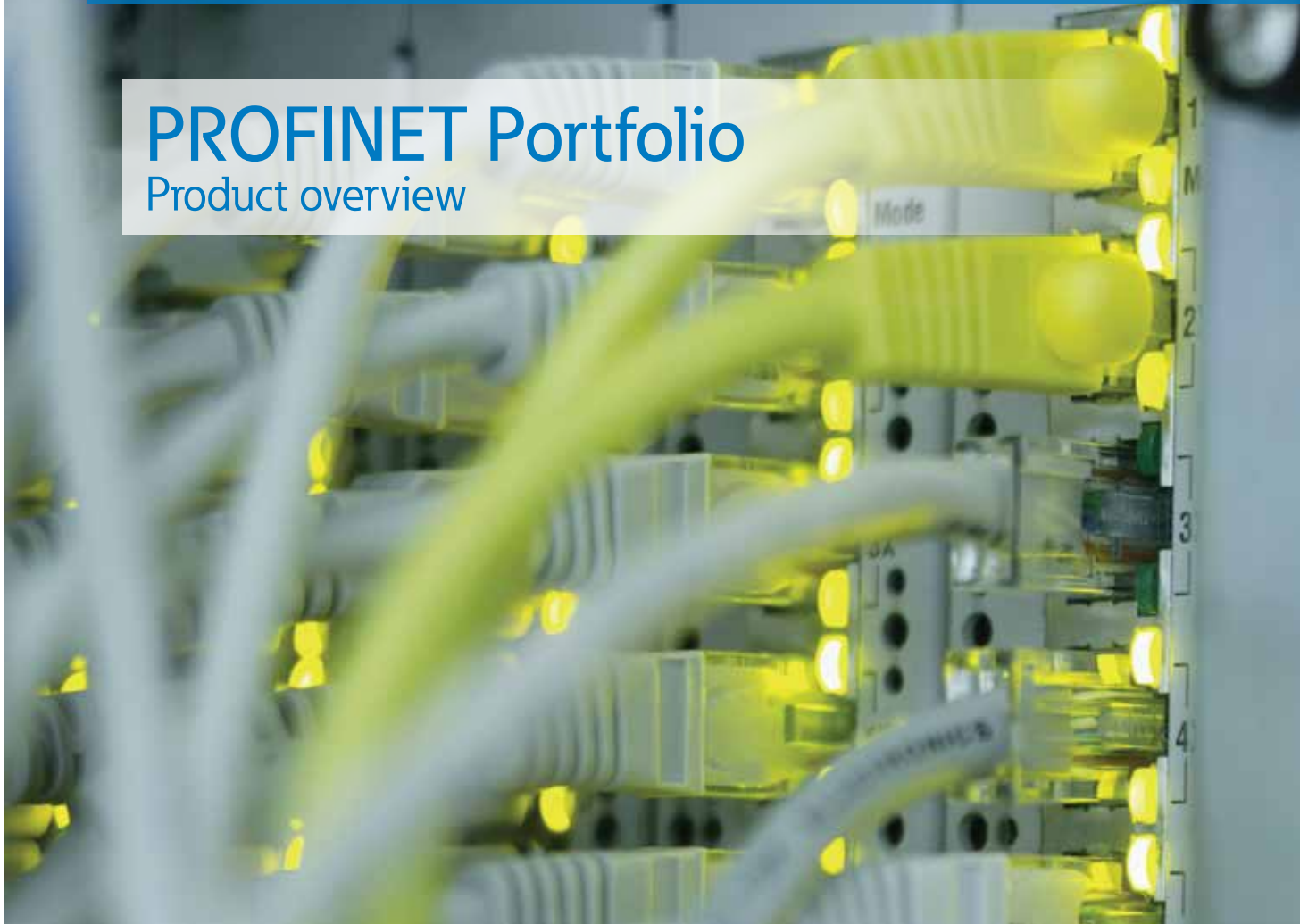# PROFINET Portfolio
Product overview

E·T·N

Powering Business Worldwide

We make what matters work.*

* At Eaton, we believe that power is a fundamental part of just about everything people do. That's why we're dedicated to helping our customers find new ways to manage electrical, hydraulic and mechanical power more efficiently, safely and sustainably. To improve people's lives, the communities where we live and work, and the planet our future generations depend upon. Because this is what really matters. And we're here to make sure it works.

To learn more go to: Eaton.com/whatmatters

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PROFINET Overview

PROFINET is the leading Industrial Ethernet Standard in the market. This globally established and future-oriented technology is supported by many product vendors, thus ensuring long-term availability and investment protection. The number of PROFINET products so far installed has increased significantly in recent years and continues to grow.

Your requirements

- A uniform, secure and protected network without any network gateways
- A uniform and reliable system based on recognized standards
- Uniform technology across the entire system
- Access, servicing and maintenance from anywhere
- Detailed diagnostics
- Reduced technology, commissioning and operating costs
- Standard Ethernet applications that are easy to use and integrate
- Mixed use of PROFINET and standard Ethernet products in one network
- IT communication in parallel with real-time communication
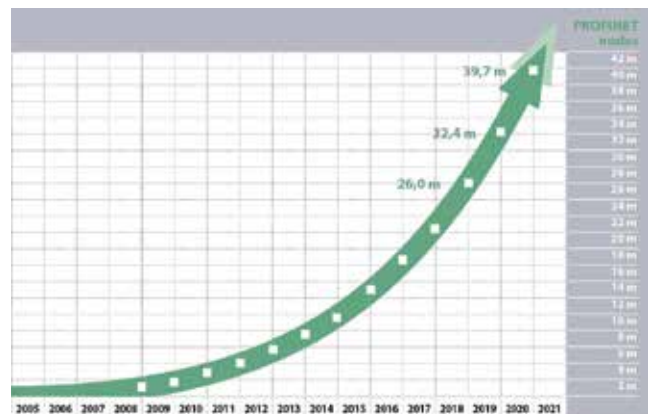

Technology

Fieldbus-based   Ethernet-based

Reasons why you should use PROFINET

- User-friendly
- Flexible installation
- Optimal diagnostics options
- Integrated security
- High availability
- Integrated synchronicity for motion applications
- Energy efficiency
- Secure IT integration
- Support from a large organization

Main PROFINET functions

- Real-time communication with simultaneous TCP/IP connection
- IT communication, global access to your system
- Standard and fail-safe communication via the same transmission link
- Proven and certified security standards (firewall, VPN)
- Media and system redundancy
- Standardized radio technology without any restrictions compared to normal cabling (safety and security)

Source and additional information: www.profibus.com

PROFIdrive ready

- PROFIdrive is the leading vendor-neutral, IEC-standardized drive and motion control technology, developed and supported by PROFIBUS & PROFINET International (PI)

- Thanks to its powerful performance and the use of other PI technologies, such as PROFIBUS, PROFINET, PROFIsafe and PROFIenergy, PROFIdrive provides optimum solutions for the demanding requirements of automation technology

- The PROFIdrive application profile provides users with an interoperable application interface

- It enables the operation of drives from different manufacturers using one control application

- The PROFIdrive profile also offers an interoperable interface for controlling safety functions

PROFIdrive makes it possible to replace a variable frequency drive from one manufacturer with that of another, without the need for costly changes to the software.

Media redundancy

- In normal operation, the ring topology is limited to one line

- One ring port of the MRP (Media Redundancy Protocol) manager is blocked

- In the event of an error, the blocked ring port of the MRP manager switches to forwarding

- The network reconfigures itself in a very short time

- The ring topology will then be limited to one line again

- Automanager for the redundant MRP manager

- MRP performance

    - Reconfiguration time: < 200 ms

    - Maximum number of nodes in one ring: 50

IT integration and cybersecurity

- Coordinated deployment of multiple security measures (defense in depth)

- PROFINET networks and application can be protected using the defense-in-depth approach according to IEC 62443 (cybersecurity for industrial systems)

- The PROFINET security guideline contains best practices
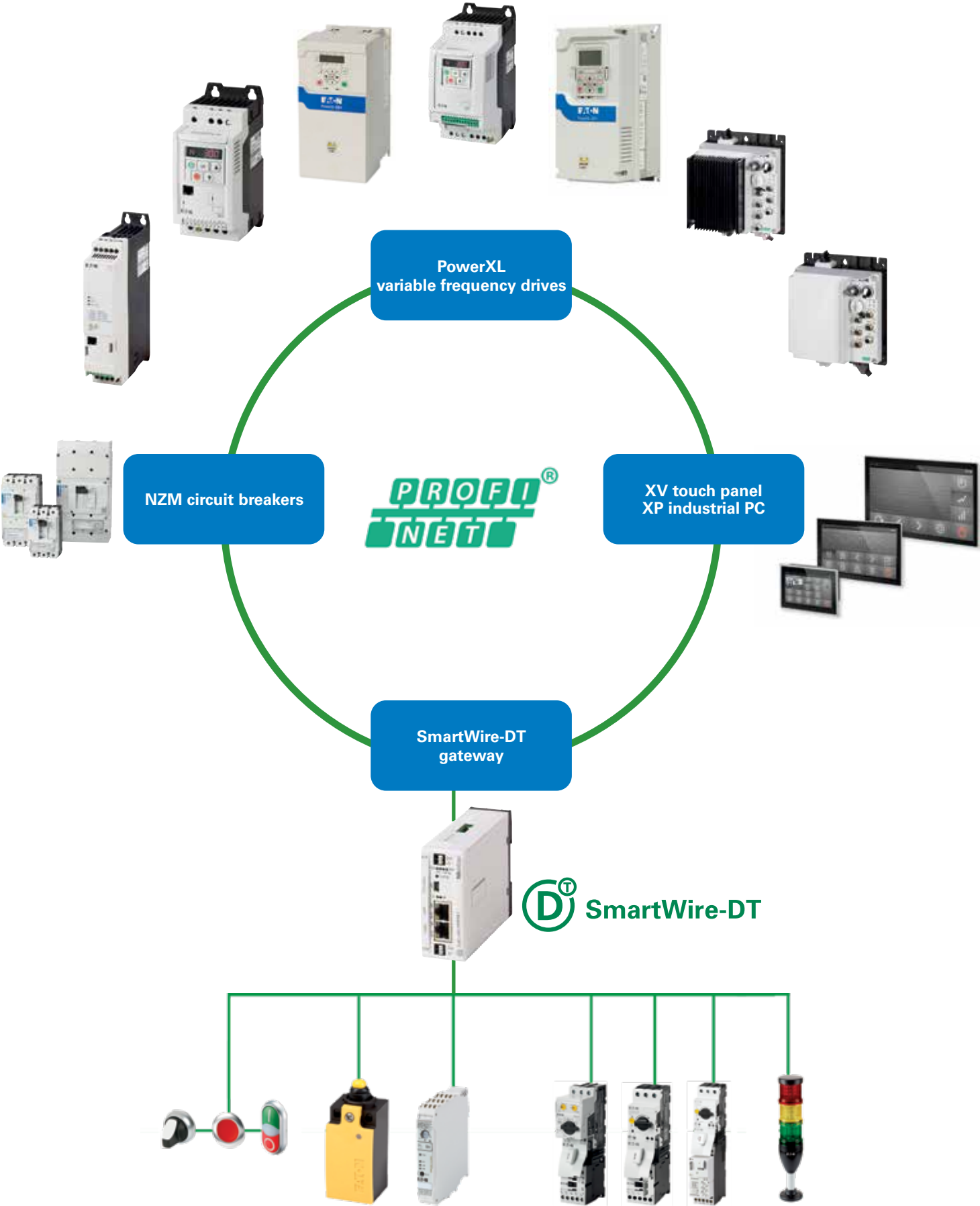
Security test

- Testing of the first security level is an integral part of PROFINET certification. PROFINET devices are tested for a high level of robustness against network errors

- PROFINET-certified products can withstand any network load and always remain in a defined state

Source and additional information: www.profibus.com

PROFINET Portfolio

**We offer a broad product portfolio
for connection to PROFINET:**

PowerXL
variable frequency drives

NZM circuit breakers

XV touch panel
XP industrial PC

SmartWire-DT
gateway

SmartWire-DT

DE1 variable speed starter

The DE1 frequency-controlled variable speed starter combines ease of use with maximum reliability for your machine. Thanks to the integrated DOL and reversing starter with variable motor speed, the DE1 closes the gap between conventional motor starters and variable frequency drives and brings together the advantages of both in a single device.

The DE1 is particularly suitable for driving three-phase asynchronous pump, fan and conveyor belt motors.

Technical data

- Power range up to 7.5 kW
- Trip-free design for maximum machine availability
- Ambient temperature up to 60°C
- Space-saving overall width of 45 mm (frame size 1)

DE1 variable speed starter with PROFINET

The DE1 can be integrated into PROFINET networks using the optional DX-NET-PROFINET2-2 dual-port interface. All parameters and device functions can be easily addressed and changed. The DE1 supports the PROFIdrive profile and can be addressed with the same software modules as any other PROFIdrive-enabled drive.

DE1 variable speed starter

PROFINET module DX-NET-PROFINET2-2 for the DE1 variable speed starter and DC1 variable frequency drive.

Find out more at www.eaton.com/de1

DC1 variable frequency drive

With its compact design, the DC1 variable frequency drive is particularly suitable for simple pump, fan and material handling applications. The DC1 series not only stands out for its quick and easy commissioning, but also for its compatibility with high-efficiency motors (IE2/IE4), including permanent magnet, synchronous reluctance and brushless DC motors.

Technical data

- Power range up to 22 kW
- Ambient temperatures of up to 50°C without derating
- IP20 and IP66 degree of protection
- Integrated PI controller

DC1 variable frequency drive with PROFINET

The DC1 can be integrated into PROFINET networks using the optional DX-NET-PROFINET2-2 dual-port interface. All parameters and device functions can be easily addressed and changed. The DC1 supports the PROFIdrive profile and can be addressed with the same software modules as any other PROFIdrive-enabled drive.

DC1 variable frequency drive with PROFINET module

Find out more at www.eaton.com/dc1

DM1Pro variable frequency drive

The DM1 is a micro inverter from the PowerXL family that is especially rugged and easy to use. Designed for use in pumps, fans and conveyor belts as well as in general machine-building applications, the DM1 expands our product range in a targeted manner. In this way, you can always select the right product, from simple to complex applications – including the production of standardized systems and more.

DM1Pro variable frequency drive with attached PROFINET interface.

Technical data

- 115 V, 230 V, 400 V, 575 V
- 1.5 to 46 A (0-75 to 22 kW @400 V)
- STO (SIL2, PLd, Cat.3), IP20, PI controller
- Bluetooth and web server on board
- Technology functions for pumps & fans, fire mode

DM1PRo variable frequency drive with PROFINET

The DM1Pro can be integrated into PROFINET networks using the optional DXM-NET-PROFINET dual-port interface. All parameters and device functions can be easily addressed and changed.

Find out more at www.eaton.com/dm1

DA1 variable frequency drive

The DA1 variable frequency drive excels in demanding applications thanks to its high starting torque, powerful vector mode and safe operating conditions with STO functionality.

In addition, the DA1 product range also offers compatibility with high-efficiency motors (IE2/IE4) such as permanent magnet, synchronous reluctance and brushless DC motors.

DA1 variable frequency drive

Technical data

- Power range up to 250 kW
- STO SIL2/PLd functional safety on board
- Ambient temperatures of up to 50°C without derating
- Degree of protection: IP20, IP55 with DNV marine approval and IP66

DA1 Profinet interface DX-NET-PROFINET-2

DA1 variable frequency drive with PROFINET

With the optional DX-NET-PROFINET-2 dual-port interface, you can integrate the DA1 into your PROFINET automation system.

Find out more at www.eaton.com/da1

DG1 universal variable frequency drive

The PowerXL DG1 universal variable frequency drives are part of our next-generation PowerXL series. They have been specifically designed for today's demanding applications: Thanks to their energy saving algorithm, high short-circuit rating, two PID controllers and rugged design, they offer increased efficiency, safety and reliability.

The DG1 drives are particularly suitable for pump, fan, smoke extraction, conveyor and compressor applications.

Technical data

- 230V, 400V, 575V
- 2,3-1180A (1,5 bis 630kW @400V)
- STO (SIL1, PLc, Cat.1), IP20, IP21, IP54, DC-Drossel intern
- 3 Timer für Gerätegesteuerte Funktionen ohne SPS
- Technologiefunktionen für Pumpen & Lüfter, Firemode, Real-Time-Clock

DG1 variable frequency drive with PROFINET

The DG1 can be integrated into PROFINET networks using the optional DXG-NET-PROFINET dual-port interface. All parameters and device functions can be easily addressed and changed.

DG1 variable frequency drive with optional dual-port interface for integration into PROFINET networks.

PROFINET interface DXG-NET-PROFINET

Find out more at www.eaton.com/dg1

Rapid Link 5 decentralized electronic drive system

From conveyor systems in airports to parcel distribution centers and warehouse store logistics, Rapid Link 5 offers the right solution for complex tasks in all areas of conveyor technology. Rapid Link 5 is a distributed drive system that offers all the features needed to switch, control, protect and network the electric motors of conveyor belts. Rapid Link 5 consists of two product lines: the RAMO5 motor starter, which can be used as a DOL and reversing starter, and the RASP5 variable frequency drive, which is used for variable speed control. Identical dimensions across the entire performance range and integrated conveyor functions make project planning significantly easier. The RASP5 variable frequency drive can also be used for optimized control of energy-efficient IE4 motors.

Technical data

- Power range up to 4 kW
- Rugged enclosure with IP65 degree of protection (NEMA 12)
- Integrated EMC filters
- STO safety function (SIL3, PLe)
- Integrated technology functions for conveyor applications
- Flexible feeding of the power and motor cable

Rapid Link 5 decentralized electronic drive system with PROFINET

The PROFINET models of the Rapid Link 5 drive system are equipped with a dual-port interface (2 x M12) and an input (M12) for an external 24V power supply. Alternatively, the power supply of the Profibus communication can also be implemented via the 400 V supply voltage of the device. All system functions and diagnostic data of the Rapid Link 5 drive system can be executed or provided via PROFINET. RAMO5 and RASP5 provide both cyclic and acyclic communication data. Cyclic data, which are exchanged as quickly as possible, include the control word, setpoints and the status word. Acyclic data can be used to change all device parameters and to read out diagnostic information from the devices.

Motor starter RAMO5 up to 3 kW

RASP5 variable frequency drives up to 4 kW

Find out more at www.eaton.com/rapidlink

PROFINET connection for the digital NZM

The digital NZM series can be used anywhere in the world, making it the perfect fit for a wide range of automation tasks. The circuit breakers are thus suitable for universal use – from small distribution boards to machine controls and motor-starter combinations all the way to low-voltage power distribution systems. Thanks to their connectivity and advanced features, they are ready for Industry 4.0 applications, including machine-building and high-energy applications with high switching power, for example wind farms and marine installations. The integrated energy measurement enables energy management according to ISO 50001, including energy data acquisition and further processing. The service life indicator can be used for predictive maintenance, and the event memory can be read out for process analysis.

The digital NZM circuit breaker offers powerful performance in a compact design.

Find out more at www.eaton.com/digitalnzm

Technical data

- Output to PROFINET IO device
- 24 V DC connection required
- DIN rail mountable

Digital NZM circuit breaker with PROFINET

The PXR-ECAM-PNET PROFINET module enables access to the NZM and supports the output of all data provided by the digital circuit breaker, including status information, current, voltage, power, energy, cos phi and THD readings, measurement up to the 30th+harmonic, the parameters of the various functions and tripping characteristics, as well as the event memory and the service life indicator for predictive maintenance information. The switch can be remote-controlled via accessories.

HMI XV100 / XV300 / XP500

With the XV/XP system of HMI touch panels, we offer machine builders and plant manufacturers a coordinated product range that can be precisely matched to various performance classes. The optional integration of PLC runtime (CODESYS) into a lean and efficient embedded platform strategy increases the scope of application. Display sizes from 3.5″ to 21″, plastic and metal versions, and the option to use capacitive, resistive or infrared touch panels allow for an extremely wide range of applications. Our products are used in harsh industrial environments, in marine and offshore applications as well as in building automation.

Powerful visualization and control devices for a wide range of applications.

Technical data

- Resistive, infrared single-touch and capacitive multi-touch display technology
- Visualization via GALILEO, CODESYS Visu or Visual Designer
- UL and DNV-GL approvals
- Interface combinations: 1 or 2 Ethernet interfaces, 10/100Mbps

Find out more at www.eaton.com/hmi

HMI/HMI PLCs and industrial PCs with PROFINET

All our HMI products support this established industrial Ethernet standard. This allows us to work directly with a large number of PLC vendors and to exchange variables that can then be processed in GALILEO. This enables the fast and efficient creation of sophisticated visualizations that can be used for easy operation of both simple and complex systems.

SmartWire-DT PROFINET gateway

The gateway acts as a PROFINET I/O device and integrates a subordinate SmartWire-DT network into PROFINET. The device maps each SmartWire-DT module as a single slot in PROFINET. Cyclic process data are converted in a transparent manner between the two networks. 1000 bytes of input and output data for up to 99 SmartWire-DT modules can be exchanged.

The connection between PROFINET and SmartWire-DT allows all the input/output data of an application to be recorded. As such, this solution can be used to implement applications across all areas of machine and panel building.

The EU5C-SWD-PROFINET SmartWire-DT gateway can be used to set up extensive SmartWire-DT networks.

- Supports the maximum number of 99 SmartWire-DT devices per cable
- IP20 degree of protection
- Integrated 100 MBit Ethernet switch
- Diagnostics via mini USB interface

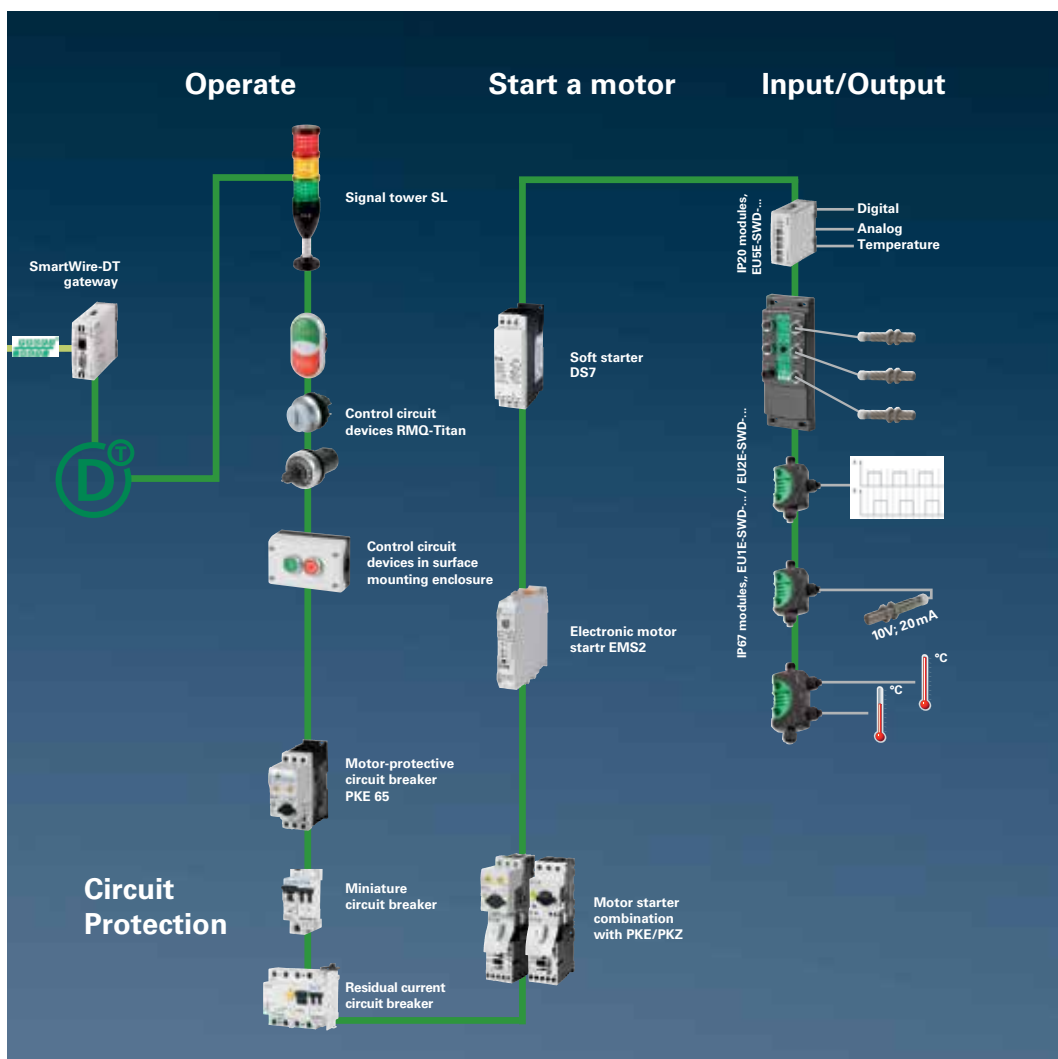**Find out more at www.eaton.com/swd**

The PROFINET gateway can be used to integrate SmartWire-DT into applications with existing PROFINET communication. This facilitates the intelligent, cost-effective and efficient connection of control cabinet devices to a PROFINET controller. This eliminates the need for additional I/O modules, for example for operating elements, contactors or motor protection.

SmartWire-DT gateway

Operate
- Signal tower SL
- Control circuit devices RMQ-Titan
- Control circuit devices in surface mounting enclosure

Circuit Protection
- Motor-protective circuit breaker PKE 65
- Miniature circuit breaker
- Residual current circuit breaker

Start a motor
- Soft starter DS7
- Electronic motor startr EMS2
- Motor starter combination with PKE/PKZ

Input/Output
- IP20 modules, EU5E-SWD-…: Digital, Analog, Temperature
- IP67 modules, EU1E-SWD-… / EU2E-SWD-…
- 10V; 20mA

Eaton's mission is to improve the quality of life and the environment through the use of power management technologies and services. We provide energy-efficient solutions that help our customers effectively manage electrical, hydraulic and mechanical power more efficiently, safely and sustainably. Eaton is a power management company with 2020 sales of $17.9 billion. Eaton has approximately 92,000 employees and sells products to customers in more than 175 countries. For more information, visit **Eaton.com.**

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