

Transforming customer wishes into concrete solutions

Intro-
duction



Headquartered in Espelkamp in East Westphalia, Germany, the HARTING Technology Group develops tailored solutions and products revolving around electrical and electronic connector technologies. These offerings focus on power and data transmission applications, as well as on network solutions. Founded in 1945 in Minden, HARTING is currently employing a workforce of more than 3000 members of staff worldwide.

In today's increasingly knowledge and information shaped societies, the capability to network and integrate with customers and suppliers, as well as technology and business partners is playing the decisive role.

And this applies to national as well as international levels. With 40 Subsidiary companies and Representatives in 27 countries, HARTING is committed to maintaining close proximity to markets and customers. Always at hand on location, HARTING is able to rapidly record market impulses and respond flexibly.



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.

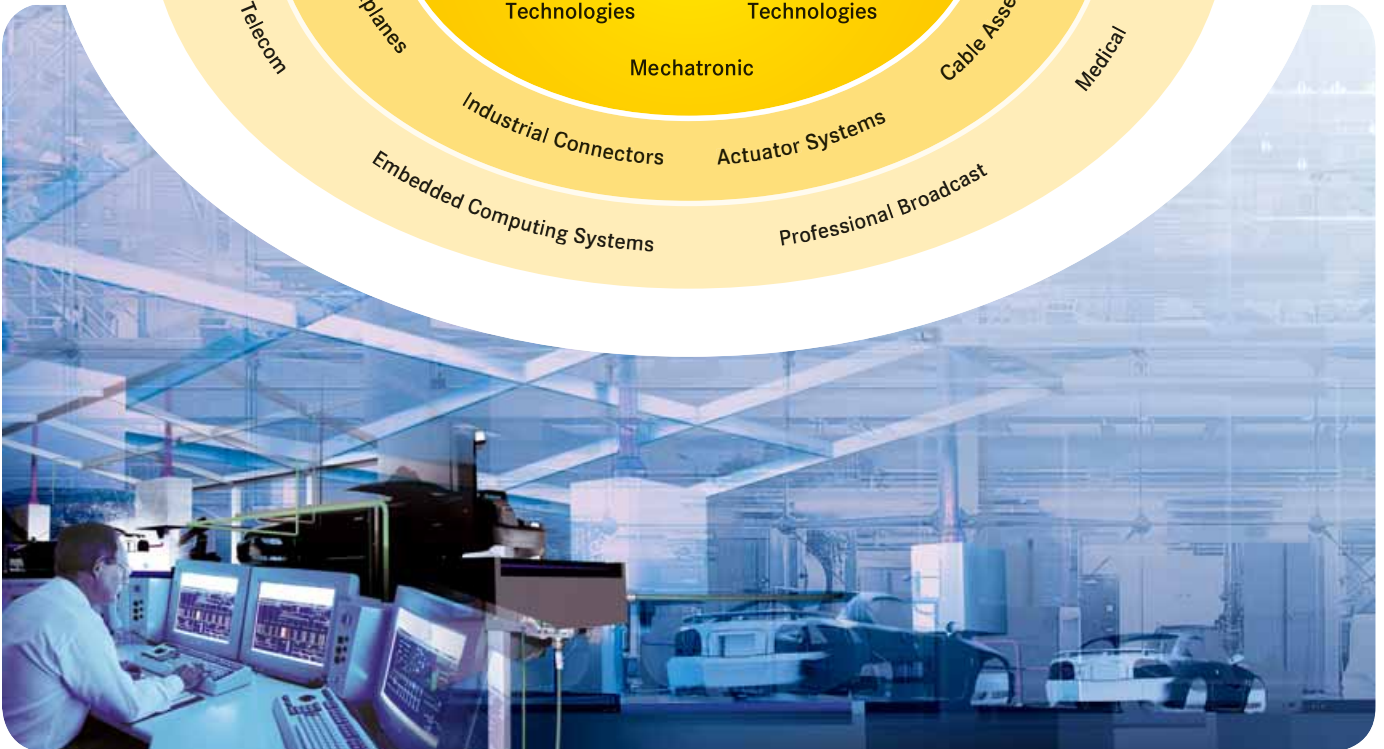
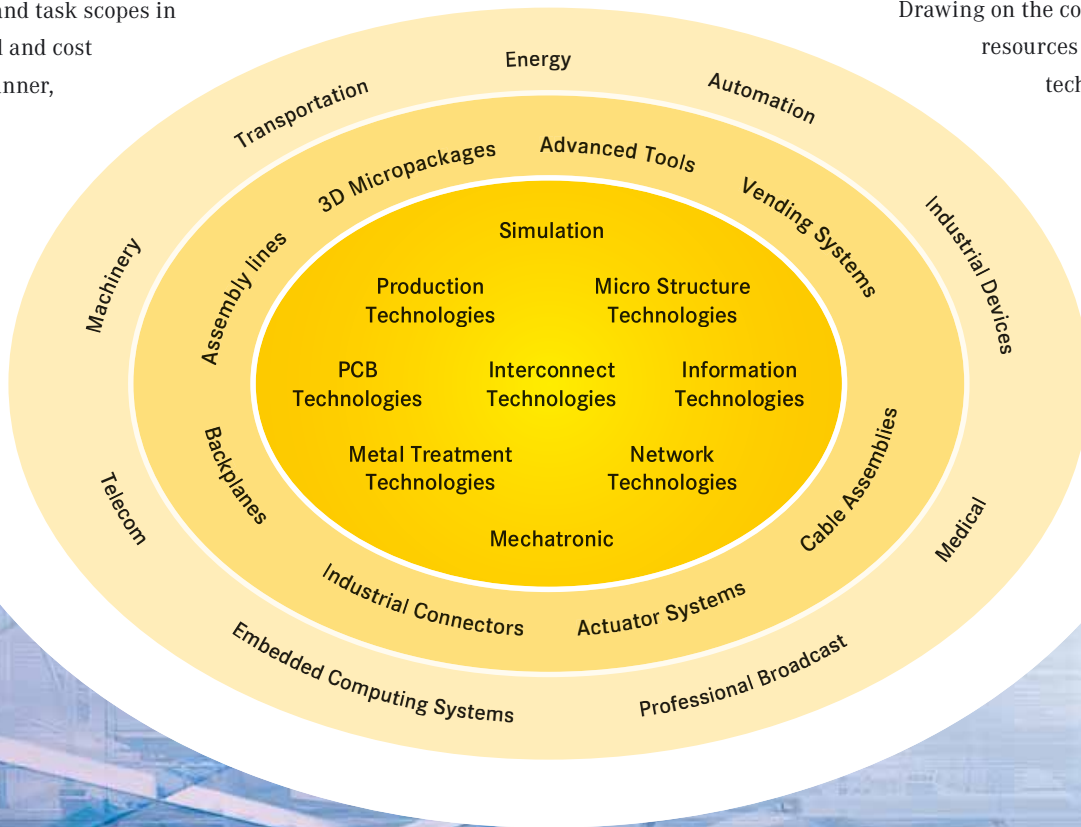
In order to develop connectivity and network solutions serving an exceptionally wide range of connector applications and task scopes in a professional and cost optimized manner, HARTING not only

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



Introduction

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.

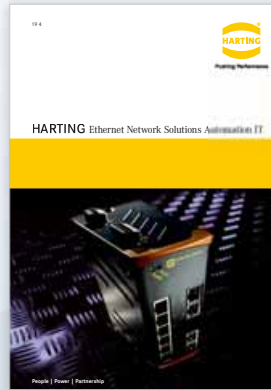
HARTING commands decades of experience with regard to the applications conditions of connectors in telecommunications, computer and network technologies and medical technologies, as well as industrial automation technologies, such as the mechanical engineering and plant engineering areas, in addition 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.

Introduction



Automation IT

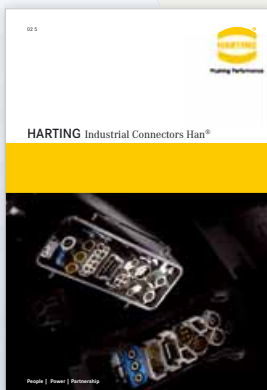


ETHERNET NETWORK SOLUTIONS

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

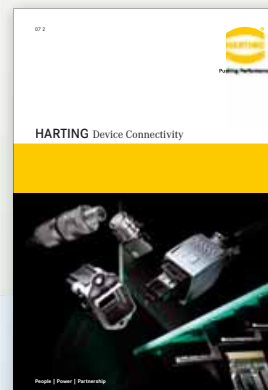


INDUSTRIAL CONNECTORS Han®

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.

CONTENTS **PAGE**

A – Active Ethernet components		A 1
A 1	eCon – Ethernet Switches, unmanaged	A-1 1
	eCon 2000	A-1 3
	eCon 3000	A-1 11
	eCon 4000	A-1 34
	eCon 9000	A-1 37
	eCon 7000	A-1 46
A 2	sCon – Ethernet Switches, configurable	A-2 1
	sCon 3000	A-2 4
A 3	mCon – Ethernet Switches, managed	A-3 1
	mCon 3000	A-3 5
	mCon 4000	A-3 16
	mCon 9000	A-3 19
	mCon 7000	A-3 28
A 4	Accessories	A-4 1
	pCon 7000 – Power supply	A-4 2
	pCon 2000 – Power supply	A-4 6

CONTENTS **PAGE**

B – Ethernet cabling **B 1**

B 1	Cabling, 4 poles	B-1 1
-----	------------------	-------

	Tools	B-1 104
--	-------	---------

B 2	Cabling, 8 poles	B-2 1
-----	------------------	-------

	Tools	B-2 64
--	-------	--------

Z – Appendix

Standards / Approvals	Z 1
-----------------------	-----

List of part numbers	Z 2
----------------------	-----

Catalogue order sheet	Z 8
-----------------------	-----

Addresses	Z 9
-----------	-----

--	--

--	--

--	--

--	--

--	--

--	--

--	--

--	--

--	--

--	--

--	--

AUTOMATION IT

Automation IT is the universal communication platform that delivers extraordinary efficiency increase 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.

Introduction



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, assuring 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 61158 standard

PROFINET is an ethernet profile of the PNO and is part of the IEC 61158 standard

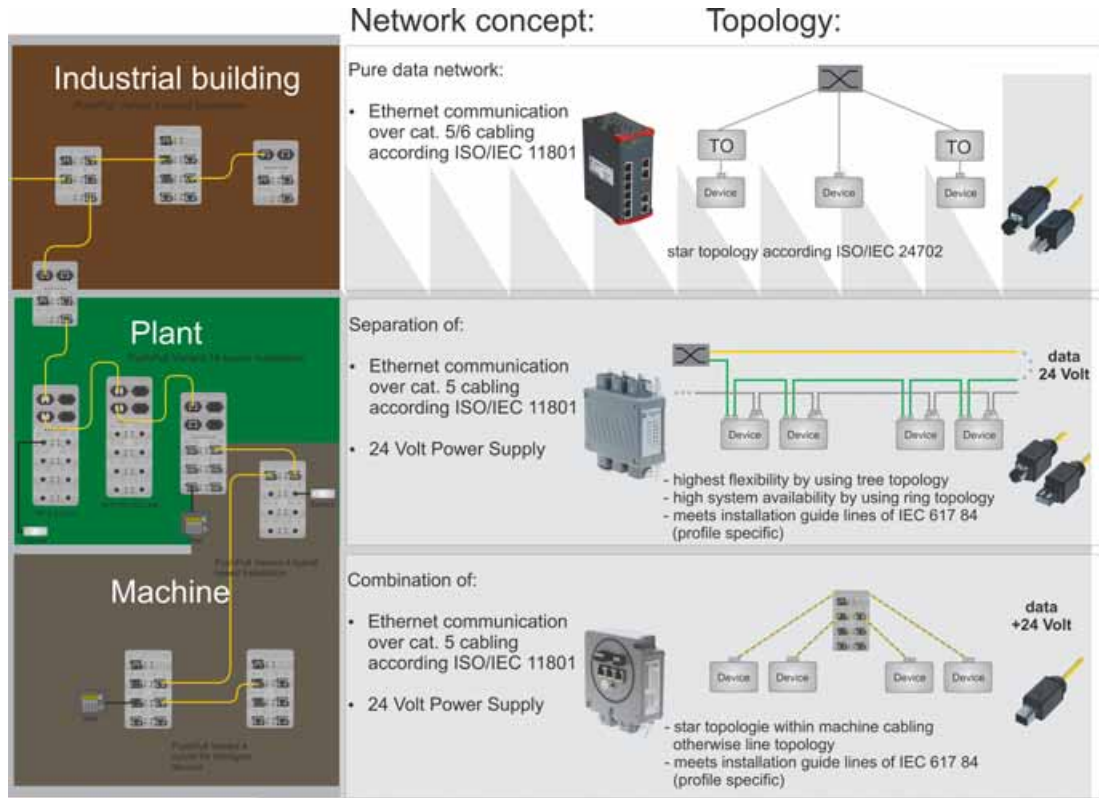
Ethernet

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 11801 cabling is widely established as an office standard. This cabling represents a tailored technology for Ethernet applications.

The IEC 11801 component categories are referenced in all industrial standards. The extensive approximation and adaptation to the industrial environment was created by the development of IEC 24702, which was published at the end of 2006. This standard has been issued as DIN EN 50173-3.

These elements represent the central organisational 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.

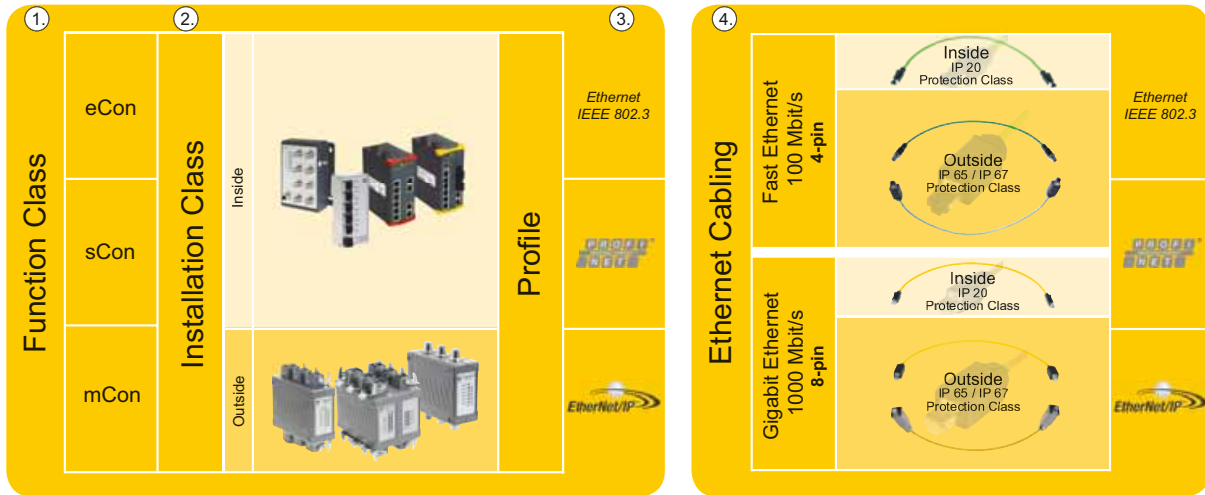
PLANT FACILITIES / MACHINES

Regarding the adaptation and attunement to plant facilities and machinery, a relevant standard exists that will be passed in the near future, namely IEC 61918. 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.

Intro-
duction



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	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> Individually configurable via USB port Parallel-redundancy, Ring-redundancy Power-off configuration + Basic functions
	mCon Management Functions	<ul style="list-style-type: none"> 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	<ul style="list-style-type: none"> 2000 3000 4000 9000 	The creation of a star-topology network within a cabinet, whose clients are also in the same cabinet.
Outside	<ul style="list-style-type: none"> 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 implementation 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.