INDUSTRIAL ETHERNET

TRANSFER INDUSTRIAL DATA RELIABLY, FLEXIBLY AND SECURELY BETWEEN DEVICES IN THE NETWORK

2024

DÄTWYLER

INCREASING DIGITALISATION
THROUGH INDUSTRY 4.0 AND IIOT

In the world of industrial automation, reliable data communication between Ethernet capable devices forms the foundation for industrial excellence. At Datwyler IT Infra, we understand the challenges involved and offer you tailor-made Industrial Ethernet solutions that optimally support your communications infrastructure.

WHY IS ETHERNET BECOMING MORE AND MORE POPULAR IN INDUSTRIAL COMMUNICATION?

A crucial prerequisite for digital transformation is the collection of large amounts of data based on the networking of machines and systems in the Industrial Internet of Things (IIoT). Upgrading existing machines with modern sensors and communication technology – so-called retrofitting – opens up cost-effective ways to increase efficiency.

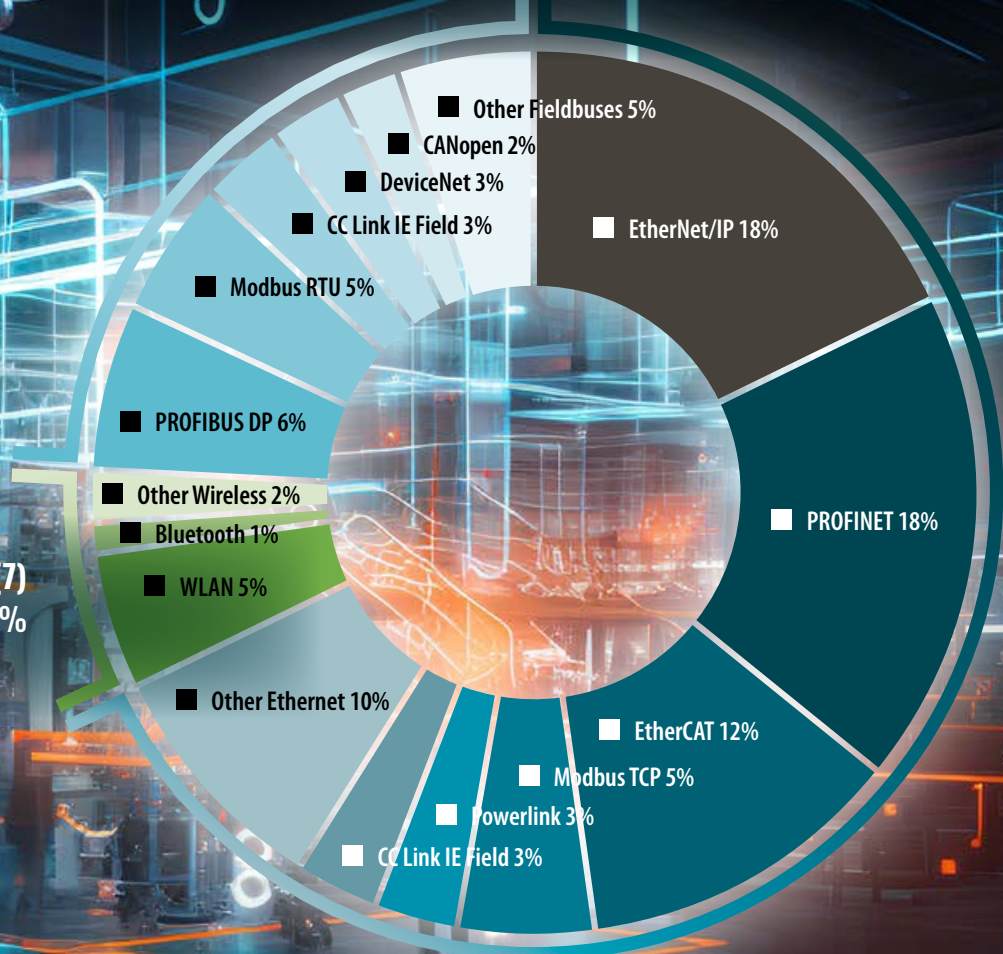The merging of building and machine networks requires a specialised communication infrastructure. Ethernet provides this infrastructure. From the field level to the corporate management level, it enables seamless real-time communication.

Our Industrial Ethernet meets these requirements, supports your production and offers a stable basis for top performance – today as well as in the constantly changing industrial landscape in which fieldbuses are increasingly being replaced.

FIELDBUS: 24% (27)
Growth annually: -5%

INDUSTRIAL ETHERNET: 68% (66)
Growth annually: +10%

Other Fieldbuses 5%
CANopen 2%
DeviceNet 3%
CC Link IE Field 3%
Modbus RTU 5%
PROFIBUS DP 6%
Other Wireless 2%
Bluetooth 1%
WLAN 5%
Other Ethernet 10%

EtherNet/IP 18%
PROFINET 18%
EtherCAT 12%
Modbus TCP 5%
Powerlink 3%
CC Link IE Field 3%

WIRELESS: 8% (7)
Growth annually: +22%

Market shares of industrial networks
Source: HMS Networks, 2023

SPE AS A NEW ETHERNET STANDARD
FOR END-TO-END CONNECTIONS UP TO THE FIELD LEVEL

Single-Pair Ethernet (SPE) is an Ethernet standard for data transmission over a single pair of wires (2-wire Ethernet). It is perfect for integrating intelligent sensors, RFID systems or high-resolution cameras into the existing industrial IP network.

When developing new industry standards, Datwyler and partners rely on innovative Single-Pair Ethernet technology. Single-Pair Ethernet enables a consistent and economical connection of a large number of end devices in the Industrial IoT, from sensors in the field to the cloud.

Single Pair Ethernet
System Alliance

OUR SOLUTIONS
FOR A CONSISTENT
NETWORK INFRASTRUCTURE
FROM THE SENSOR TO THE CLOUD

TECHNOLOGIES

Fibre optic technology
Complete fibre optic solutions (FTTx) for the transmission of large amounts of data over long distances, including for building access, for vertical cabling in the building and connectivity within the data centre.

Copper data technology
Ethernet copper cabling solutions for horizontal and structured cabling of workstations in the office area (also for increased fire safety requirements).

Industrial Ethernet
Industrial-Ethernet-Lösungen für die durchgängige Konnektivität innerhalb der industriellen Fertigung (auch für Echtzeitanforderungen).

SPE
Single-Pair Ethernet copper solutions for connectivity up to the sensor (will largely replace the proprietary fieldbus systems in the near future).

Wireless technology
Because more and more mobile devices are finding their way into your factory floor and new machines with integrated radio technology are being installed in existing plants.

APPLICATIONS

1

IT/OT infrastructure
Structured building cabling
Campus/FTTx
DATWYLER IT Infra's building or office network connects computers, servers and systems with each other and with the Internet.

The Ethernet cables and Ethernet patch cables used in these applications often need to be halogen-free, flame retardant and CPR compliant so that they do not endanger human life in the event of a fire in the building. DATWYLER fibre optic cables ensure high data transmission speeds between the buildings.
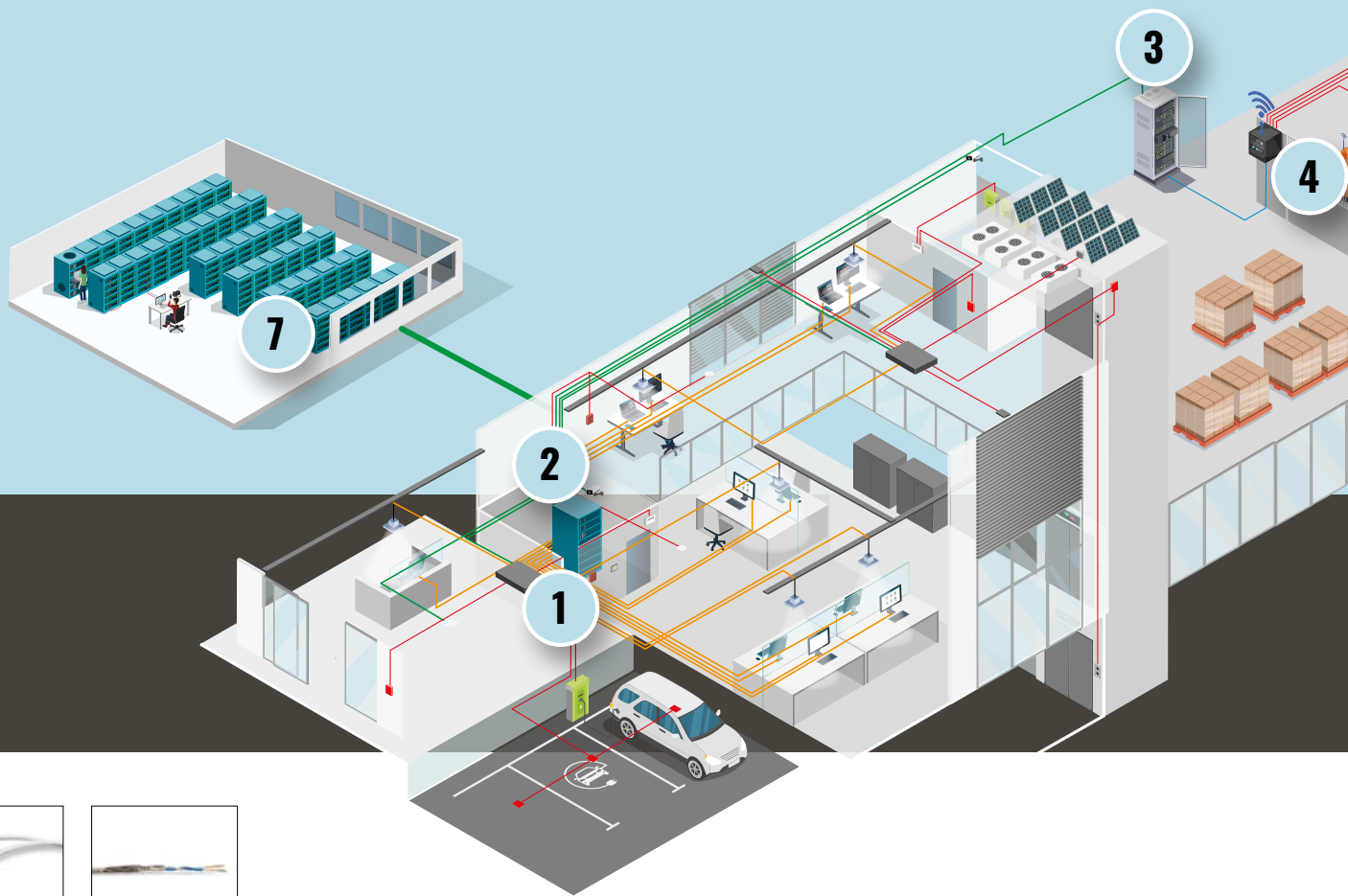
2

Main cabinet (data centre)
The main cabinet (SMDC) is the central control unit of the entire system. It connects the office level and the individual machine control cabinets in production – with each other and with the underlying IT/OT network infrastructure.
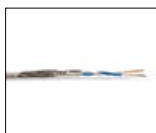
DATWYLER offers you complete solutions. This includes all products that you want to bring into your data centre. To ensure that the right infrastructure equipment is available, we design the systems and their performance to meet your requirements.
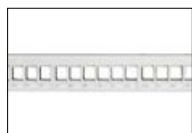
**Smart Modular
Data Centre (SMDC)**

**SPE patch cords,
61171-1, shielded**

**Copper data cable
CU SPE 1P**

Patch panel, 24x

Cat.6$_A$ module/jack

AP/UP/UP-K faceplates and outlets

RJ45 patch cords, Cat.6$_A$

**Copper data cable, Cat.7
and Cat.6$_A$, shielded**

**FTTH outlet,
AP 80 x 80**

Consolidation point box

4 Industrial Ethernet connectivity in the machine control and in the control cabinet
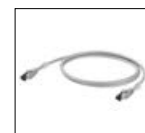
The first component is usually the machine control or the PLC. DATWYLER IT Infra's Ethernet cables (available by the metre) can be inserted into the cabinet and terminated with field-mountable RJ45 data connectors. Pre-assembled DATWYLER patch cables (with RJ45 plugs) are available for connecting the PLC as well as the decentralised I/O system, HMI, WLAN and routers. For components that are located inside the control cabinet, they are designed with protection class IP20.

3 Edge data centre

DATWYLER's Smart Modular Data Centre (SMDC) provides real-time data processing right where (or near where) the data is generated.

**FO Outdoor
wbGGT HP / A-DQ(ZN)B2Y**

**FO Universal
wbGGFR / U-DQ(ZN)BH**

Splice box OV-E

HD-DCS MTP module

**HD-DCS panel,
modular, 19"/1U**

**DCS patch cord
LCDU/PC - LCDU/PC**

**RJ45 plug, IP20,
Cat.6**

**RJ45 patch cord, IP67,
Cat.6$_A$**

**RJ45 patch cord, IP20,
Cat.6$_A$**

**Sensor-actuator active
distributor, IP67**

**IoT gateway,
Fast Ethernet, IP20**

**Security/NAT/VPN/
U link router**
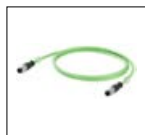
5

6

5

Industrial Ethernet connectivity up to the field level (sensor)

There are various applications for Ethernet communication in modern machinery. In most cases it involves communication between the machine control and sensors/actuators.

Robotic applications are being used more and more frequently in modern industrial factories. This application has very specific requirements for the Ethernet network. Among other things, the Ethernet cables must withstand mechanical stress.

CU 7002 4P Industrial PUR

PROFINET, M12 D code, IP67

M12 X type, IP67

Plug, assembled, M12, IDC, Cat.6$_A$

RJ45 IDC plug, Cat.5, ISO/IEC 11801, 4-wire

Field attachable plug, M12

CU 7702 4P flex Industrial PUR UL

CU 7727 4P flex Industrial FRNC UL

Network switch, unmanaged, Fast Ethernet

CU SPE 1P flex Industrial PUR UL

CU SPE 1P flex Industrial FRNC UL

SPE patch cord, IEC 63171-2, IP20

SPE patch cord, M8, IEC63171-5, IP67

SPE service interface

Adapter, SPE jack according to IEC 63171-2

SPE rail outlet

Field attachable SPE plug acc. to IEC 63171-2

WiFi omnidirectional antenna, up to WiFi 6 and 6E, IEEE802.11ax

Wireless access point/client, IEEE 802.11

6

Wireless communication solutions

DATWYLER offers you seamless complete solutions for wireless networks. We will help you assess your existing network and implement a tailored, cost-effective and high-performance 5G/Wi-Fi solution.

7

Hybrid Cloud solutions

Hybrid Cloud solutions give you the flexibility and efficiency to make the most of your IT resources by combining the advantages of Public Cloud and Private Cloud.

OUR SERVICE PORTFOLIO:

DATWYLER IT Infra offers you complete solutions for your IT and OT infrastructure including software and services.

We ensure secure data communication right down to the industrial field level.

We would be happy to take over project management for you or act as general contractor and your single point of contact for the construction of a (turnkey) infrastructure solution.

Health Check
Passive infrastructure check

Our Health Check is a global service designed to prevent problems in your data centre. European DATWYLER customers can supplement it with a Security Check that covers the entire network environment. This allows you to anticipate relevant vulnerabilities, security risks and failures and ensure the reliable operation and availability of your critical applications.

With the Data Centre Health Check you receive an initial basic inventory and assessment of your existing data centre IT infrastructure and the associated components. It includes a checking for conformity with current standards (compliance) as well as identifying general risks and specific problem areas. Our certified specialists will provide you with recommendations to improve your data centre environment.

Security Check
IT and OT infrastructure check

During the security check for your IT and OT network environment, which we currently only offer for European customers, DATWYLER's experts carry out a comprehensive analysis of your network architecture.

This assessment will identify application vulnerabilities, potential threats (from malware or botnets), and devices that pose a security risk. We also suggest customised solutions to improve the security and performance of your network.

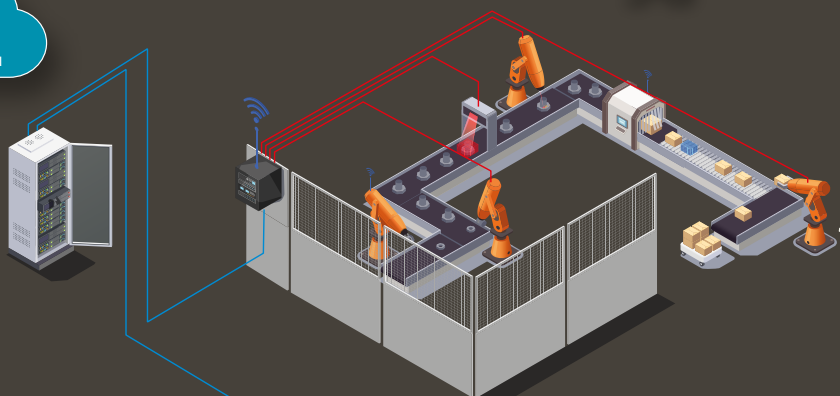## Professional Services
from design to maintenance

The DATWYLER range of services for data centre infrastructures and data networks includes all technical and site-related measures that ensure successful design and project implementation as well as professional maintenance.

It ranges from design and consulting through financing and leasing, implementation and commissioning to maintenance and repair.

With services such as Managed Networks and Managed Monitoring, we help European organisations focus on their core competencies.

For managed networks we offer you standardised packages for up to 25 or 75 employees. There are also individual solutions. The services include the planning, implementation and administration of the network and ensure that everything runs smoothly. This includes monitoring services and network security solutions to protect against cyberattacks.

With Managed Monitoring or Monitoring-as-a-Service, you can have the IT infrastructure in your company monitored around the clock. Problems are identified before they can lead to disruptions. Detailed reports help you optimise your IT infrastructure.

Private Cloud

5G

ITinfra.datwyler.com

DATWYLER