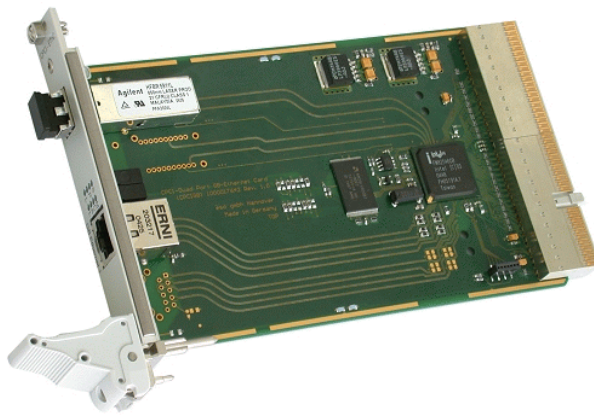


# CPCI-ETH2 CPCI-ETH2-FX CPCI-ETH2-MX

**10/100/1000BaseT- and/or 1000BASE-SX-  
ETHERNET Interface for CompactPCI**



**Hardware Manual**

to Product I.2321.xx

<b>Document file:</b>	I:\texte\Doku\MANUALS\CPCI\Eth2\English\CPCI-ETH2_10H.en9
<b>Date of print:</b>	05.07.2005

<b>PCB version:</b>	CPCIET Rev. 1.0
---------------------	-----------------

### Changes in the chapters

The changes in the user's manual listed below affect changes in the *hardware* as well as changes in the *description* of the facts only.

<b>Chapter</b>	<b>Changes versus previous version</b>
-	First version

Technical details are subject to change without notice.

## NOTE

The information in this document has been carefully checked and is believed to be entirely reliable. **esd** makes no warranty of any kind with regard to the material in this document, and assumes no responsibility for any errors that may appear in this document. **esd** reserves the right to make changes without notice to this, or any of its products, to improve reliability, performance or design.

**esd** assumes no responsibility for the use of any circuitry other than circuitry which is part of a product of **esd gmbh**.

**esd** does not convey to the purchaser of the product described herein any license under the patent rights of **esd gmbh** nor the rights of others.

### **esd electronic system design gmbh**

Vahrenwalder Str. 207  
30165 Hannover  
Germany

Phone: +49-511-372 98-0  
Fax: +49-511-372 98-68  
E-mail: [info@esd-electronics.com](mailto:info@esd-electronics.com)  
Internet: [www.esd-electronics.com](http://www.esd-electronics.com)

### **USA / Canada:**

#### **esd electronics Inc.**

12 Elm Street  
Hatfield, MA 01038-0048  
USA

Phone: +1-800-732-8006  
Fax: +1-800-732-8093  
E-mail: [us-sales@esd-electronics.com](mailto:us-sales@esd-electronics.com)  
Internet: [www.esd-electronics.us](http://www.esd-electronics.us)

# Contents

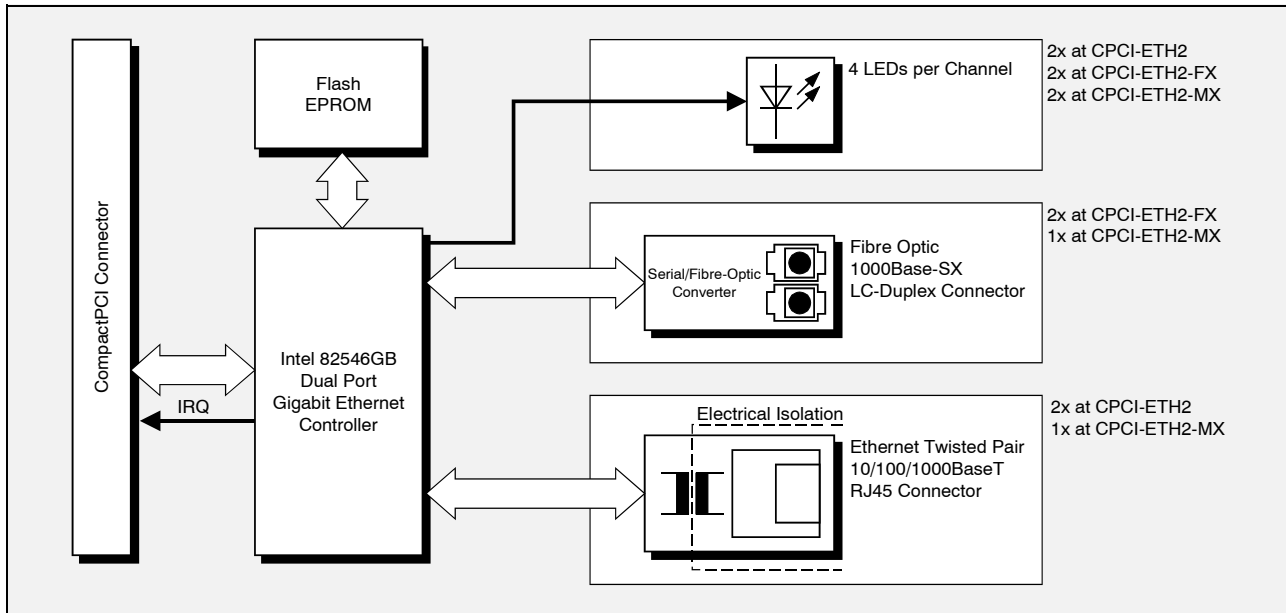
<b>1. Overview</b> .....	3
1.1 Description of the CPCI-ETH2-Module .....	3
1.2 Summary of technical Data .....	4
1.2.1 General Technical Data .....	4
1.2.2 CompactPCI Bus .....	5
1.2.3 Ethernet Interface .....	5
1.2.4 Fibre Optic Interface .....	5
1.2.5 Software Support .....	6
1.2.6 Order Information .....	7
<b>2. Hardware Installation</b> .....	8
<b>3. Front Panel View with LED-Display</b> .....	10
3.1 CPCI-ETH2: LEDs and Connectors in the Front Panel .....	10
3.2 CPCI-ETH2-MX: LEDs and Connectors in the Front Panel .....	11
3.3 CPCI-ETH2-FX: LEDs and Connectors in the Front Panel .....	12
<b>4. Control</b> .....	13
<b>5. Connector Assignment</b> .....	13
5.1 Ethernet 10/100/1000BaseT-Connection (X320, X420) .....	13
5.2 Ethernet 1000BASE-SX Connector (U310, U410) .....	14

This page is intentionally left blank.



# 1. Overview

## 1.1 Description of the CPCI-ETH2-Module



**Fig. 1.1.1:** Block diagram of the CPCI-ETH2 module

The CPCI-ETH2 is a CompactPCI board in Euro format.

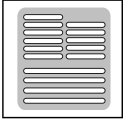
The Intel 82546GB Gigabit controller provides two Gigabit ports on a single compact component. Both Gigabit Ethernet ports can be equipped with either two 10/100/1000Base-T Ethernet interfaces, two 1000Base-SX-Ethernet interfaces for optical fibres or mixed with one of each interface.

The CPCI-ETH2-module operates with standard Ethernet drivers.

The Ethernet interfaces for 10/100/1000Base-T-networks are easily accessible via RJ45-sockets in the front panel. The interfaces are electrically isolated from the Ethernet controller.

The interfaces for the fibre optic connections are suitable for 1000Base-SX-nets (1000Base-LX on request). The optical fibres are connected via LC-Duplex connectors in the front panel.

LEDs in the front panel indicate the status of the CPCI-ETH2.

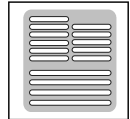


## Technical Data

### 1.2 Summary of technical Data

#### 1.2.1 General Technical Data

Ambient temperature	0...50°C
Humidity	max. 90 %, non-condensing
Power supply	via CompactPCI bus, nominal voltages: 5 V ± 5% <u>and</u> 3.3 V ± 5% current consumption: tbd.
Connectors	X100 (132-pin post connector) - CompactPCI-board connector P1 X101 (132-pin post connector) - CompactPCI-board connector P2  X320 (8-pin RJ45-socket) - Ethernet Twisted Pair 10/100/100BaseT, (CPCI-ETH2, CPCI-ETH2-MX) X420 (8-pin RJ45-socket) - Ethernet Twisted Pair 10/100/1000BaseT, (CPCI-ETH2)  U310 (HFBR-5911L/AL)- LC-Duplex connector 1000Base-SX, (CPCI-ETH2-FX) U410 (HFBR-5911L/AL)- LC-Duplex connector 1000Base-SX, (CPCI-ETH2-FX, CPCI-ETH2-MX)
Dimensions	100 mm x 160 mm
Weight	CPCI-ETH2: 165 g CPCI-ETH2-MX: 170g CPCI-ETH2-FX: 175g



### 1.2.2 CompactPCI Bus

Host bus	PCI-Bus according to PCI Local Bus Specification 2.3
PCI-data/ address bus	64 Bit
Controller	Intel 82546GB
Interrupt	Interrupt signal A, B
Board dimensions	according to CompactPCI-Specification, Rev. 1.0
Connectors	
Connector coding	Universal-Board (3.3 V <u>or</u> 5 V signalling voltage) not keyed

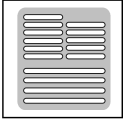
### 1.2.3 Ethernet Interface

Number	CPCI-ETH2: 2 CPCI-ETH2-FX: - CPCI-ETH2-MX: 1
Bit rate	10 Mbit/s, 100 Mbit/s, 1000 Mbit/s
Physical interface	Twisted Pair (IEEE802.3) 10/100/1000BaseT
Electrical isolation	via transformer integrated in the connector
Connector	8-pin RJ45-socket in the front panel

### 1.2.4 Fibre Optic Interface

Number	CPCI-ETH2: - CPCI-ETH2-FX: 2 CPCI-ETH2-MX: 1
Bit rate	1000 Mbit/s
Physical interface	IEEE802.3 Gigabit Ethernet (1.25Gbd) 1000Base-SX (1000Base-LX on request)
Cable distance	275 m at 62.5 µm Multimode fibre 550 m at 50 µm Multimode fibre (10 km on request for 1000Base-LX)
Connector	LC-Duplex connector in the front panel

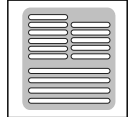




## Technical Data

### 1.2.5 Software Support

The CPCI-ETH2-module operates with standard system drivers of Windows NT/2000, Linux, VxWorks and QNX.

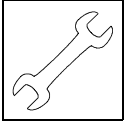


### 1.2.6 Order Information

Type	Properties	Order-No.
CPCI-ETH2	Dual 10/100/1000Base-T Ethernet	I.2321.02
CPCI-ETH2-FX	Dual Fibre Optic 1000BASE-SX Ethernet	I.2321.04
CPCI-ETH2-MX	Mixed 1000Base-T/1000BASE-SX Ethernet	I.2321.06
CPCI-ETH2-MD	User manual in English <sup>1*)</sup>	I.2321.20
CPCI-ETH2-ENG	Engineering Manual in English <sup>2*)</sup> Contents: Circuit diagrams, PCB top overlay drawing, data sheets of significant components	I.2321.25

1\*) If module and manual are ordered together, the manual is free of charge.

2\*) This manual is liable for costs, please contact our support.



## Installation

## 2. Hardware Installation



### Warning!

The fibre optic interfaces are equipped with **class 1 laser products**.  
Avoid direct eye exposure to the beam coming from the transmit port.



### Caution!

Never carry out work when the power is turned on, this is highly dangerous!



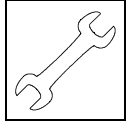
### Attention!

Electrostatic discharges may cause damage to electronic components. To avoid this, please perform the following steps *before* you touch the module, in order to discharge the static electricity from your body:

- Switch off the power of your CompactPCI system, but leave it connected to the mains.
- Please touch the metal case of the system now to discharge yourself.
- Furthermore, you should prevent your clothes from touching the CPCI module, because your clothes might be electrostatically charged as well.

### Installation:

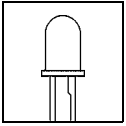
1. Switch off your CompactPCI system and all connected peripheral devices (monitor, printer etc.).
2. Discharge your body as described above.
3. Disconnect the computer from mains.
4. Insert the CPCI-ETH2 module into a free CompactPCI bus slot.
5. Fix the CPCI-ETH2-module with the mounting screws in the front panel.
6. Connect the Ethernet cables (10/100/1000Base-T) to the RJ45-sockets (X320, X420) or if applicable the Multimode fibre optic cables (1000Base-SX) to the LC-Duplex connectors (U310, U410) in the front panels.



For working with the fibre optic cables, please, pay attention to the following instructions:

- The fibre may not be bend tightly. Do not make any kinks.
- Do not touch the tip of any optical connector.
- Make sure that the connectors fit tightly.
- Never look directly into the connectors or cables.
- Take care that no dust is introduced to the connector plugs.

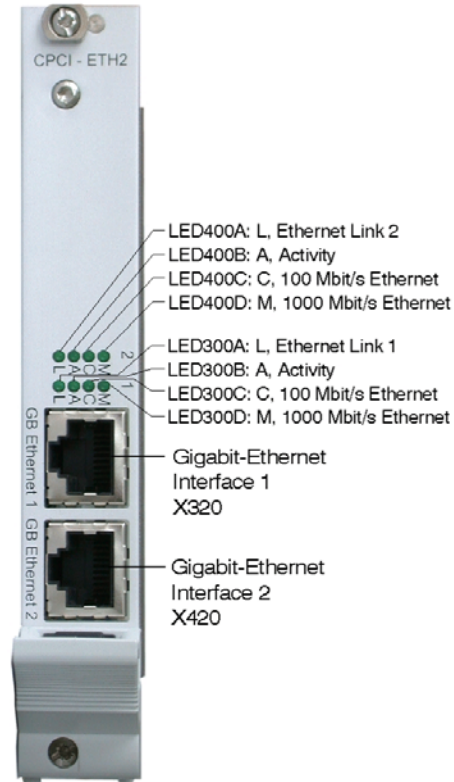
7. Connect the computer to mains again.
8. Switch on the computer and the peripheral devices.
9. End of hardware installation.
10. Now, you can install the Gigabit Ethernet interface. Refer to the documentation of your operating system.



## Front panel view with LED-Display

### 3. Front Panel View with LED-Display

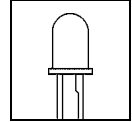
#### 3.1 CPCI-ETH2: LEDs and Connectors in the Front Panel



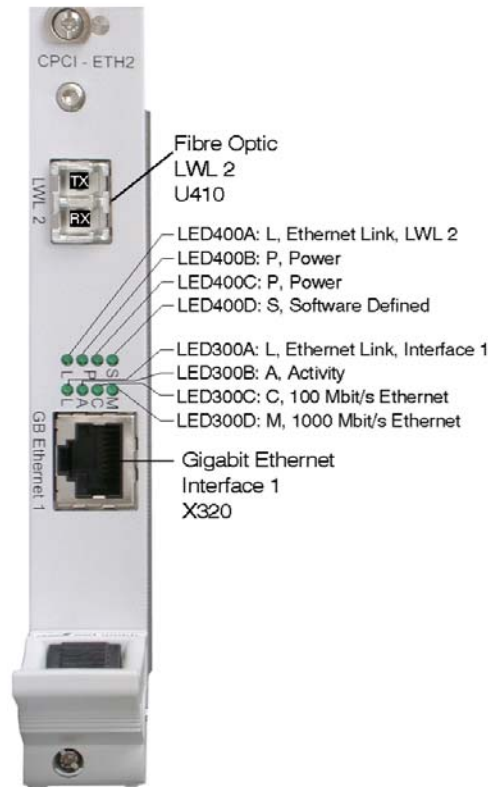
**Fig. 3.1.1:**  
Position of the LEDs and connectors of the CPCI-ETH2

LED	Color	Name	Indication of the LED (LED on)
LED400A	green	L	Link Status-Ethernet 2 (10/100/1000BaseT) (Link to server or hub detected)
LED400B	green	A	Activity, access of Ethernet 2 to the Dual Gigabit Ethernet controller 82546GB
LED400C	green	C	Speed 100 (C) Status Ethernet 2, interface operates with a bit rate of 100 Mbit/s. (at 10/1000 Mbit/s LED off).
LED400D	green	M	Speed 1000 (M) Status Ethernet 2, interface operates with a bit rate of 1000 Mbit/s. (at 10/100 Mbit/s LED off).
LED300A	green	L	Link Status-Ethernet 1 (10/100/1000BaseT) (Link to server or hub detected)
LED300B	green	A	Activity, access of Ethernet 1 to the Dual Gigabit Ethernet controller 82546GB
LED300C	green	C	Speed 100 (C) Status Ethernet 1, interface operates with a bit rate of 100 Mbit/s. (at 10/1000 Mbit/s LED off).
LED300D	green	M	Speed 1000 (M) Status Ethernet 1, interface operates with a bit rate of 1000 Mbit/s. (at 10/100 Mbit/s LED off).

**Table 3.1.1:** Indication of the LEDs of CPCI-ETH2



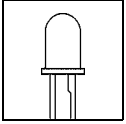
### 3.2 CPCI-ETH2-MX: LEDs and Connectors in the Front Panel



**Fig. 3.2.1:**  
Position of the LEDs and connectors of the CPCI-ETH2-MX

LED	Color	Name	Indication of the LED (LED on)
LED400A	green	L	Link Status Ethernet LWL2 (1000BASE-SX) (Connection to server or hub detected)
LED400B	green	P	Power, module in operation
LED400C	green	P	Power, module in operation
LED400D	green	S	Software Defined Pin LWL2, the indication of the LED must be defined via software
LED300A	green	L	Link Status Ethernet 1 (10/100/1000BaseT) (Connection to server or hub detected)
LED300B	green	A	Activity, access of Ethernet 1 to the Dual Gigabit Ethernet controller 82546GB
LED300C	green	C	Speed 100 (C) Status Ethernet 1, interface operates with a bit rate of 100 MBit/s. (at 10/1000 Mbit/s LED off).
LED300D	green	M	Speed 1000 (M) Status Ethernet 1, interface operates with a bit rate of 1000 Mbit/s. (at 10/100 Mbit/s LED off).

**Table 3.2.1:** Indication of the LEDs of CPCI-ETH2-MX



## Front panel view with LED-Display

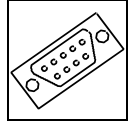
### 3.3 CPCI-ETH2-FX: LEDs and Connectors in the Front Panel



**Fig. 3.3.1:**  
Position of the LEDs and connectors of the CPCI-ETH2-FX

LED	Color	Name	Indication of the LED (LED on)
LED400A	green	L	Link Status Ethernet LWL 2 (1000BASE-SX) (Connection to server or hub detected)
LED400B	green	P	Power, module in operation
LED400C	green	P	Power, module in operation
LED400D	green	S	Software Defined Pin LWL 2, the indication of the LED must be defined via software
LED300A	green	L	Link Status Ethernet LWL 1 (1000BASE-SX) (Connection to server or hub detected)
LED300B	green	P	Power, module in operation
LED300C	green	P	Power, module in operation
LED300D	green	S	Software Defined Pin LWL 1, the indication of the LED must be defined via software

**Table 3.3.1:** Indication of the LEDs



## 4. Control

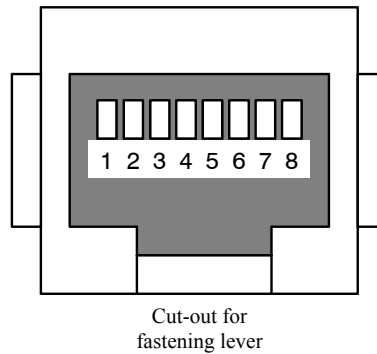
The CPCI-ETH2 module operates with the standard system drivers of Windows 95/98, Windows NT/2000, Linux, VxWorks and QNX. For software installation, please refer to the manual of the operating system.

## 5. Connector Assignment

### 5.1 Ethernet 10/100/1000BaseT-Connection (X320, X420)

Connector type: RJ45-socket

#### Pin Position:

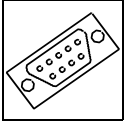


#### Pin Assignment:

Pin	Signal
1	MDI0+ (TxD+)
2	MDI0- (TxD-)
3	MDI1+ (RxD+)
4	MDI2+
5	MDI2-
6	MDI1- (RxD-)
7	MDI3+
8	MDI3-

8-pin RJ45-socket





## Connector Assignment

### 5.2 Ethernet 1000BASE-SX Connector (U310, U410)

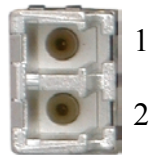
Connector type: LC-Duplex connector, integrated in HFBR-5911L/AL



#### Warning!

The fibre optic interfaces are equipped with **class 1 laser products**.  
Avoid direct eye exposure to the beam coming from the transmit port.

#### Fibre Position:



#### Assignment:

Fibre	Signal
1	TxD
2	RxD

LC-Duplex connector