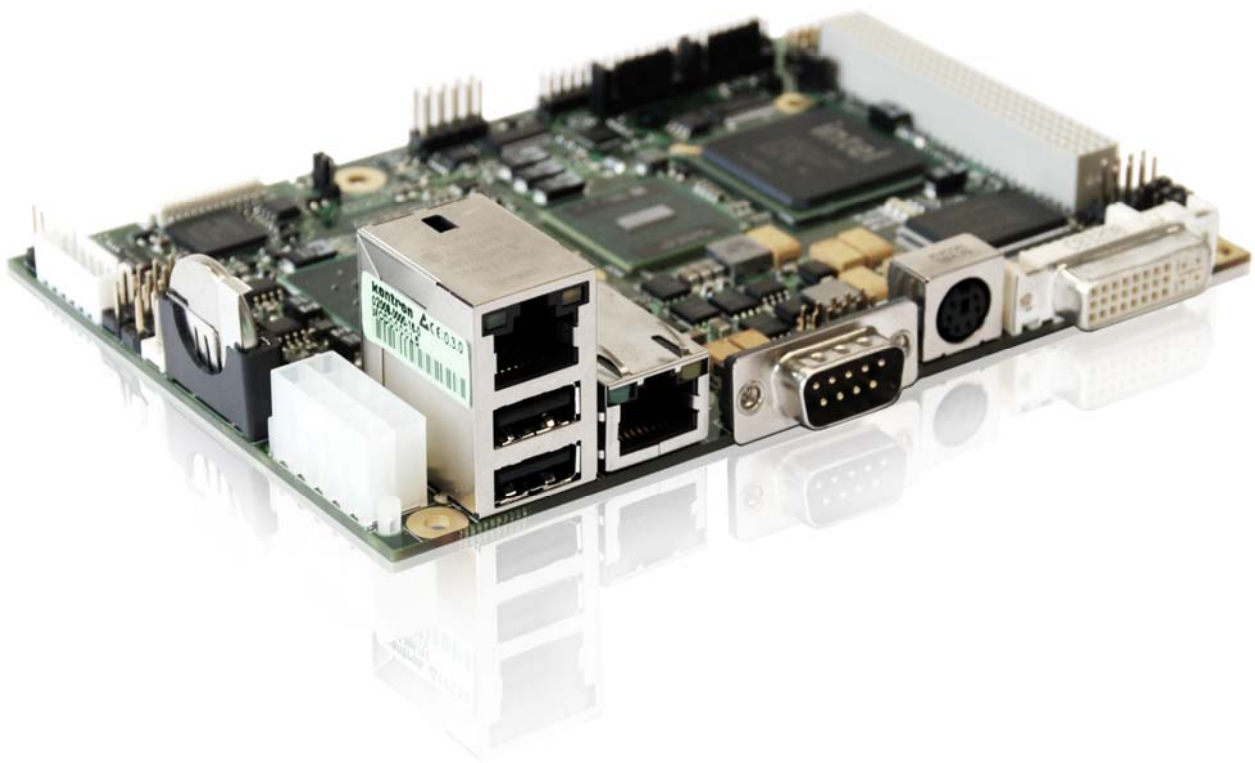


» Kontron User's Guide «



JReplus-DC

Document Revision 0.1

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1 User Information

1.1 About This Document

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1.2 Copyright Notice

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1.3 Trademarks

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

1.4 Standards

Kontron Embedded Modules 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 Web site 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

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 the 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 (**J**umpte**c**® **I**ntelligent **L**VDS **I**nterface).

As part of the standard features package, all JReX embedded line modules come with a JIDA interface (**J**umpte**c**® **I**ntelligent **D**evice **A**rchitecture), 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	CPU Clock	PC104plus	P-ATA	LPT	GPIO	TPM
02008-0000-16-0	1.6 GHz	✓	✓	✓	✓	✓
02008-0000-16-2	1.6 GHz					

3 Specifications

3.1 Functional Specifications

Processor: Intel® ATOM™ N270 (1.6 GHz)

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

Northbridge: Intel® 945GSE

- ❑ 533 MHz Front Side Bus (FSB)
- ❑ One DDR2-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 (Complies with Serial ATA specification Rev. 1.0a (Serial ATA II))
- ❑ Parallel-ATA PCI IDE controller (Supports PIO mode, Multiword DMA and Ultra DMA up to UDMA5)
- ❑ Six channel USB 2.0 (UHCI/EHCI) - 2 ports on Front panel and 4 on pin Headers
- ❑ Two PCI Express ports (x1 lanes)
- ❑ Two serial ports (RS232) COM1 and COM2
- ❑ Integrated Intel® High Definition Audio controller
- ❑ PCI-Bus: 32-bit/33Mhz

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) 18bit 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 UXGA (DVI-I connector)

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

10/100MB 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

PCIexpress MiniCard

- ❑ One PCIe MiniCard Slot on the bottom of the board allows the use of wireless LAN cards or similar add-on devices

PC104plus Interface

- ❑ 33Mhz PCI Clock
- ❑ 32bit data bus width
- ❑ Only 3.3V PCI cards are supported

Compact Flash Socket

Trusted Platform Module (TPM): Infineon SLB 9635 TT

Digital I/O

- ❑ Four digital Inputs and four digital Outputs, +3.3V signal level

LPC Super I/O: Winbond W83627DHG

- ❑ One onchip thermal sensor and one remote temperature sensor (CPU) with $\pm 1^{\circ}\text{C}$ accuracy
- ❑ Parallel Port (LPT1): Enhanced Parallel Port (EPP) and Extended Capabilities Port (ECP) with bidirectional capability
- ❑ PS/2 keyboard and mouse controller
- ❑ Serial ports (RS232) COM1 and COM2
- ❑ Fan controller

- Watchdog Timer (WDT)

Standard ACPI Support

BIOS: AMI, 1 MB Flash BIOS

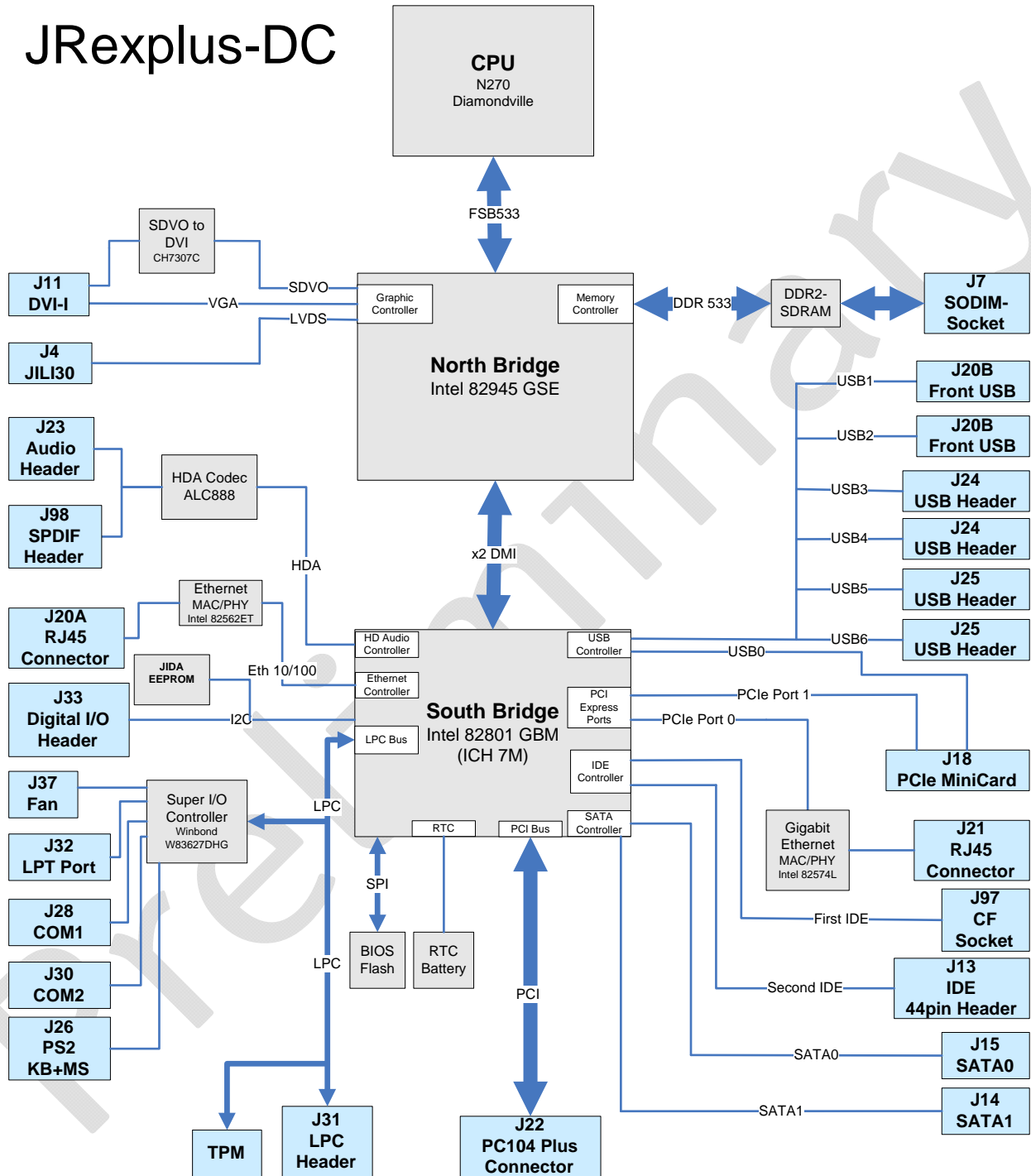
Real-Time Clock (RTC) with CMOS RAM

- Requires an external battery (equipped onboard by default)

Preliminary

3.2 Block Diagram

JRexplus-DC



3.3 Mechanical Specifications

Board Dimensions

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

Board Height

- Maximum approx. TBD mm

3.4 Electrical Specifications

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 $\pm 5\%$

Supply Voltage Ripple

- Maximum 100mV peak to peak 0 – 20 MHz

3.5 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 module (DDR2-667).

Article number	Full Load	Soft Off (S5)
02008-0000-16-0	tbd A tbd W	tbd A tbd W
02008-0000-16-2	tbd A tbd W	tbd A tbd W

3.6 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 module (DDR2-667).

Article number	Full Load	Idle	Standby S1	Suspend S3
02008-0000-16-0	tbd A	tbd A	tbd A	tbd A
	tbd W	tbd W	tbd W	tbd W
02008-0000-16-2	tbd A	tbd A	tbd A	tbd A
	tbd W	tbd W	tbd W	tbd W

3.7 Real-Time Clock Battery

- Voltage range: +2.0V - +3.6V (typ. +3.0V)
- Maximum current: 5µA @ +3.0V

3.8 Environmental Specifications

Temperature

Operating: (with Kontron Cooling Solution):

- Ambient temperature: 0 to +60°C ¹⁾
- Non-operating: -10 to +85°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.

Humidity

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

4 MTBF

The following MTBF (Mean Time Between Failure) values were calculated using a combination of manufacturer's test data, if the data was available, and a Bellcore calculation for the remaining parts. The Bellcore calculation used is "Method 1 Case 1". In that particular method the components are assumed to be operating at a 50% stress level in a 40°C ambient environment and the system is assumed to have not been burned in. Manufacturer's data has been used wherever possible. The manufacturer's data, when used, is specified at 50°C, so in that sense the following results are slightly conservative. The MTBF values shown below are for a 40°C 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 estimation assumes no fan, but a passive heat sinking arrangement. Estimated RTC battery life (as opposed to battery failures) is not included in the MTBF calculation. The RTC battery lifetime has to be considered 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 Getting Started

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

- ❶ Connect the ATX-adapter (KAB-ATX-10) to the JReplus-DC ATX power connector J35. The location of connector J35 can be found in the Appendix A: "Connector Layout".
- 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 PS2 or USB connector(s).
- ❺ Plug a Compact-Flash card into the Compact flash 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 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.

6 System Memory

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

Memory Modules with 667Mhz clock frequency can also be used. In this case the memory module is driven with 533Mhz. 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 the 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 Embedded Modules GmbH can't guarantee the correct functionality of the JReplus-DC when a DDR2-module with another frequency than 533Mhz is used.

7 Graphics Interface

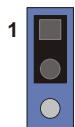
The graphics accelerator supports an Analogue Video Graphics Array Output (VGA) a SDVO interface combined with a SDVO/DVI converter up to 160 MHz and a variety of LVDS LCD panels with dual channel and color depths of 18bit. Each LVDS channel supports transmit clock frequency ranges from 25 to 112 Mhz.

7.1 DDC Interpretation

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

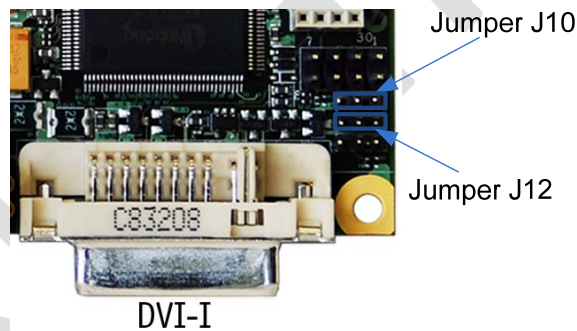
Important: Both Jumpers (J10 and J12) must be set to the same position.

:



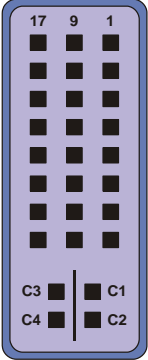
Pins	Signal
1 - 2	DVI DDC
2 - 3	VGA DDC

Jumper Positions:



7.2 DVI-I Connector

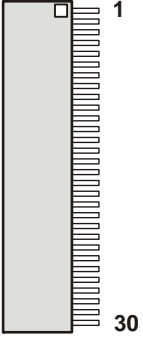
The DVI and VGA interface are available through the standard 29 pin D style DVI-I connector J11

Header	Pin	Signal Name	Function
	1	TMDS2-	TMDS data 2 (negative)
	2	TMDS2+	TMDS data 2 (positive)
	3	GND	Ground
	4	TMDS5-	TMDS data 5 (negative)
	5	TMDS5+	TMDS data 5 (positive)
	6	DDC_CLK	DDC clock
	7	DDC_DATA	DDC data
	8	V-Sync.	Vertical Sync Signal
	9	TMDS1-	TMDS data 1 (negative)
	10	TMDS1+	TMDS data 1 (positive)
	11	GND	Ground
	12	TMDS5-	TMDS data 5 (negative)
	13	TMDS5+	TMDS data 5 (positive)
	14	VCC ¹⁾	Power +5V
	15	VGA_EN	VGA Enable Signal
	16	TMDS_HPD	Hot plug detect
	17	TMDS0-	TMDS data 0 (negative)
	18	TMDS0+	TMDS data 0 (positive)
	19	GND	Ground
	20	TMDS5-	TMDS data 6 (negative)
	21	TMDS5+	TMDS data 6 (positive)
	22	GND	Ground
	23	TMDS_CLK+	TMDS clock (positive)
	24	TMDS_CLK-	TMDS clock (negative)
	C1	VGA_RED	Analog Red Video Out
	C2	VGA_GRN	Analog Green Video Out
	C3	VGA_BLU	Analog Blue Video Out
	C4	H-Sync	Horizontal Sync Signal
	C5	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.
 - enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

7.3 Flat Panel Connector - JILI30

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 (**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.

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	VCC ¹⁾	Power +3.3V or +5V

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

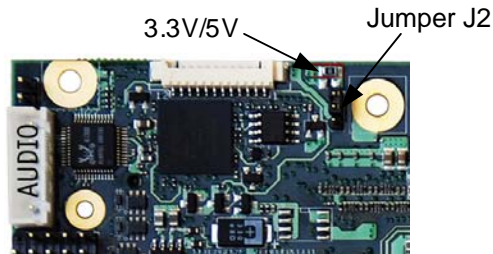
- the wires have the right diameter to withstand the maximum available current.
- enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

Warning: Check jumper J2 (Panel Power Jumper) for correct settings for your panel - not doing so might cause permanent damage to your panel.

7.4 Panel Power Jumper

The Panel Power Jumper J2 sets the Panel supply voltage.

For the panel supply voltage a solder jumper is important. The board is delivered with the solder jumper equipped as shown on the following picture:

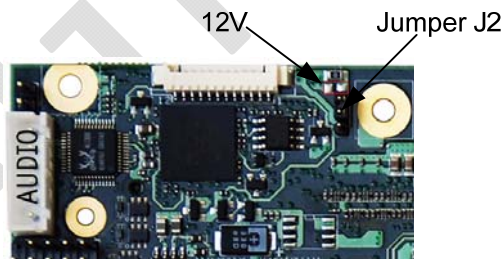


In this case the board is configured so that 3.3V or 5V Panel VCC can be selected with Jumper J2.



Pins	Signal
1 - 2	3,3V Panel VCC ¹⁾
2 - 3	5V Panel VCC

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 the 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 (1-2) for 3.3V leads to a panel supply voltage of 12V.

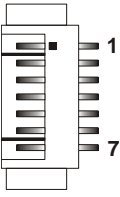
Note: 1) All soldering works must be done in a professional production environment. To avoid losing the warranty for your product please contact the board vendor before you make any solder modification on the JReplus-DC.

7.5 LVDS Limitations

The chipset of the JReplus-DC only supports single and dual channel 18bit LVDS displays. If you want to know if your 24bit Liquid Cristal Display works on the JReplus-DC please contact your board vendor for technical support.

7.6 Backlight Connector

The Backlight for LVDS Displays is available through the 7 pin connector J96. The backlight brightness (adjust voltage) can be set in the BIOS (see chapter 23 "Setup Guide").

Header	Pin	Signal Name	Function
	1	N.C.	Not connected
	2	BKLTADJ	Brightness control (0V - 5V)
	3	GND	Ground
	4	VCC¹⁾	5V or 12V backlight power (see Jumper J5)
	5	VCC¹⁾	5V or 12V backlight power (see Jumper J5)
	6	GND	Ground
	7	BKLTON	Backlight on/off (see Jumper J3)

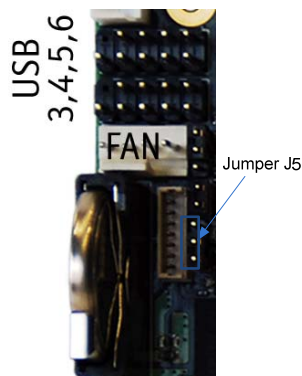
Note: 1) To protect the external power lines of peripheral devices, make sure that
 - the wires have the right diameter to withstand the maximum available current.
 - enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

7.7 Backlight Supply Power Jumper (J5)

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

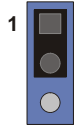
Pin	Signal Name
1 - 2	5V Backlight VCC¹⁾
2 - 3	5V Backlight VCC¹⁾

Jumper Position:



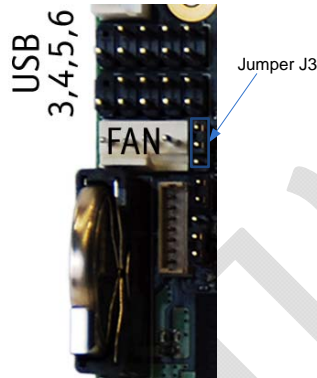
7.8 Backlight Enable Jumper (J3)

The Jumper J3 can be used to invert the Backlight-On signal of the backlight inverter.



Pin	Signal Name
1 - 2	ON (default)
2 - 3	/ON

Jumper Position:

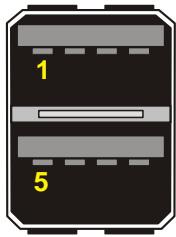


8 USB Interface

The USB interface comes with four 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.

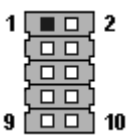
8.1 USB Standard Connector

Two USB ports are available through the standard USB connector J20B (8 pins) which is combined with a RJ45 connector.

Header	Pin	Signal Name	Function
	1	VCC ¹⁾	Power +5V
	2	USB0-	USB port 0 (negative)
	3	USB0+	USB port 0 (positive)
	4	GND	Ground
	5	VCC ¹⁾	Power +5V
	6	USB1-	USB port 1 (negative)
	7	USB1+	USB port 1 (positive)
	8	GND	Ground

8.2 USB Pin Header

The other 4 USB ports are available through the pin strip connectors J24 and J25 (9 pins). To have the signals available on the standard USB interface connectors, an adapter cable is required. An USB interface cable is available from Kontron (KAB-DUSB, Part Number 96055-0000-00-0).

Header	Pin	Signal Name	Function
	1	VCC ¹⁾	+5V
	2	VCC ¹⁾	+5V
	3	USB2-	USB port 2/4 (negative)
	4	USB3-	USB port 3/5 (negative)
	5	USB2+	USB port 2/4 (positive)
	6	USB3+	USB port 3/5 (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.
- enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

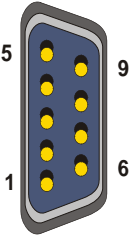
8.3 USB Limitations

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


9 COM Ports

The JReplus-DC comes with two serial ports. COM1 is available through the frontpanel connector J28 and COM2 is available through a 10 pin header J30 (matching adapter: Kontron 96061-0000-00-0).

9.1 COM Port 1

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

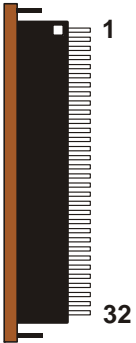
9.2 COM Port 2

Header	Pin	Signal Name	Function	DSUB-25	DSUB-9
	1	/DCD	Data Carrier Detect	8	1
	2	/DSR	Data Set Ready	6	6
	3	RXD	Receive Data	3	2
	4	/RTS	Request to Send	4	7
	5	TXD	Transmit Data	2	3
	6	/CTS	Clear to Send	5	8
	7	/DTR	Data Terminal Ready	20	4
	8	/RI	Ring Indicator	22	9
	9	GND	Signal ground	7	5
	10	VCC ¹⁾	+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.
 - enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

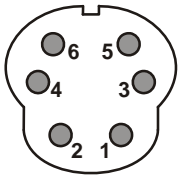
10 Parallel-Port Interface

The LPT port is available through a 32 pins Flat Foil connector J32 (matching adapter Kontron 61033).

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

11 PS/2 Keyboard and Mouse Connector

The keyboard/mouse interface is available through the standard miniDIN connector J26 (matching Y-cable 96001-0000-00-4).

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

12 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.

12.1 IDE Connector

The EIDE interface is available through connector J13 (44 pins). This interface is designed in 2 mm grid for optimal connectivity to a 2.5" harddisk.

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	/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

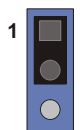
Note: 1) To protect the external power lines of peripheral devices, make sure that
 - the wires have the right diameter to withstand the maximum available current.
 - enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

12.2 Compact Flash Card Interface

The CF-Card interface is available through the CF-connector on the Bottom side.

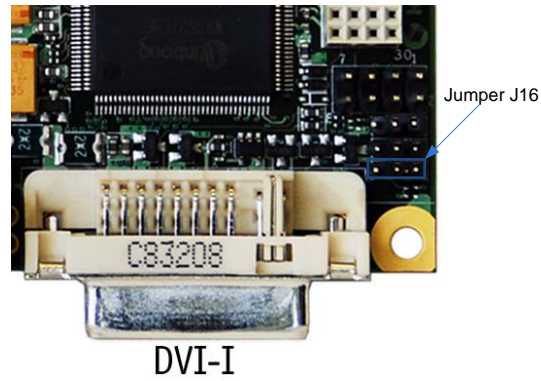
Pin	Signal Name	Function	Pin	Signal Name	Function
1	GND	Signal ground	2	D3	Data 3
3	D4	Data 4	4	D5	Data 5
5	D6	Data 6	6	D7	Data 7
7	/CS1	Chip select 1	8	GND	Signal ground
9	GND	Signal ground	10	GND	Signal ground
11	GND	Signal ground	12	GND	Signal ground
13	VCC ¹⁾	+5V	14	GND	Signal ground
15	GND	Signal ground	16	GND	Signal ground
17	GND	Signal 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	NC	Not connected
25	GND	Signal ground	26	GND	Signal 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	Signal ground	34	/IOR	I/O read
35	/IOW	I/O write	36	VCC ¹⁾	+5V
37	IRQ	Interrupt	38	VCC ¹⁾	+5V
39	GND	Signal ground	40	NC	Not connected
41	/RESET	Reset	42	IOCHRDY	I/O channel ready
43	/DRQ	DMA request	44	/DACK	DMA acknowledge
45	ACT	Drive activity	46	NC	Not connected
47	D8	Data 8	48	D9	Data 9
49	D10	Data 10	50	GND	Signal ground

Jumper J16 allows the configuration for master/slave mode for the compact flash interface.



Pin	Signal Name
1 - 2	Master
2 - 3	Slave

Jumper Position:



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.
 - enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

13 CPU FAN

The CPU fan can be connected to a 4pin, PWM mode connector. 3pin connectors of fans without PWM control do also fit to this connector.

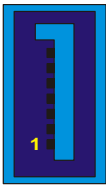
Header	Pin	Signal Name	Function
	1	GND	Ground
	2	+12V ¹⁾	12V (+-10%) Supply
	3	SENSE	Tachometer Output Signal
	4	Control	PWM Control Input Signal

14 Serial-ATA Interface (S-ATA)

The JReplus-DC has 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 not possible.

14.1 S-ATA 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

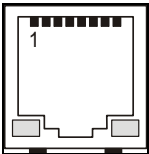
15 Gigabit Ethernet Controller

The JReplus-DC uses an Intel® 82574L 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.

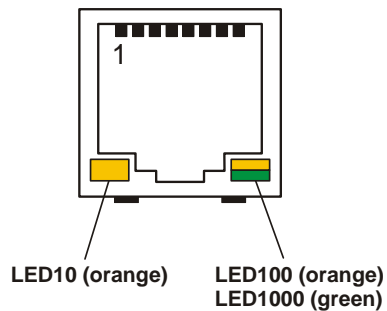
15.1 Connector

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

Header	Pin	Signal Name	Function
	1	MDI0+	1000 pair 1 (positive)
	2	MDI0-	1000 pair 1 (negative)
	3	MDI1+	1000 pair 2 (positive)
	4	MDI1-	1000 pair 3 (positive)
	5	MDI2+	1000 pair 3 (negative)
	6	MDI2-	1000 pair 2 (negative)
	7	MDI3+	1000 pair 4 (positive)
	8	MDI3-	1000 pair 4 (negative)

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).



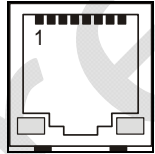
16 Ethernet Controller 10/100MBit

The JReplus-DC uses an Intel® 82562ET LAN controller. This network controller supports 10/ 100 Base-T interfaces. The devices auto-negotiate the use of a 10 or 100 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.

16.1 Connector

The Ethernet interface is available through the RJ45 connector J20A (8 pins) that is combined with USB port 1 and USB port 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	NC	NC
	5	NC	NC
	6	RXD-	10/100 receive (negative)
	7	NC	NC
	8	NC	NC

17 Audio Interface


The Intel® chipset supports a High Definition Audio Codec with 24 bit resolution and 192 kHz sample rate. The interface includes LINE OUT (DACs with 97 dB SNR), LINE IN (ADCs with 90 dB SNR), MICROPHONE IN and a digital S/PDIF output. Normally the codec manages following resolutions and sample rates: 16/20/24 bit with 44.1/48/96/192 kHz (LINE OUT, S/PDIF) and 16/20 bit with 44.1/48/96 kHz (LINE IN). The S/PDIF output drives 12mA @ 75Ω.

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®).

17.1 Analog Audio 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

17.2 Digital Connector (S/PDIF)

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


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

18 Digital I/O Interface

The JReplus-DC features four digital inputs and four digital outputs. All inputs/outputs are LVTTL compatible. Inputs can be driven from either 3.3V or 5V devices. This feature allows a mixed 3.3V / 5V system environment.

18.1 Digital I/O Connector

The Digital I/O interface is available through a 10 pin (100mil) header J33.

Header	Pin	Signal Name	Function
	1	OUT1	Digital output 1
	2	IN1	Digital input 1
	3	OUT2	Digital output 2
	4	IN2	Digital input 2
	5	OUT3	Digital output 3
	6	IN3	Digital input 3
	7	OUT4	Digital output 4
	8	IN4	Digital input 4
	9	VCC ¹⁾	+5V (with diode)
	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.
 - enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

18.2 Digital I/O Electrical Specifications

Digital Inputs

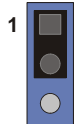
Parameter	Min.	Typ.	Max.	Units
		0.8	V	
2.0		5.25	V	2.0

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

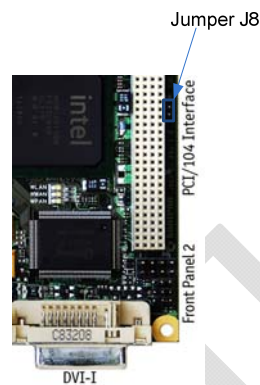
19 Clear CMOS Jumper

To Reset the Bios to the default values the Jumper J8 has to be set to position 1-2 when the board is started. When the jumper is set the default values for the bios will be loaded.



Pin	Signal Name
1-2	CLR_CMOS

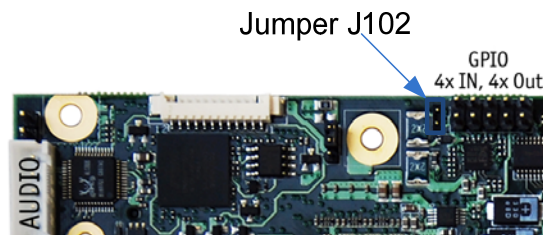
Jumper Position:



20 Autostart Jumper

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

Jumper Position:

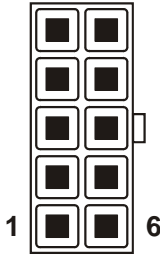


21 Power Supply

The JReplus-DC 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.

21.1 Power Connector

The power connector is available as J35 (10 pins). An adapter cable is deliverable from Kontron (KAB-ATX-20T010, Part Number 96072-0000-00-0). To find the location of the power connector on the JReplus-DC board, please see the Appendix A: "Connector Layout".

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.
- enclosure of the peripheral device fulfills the fire-protecting conditions of IEC/EN 60950.

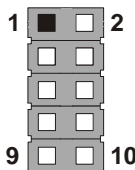
21.2 Power Pins

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 ¹⁾	3	5A
VCC12 ¹⁾	1	1A

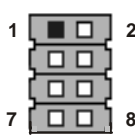
22 Front Panel Pin Header 1

The power button and other power signals are available through the pin strip J36 (10 pins). The position of the Front Panel Header 1 can be found in Appendix A: "Connector Layout".

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

22.1 Front Panel Pin Header 2

Additional signals are available through the Front Panel Pin Header J37 (10 pins). The position of the Front Panel Header 2 can be found in Appendix A: "Connector Layout".

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

22.2 RTC Battery

An external battery is only necessary if time and date should be saved when the board is turned off. For the BIOS settings no battery is needed as these settings are also stored in the BIOS flash.

- Voltage range: 2.0 V - 3.6 V (typ. 3.0 V)
- Maximum current: 5 μ 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. Udskifting 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 laltevalmistajan suosittelmaan tyyppiln. Havita kaytetty paristo valmistajan ohjeiden mukaisesti.

Spanish:

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

The battery of this product is not considered to be accessible by the end user. 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).

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 <IPSPR??> is especially helpful. To determine the AMI® BIOS version, press the DEL key on your keyboard during boot-up and look at Main Menu (additional information are available with Submenu [Board Information](#)):

```
Bios Information
BIOS Version : IPSPR??
Build Date   : ??/??/??
```

23.2 Start AMI® BIOS Setup Utility

To start the AMI® BIOS setup utility, press when the following string appears during boot-up.

Press to enter 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

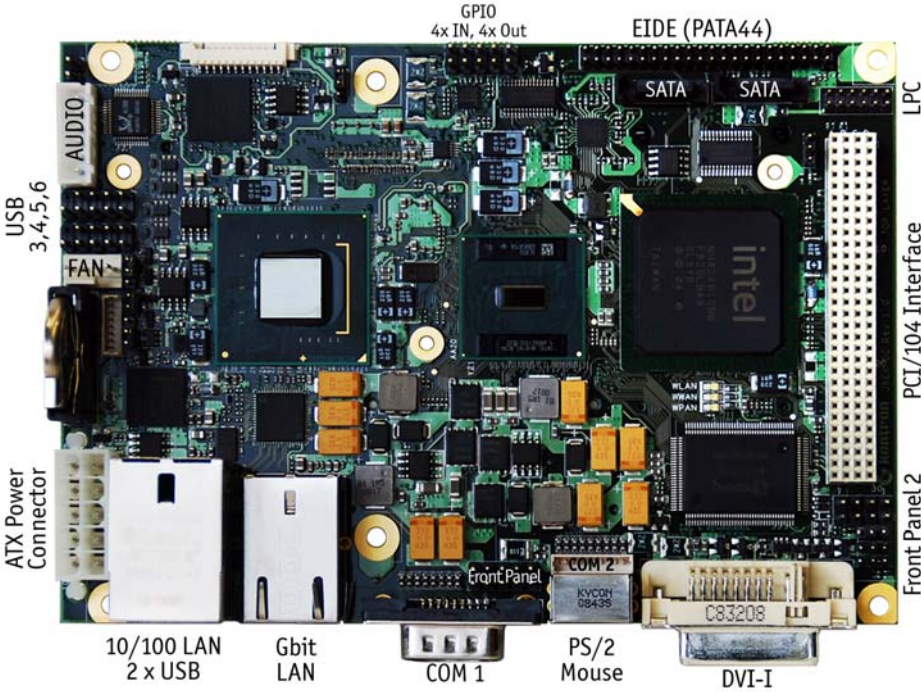
The help window on the right side of each menu displays the help text for the selected item. It updates as you move the cursor to each field.

General Help Window

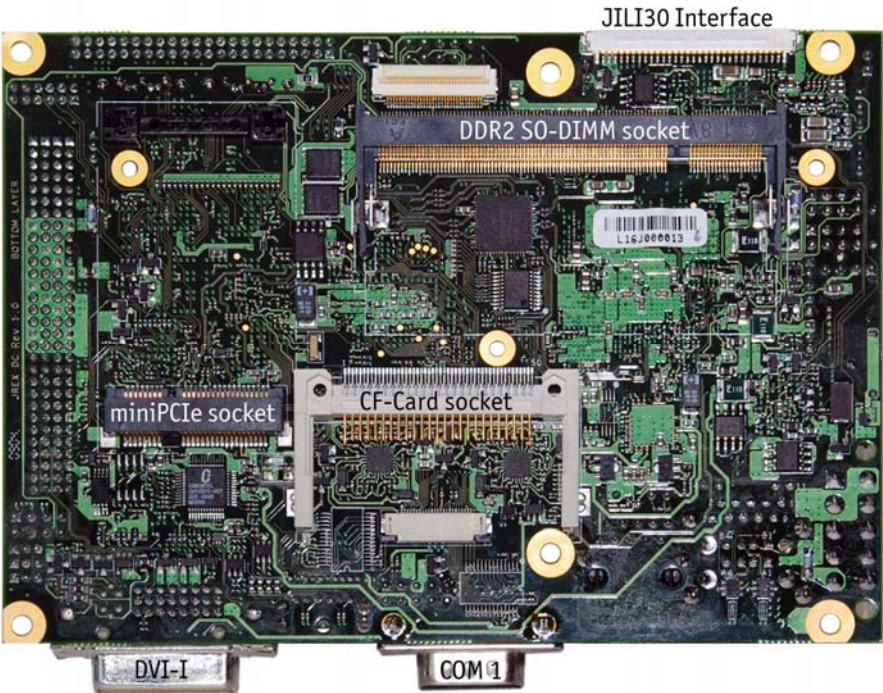
Pressing <F1> or <Alt-F1> on a menu brings up the general help window that describes the legend keys and their alternates. Press <Esc> to exit the general help window.

24 Appendix A: Connector Layout

Upper view:



Bottom view:



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