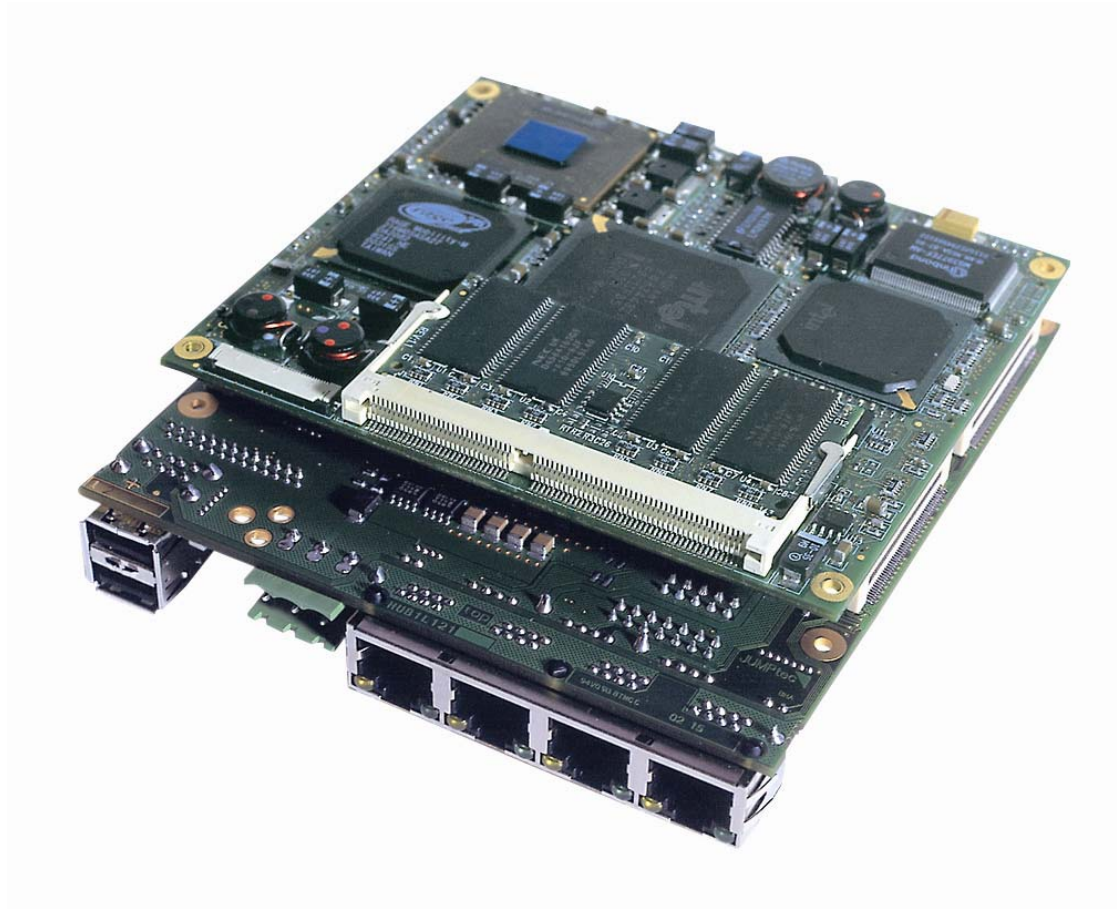


► Kontron User's Guide



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Document Revision 1.29

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1 User Information

1.1 About This Document

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1.4 Standards

Kontron Embedded Modules GmbH is certified to ISO 9000 standards.

1.5 Warranty

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

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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.

Before contacting Kontron Embedded Modules GmbH technical support, please consult our Web site at <http://www.kontron-emea.com/emd> for the latest product documentation, utilities, and drivers. If the information does not help solve the problem, contact us by telephone or email.

Asia	Europe	North/South America
Kontron Asia Inc.	Kontron Embedded Modules GmbH	Kontron America
4F, No.415, Ti-Ding Blvd., NeiHu District, Taipei 114, Taiwan	Brunnwiesenstr. 16 94469 Deggendorf – Germany	14118 Stowe Drive Poway, CA 92064-7147
Tel: +886 2 2799 2789	Tel: +49 (0) 991-37024-0	Tel: +1 (888) 294 4558
Fax: + 886 2 2799 7399	Fax: +49 (0) 991-37024-333	Fax: +1 (858) 677 0898
mailto:sales@kontron.com.tw	mailto:sales-kem@kontron.com	mailto:sales@us-kontron.com

2 Introduction

2.1 microSERVER

Kontron's microSERVER product, which serves as a baseboard for any of Kontron's ETX® modules, offers a flexible and scalable range of solutions to create an industrial computer network. When you combine a microSERVER and an ETX®-CPU module, you can create a reliable router, gateway, hub or server with up to four Ethernet connections. Such flexibility allows you to split your network into smaller and faster segments.

The microSERVER offers two Ethernet connections, the ETX® module offers one Ethernet connection, while an optional DIMM-PC® I/O socket on the microSERVER board offers a fourth possible Ethernet connection.

Two microSERVER options are available, including:

- microSERVER/HDD (2.5" hard disk)
- microSERVER/CFC (Compact Flash Type II or microdrive)

Depending on the ETX® board, your application can have the standard functions of a PC such as Ethernet, graphics or sound as well as other interfaces and features.

2.1.1 ETX® Concept

The microSERVER is an ETX® baseboard designed by Kontron. Embedded technology extended (ETX®) modules are compact (~100mm square, 12mm thick), integrated computers. All ETX® modules feature a standardized form factor and a standardized connector layout that carry a specified set of signals. This standardization allows designers to create a single-system baseboard that can accept present and future ETX® modules that include personal computer (PC) peripheral functions such as:

- Graphics
- Parallel, Serial, and USB ports
- Keyboard/mouse
- Ethernet
- Sound
- IDE

2.1.2 ETX® Products

Currently, you must use one of the following ETX® products to run a microSERVER.

The following table highlights the processor, speed, and chipset differences among the ETX® boards. For more types please refer our homepage and contact our sales Channels.

ETX® Module	Processor	Speed	Chipset
ETX®-P1	Mobile Intel Pentium with MMX	266MHz	ALI1541/1543C
ETX®-VE	VIA ESP4000, ESP6000, C3-800	300MHz ..1GHz	VT8606+VT82C686B
ETX®-PM	Intel Mobile PentiumM/CeleronM	1.1GHz/1.6GHz	82855GM+82801DB
ETX®-P3M	Intel Mobile Pentium III M	400MHz .. 1.2GHz	VT8606+VT82C686B
ETX®-P3E	Intel Mobile Pentium III/Celeron	300MHz .. 700MHz	VT8603+VT82C686A
ETX®-P3	Intel Mobile Pentium III/Celeron	400MHz .. 700MHz	Intel BX440 AGPset
ETX®-mgx	National Semi. Geode GX1	200MHz..300MHz	CS5530

2.1.3 ETX® Documentation

The ETX® product-specific manual serves as one of three principal references for an ETX® design. It documents the specifications and features of an ETX® modules. The other two references include:

- The ETX® Specification available at <http://emea.kontron.com/> defines the ETX® module form factor, pinout, and signals. You should read this first.
- The ETX® Design Guide available at <http://emea.kontron.com/> serves as a guide for baseboard design, with a focus on maximum flexibility to accommodate all ETX® modules.

2.1.4 DIMM-PC® Concept

DIMM-PC® modules are very small computer boards that embed directly on an application-specific baseboard, using industry-standard SO-DIMM sockets.

Kontron offers two types of DIMM-PC® modules:

- CPU modules, available with 80386, 80486, and 80586 processors, are fully PC/AT compatible and come with a substantial amount of onboard I/O.
- I/O modules extend the functionality of DIMM-PC® systems by allowing additional I/Os and peripherals.

2.1.5 DIMM-PC® I/O Products

You can add a fourth Ethernet connector to the microSERVER by adding one of the following DIMM-PC® I/O boards:

- DIMM-PC®/ETN1
- DIMM-PC®/ETIS

In addition, you can use the following optional DIMM-PC® I/O module on the microSERVER carrier board:

- DIMM-PC®/ISDN

You also can request information about other features <mailto:sales-kem@kontron.com>.

3 Specifications

The following features are available on microSERVER boards, which are scalable when you use an ETX®-CPU module. For a list of features available on ETX®-CPU modules, please see the product-specific ETX® manual.

IDE PCI interface for hard-disk or compact flash card depend on option

IDE PCI interface for CD,DVD,HD, or so

PS/2 mouse and keyboard

Two RS32 serial ports

- TTL signals from the ETX® and line driver on the microSERVER
- As an option, both ports are connected to the DIMM-PC® I/O such as on a null modem cable

Two USB ports

Ethernet (up to four connections)

- Ethernet 1 (located on ETX® board): 10/100MB; uses either DAVICOM DM9102AT or Intel® 82559/82559ER
- Ethernet 2 (built into microSERVER board): 10/100MB DAVICOM DM9102AT
- Ethernet 3: (built into microSERVER board): 10/100MB DAVICOM DM9102AT
- Ethernet 4 (available on an optional DIMM-PC® I/O module on the microSERVER board): CRYSTAL CS8900 10MB
- Network LAN: Boot depends on ETX® model selected.

ISDN (optional)

VGA

- CRT
- Flat panel

One parallel port (LPT1)

Floppy-drive interface (available if LPT1 port not in use)

Sound

3.1 Mechanical Specifications

- ETX® connectors follow the Kontron ETX® Specification. For a copy of the specification, go to the <http://emea.kontron.com/>.
- Baseboard dimensions: 118.5 x 116.3 mm (length x width)
- Assembled board dimensions: 121.5 x 116.3 (length x width)
- Height without ETX®: 26 mm (approximately)
- Height with ETX®: 36mm (depending on ETX® and processor heatsink)

3.2 Electrical Specifications microSERVER

3.2.1 Supply Voltage (DC/DC in)

- 9..32V DC +/- 10%

3.2.2 Supply Voltage Ripple (DC/DC in)

- 500 mV peak to peak 0-20 MHz

3.2.3 microSERVER Loads

The maximum sum of all loads on the 5V is 8000mA. For the maximum load, the DC/DC needs approximately 45W of power input.

- microSERVER (including the 3.3V load via ETX®): 150mA (approx.)
- ETX®-mgx: 650..950 mA (approx.)
- ETX®-P1: 2000 mA (approx.)
- ETX®-C3: 2060 .. 2420 mA (approx.)
- ETX®-P3: 2360 .. 3020 mA (approx.)
- DIMM-PC® I/O : 130 .. 450 mA (approx.)
- Hard disc: 500mA (approx.)
- Compact Flash: 300 mA (approx.)
- SIDE: 500 mA (approx.)
- USB load: 1000mA (approx.)
- Line-driver activity: 40mA
- Floppy: 20 .. 250 mA
- CPU fan: 100mA

3.3 Environmental Specifications

3.3.1 Temperature

- Operating: 0 to + 60°C (with appropriate air flow*)
- Nonoperating: -10 to + 85 ° C

3.3.2 Humidity

- Operating: 10% to 90% (noncondensing)
- Nonoperating: 5% to 95% (noncondensing)

Note: **The max. operating temperature is the maximum measurable temperature on any spot on a module's surface. It is your responsibility to maintain this temperature within the specification, which is set by the chip manufacturer.*

3.3.3 Temperature Table

Part	Type / Spec	Min	Max
U1	ULTC1735	0	85
U2	USI4850EY	-55	150
U3	USI4850EY	-55	150
U102	USI4850EY	-55	150
U103	USI4850EY	-55	150
C60	C330u6VESR	-55	125
C61	C330u6VESR	-55	125
C260	C330u6VESR	-55	125
C261	C330u6VESR	-55	125
U45	UWOBXP003	0	70
U301	FST3253QSC	-40	85
U4	UMAX211E	0	70
U5	UMAX211E	0	70
U6	UMIC2526	-40	85
U9	UDM9102AT	0	85
U10	UDM9102AT	0	85
Q1	Q25M0SMDF	-10	60
Q2	Q25M0SMDF	-10	60
U7	U93C46SC27	0	70
U8	U93C46SC27	0	70
L15	L_PH163112	0	70
L16	L_PH163112	0	70
L17	L_PH163112	0	70

Note: - Don't forget the additional parts (harddisk, compact flash, DIMM-PC®/IO etc.)
 - Don't forget the max. temperature of the add on parts like harddisk, compact flash card, etc. .

4 Ethernet-Controller Interface

Combining a microSERVER board, an ETX® board, and an optional DIMM-PC® I/O module allows you to create a reliable router, gateway, hub or server with up to four Ethernet connections, which allows you to split your network into smaller and faster segments.

The microSERVER board comes with two Ethernet connections. The ETX® board comes with one Ethernet connector, while a microSERVER board mounted with a DIMM-PC® I/O module can give you a fourth Ethernet connection.

For a peer to peer network we recommend a hub.

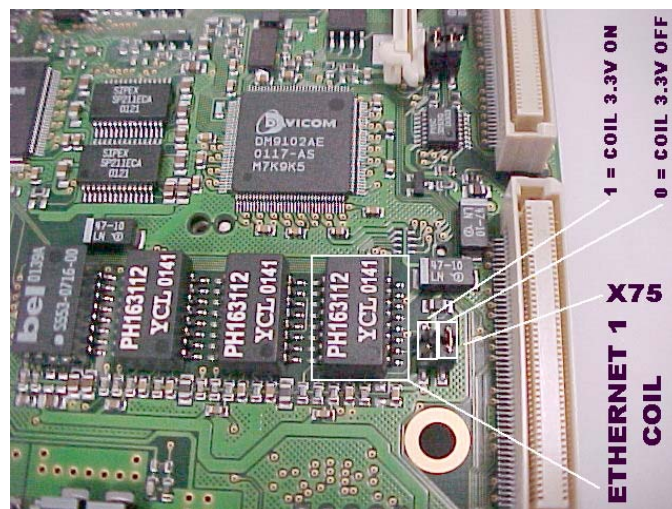
4.1 Ethernet 1 Connector (X121.A) ETX®

For full performance we recommend a short distance (2m) to a hub.

Please read the product-specific ETX® manual for information about the Ethernet 1 controller used on the ETX® board. The loading coil for the Ethernet interface sits on the microSERVER. Depend on the ethernet controller on the ETX® you must connect 3.3V to the loading coil or not.

Other information:

- Optional jumper (X75) for power supply (3.3V) to the coil
- X75 = 0 => coil open => for Realtek or Intel (ETX®-P1,P3,C3)
- X75 = 1 => 3.3V on coil => for Davicom (ETX®-MGX,P3E,C3E)



4.2 Configuration

The Ethernet 1 interface on the ETX® board is a PCI device. The BIOS setup automatically configures it during configuration of the PCI device.

4.3 Ethernet 2 and 3 Connectors (X121.B and X121.C) microSERVER

The microSERVER features two Davicom DM9102AT 10Base-T/100Base-TX LAN fully integrated, single-chip Fast Ethernet NIC controllers. A 3.3V device with 5V tolerance supports 3.3V and 5V signaling.

The DM9102AT provides direct interface to the PCI or the CardBus. It supports busmaster capability and complies with the PCI 2.2 standard. On the media side, the DM9102AT interfaces to the UTP3,4,5 in 10Base-T and UTP5 in 100Base-TX. It complies with the IEEE 802.3u specification. Its auto-negotiation function can automatically configure the DM9102AT to take maximum advantage of its abilities. The DM9102AT also supports the IEEE 802.3x full-duplex flow control.

4.4 Configuration

The Ethernet 2 & 3 interface on the ETX® board are PCI devices. The BIOS setup automatically configures it during configuration of the PCI device.

4.5 Ethernet 4 Connector (X121.D) DIMM-PC® I/O

You can add a fourth Ethernet interface on the microSERVER by adding one of the following DIMM-PC® I/O modules to the microSERVER board:

- DIMM-PC®/ETN
- DIMM-PC®/ETIS

The loading coil for the Ethernet interface is on the microSERVER. For more information please refer to the corresponding DIMM-PC®/IO manual.

4.6 Configuration

For more information, please read the documentation in the manual for the product-specific DIMM-PC® I/O module.

4.7 Software and Driver Setup

Please refer to the corresponding readme files and setup/install files.

4.8 Ethernet Technical Support

You can solve some Ethernet problems by using the latest drivers for the various Ethernet controllers. Kontron provides you with the latest tested drivers on its Web site.

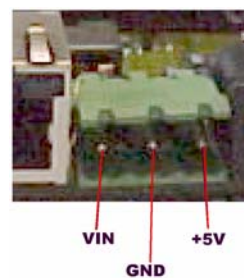
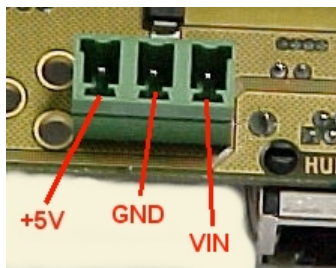
5 Power-Supply Interface

5.1 Connector (X12 and X13)

To find the locations of Connectors X12,X13 and X14, please see the Connector Layout chapter.

Pin	Signal	Remark
1	VIN	Supply Voltage 9..32V
2	GND	GND
3	+5V	Do not connect. Option Pin

5.1.1 Pin Locations



5.1.2 Configuration

Manufacturer	Description	Order Code	Device
PHOENIX CONTACT	Plug-in direction parallel to the conductor axis for X12 or X13	17 57 02 2	XMSTB 2,5/3-ST-5,08
PHOENIX CONTACT	Plug-in direction parallel to the conductor axis for X14	18 36 08 2	XMC 1,5/3-ST-5,08

5.2 Connector (X11)

To find the locations of Connector X11, please see the Connector Layout chapter.

Pin	Signal
1	VIN
2	GND

5.2.1 Pin Locations



5.2.2 Configuration

Manufacturer	Description	Order Code
CLIFF Electronic	Low voltage DC power connector DCCP1 pin diameter 2.1 mm	DCCP1

5.2.3 Signal Descriptions

VIN

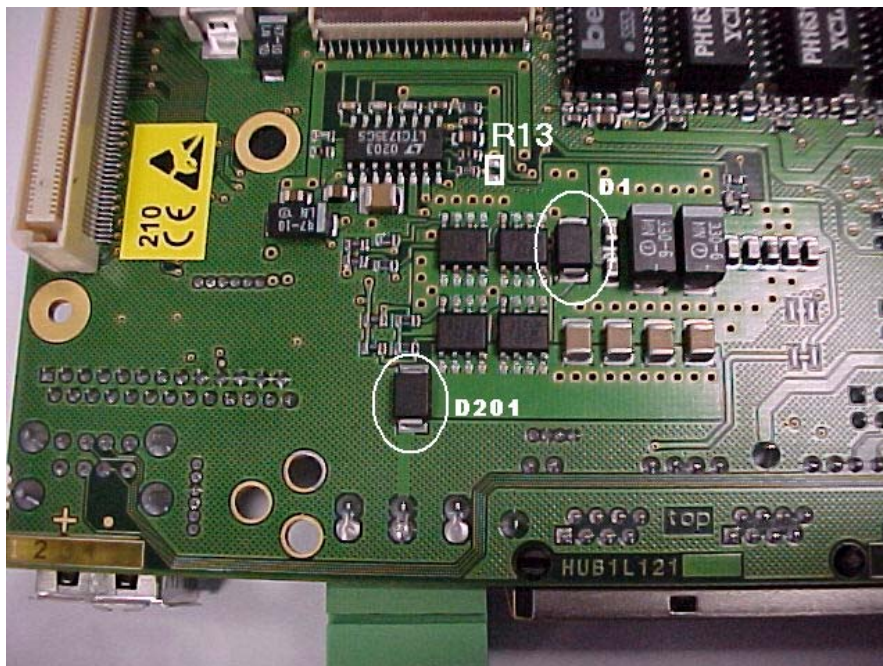
This signal is available on Connector X12 and on Connectors X11 and X13 as options. In normal use, the +5V is not connected.

Note: The power supply to the VIN is 9..32V=+-10%.

The current depends upon the CPU used by the ETX® board.

If you connect the VIN incorrectly, diode D201 limits it to -0.7V. In case of false, please check this diode:

D201 MBR51100T3, which is placed near the 4 FETs (Si4850) on the DC/DC converter.



5V

In normal use this signal is not connected.

6 Fan Interface

6.1 Connector (X15)

This is a connection for a 5V fan. You must have an external connection for a 12V fan. The maximum load is 500mA. Please check the overall power consumption of the microSERVER.

To find the location of Connector X15, see the Connector Layout chapter.

Pin	Signal
1	+5V
2	GND
3	+5V
4	GND

6.1.1 Configuration

You can order one of the following pieces of equipment.

Manufacturer	Ordering Code	Description
MOLEX	50058-8100	Crimp terminal
SPOERLE	347323	Crimp terminal
RS Components	279-9544	Crimp terminal with wire
MOLEX	51021-400	MOLEX Wire-to-Board (4 pos.)
RS Components	279-9162	Recaptacle Housing 1.25mm (.49") Pitch

7 VGA Interface

7.1 Connector (X71)

Kontron recommends using a KAB-VGA 2 cable for this connector, which is an adapter to a standard HDSUB15 cable. Monitor detection is not supported. VGA signals DDCK and DDDA are not supported.

To find the locations of Connector X71, please see the Connector Layout chapter.

Pin	Signal
1	RED
2	GREEN
3	BLUE
4	GND
5	VSNC
6	HSNC

7.1.1 Configuration

Manufacturer	Ordering Code	Description
MOLEX	50058-8100	Crimp terminal
SPOERLE	347323	Crimp terminal
RS Components	279-9544	Crimp terminal with wire
MOLEX	51021-600	MOLEX Wire-to-Board (6 pos.)
RS Components	279-9178	Recaptacle Housing 1.25mm (.49") Pitch

8 USB Interface

8.1 Connector (X51)

The microSERVER provides two USB ports. The USB interface is a standard connection with overcurrent protection. The maximum load is 500mA. Please check the overall power consumption of the microSERVER. For the bus compatibility and controller type please refer the ETX® manual.

To find the locations of Connector X51, please see the Connector Layout chapter.

8.1.1 Configuration

The plug is an USB connector type A.

9 Parallel-Port Communication Interface

9.1 Connector (X78)

Kontron recommends using an ADA-LPT-1 cable for this connector, which is an adapter to a standard DSUB25 cable. If the parallel port is used in parallel-port mode, floppy-disk support is unavailable.

To find the locations of Connector X78, please see the Connector Layout chapter.

Pin	Pin Name	Pin as Floppy	Pin as Printer
1	VCC	VCC	VCC
2	PDO_INDEX	INDEX#	PDO
3	VCC	VCC	VCC
4	ACK_DRV1#	DRV1	/ACK
5	VCC	VCC	VCC
6	PD4_DSKCHG	DSKCHG#	PD4
7	PD5		PD5
8	AFD_DENSEL	DENSEL	/AFD
9	PD6_MOT0	MOT0	PD6
10	/BUSY_MOT1	MOT1	/BUSY
11	PD7		PD7
12	/INIT_DIR	DIR#	/INIT
13	/STB_DRV0	DRV0	/STB
14	/SLIN_STEP	STEP#	/SLIN
15	LPT/FLPY#	GND	N.C.
16	PE_WDATA	WDATA#	PE
17	GND	GND	GND
18	/SLCT_WGATE	WGATE#	/SLCT
19	GND	GND	GND
20	PD1_TRK0	TRK0#	PD1
21	GND	GND	GND
22	PD2_WP	WP#	PD2
23	GND	GND	GND
24	PD3_RDATA	RDATA#	PD3
25	GND	GND	GND
26	/ERR_HDSEL	HDSEL#	/ERR

9.1.1 Configuration

If you do not use the ADA-LPT-1, then please use one of the following cables as a connector.

Device Name	POS	Length	Pitch	Type	Ohm	Manufacturer	Order #
MCAB26x300A10	26	300mm	1mm	Type A	< 1.9	YOUNGSHIN (EFCO)	MCAB26X300A10
MCAB26x300A10	26	300mm	1mm	Type A	< 1.9	YOUNGSHIN (EFCO)	HV6X026A03000MM
MCAB26x300A10	26	300mm	1mm	Type A	< 1.9	AXON	FFC 1.00A26/292L-4-4-08-08 SA

9.1.2 Signal Description

LPT/FLPY#

This signal selects whether the LPT or floppy interface will be used with ETX® interface. The following signals are multifunctional. Depending on the level of the signal, LPT/FLPY# LPT interface (LPT/FLPY#: nc., default) or floppy-interface (LPT/FLPY#: low) is used.

/STB

This active low pulse strobes printer data into the printer.

/AFD

This active low output causes the printer to automatically feed one line after each line is printed.

PDO..7

This bi-directional, parallel-data bus transfers information between the CPU and peripherals.

/ERR

This active low signal indicates an error situation at the printer.

/INIT

This active low signal initiates the printer when low.

/SLIN

This active low signal selects the printer.

/ACK

This active low output from the printer indicates it has received the data and is ready to receive new data.

/BUSY

This signal indicates the printer is busy and not ready to receive new data.

PE

This signal indicates that the printer is out of paper.

/SLCT

This active high output from the printer indicates that it has power on.

10 Floppy-Drive Interface

10.1 Connector (X78)

Kontron recommends using an ADA-FLOPPY-2 + KAB-FI-2 for this connector, which is an adapter to a standard 34 pin connector. Also ADA-LPT-1 is possible. You can only use a single floppy drive.

Note: When operating in floppy-disk mode, the parallel port is unavailable.

To find the locations of Connector X78, please see the Connector Layout chapter.

Pin	Pin Name	Pin as Floppy	Pin as Printer
1	VCC	VCC	VCC
2	PDO_INDEX	INDEX#	PDO
3	VCC	VCC	VCC
4	ACK_DRV1#	DRV1	/ACK
5	VCC	VCC	VCC
6	PD4_DSKCHG	DSKCHG#	PD4
7	PD5		PD5
8	AFD_DENSEL	DENSEL	/AFD
9	PD6_MOT0	MOT0	PD6
10	/BUSY_MOT1	MOT1	/BUSY
11	PD7		PD7
12	/INIT_DIR	DIR#	/INIT
13	/STB_DRV0	DRV0	/STB
14	/SLIN_STEP	STEP#	/SLIN
15	LPT/FLPY#	GND	N.C.
16	PE_WDATA	WDATA#	PE
17	GND	GND	GND
18	/SLCT_WGATE	WGATE#	/SLCT
19	GND	GND	GND
20	PD1_TRK0	TRK0#	PD1
21	GND	GND	GND
22	PD2_WP	WP#	PD2
23	GND	GND	GND
24	PD3_RDATA	RDATA#	PD3
25	GND	GND	GND
26	/ERR_HDSEL	HDSEL#	/ERR

10.1.1 Configuration

Device Name	POS	Length	Pitch	Type	Ohm	Manufacturer	Order #
MCAB26x300A10	26	300mm	1mm	Type A	< 1.9	YOUNGSHIN (EFCO)	MCAB26X300A10
MCAB26x300A10	26	300mm	1mm	Type A	< 1.9	YOUNGSHIN (EFCO)	HV6X026A03000MM
MCAB26x300A10	26	300mm	1mm	Type A	< 1.9	AXON	FFC 1.00A26/292L-4-4-08-08 SA

10.1.2 Signal Description

LPT/FLPY#

This signal selects whether the LPT or floppy interface will be used with the ETX® interface. The following signals are multifunctional. Depending on the level of the signal, LPT/FLPY# LPT interface (LPT/FLPY#: nc., default) or floppy-interface (LPT/FLPY#: low) is used.

DENSEL

This signal indicates whether a low (250/300Kb/s) or high (500/1000Kbs) data rate has been selected.

INDEXJ

This active low Schmitt Trigger input signal senses from the disk drive that the head is positioned over the beginning of a track as marked by an index hole.

TRK0J

This active low Schmitt Trigger input signal senses from the disk drive that the head is positioned over the outermost track.

WPJ

This active-low Schmitt Trigger input signal senses from the disk drive that a disk is write-protected.

RDATAJ

The active-low raw data read signal from the disk is connected here. Each falling edge represents a flux transition of the encoded data.

DSKCHGJ

This disk interface input indicates when the disk-drive door has been opened. This active-low signal is read from bit D7 of location base+7.

MOTO

This active-low outputs select motor drives 0.

HDSELJ

This active low output determines which disk drive head is active.

- Low = Head 0
- High (open) = Head 1

DIRJ

This active low output determines the direction of the head movement.

- Low = step-in
- High = step-out

STEPJ

This active low output signal produces a pulse at a software-programmable rate to move the head during the seek operation.

WDATAJ

This active low output is a write-precompensated serial data to be written onto the selected disk drive. Each falling edge causes a flux change on the media.

WGATEJ

This active-low, high-drive output enables the write circuitry of the selected disk drive.

11 PS/2 Keyboard, Mouse and Feature Interface

11.1 Connector (X65)

Kontron recommends using an ADA-PS/2-1 cable for this connector, which is an adapter to a standard PS/2 keyboard. If you need a PS/2 mouse, you can use a standard Y-cable. The maximum load is 200mA on VCC. Please check the overall power consumption of the microSERVER. All signals are not fused.

To find the locations of Connector X65, please see the Connector Layout chapter.

Pin	Signal
1	KBDAT
2	MSDAT
3	GND
4	VCC
5	KBCLK
6	MSCLK

11.1.1 Configuration

If you not use the ADA-PS/2-1, please use one of the following connectors.

Manufacturer	Ordering Code	Description
MOLEX	50058-8100	Crimp terminal
SPOERLE	347323	Crimp terminal
RS Components	279-9544	Crimp terminal with wire
MOLEX	51021-600	MOLEX Wire-to-Board (6 pos.)
RS Components	279-9178	Recaptacle Housing 1.25mm (.49") Pitch

11.1.2 Signal Descriptions

KBDAT

This is the bi-directional keyboard data signal.

KBCLK

This is the keyboard clock signal.

MSDAT

This is the bi-directional mouse data signal.

MSCLK

This is the mouse clock signal.

VCC/GND

This is the 5V power supply for the keyboard and mouse. Max. load is 200 mA.

11.2 Feature Connector (X76)

To find the locations of Connector X76, please see the Connector Layout chapter.

Pin	Signal	Pin	Signal
1	Speaker-	2	PowerLED-
3	SpeakerGND	4	PowerLED+
5	SpeakerGND	6	ResetGND
7	Speaker+	8	ResetIN
9	HDLED+	10	HDLED-
11	I2CLK	12	I2GND
13	I2DAT	14	I2+5V

11.2.1 Configuration

This connector is for different plugs. The grid of the connector is 100mil (2.54mm).

The pins are square 25.2mil (0.64mm).

11.2.2 Signal Descriptions

Speaker+/Speaker-

Connection for the speaker. Source impedance is 75 Ohm.

SpeakerGND

Optional GND.

PowerLED+

620 Ohm resistor to +5V. Connect the power on the LED anode here.

PowerLED-

GND. Connect the power on the LED cathode here.

HDLED+

470 Ohm resistor to +5V. Connect the activity LED (hard-disk) anode here.

HDLED-

GND via a diode. Connect the activity LED (hard-disk) cathode here.

ResetIN

Input of the ETX® reset.

ResetIGND

GND for the reset button.

I2GND

GND for the I2C-bus interface.

I2+5V

+5V for the I2C-Bus interface.

The maximum load is 500mA. Please check the overall power consumption of the microSERVER.

I2DAT

Data line for the I2C-bus interface.

I2CLK

Clock line for the I2C-Bus interface.

Please read JUMPtec Application Note JAP0012, which you can find on the Kontron Web site. There are examples for I²C bus functions.

12 Serial-Port Interface

All signals on X52 and X54 are RS232 level signals and use standard RS232 interfaces.

Please use the KAB-DSUB9-2 cable to give you a standard RS232 connector.

The TTL signals of Serial Port1—RS232 (COM1 of ETX®)—are routed to the COM3 pins of the DIMM-PC® I/O module as a null modem cable. If you have a DIMM-PC® I/O module that uses this option, than you have to switch off the line driver (U5). There are two ways to switch off the line driver (U5).

- To switch off automatically the line driver (U5) on the microSERVER. The DIMM-PC® I/O module must supply 5V (via a diode and resistor) to Pin 90 of X81 (FPVDD_COMOFF). This is the default for the microSERVER (R501= open and R505= short).
- To switch off the line driver (U5) manually. Please remove R505 and short R501.

For the position of the resistors, please see the placeplan in chapter 20.1 TOP (ETX® Connectors).

The TTL signals of Serial Port 2—RS232 (COM2 of ETX®)—are routed to the COM4 pins of the DIMM-PC®/IO as a null modem cable. If you have a DIMM-PC® I/O that uses this option, than you switch off the line driver (U4). There is one way to switch off the line driver (U4).

- Switch off the line driver (U4) manually. Please short R503.

If you plug in a DIMM-PC® I/O that uses Pin 90 of X81 (FPVDD_COMOFF) for another function, please remove R505.

Here is an example of using such an option:

Switch off line drivers U4 and U5. Please remove R505 and short R501. Short R503. Plug in a DIMM-PC®/COM1. Now you have a null modem connection from COM1 (ETX®) to COM3 (DIMM-PC®/IO) and a null modem connection from COM2 (ETX®) to COM4 (DIMM-PC®/IO), you cannot use RS232 on X52 and X54.

12.1 Connectors (X52 and X54)

The maximum load on VCC is 500mA. Please check the overall power consumption of the microSERVER.

To find the locations of Connectors X52 and 54, please see the Connector Layout chapter.

Pin	Signal
1	DCD (DCD1J,DCD2J)
2	DSR (DSR1J,DSR2J)
3	RXD (RXD1J,RXD2J)
4	RTS (RTS1J,RTS2J)
5	TXD (TXD1J,TXD2J)
6	CTS (CTS1J,CTS2J)
7	DTR (DTR1J,DTR2J)
8	RI (RI1J,RI2J)
9	GND
10	VCC

12.1.1 Configuration

Please use a KAB-DSUB9-2 cable, which is a one-sided, 10-pin DSUB9 male connector, which connects a standard COM device to Kontron board and gives you a standard RS232 connector.

12.1.2 Signal Descriptions

DTR1J, DTR2J

The active low data terminal ready output is for the serial port. The handshake output signal notifies the modem that the UART is ready to establish a data-communication link.

RI1J, RI2J

This active low input is for the serial port. A handshake signal notifies the UART that the telephone-ring signal is detected by the modem.

TXD1, TXD2

The transmitter serial data output from the serial port.

RXD1, RXD2

Receiver serial data input.

CTS1J, CTS2J

This active low input is for serial ports. A handshake signal notifies the UART that the modem is ready to receive data.

RTS1J, RTS2J

This is an active low output for the serial port.

DCD1J, DCD2J

This active low input is for the serial port. A handshake signal notifies the UART that the carrier signal is detected by the modem.

DSR1J, DSR2J

This active low input is for the serial port. A handshake signal notifies the UART that the modem is ready to establish a communication link.

13 Sound-Controller Interface

13.1 Connector (X68)

To find the locations of Connector X68, please see the Connector Layout chapter.

Pin	Signal
1	ASGND
2	SNDL
3	SNDR
4	AUXAL
5	AUXAR
6	MIC
7	MICBV

13.1.1 Configuration

Please use an ADA-SOUND-1 adapter for this connector.

Manufacturer	Ordering Code	Description
MOLEX	50058-8100	Crimp terminal
SPOERLE	347323	Crimp terminal
RS Components	279-9544	Crimp terminal with wire
MOLEX	51021-700	MOLEX Wire-to-Board (7pos.) Recaptacle Housing 1.25mm (.49") Pitch

13.1.2 Signal Descriptions

SNDL / SNDR

Line-level stereo output left / right.

This pin can drive a minimum 10kOhm AC load with a minimum 2.8V_{p-p}.

Note Use an external power amplifier or active speaker with high impedance input.

AUXAL / AUXAR

Auxiliary A input left / right. This is intended for connection to an internal or external CD-ROM analog output. The minimum input impedance is 10kOhm. The maximum input voltage is 0.15V_{p-p}.

MIC

Microphone input. The minimum input impedance is 10kOhm. The maximum input voltage is 0.15V_{p-p}.

MICBV

Analog supply voltage microphone (2.5V impedance 2.6K [$>50\text{Hz}$] 2.2K [$>1\text{kHz}$]).

ASGND

Analog ground for sound controller. Use this signal as ground of an external amplifier and microphone.

14 IDE-Controller Interface

14.1 Hard-Disk Connector (X92 Primary IDE)

This connector is present on the microSERVER-HDD option and is unavailable on the microSERVER-CFC option.

The maximum load on the VCC is 500mA. Please check the overall power consumption of the microSERVER.

To find the locations of Connector X92, please see the Connector Layout chapter.

Pin	Signal	Pin	Signal
1	HDRSTJ	2	GND
3	PIDE_D7	4	PIDE_D8
5	PIDE_D6	6	PIDE_D9
7	PIDE_D5	8	PIDE_D10
9	PIDE_D4	10	PIDE_D11
11	PIDE_D3	12	PIDE_D12
13	PIDE_D2	14	PIDE_D13
15	PIDE_D1	16	PIDE_D14
17	PIDE_D0	18	PIDE_D15
19	GND	20	
21	PIDE_DRQ	22	GND
23	PIDE_IOWJ	24	GND
25	PIDE_IORJ	26	GND
27	PIDE_RDY	28	
29	PIDE_AKJ	30	GND
31	PIDE_INTRQ	32	
33	PIDE_A1	34	
35	PIDE_A0	36	PIDE_A2
37	PIDE_CS1J	38	PIDE_CS3J
39	DASP_P	40	GND
41	VCC	42	VCC
43	GND	44	

14.1.1 Configuration

Please use a 2.5" hard disk. Use the jumper on the hard disk to make this hard disk a master (default) or slave. Dependent on the other device on the primary IDE. Please refer the corresponding ETX® manual for other device on the primary IDE interface. Most ETX® have devices only on the secondary IDE interface. Please mount the hard disk with four screws (M3*6) to the PCB.

14.2 IDE Connector (X93 Secondary IDE)

You can use this connector as an optional IDE hard disk on the microSERVER. The maximum load on the VCC is 500mA. Please check the overall power consumption of the microSERVER.

To find the locations of Connector X93, please see the Connector Layout chapter.

Pin	Signal	Pin	Signal
1	HDRSTJ	2	GND
3	SIDE_D7	4	SIDE_D8
5	SIDE_D6	6	SIDE_D9
7	SIDE_D5	8	SIDE_D10
9	SIDE_D4	10	SIDE_D11
11	SIDE_D3	12	SIDE_D12
13	SIDE_D2	14	SIDE_D13
15	SIDE_D1	16	SIDE_D14
17	SIDE_D0	18	SIDE_D15
19	GND	20	
21	SIDE_DRQ	22	GND
23	SIDE_IOWJ	24	GND
25	SIDE_IORJ	26	GND
27	SIDE_RDY	28	
29	SIDE_AKJ	30	GND
31	SIDE_INTRQ	32	
33	SIDE_A1	34	PDIAG_S
35	SIDE_A0	36	SIDE_A2
37	SIDE_CS1J	38	SIDE_CS3J
39	DASP_S	40	GND
41	VCC	42	VCC
43	GND	44	

14.2.1 Configuration

In use of a second 2.5" hard disk, please use a KAB-IDE-2MM cable to connect the 2.5" hard disk to a 2.5" hard-disk interface.

If you use a CD drive, a DVD drive, or a 3.5" hard disk, you will need a KAB-IDE-2MM cable, a ChipDisk-ADA1 adapter, and an external power connector for that drive.

Please configure it as master or slave depend on the other device on the secondary IDE interface. Please refer the corresponding ETX® manual for other device on the secondary IDE interface. Some ETX® have a sun disk as master on the secondary IDE interface.

14.3 Compact Flash (X91 Primary IDE)

This connector is present on the microSERVER-CFC option. The connector is unavailable on the microSERVER-HDD option.

The maximum load on the VCC is 300mA. Please check the overall power consumption of the microSERVER. The CompactFlash card socket does not supply 3.3V.

To find the locations of Connector X91, please see the Connector Layout chapter.

Pin	Signal	Pin	Signal
1	GND	26	GND
2	PIDE_D3	27	PIDE_D11
3	PIDE_D4	28	PIDE_D12
4	PIDE_D5	29	PIDE_D13
5	PIDE_D6	30	PIDE_D14
6	PIDE_D7	31	PIDE_D15
7	PIDE_CS1	32	PIDE_CS3J
8	GND	33	GND
9	GND	34	PIDE_IORJ
10	GND	35	PIDE_IOWJ
11	GND	36	CS_WE#
12	GND	37	PIDE_INTRQ
13	VCC	38	VCC
14	GND	39	CF_MS/SL
15	GND	40	
16	GND	41	HDRSTJ
17	GND	42	PIDE_RDY
18	PIDE_A2	43	
19	PIDE_A1	44	VCC
20	PIDE_A0	45	DASP_P
21	PIDE_D0	46	PDIAG_P
22	PIDE_D1	47	PIDE_D8
23	PIDE_D2	48	PIDE_D9
24		49	PIDE_D10
25	GND	50	GND

14.3.1 Configuration

You can set the CompactFlash as master/slave and writeprotected/writebale.

- Master => R902 = short (0 Ohm) (default)
- Slave => R902 = open
- Writebale => R900 = short & R901 = open (default)
- Writeprotected => R900 = open & R901 = short



Note: The microSERVER uses a standard compact flash socket type II to connect a CompactFlash card and microdrive. Please configure it as master (default) or slave depend on the devices on the primary IDE interface. Please refer the corresponding ETX® manual for other device on the primary IDE interface. Most ETX® have devices only on the secondary IDE interface.

14.3.2 Signal Description

PIDE_D0..15/ SIDE_D0..15

Primary / Secondary IDE ATA data bus..

PIDE_A0..2/ SIDE_A0..2

IDE ATA address bus.

PIDE_CS1J/ SIDE_CS1J

IDE Chip Select 1 for device 0. This Chip Select 1 command output pin enables the IDE device to watch the read/write command.

PIDE_CS3J/ SIDE_CS3J

IDE Chip Select 3 for device 1. This Chip Select 3 command output pin enables the IDE device to watch the read/write command.

PIDE_DRQ/ SIDE_DRQ

IDE DMA Request for IDE master. This input pin from the IDE DMA requests the IDE master transfer. It runs active high when in the DMA or Ultra-33 mode and as an inactive low when in PIO mode.

PIDED_AKJ/ SIDED_AKJ

IDE DACKJ for IDE master. This output pin grants the IDE DMA request to begin the IDE master transfer in DMA or Ultra-33 mode.

PIDE_RDY/ SIDE_RDY

IDE Ready. This input pin from the IDE Channel indicates that the IDE device is ready to terminate the IDE command in PIO mode. The IDE device can de-assert this input (logic 0) to expand the IDE command if the device is not ready. In Ultra-33 mode, this pin has different functions. In read cycle, the IDE device will drive this signal as Data Strobe (DSTROBE) to be used by the IDE busmaster to strobe the input data. In write cycles, this pin is used by IDE device to notify the IDE busmaster as DMA ready (DDMARDYJ).

PIDE_IORJ/ SIDE_IORJ

This IDE IORJ command output pin tells the IDE device to assert the read data in PIO and DMA mode. In the Ultra-33 mode, this pin has a different function. In read cycle, the IDE busmaster uses the pin to signal an IDE device as DMA Ready (DDMARDYJ). In the write cycle, the IDE busmaster will drive this signal as Data Strobe (DSTROBE) to use the IDE device to strobe the output data.

PIDE_IOWJ/ SIDE_IOWJ

The IDE IOWJ command output pin notifies the IDE device that the available write data is already asserted by IDE busmaster in PIO and DMA mode. In Ultra-33 mode, this pin is driven by IDE busmaster to force an IDE device to terminate its current transaction. After receiving this input, the IDE device will de-assert DRQ to STOP current transaction.

PIDE_INTRQ/ SIDE_INTRQ

Interrupt signal.

HDRSTJ

Low active hardware reset (RSTDRV inverted).

DASP_P/DASP_S

Time-multiplexed, open-collector output that indicates that a drive is active, or that a slave drive is present. This signal is necessary to use the IDE master/slave mode.

PDIAG_S

Output by the drive if it is configured in the slave mode; input to the drive if it is configured in the master mode. The signal indicates to the master that the slave has passed its internal diagnostic command. This signal is necessary to use the IDE master/slave mode on the secondary IDE channel.

CF_MS/SL

Master or slave selection of the Compact Flash.

- 0 = Master (default)
- 1 = Slave

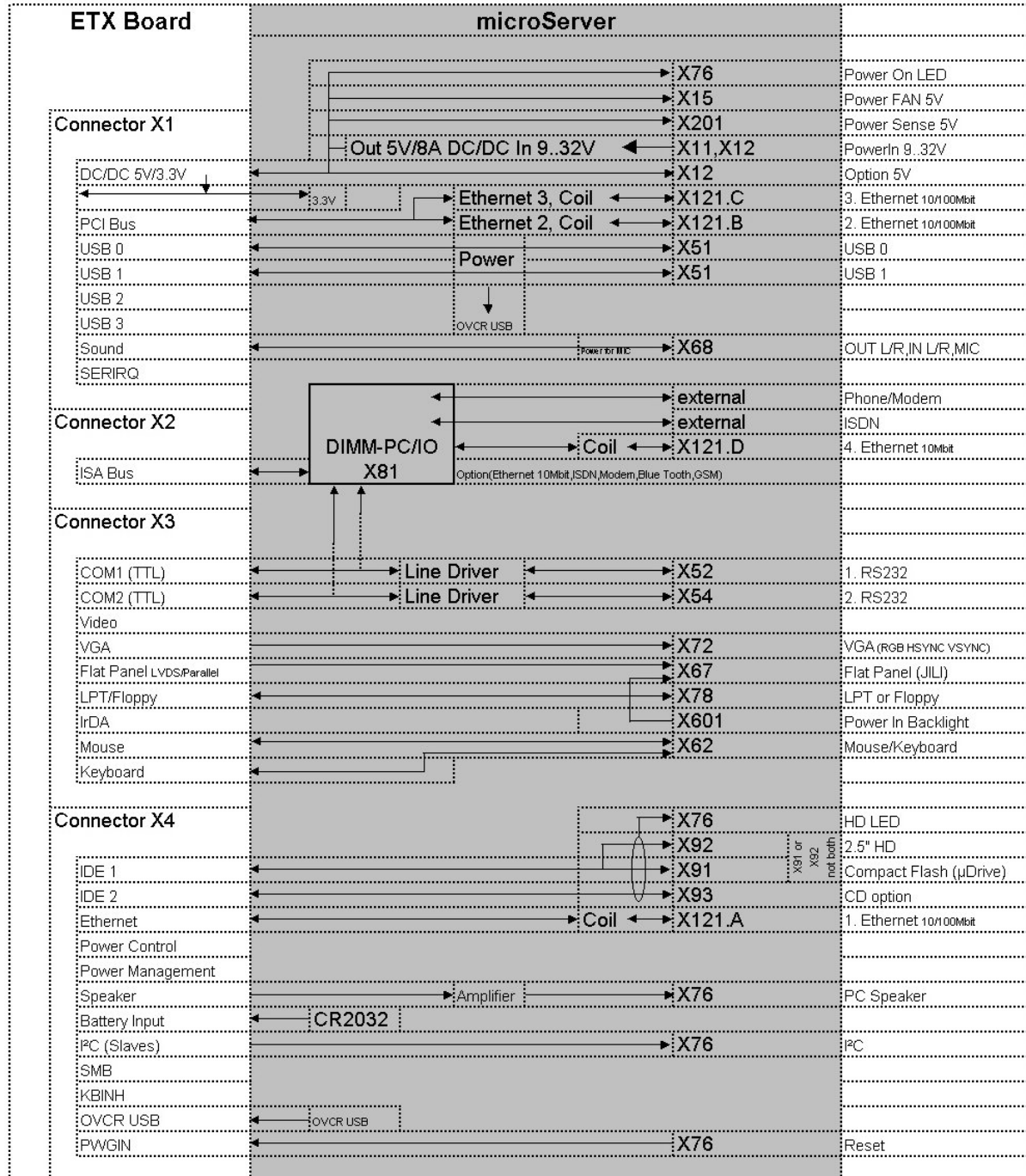
CS_WE#

Write protects the CompactFlash.

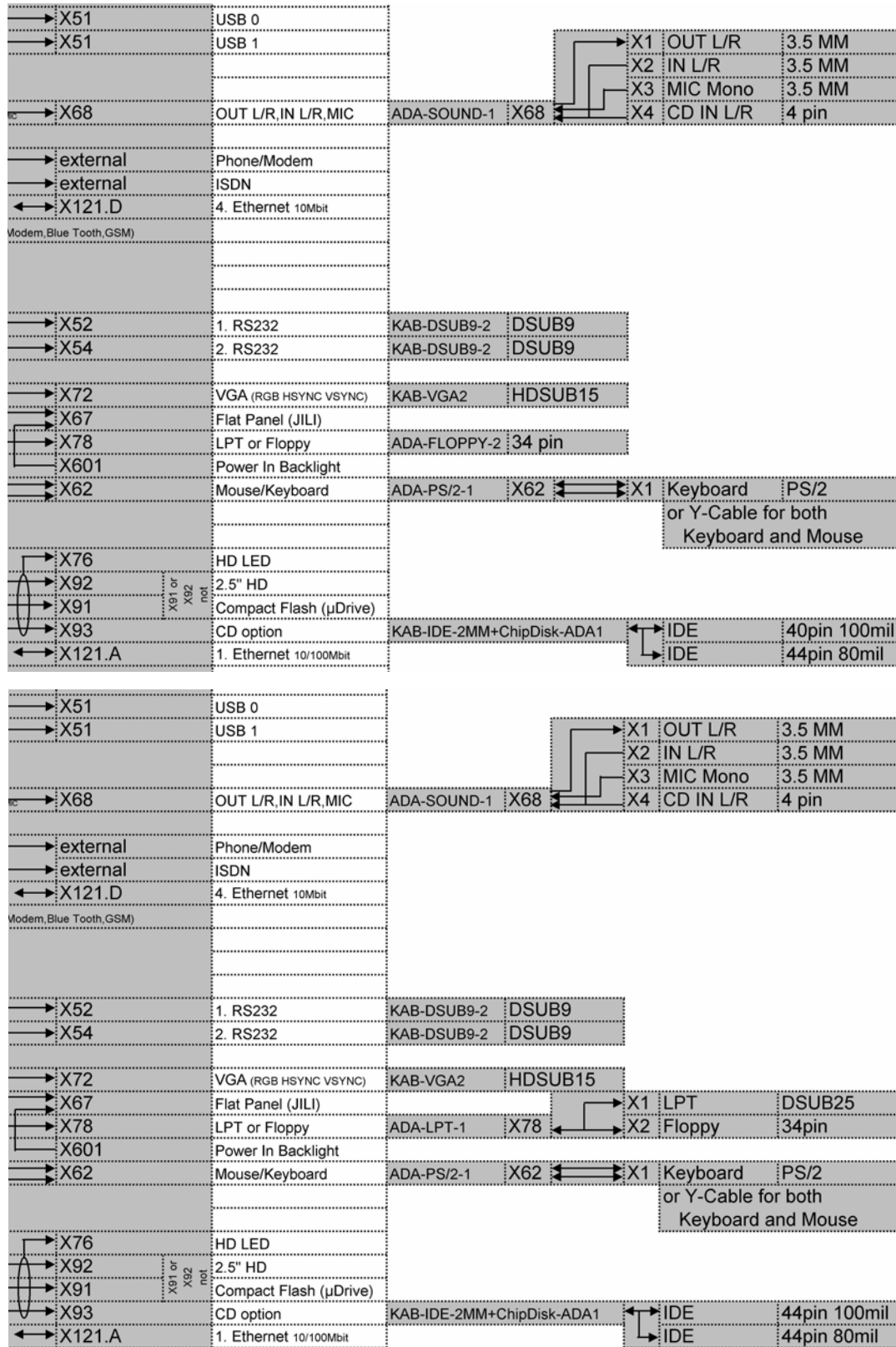
- 0 = write protected
- 1 = read/write

15 Appendix A: Block Diagram

15.1 ETX® and microSERVER



15.2 Adapter



16 Appendix B: Resources

For information on resources used on ETX® and DIMM-PC® I/O boards, please see the product-specific manuals that are available on the JUMPt^{ec} Web site. Most resources are used on the ETX® boards.

Resources used by the microSERVER include two Ethernet controllers (2 and 3.)

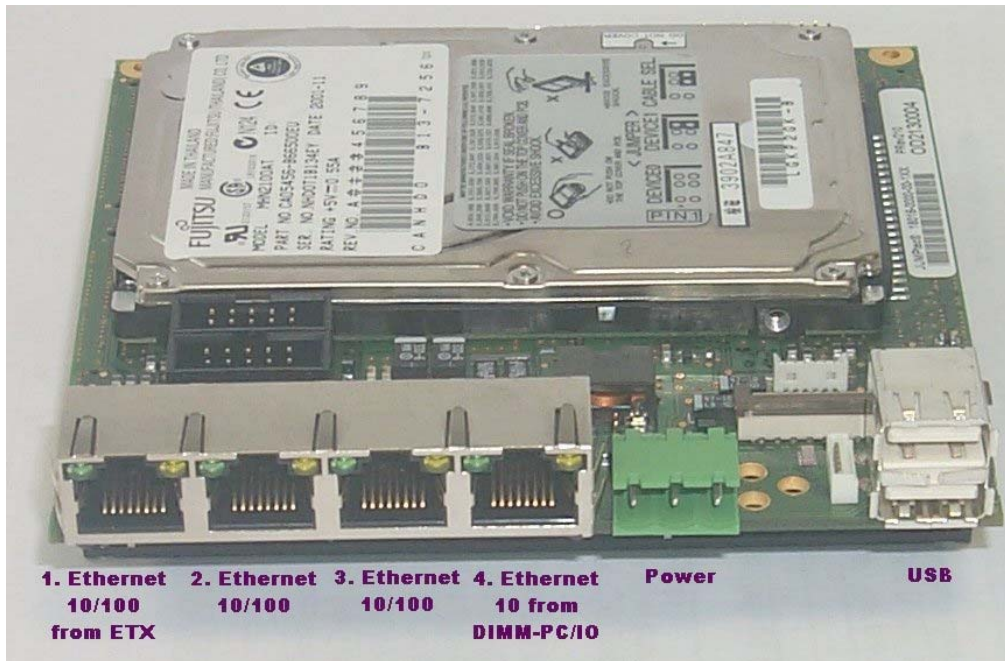
- Ethernet 2 is a PCI device that uses INTA as the interrupt, AD19 as IDSEL, and PCICLK1 as the clock.
- Ethernet 3 is a PCI device that uses INTB as the interrupt, AD20 as IDSEL, and PCICLK2 as the clock.

Both Ethernet controllers use one busmaster, which you can select via a jumper.

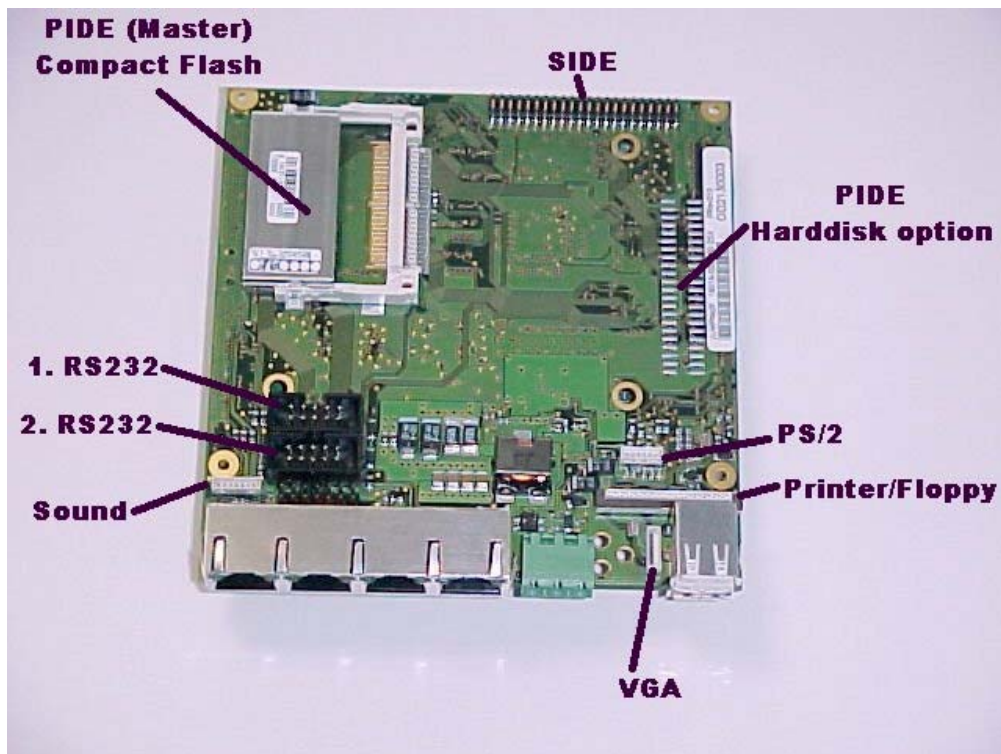
Default is REQ0/GNT0.

17 Appendix C: Views

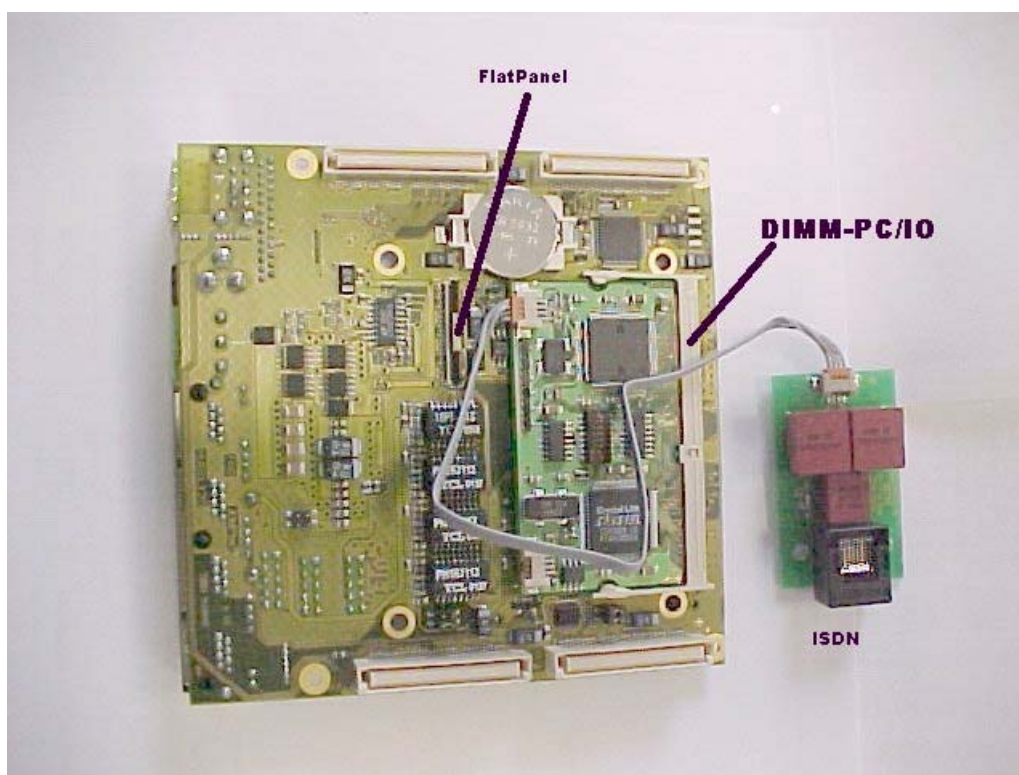
17.1 Front Side



17.2 Bottom Side

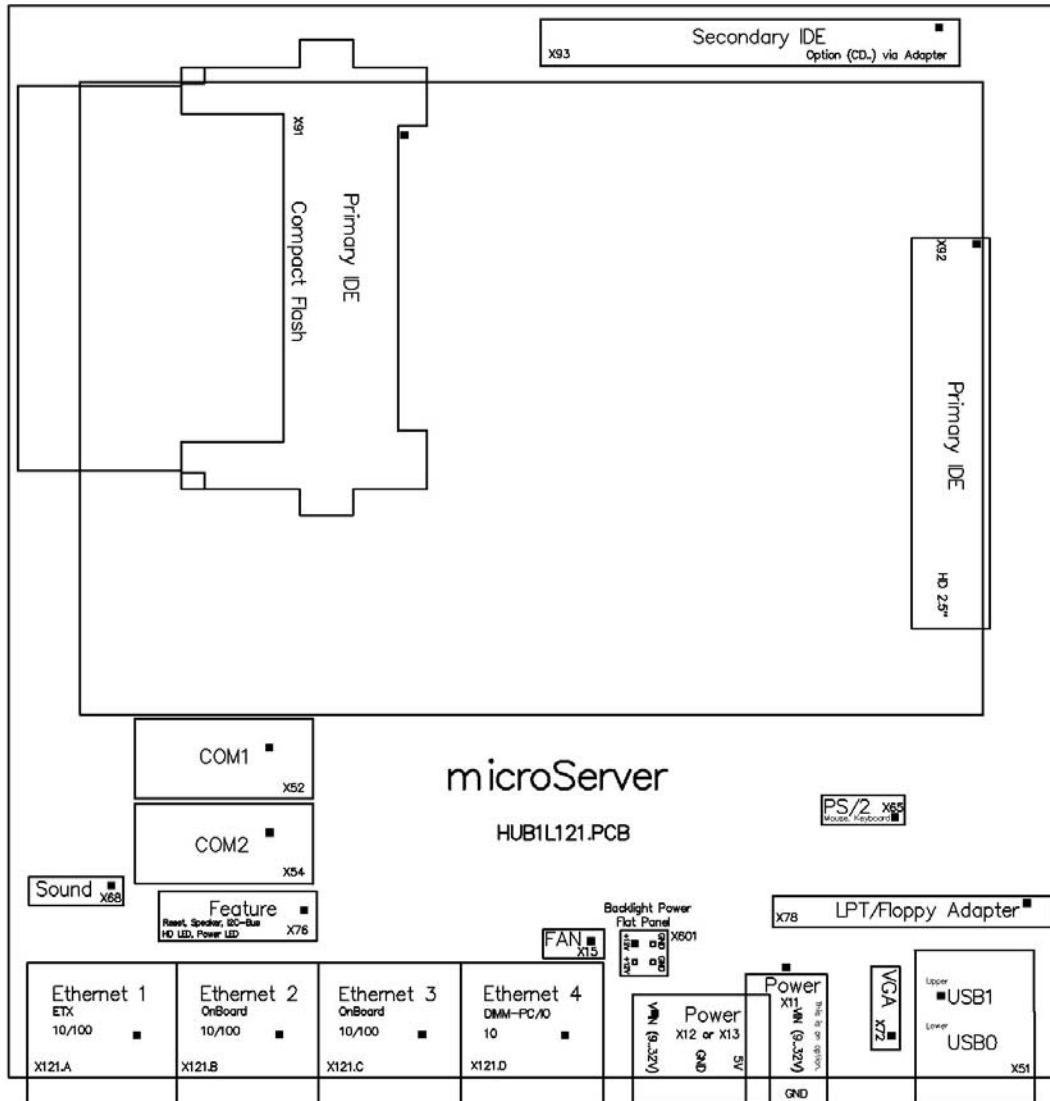


17.3 Top Side

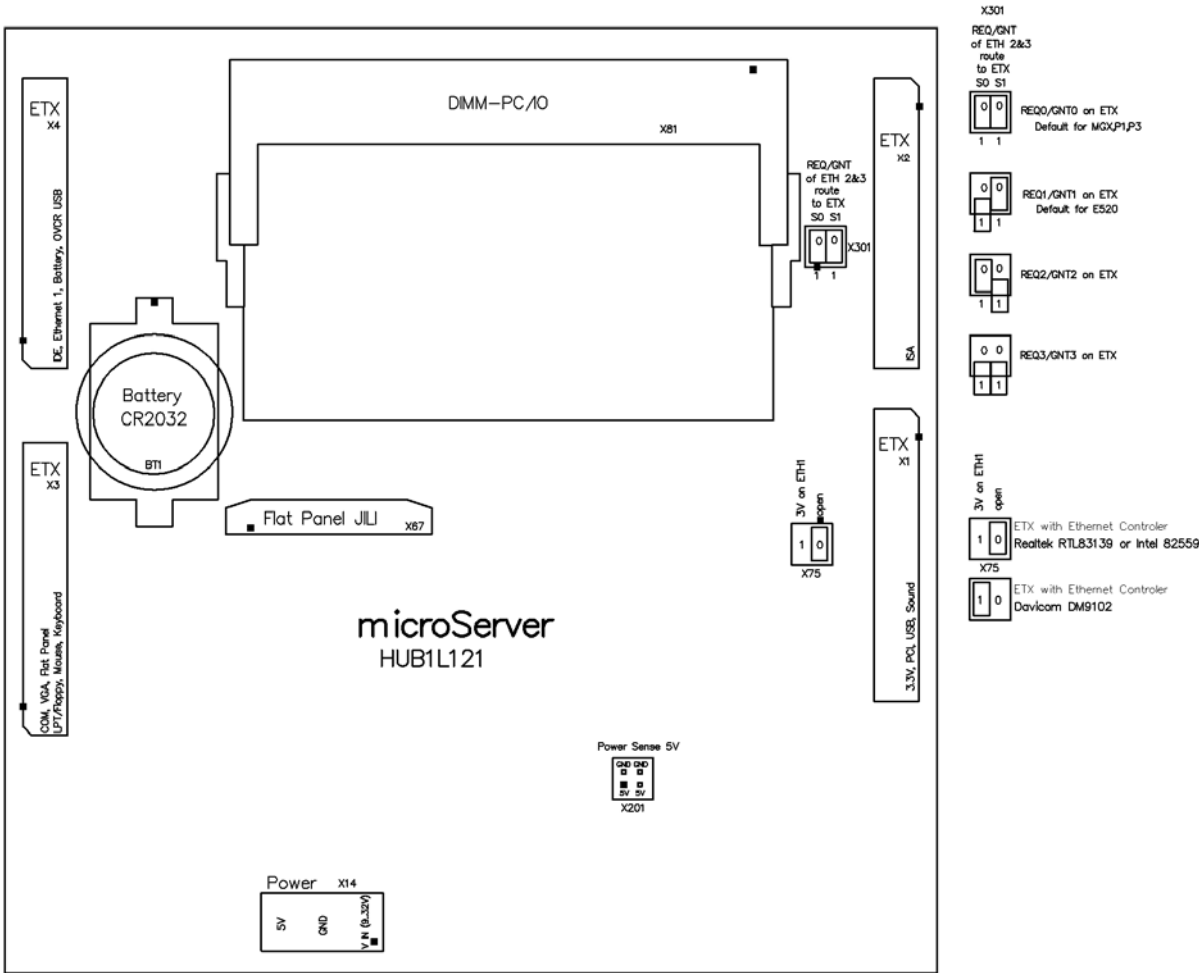


18 Appendix D: Connectors

18.1 Bottom Side (Ethernet Connectors)



18.2 Top (ETX®)



18.3 Connector Table

Side	Connector	Name	Description	Connector Type
Top	X1	ETX®	Source of PCI Bus for Ethernet 2 & 3 X121.B & X121.C Source of USB 0 & 1 for X51 Source of sound for X68 (ADA-SOUND-1=3*3.5mm) Source of 3.3V for Ethernet (U45,U9,U10)	Connector for the ETX®
Top	X2	ETX®	Source of ISA Bus for DIMM-PC® I/O (X81)	Connector for the ETX®
Top	X3	ETX®	Source of COM1 for driver U5, X52 or DIMM-PC® I/O (X81) Source of COM2 for driver U4, X54 or DIMM-PC® I/O (X81) Source of VGA for X72 Source of flat panel JILI for X67 Source of LPT/Floppy for X78 (ADA-FLOPPY-2 or ADA-LPT-1=LPT+Floppy) Source of PS/2 Mouse and Keyboard X62 (ADA-PS2/2-1=PS/2)	Connector for the ETX®
Top	X4	ETX®	Source of primary IDE for HD X92 Source of secondary IDE for Compact Flash X91 and CD X93 Source of Ethernet 1 for L15 and X121.A Input for battery BT1 Input for over current of USB	Connector for the ETX®
Top	X81	DIMM-PC®/IO	Option module for ISA Bus from ETX® X2 ISDN via an external connector ETN Ethernet 4 (10Mbit) X121.D ETIS Ethernet 4 (10Mbit) X121.D and ISDN via an external connector And other.	Connector for the DIMM-PC®/IO
Top	X67	Flat Panel	JILI interface from the ETX® X3; please see X601	YOUNGSHIN (EFCO): MCAB26X300A10 HUNG FU (EFCO): HV6X026A03000MM AXON: FFC 1.00A26/292L-4-4-08-08 SA
Top	X201	Power Sense	Connection to 5V and GND; This support sense lines for special power supply. This is an option.	BERG 94270-504 PLASTRON SPTB2-04S3-020-4.0-0
Top	BT1	Battery	Battery for ETX® X4 (CR2032)	CR2032
Top	X301	REQ/GNT route	Route for the REQ/GNT lines of the Ethernet 2 & 3	Bürklin shunt connector 2 mm 40 F 4138
Top	X75	ETH Jumper	3V for Ethernet 1 coil on/off default=off	Bürklin shunt connector 2 mm 40 F 4138
Bottom	X92	HD	Primary IDE from ETX® X4 (not usable with Compact Flash)	2.5" Hard disk
Bottom	X91	Compact Flash	Primary IDE from ETX® X4 (not usable with HD)	Connector type II for compact flash card or microdrive

Bottom	X93	CD option	Secondary IDE from ETX® X4	KAB-IDE-2MM + ChipDisk-ADA1
Bottom	X52	COM1	COM via driver from ETX® X3 to KAB-DSUB9-2	KAB-DSUB9-2
Bottom	X54	COM2	COM via driver from ETX® X3 to KAB-DSUB9-2	KAB-DSUB9-2
Bottom	X76	Featurel	Connector for reset, speaker, HD LED and power LED, I2C bus	Molex 51110-??50 + Mole 50394-8100
Bottom	X68	Sound	Sound from ETX® X1 to ADA-SOUND-1	ADA-SOUND-1
Bottom	X121A	Ethernet 1	10/100Mbit Ethernet from ETX® X4	Standard Ethernet
Bottom	X121B	Ethernet 2	10/100Mbit Ethernet onboard Davicom (PCI Bus X1)	Standard Ethernet
Bottom	X121C	Ethernet 3	10/100Mbit Ethernet onboard Davicom (PCI Bus X1)	Standard Ethernet
Bottom	X121D	Ethernet 4	10Mbit Ethernet from DIMM-PC® I/O X81 via ISA Bus X2	Standard Ethernet
Bottom	X601	Backlight Power	Connection for the flat panel (X67) input for backlight power supply 12V	Molex 51110-0450 + Molex 50394-8100
Bottom	X12, X13	Power	Power In 9..32V or (5V option if DC/DC switched off)	PHOENIX CONTACT 1757022 XMSTB 2,5/3-ST-5,08
Bottom	X14	Power	Power In 9..32V or (5V option if DC/DC switched off)	PHOENIX CONTACT 18 36 30 9 XMCV 2,5/3-G-5,08
Bottom	X11	Power	Power In 9..32V	CLIFF Electronic pin diameter 2.1 mm DCCP1
Bottom	X15	FAN	CPU fan 5V	Molex 50058-8100 + Molex 51021-400
Bottom	X72	VGA	VGA from ETX® X3 to KAB-VGA-2	HDSUB15
Bottom	X51	USB	USB 0 & 1 from ETX® X1	Type A
Bottom	X78	LPT/Floppy	LPT from ETX® X3 to ADA-FLOPPY-2 (only floppy) or LPT/Floppy from ETX® X3 to ADA-LPT-1 (Floppy or LPT DSUB via jumper)	ADA-Floppy-2 or ADA-LPT-1
Bottom	X65	PS/2	Mouse/Keyboard from ETX® X3 to ADA-PS/2-1 (2*PS/2)	PS/2 keyboard or Y-Cable for keyboard and mouse

18.4 ETX® Connector (X1 and X2)

Connector X1 (PCI-Bus, USB, Sound)					Connector X2 (ISA-Bus)			
Pin	Signal	Pin	Signal		Pin	Signal	Pin	Signal
1	GND	2	GND		1	GND	2	GND
3	PCICLK3*	4	PCICLK4		3	SD14	4	SD15
5	GND	6	GND		5	SD13	6	MASTERJ*
7	PCICLK1	8	PCICLK2		7	SD12	8	DREQ7
9	REQJ3	10	GNTJ3		9	SD11	10	DACKJ7
11	GNTJ2	12	3V		11	SD10	12	DREQ6
13	REQJ2	14	GNTJ1		13	SD9	14	DACKJ6
15	REQJ1	16	3V		15	SD8	16	DREQ5
17	GNTJ0	18	N.C.		17	MEMWJ	18	DACKJ5
19	VCC	20	VCC		19	MEMRJ	20	DREQ0
21	SERIRQ*	22	REQJ0		21	LA17	22	DACKJ0
23	AD0	24	3V		23	LA18	24	IRQ14
25	AD1	26	AD2		25	LA19	26	IRQ15
27	AD4	28	AD3		27	LA20	28	IRQ12
29	AD6	30	AD5		29	LA21	30	IRQ11
31	CBEJ0	32	AD7		31	LA22	32	IRQ10
33	AD8	34	AD9		33	LA23	34	IO16J
35	GND	36	GND		35	GND	36	GND
37	AD10	38	AUXAL		37	SBHEJ	38	M16J
39	AD11	40	MIC		39	SA0	40	OSC
41	AD12	42	AUXAR		41	SA1	42	BALE
43	AD13	44	ASVCC		43	SA2	44	TC
45	AD14	46	SNDL		45	SA3	46	DACKJ2
47	AD15	48	ASGND		47	SA4	48	IRQ3
49	CBEJ1	50	SNDR		49	SA5	50	IRQ4
51	VCC	52	VCC		51	VCC	52	VCC
53	PAR	54	SERRJ		53	SA6	54	IRQ5
55	GPERRJ	56	N.C.		55	SA7	56	IRQ6
57	PMEJ*	58	USB20*		57	SA8	58	IRQ7
59	LOCKJ	60	DEVSELJ		59	SA9	60	SYSCLK
61	TRDYJ	62	USB30*		61	SA10	62	REFSHJ
63	IRDYJ	64	STOPJ		63	SA11	64	DREQ1
65	FRAMEJ	66	USB21*		65	SA12	66	DACKJ1
67	GND	68	GND		67	GND	68	GND
69	AD16	70	CBEJ2		69	SA13	70	DREQ3
71	AD17	72	USB31*		71	SA14	72	DACKJ3
73	AD19	74	AD18		73	SA15	74	IORJ
75	AD20	76	USB00		75	SA16	76	IOWJ
77	AD22	78	AD21		77	SA18	78	SA17
79	AD23	80	USB10		79	SA19	80	SMEMRJ
81	AD24	82	CBEJ3		81	IOCHRDY	82	AEN
83	VCC	84	VCC		83	VCC	84	VCC
85	AD25	86	AD26		85	SD0	86	SMEMWJ
87	AD28	88	USB01		87	SD2	88	SD1
89	AD27	90	AD29		89	SD3	90	NOWSJ
91	AD30	92	USB11		91	DREQ2	92	SD4
93	PCIRSTJ	94	AD31		93	SD5	94	IRQ9
95	INTCJ	96	INTDJ		95	SD6	96	SD7
97	INTAJ	98	INTBJ		97	IOCHKJ	98	RSTDRV
99	GND	100	GND		99	GND	100	GND

Note: *Not connected at the microSERVER.

18.5 ETX® Connector (X3 and X4)

Connector X3 (VGA, LCD, Video, COM1, COM2, LPT/Foppy, IrDA, Mouse, Keyboard)				Connector X4 (IDE 1, IDE2, Ethernet, Feature)			
Pin	Signal	Pin	Signal	Pin	Signal	Pin	Signal
1	GND	2	GND	1	GND	2	GND
3	R	4	B	3	5V_SB*	4	PWGIN
5	HSY	6	G	5	PS_ON*	6	SPEAKER
7	VSY	8	DDCK*	7	PWRBTN*	8	BATT
9	DETECT#	10	DDDA*	9	KBINH*	10	LILED
11	LCDD016	12	LCDD018	11	WDTRIG*	12	ACTLED
13	LCDD017	14	LCDD019	13	ROMKBCSJ*	14	SPEEDLED
15	GND	16	GND	15	EXT_PRG*	16	I2CLK*
17	LCDD013	18	LCDD015	17	VCC	18	VCC
19	LCDD012	20	LCDD014	19	OVCRJ	20	GPCSJ*
21	GND	22	GND	21	EXTSMI*	22	I2DAT*
23	LCDD08	24	LCDD011	23	SMBCLK*	24	SMBDATA*
25	LCDD09	26	LCDD010	25	SIDE_CS3J	26	SMBALRT#*
27	GND	28	GND	27	SIDE_CS1J	28	DASP_S
29	LCDD04	30	LCDD07	29	SIDE_A2	30	PIDE_CS3J
31	LCDD05	32	LCDD06	31	SIDE_A0	32	PIDE_CS1J
33	GND	34	GND	33	GND	34	GND
35	LCDD01	36	LCDD03	35	PDIAG_S	36	PIDE_A2
37	LCDD00	38	LCDD02	37	SIDE_A1	38	PIDE_A0
39	VCC	40	VCC	39	SIDE_INTRQ	40	PIDE_A1
41	LTGIO2	42	LTGIO0	41	N.C.	42	N.C.
43	LTGIO1	44	BLON#	43	SIDE_AKJ	44	PIDE_INTRQ
45	BIASON	46	DIGON	45	SIDE_RDY	46	PIDE_AKJ
47	COMP*	48	Y*	47	SIDE_IORJ	48	PIDE_RDY
49	SYNC*	50	C*	49	VCC	50	VCC
51	LPT/FLPY#	52	N.C.*	51	SIDE_IOWJ	52	PIDE_IORJ
53	VCC	54	GND	53	SIDE_DRQ	54	PIDE_IOWJ
55	/STB_DRV0	56	/AFD_DENSEL	55	SIDE_D15	56	PIDE_DRQ
57	FIR*	58	PD7	57	SIDE_D0	58	PIDE_D15
59	IRRX*	60	/ERR_HDSELJ	59	SIDE_D14	60	PIDE_D0
61	IRTX*	62	PD6_MOT0	61	SIDE_D1	62	PIDE_D14
63	RXD2	64	/INIT_DIRJ	63	SIDE_D13	64	PIDE_D1
65	GND	66	GND	65	GND	66	GND
67	RTS2J	68	PD5	67	SIDE_D2	68	PIDE_D13
69	DTR2J	70	/SLIN_STEPJ	69	SIDE_D12	70	PIDE_D2
71	DCD2J	72	PD4_DSKCHGJ	71	SIDE_D3	72	PIDE_D12
73	DSR2J	74	PD3_RDATAJ	73	SIDE_D11	74	PIDE_D3
75	CTS2J	76	PD2_WPJ	75	SIDE_D4	76	PIDE_D11
77	TXD2J	78	PD1_TRK0J	77	SIDE_D10	78	PIDE_D4
79	RI2J	80	PD0_INDEXJ	79	SIDE_D5	80	PIDE_D10
81	VCC	82	VCC	81	VCC	82	VCC
83	RXD1	84	/ACK_DRV1	83	SIDE_D9	84	PIDE_D5
85	RTS1J	86	/BUSY_MOT1	85	SIDE_D6	86	PIDE_D9
87	DTR1J	88	PE_WDATAJ	87	SIDE_D8	88	PIDE_D6
89	DCD1J	90	/SLCT_WGATEJ	89	GPE2#*	90	CBLID_P#*
91	DSR1J	92	MSCLK	91	RXD-	92	PIDE_D8
93	CTS1J	94	MSDAT	93	RXD+	94	SIDE_D7
95	TXD1	96	KBCLK	95	TXD-	96	PIDE_D7
97	RI1J	98	KBDAT	97	TXD+	98	HDRSTJ
99	GND	100	GND	99	GND	100	GND

18.6 ETX® Signals

Below is a list of signals used with the microSERVER and the product-specific ETX® board. For a full list of pin descriptions, please see the product-specific ETX® manual.

PCICLK1

Used for Ethernet 2 (microSERVER).

PCICLK2

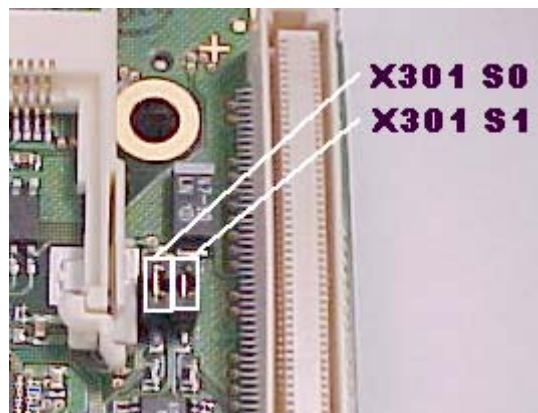
Used for Ethernet 3 (microSERVER).

PCICLK4

Used for busmaster patch.

REQ/GNT

All REQ/GNT signals are connected to a router circuit. You can choose from two jumpers (X301) to select a REQ/GNT signals. The ETX® board must support one free REQ/GNT pair. Set the jumper to this signal. In front of the router is the busmaster patch (splitter). This EPLD splits one REQ/GNT pair into two REQ/GNT pairs, creating two busmasters. Ethernet 2 and Ethernet 3 use the busmasters.



X301.S1	X301.S0	REQ/GNT of Ethernet 2 & 3 to ETX®
0 Jumper present	0 Jumper present	REQ/GNT0 use for MGX,P1,P3 (default)
0 Jumper present	1 Jumper not present	REQ/GNT1
1 Jumper not present	0 Jumper present	REQ/GNT2
1 Jumper not present	1 Jumper not present	REQ/GNT3

AD19

Used as IDSEL for Ethernet 2.

AD20

Used as IDSEL for Ethernet 3.

INTA

Used for Ethernet 2.

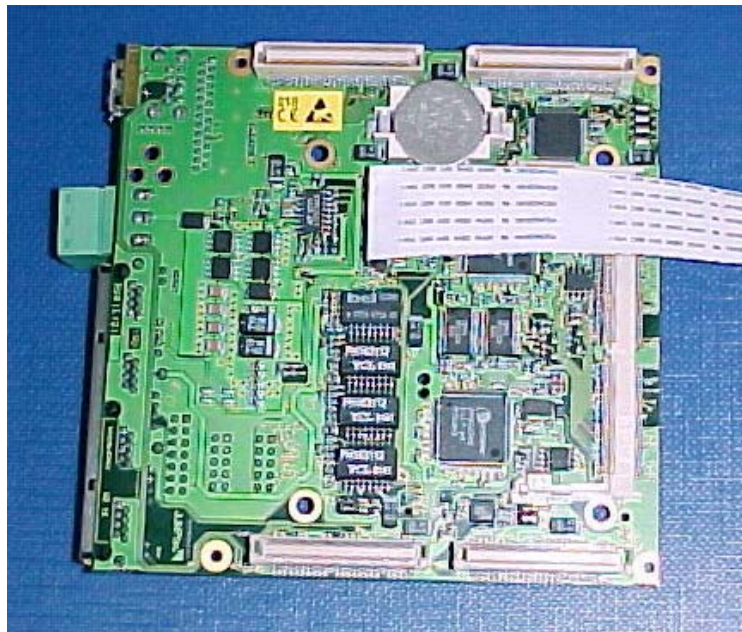
INTB

Used for Ethernet 3

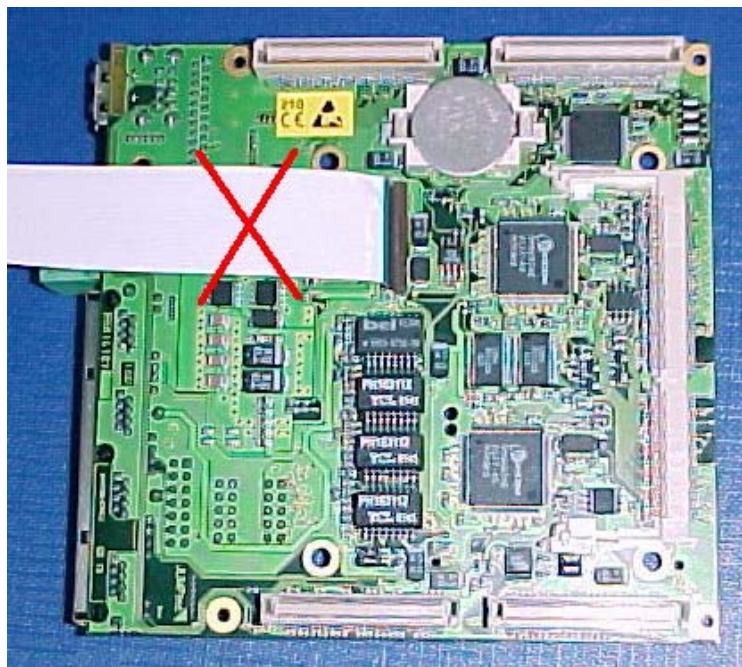
18.7 Digital and LVDS LCD (Flat Panel) (X67 and X601)

Please mount the cable in the right way. Please see the image below.

18.7.1 Correct flat cable mounting



18.7.2 Incorrect flat cable mounting



18.7.3 LCD connector

Depending on the product-specific ETX® module, LVDS or digital LCD signals are supported. Only the ETX®-mgx-AL board supports digital LCD signals.

Pin	LCD (LVDS)	LCD (Digital)
1	LTG100	VSYNC
2	LCDD00	R0
3	LCDD01	R1
4	DIGON	DIGON
5	LCDD02	R2
6	LCDD03	R3
7	BIASON	HSYNC
8	LCDD04	R4
9	LCDD05	R5
10	GND	GND
11	LCDD06	G0
12	LCDD07	G1
13	GND	GND
14	LCDD08	G2
15	LCDD09	G3
16	JILI_DAT	JILI_DAT
17	LCDD010	G4
18	LCDD011	G5
19	JILI_CLK	JILI_CLK
20	LCDD012	B0
21	LCDD013	B1
22	DETECT#	DETECT#
23	LCDD014	B2
24	LCDD015	B3
25	GND	GND
26	LCDD016	B4
27	LCDD017	B5
28	GND	GND
29	LCDD018	SHFCLK
30	LCDD019	EN
31	VCC	VCC
32	VCC	VCC
33	VCC	VCC
34	VCC	VCC
35	BLON#	BLON#
36	GND	GND
37	GND	GND
38	+12V	+12V
39	+12V	+12V
40	+12V	+12V

18.7.4 LCD Connector (LVDS) Configuration

Pin	LVDS Signal	Channel
LCDD00	Txout0-	First
LCDD01	Txout0+	First
LCDD02	Txout1-	First
LCDD03	Txout1+	First
LCDD04	Txout2-	First
LCDD05	Txout2+	First
LCDD06	Txclk-	First
LCDD07	Txclk+	First
LCDD08	Txout3-	First
LCDD09	Txout3+	First
LCDD010	Txout0-	Second
LCDD011	Txout0+	Second
LCDD012	Txout1-	Second
LCDD013	Txout1+	Second
LCDD014	Txout2-	Second
LCDD015	Txout2+	Second
LCDD016	Txclk-	Second
LCDD017	Txclk+	Second
LCDD018	Txout3-	Second
LCDD019	Txout3+	Second

18.7.5 LCD Connector (LVDS) Signal Descriptions

Pin	Purpose
BIASON	Controls panel contrast voltage.
DIGON	Controls panel digital power.
BLON#	Controls backlight power.
LTGIO0	General purpose I/O pin; not used by JILI interface.
JILI_DAT, JILI_CLK	I ² C interface for panel parameter EEPROM. The EEPROM mounts on the LVDS receiver. The data in the EEPROM allows the ETX® module to set the proper timing parameters for a specific LCD panel.
DETECT#	Panel hot-plug detection. Implementation of this pin is optional. See the product-specific ETX® manual for details.
LCDD00..19	LCD data output pins LVDS support.

18.7.6 LCD Connector (Digital) Signal Descriptions

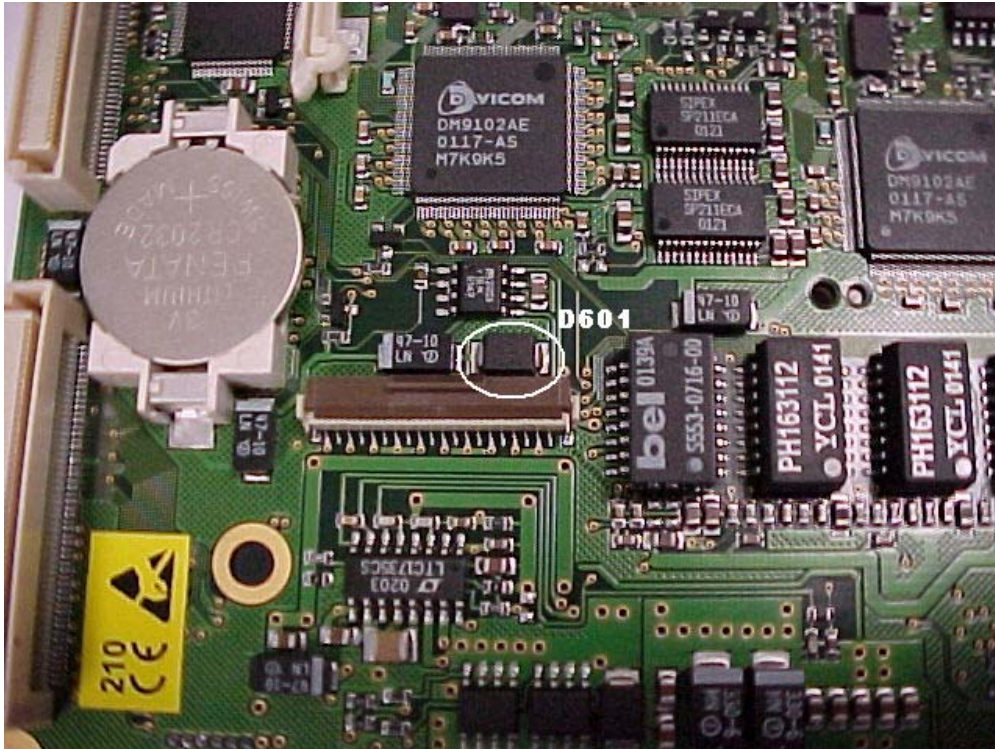
Pin	Purpose
R[0..5], G[0..5], B[0..5]	Parallel digital signals for red, green, and blue pixel data.
HSYNC	Horizontal Sync: This output supplies the horizontal synchronization pulse for flat panels. This signal is named LP (Line Pulse) in some flat-panel literature.
VSYNC	Vertical Sync: This output supplies the vertical synchronization pulse for flat panels. This signal is named FLM (First Line Marker) in some flat-panel literature.
DE	Data enable signal. Usage depends on display type.
SHCLK	Panel data clock signal.

18.7.7 Backlight Power for Flat Panel X601

There is no power supply for a backlight on the microSERVER. Use Connector X601 to supply a flat panel with 12V or use direct connection from power supply to the flat panel backlight power connector.

If you connect the 12V incorrectly, diode D601 limits it to $-0.7V$. In case of false, please check this diode.

D601 MBR51100T3, which is placed near flat-panel connector X67.

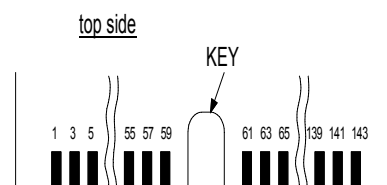


18.8 DIMM-PC® I/O X81

The I²C bus is not supported on DIMM-PC® I/O. For a list of pin descriptions, please see the product-specific DIMM-PC® I/O module.

Before you plug in a DIMM-PC®/IO card with signals on Pins (8,10,12,14,...38 = COM3 & 4), please read Chapter 12: Serial-Port Interface.

Pin	Signal		Pin	Signal
1	SA0		2	GND
3	OSC		4	BATT*
5	SA1		6	VCC
7	SA2		8	RI4#
9	MASTER#		10	DCD4#
11	SA3		12	DTR4#
13	BALE		14	DSR4#
15	SD15		16	RTS4#
17	SA4		18	CTS4#
19	TC		20	TXD4 / DO
21	SD14		22	RXD4 / DI
23	SA5		24	RI3#
25	DACK#2		26	DCD3#
27	SD13		28	DTR3#
29	SA6		30	DSR3#
31	IRQ3		32	RTS3#
33	DRQ7		34	CTS3#
35	DACK#7		36	TXD3
37	IRQ4		38	RXD3
39	SA7		40	*
41	SD12		42	*
43	IRQ5		44	TXD+
45	SA8		46	TXD-
47	SD11		48	RXD+
49	IRQ6		50	RXD-
51	SA9		52	LNLED
53	SD10		54	LKLED
55	IRQ7		56	GND
57	SA10		58	MD14*
59	SD9		60	MD13*
KEY			KEY	
61	SYSCLK		62	MD12*
63	SA11		64	*
65	SD8		66	*
67	REF#		68	BLUE*
69	SA12		70	GREEN*
71	I2DAT*		72	RED*
73	SA13		74	VCC
75	I2CLK*		76	VSYNC*
77	SA14		78	GND



Note: *Not supported by the microSERVER.

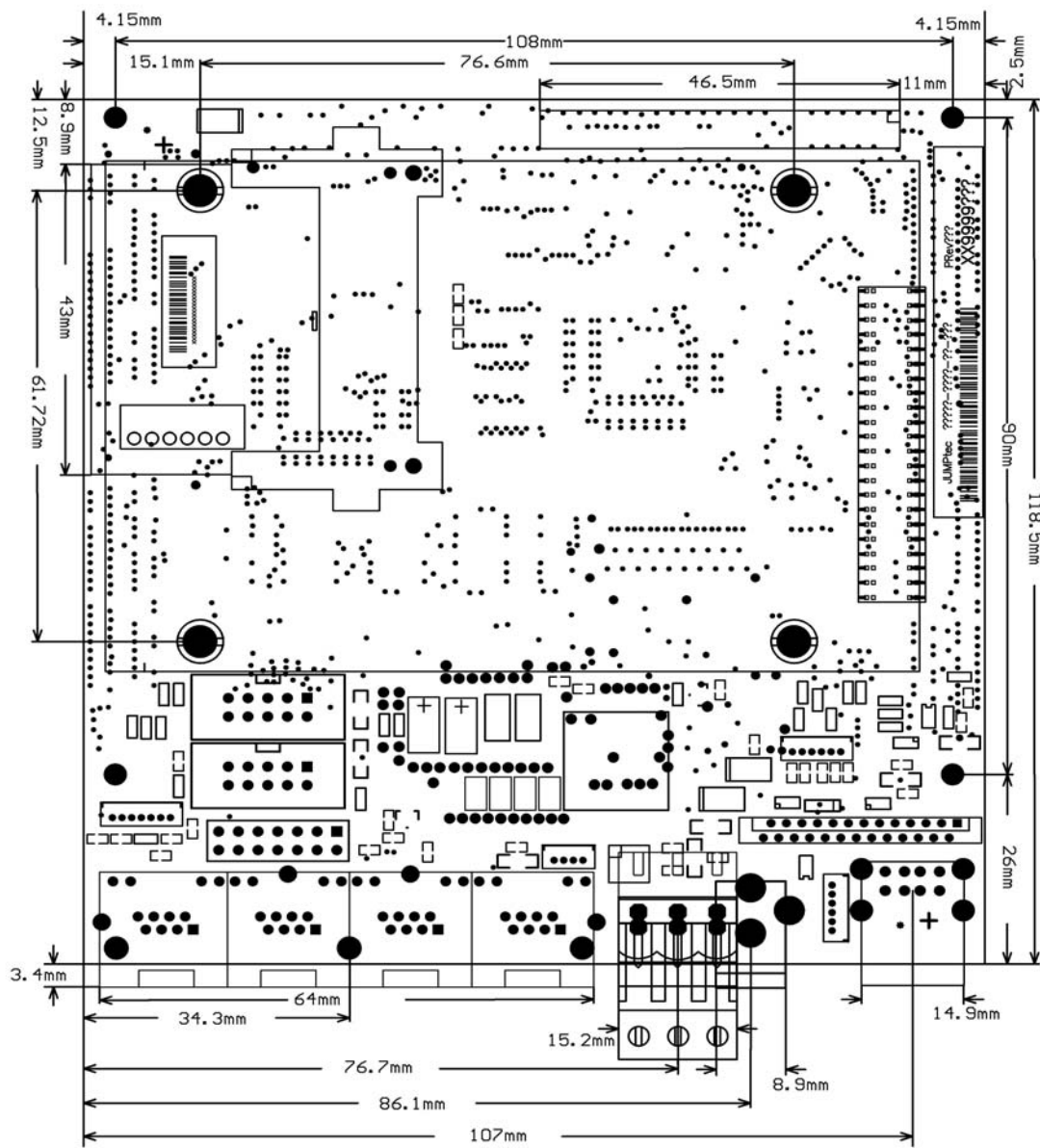
Pin	Signal		Pin	Signal
79	DRQ0		80	HSYNC*
81	SA15		82	FPBACK*
83	DACK#0		84	MODUL*
85	IRQ14		86	SA16
87	IOR#		88	GND
89	SA17		90	FPVDD*
91	IRQ15		92	BLANK#*
93	IOW#		94	P17*
95	SA18		96	P16*
97	IRQ12		98	P15*
99	SMEMr#		100	P14*
101	SA19		102	P13*
103	IRQ11		104	P12*
105	SMEMW#		106	P11*
107	AEN		108	P10*
109	IRQ10		110	P9*
111	IOCHRDY		112	P8*
113	SBHE#		114	P3*
115	SD0		116	P2*
117	IOCS16#		118	GND
119	ZWS#		120	P1*
121	SD1		122	P0*
123	MEMCS16#		124	P7*
125	SD2		126	P6*
127	SD3		128	P5*
129	DRQ2		130	P4*
131	SD4		132	VPANEL*
133	SD5		134	FPVEE*
135	IRQ9		136	VDCLK*
137	SD6		138	LLCLK*
139	SD7		140	VCC
141	RSTDRV#		142	LFS*
143	IOCHCK#		144	GND

19 Appendix E: BIOS Operation

Please see the respective BIOS chapter in the manual for the product-specific ETX® board.

On the microSERVER is no additional function that is configurable via BIOS.

21 APPENDIX G: Mechanical Dimensions



22 Appendix H: JIDA Standard

Every board with an on-board BIOS extension supports the following function calls, which supply information about the board. Kontron Intelligent Device Architecture (JIDA) functions are called via Interrupt 15h. Functions include:

- AH=Eah
- AL=function number
- DX=4648h (security word)
- CL=board number (starting with 1)

The interrupt returns a CL≠0 if a board with the number specified in CL does not exist. CL will equal 0 if the board number exists. In this case, the content of DX determines if the operation was successful. DX=6B6Fh indicates success; other values indicate an error.

22.1 Obtaining Information about Boards that Use the JIDA Standard

To obtain information about the installed boards that follow the JIDA standard, use the following procedure.

- Call Get BIOS ID with CL=1.
The name of the first device installed will be returned. If you see the result **Board exists** (CL=0), increment CL, and call **Get BIOS ID** again.
- Repeat until you see **Board not present** (CL≠0).
You now know the names of boards that follow the JIDA standard.
- You can find out more information about a specific board by calling the appropriate inquiry function with the board's number in CL.

Note: Association between board and board number may change because of configuration changes. Do not rely on associations between board and board number. Use the above procedure to determine the association between board and board number.

Refer to the JIDA manual, available at <http://emea.kontron.com/>, for further information on implementing and using JIDA calls with C sample code.

23 Appendix I: Literature and Standards

Below is a list of information sources to help you to further understand PC architecture.

23.1 Buses

23.1.1 ISA, Standard PS/2 - Connectors

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

23.1.2 PCI/104

- Embedded PC 104 Consortium
This Web site will provide information about PC/104 and PC/104-Plus technology.
- PCI SIG
The PCI-SIG provides a forum for its ~900 member companies, who develop PCI products based on the specifications that are created by the PCI-SIG.
- *PCI & PCI-X Hardware and Software Architecture & Design*, Fifth Edition, Edward Solari and George Willse, Annabooks, 2001, ISBN 0-929392-63-9.
- *PCI System Architecture*, Tom Shanley and Don Anderson, Addison-Wesley, 2000, ISBN 0-201-30974-2.

23.2 General PC Architecture

- *Embedded PCs*, Markt&Technik GmbH, ISBN 3-8272-5314-4 (German)
- ePanorama PC Hardware
ePanorama.net offers information about electronics.
- *Hardware Bible*, Winn L. Rosch, SAMS, 1997, 0-672-30954-8
- *Interfacing to the IBM Personal Computer*, Second Edition, Lewis C. Eggebrecht, SAMS, 1990, ISBN 0-672-22722-3
- *The Indispensable PC Hardware Book*, Hans-Peter Messmer, Addison-Wesley, 1994, ISBN 0-201-62424-9

- *The PC Handbook: For Engineers, Programmers, and Other Serious PC Users, Sixth Edition*, John P. Choisser and John O. Foster, Annabooks, 1997, ISBN 0-929392-36-1

23.3 Ports

23.3.1 RS-232 Serial

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

23.3.2 Serial ATA

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

23.3.3 USB

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

23.4 Programming

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

24 Appendix J: Section Security Instructions

Note: To protect the external powerlines to peripheral devices the customer has to take care about:

- The wires to the external device have the right diameter to withstand the max. available current.
- The housing of external device fulfills the fire protecting requirements of IEC/EN 60950.

Warning: *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 instruction.*

25 Appendix J: Document-Revision History

Version	Date	Edited by	Changes
2.1	25.04.02	BHA	Technical prerevision
2.2	08.06.02	BHA and JL	Initial release of manual.
2.3	15.07.02	BHA	New release
2.6	14.04.03	BHA	Added the power connector option (X14, Plug2)
2.7	18.11.03	BHA	Remove misunderstanding 5V power supply.
2.8	19.11.03	BHA	Ethernet 1 recommendations
2.9	31.07.07	GUL	Updated to current Kontron Layout