MANUAL

PNQ22-FBP.0 Profinet IO interface

Universal Motor Controller UMC100.3

Important notice

Target group
This description is intended for use by specialists trained in electrical installation and control and automation engineering, who are familiar with the applicable national standards.

Safety requirements
The responsible staff must ensure that the application or use of the products described satisfy all the requirements for safety, including all the relevant laws, regulations, guidelines and standards.

Using this handbook

Symbols
This technical document contains symbols to point the reader to important information, potential risks and precautionary information. The following symbols are used:

	Sign to indicate a potentially dangerous situation that can cause damage to the connected devices or the environment.
	Sign to indicate important information and conditions.
	Sign that indicates a potentially dangerous situation that can cause human injuries.

Terms and abbreviations

MRP	Media Redundancy Protocol
MRC	Media Redundancy Client
MRM	Media Redundancy Manager
TCP/IP	Transmission Control Protocol / Internet Protocol
UDP	User Datagram Protocol
Client / Server	The Modbus TCP messaging service provides a Client/Server communication between devices connected on an Ethernet TCP/IP network. The device initiating the communication (e.g. a PLC) is called the client. The device answering the request is called the server (the PNQ22-FBP.0 in this case).
Master / Slave	Master/Slave is a model of communication where one device, such as a PLC, has control over one or more other devices (here PNQ22-FBP.0 and UMC). In the Modbus TCP context the master is the client and the slave is the server.
MAC	Medium Access Control
MAC Address	Unique address of every Ethernet device. The MAC address of the PNQ22-FBP.0 is printed on the nameplate.
PLC	Programmable Logic Controller
SoE	Sequence of Events

Related documents

Technical Documentation	Document No.
UMC100.3 Technical manual en	2CDC135032D0204

Document history

Document No.	Changes
2CDC192015D0201 Rev. A	
2CDC192015D0201 Rev. B	Page 16, new parameter "Comm. Keep Alive Time [ms]

Table of contents

Cyber security

Disclaimer
This product is designed to be connected and to communicate information and data via a network interface.

It is your sole responsibility to provide and continuously ensure a secure connection between the product and your network or any other network (as the case may be) and to establish and maintain appropriate measures (such as but not limited to the installation of firewalls, application of authentication measures, encryption of data, installation of antivirus programs, etc.) to protect the product, the network, its system and interfaces against any kind of security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.

ABB Ltd and its affiliates are not liable for damages and/or losses related to such security breaches, unauthorized access, interference, intrusion, leakage and/or theft of data or information.

Although ABB provides functionality testing on the products and updates that we release, you should institute your own testing program for any product updates or other major system updates (to include but not limited to code changes, configuration file changes, third party software updates or patches, hardware change out, etc.) to ensure that the security measures that you have implemented have not been compromised and system functionality in your environment is as expected.

For more information/contact regarding ABB cyber security see:

http://www.abb.com/cybersecurity

Deployment guideline
This device shall be connected only to a **private/restricted network and not to any public networks.**
When connecting PNQ22-FBP.0 to public networks, security measures must be taken to reduce cyber security risks. Such measures are not provided by the EIU32.0 device, i.e. "external equipment" is needed.
This private/restricted network can be connected for access via the Internet or other networks when using “**external equipment**” which can be separate devices or devices that combine **firewall, router and secure VPN functionality**. The cyber security standard of these external equipment depends on the customer and on the targeted security level.

For a proper functionality the required IP ports must not be blocked by the firewall.
This ports are listed in the Technical Data section.

This “Cyber security deployment” guideline cannot suggest concrete products for “external equipment” to make a secure system setup. This must be decided along the specific project, requirements and existing infrastructure.

Recommendations
When commissioning a network system it is important to address the cyber security problems by making a cyber security assessment of the system. Examples of methods to reduce security vulnerabilities include:

- Network connection
  Limit the connections with routers/firewall and similar products
- Network access control
  Add some control/limitations on the network using routers/firewall and similar products
- Network monitor
  If required, add products which can monitor the network access and traffic
- Network separation
  For cyber security and to protect the factory system, it is good to separate the remote connection gateway as noted in Figure 2, Network separation
- It is highly recommended to contact cyber security personnel/consultants to make an effective cyber security assessment of the system.

Overview

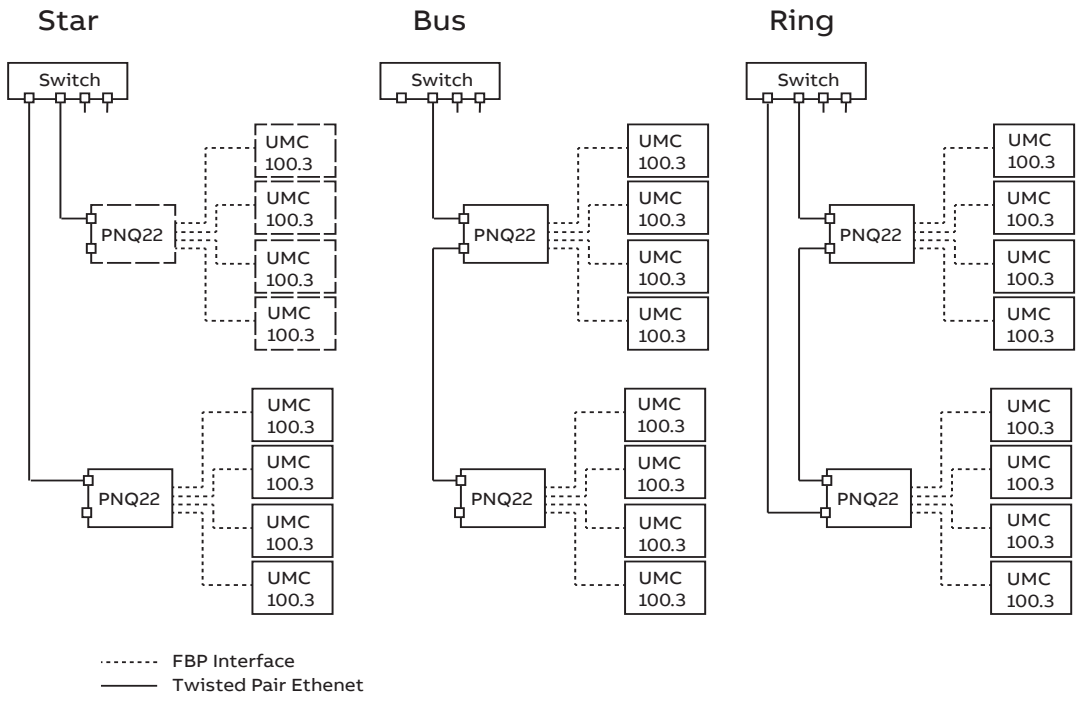
The PNQ22-FBP.0 Ethernet adapter module supports the PROFINET IO network protocol. This chapter contains a short description of PROFINET IO and the PNQ22-FBP.0 Ethernet adapter module.

Highlighted features

- The PNQ22-FBP.0 Ethernet adapter module provides Ethernet connectivity for the motor controller UMC100.3 and FieldBusPlug (FBP) devices such as UMC100-FBP.0 or PST.
- Up to four devices can be connected to one PNQ22-FBP.0. This allows cost-efficient connection of FBP devices to Ethernet.
- Through the PNQ22-FBP.0 Ethernet Adapter module it is possible to:
  - give control commands to the device (Start, Stop, Auto, etc.). The commands' meaning depends on the connected device
  - read status information and actual values from the device
  - change parameter values
  - read maintenance counters
  - reset a trip
- Configuration from within the control system by using start-up parameters (similar to blockparameters of PROFIBUS)
- A built-in two-port switch allows the flexible usage in bus, star or ring network topologies
- The Media Redundancy Protocol (MRP) is implemented (client). MRP is standardized in IEC/EN 62439-2 and offers cable redundancy in case of a single failure
- Location supervision for the detection of interchanged drawers in withdrawable systems
- Time stamped diagnosis: ABB proprietary Sequence of Event (SoE) support (800xA)

Ethernet

Ethernet standards support a variety of physical media (coaxial cable, twisted pair, fiber optics) and topologies (bus, ring and star). The PNQ22-FBP.0 Ethernet Adapter supports twisted pair as the physical media in a bus, ring and star topology. Possible topologies are shown in Figure 1. The PNQ22-FBP.0 is compatible with Ethernet standards IEEE 802.3 and IEEE 802.3u.



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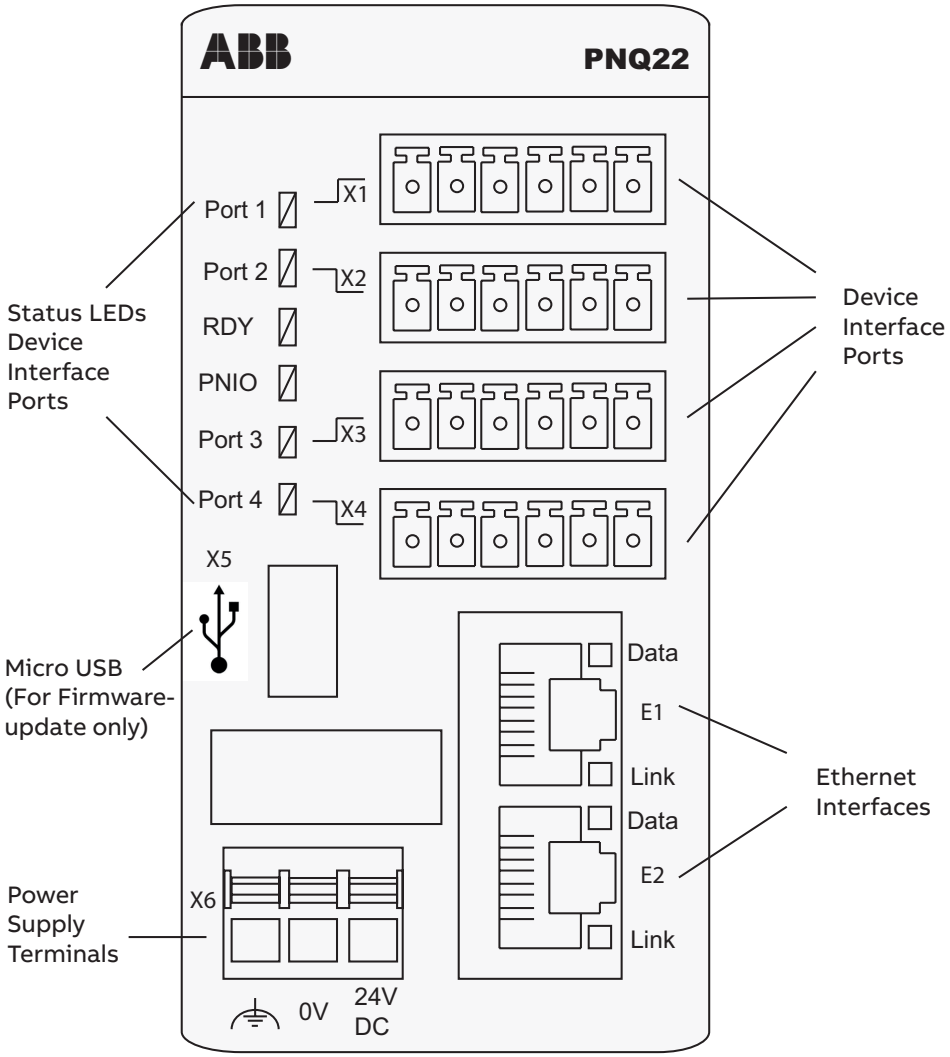
01 Different topologies can be realized with the PNQ22-FBP.0 Ethernet Adapter.
For the ring structure a special switch must be used.
See chapter Communication for more information.

PROFINET IO

PROFINET IO is a fieldbus protocol that enables communication between programmable controllers and distributed field devices in Ethernet network. The protocol classifies devices into IO controllers, IO supervisors and IO devices, with each having a specific collection of services.
PROFINET IO uses three different communication channels to exchange data. The standard UDP/IP and TCP/IP channel is used for parameterization and configuration of devices and for acyclic operations. The Real Time (RT) channel is used for cyclic data transfer and alarms. The third, Isochronous Real Time (IRT) channel, is used applications such as motion control (not implemented in PNQ22-FBP.0).
PROFINET IO devices are structured in slots and sub-slots, which can correspondingly contain modules and sub-modules. Devices can have almost any number of slots and sub-slots and they can be virtual or real. Device-specific data is represented in slot 0; module and sub-module specific data in subsequent slots and subslots. One of the benefits of PROFINET IO is the diagnostics and alarm mechanism. Every module and sub-module provides alarm data to the IO controller using the real-time channel. Diagnostic data including process alarms can be read non-cyclically from the device by using record data.

PNQ22-FBP.0

Connectors X1 ... X4 are used to connect up to four FBP devices to the PNQ22-FBP.0. Ready-made cables are available for the connection in withdrawable and non-withdrawable systems. The order codes are available in the chapter, Ordering Data. On the left side of the port connectors LEDs show the current communication status. See chapter, Diagnosis / Behavior in Case of an Error for details. Two RJ45 sockets E1 and E2 offer Ethernet connectivity. The communication status of each interface is shown by two LEDs. The PNQ22-FBP.0 must be supplied with 24VDC via X6.



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02 Top view of the PNQ22-FBP.0. Four devices can be connected to the PNQ22-FBP.0 via the ports X1 to X4.
The standard Micro USB connector is only required for firmware updates.
The Ethernet interfaces E1, E2 allow the flexible integration into different network structures.

Supported devices

The following devices can be connected to the PNQ22-FBP.0.

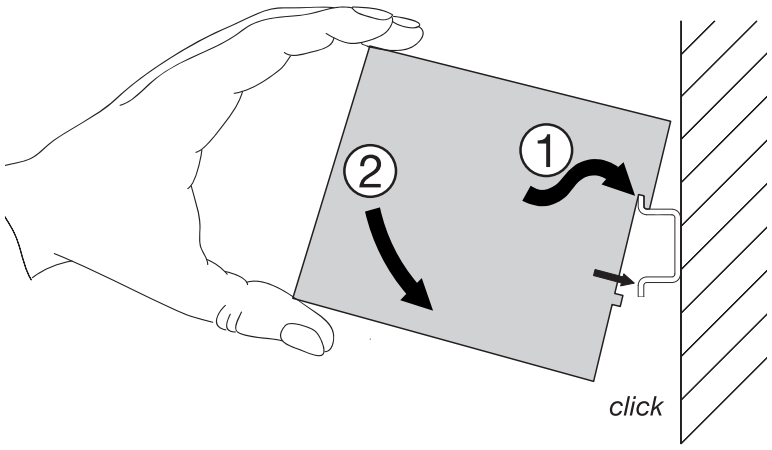
- UMC100 .3
- UMC100-FBP.0 (all revisions)
- Other FBP devices as listed in the GSDML file

Installation

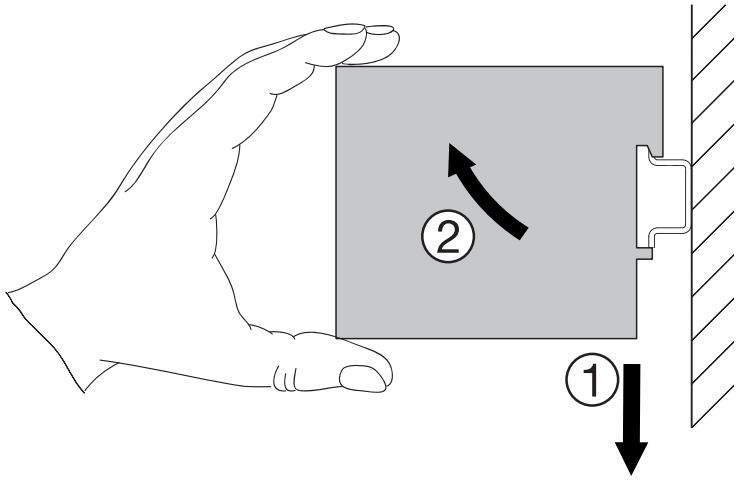
Mounting and dismounting

The PNQ22-FBP.0 can be mounted and dismounted onto a 35 mm standard mounting rail without tools

Mounting



Dismounting



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03 Mounting and dismounting the PNQ22-FBP.0 on a 35 mm standard mounting rail.

Electrical installation

General
Arrange the communication cables as far away from the motor cables as possible. Avoid parallel runs. Use bushings at cable entries.

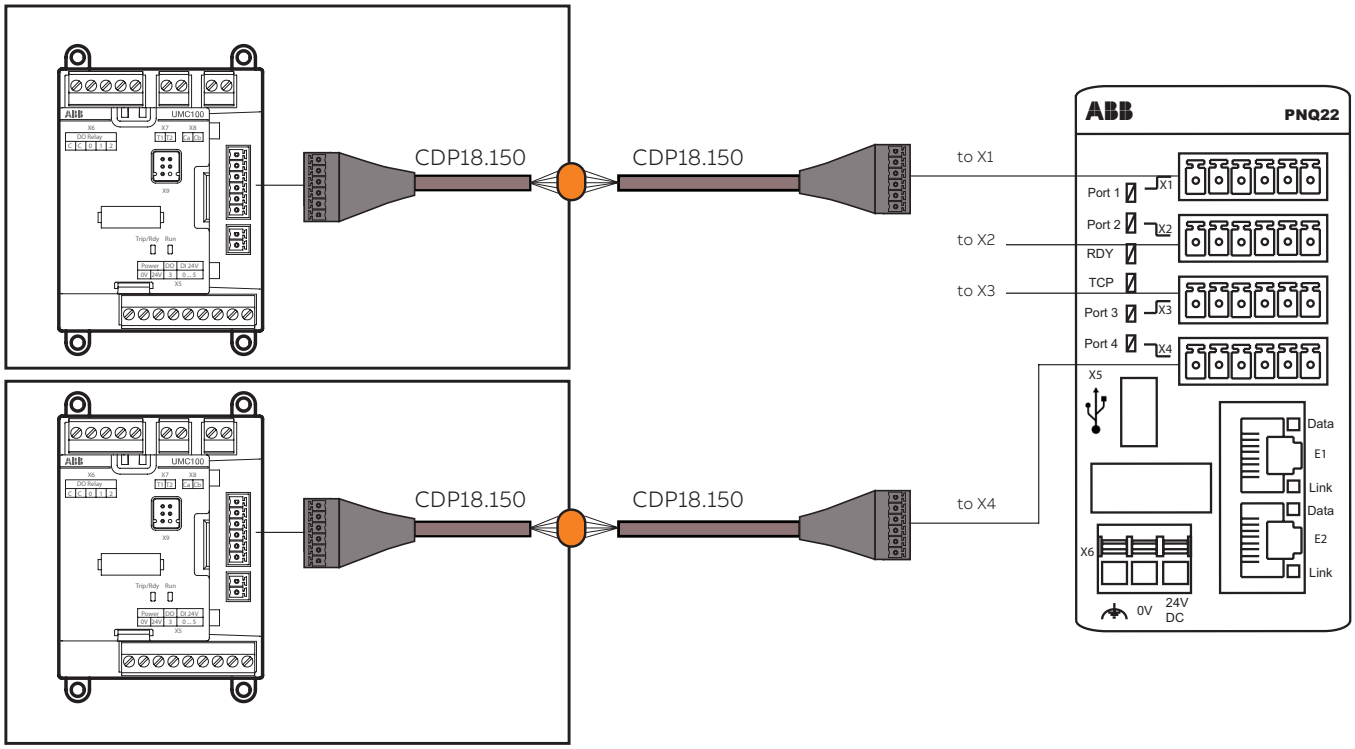
Ethernet connection
The network cable is connected to the RJ45 connectors on the PNQ22-FBP.0 module. Standard CAT5 UTP, FTP or STP cables can be used. The shield of the RJ45 cable is connected to the shield of connector X6.

Power supply connection
The PNQ22-FBP.0 has to be supplied with 24 V DC on the terminals X6. Using the shield connection is optional.

Device connection

The UMC100.3 can be connected point-to-point using the ready-made cable CDP23.xxx. This option is recommended in non withdrawable installations (e.g. using a mounting plate for the installation). In case the UMC100.3 is mounted within a withdrawable unit (drawer) all the necessary cables and auxiliaries are available and are shown in detail in the figure below.

The distance between the PNQ22-FBP.0 and the UMC100.3 shall not exceed 3 metres, and the communication cables should not run in parallel to the motor cables.



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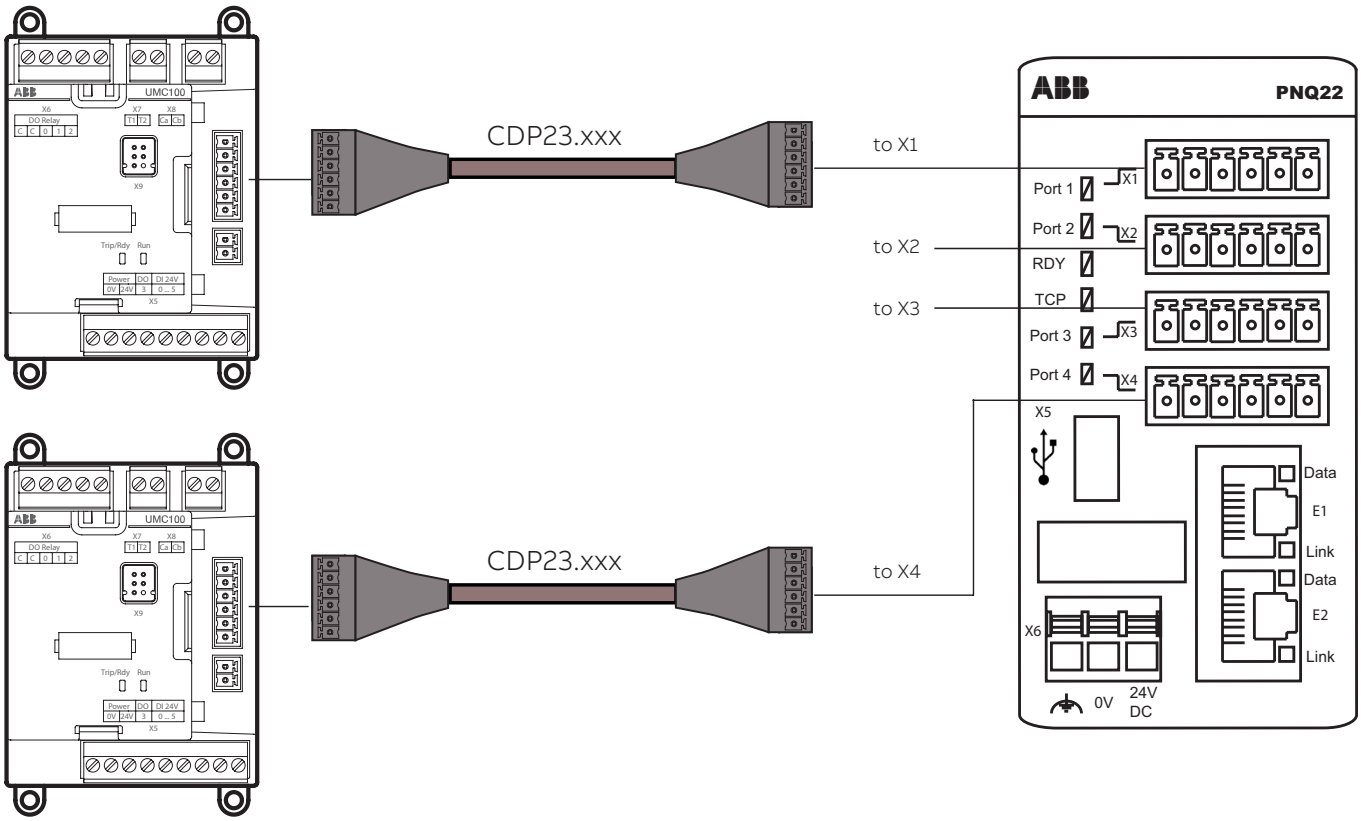
04 Solution for Motor Control Centers (MCCs) in drawout technology.
Connecting the PNQ22-FBP.0 ports 1 to 4 - connectors X1 to X4 - to the UMC100.3 mounted inside a drawer.



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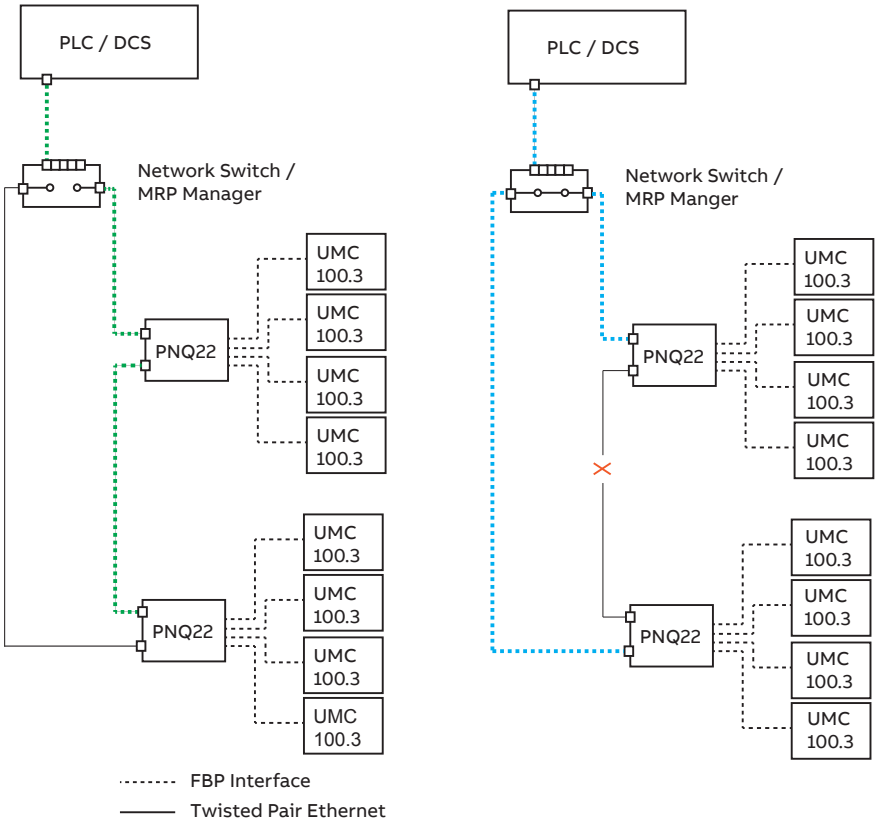
05 Connecting the PNQ22-FBP.0 ports 1 to 4 - connectors X1 to X4 - to the UMC100.3 with cable CDP23.xxx

Ethernet communication

Star topology
In star topology only one RJ45 cable must be connected between the PNQ22-FBP.0 and a switch. An unmanaged standard switch can be used in this operation mode.

Bus topology
In bus topology the internal two-port-switch of the PNQ22-FBP.0 is used to connect PNQ22-FBP.0 to PNQ22-FBP.0. Only the first PNQ22-FBP.0 in the chain needs to be connected to a switch. The second Ethernet port of the last PNQ22-FBP.0 can be left unconnected. An unmanaged standard switch can be used in this operation mode.

Ring topology with network redundancy
Ring topology offers cable redundancy on the Ethernet side. The topology is similar to the bus topology, but the last PNQ22-FBP.0 in the chain must be connected to the switch again to close the ring. A managed switch supporting MRP and acting as an MRP manager must be used in this case. The redundancy protocol implemented in the PNQ22-FBP.0 is according to EN/IEC 62439-2.
The MRP standard defines two principal device roles in an MRP network. The MRP manager – typically a managed network switch – and MRP clients – typically automation devices like the PNQ22-FBP.0.
The MRP master sends out test telegrams cyclically to check the health status of the network. If everything is ok it blocks telegrams on one side of its internal switch to avoid loops (below, left). If somewhere in the network a fault is detected, the MRP master reorganizes the network and closes its internal switch. Thus, all network nodes are still accessible (below, right).



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06 Figure shows how a single network failure is corrected in a MRP network. Left: In an intact network, the MRP manager has opened its internal switch, so all nodes can be reached using the green dotted route. Right: The MRP master has detected a network problem and has closed its internal switch to maintain connectivity to all network nodes. The blue dotted path shows how all network nodes are now reached.

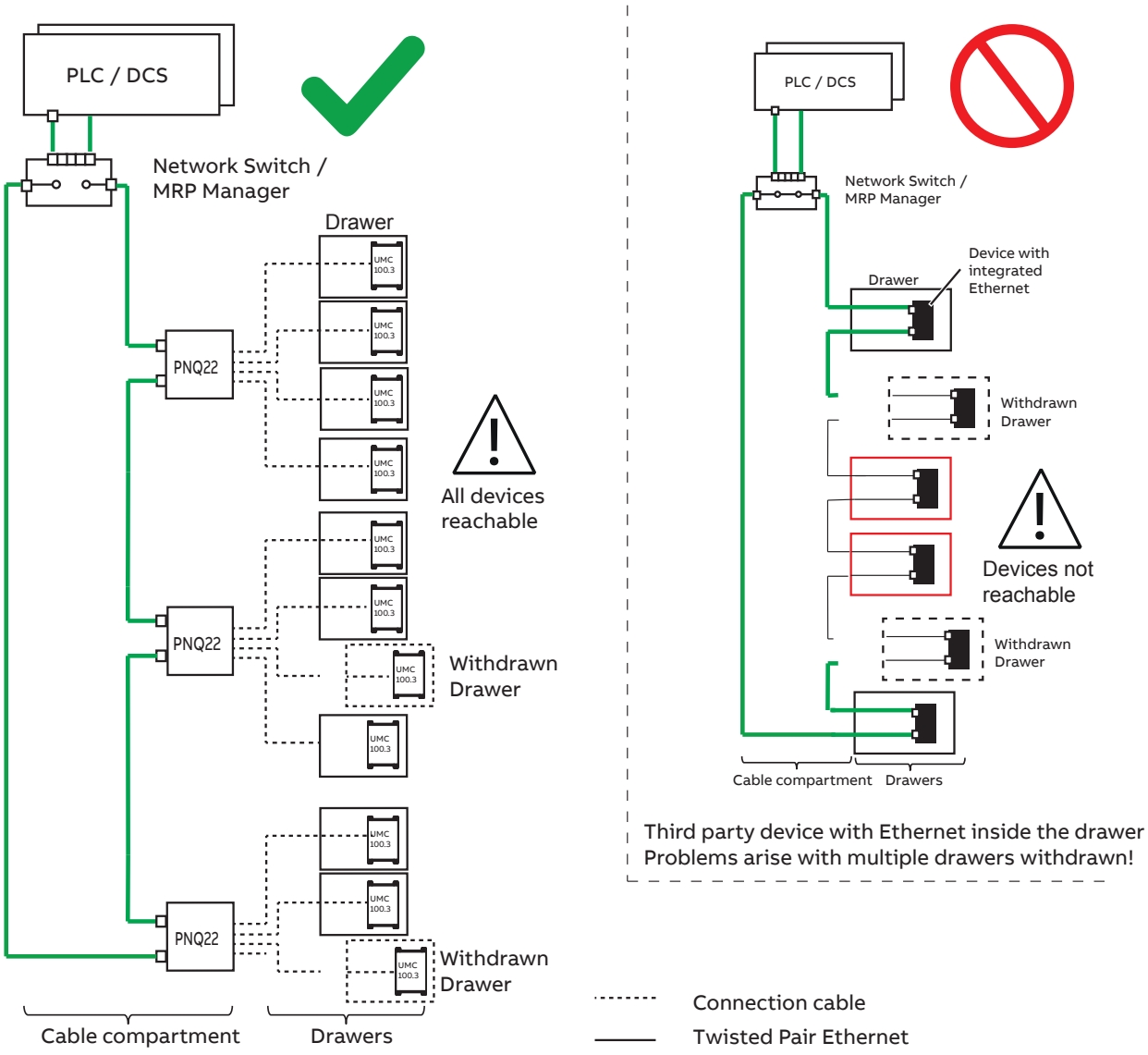
Ring topology with network redundancy in drawout systems

Drawout systems are used where highest availability and shortest downtimes should be achieved. In such systems all the devices required for a single motor feeder are installed into a drawer to ensure fast and easy exchange in the event of a failure. Here the PNQ22-FBP.0 offers the following benefits:

- No need to bring high-speed Ethernet into the withdrawable unit
- Stable communication even if two or more drawers are withdrawn

The figure below (right) shows a situation where devices have integrated Ethernet and two drawers are withdrawn. Devices between these two drawers cannot be reached anymore. Also the MRP redundancy function cannot solve this situation. The solution with PNQ22-FBP.0 is shown on the left. The PNQ22-FBP.0 is not mounted inside the drawer but is installed in the cable compartment where the switch and other central equipment are installed. The Ethernet cable is not connected to the UMC mounted inside the drawer. Instead, the robust and well known FBP interface goes to the UMC in the drawer. As a result, no special measures are required in the case that one or more drawers are withdrawn.

A removed drawer cannot disturb the Ethernet communication in any way.



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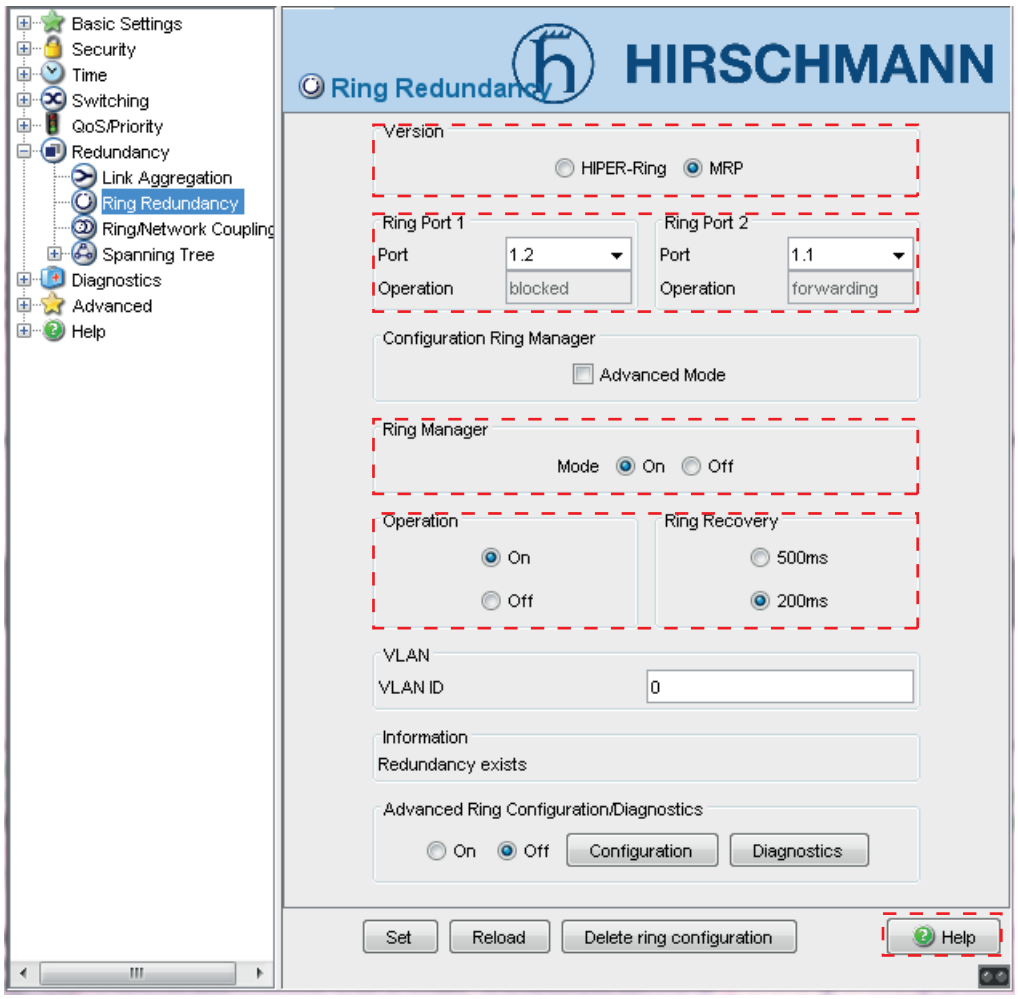
07 The left side shows the benefits of not having Ethernet connected inside a drawer.

Switch configuration for ring topology

Managed switches from various vendors offer the possibility to configure ring topologies with MRP redundancy. In the following example, a network switch from Belden/Hirschmann is used. The screenshots are taken from the RS20 configuration tool.

- Follow the setup instructions of the switch manual
- Open the "Redundancy" page and select the marked options shown in the figure below. To get help press the Help button.



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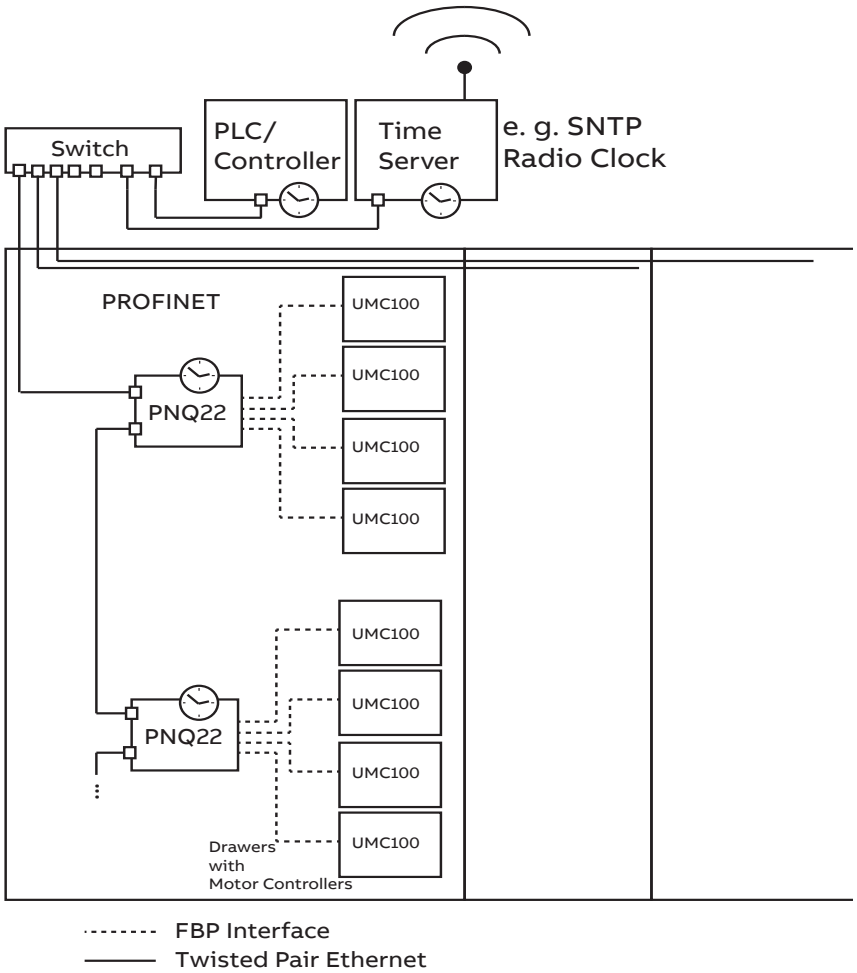
08 The page 'Ring Redundancy' enables the MRP redundancy protocol and defines the ports that are the start and end of the ring.

Time-Stamped diagnosis events

The Simple Network Time Protocol (SNTP) specified in Internet standard RFC-1305 is widely used to synchronize computer clocks on the Internet. It provides comprehensive mechanisms to access national time and frequency dissemination services, organize the time-synchronization subnet and adjust the local clock in each participating subnet peer [RFC-1305]. Due to its wide application and good availability of various time servers this protocol was choosen in the PNQ22-FBP.0 for clock syncronization. The PNQ22-FBP.0 uses a unicast (point-to-point) protocol to get the actual time from the time server. The IP address of the timer server must therefore be set.

If Diagnosis Mode is set to "SoE", a diagnosis event is time-stamped with the current time in the PNQ22-FBP.0.

- Once a valid time is received from the time server after power-on, that new time is use in the PNQ22-FBP.0. From that moment on, time stamps in any diagnosis message are marked valid.
- If no time server can be found after power-on, the time stamp is marked invalid and the master has to time-stamp the event on its side.
- If the time server is lost after one successful synchronization the PNQ22-FBP.0 increments its internal clock automatically and marks diagnosis events as valid.
- Once the time server is available again, the PNQ22-FBP.0 automatically re-synchronizes its clock.



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09 Principal setup of a network with a time time server to synchronize the clock in the PNQ22s

Control system integration

Network configuration

To enable communication through the Ethernet network, the PNQ22-FBP.0 needs a valid IP address. IO controllers and some configuration tools have a Discovery and Configuration Protocol (DCP) for assigning the IP address and the device name. These tools usually show the MAC addresses of the devices they find using a network scan. You can find the PNQ22-FBP.0 MAC address on the PNQ22-FBP.0 label. This allows you to match the MAC address shown in the configuration tool with the real device.

Some tools also provide the option to activate LED flashing on a selected PNQ22-FBP.0. This makes it faster to identify the selected device on a network with many nodes.

When the PNQ22-FBP.0 is initialized, the IP address is transferred to the PROFINET IO communication stack. If there is a need to change the IP address it should be done with a DCP tool such as Webserver 800xA PROFINET Controller or the Siemens Step7 configuration tool.

GSDML description

Properties and services of a PROFINET IO device are described in a GSD file that is written in GSDML (General Station Description Markup Language). The GSD file describes the device-specific modules and the method of assigning modules and sub-modules to predefined slots and sub-slots.

The latest GSD file can be downloaded from our website.
www.abb.com
-> Products -> Low Voltage Products -> Motor Controllers -> Universal Motor Controllers -> Ethernet Interfaces

At the time of this manual's publication, the following modules are supported:
- Universal Motor Controller UMC100-FBP.0 R101/R201 (latest version supporting voltage measurement)
- Universal Motor Controller UMC100.3
- Softstarters PST and PSE

Parameterization

Device specific parameters
It is possible to configure device-specific parameters in the PROFINET IO controller. Parameters are always downloaded by the PROFINET Controller during system start-up. This allows the central management of device parameters and device parameterization from within the system. Device specific parameters (eg for UMC100) are explained in the related device manual.

Note for UMC100.3:
Only if you want to create a customer-specific logic, the UMC100.3 configuration tool must be used for logic creation and download via service Laptop. Alternatively download from the UMC100-PAN is possible if parameters and/or logic were stored there.

PNQ22-FBP.0 specific parameters

The following table lists the parameters that influence the behaviour of the PNQ22-FBP.0 ports X1 ... X4:

Parameter	Options	Description
Port Activation	Spare Port / Port Active	Enables or disables a port. If a port is not used, set it to "Spare Port" to avoid unwanted diagnosis messages.
Expected FBP Address	0 ... 255	The device address set in the connected device must be set here too. This allows cross-checking that the right device is connected to a PNQ22-FBP.0 port. This feature is useful in Motor Control Center (MCC) applications where drawers can be easily swapped by accident. See also UMC100 parameter "Address Check".
Write Block Parameters	Disabled / Enabled	Allows blocking of the start-up parameters in the PNQ22-FBP.0. Set this parameter to Disabled, if you want to locally configure a device (e.g. UMC100). Set it to Enabled, if you want to configure a device (e.g. UMC100) in the PROFINET IO Controller configuration tool (e.g. Control Builder in case of 800xA).

The following table lists the parameters that influence the behaviour of the whole PNQ22-FBP.0:

Parameter	Options	Description
SNTP Server IP First octet ... Fourth octet	0...255	IP-V4 address of the Simple Network Time Protocol (SNTP) time server in the network. This adress is required for time-stamped diagnosis.
Diagnosis Model	Standard / SoE	Set type of diagnosis model. See section PNQ22-FBP.0 and Device Diagnosis for details.
Comm. Keep Alive Time [ms]	0...10000	In case of longer communication loss, timeout info is sent to connected devices.

I/O Data Exchange

After start-up the PROFINET IO controller enters cyclic data exchange with the devices. The cyclically transfered I/O data depends on the selected modules (e.g. four times UMC100). Please use the manual of the connected device (e.g. UMC100) for details about transfered data.

PNQ22-FBP.0 and Device Diagnosis

The PROFINET standard defines different types of diagnosis events:

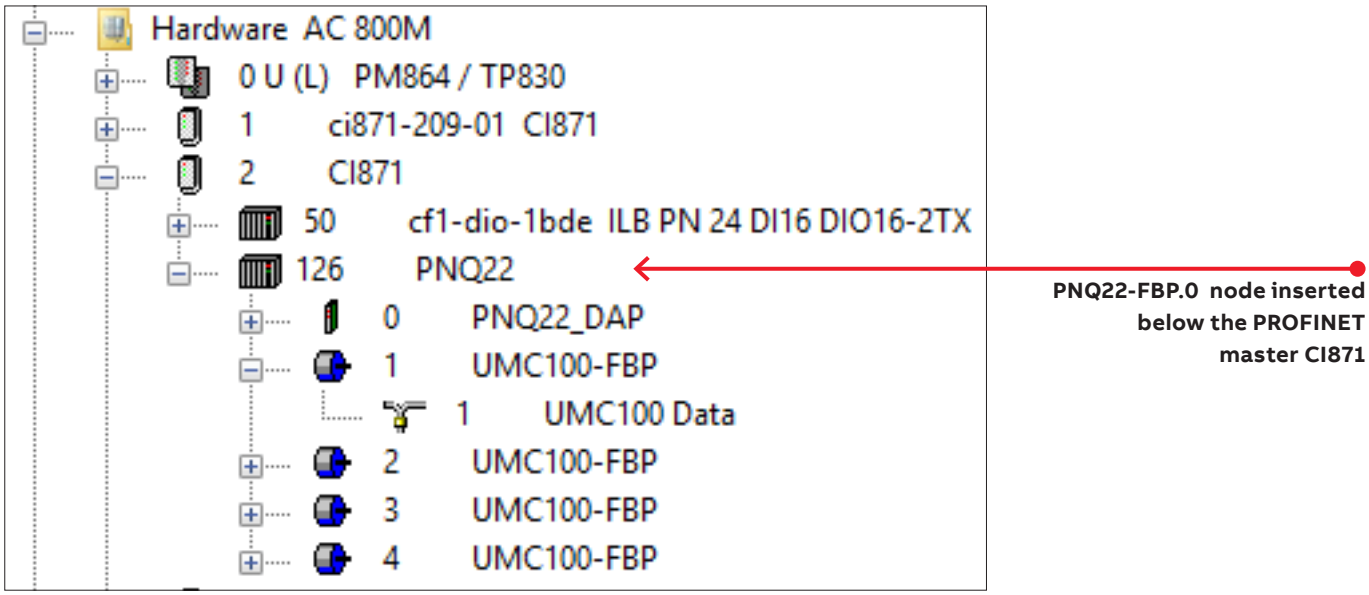
1. Plug and pull alarms: These alarms are triggered when a device (e.g. UMC100) is connected or disconnected to one of the four ports (X1 ... X4).
2. Diagnostics alarms: In case parameter Diagnosis Model is set to Standard, device-specfic diagnosis messages (e.g. PTC wire break in case of UMC100) are reported as diagnostics alarms.
3. Process alarms: In case parameter Diagnosis Model is set to SoE, device-specific diagnosis messages are sent as process alarms in a proprietary ABB sequence of events (SoE) format. This format includes time stamping information and requires an SNTP server in the network.

Integration into 800xA from ABB

The UMC100 via PNQ22-FBP.0 and PROFINET IO is supported in System 800xA since SV6.0. You get access to the UMC100 via the Hardware Library ABBPNQ22-FBP.0CI871HwLib that is installed with Control Builder M. The Hardware Library contains the following components:

- PNQ22-FBP.0
- UMC100
- PST-CU
- PSE

The following figure shows the configuration in 800xA with four UMC100s configured below one PNQ22-FBP.0.



10 Integration of the PNQ22-FBP.0 into the ABB control builder tool.
Four UMC100 are connected to the PROFINET slave in slots 1 ... 4.
Slot 0 is reserved for the PNQ22-FBP.0 itself.

The configuration works similar to PROFIBUS. I/O-data connectivity and parameterization is done via the UMC100 Data sub-module below the UMC100-FPB module.

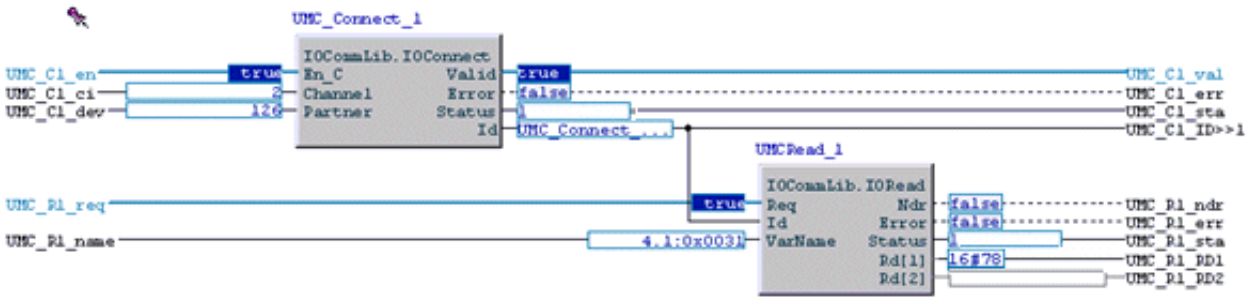
For users of PDQ22:
The connectivity of I/O-data via PROFINET is compatible with PROFIBUS and PDQ22.
Existing applications can be reused when switching from PROFIBUS to PROFINET.

PROFINET connectivity supports enhanced diagnosis functionality. Standard 800xA diagnosis functionality such as indication for WrongModuleType or ModuleMissing is given, as well as UMC100-specific diagnosis such as PTC Temperature High or Thermal Overload.

Also Sequence of Events can be enabled by setting the configuration flag Diagnosis Model (see section Parameterization). Diagnosis will then be time stamped by PNQ22-FBP.0/UMC100. Active time synchronization of PNQ22-FBP.0 via Ethernet is a precondition.

In addition to the standard cyclic I/O-data, support for enhanced acyclic communication is given as well.
If access is needed to data like Cooling Time or Time to Trip, this is given by use of IORead/IOWrite function blocks as part of the IOCommLib in 800xA.

The following figure shows an example configuration in 800xA for reading the CoolingTime from UMC100.



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11 Reading of an acyclic value from the UMC100

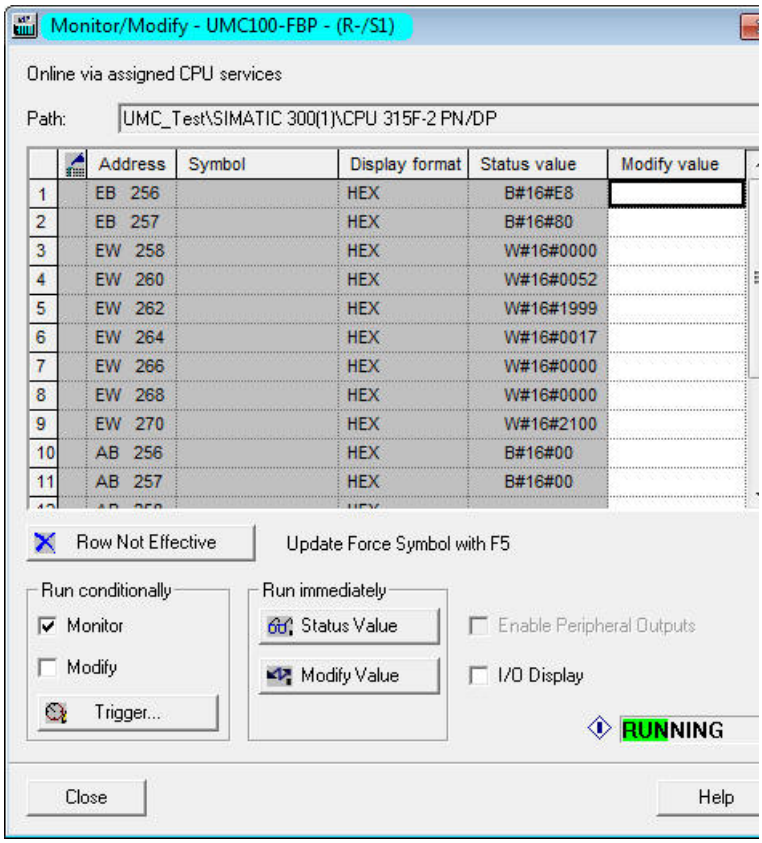
Integration into a Siemens system

With the help of the PNQ GSDML file, the PNQ22-FBP.0 can be integrated into a Siemens System supporting PROFINET. This section will not explain how to work with a Siemens system. It just aims to give the reader a basic idea how the integration looks and what features are available.

After loading the GSDML file into the configuration tool, the following components are available:

- PNQ22-FBP.0
- UMC100
- PST-CU
- PSE

As a first step, the PNQ22-FBP.0 must be added into the project. Up to four modules can then be added to the PNQ22-FBP.0 (e. g. four UMC100s). The following figure shows the automatically allocated I/O addresses after inserting a UMC100-



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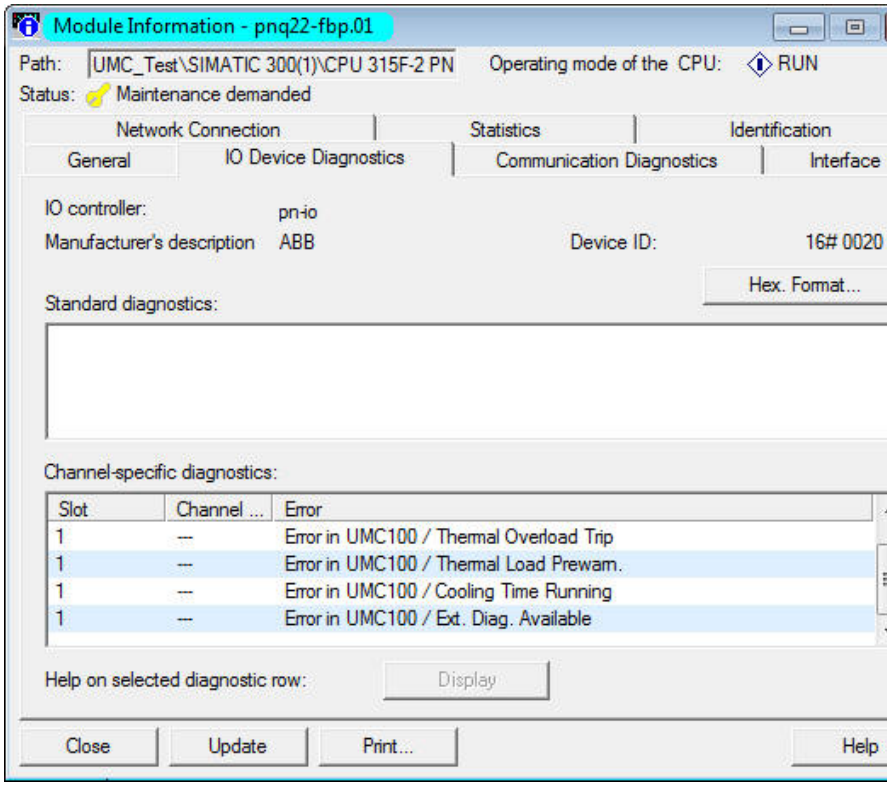
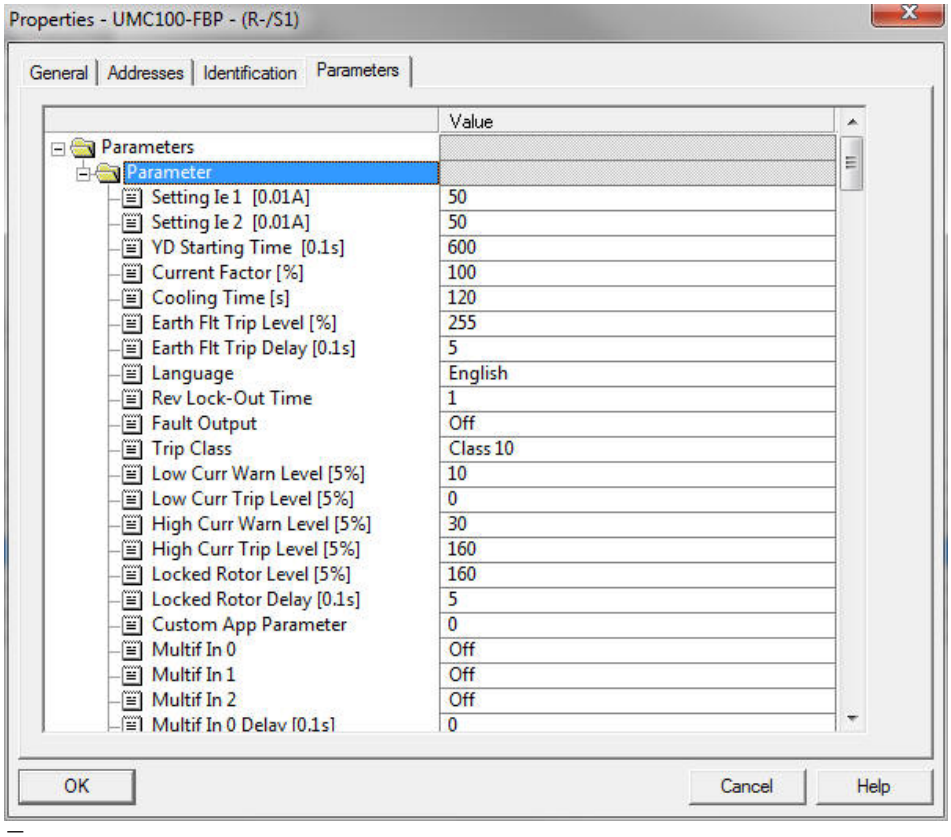
12 Variable view of the UMC100 in Step 7

The GSDML file also provides text messages for the diagnosis events sent from a device (e. g. Thermal Overload in case of UMC100). Diagnosis events can be displayed as a clear text message to the user, as shown in the figure below.



13 Diagnosis view in Step 7

As on PROFIBUS, PROFINET allows you to define start-up parameters for a device. These start-up parameters have to be set in the Siemens hardware configurator and are downloaded into the device after system start. The next figure shows the UMC100 parameters in the hardware configurator.



14 Parameter view in Step 7

Diagnosis / Behavior in case of an error

The PNQ22-FBP.0 provides detailed diagnosis information about the status of the connected devices, its own status and the status of the PROFINET connection. Diagnosis information is accessible:
- with the locally available lamps and
- via the PROFINET services.

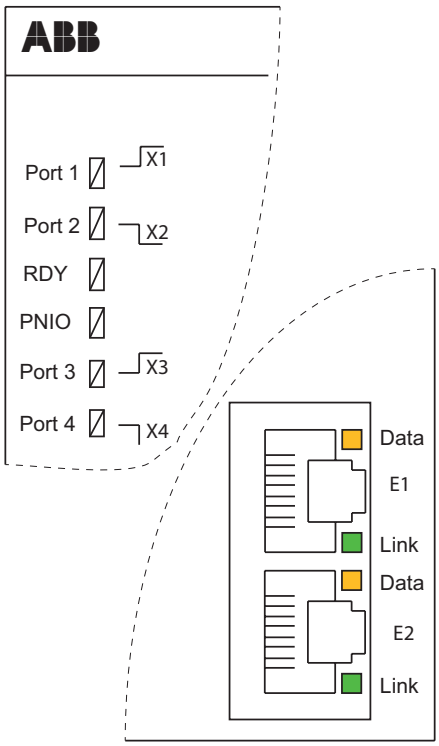
The possibilities for locally available diagnostics are described in the next section.

LED status indications

Diagnosis information is locally displayed using two LEDs for each interface to an FBP device.
LED meanings are as follows:

LED Port 1,2,3,4	Explanation
Off	Disabled (no device configured)
Green blinking	Startup (waiting for device)
Green on	Configured device identified and data exchange running
Red blinking	Communication fault
Green / Red alternating	Address mismatch between expected device address and connected device address. Eg caused by swapping two devices. Wrong device type connected.

*) Only for intelligent devices like UMC or PST. Not for passive sensors.



PNQ22-FBP.0 Status

LED RDY General Status	Explanation
Green on	Normal
Red blinking	Minor error, eg wrong configuration or IP address already available in the network.
Red on	Major internal fault. If the error is permanent after reboot replace the device.

LED PNIO Communication Status	Explanation
Green blinking	Waiting for PROFINET connection
Green on	PROFINET connection established
Red blinking	PROFINET Connection timed out
Red on	Fatal error
Green / Red alternating	Error in the configuration

Ethernet Status

The Ethernet status is shown at the two LEDs integrated in the RJ45 connectors.

	Off	On	Flashing
Data LED Yellow	No network traffic	-	Communicationwith network active (traffic).
Link LED Green	No connection to network (eg cable not plugged in or broken wire)	Connection to network established (eg connection with network switch)	-

Technical data

General

Supply voltage	24 V DC (+30 % ... -20 %) (19.2 ... 31.2 V DC) including ripple
Current consumption	Max. 180 mA (at 19.2 ... 31.2 V DC)
Short circuit protection at port 1 ... 4	PTC resistor
Reverse polarity protection of supply inputs	Yes
Pollution degree terminals	3
Mounting	Snap-on mounting onto 35 mm standard mounting rails
Mounting Position	Any
Degree of protection	IP20
Temperature range: Storage / Operation	-25 ... +70 °C / 0 ... +60 °C
Dimensions (W x H x D)	45 mm x 90 mm x 96 mm
Total power dissipation	max. 3,5 W
Net weight	0.172 kg
Diagnosis with LEDs	See section Diagnosis
Cable length between PNQ22-FBP.0 and devices	It is strongly recommanded to limit the cable length to 3 m.
Marks, Approvals	CE, cUL More in preparation. Ask your Local Sales Unit representative for other marks/approvals.
Operation altitude above sea level	max. 2000 m For higher altitudes please contact your Local Sales Unit.

EMC

Measurement of radiated and conducted interference according to EN61131-2 CISPR16-2-3	Class A
Electrostatic discharge according to IEC 61000-6-2	8 kV air discharge 6 kV contact discharge
Radiofrequency electromagnetic field according to IEC 61000-4-3	10 V/m
Fast transient bursts according to EN61000-4-4	2 kV power supply 0.5 kV communication lines
High energy surges according to EN61000-4-5	1/0.5 kV CM/DM power supply
Conducted radio frequency interference according to EN61000-4-6	10 V
Immunity low frequency harmonics according to EN61000-4-11	Power supply: 50 ... 12 kHz, 3 V

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Ethernet and PROFINET Performance Data

Network Redundancy Protocol	MRP client acc. to EN/IEC 62439-2
Recovery time in a network with 15 PNQ22-FBP.0 nodes in ring topology and interruption of the communication at one place (single fault)	< 200 ms typically (depends on the settings in the MRP master)
Response time of a PROFINET request to IO data	<< 5 ms (typically)
Response time of a PROFINET IO request to parameter data and maintenance counters	<< 10 ms (typically)
Max. concurrent PROFINET connections	1
Ethernet interfaces	2 (internal two-port switch)
Supported Ethernet topologies	Star, ring, bus (daisy chain)
Supported bitrate	100 MBit/s

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The following TCP/UDP ports are used and must not be blocked by a firewall

Port	Service
161/udp	SNMP
2583/udp	NetIdent
34964/udp	Profinet
49152/udp	Profinet
No TCP ports are used.	

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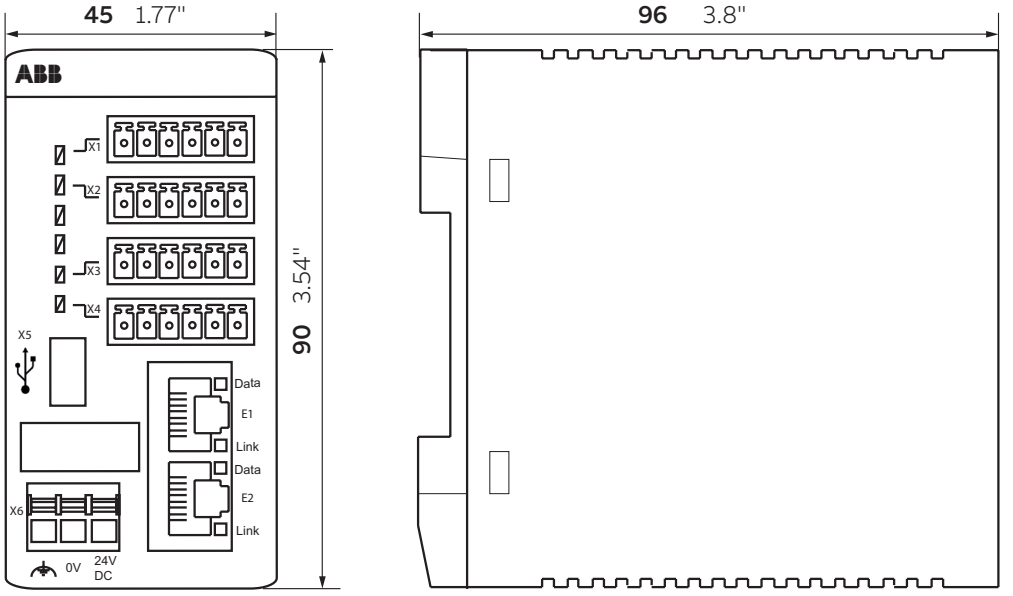
Ordering Data

Order Code	Type	Description
1SAJ261000R0100	PNQ22-FBP.0	Ethernet Profinet IO communication interface
1SAJ929180R0015	CDP18.150	Cable between UMC100.3 and drawer inside, 1.5 m Cable between PNQ22-FBP.0 and drawer outside, 1.5 m
1SAJ929230R0015	CDP23.150	Cable between PNQ22-FBP.0 and UMC100.3, 1.5 m
1SAJ929230R0030	CDP23.300	Cable between PNQ22-FBP.0 and UMC100.3, 3 m
1SAJ929200R0001	ETHTB-FBP.4	Terminal bloc for MTQ22, PNQ22, UMC100.3, 4 pcs
1SAJ929200R0002	ETHTB-FBP.50	Terminal bloc for MTQ22, PNQ22, UMC100.3, 50 pcs

Dimensional drawings



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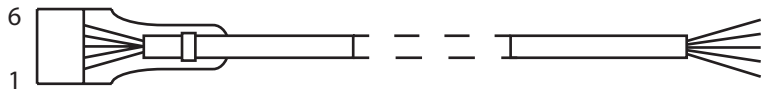
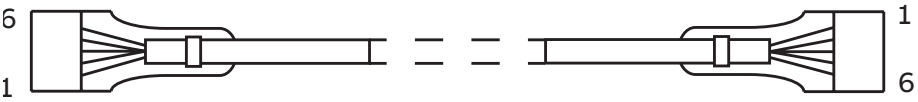
15 Dimensions PNQ22-FBP.0.0

CDP18.150



CDP23.xxx



Pin

6	nc	
5	0V	blue
4	VCC	brown
3	Rx	black
2	Tx	grey
1	Diag	white

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16 Dimensions auxiliary cables

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ABB STOTZ-KONTAKT GmbH
Electrification Products Division
Low Voltage Products and Systems
Eppelheimer Strasse 82
69123 Heidelberg
Germany

You can find the address of your local sales organization on the ABB homepage

abb.com/lowvoltage

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