

» User Guide «

XMC402

Dual 10 Gigabit Ethernet XMC Module

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Kontron Europe GmbH may be contacted via the following:

MAILING ADDRESS

Kontron Europe GmbH
Sudetenstraße 7
D - 87600 Kaufbeuren Germany

TELEPHONE AND E-MAIL

+49 (0) 800-SALESKONTRON
sales@kontron.com

For further information about other Kontron products, please visit our Internet web site:
www.kontron.com.

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Table of Contents

<i>Revision History</i>	<i>ii</i>
<i>Imprint</i>	<i>ii</i>
<i>Disclaimer</i>	<i>ii</i>
<i>Table of Contents</i>	<i>iii</i>
<i>List of Tables</i>	<i>v</i>
<i>List of Figures</i>	<i>vii</i>
<i>Proprietary Note</i>	<i>v</i>
<i>Trademarks</i>	<i>v</i>
<i>Environmental Protection Statement</i>	<i>v</i>
<i>Explanation of Symbols</i>	<i>vi</i>
<i>For Your Safety</i>	<i>vii</i>
<i>High Voltage Safety Instructions</i>	<i>vii</i>
<i>Special Handling and Unpacking Instructions</i>	<i>vii</i>
<i>General Instructions on Usage</i>	<i>viii</i>
<i>Two Year Warranty</i>	<i>ix</i>
1. Introduction	1 - 3
1.1 <i>Board Overview</i>	1 - 3
1.2 <i>Board Diagrams</i>	1 - 3
1.2.1 <i>Functional Block Diagram</i>	1 - 3
1.2.2 <i>Front Panel</i>	1 - 4
1.2.3 <i>Board Layout</i>	1 - 4
1.3 <i>Technical Specification</i>	1 - 5
1.4 <i>Standards</i>	1 - 6
1.5 <i>Related Publications</i>	1 - 7
2. Functional Description	2 - 3
2.1 <i>10 Gigabit Ethernet Controller</i>	2 - 3
2.2 <i>Memory</i>	2 - 3
2.2.1 <i>Flash</i>	2 - 3
2.2.2 <i>FRU EEPROM</i>	2 - 3
2.3 <i>Board Interfaces</i>	2 - 3
2.3.1 <i>10 Gigabit Ethernet Connectors</i>	2 - 3
2.3.2 <i>XMC Interface</i>	2 - 5



3. Installation	3 - 3
3.1 <i>Hardware Installation</i>	3 - 3
3.1.1 <i>Safety Requirements</i>	3 - 3
3.1.2 <i>Installation Procedures</i>	3 - 4
3.1.3 <i>Removal Procedures</i>	3 - 6
4. Configuration	4 - 3
5. Power Considerations	5 - 3
5.1 <i>Carrier Power Supply</i>	5 - 3
5.1.1 <i>Start-Up Requirement</i>	5 - 3
5.1.2 <i>Power-Up Sequence</i>	5 - 3
5.1.3 <i>Tolerance</i>	5 - 3
5.1.4 <i>Regulation</i>	5 - 4
5.2 <i>Power Consumption</i>	5 - 4

List of Tables

1-1 <i>XMC402 Main Specifications</i>	1 - 5
1-2 <i>Standards</i>	1 - 6
1-3 <i>Related Publications</i>	1 - 7
2-1 <i>Pinout of 10 Gigabit Ethernet Connectors J1 and J2</i>	2 - 4
2-2 <i>XMC Connector J3 Pinout</i>	2 - 5
5-1 <i>Input Voltage Characteristics</i>	5 - 3
5-2 <i>Power Consumption: XMC402 with Windows® 7</i>	5 - 4

List of Figures

1-1 <i>XMC402 Functional Block Diagram</i>	1 - 3
1-2 <i>XMC402 Front Panel</i>	1 - 4
1-3 <i>XMC402 Board Layout (Top View)</i>	1 - 4
2-1 <i>10 Gigabit Ethernet Connectors J1 and J2</i>	2 - 4
2-2 <i>XMC Connector J3</i>	2 - 5
3-1 <i>XMC402 Installation / Removal Diagrams</i>	3 - 5



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Environmental Protection Statement

This product has been manufactured to satisfy environmental protection requirements where possible. Many of the components used (structural parts, printed circuit boards, connectors, batteries, etc.) are capable of being recycled.

Final disposition of this product after its service life must be accomplished in accordance with applicable country, state, or local laws or regulations.



Explanation of Symbols



Caution, Electric Shock!

This symbol and title warn of hazards due to electrical shocks (> 60V) when touching products or parts of them. Failure to observe the precautions indicated and/or prescribed by the law may endanger your life/health and/or result in damage to your material.

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



Warning, 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.



For Your Safety

Your new Kontron product was developed and tested carefully to provide all features necessary to ensure its compliance with electrical safety requirements. It was also designed for a long fault-free life. However, the life expectancy of your product can be drastically reduced by improper treatment during unpacking and installation. Therefore, in the interest of your own safety and of the correct operation of your new Kontron product, you are requested to conform with the following guidelines.

High Voltage Safety Instructions



Warning!

All operations on this device must be carried out by sufficiently skilled personnel only.



Caution, Electric Shock!

Before installing a not hot-swappable Kontron product into a system always ensure that your mains power is switched off. This applies also to the installation of piggybacks.

Serious electrical shock hazards can exist during all installation, repair and maintenance operations with this product. Therefore, always unplug the power cable and any other cables which provide external voltages before performing work.

Special Handling and Unpacking Instructions



ESD Sensitive Device!

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.

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.

It is particularly important to observe standard anti-static precautions when changing piggybacks, ROM devices, jumper settings etc. If the product contains batteries for RTC or memory backup, ensure that the board is not placed on conductive surfaces, including anti-static plastics or sponges. They can cause short circuits and damage the batteries or conductive circuits on the board.



General Instructions on Usage

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.

Special care is necessary when handling or unpacking the product. Please consult the special handling and unpacking instruction on the previous page of this manual.



Two Year Warranty

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.

Kontron warrants their own products, excluding software, to be free from manufacturing and material defects for a period of 24 consecutive months from the date of purchase. This warranty is not transferable nor extendible to cover any other users or long-term storage of the product. It does not cover products which have been modified, altered or repaired by any other party than Kontron or their authorized agents. Furthermore, any product which has been, or is suspected of being damaged as a result of negligence, improper use, incorrect handling, servicing or maintenance, or which has been damaged as a result of excessive current/voltage or temperature, or which has had its serial number(s), any other markings or parts thereof altered, defaced or removed will also be excluded from this warranty.

If the customer's eligibility for warranty has not been voided, in the event of any claim, he may return the product at the earliest possible convenience to the original place of purchase, together with a copy of the original document of purchase, a full description of the application the product is used on and a description of the defect. Pack the product in such a way as to ensure safe transportation (see our safety instructions).

Kontron provides for repair or replacement of any part, assembly or sub-assembly at their own discretion, or to refund the original cost of purchase, if appropriate. In the event of repair, refunding or replacement of any part, the ownership of the removed or replaced parts reverts to Kontron, and the remaining part of the original guarantee, or any new guarantee to cover the repaired or replaced items, will be transferred to cover the new or repaired items. Any extensions to the original guarantee are considered gestures of goodwill, and will be defined in the "Repair Report" issued by Kontron with the repaired or replaced item.

Kontron will not accept liability for any further claims resulting directly or indirectly from any warranty claim, other than the above specified repair, replacement or refunding. In particular, all claims for damage to any system or process in which the product was employed, or any loss incurred as a result of the product not functioning at any given time, are excluded. The extent of Kontron liability to the customer shall not exceed the original purchase price of the item for which the claim exists.

Kontron issues no warranty or representation, either explicit or implicit, with respect to its products' reliability, fitness, quality, marketability or ability to fulfil any particular application or purpose. As a result, the products are sold "as is," and the responsibility to ensure their suitability for any given task remains that of the purchaser. In no event will Kontron be liable for direct, indirect or consequential damages resulting from the use of our hardware or software products, or documentation, even if Kontron were advised of the possibility of such claims prior to the purchase of the product or during any period since the date of its purchase.

Please remember that no Kontron employee, dealer or agent is authorized to make any modification or addition to the above specified terms, either verbally or in any other form, written or electronically transmitted, without the company's consent.



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Chapter

1

Introduction



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1. Introduction

1.1 Board Overview

The XMC402 Dual 10 Gigabit Ethernet module is an XMC mezzanine card designed for use with compliant carrier boards or CPU boards which support XMC modules with PCI Express 2.1 interconnection. The XMC402 incorporates a very flexible design which allows simple and easy integration of 10 Gigabit Ethernet functionality to any compliant system.

The XMC402 provides wire-speed, dual-port 10 Gigabit Ethernet throughput and is equipped with one dual-channel 10 Gigabit Ethernet controller (Intel® X540) and two 10 Gigabit Ethernet RJ-45 connectors with integrated magnetics and status LEDs.

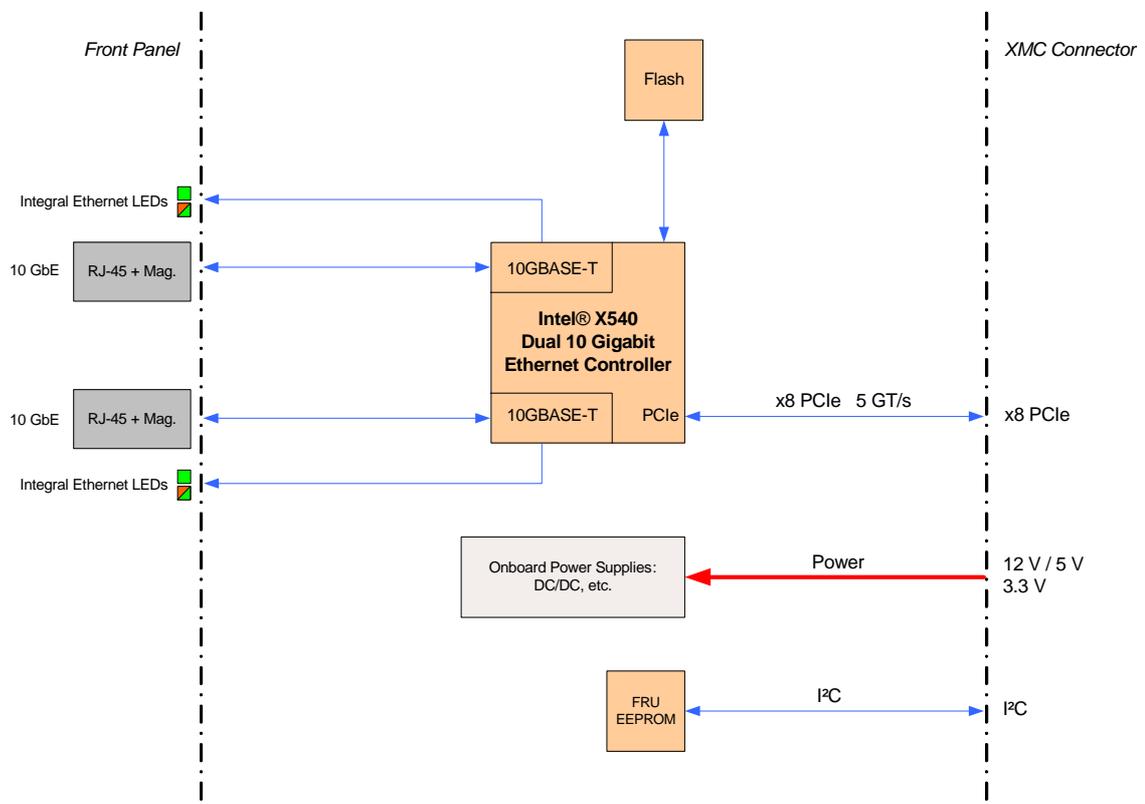
Carrier interfacing is provided by one XMC connector supporting PCI Express 2.1 (5 GT/s) with x8 lanes.

1.2 Board Diagrams

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

1.2.1 Functional Block Diagram

Figure 1-1: XMC402 Functional Block Diagram





1.2.2 Front Panel

Figure 1-2: XMC402 Front Panel



LEGEND:

Integral Ethernet LEDs

- ACT/LNK (green): Ethernet Link/Activity
- SPEED (green/amber/off): Ethernet Speed

1.2.3 Board Layout

Figure 1-3: XMC402 Board Layout (Top View)





1.3 Technical Specification

Table 1-1: XMC402 Main Specifications

XMC402		SPECIFICATIONS
Controller	Intel® X540	Intel® X540 10 Gigabit Ethernet controller with PCI Express 2.1 interface and two 10 Gigabit Ethernet ports
Memory	Flash	16 Mbit of flash memory for configuration and additional data storage
	FRU EEPROM	2 kbit EEPROM for IPMI serial EEPROM FRU data storage
Connectors	10 Gigabit Ethernet	Two front panel RJ-45 connectors with integrated magnetics and status LEDs
	XMC	One onboard XMC connector supporting PCI Express 2.1 (5 GT/s) with x8 lanes for connection to a carrier board
LEDs	Ethernet Status LEDs	Integral Ethernet LEDs: <ul style="list-style-type: none"> • ACT/LNK (green): Ethernet Activity/Link • SPEED (green/amber/off): Ethernet Speed
Software	Operating Systems	There are various operating systems available for the XMC402. For information relating to the supported operating systems, please refer to the Kontron web site or contact Kontron.
General	Mechanical	XMC-compliant form factor
	Power Consumption	See Chapter 5 for details.
	Temperature Range	Operational: 0°C to +60°C Storage: -40°C to +85°C
	Recommended Airflow	Volumetric Flow Rate: > 20 cfm Sufficient airflow must be provided to ensure optimal operation and long-term reliability of the XMC402. For further information, refer to the carrier's user guide.
	Climatic Humidity	93% RH at 40°C, non-condensing (acc. to IEC 60068-2-78)
	Dimensions	74 mm x 149 mm single-height XMC card
	Board Weight	116 grams

1.4 Standards

This product complies with the requirements of the following standards:

Table 1-2: Standards

TYPE	ASPECT	STANDARD	REMARKS
CE	Emission	EN55022 EN61000-6-3	
	Immission	EN55024 EN61000-6-2	
	Electrical Safety	EN60950-1	
Mechanical	Mechanical Dimensions	IEEE 1101.10	
Environmental	Vibration (Sinusoidal)	IEC60068-2-6	Test parameters: <ul style="list-style-type: none"> • 10-300 (Hz) frequency range • 2 (g) acceleration • 1 (oct/min) sweep rate • 10 cycles/axis • 3 axis
	Permanent Shock	IEC60068-2-29	Test parameters: <ul style="list-style-type: none"> • 15 (g) acceleration • 11 (ms) pulse duration • 500 bumps per direction • 6 directions • 1 (s) recovery time
	Single Shock	IEC60068-2-27	Test parameters: <ul style="list-style-type: none"> • 30 (g) acceleration • 9 (ms) pulse duration • 3 shocks per direction • 6 directions • 5 (s) recovery time
	Climatic Humidity	IEC60068-2-78	see note below
	WEEE	Directive 2002/96/EC	Waste electrical and electronic equipment
	RoHS	Directive 2002/95/EC	Restriction of the use of certain hazardous substances in electrical and electronic equipment



Note ...

Kontron performs comprehensive environmental testing of its products in accordance with applicable standards.

Customers desiring to perform further environmental testing of Kontron products must contact Kontron for assistance prior to performing any such testing. This is necessary, as it is possible that environmental testing can be destructive when not performed in accordance with the applicable specifications.

In particular, for example, boards **without conformal coating** must not be exposed to a change of temperature exceeding 1K/minute, averaged over a period of not more than five minutes. Otherwise, condensation may cause irreversible damage, especially when the board is powered up again.

Kontron does not accept any responsibility for damage to products resulting from destructive environmental testing.



1.5 Related Publications

The following publications contain information relating to this product.

Table 1-3: Related Publications

PRODUCT	PUBLICATION
XMC	IEEE 1386-2001, IEEE Standard for a Common Mezzanine Card (CMC) Family ANSI/VITA 42.0-200x XMC Switched Mezzanine Card Auxiliary Standard ANSI/VITA 42.3-2006 XMC PCI Express Protocol Layer Standard ANSI/VITA 42.6 10 Gigabit Ethernet Subspecification
10GBase-T	IEEE 802.3an-2006
100Base-TX/1000Base-T	IEEE 802.3
All Kontron products	Product Safety and Implementation Guide, ID 1021-9142



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