



# PROFINET

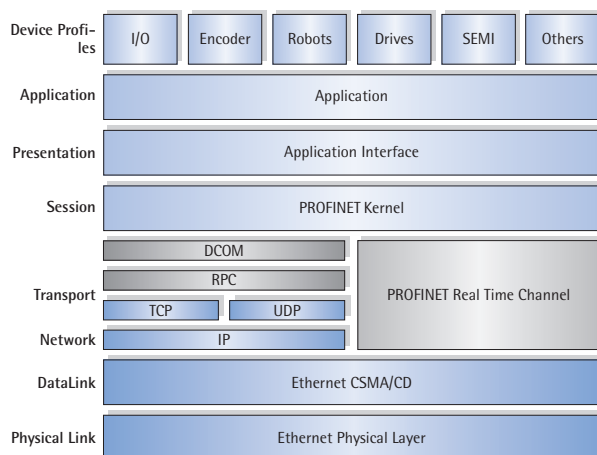
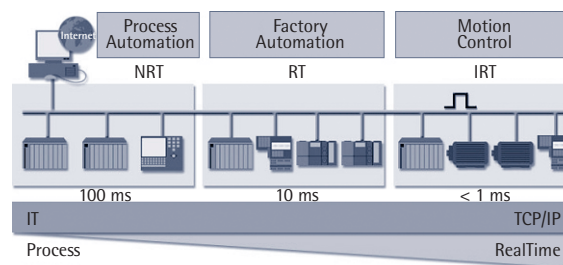


## PROFINET Introduction

PROFINET is the innovative, open standard for industrial Ethernet in automation technology. The PROFINET Standard is specified and published by PI (PROFIBUS & PROFINET International – [www.profibus.com](http://www.profibus.com)).

PROFINET provides solutions for process automation, factory automation and motion control. PROFINET enables the integration of existing fieldbus systems, like PROFIBUS, Interbus, DeviceNet and other technologies to an open Ethernet based network. PROFINET uses Ethernet standard as well as TCP, UDP and IP as protocols for communication, configuration and diagnosis in the network.

The highest requirements come from the control of complex drive systems like packaging machines or robotics. With PROFINET IRT (Isochronous Real Time) applications with cycle time < 1 ms and jitter < 1  $\mu$ s are possible. This is accomplished by the usage of specific hardware for the Ethernet interface.



On the application side three different device types are defined: IO-Controller – the classic PLC (Master), which establishes connections to the devices, exchanges data and controls the system, IO-Device – the device (Slave) which is assigned to the controller to exchange data, and IO-Supervisor – the interface for programming, commissioning and diagnosis in the network.

Beside communication and exchange of I/O data the PROFINET standard also defines the topology and structure of the network. Guidelines for the cabling, the selection of suitable connectors and topology components facilitate the planning and the commissioning of a PROFINET network. The user has the choice between a star structure using (managed) switches which is common in IT business, the classical line structure used in PROFIBUS systems and tree structure which combines both principles.

The PROFINET standard defines three different performance levels which cover the various requirements from different applications. For non-realtime applications, PROFINET NRT (Non Real Time) is defined. It uses standard protocols as UDP/IP. With cycle times > 100 ms PROFINET NRT targets for applications in process automation.

The migration of existing PROFIBUS systems to PROFINET systems can easily be achieved by using Proxies (Gateways) which enable the communication and the data exchange between both networks.

For applications with higher requirements on cycle time like factory automation, PROFINET RT (Real Time) is the right choice. I/O data is exchanged directly using the Ethernet protocol, while diagnosis and configuration uses standard UDP/IP. PROFINET RT enables applications with cycle times > 10 ms.

The device profiles already known from the PROFIBUS world can also be used for PROFINET. With PROFIdrive a powerful profile for the implementation of high-performance drive solutions is available.

For safety-relevant applications, the PROFIsafe profile for PROFINET and PROFIBUS DP systems is defined.



## PROFINET IO-Developer's Kit

The PROFINET IO Developer's Kit enables developers of embedded products to add quickly PROFINET IO Device functionality to a product's feature set.

### FUNCTION OVERVIEW

#### PROFINET IO Device functionality:

- Cyclic data exchange with a PROFINET IO-controller
- Sending and receiving of diagnostic and process alarms, and plug and pull alarms
- Assignment of IP addresses and device names via Ethernet

### SUPPORTED TARGET SYSTEMS

The PROFINET IO-Developer's Kit is delivered for NetSilicon® NS9360 Development Kit and is instantly running on this system with the demo application.

An adaptation to other systems is possible for the PROFINET IO-Developer's Kit. A suitable operating system as well as TCP/IP protocol stack must be already available for the target system, they are not content of delivery of the PROFINET IO-Developer's Kit.

This adaptation can also be done by IXXAT.

### CONTENT OF DELIVERY

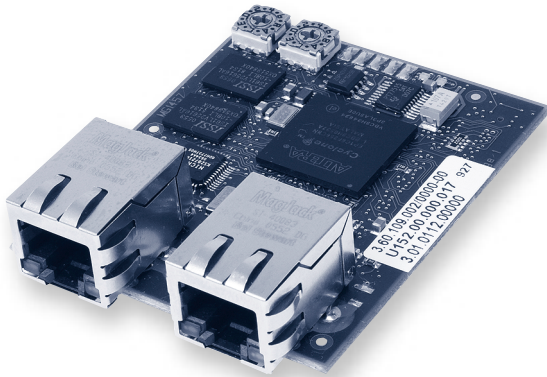
- PROFINET IO Device source code and include files
- Demo application for NetSilicon® NS9360 Development Kit
- Manual
- GSD-File for integration with Siemens STEP 7

### ORDER NUMBER

On request	PROFINET IO-Developer's Kit
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## PROFINET IO Device Module

### ► FPGA-based solution for cost-effective PROFINET IO Device implementations



### OVERVIEW

The PROFINET IO Device module represents a powerful solution for the implementation of PROFINET IO Device functionality in devices such as drives, I/O modules or encoders. Supported is the performance level Real Time (RT). For connection to the application CPU, a serial interface or a shared memory interface is available. The memory required for the data exchange is already on the PROFINET IO Device module, so that the interface of the application CPU only has to be connected to the module.

For simple applications it is possible to run the application together with the PROFINET IO Device software on the module. Device vendors can also integrate the hardware design instead of the add-on module directly in their own circuit.

A Host-API is supplied together with the PROFINET IO Device module, which allows the module to be controlled via its interface. The access and the configuration to the local data of the PROFINET IO Device module is supported by the Host-API. It is also possible to save configurations on the PROFINET IO Device module.

Process data are exchanged between application CPU and the PROFINET IO Device module via separate storage areas for input and output data. The application can use 1.5 kBytes for process data in each direction.

A baseboard is available as a supplement to the PROFINET IO Device module. This provides the power supply necessary for the evaluation of the module as well as various bus connections. With the baseboard it is possible to implement a simple I/O device directly or to connect processor modules of Phytex (phyCORE-XC161 and phyCORE-LPC2294) or Spectrum Digital (eZdsp F2812) to the PROFINET IO Device module via the integrated plugboards.

### HIGHLIGHTS

- Hardware-based single chip solution for PROFINET IO Device devices
- Reference design for Altera-FPGA with Ethernet Controller and CPU (NIOS II)
- Real Time (RT) communication with cycle time > 10 ms
- PROFINET IO Device software runs entirely on the module
- Smaller applications can be implemented directly on the PROFINET IO Device module
- Host connection via shared memory interface or serial interface

### CONTENT OF DELIVERY

- PROFINET IO Device module with integrated PROFINET IO Device software
- Host API in ANSI-C source code with programming example
- Manual
- Technical support

### ADDITIONAL PRODUCTS

- Baseboard for the PROFINET IO Device module

### FURTHER INFORMATION

The technical details and features of the PROFINET IO Device module are subject to change. The latest information can be found on the webpage.

### ORDER NUMBER

On request

PROFINET IO Device Module