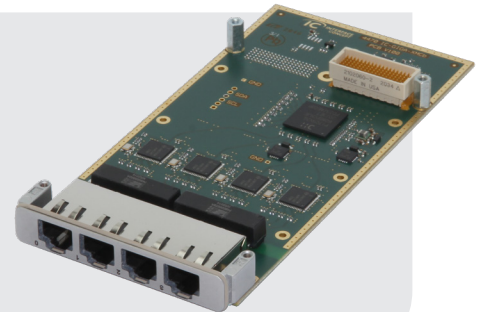


IC-RBP-XMCa

Active network redundancy XMC Switch Mezzanine Card

- XMC
- Zynq UltraScale+ MPSoC ZU4CG
- 4 * 10/100/1000BASE-T channels (front or rear)
- 1 * Gigabit Ethernet Controller
- Redundancy protocols: PRP, HSR



This is not an actual product photo.

Overview

The **IC-RBP-XMCa** takes advantage of the new Interface Concept XMC FPGA module to add a dual attached redundancy capability to Single Board Computers or systems interconnected via Ethernet, in high availability applications.

Description

The **IC-RBP-XMCa** allows to strengthen Ethernet communication systems by implementing redundancy functions in the network in order to prevent any failure.

Using standard protocols such as Parallel Redundancy Protocol (PRP), the **IC-RBP-XMCa**'s sending nodes replicate frames over two independent Ethernet networks that operate in parallel between senders and receivers.

The receiving node processes the frame arriving first and discards the duplicate. In case of failure of one network link, seamless redundancy is provided between the dual attached nodes.

Plugged onto a cPCI, VME and VPX carrier or SBC, the **IC-RBP-XMCa** brings these redundancy and robustness functionalities to all standards of critical embedded applications.

Instead of the PRP protocol, the High-availability Seamless Redundancy (HSR) protocol can also be implemented in order to provide seamless failover in case of a network failure in the ring topology created between **IC-RBP-XMCa** boards.

The **IC-RBP-XMCa** management and supervision application allow integrators to manage double attached nodes according to the Ethernet network characteristics.

This application supplies network statistics, checks the integrity of the network and generates real-time events like the loss, for instance, of a network link.

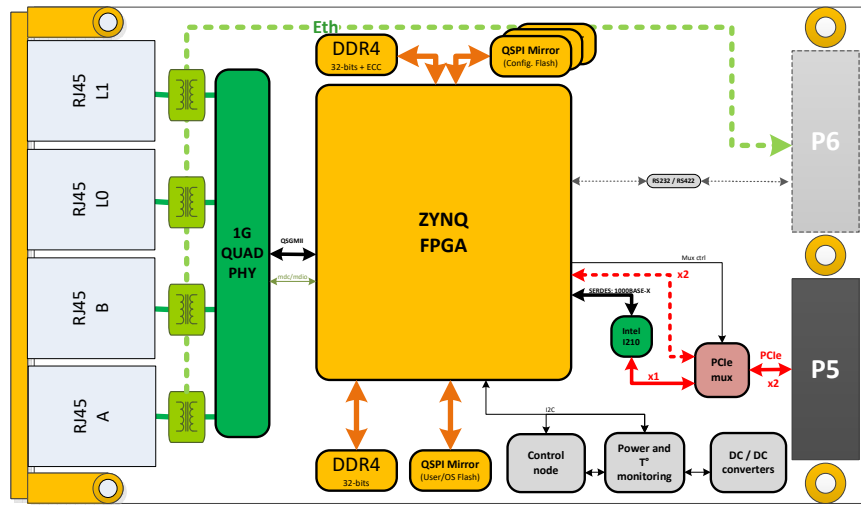
This application can be remotely controlled through:

- SNMP
- Graphical User Interface (GUI HTTP)
- Command Line Interface (CLI)

This XMC module complies with environment constraints for industrial, transportation or mil-aero applications.

It is available in air-cooled version (-40°C to 75°C).

Block Diagram



Main features

Processor unit

- Zynq® UltraScale+™ MPSoC

I/O subsystem

- 2 * 10/100/1000BASE-T interfaces, Ports A & B, for double attachment on two redundant networks (PRP) or with two bridging nodes (HSR)
- 2 * 10/100/1000BASE-T interfaces, Ports LO & L1, for attachment of one source (if both interfaces are used, network bonding must be activated)
- 1 * Gigabit Ethernet Controller (NIC) for attachment of a second source (on the carrier)

Accessories

- XMC/PMC carriers or Single Board Computers based on 6U VPX, 3U VPX, 6U VME form-factors.

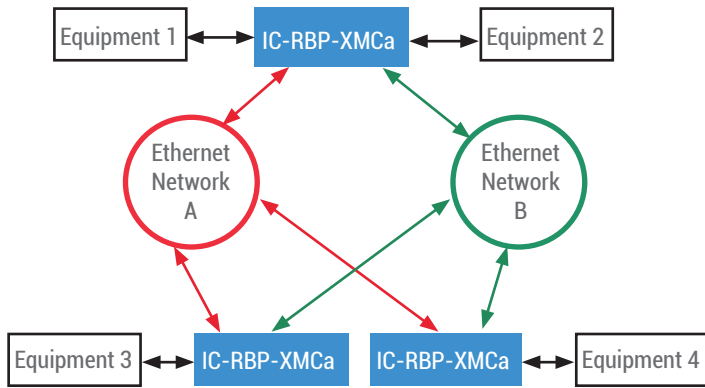
IC-RBP-XMCa

Active network redundancy XMC Switch Mezzanine Card

Case study n°1

PRP: Parallel Redundancy Protocol

Connecting a terminal equipment to a redundancy Ethernet network as shown below:

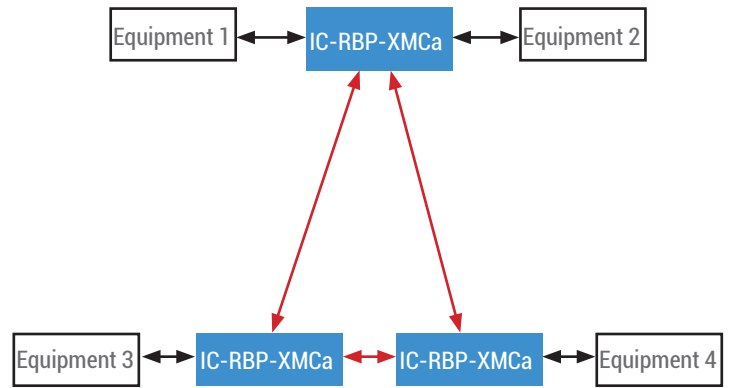


- Each **IC-RBP-XMCa** is attached to two independent networks (A and B)
- Each frame is duplicated on the sending side and transmitted over both networks
- on the receiving side, the first incoming frame from one or both networks is forwarded to the receiver (equipment 1, 2 3 or 4) and the duplicate is discarded by the **IC-RBP-XMCa**.
- The duplicates are transparent to any equipment part of the networks.
- The **IC-RBP-XMCa** provides network statistics and generates supervision events with the network management application.

Case study n°2

HSR: High-availability Seamless Redundancy

Connecting a terminal equipment to a redundancy Ethernet ring as shown below:



- Each **IC-RBP-XMCa** is attached to two others bridging nodes (**IC-RBP-XMCa**) to build a ring topology
- Each frame is duplicated on the sending side and transmitted over each port
- on the receiving side, the first incoming frame from one side is forwarded to the receiver (equipment 1, 2, 3 or 4) and the duplicate one (when received) is discarded by the **IC-RBP-XMCa**.
- The **IC-RBP-XMCa** supports bridge functionality and forward frames from one port to the other port when needed.
- The **IC-RBP-XMCa** provides network statistics and generates supervision events with the network management application.

Grades

Criterion	Coating	Operation Temperature	Rec. Airflow	Oper. HR% no cond.	Storage Temperature	Sinusoidal Vibration	Random Vibration	Shock 1/2 Sin. 11ms
Standard	Optional	0 to 55°C	1 .. 2 m/s	5 to 90%	-45 to 85°C	2G [20..2000]Hz	0.002g ² /Hz [10..2000]Hz	20G
Extended	Yes	-20 to 65°C	2 .. 3 m/s	5 to 95%	-45 to 85°C	2G [20..2000]Hz	0.002g ² /Hz [10..2000]Hz	20G
Rugged	Yes	-40 to 75°C or 85°C (*)	2 .. 5 m/s	5 to 95%	-45 to 100°C	5G [20..2000]Hz	0.05g ² /Hz [10..2000]Hz	40G
Conduction-Cooled 71°C	Yes	-40 to 71°C at the thermal interface (*)	-	5 to 95%	-45 to 100°C	5G [20..2000]Hz	0.05g ² /Hz [10..2000]Hz	40G
Conduction-Cooled 85°C	Yes	-40 to 85°C at the thermal interface (*)	-	5 to 95%	-45 to 100°C	5G [20..2000]Hz	0.1g ² /Hz [10..2000]Hz	40G

(*) : Temperature grades are subject to availability according to IC products. Please consult us.

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