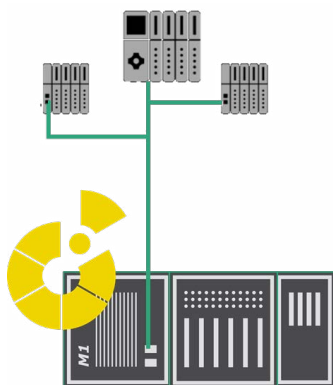
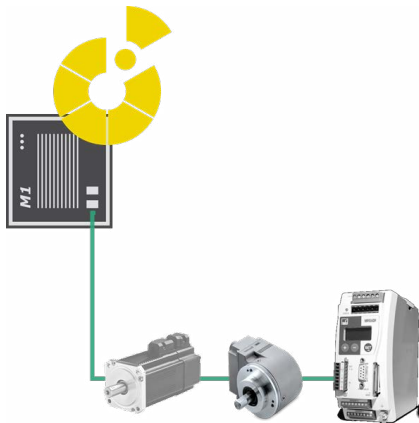




**PROFI
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PROFINET® IO (RT)

The controller 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 network 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 IO data of the devices are shown in the process image of the controller. Acyclical 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 a 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 IO 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 IO module of the device is not accepted by an external controller, the outputs of this IO module are available to the local controller programs. Selected variables of these controller programs can be exchanged cyclically with a controller exactly like IO data. This enables flexible combinations to be implemented with autonomous, intelligent and networked controllers.

Features

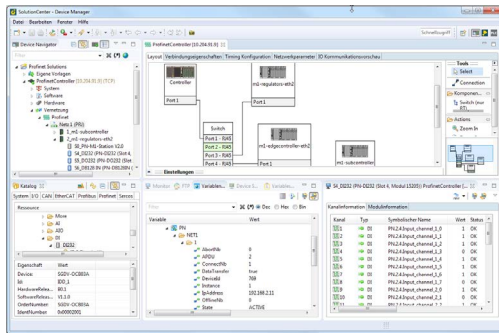
- Operating modes Controller (master), Device (slave) or combined operation
- Both operating modes certified by the PNO
- Can be used on all M1 controller CPUs without additional hardware
- Configuration via SolutionCenter or GSDML file
- Automatic device configuration with topology detection for quick setup and easy replacement of spare parts
- Minimum cycle time 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 acyclical accesses

Device

- Exchange of local IO module data with a PROFINET controller
- I-Device: Exchange of variable values of the user 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 naming and issuing of communication settings possible via the PROFINET controller



PROFINET®-Configurator

The graphical configurator for PROFINET® networks is part of the Device Manager in the SolutionCenter. It enables the design of the network topology, including all 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 distributed to all participating M1 systems. Additionally, the configuration project is stored on the controllers, so the configuration can be directly opened for verification or change. This grants that the maintenance engineer always works on the current network configuration.

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 (IO-RT 1 ms)
Netload class	III
Device certificate	Yes, certificate number Z12864
Controller controller	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 cyclical IO data of the devices	Direct mapping in the local process image
Access to acyclical 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 status variables and local channel status
Topology detection	Yes
Automatic device naming	Yes
Max. number of networks per M1 controller	4 A separate port must be used for each instance of the controller.
Max. number of devices per controller	64
Device	
Number of devices per M1 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 IO errors (cable break etc.) to the controller as diagnostics alarm

PROFINET®	
Configurator in the SolutionCenter	
Controller configuration for the M1 PROFINET controller	Fully 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
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