

ELECTRIC ACTUATORS

with PROFINET interface



Top reliability and availability are prime requirements in process automation plants in terms of deployed communication technologies. Robust and versatile Industrial Ethernet Standards are the latest trends, in particular PROFINET.

AUMA actuators with PROFINET support the entire functional scope of AC 2 actuator controls, allowing easy and flexible integration into virtually any type of network.



FLEXIBLE AND VERSATILE

Modular functional properties paired with high reliability make PROFINET an attractive communication solution in process automation. As open and standardised Industrial Ethernet protocol, PROFINET enables establishing hybrid networks comprising various topologies and transmission systems. Existing infrastructure can be adopted; different field devices can be integrated using harmonised technologies. Furthermore, PROFINET's advantages include intelligent mechanisms allowing for particularly easy and comfortable commissioning and field device handling.

FAST AND SAFE

On the one hand, PROFINET offers real time ability, crucial in process automation, while having at the same time the benefit of a multitude of components and security technologies already proven in IT networks.

APPLICATIONS

Besides general automation deployments in the process industry, actuators with PROFINET are largely used in water plants, pump stations and wastewater treatment plants. Another option are venting systems in tunnels where PROFINET can often be used..

ELECTRIC ACTUATORS EQUIPPED WITH PROFINET INTERFACE



Today, the classical Ethernet is the leading standard for wired data networks as widely used in many companies for networking PCs, printers, etc. The designation "Ethernet" describes both, hardware (connectors, cable, switches, etc.) and software for data transmission (protocols, modes of transmission, package formats).

"Industrial Ethernet" describes the enhancements allowing the use of Ethernet even for sophisticated applications in industrial automation. This concerns mainly the hard real-time capability but also development of robust network components for larger temperature ranges and harsh environmental conditions.

Compared to conventionally used fieldbus systems, Industrial Ethernet offers a variety of technical advantages:

- > Simultaneous transmission of real-time and IT data via a common medium
- > Large address range with a nearly unlimited number of participants in one network
- > Large network expansion by cascading via switches
- > Quick transmission even of extremely large data volumes
- > Equal bus access for all network participants
- > Combination of various transmission media like copper cables, fibre optic cables or radio (IWLAN).

This facilitates both, horizontal communication on field level, between the field devices and vertical integration between the field devices and the DCS.

Further to the simple exchange of process and diagnostic data, Industrial Ethernet field devices are capable of transferring additional information such as operation instructions, or other device-specific collateral documents.

Crucial factors for the deployment of Industrial Ethernet in process automation are above all high reliability, robust communication, large distances, device replacement and device integration during active service as well as long and reliable service life.

On the basis of these requirements, process automation plants mainly use the protocols which are already widely available as fieldbus protocols and for which integration into the DCS is easy and straightforward. Besides PROFINET, these include Modbus TCP/IP, Ethernet/IP and HART-IP.



EFFICIENT COMMUNICATION

AUMA actuators with PROFINET interface integrate smoothly into network infrastructures and can be identified and addressed from any place by means of their device name or their IP address – similar to the PCs within a local network.

All operation commands and feedback signals supported by AC .2 actuator controls are cyclically available in real time. Acyclic reading of diagnostic information, alarms, data for device identification as well as further parameters is available if required.

EASY COMMISSIONING

Just few steps are required to integrate an AUMA actuator into a PROFINET environment. To this end, a standardised device description (GSDML file) is linked to the DCS. The system tools of the DCS identify and assign a name to the actuator. This name allows device identification within the PROFINET system. The IP address is automatically assigned.

SUPPORTIVE FUNCTIONS

PROFINET offers a variety of functions supporting commissioning and simplifying detection and correction of problems during operation.

For example, conflicting addresses are automatically detected, just like the network topology. Thanks to the neighbourhood information, field devices can be exchanged without requiring additional tools.

An integrated AUMA web server allows swift and easy performance of connection tests, status requests and fault diagnostics by means of a web browser.

INTEGRAL REDUNDANCY

The media redundancy available for PROFINET warrants for high availability within the plant. The AUMA actuator is equipped with two physically separate communication channels to the host controller. If the first channel fails, e.g. on the basis of line interruption, the second communication channel is automatically used.

FUNCTIONS

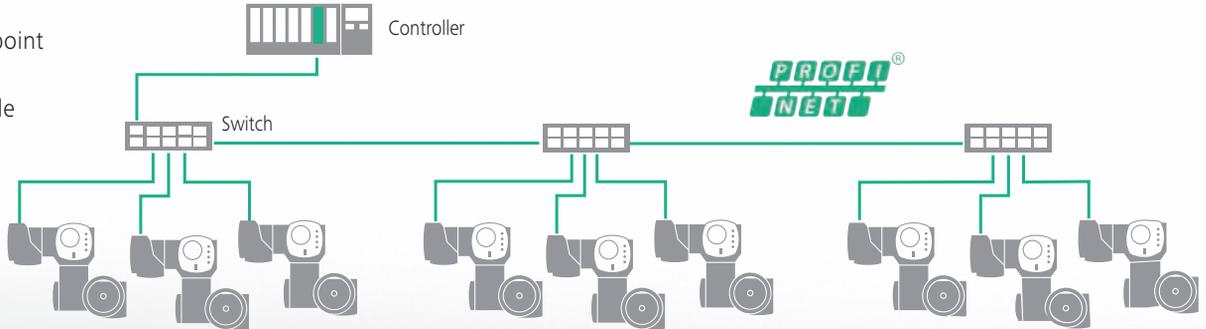
AUMA ACTUATORS WITH PROFINET

- > Available for SA multi-turn actuators and SQ part-turn actuators with AC 01.2 actuator controls.
- > Fulfils PROFINET specification V 2.3
- > Connection via field-assembled RJ-45 connector
- > Baud rate 100 Mbit/s
- > Support of CC-B (Conformance Class B)
- > Integrated switch function for line and ring topologies for use in Class A, B and C PROFINET systems
- > Redundant transmission channel via MRP (Media Redundancy Protocol) for ring topology
- > Integrated web server for simple diagnostics via web browser
- > Standardised device description via GSDML file (Generic Station Description based on XML)
- > Classification of diagnostic actuator signals according to NAMUR NE 107
- > Simple cabling and autonomous establishment of communication thanks to Auto Polarity Exchange, Auto Negotiation and Auto Crossover
- > Device identification via I&M 0 (Identification and Maintenance)
- > Automatic address assignment via ARP (Address Resolution Protocol) and DCP (Discovery and Configuration Protocol)
- > Topology detection via LLDP (Link Layer Discovery Protocol)
- > Detection of address conflicts via ACD (Address Conflict Detection)
- > Simple network diagnostic via SNMP (Simple Network Management Protocol)
- > Comprehensive alarm functions: Status Alarm, Update Alarm, Port Data Change Notification Alarm, Sync Data Change Notification Alarm

NETWORK STRUCTURE

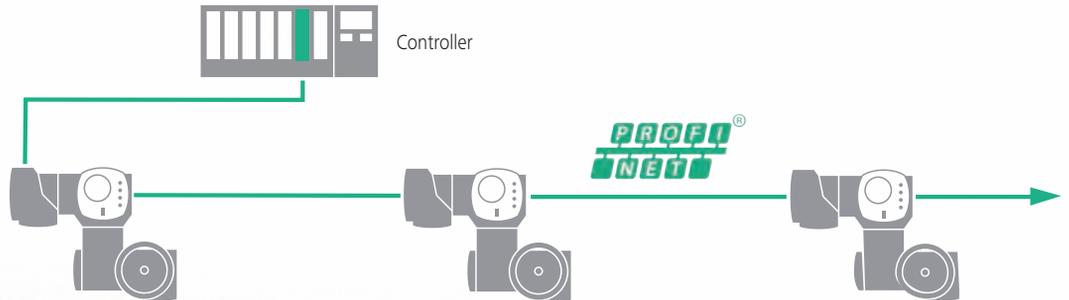
Network type 1: Star topology

- > Central, external switches to connect field devices (radial point-to-point connection)
- > Max. 100 m cable length between participants



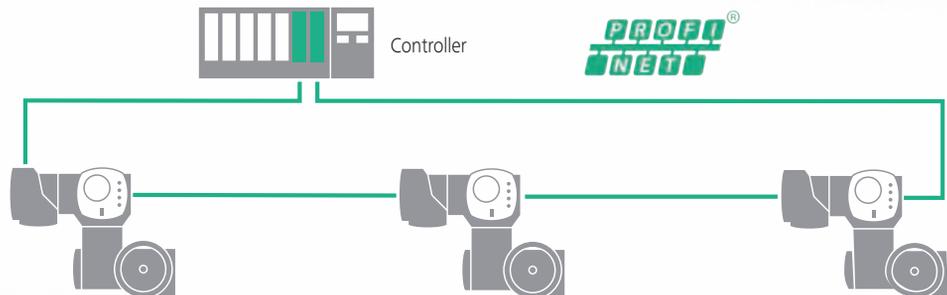
Network type 2: Line topology

- > Connection of actuators via integrated switches (to increase overall availability, supply via external 24 V DC is recommended)
- > Max. 100 m cable length between participants



Network type 3: Ring topology

- > Actuator connection via integrated switches
- > Max. 100 m cable length between participants
- > Redundancy via integral MRP (Media Redundancy Protocol)



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