Transforming customer wishes into concrete solutions

The HARTING Technology Group is skilled in the fields of electrical, electronic and optical connection, transmission and networking, as well as in manufacturing, mechatronics and software creation. The Group uses these skills to develop customized solutions and products such as connectors for energy and data transmission applications including, for example, mechanical engineering, rail technology, wind energy plants, factory automation and the telecommunications sector. In addition, HARTING also produces electro-magnetic components for the automobile industry and offers solutions in the field of Enclosures and Shop Systems.
The HARTING Group currently comprises 32 subsidiary companies and worldwide distributors employing a total of approximately 3,000 staff.

HARTING Subsidiary company HARTING Representatives

We aspire to top performance.

Connectors ensure functionality. As core elements of electrical and optical wiring, connection and infrastructure technologies, they are essential in enabling the modular construction of devices, machines and systems across a very wide range of industrial applications. Their reliability is a crucial factor guaranteeing smooth functioning in the manufacturing area, in telecommunications, applications in medical technology – in fact, connectors are at work in virtually every conceivable application area. Thanks to the consistent further development of our technologies, customers enjoy investment security and benefit from durable, long term functionality.

Always at hand, wherever our customers may be.

Increasing industrialization is creating growing markets characterized by widely diverging demands and requirements. The search for perfection, increasingly efficient processes and reliable technologies is a common factor in all sectors across the globe.

HARTING is providing these technologies – in Europe, America and Asia. The HARTING professionals at our international subsidiaries engage in close, partnership based interaction with our customers, right from the very early product development phases, in order to realize customer demands and requirements in the best possible manner.

Our people on location form the interface to the centrally coordinated development and production departments. In this way, our customers can rely on consistently high, superior product quality – worldwide.

Our claim: pushing performance.

HARTING provides more than optimally attuned components. In order to serve our customers with the best possible solutions, HARTING is able to contribute a great deal more and play a closely integrative role in the value creation process.

From ready assembled cables through to control racks or ready-to-go control desks: Our aim is to generate the maximum benefits for our customers – without compromise!

Quality creates reliability – and warrants trust.

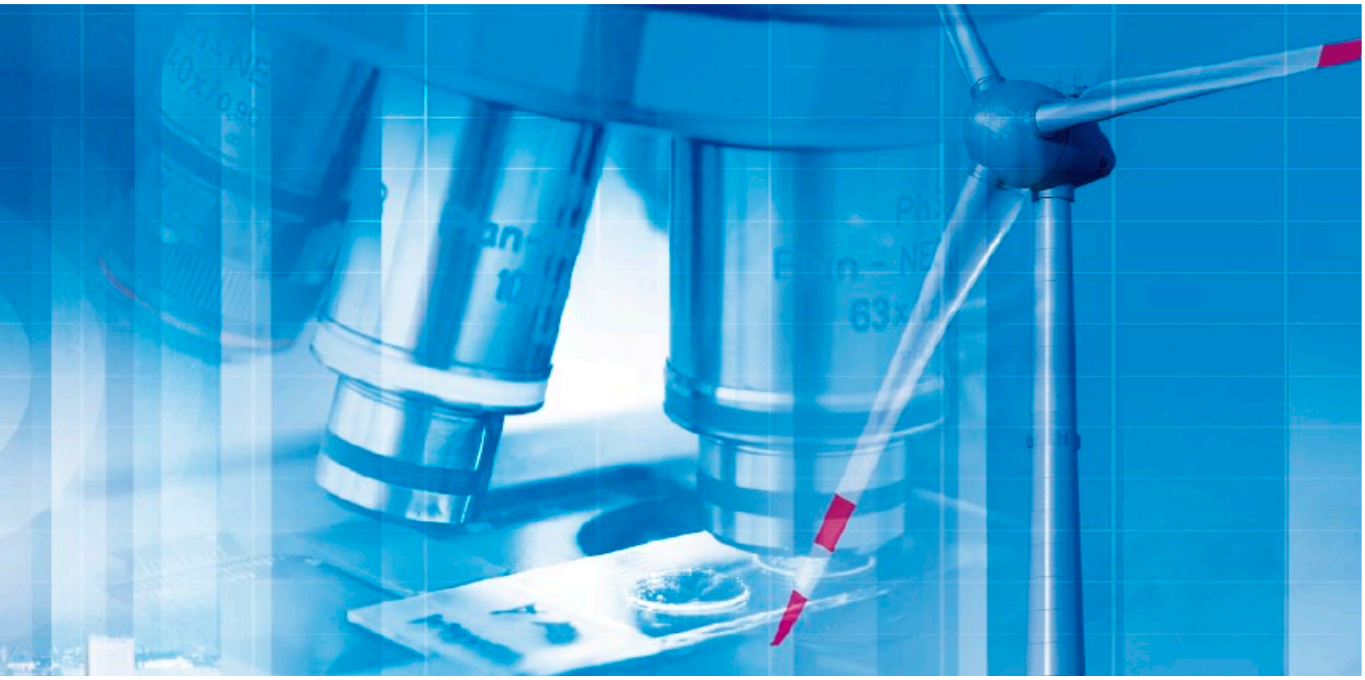
The HARTING brand stands for superior quality and reliability – worldwide. The standards we set are the result of consistent, stringent quality management that is subject to regular certifications and audits.

EN ISO 9001, the EU Eco-Audit and ISO 14001:2004 are key elements here. We take a proactive stance to new requirements, which is why HARTING ranks among the first companies worldwide to have obtained the new IRIS quality certificate for rail vehicles.

HARTING technology creates added value for customers.
Technologies by **HARTING** are at work worldwide. **HARTING**'s presence stands for smoothly functioning systems, powered by intelligent connectors, smart infrastructure solutions and mature network systems. In the course of many years of close, trust-based cooperation with its customers, the **HARTING** Technology Group has advanced to one of the worldwide leading specialists for connector technology. Extending beyond the basic functionalities demanded, we offer individual customers specific and innovative solutions. These tailored solutions deliver sustained effects, provide investment security and enable customers to achieve strong added value.

Opting for HARTING opens up an innovative, complex world of concepts and ideas.
In order to develop connectivity and network solutions serving an exceptionally wide range of connector applications and task scopes in a professional and cost optimized manner, **HARTING** not only commands the full array of conventional tools and basic technologies. Over and beyond these capabilities, **HARTING** is constantly harnessing and refining its broad base of knowledge and experience to create new solutions that ensure continuity at the same time. In securing this know-how lead, **HARTING** draws on a wealth of sources from both in-house research and the world of applications alike.
Salient examples of these sources of innovative knowledge include microstructure technologies, 3D design and construction technology, as well as high temperature or ultrahigh frequency applications that are finding use in telecommunications or automation networks, in the automotive industry, or in industrial sensor and actuator applications, RFID and wireless technologies, in addition to packaging and housing made of plastics, aluminum or stainless steel.

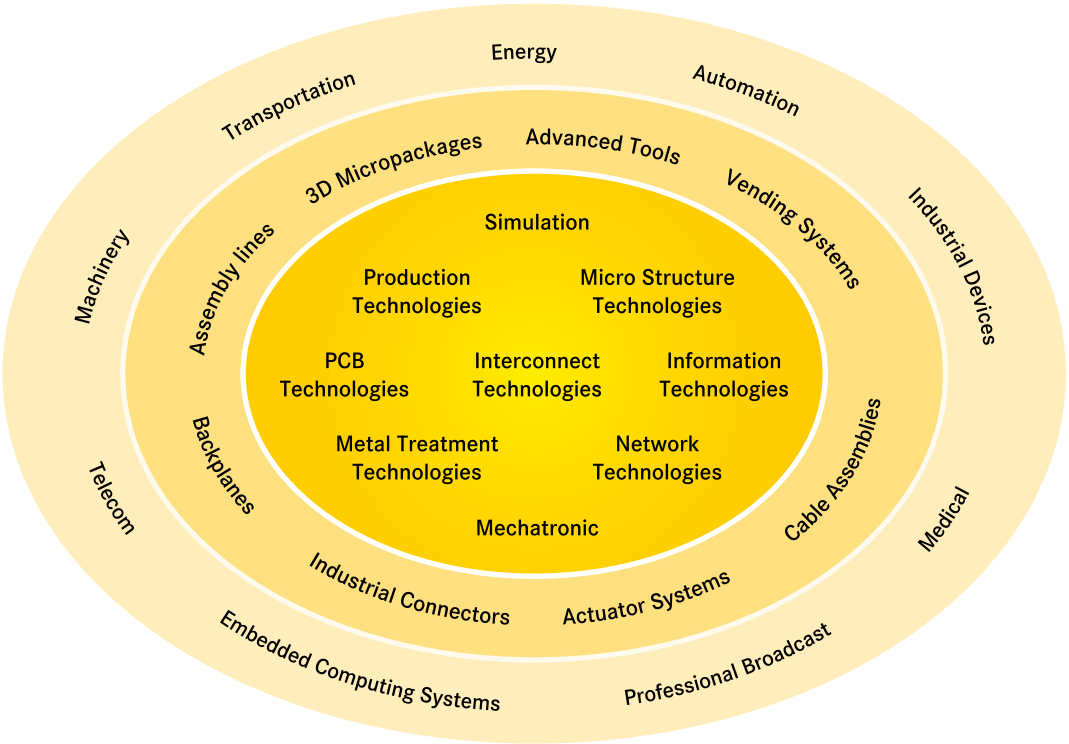
HARTING solutions extend across technology boundaries.
Drawing on the comprehensive resources of the group's technology pool, **HARTING** devises practical solutions for its customers. Whether this involves industrial networks for manufacturing automation, or hybrid interface solutions for wireless telecommunication infrastructures, 3D circuit carriers with microstructures, or cable assemblies for high-temperature applications in the automotive industry – **HARTING** technologies offer far more than components, and represent mature, comprehensive solutions attuned to individual customer requirements and wishes. The range covers ready-to-use cable configurations, completely assembled backplanes and board system carriers, as well as fully wired and tested control panels.
In order to ensure the future proof design of RF- and EMC-compatible interface solutions, the central **HARTING** laboratory (certified to EN 45001) provides simulation tools, as well as experimental, testing and diagnostics facilities all the way through to scanning electron microscopes. In the selection of materials and processes, lifecycle and environmental aspects play a key role, in addition to product and process capability considerations.



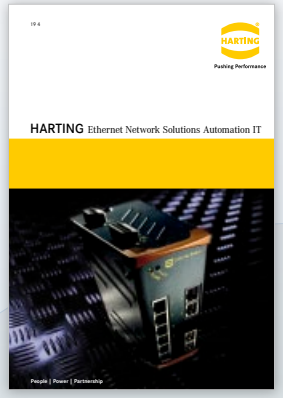
HARTING knowledge is practical know-how generating synergy effects.

HARTING commands decades of experience with regard to the applications conditions of connectors in telecommunications, computer and network technologies and medical technologies, as well as industrial automation technologies, such as the mechanical engineering and plant engineering areas, in addition to the power generation industry or the transportation sector. **HARTING** is highly conversant with the specific application areas in all of these technology fields.

The key focus is on applications in every solution approach. In this context, uncompromising, superior quality is our hallmark. Every new solution found will invariably flow back into the **HARTING** technology pool, thereby enriching our resources. And every new solution we go on to create will draw on this wealth of resources in order to optimize each and every individual solution. In this way, **HARTING** is synergy in action.



Automation IT



ETHERNET NETWORK SOLUTIONS

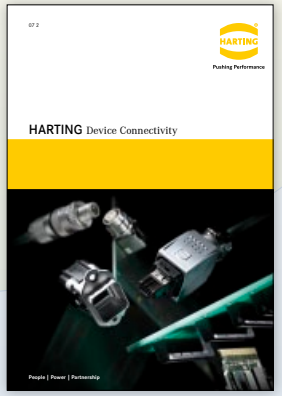
The Automation IT catalogue offers a consistent range of Ethernet network components and cabling products, which form the communication platform of convergent Automation IT networks. The performance of network components opens up access to a wide range of applications for industrial buildings, manufacturing plants and machines in industrial environments.

Installation Connectivity

INDUSTRIAL CONNECTORS Han®

This catalogue documents the worldwide standard for industrial connectors. Han® connectors represent the preferential solution in the cable-to-cable interconnection of data, signal and power applications operating under the most demanding conditions and meeting stringent requirements with regard to safe and detachable electrical connections with high degree of protection IP 65 / IP 67. Installations making use of Han® connectors impress with their rugged design, convenient handling and modularity of data, signal and power connections. Han® connectors represent the worldwide standard in industry, railway technology, as well as in power generation and distribution.

Device Connectivity



DEVICE CONNECTIVITY

The DeviceCon catalogue provides a universal, innovative product portfolio of PCB connections and of termination technology. The product range comprises board-to-board and cable-to-board connectors for industrial electronic devices with degree of protection IP 20 to IP 65 / IP 67. These **HARTING** solutions offer appropriate device connectivity for a wide range of devices, ranging from sensors to industrial computers and their respective data, signal and power interfaces.

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AUTOMATION IT

Automation IT is the universal communication platform that delivers extraordinary efficiency encrease within the overall process of industrial companies.

Standardized Ethernet technology is replacing universality in communication. In addition to communication, Automation IT also requires an adapted installation concept in all areas of a given company. In addressing the Automation IT challenges, the HARTING Technology Group is creating and providing the appropriate solutions. Meeting all the essential aims and objectives, HARTING has established a comprehensive, consistent solution comprising Ethernet network components and cabling for industrial buildings and industrial facilities, systems and machines.

Meeting all of the end customers' needs in an optimal manner is decisive for long-term success of today's companies. This extends from order placement to manufacturing, and from product delivery all the way through to after sales and support.

Quality, costs and especially speed are the determining success factors that secure a company's growth. In order to build up process optimized manufacturing, development and marketing, companies need solutions by application specialists that can be integrated to an open network.

According to the Automation IT concept, a network is defined to act as a platform for all applications of an industrial company. This universal communication platform for all applications will overcome the previous perception of delimited communication worlds and tear down existing communication barriers between applications.

In this way, the entire process of development, manufacturing and marketing can be shaped and designed in a more efficient manner, as the competitive strength of companies can only be secured by optimized processes.

THE AUTOMATION IT COMMUNICATION PLATFORM

Ethernet is the link between strategic necessities and actual networks, as today's Ethernet can be used for all Office IT applications as well as applications from the automation environment.

Seamless communication takes center stage in these concepts. And only Ethernet compatible systems are able to offer this seamless consistency. Originally, standard Ethernet was only developed for processes from the Office IT environment. Automation IT, however, factors in the justified automation demands for deterministic and real-time functionalities. Profiles such as PROFINET and Ethernet/IP have been created for the automation environment that extend the reach of Ethernet directly to intelligent sensor and actuator devices and technologies. These IEEE 802.3 compatible and internationally standardized profiles can be deployed on the Automation IT platform.

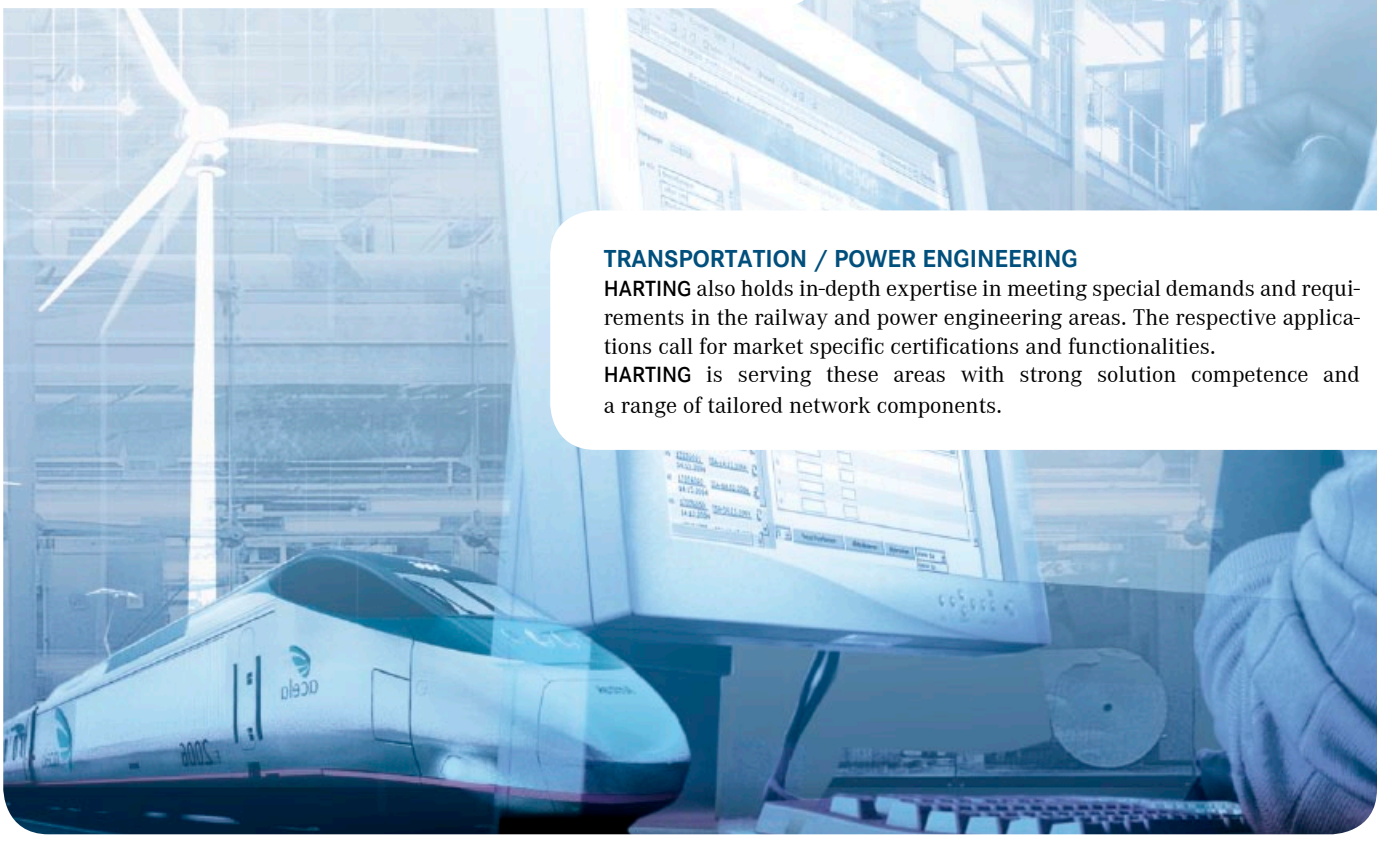
The utilization of standard IEEE 802.3 Ethernet technology is important, as this technology is under permanent advancement. Consequently, this technology is providing performance for today's as well as future's applications, asssuring optimal investment security.

The HARTING Technology Group connects networks and integrates applications in demanding industrial environments. Therefore, the Selection Guide was developed as a simple tool facilitating the selection of the right components.

Ethernet/IP is an Ethernet profile of the ODVA and is part of the **IEC 61 158** standard

PROFINET is an Ethernet profile of the PNO and is part of the **IEC 61 158** standard

Ethernet

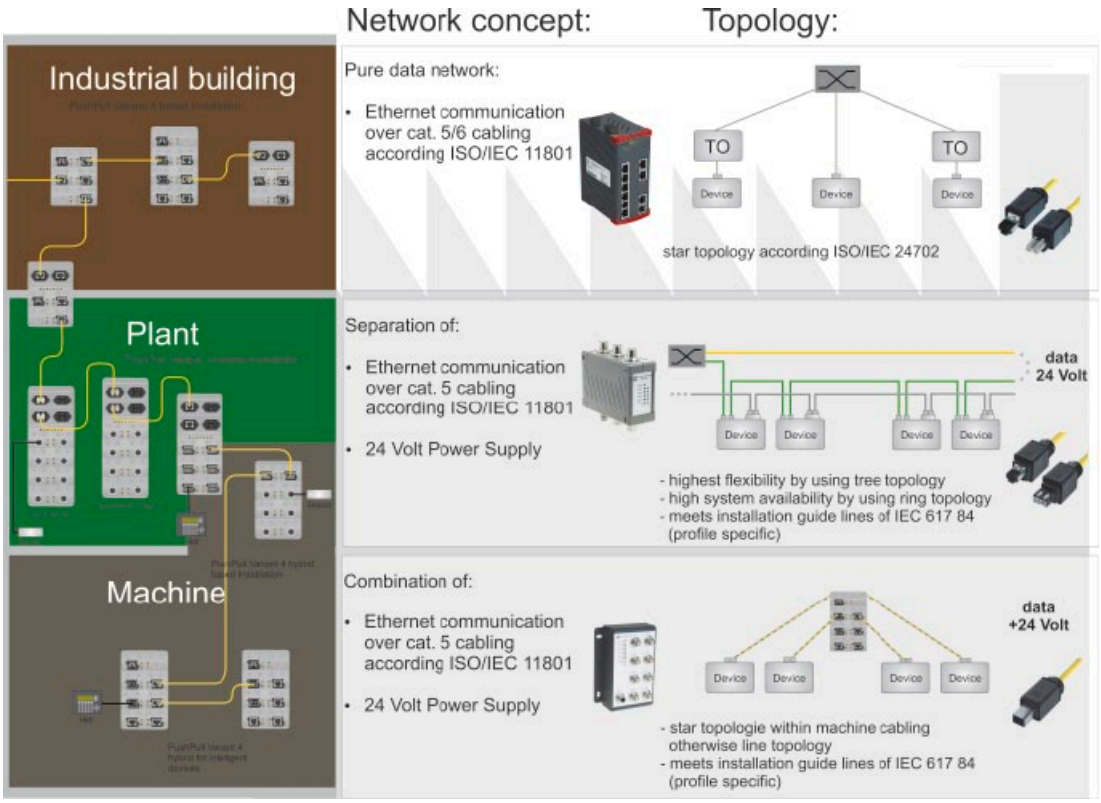


TRANSPORTATION / POWER ENGINEERING

HARTING also holds in-depth expertise in meeting special demands and requirements in the railway and power engineering areas. The respective applications call for market specific certifications and functionalities.
HARTING is serving these areas with strong solution competence and a range of tailored network components.

CONCEPTS OF AUTOMATION IT

In the machine and plant environment, the Ethernet network components and cabling merge to a functional unit. The network is adapted to the building environment, the plant facilities and machines without losing its platform character in terms of communication functionalities. This is reflected, for example, by the utilization of IP 67 components or the support of special topologies such as line or ring topologies.



Ethernet network components:

INDUSTRIAL BUILDINGS

In industrial buildings the functionalities demanded of network components are virtually identical with the office environment. SNMP based management simplifies the administration of a consistent communication platform. **HARTING** network components will withstand an extended ambient temperature range and can be installed on mounting rails, thereby adjusting to the demands of harsh industrial environments. Moreover, the mCon range features appropriate performance in connection with complete SNMP and web-based management.

PLANT FACILITIES / MACHINES

The installation of plant facilities and machines is usually profile specific, and calls for the profile specific execution of Ethernet network components. In this area, **HARTING** offers network components with the right device interfaces and functionalities attuned to automation requirements.

Ethernet cabling:

INDUSTRIAL BUILDINGS

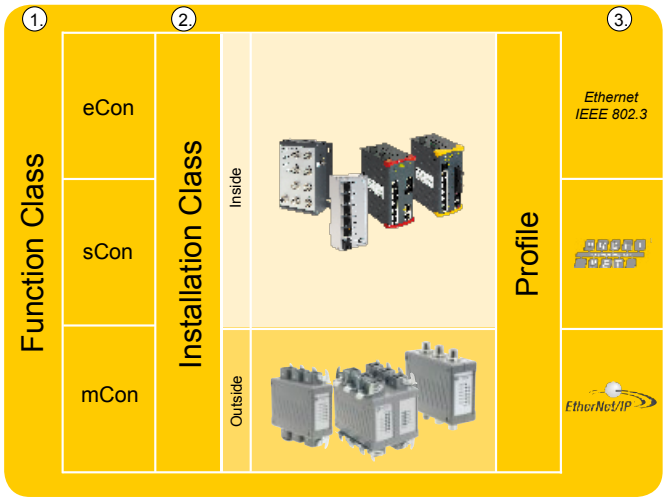
Generic IEC 11 801 cabling is widely established as an office standard. This cabling represents a tailored technology for Ethernet applications.
The IEC 11 801 component categories are referenced in all industrial standards. The extensive approximation and adaptation to the industrial environment was created by the development of IEC 24 702, which was published at the end of 2006. This standard has been issued as DIN EN 50 173-3.
These elements represent the central organise system of Ethernet data technology in industrial buildings. **HARTING** is fielding an extensive portfolio of IP 30 and IP 67 connectors, outlets and system cables.

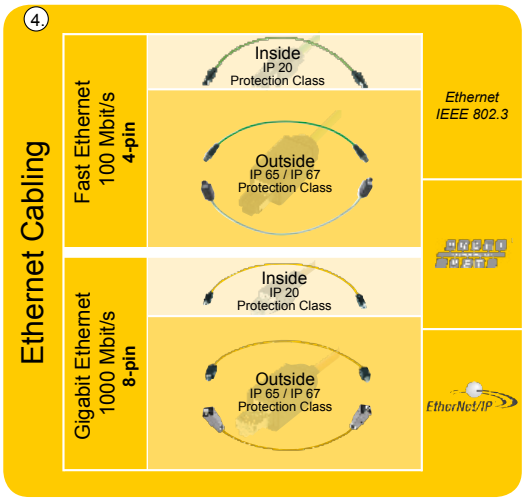
PLANT FACILITIES / MACHINES

Regarding the adaptation and attunement to plant facilities and machinery, a relevant standard exists that will be passed in the near future, namely IEC 61 918. **HARTING** is already factoring in the Ethernet/IP and PROFINET automation profiles that entail particular specifications for cabling. Here, connectors, wall ducts, outlets and system cables have been realized that feature with connector technologies that can be assembled, terminated and installed easily on location.

THE SELECTION GUIDE

Selection Guide is a consistent, uniform tool enabling the comprehensive planning of entire networks for industrial buildings, plant facilities and machines. Simple selection rules for the entire infrastructure provide support in building up a seamless Automation IT network. In view of the fact that the optimal attunement of network components and cabling is essential, the Selection Guide addresses both sides.





①

The **Functional Class** of the active network components is derived from their application. Whatever your need, with the eCon, sCon and mCon, HARTING covers the complete spectrum of industrial applications.

Function Classes

eCon Basic Functions
- EMC, temperature range and mechanical stability for the toughest demands
- Ethernet Switch according to IEEE 802.3
- Ethernet (10 Mbit/s) and Fast Ethernet (100 MBit/s), Gigabit Ethernet (1000 Mbit/s)
- Store and Forward Switching Mode
- Auto-negotiation / Auto-crossing / Auto-polarity
- Up to 10 Ports (10 TX, 8 TX and 2 FX, 6 TX and 2 FX)

sCon Configurable Functions
- Individually configurable via USB port
- Parallel-redundancy, Ring-redundancy
- Power-off configuration
- + Basic functions

mCon Management Functions
- Management Services (IGMP Snooping, QoS, VLAN, RSTP, 802.1...)
- Web Management
- SNMP Management
- + Basic functions

Network components can operate as simple star-couplers as in the eCon range, or take over the more complex tasks of active segment administration embodied by the mCon range.

②

In the second step, the **Installation Class** appropriate to the Installation Concept is selected. If, for example, your network components are located in a switch cabinet, then the *Inside* installation class is the right one for you. All HARTING network components are true industrial products, with such well thought-out default properties that they master the toughest environments.

Inside		2000 3000 4000 9000	The creation of a star-topology network within a cabinet, whose clients are also in the same cabinet.
Outside		7000	On-site creation of a star-topology network, most of whose devices are designed to a high protection class. The low number of ports also allow the implentation of simple line-topologies.

③

With the **Profile** you select whether special automation-specific functions, such as those required by PROFINET, are integrated into the network components. HARTING products can be put into Standard Ethernet, PROFINET and EtherNet/IP environments.

Structured cabling follows the particular application, since the determination of network components and other active devices decide the constraints on the cabling – for example, the selection of connectors.

④

The **Network Cabling** results from the simple connection of network clients. There are complete cable sets available as well as cables and connectors that can be made up on site.

Products are also available for transitional areas like cabinet walls or between two different installation lines.

With the help of the selection guide, you can follow an easy path to a seamless and secure network solution.

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Ethernet Netwo

Function Class		Installation Class				
Ha-VIS eCon unmanaged	Plug & Play Store and Forward Switching Mode Non-Blocking Auto-negotiation Auto-polarity Auto-crossing	Inside IP 30 Degree of protection	**Ha-VIS eCon 2000** - 3/4/5/16 copper ports (RJ45) - Robust metal housing - Top-Hat rail mount - Optimum installation depth		 **eCon 2030-A** 3 RJ45	 eCon 4 RJ4
		Inside IP 30 Degree of protection	**Ha-VIS eCon 3000** - 1/6/8/10 copper ports with optional 1/2 F.O. ports - Robust metal housing - Top-Hat Rail mount - Narrow form factor	without FO	 **eCon 3080-A/-A2/-A4** 8 RJ45 also available with: - with narrowest housing (-A2) - extended temperature range (-A4)  **eCon 3080 -A1** 8 RJ45	E
		Inside IP 30 / IP 40 Degree of protection	**Ha-VIS eCon 4000** - 8 copper ports (M12 D-coding) - Robust metal housing - EMC, temperature range and mechanical stability meet the highest requirements		 **eCon 4080-B1** 8 M12 D-coding	
		Outside IP 65 / IP 67 Degree of protection	**Ha-VIS eCon 7000** - 5/10 copper ports (Han® 3 A RJ45 or M12 D-coding) - Robust die-cast zinc housing - EMC, temperature range and mechanical stability meet the highest requirements	5 Port	 **eCon 7050-A1** 5 Han® 3 A RJ45 wide power input range	
Ha-VIS sCon configurable	via USB interface configurable through a graphic user interface	Inside IP 30 Degree of protection	**Ha-VIS sCon 3000** - 6/8/10 copper ports (RJ45) and optionally 1/2/3 F.O. ports (SC/ST) - Robust metal housing - Parallel-/ ring-redundancy - Top-Hat rail mounting - Potential-free alarm contact	without F.O.	 **sCon 3100-A** 10 RJ45	
Fast Track Switching	Webinterface SNMP (v1, v2c, v3) User Management LLDP	Inside IP 30 Degree of protection	**Ha-VIS FTS 3000** - 6/8/10 copper ports (RJ45) and optionally 2 SFP modules - Robust metal housing - Top-Hat rail mounting - Web-management - Fast Track Switching Technology	configurable	 **FTS 3100s-A** 10 RJ45	
Ha-VIS mCon managed	Quality of Service VLAN support Rapid Spanning Tree 802.1X RADIUS Client IP authorize manager Link Aggregation IGMP Snooping (v1, v2, v3) with querier DHCP Client DHCP Option 82 SNTP Alarms via Email SNMP Traps Port diagnostic	Inside IP 30 Degree of protection	**Ha-VIS mCon 3000** - 6/8/10 copper ports (RJ45) and optionally 1/2/3 F.O. ports (SC/ST) - Robust metal housing - Top-Hat rail mounting - Web management - Potential-free alarm contact	without FO	 **mCon 3100-AV** 10 RJ45  **mCon 31** 10 RJ45 2 RJ45 Gig	
		Inside IP 30 / IP 40 Degree of protection	**Ha-VIS mCon 4000** - 8 copper ports (M12 D-coding) - Robust metal housing - EMC, temperature range and mechanical stability meet the highest requirements - Web management		 **mCon 4080-B1V** 8 M12 D-Coding	
		Outside IP 65 / IP 67 Degree of protection	**Ha-VIS mCon 7000** - 5/10 copper ports (Han® 3 A RJ45 or M12 D-coding) - Robust die-cast zinc housing - EMC, temperature range and mechanical stability meet the highest requirements - Web management	5 Port	 **mCon 7050-B1V** 5 M12 D-Coding wide power input range	
Ha-VIS pCon	Industrial Power Supply 24 V/48 V	Inside IP 20 / IP 65 Degree of protection	**Ha-VIS pCon 2000** - Worldwide application through wide input voltage range: 110 ... 240 V AC - Operating temperature: -25 °C ... +70 °C without derating - Fast installation without tools due to cage clamps - Active PFC		 **pCon 2035-24** Output: 24 V / 1.4 A (35 W)	 **pCon 2** Output: 24 V / 2 **pCon 2** Output: 48 V / 1

ork Components

Switches

Application

n 2040-A
5

eCon 2050-A
5 RJ45

eCon 2050-AA
5 RJ45 Full Gigabit

eCon 2160-A
16 RJ45

Ethernet
IEEE 802.3

eCon 3061-AD
6 RJ45, 1 SC

eCon 3061-AE
6 RJ45, 1 ST

eCon 3062-AD/-AD2/-AF
6 RJ45, 2 SC also available with:
- extended temperature range (-AD2)
- Singlemode (-AF)

eCon 3062-AE
6 RJ45, 2 ST

Converter

eCon 3011-AD
1 RJ45, 1 SC
- 10/100 Mbit/s
- PoE

eCon 3011-ASFP
- 1 RJ45
- 1 SFP module slot
- 10/100 Mbit/s
- PoE

Ethernet
IEEE 802.3

eCon 4080-B3
8 M12 D-coding
110 V DC power input

eCon 4080-BPoE1
8 M12 D-coding
8 Ports PoE

Ha-VIS eCon 9000
- 7 - 8 copper ports M12 D-coding
- Robust metal housing
- 19“ rack mount
- Small form-factor

eCon 9080-B1
8 M12
D-coding

eCon 9070-B
7 M12 D-coding
Power input on the front

Ethernet
IEEE 802.3

eCon 7050- B1
5 M12 D-coding
wide power input range

10 Port

eCon 7100-B1
10 M12 D-coding

eCon 7100-AA
8 Han® 3 A RJ45
2 Han® 3 A RJ45 Gigabit

Ethernet
IEEE 802.3

sCon 3100-AA
10 RJ45
2 RJ45 Gigabit

F.O.

SC

sCon 3082-AD/-AF
8 RJ45, 2 SC

sCon 3063-AD
6 RJ45, 3 SC

Ethernet
IEEE 802.3

managed

FTS 3100-A
10 RJ45

Ethernet
IEEE 802.3

00-AAV
gabit

FO

SC

mCon 3082-ADV/ AFV
8 RJ45, 2 SC
Multi Mode (ADV)
Single Mode (AFV)

mCon 3063-ADV
6 RJ45, 3 SC

ST

mCon 3082-AEV
8 RJ45, 2 ST

mCon 3063-AEV
6 RJ45, 3 ST

Ethernet
IEEE 802.3

mCon 4080-B3V
8 M12 D-coding
110 V DC power input

mCon 4080-BPoE1V
8 M12 D-coding
8 Ports PoE

Ha-VIS mCon 9000
- 7 - 8 copper ports D-coding
- Robust metal housing
- 19“ rack mount
- Small form-factor

mCon 9080-BV
8 M12
D-coding

mCon 9070-BV
7 M12
D-coding
Power input on the front

Ethernet
IEEE 802.3

10 Port

mCon 7100-B1V
10 M12 D-coding

mCon 7100-AAV
8 Han® 3 A RJ45
2 Han® 3 A RJ45 Gigabit

Ethernet
IEEE 802.3

2060-24
2.5 A (60 W)
2060-48
.25 A (60 W)

pCon 2120-24
Output:
24 V / 5 A (120 W)

pCon 2120-48
Output:
48 V / 2.5 A (120 W)

pCon 20DRM-10A
Redundancy module:
12 ... 48 V / 16 A

Ha-VIS pCon 7000
- DC/DC Converter
- Operating temperature:
- -40 °C ... +70 °C

pCon 7060-110/24
110 V DC / 24 V DC
IP 20 Degree of protection

pCon 7150-110/48
110 V DC / 48 V DC
IP 65 Degree of protection

pCon 7150 DC-24/48
24 V DC / 48 V DC
IP 65 Degree of protection

Notes