Company-wide automation, integrated communication.
PROFINET, the open Industrial Ethernet Standard
New perspectives in industrial automation ...

*Increasing the productivity of your plant has the very highest priority. You want your investment to convert your production more quickly to the latest market demands and shorten your time to market. That is why you need a continuous flow of information company-wide – from the first production step via the plant control level to the corporate management level – for your strategic decisions.*
... through PROFINET, the innovative Industrial Ethernet Standard

The increasing significance of vertical integration shows what a decisive role industrial communication plays in modern automation as a whole. PROFINET, the open, cross-vendor standard based on Industrial Ethernet, enables direct and transparent access from the corporate management level all the way down to the field level. **PROFINET is based on established IT standards and provides unqualified support for TCP/IP.**

Utilizing synergies and securing investments: simple integration of existing systems

Do you want to continue to use and expand existing systems and plant sections which communicate via PROFIBUS and other field buses in the future? No problem! PROFINET makes integration of the existing basis easy, and with a minimum of effort. PROFINET ensures a high degree of investment protection for existing systems and you have the advantages of an innovative standard – now and in the future.

The optimum basis for PROFINET – Industrial Ethernet

Ethernet has established itself as the standard bus system in the office world. Thanks to its huge market acceptance, Ethernet development (e.g. transmission rate improvement) is continuing unabated. Siemens has been offering Industrial Ethernet as a standard-based network within the rough industrial environment for more than 15 years now.

PROFINET utilizes this basis to interface devices from the field level to the management level, thus combining industrial performance with the uniformity, continuity and transparency of corporate communication.
Industrial installation engineering, real-time capability, the integration of distributed field devices, isochronous motion control applications, simple network administration and diagnostics, protection against unauthorized access, efficient, cross-vendor engineering and a high degree of machine and plant availability – all of these demands are fulfilled by PROFINET, the open, cross-vendor standard.
... PROFINET, the comprehensive standard for the automation world
PROFINET: comprehensive and innovative

PROFINET is Real-Time Ethernet

PROFINET is based on integrated communication and simultaneous, unrestricted use of open IT standards as well as TCP/IP.

PROFINET enables the transmission of time-critical (Real-Time – RT) signals which can attain response times equivalent to those of today’s fieldbus systems. This performance level can be achieved with standard components.

A further step is the use of PROFINET with Isochronous Real-Time (IRT) for high-performance, isochronous motion control applications. IRT provides deterministic real-time capability and fulfills all the necessary requirements: response times well under 1 ms, isochronous transmission and jitter of less than 1 µs.
**PROFINET with distributed field devices**

PROFINET enables the direct interfacing of field devices on Ethernet and is capable of high-speed data interchange with the controller. Configuring is done in the familiar manner using SIMATIC STEP 7. You do not need to learn anything new, and it goes without saying that the same extensive device diagnostics familiar from the PROFIBUS world are also available for PROFINET, as is the transparent integration of PROFIBUS devices.

**PROFINET and motion control ensure the highest performance level**

PROFINET allows you to create extremely fast, isochronous drive control systems for high-performance motion control applications with a minimum of effort. Your benefit: a quantum leap compared to today’s solutions and that while using TCP/IP communication. The integration of isochronous real-time (IRT) in PROFINET devices opens up the world of high performance. The engineering is simple: it is done with familiar tools such as SIMATIC STEP 7 or SIMOTION Scout.
PROFINET and distributed intelligence

PROFINET opens up new perspectives in the implementation of distributed automation structures: uncompromising modularization with plant-wide engineering, namely Component Based Automation: intelligent modules consisting of mechanical components, electrical/electronic components and the application software are pre-tested and delivered to the plant ready to use. SIMATIC iMap allows you to graphically configure the relationship between the individual, reusable modules on both PROFINET and PROFIBUS. It is user-friendly and requires no additional programming.

PROFINET for easy network installation

PROFINET allows you to install your network without the need for expert knowledge. In addition to star-shaped cabling, PROFINET also supports line and ring structures thereby allowing you to minimize cabling overheads and ensuring a high degree of availability. The industrial cables and rugged connectors are specially designed to meet EMC and temperature demands and are standardized within the PROFINET framework. This ensures compatibility with devices from different manufacturers. The user-friendly PROFINET Installation Guide serves as the guideline for network installation and ensures simple machine and plant commissioning procedures.
PROFINET – IT standards & security

PROFINET provides all the functions required for the optimal configuration and diagnostics of PROFINET devices and networks using proven standard IT technologies such as http, HTML, SNMP, DHCP and XML. The integration of these services in PROFINET means potential savings in commissioning and maintenance. In addition, you have Internet access from any location in the world to all relevant data any time you need it.

The importance of network security in the areas of data and communication technology has increased enormously in recent years. Security means protection against system sabotage and unauthorized access to sensitive data. PROFINET already has an integrated security concept in place which is capable of minimizing the security risks for an automation network without unnecessarily affecting production.

PROFINET with Safety Integrated

PROFINET also fulfills the demands for a complete security concept for humans, machines and the environment. Thanks to PROFIsafe, the standard profile for fail-safe communication, PROFINET can be used for both standard and fail-safe applications – a single network for everything. The freely programmable security logic uses standard tools to simplify commissioning and programming.

PROFINET in process

PROFINET is designed as a comprehensive standard for all automation tasks. Special requirements for its use in industrial plants and the interfacing of process instrumentation and analyzers are currently being dealt with as part of the overall efforts toward standardization. The first stage will provide transparent integration based on existing PROFIBUS solutions.
Products that make applications with PROFINET easier

Siemens already offers an extensive range of products for PROFINET which includes the SIMATIC S7-300 and S7-400 programmable controllers, PCs and workstations. Field devices from the SIMATIC ET 200 product family can be directly connected to PROFINET. Existing PROFIBUS devices can also be integrated in a PROFINET solution. The product line is rounded off by a comprehensive range of active and passive network components, security products for the creation of secure Industrial Ethernet networks and the option of wireless communication with industrial WLAN.
PROFINET controllers for automation systems

For SIMATIC S7-300 there is the CPU 317-2 PN/DP with integrated PROFINET interface. The CP 343-1 communications processor also makes it possible to interface S7-300 stations to PROFINET. The CP 443-1 Advanced communications processor with integrated switch serves as a PROFINET interface for the powerful SIMATIC S7-400 PLCs.

PC / Workstation

SIMATIC NET SOFTNET PN IO

This communication software makes it possible to operate field devices directly from a PC via Ethernet.

SIMATIC NET PN OPC server

This communication software makes it possible to integrate a PC or workstation as a component in an application with Component Based Automation.

SIMATIC WinAC PN with software PLC

SIMATIC WinAC PN is a software PLC based on SIMATIC WinAC V3.0. It can be integrated as a component in an application with Component Based Automation and functions as a proxy for as many as 60 PROFIBUS devices.

Distributed field devices

The IM 151-3 PN PROFINET interface module for the SIMATIC ET 200S distributed I/O station makes it possible to enjoy all the advantages of the multifunctional I/O system on Ethernet. For example, analog signals, counters, serial interfaces, motor starters, frequency converters and pneumatic devices can all be controlled via Ethernet.

Proxies/Interfaces

As a stand-alone component, the IE/PB link forms the seamless transition between Industrial Ethernet and PROFIBUS, thus making it possible to integrate existing PROFIBUS devices in a Component Based Automation application. The IE/PB Link PN IO version makes it possible to interface PROFIBUS field devices directly to a PLC via Ethernet.

Active and passive network component

The SCALANCE X product family comprises industrial switches optimized for field use through, for instance, the integration in PROFINET diagnostics.

With its FastConnect system, based on copper technology, Siemens has created a system for fast, easy, fault-free installation of the Ethernet network in industrial environments. The system comprises installation cables and patch cords, sockets and connectors which can be cut to length and terminated on site using the FC stripping tool. Siemens also offers a wide variety of products for optical cabling.

Security components

SCALANCE 5 security products include both a software module (e.g. for client PCs) and a hardware module (e.g. a network component such as a switch with security port).

Industrial WLAN

Even wireless communication is not a problem for PROFINET with the SCALANCE W industrial WLAN components.
Always with up-to-date information. Fast and simple – just fax us.
+49/911/978-3321, info service AD/Z 1098

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- [ ] PROFINET Technical Product Brief
- [ ] Modularization with PROFINET and Component Based Automation
- [ ] Product Overview on Industrial Ethernet
- [ ] Product Overview on Controllers and Distributed I/Os
- [ ] Industrial Image Processing using PROFINET with SIMATIC VS 130-2

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