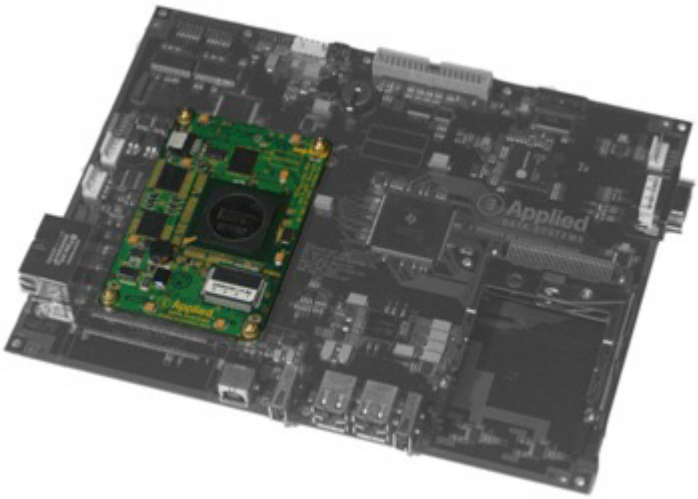
TurboIXP
Development System
User Manual



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About the Cover Image

The cover image illustrates a fully populated TurboIXP development system, which includes a Revision 1 TurboIXP module and Revision 1 solution board.

About this Manual

This manual provides a description of the TurboIXP development system. It is intended for software application developers and system integrators.

Organization of this Manual

The manual organizes information in seven key sections:

Introduction	Provides an overview of the functionality and organization of the TurboIXP development system.
Getting Started	Describes the platform for developing applications.
Hardware Reference	Defines the configuration settings and pinouts for all connectors and jumpers on the TurboIXP development system.
Feature Reference	Gives details about the various subsystems of the TurboIXP development system.
Power Management	Provides key information about the power supply architecture and tips for optimizing power management.
System Specifications	Specifies mechanical and electrical interfaces.
Revision History	Identifies and explains board revisions.

To locate the information you need, try the following:

1. Browse the *Table of Contents.* Section titles include connector designators and their function.
2. Follow cross-references between sections.
3. View and search this manual in PDF format.

Printing this Manual

This manual is designed for printing on both sides of an 8.5x11 inch paper sheet or two pages per sheet but can be printed single-sided also.

Revision History

The following table summarizes the changes made between released revisions of the manual.

Revision	Description	By
1	First preliminary release	11/07/07 ch
2	Second preliminary release Style and formatting updates	07/18/08 ch
A	Initial release	07/22/11 ch

Errata, Addenda, and Further Information

Errata and addenda to this manual are posted on the Eurotech support forums along with the latest release of the manual. Consult the support forums any time you need further information or feel information in this manual is in error. You may access the forums from the Eurotech support site,

http://www.eurotech.com

In addition to manuals, the support forums include downloads, troubleshooting guides, operating system updates, and answers to hundreds of questions about developing applications for Eurotech products. You may also post questions you have about Eurotech products on the forums.

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Table of Contents

1 Introduction

1.1 Overview

The TurboIXP is a full-featured, application-ready module using the Intel® IXP465 network processor. It is designed to integrate with an application-specific solution board for a total production solution.

This manual describes the TurboIXP development system, which includes the TurboIXP module and solution board. The document applies to the current revision of the boards. Section 7 lists the revision histories of both boards.

1.2 Features

1.2.1 Processor

- IXP465 32-bit XScale ARM RISC Processor
- 32 KB Instruction and 32 KB Data L1 Cache
- Distributed processing via three Network Processor Engines (NPE)
- Integrated support for cryptography and IEEE 1588 time synchronization
- Clock rates up to 667 MHz

1.2.2 Power Supply

- 5 V main power input
- Backlight power input

1.2.3 Memory

- 64 MiB DDR-I SDRAM [1] [2]
- 32 MiB NOR Flash memory [3]
- Two PCMCIA interfaces, Type I and II, 3.3 V and 5 V
- Battery-backed real-time clock

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[1] MiB is the IEC abbreviation for mebibyte = 2^{20} byte = 1 048 576 byte. The kibi and mebi abbreviations are based on the 1998 IEC standard for binary multiples. For further reading, see the US NIST web site, http://physics.nist.gov/cuu/Units/binary.html.

[2] The TurboIXP module supports up to 128 MiB of DDR-I SDRAM.

[3] The TurboIXP module supports up to 64 MiB of NOR Flash memory.

1.2.4 Communications

- Five port USB 2.0 Host Controller supporting high (480 Mbps), full (12 Mbps), and low (1.5 Mbps) speeds
- USB 2.0 Host port supporting low and full speeds
- USB 1.1 Function port
- Two Serial ports
  - Serial 0: EIA-232 (5-wire)
  - Serial 1: EIA-232 (5-wire) or EIA-422/485, selectable under software control
- Two CAN 2.0B buses
- 32-bit PCI v2.2 bus expansion
- Two 10/100BT Ethernet interfaces
- Synchronous Serial Protocol port
- I^2C bus with I^2C master device
- Two High Speed Serial ports (optional)

1.2.5 User Interface and Display

- Graphics Controller supporting
  - Parallel LCD interface
  - Serial LVDS LCD interface
  - Analog RGB monitor connection
- Analog Touch Panel interface (four- or five wire options)
- Backlight control signals for Intensity and On/Off

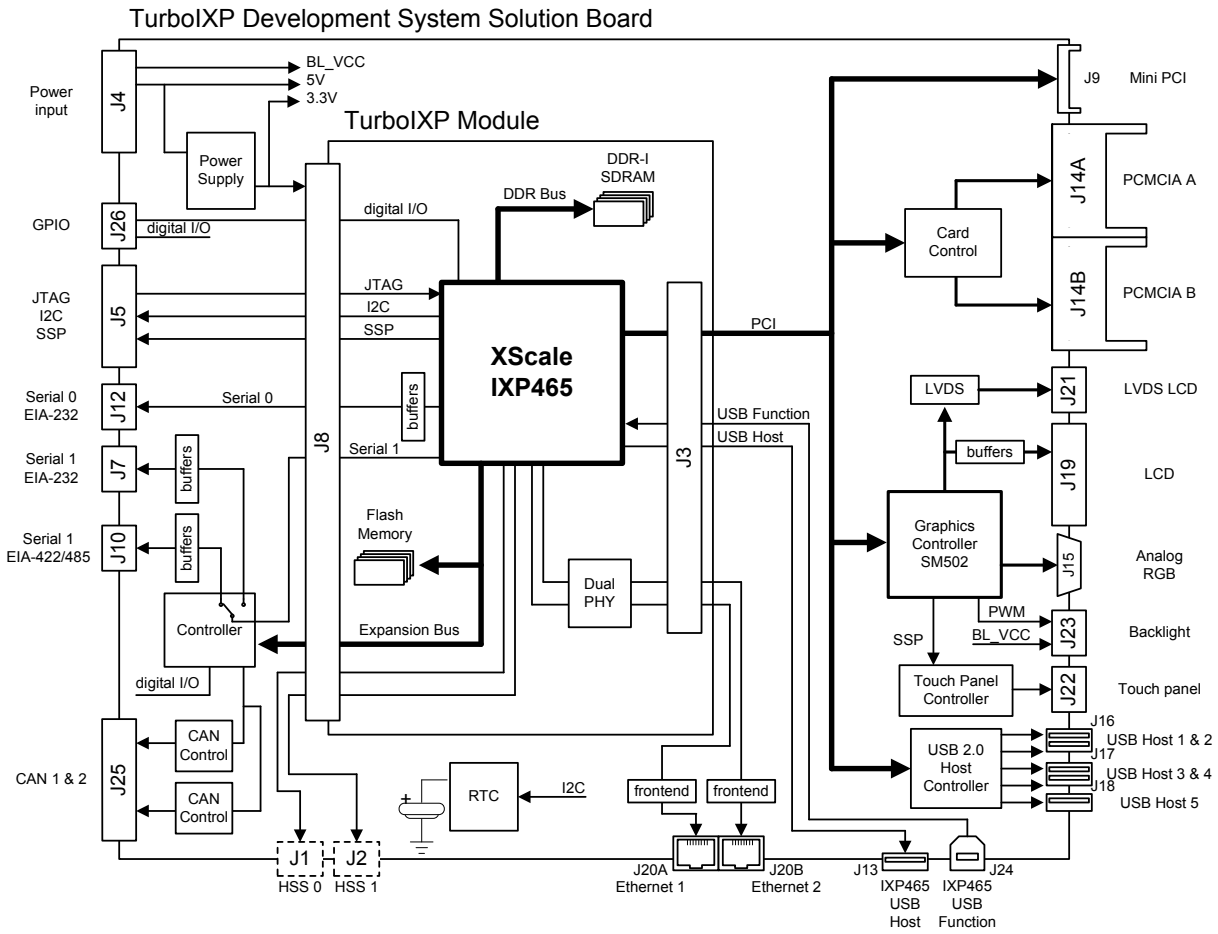
1.2.6 Inputs and Outputs

- Eight general purpose I/O

1.3 Block Diagram

The following diagram illustrates the system organization of the TurboIXP development system. Arrows indicate the direction of control and not necessarily signal flow. Connectors represented by dotted lines are volume production options.

Reference designators shown are for the solution board.



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2 Getting Started

2.1 Development Systems

TurboIXP development systems are designed to get the developer up and running quickly.

To use the system, simply plug the power supply into the receptacle on the system.

If the screen does not display anything after five to ten seconds, check the *Frequently Asked Questions*, below. Most operating systems cold boot within twenty seconds.

2.1.1 System Components

A typical BitsyX development system is shown at right. The TurboIXP development system conforms to the same format. It consists of the following components:

- TurboIXP application-ready module
- Solution board
- Flat panel display and cable
- Backlight inverter and cable
- Touch panel and cable
- 100-240 VAC power adapter
- Plexiglas mounting
- Developer's Cable Kit including
  - Serial Port DB9 adapter (Eurotech cable #610111-80001)
  - DB9F/F null modem cable
  - USB A-B cable
- Operating system of your choice
- User's Guide (this document and operating system guide)

Please make sure you have received ***all*** the components before you begin your development.

2.2 Frequently Asked Questions

The following are some of the most commonly asked questions about development systems:

Q: When I plug in power, my screen is white and nothing comes up on it.

A: Check the connector seating. The flat panel connector may have come loose in shipping. Press it firmly into the panel and reapply power to your system.

Q: When I plug in power, the LED does not turn on.

A: Your system may still be booting. The LED is software-controlled and is not necessarily turned on at boot.

Q: Do I have to turn off the system before I insert a PCMCIA card?

A: No. The TurboIXP supports hot-swapping of PCMCIA cards. Consult the operating system documentation for details.

Q: Do I need to observe any ESD precautions when working with the system?

A: Yes. Where possible, work on a grounded anti-static mat. At a minimum, touch an electrically grounded object before handling the board or touching any components on the board.

Q: What do I need to start developing my application for the system?

A: You will need a flash ATA card (32 MiB or larger, 128 MiB recommended) and the cables supplied with your system to interface your development station to the system. For further direction, consult the Eurotech guide for the installed operating system.

Q: Who can I call if I need help developing my application?

A: Eurotech provides technical support to get your development system running. For customers who establish a business relationship with Eurotech, we provide support to develop applications and drivers.

Q: Is there online support?

A: Yes. Information about the TurboIXP hardware and software is available on the Eurotech support site at http://www.eurotech.com.

Q: Can I upgrade the version of the operating system?

A: Yes. Eurotech provides regular operating system updates on its developers' web site. For operating systems not maintained by Eurotech, contact the operating system vendor.

Q: I would like to interface to a different display panel. How can I do this?

A: Eurotech may have already interfaced to the panel of which you are interested. Consult Eurotech for availability.

3 Hardware Reference

This section gives an overview of the hardware features of the TurboIXP development system. The overview includes a description including location and pinouts of the switches, indicators, and connectors.

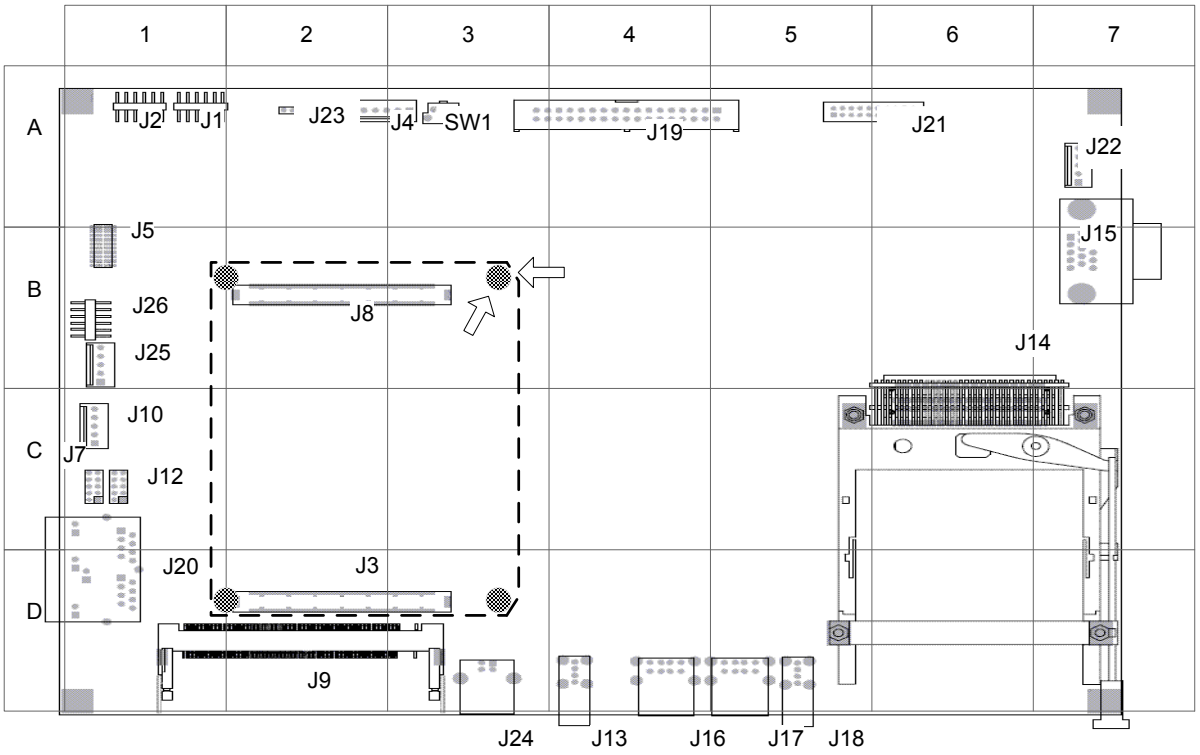
3.1 Identifying Connectors

This section describes the location and numbering of headers and connectors on the board.

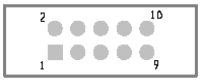
3.1.1 Locating Components

The following diagram illustrates the location of key components on the TurboIXP development system. Components are located based upon the grid overlay of the component side of the solution board. For example, the backlight connector, J23, lies at location A2, and the PCMCIA socket covers C6 through D7. Component locations given in this chapter refer to the following diagram.

The TurboIXP module is located on the left side of the solution board indicated with a dashed line border. The mating connectors, J3 and J8, lie under the module. The TurboIXP development system uses two indicators to ensure correct alignment between the module connectors, J1 and J2, and the solution board connectors, J3 and J8. First, the right hand corners of the module are notched. These notches align with identical notches silk-screened on the solution board. Second, arrow indicators are included on the silkscreen of both the module and the solution board. The two arrows align for correct installation.



3.1.2 Determining Pin Numbers



Headers and connectors on Eurotech products number the pins sequentially. All double-row headers place even pins on one side and odd pins on the other. The diagram at right indicates the pin numbering, as seen from the component side [4] of the board. To locate pin 1 of a connector or jumper, try the following:

1. Look for a visible number or marking on the board that indicates connector pin numbering. A notch or dot usually indicates pin 1.

2. Look at the underside of the board. The square pad is pin 1.

3.2 Switches, Controls, and Indicators

This section describes various switches and indicators on the TurboIXP development system. The location indicated for each item refers to the grid diagram of the TurboIXP development system in Section 3.1.1.

3.2.1 SW1: Reset Switch

Location on board: A3

SW1 is the reset button for the TurboIXP development system. Pressing SW1 shorts the /RESET_IN signal (J5 pin 1) to ground issuing a hardware reset to the IXP465 and system peripherals. Press this button to restart the TurboIXP without cycling power.

3.2.2 Ethernet LED Indicators

Location on board: C1-D1 (Ethernet socket J20)

The Ethernet LEDs indicate valid Ethernet connection and bus activity. The Ethernet connector, J20, integrates the LEDs with the socket.

[4] The component side of the TurboIXP module is the one on which the processor and most large chips are populated. The component side of the solution board is the one that mates to the module.

3.3 Signal Headers

The following tables describe the electrical signals available on the connectors of the TurboIXP development system. Each section provides relevant details about the connector including part numbers, mating connectors, signal descriptions, and references to related chapters.

The location indicated for each item refers to the grid diagram of the TurboIXP development system in Section 3.1.1. For details about how to determine pin numbers of a header, see Section 3.1.2.

The following table describes the abbreviations and conventions used in the signal tables.

Legend	
GND	digital ground plane
/	active low signal
+	positive signal in differential pair
-	negative signal in differential pair

Each signal includes a column that describes the direction and electrical characteristics of the signal. The following table describes the abbreviations that specify the signal types.

Type	
I	signal is an input to the system
O	signal is an output from the system
IO	signal may be input or output
P	power and ground
A	analog signal
OD	open-drain

3.3.1 J1: High Speed Serial 0 (optional)

Board Connector: 2x6 terminal strip, 2mm, Samtec TMM-106-01-T-D-RA

Recommended Mating Connector: TCSD series

Location on board: A1-A2

Connector J1 is an interface to the High Speed Serial 0 (HSS 0) port included on the IXP465 and is available as a volume production option.

Pin	Name	Type	Description
1	HSS_TXCLK0	IO	Transmit clock
2 3	GND	P	ground
4	HSS_RXCLK0	IO	Receive clock
5	HSS_TXDATA0	OD	Transmit data
6 7	GND	P	ground
8	HSS_RXDATA0	I	Receive data
9	HSS_TXFRAME0	IO	Transmit frame
10	GND	P	ground
11	n/c		
12	HSS_RXFRAME0	IO	Receive frame

3.3.2 J2: High Speed Serial 1 (optional)

Board Connector: 2x6 terminal strip, 2mm, Samtec TMM-106-01-T-D-RA

Recommended Mating Connector: TCSD series

Location on board: A1

Connector J2 is an interface to the High Speed Serial 1 (HSS 1) port included on the IXP465 and is available as a volume production option.

Pin	Name	Type	Description
1	HSS_TXCLK1	IO	Transmit clock
2 3	GND	P	ground
4	HSS_RXCLK1	IO	Receive clock
5	HSS_TXDATA1	OD	Transmit data
6 7	GND	P	ground
8	HSS_RXDATA1	I	Receive data
9	HSS_TXFRAME1	IO	Transmit frame
10	GND	P	ground
11	n/c		
12	HSS_RXFRAME1	IO	Receive frame

3.3.3 J3: Docking Header: Expansion Bus, PCI, Ethernet, USB

Board Connector: 140-pin, 0.5mm, Hirose FX10A-140P/14-SV(91)

TurboIXP Module Connector: 140-pin, 0.5mm, Hirose FX10A-140S/14-SV(91)

Location on board: D2-D3

Receptacle J1 of the TurboIXP module mates to header J3.

3.3.4 J4: Power Input

Board Connector: 6-pin header with friction lock, 0.1-inch, Molex 22-23-2061

Recommended Mating Connector: 6471 series

Location on board: A2-A3

Connector J4 accepts input power from external supplies. The 5V_IN is the main input power to the TurboIXP development system. Other voltages required by the TurboIXP module and peripherals are generated from the 5V_IN. The backlight power input, BL_VCC, is filtered and passed through to the backlight connector, J23.

Pin	Name	Type	Description
1 2	5V_IN	P	5 V input power
3 4 5	GND_IN	P	ground
6	BL_VCC	P	Backlight power

3.3.5 J5: JTAG, I²C, SSP

Board Connector: 2x10 socket, 0.05-inch, Samtec SFMC-110-02-S-D

Recommended Mating Connector: TFMDL series

Location on board: A1-B1

Connector J5 includes a hardware reset input, a JTAG interface, an external connection to the I²C bus, and a SSP port. The JTAG interface is used during manufacturing for programming and debug; otherwise, it is not supported for application use. Production customers may use this connector to reprogram boot code. Two serial interfaces, an I²C bus and SSP port, provide communication with external devices.

Pin	Name	Type	Description
1	/RESET_IN	I	Hardware reset (3.2.1)
2	/TRST	I	JTAG
3	TMS	I	
4	GND	P	
5	TCK	I	
6	GND	P	
7	TDI	I	
8	GND	P	
9	TDO	O	
10	GND	P	ground
11	I2C_SDA	IO	I²C data
12	JTAG_VREF	P	Reference voltage
13	SSP_FRM	O	IXP465 SSP slave select
14	VREF	P	Reference voltage
15	SSP_MISO	I	IXP465 SSP receive data
16	I2C_SCL	IO	I²C clock
17	SSP_MOSI	O	IXP465 SSP transmit data
18	GND	P	ground
19	SSP_SCK	O	IXP465 SSP clock
20	GND	P	ground

3.3.6 J7: Serial 1 (EIA-232)

Board Connector: 2x5 terminal strip, 2mm, Samtec TMM-105-03-T-D

Recommended Mating Connector: TCSD series

Location on board: C1

The IXP465 UART 1 signals are provided as either an EIA-232 interface on J7 or an EIA-422/485 interface on J10. Selection of the data and hardware flow control buffers is software-controlled.

Pin	Name	Type	Description
1 2	GND	P	ground
3	RXD1	I	Receive data 1
4	TXD1	O	Transmit data 1
5 6	GND	P	ground
7	CTS1	I	Clear to send 1
8	RTS1	O	Ready to send 1
9	GND	P	ground
10			

3.3.7 J8: Docking Header: Expansion Bus, Serial, JTAG, I^2C, SSP, GPIO

Board Connector: 140-pin, 0.5mm, Hirose FX10A-140P/14-SV(91)

TurboIXP Module Connector: 140-pin, 0.5mm, Hirose FX10A-140S/14-SV(91)

Location on board: B2-B3

Receptacle J2 of the TurboIXP module mates to header J8.

3.3.8 J9: Mini PCI

Board Connector: 2x62 Mini PCI socket, 0.8mm, Tyco 1734027-1

Location on board: D1-D3

The 124-pin Mini PCI socket supports a 32-bit PCI version 2.2 bus expansion.

3.3.9 J10: Serial 1 (EIA-422/485)

Board Connector: 5-pin header with friction lock, 0.1-inch, Molex 22-23-2051

Recommended Mating Connector: 6471 series

Location on board: C1

The IXP465 UART 1 signals are provided as either an EIA-232 interface on J7 or an EIA-422/485 interface on J10 [5]. Selection of the data and hardware flow control buffers is software-controlled.

Pin	Name	Type	Description
1	RX1+	I	Non-inverting receive data
2	RX1-	I	Inverting receive data
3	GND	P	ground
4	TX1-	O	Inverting transmit data
5	TX1+	O	Non-inverting transmit data

3.3.10 J12: Serial 0 (EIA-232)

Board Connector: 2x5 terminal strip, 2mm, Samtec TMM-105-03-T-D

Recommended Mating Connector: TCSD series

Location on board: C1

Connector, J12, provides the IXP465 UART 0 signals including hardware flow control at EIA-232 signaling levels.

Pin	Name	Type	Description
1 2	GND	P	ground
3	RXD0	I	Receive data 0
4	TXD0	O	Transmit data 0
5 6	GND	P	ground
7	CTS0	I	Clear to send 0
8	RTS0	O	Ready to send 0
9	GND	P	ground
10			

[5] A standard TurboIXP development system is configured for EIA-422 with no termination. Other termination and EIA-485 options are available in volume production quantities.

3.3.11 J13: IXP465 USB Host

Board Connector: USB Type A receptacle, Tyco 292336-1

Recommended Mating Connector: USB Type A plug

Location on board: D4

Connector J13 provides a USB 2.0 Host port from the IXP465 operating at low or full speed. Plug USB function devices, such as mice and keyboards, into this port. Connector shields are tied to chassis ground.

Pin	Name	Type	Description
1	USB_HOST_PWR	P	DC power output
2	USB_HOST-	IO	IXP465 USB Host port data
3	USB_HOST+	IO	
4	GND	P	ground

3.3.12 J14: PCMCIA A & B

Double-deck Integrated Ejector: FCI 61124-250CALF

Location on board: C6-D7

The 136-pin, double-deck PCMCIA socket supports two interfaces conforming to the PCMCIA standard for Type I and II cards. Both slots can operate independently at 5 V or 3.3 V. Normally, the socket is de-energized. The operating system is responsible for turning the socket on when a card is inserted and turning it off when the card is removed.

3.3.13 J15: Analog RGB

Board Connector: D-sub 15, Edac 634-015-263-033

Recommended Mating Connector: 633 series

Location on board: A7-B7

The VGA connector, J15, interfaces to devices such as video cards or computer monitors. Signals from a 24-bit DAC included in the SM502 Graphics Controller support an analog RGB (8:8:8) connection. Connector shields are tied to chassis ground.

Pin	Name	Type	Description
1	VGA_RED	AO	Red video
2	VGA_GREEN	AO	Green video
3	VGA_BLUE	AO	Blue video
4	n/c		
5	GND	P	ground
6	GND	P	Red return
7	GND	P	Green return
8	GND	P	Blue return
9	CRT_VCC	PO	5 V
10	GND	P	ground
11	n/c		
12	SDA_GPIO47	IO	SM502 I^2C data [6]
13	VGA_HSYNC	O	Horizontal Sync
14	VGA_VSYNC	O	Vertical Sync
15	SCL_GPIO46	IO	SM502 I^2C clock [6]

[6] Standard TurboIXP development systems do not connect on SDA_GPIO47 and SCL_GPIO46.

3.3.14 J16: USB Host 1 and 2

Board Connector: USB Type A dual receptacle, Tyco 5787745-2

Recommended Mating Connector: USB Type A plug

Location on board: D4-D5

The TurboIXP solution board includes a USB 2.0 Host Controller for expanded USB connectivity. Connectors J16, J17, and J18 provide the connections to five additional USB 2.0 Host ports operating at high, full, and low speeds. The dual receptacle, J16, includes the signals for port 1 and port 2. Connector shields are tied to chassis ground.

Pin	Name	Pin	Type	Description
A1	USB_HOST1_PWR		PO	DC power output
A2	USB_HOST1-		IO	USB Host port 1 data
A3	USB_HOST1+		IO	
A4	GND		P	ground
	USB_HOST2_PWR	B1	PO	DC power output
	USB_HOST2-	B2	IO	USB Host port 2 data
	USB_HOST2+	B3	IO	
	GND	B4	P	ground

3.3.15 J17: USB Host 3 and 4

Board Connector: USB Type A dual receptacle, Tyco 5787745-2

Recommended Mating Connector: USB Type A plug

Location on board: D5

The TurboIXP solution board includes a USB 2.0 Host Controller for expanded USB connectivity. Connectors J16, J17, and J18 provide the connections to five additional USB 2.0 Host ports operating at high, full, and low speeds. The dual receptacle, J17, includes the signals for port 3 and port 4. Connector shields are tied to chassis ground.

Pin	Name	Pin	Type	Description
A1	USB_HOST3_PWR		PO	DC power output
A2	USB_HOST3-		IO	USB Host port 3 data
A3	USB_HOST3+		IO	
A4	GND		P	ground
	USB_HOST4_PWR	B1	PO	DC power output
	USB_HOST4-	B2	IO	USB Host port 4 data
	USB_HOST4+	B3	IO	
	GND	B4	P	ground

3.3.16 J18: USB Host 5

Board Connector: USB Type A receptacle, Tyco 292336-1

Recommended Mating Connector: USB Type A plug

Location on board: D5

The TurboIXP solution board includes a USB 2.0 Host Controller for expanded USB connectivity. Connectors J16, J17, and J18 provide the connections to five additional USB 2.0 Host ports operating at high, full, and low speeds. The single receptacle, J18, includes the signals for port 5. Connector shields are tied to chassis ground.

Pin	Name	Type	Description
1	USB_HOST5_PWR	PO	DC power output
2	USB_HOST5-	IO	USB Host port 5 data
3	USB_HOST5+	IO	
4	GND	P	ground

3.3.17 J19: LCD

Board Connector: 2x17 shrouded terminal strip, 0.1-inch, Samtec HTST-117-01-L-D

Recommended Mating Connector: HCSD series

Location on board: A4-A5

Connector J19 provides a parallel interface to a liquid crystal display (LCD). The following table describes the signals included on the connector. Signal names shown are for TFT active matrix color LCDs at 18 bpp (bit-per-pixel). Signals from the SM502 Graphics Controller are buffered and EMI/RFI filtered before reaching J19. The panel buffers can operate at either 5 V or 3.3 V [7].

Pin	SM502 Signal Name	Color Active TFT Display at 18bpp	
		Eurotech Signal Name	Description
1		n/c	
2		GND	ground
3	FPCLK	PNL_PIXCLK	Pixel Clock
4	FP_HSYNC	PNL_HSYNC	Horizontal Sync
5	FP_VSYNC	PNL_VSYNC	Vertical Sync
6		GND	ground
7	FP18	PNL_RED0	Red data
8	FP19	PNL_RED1	
9	FP20	PNL_RED2	
10	FP21	PNL_RED3	
11	FP22	PNL_RED4	
12	FP23	PNL_RED5	
13		GND	ground

[7] One of two on-board resistors, R303 or R304, sets the LCD output buffer voltage. Standard TurboIXP development systems operate at 3.3 V.

Pin	SM502 Signal Name	Color Active TFT Display at 18bpp	
		Eurotech Signal Name	Description
14	FP10	PNL_GREEN0	Green data
15	FP11	PNL_GREEN1	
16	FP12	PNL_GREEN2	
17	FP13	PNL_GREEN3	
18	FP14	PNL_GREEN4	
19	FP15	PNL_GREEN5	
20		GND	ground
21	FP2	PNL_BLUE0	Blue data
22	FP3	PNL_BLUE1	
23	FP4	PNL_BLUE2	
24	FP5	PNL_BLUE3	
25	FP6	PNL_BLUE4	
26	FP7	PNL_BLUE5	
27		GND	ground
28	FP_DISP	PNL_LBIAS	Data enable
29 30		PNL_PWR	5 V or 3.3 V (set by R301 or R302) [8]
31		PNL_RL	Horizontal Mode Select (set by R201 or R306) [9]
32		PNL_UD	Vertical Mode Select (set by R202 or R305) [9]
33	CPLD (PANELENABLE)	PNL_ENA	Panel enable
34	PWM1	VCON	Low-voltage adjust for contrast control of some displays

3.3.18 J20: Ethernet 1 and 2

Board Connector: 2 x RJ-45 with LEDs, Pulse Engineering J8064D628ANL

Recommended Mating Connector: RJ-45 plug

Location on board: C1-D1

Connector J20 supports two standard 10/100 BT Ethernet, RJ-45 ports. Connector shields are tied to chassis ground.

[8] One of two resistors selects the supply voltage for the LCD. Standard TurboIXP development systems are configured for 5 V.

[9] Changing the voltage on the PNL_RL and PNL_UD signals selects the LCD scan direction. These signals are pulled up on standard TurboIXP development systems.

3.3.19 J21: LVDS LCD

Board Connector: 2x10 shrouded header, 2mm, Molex 87831-2020

Recommended Mating Connector: 87568 series

Location on board: A6

The TurboIXP development system supports a serial interface to a LCD. A LVDS transmitter on the solution board converts the parallel LCD data into four LVDS data streams. The data streams, along with a LVDS transmit clock and panel power, are included on connector J21.

Pin	Name	Type	Description
1 2	PNL_PWR	PO	5 V or 3.3 V (3.3.17)
3 4	GND	P	ground
5 6	RXIN0- RXIN0+	O	LVDS differential data 0
7	GND	P	ground
8 9	RXIN1- RXIN1+	O	LVDS differential data 1
10	GND		ground
11 12	RXIN2- RXIN2+	O	LVDS differential data 2
13	GND	O	ground
14 15	CKIN- CKIN+	O	LVDS differential clock
16	GND		ground
17 18	RXIN3- RXIN3+	O	LVDS differential data 3
19	GND	P	ground
20			

3.3.20 J22: Touch Panel

Board Connector: 5-pin header, 0.1-inch, Molex 22-23-2051

Recommended Mating Connector: 6471 series

Location on board: A7

Connector J22 provides the signals to support a 4- or 5- wire analog touch panel.

Pin	Name	Type	Description		
1	TSMX	AIO	left	LL	Touch panel
2	TSPX	AIO	right	UL	
3	TSPY	AIO	bottom	UR	
4	TSMY	AIO	top	LR	
5	WIPER	AI			Touch panel wiper (optional 5-wire touch)

3.3.21 J23: Backlight

Board Connector: 7-pin terminal strip, 2mm, Samtec TMM-107-01-T-S

Recommended Mating Connector: TCSD series

Location on board: A2

Connector J23 includes the power and control signals required by an external LCD backlight inverter.

Pin	Name	Type	Description
1 2	BL_VCC	P	Backlight output power
3 4	GND	P	ground
5	Backlight_On	OC	Backlight on/off [10]
6	GND	P	ground
7	Backlight_PWM	AO	Backlight intensity

3.3.22 J24: IXP465 USB Function

Board Connector: USB Type B receptacle, Tyco 292304-1

Recommended Mating Connector: USB Type B plug

Location on board: D3

Connector J24 supplies the signals for the IXP465 USB 1.1 Function port. Typically, this port connects to a PC. Connector shields are tied to chassis ground.

Pin	Name	Type	Description
1	USB_FCN_CNCT	P	DC power input (used to sense connection)
2 3	USB_FCN- USB_FCN+	IO IO	USB function port data
4	GND	P	ground

3.3.23 J25: CAN 1 and 2

Board Connector: 5-pin header, 0.1-inch, Molex 22-23-2051

Recommended Mating Connector: 6471 series

Location on board: B1

Connector J25 supplies the signals for two CAN 2.0B bus connections.

Pin	Name	Type	Description
1 2	CAN2+ CAN2-	IO	CAN 2
3	GND	P	ground
4 5	CAN1- CAN1+	IO	CAN 1

[10] The Backlight_On signal includes a 47kΩ pull-up resistor to BL_VCC.

3.3.24 J26: General Purpose Input and Output

Board Connector: 2x6 terminal strip, 2mm, Samtec TMM-106-01-T-D-RA

Recommended Mating Connector: TCSD series

Location on board: B1

Connector J26 supports eight discrete digital I/Os for application use. Each general-purpose digital input and output (GPIO) can be configured as an input or as an output. Two of the GPIOs interface to the IXP465, while the remaining six GPIOs interface to the CPLD. All signals include ESD protection, and the IXP465 GPIOs include 10K pull up resistors.

Pin	Name	Type	Description
1	GPIO7	IO	IXP465 GPIO
2	GND	P	ground
3	GPIO8	IO	IXP465 GPIO
4	GND	P	ground
5	CPLDIO0		
6	CPLDIO1	IO	CPLD GPIO
7	CPLDIO2		
8	GND	P	ground
9	CPLDIO3		
10	CPLDIO4	IO	CPLD GPIO
11	CPLDIO5		
12	GND	P	ground

4 Board Revision History

4.1 Identifying the Board Revision

The product revision numbers of the TurboIXP module and solution board are etched on the printed circuit boards.

The revision number of the solution board is located on the component side in the lower left corner. That number is 170121-600Rx, where "x" is the board revision.

The TurboIXP module revision number is located on the underside of the printed circuit board along the edge of the board. That number is 170121-500Rx, where "x" is the board revision.

4.2 Solution Board Revision History

The following is an overview of the revisions to the solution board.

4.2.1 Revision 1

Initial release

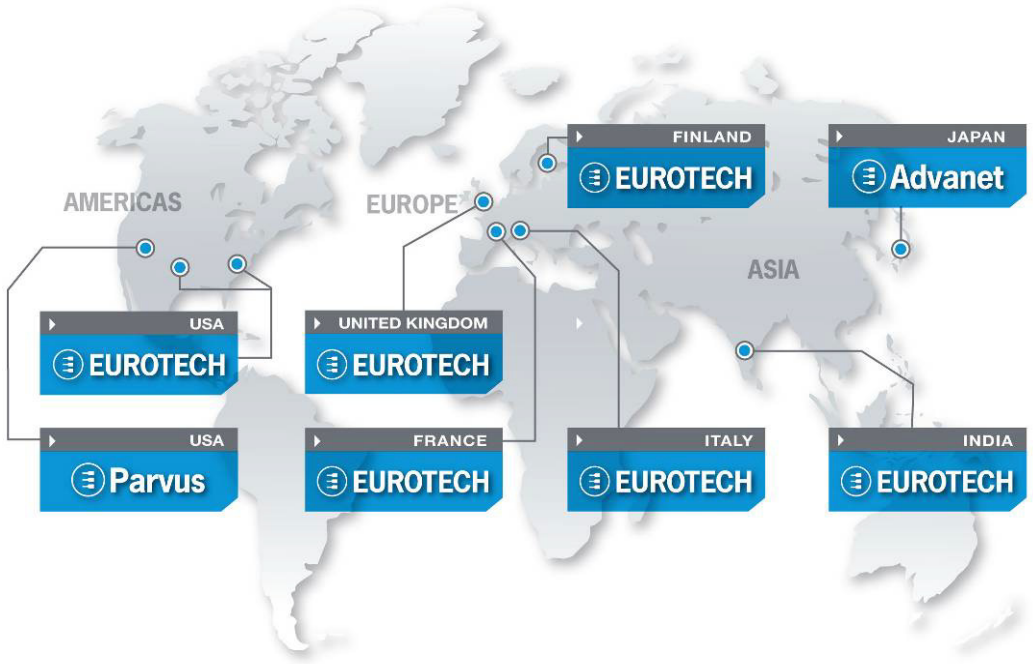
4.3 TurboIXP Module Revision History

The following is an overview of the revisions to the TurboIXP module.

4.3.1 Revision 1

Initial release

Eurotech Worldwide Presence



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