

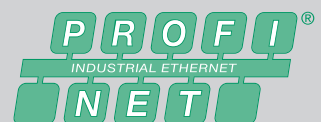
# PROFINET

[efesotomasyon.com](http://efesotomasyon.com)

Ethernet for Automation = PROFINET



Open Solutions for the World of Automation





### **Maximizing performance with PROFINET**

To be victorious in Formula 1 requires state-of-the-art technology, precision and maximum performance. Is it your aim to get the pole position and to win the race with...

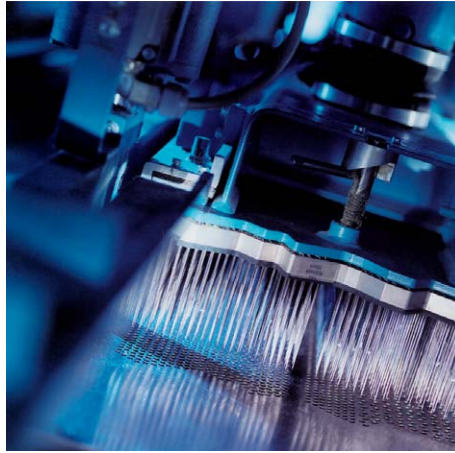
- An automation system which uses open, independent and established standards?
- An automation system with integrated communication from enterprise management to field level?
- An automation system which is able to meet your automation technology requirements in terms of performance, determinism and quantity structures?
- An automation system which is able to protect for your investments by integrating existing fieldbus systems?
- An automation system which is open to expansions and innovations?

Increase your success with PROFINET, the Number 1 in the Formula 1 of industrial communication!

# PROFINET...

**...is the open, multi-vendor  
Industrial Ethernet standard for  
factory and process automation**

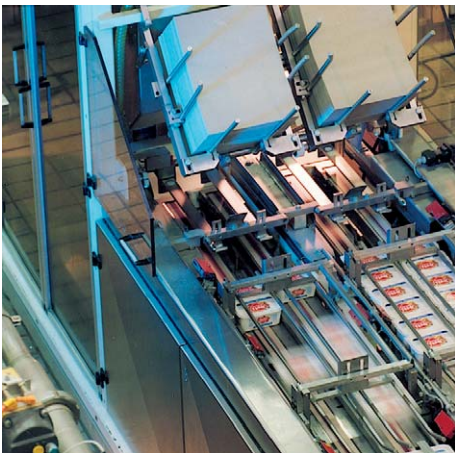
- Uses TCP/IP and IT standards
- Supports integrated communication from enterprise management to field level
- Offers scalable real-time communication culminating in clock-synchronized motion control
- Integrates safety for the protection of personnel, equipment and the environment
- Protects your equipment against unauthorized access and sabotage (security)
- Supports the seamless integration of all fieldbus systems



## PROFINET in action...

Numerous applications in every imaginable sector and application field in industrial automation provide proof of PROFINET's success.

- Automotive industry
- Food, beverage and tobacco
- Logistics
- Material handling
- Mechanical engineering
- Packaging industry
- Pharmaceuticals
- Power generation and distribution
- Printing units
- Production and assembly plants
- Textile industry
- ...



## Integrated communication



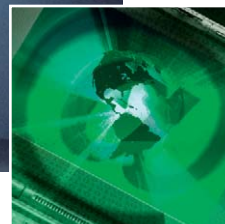
### One single cable

PROFINET supports vertical and horizontal communication from enterprise management to field level. The use of Ethernet enables office and production facilities to be networked uniformly throughout the enterprise. Provision has been made for communication throughout the production chain, from incoming goods through the various phases of the production process and beyond to packaging. PROFINET uses globally established standard IT services and supports scalable Real-Time communications for all automation applications. Real-Time and TCP/IP communication can take place simultaneously on the same cable.



### Global access

PROFINET supports global access to applications and devices. This is implemented, for example, using Web services based on standard technology from the Internet arena. Thus PROFINET devices can be accessed for the purpose of remote diagnostics from any location in accordance with the relevant PROFINET security standards.



## Wireless communication

PROFINET supports wireless communication between PROFINET devices and the wireless integration of sensors and actuators. For this type of communication, PROFINET uses existing standards established in the industry.

## Maintenance and diagnostics

Preventive condition-based maintenance is gaining in importance in the field of automation. PROFINET provides corresponding device functions as well as a suitable MES interface. Network management on PROFINET includes functions for administering devices and switches. Furthermore, PROFINET supports the configuration and diagnostics of applications, devices and networks.

**PROFINET meets all the requirements of industrial communication and can, therefore, be used in all sectors of automation.**



# High Performance in Real-Time



## Maximum performance

The various application areas in industrial automation require a wide range of services for communication. These range from TCP/IP through Real-Time and beyond to clock-synchronized services. PROFINET communication is deterministic and offers maximum levels of performance, with the result that even the most complex motion control requirements can be met.

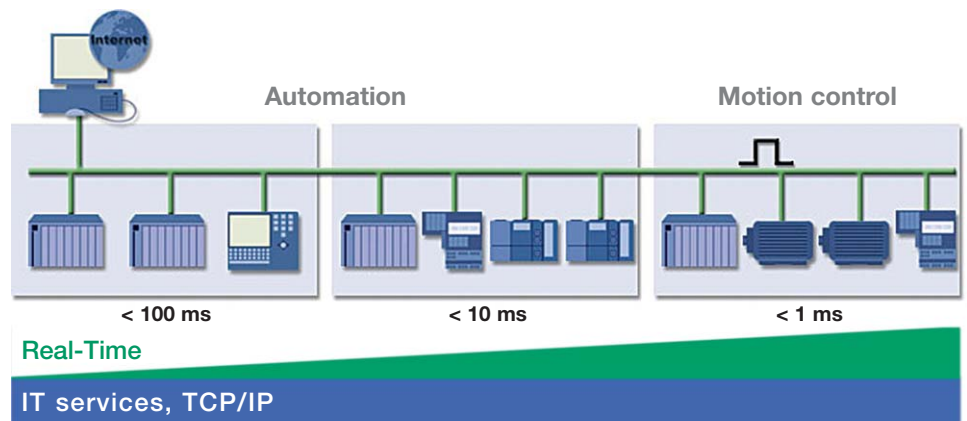
## Scalable communication

PROFINET communication supports three levels of performance:

- Engineering data and non-time-critical data are transferred via TCP/IP. This standard communication takes place between two intelligent field devices in distributed automation structures.
- For the transmission of time-critical process data, there is a Real-Time (RT) channel available.
- For clock-synchronized applications such as motion control, there is isochronous Real-Time communication (IRT), which, at a clock-pulse rate of less than 1 ms, supports a jitter accuracy rate of 1  $\mu$ s.

## IT compatibility of communication

PROFINET communication is compatible with IT communication. This means that various Real-Time-communication performance levels can run on the same cable and at the same time as IT communication.



# Investment protection

## Fieldbus integration

PROFINET enables existing fieldbus systems such as PROFIBUS, INTERBUS, DeviceNet, Fieldbus Foundation, and AS-Interface to be integrated without changes having to be made to existing devices. This means that the investments made by plant operators, machine and system builders, and device manufacturers, are all protected.

## Use of existing profiles

Profiles ensure the compatibility of devices of the same type supplied by different manufacturers. Established profiles such as those derived from PROFIBUS can also be used on PROFINET. The PROFIsafe profile is used for safety-oriented communication, for example, and PROFIdrive is used to solve drive tasks.

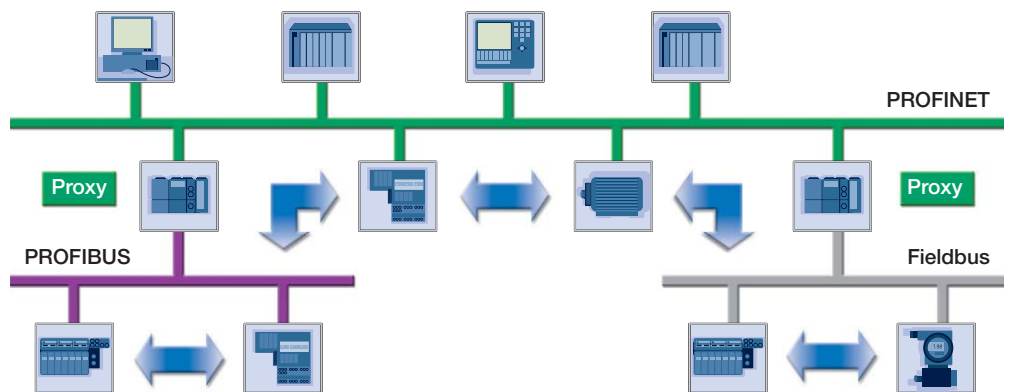
## Global support

Today, PI (PROFIBUS & PROFINET International) has 25 regional organizations on all continents and 1,400 members all over the world. This strong community of manufacturers, system integrators and OEMs provides users with a high level of investment security where their equipment is concerned.

The international standardization of PROFINET safeguards global acceptance.



**PROFINET's modular architecture makes expansion easy and ensures that it will also be possible to integrate future innovations.**



## Distributed automation

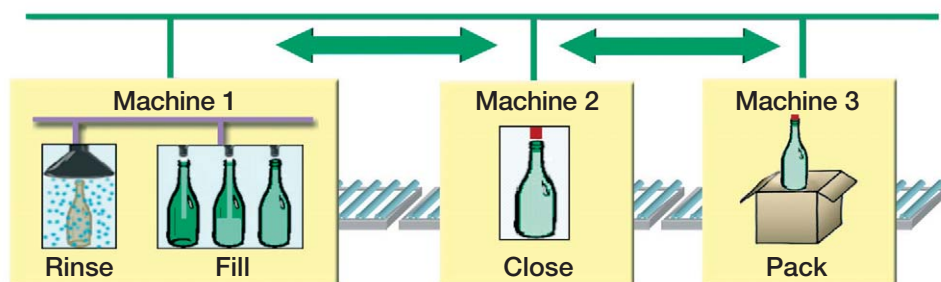


### Modular plant and machine concept

Engineering costs in modern industrial plants are increasing at a disproportionate rate. This rise can be explained by the increasing complexity of the individual machines, interlinking to create integrated production facilities and the networking of the various enterprise processes. Plant operators need these features in order to make their production processes more flexible and reduce their operating costs.

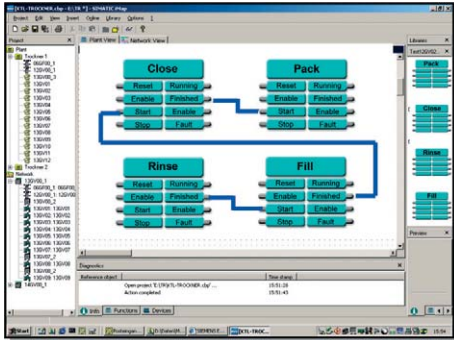
By means of modularization, PROFINET is able to offer an ideal solution to this problem. A plant is subdivided into reusable and standardized modules with specified interfaces.

The functionality of these modules is encapsulated in the form of standard PROFINET components. These can be connected in a manufacturer-independent configuration meeting individual requirements. This type of plant-wide engineering provides the technological basis for distributed automation.



## Configuration instead of programming

Machine-to-machine communication is configured in graphics-based format by interconnecting the inputs and outputs of PROFINET components. There is, therefore, no longer a need to program communication explicitly. The same graphics-based plant view also supports plant-wide diagnostics and provides information about preventive maintenance.



Because it uses the principles of modularization and standardization, PROFINET consistently enables devices to be used for more than one purpose, thereby significantly reducing engineering costs.

# Safety of personnel, equipment and the environment



## No separate installation

Behind the forward-thinking concept on which PROFIsafe is based, whereby standard and safety-oriented communication coexist on one and the same cable, lie a range of decisive advantages. As well as reducing wiring overheads, PROFIsafe also increases flexibility in respect of startup, expansion and retrofitting. Furthermore, standard and safety functions can easily be synchronized.

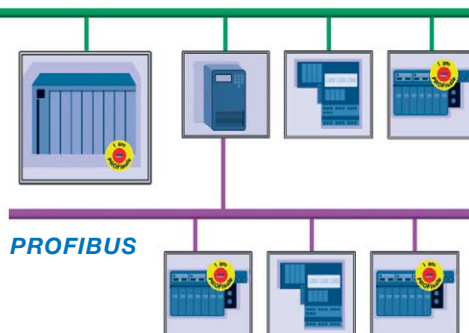
## Platform integration

PROFIsafe supports secure networked communication for safety-oriented devices (emergency-off switches, light grids, overfill safety systems, etc.) with safety-oriented controls. It enables these field devices to be used in safety-oriented automation tasks up to SIL3 (Safety Integrity Level). The PROFIsafe profile uses standard PROFINET mechanisms to implement platform-wide secure communication. PROFIsafe on PROFIBUS is seamlessly integrated.

## Optimizing production with PROFIsafe

PROFIsafe also offers numerous additional functions. For example, safety functions to EN 954-1, such as STO (Safe Torque Off) or SLS (Safely Limited Speed), can be activated via PROFIsafe. This reduces downtimes and makes it possible to carry out assembly operations while parts are in motion without exposing operators to mechanical risks.

PROFINET



PROFINET is the first open Industrial Ethernet standard with integrated safety. Safety-oriented applications with PROFINET can also be implemented wirelessly with industrial WLAN components.

# Protection against unauthorized access and sabotage

## PROFINET Security

The particular focus of security in automation technology is to ensure the availability, reliable operation and protection of industrial installations and production processes. The PROFINET security concept can handle the increased need for network security in Ethernet-based automation systems. This concept meets the requirements for access control, data encryption, authentication, and logging of security-relevant events.



## Authentication

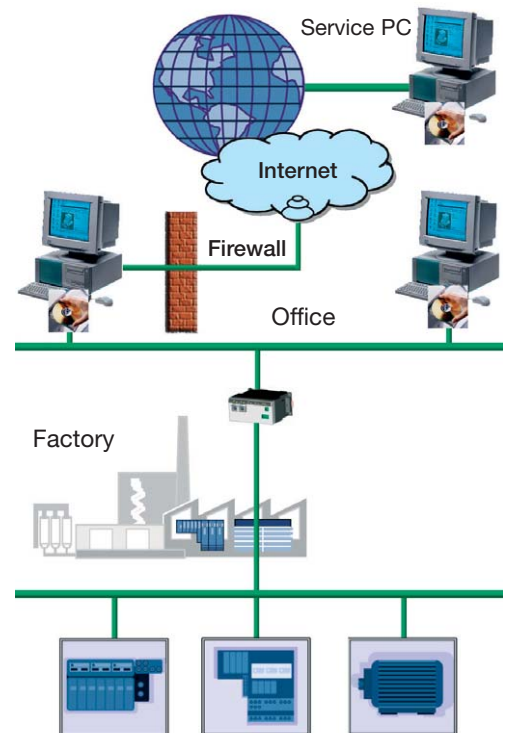
The core of the security concept is in the security-motivated segmentation of the automation network, which enables secure automation cells to be built. The network nodes within a cell are protected by special security network components (e.g., switches or security appliances) which control data traffic from and to the cell and check access privileges. Only authorized data traffic is permitted.

## Identification

Data traffic between secure cells or between clients and cell nodes can also be encrypted, thereby safeguarding it against data espionage and data manipulation. This is particularly relevant where communication via non-secure networks is concerned, as is the case with remote access via the Internet for maintenance intervention.

## Security standards

PROFINET security components use open and established IT security mechanisms, facilitating integration into the network structure in the office environment. Firewall mechanisms are used to control data traffic, and certificate-based VPN or SSL are used for the secure identification and encryption of data.



**P**OWERFUL  
**R**EAL-TIME  
**O**PEN  
**F**LEXIBLE  
**I**NTEGRATED  
**N**ET CONVERGENCE  
**E**NTERPRISEWIDE  
**T**RANSSPARENT



For more information, please visit:

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