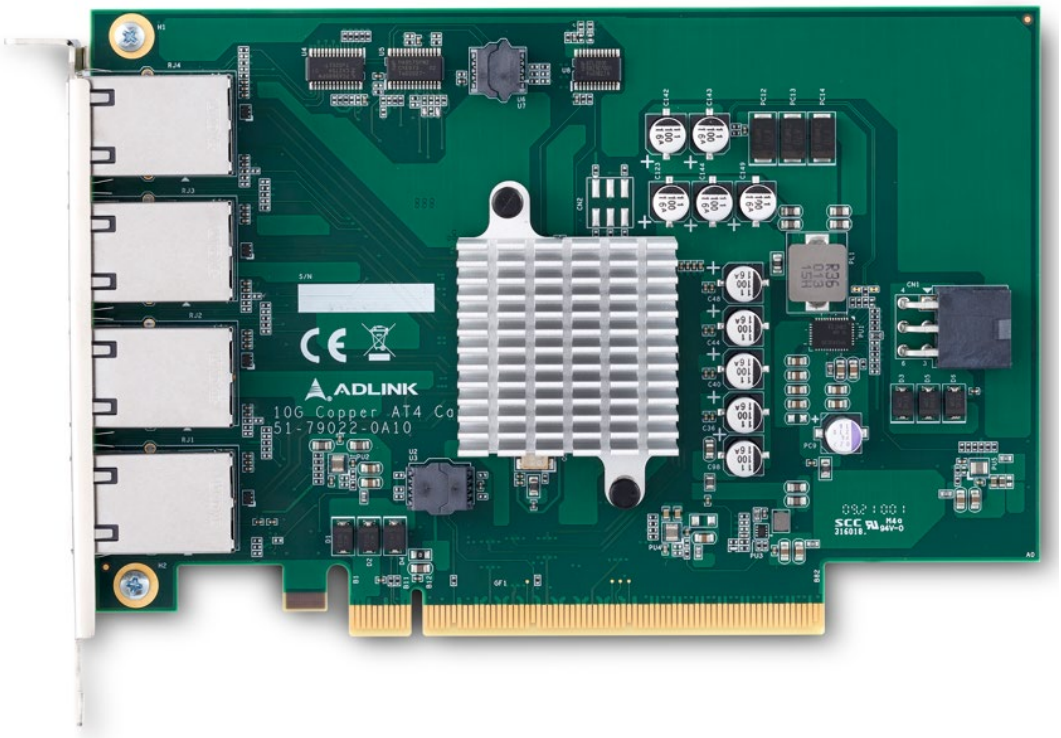
CEI-4x10GBASE-T

Network Adapter Card for Express-ID7

User's Guide



COM Express®

Revision: 0.1
Date: 2023-12-19
Part Number: 50M-79022-1000

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Revision History

Revision	Description	Date	Author
0.1	Preliminary release	2023-12-19	CC

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Preface

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Safety Instructions

For user safety, please read and follow all Instructions, **WARNING**s, **CAUTION**s, and **NOTE**s marked in this manual and on the associated equipment before handling/operating the equipment.

Read these safety instructions carefully.

- Keep this manual for future reference.
- Read the specifications section of this manual for detailed information on the operating environment of this equipment.
- Turn off power and unplug any power cords/cables when installing/mounting or un-installing/removing equipment.
- To avoid electrical shock and/or damage to equipment:
- Keep equipment away from water or liquid sources;
- Keep equipment away from high heat or high humidity;
- Keep equipment properly ventilated (do not block or cover ventilation openings);
- Make sure to use recommended voltage and power source settings;
- Always install and operate equipment near an easily accessible electrical socket outlet;
- Secure the power cord (do not place any object on/over the power cord);
- Only install/attach and operate equipment on stable surfaces and/or recommended mountings;
- If the equipment will not be used for long periods of time, turn off the power source and unplug the equipment.

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Conventions

The following conventions may be used throughout this manual, denoting special levels of information

Note: This information adds clarity or specifics to text and illustrations.

Caution: This information indicates the possibility of minor physical injury, component damage, data loss, and/or program corruption.

Warning: This information warns of possible serious physical injury, component damage, data loss, and/or program corruption.

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ADLINK Technology, Inc.
No. 66, Huaya 1st Rd., Guishan District, Taoyuan City 333411, Taiwan
Tel: +886-3-216-5088
Fax: +886-3-328-5706
Email: service@adlinktech.com

Ampro ADLINK Technology, Inc.
6450 Via Del Oro, San Jose, CA 95119-1208, USA
Tel: +1-408-360-0200
Toll Free: +1-800-966-5200 (USA only)
Fax: +1-408-600-1189
Email: info@adlinktech.com

ADLINK Technology (China) Co., Ltd.
300 Fang Chun Rd., Zhangjiang Hi-Tech Park, Pudong New Area, Shanghai, 201203, China
Tel: +86-21-5132-8988
Fax: +86-21-5132-3588
Email: market@adlinktech.com

ADLINK Technology GmbH
Hans-Thoma-Strasse 11, D-68163 Mannheim, Germany
Tel: +49-621-43214-0
Fax: +49-621 43214-30
Email: emea@adlinktech.com

Please visit the Contact page at www.adlinktech.com for information on how to contact the ADLINK regional office nearest you.

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1. Introduction

The ADLINK CEI-4x10GBASE-T card is a 10GbE network adapter card that is dedicated to Express-ID7 module. Delivering 10Gbps network within the guidelines of PICMG COM.0 R3.1 specification, the adapter card converts up to four 10GBASE-KR interfaces, and related CEI sideband signals, to four 10GBASE-T interfaces via RJ45 connectors, through Intel X557-AT4 PHY and multiple I/O expanders.

The CEI-4x10GBASE-T network adapter card can only be used with ADLINK Express-ID7 COM Express module (PICMG COM.0 R3.1 Type 7 compliant).

Utilizing the CEI-4x10GBASE-T card along with an Express-ID7 module and Express-BASE7 reference carrier board, you can quickly emulate the functionality of your end product for software development and hardware verification. Applications include entry level switch, cloud storage platforms, communications servers, and more.

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2. Specifications

2.1. Interface

Input

Up to 4x 10GBASE-KR and related CEI sideband signals from a dedicated COM Express Type 7 module through a 164-pin edge connector (PCIe x16 slot PCIEKR on Express-BASE7)

Output

Up to 4x 10GBASE-T via 4x RJ45 connectors

2.2. 10GbE PHY

PHY

Intel X557-AT4 Copper

Converts 10GBASE-KR and sidebands to 10GBASE-T

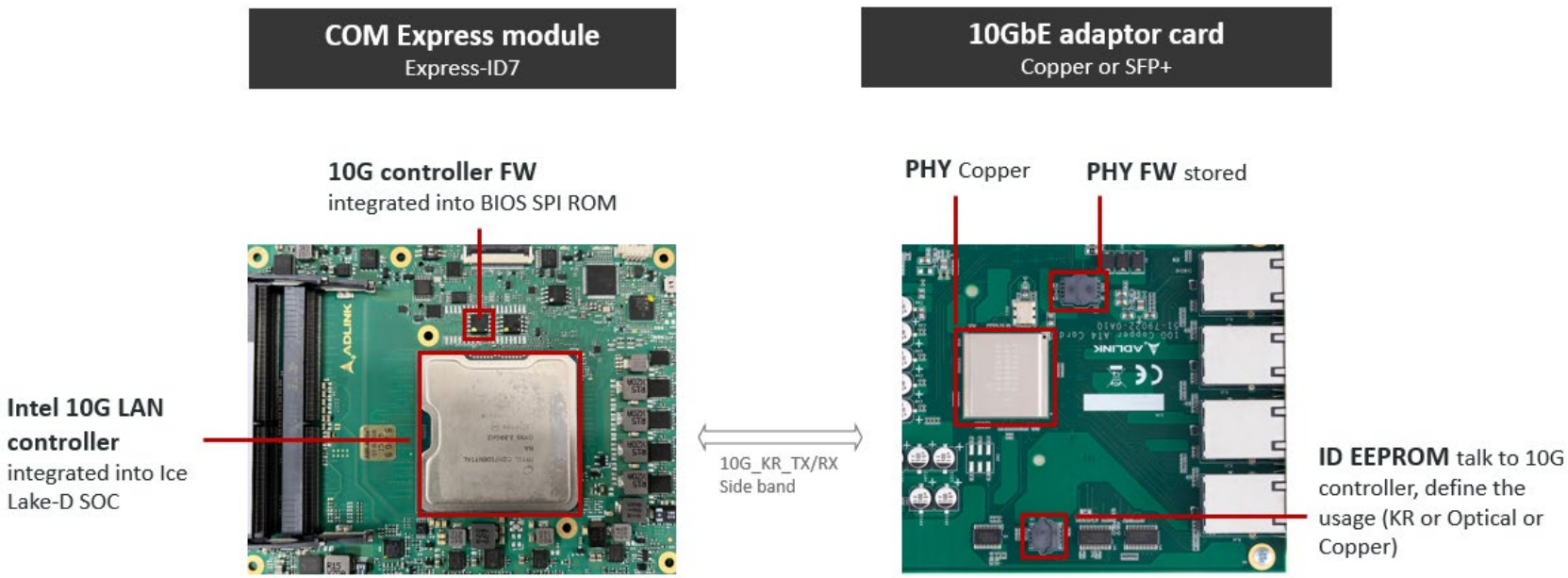
PHY Firmware on SPI ROM

Dedicated ROM for storing PHY firmware

ID EEPROM (AT24CS32 EEPROM)

I2C-based device, identifies the capabilities of the attached site. This allows the firmware to configure the attached PHY(s) and necessary I/O modes.

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2.3. Dimensions

168 mm x 107 mm (PCB only, including edge connector)

2.4. Operating Temperature

0°C to 55°C

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2.5. Specification Compliance

PICMG COM.0 Rev 3.1 Type 7

2.6. I/O Expander & EEPROM

Additional expander and EEPROM not mentioned are described below:

PCA9575 IO Expander

I2C-based device, de-serialized for low speed sideband IO, including interrupt, reset, etc.

PCA9685 LED Ctrl

I2C-based device, controls LED indication

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3. Block Diagram

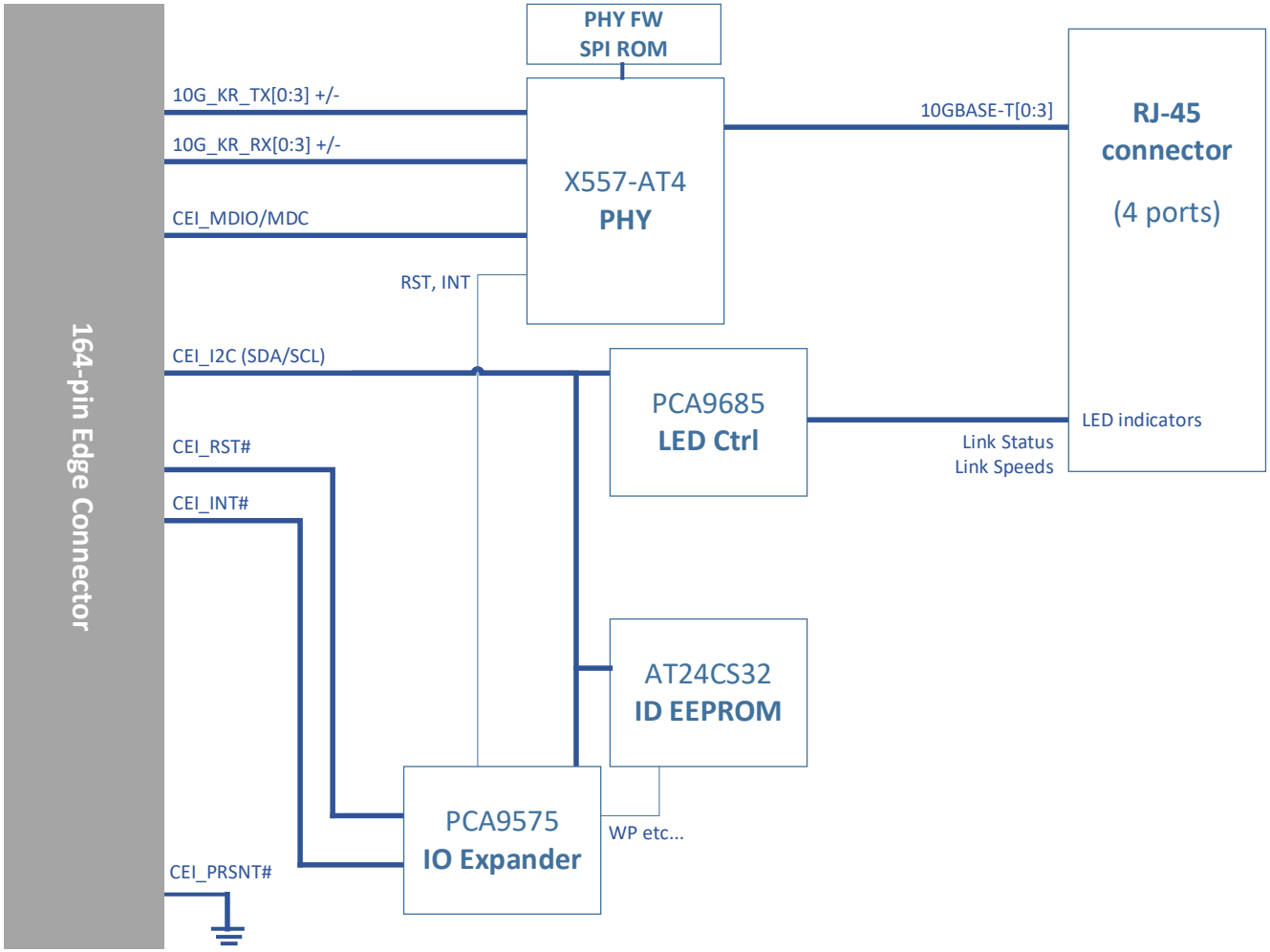


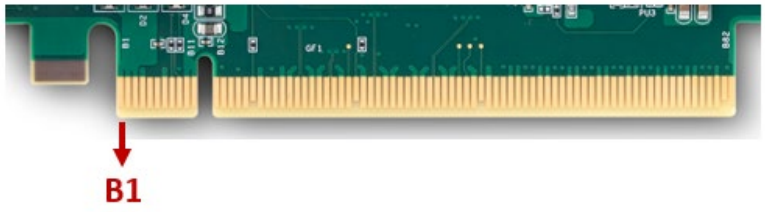
Figure 1 – CEI-4x10GBASE-T function diagram

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4. Pinout and Signal Descriptions

4.1. Input Interface Definitions

The table below is a comprehensible list of all signal pins supported on the 164-pin edge connector of the CEI-4x10GBASE-T card. Signal names follow the PICMG COM.0 R3.1 specification. Signals described in the specification but not supported on the CEI-4x10GBASE-T card are marked with strikethrough ~~STRIKETHROUGH.~~



Row B		Row A	
Pin	**Name**	**Pin**	**Name**
B1	12V	A1	NC
B2	12V	A2	12V
B3	12V	A3	12V
B4	GND	A4	GND
B5	NC	A5	NC
B6	NC	A6	NC
B7	GND	A7	GND
B8	CEI_SDA	A8	NC
B9	CEI_SCL	A9	NC
B10	3V3SB (TBC)	A10	GND
B11	3V3SB (TBC)	A11	CB_RST-L (TBC)
B12	NC	A12	GND
B13	NC	A13	NC
B14	NC	A14	NC
B15	NC	A15	GND

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Row B		Row A	
Pin	**Name**	**Pin**	**Name**
B16	NC	A16	NC
B17	CEI_INT#	A17	NC
B18	GND	A18	GND
B19	NC	A19	NC
B20	NC	A20	GND
B21	GND	A21	NC
B22	GND	A22	NC
B23	10G_KR_RX3+	A23	GND
B24	10G_KR_RX3-	A24	GND
B25	GND	A25	10G_KR_TX3+
B26	GND	A26	10G_KR_TX3-
B27	10G_KR_RX2+	A27	GND
B28	10G_KR_RX2-	A28	GND
B29	GND	A29	10G_KR_TX2+
B30	10G_PHY_RST_01 (TBC)	A30	10G_KR_TX2-
B31	CEI_RST#	A31	GND
B32	GND	A32	CEI_SDA (TBC)
B33	10G_KR_RX1+	A33	CEI_SCL (TBC)
B34	10G_KR_RX1-	A34	GND
B35	GND	A35	10G_KR_TX1+
B36	GND	A36	10G_KR_TX1-
B37	NC	A37	GND
B38	NC	A38	GND
B39	GND	A39	CEI_MDIO
B40	GND	A40	CEI_MDC
B41	10G_KR_RX0+	A41	GND
B42	10G_KR_RX0-	A42	GND
B43	GND	A43	10G_KR_TX0+
B44	GND	A44	10G_KR_TX0-
B45	10G_SDP3	A45	GND
B46	10G_SDP2	A46	GND
B47	GND	A47	NC
B48	10G_SDP1	A48	CEI_PRSNT#
B49	GND	A49	GND

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Row B		Row A	
Pin	**Name**	**Pin**	**Name**
B50	NC	A50	10G_SDP0
B51	NC	A51	GND
B52	GND	A52	NC
B53	GND	A53	NC
B54	NC	A54	GND
B55	NC	A55	GND
B56	GND	A56	NC
B57	GND	A57	NC
B58	NC	A58	GND
B59	NC	A59	GND
B60	GND	A60	NC
B61	GND	A61	NC
B62	NC	A62	GND
B63	NC	A63	GND
B64	GND	A64	NC
B65	GND	A65	NC
B66	NC	A66	GND
B67	NC	A67	GND
B68	GND	A68	NC
B69	GND	A69	NC
B70	NC	A70	GND
B71	NC	A71	GND
B72	GND	A72	NC
B73	GND	A73	NC
B74	NC	A74	GND
B75	NC	A75	GND
B76	GND	A76	NC
B77	GND	A77	NC
B78	NC	A78	GND
B79	NC	A79	GND
B80	GND	A80	NC
B81	NC	A81	NC
B82	NC	A82	GND

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5. Module Interfaces and Configuration

This chapter describes connectors, LEDs, and switches that are used on the CEI-4x10GBASE-T adapter card.

5.1. Connector and LED Locations

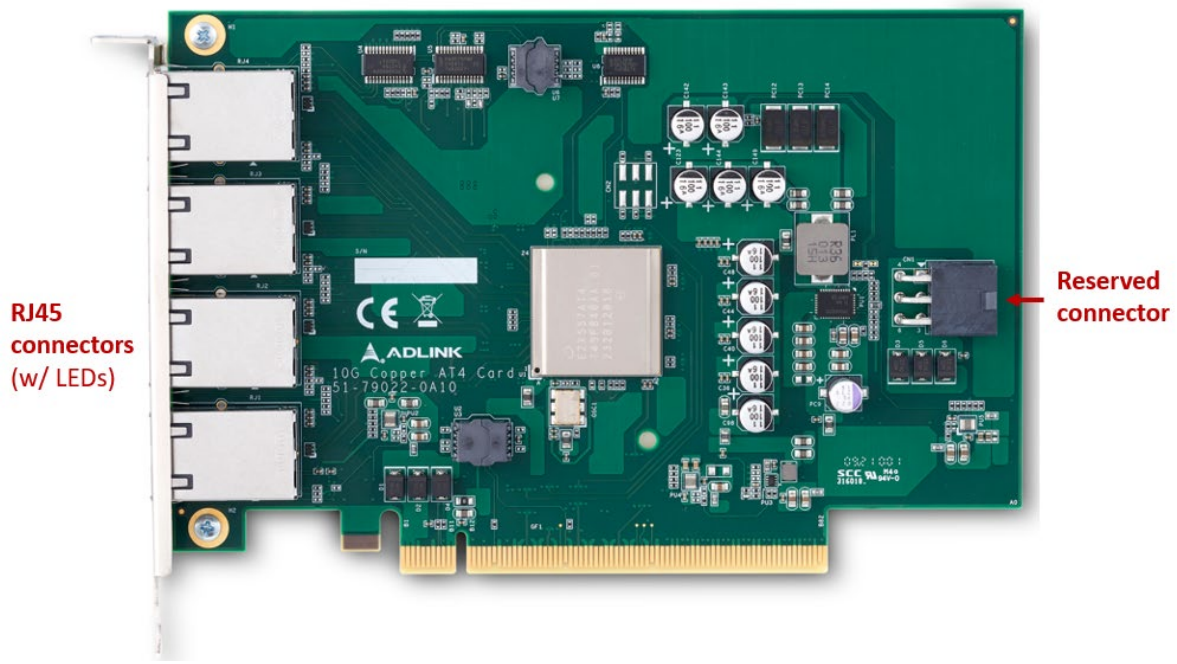
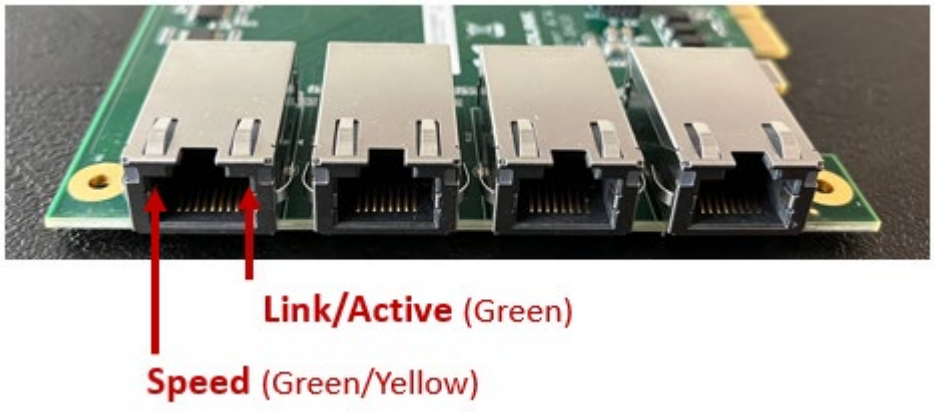


Figure 2 – Adapter card feature locations

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5.2. LED Indicators

There are two status LEDs for each 10GBASE-T port



Function	LED Color	LED State	Description
Speed	Green / Yellow	Off	TBC
		Yellow	1 Gbps link speed
		Green	10 Gbps link speed
Link / Active Status	Green	Off	No Link
		Steady On	Link established, no activity detected
		Blinking	Link established, activity detected

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5.3. 10GbE Adaptor Card Installation

Below is an example (illustration purposes only) of a CEI-4x10GBASE-T adapter card installed on an Express-BASE7 carrier board with a Type 7 Express-ID7 module.



Note: If input 5VSB-to-10GbE adapter card is needed for testing purposes, a specific cable and connection are required. Please contact an ADLINK representative for details.

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6. Mechanical

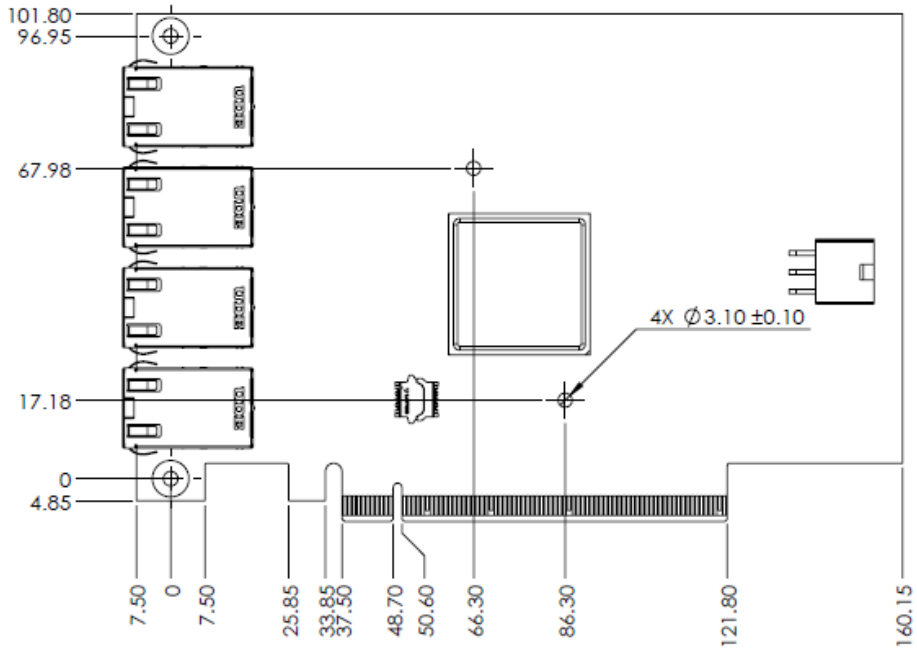


Figure 3 – CEI-4x10GBASE-T mechanical dimensions

Note: All dimensions are shown in millimeters with a tolerances of ± 0.25mm unless otherwise noted.

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