'F1' if Error	Disabled Enabled	Enabled 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
'Press DEL' Message Display	Disabled Enabled	Enabled allows the BIOS to display the message <i>Press DEL to run Setup</i> after memory initialization otherwise this message is suppressed
Interrupt 19h Capture	Disabled Enabled	If enabled 'Addon ROMs' can be trapped interrupt 19h (boot IRQ)
Flash Write Protection	Disabled Enabled	Write-protect the BIOS flash chip

23.8 Security Menu

Feature	Option	Description
Supervisor Password	Not Installed Installed	Show state of supervisor password
User Password	Not Installed Installed	Show state of user password
Change Supervisor Password	N / A	Press 'Enter' to change the supervisor password
Change User Password	N / A	Press 'Enter' to change the user password
Boot Sector Virus Protection	Disabled Enabled	If a program or a virus accesses the boot sector a warning appears if the option is enabled

23.9 Exit Menu

Feature	Option	Description
Save Changes and Exit	Ok 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	Ok Cancel	Exit Setup without storing in CMOS any new selections you may have made
Discard Changes	Ok 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	Ok Cancel	Load the optimal default values
Load Failsafe Defaults	Ok Cancel	Load the failsafe default values

Appendix A: System Resources

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.

Legacy mode

IRQ #	Used for	Available	Comment
0	Timer 0	No	
1	Keyboard	No	
2	8259 Slave (Cascade)	No	
3		Yes	Possible IRQ of COM2
4	Serial Port 1 (COM1)	No	Note (1)
5	PCI IRQ	for PCI	Dynamic
6	PCI IRQ	for PCI	Dynamic
7	Parallel Port (LPT)	No	Note (1)
8	Real Time Clock (RTC)	No	
9	ACPI Power Management	No	
10	PCI IRQ	for PCI	Dynamic
11	PCI IRQ	for PCI	Dynamic
12	PS/2 Mouse	No	Note (1)
13	Floating Point Unit (FPU)	No	
14	IDE Controller (Primary)	No	Note (1)
15	IDE Controller (Secondary)	No	Note (1)

APIC mode

IRQ #	Used for	Available	Comment
0	Timer 0	No	
1	Keyboard	No	
2	8259 Slave (Cascade)	No	
3		Yes	Possible IRQ of COM2
4	Serial Port 1 (COM1)	No	Note (1)
5		Yes	
6		Yes	
7	Parallel Port (LPT)	No	Note (1)
8	Real Time Clock (RTC)	No	
9	ACPI Power Management	No	
10		Yes	
11		Yes	
12	PS/2 Mouse	No	Note (1)
13	Floating Point Unit (FPU)	No	
14	IDE Controller (Primary)	No	Note (1)
15	IDE Controller (Secondary)	No	Note (1)
16	PCI IRQ	for PCI	
17	PCI IRQ	for PCI	
18	PCI IRQ	for PCI	
19	PCI IRQ	for PCI	
20		Yes	
21		Yes	
22		Yes	
23	PCI IRQ	for PCI	

Note: 1) If the Used for device is disabled in the BIOS Setup the corresponding interrupt is free.

A.2 Direct Memory Access (DMA) Channels

DMA #	Used for	Available	Comment
0		Yes	Possible channel of LPT - Note (1)
1		Yes	Possible channel of LPT - Note (1)
2		Yes	
3		Yes	Possible channel of LPT - Note (1)
4	Cascade	No	
5		Yes	
6		Yes	
7		Yes	

Note: 1) Possible setting for LPT if configured for ECP mode.

A.3 Memory Area

The first 640 kB of DRAM are used as main memory. DOS 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. Other operating systems (Linux or Windows® versions) allow you to address the full memory area directly.

Memory Range	Used for	Available	Comment
C0000h - CFFFFh	VGA BIOS	No	
D0000h - DFFFFh		Yes	
E0000h - FFFFFh	System BIOS	No	

A.4 I/O Address Map

The I/O-port addresses of the JReplus-DC 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 though they are available.

I/O Address	Used for	Available	Comment
01F0h - 01F7h	IDE Controller (P-ATA)	No	Note (1)
0278h - 027Fh		Yes	Possible address of LPT2
02E8h - 02EFh		Yes	Possible address of COM4
02F8h - 02FFh		Yes	Possible address of COM2
0376h	IDE Controller (P-ATA)	No	Note (1)
0378h - 037Fh	Parallel Port	No	Note (1)
03B0h - 03DFh	Graphic Controller	No	
03E8h - 03EFh		Yes	Possible address of COM3
03F6h	IDE Controller (P-ATA)	No	Note (1)
03F8h - 03FFh	Serial Port 1	No	Note (1)
0400h - 041Fh	SMBus	No	Chipset
04D0h - 04D1h	PIC Extension	No	Chipset
0500h - 053Fh	GPIO	No	Chipset
0800h - 087Fh	Power Management	No	Chipset
0A00h - 0A07h	Hardware Monitor	No	Super-I/O
0A80h - 0A83h	System Extension	No	CPLD
0CF8h - 0CFFh	PCI Configuration	No	Chipset
C480h - C49Fh	USB Controller	No	Chipset Note (1)
C800h - C81Fh	USB Controller	No	Chipset Note (1)
C880h - C89Fh	USB Controller	No	Chipset Note (1)
CC00h - CC1Fh	USB Controller	No	Chipset Note (1)
CC80h - CC87h	Graphics Controller	No	Chipset
DC80h - DC87h	Gigabit Ethernet Controller	No	Onboard PCI Express device
EC80h - ECBFh	Fast Ethernet Controller	No	Chipset Note (1)
FFA0h - FFAFh	IDE Controller	No	Chipset Note (1)

Note: 1) If the Used for device is disabled in the BIOS Setup the corresponding address is free.

A.5 PCI Devices

All devices follow the Peripheral Component Interconnect 2.3 (PCI 2.3) specification. Please see the specification for more details.

PCI Device	PCI IRQ	Comment
Host Bridge	None	Chipset
VGA Graphics	INTA	Chipset
Graphics Controller	None	Chipset
HD Audio Controller	INTA	Chipset
PCI Express Bridge 1	INTA	Chipset
USB 1.1 Controller 1	INTA	Chipset
USB 1.1 Controller 2	INTB	Chipset
USB 1.1 Controller 3	INTC	Chipset
USB 1.1 Controller 4	INTD	Chipset
USB 2.0 Controller (EHCI)	INTA	Chipset
PCI Express Bridge 2	None	Chipset
ISA Bridge / LPC Controller	None	Chipset
IDE Controller	INTB	Chipset
SMBus Controller	INTB	Chipset
Fast Ethernet Controller	INTA	Chipset
Gigabit Ethernet Controller	INTA	Onboard PCI Express device

A.6 System Management Bus (SMBus)

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

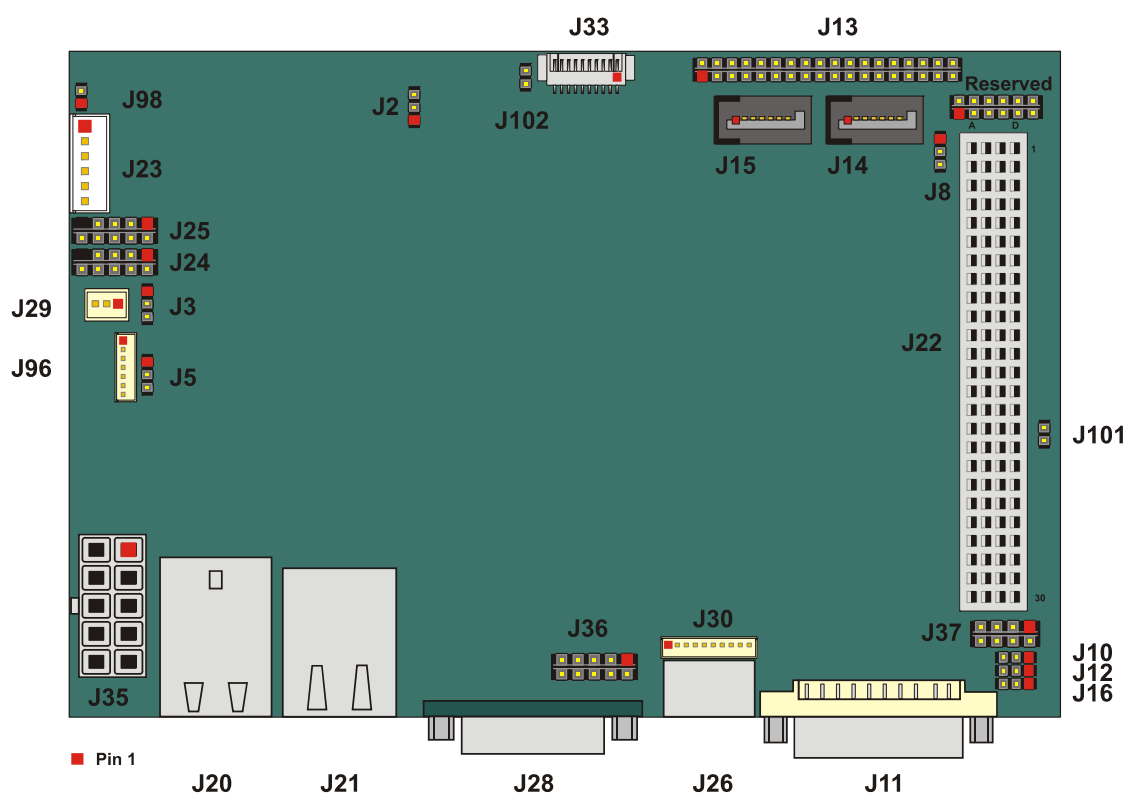
SMBus Address	Device	Comment
A0h / A1h	SPD Eeprom (DDR-SDRAM)	Part of the DDR RAM module
E2h / E3h	GPIO Controller	PHILIPS I/O controller PCA9538

Warning: *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.*

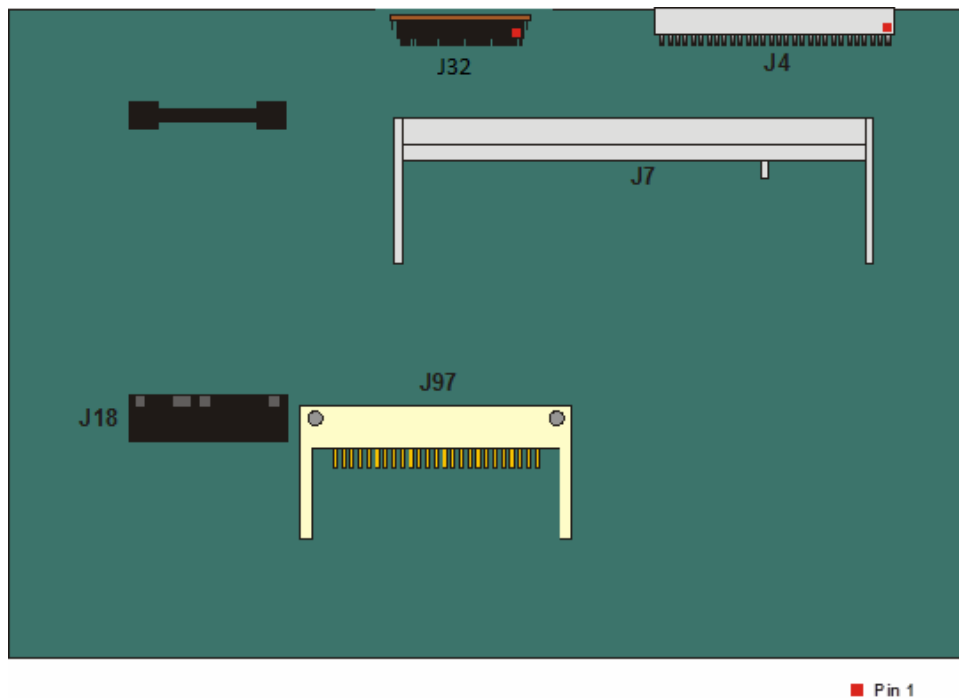
Appendix B: Connector Layout

B.1 Connector Locations

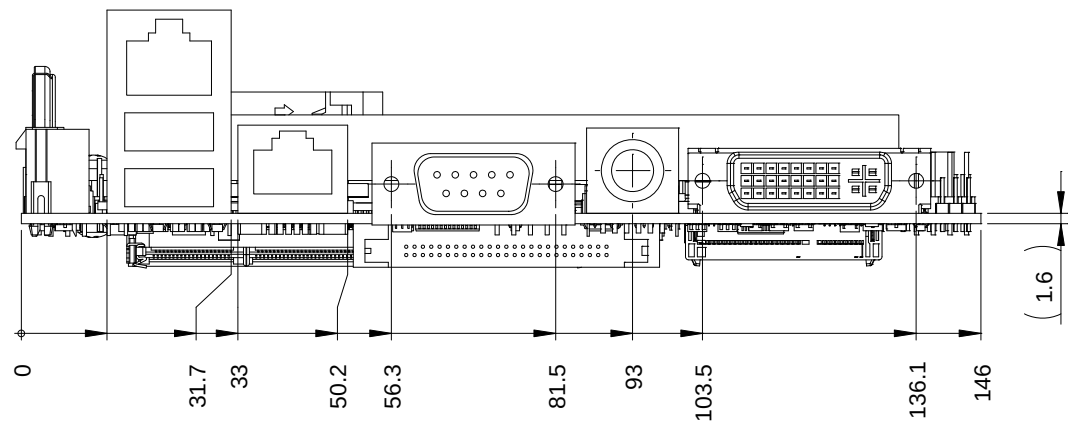
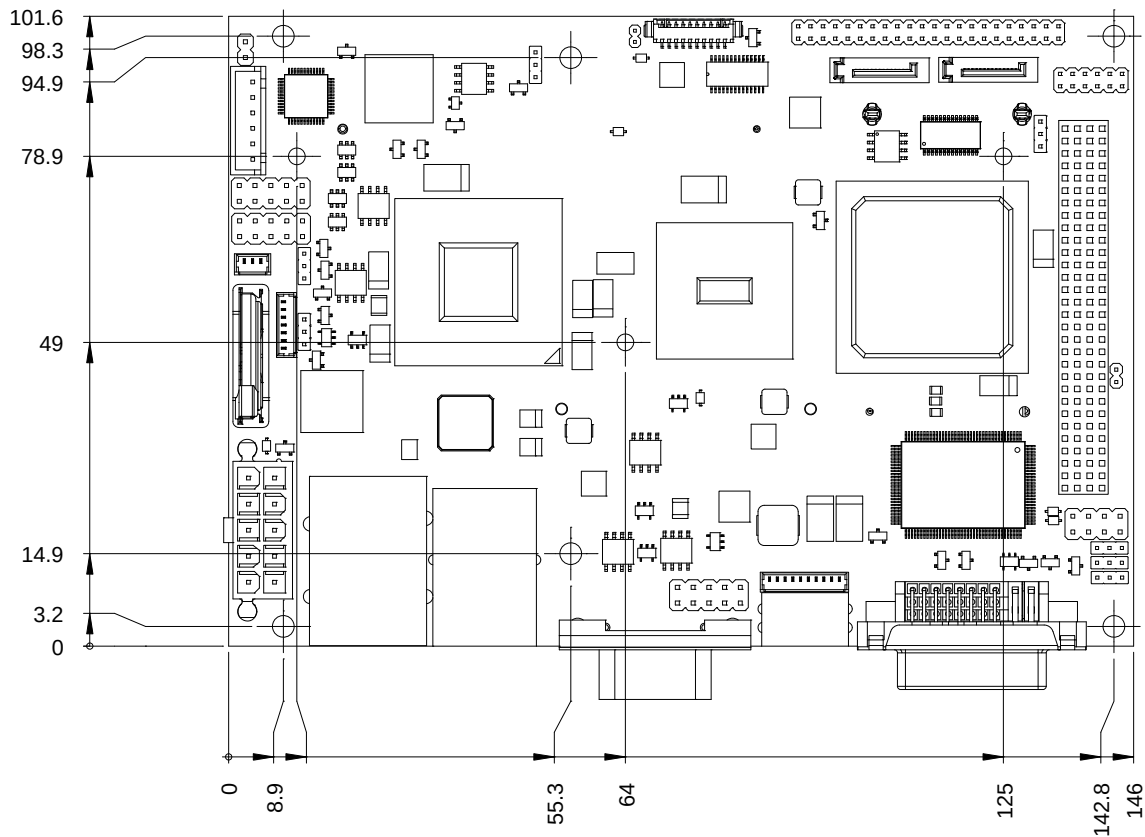
B.1.1 Top Side



B.1.2 Bottom Side



B.2 Mechanical Dimensions



B.3 Mating Connectors

The table notes mating connectors.

Identifier	Mating Connector	Comment
J23	2.50 mm 6 pin (JST SXH-002T-P0.6 or comp.)	for audio support (Line In, Line Out and Microphone)
J29	1.25 mm 3 pin (MOLEX 51021-0300 or comp.)	fan interface
J30	1.25 mm 10 pin (MOLEX 51021-1000 or comp.)	for DSUB9 adaption (COMB)
J96	1.25 mm 7 pin (MOLEX 51021-0700 or comp.)	for backlight connector

B.4 Pinout Tables

Pin	PCI-104 (A)	PCI-104 (B)	PCI-104 (C)	PCI-104 (D)
1	N.C.	Reserved	VCC5 ¹⁾	AD0
2	V _{I/O} ¹⁾	AD2	AD1	VCC5 ¹⁾
3	AD5	GND	AD4	AD3
4	C/BE0	AD7	GND	AD6
5	GND	AD9	AD8	GND
6	AD11	V _{I/O} ¹⁾	AD10	Reserved
7	AD14	AD13	GND	AD12
8	VCC3 ¹⁾	C/BE1	AD15	VCC3 ¹⁾
9	SERR	GND	N.C.	PAR
10	GND	PERR	VCC3 ¹⁾	N.C.
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	IDSEL0 (AD20)	GND	IDSEL1 (AD21)	IDSEL2 (AD22)
19	AD24	C/BE3	V _{I/O} 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 _{I/O} ¹⁾
24	GND	REQ2	VCC5 ¹⁾	GNT0
25	GNT1	V _{I/O} ¹⁾	GNT2	GND
26	VCC5 ¹⁾	CLK0	GND	CLK1
27	CLK2	VCC5 ¹⁾	CLK3	GND
28	GND	INTD	VCC5 ¹⁾	RST
29	VCC12 (+12V) ¹⁾	INTA	INTB	INTC
30	VCC12# (-12V) ¹⁾	REQ3	GNT3	GND

Pin	P-ATA J13	CF-Card J97	PCIe MiniCard J18	DVI J11	JILI30 J4
1	/RESET	GND	/WAKE	TMDS2-	FTX0-
2	GND	D3	VCC3 ¹⁾	TMDS+	FTX0+
3	D7	D4	N.C.	GND	FTX1-
4	D8	D5	GND	N.C.	FTX1+
5	D6	D6	N.C.	N.C.	FTX2-
6	D9	D7	VCC1 ¹⁾	DDC_CLK	FTX2+
7	D5	/CS1	/CLKREQ	DDC_DATA	GND
8	D10	GND	N.C.	VSYNC	FTXC-
9	D4	GND	GND	TMDS1-	FTXC+
10	D11	GND	N.C.	TMDS1+	FTX3-
11	D3	GND	REFCLK-	GND	FTX3+
12	D12	GND	N.C.	N.C.	STX0-
13	D2	VCC3 ¹⁾	REFCLK+	N.C.	STX0+
14	D13	GND	N.C.	VCC5 ¹⁾	GND
15	D1	GND	GND	GND	STX1-
16	D14	GND	N.C.	TMDS_HPD	STX1+
17	D0	GND	N.C.	TMDS0-	GND
18	D15	SA2	GND	TMDS0+	STX2-
19	GND	SA1	N.C.	GND	STX2+
20	KEY (N.C.)	SA0	/W_DISABLE	N.C.	STXC-
21	DRQ	D0	GND	N.C.	STXC+
22	GND	D1	/PERST	GND	STX3-
23	/IOW	D2	PERn0	TMDS_CLK+	STX3+
24	GND	N.C.	VCC3AUX ¹⁾	TMDS_CLK-	GND
25 / C1	/IOR	GND	PERp0	RED	SDA
26 / C2	GND	GND	GND	GRN	DATAENA
27 / C3	IOCHRDY	D11	GND	BLU	SCL
28 / C4	CSEL	D12	VCC1 ¹⁾	HSYNC	PANEL_VCC ¹⁾
29 / C5	/DACK	D13	GND	GND	PANEL_VCC ¹⁾
30	GND	D14	SMB_CLK		PANEL_VCC ¹⁾
31	IRQ	D15	PETn0		
32	N.C.	/CS3	SMB_DATA		
33	SA1	GND	PETp0		
34	ATAD	/IOR	GND		
35	SA0	/IOW	GND		
36	SA2	VCC3 ¹⁾	USB-		
37	/CS1	IRQ	GND		
38	/CS3	VCC3 ¹⁾	USB+		
39	ACT	GND	VCC3 ¹⁾		
40	GND	N.C.	GND		
41	VCC5 ¹⁾	/RESET	VCC3 ¹⁾		
42	VCC5 ¹⁾	IOCHRDY	/LED_WWAN		
43	GND	DRQ	GND		
44	N.C.	/DACK	/LED_WLAN		
45		ACT	N.C.		
46		ATAD	/LED_WPAN		
47		D8	N.C.		
48		D9	VCC1 ¹⁾		
49		D10	N.C.		
50		GND	GND		
51			N.C.		
52			VCC3 ¹⁾		

Pin	PS/2 KB+MS J26	COM A RS-232 J28	COM A RS-422/485 J28	COM B J30	USB A J20	USB B / C J24 / J25
1	KBDAT	/DCD	TX- (TX-/RX-)	/DCD	VCC5 ¹⁾	VCC5 ¹⁾
2	MSDAT	RXD	N.C.	/DSR	USB1-	VCC5 ¹⁾
3	GND	TXD	TX+ (TX+/RX+)	RXD	USB1+	USB3/5-
4	VCC5 ¹⁾	/DTR	N.C.	/RTS	GND	USB4/6-
5	KBCLK	GND	GND	TXD	VCC5 ¹⁾	USB3/5+
6	MSCLK	/DSR	RX+	/CTS	USB2-	USB4/6+
7		/RTS	N.C.	/DTR	USB2+	GND
8		/CTS	RX-	/RI	GND	GND
9		/RI	N.C.	GND		KEY (N.C.)
10				VCC5 ¹⁾		GND

Pin	Backlight J96	S-ATA J14 / J15	Gigabit LAN J21	Fast LAN J20	Audio J23
1	N.C.	GND	TXD+ / BI_D1+	TXD+	LINE_OUT_R
2	BKLTADJ	TX+	TXD- / BI_D1-	TXD-	GND
3	GND	TX-	RXD+ / BI_D2+	RXD+	LINE_OUT_L
4	BKL_VCC ¹⁾	GND	BI_D3+	GND	LINE_IN_R
5	BKL_VCC ¹⁾	RX-	BI_D3-	GND	MIC_IN
6	GND	RX+	RXD- / BI_D2-	RXD-	LINE_IN_L
7	BKLTON	GND	BI_D4+	GND	
8			BI_D4-	GND	
9					
10					

Pin	Audio S/PDIF J98	Digital I/O J33	Common Front Panel J37	Power Front Panel J36	Main Power J35
1	SPDIF_OUT	VCC3 ¹⁾	RST_BTN+	PWR_LED+	PS_ON
2	GND	GPI00	SPKR+	PWR_BTN+	GND
3		GPI01	RST_BTN-	N.C.	GND
4		GPI02	N.C.	PWR_BTN-	VCC12 ¹⁾
5		GPI03	HDD_LED+	PWR_LED-	NC
6		GPI04	N.C.	N.C.	VCC5SB ¹⁾
7		GPI05	HDD_LED-	KBD_LOCK	VCC5 ¹⁾
8		GPI06	SPKR-	RSVD	VCC5 ¹⁾
9		GPI07		GND	VCC12# ¹⁾
10		GND		RSVD	GND

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.

Appendix C: Reference Documents

KONTRON Technology A/S can't guarantee the availability of internet addresses.

Document	Internet Address
Advanced Configuration and Power Interface (ACPI)	http://www.acpi.info/spec.htm
AT Attachment Storage Interface Specification (ATA)	http://t13.org
Digital Visual Interface (DVI)	http://www.ddwg.org
High Definition Audio Specification (HD Audio)	http://www.intel.com/standards/hdaudio
High Speed Serialized AT Attachment (S-ATA)	http://www.sata-io.org/developers
IEEE 802.3 Specification (Ethernet)	http://standards.ieee.org/getieee802
Low Pin Count Interface Specification (LPC-Bus)	http://developer.intel.com/design/chipsets/industry/lpc.htm
Open LVDS Display Interface Standard Spec. (Open LDI)	http://www.national.com/analog/displays/open_ldi
PCI Express Base Specification (PCI Express)	http://www.pcisig.com/specifications
SD Specification (SD Card)	http://www.sdcard.org/developers/tech/sdio/sdio_spec
System Management Bus Specification (SMBus)	http://www.smbus.org/specs
Universal Serial Bus Specification (USB)	http://www.usb.org/developers/docs

Appendix D: Document Revision History

Revision	Date	Author	Changes
S0008-F	05/16/13	MHU	Changed backlight pin 1
S0008-E	11/27/12	MHU	Changed in chapter Panel Power the jumper J2 pin assignment
S0008-D	07/04/12	MHU	Added chapter 'Fan Interface' and change GPIO connector
S0008-C	08/17/11	MHU	Changed the battery precaution
S0008-2	07/19/11	HAM	Added MTBF information
S0008-1	06/24/11	HAM	Updated for redesigned hardware with 5V only mode and crisis management
S0008-0	02/03/10	HAM	Adapted to KONTRON Technology A/S guidelines
0.1	06/10/09	HAM	Initial release

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