



# The Industrial Ethernet Module (IEM) provides a universal interface to integrate Industrial Ethernet functionality into your product

The IXXAT IEM gives you a flexible, extendible and powerful network interface for adding Industrial Ethernet to intelligent devices, such as frequency converters, IO-modules, valves, and many automation components. And it makes this possible without the uncertain cost and effort of having to develop your own solution.

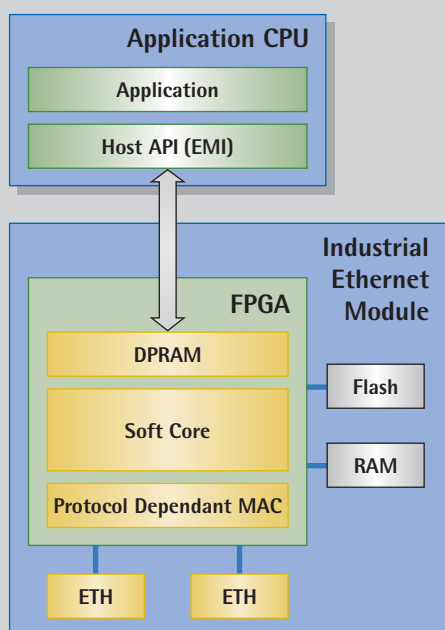
## Flexibility to meet diverse goals

Industrial Ethernet is becoming increasingly important in industrial automation. More than 20 types of Industrial Ethernet protocol compete in various segments of this rapidly growing market. **EtherCAT, EtherNet/IP, Modbus-TCP, POWERLINK, PROFINET** and **SERCOS III** play leading roles in most factory and process automation applications. Each of these adapts the Ethernet standard to meet different real-

time and cost challenges. Covering the software and hardware compatibility issues can be a big challenge for your developers.

At IXXAT we have created a module that can integrate the most common Industrial Ethernet protocols into your hardware easily and flexibly, and which only needs small adaptations in your software to switch between the protocols.

Industrial Ethernet Module – Application Interface

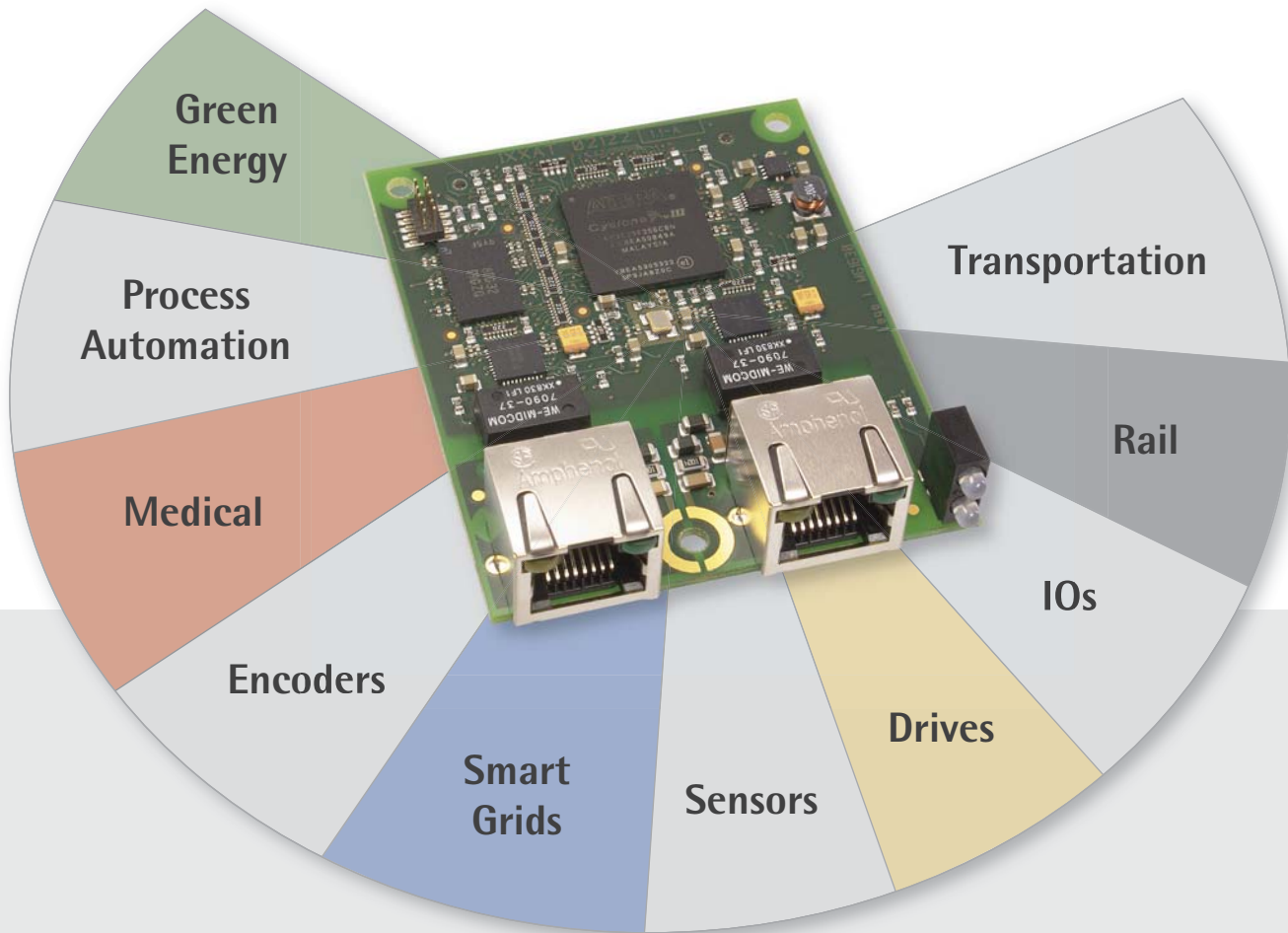


## One hardware fits all, now and in the future

### Shortening your time to market, reducing development costs

The IXXAT Industrial Ethernet Module takes time out of development and the strain out of engineering.

- Your developers do not have to deal with the multiple development tool chains for hardware and software platforms, or the various needs of different Industrial Ethernet protocols. This frees up time, money and energy for core development work.



- Using the integrated 3-port switch, you can easily set up the line topology you need.
- As a "turnkey" solution to your networking challenges, the IXXAT IEM helps you set-up the development environment and prototypes faster.
- IXXAT's optional evaluation kit and CPU-board adaptors can help you further speed up the start of your development.
- We have carefully tested the IEM with other network components, and have a full compatibility matrix for different master and master stack solutions. We have also precertified the IEM for the protocols we offer. This shortens and simplifies integrating and obtaining certification.

### Minimizing TCO, extending product lifetimes

The IXXAT Industrial Ethernet Module ensures the long-term viability of your design.

- Because the IEM is FPGA-based, it can change to meet the needs of future protocols, without changing the hardware on your board or the software interface in your application.

- You can even update the module in the field – so you too can promote a healthy return on investment to your customers.

### Simplifying production logistics, increasing product margins

The IXXAT Industrial Ethernet Module reduces component and production costs.

- Whether you continue using the plug-in or design-in alternative in volume production, the identical interface to development and manufacturing modules ensures an easy transition to production and volume.
- A single module for up to six Industrial Ethernet protocols also reduces component costs and handling complexity in production.

#### Technical specifications of the Industrial Ethernet Module

FPGA	Altera Cyclone III
Network interface	2 x RJ45 socket with 10/100 Mbit/s Ethernet (10Base-T/100Base-T) according to IEEE 802.3
Host interface	Two-row 50-pin plug connector in 1.27 mm grid; access over SPI or memory mapped
Displays	1x yellow and 1x green LED in the RJ45 sockets to display Ethernet states; 2x bi-coloured LED to display protocol-specific states
Power supply	3.3 V, approx. 1 W
Temperature range	0 °C to +70 °C (commercial temperature range); -40 °C to +85 °C (industrial temperature range)
Certificates	Conforms with the relevant Industrial Ethernet / CE standards
Protection class	IP20 when installed in a suitable housing
Dimensions	72.2 x 57.5 x 16 mm

## Services

Besides the Industrial Ethernet Module and the Design-In offered as standard products, IXXAT provides further services to allow an easy integration of Ethernet connectivity into customers hardware.

### OEM Products

Based on the sophisticated Industrial Ethernet Module, IXXAT can develop and manufacture customer specific products in all production volumes.

### Consultation

IXXAT has long term and extensive experience with industrial communication systems. In close collaboration with our customers we are analyzing the system requirements and specifications and present the best solutions for their application.

### Specification

Defining the product requirements is a major step of the specification process. IXXAT can support customers in specifying their device in order to achieve best-in-class performance.

### Hardware and Software Development

Our experienced engineers are familiar with all major Industrial Ethernet technologies as well as with all aspects of software and hardware development. Thus there are many possibilities in assisting our customers, starting from basic integration and implementation support during development, up to comprehensive development projects including hardware and software development and system testing. Moreover IXXAT offers series production handling and maintenance of customer products.

### System Test and Certification

IXXAT can provide knowledge in setting up test systems and preparing the product for certification tests. We closely work together with the various organizations and their labs to ensure that customer's product will pass certification tests.



Evaluation Kit

## Products

### Industrial Ethernet Module

IXXAT's Industrial Ethernet Module is a ready-to-mount, all-in-one, pre-programmed, and fully licensed package for all Industrial Ethernet protocols. This makes it the easiest way to integrate Industrial Ethernet into your development, prototyping and volume production.

### Design-In

You can also integrate IXXAT's Industrial Ethernet Module fully into your design. The development licence contains all you need: schematics, design guidelines, FPGA bitstream, API source code, and examples.

In production, IXXAT offers inexpensive, volume-based royalties.

### Customer-specific solutions

Both, the Industrial Ethernet Module and the Design-In can be adapted to accommodate your design. This starts from changing the form-factor up to integrating extra functionalities and interfaces. IXXAT also offers further development, production and handling services.

### Evaluation and Prototyping

IXXAT's evaluation kit for the Industrial Ethernet Module provides you with a quick start opportunity, so you can hit

the ground running. The evaluation kit consists of:

- Industrial Ethernet Module with a protocol of your choice
- Carrier board, which provides all the electrical signals for the module on standard connectors. 8 digital inputs (buttons) and 8 digital outputs (LEDs) make testing simple. The evaluation board manages the voltages for the IEM and the CPU module, from a 9 to 32 V DC input.
- CPU-board (Phytec phyCORE-XC161, or Spectrum Digital TMS320)
- Adaptor board to connect the CPU-board to the carrier board. You can also create your own adaptor boards or cables to connect the development environment to the module.
- Software for the CPU-board and documentation