CP342

Dual Port Three Speed Ethernet Board for Copper and Fiber Optic Applications

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User Guide

kontron

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Please refer also to the section “High Voltage Safety Instructions” on the following page.

ESD Sensitive Device!

This symbol and title inform that electronic boards and their components are sensitive to static electricity. Therefore, care must be taken during all handling operations and inspections of this product, in order to ensure product integrity at all times.

Please read also the section “Special Handling and Unpacking Instructions” on the following page.

Warning!

This symbol and title emphasize points which, if not fully understood and taken into consideration by the reader, may endanger your health and/or result in damage to your material.

Note ...

This symbol and title emphasize aspects the reader should read through carefully for his or her own advantage.

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High Voltage Safety Instructions

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Special Handling and Unpacking Instructions

ESD Sensitive Device!

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Do not handle this product out of its protective enclosure while it is not used for operational purposes unless it is otherwise protected.

Whenever possible, unpack or pack this product only at EOS/ESD safe work stations. Where a safe work station is not guaranteed, it is important for the user to be electrically discharged before touching the product with his/her hands or tools. This is most easily done by touching a metal part of your system housing.

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In order to maintain Kontron's product warranty, this product must not be altered or modified in any way. Changes or modifications to the device, which are not explicitly approved by Kontron and described in this manual or received from Kontron's Technical Support as a special handling instruction, will void your warranty.

This device should only be installed in or connected to systems that fulfill all necessary technical and specific environmental requirements. This applies also to the operational temperature range of the specific board version, which must not be exceeded. If batteries are present their temperature restrictions must be taken into account.

In performing all necessary installation and application operations, please follow only the instructions supplied by the present manual.

Keep all the original packaging material for future storage or warranty shipments. If it is necessary to store or ship the board please re-pack it as nearly as possible in the manner in which it was delivered. In the event that the original packaging material is not available for storage or warranty shipments, packaging which complies with the standards indicated in section 1.8 may be used to ensure the proper protection of this product.

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Kontron grants the original purchaser of Kontron's products a ***TWO YEAR LIMITED HARDWARE WARRANTY*** as described in the following. However, no other warranties that may be granted or implied by anyone on behalf of Kontron are valid unless the consumer has the express written consent of Kontron.

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Chapter 1

Introduction

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1. Introduction

1.1 System Overview

The CompactPCI board described in this manual operates with the PCI bus architecture to support additional I/O and memory-mapped devices as required by various industrial applications. For detailed information concerning the CompactPCI standard, please consult the complete Peripheral Component Interconnect (PCI) and CompactPCI Specifications. For further information regarding these standards and their use, visit the home page of the *PCI Industrial Computer Manufacturers Group (PICMG)*.

Many system-relevant CompactPCI features that are specific to Kontron Modular Computers CompactPCI systems may be found described in the Kontron CompactPCI System Manual. Please refer to the section “Related Publications” at the end of this chapter for the relevant ordering information.

The CompactPCI System Manual includes the following information:

- Common information that is applicable to all system components, such as safety information, warranty conditions, standard connector pinouts etc.
- All the information necessary to combine Kontron’s racks, boards, backplanes, power supply units and peripheral devices in a customized CompactPCI system, as well as configuration examples.
- Data on rack dimensions and configurations as well as information on mechanical and electrical rack characteristics.
- Information on the distinctive features of Kontron CompactPCI boards, such as functionality, hot swap capability. In addition, an overview is given for all existing Kontron CompactPCI boards with links to the relating data sheets.
- Generic information on the Kontron CompactPCI backplanes, such as the slot assignment, PCB form factor, distinctive features, clocks, power supply connectors and signalling environment, as well as an overview of the Kontron CompactPCI standard backplane family.
- Generic information on the Kontron CompactPCI power supply units, such as the input/output characteristics, redundant operation and distinctive features, as well as an overview of the Kontron CompactPCI standard power supply unit family.

1.2 Board Overview

1.2.1 Board Introduction

The CP342 board is a CompactPCI three speed Ethernet LAN controller for multiple server-to-client networking functions. It provides dual independent Gigabit / Fast Ethernet interfaces. Both interfaces are based on the Intell® Gigabit Ethernet PCI Bus LAN Controller 82546GB with integrated physical layer interface (PHY).

CP342 is a 3U CPCI Ethernet board suitable for both 10Base-T, 100Base-TX, and 1000Base-TX interfacing and includes all necessary features for auto-negotiation. Thus, 10/100/1000 Mbit/s transfer rates are supported by the board. In fact, provided that the network has the speed capability, the CP342 switches automatically. Additionally, if the addressed network station is compatible, it switches automatically to full-duplex mode.

The 3.3V signalling, 5V tolerant, board is designed to permit a very high PCI data bandwidth, which is achieved thanks to a MAC with dual 64 kB configurable Transmit and Receive buffers.

The board does not have any jumpers and, therefore, does not require hardware configuration. To make installation, repairs and updates easier, a PXE Boot allows the system to be started from a different operating system via network provided the optional Boot Flash is installed.

Three versions of the board are available: the CP342 with a dual front panel RJ45 connector; the CP342-RIO with no front panel connectors (signals are routed to J2 for rear IO capability); the CP342-SFP with two Small Form-factor Pluggable (SFP) interfaces on the front panel. For the CP342-RIO, there is a RIO module (CP-RIO3-42) with a dual RJ45 connector available.

1.2.2 Board Specific Information

Major board components of the CP342 board are:

- dual independent Gigabit Ethernet controller: Intel® 82546GB
- a Boot Flash (optional)
- a configuration EEPROM
- Magnetics (CP342, CP342-RIO)
- dual RJ45 connector (CP342)
- two SFP (small format pluggable) fiber optic connectors (CP342-SFP)

Other board features are:

- multiple server-to-client networking
- three speed operation: 10/100/1000 Mbit/s (the CP342-SFP supports only 1000 Mbits/s)
- auto-negotiation
- 64 kB Transmit and Receive buffers
- galvanic de-coupling
- optional rear IO capability (CP342-RIO plus CP-RIO3-42)

1.3 Board Versions

1.3.1 CP342

This is the standard version of the CP342. It has a dual RJ45 connector on the front panel with two LEDs integrated in each connector.

1.3.2 CP342-RIO

This version of the CP342 provides the basis for rear IO output. Both Ethernet channel signals are routed to the J2 connector for rear IO capablility on backplanes which support rear IO. There are no front panel connectors with this version, however, there are three operational status LEDs for each channel available on the front panel. To support standard CompactPCI rear IO, there is an optional rear IO module available, the CP-RIO3-42.

1.3.3 CP342-SFP

This version of the CP342 provides two SFP (small form-factor pluggable) cages at the front panel for use with SPF transceivers (fiber optic or RJ45 type modules). In addition, there are three operational status LEDs available for each channel.

Note ...

This version of the CP342 is supplied **only with SFP cages** as receptacles for SFP transceiver modules.

SFP transceiver modules are not a part of this product.

1.3.4 Optional CP-RIO3-42 RIO Module for CP342-RIO

This optional module is designed for use with the CP342-RIO. It provides two rear IO Ethernet channels with RJ45 interfacing (copper only)

Refer to Appendix A for further information on the CP-RIO3-42 module.

1.3.5 System Considerations

Within any given CompactPCI system there may be more than one CP342 board installed. The mixing of different versions within a system is also permitted. Use of the CP342-RIO version requires a backplane which supports rear IO. This may be a standard CPCI backplane with rear IO slots or may be a customized backplane.

1.4 System Relevant Information

The following system relevant information is general in nature but should still be considered when developing applications using the CP342.

Table 1-1: System Relevant Information

SUBJECT	INFORMATION
System Configuration	The CP342 may be used in any CompactPCI system.
Master/Slave Functionality	The CP342 can operate as a peripheral board (bus master capable).
Board Location in the System	The CP342 board may be installed anywhere in a system except in the system slot of a CompactPCI backplane. The CP342-RIO requires a rear IO capable slot for use.
Hot Swap Compatibility	The CP342 is not Hot Swap capable.
Operating Systems	The CP342 can operate under the following operating systems: Microsoft® Windows® XP Microsoft® Windows® XP Embedded Linux VxWorks® Please contact Kontron for further information concerning other operating systems.

1.5 Board Diagrams

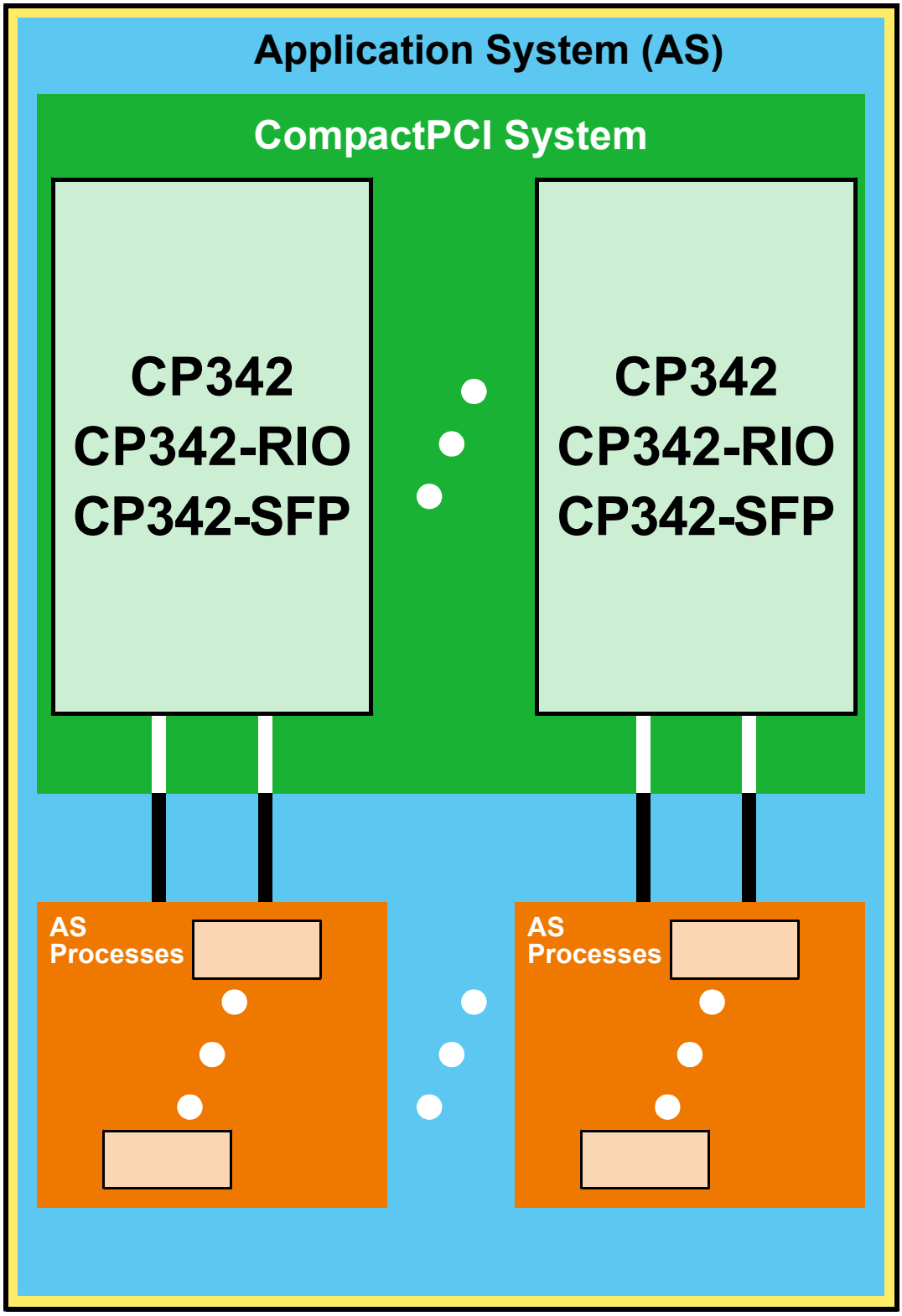
The following diagrams provide additional information concerning board functionality and component layout.

LEGEND FOR FIGURE 1-2

CPCI CompactPCI
GbE Gigabit Ethernet
SFP Small Form-factor Pluggable
TSE Three Speed Ethernet (10/100/1000 Mbits/s)
TXRX Transceiver

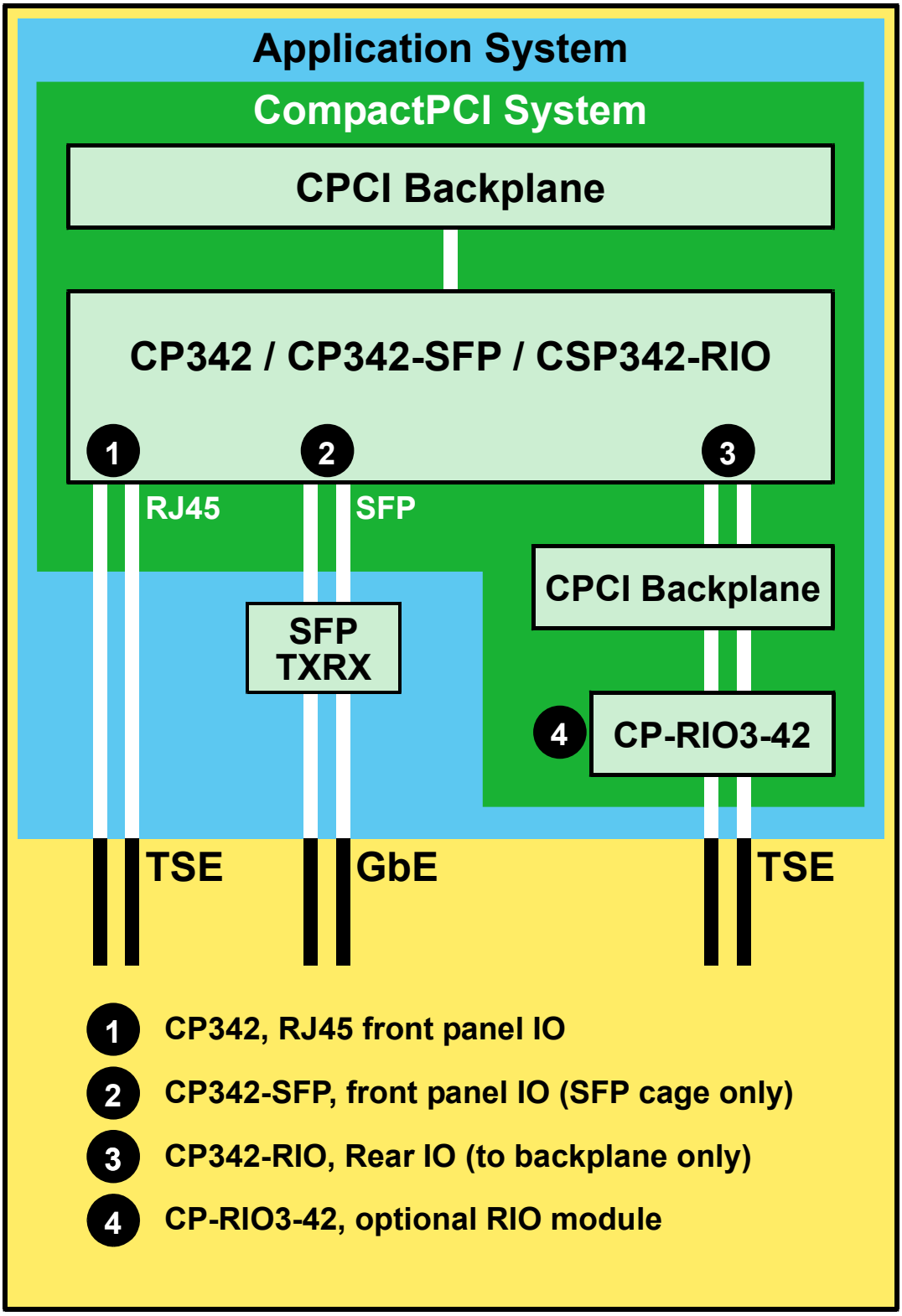
1.5.1 Application System Interfacing

Figure 1-1: CP342 Application System Interfacing Diagram



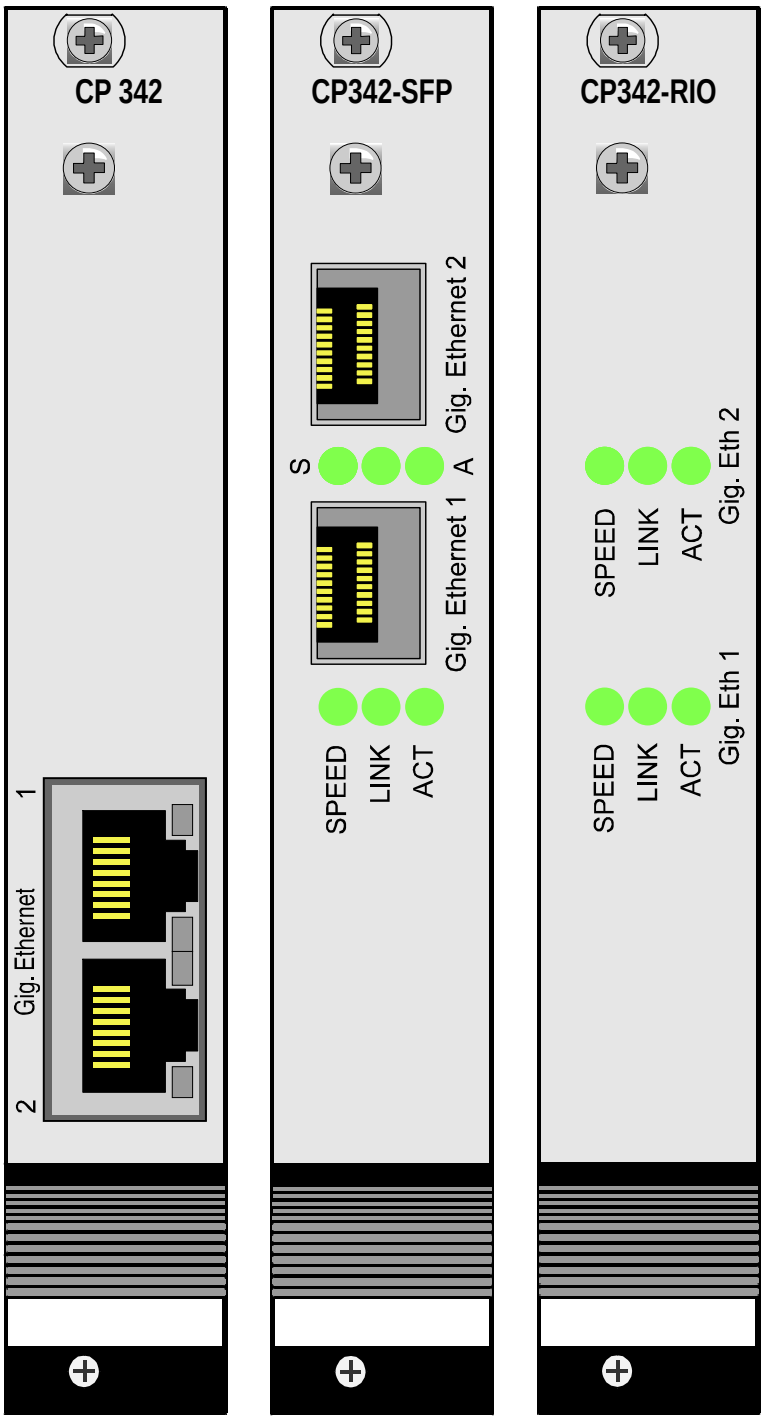
1.5.2 System Level Interfacing

Figure 1-2: CP342 System Level Interfacing Diagram



1.5.3 Front Panels

Figure 1-3: CP342, CP342-SFP, and CP342-RIO Front Panels



1.5.4 Board Layout

Figure 1-4: CP342 Board (Top View)

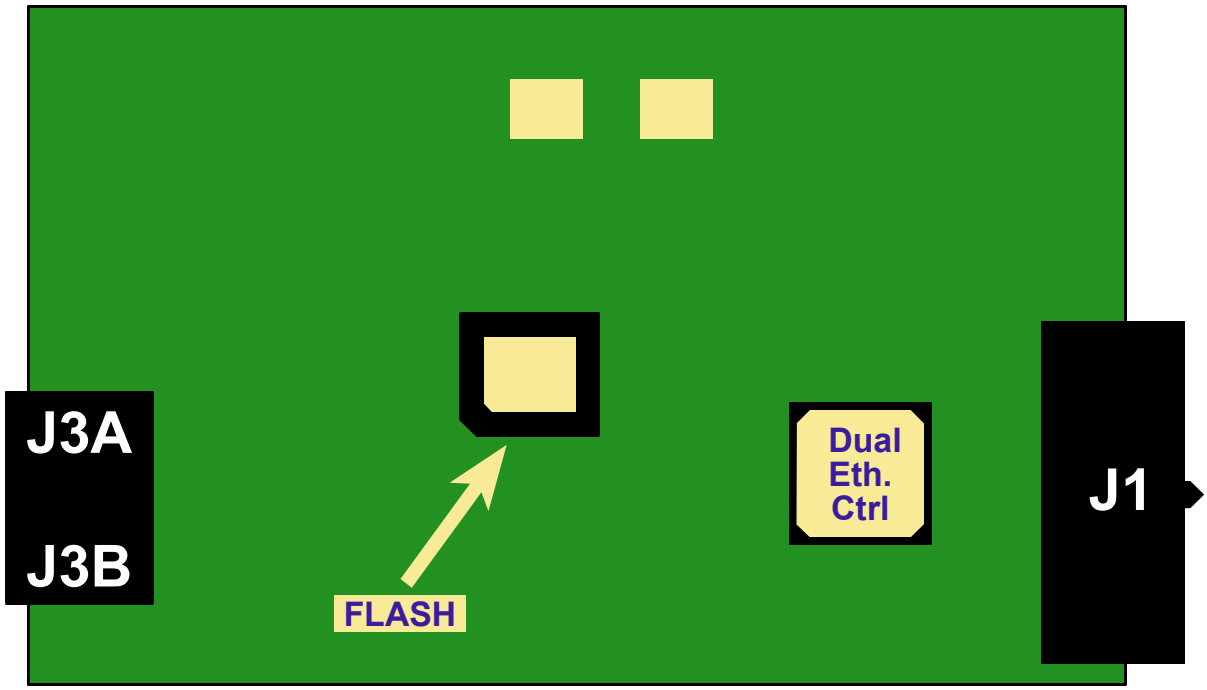


Figure 1-5: CP342_SFP Board (Top View)

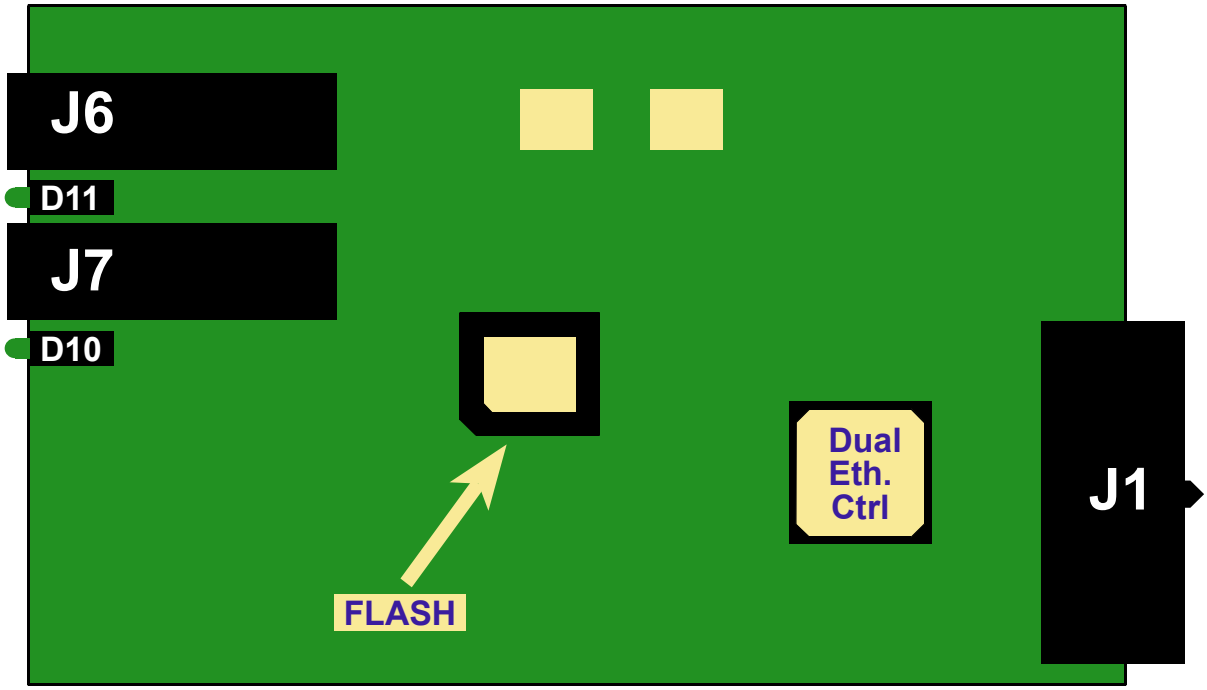
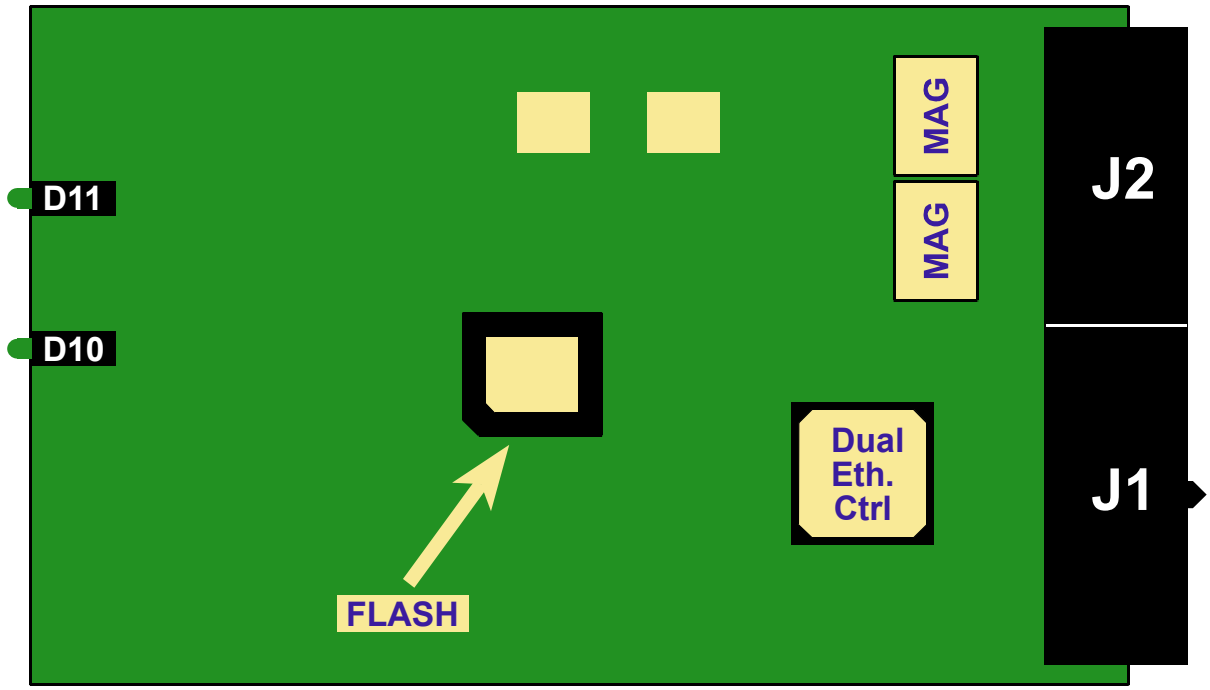


Figure 1-6: CP342_RIO Board (Top View)



1.6 Technical Specifications

Table 1-2: Main Specifications

	TYPE	SPECIFICATIONS
CP342	Controller	Intel® 82546GB, dual channel Gigabit Ethernet, lead free version
	Ethernet	Two channels of three speed Ethernet: 10/100/1000 Mbit/s
	Ethernet Interfaces	Two RJ45 front panel connectors
	LEDs	Two status LEDs per channel, integrated in each connector, yellow and green
	Boot Flash	Flash memory socket (PLCC32) available for up to 1 MB of removable Flash memory for user-installed and programmed boot chip (Flash memory is optionally available with the product)
	Speed Configuration	Auto-negotiation for speed and switching
	Signalling Voltage	3.3 volt (5 volt tolerant)
	Plug & Play Design	No jumpers to be configured
	Power Consumption	Source: 3.3 V: consumption: ca. 5.6 watts
	Temperature Range	Operational: 0°C to +55°C Standard -40°C to +85°C E2 (on request) Storage: -55°C to +125°C
	Climatic Humidity	93% relative humidity at 40°C, non-condensing
	Dimensions	160 mm L x 100 mm W (single height Eurocard)
	Board Weight	ca. 145 g (with heatsink)

Table 1-2: Main Specifications (Continued)

	TYPE	SPECIFICATIONS
CP342-SFP	Controller	Intel® 82546GB, dual channel Gigabit Ethernet, lead free version
	Ethernet	Two channels of Gigabit Ethernet: 1000 Mbit/s
	Ethernet Interfaces	Two SFP cage interfaces on the front panel
	LEDs	Three status LEDs per channel, integrated in the front panel, green
	Boot Flash	Flash memory socket (PLCC32) available for up to 1 MB of removable Flash memory for user-installed and programmed boot chip (Flash memory is optionally available with the product)
	Speed Configuration	Gigabit Ethernet only
	Signalling Voltage	3.3 volt (5 volt tolerant)
	Plug & Play Design	No jumpers to be configured
	Power Consumption	Source: 3.3 V: consumption: ca. 5.6 watts
	Temperature Range	Operational: 0ºC to +55ºC Standard Storage: -55ºC to +125ºC
	Climatic Humidity	93% relative humidity at 40°C, non-condensing
	Dimensions	160 mm L x 100 mm W (single height Eurocard)
	Board Weight	ca. 145 g (with heatsink)
CP342-RIO	Controller	Intel® 82546GB, dual channel Gigabit Ethernet, lead free version
	Ethernet	Two channels of three speed Ethernet: 10/100/1000 Mbit/s
	Ethernet Interfaces	Backplane rear IO only on the J2 connector (requires rear IO capable backplane)
	LEDs	Three status LEDs per channel, integrated in the front panel, green
	Boot Flash	Flash memory socket (PLCC32) available for up to 1 MB of removable Flash memory for user-installed and programmed boot chip (Flash memory is optionally available with the product)
	Speed Configuration	Auto-negotiation for speed and switching
	Signalling Voltage	3.3 volt (5 volt tolerant)
	Plug & Play Design	No jumpers to be configured
	Power Consumption	Source: 3.3 V: consumption: ca. 5.6 watts
	Temperature Range	Operational: 0ºC to +55ºC Standard -40ºC to +85ºC E2 (on request) Storage: -55ºC to +125ºC
	Climatic Humidity	93% relative humidity at 40°C, non-condensing
	Dimensions	160 mm L x 100 mm W (single height Eurocard)
	Board Weight	ca. 145 g (with heatsink)

1.7 Applied Standards

The Kontron Modular Computers' CompactPCI module CP342 complies with the requirements of the following standards:

Table 1-3: Applied Standards

	TYPE	STANDARD
CE	Emission	EN55022, EN61000-6-3
	Immunity, Industrial Environment	EN61000-6-2
	Immunity, IT Equipment	EN55024
	Electrical Safety	EN60950-1 Note: The CP342 is specified I/O only for: SELV and EVL. It is **NOT SPECIFIED** for "Hazardous"
MECHANICAL	Mechanical Dimensions	IEEE1101.10
ENVIRONMENTAL	Vibration, Sinusoidal	IEC 60068-2-6
	Random Vibration, Broadband	IEC 60068-2-64
	Bump	IEC 60068-2-29
	Single Shock	IEC 60068-2-27
	Temperature Tests A: Cold	IEC 60068-2-1
	Temperature Tests B: Dry Heat	IEC 60068-2-2
	Climatic Humidity	IEC 60068-2-78

1.8 Related Publications

Table 1-4: Related Publications

	ISSUED BY	DOCUMENT
CompactPCI	PICMG	CompactPCI Specification 2.0, Rev. 3.0
	Kontron	Kontron's CompactPCI System Manual, ID 19954

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Chapter 2

Functional Description

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2. Functional Description

The following chapters present more detailed, board level information about the CP342, the CP342-SFP, and the CP342-RIO versions of the product whereby the board components and their basic functionality are discussed in general.

2.1 General Information

The CP342 is designed as a dual channel Gigabit Ethernet CompactPCI IO board with interfacing for front panel connectors as well as supporting rear IO on the J2 connector. There are three versions available with each version supporting a single interfacing type:

- a dual RJ45 connector (CP342)
- two single SFP cages for SFP transceivers (CP342-SFP)
- rear IO interfacing for both Gigabit Ethernet channels (CP342-RIO)

In addition, there are operational status LEDs provided with each version:

- integrated connector LEDs on the dual RJ45 connector
- three LEDs for each SFP/RIO Ethernet channel on the front panel

Further, there is a PLCC32 socket available for installing optional Boot Flash memory.

2.2 Board-Level Interfacing Diagram

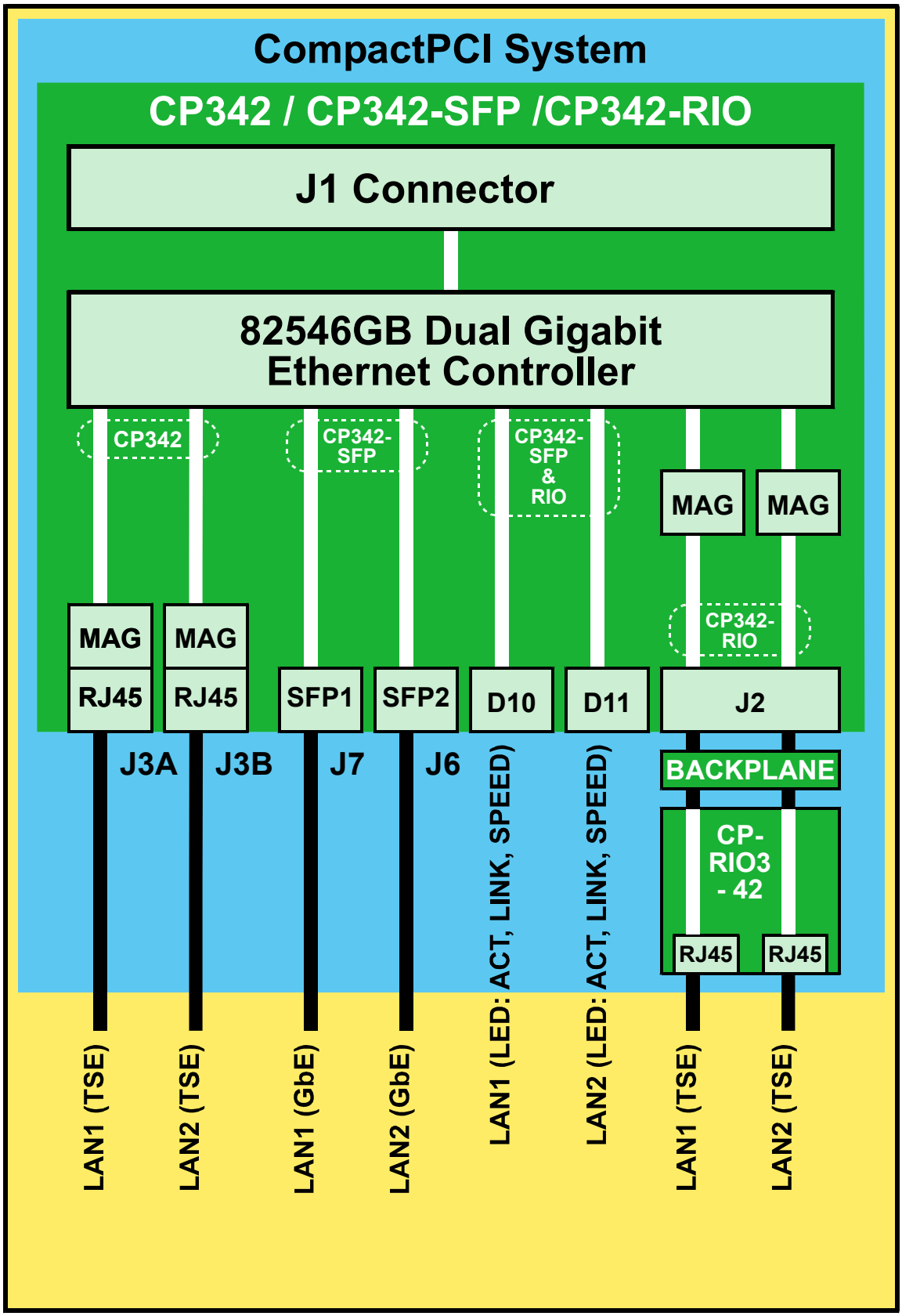
The following figure demonstrates the interfacing structure between the internal processing modules of the CP342 and other major CP342 module components. Where CP342 system elements have common interfacing they are grouped into a block. Interfacing common to only one element of a block is indicated with a direct connecting line. The interfacing lines are shown in white where they are on board and in black for board external interfacing.

LEGEND FOR FIGURE 2-1:

Dnn	Diode (LED) and designator: 10 or 11 for Activity, Link, and Speed
GbE	Gigabit Ethernet (1000 Mbit/s)
Jn[a]	Board Connector
LANn	Ethernet channel and designator: 1 or 2
MAG	Magnetics
RJ45	Type of Connector (for copper connection)
SFPn	Type of Connector with housing (Small Form-factor Pluggable) and designator: 1 or 2 for SFP transceivers
TSE	Three speed Ethernet (10/100/1000 Mbit/s)

Board functions are dependent on the CP342 version and mutually exclusive of each other except for the LEDs which are shared by the CP342-SFP and CP342-RIO versions.

Figure 2-1: CP342 Board Level Interfacing



2.3 Interfaces

2.3.1 CompactPCI Bus Interface

The complete CompactPCI connector configuration comprises two connectors designated as J1 and J2.

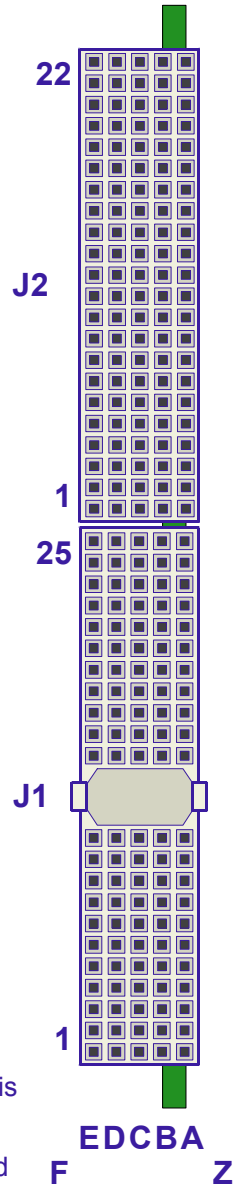
Their function is as follows:

- J1: 32-bit CompactPCI interface with PCI bus signals and power
- J2: has Rear I/O interface functionality

2.3.1.1 CompactPCI Connector Keying

CompactPCI connectors support guide lugs to ensure a correct polarized mating. A proper mating is further assured by the use of color coded keys for 3.3 V and 5 V operation. The CP342 versions support 3.3V VIO and are 5V tolerant (universal). Therefore, there is no keying necessary.

Figure 2-2: CPCI Connectors J1/J2



Note:
Pinrow F is GND and Z is not connected

2.3.1.2 CompactPCI Connectors J1 and J2 Pinouts

The CP342 is provided with two 2 mm x 2 mm pitch female CompactPCI bus connectors, J1 and J2.

Table 2-1: CompactPCI Bus Connector J1 Pinout

PIN	ROW Z	ROW A	ROW B	ROW C	ROW D	ROW E	ROW F
25	NC	5V	NC	NC	3.3V	5V	GND
24	NC	AD[1]	5V	V(I/O)	AD[0]	NC	GND
23	NC	3.3V	AD[4]	AD[3]	5V	AD[2]	GND
22	NC	AD[7]	GND	3.3V	AD[6]	AD[5]	GND
21	NC	3.3V	AD[9]	AD[8]	M66EN#	C/BE[0]#	GND
20	NC	AD[12]	GND	V(I/O)	AD[11]	AD[10]	GND
19	NC	3.3V	AD[15]	AD[14]	GND	AD[13]	GND
18	NC	SERR#	GND	3.3V	PAR	C/BE[1]#	GND
17	NC	3.3V	NC	NC	GND	PERR#	GND
16	NC	DEVSEL#	GND	V(I/O)	STOP#	LOCK#	GND
15	NC	3.3V	FRAME#	IRDY#	GND	TRDY#	GND
12-14	Key Area						
11	NC	AD[18]	AD[17]	AD[16]	GND	C/BE[2]#	GND
10	NC	AD[21]	GND	3.3V	AD[20]	AD[19]	GND
9	NC	C/BE[3]#	IDSEL	AD[23]	GND	AD[22]	GND
8	NC	AD[26]	GND	V(I/O)	AD[25]	AD[24]	GND
7	NC	AD[30]	AD[29]	AD[28]	GND	AD[27]	GND
6	NC	REQ0#	GND	3.3V	CLK0	AD[31]	GND
5	NC	NC	NC	RST#	GND	GNT0#	GND
4	NC	NC	GND	V(I/O)	NC	NC	GND
3	NC	INTA#	INTB#	NC	5V	NC	GND
2	NC	NC	5V	NC	TDO	TDI	GND
1	NC	5V	NC	NC	NC	5V	GND

Table 2-2: Rear IO CompactPCI Bus Connector J2 Pinout (CP342-RIO only)

PIN	ROW Z	ROW A	ROW B	ROW C	ROW D	ROW E	ROW F
22	NC	NC	NC	NC	NC	NC	GND
21	NC	NC	GND	NC	NC	NC	GND
20	NC	NC	GND	NC	NC	NC	GND
19	NC	GND	GND	NC	NC	+3.3V	GND
18	NC	NC	NC	NC	NC	NC	GND
17	NC	NC	NC	NC	NC	NC	GND
16	NC	NC	NC	NC	NC	NC	GND
15	NC	NC	NC	NC	NC	NC	GND
14	NC	LAN1R_DA+	LAN1R_DA-	NC	LAN1R_DC+	LAN1R_DC-	GND
13	NC	LAN1R_DB+	LAN1R_DB-	NC	LAN1R_DD+	LAN1R_DD-	GND
12	NC	LAN2R_DA+	LAN2R_DA-	NC	LAN2R_DC+	LAN2R_DC-	GND
11	NC	LAN2R_DB+	LAN2R_DB-	NC	LAN2R_DD+	LAN2R_DD-	GND
10	NC	GND	NC	NC	NC	NC	GND
9	NC	NC	GND	NC	GND	NC	GND
8	NC	NC	GND	NC	GND	NC	GND
7	NC	GND	NC	NC	NC	GND	GND
6	NC	NC	GND	NC	GND	NC	GND
5	NC	NC	GND	NC	GND	NC	GND
4	NC	NC	+5V	NC	NC	GND	GND
3	NC	NC	GND	NC	NC	NC	GND
2	NC	NC	NC	NC	NC	NC	GND
1	NC	NC	NC	NC	NC	NC	GND

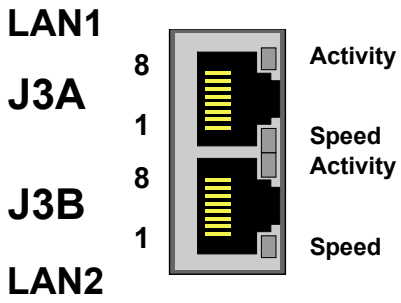
2.3.2 Gigabit Ethernet

The CP342 board includes two 10Base-T/100Base-TX/1000Base-T Ethernet ports.

The Boot from LAN feature is supported.

The Ethernet connectors are realized as RJ45 connectors. The interfaces provide automatic detection and switching between 10Base-T, 100Base-TX and 1000Base-T data transmission (Auto-Negotiation). Auto-wire switching for crossed cables is also supported (Auto-MDI/X).

Figure 2-3: Dual Gigabit Ethernet Connector J3A/B



RJ45 Connector J3A/B Pinouts

The J3A/B connector supplies the 10Base-T, 100Base-TX and 1000Base-T interfaces.

Table 2-3: Pinouts of J3A/B Based on the Implementation

MDI / STANDARD ETHERNET CABLE						PIN	MDIX / CROSSED ETHERNET CABLE					
10BASE-T		100BASE-TX		1000BASE-T			10BASE-T		100BASE-TX		1000BASE-T	
I/O	SIGNAL	I/O	SIGNAL	I/O	SIGNAL		I/O	SIGNAL	I/O	SIGNAL	I/O	SIGNAL
O	TX+	O	TX+	I/O	BI_DA+	1	I	RX+	I	RX+	I/O	BI_DB+
O	TX-	O	TX-	I/O	BI_DA-	2	I	RX-	I	RX-	I/O	BI_DB-
I	RX+	I	RX+	I/O	BI_DB+	3	O	TX+	O	TX+	I/O	BI_DA+
-	-	-	-	I/O	BI_DC+	4	-	-	-	-	I/O	BI_DD+
-	-	-	-	I/O	BI_DC-	5	-	-	-	-	I/O	BI_DD-
I	RX-	I	RX-	I/O	BI_DB-	6	O	TX-	O	TX-	I/O	BI_DA-
-	-	-	-	I/O	BI_DD+	7	-	-	-	-	I/O	BI_DC+
-	-	-	-	I/O	BI_DD-	8	-	-	-	-	I/O	BI_DC-

Ethernet LED Status

Activity (green): This LED monitors network connection and activity. The LED lights up when a valid link (cable connection) has been established. The LED goes temporarily off if network packets are being sent or received through the RJ45 port. When this LED remains off, a valid link has not been established due to a missing or a faulty cable connection.

Speed (green/orange): This LED lights up to indicate a successful 100Base-TX or 1000BASE-T connection. When green it indicates a 100Base-TX connection and when orange it indicates a 1000Base-T connection. When not lit and the Activity LED is active, the connection is operating at 10Base-T.

2.3.3 SFP Cages

The CP342-SFP board includes two SFP cages for SFP transceivers, fiber optic or RJ45, along with three operational status LEDs for each Ethernet channel. Only Gigabit Ethernet is available with this configuration.

Figure 2-4: SFP Cages, J6 and J7, and Status LEDs

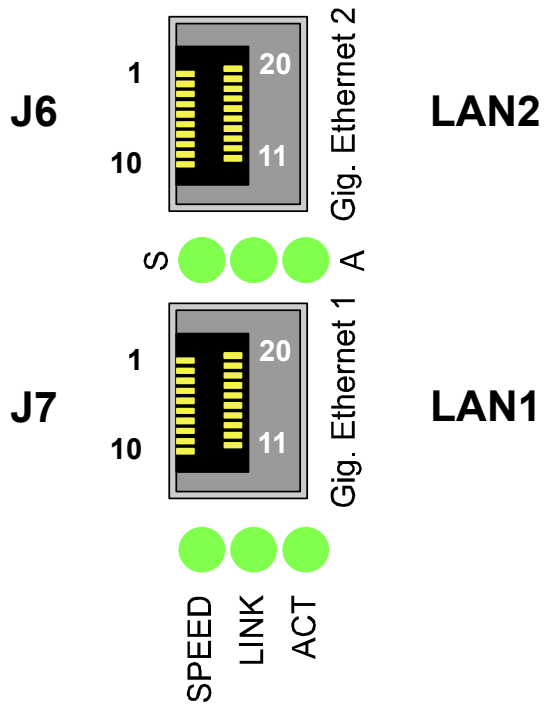


Table 2-4: SFP Cage, J6 and J7, Pinout

FUNCTION	SIGNAL	PIN	PIN	SIGNAL	FUNCTION
Transmitter ground	VeeT1	1	20	VeeT2	Transmitter ground
Transmitter fault indicator	TxFault	2	19	TD-	Inverse transmitter data in
Transmitter disable	TxDis	3	18	TD+	Transmitter data in
Module definition 2	MD2	4	17	VeeT3	Transmitter ground
Module definition 1	MD1	5	16	VccT	Transmitter power (3.3V)
Module definition 0	MD0	6	15	VccR	Receiver power (3.3V)
Rate select	RateSel	7	14	VeeR4	Receiver ground
Loss of signal	LOS	8	13	RD+	Received data out
Receiver ground	VeeR1	9	12	RD-	Inverse received data out
Receiver ground	VeeR2	10	11	VeeR3	Receiver ground

Ethernet LED Status

ACT (green): This LED monitors network activity. The LED goes temporarily on if network packets are being sent or received through the RJ45 port.

LINK (green): This LED monitors network connection. The LED lights up when a valid link (cable connection) has been established. When this LED remains off, a valid link has not been established due to a missing or a faulty cable connection.

SPEED (green): This LED lights up to indicate a successful 1000BASE-T connection. When not lit and the ACT-LED is active, the connection is operating at 10Base-T or 100Base-T.

2.3.4 CP342-RIO

Except for the operational status LEDs, there are no front panel interfaces on the CP342-RIO board. Refer to the CPCI connector interfacing for pinout of the J2 connector.

Ethernet LED Status

ACT (green): This LED monitors network activity. The LED goes temporarily on if network packets are being sent or received through the RJ45 port.

LINK (green): This LED monitors network connection. The LED lights up when a valid link (cable connection) has been established. When this LED remains off, a valid link has not been established due to a missing or a faulty cable connection.

SPEED (green): This LED lights up to indicate a successful 1000BASE-T connection. When not lit and the ACT-LED is active, the connection is operating at 10Base-T or 100Base-T.

2.4 Remote Boot Operation

All of the CP342 versions come with a PLCC32 socket for adding a Boot Flash device. This Flash device is optional. If installed, it provides additional memory space which can be addressed from the CPU board's firmware. Through appropriate Boot Flash code, e.g. PXE compatible, it is possible to perform remote boot operations with the CP342.

Chapter 3

Installation

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3. Installation

The CP342 has been designed for easy installation. However, the following standard precautions, installation procedures, and general information must be observed to ensure proper installation and to preclude damage to the board, other system components, or injury to personnel.

3.1 Safety Requirements

The following safety precautions must be observed when installing or operating the CP342. *Kontron* assumes no responsibility for any damage resulting from failure to comply with these requirements.

Warning!

Due care should be exercised when handling the board due to the fact that the heat sink can get very hot. Do not touch the heat sink when installing or removing the board.

In addition, the board should not be placed on any surface or in any form of storage container until such time as the board and heat sink have cooled down to room temperature.

Caution!

If your board type is not specifically qualified as being hot swap capable, switch off the CompactPCI system power before installing the board in a free CompactPCI slot. Failure to do so could endanger your life or health and may damage your board or system.

Note ...

Certain CompactPCI boards require bus master and/or Rear I/O capability. If you are in doubt whether such features are required for the board you intend to install, please check your specific board and/or system documentation to make sure that your system is provided with an appropriate free slot in which to insert the board.

ESD Equipment!

This CompactPCI board contains electrostatic sensitive devices. Please observe the necessary precautions to avoid damage to your board:

- Discharge your clothing before touching the assembly. Tools must be discharged before use.
- Do not touch components, connector-pins or traces.
- If working at an anti-static workbench with professional discharging equipment, please do not omit to use it.

3.2 CP342 Installation Procedures

The following procedures are applicable the installation of the CP342 in a system. Procedures for standard removal are found in its respective chapter.

To perform an installation of the CP342 in a system proceed as follows:

1. Ensure that the safety requirements indicated in Chapter 3.1 are observed.

Warning!

Failure to comply with the instruction below may cause damage to the board or result in improper system operation.

2. Ensure that the board is properly configured for operation in accordance with application requirements before installing.

Warning!

Care must be taken when applying the procedures below to ensure that neither the CP342 nor other system boards are physically damaged by the application of these procedures.

3. To install the CP342 perform the following:
   1. Ensure that no power is applied to the system before proceeding.

Warning!

When performing the next step, **DO NOT** push the board into the backplane connectors. Use the ejector handles to seat the board into the backplane connectors.

   2. Carefully insert the board into the slot designated by the application requirements for the board until it makes contact with the backplane connectors.
   3. Using the ejector handle, engage the board with the backplane. When the ejector handle is locked, the board is engaged.
   4. Fasten the front panel retaining screws.
   5. Connect all external interfacing cables to the board as required.
   6. Ensure that the board and all required interfacing cables are properly secured.

The CP342 is now ready for operation. For operation of the CP342, refer to appropriate CP342 specific software, application, and system documentation.

3.3 Standard Removal Procedures

To remove the board proceed as follows:

1. Ensure that the safety requirements indicated in Chapter 3.1 are observed. Particular attention must be paid to the warning regarding the heat sink!

Warning!

Care must be taken when applying the procedures below to ensure that neither the CP342 nor system boards are physically damaged by the application of these procedures.

2. Ensure that no power is applied to the system before proceeding.
3. Disconnect any interfacing cables that may be connected to the board.
4. Unscrew the front panel retaining screws.
5. Disengage the board from the backplane by first unlocking the board ejection handle and then by pressing the handle as required until the board is disengaged.
6. After disengaging the board from the backplane, pull the board out of the slot.

Warning!

Due care should be exercised when handling the board due to the fact that the heat sink can get very hot. Do not touch the heat sink when changing the board.

7. Dispose of the board as required.

3.4 Software Installation

The installation of the Ethernet and all other onboard peripheral drivers is described in detail in the relevant Driver Kit files.

Installation of an operating system is a function of the OS software and is not addressed in this manual. Refer to appropriate OS software documentation for installation.

Note ...

Users working with pre-configured operating system installation images for Plug and Play compliant operating systems, for example Windows® XP, Windows® XP Embedded, must take into consideration that the stepping and revision ID of the chipset and/or other onboard PCI devices may change. Thus, a re-configuration of the operating system installation image deployed for a previous chipset stepping or revision ID is in most cases required. The corresponding operating system will detect new devices according to the Plug and Play configuration rules.

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Appendix A

CP-RIO3-42

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A. CP-RIO3-42

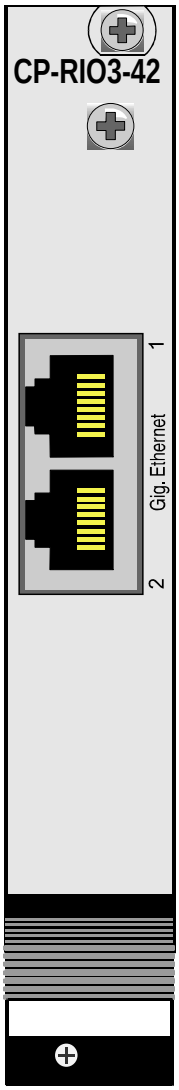
A.1 Overview

The CP-RIO3-42 provides optional rear I/O connectivity for Gigabit Ethernet. Is is designed for use in conjunction with the CP342-RIO board or any other rear IO capable board with appropriate signal conditioning and pinout on the J1 connector.

There are two Gigabit Ethernet ports available, but without operational status LEDs. This board is passive in that it only provides signal routing to the RJ45 connectors, therefore, all signals coming from the associated CPCI-bus front side board must have corresponding signal conditioning which is the case with the CP342-RIO board. If used with any other front side board, this must be taken into consideration.

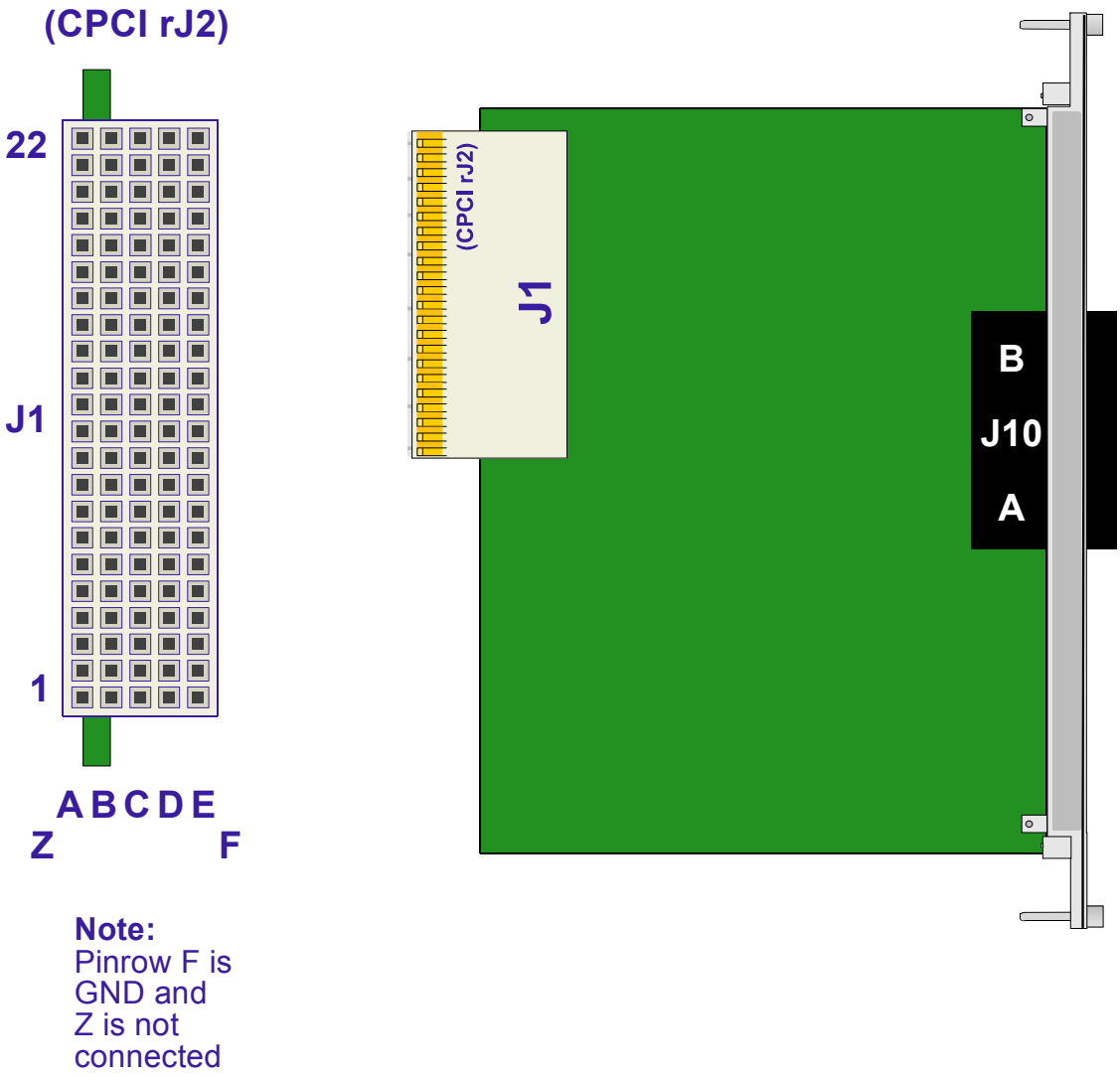
A.2 Front Panel

Figure A-1: CP-RIO3-42 Front Panel



A.3 Board Layout

Figure A-2: CP-RIO3-42 Board and J1 Connector Pin Layout

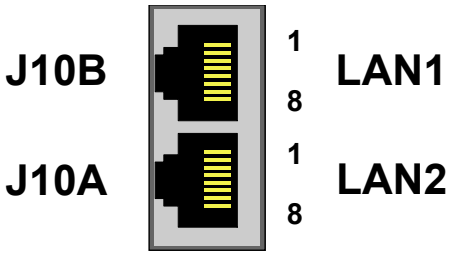


A.4 Gigabit Ethernet

The CP-RIO3-42 board includes two 10Base-T/ 100Base-TX/1000Base-T Ethernet ports.

The Ethernet connectors are realized as RJ45 connectors, but without operational status LEDs. The interfaces provide automatic detection and switching between 10Base-T, 100Base-TX and 1000Base-T data transmission (Auto-Negotiation). Auto-wire switching for crossed cables is also supported (Auto-MDI/X).

Figure A-3: Dual Gigabit Ethernet Connector J10A/B



RJ45 Connector J10A/B Pinouts

The J10A/B connector supplies the 10Base-T, 100Base-TX and 1000Base-T interfaces.

Table A-1: Pinouts of J10A/B Based on the Implementation

MDI / STANDARD ETHERNET CABLE						PIN	MDIX / CROSSED ETHERNET CABLE					
10BASE-T		100BASE-TX		1000BASE-T			10BASE-T		100BASE-TX		1000BASE-T	
I/O	SIGNAL	I/O	SIGNAL	I/O	SIGNAL		I/O	SIGNAL	I/O	SIGNAL	I/O	SIGNAL
O	TX+	O	TX+	I/O	BI_DA+	1	I	RX+	I	RX+	I/O	BI_DB+
O	TX-	O	TX-	I/O	BI_DA-	2	I	RX-	I	RX-	I/O	BI_DB-
I	RX+	I	RX+	I/O	BI_DB+	3	O	TX+	O	TX+	I/O	BI_DA+
-	-	-	-	I/O	BI_DC+	4	-	-	-	-	I/O	BI_DD+
-	-	-	-	I/O	BI_DC-	5	-	-	-	-	I/O	BI_DD-
I	RX-	I	RX-	I/O	BI_DB-	6	O	TX-	O	TX-	I/O	BI_DA-
-	-	-	-	I/O	BI_DD+	7	-	-	-	-	I/O	BI_DC+
-	-	-	-	I/O	BI_DD-	8	-	-	-	-	I/O	BI_DC-

A.5 Rear I/O Interface on J1 (CPCI rJ2)

Table A-2: Rear IO J1 Pinout (CPCI rJ2)

PIN	ROW Z	ROW A	ROW B	ROW C	ROW D	ROW E	ROW F
22	NC	NC	NC	NC	NC	NC	GND
21	NC	NC	GND	NC	NC	NC	GND
20	NC	NC	GND	NC	NC	NC	GND
19	NC	GND	GND	NC	NC	+3.3V	GND
18	NC	NC	NC	NC	NC	NC	GND
17	NC	NC	NC	NC	NC	NC	GND
16	NC	NC	NC	NC	NC	NC	GND
15	NC	NC	NC	NC	NC	NC	GND
14	NC	LAN1R_DA+	LAN1R_DA-	NC	LAN1R_DC+	LAN1R_DC-	GND
13	NC	LAN1R_DB+	LAN1R_DB-	NC	LAN1R_DD+	LAN1R_DD-	GND
12	NC	LAN2R_DA+	LAN2R_DA-	NC	LAN2R_DC+	LAN2R_DC-	GND
11	NC	LAN2R_DB+	LAN2R_DB-	NC	LAN2R_DD+	LAN2R_DD-	GND
10	NC	GND	NC	NC	NC	NC	GND
9	NC	NC	GND	NC	GND	NC	GND
8	NC	NC	GND	NC	GND	NC	GND
7	NC	GND	NC	NC	NC	GND	GND
6	NC	NC	GND	NC	GND	NC	GND
5	NC	NC	GND	NC	GND	NC	GND
4	NC	NC	+5V	NC	NC	GND	GND
3	NC	NC	GND	NC	NC	NC	GND
2	NC	NC	NC	NC	NC	NC	GND
1	NC	NC	NC	NC	NC	NC	GND

A.6 Technical Specifications

Table A-3: Main Specifications

	TYPE	SPECIFICATIONS
CP-RIO3-42	Ethernet	Two channels of three speed Ethernet: 10/100/1000 Mbit/s
	Ethernet Interfaces	Two RJ45 front panel connectors
	LEDs	None
	Temperature Range	Operational: 0ºC to +55ºC Standard -40ºC to +85ºC E2 (on request) Storage: -55ºC to +125ºC
	Climatic Humidity	93% relative humidity at 40°C, non-condensing
	Dimensions	80 mm L x 100 mm W (single height)
	Board Weight	ca. 100 g

A.7 Applied Standards

The Kontron Modular Computers' CompactPCI module CP-RIO3-42 complies with the requirements of the following standards:

Table A-4: Applied Standards

	TYPE	STANDARD
CE	Emission	EN55022, EN61000-6-3
	Immunity, Industrial Environment	EN61000-6-2
	Immunity, IT Equipment	EN55024
	Electrical Safety	EN60950-1 Note: The CP-RIO3-42 is specified I/O only for: SELV and EVL. It is **NOT SPECIFIED** for "Hazardous"
MECHANICAL	Mechanical Dimensions	IEEE1101.10
ENVIRONMENTAL	Vibration, Sinusoidal	IEC 60068-2-6
	Random Vibration, Broadband	IEC 60068-2-64
	Bump	IEC 60068-2-29
	Single Shock	IEC 60068-2-27
	Temperature Tests A: Cold	IEC 60068-2-1
	Temperature Tests B: Dry Heat	IEC 60068-2-2
	Climatic Humidity	IEC 60068-2-78

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