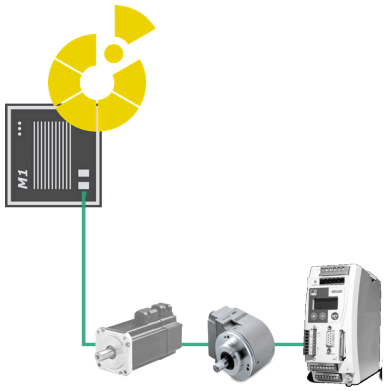
PROFINET® IO (RT)

Process Field Network (Real Time)

The control system can be run as a PROFINET® controller (master) and/or as a PROFINET® device (slave).

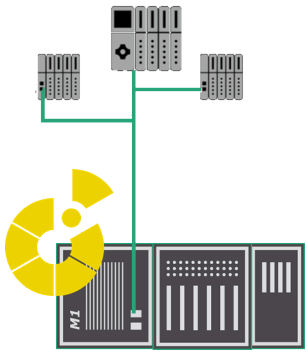
Operation as **PROFINET® Controller** enables the implementation of several separate PROFINET® networks in one controller. Configuration, commissioning and test of the networks are carried out in the SolutionCenter. This does not require any programming. Information on connection and error status are displayed together with the channel values as well as on status variables. The configuration of existing installations can be opened, tested and edited in the SolutionCenter without the need for the configuration project with the GSDML files to be on the laptop.

When the controller is started and also during operation, the devices are detected and initialized according to their position in the network. Spare parts can thus be replaced during operation with the screwdriver, without any configuration tools required. The I/O data of the devices are shown in the process image of the controller. Acyclic access via the application programs to device data (such as Record read, Record write, reading of diagnostic information, status requests and commands) is carried out via an Application Programming Interface that is used with PLC function blocks and C/C++ functions.



The operation of the controller as **PROFINET® Device** enables the parallel connection with several controllers (shared device). The channel diagnostics of the I/O modules (cable break, short-circuit etc.) can be mapped to PROFINET® diagnostic alarms, so that these errors can be detected on the controller.

If an I/O module of the device is not accepted by an external controller, the outputs of this I/O module are available to the local controller programs. Selected variables of these controller programs can be exchanged cyclically with a controller exactly like I/O data. This enables flexible combinations to be implemented with autonomous, intelligent and networked controllers.



Features

- Operating modes controller (master), device (slave) or combined operation
- Both operation modes certified by the PNO
- Can be used on all M200 controller CPUs without additional hardware
- Configuration via SolutionCenter or GSDML file
- Automatic device configuration with topology detection for quick setup and easy replacement of spare parts
- Bus cycle time, min. 1 ms
- Data rate 10/100/1000 Mbit
- Parallel Ethernet data traffic in the same network possible

Controller

- Automatic initialization of the stations on startup and when restoring lost connections
- Neighborhood detection for easy device replacement
- Representation of the device data in the process image for read and write access
- Representation of errors and diagnostics data as channel status
- Function interface for acyclic accesses

Device

- Exchange of local I/O module data with a PROFINET® controller
- I-Device: Exchange of variable values of the controller programs with a PROFINET® Controller for networking intelligent devices
- Shared device: Parallel access of multiple masters to modules of the slave
- Supports additional legacy initialization for operation on PROFINET® Controllers according to older GSDML standards
- Device configuration and issuing of communication settings possible via the PROFINET® Controller

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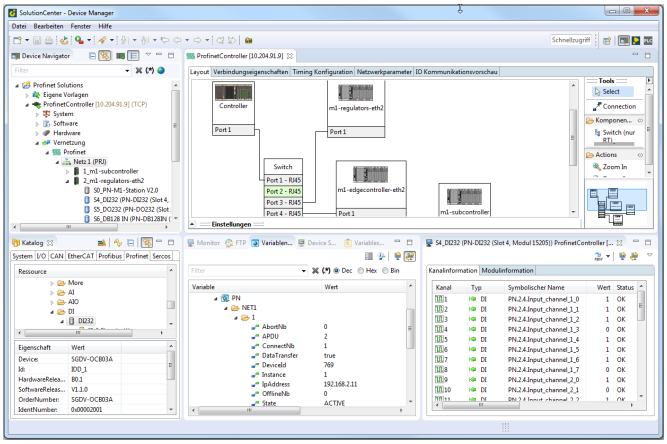
SolutionCenter



PROFINET® configurator

The graphical configurator for PROFINET® networks is part of the Device Manager in the SolutionCenter. It permits the display of the complete network topology, including all components such as switches and cables.

Network parameters such as timeout limits, optional stations, assignment of process values to communication relations and further settings are available in parameter tables. The controller and device configurations are automatically transferred to all participtating M200 systems. The configuration project is also stored in compressed form on the controller, so that it can be reopened, checked and, if necessary, changed on another PC without manual transfer of project files. This grants that the maintenance engineer always works on the current network configuration.

PROFINET

Conformity with the PROFINET® standard was confirmed by the COMDEC test laboratory for the controller, for the device and for the configurator in the SolutionCenter. The certificates can be obtained from the website of the PNO as well as from the Bachmann website.

PROFINET®

General product features	
GSDML standard	V2.35
Conformance class	B (incl. SNMP)
Realtime class	3 (I/O RT 1 ms)
Netload class	III
Device certificate	Yes, certificate number Z12864
Controller certificate	Yes, certificate number Z12733
Hardware requirements	All available Ethernet ports of the controller CPU as well as Ethernet ports on EM213 modules can be used; no special hardware required
Joint operation of device and controller possible on the same Ethernet port	Yes
Simultaneous operation of controller and device on one controller	Yes
Ethernet ports still available for other protocols	Yes
Supported bit rates	10 Mbit/s to 1 Gbit/s; depending on CPU, network and communication partner
Controller	
Access to cyclic I/O data of the devices	Direct mapping in the local process image
Access to acyclic device data	Function interface, can be operated via PLC function blocks or C/C++ function
Access to diagnostic data of the devices	Automatic mapping of PROFINET® diagnostics on the local channel status (provider status, consumer status, problem, disconnected)
Detection of connection failure	Via state variables and local channel status
Topology detection	Yes
Automatic device configuration	Yes
Max. number of networks per M200 controller	4 A separate Ethernet port must be used for each instance of the controller
Max. number of devices per controller	64
Device	
Number of devices per M200 controller	1
Shared device	Yes Connection with up to 3 controllers possible. All connections must run via the same Ethernet port.
Legacy initialization for operation on older Controllers	Yes
Diagnostics	Routing of local I/O errors (cable break etc.) to the controller as diagnostics alarm
Configurator in the SolutionCenter	
Controller configuration for the M1 PROFINET® Controller	Complete graphical network configurations including topology information
Management of device information	Catalog with device description files in GSDML format
Placing of modules, input of network and device parameters	Convenient editing via tables with input verification
Parameter setting of M1 PROFINET® devices	Completely by the controller on startup via topology detection or static preconfiguration of parameters in the SolutionCenter
Editing of the configuration on the machine	The project can be opened directly from the controller, no suitable catalog and no project files are required on the laptop
Configuration of M1 PROFINET® devices for the operation on an M1 PROFINET® Controller	Complete configuration of all devices in the same configuration project

Configurator in the SolutionCenter	
Configuration of M1 PROFINET® device for operation on other PROFINET® Controllers	Via GSDML file in the engineering tool of the particular controller
Manual search and parameter setting of devices	The PROFINET® Monitor enables the search for devices in the network and the assignment and resetting of communication parameters