

# Infrastructure components

PROFINET, EtherNet/IP, PROFIBUS, and EMC

Products/Systems 

Diagnosis 

Monitoring/Management 

Training 

Consulting/Planning 

Network Services 



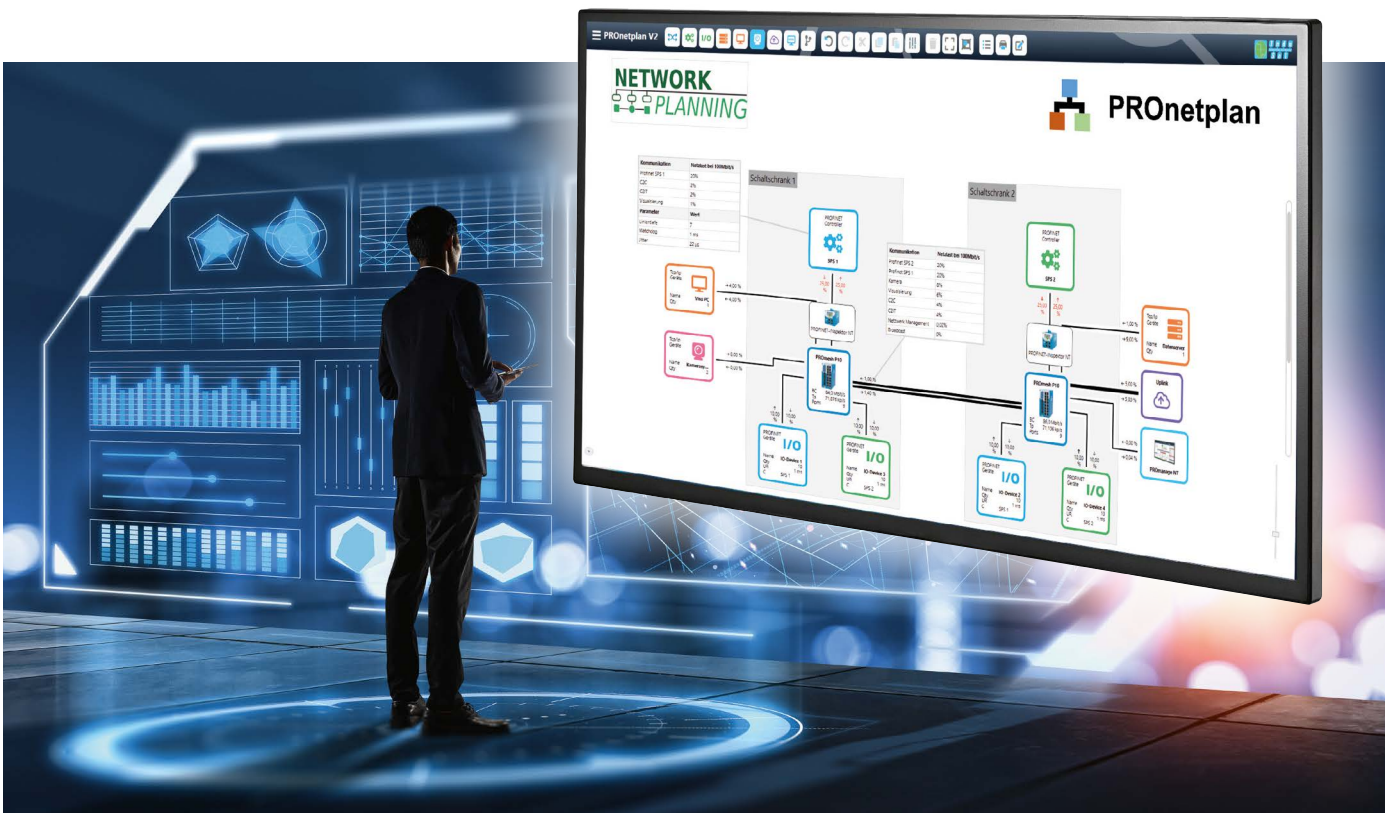
# Networks require planning

The network areas of IT and OT are increasingly merging because of digitalisation. As a result, formerly standalone application networks like PROFINET are becoming heterogeneous or **convergent networks**.

This development necessitates a **rethink of component selection**, but also a **new type of network planning**.

The objective of this planning is to define the necessary functional and performance requirements of the (overall) network, and to realise this with **suitable switches**, while at the same time maintaining economic efficiency.

This planning is reflected, among other things, in the functional selection of the switches to be used.



## READY FOR THE NETWORKS OF THE FUTURE WITH INDU-SOL

- **Consulting** from planning to operation of your system network
- Manufacturer neutral **planning of OT networks**
- Network planning software **PROnetplan V2**
- **Training** on network planning, PROFINET, EMC & Co.

Ordering specifications for PROnetplan V2


Art. no. 114010012



**MORE ON NETWORK PLANNING**

<https://bit.ly/40DaCI9>


## PROmesh B Line Switches



**B8**

- PROFINET v2.4 certified
- Conformance Class B
- EtherNet / IP certified
- Netload Class III
- 8x RJ45 (up to 100 mbps)


Article no. **114110501**



**B16**

- PROFINET v2.4 certified
- Conformance Class B
- EtherNet / IP conform
- Netload Class III
- 16x RJ45 (up to 100 mbps)

Article no. **114110510**



**B12 PoE**

- Power-over-Ethernet (up to 120 W)
- 8 x PoE+ (120W)
- 8 x RJ45 (up to 1.0 gbps)
- 4 x SFP (up to 1.0 gbps)

Article no. **114110251**




**B28-RL**

- Routing
- 16x RJ45 (up to 1.0 gbps)
- 8x Combo RJ45 (up to 1.0 gbps)
- or 8x SFP (up to 1.0 gbps)
- 4x SFP+ (up to 10.0 gbps)

Article no. **114110110**


## PROmesh P Line Switches



**PROmesh P9+**

- **online line diagnostics**
- **environmental monitoring** (leakage current, 24 V power supply, temperature)
- 9 x 1 Gbit/s RJ45
- PROFINET 2.4 and TSN ready
- Ethernet IP
- Performance Monitoring
- Netload Class III


Article no. **114110194**



**PROmesh P10+**

- **Online line diagnosis**
- **Environmental monitoring** (discharge current, 24 V voltage supply, temperature)
- **Highspeed:** up to 2.5 Gbit/s
- 8 x 1 Gbit/s RJ45; 2 x 2.5 Gbit/s SFP
- PROFINET 2.4 and TSN ready
- Performance monitoring
- Netload class III


Article no. **114110204**



**PROmesh P10X**

- **Online line diagnosis**
- **Environmental monitoring** (discharge current, 24 V voltage supply, temperature)
- **IP67 certified**
- 8 x 100 Mbit/s M12 D-coded; 2 x 1 Gbit/s M12 X-coded
- PROFINET 2.4 and TSN ready
- Performance monitoring


Article no. **114110211**



**PROmesh P20**

- **Integrated NAT and firewall function**
- **Environmental monitoring** (discharge current, 24 V voltage supply, temperature)
- 16 x 100 Mbit/s; 4 x 1 Gbit/s SFP
- PROFINET certified (2.3)
- Performance monitoring
- Netload class III

Article no. **114110022**



**PROmesh P8+F**

- **Online cable diagnostics**
- Leakage current monitoring
- Millisec.-precise display of network load
- Diagnostic functions
- PROFINET v2.4 certified
- Conformance Class B
- Netload Class III
- 8x RJ45 (up to 1.0 gbps)


Article no. **114110198**



**THE ENTIRE PROMESH SWITCH RANGE:**  
 Technical datasheets and requests at:

<https://bit.ly/3Mc9cQH>


## PROmesh U Line Switches



**U3**

- PROFINET conform
- Conformance Class A
- EtherNet / IP conform
- 2x RJ45 (up to 100 mbps) and 1x LWL MM (bis zu 100 mbps)


Article no. **114110130**



**U5**

- PROFINET conform
- Conformance Class A
- EtherNet / IP conform
- 5x RJ45 (up to 100 mbps)


Article no. **114110120**



**U8**

- PROFINET conform
- Conformance Class A
- EtherNet / IP conform
- 8x RJ45 (up to 100 mbps)

Article no. **114110122**




**U16**

- PROFINET conform
- Conformance Class A
- EtherNet / IP conform
- 16x RJ45 (up to 100 mbps)

Article no. **114110124**


## Measuring points



**PNMA II**

- Feedback-free telegram record
- 100 MBit/s transfer rate
- Two monitor sockets (M1 and M2) for parallel monitoring of both communication directions
- Forwarding error telegrams

Article no. **114090100**




**INspektor® NT**

- Smart PROFINET or EtherNet/IP measuring point
- Determination of the quality parameters of telegram jitter, gaps, overtakes, network capacity utilisation, refresh rate, device diagnoses, failures, and restarts, error telegrams

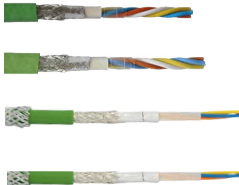
Article no. **124030100 – PROFINET INspektor NT**  
**124090000 – EtherNet/IP INspektor**

## Plugs, SFP-modules and cables




**RJ45 Fast Connect Plug 180°/90°**

- 100 MBit/s transfer rate
- Integrated cutting and clamping contacts
- Visual connection control




**PROFINET cable**

- Cat5 type B, flexible
- Cat5 type C for drag chains
- \*FE type A, solid
- \*FE type A, solid



**PROFINET/Ethernet SFP module**

- SFP module RJ45
- SFP module SM/MM



**Round plug connection IE Fast Connect Plug PRO M12**

- 10/100 MBit/s transfer rate
- Integrated cutting and clamping contacts
- as coupling in rough environment

also available with Ethertest for line certification

**Mobile diagnosis**

**PROFINET diagnostic case with PROlinetest**


- PROFINET-INspektor® NT
- PROmanage® NT
- PROscan® Active V2
- PROlinetest
- Leakage current clamp EMCheck® LSMZI
- Power supply, 2x patch cables

Article no. **114010020**




**THE ENTIRE PROFINET RANGE**  
 Technical datasheets and requests at:  
<https://bit.ly/profinet-infrastructure>


## Repeater



**MULTIrep X2**

- PROFIBUS repeater for 2 segments
- Signal stabilisation/regeneration
- Report of logical and physical peculiarities
- Error isolation on individual segments


Article no. 110030010



**MULTIrep X5**

- PROFIBUS repeater for up to 5 segments
- Signal stabilisation/regeneration
- Report of logical and physical peculiarities
- Error isolation on individual segments by automatic filtering

Article no. 110030009




**MULTIrep X7**

- PROFIBUS repeater for 7 segments
- Signal stabilisation/regeneration
- Report of logical and physical peculiarities
- Error isolation on individual segments by automatic filtering


Article no. 110030011

## Plugs and cables




**Diagnosis plug**

- Connection: Fast Connect (90° and axial)
- Cutting clamp connection (suitable for fast connect cables)
- Quick diagnosis of the bus status via integrated LEDs




**Diagnosis plug PG/90°**

- Connection: Screw terminal
- Quick diagnosis of the bus status via integrated LEDs



**PROFIBUS cable**


- Solid and Flexible
- For drag chains
- \*FE flexible



**Round plug connection**

- Connection: M12 Fast Connect Plug Pro
- Self-customisable
- b-coded


## Measuring points



**PBMA IP20**

- For physical determination of the interference distance of the PROFIBUS communication
- With fast-Connect diagnosis plug

Article no. 110080001




**PBMX IP67**

- Active PROFIBUS measuring point
- Protection type IP67 for rough production environments without additional protection housing
- Power line M12 as mains connection for the active measuring pointNum, ublium


Article no. 110080004

## PROFIBUS-F0 transfer



**OPTIrep F1, F2**

- For connecting PROFIBUS segments via optical fibres
- For line structures and redundant ring structures



**Plugs**

- Connection: Screw terminal
- 90°, 35° and axial
- For measurements during production

**Mobile diagnosis**



**PROFIBUS diagnostic case III**

- PROFIBUS-INspektor®NT
- PROFIBUS Tester PB-Qone
- PROFtest II XL
- Leakage current clamp EMCheck® LSMZ I
- APKA II – Active programming cable II
- Patch cable
- Power supply

Article no. 110010032



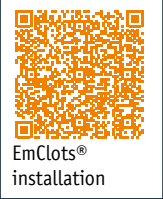

# Equipotential bonding

Increasing networking of the communication networks on OT and IIT levels is based on a high-performance equipotential bonding system.


The increased demands to EMC resistance are only met by meshed equipotential bonding (MESH-BN).

This continues to ensure stable device function and network availability.

The demand for professional and meshed designs is now also considered in the standards and directives.




## EmClots® mounting elements




**EmClots® Junction V2**

- Conductor cable attachment for low-impedance equipotential bonding systems
- Connection terminal for 2 or 3 conductor cables



**EmClots® Connector V2**


- Conductor cable attachment for low-impedance equipotential bonding systems
- Connection terminal for 2 conductor cables



**EmClots® Fastening V2**

- Conductor cable attachment for low-impedance equipotential bonding systems
- Connection terminal for 1 conductor cable


## Cables and conductor cables



**Isolated conductor cables**


- Categories 5, 7, and 8\*
- Various cross-sections upon request
- Tin-plated/fine/micro-wire
- gn/ge insulated

\* UL versions also available



**Multifrequency conductor cable**

- Discharges low- and higher-frequency interference currents
- in 6, 10, and 16 mm<sup>2</sup>



**Conductor cables, blank**

- Classes 2, 5, and 7
- Various cross-sections upon request
- Tin-plated/multi-wire/fine/micro-wire

## Shield contacting




**EMC STARTER BOX**

- Box for any EMC case
- Contains shield clamps for all common shielded cables with diameters from 3 to 16 mm
- 111 parts




Article no. 122160500



**Motor cable SymFlex® EMC drive**

- Symmetrical motor cable (different cross-sections upon request)



**EMClip® shield terminals**


- Possible mounting types: Direct assembly (D), busbar (S), top-hat rail (H)
- Available with tension relief (Z)
- Available as double shield terminal (Duo)

**Mobile diagnosis**

**Measuring clamp case EMCheck® XL**

- PROFIBUS-INspektor®NT
- PROFIBUS Tester PB-Qone
- PROFtest II XL
- Leakage current clamp EMCheck® LSMZ I
- APKA II – Active programming cable II
- Patch cable
- Power supply

Article no. 110010010



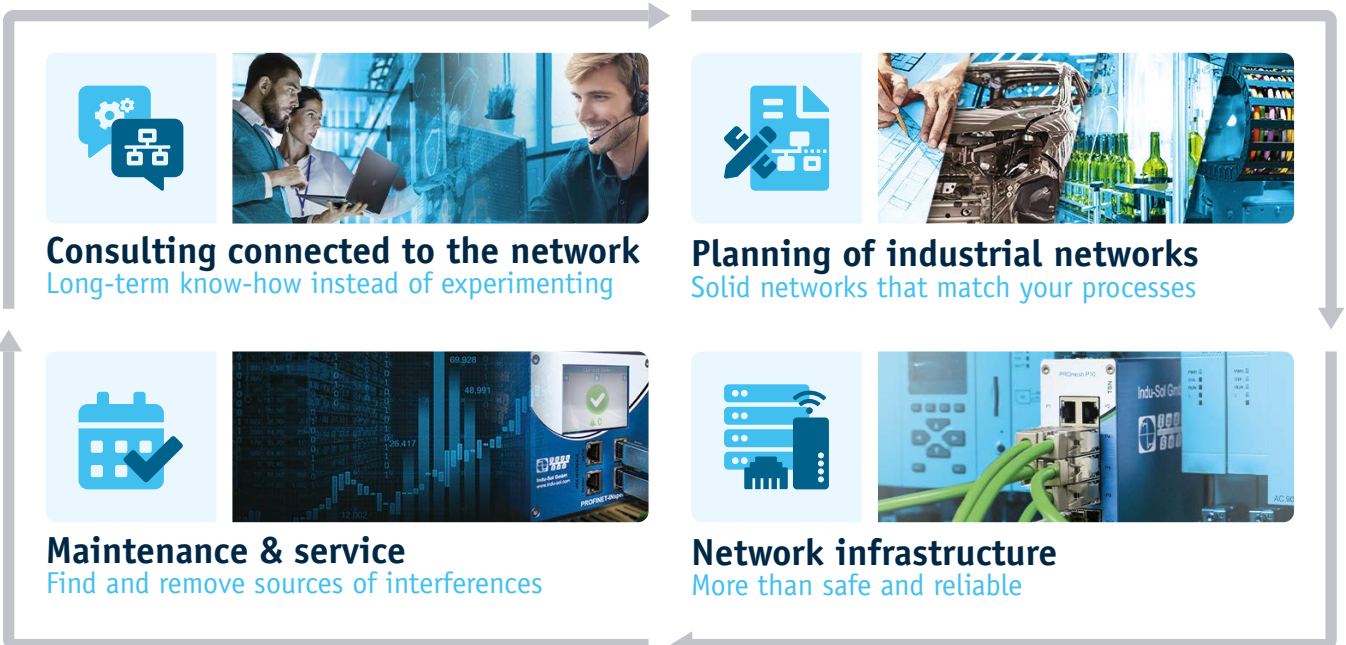

**THE ENTIRE EMC RANGE**  
 Technical datasheets and requests at:  
<https://bit.ly/emc-infrastructure>

# Your competence partner for industrial networks

We create the structural basics for successful digitalisation and secure operation of your plants.

As an expert for high-performance industrial networks with many years of experience, we support you in understanding innovations, discovering potentials, and recognising a need for action in time.

Create the prerequisites for keeping control of increasing networking of machines and plants with a future-capable network structure. Clearly assigned responsibilities, demand-oriented infrastructure components, and targeted network management lays the foundations for a secure tomorrow even today.



Reliable and trouble-free communication is the guarantee for continuous production. Indu-Sol offers a comprehensive range of products and suitable solutions to increase network reliability and stability. The company sees itself as a holistic partner for industrial networks.

Starting with network consulting/planning, through the delivery of components (infrastructure and diagnostics) to on-site technical service – i.e. support with the topics of commissioning, maintenance, repair and training.



**COMPLETE RANGE FOR YOUR NETWORK INFRASTRUCTURE**

Learn more at:

<https://bit.ly/network-components>



## Indu-Sol GmbH

Blumenstrasse 3  
04626 Schmoelln

Phone: +49 (0) 34491 580-0  
Telefax: +49 (0) 34491 580-499

info@indu-sol.com  
www.indu-sol.com/en/

Certified to DIN EN ISO 9001:2015



### Video: How does a switch work?

Use the QR code or simply enter  
"indu-sol switch movie" in your browser.



### Learn more about the PROMesh switches

Use the QR code or simply enter  
"indu-sol promesh" in your browser.



### Learn more about network monitoring

Use the QR code or go to  
www.indu-sol.com/prom-monitoring