

CTR-1475

User Manual

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The information below is issued in compliance with the regulations as set out in the 2002/96/CE directive, subsequently superseded by 2003/108/CE. It refers electrical and electronic equipment and the waste management of such products. When disposing of a device, including all of its components, subassemblies and materials that are an integral part of the product, you should consider the WEEE directive.



This symbol has been attached to the equipment or, if this has not been possible, on the packaging, instruction literature and/or the guarantee sheet. By using this symbol, it states that the device has been marketed after August 13th 2005, and implies that you must separate all of its components when possible, and dispose of them in accordance with local waste disposal legislations.

- Because of the substances present in the equipment, improper use or disposal of the refuse can cause damage to human health and to the environment.
- With reference to WEEE, it is compulsory not dispose of the equipment with normal urban refuse, arrangements should be instigated for separate collection and disposal.
- Contact your local waste collection body for more detailed recycling information.
- In case of illicit disposal, sanctions will be levied on transgressors.

RoHS

This device, including all its components, subassemblies and the consumable materials that are an integral part of the product, has been manufactured in compliance with the European directive 2002/95/EC known as the RoHS directive (Restrictions on the use of certain Hazardous Substances). This directive targets the reduction of certain hazardous substances previously used in electrical and electronic equipment (EEE).

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ITALY

Introduction

Manual Conventions

The following conventions are used throughout this manual.

The “Mode” of the register:

Symbol / Text	Definition
RW	Readable and Writable register
RO	Read only register
W	Meaning of the register when written
R	Meaning of the register when read

Hexadecimal numbering:

Hexadecimal numbers are indicated with an “h” suffix (for example: 11Ch)

Symbols and Text used in Pin-out tables:

Symbol / Text	Definition
◀	Input
▶	Output
◀▶	Bi-Directional
—	Passive
Module specific	Dependent on module installed
NC	Not Connected
Reserved	Use reserved to Eurotech, must remain unconnected
#	Active low signal
◆	Pass-thru signal: not used by the board described in this manual

Warnings and Important Notices:

Within this manual you will find the following tables, please ensure that you read and understand these as they are intended to highlight potential risks or precautions that should be taken.

**Warnings:**

Information to alert you to potential hazards:
Potential personal injury or damage to a system, device or program.

**Information notes:**

Indicates important features or instructions that should be observed

Technical Assistance

If you have any technical questions or if you cannot isolate a problem with your device, please e-mail the Eurotech Technical Support Team: techsupp@eurotech.it.

RMA Requests

Before returning any Eurotech product, for any reason, you must e-mail the Eurotech Technical Support Team on the above email address, giving the following information; you will then be sent an RMA number (Returned Material Authorization) for the return of the material:

- Model number (see Figure 1)
- Serial number (see Figure 1)
- Detailed fault description
- Company Details
- Contact details

Transportation

When transporting any module or system, for any reason, it should be packed using anti-static material and placed in a sturdy box with enough packing material to adequately cushion it.

**Warnings:**

Any product returned to Eurotech that is damaged due to inappropriate packaging will not be covered by the warranty!

Board labelling

On the external side of the ISA Bus connector, you will find several labels displaying the following:

- Batch Number
- Serial Number
- Model Number
- Hardware Revision

**Note:**

The actual location of these labels may vary depending on the product purchased. For example: If no ISA bus is present, the PCI bus may be used instead. However, the labelling formats will remain the same.

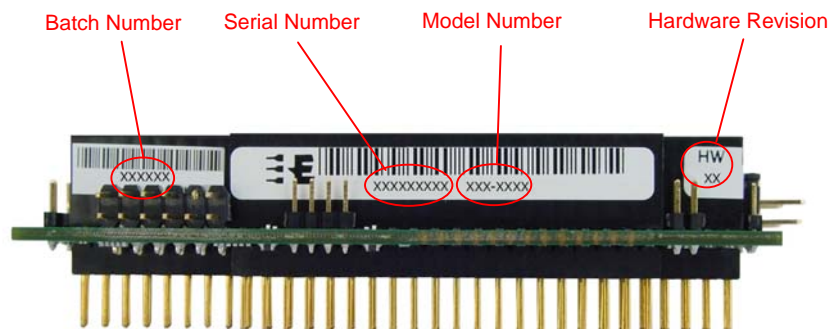


Figure 1. Board label locations

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Chapter 1 Product Overview

The CTR-1475 is a real-time MPEG-4 video compressor, encoder and frame grabber module designed to capture up to four concurrent high-quality analog video and audio streams, encode them in compressed MPEG-4 or AVI formats, and send them to an embedded computer over the 32-bit PCI bus.

In the following paragraphs, you will find a brief description of the CTR-1475 characteristics.

For a complete list of our products please go to our web site: <http://www.eurotech.it/>

Product Definition

Encoding Processor:

Integrated RISC Microcontroller

(To offload compression overhead from system CPU)

Video Input:

4 Analog Video Input Channels

(Up to 16 concurrent cameras can be supported with four CTR-1475 in a single PC/104-Plus stack)

Video Output (Analog):

1 Analog Video Output Channel

(For Monitoring)

Audio Input:

4 Audio Input Channels

(PCM, ADPCM Audio Compression)

Video Quality Control:

Programmable Quantization Values - Picture Size, Position, Panning, Tilting, Freeze

Bit Rate Control:

Supports Variable Bit Rate (VBR), Constant Bit Rate (CBR) and Hybrid Bit Rate (HBR)

General Purpose Digital I/O:

8 Digital I/O Channels

Electrical and Environmental Specifications

Operating Characteristics

Electrical Operating Characteristics

Power supply	<ul style="list-style-type: none"> +5V dc +/- 5%
Power consumption	<ul style="list-style-type: none"> 7W typical 10 W maximum
Analog video input	<ul style="list-style-type: none"> 1V typical (nominal value) Termination impedance: 75 Ohm
Analog video output	<ul style="list-style-type: none"> 1.25V typical (nominal value) Termination impedance: 75 Ohm
Analog Audio input	<ul style="list-style-type: none"> 1V

Operating Temperature Range

For correct operation of the module, the ambient air temperature must remain within the following range:

Standard	<ul style="list-style-type: none"> Minimum +0 °C Maximum +60 °C
Extended (optional)	<ul style="list-style-type: none"> Minimum -40 °C Maximum +85 °C

Absolute Maximum Ratings

Supply Voltage:	0.00 to 5.50V
Storage Temperature Range:	-40°C to +85°C
Non-Condensing Relative Humidity:	<95% at 40°C



Warning:

Stressing the device beyond the “Absolute Maximum Ratings” may cause permanent damage. These are stress ratings only. Operation beyond the “Operating Conditions” is not recommended. Extended exposure beyond the “Operating Conditions” may affect device reliability

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Chapter 2 Jumper Description

Jumper Layout and Configuration

Jumpers are shown as **JP** followed by its designated number.

Six 2-pin jumpers are located on the module. They can be set as follows:

- Pin 1 connected to pin 2 (which will be indicated as 'Closed')
- Pin 1 and pin 2 not connected (which will be indicated as 'Open')

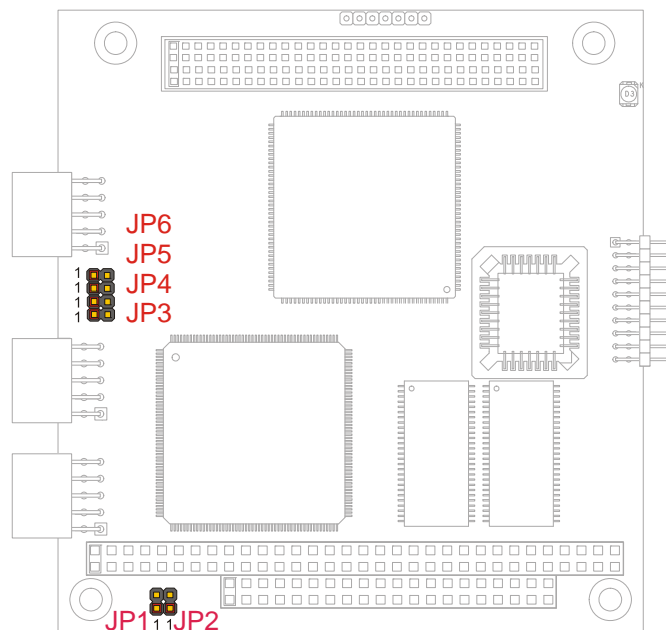


Figure 2. Jumper layout

JP#	TYPE	FUNCTION			DEFAULT
		JP1	JP2	PCI Selection Slot:	
JP1-2	2 pin jumper	Closed	Closed	Slot 0	JP1 and JP2 Closed
		Open	Closed	Slot 1	
		Closed	Open	Slot 2	
		Open	Open	Slot 3	
JP3	2 pin jumper	AUDIO IN1 - Microphone polarization <ul style="list-style-type: none">• Closed: Polarization Enabled• Open: Polarization Disabled			Open
JP4	2 pin jumper	AUDIO IN2 - Microphone polarization <ul style="list-style-type: none">• Closed: Polarization Enabled• Open: Polarization Disabled			Open
JP5	2 pin jumper	AUDIO IN3 - Microphone polarization <ul style="list-style-type: none">• Closed: Polarization Enabled• Open: Polarization Disabled			Open
JP6	2 pin jumper	AUDIO IN4 - Microphone polarization <ul style="list-style-type: none">• Closed: Polarization Enabled• Open: Polarization Disabled			Open

Table 1. Jumper Functions

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Chapter 3 Connector Description

Connector Layout

Connectors are shown as **J** followed by its designated number and a red pad indicates pin 1.

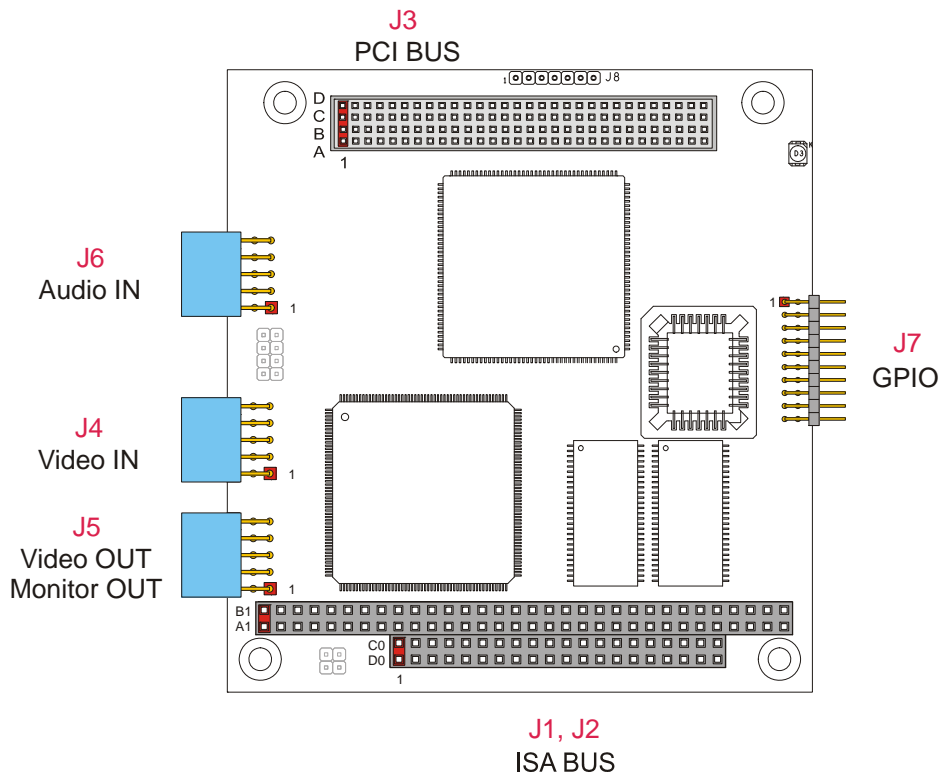


Figure 3. Connector layout

Connector #	Function	Qty of pins	Format	Pitch (mm)
J1	ISA Bus	64	PC104: 32x2	2.54
J2	ISA Bus	40	PC104: 20x2	2.54
J3	PCI Bus	120	PC104PLUS: 30x4	2.00
J4	Video IN	10	HE14 5X2 polarized with retain	2.54
J5	Video OUT, Monitor OUT	10	HE14 5X2 polarized with retain	2.54
J6	Audio IN	10	HE14 5X2 polarized with retain	2.54
J7	GPIO	20	Pinstrip 10X2	2.00

Table 2. Connector Functions

How to connect the CTR-1475 with other PC/104 & PC/104-Plus devices: the stack assembly

The ISA and PCI bus connectors of the module are designed to allow it to be connected with other PC/104 and/or PC/104-Plus devices, we recommend users to follow this procedure to ensure that stacked modules are not damaged.



Warning:

Appropriate ESD (Electro Static Discharge) precautions should be used for the following procedure.

1. Turn off the power to the PC/104 (or PC/104-Plus) system or stack.
2. Select and install standoffs as required to correctly position the module on the PC/104 stack.
3. Remove the module from its anti-static bag.
4. Check that keying pins in the bus connector are correctly positioned.
5. Check the stacking order; make sure an XT bus card will not be placed between two AT bus cards or it will interrupt the AT bus signals.
6. Hold the module by its edges and orient it so that the bus connector pins line up with the matching connector on the stack.
7. Press the module evenly onto the PC/104 stack.

Figure 4 shows a typical module stack with two PC/104 modules, one PC/104 16-BIT module, and one PC/104 8-BIT module.

The maximum number of modules is four in addition to the Host Board.

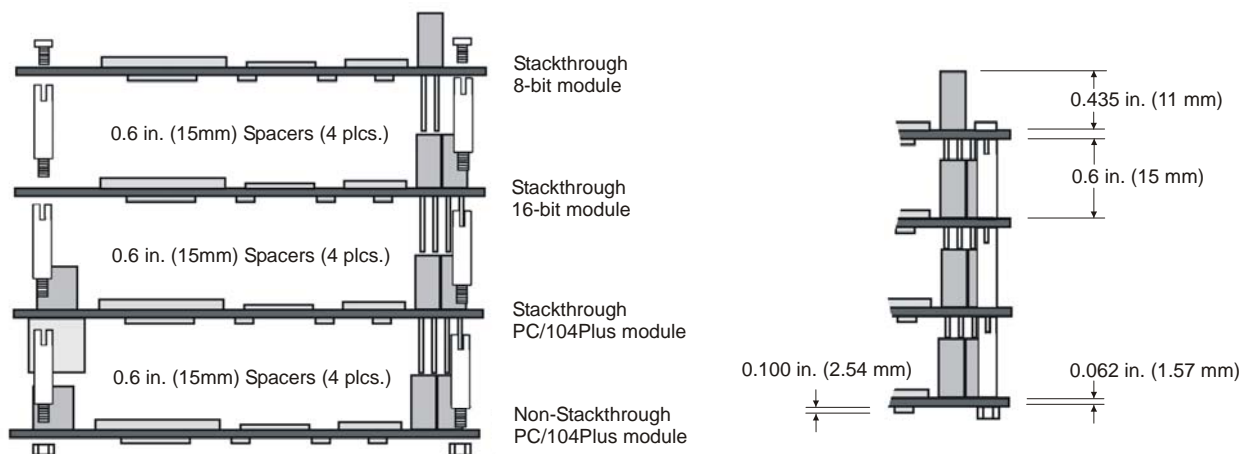


Figure 4. The Module Stack



Warning:

Do not force the module onto the stack! Wiggling the module or applying too much pressure may damage it. If the module does not readily press into place, remove it, check for bent pins or out-of-place keying pins, and try again.

J1 and J2: the ISA Bus

Connectors J1 and J2 carry the signals for the ISA Bus. The ISA Bus is only used to convey signals to/from boards above or below the CTR-1475. No physical connections are made to the CTR-1475 circuitry. These signals match the definitions of the IEEE P996 standard.

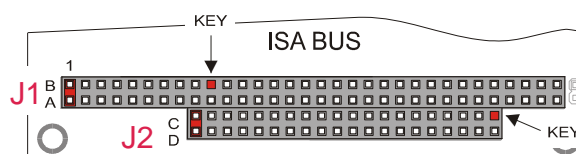


Figure 5. ISA BUS layout

According to the PC/104 specifications, these connectors include KEY pins; these are filled holes in the female side and missing pins on the male side of a connector, to avoid the wrong insertion in/of another module.

Pin #	Row A Signal	Pin #	Row B Signal
1	IOCHK#	1	GND
2	SD7	2	RESET
3	SD6	3	+5V
4	SD5	4	IRQ9
5	SD4	5	-5V
6	SD3	6	DRQ2
7	SD2	7	-12V
8	SD1	8	SRDY#
9	SD0	9	+12V
10	IOCHRDY	10	NC KEY
11	AEN	11	SMEMW#
12	SA19	12	SMEMR#
13	SA18	13	IOW#
14	SA17	14	IOR#
15	SA16	15	DACK3#
16	SA15	16	DRQ3
17	SA14	17	DACK1#
18	SA13	18	DRQ1
19	SA12	19	REFRESH#
20	SA11	20	BCLK
21	SA10	21	IRQ7
22	SA9	22	IRQ6
23	SA8	23	IRQ5
24	SA7	24	IRQ4
25	SA6	25	IRQ3
26	SA5	26	DACK2#
27	SA4	27	TC
28	SA3	28	BALE
29	SA2	29	+5V
30	SA1	30	OSC
31	SA0	31	GND
32	GND	32	GND

Figure 6. J1 connector pinout

Pin #		Row D Signal	Pin #		Row C Signal
1	◆	GND	1	◆	GND
2	◆	MEMCS16#	2	◆	SBHE#
3	◆	IOC16#	3	◆	LA23
4	◆	IRQ10	4	◆	LA22
5	◆	IRQ11	5	◆	LA21
6	◆	IRQ12	6	◆	LA20
7	◆	IRQ15	7	◆	LA19
8	◆	IRQ14	8	◆	LA18
9	◆	DACK0#	9	◆	LA17
10	◆	DRQ0	10	◆	MEMR#
11	◆	DACK5#	11	◆	MEMW#
12	◆	DRQ5	12	◆	SD8
13	◆	DACK6#	13	◆	SD9
14	◆	DRQ6	14	◆	SD10
15	◆	DACK7#	15	◆	SD11
16	◆	DRQ7	16	◆	SD12
17	◆	+5V	17	◆	SD13
18	◆	MASTER#	18	◆	SD14
19	◆	GND	19	◆	SD15
20	◆	GND	20	NC	KEY

Figure 7. J2 connector pinout

**Note:**

For further information regarding the ISA and PCI bus, please visit the Eurotech website (<http://www.eurotech.it/>), referring to the section titled "Industry Standards".

J3: PCI Bus

Connector J3 carries signals of the PCI Bus. The PCI Bus mechanical interface is a stackable 30x4 header. This interface carries all of the required PCI signals per *PCI Local Bus Specification Version. 2.1*.

J3 PCI Bus

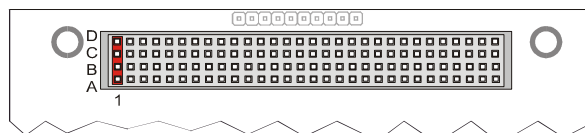


Figure 8. PCI BUS layout

Pin	A	B	C	D
1	GND	Reserved	+5	AD00
2	VI/O	AD02	AD01	+5V
3	AD05	GND	AD04	AD03
4	C/BE0#	AD07	GND	AD06
5	GND	AD09	AD08	GND
6	AD11	VI/O	AD10	M66EN
7	AD14	AD13	GND	AD12
8	+3.3V	C/BE1#	AD15	+3.3V
9	SERR#	GND	Reserved	PAR
10	GND	PERR#	+3.3V	Reserved
11	STOP#	+3.3V	LOCK#	GND
12	+3.3V	TRDY#	GND	DEVSEL#
13	FRAME#	GND	IRDY#	+3.3V
14	GND	AD16	+3.3V	C/BE2#
15	AD18	+3.3V	AD17	GND
16	AD21	AD20	GND	AD19
17	+3.3V	AD23	AD22	+3.3V
18	IDSEL0	GND	IDSEL1	IDSEL2
19	AD24	C/BE3#	VI/O	IDSEL3
20	GND	AD26	AD25	GND
21	AD29	+5V	AD28	AD27
22	+5V	AD30	GND	AD31
23	REQ0#	GND	REQ1#	VI/O
24	GND	REQ2#	+5V	GNT0#
25	GNT1#	VI/O	GNT2#	GND
26	+5V	CLK0	GND	CLK1
27	CLK2	+5V	CLK3	GND
28	GND	INTD#	+5V	RST#
29	+12V	INTA#	INTB#	INTC#
30	-12V	REQ3#	GNT3#	GND

Table 3. J3 connector pinout



Note:

For further information regarding the ISA and PCI bus, please visit the Eurotech website (<http://www.eurotech.it/>), referring to the section titled "Industry Standards".

J4: Composite Video IN

By using connector J4, the CTR-1475 module offers the possibility to add a video composite input, from up to four NTSC, PAL and SECAM video format cameras, to a PC/104-Plus system.

Analog Video Input

Electrical characteristics

- 1V typical (nominal value)
- Termination impedance: 75 Ohm

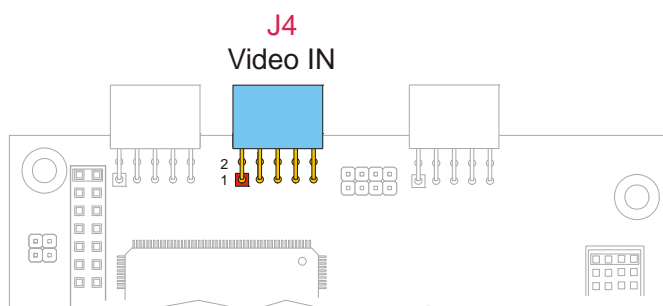


Figure 9. J4 Connector

PIN#	SIGNAL	SIGNAL	PIN#
1	Reserved	GND	2
3	Video IN4	GND	4
5	Video IN3	GND	6
7	Video IN2	GND	8
9	Video IN1	GND	10

Table 4. J4 Pinout



Information notes:

Please refer to the Technical Datasheet Td0022 for further information about the cable set that can be used.

J5: Video OUT and Monitor OUT

The J5 connector features four analog video outputs that can only be used for testing the signals coming from the cameras.

J5 also features an analog monitor video out that allows monitoring the sequence that is going to be recorded.

Analog Video Output Electrical characteristics

- 1.25V typical (nominal value)
- Termination impedance: 75 Ohm

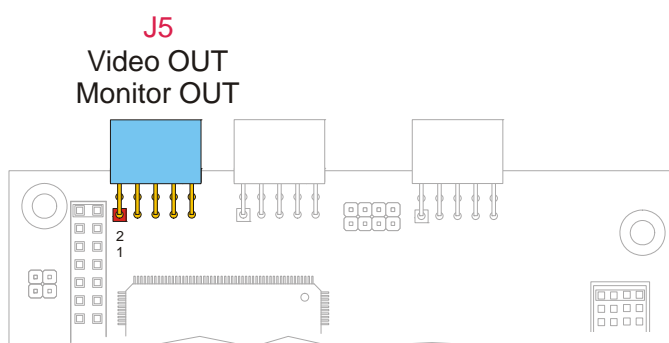


Figure 10. J5 Connector

PIN#	SIGNAL	SIGNAL	PIN#
1	Monitor OUT	GND	2
3	Video OUT4	GND	4
5	Video OUT3	GND	6
7	Video OUT2	GND	8
9	Video OUT1	GND	10

Table 5. J5 Pinout



Information notes:

Please refer to the Technical Datasheet Td0022 for further information about the cable set that can be used.

J6: Audio IN

J6 allow the connection of up to 4 mono audio inputs.

Analog Video Output Electrical characteristics	1V
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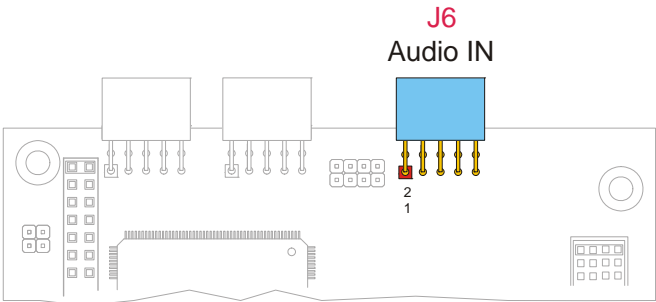


Figure 11. J6 Connector

PIN#	SIGNAL	SIGNAL	PIN#
1	NC	GND	2
3	Audio IN1	GND	4
5	Audio IN2	GND	6
7	Audio IN3	GND	8
9	Audio IN4	GND	10

Table 6. J6 Pinout

J7: GPIO

J7 implements 4 TTL I/O level general-purpose digital inputs and 8 TTL I/O level general-purpose digital outputs.

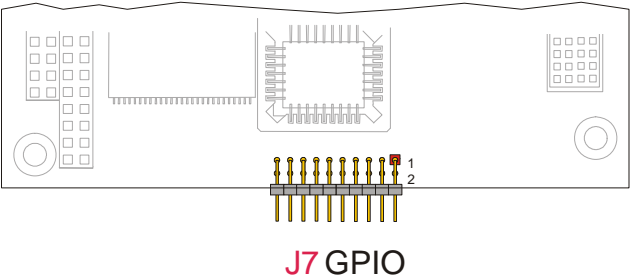


Figure 12. J7 Connector

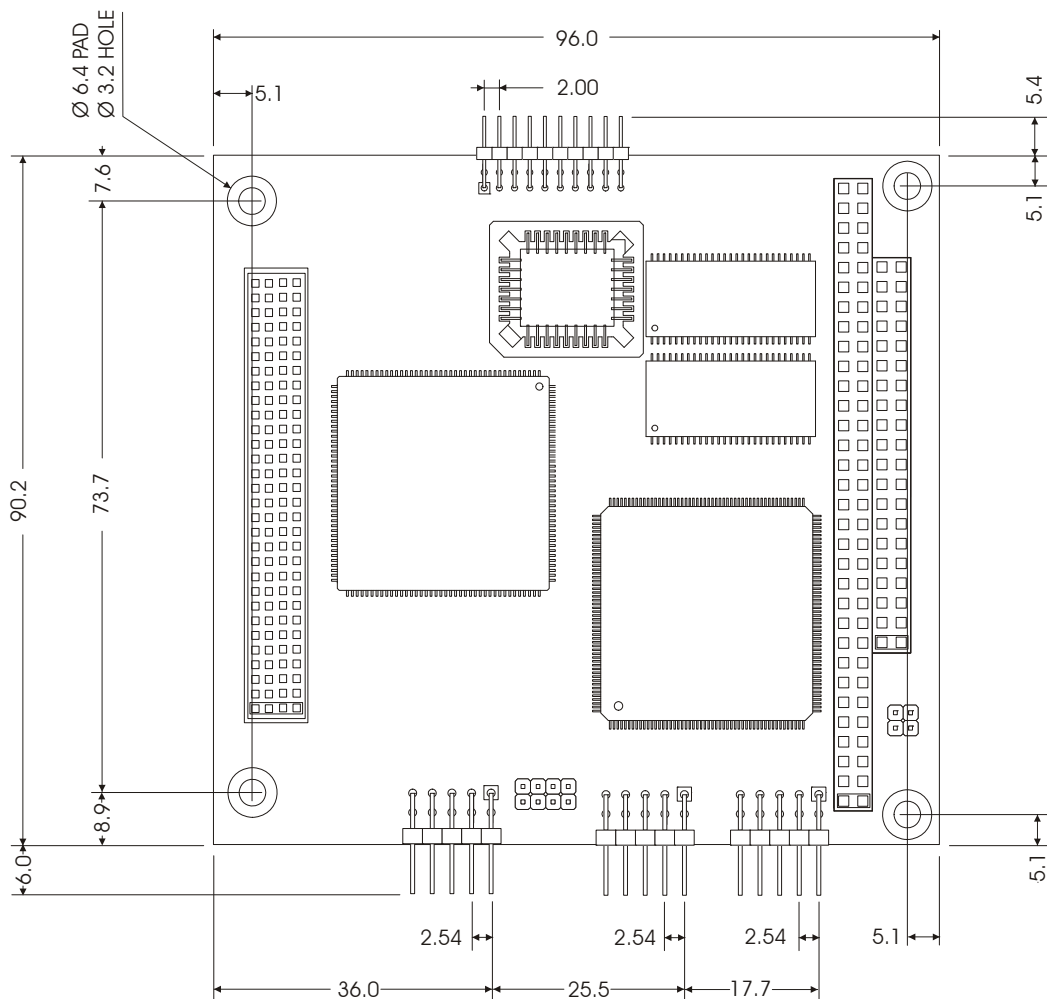
PIN#	SIGNAL	SIGNAL	PIN#
1	Digital IN0	Digital OUT0	2
3	Digital IN1	Digital OUT1	4
5	Digital IN2	Digital OUT2	6
7	Digital IN3	Digital OUT3	8
9	+3.3V	Digital OUT4	10
11	+3.3V	Digital OUT5	12
13	+5V	Digital OUT6	14
15	+5V	Digital OUT7	16
17	GND	Reserved	18
19	GND	GND	20

Table 7. J7 Pinout

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Chapter 4 Appendix

A.1. Mechanical Dimensions



Dimensions are in millimetres

Figure 13. CTR-1475 Board dimensions



Note:

Note: For further information about the mechanical dimensions of ISA and PCI buses please refer to the pc104 consortium site (www.pc104.org)

A.2. Manual Revision History

REVISION	DESCRIPTION	DATE
1.0	First Release	6 th November 2007
1.1	Updated the "J1 and J2: the ISA Bus" paragraph	8 th January 2008