



Pushing Performance



People | Power | Partnership

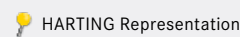
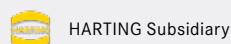
HARTING Smart Network Infrastructure Intelligent Network Solutions

Transforming customer wishes into concrete solutions



The HARTING Technology Group is skilled in the fields of electrical, electronic and optical connection, transmission and networking technology, 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/data-networking 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 housing technology and shop systems.

The HARTING Group currently comprises 51 subsidiary companies and worldwide distributors employing a total of about 4,000 staff.



We aspire to top performance.

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

Wherever our customers are, we're there.

Increasing industrialization is creating growing markets that are characterized by widely diverging demands and requirements. What these markets all share in common is the quest for perfection, increasingly efficient processes and reliable technologies. **HARTING** is providing these technologies – in Europe, the Americas and Asia. In order to implement customer requirements in the best possible manner, the **HARTING** professionals at our international subsidiaries engage in up-close, partnership-based interaction with our customers, right from the very early product development phase.

Our on-site staff 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 offer our customers the best possible solutions, on request **HARTING** contributes a great deal more and is tightly integrated into the value-creation process.

From ready-assembled cables through to control racks or ready-to-go control desks. Our aim is to generate maximum benefit for our customers – with no compromises!

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 towards new requirements, which is why **HARTING** is the first company 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 sophisticated network systems. Over the course of many years of close, trust-based cooperation with its customers, the **HARTING** Technology Group has become one of the leading specialists globally for connector technology. We offer individual customers specific and innovative solutions that go beyond the basic standard functionalities. These tailored solutions deliver sustained results, ensure investment security and enable customers to achieve significant added value.

Opting for HARTING opens up an innovative, complex world of concepts and ideas.

In order to develop and produce connectivity and network solutions serving an exceptionally wide range of connector applications in a professional and cost-effective manner, **HARTING** not only commands the full array of conventional tools and basic technologies. Above and beyond these capabilities, **HARTING** is constantly harnessing and refining its broad base of knowledge and experience to create new solutions that also ensure continuity. To secure its lead in know-how, **HARTING** draws on a wealth of sources from its in-house research and applications.

Salient examples of these sources of innovative knowledge include microstructure technologies, 3D design and connection technology,

high-temperature and ultrahigh-frequency applications that are finding use in telecommunications and 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 and stainless steel.

HARTING overcomes technological limitations.

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 not only components, but comprehensive solutions attuned to individual customer requirements and preferences. The range of cost-effective solutions covers ready-to-use cable configurations, completely assembled backplanes and board system carriers, as well as fully wired and tested control panels.

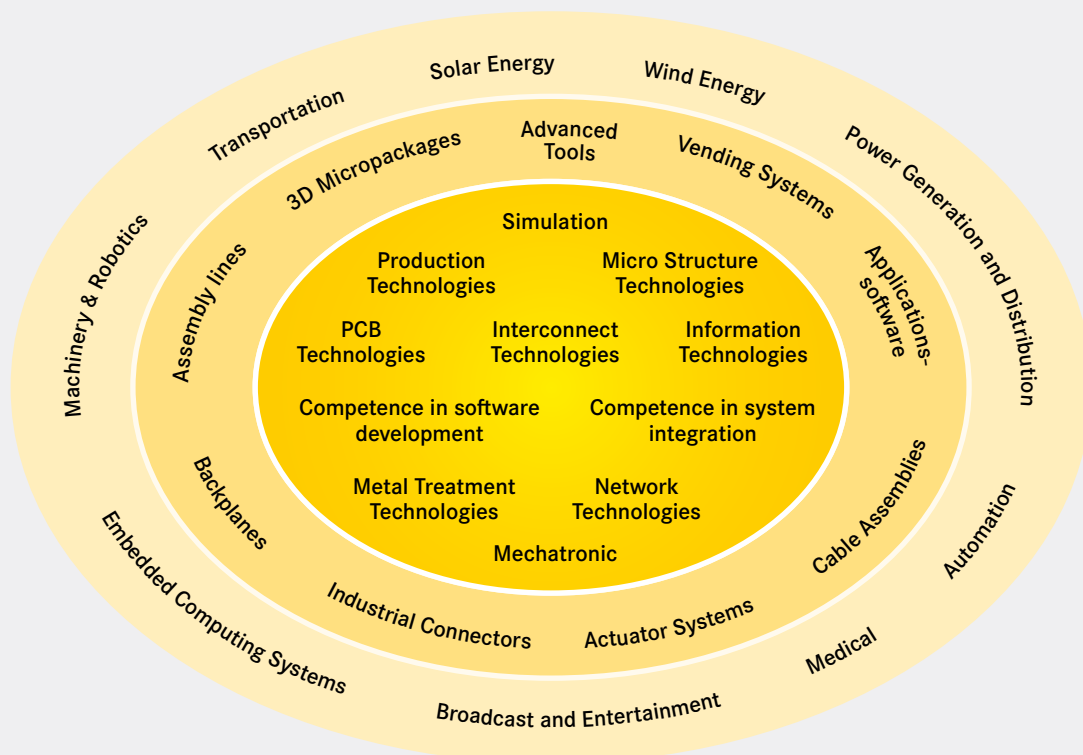
In order to ensure the future-proof design of RF and EMC-compatible interface solutions, the central **HARTING** laboratory (certified to EN 45001) employs simulation tools, as well as experimental, testing and diagnostics facilities all the way to scanning electron microscopes. In addition to product and process suitability considerations, lifecycle and environmental aspects play a key role in the selection of materials and processes.



HARTING's knowledge is practical know-how that generates synergy effects.

HARTING commands decades of experience with regard to the applications conditions involved in connections in telecommunications, computer, network and medical technologies, as well as industrial automation technologies, e.g. in the mechanical engineering and plant engineering areas, in addition to the power generation industry and the transportation sector. HARTING is

highly conversant with the specific application areas in all of these technology fields. In every solution approach, the key focus is on the application. In this context, uncompromising, superior quality is our hallmark. Every new solution found invariably flows 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. HARTING is synergy in action.



Smart Network Infrastructure



INTELLIGENT NETWORK SOLUTIONS

With its product series Ha-VIS, HARTING offers a consistent range of Ethernet network components and cabling products, which form the communication platform of convergent

automation IT networks. Under Ha-VIS HARTING offers fully integrated RFID solutions.

Installation Technology



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 IP65 / IP67. 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 Device Connectivity 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 IP20 to IP65 / IP67. 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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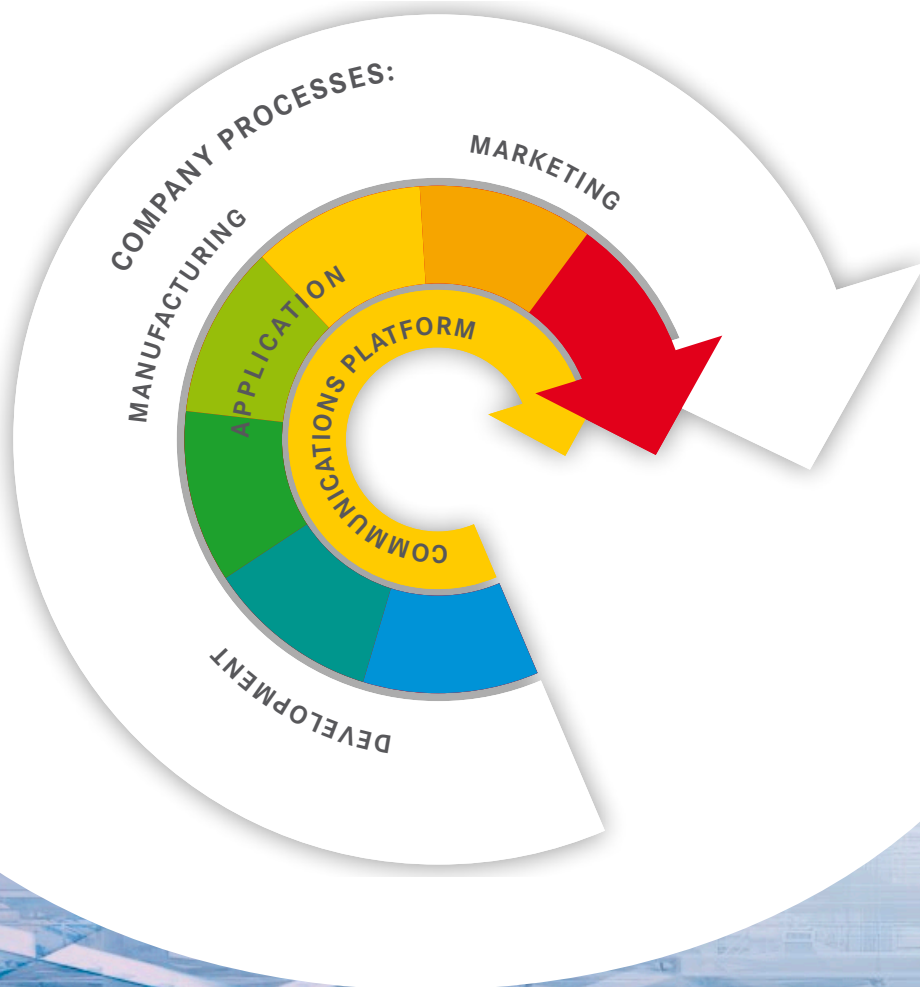
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Intro-
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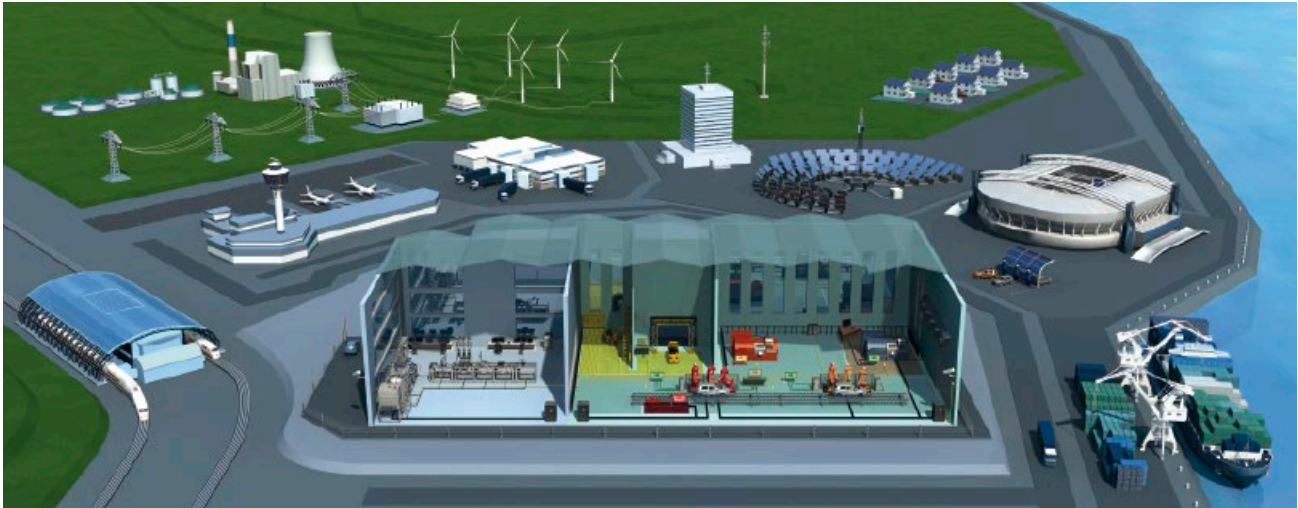
A Smart Network Infrastructure is the Key to Efficient Processes

Efficient industrial production processes require a convergent network infrastructure that serves as the platform for all enterprise applications. Only this makes it possible to seamlessly integrate all applications into a total value-creation process. HARTING has formulated this insight into our Automation IT vision.

The HARTING Technology Group has created a smart network infrastructure strategy in order to implement this vision. It transforms the data/signal network: from a pure configuration and combination of passive components into a key functional component of the modern process chain. Thus it is possible for multiple applications with varying service quality demands to simultaneously use the infrastructure.



HARTING's infrastructure solutions are targeted for industrial applications in the transportation, power generation and power distribution sectors. In all these sectors, the functional units are connected together in a similar way in order to maintain the three main application arteries – data, power and signal exchange. HARTING contributes the systems and components that are critical in keeping these arteries interconnected.



THE FUTURE OF INFRASTRUCTURE

Applications are being integrated into value-creation chains which are becoming more and more complex. In the past, each industrial sector had a proprietary specification for these main arteries. Now, however, the goal is to implement solutions which are portable and integrated. Ethernet is responsible for exchanging data between applications, since applications can be integrated into a complete system with this protocol.

During the development of a universal infrastructure platform, the HARTING Technology Group has played, and will continue to play, a central role.

Nowadays, Ethernet is being used for automation applications as well as classic IT – and it is establishing itself as a universal standard. However there are obstacles during the conversion from a Fieldbus infrastructure to an open Ethernet network, because the installation strategy and planning for an automation infrastructure is radically different than an IT application's infrastructure.

HARTING's Automation IT helps you to overcome these obstacles. Automation IT is responsible for the specifics of the Fieldbus-based infrastructure. It can therefore maintain the key automation requirements and still take advantage of innovative Ethernet technology.

Ethernet

CONVERT AND PRESERVE: A RECIPE FOR INFRASTRUCTURE SUCCESS

An infrastructure should have a long lifespan and ensure compatibility - but it should also keep your perspective open with its versatility and extensibility. Thus, an infrastructure has a seemingly contradictory character. It is structurally conservative - in a positive sense - because longevity and compatibility ensure the value of your investment. And infrastructure is also versatile, since there are challenging new tasks emerging for the future of automation.

So a converted infrastructure is used which allows the user to integrated existing technologies. The bridging technologies required for this topology are the actual key to these new infrastructure solutions. The HARTING Technology Group designs its own bridging technologies for Ethernet networking components, Ethernet cabling and RFID.

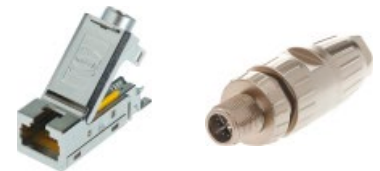
ACTIVE ETHERNET NETWORK COMPONENTS:

Optimized and designed for use in harsh industrial environments, the innovative portfolio provides unmanaged Plug & Play and full managed Ethernet switches. The degree of protection (IP30 to IP67) and connectivity (RJ45, M12, SC-D SFP) allow the use in all applications. Extensive software functions and powerful Power over Ethernet, allow the enhancement of existing network infrastructures and the development and construction of new systems. The field of application for the Ha-VIS switches is diverse, through approvals for the industry, the maritime market and traffic engineering, the switches can be optimally selected for each application.



ETHERNET CABLING:

HARTING's bridging solutions for adapter plugs are positioned at an entirely different level. At the transition from 2-pair to 4-pair cabling, HARTING's M12 connector - featuring Ha-VIS preLink® - serves as the bridging mechanism. This is also the foundation of our new *har*-speed M12 connector for PROFINET.



RFID:

With RFID, HARTING has extended the classic data/power network to real world objects. In so doing, we have synchronized virtual and actual processes. Wireless or cable-bound sensors (such as those used for automotive identification, RFID or image recording) provide real-time data and signals emanating from many objects and process states.

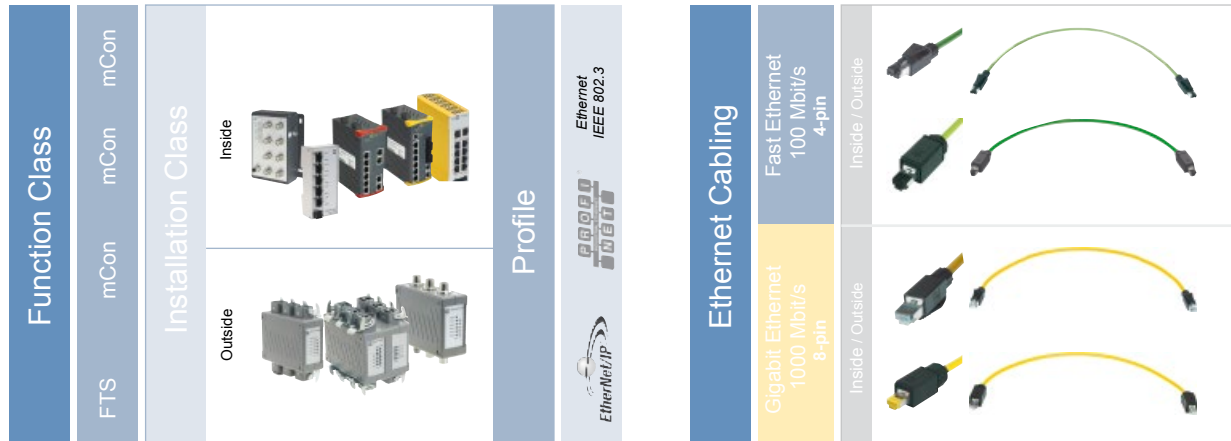


HARTING provides a software platform that represents the link between the infrastructure zones (Dashboard). Our strategy in a convergent network is to give the user an universal software tool that allows him to see each application zone on the network separately.



ARRIVE AT A COMPLETE NETWORK IN JUST A FEW STEPS WITH THE SELECTION GUIDE

Introduction



Our Selection Guide is a simple tool that provides you with a quick, reliable way to design an automation IT network that fits your requirements.

HARTING's Automation IT combines our services and products for passive network technology used in industrial applications.

The Selection Guide is divided into the Ethernet Switches and Ethernet Cabling chapters. The chapter on switches is sub-divided into sections describing functional classes and installation classes like protective degrees and interface-specific (profile) characteristics for each area of usage.

Various Ethernet cabling solutions exist for specific interfaces. Fast Ethernet uses four wires and up to 100 MBit/s while Gigabit Ethernet applications and other services use 8 wires.

These solutions follow structured cabling standards. HARTING offers different components that are optimized for various applications. When used together, they represent a perfect system solution for your industrial network.

Switching is typically used in a wide range of applications: for machinery, automation applications, renewable energy grids (for wind and solar), and for transportation equipment such as rail, bus, shipping and signalling.

The Selection Guide is divided into logical planning steps, so that you can quickly find the best components to build a reliable industrial network. The combination of the proper individual components results in a reliable network system that fits your requirements.

Our trio of installation technology, device connectivity and smart network infrastructure helps us to deliver state-of-the-art, custom-fit solutions to industrial customers around the globe.

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Overview

Ha-VIS eCon

Ha-VIS sCon


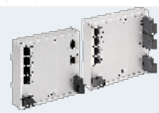


















Ha-VIS FTS

Ha-VIS mCon






Ha-VIS smart Power Networks






Accessories




01 | 01




FUNCTION CLASS	INSTALLATION CLASS					
Ha-VIS eCon unmanaged Ethernet Switches Plug-and-Play Non-blocking Store and Forward Fast Ethernet Full Gigabit Jumbo-Frames Auto-negotiation Auto-polarity Auto-MDI(X) Quality of Service PoE / PoE+	- IP30 - DIN rail mounting - 24 / 48 / 54 VDC - 0 ... +55 °C - -40 ... +70 °C - Surge protection - Reverse voltage protection - Energy Efficient Ethernet	Ha-VIS eCon 2000 - 3 to 16 ports Fast Ethernet - 5 to 7 ports Full Gigabit Ethernet - RJ45, SC Duplex - PoE+		eCon 2000 Fast Ethernet Basic		eCon 2000 Full Gigabit Ethernet Basic
		Ha-VIS eCon 3000 - 3 to 10 ports Fast Ethernet - 2 to 7 ports Full Gigabit Ethernet - RJ45, SC Duplex, SFP - 24 V PoE+ Switches		eCon 3000 Fast Ethernet Basic		eCon 3000 Full Gigabit Ethernet Basic
		Inside Degree of protection IP30 / IP40 Ha-VIS eCon 4000 - 8 / 8 + 2 copper ports (M12 D-coding) - PoE - Robust metal housing - Extended temperature range Ha-VIS eCon 9000 - 7 - 8 copper ports M12 D-coding - Robust metal housing - 19" assembly/- narrow design		eCon 4080-B1 8 M12 D-coding		eCon 4080-B3 8 M12 D-coding 110 V DC power supply
		Outside Degree of protection IP65 / IP67 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		eCon 7050-B1 5 M12 D-coding wide power input range
Ha-VIS sCon configurable Plug & Play, via USB interface configurable through a graphic user interface	Inside Degree of protection IP30	Ha-VIS sCon 3000 - 6 / 8 / 10 copper ports (RJ45) and optionally 2 / 3 FO ports (SC) - Robust metal housing - Parallel- / ring-redundancy - DIN rail mounting - Potential-free alarm contact	WITHOUT FO 	sCon 3100-A 10 RJ45		sCon 3100-AA 8 RJ45 2 RJ45 Gigabit
Ha-VIS Fast Track Switching Webinterface, SNMP (v1, v2c, v3) User Management, LLDP	Inside Degree of protection IP30	Ha-VIS FTS 3000 - 6 / 8 / 10 copper ports (RJ45) and optionally 2 SFP modules - Robust metal housing - DIN rail mounting - Web-management - Fast Track Switching Technology	CONFIGURABLE 	FTS 3100s-A 10 RJ45	MANAGED 	FTS 3060-A 6 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 SNMP Alarms via Email SNMP Traps Port diagnostic	Inside Degree of protection IP30	Ha-VIS mCon 3000 - Copper ports (RJ45); FO ports (SC / ST / SFP); Gigabit Uplink - Small, robust metal housing - Extended temperature range - DIN rail mounting - Fully manageable via Web Interface and SNMP - Fanless Low-Power-Design		mCon 3080-A 8 RJ45 mCon 3102-AASF 8 RJ45 2 RJ45 Gigabit 2 SFP Gigabit Combo	WITHOUT FO 	mCon 3100-AAV 8 RJ45 2 RJ45 Gigabit
	Inside Degree of protection IP30 / IP40	Ha-VIS mCon 4000 - 8 / 8 + 2 copper ports (M12 D-coding) - PoE - Robust metal housing - Extended temperature range Ha-VIS eCon 9000 - 7 - 8 copper ports M12 D-coding - Robust metal housing - 19" assembly/- narrow design		mCon 4080-B1V 8 M12 D-coding		mCon 4080-B3V 8 M12 D-coding 110 V DC power supply
	Outside Degree of protection IP65 / IP67	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	10 PORT 	mCon 7100-B1V 10 M12 D-coding
Ha-VIS pCon Industrial DC / DC Converter 24 V / 48 V	Inside Degree of protection IP20 / IP65	Ha-VIS pCon 7000 - DC / DC converter - Working temperature: -40 °C ... +70 °C		pCon 7060-110 / 24 110 V DC / 24 V DC, Degree of protection IP20		pCon 7150-110 / 48 110 V DC / 48 V DC Degree of protection IP65




	eCon 2000 Fast Ethernet Basic PoE		eCon 2000 Full Gigabit Ethernet Basic PoE	Ethernet IEEE 802.3	
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	eCon 3000 Fast Ethernet Basic PoE		eCon 3000 Full Gigabit Ethernet Basic PoE		eCon 3000 Fast Ethernet Basic PoE DC/DC (24V)		eCon 3000 Full Gigabit Ethernet Basic PoE DC/DC (24V)	Ethernet IEEE 802.3	
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	eCon 4080-BPoE1 8 M12 D-coding PoE on 8 ports		eCon 4100-BB-L 8 M12 FE + 2 M12 GbE optional with by-pass function		eCon 9080-B1 8 M12, D-coding		eCon 9070-B 7 M12 D-coding Power supply on the front	Ethernet IEEE 802.3	
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	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	
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	sCon 3082-AD 8 RJ45, 2 SC		sCon 3063-AD 6 RJ45, 3 SC	Ethernet IEEE 802.3	
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	FTS 3100-A 10 RJ45		FTS 3082-ASFP 8 RJ45 2 SFP module slot	Ethernet IEEE 802.3	
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	mCon 3082-ADV / AFV 8 RJ45, 2 SC multi-mode (ADV) single-mode (AFV)		mCon 3082-AEV 8 RJ45, 2 ST	EtherNet/IP	
	mCon 3063-ADV 6 RJ45, 3 SC		mCon 3063-AEV 6 RJ45, 3 ST		

	mCon 4080-BPoE1V 8 M12 D-coding PoE on 8 ports		mCon 4100-BB-L 8 M12 FE + 2 M12 GbE external configuration memory optional with by-pass function		mCon 9080-BV 8 M12 D-coding		mCon 9070-BV 7 M12 D-coding power supply on the front	Ethernet IEEE 802.3	
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	mCon 7100-AAV 8 Han® 3 A RJ45 2 Han® 3 A RJ45 Gigabit	Ethernet IEEE 802.3	
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	pCon 7150 DC-24 / 48 24 V DC / 48 V DC Degree of protection IP65
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5-year-service for Ethernet Switches and Network Components

HARTING's 5-year-service package provides you with additional protection beyond statutory warranty claims for HARTING Ethernet switches in the event of a product or workmanship defect.

HARTING Ethernet switches are optimally designed for scenarios in harsh industrial environments. High availability, network security and high reliability are the decisive technical characteristics necessary for the operation of an Ethernet network in industrial environments.

In order to provide even more protection beyond the time limits for statutory warranty claims, HARTING



Ethernet switches can now also be purchased together with a 5-year-service package. Plainly put, this means that within the first 5 years there will be no cost to you for repairs or replacement equipment in the event of a product or workmanship defect.



Note:

The General conditions for service package "5-year-service" for HARTING Ethernet Switches shall take precedence and apply to every order, delivery and use of this product. These terms and conditions are

applicable on www.HARTING.com/en/service. Please feel free to ask for providing you with print version by post.

Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C /

Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE)

with 4 Ports PoE+ (34.2 watts per port)



General description

Unmanaged Ethernet switches of the Ha-VIS eCon 2000 group enable cost-effective and quick extension or restructuring of network infrastructures. Owing to the extremely flat design, these switches can be accommodated in installations where space is restricted towards the cable connection at the front. The selection includes various combinations of variants with RJ45s and fibre optic cables. These switches are available with two different speeds: Fast Ethernet (FE) with a bandwidth of 100 Mbit/s and full gigabit Ethernet (Full GbE) with 1000 Mbit/s for applications requiring a high data transfer rate. Thanks to the PoE+ standard, our switches enable end devices to be supplied with energy. There is a wide range of application areas for Ha-VIS eCon switches. Approvals for the industrial market, including the maritime sector and the transportation sector, enable the optimum selection of switches for any application.

Features

- Fast and full gigabit Ethernet, non-blocking switch architecture in accordance with IEEE 802.3
- Industrial temperature range from -40 °C up to +70 °C
- Support of auto-negotiation, auto-polarity, auto-MDI(X)
- Support of jumbo frames (10 kbytes)
- Variants with RJ45s, SC multi-mode fibres and single-mode fibres
- Energy supply of up to 4 end device via PoE+ (137 watts) in accordance with IEEE 802.3at
- Minimum energy consumption owing to energy-efficient Ethernet in accordance with IEEE 802.3az
- IP30 aluminium enclosures
- Wide range voltage supply, 24/48 V DC
- Surge protection and reverse voltage protection
- Extensive diagnostic options via LED displays at the front

Advantages

- Plug-and-Play switch, without time-consuming configuration and therefore easy and quick start-up
- Maximum data transfer rate without restrictions, even if all ports are in use
- Fault-tolerant owing to automatic recognition of data transfer rate and cable wiring
- High MTBF durations ensure secure and reliable operation
- Flat design with low installation depth
- Easy and quick connection of data transfer cables

Field of application

- Mechanical engineering & robotics
- Automation technology
- Industrial network infrastructures
- Solar energy
- Wind energy
- Transportation
- Shipbuilding

Technical characteristics

Switch Features

Switch type	Unmanaged Ethernet Switch
Supported standards	IEEE 802.3
Support of jumbo frames	Yes (Full Gigabit Ethernet Basic) No (Fast Ethernet Basic)
Non-blocking	Yes
PROFINET compatible	Yes
Ethernet/IP compatible	Yes
Frame Size	1552 bytes (Fast Ethernet Basic) 10 kbytes (Full Gigabit Ethernet Basic)
Quality of Service	Yes
Energy Efficient Ethernet	Yes






Ethernet Ports Twisted Pair

Transfer standard	10BASE-T _e / 100BASE-T _X EEE; (Fast Ethernet Basic) 10BASE-T _e / 100BASE-T _X EEE / 1000BASE-T EEE; (Full Gigabit Ethernet Basic)
Auto-Negotiation	Yes
Auto-Polarity	Yes
Auto-MDI(X)	Yes
Transfer length	100 m (Twisted Pair, Cat 5)

Ethernet ports, fibre optic cables

Transfer standard	100BASE-FX (Fast Ethernet Basic) 1000BASE-LX (Full Gigabit Ethernet Basic)
Wavelength	1310 nm (MM / SM); (Fast Ethernet Basic) 850 nm (MM) / 1310 nm (SM); (Full Gigabit Ethernet Basic)
Output capacity in dBm	-19 dBm ... -14 dBm (MM) / -15 dBm ... -8 dBm (SM); (Fast Ethernet Basic) -9.5 dBm ... -4 dBm (MM) / -9.5 dBm ... -3 dBm (SM); (Full Gigabit Ethernet Basic)
Receiver sensitivity	≤ -32 dBm (MM) / ≤ -34 dBm (SM); (Fast Ethernet Basic) ≤ -17 dBm (MM) / ≤ -21 dBm (SM); (Full Gigabit Ethernet Basic)

Status and diagnostic displays (Switch and Ports)

Power  lit green	Supply voltage is applied
Link/Activity ("L/A") off	No link
Link/Activity ("L/A") lit green	Link is active
Link/Activity ("L/A") flashes green	Link is active and data is transferred
Link speed ("Spd") off	10 Mbit/s
Link speed ("Spd") lit yellow	100 Mbit/s
Link speed ("Spd") lit green	1000 Mbit/s (Full Gigabit Ethernet Basic)
PoE  off	PoE is inactive / low voltage
PoE  lit green	Voltage in PoE range
PoE  lit blue	Voltage in PoE+ range
PoE  lit red	Fault (see manual)

Technical characteristics

Power supply

Surge protection	Yes
Overcurrent protection at input	Yes
Reverse polarity proof	Yes

Power over Ethernet PoE

Standard	IEEE 802.3af / IEEE 803.3at
Supported mode	Alternative A
Power supply PSE (PoE/PoE+)	48 / 54 VDC ≡
Supported cabling	See 802.3at, section 33.1.4
PoE Pinout	Alternative A, MDI-X (1/2 = V-, 3/6 = V+)

Enclosures

Type of installation	35 mm DIN rail acc. to EN 60 715
Material enclosures	Anodised aluminium
Protection degree	III
Protection degree acc. to DIN EN 60 529 (with plugged screw type terminal block)	IP30

Ambient conditions

Commercial temperature range	0 °C ... +55 °C
Industrial temperature range	-40 °C ... +70 °C
Storage temperature range	-40 °C ... +85 °C
Relative humidity (operation)	0 % ... 95 % (not-condensing)
Relative humidity (storage/transport)	0 % ... 95 % (not-condensing)
Air pressure	2000 m (795 hPa)

EMC and environmental conditions

EMC interference immunity (EN 61 000-6-1, 61 000-6-2, 55204)	Electrostatic discharge (ESD) EN 61 000-4-2 Electromagnetic field EN 61000-4-3 Rapid transients (burst) EN 61 000-4-4 Surge voltages EN 61 000-4-5 Conducted interference voltages EN 61 000-4-6
EMC interference emission	EN 61 000-6-4, EN 55 022, FCC CFR 47 Part 15
Mechanical stability (EN 60721-3)	IEC 60068-2-6 Vibration IEC 60068-2-6 Vibration resonance search IEC 60068-2-27 Shock test

Included in delivery

Pluggable screw contact for power supply	Yes
Operating manual	Yes



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	3 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair)
Nominal voltage	24 / 48 VDC ≐
Permissible voltage range	9 V ... 60 VDC ≐
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≐)
Current consumption typical @ 24 V / 48 V	32 mA / 17 mA
Dimensions (W x H x D)	46.5 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	162 g
MTBF in million hours	3.13
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, E1, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2030B-A 0 °C ... +55 °C	24 02 003 0010		
Ha-VIS eCon 2030BT-A -40 °C ... +70 °C	24 02 003 0000		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	4 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair)
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / =)
Current consumption typical @ 24 V / 48 V	37 mA / 20 mA
Dimensions (W x H x D)	46.5 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	166 g
MTBF in million hours	2.99
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, E1, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2040B-A 0 °C ... +55 °C	24 02 004 0010		
Ha-VIS eCon 2040BT-A -40 °C ... +70 °C	24 02 004 0000		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	5 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair)
Nominal voltage	24 / 48 VDC ≐
Permissible voltage range	9 V ... 60 VDC ≐
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≐)
Current consumption typical @ 24 V / 48 V	42 mA / 23 mA
Dimensions (W x H x D)	46.5 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	170 g
MTBF in million hours	2.86
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, E1, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2050B-A 0 °C ... +55 °C	24 02 005 0010		
Ha-VIS eCon 2050BT-A -40 °C ... +70 °C	24 02 005 0000		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	8 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair)
Nominal voltage	24 / 48 VDC ≙
Permissible voltage range	9 V ... 60 VDC ≙
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≙)
Current consumption typical @ 24 V / 48 V	58 mA / 31 mA
Dimensions (W x H x D)	60.0 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	217 g
MTBF in million hours	2.53
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, E1, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2080B-A 0 °C ... +55 °C	24 02 008 0010		
Ha-VIS eCon 2080BT-A -40 °C ... +70 °C	24 02 008 0000		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	6 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	1 x 100BASE-FX / SC duplex socket
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / =)
Current consumption typical @ 24 V / 48 V	81 mA - 94 mA / 45 mA - 51 mA
Dimensions (W x H x D)	120 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	372 g - 378 g
MTBF in million hours	1.24 - 1.26
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2061B-AD 0 °C ... +55 °C 1 x MM (2 km)	24 02 006 1110		
Ha-VIS eCon 2061B-AF 0 °C ... +55 °C 1 x SM (15 km)	24 02 006 1210		
Ha-VIS eCon 2061BT-AD -40 °C ... +70 °C 1 x MM (2 km)	24 02 006 1100		
Ha-VIS eCon 2061BT-AF -40 °C ... +70 °C 1 x SM (15 km)	24 02 006 1200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	6 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	2 x 100BASE-FX / SC duplex socket
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V	113 mA - 119 mA / 60 mA - 69 mA
Dimensions (W x H x D)	120 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	380 g - 386 g
MTBF in million hours	1.20 - 1.23
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2062B-AD 0 °C ... +55 °C 2 x MM (2 km)	24 02 006 2110		120
Ha-VIS eCon 2062B-AF 0 °C ... +55 °C 2 x SM (15 km)	24 02 006 2210		
Ha-VIS eCon 2062BT-AD -40 °C ... +70 °C 2 x MM (2 km)	24 02 006 2100		
Ha-VIS eCon 2062BT-AF -40 °C ... +70 °C 2 x SM (15 km)	24 02 006 2200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	5 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE / RJ45 (twisted pair)
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V	134 mA / 69 mA
Dimensions (W x H x D)	60.0 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	205 g
MTBF in million hours	3.06
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2050GB-A 0 °C ... +55 °C	24 02 405 0010		
Ha-VIS eCon 2050GBT-A -40 °C ... +70 °C	24 02 405 0000		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	7 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE / RJ45 (twisted pair)
Nominal voltage	24 / 48 VDC ≐
Permissible voltage range	9 V ... 60 VDC ≐
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≐)
Current consumption typical @ 24 V / 48 V	182 mA / 96 mA
Dimensions (W x H x D)	120.0 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	378 g
MTBF in million hours	1.70
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

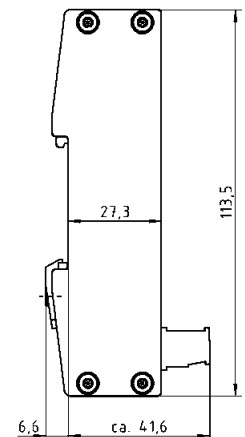
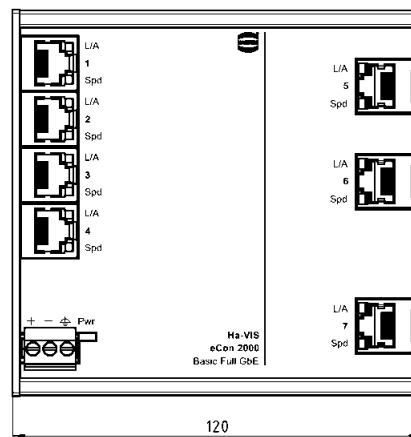
Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 2070GB-A
0 °C ... +55 °C

24 02 407 0010

Ha-VIS eCon 2070GBT-A
-40 °C ... +70 °C

24 02 407 0000





Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	4 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	3 x 1000BASE-SX / SC duplex socket
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V	185 mA - 199 mA / 96 mA - 103 mA
Dimensions (W x H x D)	120 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	386 g - 393 g
MTBF in million hours	1.69
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2043GB-AD 0 °C ... +55 °C 3 x MM (550 m)	24 02 404 3110		
Ha-VIS eCon 2043GB-AF 0 °C ... +55 °C 3 x SM (10 km)	24 02 404 3210		
Ha-VIS eCon 2043GBT-AD -40 °C ... +70 °C 3 x MM (550 m)	24 02 404 3100		
Ha-VIS eCon 2043GBT-AF -40 °C ... +70 °C 3 x SM (10 km)	24 02 404 3200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	5 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	2 x 1000BASE-SX / SC duplex socket
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V	184 mA - 194 mA / 96 mA - 101 mA
Dimensions (W x H x D)	120 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	384 g - 391 g
MTBF in million hours	1.69
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2052GB-AD 0 °C ... +55 °C 2 x MM (550 m)	24 02 405 2110		
Ha-VIS eCon 2052GB-AF 0 °C ... +55 °C 2 x SM (10 km)	24 02 405 2210		
Ha-VIS eCon 2052GBT-AD -40 °C ... +70 °C 2 x MM (550 m)	24 02 405 2100		
Ha-VIS eCon 2052GBT-AF -40 °C ... +70 °C 2 x SM (10 km)	24 02 405 2200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	6 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	1 x 1000BASE-SX / SC duplex socket
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V	183 mA - 190 mA / 95 mA - 98 mA
Dimensions (W x H x D)	120 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	382 g - 389 g
MTBF in million hours	1.69
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2061GB-AD 0 °C ... +55 °C 1 x MM (550 m)	24 02 406 1110		
Ha-VIS eCon 2061GB-AF 0 °C ... +55 °C 1 x SM (10 km)	24 02 406 1210		
Ha-VIS eCon 2061GBT-AD -40 °C ... +70 °C 1 x MM (550 m)	24 02 406 1100		
Ha-VIS eCon 2061GBT-AF -40 °C ... +70 °C 1 x SM (10 km)	24 02 406 1200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination including PoE+ ports	5 x 10BASE-T _e / 100BASE-TX EEE / RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V / 54 V	0.05 A / 1.40 A / 2.39 A
Dimensions (W x H x D)	120.0 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	364 g
MTBF in million hours	0.84
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, E1, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2050B-A-P 0 °C ... +55 °C	24 02 005 0030		
Ha-VIS eCon 2050BT-A-P -40 °C ... +70 °C	24 02 005 0020		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination, including PoE+ ports	8 x 10BASE-T _e / 100BASE-TX EEE / RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC ≐
Permissible voltage range	9 V ... 60 VDC ≐
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V / 54 V	0.07 A / 1.40 A / 2.39 A
Dimensions (W x H x D)	120.0 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	374 g
MTBF in million hours	0.73
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, E1, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2080B-A-P 0 °C ... +55 °C	24 02 008 0030		
Ha-VIS eCon 2080BT-A-P -40 °C ... +70 °C	24 02 008 0020		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination including PoE+ ports	6 x 10BASE-T _e / 100BASE-TX EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	4 x PoE+ with 34.2 watts per port 1 x 100BASE-FX / SC duplex socket
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC ≐
Permissible voltage range	9 V ... 60 VDC ≐
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≐)
Current consumption typical @ 24 V / 48 V / 54 V	0.09 - 0.10 A / 1.41 - 1.42 A / 2.41 - 2.42 A
Dimensions (W x H x D)	120 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	406 g - 412 g
MTBF in million hours	0.78 - 0.79
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2061B-AD-P 0 °C ... +55 °C 1 x MM (2 km)	24 02 006 1130		
Ha-VIS eCon 2061B-AF-P 0 °C ... +55 °C 1 x SM (15 km)	24 02 006 1230		
Ha-VIS eCon 2061BT-AD-P -40 °C ... +70 °C 1 x MM (2 km)	24 02 006 1120		
Ha-VIS eCon 2061BT-AF-P -40 °C ... +70 °C 1 x SM (15 km)	24 02 006 1220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination, including PoE+ ports	6 x 10BASE-T _e / 100BASE-TX EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	4 x PoE+ with 34.2 watts per port 2 x 100BASE-FX / SC duplex socket
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC ≐
Permissible voltage range	9 V ... 60 VDC ≐
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≐)
Current consumption typical @ 24 V / 48 V / 54 V	0.12 - 0.14 A / 1.44 A / 2.42 - 2.43 A
Dimensions (W x H x D)	120 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	414 g - 420 g
MTBF in million hours	0.76 - 0.78
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2062B-AD-P 0 °C ... +55 °C 2 x MM (2 km)	24 02 006 2130		120
Ha-VIS eCon 2062B-AF-P 0 °C ... +55 °C 2 x SM (15 km)	24 02 006 2230		
Ha-VIS eCon 2062BT-AD-P -40 °C ... +70 °C 2 x MM (2 km)	24 02 006 2120		
Ha-VIS eCon 2062BT-AF-P -40 °C ... +70 °C 2 x SM (15 km)	24 02 006 2220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination including PoE+ ports	5 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE / RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC ≐
Permissible voltage range	9 V ... 60 VDC ≐
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≐)
Current consumption typical @ 24 V / 48 V / 54 V	0.15 A / 1.45 A / 2.43 A
Dimensions (W x H x D)	120.0 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	410 g
MTBF in million hours	1.01
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

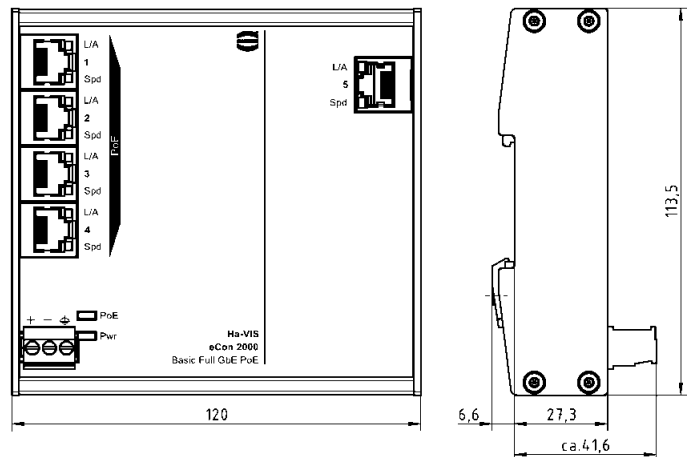
Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 2050GB-A-P
0 °C ... +55 °C

24 02 405 0030

Ha-VIS eCon 2050GBT-A-P
-40 °C ... +70 °C

24 02 405 0020





Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination, including PoE+ ports	7 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE / RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V / 54 V	0.19 A / 1.47 A / 2.45 A
Dimensions (W x H x D)	120.0 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	427 g
MTBF in million hours	0.98
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

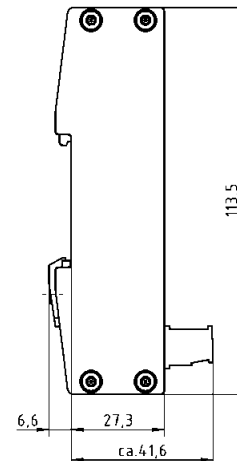
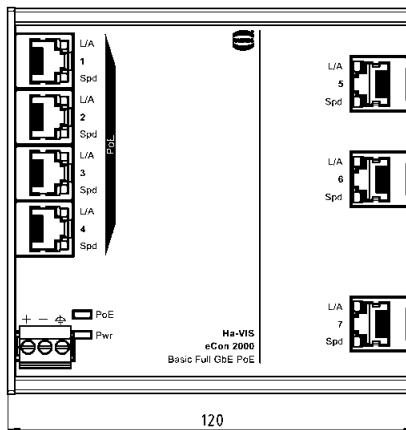
Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 2070GB-A-P
0 °C ... +55 °C

24 02 407 0030

Ha-VIS eCon 2070GBT-A-P
-40 °C ... +70 °C

24 02 407 0020





Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination	4 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE / RJ45 (twisted pair)
including PoE+ ports	4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	3 x 1000BASE-SX / SC duplex socket
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC ==
Permissible voltage range	9 V ... 60 VDC ==
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V / 54 V	0.19 - 0.20 A / 1.46 A / 2.45 A
Dimensions (W x H x D)	120 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	435 g - 442 g
MTBF in million hours	0.98
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2043GB-AD-P 0 °C ... +55 °C 3 x MM (550 m)	24 02 404 3130		
Ha-VIS eCon 2043GB-AF-P 0 °C ... +55 °C 3 x SM (10 km)	24 02 404 3230		
Ha-VIS eCon 2043GBT-AD-P -40 °C ... +70 °C 3 x MM (550 m)	24 02 404 3120		
Ha-VIS eCon 2043GBT-AF-P -40 °C ... +70 °C 3 x SM (10 km)	24 02 404 3220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination	5 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE / RJ45 (twisted pair)
including PoE+ ports	4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	2 x 1000BASE-SX / SC duplex socket
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V / 54 V	0.19 - 0.20 A / 1.46 A / 2.45 A
Dimensions (W x H x D)	120 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	435 g - 442 g
MTBF in million hours	0.98
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2052GB-AD-P 0 °C ... +55 °C 2 x MM (550 m)	24 02 405 2130		
Ha-VIS eCon 2052GB-AF-P 0 °C ... +55 °C 2 x SM (10 km)	24 02 405 2230		
Ha-VIS eCon 2052GBT-AD-P -40 °C ... +70 °C 2 x MM (550 m)	24 02 405 2120		
Ha-VIS eCon 2052GBT-AF-P -40 °C ... +70 °C 2 x SM (10 km)	24 02 405 2220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination	6 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE / RJ45 (twisted pair)
including PoE+ ports	4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	1 x 1000BASE-SX / SC duplex socket
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC ==
Permissible voltage range	9 V ... 60 VDC ==
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V / 54 V	0.19 - 0.20 A / 1.46 A / 2.45 A
Dimensions (W x H x D)	120 x 113.5 x 27.3 mm (without pluggable screw type terminal block)
Weight	431 g - 438 g
MTBF in million hours	0.98
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 2061GB-AD-P 0 °C ... +55 °C 1 x MM (550 m)	24 02 406 1130		
Ha-VIS eCon 2061GB-AF-P 0 °C ... +55 °C 1 x SM (10 km)	24 02 406 1230		
Ha-VIS eCon 2061GBT-AD-P -40 °C ... +70 °C 1 x MM (550 m)	24 02 406 1120		
Ha-VIS eCon 2061GBT-AF-P -40 °C ... +70 °C 1 x SM (10 km)	24 02 406 1220		

Ethernet Switch Ha-VIS eCon 2160-A

16-port Ethernet Switch for flat mounting
onto top-hat mounting rail in control cabinets



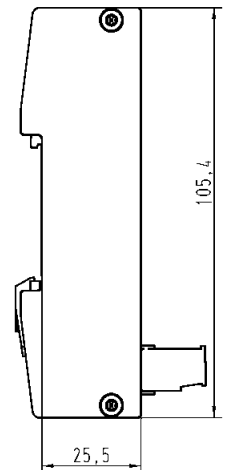
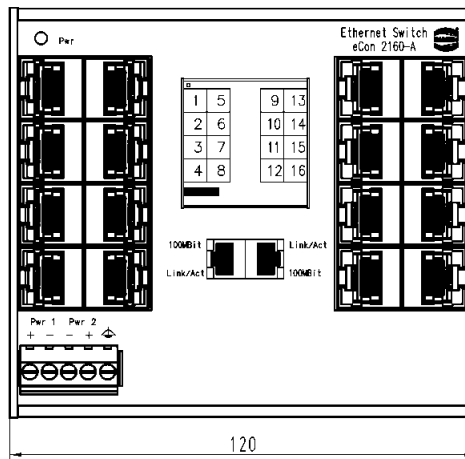
Specification

Number of ports, Copper / Termination	16x 10/100Base-T(X) / RJ45 (Twisted Pair)
Input voltage / Termination	24 V DC / 5-pole, pluggable screw contact, redundant (PWR1 + / PWR1 - / PWR2 + / PWR2 - / FE)
Permissible range (min./max.)	9.6 V ... 60 V DC
Input current	approx. 220 mA (at 24 V DC)
Housing material	aluminium, anodised
Dimensions (W x H x D)	120 x 105 x 25.5 mm (without connectors)
Weight	approx. 0.4 kg
Working temperature	-10 °C ... +70 °C
MTBF	1.150.000 h
Approvals	cUL US 508 listed

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 2160-A
Ethernet Switch with
16 RJ45 ports

20 76 116 3000



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C /

Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE)

with 4 Ports PoE+ (34.2 watts per port)

Integrated 24 / 54 V DC Voltage Transformer



General description

Unmanaged Ethernet switches of the Ha-VIS eCon 3000 group enable cost-effective and quick extension or restructuring of network infrastructures. The slender design of the switches enables an extremely high packing density on the DIN rail. The selection includes various combinations of variants with RJ45s and fibre optic cables. These switches are available with two different speeds: Fast Ethernet (FE) with a bandwidth of 100 Mbit/s and full gigabit Ethernet (Full GbE) with 1000 Mbit/s for applications requiring a high data transfer rate. Thanks to the PoE+ standard, our switches enable end devices to be supplied with energy. Likewise, variants with an integrated DC/DC transformer enable the use of 24 V as supply voltage and hence help to keep cabling expenses to a minimum, saving time and money. There is a wide range of application areas for Ha-VIS eCon switches. Approvals for the industrial market, including the maritime sector and the transportation sector, enable the optimum selection of switches for any application.

Features

- Fast and full gigabit Ethernet, non-blocking switch architecture in accordance with IEEE 802.3
- Industrial temperature range from -40 °C up to +70 °C
- Support of auto-negotiation, auto-polarity, auto-MDI(X)
- Support of jumbo frames (10 kbytes)
- Variants with RJ45s, SC multi-mode fibres, single-mode fibres and SFP
- Energy supply of up to 4 end device via PoE+ (137 watts) in accordance with IEEE 802.3at
- Minimum energy consumption owing to energy-efficient Ethernet, IEEE 802.3az
- IP30 aluminium/steel sheet enclosure
- Wide range voltage supply, 24/48 V DC
- Surge protection and reverse voltage protection
- Extensive diagnostic options via LED displays at the front
- Optimised DIN rail bracket

Advantages

- Plug-and-Play switch, without time-consuming configuration and therefore easy and quick start-up
- Maximum data transfer rate without restrictions, even if all ports are in use
- Fault-tolerant owing to automatic recognition of data transfer rate and cable wiring
- High MTBF durations ensure secure and reliable operation
- Slender design for high packing density
- Use of PoE+ with 24 V DC supply (isolated)
- Easy and quick connection of data transfer cables

Field of application

- Mechanical engineering & robotics
- Automation technology
- Industrial network infrastructures
- Solar energy
- Wind energy
- Transportation
- Shipbuilding

Technical characteristics

Switch Features

Switch type	Unmanaged Ethernet Switch
Supported standards	IEEE 802.3
Support of jumbo frames	No (Fast Ethernet Basic) Yes (Full Gigabit Ethernet Basic)
Non-blocking	Yes
PROFINET compatible	Yes
Ethernet/IP compatible	Yes
Frame Size	1522 bytes (Fast Ethernet Basic) 10 kbytes (Full Gigabit Ethernet Basic)
Quality of Service	Yes
Energy Efficient Ethernet	Yes

Ethernet Ports Twisted Pair

Transfer standard	10BASE-T _e / 100BASE-T _X EEE; (Fast Ethernet Basic) 10BASE-T _e / 100BASE-T _X EEE / 1000BASE-T EEE; (Full Gigabit Ethernet Basic)
Auto-Negotiation	Yes
Auto-Polarity	Yes
Auto-MDI(X)	Yes
Transfer length	100 m (twisted pair, Cat 5)






Ethernet ports, fibre optic cables

Transfer standard	100BASE-FX (Fast Ethernet Basic) 1000BASE-SX (MM) / 1000BASE-LX (SM); (Full Gigabit Ethernet Basic)
Wavelength	1310 nm (Fast Ethernet Basic) 850 nm (MM) / 1310 nm (SM); (Full Gigabit Ethernet Basic)
Output capacity in dBm	-20 dBm ... -14 dBm (MM) / -15 dBm ... -8 dBm (SM); (Fast Ethernet Basic) -9.5 dBm ... -4 dBm (MM) / -9.5 dBm ... -3 dBm (SM); (Full Gigabit Ethernet Basic)
Receiver sensitivity	≤ -30 dBm (MM) / ≤ -32 dBm (SM); (Fast Ethernet Basic) ≤ -17 dBm (MM) / ≤ -21 dBm (SM); (Full Gigabit Ethernet Basic)

Ethernet ports, SFP

Transfer standard	Depending on used SFP
Termination	Depending on used SFP, RJ45 or LC
Transfer conditions	Depending on used SFP, twisted pair or optical fibre cable
Transfer speed	Depending on used SFP, 100 or 1000 Mbit/s
Transfer length	Depending on used SFP

Status and diagnostics displays (Switch and Ports)

Power  lit green	Supply voltage is applied
Link/Activity ("L/A") off	No link
Link/Activity ("L/A") lit green	Link is active
Link/Activity ("L/A") flashes green	Link is active and data is transferred
Link speed ("Spd") off	10 Mbit/s
Link speed ("Spd") lit yellow	100 Mbit/s
Link speed ("Spd") lit green	1000 Mbit/s (Full Gigabit Ethernet Basic)
PoE  off	PoE is inactive / low voltage
PoE  lit green	Voltage in PoE range
PoE  lit blue	Voltage in PoE+ range
PoE  lit red	Fault (see manual)

Technical characteristics

Power supply

Surge protection	Yes
Overcurrent protection at input	Yes
Reverse polarity proof	Yes

Power over Ethernet PoE

Standard	IEEE 802.3af / IEEE 803.3at
Supported mode	Alternative A
Power supply PSE (PoE/PoE+)	48 / 54 VDC ≡ 24 VDC with integrated Voltage Transformer
Supported cabling	See 802.3at, section 33.1.4
PoE Pinout	Alternative A, MDI-X (1/2 = V-, 3/6 = V+)

Enclosures

Type of installation	35 mm DIN rail acc. to EN 60 715
Material enclosures	Anodised aluminium / Powder-coated steel sheet
Protection degree	III
Protection degree acc. to DIN EN 60 529 (with plugged screw type terminal block)	IP30

Ambient conditions

Commercial temperature range	0 °C ... +55 °C
Industrial temperature range	-40 °C ... +70 °C
Storage temperature range	-40 °C ... +85 °C
Relative humidity (operation)	0 % ... 95 % (not-condensing)
Relative humidity (storage/transport)	0 % ... 95 % (not-condensing)
Air pressure	2000 m (795 hPa)

EMC and environmental conditions

EMC interference immunity (EN 61 000-6-1, 61 000-6-2, 55204)	Electrostatic discharge (ESD) EN 61 000-4-2 Electromagnetic field EN 61000-4-3 Rapid transients (burst) EN 61 000-4-4 Surge voltages EN 61 000-4-5 Conducted interference voltages EN 61 000-4-6
EMC interference emission	EN 61 000-6-4, EN 55 022, FCC CFR 47 Part 15
Mechanical stability (EN 60721-3)	IEC 60068-2-6 Vibration IEC 60068-2-6 Vibration resonance search IEC 60068-2-27 Shock test

Included in delivery

Pluggable screw type terminal block for power supply	Yes
Operating manual	Yes



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	6 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair)
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / =)
Current consumption typical @ 24 V / 48 V	75 mA / 40 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	430 g
MTBF in million hours	2.29
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, E1, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3060B-A 0 °C ... +55 °C	24 03 006 0010		
Ha-VIS eCon 3060BT-A -40 °C ... +70 °C	24 03 006 0000		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	8 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair)
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V	85 mA / 46 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	442 g
MTBF in million hours	2.16
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, E1, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3080B-A 0 °C ... +55 °C	24 03 008 0010		
Ha-VIS eCon 3080BT-A -40 °C ... +70 °C	24 03 008 0000		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	10 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair)
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / =)
Current consumption typical @ 24 V / 48 V	220 mA / 114 mA
Dimensions (W x H x D)	38.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	512 g
MTBF in million hours	0.91
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3100B-A 0 °C ... +55 °C	24 03 010 0010		
Ha-VIS eCon 3100BT-A -40 °C ... +70 °C	24 03 010 0000		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	2 x 10BASE-T _e / 100BASE-TX EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	1 x 100BASE-FX / SC duplex socket
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	97 mA / 53 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	425 g - 431 g
MTBF in million hours	2.51
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3021B-AD 0 °C ... +55 °C 1 x MM (2 km)	24 03 002 1110		
Ha-VIS eCon 3021B-AF 0 °C ... +55 °C 1 x SM (15 km)	24 03 002 1210		
Ha-VIS eCon 3021BT-AD -40 °C ... +70 °C 1 x MM (2 km)	24 03 002 1100		
Ha-VIS eCon 3021BT-AF -40 °C ... +70 °C 1 x SM (15 km)	24 03 002 1200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	4 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	1 x 100BASE-FX / SC duplex socket
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / =)
Current consumption typical @ 24 V / 48 V	111 mA / 59 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	430 g - 436 g
MTBF in million hours	2.35
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3041B-AD 0 °C ... +55 °C 1 x MM (2 km)	24 03 004 1110		
Ha-VIS eCon 3041B-AF 0 °C ... +55 °C 1 x SM (15 km)	24 03 004 1210		
Ha-VIS eCon 3041BT-AD -40 °C ... +70 °C 1 x MM (2 km)	24 03 004 1100		
Ha-VIS eCon 3041BT-AF -40 °C ... +70 °C 1 x SM (15 km)	24 03 004 1200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	4 x 10BASE-T _e / 100BASE-TX EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	2 x 100BASE-FX / SC duplex socket
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	142 mA / 77 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	446 g - 458 g
MTBF in million hours	2.27
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3042B-AD 0 °C ... +55 °C 2 x MM (2 km)	24 03 004 2110		
Ha-VIS eCon 3042B-AF 0 °C ... +55 °C 2 x SM (15 km)	24 03 004 2210		
Ha-VIS eCon 3042BT-AD -40 °C ... +70 °C 2 x MM (2 km)	24 03 004 2100		
Ha-VIS eCon 3042BT-AF -40 °C ... +70 °C 2 x SM (15 km)	24 03 004 2200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	6 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	1 x 100BASE-FX / SC duplex socket
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / =)
Current consumption typical @ 24 V / 48 V	121 mA / 65 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	443 g - 449 g
MTBF in million hours	2.21
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3061B-AD 0 °C ... +55 °C 1 x MM (2 km)	24 03 006 1110		
Ha-VIS eCon 3061B-AF 0 °C ... +55 °C 1 x SM (15 km)	24 03 006 1210		
Ha-VIS eCon 3061BT-AD -40 °C ... +70 °C 1 x MM (2 km)	24 03 006 1100		
Ha-VIS eCon 3061BT-AF -40 °C ... +70 °C 1 x SM (15 km)	24 03 006 1200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	8 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	1 x 100BASE-FX / SC duplex socket
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V	227 mA / 117 mA
Dimensions (W x H x D)	38.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	514 g
MTBF in million hours	0.94
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3081B-AD 0 °C ... +55 °C 1 x MM (2 km)	24 03 008 1110		
Ha-VIS eCon 3081B-AF 0 °C ... +55 °C 1 x SM (15 km)	24 03 008 1210		
Ha-VIS eCon 3081BT-AD -40 °C ... +70 °C 1 x MM (2 km)	24 03 008 1100		
Ha-VIS eCon 3081BT-AF -40 °C ... +70 °C 1 x SM (15 km)	24 03 008 1200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	8 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	2 x 100BASE-FX / SC duplex socket
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / =)
Current consumption typical @ 24 V / 48 V	275 mA / 139 mA
Dimensions (W x H x D)	38.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	531 g
MTBF in million hours	0.93
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3082B-AD 0 °C ... +55 °C 2 x MM (2 km)	24 03 008 2110		
Ha-VIS eCon 3082B-AF 0 °C ... +55 °C 2 x SM (15 km)	24 03 008 2210		
Ha-VIS eCon 3082BT-AD -40 °C ... +70 °C 2 x MM (2 km)	24 03 008 2100		
Ha-VIS eCon 3082BT-AF -40 °C ... +70 °C 2 x SM (15 km)	24 03 008 2200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	5 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	149 mA / 77 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	457 g
MTBF in million hours	1.97
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3050GB-A 0 °C ... +55 °C	24 03 405 0010		
Ha-VIS eCon 3050GBT-A -40 °C ... +70 °C	24 03 405 0000		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	6 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	172 mA / 89 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	464 g
MTBF in million hours	1.76
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3060GB-A 0 °C ... +55 °C	24 03 406 0010		
Ha-VIS eCon 3060GBT-A -40 °C ... +70 °C	24 03 406 0000		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	7 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V	182 mA / 93 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	490 g
MTBF in million hours	0.85
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3070GB-A 0 °C ... +55 °C	24 03 407 0010		
Ha-VIS eCon 3070GBT-A -40 °C ... +70 °C	24 03 407 0000		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	1 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
Number of ports F.O. / termination	1 x 1000BASE-SX / SC duplex socket
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	92 mA / 50 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	428 g - 434 g
MTBF in million hours	2.13
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3011GB-AD 0 °C ... +55 °C 1 x MM (550 m)	24 03 401 1110		
Ha-VIS eCon 3011GB-AF 0 °C ... +55 °C 1 x SM (10 km)	24 03 401 1210		
Ha-VIS eCon 3011GBT-AD -40 °C ... +70 °C 1 x MM (550 m)	24 03 401 1100		
Ha-VIS eCon 3011GBT-AF -40 °C ... +70 °C 1 x SM (10 km)	24 03 401 1200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	4 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
Number of ports F.O. / termination	1 x 1000BASE-SX / SC duplex socket
Nominal voltage	24 / 48 / 54 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	155 mA / 81 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	468 g - 474 g
MTBF in million hours	2.15
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, E1, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3041GB-AD 0 °C ... +55 °C 1 x MM (550 m)	24 03 404 1110		
Ha-VIS eCon 3041GB-AF 0 °C ... +55 °C 1 x SM (10 km)	24 03 404 1210		
Ha-VIS eCon 3041GBT-AD -40 °C ... +70 °C 1 x MM (550 m)	24 03 404 1100		
Ha-VIS eCon 3041GBT-AF -40 °C ... +70 °C 1 x SM (10 km)	24 03 404 1200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	4 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
Number of ports F.O. / termination	2 x 1000BASE-SX / SC duplex socket
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	182 mA / 95 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	476 g - 488 g
MTBF in million hours	2.08
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, E1, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3042GB-AD 0 °C ... +55 °C 2 x MM (550 m)	24 03 404 2110	<p>Technical drawing showing front and side views of the switch module. Dimensions in mm: 14,2 (height of top section), 142,0 (height of main body), 8,2 (height of bottom section), 107,5 (width of main body), 112,76 (width including top section), 125,76 (width including bottom section), 6,7 (width of side section), 25,0 (width of side section).</p>	
Ha-VIS eCon 3042GB-AF 0 °C ... +55 °C 2 x SM (10 km)	24 03 404 2210		
Ha-VIS eCon 3042GBT-AD -40 °C ... +70 °C 2 x MM (550 m)	24 03 404 2100		
Ha-VIS eCon 3042GBT-AF -40 °C ... +70 °C 2 x SM (10 km)	24 03 404 2200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	5 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
Number of ports F.O. / termination	1 x 1000BASE-SX / SC duplex socket
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	177 mA / 92 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	474 g - 480 g
MTBF in million hours	1.91
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3051GB-AD 0 °C ... +55 °C 1 x MM (550 m)	24 03 405 1110		
Ha-VIS eCon 3051GB-AF 0 °C ... +55 °C 1 x SM (10 km)	24 03 405 1210		
Ha-VIS eCon 3051GBT-AD -40 °C ... +70 °C 1 x MM (550 m)	24 03 405 1100		
Ha-VIS eCon 3051GBT-AF -40 °C ... +70 °C 1 x SM (10 km)	24 03 405 1200		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	1 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
Number of ports F.O. / termination	1 x 100/1000 SFP
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	90 mA / 50 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	437 g
MTBF in million hours	0.95
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3011GB-AC 0 °C ... +55 °C 1 x SFP	24 03 401 1310		
Ha-VIS eCon 3011GBT-AC -40 °C ... +70 °C 1 x SFP	24 03 401 1300		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	4 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
Number of ports F.O. / termination	3 x 100/1000 SFP
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	172 mA / 89 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	486 g
MTBF in million hours	0.99
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3043GB-AC 0 °C ... +55 °C 3 x SFP	24 03 404 3310		
Ha-VIS eCon 3043GBT-AC -40 °C ... +70 °C 3 x SFP	24 03 404 3300		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	5 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
Number of ports F.O. / termination	2 x 100/1000 SFP
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	175 mA / 90 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	488 g
MTBF in million hours	0.94
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3052GB-AC 0 °C ... +55 °C 2 x SFP	24 03 405 2310		
Ha-VIS eCon 3052GBT-AC -40 °C ... +70 °C 2 x SFP	24 03 405 2300		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Specification

Number of ports copper / termination	6 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
Number of ports F.O. / termination	1 x 100/1000 SFP
Nominal voltage	24 / 48 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	178 mA / 92 mA
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	490 g
MTBF in million hours	0.89
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3061GB-AC 0 °C ... +55 °C 1 x SFP	24 03 406 1310	<p>Technical drawing showing front and side views of the switch module. Dimensions are provided in millimeters: Front view shows a height of 142.0 mm and a width of 109.75 mm. The main body width is 107.5 mm. A top protrusion is 14.2 mm high. A side protrusion is 6.7 mm wide. The side view shows a depth of 25.0 mm and a mounting offset of 8.2 mm.</p>	
Ha-VIS eCon 3061GBT-AC -40 °C ... +70 °C 1 x SFP	24 03 406 1300		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination including PoE+ ports	6 x 10BASE-T _e / 100BASE-TX EEE / RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V / 54 V	0.08 A / 1.40 A / 2.40 A
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	480 g
MTBF in million hours	1.18
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, E1, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3060B-A-P 0 °C ... +55 °C	24 03 006 0030		
Ha-VIS eCon 3060BT-A-P -40 °C ... +70 °C	24 03 006 0020		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination including PoE+ ports	8 x 10BASE-T _e / 100BASE-TX EEE / RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC ≡
Permissible voltage range	9 V ... 60 VDC ≡
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V / 54 V	0.09 A / 1.41 A / 2.40 A
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	492 g
MTBF in million hours	1.14
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, E1, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3080B-A-P 0 °C ... +55 °C	24 03 008 0030		
Ha-VIS eCon 3080BT-A-P -40 °C ... +70 °C	24 03 008 0020		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination, including PoE+ ports	4 x 10BASE-T _e / 100BASE-TX EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	4 x PoE+ with 34.2 watts per port 1 x 100BASE-FX / SC duplex socket
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC ≡
Permissible voltage range	9 V ... 60 VDC ≡
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≡)
Current consumption typical @ 24 V / 48 V / 54 V	0.12 A / 1.42 A / 2.41 A
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	480 g - 486 g
MTBF in million hours	1.19
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3041B-AD-P 0 °C ... +55 °C 1 x MM (2 km)	24 03 004 1130		
Ha-VIS eCon 3041B-AF-P 0 °C ... +55 °C 1 x SM (15 km)	24 03 004 1230		
Ha-VIS eCon 3041BT-AD-P -40 °C ... +70 °C 1 x MM (2 km)	24 03 004 1120		
Ha-VIS eCon 3041BT-AF-P -40 °C ... +70 °C 1 x SM (15 km)	24 03 004 1220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination including PoE+ ports	4 x 10BASE-T _e / 100BASE-TX EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	4 x PoE+ with 34.2 watts per port 2 x 100BASE-FX / SC duplex socket
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC ≡
Permissible voltage range	9 V ... 60 VDC ≡
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≡)
Current consumption typical @ 24 V / 48 V / 54 V	0.15 A / 1.44 A / 2.43 A
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	496 g - 508 g
MTBF in million hours	1.17
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3042B-AD-P 0 °C ... +55 °C 2 x MM (2 km)	24 03 004 2130		
Ha-VIS eCon 3042B-AF-P 0 °C ... +55 °C 2 x SM (15 km)	24 03 004 2230		
Ha-VIS eCon 3042BT-AD-P -40 °C ... +70 °C 2 x MM (2 km)	24 03 004 2120		
Ha-VIS eCon 3042BT-AF-P -40 °C ... +70 °C 2 x SM (15 km)	24 03 004 2220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination including PoE+ ports	6 x 10BASE-T _e / 100BASE-TX EEE / RJ45 (twisted pair)
Number of ports F.O. / termination	4 x PoE+ with 34.2 watts per port 1 x 100BASE-FX / SC duplex socket
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC ≐
Permissible voltage range	9 V ... 60 VDC ≐
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≐)
Current consumption typical @ 24 V / 48 V / 54 V	0.13 A / 1.43 A / 2.42 A
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	493 g - 499 g
MTBF in million hours	1.15
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3061B-AD-P 0 °C ... +55 °C 1 x MM (2 km)	24 03 006 1130		
Ha-VIS eCon 3061B-AF-P 0 °C ... +55 °C 1 x SM (15 km)	24 03 006 1230		
Ha-VIS eCon 3061BT-AD-P -40 °C ... +70 °C 1 x MM (2 km)	24 03 006 1120		
Ha-VIS eCon 3061BT-AF-P -40 °C ... +70 °C 1 x SM (15 km)	24 03 006 1220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

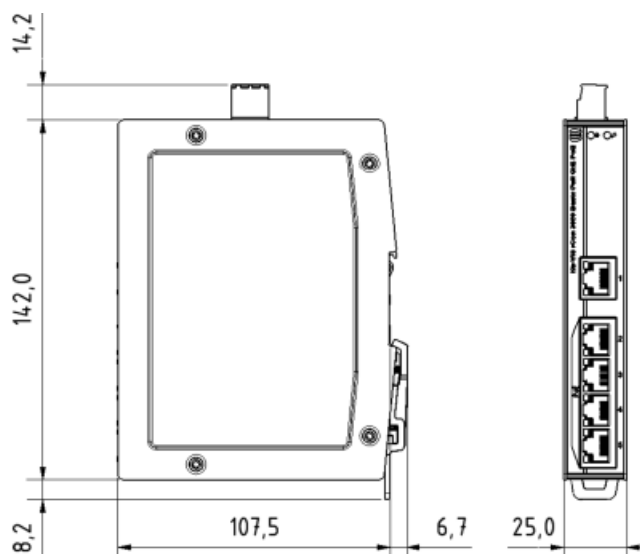
Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination, including PoE+ ports	5 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC ≡
Permissible voltage range	9 V ... 60 VDC ≡
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≡)
Current consumption typical @ 24 V / 48 V / 54 V	0.16 A / 1.43 A / 2.42 A
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	498 g
MTBF in million hours	1.08
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 3050GB-A-P 0 °C ... +55 °C	24 03 405 0030		
Ha-VIS eCon 3050GBT-A-P -40 °C ... +70 °C	24 03 405 0020		





Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination including PoE+ ports	6 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V / 54 V	0.18 A / 1.44 A / 2.43 A
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	505 g
MTBF in million hours	1.01
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 3060GB-A-P 0 °C ... +55 °C	24 03 406 0030	
Ha-VIS eCon 3060GBT-A-P -40 °C ... +70 °C	24 03 406 0020	



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

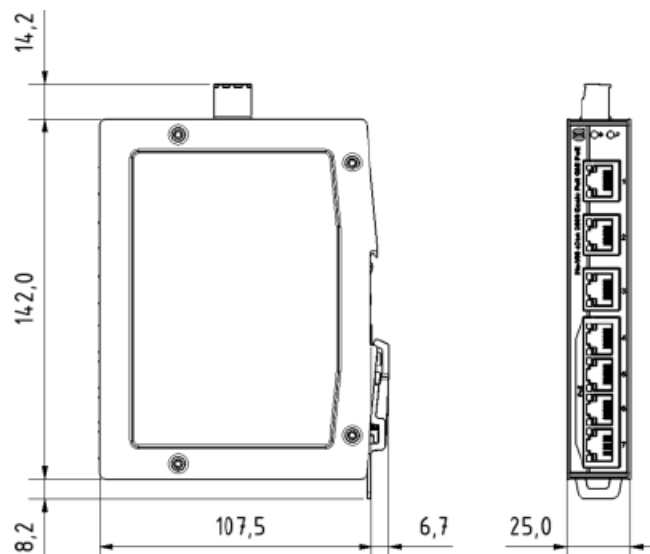
Specification

Number of ports copper / termination including PoE+ ports	7 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC ≡
Permissible voltage range	9 V ... 60 VDC ≡
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≡)
Current consumption typical @ 24 V / 48 V / 54 V	0.19 A / 1.48 A / 2.45 A
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	531 g
MTBF in million hours	0.63
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 3070GB-A-P 0 °C ... +55 °C	24 03 407 0030		
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Ha-VIS eCon 3070GBT-A-P -40 °C ... +70 °C	24 03 407 0020		
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Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination	4 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
including PoE+ ports	4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	1 x 1000BASE-SX / SC duplex socket
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V / 54 V	0.17 A / 1.44 A / 2.42 A
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	509 g - 515 g
MTBF in million hours	1.13
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3041GB-AD-P 0 °C ... +55 °C 1 x MM (550 m)	24 03 404 1130		
Ha-VIS eCon 3041GB-AF-P 0 °C ... +55 °C 1 x SM (10 km)	24 03 404 1230		
Ha-VIS eCon 3041GBT-AD-P -40 °C ... +70 °C 1 x MM (550 m)	24 03 404 1120		
Ha-VIS eCon 3041GBT-AF-P -40 °C ... +70 °C 1 x SM (10 km)	24 03 404 1220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination	4 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
including PoE+ ports	4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	2 x 1000BASE-SX / SC duplex socket
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V / 54 V	0.19 A / 1.45 A / 2.44 A
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	517 g - 529 g
MTBF in million hours	1.11
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3042GB-AD-P 0 °C ... +55 °C 2 x MM (550 m)	24 03 404 2130		
Ha-VIS eCon 3042GB-AF-P 0 °C ... +55 °C 2 x SM (10 km)	24 03 404 2230		
Ha-VIS eCon 3042GBT-AD-P -40 °C ... +70 °C 2 x MM (550 m)	24 03 404 2120		
Ha-VIS eCon 3042GBT-AF-P -40 °C ... +70 °C 2 x SM (10 km)	24 03 404 2220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination	5 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
including PoE+ ports	4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	1 x 1000BASE-SX / SC duplex socket
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V / 54 V	0.19 A / 1.45 A / 2.44 A
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	515 g - 521 g
MTBF in million hours	1.06
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3051GB-AD-P 0 °C ... +55 °C 1 x MM (550 m)	24 03 405 1130		
Ha-VIS eCon 3051GB-AF-P 0 °C ... +55 °C 1 x SM (10 km)	24 03 405 1230		
Ha-VIS eCon 3051GBT-AD-P -40 °C ... +70 °C 1 x MM (550 m)	24 03 405 1120		
Ha-VIS eCon 3051GBT-AF-P -40 °C ... +70 °C 1 x SM (10 km)	24 03 405 1220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 PoE+ ports (34.2 watts per port)

Specification

Number of ports copper / termination	4 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
including PoE+ ports	4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	3 x 100/1000 SFP
Nominal voltage	24 / 48 / 54 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V / 54 V	0.18 A / 1.46 A / 2.44 A
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	526 g
MTBF in million hours	0.70
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3043GB-AC-P 0 °C ... +55 °C 3 x SFP	24 03 404 3330		
Ha-VIS eCon 3043GBT-AC-P -40 °C ... +70 °C 3 x SFP	24 03 404 3320		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination	5 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
including PoE+ ports	4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	2 x 100/1000 SFP
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V / 54 V	0.19 A / 1.47 A / 2.45 A
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	529 g
MTBF in million hours	0.68
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3052GB-AC-P 0 °C ... +55 °C 2 x SFP	24 03 405 2330	<p>Technical drawing showing front and side views of the switch module. Dimensions are provided in millimeters: 14,2 (top height), 112,0 (main body height), 8,2 (bottom height), 107,5 (main body width), 109,75 (total width including mounting tabs), 6,7 (mounting tab width), and 25,0 (depth).</p>	
Ha-VIS eCon 3052GBT-AC-P -40 °C ... +70 °C 2 x SFP	24 03 405 2320		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Specification

Number of ports copper / termination	6 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
including PoE+ ports	4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	1 x 100/1000 SFP
Nominal voltage (without PoE / PoE / PoE+)	24 / 48 / 54 VDC =
Permissible voltage range	9 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V / 54 V	0.19 A / 1.48 A / 2.45 A
Dimensions (W x H x D)	25.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	527 g
MTBF in million hours	0.66
Approvals	CE FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

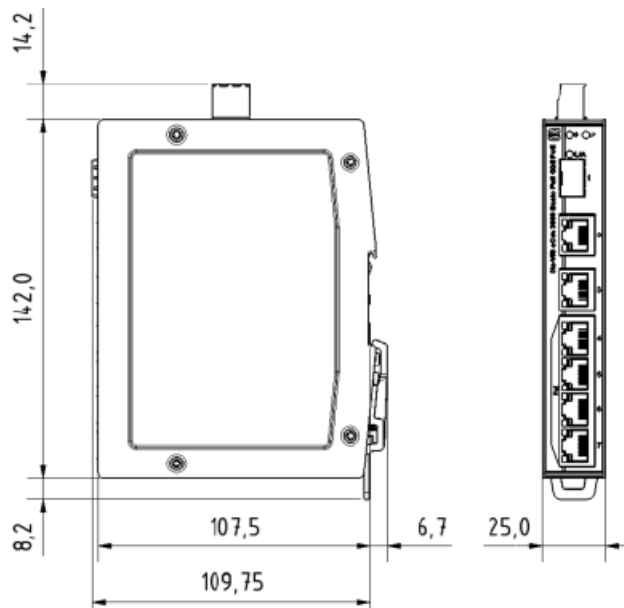
Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon
3061GB-AC-P
0 °C ... +55 °C
1 x SFP

24 03 406 1330

Ha-VIS eCon
3061GBT-AC-P
-40 °C ... +70 °C
1 x SFP

24 03 406 1320





Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Integrated 24 / 54 V DC Voltage Transformer

Specification

Number of ports copper / termination including PoE+ ports	6 x 10BASE-T _e / 100BASE-TX EEE RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Nominal voltage	24 VDC ≐
Permissible voltage range	18 V ... 60 VDC ≐
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≐)
Current consumption typical @ 24 V / 48 V	See eCatalogue
Dimensions (W x H x D)	60.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	See eCatalogue
MTBF in million hours	See eCatalogue
Approvals	CE
Approvals (in preparation)	FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

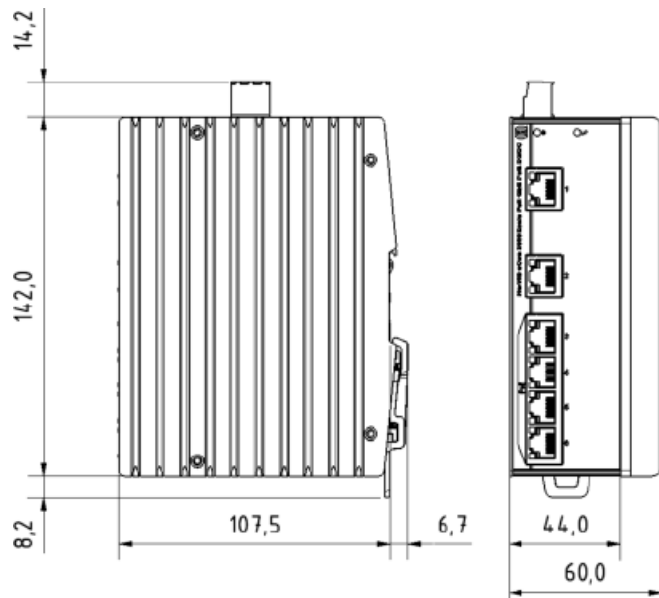
Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 3060B-A-PP
0 °C ... +55 °C

24 03 106 0030

Ha-VIS eCon 3060BT-A-PP
-40 °C ... +70 °C

24 03 106 0020





Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Integrated 24 / 54 V DC Voltage Transformer

Specification

Number of ports copper / termination including PoE+ ports	8 x 10BASE-T _e / 100BASE-TX EEE / RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Nominal voltage	24 VDC ≡
Permissible voltage range	18 V ... 60 VDC ≡
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≡)
Current consumption typical @ 24 V / 48 V	See eCatalogue
Dimensions (W x H x D)	60.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	445 g
MTBF in million hours	See eCatalogue
Approvals	CE
Approvals (in preparation)	FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3080B-A-PP 0 °C ... +55 °C	24 03 108 0030		
Ha-VIS eCon 3080BT-A-PP -40 °C ... +70 °C	24 03 108 0020		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Integrated 24 / 54 V DC Voltage Transformer

Specification

Number of ports copper / termination including PoE+ ports	4 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	1 x 100BASE-FX / SC duplex socket
Nominal voltage	24 VDC ≐
Permissible voltage range	18 V ... 60 VDC ≐
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≐)
Current consumption typical @ 24 V / 48 V	See eCatalogue
Dimensions (W x H x D)	60.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	430 g
MTBF in million hours	See eCatalogue
Approvals	CE
Approvals (in preparation)	FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3041B-AD-PP 0 °C ... +55 °C 1 x MM (2 km)	24 03 104 1130		
Ha-VIS eCon 3041B-AF-PP 0 °C ... +55 °C 1 x SM (15 km)	24 03 104 1230		
Ha-VIS eCon 3041BT-AD-PP -40 °C ... +70 °C 1 x MM (2 km)	24 03 104 1120		
Ha-VIS eCon 3041BT-AF-PP -40 °C ... +70 °C 1 x SM (15 km)	24 03 104 1220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Integrated 24 / 54 V DC Voltage Transformer

Specification

Number of ports copper / termination including PoE+ ports	4 x 10BASE-T _e / 100BASE-TX EEE / RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	2 x 100BASE-FX / SC duplex socket
Nominal voltage	24 VDC =
Permissible voltage range	18 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V	See eCatalogue
Dimensions (W x H x D)	60.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	445 g
MTBF in million hours	See eCatalogue
Approvals	CE
Approvals (in preparation)	FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3042B-AD-PP 0 °C ... +55 °C 2 x MM (2 km)	24 03 104 2130		
Ha-VIS eCon 3042B-AF-PP 0 °C ... +55 °C 2 x SM (15 km)	24 03 104 2230		
Ha-VIS eCon 3042BT-AD-PP -40 °C ... +70 °C 2 x MM (2 km)	24 03 104 2120		
Ha-VIS eCon 3042BT-AF-PP -40 °C ... +70 °C 2 x SM (15 km)	24 03 104 2220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Integrated 24 / 54 V DC Voltage Transformer

Specification

Number of ports copper / termination including PoE+ ports	6 x 10BASE-Te / 100BASE-TX EEE / RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	1 x 100BASE-FX / SC duplex socket
Nominal voltage	24 VDC =
Permissible voltage range	18 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / =)
Current consumption typical @ 24 V / 48 V	See eCatalogue
Dimensions (W x H x D)	60.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	445 g
MTBF in million hours	See eCatalogue
Approvals	CE
Approvals (in preparation)	FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3061B-AD-PP 0 °C ... +55 °C 1 x MM (2 km)	24 03 106 1130		
Ha-VIS eCon 3061B-AF-PP 0 °C ... +55 °C 1 x SM (15 km)	24 03 106 1230		
Ha-VIS eCon 3061BT-AD-PP -40 °C ... +70 °C 1 x MM (2 km)	24 03 106 1120		
Ha-VIS eCon 3061BT-AF-PP -40 °C ... +70 °C 1 x SM (15 km)	24 03 106 1220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Integrated 24 / 54 V DC Voltage Transformer

Specification

Number of ports copper / termination including PoE+ ports	5 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Nominal voltage	24 VDC =
Permissible voltage range	18 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	See eCatalogue
Dimensions (W x H x D)	60.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	See eCatalogue
MTBF in million hours	See eCatalogue
Approvals	CE
Approvals (in preparation)	FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3050GB-A-PP 0 °C ... +55 °C	24 03 505 0030		
Ha-VIS eCon 3050GBT-A-PP -40 °C ... +70 °C	24 03 505 0020		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

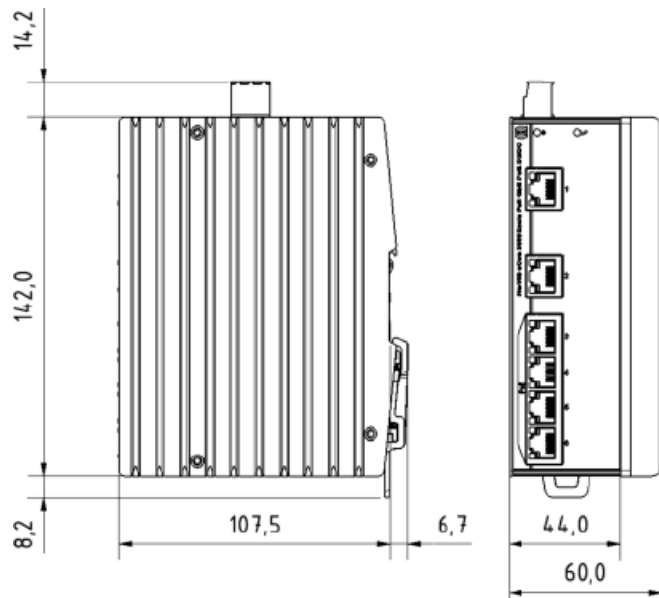
Integrated 24 / 54 V DC Voltage Transformer

Specification

Number of ports copper / termination including PoE+ ports	6 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Nominal voltage	24 VDC ≍
Permissible voltage range	18 V ... 60 VDC ≍
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ≍)
Current consumption typical @ 24 V / 48 V	See eCatalogue
Dimensions (W x H x D)	60.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	See eCatalogue
MTBF in million hours	See eCatalogue
Approvals	CE
Approvals (in preparation)	FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 3060GB-A-PP 0 °C ... +55 °C	24 03 506 0030		
Ha-VIS eCon 3060GBT-A-PP -40 °C ... +70 °C	24 03 506 0020		





Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Integrated 24 / 54 V DC Voltage Transformer

Specification

Number of ports copper / termination including PoE+ ports	7 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair) 4 x PoE+ with 34.2 watts per port
Nominal voltage	24 VDC =
Permissible voltage range	18 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V	See eCatalogue
Dimensions (W x H x D)	60.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	See eCatalogue
MTBF in million hours	See eCatalogue
Approvals	CE
Approvals (in preparation)	FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3070GB-A-PP 0 °C ... +55 °C	24 03 507 0030		
Ha-VIS eCon 3070GBT-A-PP -40 °C ... +70 °C	24 03 507 0020		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Integrated 24 / 54 V DC Voltage Transformer

Specification

Number of ports copper / termination, including PoE+ ports	4 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
Number of ports F.O. / termination	4 x PoE+ with 34.2 watts per port 1 x 1000BASE-SX / SC duplex socket
Nominal voltage	24 VDC ==
Permissible voltage range	18 V ... 60 VDC ==
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	See eCatalogue
Dimensions (W x H x D)	60.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	See eCatalogue
MTBF in million hours	See eCatalogue
Approvals	CE
Approvals (in preparation)	FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3041GB-AD-PP 0 °C ... +55 °C 1 x MM (550 m)	24 03 504 1130		
Ha-VIS eCon 3041GB-AF-PP 0 °C ... +55 °C 1 x SM (10 km)	24 03 504 1230		
Ha-VIS eCon 3041GBT-AD-PP -40 °C ... +70 °C 1 x MM (550 m)	24 03 504 1120		
Ha-VIS eCon 3041GBT-AF-PP -40 °C ... +70 °C 1 x SM (10 km)	24 03 504 1220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Integrated 24 / 54 V DC Voltage Transformer

Specification

Number of ports copper / termination	4 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
including PoE+ ports	4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	2 x 1000BASE-SX / SC duplex socket
Nominal voltage	24 VDC =
Permissible voltage range	18 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V	See eCatalogue
Dimensions (W x H x D)	60.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	See eCatalogue
MTBF in million hours	See eCatalogue
Approvals	CE
Approvals (in preparation)	FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3042GB-AD-PP 0 °C ... +55 °C 2 x MM (550 m)	24 03 504 2130		
Ha-VIS eCon 3042GB-AF-PP 0 °C ... +55 °C 2 x SM (10 km)	24 03 504 2230		
Ha-VIS eCon 3042GBT-AD-PP -40 °C ... +70 °C 2 x MM (550 m)	24 03 504 2120		
Ha-VIS eCon 3042GBT-AF-PP -40 °C ... +70 °C 2 x SM (10 km)	24 03 504 2220		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Integrated 24 / 54 V DC Voltage Transformer

Specification

Number of ports copper / termination	5 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
including PoE+ ports	4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	1 x 1000BASE-SX / SC duplex socket
Nominal voltage	24 VDC ==
Permissible voltage range	18 V ... 60 VDC ==
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V	See eCatalogue
Dimensions (W x H x D)	60.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	See eCatalogue
MTBF in million hours	See eCatalogue
Approvals	CE
Approvals (in preparation)	FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon
3051GB-AD-PP

0 °C ... +55 °C
1 x MM (550 m)

24 03 505 1130

Ha-VIS eCon
3051GB-AF-PP

0 °C ... +55 °C
1 x SM (10 km)

24 03 505 1230

Ha-VIS eCon
3051GBT-AD-PP

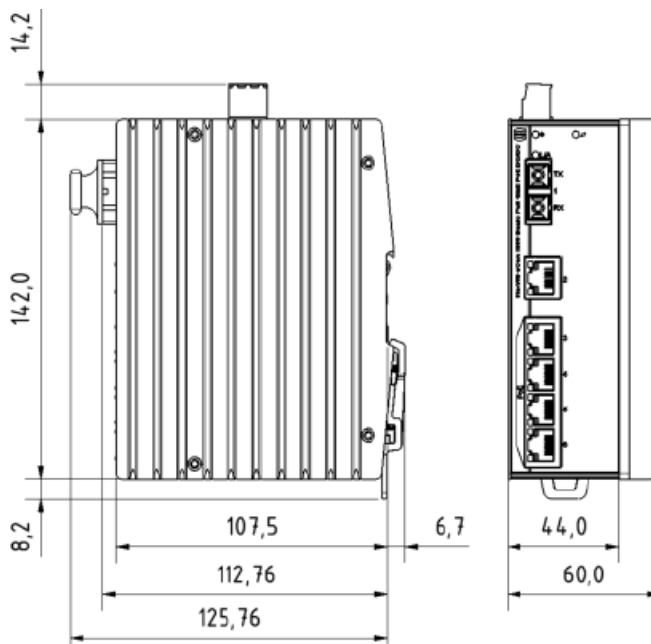
-40 °C ... +70 °C
1 x MM (550 m)

24 03 505 1120

Ha-VIS eCon
3051GBT-AF-PP

-40 °C ... +70 °C
1 x SM (10 km)

24 03 505 1220





Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Integrated 24 / 54 V DC Voltage Transformer

Specification

Number of ports copper / termination	4 x 10BASE-T _e / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
including PoE+ ports	4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	3 x 100/1000 SFP
Nominal voltage	24 VDC =
Permissible voltage range	18 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⌀)
Current consumption typical @ 24 V / 48 V	See eCatalogue
Dimensions (W x H x D)	60.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	See eCatalogue
MTBF in million hours	See eCatalogue
Approvals	CE
Approvals (in preparation)	FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3043GB-AC-PP 0 °C ... +55 °C 3 x SFP	24 03 504 3330		
Ha-VIS eCon 3043GBT-AC-PP -40 °C ... +70 °C 3 x SFP	24 03 504 3320		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Integrated 24 / 54 V DC Voltage Transformer

Specification

Number of ports copper / termination	5 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
including PoE+ ports	4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	2 x 100/1000 SFP
Nominal voltage	24 VDC ==
Permissible voltage range	18 V ... 60 VDC ==
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V	See eCatalogue
Dimensions (W x H x D)	60.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	See eCatalogue
MTBF in million hours	See eCatalogue
Approvals	CE
Approvals (in preparation)	FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3052GB-AC-PP 0 °C ... +55 °C 2 x SFP	24 03 505 2330		
Ha-VIS eCon 3052GBT-AC-PP -40 °C ... +70 °C 2 x SFP	24 03 505 2320		



Unmanaged Plug-and-Play Ethernet Switches

for Assembly on DIN Rail in Control Cabinets

Commercial Temp.: 0 °C ... +55 °C / Industrial Temp.: -40 °C ... +70 °C

Power Sourcing Equipment (PSE) with 4 Ports PoE+ (34.2 watts per port)

Integrated 24 / 54 V DC Voltage Transformer

Specification

Number of ports copper / termination	6 x 10BASE-Te / 100BASE-TX EEE / 1000BASE-T EEE RJ45 (twisted pair)
including PoE+ ports	4 x PoE+ with 34.2 watts per port
Number of ports F.O. / termination	1 x 100/1000 SFP
Nominal voltage	24 VDC =
Permissible voltage range	18 V ... 60 VDC =
Termination	Screw type terminal block, pluggable, 3-poles (+ / - / ⚡)
Current consumption typical @ 24 V / 48 V	See eCatalogue
Dimensions (W x H x D)	60.0 x 142.0 x 107.5 mm (without pluggable screw type terminal block)
Weight	See eCatalogue
MTBF in million hours	See eCatalogue
Approvals	CE
Approvals (in preparation)	FCC CFR 47 Part 15, cUL US 508 listed, Det Norske Veritas (DNV), Germanischer Lloyd (GL), American Bureau of Shipping (ABS), Nippon Kaiji Kyokai (NK)

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3061GB-AC-PP 0 °C ... +55 °C 1 x SFP	24 03 506 1330		
Ha-VIS eCon 3061GBT-AC-PP -40 °C ... +70 °C 1 x SFP	24 03 506 1320		

Ethernet Media converter Ha-VIS eCon 3000

Ethernet Media converter for vertical installation in control cabinets,
including 1 F.O. port



General description

The Fast Ethernet Media converter Ha-VIS eCon 3011 of the product family Ha-VIS eCon 3000 is suitable for industrial applications and support both Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s). The Mediaconverter enables the conversion from Twisted Pair cables to fiber-optic cables (Multimode and Singlemode).

The Ha-VIS eCon 3011 Media converter is configurable via Dip switch and offers a variety of control functions.

The Media converter has two operating modes:

In the switch mode, it operates as an unmanaged Ethernet Switch with Store and Forward Switching which supports asynchronous data communication, Auto-crossing and Auto-negotiation.

In the converter mode, it works with a data rate of 100 Mbit/s (Full duplex). The latency is very low in this operation mode.

Features

- Auto-crossing
- Auto-negotiation
- Auto-polarity
- Store and Forward Switching Mode

Advantages

- Power over Ethernet (IEEE 802.3af)
- Configuration via Dip switch
- Small housing
- Robust metal housing
- Adapted for mounting onto top-hat mounting rail 35 mm according to EN 60 715

Application fields

- Industrial automation
- Automotive industry
- Wind power
- Power distribution systems

Technical characteristics Media converter

Ethernet interface – RJ45

Number of ports	1x 10/100Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s (RJ45)
Repeater class	Class II (latency: 860 ns in converter mode)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination	RJ45 (Twisted Pair)
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow 10 Mbit/s: OFF • Duplex - Full duplex: Yellow Half duplex: OFF • PoE (Power Source Equipment) (PSE) - Green
Topology	<ul style="list-style-type: none"> • Line • Star • mixed

Power supply

Input voltage	24 V DC (12 V ... 30 V DC) - redundant
Input voltage, mode PoE	48 V DC (46 V ... 57 V DC) - redundant
Termination	5-pole, pluggable screw contact, redundant (PWR1 + / PWR1 - / PWR2 + / PWR2 - / FE)
Diagnostics (LED)	Power supply - LED Green

Configuration

Configuration via Dip switch:
Mode, Auto-negotiation, Data rate, Duplex TP, Duplex FX,
Link monitoring, PoE (PSE)

Design features

Housing material	metal
Dimensions (W x H x D)	23 x 130 x 100 mm (without connectors)
Degree of protection acc. to DIN EN 60 529	IP30
Assembly	35 mm top-hat rail acc. to EN 60 715
Weight	approx. 0.6 kg

Environmental conditions

Stock temperature	-40 °C ... +85 °C
Relative humidity	10 % ... +95 % (non-condensing)

Technical characteristics Media converter F.O. termination

Ethernet interface – F.O.

Number of ports	1x 100Base-FX
Cable types according to IEEE 802.3	Multimodefibre, 1300 nm; 50 µm / 125 µm or 62.5 µm / 125 µm
Data rate	100 Mbit/s
Maximum cable length	2000 m (Multimode)
Termination	SC-D female
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing • Duplex - Full duplex: Yellow Half duplex: OFF
Wavelength	1300 nm
Transceive power T(X) max. (dynamic)	<ul style="list-style-type: none"> • -14 dBm (50 µm / 125 µm) • -14 dBm (62.5 µm / 125 µm)
Transceive power T(X) min.	<ul style="list-style-type: none"> • -23.5 dBm (50 µm / 125 µm) • -20 dBm (62.5 µm / 125 µm)
Receive power RX typical (dynamic)	<ul style="list-style-type: none"> • -33.9 dBm (window) • -35.2 dBm (centre)
Receive power RX max. (dynamic)	-14 dBm
Signal detection (dynamic)	-33 dBm
Topology	<ul style="list-style-type: none"> • Line • Star • mixed



Ethernet Media converter Ha-VIS eCon 3011-AD

2-port Ethernet Media converter for vertical installation in control cabinets,
including 1 F.O. port (SC, MM)

Unmanaged	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	1x 10/100Base-T(X) / RJ45 (Twisted Pair) PoE support		
Number of ports, F.O. / Termination	1x 100Base-FX / SC-D female		
mode PoE			
Input voltage / Termination	48 V DC		
Permissible range (min./max.)	46 V ... 57 V DC		
Input current	approx. 100 mA ... 400 mA at 48 V DC with PoE		
mode Non-PoE			
Input voltage / Termination	24 V DC / 5-pole, pluggable screw contact, redundant (PWR1 + / PWR1 - / PWR2 + / PWR2 - / FE)		
Permissible range (min./max.)	12 V ... 30 V DC		
Input current	approx. 100 mA (at 24 V DC)		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	23 x 130 x 100 mm (without connectors)		
Weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	cUL (in preparation)		
MTBF	2.055.000 h		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3011-AD Ethernet Switch with 1 RJ45 port 1 F.O. port	20 76 102 3100		



Ethernet Media converter Ha-VIS eCon 3011-ASFP

2-port Ethernet Media converter for vertical installation in control cabinets,
including 1 F.O. port (SFP)

Unmanaged	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	1x 10/100Base-T(X) / RJ45 (Twisted Pair) PoE support		
Number of ports, F.O. / Termination	1x 100Base-FX / SFP module slot		
mode PoE			
Input voltage / Termination	48 V DC		
Permissible range (min./max.)	46 V ... 57 V DC		
Input current	approx. 100 mA ... 400 mA at 48 V DC with PoE		
mode Non-PoE			
Input voltage / Termination	24 V DC / 5-pole, pluggable screw contact, redundant (PWR1 + / PWR1 - / PWR2 + / PWR2 - / FE)		
Permissible range (min./max.)	12 V ... 30 V DC		
Input current	approx. 100 mA (at 24 V DC)		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	23 x 130 x 100 mm (without connectors)		
Weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	cUL (in preparation)		
MTBF	2.090.000 h		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 3011-ASFP Ethernet Switch with 1 RJ45 port 1 F.O. port	20 76 102 3101		



Ha-VIS MK3000 Cover

Features

- Mounting cover for use with HARTING mounting adapter
- Fixing of Ha-VIS eCon 3000 Ethernet switches on the mounting adapter
- Mounting adapter must be ordered separately for the right housing width:
 - Ha-VIS MK3000 Wall
 - Ha-VIS MK3000 DINV
 - Ha-VIS MK3000 DINH

Technical characteristics

- Material Steel (1.5 mm)
- Surface Galvanized

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS MK3000 Cover25
For switches with 25 mm width

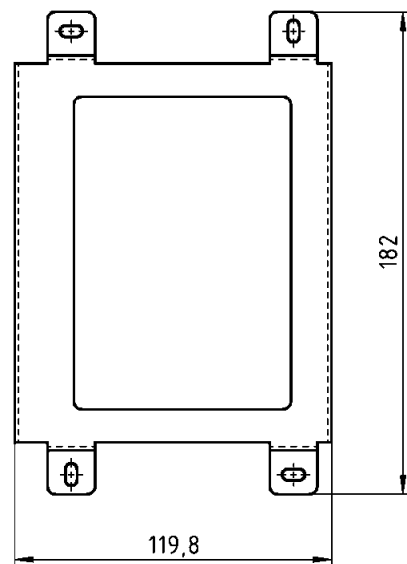
24 98 100 0000

Ha-VIS MK3000 Cover38
For switches with 38 mm width

24 98 100 0001

Ha-VIS MK3000 Cover60
For switches with 60 mm width

24 98 100 0002



Ha-VIS MK3000 Wall
 Ha-VIS MK3000 DINV
 Ha-VIS MK3000 DINH



Features

- Mounting adapter for use with Ha-VIS eCon 3000 Ethernet Switches
- Easy mounting of DIN rail switches on walls
- Flat mounting on DIN rail with port orientation to the side (vertical)
- Flat mounting on DIN rail with port orientation downwards (horizontal)
- Integrated cable manager, for direct fixing the data cable close to the switch, improves the stability and the shock and vibration performance

Technical characteristics

- Material Steel (1.5 mm)
- Surface Galvanized

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS MK3000 Wall
 Flat wall mounting

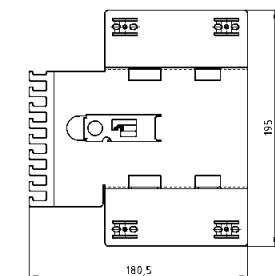
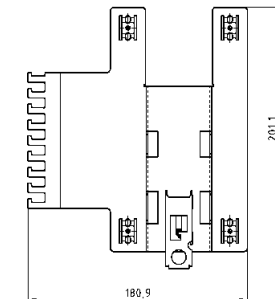
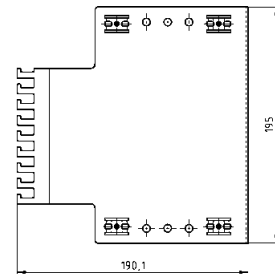
24 98 100 0003

Ha-VIS MK3000 DINV
 Flat DIN rail mounting, vertical

24 98 100 0004

Ha-VIS MK3000 DINH
 Flat DIN rail mounting, horizontal

24 98 100 0005





Ha-VIS MK3000 S7
S7 profile rail

Features

- Mounting of Ha-VIS eCon / mCon Ethernet switches on a S7-300 rail
- Mounting adapter can be used for all DIN rail mountable devices
- Adapter will be mounted on the S7-300 mounting rail and secured with screws
- The adapter is available in different widths

Technical characteristics

- Material Aluminium

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS MK3000 S725
S7 profile rail 25 mm

24 98 100 0010

Ha-VIS MK3000 S738
S7 profile rail 38 mm

24 98 100 0011

Ha-VIS MK3000 S760
S7 profile rail 60 mm

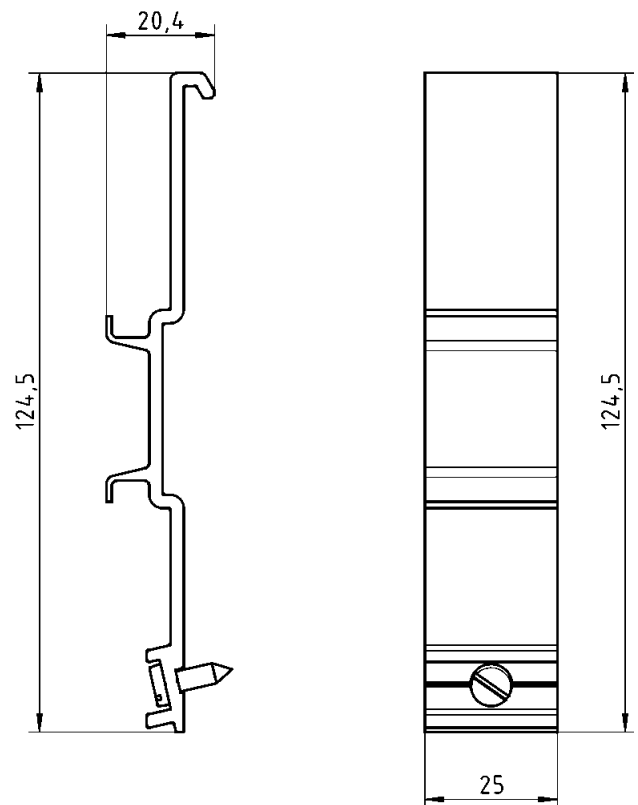
24 98 100 0012

Ha-VIS MK3000 S790
S7 profile rail 90 mm

24 98 100 0013

Ha-VIS MK3000 S7120
S7 profile rail 120 mm

24 98 100 0014





Ethernet Switch Ha-VIS eCon 4000

Ethernet Switches, unmanaged, for flat wall mounting

General description

The Fast Ethernet Switches of the product family Ha-VIS eCon 4000 are recommended for use in the widest range of industrial applications and support both Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s). The product family enables the connection of up to 8 network devices over Twisted Pair cables.

The robust M12 interface shows its advantages especially in applications at risk of vibrations.

The Ha-VIS eCon 4000 Ethernet Switch product family, with its integrated LEDs, supports fast and easy network diagnosis. The Ha-VIS eCon Ethernet Switch operates as an unmanaged Switch in Store and Forward Switching Mode and supports Auto-crossing, Auto-negotiation and Auto-polarity.

Features

- Ethernet Switch according to IEEE 802.3
- Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s)
- Auto-crossing, Auto-negotiation, Auto-polarity
- Diagnostic LEDs (Link Status, Data, Power)
- Store and Forward Switching Mode
- Mounting onto wall, optionally onto top-hat mounting rail

For Ethernet Switch Ha-VIS eCon 4080-BPoE1 only:

- PoE support

Advantages

- Robust metal housing and flat housing style
- EMC, temperature range and mechanical stability meet the toughest demands
- Wide range for power supply input
- Additional type test according to EN 50 155 and EN 50 121-3-2

Application fields

- Railway applications
- Industrial automation
- Automotive industry
- Wind power

Technical characteristics

Ethernet interface – M12

Number of ports	8x 10/100Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s (M12 D-coding)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination	M12 D-coding
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow 10 Mbit/s: Green
Topology	<ul style="list-style-type: none"> • Line • Star • mixed

Power supply

Input voltage	24 / 48 V DC (12 V ... 60 V DC) - redundant
Termination	M12 A-coding, male, for redundant power supply
Diagnostics (LED)	Power supply - LED Green

Design features

Housing material	metal
Dimensions (W x H x D)	130 x 166 x 50 mm (without connectors)
Degree of protection acc. to DIN EN 60 529	IP40
Assembly	Wall mounting, flat assembly
Weight	approx. 0.85 kg

Environmental conditions

Stock temperature	-40 °C ... +85 °C
Relative humidity	10 % ... +95 % (non-condensing)

Technical characteristics Ha-VIS eCon 4080-BPoE1

Ethernet interface – M12

Number of ports	8x 10/100Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s (M12 D-coding)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination	M12 D-coding
Diagnostics (LED) Link	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow 10 Mbit/s: Green
PoE	<ul style="list-style-type: none"> • no PoE device - OFF • PoE device with failure - Red • PoE device connected - Green
Topology	<ul style="list-style-type: none"> • Line • Star • mixed

Power supply

Input voltage mode PoE	48 V DC (46 V ... 55 V DC)						
mode Non-PoE	24 / 48 V DC (12 V ... 55 V DC)						
Termination	M12 A-coding, male, for redundant power supply						
Diagnostics (LED)	<table> <tr> <td>Pwr X9 (switch)</td> <td>voltage – LED Green</td> </tr> <tr> <td>Pwr PoE (mode PoE)</td> <td>> 46 V DC – LED Green</td> </tr> <tr> <td>State</td> <td>< 46 V DC – LED Red</td> </tr> </table>	Pwr X9 (switch)	voltage – LED Green	Pwr PoE (mode PoE)	> 46 V DC – LED Green	State	< 46 V DC – LED Red
Pwr X9 (switch)	voltage – LED Green						
Pwr PoE (mode PoE)	> 46 V DC – LED Green						
State	< 46 V DC – LED Red						

Design features

Housing material	metal
Dimensions (W x H x D)	130 x 166 x 50 mm (without connectors)
Degree of protection acc. to DIN EN 60 529	IP30
Assembly	Wall mounting, flat assembly
Weight	approx. 0.85 kg

Environmental conditions

Stock temperature	-40 °C ... +85 °C
Relative humidity	10 % ... +95 % (non-condensing)



Ethernet Switch
Ha-VIS eCon 4080-B1
 8-port Ethernet Switch for flat wall mounting

Unmanaged	IP40	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
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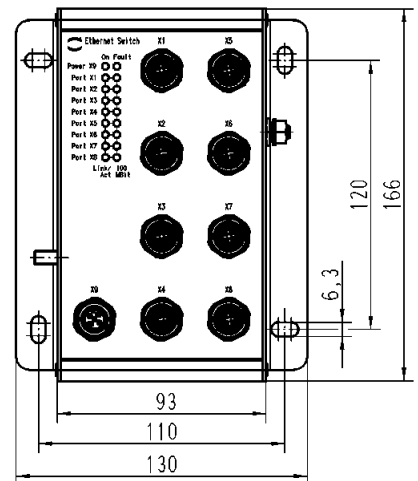
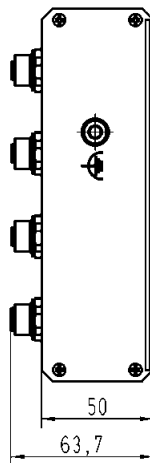
Number of ports, Copper / Termination	8x 10/100Base-T(X) / M12 D-coding
Input voltage / Termination	24 / 48 V DC / M12 A-coding, male, for redundant power supply
Permissible range (min./max.)	12 V ... 60 V DC
Input current	approx. 150 mA (at 24 V DC)
Housing material	metal, powder-coated
Dimensions (W x H x D)	130 x 166 x 50 mm (without connectors)
Weight	approx. 0.85 kg
Working temperature	-40 °C ... +70 °C
Approvals	e1
MTBF	1.544.000 h

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 4080-B1
 Ethernet Switch with
 8 ports M12 D-coding

20 77 208 3001

for wall mounting





Ethernet Switch
Ha-VIS eCon 4080-B3
 8-port Ethernet Switch (110 V DC) for flat wall mounting

Unmanaged	IP40	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-T(X) / M12 D-coding		
Input voltage / Termination	72 / 110 V DC / M12 A-coding, male, for redundant power supply		
Permissible range (min./max.)	50.4 V ... 137.5 V DC		
Input current	approx. 40 mA (at 110 V DC)		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	130 x 166 x 50 mm (without connectors)		
Weight	approx. 0.85 kg		
Working temperature	-40 °C ... +70 °C		
MTBF	1.183.000 h		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 4080-B3 Ethernet Switch with 8 ports M12 D-coding for wall mounting	20 77 208 3003		



Ethernet Switch
Ha-VIS eCon 4080-BPoE1
 8-port Ethernet Switch for flat wall mounting, with Power over Ethernet

Unmanaged	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
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Number of ports, Copper / Termination 8x 10/100Base-T(X) / M12 D-coding
 PoE supports 8 ports

mode PoE

Input voltage / Termination 48 V DC / M12 A-coding, male
 Permissible range (min./max.) 46 V ... 55 V DC
 Input current max. 3 A at 46 V DC, load 350 mA per port

mode Non-PoE

Input voltage / Termination 24 / 48 V DC / M12 A-coding, male, for redundant power supply
 Permissible range (min./max.) 12 V ... 55 V DC
 Input current approx. 150 mA (at 24 V DC)

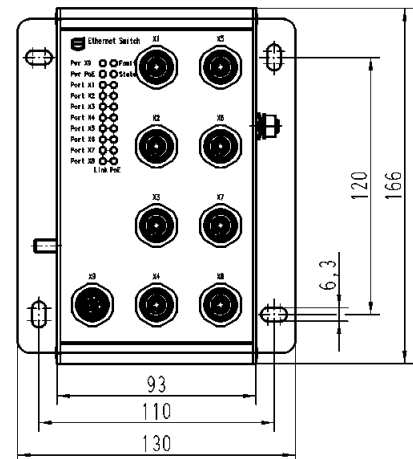
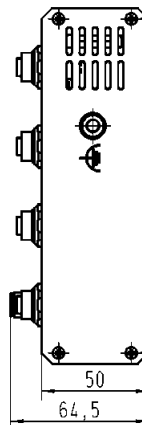
Housing material metal, powder-coated
 Dimensions (W x H x D) 130 x 166 x 50 mm (without connectors)
 Weight approx. 0.85 kg
 Working temperature -40 °C ... +70 °C
 MTBF 505.000 h

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 4080-BPoE1
 Ethernet Switch with
 8 ports M12 D-coding

20 77 208 3009

for wall mounting





Ethernet Switch Ha-VIS eCon 7000

Ethernet Switches, unmanaged, for use in harsh industrial environments

General description

The Ethernet Switches of the product family Ha-VIS eCon 7000 allow, according to type, the connection of up to 10 end units in industrial networks.

Protection class, temperature range and mechanical stability meet the highest demands. These Ethernet Switches can therefore be used directly in industrial environments.

Through their use, a reduction of cabling costs in the construction of industrial networks will be achieved. The Ethernet Switches facilitate any kind of network configuration. All connections are plugged, which ensures that assembly and disassembly is fast and reliable.

Features

- Ethernet Switch acc. to IEEE 802.3
- Ethernet (10 Mbit/s), Fast Ethernet (100 Mbit/s) and Gigabit Ethernet (1000 Mbit/s)
- 5 / 10 ports unmanaged
- Auto-crossing, Auto-negotiation, Auto-polarity
- Diagnostic LEDs (Link status, Data, Power, Error)
- Store and Forward Switching Mode, non-blocking

Advantages

- High degree of protection IP65 / IP67
- Robust metal housing
- Can be used directly in industrial environments
- EMC, temperature range and mechanical stability meet the toughest demands
- PROFINET compatible

Application fields

- Industrial automation
- Railway applications
- Automotive industry
- Wind power

Technical characteristics Ha-VIS eCon 7050-A1, eCon 7100-AA

Ethernet interface – RJ45

Number of ports	5x / 8x 10/100Base-T(X) 2x 10/100/1000-Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s, 100 Mbit/s or 1000 Mbit/s (for Ha-VIS eCon 7100-AA only) (Han® 3 A RJ45)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination, device-side	Han® 3 A RJ45 (female)
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link (Link/Act) - terminal device is connected: Green data transmission in process: Green flashing • Data transfer rate (Speed) - 1000 Mbit/s: Green 100 Mbit/s: Yellow 10 Mbit/s: OFF
Topology	<ul style="list-style-type: none"> • Line • Star • mixed

Power supply

Input voltage	24 / 48 V DC (12 V ... 60 V DC) - redundant
Termination, device-side	Han® 4 A, male, for redundant power supply including fixing screw 09 20 000 9918 to maintain IP67
Diagnostics (LED)	Power supply - LED Green

Alarm signalling contact (for Ha-VIS eCon 7100-AA only)

Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A
Termination, device-side	Han® 3 A, male
Diagnostics (LED)	Error - Red

Design features

	Ha-VIS eCon 7050	Ha-VIS eCon 7100
Housing material	zinc die-cast	zinc die-cast
Dimensions (W x H x D)	45 x 120 x 87 mm (without connectors)	90 x 120 x 87 mm (without connectors)
Degree of protection acc. to DIN EN 60 529	IP65 / IP67	IP65 / IP67
Assembly	<ul style="list-style-type: none"> • Wall mounting, vertical assembly • Wall mounting, flat assembly • 35 mm top-hat rail acc. to EN 60 715 	<ul style="list-style-type: none"> • Wall mounting, vertical assembly • 35 mm top-hat rail acc. to EN 60 715
Weight	approx. 0.8 kg	approx. 1.4 kg

Environmental conditions

Stock temperature	-40 °C ... +85 °C
Relative humidity	10 % ... +95 % (non-condensing)

Technical characteristics Ha-VIS eCon 7050-B1, eCon 7100-B1

Ethernet interface – M12

Number of ports	5x / 10x 10/100Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s (M12 D-coding)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination, device-side	M12 D-coding (female)
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link (Link/Act) - terminal device is connected: Green data transmission in process: Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow 10 Mbit/s: OFF
Topology	<ul style="list-style-type: none"> • Line • Star • mixed

Power supply

Input voltage	24 / 48 V DC (12 V ... 60 V DC) - redundant
Termination, device-side	M12 A-coding, male, for redundant power supply
Diagnostics (LED)	Power supply - LED Green

Alarm signalling contact (for Ha-VIS eCon 7100 only)

Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A
Termination, device-side	M12 D-coding, male
Diagnostics (LED)	Error - Red

Design features

	Ha-VIS eCon 7050	Ha-VIS eCon 7100
Housing material	zinc die-cast	zinc die-cast
Dimensions (W x H x D)	45 x 120 x 87 mm (without connectors)	90 x 120 x 87 mm (without connectors)
Degree of protection acc. to DIN EN 60 529	IP65 / IP67	IP65 / IP67
Assembly	<ul style="list-style-type: none"> • Wall mounting, vertical assembly • Wall mounting, flat assembly • 35 mm top-hat rail acc. to EN 60 715 	<ul style="list-style-type: none"> • Wall mounting, vertical assembly • 35 mm top-hat rail acc. to EN 60 715
Weight	approx. 0.8 kg	approx. 1.4 kg

Environmental conditions

Stock temperature	-40 °C ... +85 °C
Relative humidity	10 % ... +95 % (non-condensing)



Ethernet Switch Ha-VIS eCon 7050-A1

5-port Ethernet Switch with extended input voltage range
for use in harsh industrial environments

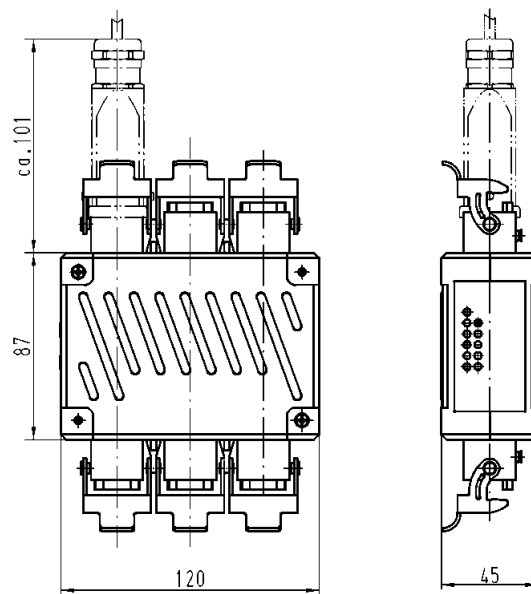
Unmanaged	IP65 / IP67	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
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Number of ports, Copper / Termination	5x 10/100Base-T(X) / Han® 3 A RJ45 (female)
Input voltage / Termination	24 / 48 V DC / Han® 4 A, male, for redundant power supply
Permissible range (min./max.)	12 V ... 60 V DC
Input current	approx. 110 mA (at 24 V DC)
Housing material	zinc die-cast
Dimensions (W x H x D)	45 x 120 x 87 mm
Weight	approx. 0.8 kg
Working temperature	-40 °C ... +70 °C
MTBF	1.150.000 h

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 7050-A1
Ethernet Switch with
5 RJ45 ports

20 70 305 3923



Ethernet Switch Ha-VIS eCon 7050-B1

5-port Ethernet Switch for industrial Ethernet networks
with extended input voltage range, with M12 system cabling



Unmanaged	IP65 / IP67	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
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Number of ports, Copper / Termination 5x 10/100Base-T(X) / M12 D-coding (female)

Input voltage / Termination 24 / 48 V DC / M12 A-coding, male,
for redundant power supply

Permissible range (min./max.) 12 V ... 60 V DC

Input current approx. 110 mA (at 24 V DC)

Housing material zinc die-cast

Dimensions (W x H x D) 45 x 120 x 87 mm

Weight approx. 0.8 kg

Working temperature -40 °C ... +70 °C

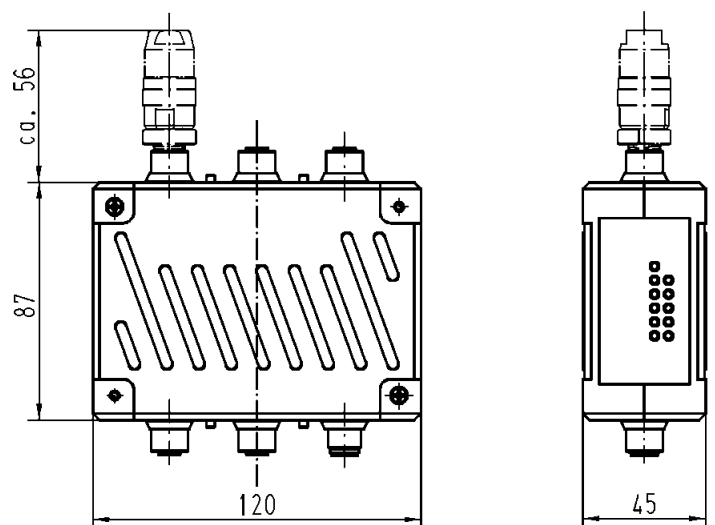
Approvals e1

MTBF 1.140.000 h

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 7050-B1
Ethernet Switch with
5 ports M12 D-coding

20 70 305 3943





Ethernet Switch Ha-VIS eCon 7100-B1

10-port Ethernet Switch for industrial Ethernet networks,
with M12 system cabling

Unmanaged	IP65 / IP67	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	10x 10/100Base-T(X) / M12 D-coding (female)		
Input voltage / Termination	24 / 48 V DC / M12 A-coding, male, for redundant power supply		
Permissible range (min./max.)	12 V ... 60 V DC		
Input current	approx. 150 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A M12 D-coding, male		
Housing material	zinc die-cast		
Dimensions (W x H x D)	90 x 120 x 87 mm		
Weight	approx. 1.4 kg		
Working temperature	-40 °C ... +70 °C		
MTBF	740.000 h		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 7100-B1 Ethernet Switch with 10 ports M12 D-coding	20 70 310 3942		



Ethernet Switch Ha-VIS eCon 7100-AA

10-port Ethernet Switch for use in harsh industrial environments,
with 2 Gigabit ports

Unmanaged	IP65 / IP67	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-T(X) / Han® 3 A RJ45 (female) 2x 10/100/1000-Base-T(X) / Han® 3 A RJ45 (female)		
Input voltage / Termination	24 / 48 V DC / Han® 4 A, male, for redundant power supply		
Permissible range (min./max.)	12 V ... 60 V DC		
Input current	approx. 230 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A Han® 3 A, male		
Housing material	zinc die-cast		
Dimensions (W x H x D)	90 x 120 x 87 mm		
Weight	approx. 1.4 kg		
Working temperature	-40 °C ... +70 °C		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS eCon 7100-AA Ethernet Switch with 10 ports RJ45	20 70 310 3924		

Identification	Part number	Drawing	Dimensions in mm
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Han A® Connectors and Protection covers

Hood Metal, straight, metric	19 20 003 1440 ¹⁾		
Female insert Han® 4 A for power supply	09 20 004 2711		
Female insert Han® 3 A for Alarm signalling contact (Ha-VIS eCon 7100-AA only)	09 20 003 2711		
Cable gland Metal, IP65, metric, M20, cable Ø: 5 mm ... 9 mm	19 00 000 5080		
Protection cover Han® 3 A, female insert	09 20 003 5426		
Protection cover Han® 3 A, male insert for RJ45 interface	09 20 003 5425		

HARAX® Connectors and Protection covers

HARAX® M12-L Circular Connectors A-coding	21 03 212 2305		
Protection cover M12 for Ethernet	21 01 000 0003		

1) ... Order insert fixing screw 09 20 000 9918 separately

Identification	Part number	Drawing	Dimensions in mm
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Assembly

Set for assembly on standard rail according to DIN EN 60 715	20 80 000 0003		
Set for panel mounting vertical assembly	20 80 010 0001		
Set for panel mounting flat assembly	20 80 024 0002		
Set for panel mounting Ha-VIS eCon 7100 vertical assembly	20 80 010 0002		



Ethernet Switch Ha-VIS eCon 9000

19" Ethernet Switches, unmanaged, for installation in a 19" rack

General description

The Ethernet Switches of the product family Ha-VIS eCon 9000 are recommended for use in the widest range of industrial applications and support Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s). The product family enables the connection of up to 8 network devices over Twisted Pair cables.

The Ha-VIS eCon 9000 Ethernet Switch family, with its integrated LEDs on each port, supports fast and easy network diagnosis. The Ha-VIS eCon Ethernet Switch operates as an unmanaged Switch in Store and Forward Switching mode and supports Auto-crossing, Auto-negotiation and Auto-polarity.

Features

- Ethernet Switch acc. to IEEE 802.3
- Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s)
- Auto-crossing, Auto-negotiation, Auto-polarity
- Diagnostic LEDs (Link status, Data, Power)
- Store and Forward Switching Mode, non blocking
- Pluggable in 19" racks

For Ethernet Switch Ha-VIS eCon eCon 9070-B only:

- Power input on the front – no backplane necessary

Advantages

- Robust metal housing
- EMC, temperature range and mechanical stability meet the toughest demands

Application fields

- Railway applications
- Industrial automation
- Automotive industry
- Wind power
- Power distribution systems

Technical characteristics

Ethernet interface – M12

Number of ports	7x / 8x 10/100Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s (M12 D-coding)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination	M12 D-coding
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow 10 Mbit/s: OFF
Topology	<ul style="list-style-type: none"> • Line • Star • mixed

Power supply

Input voltage	24 / 48 V DC (8 V ... 60 V DC) - redundant
Termination	<ul style="list-style-type: none"> • M12 A-coding, male or • DIN frame connector, type F
Diagnostics (LED)	Power supply - LED Green

Design features

Housing material	aluminium
Degree of protection acc. to DIN EN 60 529	IP20
Assembly	19" rack, 3 U
Weight	approx. 0.6 kg

Environmental conditions

Stock temperature	-40 °C ... +85 °C
Relative humidity	10 % ... +95 % (non-condensing)



Ethernet Switch Ha-VIS eCon 9070-B

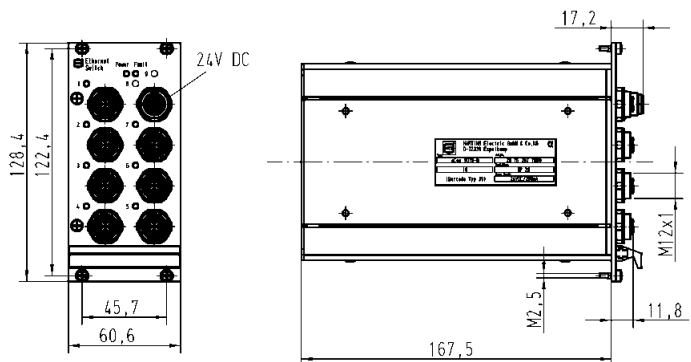
7-port Ethernet Switch for installation in a 19" rack

Unmanaged	IP20	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	7x 10/100Base-T(X) / M12 D-coding		
Input voltage / Termination	24 / 48 V DC / M12 A-coding, male		
Permissible range (min./max.)	8 V ... 60 V DC		
Input current	approx. 150 mA (at 24 V DC)		
Housing material	aluminium, anodised		
Dimensions (W x H x D)	60.6 mm (3 U) x 128.4 mm (12 HP) x 167.5 mm		
Weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
MTBF	1.411.000 h		

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 9070-B
Ethernet Switch with
7 ports M12 D-coding

20 76 207 7000





Ethernet Switch Ha-VIS eCon 9080-B1

8-port Ethernet Switch for installation in a 19" rack

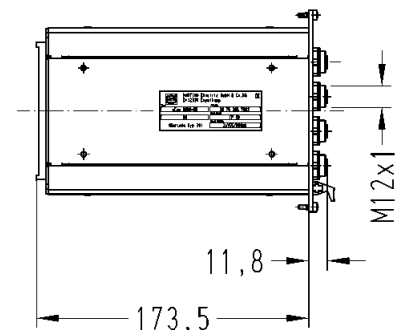
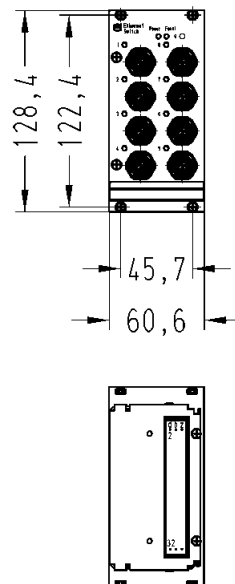
Unmanaged	IP20	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
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Number of ports, Copper / Termination	8x 10/100Base-T(X) / M12 D-coding
Input voltage / Termination	24 / 48 V DC / DIN frame connector, Type F
Permissible range (min./max.)	8 V ... 60 V DC
Input current	approx. 110 mA (at 24 V DC)
Housing material	aluminium, anodised
Dimensions (W x H x D)	60.6 mm (3 U) x 128.4 mm (12 HP) x 173.5 mm
Weight	approx. 0.6 kg
Working temperature	-40 °C ... +70 °C
Approvals	E1
MTBF	1.260.000 h

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS eCon 9080-B1
Ethernet Switch with
8 ports M12 D-coding

20 76 208 7003



Introduction

For the user, HARTING's novel and innovative solutions open up new, more convenient and extensive options for configuring Unmanaged Ethernet Switches. The solutions available to date offered only very limited or basic options for making alterations to different settings on an Ethernet Switch.

The user made changes to the settings or the configuration via the DIP switches on the Ethernet Switch. The extensive possibilities for applications were physically restricted by the enormous space requirements of the mechanical solution.

Now for the first time, HARTING's Ha-VIS sCon solution makes it possible for the user to realise more configurations than have been possible to date.

Ease of handling and simple operation have been designed in to meet real-life application requirements. Simple and fast configuration is what this solution aims to achieve.

All Ha-VIS sCon Ethernet Switches can be configured via a USB connection cable.

At first sight, Ha-VIS sCon Ethernet Switches do not differ from the Ethernet Switches available to date. However, the possibilities that Ha-VIS sCon has to offer become more than apparent to the user when he connects the Ethernet Switch via the front-side USB socket to a PC, laptop or hand-held PC.

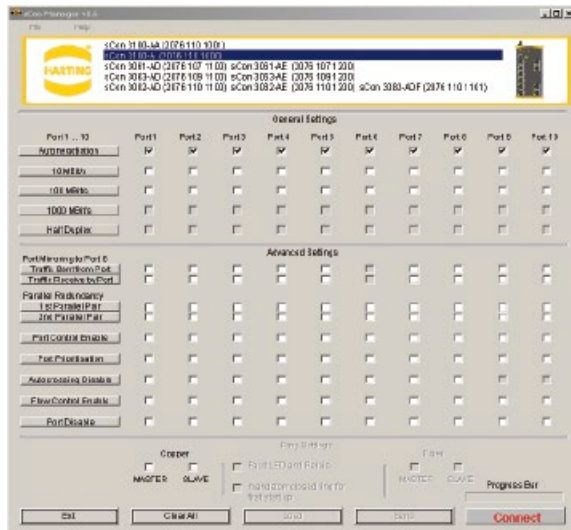


Figure 1 The Start-up menu

Once the Ha-VIS sCon Ethernet Switch has been connected to a PC, it can be accessed on-screen in much the same manner as a commercially available USB stick (Figure 1: The Start-up menu).

The user only has to copy the Ha-VIS sCon software in advance onto the PC. No administrator rights are required. The Ethernet Switch does not have to be connected to a power supply for configuration purposes. That means that the configuration procedure can take place at the user's location of choice: in the office, workshop or production facility. The Ha-VIS sCon Ethernet Switch automatically detects which power supply is connected: mains supply or power supply via the USB port. Please note that it is not possible to operate the Ethernet Switch purely via the USB port. For normal industrial operations, the power must be supplied via one of the redundant inputs.

Introduction

Making configuration settings by means of DIP switches may appear to be uncomplicated. However, accidentally making an alteration to the configuration can happen more quickly than one would think possible, and in so doing make considerable changes to the previously set procedures. The Ha-VIS sCon family prevents these inadvertent alterations to the configuration. No alteration can be made to the configuration without an USB connection and the software.

Each configuration can be archived on the PC and the back-ups retrieved for future projects. By making back-ups of the configuration, all settings can be conveniently stored in case servicing is necessary.

Archived configurations can be imported and printed out when convenient. These extensive options in Ha-VIS sCon ensure that data security enjoys the significance it deserves.

The switch configuration is transmitted only when a new configuration is uploaded via the corresponding 'Send' button. This means that until the data has actually been uploaded, it is still possible to read-in the 'old' data from the Ha-VIS sCon Ethernet Switch via the Refresh option. This means it is easily possible to reverse any inadvertent activation in the corresponding menu.

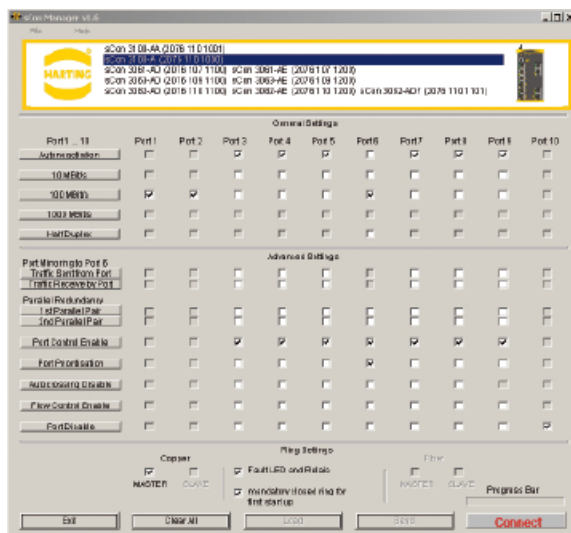


Figure 2 Example of a configuration

Once configured, the Ethernet Switch can be utilised immediately. The configuration remains stored in the Ethernet Switch after the USB cable is removed.

Meeting international standards, the USB port described is recognised as state-of-the-art technology. The standardised possibility for world-wide utilisation with all notebooks, PCs and Palmtops (revisions 1.0, 1.1 and 2.0) mean that this technology is suitable for universal usage.

The intuitive, but extensive options setting via the relevant buttons and the various options offered by Ha-VIS sCon extend the range of applications for unmanaged Ethernet Switches. With Ha-VIS sCon, the gap between unmanaged and manageable switches is getting smaller.

It is true that sCon is a solution for Unmanaged Ethernet Switches; however, it comes very close to Managed Ethernet Switch functionality.

Ethernet Switch Ha-VIS sCon 3000

Ethernet Switches, unmanaged, for mounting onto top-hat mounting rail in control cabinets, including sCon functions



General description

The Fast Ethernet Switches of the product family Ha-VIS sCon 3000 can be configured via a USB port for special or more performance-oriented industrial usages. There are almost no limits to the different possibilities.

Activation of parallel and / or ring redundancy or port prioritisation will clearly increase the availability and reliability of data communications through the Ha-VIS sCon 3000.

Features

- Ethernet Switch acc. to IEEE 802.3
- Store and Forward Switching Mode, non blocking, unmanaged
- Auto-crossing, Auto-negotiation, Auto-polarity
- Diagnostic LEDs (Link status, Act, Power, Data transmission rate, Error)
- Following settings are available via USB port:
 - Parameterisation via USB port:
 - Alarm signalling contact (Link alignment, low voltage, ring error)
 - Auto-negotiation
 - Data transmission rate
 - Full/Half Duplex
 - Ring and/or parallel redundancy
 - ports enable / disable
 - Port priority
 - Port Mirroring
 - Pause Frame

Advantages

- Individually configurable via USB port
- Robust metal housing
- EMC, temperature range and mechanical stability meet the toughest demands
- Ring redundancy and/or parallel redundancy

Application fields

- Industrial automation
- Power distribution systems
- Automotive industry
- Mechanical engineering
- Railway applications

Technical characteristics

Ethernet interface – RJ45

Number of ports	6x / 8x / 10x 10/100Base-T(X) 2x 10/100/1000-Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s (RJ45)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination	RJ45 (Twisted Pair)
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow 10 Mbit/s: Green
Topology	<ul style="list-style-type: none"> • Line • Star

Power supply

Input voltage	24 / V DC (9.6 V ... 60 V DC)
Termination	5-pole, pluggable screw contact, for redundant power supply
Diagnostics (LED)	Power supply - LED Green

Alarm signalling contact

Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A
Termination	3-pole pluggable screw contact
Diagnostics (LED)	Error - Red

Design features

Housing material	metal
Dimensions (W x H x D)	60 x 132 x 104 mm (without connectors)
Degree of protection acc. to DIN EN 60 529	IP30
Assembly	<ul style="list-style-type: none"> • 35 mm top-hat rail acc. to EN 60 715 • Wall mounting, vertical assembly
weight	approx. 0.6 kg

Environmental conditions

Stock temperature	-40 °C ... +85 °C
Relative humidity	10 % ... +95 % (non-condensing)

Technical characteristics F.O. termination

Ethernet interface – F.O.

Number of ports	3x / 2x 100Base-FX
Cable types according to IEEE 802.3	<ul style="list-style-type: none"> • Multimodefibre, 1300 nm; 50 µm / 125 µm or 62.5 µm / 125 µm
Data rate	100 Mbit/s
Maximum cable length	<ul style="list-style-type: none"> • 2000 m (Multimode) • 15 km (Singlemode)
Termination	SC-D female
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing
Wavelength	1300 nm
Transceive power T(X) max. (dynamic)	<ul style="list-style-type: none"> • -14 dBm (50 µm / 125 µm) • -14 dBm (62.5 µm / 125 µm)
Transceive power T(X) min.	<ul style="list-style-type: none"> • -23.5 dBm (50 µm / 125 µm) • -20 dBm (62.5 µm / 125 µm)
Receive power RX typical (dynamic)	<ul style="list-style-type: none"> • -33.9 dBm (window) • -35.2 dBm (centre)
Receive power RX max. (dynamic)	-14 dBm
Signal detection (dynamic)	-33 dBm
Topology	<ul style="list-style-type: none"> • Line • Star



Ethernet Switch Ha-VIS sCon 3100-A

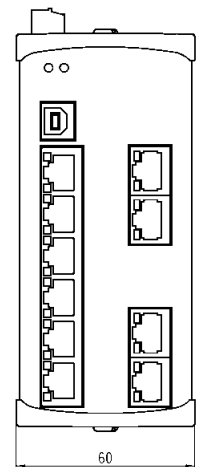
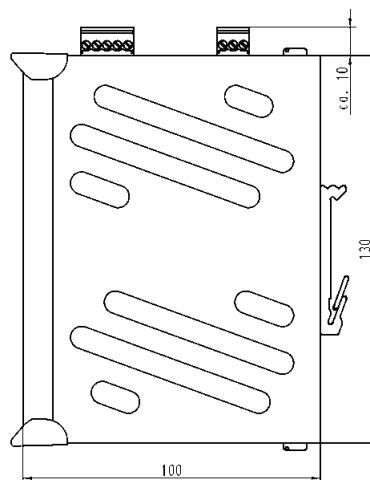
10-port Ethernet Switch for mounting onto top-hat mounting rail in control cabinets, including sCon functions

Unmanaged	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	10x 10/100Base-T(X) / RJ45 (Twisted Pair)		
Input voltage / Termination	24 V DC / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V DC		
Input current	approx. 170 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	60 x 132 x 104 mm (including cap, without connectors)		
weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	UL 508; UL 60 950-1		
MTBF	745.000 h		

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS sCon 3100-A
Ethernet Switch with
10 RJ45 ports

20 76 110 1000





Ethernet Switch Ha-VIS sCon 3100-AA

10-port Ethernet Switch for mounting onto top-hat mounting rail in control cabinets, including 2 Gigabit ports and sCon functions, extended temperature range

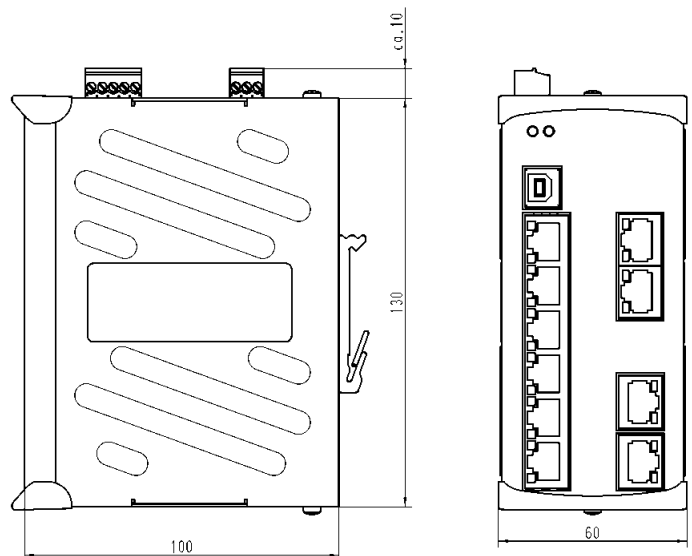
Unmanaged	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
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Number of ports, Copper / Termination	8x 10/100Base-T(X) / RJ45 (Twisted Pair) 2x 10/100/1000-Base-T(X) / RJ45 (Twisted Pair)
Input voltage / Termination	24 / 48 V DC / 5-pole, pluggable screw contact, for redundant power supply
Permissible range (min./max.)	9.6 V ... 60 V DC
Input current	approx. 240 mA (at 24 V DC)
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact
Housing material	metal, powder-coated
Dimensions (W x H x D)	60 x 132 x 104 mm (including cap, without connectors)
weight	approx. 0.6 kg
Working temperature	-40 °C ... +70 °C
Approvals	UL 508; UL 60 950-1; DNV
MTBF	670.000 h

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS sCon 3100-AA
Ethernet Switch with
10 RJ45 ports

20 76 110 1001





Ethernet Switch Ha-VIS sCon 3063-AD

9-port Ethernet Switch for mounting onto top-hat mounting rail in control cabinets, including 3 F.O. ports (SC, MM) and sCon functions

Unmanaged	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	6x 10/100Base-T(X) / RJ45 (Twisted Pair)		
Number of ports, F.O. / Termination	3x 100Base-FX / SC-D female		
Input voltage / Termination	24 V DC / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V DC		
Input current	approx. 290 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	60 x 132 x 104 mm (including cap, without connectors)		
weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	UL 508; UL 60 950-1		
MTBF	660.000 h		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS sCon 3063-AD Ethernet Switch with 6 RJ45 ports 3 F.O. ports	20 76 109 1100		



Ethernet Switch Ha-VIS sCon 3082-AD

10-port Ethernet Switch for mounting onto top-hat mounting rail in control cabinets, including 2 F.O. ports (SC, MM) and sCon functions

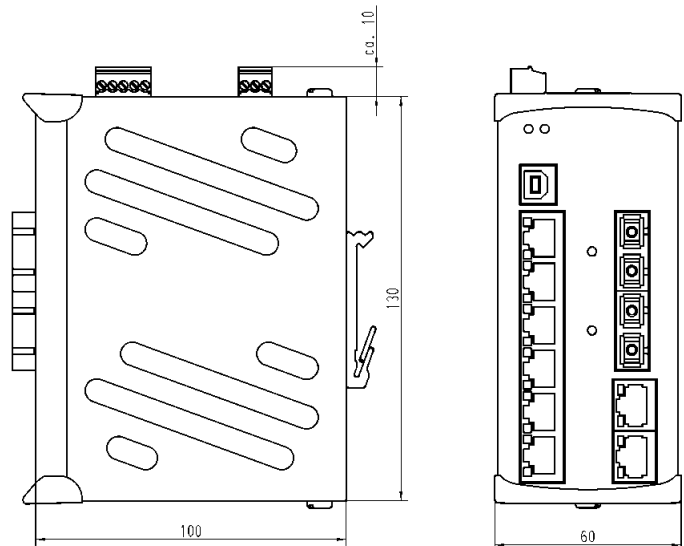
Unmanaged	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-T(X) / RJ45 (Twisted Pair)		
Number of ports, F.O. / Termination	2x 100Base-FX / SC-D female		
Input voltage / Termination	24 V DC / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V DC		
Input current	approx. 260 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	60 x 132 x 104 mm (including cap, without connectors)		
weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	UL 508; UL 60 950-1		
MTBF	585.000 h		

Ha-VIS sCon

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS sCon 3082-AD
Ethernet Switch with
8 RJ45 ports
2 F.O. ports

20 76 110 1100



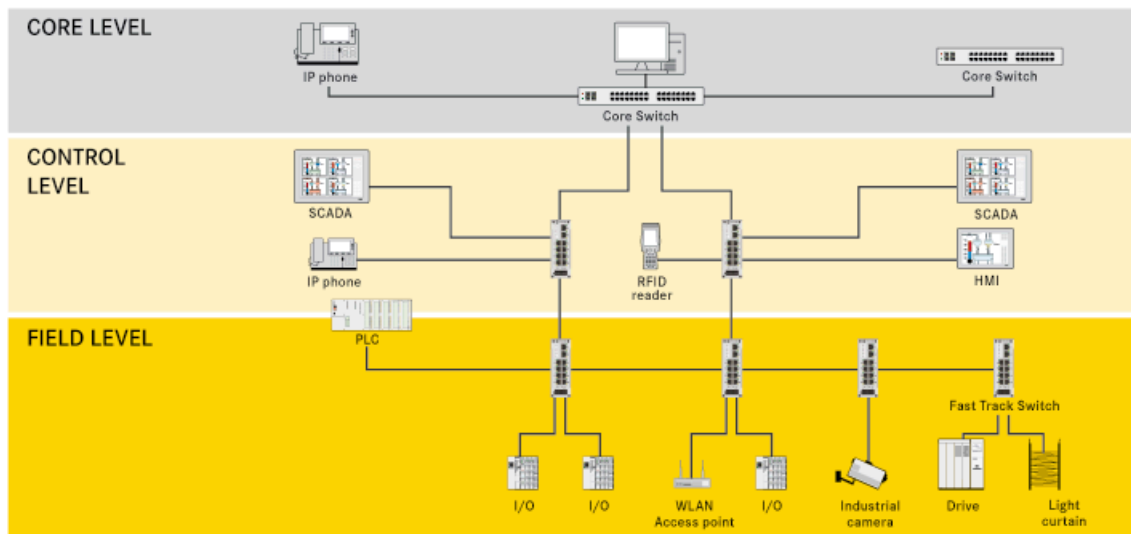
Fast Track Switching Introduction

Fast Track Switching

Automation IT is a communication platform that serves all applications within an industrial manufacturing firm. By connecting all applications, the uniform platform network increases the efficiency of company workflows.

Automation IT supports Standard Ethernet at all levels – including the office, management and control levels, and also in the field.

Automation IT – the platform for all applications



The currently available switching technology used in IEEE 802.3 Ethernet, however, does not offer the level of determinism required for automation applications. That is why automation solutions that only implement standard (unchanged) Ethernet require a restricted network design in order to match automation performance levels. Thus there are limited options for the network topology or segmentation – to the extent that IT communications are not allowed within the automation environment.

Automation requires for Industrial Ethernet:

- top performance
- safety
- flexible topology
- and above all determinism

Standard Ethernet switching is based on store-and-forward switching and this introduces long latency times for the frames. But even more serious is the tight dependency on the degree of network traffic: if only automation frames are present in the network, then these frames can be transmitted with no problems. But additional data traffic on the network will compete with the automation frames for forwarding and can thus delay these frames.

Standard switching uses the QoS (Quality of Service) option to influence this. If multiple frames are located in the switch queue, then the frames with the highest priority are forwarded first. But it is still possible for other data frames with priorities equal to or greater than the automation frames to be present. And even when the automation frame has the highest priority, if a data frame is in the process of being sent, the next automation frame must wait until 1522 bytes have been completely sent. Only then is the path open for the automation frame. The same delay could then happen on the next network switch once more. So these wait delays can quickly add up to times which are critical for automation applications. This behaviour can be seen as stochastically random. Most of the time the transfer times will be sufficient. But it only takes one delayed frame to trigger a problem.

Fast Track Switching Introduction

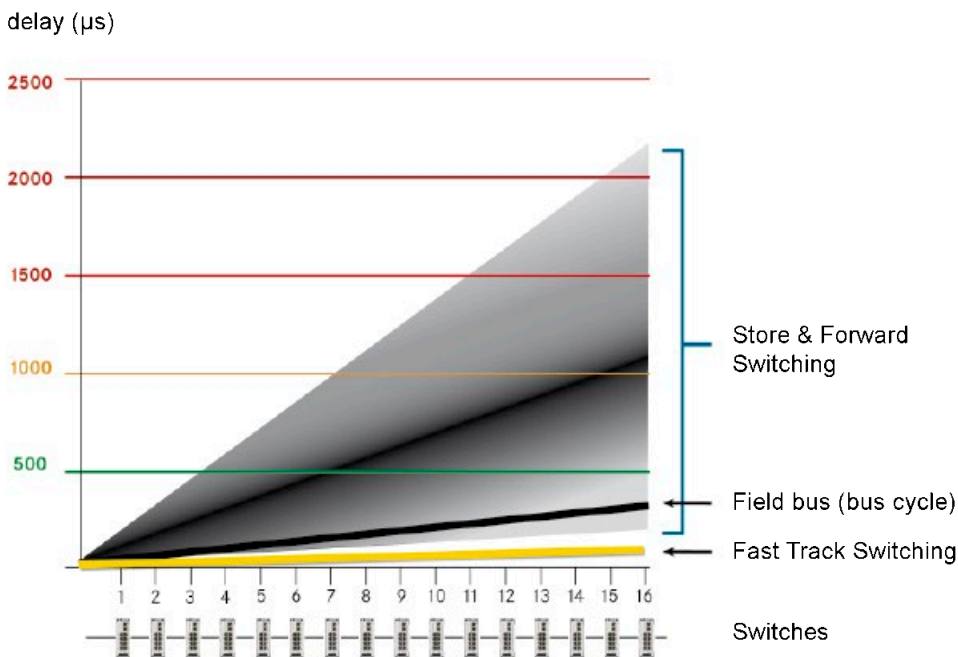
Several Ethernet-based methods have identified this problem and eliminated it. However such methods require each network node to implement specialized hardware for communication.

With the development of Fast Track Switching (FTS), HARTING has found a new path. FTS switches solve the performance and deterministic problems while all other nodes require only the standard Ethernet interfaces.

Fast Track Switching uses three key features to achieve this:

1. Preferred frames (such as automation frames) are detected first. The switch can focus on any specific part of the Ethernet header for special properties. For example, PROFINET frames are Ethertype 8892. This type is then monitored and evaluated if the application needs to accelerate their transmission.
2. These key frames get fast-track forwarding – a cut-through process instead of store-and-forwarding. As a result, the switch latency time is minimized.
3. If the switch port needed for the forwarding is busy at that moment sending a data frame, then the data frame is buffered and the forwarding is aborted so that the automation frame can be forwarded immediately. Only after the automation frame is sent is a second attempt made to send the data frame.

A simple example serves to illustrate the superior performance of this Fast Track Switching:



An automation frame must travel on a path through 16 switches. The transmission time for the Ethernet frames under standard switching rules is tightly dependent on the network load. Thus the transmission time for the frames can vary widely according to the network load: a few arrive quite quickly, the majority have an average time, and a few frames travel quite slowly.

As a reference point, a comparable cycle for one of the Field bus protocols used widely in automation applications is shown in black. This protocol has state-of-the-art levels of determinism and transfer speeds. Sometimes the data arrives just as fast at its destination when standard switching is used – but only sometimes.

Fast Track Switching, on the contrary, exhibits excellent results and is deterministic.

Fast Track Switching Introduction

Now it has finally become possible to setup a universal Automation IT communications platform that reaches into the field level. And finally automation protocols which rely on standard unchanged Ethernet (such as PROFINET RT or EtherNet/IP) can deliver the high performance needed for automation applications.

HARTING has also integrated this groundbreaking technology into production models available for the user:

The configurable Ha-VIS FTS 3100 model offers an easy-to-configure FTS solution for users. Many switch options can be customized to fit your application – even by those who are not trained network administrators.

And with the fully managed switches from the Ha-VIS FTS 3000 line, HARTING combines FTS technology with all of the well-known functions of modern managed industrial Ethernet Switches.



Ethernet Switch Ha-VIS FTS 3000s

Ethernet Switches, unmanaged, with Fast Track Switching Technology, configurable via USB

General description

The Fast Ethernet Switches of the product family Ha-VIS FTS 3000 can identify automation protocols (e.g. PROFINET, EtherNet/IP, Modbus TCP and customized profiles), accelerate their data transmission and prefer them. They are suitable for industrial applications.

The product family enables the connection of up to 10 network devices over shielded Twisted Pair. It supports Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s).

The Ethernet Switch works as an unmanaged switch and can work in Cut Through mode and in Store and Forward mode. It supports Auto-crossing, Auto-negotiation and Auto-polarity.

Features

- Ethernet Switch according to IEEE 802.3
- Auto-crossing, Auto-negotiation, Auto-polarity
- Diagnostic LEDs (Link Status, Act, Data transmission rate, Power, Error)
- Store and Forward Switching Mode, non blocking, unmanaged
- Identification, acceleration and preference for automation frames
- Deterministic data transfer for selected profiles

Advantages

- Individually configurable via USB port
- Robust metal housing
- EMC, temperature range and mechanical stability meet the toughest demands

Application fields

- Industrial automation
- Mechanical engineering
- Automotive industry

Technical characteristics

Ethernet interface – RJ45

Number of ports	10x 10/100Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s (RJ45)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination	RJ45 (Twisted Pair)
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow 10 Mbit/s: Green
Topology	<ul style="list-style-type: none"> • Line • Star • mixed
Parameterisation via USB	<ul style="list-style-type: none"> • Auto-negotiation • 10/100 Mbit/s • Full/Half Duplex • Port enable/disable • Port mirroring • Flow Control • FTS Port enable/disable • Industrial Profile (PROFINET, EtherNet/IP, Modbus TCP, customized) • NRT Bandwidth Control

Power supply

Input voltage	24 V $\overline{=}$ (9.6 V ... 60 V $\overline{=}$)
Termination	5-pole, pluggable screw contact, for redundant power supply
Diagnostics (LED)	Power supply - LED Green

Design features

Housing material	aluminium
Dimensions (W x H x D)	44 x 130 x 100 mm (without connectors)
Degree of protection acc. to DIN EN 60 529	IP30
Assembly	<ul style="list-style-type: none"> • 35 mm top-hat rail acc. to EN 60 715 • Wall mounting, vertical assembly
weight	approx. 0.5 kg

Environmental conditions

Stock temperature	-40 °C ... +85 °C
Relative humidity	30 % ... +95 % (non-condensing)



Ethernet Switch Ha-VIS FTS 3100s-A

10-port Ethernet Switch with Fast Track Switching Technology,
configurable via USB

Unmanaged	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	10x 10/100Base-T(X) / RJ45 (Twisted Pair)		
Input voltage / Termination	24 V $\overline{=}$ / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V $\overline{=}$		
Input current	approx. 270 mA (at 24 V DC)		
Housing material	aluminium, anodised		
Dimensions (W x H x D)	44 x 130 x 100 mm (without connectors)		
weight	approx. 0.5 kg		
Working temperature	0 °C ... +70 °C		
Approvals	UL 508; UL 60 950-1; DNV		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS FTS 3100s-A Ethernet Switch with 10 RJ45 ports	20 76 110 1000		



Ethernet Switch Ha-VIS FTS 3000

Ethernet Switches, with Fast Track Switching Technology, managed

General description

The Fast Ethernet Switches of the product family Ha-VIS FTS 3000 can identify automation profiles (e.g. PROFINET, EtherNet/IP, Modbus TCP and customized profiles), accelerate their data transmission and prefer them. They are suitable for industrial applications.

The product family enables the connection of up to 10 network devices over shielded Twisted Pair or F.O. interfaces, according to type. It supports Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s).

The Ethernet Switch works as a managed switch and can work in Fast Track Switching mode and in Store and Forward mode. It supports Auto-crossing, Auto-negotiation and Auto-polarity.

Features

- Managed Ethernet Switch according to IEEE 802.3
- Fast Track Switching Mode, Store and Forward Switching Mode
- Auto-crossing, Auto-negotiation, Auto-polarity
- Diagnostic LEDs (Link Status, Data, Power)
- Identification, acceleration and preference for automation frames
- Deterministic data transfer for selected profiles
- Robust metal housing, RoHS compliant
- PROFINET IO Device

Advantages

- Robust metal housing
- EMC, temperature range and mechanical stability meet the toughest demands

Application fields

- Industrial automation
- Automotive industry
- Mechanical engineering

Technical characteristics

Ethernet interface – RJ45

Number of ports	6x / 8x / 10x 10/100Base-TX
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s (RJ45)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination	RJ45 (Twisted Pair)
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow 10 Mbit/s: Green
Topology	<ul style="list-style-type: none"> • Line • Star • Ring • mixed

Power supply

Input voltage	24 V $\overline{=}$ (9.6 V ... 60 V $\overline{=}$)
Termination	5-pole, pluggable screw contact, for redundant power supply
Diagnostics (LED)	Power supply - LED Green

Diagnosis device

Diagnostics (LED)	<ul style="list-style-type: none"> • Device acts error free - Green • Diagnosis error - Red • PROFINET error display - Red / Green flashing • Low voltage error - Red
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Design features

Housing material	aluminium
Degree of protection acc. to DIN EN 60 529	IP30
Assembly	<ul style="list-style-type: none"> • 35 mm top-hat rail acc. to EN 60 715 • Wall mounting, vertical assembly
weight	approx. 0.35 kg

Environmental conditions

Stock temperature	-40 °C ... +85 °C
Relative humidity	30 % ... +95 % (non-condensing)

Technical characteristics F.O. termination

Ethernet interface – F.O.

Number of ports	2x 100Base-FX
Cable types according to IEEE 802.3	Multimodefibre, 1300 nm; 50 µm / 125 µm or 62.5 µm / 125 µm
Data rate	100 Mbit/s
Maximum cable length	2000 m (Multimode)
Termination	SFP module slot
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing • Duplex - <ul style="list-style-type: none"> Full duplex: Yellow Half duplex: OFF
Wavelength	1300 nm
Transceive power T(X) max. (dynamic)	<ul style="list-style-type: none"> • -14 dBm (50 µm / 125 µm) • -14 dBm (62.5 µm / 125 µm)
Transceive power T(X) min.	<ul style="list-style-type: none"> • -23.5 dBm (50 µm / 125 µm) • -20 dBm (62.5 µm / 125 µm)
Receive power RX typical (dynamic)	<ul style="list-style-type: none"> • -33.9 dBm (window) • -35.2 dBm (centre)
Receive power RX max. (dynamic)	-14 dBm
Signal detection (dynamic)	-33 dBm
Topology	<ul style="list-style-type: none"> • Line • Ring • Star • mixed

Management functions

Basic Functions		
	Store and Forward Switching Mode	IEEE 802.3
	Manual and Dynamic IP Address Assignment	
Port-Settings	Auto-negotiation on / off	
	Port Speed 10 Mbit/s / 100 Mbit/s	
	Half / Full duplex	
	Port disable / enable	
	Link Up/Down Trap disable / enable	
	Port mirroring disable / enable	
	Flow Control disable / enable	
	Industrial profiles (PROFINET, EtherNet/IP, Modbus TCP, customer specific)	
	NRT Bandwidth Control	
	Network Discovery	Link Layer Discovery Protocol (LLDP)
Protocols	IPv4	RFC 791, 903, 951, 1293, 1519
	TCP	RFC 793, 896
	UDP	RFC 768
	Ethernet ARP	RFC 826
	ICMP	RFC 2521, 1191, 1788, 792
File Transfer	Firmware import and export via TFTP	
	Configuration import and export via TFTP	
Time Settings	Manual time setting	
	Simple Network Time Protocol (SNTP)	RFC 1305, RFC 4330
	Precision Time Protocol (PTP) in hardware	IEEE 1588v2
User Management	Admin, Guest and Service Level	
Service	Service Mode via port 10 or 6	
QoS		
	Quality of Service (QoS)	IEEE 802.1p
VLAN		
	Port protocol based VLANs	IEEE 802.1Q Rev D5.0, 2005
Redundancy		
	Spanning Tree (STP)	IEEE 802.1D (2004)
	Rapid Spanning Tree (RSTP)	IEEE 802.1D (2004)
Security		
	Port-Based Network Access Control Port Based Authentication with EAP	802.1x (2004)
	RADIUS Client	RFC 2138
	IP authorized manager	
Multicast		
	IGMP Snooping (v1, v2, v3) with support for querier	RFC 1112, 2236, 3376
DHCP		
	DHCP Client	RFC 2131
	DHCP relay agent	RFC 2131
	DHCP Option 82	RFC 3046

Management functions

Alarm		
	Alarms via E-mail (SMTP) and SNMP Traps	
Diagnostic		
	PROFINET diagnostic	
	Port Mirroring	
	Switch History	
	MAC Address Table	
Management		
	Password protected Web-Management interface	
	SNMP (v1, v2c, v3) agent & MIB support	RFC 1155, 1157, 1212, 1213, 1215, 2089, 2578, 3411, 3412, 3413, 3414, 3415, 3416, 3417, 3584
	Pluggable memory card	
MIB Support		
	Enterprise (HARTING MIB)	
	MIB II	
	MIB II for SNMPv1, SNMPv2, SNMPv3	
	Interface group MIB	
	Bridge MIB	
	MIB for Ethernet-like interfaces (requires support in hardware)	
	VLAN MIB	
	Spanning Tree Protocol MIB	
	Rapid STP MIB	
	Port-based Network Authentication Control MIB	
	Definitions of managed objects for LLDP	
	802.1/LLDP extension MIB	
	802.3/LLDP extension MIB	
	Radius Client MIB	
	IPv4 MIB	
	IGMP MIB	
	DHCP	



Ethernet Switch Ha-VIS FTS 3060-A

6-port Ethernet Switch with Fast Track Switching Technology, managed

Managed	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	6x 10/100Base-TX / RJ45 (Twisted Pair)		
Input voltage / Termination	24 V $\overline{=}$ / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V $\overline{=}$		
Input current	approx. 220 mA (at 24 V DC)		
Housing material	aluminium, anodised		
Dimensions (W x H x D)	33 x 130 x 100 mm (without connectors)		
weight	approx. 0.35 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	UL 508; UL 60 950-1; DNV		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS FTS 3060-A Ethernet Switch with 6 RJ45 ports	20 78 106 4000		



Ethernet Switch Ha-VIS FTS 3100-A

10-port Ethernet Switch with Fast Track Switching Technology, managed

Managed	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
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Number of ports, Copper / Termination	10x 10/100Base-TX / RJ45 (Twisted Pair)
Input voltage / Termination	24 V $\overline{=}$ / 5-pole, pluggable screw contact, for redundant power supply
Permissible range (min./max.)	9.6 V ... 60 V $\overline{=}$
Input current	approx. 300 mA (at 24 V DC)
Housing material	aluminium, anodised
Dimensions (W x H x D)	44 x 130 x 100 mm (without connectors)
weight	approx. 0.5 kg
Working temperature	0 °C ... +70 °C
Approvals	UL 508; UL 60 950-1; DNV

Ha-VIS FTS

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS FTS 3100-A Ethernet Switch with 10 RJ45 ports	20 78 110 4000		
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Ethernet Switch

Ha-VIS FTS 3082-ASFP

10-port Ethernet Switch with Fast Track Switching Technology, with 2 slots for SFP modules, managed

Managed	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-TX / RJ45 (Twisted Pair)		
Number of ports, F.O. / Termination	2x 100Base-FX / SFP module slot		
Input voltage / Termination	24 V $\overline{=}$ / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V $\overline{=}$		
Input current	approx. 340 mA (at 24 V DC)		
Housing material	aluminium, anodised		
Dimensions (W x H x D)	44 x 130 x 100 mm (without connectors)		
weight	approx. 0.5 kg		
Working temperature	0 °C ... +60 °C		
Approvals	UL 508; UL 60 950-1		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS FTS 3082-ASFP Ethernet Switch with 8 RJ45 ports 2 F.O. ports	20 78 110 4300		



Ethernet Switch

Ha-VIS FTS 3100-A-PTP

10-port Ethernet Switch with Fast Track Switching Technology, managed

Managed	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	10x 10/100Base-TX / RJ45 (Twisted Pair)		
Input voltage / Termination	24 V $\overline{=}$ / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V $\overline{=}$		
Input current	approx. 300 mA (at 24 V DC)		
Housing material	aluminium, anodised		
Dimensions (W x H x D)	44 x 130 x 100 mm (without connectors)		
weight	approx. 0.5 kg		
Working temperature	0 °C ... +70 °C		
Approvals	UL 508; UL 60 950-1; DNV		
Time synchronization	Precision Time Protocol (PTP) hardware based		

Ha-VIS FTS

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS FTS 3100-A-PTP Ethernet Switch with 10 RJ45 ports	20 78 110 4001		
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Ethernet Switch

Ha-VIS FTS 3082-ASFP-PTP

10-port Ethernet Switch with Fast Track Switching Technology, with 2 slots for SFP modules, managed

Managed	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-TX / RJ45 (Twisted Pair)		
Number of ports, F.O. / Termination	2x 100Base-FX / SFP module slot		
Input voltage / Termination	24 V $\overline{=}$ / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V $\overline{=}$		
Input current	approx. 340 mA (at 24 V DC)		
Housing material	aluminium, anodised		
Dimensions (W x H x D)	44 x 130 x 100 mm (without connectors)		
weight	approx. 0.5 kg		
Working temperature	0 °C ... +60 °C		
Approvals	UL 508; UL 60 950-1		
Time synchronization	Precision Time Protocol (PTP) hardware based		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS FTS 3082-ASFP-PTP Ethernet Switch with 8 RJ45 ports 2 F.O. ports	20 78 110 4301		

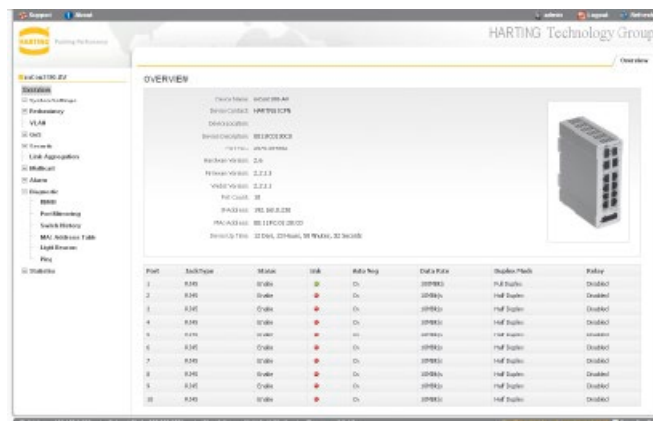
Management Software Overview

Network Management

With the Ha-VIS mCon families, HARTING has expanded its range of Ethernet switches. The series offers a broad spectrum of possibilities: in addition to the standard functions already present in the sCon and eCon Series, the Ha-VIS mCon switches offers management functions which set up a convergent and manageable network.

With the introduction of the new management software V2.0 for the HARTING Ha-VIS mCon switch families, the strong competitive capability will achieve a new level. A lot of improvements and additional features have been added to the software and the future development is assured. This new management software has been designed for industrial use and provides professional network solutions.

The configuration and management of the Ha-VIS mCon switches is made simply: either via SNMP tools, network management software or very easily via a web interface.



Overview – Intuitive web management interface

The Ha-VIS mCon switches can be accessed and configured via a normal internet browser, without the need of any additional tools or browser plugins (Java etc.)The web management is password protected and provides a range of access levels. An easy and intuitive tree menu allows the Ha-VIS mCon switches to be customized and adapted to a specific network.

A huge variety of management functionalities and features are integrated in the HARTING Ha-VIS mCon switches, to provide the best possibilities for the customer.

Support of VLANs allow the Ha-VIS mCon switches to segment a network, which results in better control of the communication flow and the avoidance of unnecessary network loads. The IGMP functionality ensures, that multicast traffic like video/audio streams and automation packets are only forwarded through ports, which are involved in this application. With RSTP it is possible to build up redundant networks, to assure the availability of the network even in the case of failure or incorrect configuration. To improve and assure the security and integrity of the network, HARTING has integrated a lot of security functionalities, like the port based access control via 802.1x and Radius and the IP Authorized manager. All Ha-VIS mCon switches support a fast and easy network diagnosis and a wide scale of alerting mechanisms.

Ha-VIS mCon switches can be used in all applications, offer professional solutions for the operation of Ethernet networks and are simple to install and use. The Ha-VIS mCon families will always be used in high level applications to provide a fully managed and adaptable Ethernet network for automation solutions. The customer has the possibility to configure and develop all applications on the basis of his requirements.

Web-Interface via HTTP

- HTML based web interface
- No additional software needed
- Rapid access to the switch
- Intuitive configuration

SNMP (v1, v2, v3)

- Accessible via standard MIBs
- Professional configuration
- Using of professional management tools

Management Software Overview

Diagnostic and alert functions

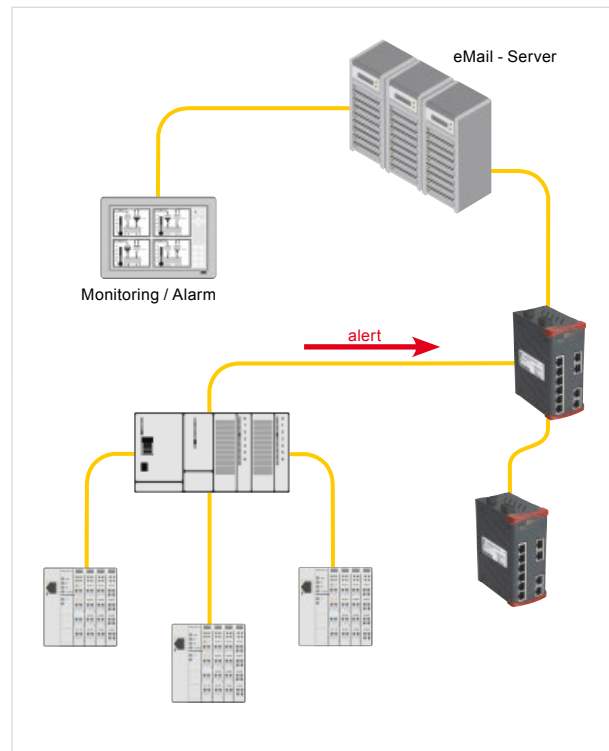
The reliability and operational availability of industrial Ethernet networks are highly associated with the possibility of management and diagnosis functionalities. For most applications it is mandatory to have an overview of what is happening in the network anytime. To assure a trouble free data flow, it is necessary that all failures in the network are propagate to a maintenance station.

The Port Mirroring feature allows the capturing of the incoming and outgoing data traffic of the switch. By connecting a network analyzer to a configured mirror-to port, the network traffic going through the entire switch can be easily monitored, without changing the network topology.

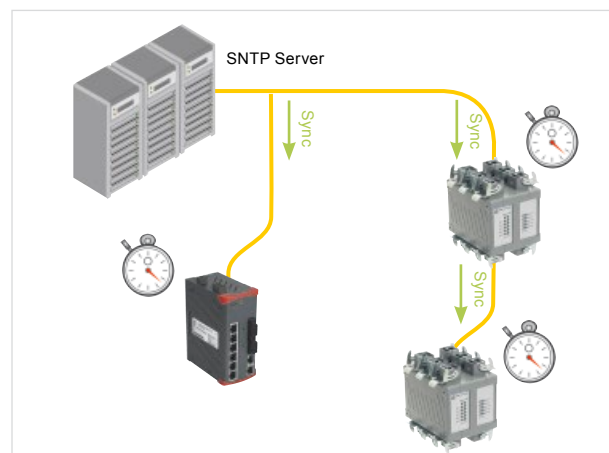
Certain network or Ethernet switch events may require the attention of service personnel. It is possible to select several events according to the requirements, which will cause a notification to a remote monitoring station if they occur. This notification can be done by sending an eMail or a SNMP trap.

In addition to notification per e-mail and SNMP trap, the alarm signal can be relayed via a connected relay to an external signaling device (depending on the type).

Examples for an event within the system are alterations to the configuration, a port event, interruption or creation of a link between a port and a connected device. Additional features like a locally saved switch history and a MAC address table are also helpful utilities to keep track of the network. All events are time synchronized with support of the SNTP protocol.



eMail and SNMP alert mechanism



Time synchronization with SNTP

Management Software Overview

Network Discovery via Link Layer Discovery Protocol (LLDP)

The Link Layer Discovery Protocol allow systems on an Ethernet LAN to advertise their key capabilities to neighbor nodes and also to learn about the key capabilities of other systems on the same Ethernet LAN.

This, in turn, promotes a unified network management view of the LAN topology and connectivity to aid network administration and trouble-shooting.

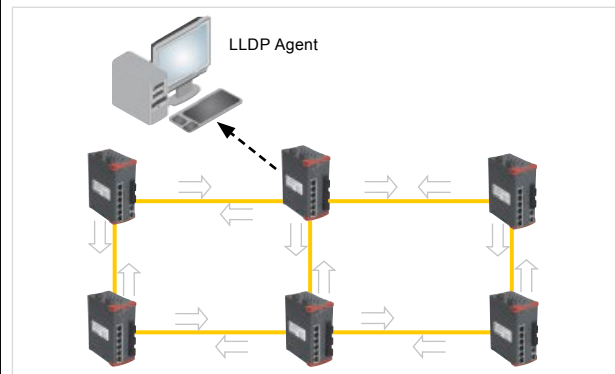
In general a network administration station can be connected to one single switch and from there it is able to access the connectivity information in the complete network within the application.

Port-Based Access Control with 802.1x

With the affiliation of the common office communication with the industrial networks, security and flexibility become more and more important for industrial Ethernet networks and applications. The demand of security and reliability is increasing rapidly. Therefore, industrial Ethernet networks need an end device authentication method that is highly secure but not tied to a ports physical location. For this reason, the HARTING Ha-VIS mCon Switches supports the 802.1x authentication functionality conform to the IEEE standard 802.1X REV 2004. This authentication method prevents access to a switch port in cases, if the authentication and authorization fails. The HARTING management software supports dynamic enabling or disabling of the Network Access Control feature in the switch through management configuration. The authorization of an attached supplicant can be proceed on two different ways: either remote or local.

IP authorized manager

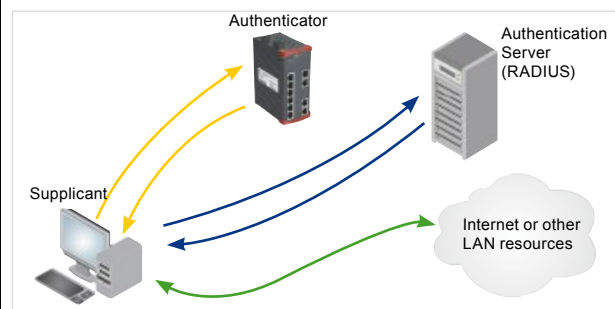
The IP authorized manager feature enables the switch to enhance security on the network by using IP addresses to authorize which stations (PCs or workstations) can access the switch. Thus, having the correct passwords (when logging through TELNET/WEB) is not sufficient for accessing the switch through the network, unless the station attempting access is also included in the switch's Authorized IP Managers configuration.



LLDP – Neighbor information exchange

With the local authorization, the data which is needed is stored directly on the switch, so no external instance is needed. The other way is the remote authorization via a RADIUS server and the EAPoL protocol. The database, containing all information of the network devices which are allowed to get access to the network are stored at the server side and can be managed from a single point. 802.1x user authentication is rapidly becoming an expected component of any Ethernet infrastructure.

- Prevention of unauthorized network access based on access data, not the physical address
- User authentication in the complete network without bindings to a special port
- Attaching an move devices

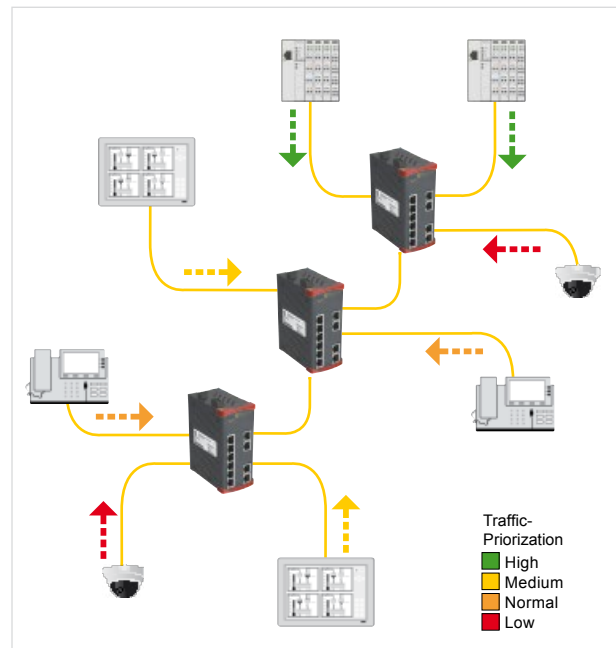


802.1X based user authentication procedure

Management Software Overview

Quality of Service (802.1p, DiffServ)

Quality of Service (QoS) is a technology for managing network traffic in a cost effective manner to enhance network performance and reliability of the application. QoS allows the prioritization of the network traffic to assure quality and performance at any time. For example, QoS technologies can be applied to prioritize traffic for latency-sensitive applications (such as automation protocols and voice or video) and to control the impact of latency-insensitive traffic. The IEEE 802.1p standard provides up to eight traffic classes which can be configured via the management software. The queuing scheme and the way the traffic will be handled inside the switch can be adapted to the requirements of the application.

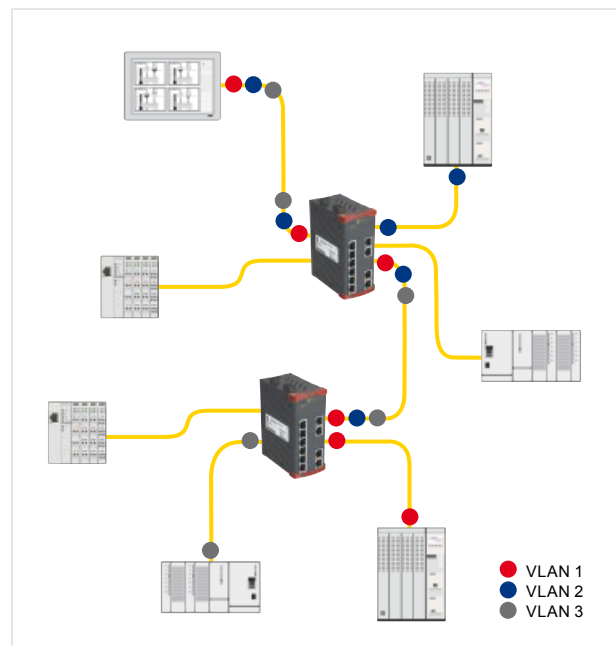


Traffic prioritization for time critical applications

Virtual LAN (VLAN)

As networks have grown in size and complexity, the claim to segment these networks increased rapidly. To avoid the rise of costs and complexity of the devices, the segmentation and separation of different network groups should be established by virtual local area networks (VLANs). This functionality provides a way of structuring and organize the network. Basically, a VLAN is a collection of nodes that are grouped together in a single broadcast domain that is not based on physical location of the devices. VLANs logically segment the shared media LAN and forming virtual workgroups. The different VLANs will send and receive data only to devices which are members of this special LAN. HARTING Ha-VIS mCon switches support up to 4094 VLAN tags and conforms with IEEE standard 802.1Q. The use of VLANs will have the following benefits:

- Security – Separating systems that have sensitive data from the rest of the network
- Performance/Bandbreite – Limitation and administrativ control of the network
- Broadcasts/Traffic-flows – VLANs does not pass broadcast traffic to nodes that are not part of the VLAN, it automatically reduces broadcasts



Traffic management with VLANs

Management Software Overview

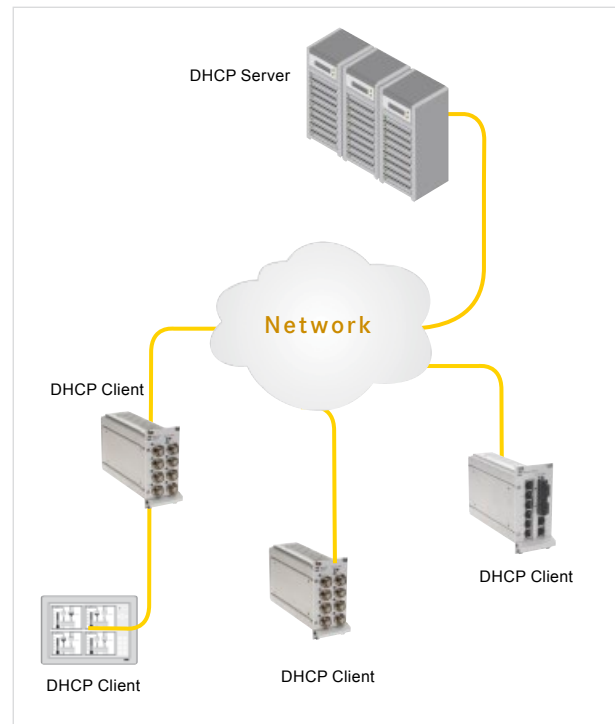
DHCP Option 82

Upgrading and changing the structure of Ethernet networks causes usually a lot of administrative effort. Configuration of security and addressing procedures has to be redone every time a device will be changed. Replacing or moving of network devices causes a lot of trouble, because some network mechanisms such as dynamic IP address assignment are MAC based. The Industrial market searches for a method to simplify the addition and replacement of Ethernet devices to reduce the maintenance effort. DHCP Option 82 provides a mechanism for generating IP addresses based on the location where the client device is attached in the network. By using DHCP option 82, the Ha-VIS mCon switches are able to include additional information about itself, when forwarding DHCP packets. Information about its location can be sent along with the request to the server.

The DHCP server makes a decision on what IP should be assigned to the end device based on this location information.

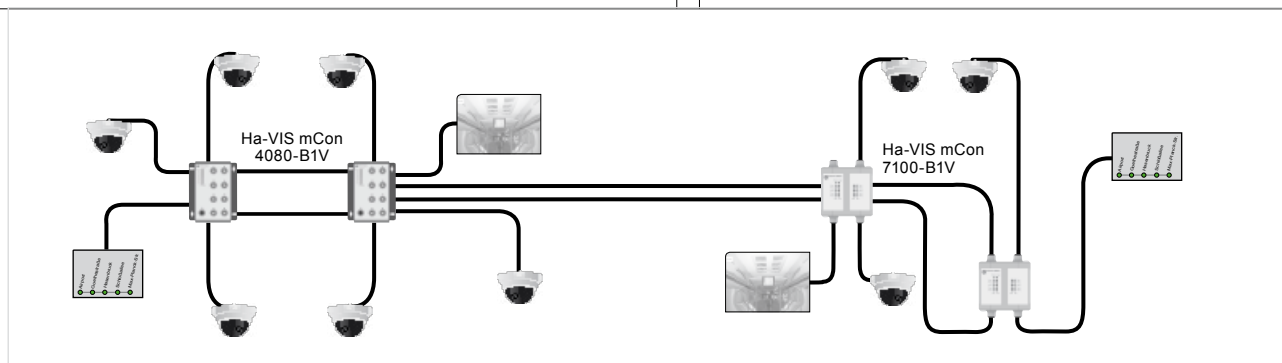
IGMP Snooping

A Layer 2 switch by default, floods multicast traffic within the broadcast domain. This can consume a lot of bandwidth if many multicast servers are sending streams of data. IGMP Snooping are meant to dynamically discover the presence of multicast receivers and use the learnt information to control the multicast traffic flow, restricting it only to the desired ports on which receivers are present. HARTING provides support for dynamic multicast registration support through IGMP snooping (for IPv4 multicast traffic). IGMP snooping can be used for Layer 2/3 traffic and provides a much greater degree of granularity in selecting multicast traffic.



Location-dependent IP address assignment

IGMP learns the multicast forwarding information through the IGMP report messages from hosts and updates the forwarding database. It is possible to edit and add information to the forwarding database manually, so there is no limitation and restriction for the network topology and the application. The IGMP forwarding database based on multicast group MAC address (MAC based). All Ha-VIS mCon switches support IGMP version 1,2 and 3 and also the Querier functionality.



Multicast application with multiple sources and receivers

Management Software Overview

Rapid Spanning Tree

A continuous and failure tolerant network is an essential claim for industrial applications and their network components. The high availability is a mandatory demand to guarantee the failure free operation of these networks. Network redundancy is the ability to handle and endure a link failure without a permanent communication break down. Network redundancy is important in applications, where a single failure can result in significant consequences which can not be tolerated. The Ha-VIS Management Software supports the Rapid Spanning Tree protocol to form loop free topology in a network. RSTP detects topology changes and reconfigures the topology and intimates the topology change to all the switches in the LAN. RSTP avoids this delay by calculating an alternate root port, and immediately switching over to this port if the root port becomes unavailable. Thus, using RSTP, the switch immediately brings the alternate port to forwarding state, without any delay.

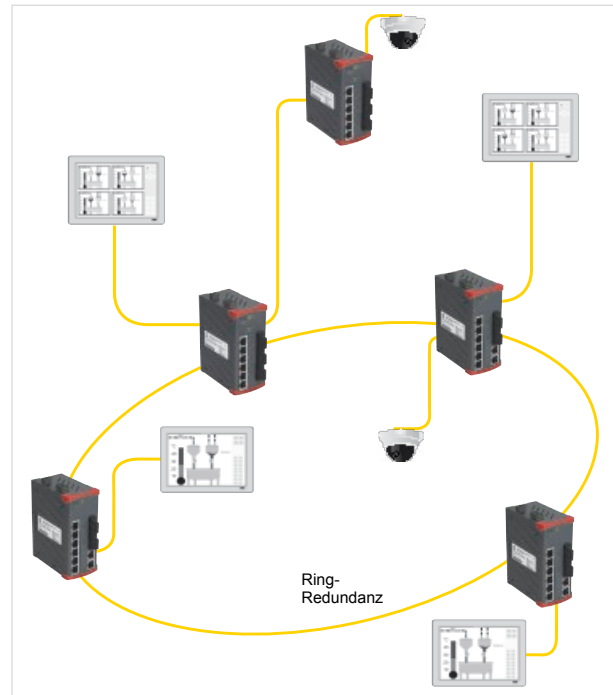
- High availability via redundancy
- Loop free and failure tolerant network
- Fast convergent and recovery time

Link Aggregation (LA)

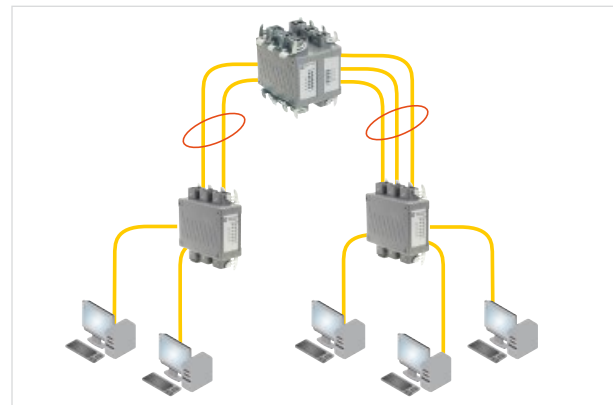
Link Aggregation or trunking is a feature, which allows the combining of several physical network links into a single logical link. This combination brings a lot of advantages to the existing network topology. With Link Aggregation it is clearly possible to increase the bandwidth between to switches to handle heavy network loads at specific points. Furthermore LA offers the possibility to use load balancing on these links. One of the most important benefits is the increased availability between to network devices. Because of the physical redundant link with more than one cable, the connection is still available in case of a link failure. Aggregation groups are formed dynamically using LACP or statically using manual aggregation.

Link Aggregation bietet die folgenden Vorteile:

- Increased bandwidth
- Link redundancy
- High availability
- Load sharing on the individual links
- Aggregating replaces Upgrading



High availability with RSTP



Link Aggregation – Load Balancing, Redundancy, increased bandwidth

Management Functions

Basic Functions		
	Store and Forward Switching Mode	IEEE 802.3
	Manual and Dynamic IP Address Assignment	
Port-Settings	Auto-negotiation on / off	
	Port Speed 10 Mbit/s / 100 Mbit/s	
	Half / Full duplex	
	Port disable / enable	
	Link Up/Down Trap disable / enable	
	Flow Control disable / enable	
Network Discovery	Link Layer Discovery Protocol (LLDP)	802.1AB, 2005
Rate Control	Rate Control per port (Broadcast, Multicast, Unicast)	
File Transfer	Firmware import and export via TFTP and HTTP	
	Configuration import and export via TFTP and HTTP	
Time Settings	Manual time setting	
	Simple Network Time Protocol (SNTP)	RFC 1305, RFC 4330
User Management	Admin, Guest and Service Level	
Service	Service Mode via port 1	
PROFINET		
	PROFINET IO Device Stack ¹⁾	
Time synchronization		
	Precision Time Protocol ¹⁾	IEEE 1588, 2008
QoS		
	Quality of Service (QoS)	IEEE 802.1p
	Differentiated services (DiffServ)	RFC 2474, 2475
VLAN		
	Port protocol based VLANs VLAN ID Range: 1 – 4094 Max. number of configured VLANs: 256	IEEE 802.1Q Rev D5.0, 2005
Redundancy		
	Spanning Tree (STP)	IEEE 802.1D (2004)
	Rapid Spanning Tree (RSTP)	IEEE 802.1D (2004)
	Media redundancy protocol ¹⁾²⁾	DIN EN 62 439-2
Security		
	Port-Based Network Access Control Port Based Authentication with EAP	802.1X (2004)
	RADIUS Client	RFC 2138
	IP authorized manager	
Link Aggregation		
	Link Aggregation (LACP)	IEEE 802.3ad (2005)
Multicast		
	IGMP Snooping (v1, v2, v3) with support for querier	RFC 1112, 2236, 3376

¹⁾ ... Available for Ha-VIS mCon 3000 Next Generation

²⁾ ... Licensing via separately available SD card

Management Functions

DHCP		
	DHCP Client	RFC 2131
	DHCP relay agent	RFC 2131
	DHCP Option 82	RFC 3046
Alarm		
	Alarms via E-mail (SMTP) and SNMP Traps	
	Signalling contact for low voltage detection or link break	
Diagnostic		
	Port diagnostic	
	Port Mirroring	
	Switch History	
	MAC Address Table	
	RMON (1,2,3 & 9 groups)	RFC 2819
Management		
	Password protected Web-Management interface	
	SNMP (v1, v2c, v3) agent & MIB support	RFC 1155, 1157, 1212, 1213, 1215, 2089, 2578, 3411, 3412, 3413, 3414, 3415, 3416, 3417, 3584
	Command Line Interface (CLI)	
	Pluggable SD card for saving of configuration ¹⁾	
	Multifunction button ¹⁾	



Ethernet Switch Ha-VIS mCon 3000 Next Generation

Ethernet Switches, managed, for mounting onto top-hat mounting rail in control cabinets

General Description

The fully Managed Ethernet Switches of the product family Ha-VIS mCon 3000 enable the connection of up to 10 network devices (according to type) over RJ45 ports or SFP modules on lowest area.

Degree of protection, mechanical stability and the comprehensive management software provide for high operation safety and meet highest demands.

The Ha-VIS mCon 3000 Ethernet Switches are designed for an effective, industrial and individual use.

The configuraton via SD card or via the Multifunction button enables an easy and fast commisioning in the field.

Comprehensive possibilities of configuration and diagnostic are provided easy via web interface or standardized via SNMP.

The Ethernet Switches of the Ha-VIS mCon 3000 Next Generation family can be used as PROFINET IO devices.

Features

- Full managed Ethernet Switch acc. to IEEE 802.3
- Up to 10 ports, managed, non-blocking
- Store and Forward Switching Mode
- Gigabit Uplink ports, RJ45 and SFP modules
- Auto-crossing, Auto-negotiation, Auto-polarity
- Temperature range -40 °C ... +70 °C
- PROFINET IO device
- Time synchronization via IEEE 1588v2
- Multifunction button for fast commisioning
- SD card slot for storage of the configuration
- Management functions see pages 01.141 and 01.142

Advantages

- Small, robust metal housing
- External SD card for storage of the configuration
- Individual pre-configuration via Multifunction button
- Fast removable Ethernet data links via SFP “Hot-Swap”
- Optimised DIN rail fitting
- EMC, temperature range and mechanical stability meet the highest demands
- Universally applicable: PROFINET, Ethernet/IP or profile neutral

Application fields

- Mechanical engineering
- Robotics
- Industrial automation
- Industrial Network Infrastructure
- Wind power, Solar power
- Maritime

Technical characteristics

Ethernet interface RJ45

Number of ports	
Ha-VIS mCon 3080-A	8x 10/100Base-T(X)
Ha-VIS mCon 3102-AASFP	8x 10/100Base-T(X) 2x 10/100/1000Base-T(X) (Combo ports with SFP slot)
Cable types acc, to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s, 100 Mbit/s or 1000 Mbit/s (RJ45)
Maximum cable length	100 m (Twisted Pair; with Category 5 cable acc. to DIN EN 50 173-1)
Termination	RJ45 (Twisted Pair)
Diagnostics (via LED)	<ul style="list-style-type: none"> • Status Link – Green • Data transfer (Act) – Green flashing • Data transfer rate (Speed) – 1000 Mbit/s: Green 100 Mbit/s: Yellow 10 Mbit/s: OFF
Topology	Ring, Line, Star or mixed

Ethernet Interface SFP (mini-GBIC) Fibre Optic and copper

Number of ports	
Ha-VIS mCon 3102-AASFP	2x 100/1000Base (Combo ports with SFP slot)
Data rate	100 Mbit/s, 1000 Mbit/s
Termination	SFP modules according to MSA (Multi Source Agreement)
Diagnostics (via LED)	<ul style="list-style-type: none"> • Status Link – Green • Data transfer (Act) – Green flashing

Power supply

Nominal input voltage	24 V ---
Termination	5-pole screw terminal, pluggable for redundant power supply

Switch

Diagnostics (via LED)	<ul style="list-style-type: none"> • Device operates without failures – Green • Power supply in the admissible range – Green • Low voltage – Red • Diagnostics failure – Red • PROFINET failure / diagnosis – Red/Green flashing
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Configuration

Slot for SD cards (back side)	<ul style="list-style-type: none"> • Saving and loading of configuration files • Licence management for MRP
Multifunction button	Individual pre-configuration of software functions

Technical characteristics

Design features

Housing material	Aluminium, anodized
Dimensions (W x H x D)	44 x 130 x 100 mm (without connectors)
Degree of protection acc. to DIN 60529	IP30
Mounting	<ul style="list-style-type: none"> • 35 mm top-hat rail acc. to EN 60715 • Panel mounting, vertical assembly

Environmental conditions

Operating temperature	-40 °C ... +70 °C
Storage temperature	-40 °C ... +85 °C
Relative humidity	10 % ... 95 % (non-condensing)

Mechanical solidness

Shock	IEC 60 068-2-27 <ul style="list-style-type: none"> • 15 g • 11 ms duration • Shock form: Half sine-wave
Vibration	EN 60 068-2-6
Rail-standard	EN 50 155, Class 1

EMC Interference immunity (EN 61 000-6-2, EN 50 121-3-2)

		<i>Industrial</i>	<i>Railway</i>	<i>Maritime</i>
Electrostatic discharge (ESD)	EN 61 000-4-2	Criterion B	Criterion B	Criterion B
Electromagnetic field	EN 61 000-4-3	Criterion A	Criterion A	Criterion A
Fast transients (Burst)	EN 61 000-4-4	Criterion B	Criterion A	Criterion B
Impulse voltages (Surge)	EN 61 000-4-5	Criterion B	Criterion B	Criterion B
Conducted emissions	EN 61 000-4-6	Criterion A	Criterion A	Criterion A
Rail applications	EN 50 121-3-2			

EMC interference (EN 61 000-6-4, EN 55 022, EN 50 121-3-2)

Management software	Full managed via web interface, SNMP and CLI
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Ethernet Switch Ha-VIS mCon 3080-A

8-port Ethernet Switch, full managed
for mounting onto top-hat mounting rail in control cabinets

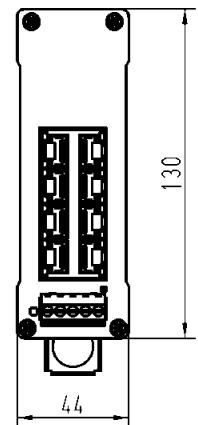
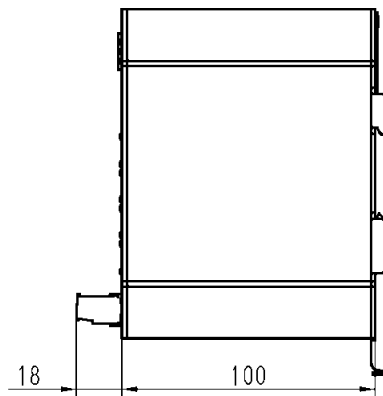
Managed	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-T(X) / RJ45 (Twisted Pair)		
Nominal input voltage range	24 V / 48 V ---		
Permissible range (min/max)	12 V ... 60 V ---		
Termination	5-pole screw terminal, pluggable redundant power supply		
Input current	approx. 170 mA (at 24 V ---) approx. 90 mA (at 48 V ---)		
Housing material	Aluminium, anodized		
Dimensions (W x H x D)	44 x 130 x 100 mm (without connectors)		
Weight	approx. 0.450 kg		
Operating temperature	-40 °C ... +70 °C		
MTBF	678.372 h		
Approvals	UL 508, DNV		
Management	fully Managed via Web interface, SNMP and CLI Functions see pages 01.141 and 01.142		

Ha-VIS mCon

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS mCon 3080-A
Ethernet Switch, full managed
8 RJ45 ports
including
Set for assembly on standard rail

20 76 108 4000





Ethernet Switch

Ha-VIS mCon 3102-AASFP

10-port Ethernet Switch with 2 ports Gigabit Ethernet, full managed for mounting onto top-hat mounting rail in control cabinets

Managed	IP30	PROFINET compatible	EtherNet/IP compatible
Number of ports, Copper / Termination	8x 10/100Base-T(X) / RJ45 (Twisted Pair) 2x 10/100/1000Base-T(X) / RJ45 (Twisted Pair)		
Number of slots SFP / Termination	2x 100/1000Base / Combo ports		
Nominal input voltage range	24 V / 48 V ---		
Permissible range (min/max)	12 V ... 60 V ---		
Termination	5-pole screw terminal, pluggable redundant power supply		
Input current	approx. 280 mA (at 24 V ---) approx. 140 mA (at 48 V ---)		
Housing material	Aluminium, eloxiert		
Dimensions (W x H x D)	44 x 130 x 100 mm (incl. cap, without connectors)		
Weight	approx. 0.485 kg		
Operating temperature	-40 °C ... +70 °C		
MTBF	597.974 h		
Approvals	UL 508, DNV		
Management	fully Managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3102-AASFP Ethernet Switch, full managed 8 ports Fast Ethernet RJ45 2 ports Gigabit Ethernet (combo SFP) including Set for assembly on standard rail	20 76 112 4300		



Ethernet Switch Ha-VIS mCon 3000

Ethernet Switches, managed,
for mounting onto top-hat mounting rail in control cabinets

General description

The fully managed Ethernet Switches of the product family Ha-VIS mCon 3000 enable the connection of up to 10 network devices (according to type) over Twisted Pair cables and fibre-optic cables (Multi- and Singlemode). The Ha-VIS mCon 3000 Ethernet Switch family, with its integrated LEDs on each port, supports fast and easy network diagnosis.

The Ha-VIS mCon 3000 Ethernet Switches are designed for an effective, industrial and individual use. They support both SNMP and an easy Web interface for management functions.

Features

- Ethernet Switch acc. to IEEE 802.3
- Store and Forward Switching Mode
- Up to 10 ports, managed, non-blocking
- Auto-crossing, Auto-negotiation, Auto-polarity
- Temperature range -40 °C ... +70 °C

Advantages

- Robust metal housing
- EMC, temperature range and mechanical stability meet the toughest demands
- Integrated management functions

Application fields

- Industrial automation
- Automotive industry
- Wind power
- Power distribution systems

Technical characteristics

Ethernet interface – RJ45

Number of ports	6x / 8x / 10x 10/100Base-T(X) 2x 10/100/1000-Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s, 100 Mbit/s or 1000 Mbit/s (RJ45)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination	RJ45 (Twisted Pair)
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing • Data transfer rate (Speed) - <ul style="list-style-type: none"> 1000 Mbit/s: Green 100 Mbit/s: Yellow 10 Mbit/s: OFF
Topology	<ul style="list-style-type: none"> • Line • Ring • Star • mixed

Power supply

Input voltage	24 V DC (9.6 V ... 60 V DC)
Termination	5-pole, pluggable screw contact, for redundant power supply
Diagnostics (LED)	Power supply - LED Green

Alarm signalling contact

Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A
Termination	3-pole pluggable screw contact
Diagnostics (LED)	Error - Red

Design features

Housing material	metal
Dimensions (W x H x D)	60 x 132 x 104 mm (without connectors)
Degree of protection acc. to DIN EN 60 529	IP30
for Ha-VIS mCon xxxx-AEx only	IP20
Assembly	<ul style="list-style-type: none"> • 35 mm top-hat rail acc. to EN 60 715 • Wall mounting, vertical assembly
Weight	approx. 0.6 kg

Environmental conditions

Stock temperature	-40 °C ... +85 °C
Relative humidity	10 % ... +95 % (non-condensing)

Technical characteristics F.O. termination

Ethernet interface – F.O.

Number of ports	2x / 3x 100Base-FX
Cable types according to IEEE 802.3	<ul style="list-style-type: none"> • Multimode fibre, 1300 nm; 50 µm / 125 µm or 62.5 µm / 125 µm • Singlemode fibre, 1300 nm; 9 µm (for AF versions only)
Data rate	100 Mbit/s
Maximum cable length	<ul style="list-style-type: none"> • 2000 m (Multimode) • 15 km (Singlemode)
Termination	SC-D female / ST female
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing
Wavelength	1300 nm
Transceive power T(X) max. (dynamic)	<ul style="list-style-type: none"> • -14 dBm (50 µm / 125 µm) • -14 dBm (62.5 µm / 125 µm)
Transceive power T(X) min.	<ul style="list-style-type: none"> • -23.5 dBm (50 µm / 125 µm) • -20 dBm (62.5 µm / 125 µm)
Receive power RX typical (dynamic)	<ul style="list-style-type: none"> • -33.9 dBm (window) • -35.2 dBm (centre)
Receive power RX max. (dynamic)	-14 dBm
Signal detection (dynamic)	-33 dBm
Topology	<ul style="list-style-type: none"> • Line • Ring • Star • mixed



Ethernet Switch

Ha-VIS mCon 3100-AV

10-port Ethernet Switch for mounting onto top-hat mounting rail in control cabinets

Managed	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	10x 10/100Base-T(X) / RJ45 (Twisted Pair)		
Input voltage / Termination	24 V DC / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V DC		
Input current	approx. 190 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	60 x 132 x 104 mm (including cap, without connectors)		
Weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	UL 508; UL 60 950-1; DNV		
MTBF	625.000 h		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3100-AV Ethernet Switch with 10 RJ45 ports including set for assembly on standard rail	20 76 110 4002		



Ethernet Switch Ha-VIS mCon 3100-AAV

10-port Ethernet Switch for mounting onto top-hat mounting rail in control cabinets, including 2 Gigabit ports, with extended temperature range

Managed	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-T(X) / RJ45 (Twisted Pair) 2x 10/100/1000-Base-T(X) / RJ45 (Twisted Pair)		
Input voltage / Termination	24 V DC / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V DC		
Input current	approx. 260 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	60 x 132 x 104 mm (including cap, without connectors)		
Weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	UL 60 950-1; DNV		
MTBF	720.000 h		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3100-AAV Ethernet Switch with 10 RJ45 ports including set for assembly on standard rail	20 76 110 4003		



Ethernet Switch

Ha-VIS mCon 3063-ADV

9-port Ethernet Switch for mounting onto top-hat mounting rail in control cabinets, including 3 F.O. ports (SC, MM)

Managed	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	6x 10/100Base-T(X) / RJ45 (Twisted Pair)		
Number of ports, F.O. / Termination	3x 100Base-FX / SC-D female		
Input voltage / Termination	24 V DC / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V DC		
Input current	approx. 320 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	60 x 132 x 104 mm (including cap, without connectors)		
Weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	UL 508; UL 60 950-1		
MTBF	710.000 h		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
<p>Ha-VIS mCon 3063-ADV</p> <p>Ethernet Switch with 6 RJ45 ports 3 F.O. ports</p> <p>including set for assembly on standard rail</p>	20 76 109 4101		<p>100</p> <p>130</p> <p>60</p>



Ethernet Switch

Ha-VIS mCon 3082-ADV

10-port Ethernet Switch for mounting onto top-hat mounting rail in control cabinets, including 2 F.O. ports (SC, MM)

Managed	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-T(X) / RJ45 (Twisted Pair)		
Number of ports, F.O. / Termination	2x 100Base-FX / SC-D female		
Input voltage / Termination	24 V DC / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V DC		
Input current	approx. 290 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	60 x 132 x 104 mm (including cap, without connectors)		
Weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	UL 508; UL 60 950-1; DNV		
MTBF	560.000 h		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3082-ADV Ethernet Switch with 8 RJ45 ports 2 F.O. ports including set for assembly on standard rail	20 76 110 4101		



Ethernet Switch

Ha-VIS mCon 3082-AFV

10-port Ethernet Switch for mounting onto top-hat mounting rail in control cabinets, including 2 F.O. ports (SC, SM)

Managed	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-T(X) / RJ45 (Twisted Pair)		
Number of ports, F.O. / Termination	2x 100Base-FX / SC-D female		
Input voltage / Termination	24 V DC / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V DC		
Input current	approx. 270 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	60 x 132 x 104 mm (including cap, without connectors)		
Weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	cUL (in preparation)		
MTBF	560.000 h		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3082-AFV Ethernet Switch with 8 RJ45 ports 2 F.O. ports including set for assembly on standard rail	20 76 110 4102		



Ethernet Switch Ha-VIS mCon 3063-AEV

9-port Ethernet Switch for mounting onto top-hat mounting rail in control cabinets, including 3 F.O. ports (ST, MM)

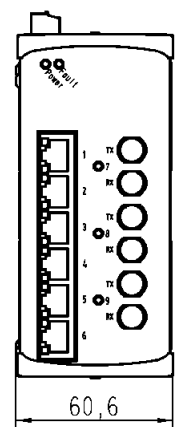
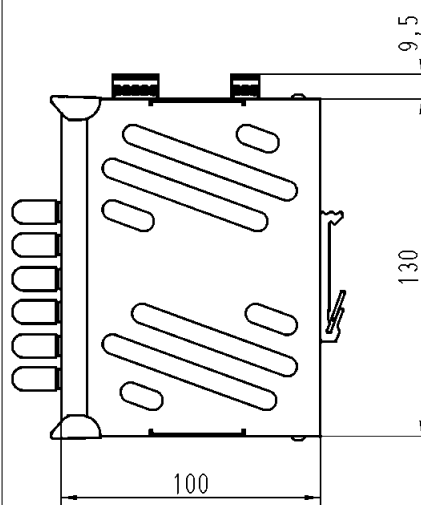
Managed	IP20	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	6x 10/100Base-T(X) / RJ45 (Twisted Pair)		
Number of ports, F.O. / Termination	3x 100Base-FX / ST female		
Input voltage / Termination	24 V DC / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V DC		
Input current	approx. 320 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	60 x 132 x 104 mm (including cap, without connectors)		
Weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	UL 508; UL 60 950-1		
MTBF	710.000 h		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS mCon 3063-AEV
Ethernet Switch with
6 RJ45 ports
3 F.O. ports

including
set for assembly on standard rail

20 76 109 4201





Ethernet Switch

Ha-VIS mCon 3082-AEV

10-port Ethernet Switch for mounting onto top-hat mounting rail in control cabinets, including 2 F.O. ports (ST, MM)

Managed	IP20	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-T(X) / RJ45 (Twisted Pair)		
Number of ports, F.O. / Termination	2x 100Base-FX / ST female		
Input voltage / Termination	24 V DC / 5-pole, pluggable screw contact, for redundant power supply		
Permissible range (min./max.)	9.6 V ... 60 V DC		
Input current	approx. 290 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A 3-pole pluggable screw contact		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	60 x 132 x 104 mm (including cap, without connectors)		
Weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	UL 508; UL 60 950-1; DNV		
MTBF	560.000 h		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3082-AEV Ethernet Switch with 8 RJ45 ports 2 F.O. ports including set for assembly on standard rail	20 76 110 4201		



Ethernet Switch Ha-VIS mCon 4000

Ethernet Switches, managed, for flat wall mounting

General description

The Fast Ethernet Switches of the product family Ha-VIS mCon 4000 are recommended for use in the widest range of industrial applications and support Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s). The product family enables the connection of up to 8 network devices over Twisted Pair cables.

Mechanical stability and temperature range meet the highest demands. The robust M12 interface shows its advantages especially in applications at risk of vibrations.

The Ethernet Switches support both SNMP and an easy Web interface for management functions.

Features

- Ethernet Switch according to IEEE 802.3
- Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s)
- Auto-crossing, Auto-negotiation, Auto-polarity
- Diagnostic LEDs (Link status, Data, Power)
- Store and Forward Switching Mode, non blocking
- Mounting onto wall, optionally onto top-hat mounting rail

For Ethernet Switch Ha-VIS eCon 4080-BPoE1 only:

- PoE support

Advantages

- Robust metal housing and flat housing style
- EMC, temperature range and mechanical stability meet the toughest demands
- Wide range for power supply input
- Additional type test according to EN 50 155 and EN 50 121-3-2

Application fields

- Railway applications
- Industrial automation
- Automotive industry
- Wind power

Technical characteristics

Ethernet interface – M12

Number of ports	8x 10/100Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s (M12 D-coding)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination	M12 D-coding (female)
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow 10 Mbit/s: Green • Error - Red
Topology	<ul style="list-style-type: none"> • Line • Ring • Star • mixed

Power supply

Input voltage	24 / 48 V DC (12 V ... 60 V DC) - redundant
for Ha-VIS mCon 4080-B3V only	72 / 110 V DC (50.4 V ... 137.5 V DC) - redundant
Termination	M12 A-coding, male, for redundant power supply
Diagnostics (LED)	Power supply - LED Green

Design features

Housing material	metal
Dimensions (W x H x D)	130 x 166 x 50 mm (without connectors)
Degree of protection acc. to DIN EN 60 529	IP40
Assembly	Wall mounting, flat assembly
Weight	approx. 0.85 kg

Environmental conditions

Stock temperature	-40 °C ... +85 °C
Relative humidity	10 % ... +95 % (non-condensing)

Technical characteristics Ha-VIS mCon 4080-BPoE1V

Ethernet interface – M12

Number of ports	8x 10/100Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s (M12 D-coding)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination	M12 D-coding
Diagnostics (LED) Link	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow 10 Mbit/s: Green
PoE	<ul style="list-style-type: none"> • no PoE device - OFF • PoE device with failure - Red • PoE device connected - Green
Topology	<ul style="list-style-type: none"> • Line • Star • mixed

Power supply

Input voltage mode PoE	48 V DC (46 V ... 55 V DC)						
mode Non-PoE	24 / 48 V DC (12 V ... 55 V DC)						
Termination	M12 A-coding, male, for redundant power supply						
Diagnostics (LED)	<table> <tr> <td>Pwr X9 (switch)</td> <td>voltage – LED Green</td> </tr> <tr> <td>Pwr PoE (mode PoE)</td> <td>> 46 V DC – LED Green</td> </tr> <tr> <td>State</td> <td>< 46 V DC – LED Red</td> </tr> </table>	Pwr X9 (switch)	voltage – LED Green	Pwr PoE (mode PoE)	> 46 V DC – LED Green	State	< 46 V DC – LED Red
Pwr X9 (switch)	voltage – LED Green						
Pwr PoE (mode PoE)	> 46 V DC – LED Green						
State	< 46 V DC – LED Red						

Design features

Housing material	metal
Dimensions (W x H x D)	130 x 166 x 50 mm (without connectors)
Degree of protection acc. to DIN EN 60 529	IP30
Assembly	Wall mounting, flat assembly
Weight	approx. 0.85 kg

Environmental conditions

Stock temperature	-40 °C ... +85 °C
Relative humidity	10 % ... +95 % (non-condensing)



Ethernet Switch
Ha-VIS mCon 4080-B1V
 8-port Ethernet Switch for flat installation

Managed	IP40	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-T(X) / M12 D-coding (female)		
Input voltage / Termination	24 / 48 V DC / M12 A-coding, male, for redundant power supply		
Permissible range (min./max.)	12 V ... 60 V DC		
Input current	approx. 165 mA (at 24 V DC)		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	130 x 166 x 50 mm (without connectors)		
Weight	approx. 0.85 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	e1		
MTBF	489.000 h		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 4080-B1V Ethernet Switch with 8 ports M12 D-coding for wall mounting	20 77 208 4001		



Ethernet Switch
Ha-VIS mCon 4080-B3V
 8-port Ethernet Switch (110 V DC) for flat installation

Managed	IP40	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-T(X) / M12 D-coding (female)		
Input voltage / Termination	72 / 110 V DC / M12 A-coding, male, for redundant power supply		
Permissible range (min./max.)	50.4 V ... 137.5 V DC		
Input current	approx. 48 mA (at 110 V DC)		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	130 x 166 x 50 mm (without connectors)		
Weight	approx. 0.85 kg		
Working temperature	-40 °C ... +70 °C		
MTBF	446.000 h		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 4080-B3V Ethernet Switch with 8 ports M12 D-coding for wall mounting	20 77 208 4003		



Ethernet Switch
Ha-VIS mCon 4080-BPoE1V
 8-port Ethernet Switch for flat installation

Managed	IP30	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-T(X) / M12 D-coding (female)		
mode PoE			
Input voltage / Termination	48 V DC		
Permissible range (min./max.)	46 V ... 55 V DC		
Input current	max. 3.0 A at 48 V DC with PoE; load 350 mA each port		
mode Non-PoE			
Input voltage / Termination	24 / 48 V DC / M12 A-coding, male, for redundant power supply		
Permissible range (min./max.)	12 V ... 55 V DC		
Input current	approx. 350 mA (at 24 V DC)		
Housing material	metal, powder-coated		
Dimensions (W x H x D)	130 x 166 x 50 mm (without connectors)		
Weight	approx. 0.85 kg		
Working temperature	-40 °C ... +70 °C		
MTBF	296.000 h		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 4080-BPoE1V Ethernet Switch with 8 ports M12 D-coding for wall mounting	20 77 208 4009		



Ethernet Switch Ha-VIS mCon 7000

Ethernet Switches, managed, for harsh industrial environments

General description

If additional services for networks in harsh industrial environments (filtering, prioritisation, topology), or individual network configurations are required, then the Ethernet Switches of the product family Ha-VIS mCon 7000 come into play.

These managed switches allow the connection of up to 10 end-units, according to switch type, over IEC 802.3 Twisted-Pair cabling. Protection class, temperature range and mechanical stability satisfy the highest requirements. These Ethernet Switches can therefore be directly used in industrial environments.

They support both SNMP and an easy Web interface for management functions.

Features

- Ethernet Switch acc. to IEEE 802.3
- Store and Forward Switching Mode
- 5 or 10 ports, managed, non-blocking
- Auto-crossing, Auto-negotiation, Auto-polarity
- Ethernet (10 Mbit/s), Fast Ethernet (100 Mbit/s) and Gigabit Ethernet (1000 Mbit/s)
- Diagnostic LEDs (Link status, Data, Power, Error)

Advantages

- High degree of protection IP65 / IP67
- Robust metal housing, zinc die-cast
- Can be used directly in industrial environments
- EMC, temperature range and mechanical stability meet the toughest demands
- Integrated management functions

Application fields

- Industrial automation
- Railway applications
- Automotive industry
- Wind power

Technical characteristics

Ethernet interface – RJ45

Number of ports	8x 10/100Base-T(X) 2x 10/100/1000-Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s, 100 Mbit/s or 1000 Mbit/s (for Ha-VIS mCon 7100-AAV only) (Han® 3 A RJ45)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination	Han® 3 A RJ45 (female)
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link (Link/Act) - terminal device is connected: Green data transmission in process: Green flashing • Data transfer rate (Speed) - 1000 Mbit/s: Green 100 Mbit/s: Yellow 10 Mbit/s: OFF
Topology	<ul style="list-style-type: none"> • Line • Ring • Star • mixed

Power supply

Input voltage	24 / 48 V DC (12 V ... 60 V DC) - redundant
Termination	Han® 4 A, male, for redundant power supply (including fixing screw 09 20 000 9918 to maintain IP67)
Diagnostics (LED)	Power supply - LED Green

Alarm signalling contact

Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A
Termination, device-side	Han® 3 A, male
Diagnostics (LED)	Error - Red

Design features

Housing material	zinc die-cast
Dimensions (W x H x D)	90 x 120 x 87 mm (without connectors)
Degree of protection acc. to DIN EN 60 529	IP65 / IP67
Assembly	<ul style="list-style-type: none"> • 35 mm top-hat rail acc. to EN 60 715 • Wall mounting, vertical assembly
Weight	approx. 1.4 kg

Environmental conditions

Working temperature	-40 °C ... +70 °C
Stock temperature	-40 °C ... +85 °C
Relative humidity	10 % ... +95 % (non-condensing)

Technical characteristics Ha-VIS mCon 7050-B1V, mCon 7100-B1V

Ethernet interface – M12

Number of ports	5x / 10x 10/100Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s (M12 D-coding)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination, device-side	M12 D-coding (female)
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link (Link/Act) - terminal device is connected: Green data transmission in process: Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow 10 Mbit/s: OFF
Topology	<ul style="list-style-type: none"> • Line • Ring • Star • mixed

Power supply

Input voltage	24 / 48 V DC (12 V ... 60 V DC) - redundant
Termination, device-side	M12 A-coding, male, for redundant power supply
Diagnostics (LED)	Power supply - LED Green

Alarm signalling contact

Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A
Termination, device-side	M12 D-coding, male
Diagnostics (LED)	Error - Red

Design features

	Ha-VIS mCon 7050	Ha-VIS mCon 7100
Housing material	zinc die-cast	zinc die-cast
Dimensions (W x H x D)	45 x 120 x 87 mm (without connectors)	90 x 120 x 87 mm (without connectors)
Degree of protection acc. to DIN EN 60 529	IP65 / IP67	IP65 / IP67
Assembly	<ul style="list-style-type: none"> • 35 mm top-hat rail acc. to EN 60 715 • Wall mounting, flat assembly • Wall mounting, vertical assembly 	<ul style="list-style-type: none"> • 35 mm top-hat rail acc. to EN 60 715 • Wall mounting, vertical assembly
Weight	approx. 0.8 kg	approx. 1.4 kg

Environmental conditions

Working temperature	-40 °C ... +70 °C
Stock temperature	-40 °C ... +85 °C
Relative humidity	10 % ... +95 % (non-condensing)



Ethernet Switch Ha-VIS mCon 7050-B1V

5-port Ethernet Switch with extended input voltage range for industrial Ethernet networks, with M12 system cabling

Managed	IP65 / IP67	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	5x 10/100Base-T(X) / M12 D-coding (female)		
Input voltage / Termination	24 / 48 V DC / M12 A-coding, male, for redundant power supply		
Permissible range (min./max.)	12 V ... 60 V DC		
Input current	approx. 160 mA (at 24 V DC)		
Housing material	zinc die-cast		
Dimensions (W x H x D)	45 x 120 x 87 mm		
Weight	approx. 0.8 kg		
Working temperature	-40 °C ... +70 °C		
Approvals	e1		
MTBF	462.000 h		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 7050-B1V Ethernet Switch with 5 ports M12 D-coding	20 70 305 4943		



Ethernet Switch Ha-VIS mCon 7100-B1V

10-port Ethernet Switch for industrial Ethernet networks,
with M12 system cabling

Managed	IP65 / IP67	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	10x 10/100Base-T(X) / M12 D-coding (female)		
Input voltage / Termination	24 / 48 V DC / M12 A-coding, male, for redundant power supply		
Permissible range (min./max.)	12 V ... 60 V DC		
Input current	approx. 180 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A M12 D-coding, male		
Housing material	zinc die-cast		
Dimensions (W x H x D)	90 x 120 x 87 mm		
Weight	approx. 1.4 kg		
Working temperature	-40 °C ... +70 °C		
MTBF	378.000 h		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 7100-B1V Ethernet Switch with 10 ports M12 D-coding	20 70 310 4945		



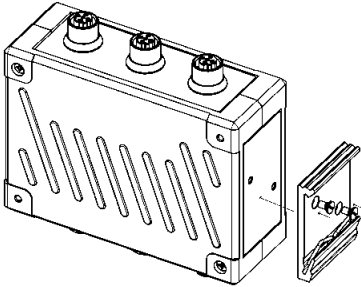
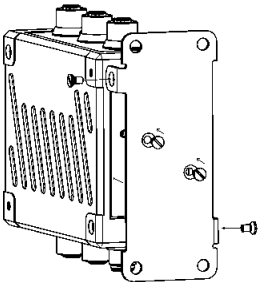
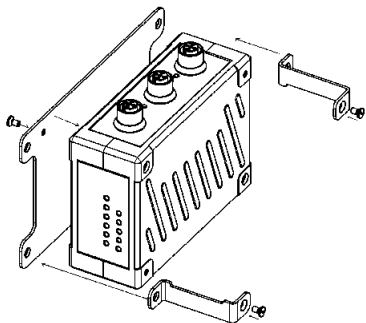
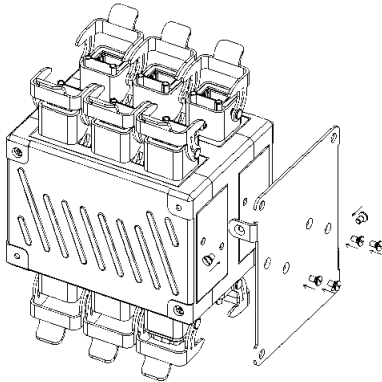
Ethernet Switch

Ha-VIS mCon 7100-AAV

10-port Ethernet Switch for use in harsh industrial environments, with 2 Gigabit ports

Managed	IP65 / IP67	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-T(X) / Han® 3 A RJ45 (female) 2x 10/100/1000-Base-T(X) / Han® 3 A RJ45 (female)		
Input voltage / Termination	24 / 48 V DC / Han® 4 A, male, for redundant power supply		
Permissible range (min./max.)	12 V ... 60 V DC		
Input current	approx. 260 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A Han® 3 A, male		
Housing material	zinc die-cast		
Dimensions (W x H x D)	90 x 120 x 87 mm		
Weight	approx. 1.4 kg		
Working temperature	-40 °C ... +70 °C		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 7100-AAV Ethernet Switch with 10 RJ45 ports	20 70 310 4924		

Identification	Part number	Drawing	Dimensions in mm
Assembly			
Set for assembly on standard rail according to DIN EN 60 715	20 80 000 0003		
Set for panel mounting vertical assembly	20 80 010 0001		
Set for panel mounting flat assembly	20 80 024 0002		
Set for panel mounting Ha-VIS mCon 7100 vertical assembly	20 80 010 0002		



Ethernet Switch Ha-VIS mCon 9000

Ethernet Switches, managed, for installation in a 19" rack

General description

The Ethernet Switches of the product family Ha-VIS mCon 9000 are recommended for use in the widest range of industrial applications and support Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s). The product family enables the connection of up to 8 network devices over Twisted Pair cables.

The Ha-VIS mCon 9000 Ethernet Switch family, with its integrated LEDs on each port, supports fast and easy network diagnosis. The Ha-VIS mCon Ethernet Switch operates in Store and Forward Switching mode and supports Auto-crossing, Auto-negotiation and Auto-polarity.

Features

- Ethernet Switch acc. to IEEE 802.3
- Ethernet (10 Mbit/s) and Fast Ethernet (100 Mbit/s)
- Auto-crossing, Auto-negotiation, Auto-polarity
- Diagnostic LEDs (Link status, Data, Power)
- Store and Forward Switching Mode, non-blocking
- Pluggable in 19" racks
- Power input on the front, no backplane necessary

Advantages

- Robust metal housing
- Integrated management functions
- EMC, temperature range and mechanical stability meet the toughest demands

Application fields

- Railway applications
- Industrial automation
- Automotive industry
- Wind power
- Power distribution systems

Technical characteristics

Ethernet interface – M12

Number of ports	7x / 8x 10/100Base-T(X)
Cable types according to IEEE 802.3	Shielded Twisted Pair (STP) or Unshielded Twisted Pair (UTP), Category 5
Data rate	10 Mbit/s or 100 Mbit/s (M12 D-coding)
Maximum cable length	100 m (Twisted Pair, with cable Category 5 acc. to DIN EN 50 173-1)
Termination	M12 D-coding (female)
Diagnostics (LED)	<ul style="list-style-type: none"> • Status Link - Green • Data transfer (Act) - Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow 10 Mbit/s: OFF
Topology	<ul style="list-style-type: none"> • Line • Ring • Star • mixed

Power supply

Input voltage	24 / 48 V DC (8 V ... 60 V DC) - redundant
Termination	<ul style="list-style-type: none"> • M12 A-coding, male or • DIN frame connector, type F
Diagnostics (LED)	Power supply - LED Green

Alarm signalling contact (for Ha-VIS mCon 9080-B1V only)

Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A
Termination, device-side	DIN frame connector, Type F
Diagnostics (LED)	Error - Red

Design features

Housing material	aluminium
Degree of protection acc. to DIN EN 60 529	IP20 (front side IP40, when mounted)
Assembly	19" rack, 3 U
Weight	approx. 0.6 kg

Environmental conditions

Stock temperature	-40 °C ... +85 °C
Relative humidity	10 % ... +95 % (non-condensing)



Ethernet Switch Ha-VIS mCon 9070-BV

7-port Ethernet Switch for installation in a 19" rack

Managed	IP20	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	7x 10/100Base-T(X) / M12 D-coding (female)		
Input voltage / Termination	24 / 48 V DC / M12 A-coding, male		
Permissible range (min./max.)	8 V ... 60 V DC		
Input current	approx. 130 mA (at 24 V DC)		
Housing material	aluminium, anodised		
Dimensions (W x H x D)	60.6 mm (3 U) x 128.4 mm (12 HP) x 167.5 mm		
Weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
MTBF	667.000 h		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 9070-BV Ethernet Switch with 7 ports M12 D-coding	20 76 207 7002		



Ethernet Switch

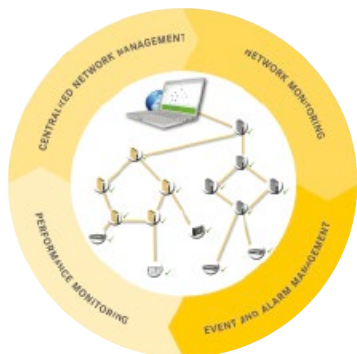
Ha-VIS mCon 9080-B1V

8-port Ethernet Switch for installation in a 19" rack

Managed	IP20	PROFINET compatible <input checked="" type="checkbox"/>	EtherNet/IP compatible <input checked="" type="checkbox"/>
Number of ports, Copper / Termination	8x 10/100Base-T(X) / M12 D-coding (female)		
Input voltage / Termination	24 / 48 V DC / DIN frame connector, Type F		
Permissible range (min./max.)	8 V ... 60 V DC		
Input current	approx. 130 mA (at 24 V DC)		
Alarm signalling contact	Change-over contact, potential-free, 24 V DC / 0.5 A DIN frame connector, Type F		
Housing material	aluminium, anodised		
Dimensions (W x H x D)	60.6 mm (3 U) x 128.4 mm (12 HP) x 173.5 mm		
Weight	approx. 0.6 kg		
Working temperature	-40 °C ... +70 °C		
MTBF	631.000 h		
Management	fully managed via Web interface and SNMP Functions see pages 01.141 and 01.142		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 9080-B1V Ethernet Switch with 8 ports M12 D-coding	20 76 208 7002		

General Description



The Ha-VIS Dashboard acts as central operating and management software for Ethernet networks. The software is developed especially for monitoring, setting up, and maintaining complex and powerful IP-based communication networks.

The Ha-VIS Dashboard detects managed network devices and is capable of representing the network topology automatically. All intelligent HARTING network devices can be centrally monitored and administrated.

A list of individual devices and a topology overview are displayed. A search function is also available for these devices.

The software displays ring topologies recognized by HARTING switches using the Rapid Spanning Tree Protocol.

HARTING's Ha-VIS Dashboard displays connectivity interruptions within the topology and lists them in an event log. Events (including SNMP traps) can be configured to trigger further actions such as sending e-mails or executing programs.

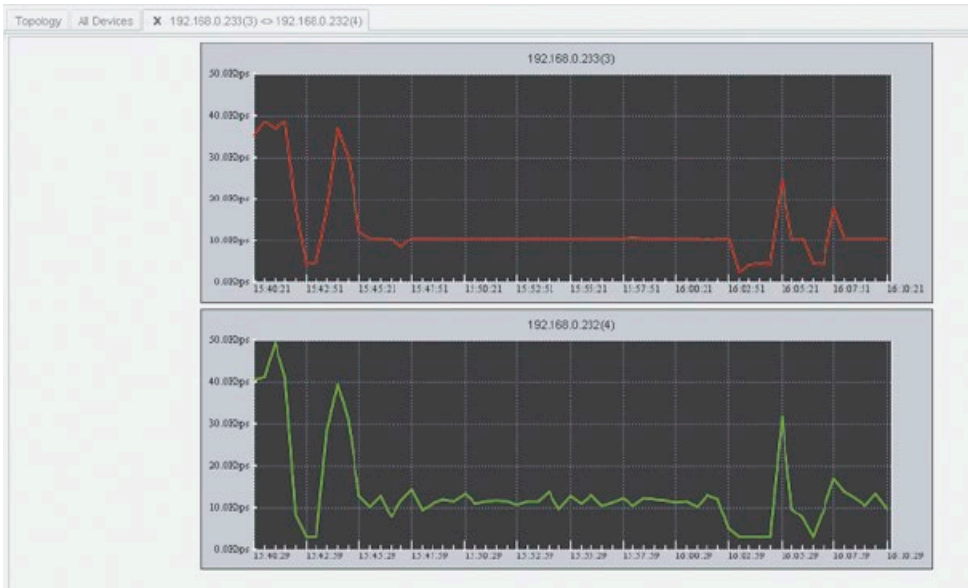
To improve clarity, events which have already been processed can be manually confirmed by the user. Custom filters can be created to filter out certain types of event messages

ID	Ack	Type	Category	Receive Time	Source	Component
133	<input type="checkbox"/>	Info	Status Setter	2012-05-09 15:23:38	192.168.0.221	Protocol/Protocol: RSTP Status OK(Reachability=yes)
132	<input type="checkbox"/>	Info	Status Setter	2012-05-09 15:23:34	192.168.0.223	Protocol/Protocol: RSTP Status OK(Reachability=yes)
131	<input type="checkbox"/>	Info	Status Setter	2012-05-09 15:23:34	192.168.0.221	Protocol/Protocol: RSTP Status OK(Reachability=yes)
130	<input type="checkbox"/>	Info	Status Setter	2012-05-09 15:23:34	192.168.0.216	Protocol/Protocol: RSTP Status OK(Reachability=yes)

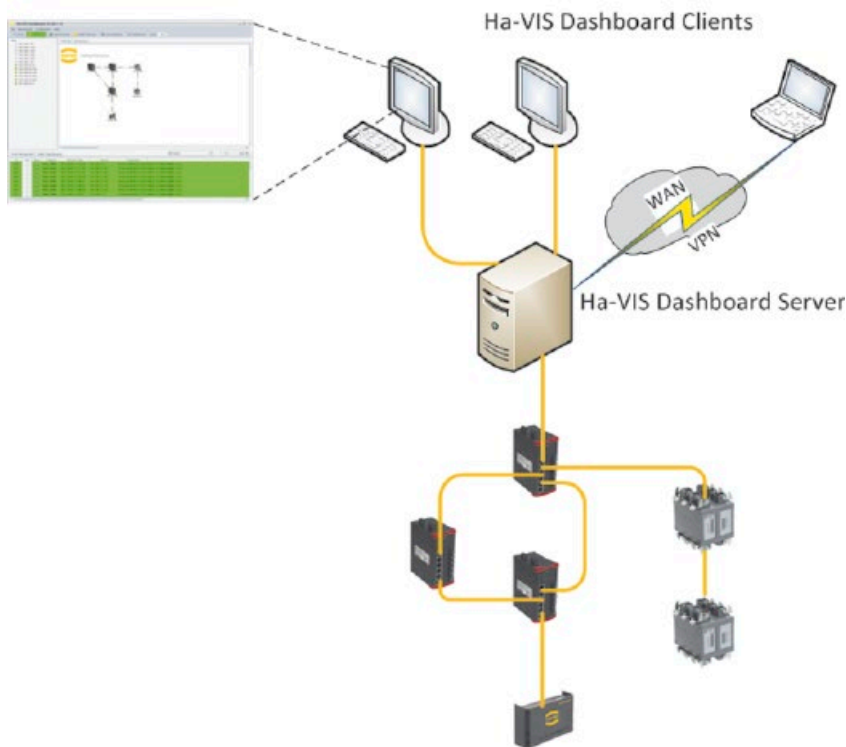
The Ha-VIS Dashboard features web-based configuration, SNMP, Telnet and SSH for configuring network devices.

The software provides centralized monitoring and configuring for an Ethernet network with up to 256 network devices. The Ha-VIS Dashboard also enables you to analyse the network load by illustrating the link and port based loads in a graph over a period of 30 minutes.

General description



You can also configure the Ha-VIS Dashboard so that external programs are integrated into its context menu. This feature allows the Ha-VIS Dashboard to be used together with other applications in a centralized display and management software system.



The Ha-VIS Dashboard can be installed as a local installation or as a server-client application, depending on your requirements. The server-client installation minimizes the network traffic generated by the monitoring process and centralizes data storage, since the key processes all run on a central server.

A VPN connection from the client can be used to establish a wide-area network (WAN) link so that the full functionality of Ha-VIS Dashboard is available on the client.

Technical Characteristics

Functionality

- Centralized management application for HARTING network devices
- Network topology visualization with all managed network devices
- Automatic topology detection based on LLDP
- Manages up to 256 network devices (basic version: 16)
- Third party devices can be included
- Link down detection and visualization
- Event logging
- Event triggered email messages or call of executable files are possible
- Possible to configure devices via SNMP, Telnet, SSH or web interface
- SNMP Trap handling
- Traffic monitoring per connection
- Possible to start up external applications
- Device images and background image are changeable
- Server-Client application with up to 5 parallel clients

Hardware

- CPU: Minimum 2 core processor with 2.5 GHz, x86 or x64 compatible
- RAM: Minimum 1 GB
- Hard Drive: Minimum 1 GB

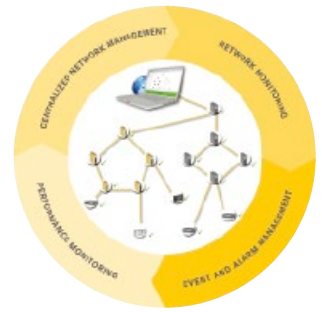
Software

Operating Systems

- Windows XP
- Windows 7
- Windows Server 2003
- Windows Server 2008

Java

- Java Runtime Version 1.6.0_29 or newer



Ha-VIS Dashboard

Advantages

- **Centralized management for managed Ethernet devices**
- **Network monitoring**
- **Event and alarm management**
- **Performance monitoring**

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS Dashboard *			
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Ha-VIS Dashboard License 64	20 16 111 2110		
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Ha-VIS Dashboard License 128	20 16 111 3110		
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Ha-VIS Dashboard License 256	20 16 111 4110		
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* ... The basic version is included in the scope of delivery of Ethernet Switches of the Ha-VIS mCon series.

Available
July 2015



Energy Management System

Advantages

- User-defined reports in various formats, with periodic automatic shipping: load profile curve, ABC analysis, Sankey diagram, heat map analysis, etc.
- Formula-based performance measurement system
- Monitoring of systems, measurements and metrics; with user-group alarm functionality
- Wide variety of interfaces: Modbus RTU and TCP, mbus, S0, CSV, SQL, OPC-UA, etc.
- Every Ha-VIS smartPN unit has digital outputs which can be switched automatically and manually.
- Complete web-based system including SQL database

General description

Companies nowadays must monitor and actively manage their energy consumption and associated costs. The smart Power Networks system provides the basis for measuring all relevant energy flows and for optimising the the data in a beneficial way. Measuring equipment is interfaced with smart Power Network Units which monitor, convert and forward their data over the Ethernet to centralized software modules. Our integrated network switch can be used to expand your network and to enhance your management capabilities.

The web-based software can be configured to fit your requirements. It provides a messaging/alarm system, evaluative functionality, and a reporting function for automatically generating periodic user-defined reports. The live-view function enables you to analyse live measurement values.

This system provides the necessary conditions for a DIN EN ISO 50 001 certification.

Identification

Part No.

Drawing

Ha-VIS TD 64:1 AS

Current transformer with 64:1 A ratio
- Additional types available on request -

20 74 000 4101

Ha-VIS UMG 96 RM

3-phase current meter
- Additional types available on request -

20 74 000 3210

Ha-VIS smartPN Unit

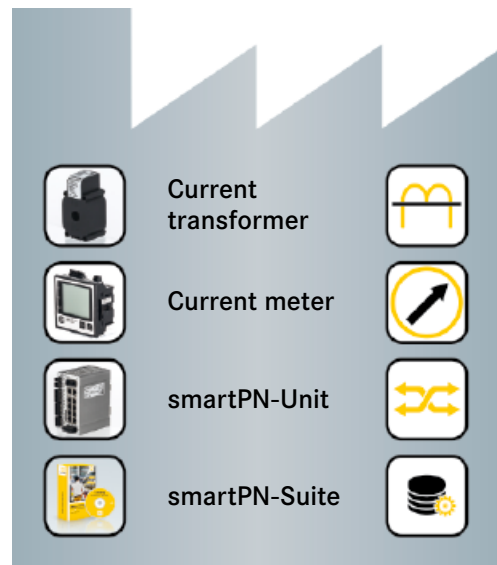
Managed switch with interfaces for recording measurement data

20 74 112 4611

Ha-VIS smartPN Suite

smart Power Networks software

20 74 000 5110



System description

Measuring

The key to energy management is being able to record all of the company's relevant consumption-based power data. The power usage of your main consumer loads must be measured and analysed for optimisation potential. In addition to the electrical loads which are recorded using these current transformers and meters, you should also be able to measure air consumption, heating energy and cooling capacity. This is why the smart Power Network provides all standard industrial interfaces for connecting any of your existing and other conventional meters.

Collecting data

The smartPN unit collects this measurement data, validates it, and checks that it is within the specified limits. The data is then forwarded via TCP/IP to your database. The data can be saved to the unit itself if your database is unreachable. The smartPN unit integrates into your existing network infrastructure so that you can use it to capture measurement data wherever you have network connectivity. The integrated switch also permits you to expand your network and connect to network-compliant meters directly. The management functionality (including RSTP, MRP and VLAN) makes it is easy to use in a modern industrial network environment.

Evaluating

Data is processed in the central module of the Ha-VIS smartPN software suite and then displayed using the web interface. This is where consistency checks are run, metrics and virtual measuring points are determined, and automatic reports are generated.

The following functions are available:

- Individually customized and configured briefing reports and overviews
- Line, column and pie charts
- Sankey diagrams, heat maps and ABC analyses
- Comparisons of time and measuring points
- User-defined evaluation rules
- User groups can be specified for alarm and messaging functions

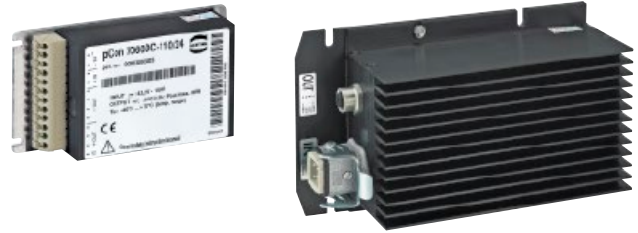
Optimising

Based on this data and the many evaluative options, you can quickly and easily discover where your power saving potential lies. You can also demonstrate the potential savings that would be generated by any implemented changes. The live-view function enables you to get a detailed analysis of individual measurements: values are displayed directly with minimal delays so that you can analyse routines such as a machine's start-up behaviour.

Services

HARTING supports you during the planning and implementation of your smart Power Networks energy management system. You can take advantage of our installation, configuration and maintenance service contracts, or use these services on an as-needed basis.

Industrial DC/DC converter
 Serial Ha-VIS pCon 7000
 for centralised power supply
 with degree of protection IP20 / IP65



General Description

These primary switched DC/DC converters of the product family Ha-VIS pCon 7000 are designed for the decentralised supply of control units, Ethernet components or automation devices in industrial areas and harsh environments.

With their wide range of input voltage, the units are suitable for world-wide use.

The converters need no ground load and are short-circuit protected by primary and secondary power limitation.

The converters are maintenance free, vacuum potted and prepared for the use in devices with Protection Class I or II, depending on the type of the converter.

Features

- Wide input range for world-wide use
- Easy installation
- Galvanically separated
- Short circuit protected
- Ambient Temperature up to 70 °C
- High degree of protection IP65 / IP67

Advantages

- Robust housing
- Wide operating temperature range
- Mechanical stability for highest demands
- Can be used directly in industrial and railway environments
- Compact design and high power density
- Proofed against short-circuits, overloads and no-load operation
- International approvals

Application fields

- Industrial automation
- Automotive industry
- Railway applications
- Power generation and distribution



DC/DC converter
Ha-VIS pCon 7150-110/48
for centralised power supply
with degree of protection IP65

Han® 3 A / M12 A-coding	IP65	110 V DC	48 V DC
Input		Output	
Input voltage	50.4 ... 154 V DC (wide range input)	Output voltage	48 V DC -1 % / +2 %
Inrush current	$< 7 \times I_{in\ nom}$	Output current	3.1 A
Switching frequency	approx. 70 kHz	Ripple	$\leq 1\ %\ p-p$
Efficiency	$\geq 88\ %$	Noise	$\leq 2\ %\ p-p$
Input filter	two-step filter	Starting time	$\leq 200\ ms$
Reverse polarity protection	by means of connector with coding	No load characteristics	no ground load
Termination	Han® 3 A	Current limiting	105 ... 130 % stabilised current
Protection class	I	Termination	M12 A-coding

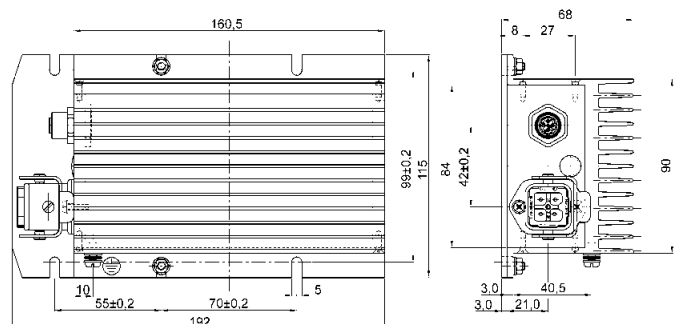
General data

Operating temperature	-40 °C ... +70 °C / -40 °C ... +85 °C for $t \leq 10\ min.$ according to EN 50 155
Cooling	free convection
Weight	approx. 1800 g
Relative humidity	30 % ... 95 % (non-condensing)
Dimensions	192 x 115 x 68 mm
MTBF	> 950 000 hours (according to SN 29 500, $T_A = +50\ ^\circ C$)

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS pCon 7150-110/48
DC/DC converter

20 80 300 3026





DC/DC converter
Ha-VIS pCon 7150-24/48
for centralised power supply
with degree of protection IP65

Han® 3 A / M12 A-coding	IP65	24 V DC	48 V DC
Input		Output	
Input voltage	16.8 ... 33.6 V DC (wide range input)	Output voltage	48 V DC -1 % / +2 %
Inrush current	< 7 x I _{in nom}	Output current	3.1 A
Switching frequency	approx. 70 kHz	Ripple	≤ 1 % p-p
Efficiency	> 90 %	Noise	≤ 2 % p-p
Input filter	two-step filter	Starting time	≤ 200 ms
Reverse polarity protection	by means of connector with coding	No load characteristics	no ground load
Termination	Han® 3 A	Current limiting	105 ... 130 % stabilised current
Protection class	I	Termination	M12 A-coding
General data			
Operating temperature	-40 °C ... +70 °C / -40 °C ... +85 °C for t ≤ 10 min. according to EN 50 155		
Cooling	free convection		
Weight	approx. 1800 g		
Relative humidity	30 % ... 95 % (non-condensing)		
Dimensions	192 x 115 x 68 mm		
Approvals	E1		
MTBF	> 950 000 hours (according to SN 29 500, T _A = +50 °C)		

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS pCon 7150-24/48 DC/DC converter	20 80 300 3027		



DC/DC converter
Ha-VIS pCon 7060-110/24
for centralised power supply
with degree of protection IP20

2x spring-type terminals	IP20	110 V DC	24 V DC
Input		Output	
Input voltage	43.2 ... 154 V DC (wide range input)	Output voltage	24 V DC ±2 %
Switching frequency	approx. 70 kHz	Output current	2.5 A
Efficiency	≥ 85 %	Ripple	≤ 1.5 % p-p
Input filter	LC filter	Noise	≤ 2 % p-p
Transient protection	1.8 kV / 5/50 μs	Starting time	≤ 200 ms
Reverse polarity protection	cross diode (together with external fuse)	No load characteristics	no ground load
Termination	Spring clamps	Current limiting	105 ... 130 % stabilised current
Protection class	II (no earth connection necessary)	Termination	Spring clamps

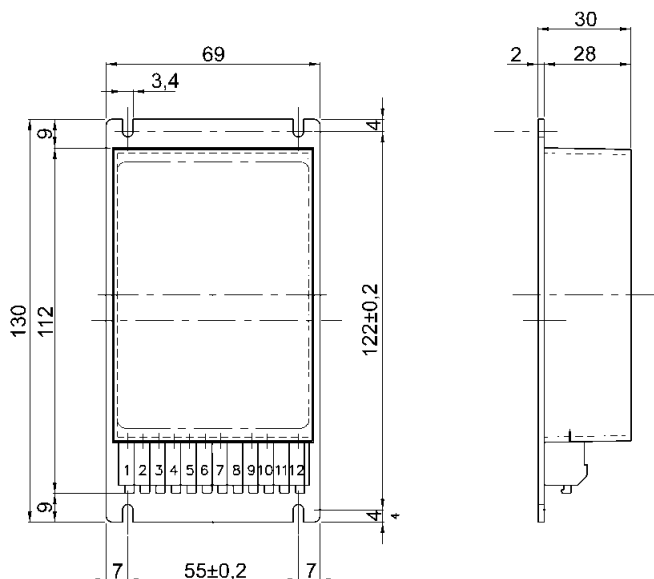
General data

Operating temperature	-40 °C ... +70 °C / -40 °C ... +85 °C for t ≤ 10 min. according to EN 50 155
Cooling	mounting on heat sink with R _{th} < 2.5 K/W, thermal coupling with Al base plate
Weight	approx. 400 g
Relative humidity	30 % ... 95 % (non-condensing)
Dimensions	69 x 130 x 30 mm
MTBF	> 1 400 000 hours (according to SN 29 500, T _A = +50 °C)

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS pCon 7060-110/24
DC/DC converter

20 80 300 3025





Accessories
Ha-VIS SFP modules

General description

SFPs (Small Form-factor Pluggable) are small standardized modules for network connections.

These modules are a specification for a new generation of modular optical transceivers. The devices are constructed as connecting plugs for extremely quick network connections.

The SFPs are available in a variety of models, depending on the cable type (multi-mode or single-mode), the wave length (850 nm, 1300 nm, 1550 nm or CWDM), data rate or range.

Copper-based SFP are also available.

Features

- Highly flexible
- Easily swapped out in event of malfunction
- Hot swappable
- Variants:

	SM fibre	MM fibre
100 Mbit/s	X	X
1000 Mbit/s	X	X

Advantages

- SFP used as connecting plug for extremely quick network connections
- Standardized modules for network connections

Application fields

- Industrial automation
- Automotive industry
- Wind power



Accessories Ha-VIS SFP modules

SFP:

Type	SFP Fast Ethernet Transceiver 155 Mbit/s MM	SFP Fast Ethernet Transceiver 155 Mbit/s SM	SFP Fast Ethernet Transceiver 155 Mbit/s SM	SFP Fast Ethernet Transceiver 155 Mbit/s SM
Wave length	1310 nm	1310 nm	1310 nm	1550 nm
Mode	Multimode	Singlemode	Singlemode	Singlemode
Fiber	50 / 125 µm or 62.5 / 125 µm	9 / 125 µm	9 / 125 µm	9 / 125 µm
Max. cable length*	2 km	15 km	40 km	80 km
Connector	LC connector duplex	LC connector duplex	LC connector duplex	LC connector duplex
Optical budget	min. 8.2 dB	min. 8.2 dB	min. 10 dB	min. 10 dB
Data rate	155 Mbit/s	155 Mbit/s	155 Mbit/s	155 Mbit/s
Operating temperature	-40 °C ... +70 °C	-40 °C ... +70 °C	-40 °C ... +70 °C	-40 °C ... +70 °C

* Typical cable length depending on attenuation of each specific application.

Identification	Part number	Drawing	Dimensions in mm
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SFP modules

SFP Fast Ethernet Transceiver 155 Mbit/s MM	20 76 000 0300	
SFP Fast Ethernet Transceiver 155 Mbit/s SM	20 76 020 0300	
SFP Fast Ethernet Transceiver L40 155 Mbit/s SM	20 76 024 0300	
SFP Fast Ethernet Transceiver L80 155 Mbit/s SM	20 76 028 0300	
other types on request		



Accessories

Ha-VIS SFP modules 1000 Mbit/s

SFP:

Type	SFP Gigabit Ethernet Transceiver 1.25 Gbit/s MM	SFP Gigabit Ethernet Transceiver 1.25 Gbit/s SM	SFP Gigabit Ethernet Transceiver 1.25 Gbit/s SM	SFP Gigabit Ethernet Transceiver 1.25 Gbit/s SM
Wave length	850 nm	1310 nm	1310 nm	1310 nm
Mode	Multimode	Singlemode	Singlemode	Singlemode
Fiber	50 / 125 μ m or 62.5 / 125 μ m	9 / 125 μ m	9 / 125 μ m	9 / 125 μ m
Max. cable length*	550 m (50 / 125) 275 m (62.5 / 125)	10 km	40 km	80 km
Connector	LC connector duplex	LC connector duplex	LC connector duplex	LC connector duplex
Optical budget	min. 9 dB	min. 9 dB	min. 9 dB	min. 9 dB
Data rate	1250 Mbit/s	1250 Mbit/s	1250 Mbit/s	1250 Mbit/s
Operating temperature	-40 °C ... +70 °C	-40 °C ... +70 °C	-40 °C ... +70 °C	-40 °C ... +70 °C

* Typical cable length depending on attenuation of each specific application.

Identification	Part number	Drawing	Dimensions in mm
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SFP modules

SFP Gigabit Ethernet Transceiver 1,25 Gbit/s MM	20 76 010 0300	
SFP Gigabit Ethernet Transceiver 1,25 Gbit/s SM	20 76 030 0300	
SFP Gigabit Ethernet Transceiver L40 1,25 Gbit/s SM	20 76 034 0300	
SFP Gigabit Ethernet Transceiver L80 1,25 Gbit/s SM	20 76 038 0300	
other types on request		



Accessories Ha-VIS Memory cards

The HARTING SD cards are used for saving the switch configuration. The web interface can be used to save the current configuration to the SD card.

If an SD card is inserted in the back of the switch, the switch will use the configuration saved on the card when it boots.

So it's quite easy when replacing a switch to transfer the entire configuration to the new switch. The old SD card with your current configuration is simply pushed into the new switch which then boots with these settings. No special network expertise is required.

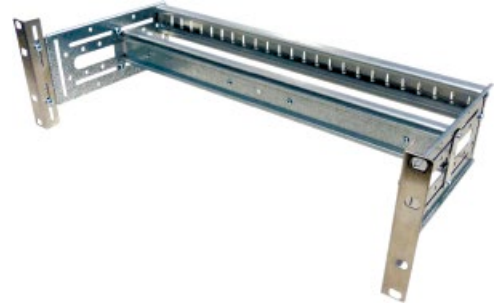
Note: The HARTING Ethernet Switches are not compatible with conventional memory cards.

MRP memory cards allow you to activate the MRP functionality (media redundancy protocol) when using switches from the FTS 3000 and mCon 3000 series (with firmware ver. 3.0.0.1 and later). For example, in order to operate the device as an MRP Ring Client, you need only have the corresponding MRP Ring Client card inserted during operations.

Operating temperature -40 °C ... +70 °C

Memory space 128 MB

Identification	Part number	Drawing	Dimensions in mm
SD Memory cards			
Configuration memory	20 89 900 1000		
MRP Ring Client	20 89 900 1001		
MRP Ring Manager	20 89 900 1002		



Ha-VIS 19" DIN-Rail Mounting kit

The 19" mounting kit has been designed to install DIN-Rail mounted systems in a standard 19" rack.

The mounting kit is modular and very flexible. The DIN-Rail position can be changed in a very easy way. It can be installed in a horizontal or in a vertical position.

Each mounting kit has a cable management at the backside.

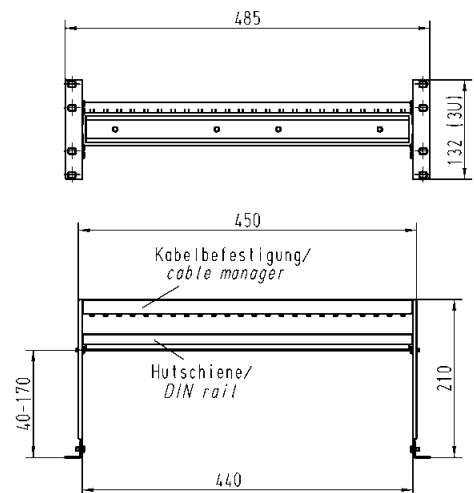
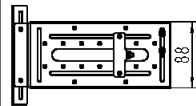
Features:

- 19 inch / 3 U
- Flexible installation
- Variable mounting
- Integrated mounting rail
- Robust design

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS 19" DIN-Rail Mounting kit

20 80 000 0007



Directory

Page





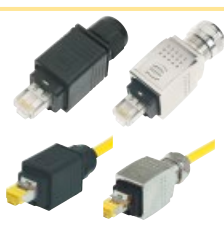
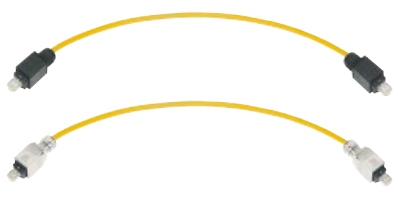










Overview Ethernet cabling	02.02	Overview
HARTING Ethernet cabling – RJ45 cords	02.06	RJ45 cords
HARTING Ethernet cabling – M12 cords	02.22	M12 cords
HARTING Ethernet cabling – fibre optic cords	02.32	Fibre optic cords
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HARTING Ethernet cabling – tools	02.76	Tools

**Fast Ethernet
100 Mbit/s
4-pin & POF
Ethernet IEEE 802.3**

	Connectors	System Cable
Outside IP65 / IP67 Protection Class	 <p>HARTING RJ Industrial® RJ45 Connector 4-pin IP20, RJ45, Cat. 5</p>	 <p>HARTING RJ Industrial System Cable 4-wire assembled / overmoulded IP20, Cat. 5, AWG 22</p>
	 <p>HARTING PushPull RJ45 Connector 4-pin IP65 / IP67, Cat. 5</p>	 <p>HARTING PushPull RJ45 System Cable 4-wire assembled / overmoulded IP65 / IP67, Cat. 5, AWG 22</p>
	 <p>Han® PushPull RJ45 Connector 4-pin plastic / metal IP65 / IP67, Cat. 5</p>	 <p>Han® PushPull RJ45 System Cable 4-wire plastic / metal IP65 / IP67, Cat. 5, AWG 22</p>
	 <p>Han® 3 A RJ45 Connector 4-pin plastic / metal IP65 / IP67, Cat. 5</p>	 <p>Han® 3 A RJ45 System Cable 4-wire IP65 / IP67, Cat. 5, AWG 22</p>
	 <p>HARAX® M12 D-coding Connector 4-pin IP65 / IP67, Cat. 5 (with IDC contacts)</p>	 <p>Han® M12 D-coding System Cable 4-wire IP65 / IP67, Cat. 5, AWG 22</p>
	 <p>Han® PushPull SCRJ Connector POF Variant 14 plastic / metal IP65 / IP67</p>	 <p>Han® PushPull SCRJ System Cable, POF Variant 14 plastic / metal IP65 / IP67</p>
	 <p>Han® 3 A RJ45 Hybrid Connector, 4-pin plastic / metal IP65 / IP67, Cat. 5 with 4x power supply</p>	 <p>Han® 3 A RJ45 Hybrid System Cable, 4-wire plastic / metal IP65 / IP67, Cat. 5, AWG 22, stranded with 4x power supply</p>
	 <p>HARTING RJ Industrial® RJ45 Connector 4-pin IP20, RJ45, Cat. 5</p>	 <p>HARTING RJ Industrial System Cable 4-wire assembled / overmoulded IP20, Cat. 5, AWG 22</p>
	 <p>Han® PushPull RJ45 Connector 4-pin plastic / metal IP65 / IP67, Cat. 5</p>	 <p>Han® PushPull RJ45 System Cable 4-wire plastic / metal IP65 / IP67, Cat. 5, AWG 22</p>
	 <p>HARAX® M12 D-coding Connector 4-pin IP65 / IP67, Cat. 5</p>	 <p>Han® M12 D-coding System Cable 4-wire IP65 / IP67, Cat. 5, AWG 22</p>

Outlets and Panel feed-through		Cable	Application
<p>® RJ45</p> <p>Ided</p>  <p>HARTING Cabinet Outlet RJ45 IP20, Cat. 6</p>  <p>HARTING RJ Industrial® 10G RJ45 Coupling IP20, Cat. 6</p>	<p>Typ A (for fixed layouts) Industrial Cat. 5</p>  <p>Standard Cable AWG 22/1, solid, PVC</p>		
<p>5</p> <p>Ided</p>  <p>HARTING PushPull RJ45 Panel feed-through IP65 / IP67, Cat. 5</p>  <p>HARTING PushPull RJ45 Panel feed-through IP65 / IP67, Cat. 5</p>  <p>HARTING PushPull RJ45 Outlet IP65 / IP67, Cat. 6</p>	<p>Typ B (for flexible layouts) Industrial Cat. 5</p>  <p>Stranded Cable AWG 22/7, stranded, PVC</p>		
 <p>Han® PushPull RJ45 Panel feed-through plastic / metal IP65 / IP67, Cat. 6 Socket horizontal, vertical</p>  <p>Han® PushPull RJ45 Gender Changer IP65 / IP67, Cat. 6</p>	<p>Outdoor Cable AWG 22/7, stranded, PVC</p> 	 <p>AIDA*</p>	
 <p>Han® 3 A RJ45 Panel feed-through IP65 / IP67, Cat. 5</p>  <p>Han® 3 A RJ45 Metal Outlet IP65 / IP67, Cat. 5</p>  <p>Han® 3 A RJ45 Metal Outlet IP65 / IP67, Cat. 6</p>	<p>Typ C (for special applications) Industrial Cat. 5</p>  <p>Trailing Cable AWG 22/7, stranded, PUR</p>		
 <p>Han® M 12 D-coding Panel feed-through IP65 / IP67, Cat. 5 straight or angled</p>	 <p>PROFINET Torsional Stress cable, AWG 22/19, flexible, PUR</p>		
	<p>Ha-VIS EtherRail® Cable Industrial Cat. 5</p>  <p>Ha-VIS EtherRail® Flexible or ultra flexible cable AWG 22/7 or AWG 22/19, Elastomer</p>		
 <p>Han® PushPull SCRJ Panel feed-through plastic / metal IP65 / IP67</p>	<p>POF Cable</p>  <p>POF Cable Type B flexible, incidental movement or vibrations</p>	 <p>AIDA*</p>	
 <p>Han® 3 A RJ45 Hybrid plastic / metal IP65 / IP67, Cat. 5</p>	<p>Industrial Cat. 5 Hybrid Cable AWG 22/7, stranded with 4x power supply, FRNC</p> 		
<p>® RJ45</p> <p>Ided</p>  <p>HARTING Cabinet Outlet RJ45 IP20, Cat. 6</p>	<p>Typ B (for flexible layouts) Industrial Cat. 5</p>  <p>Stranded Cable AWG 22/7, stranded, PVC</p>		
 <p>Han® PushPull RJ45 Panel feed-through plastic / metal IP65 / IP67, Cat. 6 Socket horizontal, vertical</p>  <p>Han® PushPull RJ45 Gender Changer IP65 / IP67, Cat. 6</p>	<p>Outdoor Cable AWG 22/7, stranded, PVC</p> 		
 <p>Han® M 12 D-coding Panel feed-through IP65 / IP67, Cat. 5 straight or angled</p>			

Gigabit Ethernet 1000 Mbit/s 8-pin

	Connectors	System Cable	
Inside IP20 Protection Class	 <p>HARTING RJ Industrial® / HARTING RJ Industrial® 10G RJ45 Connector 8-pin IP20, RJ45, Cat. 6</p>	 <p>HARTING RJ Industrial System Cable 8-wire IP20, Cat. 5, flexible Industrial Ethernet Patchcable RJ45, 8-wire IP20, Cat. 6 or Cat. 5, AWG 24/26</p>	
	 <p>HARTING PushPull RJ45 / HARTING PushPull RJ45 10G Connector 8-pin IP65 / IP67, Cat. 6</p>	 <p>HARTING PushPull System Cable, flexible 8-wire IP65 / IP67, Cat. 6, flexible</p>	
	 <p>Han® PushPull RJ45 / Han® PushPull RJ45 10G Connector 8-pin plastic / metal IP65 / IP67, Cat. 6</p>	 <p>Han® PushPull RJ45 System Cable 8-wire plastic / metal IP65 / IP67, Cat. 6</p>	
	 <p>Han® 3 A RJ45 / Han® 3 A RJ45 10G Connector 8-pin plastic / metal IP65 / IP67, Cat. 6</p>	 <p>Han® 3 A RJ45 System Cable 8-wire IP65 / IP67, Cat. 6, flexible</p>	
	 <p>Han-Max® RJ45 / Han-Max® RJ45 10G Connector 8-pin IP67, Cat. 6</p>		
Outside IP65 / IP67 Protection Class	 <p>han-speed M12 Connector 8-pin IP67, Cat. 6A</p>	 <p>han-speed M12 System Cable 8-wire IP67, Cat. 6</p>	
	 <p>Han® 3 A RJ45 Hybrid 10G Connector 8-pin plastic / metal IP65 / IP67, Cat. 6 with 4x power supply</p>	 <p>Han® 3 A RJ45 Hybrid System Cable 8-wire IP65 / IP67, Cat. 6, flexible</p>	
	Ha-VIS preLink® HIFF and accessories	 <p>Ha-VIS preLink® HIFF Jack RJ45</p>	 <p>Ha-VIS preLink® System Cable 8-wire AWG 27/7</p>
		 <p>Ha-VIS preLink® RJ45 Keystone</p>	

Cabling

	Outlets and Panel feed-through	Cables
Industrial RJ45 8-wire AWG 26/7	 <p>HARTING Cabinet Outlet RJ45 IP20, Cat. 6</p>  <p>HARTING RJ Industrial® 10G RJ45 Coupling IP20, Cat. 6</p>	 <p>Industrial Cat. 6_A Stranded cable 8-wire AWG 26/7, stranded, PVC or PUR</p>
RJ45 Panel feed-through	 <p>HARTING PushPull RJ45 10G Panel feed-through IP65 / IP67, Cat. 6</p>  <p>HARTING PushPull Outlet RJ45 IP65 / IP67, Cat. 6</p>	 <p>Industrial Cat. 6_A Outdoor Cable 8-wire AWG 26/7, stranded, PVC</p>
10G Panel feed-through	 <p>Han® PushPull RJ45 Panel feed-through plastic / metal IP65 / IP67, Cat. 6 Socket horizontal, vertical</p>  <p>Han® PushPull RJ45 Outlet RJ45 IP65 / IP67, Cat. 6</p>	 <p>Industrial Cat. 5 Stranded cable 8-wire AWG 26/7, stranded, PUR</p>
Panel feed-through	 <p>Han® 3 A RJ45 Panel feed-through IP65 / IP67, Cat. 6</p>  <p>Han® 3 A RJ45 Metal Outlet IP65 / IP67, Cat. 5</p>  <p>Han® 3 A RJ45 Metal Outlet IP65 / IP67, Cat. 6</p>	 <p>Industrial Cat. 5 Trailing Cable 8-wire AWG 26/19, PUR</p>
	 <p>Han-Max® Panel feed-through RJ45 IP65 / IP67, Cat. 5</p>	 <p>Industrial Cat. 5 Outdoor cable, 8-wire AWG 26/7, stranded, PVC</p>
Hybrid Panel feed-through	 <p>Han® 3 A RJ45 Hybrid Panel feed-through plastic / metal IP65 / IP67, Cat. 5</p>	 <p>Industrial Cat. 6 Hybrid Cable, 8-wire 4x power supply for fixed and flexible Installation AWG 26/7, PUR</p>
	 <p>Ha-VIS preLink® HIFF RJ45 AP Box IP20, Cat. 6</p>  <p>Han® 3 A RJ45 Metal Outlet IP65 / IP67, Cat. 6</p>  <p>Han® PushPull RJ45 Metal Outlet RJ45 IP65 / IP67, Cat. 6</p>	 <p>Industrial Cat. 7 Installation Cable 8-wire for fixed Installation AWG 23/1, solid, PUR</p>



HARTING RJ Industrial®

Patch cable, overmoulded, 8-wire, Cat. 6

RJ45 connection cable for control or distributor cabinets or within controllers

RJ45 cords

PUR	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input type="checkbox"/>	Cat. 6	<input checked="" type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Connector types RJ45, overmoulded, with locking lever protection

Cable types 4 x 2, Twisted Pair, shielded, S/FTP
Category 7 acc. to IEC 61 156-6, EN 50 288-4-2

Sheath material PUR, halogen free LSZH

Wiring 8-pole, 1:1 or crossed

Transmission performance Category 6 / Class E up to 250 MHz
acc. to ISO/IEC 11 801:2002, EN 50 173-1

Transmission rate 10/100/1000 Mbit/s

Shielding Fully shielded, 360° shielding contact


Operating temperature range 0 °C ... +60 °C

Standard lengths 0.5 m / 1 m / 2 m / 3 m / 5 m / 10 m
other lengths available on request

Colour Yellow

Advantages

- Robust industrial design
- Easy handling for all applications
- Halogen free
- RoHS compliant

Identification		Part number		Drawing	Dimensions in mm
HARTING RJ Industrial® Patch cable, 8-wire, Cat. 6, overmoulded		Yellow 1:1	Yellow crossed		
Length	0,20	09 47 474 7101	09 47 474 7141		
Length	0,30	09 47 474 7102	09 47 474 7142		
Length	0,40	09 47 474 7103	09 47 474 7143		
Length	0,50	09 47 474 7104	09 47 474 7144		
Length	0,60	09 47 474 7105	09 47 474 7145		
Length	0,70	09 47 474 7106	09 47 474 7146		
Length	0,80	09 47 474 7107	09 47 474 7147		
Length	0,90	09 47 474 7108	09 47 474 7148		
Length	1,00	09 47 474 7109	09 47 474 7149		
Length	1,50	09 47 474 7110	09 47 474 7150		
Length	2,00	09 47 474 7111	09 47 474 7151		
Length	2,50	09 47 474 7112	09 47 474 7152		
Length	3,00	09 47 474 7113	09 47 474 7153		
Length	4,00	09 47 474 7114	09 47 474 7154		
Length	5,00	09 47 474 7115	09 47 474 7155		
Length	6,00	09 47 474 7116	09 47 474 7156		
Length	7,00	09 47 474 7117	09 47 474 7157		
Length	7,50	09 47 474 7118	09 47 474 7158		
Length	8,00	09 47 474 7119	09 47 474 7159		
Length	9,00	09 47 474 7120	09 47 474 7160		
Length	10,00	09 47 474 7121	09 47 474 7161		
Length	15,00	09 47 474 7122	09 47 474 7162		
Length	20,00	09 47 474 7123	09 47 474 7163		
HARTING RJ Industrial® colour clips for HARTING RJ Industrial® connectors package with 10 pieces Colour:		Grey 09 45 870 0002			
	Yellow	09 45 870 0003			
	Orange	09 45 870 0006			
	Red	09 45 870 0007			
	Blue	09 45 870 0008			
	Green	09 45 870 0009			
	Black	09 45 870 0011			
					



HARTING RJ Industrial®

Patch cable, overmoulded, 8-wire, Cat. 5e

RJ45 connection cable for control or distributor cabinets or within controllers

RJ45 cords

PUR	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Connector types RJ45, overmoulded, with locking lever protection

Cable types 4 x 2, Twisted Pair, shielded, SF/UTP

Sheath material PUR, halogen free LSZH

Wiring 8-pole, 1:1

Transmission performance Category 5e / Class D up to 100 MHz
acc. to ISO/IEC 11 801:2002, EN 50 173-1

Transmission rate 10/100/1000 Mbit/s

Shielding Fully shielded, 360° shielding contact


Operating temperature range 0 °C ... +60 °C

Standard lengths 0.5 m / 1 m / 2 m / 3 m / 5 m / 10 m
other lengths available on request

Colour Yellow

Advantages

- Robust industrial design
- High operational reliability in vibration-prone locations
- Halogen free
- RoHS compliant

Identification	Part number	Drawing	Dimensions in mm
<p>HARTING RJ Industrial® Patch cable, 8-wire, Cat. 5e, overmoulded</p>	<p>Yellow</p>		
<p>HARTING RJ Industrial® colour clips for HARTING RJ Industrial® connectors package with 10 pieces</p> <p>Colour:</p>	<p>Grey 09 45 870 0002 Yellow 09 45 870 0003 Orange 09 45 870 0006 Red 09 45 870 0007 Blue 09 45 870 0008 Green 09 45 870 0009 Black 09 45 870 0011</p>		



Ha-VIS Smart Patch Cable IP20 Cat. 6

RJ45 cords

FRNC	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input type="checkbox"/>	Cat. 6	<input checked="" type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Connector types	HARTING RJ45 Industrial®
Cable types	4 x 2, Twisted Pair, shielded, AWG 27
Sheath material	FRNC
Wiring	8-pole, 1:1
Transmission performance	Category 6 / Class E up to 250 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100/1000 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-10 °C to +70 °C
Standard lengths	1 m / 2 m / 5 m / 7 m / 10 m other lengths available on request
Colour	Yellow

Advantages

- Easy and fast illuminated detection of patch cables via integrated LEDs
- Compact and space saving plug by dual boot design
- Capable for Multiport applications
- Flame retardant
- Halogen free
- Colour coding option

Identification	Part number FRNC	Drawing	Dimensions in mm
Ha-VIS Smart Patch Cable IP20 Cat. 6	Yellow		
Length 1.0 m	09 47 474 7201		
Length 2.0 m	09 47 474 7203		
Length 5.0 m	09 47 474 7206		
Length 7.0 m	09 47 474 7208		
Length 10.0 m	09 47 474 7211		
further lengths on request			

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS Smart Patchkabel Detektor

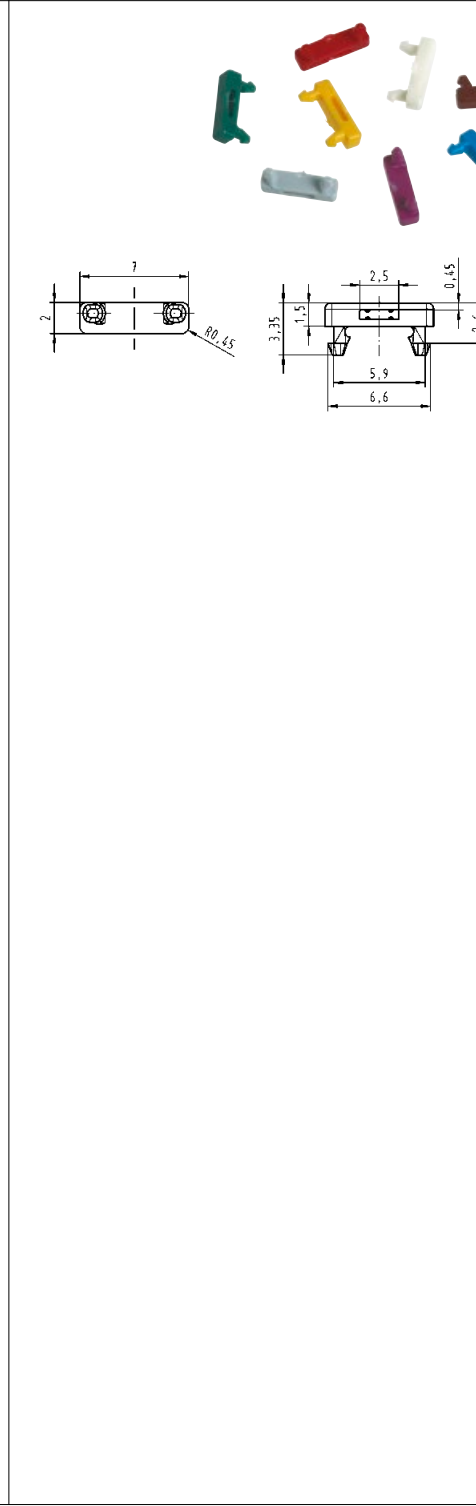
09 47 900 0001



HARTING RJ Industrial® 10G colour clips
for HARTING RJ Industrial® 10G connectors
package with 50 pieces

Colour: White 09 45 850 0001
 Grey 09 45 850 0002
 Yellow 09 45 850 0003
 Magenta 09 45 850 0005
 Red 09 45 850 0007
 Blue 09 45 850 0008
 Green 09 45 850 0009
 Brown 09 45 850 0010

09 45 850 0001
09 45 850 0002
09 45 850 0003
09 45 850 0005
09 45 850 0007
09 45 850 0008
09 45 850 0009
09 45 850 0010





Patch Cable RJ45 DualBoot®,
Cat. 6_A ISO/IEC, shielded

RJ45 cords

FRNC	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6 _A	<input checked="" type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Connection cable RJ45/RJ45, shielded 1:1 pinout and featuring DualBoot® overmolding incl. unlock protection. This patch cable is suitable for installations in offices and data centers.

Plugs are optimized for applications in high density switches. Use of DualBoot® overmolding ensures optimal strain relief and eliminates catching of locking levers.

Service mapping may also be effected at a later point in time via the application of colour coding (special accessory). The patch cable provides maximum data reliability via its foil shield and 360° shielded RJ45 plugs.

Standards: IEEE 802.3; 10BaseT; 100BaseT; 1000BaseT; 10GBaseT; IEEE 802.5 16MB; ISDN; FDDI; ATM; Telephone

Sheath FRNC: IEC 60 332-1-2; IEC 60 754-2; IEC 61 034

Colour white, black, gray, red, yellow, green, blue

EMC shielding / plug to EN 60 603-7 with 360° shielding

Electrical specifications Cat. 6_A ISO/IEC 2nd FPDAM 2 to ISO/IEC 11 801 AMD 2 (2009-04), Cat. 6A TIA/EIA 568-B.2-10:2008, GHMT certified

Chemical Properties free of hazardous substances pursuant to RoHS 2002/95/EC

Application: use in offices, data centers and industrial settings

Packaging unit: up to 3m in length: 10 units in polybag
3.01 to 5 m: 5 units in polybag
over 5 m: individually packed

Length key: Please insert digit for part number
xxx = length in dm

Identification	Part number
Patch Cable Cat. 6 _A ISO/IEC DualBoot® 1:1	
white	09 48 878 7584 xxx
gray	09 48 878 7585 xxx
red	09 48 878 7586 xxx
yellow	09 48 878 7587 xxx
green	09 48 878 7588 xxx
blue	09 48 878 7589 xxx



PushPull Patch Cable RJ45 DualBoot®, Cat. 6_A ISO/IEC, shielded

FRNC	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6 _A	<input checked="" type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Connection cable RJ45/RJ45, shielded 1:1 pinout and featuring DualBoot® overmolding incl. unlock protection. This patch cable is suitable for installations in offices and data centers.

Plugs are optimized for applications in high density switches. Use of DualBoot® overmolding ensures optimal strain relief and eliminates catching of locking levers.

Service mapping may also be effected at a later point in time via the application of colour coding (special accessory). The patch cable provides maximum data reliability via its foil shield and 360° shielded RJ45 plugs.

Standards: IEEE 802.3; 10BaseT; 100BaseT; 1000BaseT; 10GBaseT; IEEE 802.5 16MB; ISDN; FDDI; ATM; Telephone

Sheath FRNC: IEC 60 332-1-2; IEC 60 754-2; IEC 61 034

Colour white, black, gray, red, yellow, green, blue

EMC shielding / plug to EN 60 603-7 with 360° shielding

Electrical specifications Cat. 6_A ISO/IEC 2nd FPDAM 2 to ISO/IEC 11 801 AMD 2 (2009-04), Cat. 6A TIA/EIA 568-B.2-10:2008, GHMT certified

Chemical Properties free of hazardous substances pursuant to RoHS 2002/95/EC

Application: use in offices, data centers and industrial settings

Packaging unit: up to 3m in length: 10 units in polybag
3.01 to 5 m: 5 units in polybag
over 5 m: individually packed

Length key: Please insert digit for part number
xxx = length in dm

Identification

Part number

PushPull Patch Cable Cat. 6_A ISO/IEC DualBoot® 1:1
white
black
gray
red
yellow
green
blue

09 48 888 8574 xxx
09 48 888 8575 xxx
09 48 888 8576 xxx
09 48 888 8577 xxx
09 48 888 8578 xxx
09 48 888 8579 xxx
09 48 888 8580 xxx



Patch Cable RJ45 DualBoot®,
Cat. 5e ISO/IEC, shielded

RJ45 cords

FRNC	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Connection cable RJ45/RJ45, shielded 1:1 pinout and featuring DualBoot® overmolding incl. unlock protection. This patch cable is suitable for installations in offices and data centers.

Plugs are optimized for applications in high density switches. Use of DualBoot® overmolding ensures optimal strain relief and eliminates catching of locking levers.

Service mapping may also be effected at a later point in time via the application of colour coding (special accessory). The patch cable provides maximum data reliability via its foil shield and 360° shielded RJ45 plugs.

Standards: IEEE 802.3; 10BaseT; 100BaseT; 1000BaseT; 10GBaseT; IEEE 802.5 16MB; ISDN; FDDI; ATM; Telephone

Sheath FRNC: IEC 60 332-1-2; IEC 60 754-2; IEC 61 034
Colour white, black, gray, red, yellow, green, blue

EMC shielding / plug to EN 60 603-7 with 360° shielding

Electrical specifications Cat. 5e

Chemical Properties free of hazardous substances pursuant to RoHS 2002/95/EC

Application: use in offices, data centers and industrial settings

Packaging unit: up to 3m in length: 10 units in polybag
3.01 to 5 m: 5 units in polybag
over 5 m: individually packed

Length key: Please insert digit for part number
xxx = length in dm

Identification

Part number

Patch Cable Cat. 5e ISO/IEC DualBoot® 1:1
white
gray
red
yellow
green
blue

09 48 868 6568 xxx
09 48 868 6569 xxx
09 48 868 6570 xxx
09 48 868 6571 xxx
09 48 868 6572 xxx
09 48 868 6573 xxx



PROFINET cabinet cord cat. 6

PVC	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input type="checkbox"/>	Cat. 6	<input checked="" type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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- Universal use for PROFINET and Industrial Ethernet cabling in control cabinets
- Compact and space saving plug by HARTINGs Dual-Boot design
- Very robust locking lever protection and unlocking latch
- Reliable data transmission due to high EMC-immunity

The new Cat. 6 S/FTP patch cable completes the HARTING cabling solutions for industrial applications.

It is specially designed for the use in electrical cabinets and fulfills the PROFINET requirements. The design leads to a high flexibility and the innovative two-piece molding features to a good handling and a robust bending protection.

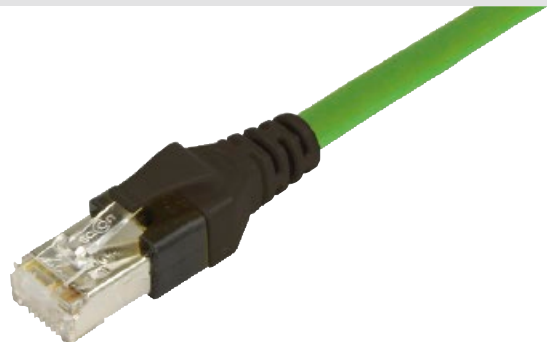
The double screened cable is EMC-safe against the unavoidable emitters in electrical cabinets.

The cable jacket is out of PVC, which is flame retardant and RoHS conform.

Identification	Part number	Drawing
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PROFINET cabinet cord
8-wire

0.3 m	09 48 474 7766 003
0.5 m	09 48 474 7766 005
1.0 m	09 48 474 7766 010
1.5 m	09 48 474 7766 015
2.0 m	09 48 474 7766 020
3.0 m	09 48 474 7766 030
5.0 m	09 48 474 7766 050



- RJ45 acc. to IEC 60603-7
- Boot black
- Locking lever protection and unlocking latch
- Cable: S/FTP AWG 26/7
- PVC cable, jacket green
- Wiring 1:1 TIA/EIA-568-B, 8-wire
- 100 % electrical tested

Technical characteristics

Performance Cat. 6 / Class E acc. to ISO/IEC 24 702 resp. ISO/IEC 11 801,
Cat. 6 acc. to IEC 61 935-2
Cable: Cat. 6_A acc. to IEC 61 156-6

Mechanical characteristics

Bending protection

Locking lever protection

Bending radius Repeated bending radius ≥ 55 mm
Single bending radius ≥ 30 mm

Lateral force 1000 N

Electrical characteristics

Characteristic impedance 100 ± 5 Ohm

Loop resistance ≤ 290 Ohm/km

Delay skew ≤ 20 ns/100 m

Wiring 1:1 TIA/EIA-568-B

Coupling attenuation ≥ 80 dB (segregation class d)

Environmental characteristics

Protection class IP20

Flame retardant acc. to IEC 60 332-1-2

Thermal characteristics

Operating temperature $- 20$ °C ... $+ 70$ °C

Printing

“PROFINET Cabinet Cord 4-pair”

Packaging

One piece in poly-bag, labelled



HARTING RJ Industrial® System cable, 4-wire, straight

RJ45 connection cable for control or distributor cabinets or within controllers

PVC / PUR	<input checked="" type="checkbox"/>	8 wire	<input type="checkbox"/>	4 wire	<input checked="" type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Cable types

Cable type	Type B	Type C
Cables	Copper, stranded, shielded	Copper, stranded, shielded, useable as trailing cable
Wire gauge	4 x AWG 22/7	4 x AWG 22/7
Sheath material	PVC	PUR
Operating temperature range	-40 °C ... +70 °C	-40 °C ... +70 °C
Application PROFINET	Green	Green
Application SERCOS III	Red	Red

Wiring	4-pole, 1:1 (RJ45 contacts 1/2 and 3/6)
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded
Standard lengths	1.5 m / 3 m / 5 m / 7.5 m / 10 m / 20 m other lengths available on request
Advantages	Robust industrial design Multiport compatible PROFINET compliant



RJ45 cords

Identification	Profinet	Part No.	
		SERCOS III*	
HARTING RJ System cable, compact 4-wire Type B	Length 0.5 m	09 48 686 8001 005	09 48 686 8006 005
	Length 1.0 m	09 48 686 8001 010	09 48 686 8006 010
	Length 1.5 m	09 48 686 8001 015	09 48 686 8006 015
	Length 3.0 m	09 48 686 8001 030	09 48 686 8006 030
	Length 5.0 m	09 48 686 8001 050	09 48 686 8006 050
	Length 7.5 m	09 48 686 8001 075	09 48 686 8006 075
	Length 10.0 m	09 48 686 8001 100	09 48 686 8006 100
	Length 15.0 m	09 48 686 8001 150	09 48 686 8006 150
	Length 20.0 m	09 48 686 8001 200	09 48 686 8006 200
HARTING RJ System cable, compact 4-wire Type C	Length 0.5 m	09 48 686 8004 005	09 48 686 8007 005
	Length 1.0 m	09 48 686 8004 010	09 48 686 8007 010
	Length 1.5 m	09 48 686 8004 015	09 48 686 8007 015
	Length 3.0 m	09 48 686 8004 030	09 48 686 8007 030
	Length 5.0 m	09 48 686 8004 050	09 48 686 8007 050
	Length 7.5 m	09 48 686 8004 075	09 48 686 8007 075
	Length 10.0 m	09 48 686 8004 100	09 48 686 8007 100
	Length 15.0 m	09 48 686 8004 150	09 48 686 8007 150
	Length 20.0 m	09 48 686 8004 200	09 48 686 8007 200

* under preparation



Han® 3 A RJ45 System cable, 8-wire

RJ45 connector cable Han® 3 A for IP65 / IP67 applications

PVC / PUR	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input type="checkbox"/>	Cat. 6	<input checked="" type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Connector types	Han® 3 A RJ45
Cable types	4 x 2, Twisted Pair, shielded
Sheath material	PVC / PUR
Wiring	8-pole, 1:1
Transmission performance	Category 6 / Class E up to 250 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100/1000 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-10 °C ... +70 °C
Standard lengths	1.5 m / 3 m / 5 m / 10 m / 20 m other lengths available on request
Colour	Yellow

Advantages

- Very robust metal housing Han® 3 A for IP65 / IP67
- Additional locking

Identification	Part number		Drawing	Dimensions in mm
	PVC	PUR		
Han® 3 A RJ45 System cable, 8-wire	Yellow	Yellow		
Length 1.5 m	09 45 715 1523	09 45 715 1563		
Length 3.0 m	09 45 715 1525	09 45 715 1565		
Length 5.0 m	09 45 715 1527	09 45 715 1567		
Length 10.0 m	09 45 715 1551	09 45 715 1572		
Length 20.0 m	09 45 715 1553	09 45 715 1574		



Han® 3 A RJ45 System cable, 8-wire

RJ45 connector cable Han® 3 A for IP65 / IP67 applications to RJ45 (IP20)

RJ45 cords

PVC / PUR	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input type="checkbox"/>	Cat. 6	<input checked="" type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Connector types	Han® 3 A RJ45 (IP65 / IP67) RJ45 (IP20)
Cable types	4 x 2, Twisted Pair, shielded
Sheath material	PVC / PUR
Wiring	8-pole, 1:1
Transmission performance	Category 6 / Class E up to 250 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100/1000 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-10 °C to +70 °C

Standard lengths	1.5 m / 3 m / 5 m / 10 m / 20 m other lengths available on request
Colour	Yellow

- Advantages**
- Very robust metal housing Han® 3 A for IP65 / IP67
 - Additional locking
 - Easy change-over from harsh industrial environment to protected IP20 environment
 - Easy handling for all applications

Identification	Part number		Drawing	Dimensions in mm
	PVC	PUR		
Han® 3 A RJ45 System cable, 8-wire IP65 / IP67 to IP20	Yellow	Yellow		
Length 1.5 m	09 45 701 1564	09 45 701 1534		
Length 3.0 m	09 45 701 1566	09 45 701 1536		
Length 5.0 m	09 45 701 1568	09 45 701 1538		
Length 10.0 m	09 45 701 1573	09 45 701 1543		
Length 20.0 m	09 45 701 1575	09 45 701 1545		



HARTING M12
 System cable, 4-wire, straight
 HARTING M12 connection cable, D-coding,
 for harsh industrial environments, pre-assembled on both sides

PUR / PVC / PE	<input checked="" type="checkbox"/>	8 wire	<input type="checkbox"/>	4 wire	<input checked="" type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Connector types	2x HARTING M12 D-coding, overmoulded
Cable types	4 x AWG 22/7, Star quad, double shielding
Sheath material	PUR / PVC
Wiring	4-pole, 1:1
Transmission performance	Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-25 °C ... +70 °C
Standard lengths	1 m / 1.5 m / 3 m / 5 m / 7.5 m / 10 m / 20 m other lengths available on request
Colour	Green / Black Red (SERCOS III)

- Advantages**
- Robust design
 - Use on-site made possible by IP65 / IP67 protection
 - PUR variants are useable as trailing cables

Identification	Part number			
	PUR	PVC	PE*	PE ultra flexible*
HARTING M12 System cable, 4-wire	Green	Black	Black	Black
Length 1.0 m	21 34 929 2477 010	21 34 929 2405 010	09 48 222 2011 010	09 48 222 2012 010
Length 1.5 m	21 34 929 2477 015	21 34 929 2405 015	09 48 222 2011 015	09 48 222 2012 015
Length 3.0 m	21 34 929 2477 030	21 34 929 2405 030	09 48 222 2011 030	09 48 222 2012 030
Length 5.0 m	21 34 929 2477 050	21 34 929 2405 050	09 48 222 2011 050	09 48 222 2012 050
Length 7.5 m	21 34 929 2477 075	21 34 929 2405 075	09 48 222 2011 075	09 48 222 2012 075
Length 10.0 m	21 34 929 2477 100	21 34 929 2405 100	09 48 222 2011 100	09 48 222 2012 100
Length 20.0 m	21 34 929 2477 200	21 34 929 2405 200	09 48 222 2011 200	09 48 222 2012 200

* Technical characteristics see pages 02.28 and 02.29



HARTING M12

System cable, 4-wire, angled

HARTING M12 connection cable, D-coding,
for harsh industrial environments pre-assembled on both sides

PUR / PVC / PE	<input checked="" type="checkbox"/>	8 wire	<input type="checkbox"/>	4 wire	<input checked="" type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Connector types 2x HARTING M12 D-coding, angled, overmoulded

Cable types 4 x AWG 22/7, Star quad, double shielding

Sheath material PUR / PVC

Wiring 4-pole, 1:1

Transmission performance Class D up to 100 MHz
acc. to ISO/IEC 11 801:2002, EN 50 173-1

Transmission rate 10/100 Mbit/s

Shielding Fully shielded, 360° shielding contact

Operating temperature range -25 °C ... +70 °C

Standard lengths 1 m / 1.5 m / 3 m / 5 m / 7.5 m / 10 m / 20 m
other lengths available on request

Colour Green / Black

Advantages

- Robust design
- Use on-site made possible by IP65 / IP67 protection
- PUR variants are useable as trailing cables

Identification	Part number			
	PUR	PVC	PE*	PE ultra flexible*
HARTING M12 System cable, angled, 4-wire	Green	Black	Black	Black
Length 1.0 m	21 34 949 4477 010	21 34 949 4405 010	09 48 808 0011 010	09 48 808 0012 010
Length 1.5 m	21 34 949 4477 015	21 34 949 4405 015	09 48 808 0011 015	09 48 808 0012 015
Length 3.0 m	21 34 949 4477 030	21 34 949 4405 030	09 48 808 0011 030	09 48 808 0012 030
Length 5.0 m	21 34 949 4477 050	21 34 949 4405 050	09 48 808 0011 050	09 48 808 0012 050
Length 7.5 m	21 34 949 4477 075	21 34 949 4405 075	09 48 808 0011 075	09 48 808 0012 075
Length 10.0 m	21 34 949 4477 100	21 34 949 4405 100	09 48 808 0011 100	09 48 808 0012 100
Length 20.0 m	21 34 949 4477 200	21 34 949 4405 200	09 48 808 0011 200	09 48 808 0012 200

* Technical characteristics see pages 02.28 and 02.29



HARTING M12 System cable, 4-wire

HARTING M12 connection cable, D-coding,
for harsh industrial environments, second side open

PUR / PVC / PE	<input checked="" type="checkbox"/>	8 wire	<input type="checkbox"/>	4 wire	<input checked="" type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Connector types	1x HARTING M12 D-coding, overmoulded second side open
Cable types	4 x AWG 22/7, Star quad, double shielding
Sheath material	PUR / PVC
Wiring	4-pole
Transmission performance	Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact

Operating temperature range –25 °C ... +70 °C

Standard lengths 1 m / 1.5 m / 3 m / 5 m / 7.5 m / 10 m / 20 m
other lengths available on request

Colour Green / Black
Red (SERCOS III)

Advantages
Robust design
Use on-site made possible by IP65 / IP67 protection
PUR variants are useable as trailing cables

Identification	Part number			
	PUR	PVC	PE*	PE ultra flexible*
HARTING M12 System cable, 4-wire	Green	Black	Black	Black
Length 1.0 m	21 34 920 0477 010	21 34 920 0405 010	09 48 220 0011 010	09 48 220 0012 010
Length 1.5 m	21 34 920 0477 015	21 34 920 0405 015	09 48 220 0011 015	09 48 220 0012 015
Length 3.0 m	21 34 920 0477 030	21 34 920 0405 030	09 48 220 0011 030	09 48 220 0012 030
Length 5.0 m	21 34 920 0477 050	21 34 920 0405 050	09 48 220 0011 050	09 48 220 0012 050
Length 7.5 m	21 34 920 0477 075	21 34 920 0405 075	09 48 220 0011 075	09 48 220 0012 075
Length 10.0 m	21 34 920 0477 100	21 34 920 0405 100	09 48 220 0011 100	09 48 220 0012 100
Length 20.0 m	21 34 920 0477 200	21 34 920 0405 200	09 48 220 0011 200	09 48 220 0012 200

* Technical characteristics see pages 02.28 and 02.29



HARTING M12
 System cable, 4-wire, angled
 HARTING M12 connection cable, D-coding,
 for harsh industrial environments, second side open

PUR / PVC / PE	<input checked="" type="checkbox"/>	8 wire	<input type="checkbox"/>	4 wire	<input checked="" type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Connector types 1x HARTING M12 D-coding, angled, overmoulded second side open

Cable types 4 x AWG 22/7, Star quad, double shielding

Sheath material PUR / PVC

Wiring 4-pole

Transmission performance Class D up to 100 MHz
 acc. to ISO/IEC 11 801:2002, EN 50 173-1

Transmission rate 10/100 Mbit/s

Shielding Fully shielded, 360° shielding contact

Operating temperature range -25 °C ... +70 °C

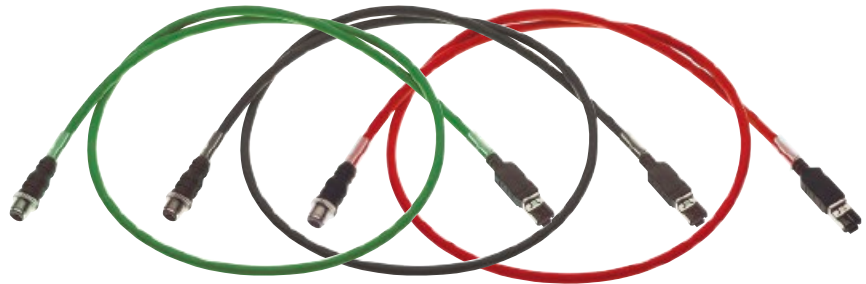
Standard lengths 1 m / 1.5 m / 3 m / 5 m / 7.5 m / 10 m / 20 m
 other lengths available on request

Colour Green / Black

Advantages
 Robust design
 Use on-site made possible by IP65 / IP67 protection
 PUR variants are useable as trailing cables

Identification	Part number			
	PUR	PVC	PE*	PE ultra flexible*
HARTING M12 System cable, angled, 4-wire	Green	Black	Black	Black
Length 1.0 m	21 34 940 0477 010	21 34 940 0405 010	09 48 800 0011 010	09 48 800 0012 010
Length 1.5 m	21 34 940 0477 015	21 34 940 0405 015	09 48 800 0011 015	09 48 800 0012 015
Length 3.0 m	21 34 940 0477 030	21 34 940 0405 030	09 48 800 0011 030	09 48 800 0012 030
Length 5.0 m	21 34 940 0477 050	21 34 940 0405 050	09 48 800 0011 050	09 48 800 0012 050
Length 7.5 m	21 34 940 0477 075	21 34 940 0405 075	09 48 800 0011 075	09 48 800 0012 075
Length 10.0 m	21 34 940 0477 100	21 34 940 0405 100	09 48 800 0011 100	09 48 800 0012 100
Length 20.0 m	21 34 940 0477 200	21 34 940 0405 200	09 48 800 0011 200	09 48 800 0012 200

* Technical characteristics see pages 02.28 and 02.29



HARTING M12 / RJ45 System cable, 4-wire

HARTING M12 connection cable, D-coding, to RJ45 (IP20), overmoulded

PUR / PVC / PE	<input checked="" type="checkbox"/>	8 wire	<input type="checkbox"/>	4 wire	<input checked="" type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Connector types HARTING M12 D-coding, overmoulded (IP65 / IP67)
RJ45 4-pole, contacts 1/2 and 3/6, overmoulded (IP20)

Cable types 4 x AWG 22/7, Star quad, double shielding

Sheath material PUR / PVC

Wiring 4-pole

Transmission performance Cat. 5e / Class D up to 100 MHz
acc. to ISO/IEC 11 801:2002, EN 50 173-1

Transmission rate 10/100 Mbit/s

Shielding Fully shielded, 360° shielding contact

Operating temperature range -25 °C ... +70 °C

Standard lengths 1 m / 3 m / 5 m / 10 m
other lengths available on request

Colour Green / Black
Red (SERCOS III)

- Advantages**
- Robust design
 - PUR variants are useable as trailing cables
 - PROFINET compliant

Contact assignment	Signal	M12 D-coding	RJ45
	TD+	1	1
	TD-	3	2
	RD+	2	3
	RD-	4	6

Identification	Part number		
	PUR	PVC	SERCOS III PUR
HARTING M12 / RJ45 System cable, 4-adrig	Green	Black	Red
Length 1.0 m	09 45 700 5022	09 45 700 5063	09 47 220 2003 018
Length 3.0 m	09 45 700 5025	09 45 700 5066	09 47 220 2005 018
Length 5.0 m	09 45 700 5027	09 45 700 5068	09 47 220 2007 018
Length 10.0 m	09 45 700 5051	09 45 700 5073	09 47 220 2012 018
Length 20.0 m	09 45 700 5053	09 45 700 5075	09 47 220 2014 018



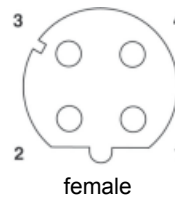
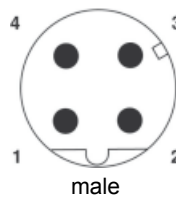
HARTING M12 circular connector,
D-coded, overmoulded



General information

Nominal voltage	60 V DC
Design	IEC 61 076-2-101 D-coded
No. of contacts	4
Rated impulse voltage	2.5 kV
Contact resistance	10 mOhm
Insulation resistance	> 100 MOhm
Rated current	4 A @ 40 °C / every contact
Temperature range moveable cable	-40 °C ... +85 °C
Temperature range fixed cable	-40 °C ... +85 °C
Pollution degree	3
Protection	IP65 / IP67
Insertion and withdrawal force	Insertion 10 N max. Withdrawal 15 N max.
Mating cycles	100
Transmission performance	Category 5e acc. to ISO/IEC 11 801
Transmission rate	10/100 Mbit/s
RoHS - compliant	Yes
Insulator material	
Colour	Black
Material group acc. IEC 60112	CTI 600
Contact material	
Contact material	Copper alloy
Plating contact zone	Ni / Au
Assembly instructions	
Recommended tightening torque	0.6 Nm
Width across flats	13 mm

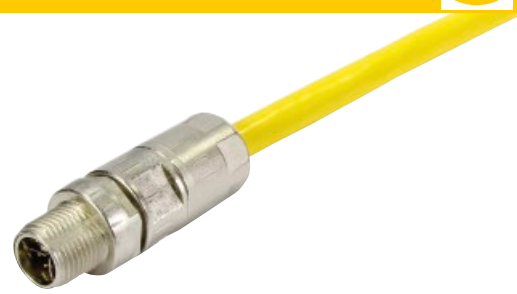
Mating face acc. IEC 61 076-2-101 D-coded



Cable information – Ether Rail®

Cable type	1x4xAWG22/7
Cable sheath diameter	6.6 ± 0.2 mm
Colour	Black
Wire construction	4 x stranded copper wire, tin-plated, AWG 22/7 x 0.25 mm
Wire insulation	Insulation PE, Comp. 717, Ø 1.5 mm
Cable jacket material	Elastomer, electron beam cross-linked Comp. 603
Min. bending radius repeat bending	6 x cable diameter
Min. bending radius singular bending	5 x cable diameter
Transmission performance	Category 5e acc. to EN 50 288-2-1, IEC 61 156-6 acc. to ISO/IEC 11 801 and EN 50 173
Transmission rate	10/100 Mbit/s

Cable type	1x4xAWG22/19
Cable sheath diameter	7.4 ± 0.1 mm
Colour	Black
Wire construction	4 x stranded copper wire, tin-plated, AWG 22/19 x 0.16 mm
Wire insulation	Insulation PE, Comp. 655, Ø 1.98 mm
Cable jacket material	Elastomer, electron beam cross-linked Comp. 603
Min. bending radius repeat bending	12 x cable diameter
Min. bending radius singular bending	6 x cable diameter
Transmission performance	Category 5/5e acc. to EN 50 288-2-1, IEC 61 156-6 acc. to ISO/IEC 11 801 and EN 50 173
Transmission rate	10/100 Mbit/s



har-speed M12 System cable, 8-wire

har-speed M12 connector cable for IP65 / IP67 applications

PUR	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input checked="" type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Connector types	har-speed M12 connector X coding acc. to IEC 61076-2-109
Cable types	4 x 2, Twisted Pair, shielded
Sheath material	PUR
Wiring	8-pole, 1:1
Transmission performance	Category 6 _A / Class E _A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100/1000 Mbit/s / 1/10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Operating temperature range	-40 °C ... +70 °C

Standard lengths	0.5 m / 1 m / 1.5 m / 2 m / 2.5 m other lengths available on request
Colour	Yellow

Advantages

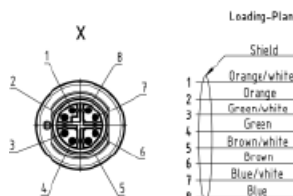
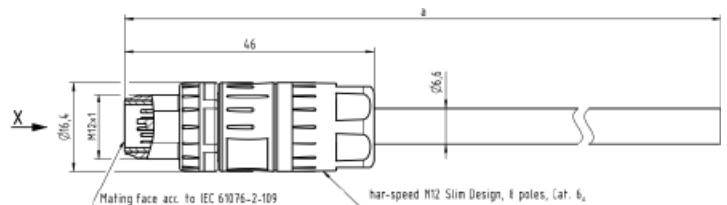
- Very robust metal housing M12 with degree of protection IP65
- Vibration proof crimp connection
- Maximum data rates through the configuration of the contacts in conformance with Ethernet technology
- Minimal interaction and perfect shielding through paired shielding of the contacts
- Fault proof connection through coding of the connector face. A connection error with other 8-pole M12's is impossible
- PROFINET compliant Type X mating face

Identification	Part number PUR	Drawing	Dimensions in mm
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har-speed M12
system cable, 8-wire

Yellow

Length	0.5 m	21 33 010 0850 005
Length	1.0 m	21 33 010 0850 010
Length	1.5 m	21 33 010 0850 015
Length	2.0 m	21 33 010 0850 020
Length	2.5 m	21 33 010 0850 025





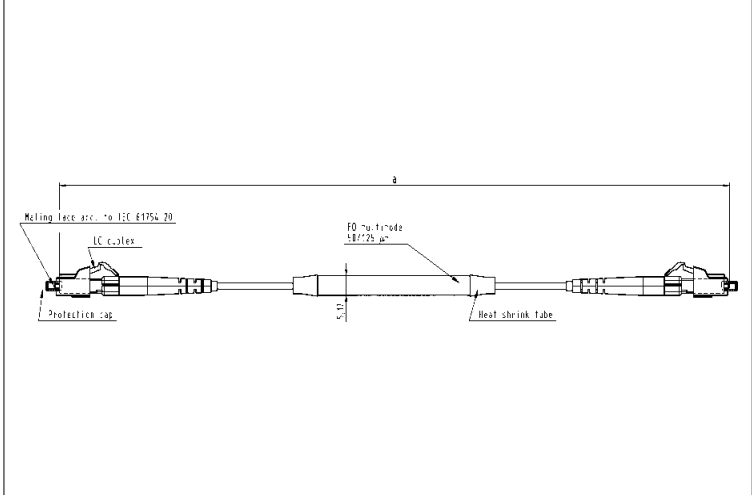
System cables fibre optics

Fibre optic cords

Identification	Part number	Drawing	Dimensions in mm
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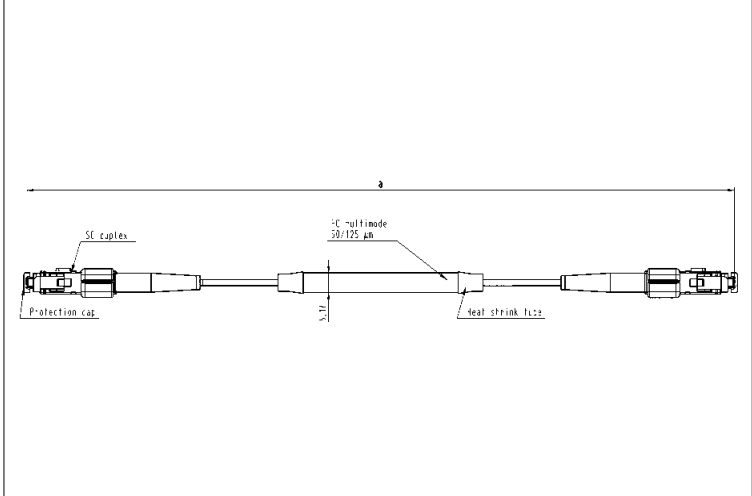
<p>Jumper cable 2 x LC duplex Multi Mode 50/125 µm</p> <p>Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m</p>

33 01 241 0010 005
33 01 241 0020 005
33 01 241 0030 005
33 01 241 0040 005
33 01 241 0050 005
33 01 241 0060 005
33 01 241 0070 005
33 01 241 0080 005
33 01 241 0090 005
33 01 241 0100 005



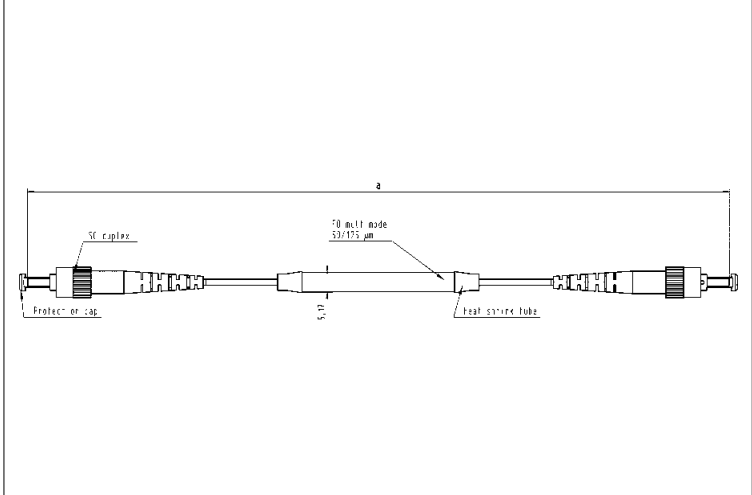
<p>Jumper cable 2 x SC duplex Multi Mode 50/125 µm</p> <p>Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m</p>

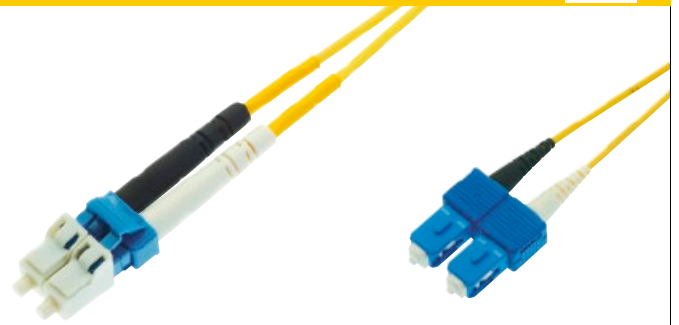
33 01 241 0010 006
33 01 241 0020 006
33 01 241 0030 006
33 01 241 0040 006
33 01 241 0050 006
33 01 241 0060 006
33 01 241 0070 006
33 01 241 0080 006
33 01 241 0090 006
33 01 241 0100 006



<p>Jumper cable 2 x ST duplex Multi Mode 50/125 µm</p> <p>Length: a = 1 m a = 2 m a = 3 m a = 4 m a = 5 m a = 6 m a = 7 m a = 8 m a = 9 m a = 10 m</p>

33 01 241 0010 007
33 01 241 0020 007
33 01 241 0030 007
33 01 241 0040 007
33 01 241 0050 007
33 01 241 0060 007
33 01 241 0070 007
33 01 241 0080 007
33 01 241 0090 007
33 01 241 0100 007



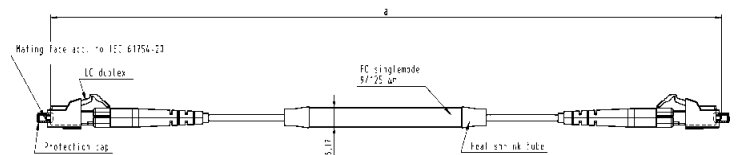


System cables fibre optics

Identification	Part number	Drawing	Dimensions in mm
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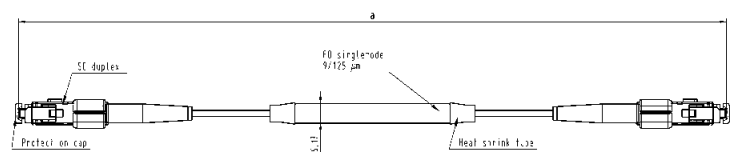
Jumper cable
2 x LC duplex
Single Mode 9/125 µm

Length: a = 1 m	33 01 241 0010 008
a = 2 m	33 01 241 0020 008
a = 3 m	33 01 241 0030 008
a = 4 m	33 01 241 0040 008
a = 5 m	33 01 241 0050 008
a = 6 m	33 01 241 0060 008
a = 7 m	33 01 241 0070 008
a = 8 m	33 01 241 0080 008
a = 9 m	33 01 241 0090 008
a = 10 m	33 01 241 0100 008



Jumper cable
2 x SC duplex
Single Mode 9/125 µm

Length: a = 1 m	33 01 241 0010 009
a = 2 m	33 01 241 0020 009
a = 3 m	33 01 241 0030 009
a = 4 m	33 01 241 0040 009
a = 5 m	33 01 241 0050 009
a = 6 m	33 01 241 0060 009
a = 7 m	33 01 241 0070 009
a = 8 m	33 01 241 0080 009
a = 9 m	33 01 241 0090 009
a = 10 m	33 01 241 0100 009





System cables fibre optics

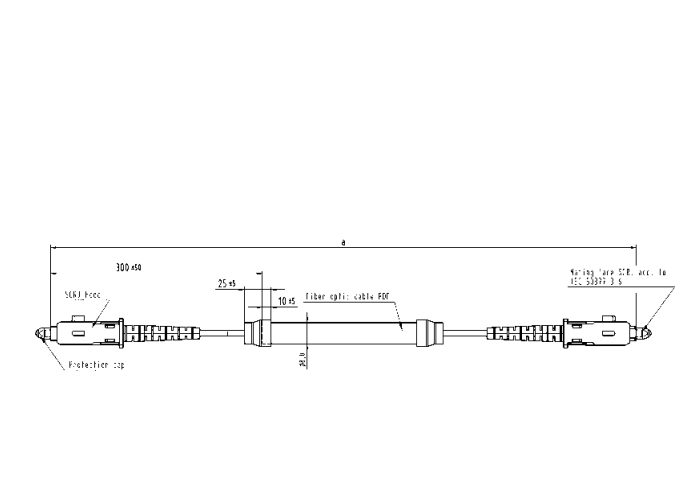
Fibre optic cords

Identification	Part number	Drawing	Dimensions in mm
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SCRJ
 double ended
 Hood: plastic hood with top entry
 Cable: POF, Multi Mode,
 980/1000 µm,
 PROFINET type C

Length: a = 1 m
 a = 2 m
 a = 5 m
 a = 10 m
 a = 20 m

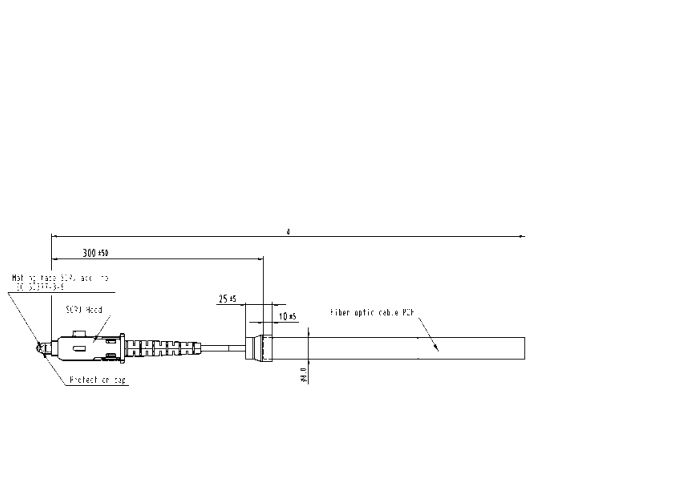
33 02 211 0010 001
 33 02 211 0020 001
 33 02 211 0050 001
 33 02 211 0100 001
 33 02 211 0200 001



SCRJ
 single ended
 Hood: plastic hood with top entry
 Cable: POF, Multi Mode,
 980/1000 µm,
 PROFINET type C

Length: a = 1 m
 a = 2 m
 a = 5 m
 a = 10 m
 a = 20 m

33 02 111 0010 001
 33 02 111 0020 001
 33 02 111 0050 001
 33 02 111 0100 001
 33 02 111 0200 001






Industrial Cat. 6_A cable, stranded, 8-wire, PVC
to build-up flexible connections
(one- or two-sided assembled system cables)

PVC	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6 _A	<input checked="" type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Cable structure	4 x 2, Twisted Pair, shielded, PIMF
Core structure	4 x 2 x AWG 26/7
Wire insulation	PE, Ø 1.05 mm
Sheath material	PVC
Cable sheath diameter	6.3 mm ... 6.9 mm
Transmission performance	Category 6 _A / Class E _A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100/1000 Mbit/s, 10 Gbit/s
Shielding	Paired shielded with additional cable shield
Operating temperature range	-20 °C ... +80 °C
Standard lengths	20 m / 50 m / 100 m / 500 m
Colour	Yellow

Advantages

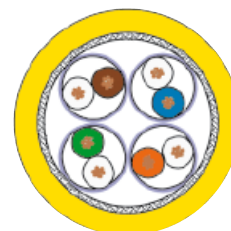
- Robust design suitable for industry
- Optimal performance reserves
-  UL, AWM style 20 276
- Flame retardant
- RoHS compliant
- Best usable for all 8-wire HARTING RJ45 connectors

Identification	Part number	Drawing	Dimensions in mm
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Industrial Cat. 6_A cable, stranded,
8-wire
PVC

20 m ring
50 m ring
100 m ring
500 m drum

09 45 600 0532
09 45 600 0542
09 45 600 0502
09 45 600 0522





Industrial Cat. 6_A cable, stranded, 8-wire, PUR
to build-up flexible connections
(one- or two-sided assembled system cables)

PUR	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6 _A	<input checked="" type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Cable structure	4 x 2, Twisted Pair, shielded, PIMF
Core structure	4 x 2 x AWG 26/7
Wire insulation	PE, Ø 1.05 mm
Sheath material	PUR
Cable sheath diameter	6.3 mm ... 6.9 mm
Transmission performance	Category 6 _A / Class E _A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100/1000 Mbit/s, 10 Gbit/s
Shielding	Paired shielded with additional cable shield
Operating temperature range	-40 °C ... +80 °C

Standard lengths	20 m / 50 m / 100 m / 500 m
Colour	Yellow

Advantages

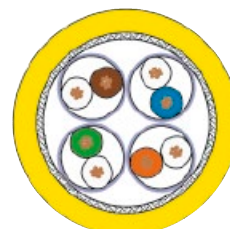
- Robust design suitable for industry
- Optimal performance reserves
- Halogen free
- RoHS compliant
- Flame retardant sheath material

Identification	Part number	Drawing	Dimensions in mm
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Industrial Cat. 6_A cable, stranded,
8-wire
PUR

20 m ring
50 m ring
100 m ring
500 m drum

09 45 600 0630
09 45 600 0640
09 45 600 0600
09 45 600 0620





Industrial Cat. 6_A cable, stranded, 8-wire, PVC, Outdoor
to build-up flexible connections
(one- or two-sided assembled system cables)

PVC	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6 _A	<input checked="" type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Cable structure	4 x 2, Twisted Pair, shielded, PIMF
Core structure	4 x 2 x AWG 26/7
Wire insulation	PE, Ø 1.05 mm
Sheath material	PVC
Cable sheath diameter	6.3 mm ... 6.9 mm
Transmission performance	Category 6 _A / Class E _A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100/1000 Mbit/s, 10 Gbit/s
Shielding	Paired shielded with additional cable shield
Operating temperature range	-20 °C ... +80 °C
Standard lengths	20 m / 50 m / 100 m / 500 m
Colour	Black

- Advantages**
- Robust design suitable for industry
 - Optimal performance reserves
 - Usable for outdoor applications
 - UV proof
 - RoHS compliant
 - UL, AWM style 20 276

Identification	Part number	Drawing	Dimensions in mm
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Industrial Cat. 6_A stranded cable,
8-wire, Outdoor
PVC

20 m ring
50 m ring
100 m ring
500 m drum

09 45 600 0531
09 45 600 0541
09 45 600 0501
09 45 600 0521





Industrial Cat. 5e cable, stranded, 8-wire, PUR
to build-up flexible connections
(one- or two-sided assembled system cables)

PUR	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
-----	-------------------------------------	--------	-------------------------------------	--------	--------------------------	---------	-------------------------------------	--------	--------------------------	---------	--------------------------	--------	--------------------------

Cable structure	4 x 2, Twisted Pair, shielded
Core structure	4 x 2 x AWG 26/7
Wire insulation	PE, Ø 1.0 mm
Sheath material	PUR
Cable sheath diameter	6.5 mm ... 6.9 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100/1000 Mbit/s
Shielding	Foil screen and additional plaited cable
Operating temperature range	-10 °C ... +60 °C

Standard lengths	20 m / 50 m / 100 m / 500 m
Colour	Yellow

Advantages

- Robust design suitable for industry
- Halogen free
- UL, AWM style 21 586
- Flame retardant
- Oil proof
- RoHS compliant
- With Fast Connect inside sheath

Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

Industrial Cat. 5e stranded cable,
8-wire
PUR

20 m ring
50 m ring
100 m ring
500 m drum

09 45 600 0430
09 45 600 0440
09 45 600 0400
09 45 600 0420





Industrial Cat. 5e high flexible cable, 8-wire, PUR trailing

PUR	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Cable structure	4 x 2, Twisted Pair, shielded
Core structure	4 x 2 x AWG 26/19
Wire insulation	PE, Ø 1.0 mm
Sheath material	PUR
Cable sheath diameter	6.8 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to EN 50288-2-2:2004, IEC 61 156-6:2002
Transmission rate	10/100/1000 Mbit/s
Shielding	Overall screen of tinned copper braid
Operating temperature range	
- fix operation	-40 °C ... +85 °C
- flexible operation	0 °C ... +50 °C
Bending cycles	5 million
Supply lengths	20 m / 50 m / 100 m / 500 m
Colour	Yellow

Advantages

- Robust design suitable for industry
- Usable as trailing cables in drag chains and fit for torsion strength
- Usable for transfer rate up to 1 Gigabit Ethernet
- Halogen free
- Flame retardant
- Free silicone oil
- RoHS compliant

Identification	Part number	Drawing	Dimensions in mm
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Industrial Cat. 5e
installation cable, 8-wire
PUR

20 m ring	09 45 600 0136
50 m ring	09 45 600 0146
100 m ring	09 45 600 0106
500 m drum	09 45 600 0156



Industrial Cat. 5e stranded cable, 8-wire, PVC, Outdoor
to build-up flexible connections
(one- or two-sided assembled system cables)



PVC	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Cable structure	4 x 2, Twisted Pair, shielded
Core structure	4 x 2 x AWG 26/7
Wire insulation	PE, Ø 1.0 mm
Sheath material	PVC
Cable sheath diameter	6.5 mm ... 6.9 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100/1000 Mbit/s
Shielding	Foil screen and additional plaited cable
Operating temperature range	-10 °C ... +60 °C

Standard lengths	20 m / 50 m / 100 m / 500 m
Colour	Black

Advantages

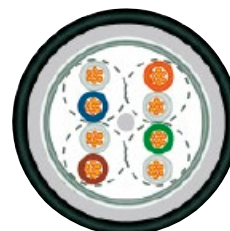
- Robust design suitable for industry
- Applicable also for outside applications
- UL, AWM style 2969
- Flame retardant
- Weather proof
- UV resistant
- RoHS compliant
- With Fast Connect inside sheath

Identification	Part number	Drawing	Dimensions in mm
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Industrial Cat. 5e stranded cable,
8-wire, outdoor
PVC

20 m ring
50 m ring
100 m ring
500 m drum

09 45 600 0230
09 45 600 0240
09 45 600 0200
09 45 600 0220





Industrial Cat. 7 cable, 8-wire, PUR

PUR	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input checked="" type="checkbox"/>
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Cable structure	4 x 2, Twisted Pair, shielded, PIMF
Core structure	4 x 2 x AWG 23/1, solid copper wire
Wire insulation	PE, Ø 1.4 mm
Sheath material	PUR Elastomer
Cable sheath diameter	8.3 mm
Transmission performance	Category 7 / Class F up to 600 MHz acc. to ISO/IEC 11 801 and EN 50 173-1
Transmission rate	1/10 Gbit/s
Shielding	Paired shielded with additional cable shield
Operating temperature range	-40 °C ... +70 °C - flexible operation -10 °C ... +50 °C
Supply lengths	100 m / 500 m / 1000 m
Colour	Yellow

Advantages

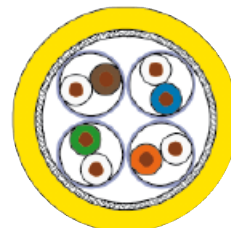
- Robust design suitable for industry
- Transmission of Gigabit and 10 Gigabit Ethernet acc. IEEE 802.3 and multimedia services
- Flame retardant
- Oil retardant
- RoHS conform
- Halogen free

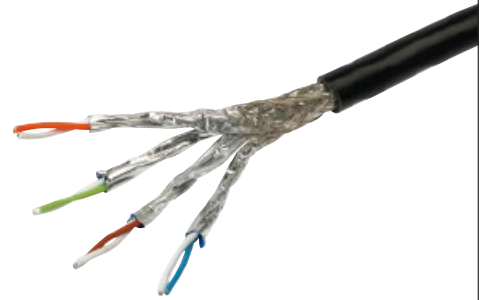
Identification	Part number	Drawing	Dimensions in mm
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Industrial Cat. 7
installation cable, 8-wire
PUR

100 m ring
500 m reel
1000 m reel

09 45 600 0651
09 45 600 0650
09 45 600 0660





Ha-VIS EtherRail® flexible data cable, Cat. 7, 8-wire

for installation within and outside rail vehicles and buses

PE	<input checked="" type="checkbox"/>	8 wire	<input checked="" type="checkbox"/>	4 wire	<input type="checkbox"/>	Cat. 5e	<input type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input checked="" type="checkbox"/>
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Cable structure	4 x 2, Twisted Pair, shielded, PIMF
Core structure	4 x 2 x AWG 24/7, tinned copper wire
Wire insulation	PE, Ø 1.55 mm
Sheath material	Elastomer, electron beam, cross-linked
Cable sheath diameter	(8.8 +/- 0.2) mm
Transmission performance	Category 7 / Class D, E, EA, F up to 600 MHz acc. to ISO/IEC 11 801 and EN 50 173-1
Transmission rate	1/10 Gbit/s
Shielding	Paired shielded with additional cable shield
Operating temperature range	-40 °C ... +90 °C

Supply lengths	100 m / 500 m / 1000 m
Colour	Black

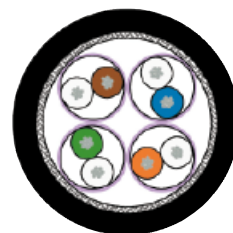
Advantages

- Transmission of Gigabit and 10 Gigabit Ethernet acc. IEEE 802.3 and multimedia services
- For installation within and outside rail vehicles and buses
- Fire protection acc. EN 45 545-1, -2 and -5, flame retardant and heat resistant acc. DIN 5510 (1-4) and EN 50 264-1
- UV resistant, RoHS conform, halogen free LSZH
- Designed to be compatible with products from HARTING like *har-speed* M12 Crimp and Han® GigaBit module.

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS EtherRail®
flexible data cable, PIMF
4x2xAWG24/7, Cat. 7

10 m ring	09 45 600 0694
100 m ring	09 45 600 0692
500 m reel	09 45 600 0691
1000 m reel	09 45 600 0690





HARTING RJ Industrial® 10G connector set RJ45, 8-poles

Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Field-assembly with *HARAX*® quick termination in IDC technology
- Compact design
- Ergonomically unlocking clip
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. 6
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

Connector type	RJ45 connector acc. to IEC 60 603-7
Number of contacts	8
Transmission category	Category 6, class E _A , suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6 / Class E _A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Field-assembly
Cable termination	with IDC-contacts, without tools
Connectable cables	
- Conductor cross section	AWG 27 ... AWG 22 (solid / stranded)
- Conductor diameter	max. 1.6 mm (incl. insulation)
- Cable diameter	4.5 ... 9 mm (straight version) 4.5 up to 8 mm (45° angled version)
Mating cycles	min. 750
Degree of protection	IP20
Temperature range	-40 °C ... +70 °C
Housing material	Polyamide, UL 94-V0
Colour	black

8 wire

Identification	Part number	Drawing	Dimensions in mm
HARTING RJ Industrial® 10G connector set RJ45, 8-poles			
straight version	09 45 151 1560 09 45 151 1560 XL ¹⁾		
45° angled version (four different cable outlets possible)	09 45 151 1561		

Identification	Colour	Part number
Colour clips for colour coding the HARTING RJ Industrial® 10G connector If required the colour clips can be equipped with an RFID-chip for automatic patch cable-ID recognition and storage.	White	09 45 850 0001
	Grey	09 45 850 0002
	Yellow	09 45 850 0003
	Magenta	09 45 850 0005
	Red	09 45 850 0007
	Blue	09 45 850 0008
	Green	09 45 850 0009
	Brown	09 45 850 0010

¹⁾ Packaging with 100 sets



Han® 3 A RJ45 10G
 Connector set, 8-pole
 to build-up Han® 3 A RJ45 system cables

Technical characteristics

Connector type	Han® 3 A RJ45 connector
Number of contacts	8
Transmission performance	Category 6 / Class E _A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s / 1/10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Mounting	Field-assembly
Wire termination	Via IDC contacts , tool-less
Cable options	
– Strand gauge	AWG 27 ... AWG 22 (solid, stranded)
– Strand diameter	max. 1.6 mm (including insulation)
– Cable sheath diameter	5 mm ... 9 mm
Degree of protection	IP65 / IP67
Operating temperature range	–40 °C ... +70 °C
Plastic version	
Housing material	Polyamide, UL94 V-0
Colour	Black
Metal version Standard	
Housing material	Zinc, die-cast
Colour	Grey

Advantages

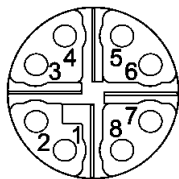
- Robust metal housing
- Field-assembly connector, IP65 / IP67

Identification	Part number	Drawing	Dimensions in mm
<p>Han® 3 A RJ45 10G Connector set, 8-pole</p> <p>Plastic version</p> <p>Metal version Standard</p> <p>Set consists of: Han® 3 A housing including RJ45 connector and shielding Cable gland Assembly instructions</p>	<p>09 45 125 1560</p> <p>09 45 115 1560</p>	<p>mating face acc. to IEC 60603-7</p>	
<p>Han® 3 A RJ45 10G insert, 8-pole</p> <p>for Han® 3 A connector hoods</p>	<p>09 45 100 1560</p>	<p>contact 1 contact 8</p>	
<p>Protection cover for Han® 3 A connector</p> <p>Plastic version</p> <p>Metal version Standard</p> <p>Metal version M</p>	<p>09 20 003 5442</p> <p>09 20 003 5422</p> <p>09 37 003 5402</p>	<p>Dimensions valid for Plastic version</p>	
<p>Accessories</p> <p>Set of coding pins</p>	<p>09 45 820 0000</p>		

8 wire



Mating face



X-coding
Mating face
acc. to IEC 61076-2-101



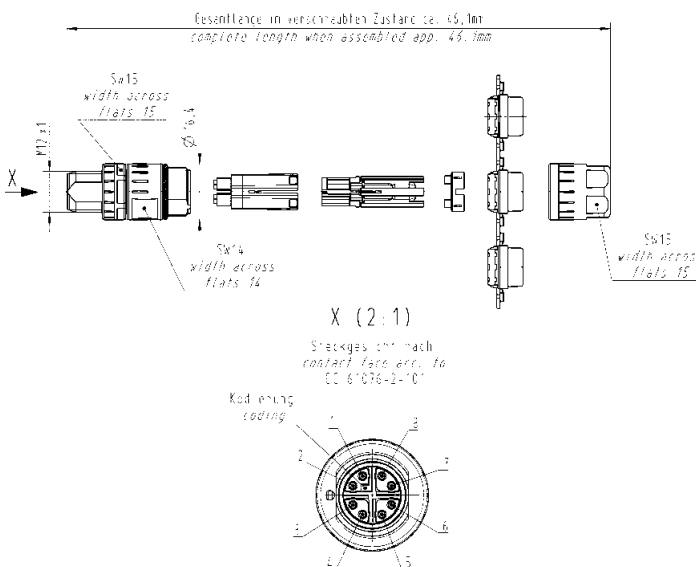
Identification	Part number	Drawing	Dimensions in mm
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har-speed M12

8 poles, X-coded, Cat. 6A
Cable: 4.4 - 8.8 mm outer diameter



21 03 881 1805



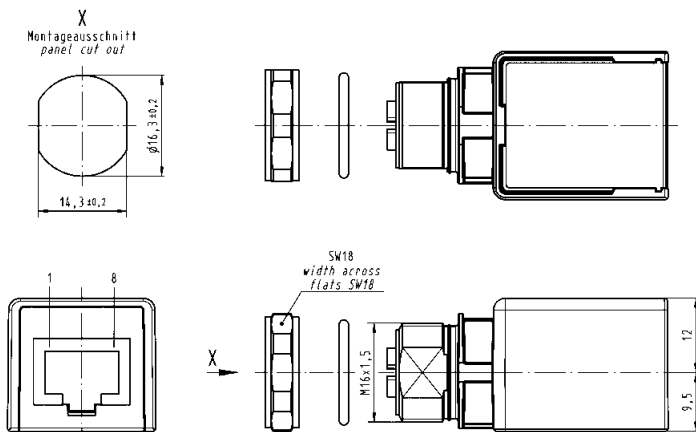
har-speed M12 Adapter M12-RJ45

straight, Cat. 6A

Panel thickness
min. 2.1 mm
max. 4.5 mm



21 03 381 2800

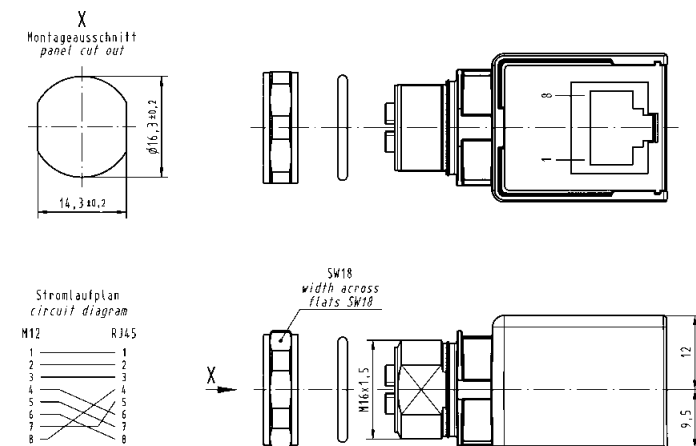


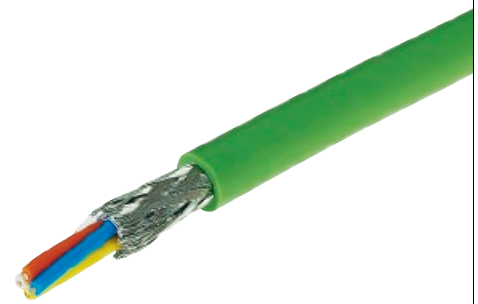
angled, Cat. 6A

Panel thickness
min. 2.1 mm
max. 4.5 mm



21 03 381 4800





Industrial Cat. 5e Standard cable, 4-wire Type A

for permanent installation or to build-up PROFINET system cables

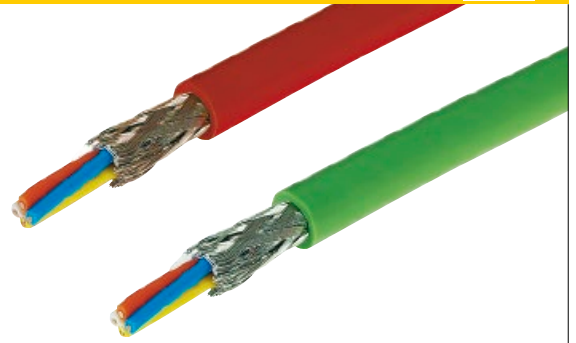
PVC	<input checked="" type="checkbox"/>	8 wire	<input type="checkbox"/>	4 wire	<input checked="" type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Cable structure	Star quad, double shielding
Core structure	4 x AWG 22/1, solid
Wire insulation	PE, Ø 1.5 mm
Sheath material	PVC
Cable sheath diameter	6.5 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	Shielding foil and shielding braid
Operating temperature range	-40 °C ... +75 °C
Standard lengths	20 m / 50 m / 100 m / 500 m
Colour	Green
Printing	HARTING specific printing

Advantages

- Robust design suitable for industry
- PROFINET compliant
- Easy stripping of cable sheath and screening braid with stripping tool **09 45 800 0000**
- RoHS compliant

Identification	Part number PVC	Drawing	Dimensions in mm
Industrial Cat. 5e Standard cable Type A, 4-wire	Green		
20 m ring	09 45 600 0130		
50 m ring	09 45 600 0140		
100 m ring	09 45 600 0100		
500 m drum	09 45 600 0110		




Industrial Cat. 5e stranded cable, 4-wire
 Type B
 to build-up PROFINET / SERCOS III system cables

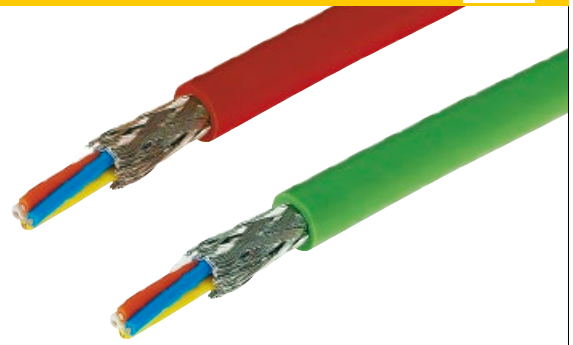
PUR / PVC	<input checked="" type="checkbox"/>	8 wire	<input type="checkbox"/>	4 wire	<input checked="" type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Cable structure	Star quad, double shielding
Core structure	4 x AWG 22/7, tinned copper wire, stranded
Wire insulation	PE, Ø 1.56 mm
Sheath material	PVC
Cable sheath diameter	6.5 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	Shielding foil and shielding braid
Operating temperature range	-40 °C ... +70 °C
Standard lengths	20 m / 50 m / 100 m / 500 m
Colour	Green (PROFINET) Red (SERCOS III)
Printing	HARTING specific printing

Advantages

- Robust design suitable for industry
- PROFINET compliant (Green)
- SERCOS III compliant (Red)
- Easy stripping of cable sheath and screening braid with stripping tool **09 45 800 0000**
- RoHS compliant

Identification	PUR	Part number PVC	SERCOS III PVC	Drawing	Dimensions in mm
Industrial Cat. 5e stranded cable Type B, 4-wire	Green	Green	Red		
20 m ring	09 45 600 0139	09 45 600 0132	09 45 600 0134		
50 m ring	09 45 600 0149	09 45 600 0142	09 45 600 0144		
100 m ring	09 45 600 0109	09 45 600 0102	09 45 600 0104		
500 m drum	09 45 600 0119	09 45 600 0112	09 45 600 0114		



Industrial Cat. 5e stranded cable, 4-wire,
useable as trailing cables,
Type C
to connect to mobile equipment
to build-up PROFINET / SERCOS III system cables

PUR	<input checked="" type="checkbox"/>	8 wire	<input type="checkbox"/>	4 wire	<input checked="" type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Cable structure	Star quad, double shielding
Core structure	4 x AWG 22/7, stranded
Wire insulation	PE, Ø 1.5 mm
Sheath material	PUR
Cable sheath diameter	6.5 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	Shielding foil and shielding braid
Operating temperature range	-40 °C ... +70 °C

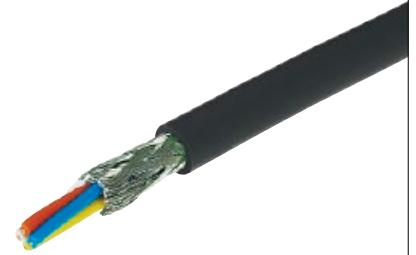
Standard lengths	20 m / 50 m / 100 m / 500 m
Colour	Green (PROFINET) Red (SERCOS III)
Printing	HARTING specific printing

Advantages

- Robust design suitable for industry
- PROFINET compliant (Green)
- SERCOS III compliant (Red)
- Useable as trailing cables
- Easy stripping of cable sheath and screening braid with stripping tool **09 45 800 0000**
- RoHS compliant

Identification	Part number		Drawing	Dimensions in mm
	PUR	SERCOS III PUR		
Industrial Cat. 5e stranded cable, 4-wire, useable as trailing cables, Type C				
	Green	Red		
20 m ring	09 45 600 0131	09 45 600 0137		
50 m ring	09 45 600 0141	09 45 600 0147		
100 m ring	09 45 600 0101	09 45 600 0107		
500 m drum	09 45 600 0111	09 45 600 0117		

Industrial Cat. 5e stranded cable, 4-wire,
Type B, outdoor
to build-up PROFINET system cables



PVC	<input checked="" type="checkbox"/>	8 wire	<input type="checkbox"/>	4 wire	<input checked="" type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Cable structure	Star quad, double shielding
Core structure	4 x AWG 22/7, stranded
Wire insulation	PE, Ø 1.56 mm
Sheath material	PVC
Cable sheath diameter	6.5 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	Shielding foil and shielding braid
Operating temperature range	-45 °C ... +60 °C
Standard lengths	20 m / 50 m / 100 m / 500 m
Colour	Black
Printing	HARTING specific printing

Advantages

- Robust design suitable for industry
- PROFINET compliant
- UV protected
- Easy stripping of cable sheath and screening braid with stripping tool **09 45 800 0000**
- RoHS compliant

Identification	Part number PVC	Drawing	Dimensions in mm
Industrial Cat. 5e stranded cable, 4-wire, Type B, outdoor	Black		
20 m ring	09 45 600 0135		
50 m ring	09 45 600 0145		
100 m ring	09 45 600 0105		
500 m drum	09 45 600 0115		



Ha-VIS EtherRail®
 stranded cable, Cat. 5e, 4-wire
 for installation within and outside rail vehicles

PE	<input checked="" type="checkbox"/>	8 wire	<input type="checkbox"/>	4 wire	<input checked="" type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Cable structure	Star quad, double shielding
Core structure	4 x AWG 22/7, tinned copper wire, stranded
Wire insulation	PE-Foam Skin, Ø 1.5 mm
Sheath material	Elastomer, electron beam cross-linked
Cable sheath diameter	6.6 +/-0.2 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	Shielding foil and shielding braid
Operating temperature range	-40 °C ... +90 °C
Standard lengths	100 m / 500 m / 1000 m
Colour	Black
Tests / Certificats	Tests and certificats acc. to DIN, N FF, BS and ASTM, detail information see Technical Data sheet

Advantages

- Robust design
- Fire protection acc. to EN 45 545-1, -2 and -5
- Flame-retardant and heat resistant acc. to DIN 5510 (1-4) and EN 50 264-1
- UV protected
- RoHS compliant
- Halogen free
- small Ø permits RJ45 assembly

Identification	Part number Elastomer	Drawing	Dimensions in mm
Ha-VIS EtherRail® stranded cable, Cat. 5e 4-wire 100 m ring 500 m drum 1000 m drum	Black 09 45 600 0108 09 45 600 0118 09 45 600 0128		

4 wire



Ha-VIS EtherRail®

ultra flexible cable, Cat. 5e, 4-wire

for installation within and outside rail vehicles and especially between coaches

PE	<input checked="" type="checkbox"/>	8 wire	<input type="checkbox"/>	4 wire	<input checked="" type="checkbox"/>	Cat. 5e	<input checked="" type="checkbox"/>	Cat. 6	<input type="checkbox"/>	Cat. 6A	<input type="checkbox"/>	Cat. 7	<input type="checkbox"/>
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Cable structure	Star quad, double shielding
Core structure	4 x AWG 22/19, tinned copper wire, ultra flexible
Wire insulation	PE, Ø 1.98 mm
Sheath material	Elastomer, electron beam cross-linked
Cable sheath diameter	7.4 +/- 1 mm
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	Shielding foil and shielding braid
Operating temperature range	-40 °C ... +90 °C
Standard lengths	100 m / 500 m / 1000 m
Colour	Black
Tests / Certificats	Tests and certificats acc. to DIN, N FF, BS and ASTM, detail information see Technical Data sheet

Advantages

- Robust design, especially suitable between coaches
- Fire protection acc. to EN 45 545-1, -2 and -5
- Flame-retardant and heat resistant acc. to DIN 5510 (1-4) and EN 50 264-1
- UV protected
- RoHS compliant
- Halogen free

Identification	Part number Elastomer	Drawing	Dimensions in mm
Ha-VIS EtherRail® ultra flexible cable, Cat. 5e 4-wire 100 m ring 500 m drum 1000 m drum	Black 09 45 600 0138 09 45 600 0148 09 45 600 0158		



HARTING RJ Industrial® PN connector set RJ45, 4-poles

Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Field-assembly with *HARAX*® quick termination in IDC technology
- Compact design
- Ergonomically unlocking clip
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. 5e
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

Connector type	RJ45 connector acc. to IEC 60 603-7
Number of contacts	4
Transmission category	Category 5e, class D, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Field-assembly
Cable termination	with IDC-contacts, without tools
Connectable cables	
- Conductor cross section	AWG 27 ... AWG 22 (solid / stranded)
- Conductor diameter	max. 1.6 mm (incl. insulation)
- Cable diameter	4.5 ... 9 mm (straight version) 4.5 up to 8 mm (45° angled version)
Mating cycles	min. 750
Degree of protection	IP20
Temperature range	-40 °C ... +70 °C
Housing material	Polyamide, UL 94-V0
Colour	black

Identification	Part No.	Drawing	Dimensions in mm
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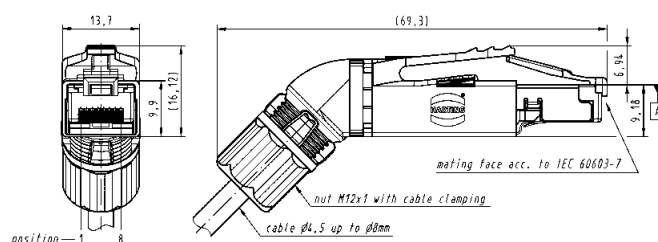
HARTING RJ Industrial® PN connector set RJ45, 4-poles

straight version

09 45 151 1120

45° angled version
(four different cable outlets possible)

09 45 151 1121



Identification	Colour	Part No.
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Colour clips for colour coding the HARTING RJ Industrial® PN connector

If required the colour clips can be equipped with an RFID-chip for automatic patch cable-ID recognition and storage.

White	09 45 850 0001
Grey	09 45 850 0002
Yellow	09 45 850 0003
Magenta	09 45 850 0005
Red	09 45 850 0007
Blue	09 45 850 0008
Green	09 45 850 0009
Brown	09 45 850 0010



HARTING RJ Industrial® EtherRail® RJ45 connector set, 4-poles

Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Field-assembly with *HARAX*® quick termination in IDC technology
- Compact design
- Ergonomically unlocking clip
- Less weight assures shock- and vibration resisting connection
- Category of transmission Cat. 5e
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)
- Optimized version for Ha-VIS EtherRail® Ethernet cable, Shielded Star Quad Cable, AWG 22/19 ultra-flexible, acc. Cat. 5e cabling standard (ISO/IEC 11 801), part numbers 09 45 600 0188, 09 45 600 0138, 09 45 600 0148 and 09 45 600 0158

Technical characteristics

Connector type	RJ45 connector acc. to IEC 60 603-7
Number of contacts	4
Transmission category	Category 5e, class D
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	Field-assembly
Cable termination	with IDC-contacts, without tools
Connectable cables	
- Conductor cross section	AWG 27 ... AWG 22 (solid / stranded)
- Conductor diameter	max. 2 mm (incl. insulation)
- Cable diameter	4.5 ... 9 mm
Mating cycles	min. 750
Degree of protection	IP20
Temperature range	-40 °C ... +70 °C
Housing material	Polyamide, UL 94-V0
Colour	black

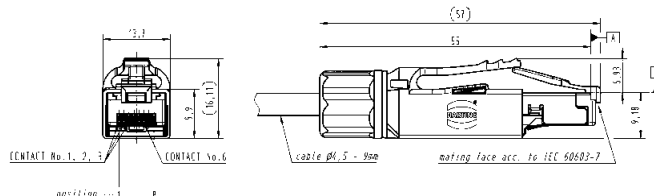
4 wire

Identification	Part No.	Drawing	Dimensions in mm
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HARTING RJ Industrial® EtherRail® RJ45 connector set, 4-poles

straight version

09 45 151 1122



Identification	Colour	Part No.
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Colour clips for colour coding the HARTING RJ Industrial® EtherRail® RJ45 connector

If required the colour clips can be equipped with an RFID-chip for automatic patch cable-ID recognition and storage.

White	09 45 850 0001
Grey	09 45 850 0002
Yellow	09 45 850 0003
Magenta	09 45 850 0005
Red	09 45 850 0007
Blue	09 45 850 0008
Green	09 45 850 0009
Brown	09 45 850 0010



Han® 3 A RJ45
 Connector set, 4-pole
 to build-up Han® 3 A system cables RJ45

Technical characteristics

Connector type	Han® 3 A RJ45 connector acc. to IEC 61 918
Number of contacts	4
Transmission performance	Category 5e / Class D up to 100 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Mounting	Field-assembly
Wire termination	Via IDC contacts, tool-less
Cable options	
– Strand gauge	AWG 24/7 ... AWG 22/7 (stranded) AWG 23/1 ... AWG 22/1 (solid)
– Strand diameter	max. 1.6 mm
– Cable sheath diameter	5 mm ... 9 mm
Degree of protection	IP65 / IP67
Operating temperature range	–40 °C ... +70 °C
Plastic version	
Housing material	Polyamide, UL94 V-0
Colour	Black
Metal version Standard	
Housing material	Zinc, die-cast
Colour	Grey
Metal version M	
Housing material	Zinc, die-cast
Colour	Black

Advantages

- Tool-less field-assembly with *HARAX*® rapid termination in IDC technology
- Category of transmission Cat. 5e
- Coding possible
- Up to 10x reductable
- PROFINET compliant



HARAX® M12
 Connector D-coding, 4-pole
 to build-up HARTING system cables M12

Technical characteristics

Connector type	HARAX® connector M12-L, D-coding
Number of contacts	4
Transmission performance	Class D acc. to ISO/IEC 11 801:2002
Transmission rate	10/100 Mbit/s
Shielding	Fully shielded, 360° shielding contact
Mounting	Field-assembly
Wire termination	Via IDC contacts
Cable options	
– Strand diameter	AWG 26 ... AWG 22 (Cord)
– Cable sheath diameter	4.5 mm ... 8.8 mm
Degree of protection	IP65 / IP67
Operating temperature range	–25 °C ... +85 °C

Housing material Metal

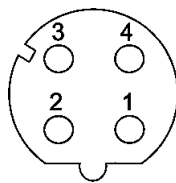
Advantages Field-assembly M12 connector
 Compact design
 Tool-less assembly

Specifications IEC 60 352-4
 IEC 60 947-5-2

Approvals 



Mating face



D-coding
Mating face
acc. to IEC 61076-2-101



Identification

Part number

Drawing

Dimensions in mm

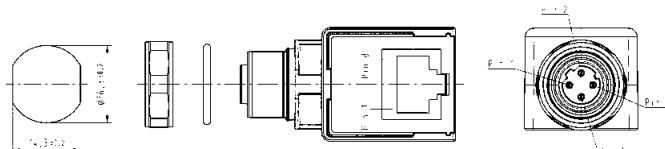
**M12 Female-RJ45
Panel feed-through**

4 poles, D-coding
angled



Panel thickness
min. 2.1 mm
max. 4.5 mm

21 03 381 4401



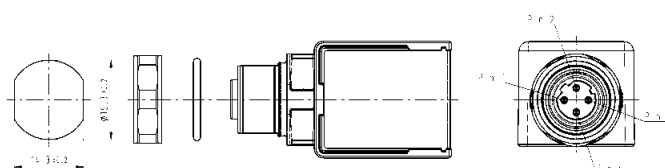
**M12 Female-RJ45
Panel feed-through**

4 poles, D-coding
straight



Panel thickness
min. 2.1 mm
max. 4.5 mm

21 03 381 2401

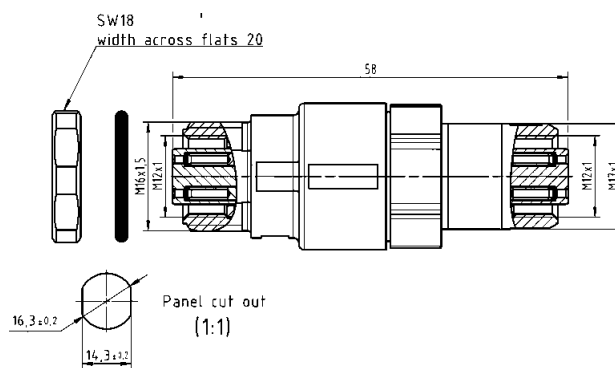


**M12 Gender Changer
Female-Female**



4 poles, D-coding
Cat. 5

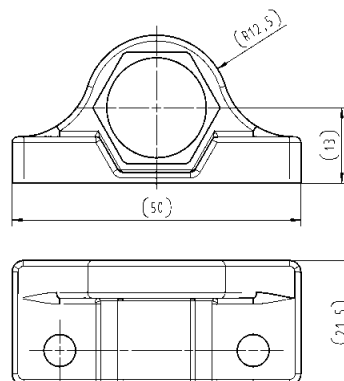
21 03 381 6401*



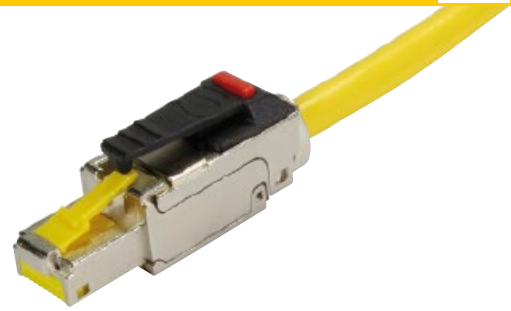
Wall bracket



21 01 000 0036



4 wire



Ha-VIS preLink® RJ45 connector

Advantages

- RJ45 Ethernet-Data connector suitable for industry
- Compact and robust design
- 360° shielding
- Ergonomically unlocking clip
- Category of transmission Cat. 6_A
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

Connector type	RJ45 connector acc. to IEC 60 603-7
Number of contacts	8
Transmission category	Category 6 _A , Class E _A , suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6 _A / Class E _A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	IDC termination
Cable termination for preLink® terminal module, yellow, 20 82 000 0001	
Connectable cables	
– Conductor cross section	AWG 23 ... AWG 22 (solid and stranded)
– Conductor diameter	1.3 ... 1.6 mm
Cable termination for preLink® terminal module, white, 20 82 000 0003	
Connectable cables	
– Conductor cross section	AWG 27 ... AWG 26 (solid and stranded)
– Conductor diameter	0.8 ... 1.1 mm
Cable diameter	5 ... 9 mm
Degree of protection	IP20
Mating cycles	min. 750
Temperature range	-40 °C ... +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS preLink® RJ45 connector	20 82 101 0010		
Ha-VIS preLink® RJ45 terminal module	20 82 000 0001 20 82 000 0003		
AWG 22/23, yellow ¹⁾ AWG 26/27, white ¹⁾			
Ha-VIS preLink® assembly tool	20 82 000 9901		

Identification	Colour	Part number
Colour clips for colour coding the Ha-VIS preLink® connectors	White	09 45 850 0001
	Grey	09 45 850 0002
	Yellow	09 45 850 0003
	Magenta	09 45 850 0005
	Red	09 45 850 0007
	Blue	09 45 850 0008
	Green	09 45 850 0009
	Brown	09 45 850 0010

¹⁾ Packaging with 10 pieces



Ha-VIS preLink® RJ45 jacks (HIFF)

Advantages

- Compact and robust design
- Category of transmission Cat. 6
- Suitable for solid and stranded wires
- Compatible with HIFF dimensions for use in:
 - Han® 3 A series with HIFF adapter 09 45 515 0024
 - HARTING PushPull (V4)
 - Compact bulkhead mounting housing 09 45 545 0028
 - EasyInstall bulkhead mounting housing 09 45 545 0032
 - Han® PushPull (V14)
 - Panel feed-through plastic 09 35 012 0331
 - Panel feed-through metal rectangular 09 35 012 0311
 - Panel feed-through metal circular 09 35 012 0312
 - har-port 09 45 452 0000
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

Connector type	RJ45 connector acc. to IEC 60 603-7
Number of contacts	8
Transmission category	Category 6 _A , Class E _A , suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6 _A / Class E _A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	IDC termination
Cable termination for preLink® terminal module, yellow, 20 82 000 0001	
Connectable cables	
– Conductor cross section	AWG 23 ... AWG 22 (solid and stranded)
– Conductor diameter	1.3 ... 1.6 mm
Cable termination for preLink® terminal module, white, 20 82 000 0003	
Connectable cables	
– Conductor cross section	AWG 27 ... AWG 26 (solid and stranded)
– Conductor diameter	0.8 ... 1.1 mm
Cable diameter	5 ... 9 mm
Degree of protection	IP20
Mating cycles	min. 750
Temperature range	-40 °C ... +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS preLink® set RJ45 jack consists of: • 1x RJ45 module • 1x terminal module • 1x cable tie	AWG 22/23 20 82 001 0001 AWG 26/27 20 82 001 0002		
Ha-VIS preLink® RJ45 jack module	20 82 000 0002		
Ha-VIS preLink® RJ45 terminal module	AWG 22/23, yellow ¹⁾ 20 82 000 0001 AWG 26/27, white ¹⁾ 20 82 000 0003		
Ha-VIS preLink® protection cover	20 82 000 9915		
Ha-VIS preLink® unlocking tool	20 82 000 9916		
Ha-VIS preLink® assembly tool	20 82 000 9901		

¹⁾ Packaging with 10 pieces



Ha-VIS preLink®
19" Patch panel, HIFF

Advantages

- Flexible, suitable for Ha-VIS preLink® modules RJ45 jack and HARTING RJ Industrial® modules in HIFF size
- Economical, time-saving installation due to the slidable module carrier, frontward and backward removal
- Safety, additional strain-relief
- Fully shielded modules connected by module carrier
- Earth bolt
- IP20 installation for distributors and switch cabinets

Technical characteristics

Number of modules	24
Transmission performance	Category 6 / Class E _A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	up to 10 Gbit/s
Assembly	in 19" racks acc. to IEC/DIN EN 60 297-3-100 (DIN 41 494-1)
Dimensions (W x H x D)	482.6 mm (19") x 44.5 mm (1 U) x 181 mm
Degree of protection	IP20
Operating temperature range	-40 °C ... +70 °C
Material	
module carrier, 2-parts	steel sheet
front cover	stainless steel

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS preLink®
19" patch panel, unloaded

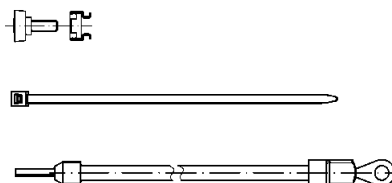
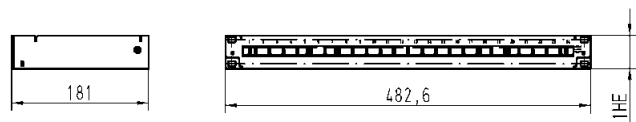
20 82 400 0001

Suitable modules:

- Ha-VIS preLink® RJ45 jack, HIFF
- mixed loading possible

Range of delivery::

- Screw set M5
- 24 cable ties
- 1x earth conductor 6 mm²





Ha-VIS preLink® HIFF RJ45 AP Box

Advantages

- Flexible, suitable for on-wall mounting or for top-hat mounting rail (35 mm)
- Economical, time-saving installation due to the use of pre-assembled data cables with Ha-VIS preLink® termination
- Robust design, powder-coated steel plate housing
- Structured cabling for industrial premises

Technical characteristics

Number of ports, Copper / Termination	2 / RJ45 jack HIFF
Transmission performance	Category 6 / Class EA up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	up to 10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Cable diameter	5 mm ... 9 mm
Mounting	on-wall or DIN Rail
Dimensions (WxHxD)	60 x 81 x 70 mm
Degree of protection	IP20
Operating temperature	-40 °C ... +70 °C
Housing material	steel plate
Colour	Anthracite grey (RAL 7016)

Identification	Part number	Drawing	Dimensions in mm
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<p>Ha-VIS preLink® HIFF RJ45 AP Box</p> <p>RJ45 wall-mounted box consisting of:</p> <ul style="list-style-type: none"> • 1x steel-plate housing, 2-parts • 2x Ha-VIS preLink® Set, RJ45 jack HIFF, AWG 22/23 • 2x grommet with membrane • 1x assembly instruction

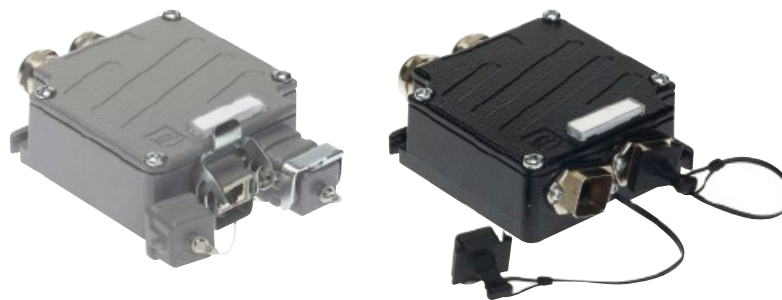
20 82 101 0220

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<p>Accessory</p> <p>DIN Rail mounting bracket</p>

20 80 000 0003

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Ha-VIS preLink®
Han® PushPull Metal Outlet
and Han® 3 A Metal Outlet

Advantages

- Simple mounting, fixing and earth connection both outside
- Fast termination of data cables due to Ha-VIS preLink® technology
- Structured cabling for industrial premises
- Mating face AIDA compliant, protection cover incl.
- PROFINET compatible

Technical characteristics

Number of ports, Copper / Termination	2 x Han® PushPull RJ45 (IP65 / IP67) or Han® 3 A RJ45
Transmission performance	Category 6 / Class EA up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	up to 10 Gbit/s
Termination	Ha-VIS preLink®
Wire gauge	AWG 24 ... 22 (0.25 mm² ... 0.34 mm²) solid and stranded
Strand diameter	Ø 1.3 mm ... 1.6 mm
Cable diameter	7.2 mm ... 8 mm
Shielding	Fully shielded 360° flexible shielding termination
Mounting	Wall mounting
Dimensions (H x W x D)	105 x 105 x 40.5 mm
Degree of protection	IP65 / IP67
Operating temperature range	-40 °C ... +70 °C
Housing material	Aluminium, die-cast
Colour	Black

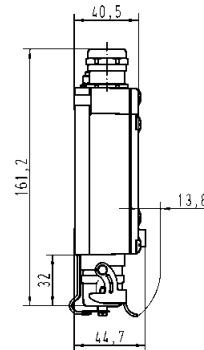
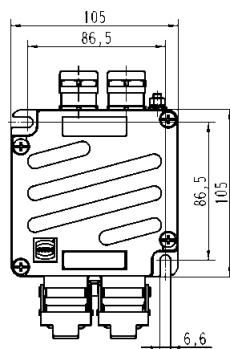
Identification Part number Drawing Dimensions in mm

Ha-VIS preLink®
Han® PushPull Metal Outlet

20 82 104 0101

consists of:

- 1x Housing including protection covers
- 2x Ha-VIS preLink® Set RJ45 jack AWG 22/23
- 2x Cable gland with slotted seal
- 1x Assembly instruction

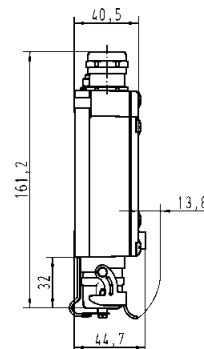
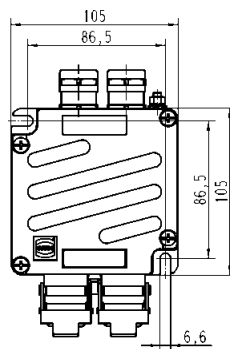


Ha-VIS preLink®
Han® 3 A Metal Outlet

20 82 102 0101

consists of:

- 1x Housing including protection covers
- 2x Ha-VIS preLink® Set RJ45 jack AWG 22/23
- 2x Cable gland with slotted seal
- 1x Assembly instruction





Ha-VIS preLink® RJ45 jack
(keystone version)

Advantages

- RJ45 Ethernet-Data jack suitable for industry
- Compact and robust design
- 360° shielding
- Ergonomically unlocking clip
- Category of transmission Cat. 6_A
- Suitable for solid and stranded wires
- Compatible with keystone panel cut out acc. to IEC 60 603-7
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

Connector type	RJ45 connector acc. to IEC 60 603-7
Number of contacts	8
Transmission category	Category 6 _A , Class E _A , suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6 _A / Class E _A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	IDC termination
Cable termination for preLink® terminal module, yellow, 20 82 000 0001	
Connectable cables	
– Conductor cross section	AWG 23 ... AWG 22 (solid and stranded)
– Conductor diameter	1.3 ... 1.6 mm
Cable termination for preLink® terminal module, white, 20 82 000 0003	
Connectable cables	
– Conductor cross section	AWG 27 ... AWG 26 (solid and stranded)
– Conductor diameter	0.8 ... 1.1 mm
Cable diameter	5 ... 9 mm
Degree of protection	IP20
Mating cycles	min. 750
Temperature range	-40 °C ... +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS preLink® set RJ45 keystone jack consists of: • 1x RJ45 module • 1x terminal module • 1x cable tie	AWG 22/23 20 82 501 0001		
Ha-VIS preLink® RJ45 keystone jack module	20 82 500 0001		
Ha-VIS preLink® RJ45 angled keystone jack module	20 82 500 0002 ²⁾		
Ha-VIS preLink® RJ45 terminal module	AWG 22/23, yellow ¹⁾ 20 82 000 0001 AWG 26/27, white ¹⁾ 20 82 000 0003		
Ha-VIS preLink® protection cover	20 82 000 9915		
Ha-VIS preLink® unlocking tool	20 82 000 9916		
Ha-VIS preLink® assembly tool	20 82 000 9901		

¹⁾ Packaging with 10 pieces
²⁾ Packaging with 24 pieces



Ha-VIS preLink® 19" Patch panel, Keystone

Advantages

- Suitable for Ha-VIS preLink® RJ45 module in Keystone size
- Economic due to easy design
- Safety, additional strain-relief
- Fully shielded modules connected through metal holding fixture
- Earth bolt

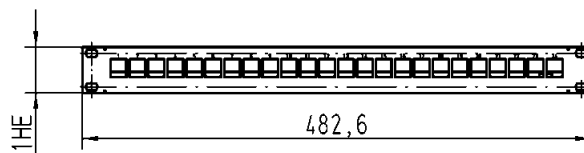
Technical characteristics

Number of modules	24
Transmission performance	Category 6 / Class EA up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	up to 10 Gbit/s
Module design	Keystone size acc. to EN 60 603-7:2009
Assembly	in 19" racks acc. to IEC/DIN EN 60 297-3-100 (DIN 41 494-1)
Dimensions (W x H x D)	482.6 mm (19") x 44.5 mm (1 U) x 107 mm
Degree of protection	IP20
Operating temperature range	-40 °C ... +70 °C
Material	steel sheet

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS preLink®
19" patch panel, Keystone

20 82 405 0001



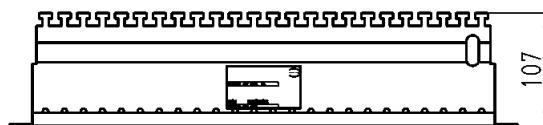
Range of delivery::

24 pieces of:

- Ha-VIS preLink® RJ45 Keystone jack
- terminal modules for AWG 22 / 23
- strain relief

Ha-VIS preLink®
19" patch panel, Keystone
empty

20 82 400 0002





HARTING Cabinet Outlet RJ45, 8-poles
RJ45 distribution module for IP20 environments
(top-hat rail mounting)

Advantages

- Simple mounting
- Dust protection caps
- Port identification
- Angled output

Technical characteristics

Number of ports, Copper / Termination	1 / RJ45 (Twisted Pair)
Transmission performance	Category 6A / Class EA up to 250 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Mounting	To 35 mm top-hat mounting rail acc. to DIN EN 60 715, alignable
Dimensions (H x W x D)	71 x 18 x 68 mm
Degree of protection	IP20
Operating temperature range	-20 °C ... +70 °C
Housing material	Polyamide, UL94 V-0
Colour	Grey

Identification	Part No.	Drawing	Dimensions in mm
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HARTING RJ Industrial®
Cabinet Outlet RJ45

09 45 851 0000

Protection cover set
for 09 45 851 0000

09 45 851 0001

Usable RJ45 cable jacks

- Ha-VIS preLink® keystone set AWG 22/23 (with Ha-VIS preLink® terminal block)
- Ha-VIS preLink® keystone set (without Ha-VIS preLink® terminal block)

20 82 501 0001

20 82 500 0001

Usable with Ha-VIS preLink® terminal blocks

- Ha-VIS preLink® terminal block AWG 22/23 (24)
- Ha-VIS preLink® terminal block AWG 26/27

20 82 000 0001

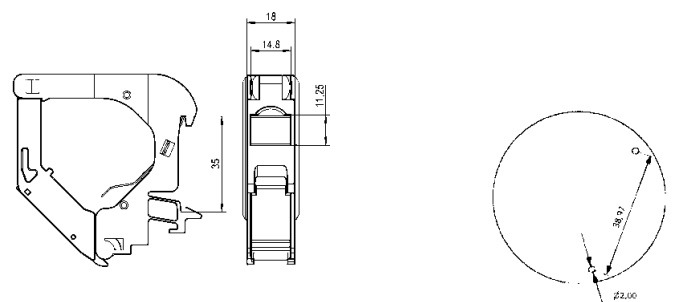
20 82 500 0003

Usable RJ45 cable jacks

- RJ45 keystone module IDC AWG 24 – AWG 22
- RJ45 keystone module IDC AWG 27 – AWG 26

09 45 545 1564

09 45 545 1563





Ha-VIS preLink® Patch cables

Advantages

- Pre-assembled system cable, fast, flexible and reliable in the application
- Simple in handling
- Robust in design
- Installation of Ha-VIS preLink® cables for industrial environment
- Connection cable for control or distributor cabinets or within controllers

Technical characteristics

Cable types	4 x 2 AWG 27/7, shielded, S/FTP Cat. 7
Sheath material	PUR
Wiring	TIA/EIA 568B, 1:1
Transmission performance	Category 6 / Class EA up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	up to 10 Gbit/s
Shielding	Copper braid, tinned
Operating temperature range	
fixed operation	-35 °C ... +70 °C
flexible operation	-5 °C ... +50 °C
Standard lengths	0.6 m / 1 m / 2 m / 3 m / 5 m / 10 m other lengths available on request
Colour	Yellow

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS preLink® Patch cable

Yellow

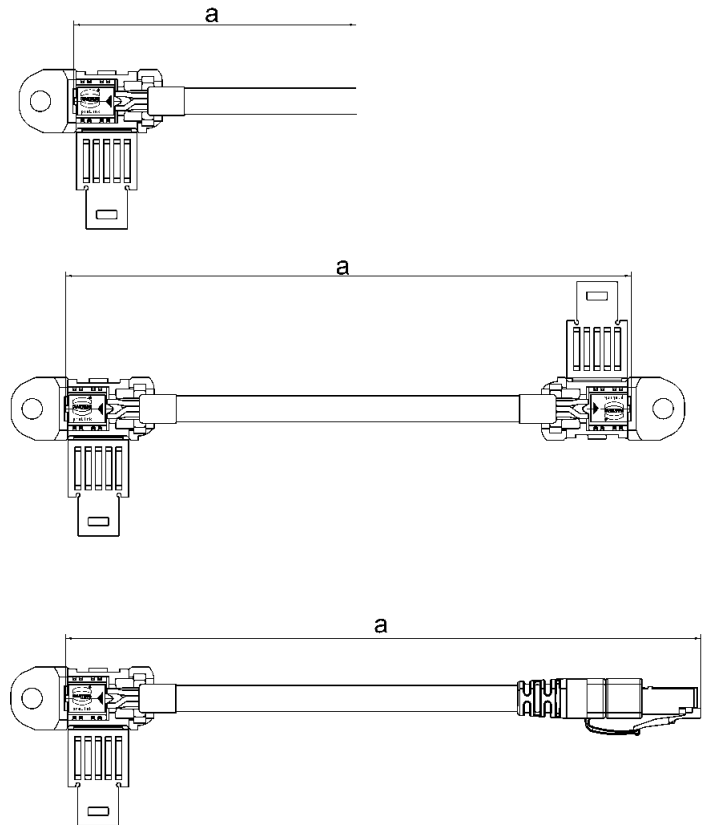
terminal module to one side, secured by protection cap	Length	Part number
	0.2 m	20 82 600 1002
	0.4 m	20 82 600 1004
	0.6 m	20 82 600 1006
	0.8 m	20 82 600 1008
	1.0 m	20 82 600 1010
	2.0 m	20 82 600 1020
	3.0 m	20 82 600 1030
	4.0 m	20 82 600 1040
	5.0 m	20 82 600 1050
	10.0 m	20 82 600 1100



terminal module to both sides, secured by protection cap	Length	Part number
	0.2 m	20 82 600 2002
	0.4 m	20 82 600 2004
	0.6 m	20 82 600 2006
	0.8 m	20 82 600 2008
	1.0 m	20 82 600 2010
	2.0 m	20 82 600 2020
	3.0 m	20 82 600 2030
	4.0 m	20 82 600 2040
	5.0 m	20 82 600 2050
	10.0 m	20 82 600 2100



Side 1 with terminal module, secured by protection cap	Length	Part number
	0.2 m	20 82 601 1002
	0.4 m	20 82 601 1004
	0.6 m	20 82 601 1006
	0.8 m	20 82 601 1008
	1.0 m	20 82 601 1010
	2.0 m	20 82 601 1020
	3.0 m	20 82 601 1030
	4.0 m	20 82 601 1040
	5.0 m	20 82 601 1050
	10.0 m	20 82 601 1100





Ha-VIS preLink® Extender

Advantages

- Simple, fast and reliable connection of data cables
- Compact and robust design
- 360° shielding
- Category of transmission Cat. 6_A
- Suitable for solid and stranded wires

Application

- Extension of cables for data communication
- Connection of cables with different cross-sections
- Linking of fire compartments

Technical characteristics

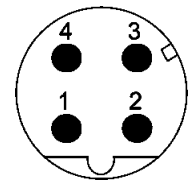
Connector type	RJ45 connector acc. to IEC 60 603-7
Number of contacts	8
Transmission category	Category 6 _A , Class E _A , suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6 _A / Class E _A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	IDC termination
Cable termination for preLink® terminal module, yellow, 20 82 000 0001	
Connectable cables	
– Conductor cross section	AWG 23 ... AWG 22 (solid and stranded)
– Conductor diameter	1.3 ... 1.6 mm
Cable termination for preLink® terminal module, white, 20 82 000 0003	
Connectable cables	
– Conductor cross section	AWG 27 ... AWG 26 (solid and stranded)
– Conductor diameter	0.8 ... 1.1 mm
Cable diameter	5 ... 9 mm
Degree of protection	IP20
Mating cycles	min. 750
Temperature range	-40 °C ... +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS preLink® Extender	20 82 101 0001		
Ha-VIS preLink® RJ45 terminal module AWG 22/23, yellow ¹⁾ AWG 26/27, white ¹⁾	20 82 000 0001 20 82 000 0003		
Ha-VIS preLink® assembly tool	20 82 000 9901		

¹⁾ Packaging with 10 pieces



Mating face



D-coding
Mating face
acc. to IEC 61 076-2-101

Ha-VIS preLink® M12 connector
D-coding

Advantages

- M12 Ethernet-Data connector suitable for industry
- Robust design
- 360° shielding
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

Connector type	M12 D-coding acc. to IEC 61 076-2-101
Number of contacts	4
Transmission category	Category 5, Class D, suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 5 / Class D up to 200 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	IDC termination
Cable termination for preLink® Connectable cables	terminal module, yellow, 20 82 000 0001
– Conductor cross section	AWG 23 ... AWG 22 (solid and stranded)
– Conductor diameter	1.3 ... 1.6 mm
Cable termination for preLink® Connectable cables	terminal module, white, 20 82 000 0003
– Conductor cross section	AWG 27 ... AWG 26 (solid and stranded)
– Conductor diameter	0.8 ... 1.1 mm
Cable diameter	5 ... 9 mm
Degree of protection	IP20
Mating cycles	min. 750
Temperature range	-40 °C ... +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification

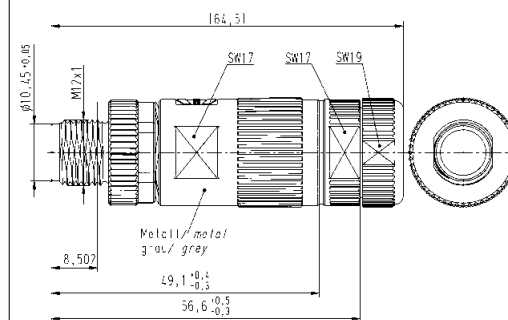
Part number

Drawing

Dimensions in mm

preLink® M12 housing

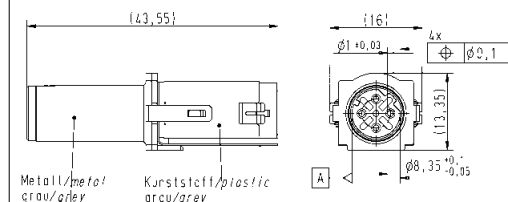
20 82 000 1210



preLink® M12 male module

20 82 005 1214

Male
4 poles,
D-coding



preLink® M12 connector set

20 82 005 0001

D-coding

Ha-VIS preLink® RJ45 terminal module

20 82 000 0001
20 82 000 0003

AWG 22/23, yellow¹⁾
AWG 26/27, white¹⁾

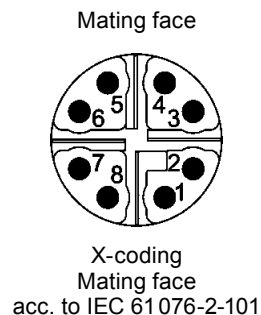
Ha-VIS preLink® assembly tool

20 82 000 9901

¹⁾ Packaging with 10 pieces



Ha-VIS preLink® M12 connector
D-coding



Advantages

- M12 Ethernet-Data connector suitable for industry
- Robust design
- 360° shielding
- Category of transmission Cat. 6_A
- Suitable for solid and stranded wires
- Suitable for PoE (IEEE 802.3af) and PoE+ (IEEE 802.3at)

Technical characteristics

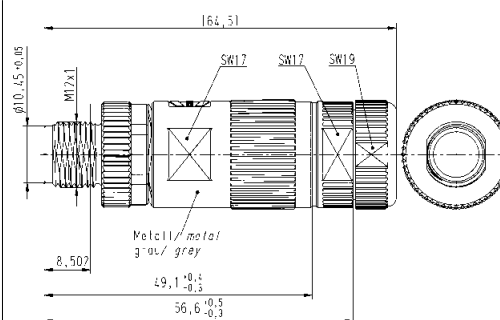
Connector type	M12 X-coding acc. to IEC 61 076-2-101
Number of contacts	8
Transmission category	Category 6 _A , Class E _A , suitable for 1/10 Gigabit Ethernet
Transmission performance	Category 6 _A / Class E _A up to 500 MHz acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	fully shielded, 360° shielding contact
Mounting	IDC termination
Cable termination for preLink® Connectable cables	terminal module, yellow, 20 82 000 0001
– Conductor cross section	AWG 23 ... AWG 22 (solid and stranded)
– Conductor diameter	1.3 ... 1.6 mm
Cable termination for preLink® Connectable cables	terminal module, white, 20 82 000 0003
– Conductor cross section	AWG 27 ... AWG 26 (solid and stranded)
– Conductor diameter	0.8 ... 1.1 mm
Cable diameter	5 ... 9 mm
Degree of protection	IP20
Mating cycles	min. 750
Temperature range	-40 °C ... +70 °C
Housing material	Zinc die-cast, nickel-plated

Identification	Part number	Drawing	Dimensions in mm
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preLink® M12 housing



20 82 000 1210

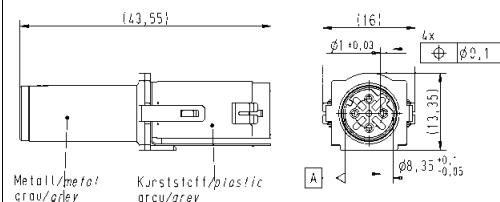


preLink® M12 male module

Male
8 poles,
X-coding



20 82 006 1218



preLink® M12 connector set

X-coding

20 82 005 0002

Ha-VIS preLink® RJ45 terminal module

AWG 22/23, yellow¹⁾
AWG 26/27, white¹⁾

20 82 000 0001
20 82 000 0003

Ha-VIS preLink® assembly tool

20 82 000 9901

¹⁾ Packaging with 10 pieces

Identification

Part number

Cable gland M20x1.5
for pre-terminated Ha-VIS
preLink® cable assemblies

with slotted seal

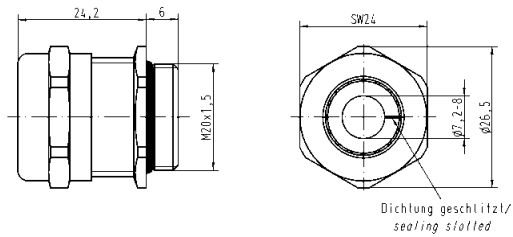
Cable-sheath 7.2 mm ... 8.0 mm

Cable-sheath 4.0 mm ... 6.5 mm



19 00 000 5020

19 00 000 5079

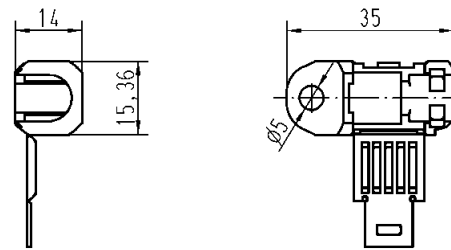


Protection cover
for pre-terminated Ha-VIS
preLink® cable assemblies

Set of 10 pieces



20 82 000 9915

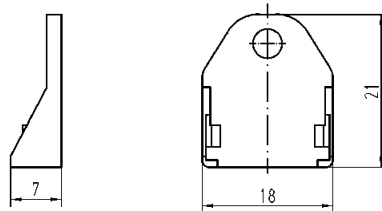


Unlocking tool
for Ha-VIS preLink® RJ45 module

Set of 5 pieces



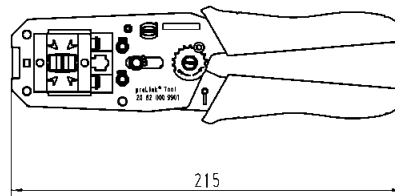
20 82 000 9916



HARTING Assembly tool
for Ha-VIS preLink® terminal
module



20 82 000 9901





har-port RJ45 coupler

Advantages

- Compact and well-shaped service interface in a timeless attractive design
- Easy mounting
- Transmission category 6, performance class E_A, suitable for 1/10 Gigabit Ethernet
- Compact and robust design
- Practical accessories

Technical characteristics

Number of ports	2x RJ45
Transmission performance	Category 6 / class E _A acc. to ISO/IEC 11 801:2002, EN 50 173-1
Transmission rate	10/100 Mbit/s and 1/10 Gbit/s
Shielding	Fully shielded, 360° shielding contact
Mounting	Screwable in cover plates
Degree of protection	IP20
Mating cycles	min. 750
Temperature range	-25 °C ... +70 °C
Housing material	Polyamide

Identification

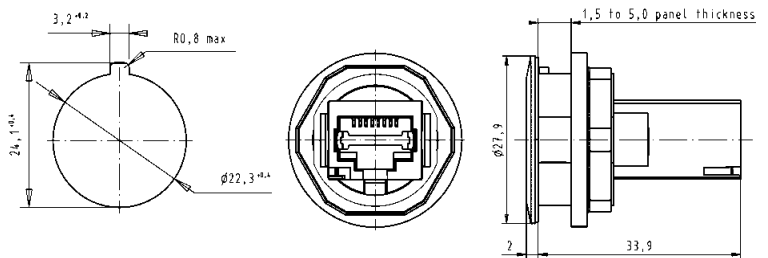
Part number

Drawing

Dimensions in mm

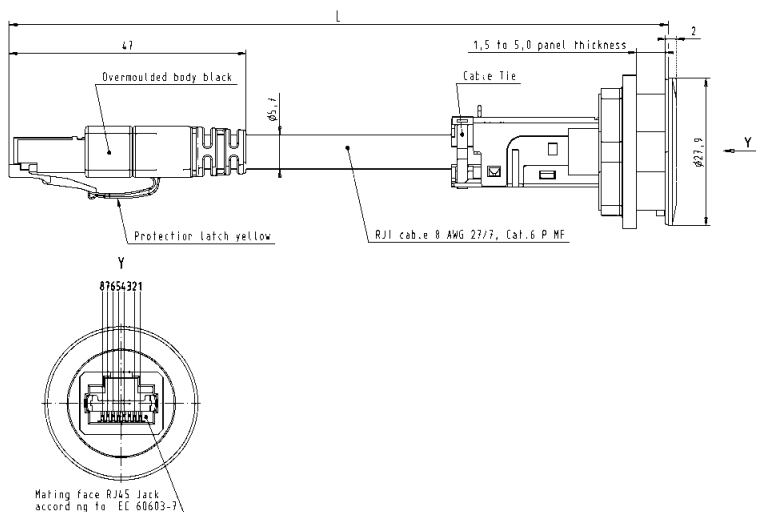
har-port RJ45 Cat. 6 coupler

09 45 452 1560



har-port RJ45 Cat. 6 coupler with cable

Length:	0.15 m	09 45 452 1500
	0.2 m	09 45 452 1501
	0.3 m	09 45 452 1502
	0.4 m	09 45 452 1503
	0.5 m	09 45 452 1504
	0.6 m	09 45 452 1505
	0.7 m	09 45 452 1506
	0.8 m	09 45 452 1507
	0.9 m	09 45 452 1508
	1.0 m	09 45 452 1509
	1.5 m	09 45 452 1510
	2.0 m	09 45 452 1511
	2.5 m	09 45 452 1512
	3.0 m	09 45 452 1513
	3.5 m	09 45 452 1514
	4.0 m	09 45 452 1515
	5.0 m	09 45 452 1516
	7.5 m	09 45 452 1517
	10.0 m	09 45 452 1518



har-port HIFF coupler housing (for all HIFF compatible modules)

09 45 452 0000



har-port USB coupler

Advantages

- Compact and well-shaped service interface in a timeless attractive design
- Easy mounting
- Compact and robust design
- Practical accessories

Technical characteristics

Number of ports	2x USB Typ A
Mounting	Screwable in cover plates
Degree of protection	IP20
Mating cycles	min. 1500
Temperature range	-25 °C ... +70 °C
Housing material	Polyamide

Identification	Part No.	Drawing	Dimensions in mm
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har-port USB 2.0 A-A coupler

09 45 452 1901

har-port USB 3.0 A-A coupler

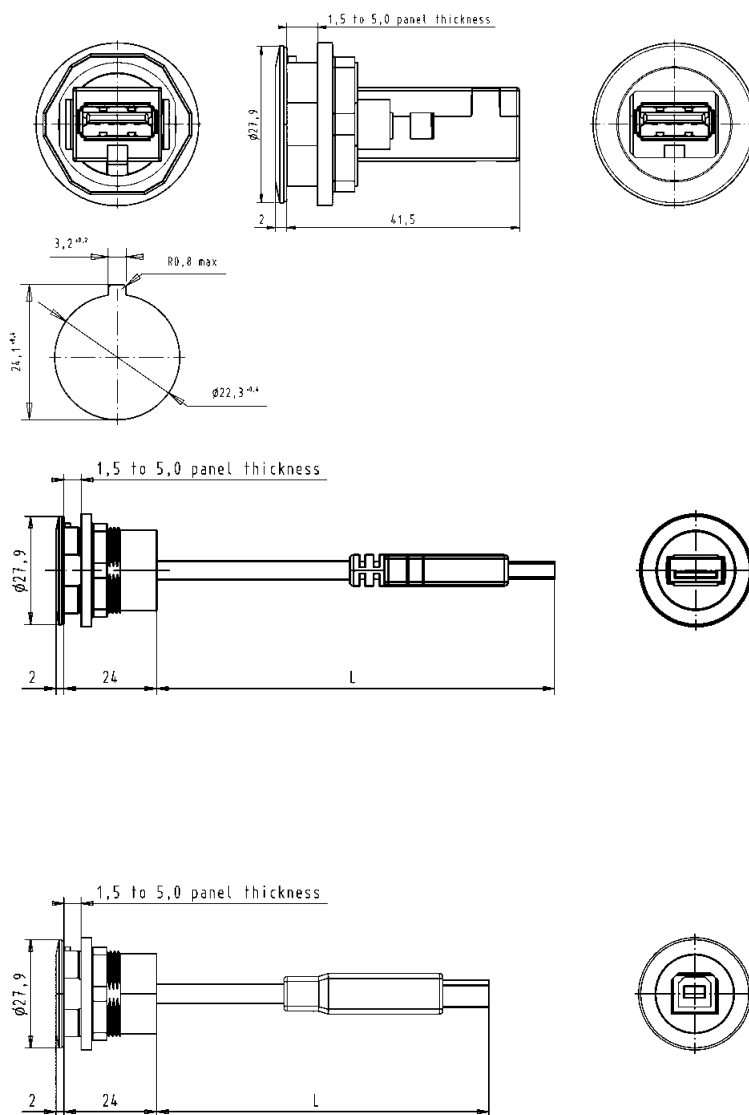
09 45 452 1902

har-port USB 2.0 A-A coupler with cable

Length: 0.15 m	09 45 452 1927
0.4 m	09 45 452 1928
0.5 m	09 45 452 1920
1.0 m	09 45 452 1921
1.5 m	09 45 452 1922
2.0 m	09 45 452 1923
3.0 m	09 45 452 1924
4.0 m	09 45 452 1926
5.0 m	09 45 452 1925

har-port USB 2.0 B-B coupler with cable

Length: 0.5 m	09 45 452 1910
1.0 m	09 45 452 1911
1.5 m	09 45 452 1912
2.0 m	09 45 452 1913
3.0 m	09 45 452 1914
4.0 m	09 45 452 1916
5.0 m	09 45 452 1915





har-port accessories









Advantages

- Compact and well-shaped service interface in a timeless attractive design
- Easy mounting
- Compact and robust design
- Practical accessories

Technical characteristics

Temperature range -25 °C ... +70 °C
 Housing material Polyamide

Identification	Part No.	Drawing	Dimensions in mm
Accessories			
<i>har-port</i> protection cover IP65 / IP67 black	09 45 502 0000		
<i>har-port</i> sealing cover	09 45 502 0001		
<i>har-port</i> label holder	09 45 502 0002		
<i>har-port</i> label for label holder 09 45 502 0002	09 45 502 0003		
<i>har-port</i> blind cover IP65 / IP67	09 45 502 0004		
<i>har-port</i> protection cover IP65 / IP67 transparent	09 45 502 0005		

Identification	Part number	
<p>HARTING RJ Industrial® Stripping Tool Stripping tool for Ethernet cables including blade cassette</p> <p>Spare blade cassette</p>	<p>09 45 800 0000</p> <p>09 45 800 0001</p>	 <p>The RJ Industrial Stripping Tool is ready to remove insulation from Ethernet cables for fast mounting with diameters from 2.5 to 8 mm quick and easy. It allows to remove cable sheath and shielding braid in one.</p>
<p>Stripping tool</p>	<p>09 45 800 0002</p>	
<p>HARTING RJ Industrial® LSA-Punch Down Tool</p>	<p>09 45 800 0020</p>	 <p>The LSA-Punch Down Tool is used to wire RJ45 Industrial Metal Outlets (part no. 09 45 815 1100). The various conductors are cut to length and inserted into the insulation displacement contacts in a single pass.</p>
<p>HARTING M12 dynamometric screwdriver SW 18 or 13</p>	<p>09 99 000 0382</p>	
<p>Crimping tool for M12 Crimp</p>	<p>09 99 000 0501</p>	
<p>Cable shear</p>	<p>09 45 800 0004</p>	
<p>Wire cutter</p>	<p>09 45 800 0005</p>	
<p>Ha-VIS preLink® assembly tool</p>	<p>20 82 000 9901</p>	

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Ha-VIS RFID Transponder

Ha-VIS RFID Reader

Ha-VIS RFID Antennas

Cables and Accessories

General

HARTING Ha-VIS RFID System components

Real-time information and the close synchronization of computer data and real processes play a critical role in process management and process optimization.

Ensuring that information precisely maps and concurs with reality is the only way to control processes optimally and reap savings potentials accordingly.

One important prerequisite for guaranteeing that data and processes are synchronized is an intelligent infrastructure that makes data transparent and available throughout a company in order to achieve the maximum savings potentials.

RFID offers you the full potential to create intelligent infrastructures: benefit from the simultaneous identification of up to several hundred objects - without the need for the direct line of sight as required by barcode solutions. The collected data are immediately ready for further processing throughout the company.

Moreover, a transponder can be used to store information directly on the product at the same time it is identified. This means that these data are also always available wherever the product may happen to be located.

HARTING offers smart infrastructure solutions based on optimally coordinated components from a single source. These solutions enable the reliable control and steering of production and business processes, thereby resulting in lower costs.

The HARTING RFID Reader and components have been designed for harsh industrial applications. Deployed in the transportation, machinery and energy markets, HARTING RFID components guarantee secure and reliable information processing - also under the most challenging environmental conditions

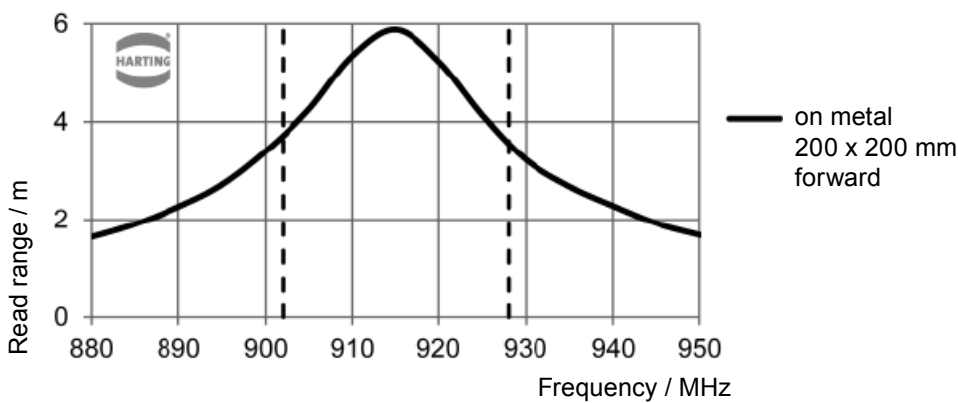


Technical characteristics

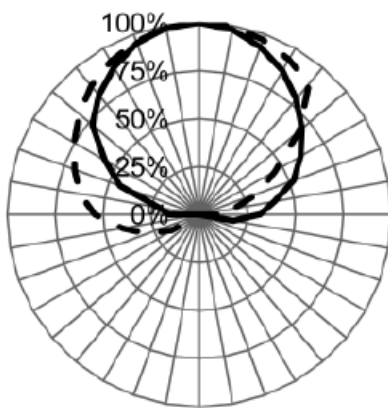
Frequency range	860 ... 870 MHz	EU Band
Protocol	EPC Class 1 Gen 2	
EPC / User Memory (Chip)	96 Bit / 512 Bit	(Alien Higgs 3)
Temperature range	Function Storage Thermal shock (0 °C to 210 °C) Thermal stress test (210 °C)	-50 °C ... +85 °C -65 °C ... +160 °C 5000 cycles 5000 h
Housing	Size (W x D x H) Protection class Mounting Colour	41 x 11 x 5.15 mm IP64 / IP67 / IP69K screws, glue black

Measurements

Read range / Radiation pattern



Theoretical read range measured in free field conditions (radiated power – 2 W ERP).



— E-Pattern
- - H-Pattern

E-Pattern



H-Pattern



The general shape of the radiation pattern remains the same, regardless of:

- Placement of tag on different metallic surfaces



Transponder
Ha-VIS RFID VT 92 S (HT)

Features

- Optimized for the US/Asia band
- Very high read ranges, in relation to the housing dimension
- Robust, chemical resistant housing
- Small size
- Flexible mounting
- High temperature resistance
- Protection class IP69K
- Integration in type labels possible

General Description

- Particularly robust and durable transponder for repair and maintenance cycles in extremely harsh environments
- Optimized for function on metal
- EPC C1 Gen2 compatible
- Read range (on metal, 2 W ERP, 915 MHz): > 4 m

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS RFID VT 92 S (HT)

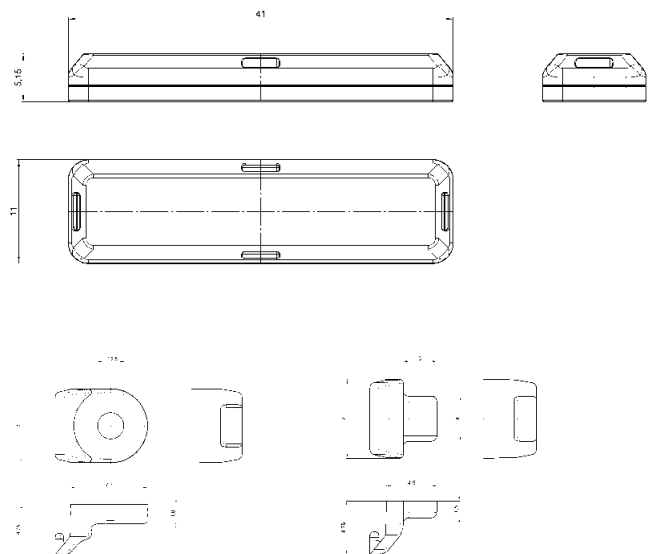
Packaging unit

10 pieces

20 92 621 0201

50 pieces

20 92 621 0202

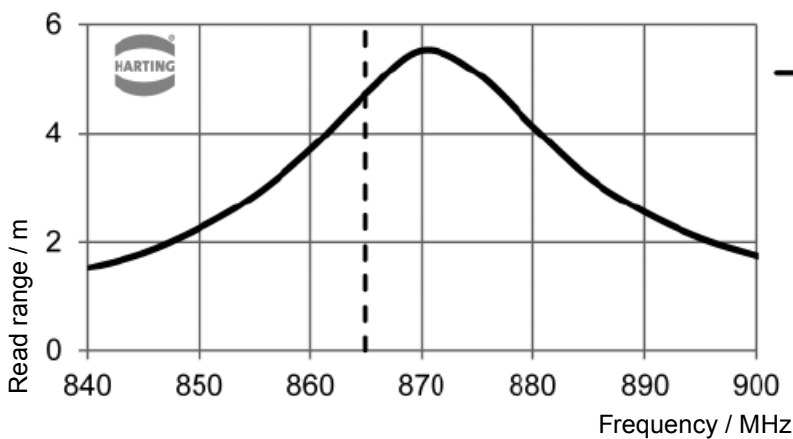


Technical characteristics

Frequency range	900 ... 930 MHz	US/Asia Band
Protocol	EPC Class 1 Gen 2	
EPC / User Memory (Chip)	96 Bit / 512 Bit	(Alien Higgs 3)
Temperature range	Function Storage Thermal shock (0 °C to 210 °C) Thermal stress test (210° C)	-50 °C ... +85 °C -65 °C ... +160 °C 5000 cycles 5000 h
Housing	Size (W x D x H) Protection class Mounting Colour	41 x 11 x 5 mm IP64 / IP67 / IP69K screws, glue black

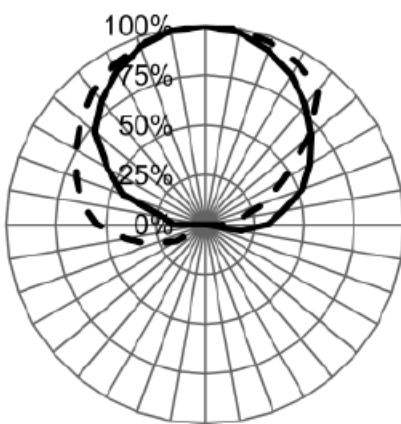
Measurements

Read range / Radiation pattern



— on metal
200 x 200 mm
forward

Theoretical read range
measured in free field
conditions (radiated
power – 2 W ERP).



— E-Pattern
- - H-Pattern

H-Pattern



E-Pattern



The general shape of the radiation pattern remains the same, regardless of:

- Placement of tag on different metallic surfaces

Transponder
Ha-VIS RFID VT 89 S (HT)



Features

- Global use possible thanks to wideband antenna design
- Robust, chemical resistant housing
- Small size
- Flexible mounting
- High temperature resistance
- Protection class IP69K
- Integration in type labels possible

General Description

- Particularly robust and durable transponder for repair and maintenance cycles in extremely harsh environments
- Optimized for function on metal
- EPC C1 Gen2 compatible
- Read range (on metal, 2 W ERP, 868 MHz): > 2,5 m

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS RFID VT 89 S (HT)

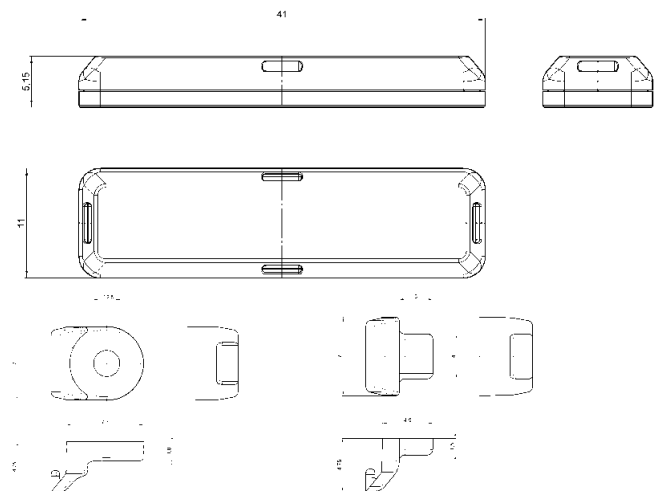
Packaging unit

10 pieces

20 92 641 0201

50 pieces

20 92 641 0202

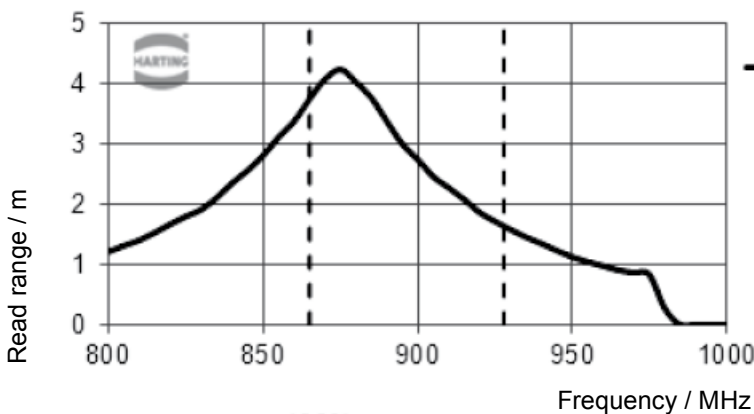


Technical characteristics

Frequency range	860 ... 930 MHz	global use
Protocol	EPC Class 1 Gen 2	
EPC / User Memory (Chip)	96 Bit / 512 Bit	(Alien Higgs 3)
Temperature range	Function Storage Thermal shock (0 °C to 210 °C) Thermal stress test (210° C)	-50 °C ... +85 °C -65 °C ... +160 °C 5000 cycles 5000 h
Housing	Size (W x D x H) Protection class Mounting Colour	41 x 11 x 5.15 mm IP64 / IP67 / IP69K screws, glue black

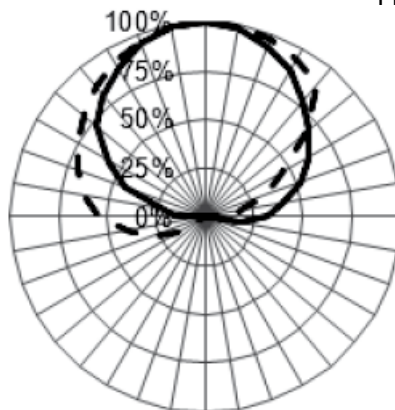
Measurements

Read range / Radiation pattern

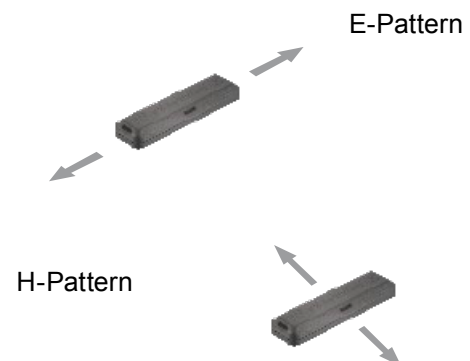


on metal
200 x 200 mm
forward

Theoretical read range
measured in free field
conditions (radiated
power – 2 W ERP).



— E-Pattern
- - H-Pattern



The general Shape of the Radiation Pattern remains the same, regardless of:

- Placement of tag on different metallic surfaces
- 868 MHz or 910 MHz

Available
June 2015



Transponder
Ha-VIS RFID VT 86 L (HT)

Features

- Optimised for the EU frequency band
- Very high read ranges, in relation to the housing dimensions
- Increased memory (User Memory 3.3 kBit)
- Robust, chemically resistant housing
- Small size
- Flexible mounting
- High temperature resistance
- Protection class IP69K
- Integration in type labels possible

General description

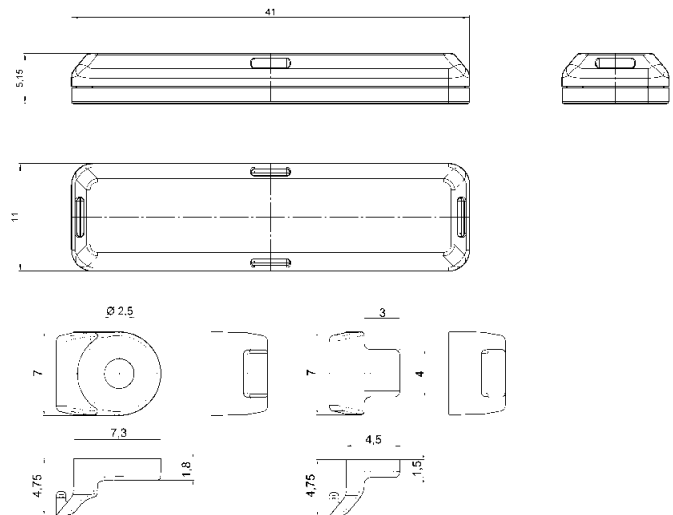
- Particularly robust and durable transponder for repair and maintenance applications in extremely harsh environments
- Optimised for function on metal
- EPC Class 1 Gen 2 compatible
- Read range on metal, 2 W ERP, 868 MHz: up to 4 m

Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

Ha-VIS RFID VT 86 L (HT)

Packaging unit: - 10 pieces
- 50 pieces

20 92 612 0201
20 92 612 0202

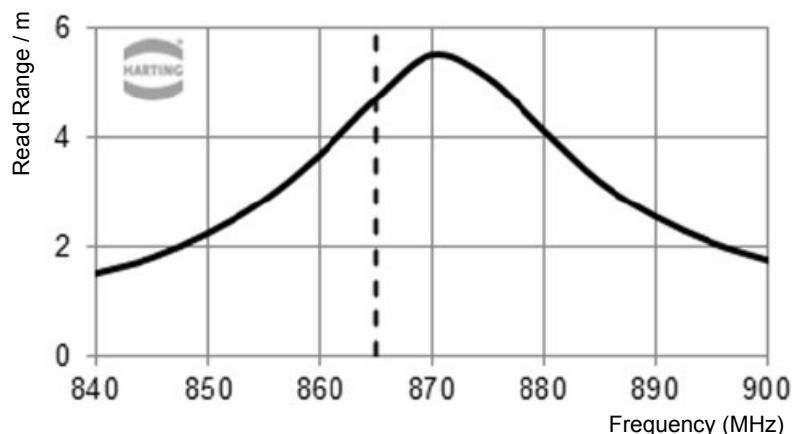


Technical characteristics

Frequency range	860 ... 870 MHz, EU frequency band
Protocol	EPC Class 1 Gen 2
EPC / User Memory (Chip)	160 Bit / 3328 Bit (NXP UCODE I2C)
Read range	on metal, 2 W ERP, 868 MHz: up to 4 m
Temperature range	
Operational	-40 °C ... +85 °C
Storage	-55 °C ... +125 °C
Housing	
Dimensions (W x D x H)	41 x 11 x 5.15 mm
Protection class	IP67 / IP69K
Mounting	screw, rivet, glue
Colour	black

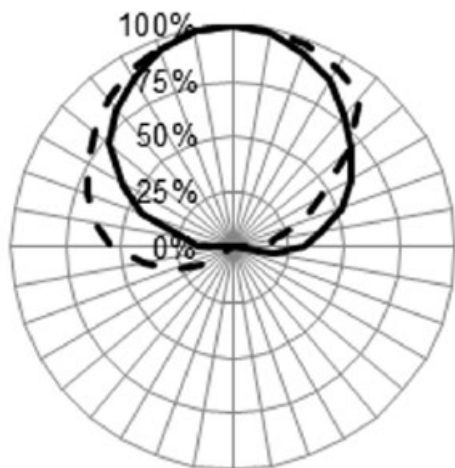
Measurements

Read Range

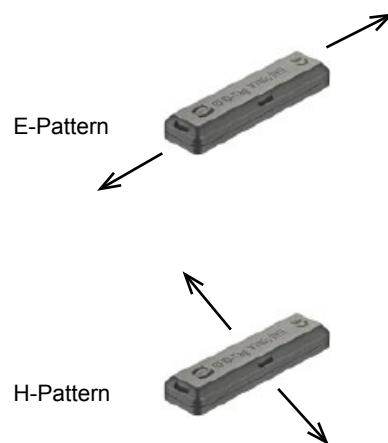


— on metal
200 x 200 mm
forward

Theoretical read range measured
in free field conditions
(radiated power: 2 W ERP)



— E-Pattern
- - H-Pattern



The general shape of the radiation pattern remains the same, regardless of:

- Placement of transponder on different metallic surfaces

Available
June 2015



Transponder
Ha-VIS RFID VT 92 L (HT)

Features

- Optimised for the US/Asia frequency band
- Very high read ranges, in relation to the housing dimensions
- Increased memory (User Memory 3.3 kBit)
- Robust, chemically resistant housing
- Small size
- Flexible mounting
- High temperature resistance
- Protection class IP69K
- Integration in type labels possible

General description

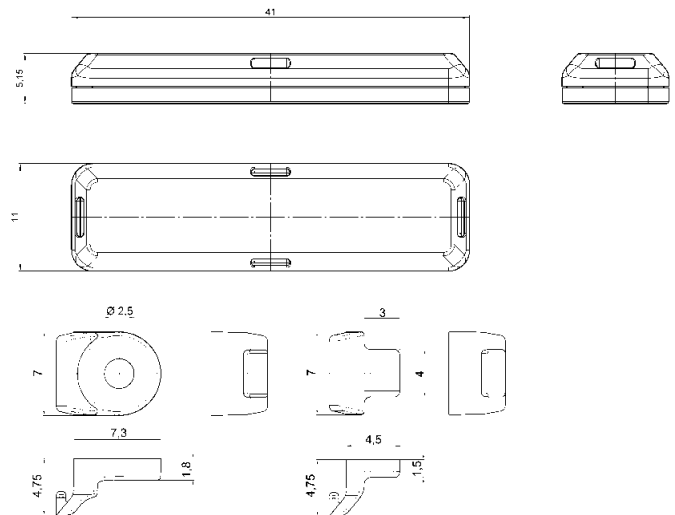
- Particularly robust and durable transponder for repair and maintenance applications in extremely harsh environments
- Optimised for function on metal
- Class 1 Gen 2 compatible
- Read range on metal, 2 W ERP, 915 MHz: up to 4 m

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS RFID VT 92 L (HT)

Packaging unit: - 10 pieces
- 50 pieces

20 92 622 0201
20 92 622 0202

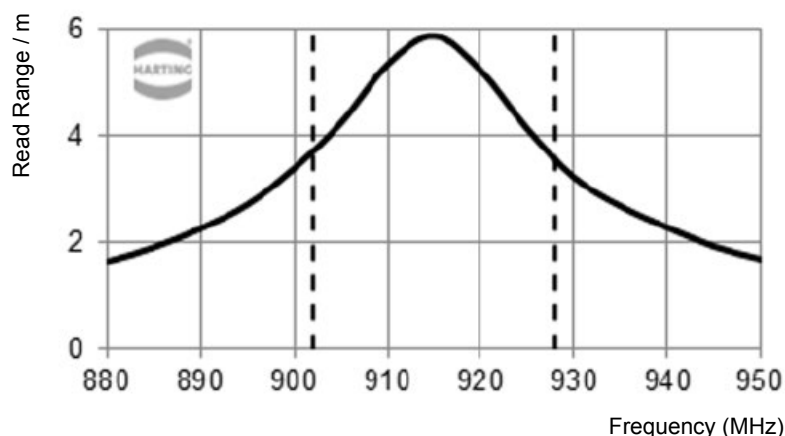


Technical characteristics

Frequency range	900 ... 930 MHz, US/Asia frequency band
Protocol	EPC Class 1 Gen 2
EPC / User Memory (Chip)	160 Bit / 3328 Bit (NXP UCODE I2C)
Read range	on metal, 2 W ERP, 915 MHz: up to 4 m
Temperature range	
Operational	-40 °C ... +85 °C
Storage	-55 °C ... +125 °C
Housing	
Dimensions (W x D x H)	41 x 11 x 5.15 mm
Protection class	IP67 / IP69K
Mounting	screw, rivet, glue
Colour	black

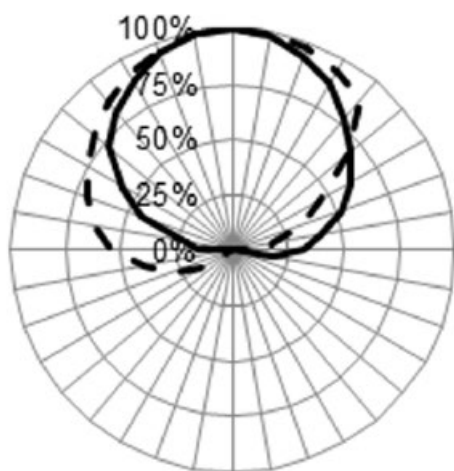
Measurements

Read Range

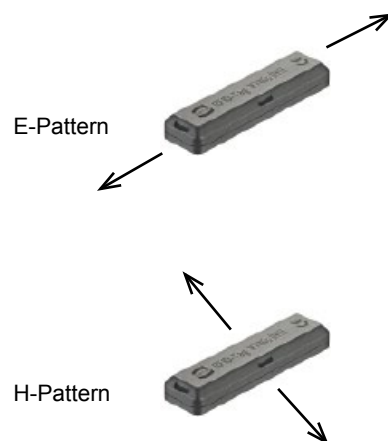


— on metal
200 x 200 mm
forward

Theoretical read range measured in free field conditions (radiated power: 2 W ERP)



— E-Pattern
- - H-Pattern



The general shape of the radiation pattern remains the same, regardless of:

- Placement of transponder on different metallic surfaces

Available
June 2015



Transponder
Ha-VIS RFID VT 89 L (HT)

Features

- Global use possible thanks to wideband antenna design
- Increased memory (User Memory 3.3 kBit)
- Robust, chemically resistant housing
- Small size
- Flexible mounting
- High temperature resistance
- Protection class IP69K
- Integration in type labels possible

General description

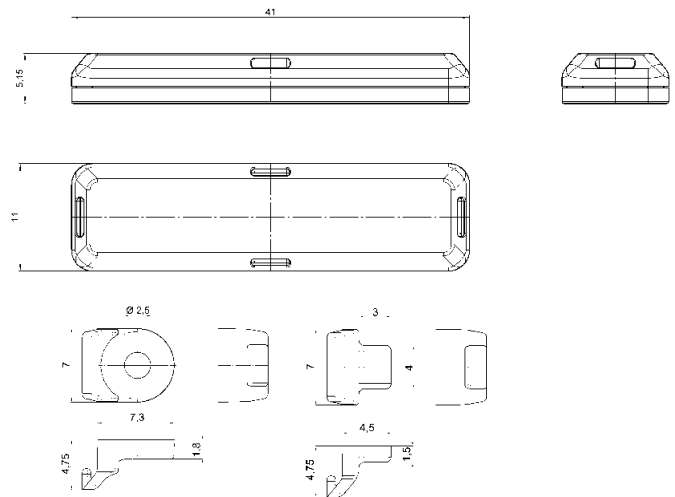
- Particularly robust and durable transponder for repair and maintenance applications in extremely harsh environments
- Optimised for function on metal
- EPC Class 1 Gen 2 compatible
- Read range on metal, 2 W ERP, 868 MHz: up to 2 m

Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

Ha-VIS RFID VT 89 L (HT)

Packaging unit: - 10 pieces
- 50 pieces

20 92 642 0201
20 92 642 0202

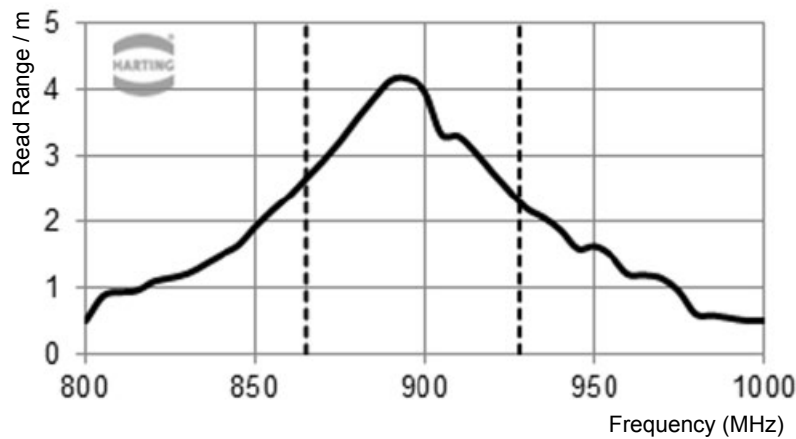


Technical characteristics

Frequency range	860 ... 930 MHz, global use possible
Protocol	EPC Class 1 Gen 2
EPC / User Memory (Chip)	160 Bit / 3328 Bit (NXP UCODE I2C)
Read range	on metal, 2 W ERP, 868 MHz: up to 2 m
Temperature range	
Operational	-40 °C ... +85 °C
Storage	-55 °C ... +125 °C
Housing	
Dimensions (W x D x H)	41 x 11 x 5.15 mm
Protection class	IP67 / IP69K
Mounting	screw, rivets, glue
Colour	black

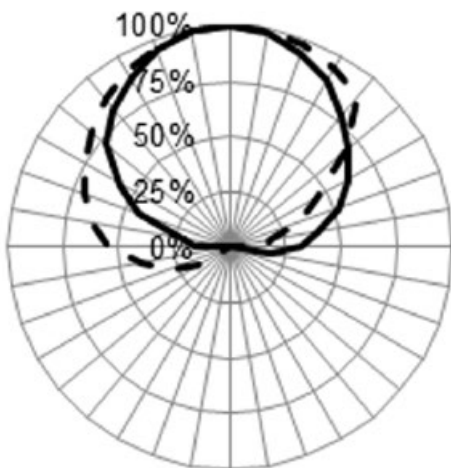
Measurements

Read Range

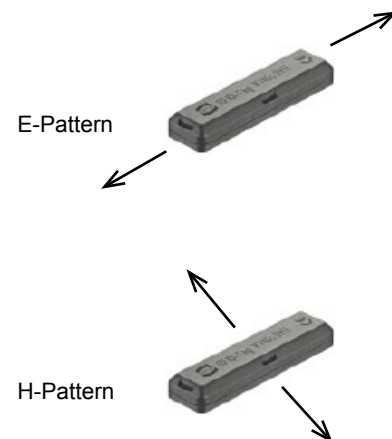


— on metal
200 x 200 mm
forward

Theoretical read range measured in free field conditions (radiated power: 2 W ERP)



— E-Pattern
- - H-Pattern



The general shape of the radiation pattern remains the same, regardless of:

- Placement of transponder on different metallic surfaces
- 868 MHz or 915 MHz



Transponder
Ha-VIS RFID FT 89 (NT)

Features

- Global use possible thanks to wideband antenna design
- Scratch- and smudge-resistant by polycarbonate film
- Washable, resistant to chemicals
- Flexible mounting on different forms
- Glueable / screwable
- Flexible printing possible (barcode, datamatrix, custom logo / name)

General Description

- Applications on non-conducting surfaces
- Plastic container detection
- Container management
- Asset management
- Intralogistic
- EPC C1 Gen2 compatible
- Read range (on air, 2 W ERP): > 7 m

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS RFID FT 89 (NT)

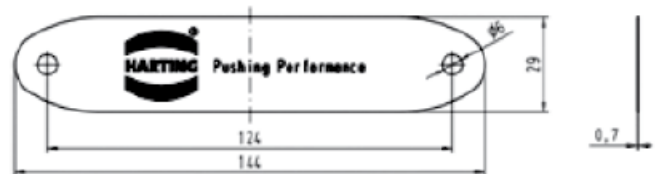
Packaging unit

50 pieces

20 92 641 0702

500 pieces

20 92 641 0703

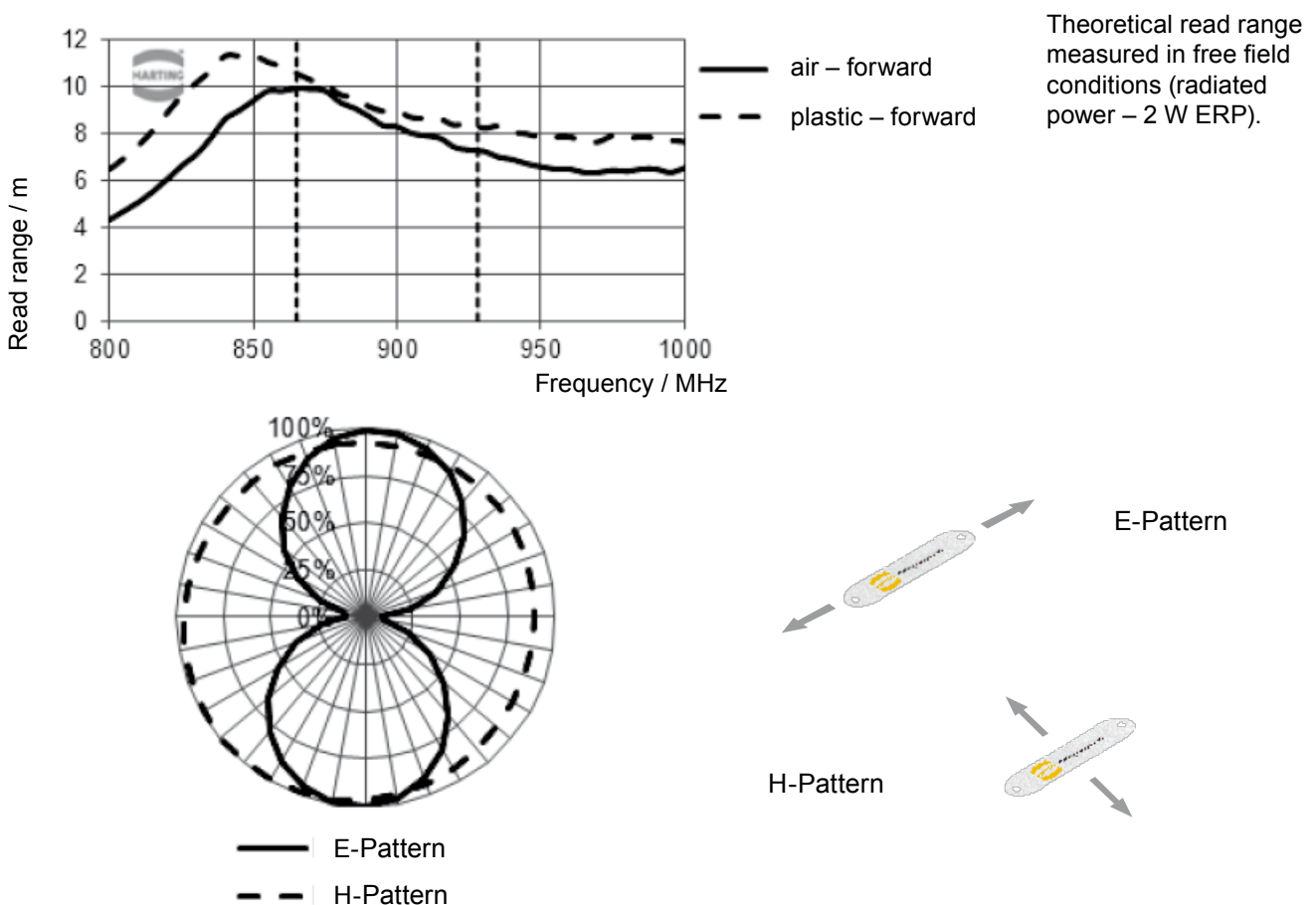


Technical characteristics

Frequency range	860 ... 930 MHz	global use
Protocol	EPC Class 1 Gen 2	
EPC / User Memory (Chip)	128 Bit / 32 Bit	(Impinj Monza 4D)
Temperature range	Function Storage	-32 °C ... +90 °C -32 °C ... +90 °C
Housing	Size (W x D x H) Protection class Mounting Colour	144 x 29 x 0.7 mm IP64 / IP67 / IP69K screws, glue white / flexible

Measurements

Read range / Radiation pattern



The general Shape of the Radiation Pattern remains the same, regardless of:

- 868 MHz or 910 MHz



Transponder
Ha-VIS RFID FT 89 small (NT)

Features

- Global use possible thanks to wideband antenna design
- High read ranges, in relation to the housing dimension
- Scratch- and smudge-resistant by polycarbonate film
- Washable, resistant to chemicals
- Flexible mounting on different forms
- Flexible printing possible (barcode, datamatrix, custom logo / name)

General Description

- Applications on non-conducting surfaces
- Plastic container detection
- Container management
- Asset management
- Intralogistic
- Small size
- EPC C1 Gen2 compatible
- Read range (on air, 2 W ERP): > 4 m

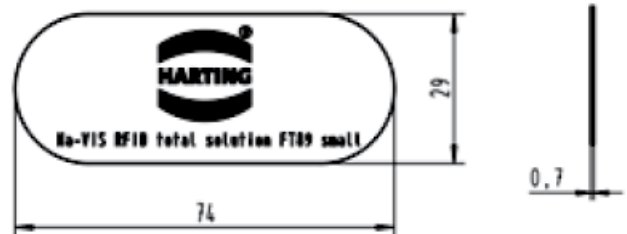
Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS RFID FT 89 small (NT)

Packaging unit

50 pieces
500 pieces

20 92 641 0802
20 92 641 0803

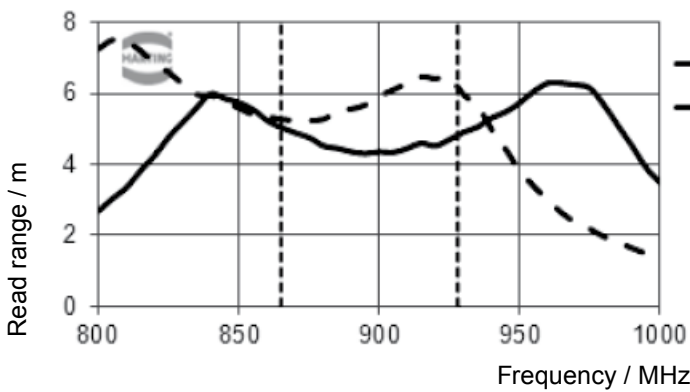


Technical characteristics

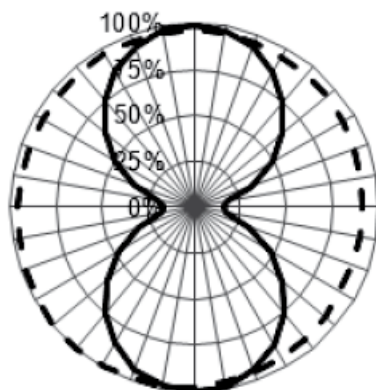
Frequency range	860 ... 930 MHz	global use
Protocol	EPC Class 1 Gen 2	
EPC / User Memory (Chip)	128 Bit / not exist	(NXP U-Code G2iL)
Temperature range	Function Storage	-32 °C ... +90 °C -32 °C ... +90 °C
Housing	Size (W x D x H) Protection class Mounting Colour	74 x 29 x 0.7 mm IP64 / IP67 / IP69K glue white / flexible

Measurements

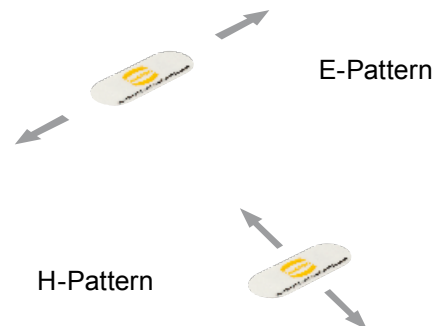
Read range / Radiation pattern



Theoretical read range measured in free field conditions (radiated power – 2 W ERP).



— E-Pattern
- - H-Pattern



The general Shape of the Radiation Pattern remains the same, regardless of:

- 868 MHz or 910 MHz



Transponder
Ha-VIS RFID FT 89 on metal (NT)

Features

- Global use possible thanks to wideband antenna design
- High read ranges on metal
- Scratch- and smudge-resistant by polycarbonate film
- Washable, resistant to chemicals
- Flexible mounting on different forms
- Flexible printing possible (barcode, datamatrix, custom logo / name)

General Description

- Applications on metallic and non-conducting surfaces
- Metal container detection
- Container management
- Asset management
- Intralogistic
- EPC C1 Gen2 compatible
- Read range (on metal, 2 W ERP): > 2 m

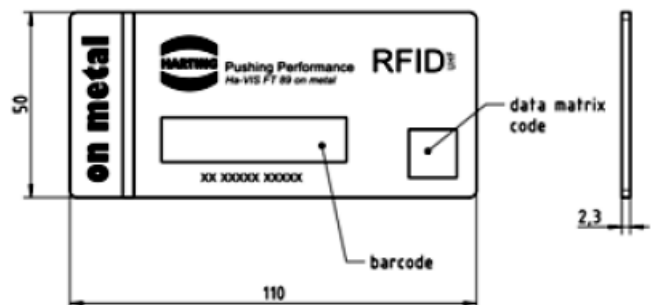
Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS RFID FT 89 on metal (NT)

Packaging unit

50 pieces
500 pieces

20 92 641 0752
20 92 641 0753

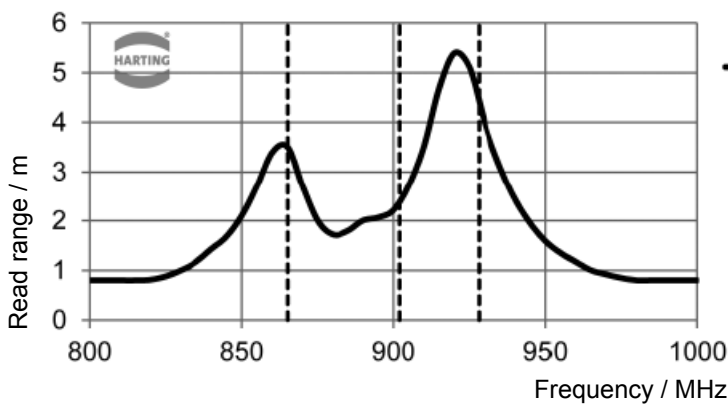


Technical characteristics

Frequency range	860 ... 930 MHz	global use
Protocol	EPC Class 1 Gen 2	
EPC / User Memory (Chip)	496 Bit / 128 Bit	(Impinj Monza 4E)
Temperature range	Function Storage	-32 °C ... +90 °C -32 °C ... +90 °C
Housing	Size (W x D x H) Protection class Mounting Colour	110 x 50 x 2.3 mm IP64 / IP67 / IP69K glue white / flexible

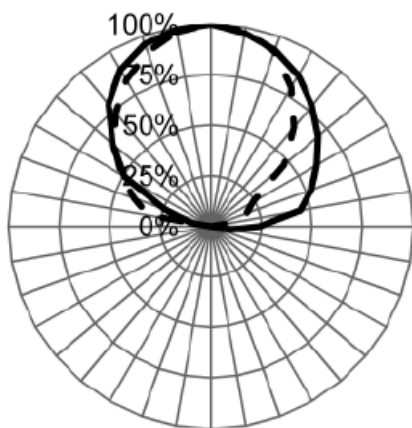
Measurements

Read range / Radiation pattern



— on metal
200 x 200 mm
forward

Theoretical read range
measured in free field
conditions (radiated
power – 2 W ERP).



— E-Pattern
- - H-Pattern

E-Pattern



H-Pattern



The general shape of the radiation pattern remains the same, regardless of:

- placement of tag on different metallic surfaces
- 868 MHz or 910 MHz



Transponder
Ha-VIS RFID IT 86 S (NT)

Features

- Optimised for the EU frequency band
- Very high read ranges, in relation to the housing dimensions
- Very small size
- Flexible mounting on different surface shapes
- Supplied with 3M adhesive pad
- Holder for mounting option with cable ties included
- Protection class IP67
- Shock resistant

General description

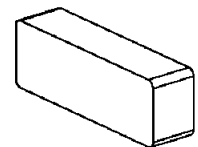
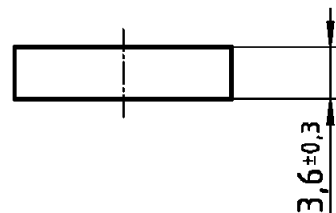
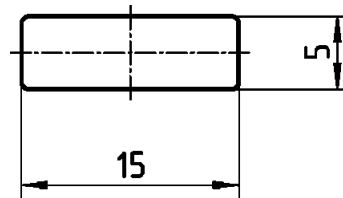
- Very small on-metal transponder, with high read ranges
- Flexible options to integrate the Ha-VIS RFID IT 86 S (NT) on different metal surfaces
- Due to the small housing dimensions ideally suited for tool-tagging
- Optimised for function on metal
- EPC Class 1 Gen 2 compatible
- Read range on metal, 2 W ERP, 868 MHz: up to 3 m

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS RFID IT 86 S (NT)

Packaging unit: - 10 pieces
- 50 pieces

20 92 611 0901
20 92 611 0902

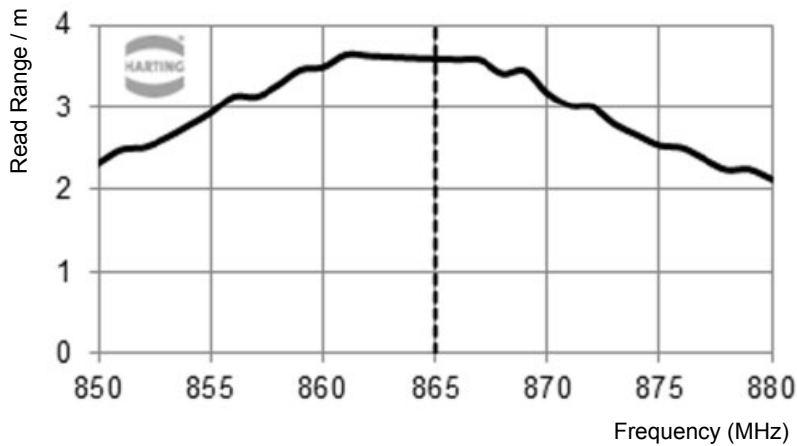


Technical characteristics

Frequency range	860 ... 870 MHz, EU frequency band
Protocol	EPC Class 1 Gen 2
EPC / User Memory (Chip)	128 Bit / 512 Bit (Monza 4QT)
Read range	on metal, 2 W ERP, 868 MHz: up to 3 m
Temperature range	
Operational	-45 °C ... +105 °C
Thermal stress test	
• min. temperature	-45 °C / 1500 h
• max. temperature	+105 °C / 1500 h
Housing	
Dimensions (W x D x H)	15 x 5 x 3.5 mm
Protection class	IP67
Mounting	holder with cable tie, glue
Colour	white/black

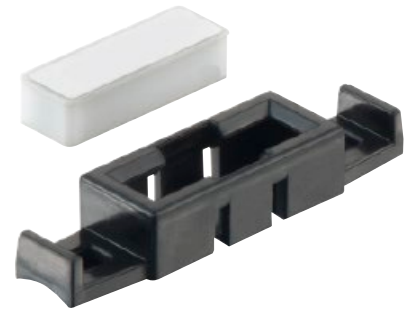
Measurements

Read Range



— on metal
200 x 200 mm
forward

Theoretical read range measured in
free field conditions (radiated power:
2 W ERP)



Transponder
Ha-VIS RFID IT 92 S (NT)

Features

- Optimised for the US/Asia frequency band
- Very high read ranges, in relation to the housing dimensions
- Very small size
- Flexible mounting on different surface shapes
- Supplied with 3M adhesive pad
- Holder for mounting option with cable ties included
- Protection class IP67
- Shock resistant

General description

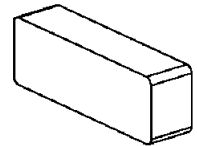
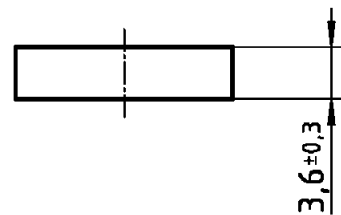
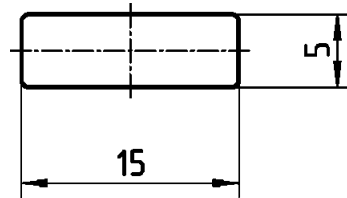
- Very small on-metal transponder, with high read ranges
- Flexible options to integrate the Ha-VIS RFID IT 92 S (NT) on different metal surfaces
- Due to the small housing dimensions ideally suited for tool-tagging
- Optimised for function on metal
- EPC Class 1 Gen 2 compatible
- Read range on metal, 2 W ERP, 915 MHz: up to 3 m

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS RFID IT 92 S (NT)

Packaging unit: - 10 pieces
- 50 pieces

20 92 621 0901
20 92 621 0902

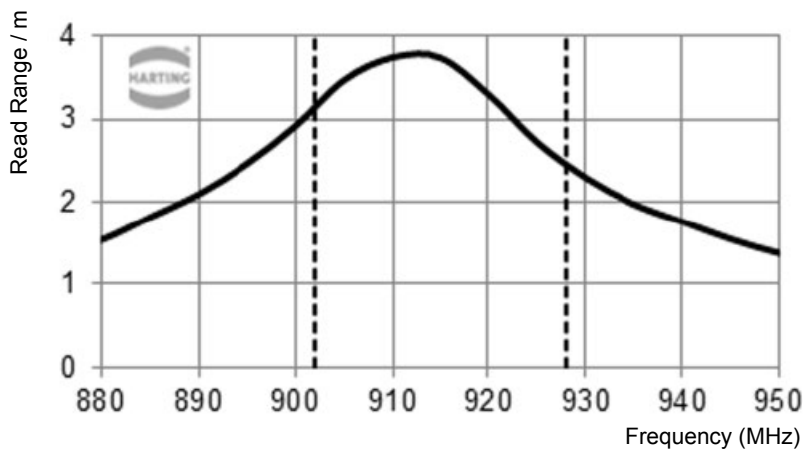


Technical characteristics

Frequency range	900 ... 930 MHz, US/Asia frequency band
Protocol	EPC Class 1 Gen 2
EPC / User Memory (Chip)	128 Bit / 512 Bit (Monza 4QT)
Read range	on metal, 2 W ERP, 915 MHz: up to 3 m
Temperature range	
Operational	-40 °C ... +85 °C
Thermal stress test	
• min. temperature	-40 °C / 1500 h
• max. temperature	+85 °C / 1500 h
Housing	
Dimensions (W x D x H)	15 x 5 x 3.6 mm
Protection class	IP67
Mounting	holder with cable tie, glue
Colour	white/black

Measurements

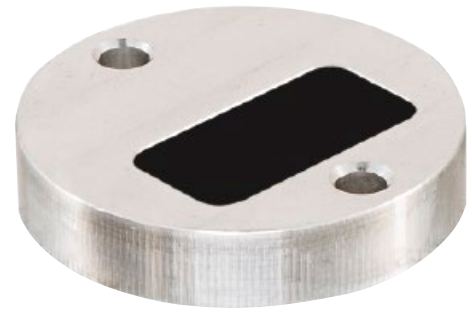
Read Range



— on metal
200 x 200 mm
forward

Theoretical read range measured in
free field conditions (radiated power:
2 W ERP)

Available
May 2015



Transponder
Ha-VIS RFID Steel ID 86 S Coin - BSR

Features

- Optimised for the EU frequency band
- The steel ID coin is readable from both sides
- Extremely robust housing
- Mechanical shock resistance IK10
- Flexible mounting with screws, rivets, wire
- Protection class IP69K
- Application:
 - Maintenance of portable equipment

General description

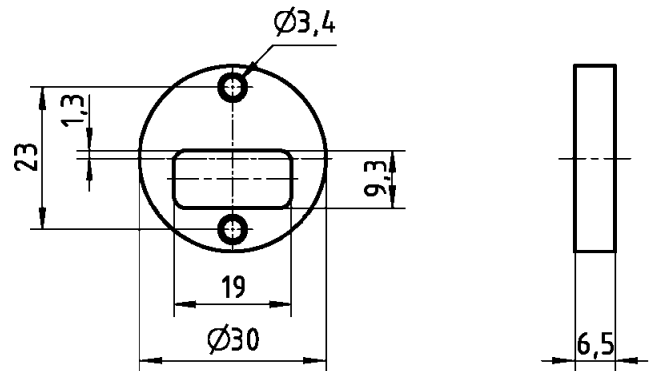
- Particularly robust and durable transponders for repair and maintenance applications in extremely harsh environments, where a high mechanical protection is required.
- The steel ID coin is optimised to use in industry to improve the maintenance process of portable equipment with an RFID solution.
- To have a better localisation of the objects (equipped with the steel ID coins) the read range is reduced to 10 cm.
- EPC Class 1 Gen 2 compatible

Identification	Part number	Drawing	Dimensions in mm
----------------	-------------	---------	------------------

Ha-VIS RFID
Steel ID 86 S Coin - BSR

Packaging unit: 10 pieces

20 92 611 1101



Technical characteristics

Frequency range	860 ... 870 MHz, EU frequency band
Protocol	EPC Class 1 Gen 2
EPC / User Memory (Chip)	128 Bit / 512 Bit (Monza 4QT)
Temperature range	
Operational	-45 °C ... +85 °C
Storage	-45 °C ... +105 °C
Housing	
Dimensions (W x D x H)	30 x 6.5 mm
Protection class	IP67 / IP69K
Mounting	screws, rivets, wire

Measurements

Read range with RFID UHF Handheld (0.5 W ERP)	approx. 10 cm
Possibility to read the Coin from both sides	yes
Function on metallic surfaces	yes



Transponder
Ha-VIS RFID SL 89 Set V1

Features

- For metallic / nonmetallic surfaces
- High read ranges
- Robust
- Flexible integration in different metallic surfaces possible
- Global use possible thanks to wideband antenna design

General Description

This set consists of a metallic holder with a built-in slot, which acts as a slot antenna, and an SL 89 tag.

This is an example of how the SL can be integrated into various metallic surfaces.

- Metal container detection and management
- Flexible customizing possible
- Applications on metallic surfaces
- Read range (free space, 2 W ERP): > 10 m

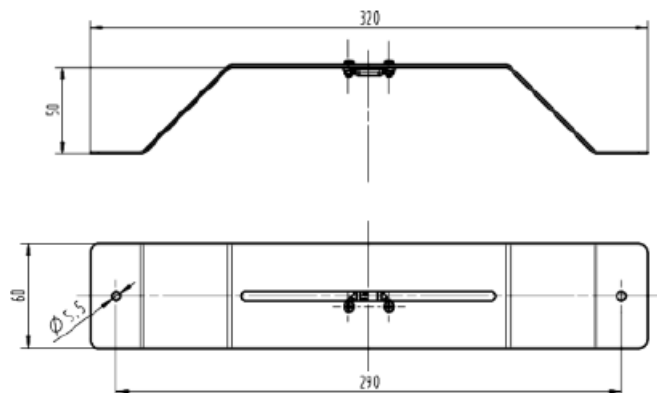
Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS RFID SL 89 Set V1

Packaging unit

1 piece

20 92 641 1600

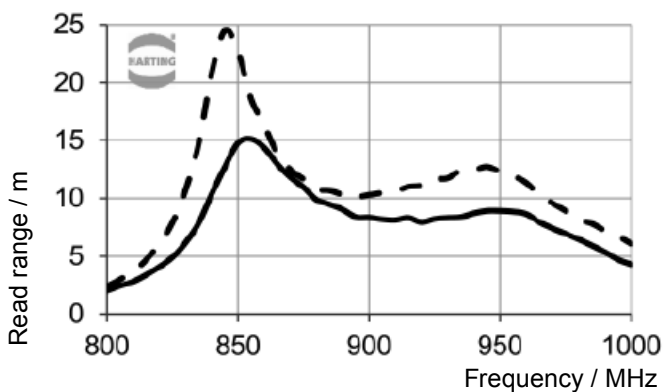


Technical characteristics

Frequency range	860 ... 930 MHz	global
Protocol	EPC Class 1 Gen 2	
EPC / User Memory (Chip)	96 Bit / 512 Bit	(Alien Higgs 3)
Temperature range	Function Storage	-50 °C ... +85 °C -65 °C ... +130 °C
Housing	Size (W x D x H) Protection class Mounting Colour	320 x 60 x 50 mm IP64 / IP67 / IP69K screws metallic

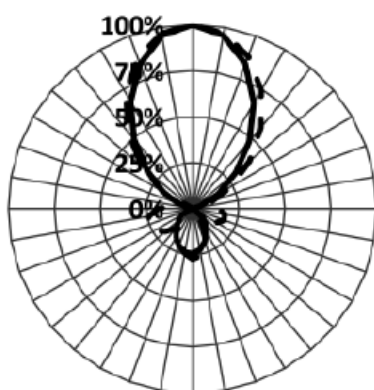
Measurements

Read range / Radiation pattern

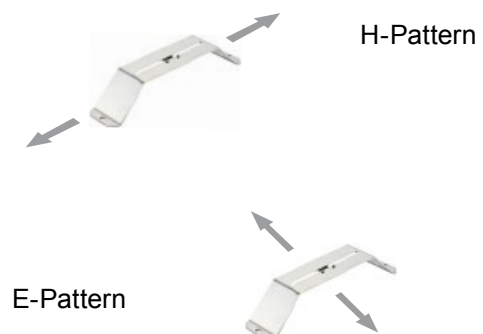


— air – forward
- - metal –
200 x 100 mm –
forward

Theoretical read range measured in free field conditions (radiated power – 2 W ERP).



- - E-Pattern
— H-Pattern



The general Shape of the Radiation Pattern remains the same, regardless of:

- Placement of tag on different metallic surfaces
- 868 MHz or 915 MHz



Passive UHF Transponder
Ha-VIS RFID CT 89 (NT)

Features

- High read range also in wet materials
- Robust housing
- EPC C1 Gen2 compatible
- Degree of protection IP69K
- Extended memory

General Description

- Identification of reinforced concrete parts for the building industry
- Integration in concrete floors for location of storage areas
- Read range (free space, 2 W ERP): ≥ 5.0 m

Identification	Part number	Drawing	Dimensions in mm
Passive UHF Transponder Ha-VIS RFID CT 89 (NT)			
Packaging unit	10 pieces 50 pieces	20 92 641 0301 20 92 641 0302	

Technical characteristics

Frequency range	860 MHz ... 960 MHz	
Protocol	EPC C1Gen2	
Chip	NXP UCODE G2XM	
Memory	512 Bit	
Temperature range	Operational range (read)	-40 °C ... +85 °C
	Operational range (write)	-40 °C ... +85 °C
	Storage	-50 °C ... +85 °C
Housing	Size (W x D x H)	165 x 51 x 2 mm
	Degrees of protection	IP64 / IP67 / IP69K
	Mounting	M4 screws or rivets with washers
	Colour	black



Passive UHF Transponder
Ha-VIS RFID CF 89 (NT)

Features

- High read range also in wet materials
- Robust housing
- EPC C1 Gen2 compatible
- Degree of protection IP69K
- Extended memory

General Description

- Identification of reinforced concrete parts for the building industry
- Integration in concrete floors for location of storage areas
- Read range (free space, 2 W ERP): ≥ 5.0 m

Identification	Part number	Drawing	Dimensions in mm
Passive UHF Transponder Ha-VIS RFID CF 89 (NT)			
Packaging unit	10 pieces 50 pieces	20 92 641 0401 20 92 641 0402	

Technical characteristics

Frequency range	860 MHz ... 960 MHz	
Protocol	EPC C1Gen2	
Chip	NXP UCODE G2XM	
Memory	512 Bit	
Temperature range	Operational range (read)	-40 °C ... +85 °C
	Operational range (write)	-40 °C ... +85 °C
	Storage	-50 °C ... +85 °C
Housing	Size (W x D x H)	108 x 48 x 2.4 mm
	Degrees of protection	IP64 / IP67 / IP69K
	Mounting	M4 screws or rivets with washers
	Colour	black



Passive UHF Transponder
Ha-VIS RFID CS 89 (NT)

Features

- High read range also in wet materials
- Robust housing
- EPC C1 Gen2 compatible
- Degree of protection IP69K
- Extended memory

General Description

- Identification of reinforced concrete parts for the building industry
- Integration in concrete floors for location of storage areas
- Read range (free space, 2 W ERP): ≥ 5.0 m

Identification	Part number	Drawing	Dimensions in mm
Passive UHF Transponder Ha-VIS RFID CS 89 (NT)			
Packaging unit	10 pieces 50 pieces	20 92 641 0501 20 92 641 0502	

Technical characteristics

Frequency range	860 MHz ... 960 MHz	
Protocol	EPC C1Gen2	
Chip	NXP UCODE G2XM	
Memory	512 Bit	
Temperature range	Operational range (read)	-40 °C ... +85 °C
	Operational range (write)	-40 °C ... +85 °C
	Storage	-50 °C ... +85 °C
Housing	Size (W x D x H)	108 x 27 x 2.4 mm
	Degrees of protection	IP64 / IP67 / IP69K
	Mounting	M4 screws or rivets with washers
	Colour	black

Available
May 2015



Transponder
Ha-VIS RFID Control ETB 86v1

Features

- Passive RFID Transponder with monitoring function
- Monitoring of 2 inputs
- Dry contact control via 8 m cable
- Optimised for the EU frequency band
- Optimised for function on metal
- Completely Class 1 Gen 2 compatible
- Read range on metal, 2 W ERP: up to 4 m
- Extremely robust and chemically resistant housings
- Easy fixing (with screws)
- High temperature resistance
- Protection class IP67

General description

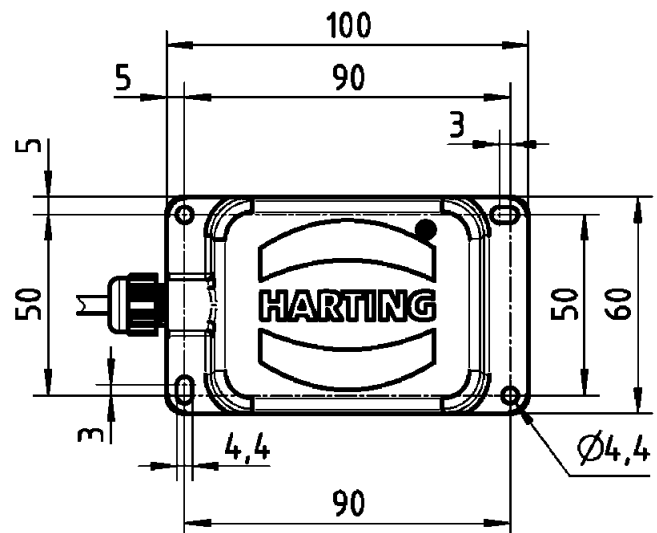
- The Ha-VIS RFID Control ETB is an intelligent UHF Transponder acting as a condition monitoring system. In addition to the EPC Header and User Memory, it communicates the status of 2 digital inputs. Due to these inputs i.e. open/closed contacts are connected directly via a cable to the transponder.
- Passive mode, no power supply on transponder necessary
- Control transponder for:
 - industrial conveyor systems
 - lifts or elevator systems
 - cable cars
 - moving parts (machinery)
 - intelligent vehicles

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS RFID Control ETB 86v1

Packaging unit: 1 piece

20 92 614 7055

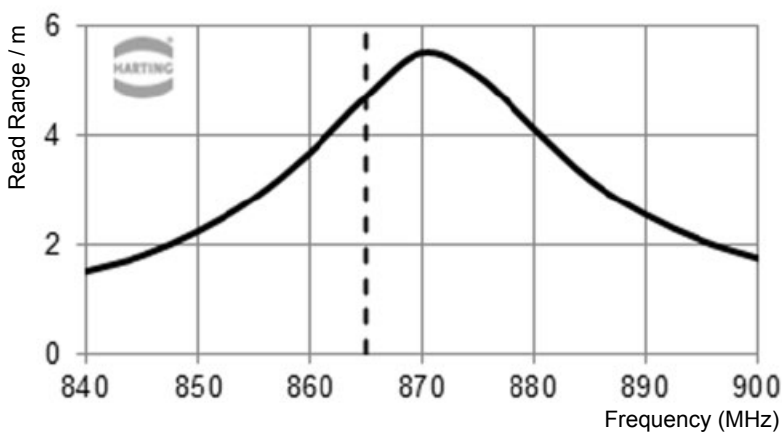


Technical characteristics

Frequency range	860 ... 870 MHz, EU frequency band
Protocol	EPC Class 1 Gen 2
EPC / User Memory	128 Bit / 512 Bit
Read range on metal, 2 W ERP	up to 4 m
Temperature range Operational	-40 °C ... +85 °C
Housing	
Dimensions (W x D x H)	100 x 60 x 18 mm
Protection class	IP67
Mounting	screws, rivets, glue
Colour	black

Measurements

Read range

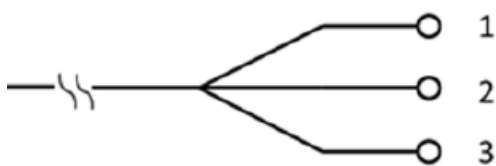


— on metal
200 x 200 mm
forward

Theoretical read range measured in
free field conditions
(radiated power: 2 W ERP)

Monitoring function

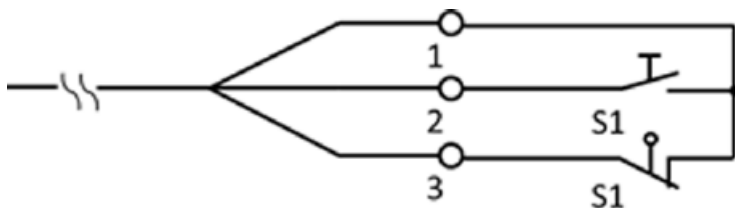
Pin assignment of cable



Pin	colour code	function
1	green	U _V
2	brown	input 1
3	white	input 2

Status of inputs is stored in the User Memory:
decimal address 268 / Bit 0 and 1 (MSB first)

Connection example





RFID Reader
Ha-VIS RFID RF-R500

General description

The Ha-VIS® RFID RF-R500 is a high performance UHF RFID long range reader. It supports up to 4 antennas simultaneously reducing costs and easing integration of RFID technology. Due to its robust aluminium housing and up to IP64, it is ideally suited for industrial applications.

The reader was designed for very high reading sensitivity combined with impressive reading and data processing speed. The reader brings wireless RFID communication into industrial environments.

The reader can directly control lamps, sirens or gates via the integrated GPIOs.

Features

- Up to 4 antenna
- Up to 4 W transmitting power
- Impressive bulk reading
- Power over Ethernet (PoE)
- Up to IP64 with an optional protection cap (otherwise IP53)
- 5 hardware interfaces: Ethernet, RS 232, RS 485, USB

Advantages

- High receiver sensitivity for enlarged and homogeneous tag detection range
- Metal housing
- Integrated antenna multiplexer
- Simple installation
- Versatile hardware and software configuration

Application fields

- Smart infrastructure
- Logistics
- Asset management
- Machinery

Technical characteristics

Transponder protocol	EPC Gen2 (ISO 18000-6-c)
UHF RFID antenna interface	
Antenna connection	4x SMA connector (50 Ohm); Reader internally multiplexed
Frequency area	860 MHz ... 960 MHz (depending on specific reader)
Radio license	Europe EN 302 208
Supply voltage on antenna outputs	24 V DC / 200 mA (Ha-VIS RFID RF-R500-p only)
Interfaces	
	<ul style="list-style-type: none"> • Ethernet (TCP/IP) 10/100 Mbit/s; Full Spec. 802.3 • RS 232 / RS 485 • USB / USB-Port for WLAN dongle or external memory
Inputs	5 Optocoupler (max. 24 V DC / 20 mA)
Outputs	<ul style="list-style-type: none"> • 2 Optocoupler (24 V DC / 30 mA) • 3 Relays (24 V DC / 1 A)
LED Diagnosis	
8 LEDs (from left to right)	<ul style="list-style-type: none"> • Run • Host communication • Warning • Input / output • Antenna 1 • Antenna 2 • Antenna 3 • Antenna 4
Performance	
Max. Operating Distance	Up to 16 m, depending on kind of transponder & environmental conditions
Protocol Modi	
	<ul style="list-style-type: none"> • HARTING Host Mode • Scan Mode • Notification Mode • Buffered Read Mode
Power Supply	
Current consumption	max. 2 A
Design features	
Material of housing	Aluminium, powder coated
Dimensions (W x H x D)	260 x 157 x 68 mm
Weight	2000 g
Degree of protection acc. to DIN 60 529	IP64 (with protection cap) / IP53 (without protection cap)
Installation on DIN rail	DIN rail mounting kit (optional accessories)

Technical characteristics

Environmental conditions

Operating temperature	-25 °C ... +50 °C
Storage temperature	-25 °C ... +85 °C
Relative humidity	5 % ... 95 % (non-condensing)
Vibration	EN 60 068-2-6 10 Hz ... 150 Hz: 0.075 mm / 1 g
Shock	EN 60 068-2-27 Acceleration: 30 g

Norms & Safety

Radio license	<ul style="list-style-type: none"> • EN 302 208 • FCC 47 FCR Part 15 • IC RSS-GEN, RSS-210
EMC	EN 301 489
Low voltage	EN 60 950
Human Exposure	EN 50 364
RoHS compliant	

RF diagnosis

- RF Channel monitoring
- Antenna SWR control
- Internal overheating control

Operating system

Linux (Kernel 3.x.x)
64 MB RAM, 256 MB Flash

Others

- Anticollision function
- Real time clock
- RSSI

Software

Demo- and configuration software	Ha-VIS RFID config
Minimal hardware requirements	<ul style="list-style-type: none"> • Personal computer IBM PC Pentium III 1000 MHz or faster recommended • Windows XP® (32 Bit) with 256 MB RAM or Windows® 7 (32 / 64 Bit) • Hard disk with minimum free 30 MB memory space • Windows® compatible mouse • Windows® compatible super VGA graphic card (800 x 600) (1024x768 recommended)



UHF RFID Long Range Reader
Ha-VIS RFID RF-R500-c-EU

Technical characteristics

Antenna connection	4x SMA connector (50 Ohm); reader internally multiplexed
Transmitting Power	max. 2 W
Frequency area	865 MHz ... 870 MHz
Radio license	EN 302 208
Inputs	5 optocoupler (max. 24 V DC / 20 mA)
Outputs	<ul style="list-style-type: none"> • 2 optocoupler (24 V DC / 30 mA) • 3 relays (24 V DC / 1 A)
Bulk-Read capability	< 150 transponders/sec
Max. Operating Distance	< 10 m, depending on kind of transponder & environmental conditions
Power supply	+24 V DC ($\pm 5\%$)
Current consumption	max. 2 A
Dimensions (W x H x D)	260 x 157 x 68 mm
Weight	2000 g
Degree of protection acc. to DIN 60 529	IP64 (with protection cap) / IP53 (without protection cap)
Operating temperature	-25 °C ... +50 °C

Identification	Part number	Drawing	Dimensions in mm
UHF RFID long range Reader Ha-VIS RFID RF-R500-c-EU 2 W transmission power EU version	20 91 104 1103	<p>The drawing shows two views of the reader. The top view shows a rectangular device with a height of 68 mm. The front view shows a width of 241.7 mm and a height of 157.3 mm. There are two mounting holes on the left side, with a center-to-center distance of 34 mm and a distance of 25.5 mm from the left edge to the first hole. On the right side, there are two mounting holes with diameters of $\phi 5$ and $\phi 10$.</p>	



UHF RFID Long Range Reader
Ha-VIS RFID RF-R500-p-EU

Technical characteristics

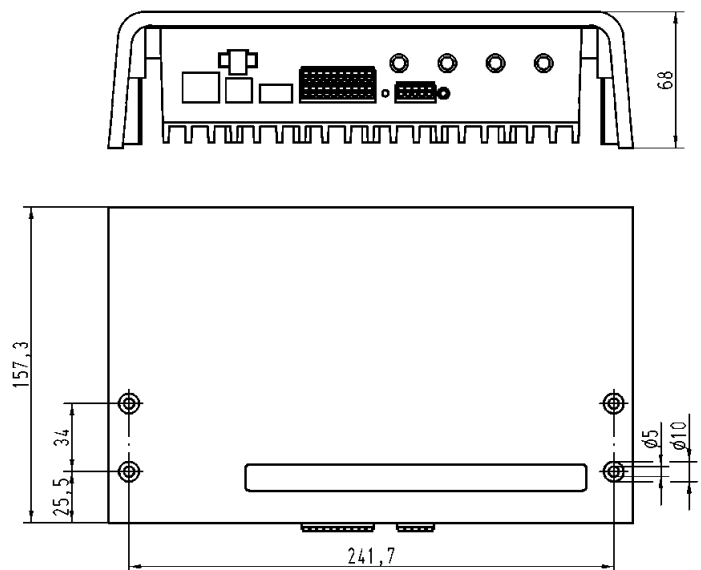
Antenna connection	4x SMA connector (50 Ohm); reader internally multiplexed
Transmitting Power	max. 4 W / max. 1 W in PoE mode
Frequency area	865 MHz ... 870 MHz
Radio license	EN 302 208
Supply voltage on antenna outputs	24 V DC / 200 mA
Inputs	5 optocoupler (max. 24 V DC / 20 mA)
Outputs	<ul style="list-style-type: none"> • 2 optocoupler (24 V DC / 30 mA) • 3 relays (24 V DC / 1 A)
Bulk-Read capability	> 150 transponders/sec
Max. Operating Distance	Up to 16 m, depending on kind of transponder & environmental conditions
Power supply	+24 V DC ($\pm 5\%$) / Power over Ethernet (PoE)
Current consumption	max. 2 A
Dimensions (W x H x D)	260 x 157 x 70 mm
Weight	2000 g
Degree of protection acc. to DIN 60 529	IP64 (with protection cap) / IP53 (without protection cap)
Operating temperature	-25 °C ... +50 °C

Identification	Part number	Drawing	Dimensions in mm
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UHF RFID long range Reader
Ha-VIS RFID RF-R500-p-EU
4 W transmission power
with PoE

EU version

20 91 104 1101





UHF RFID Long Range Reader
Ha-VIS RFID RF-R500-c-US

Technical characteristics

Antenna connection	4x SMA connector (50 Ohm); reader internally multiplexed
Transmitting Power	max. 2 W
Frequency area	902 MHz ... 928 MHz
Radio license	FCC 47 CFR Part 15; IC RSS-GEN; IC RSS -210
Inputs	5 optocoupler (max. 24 V DC / 20 mA)
Outputs	<ul style="list-style-type: none"> • 2 optocoupler (24 V DC / 30 mA) • 3 relays (24 V DC / 1 A)
Bulk-Read capability	< 150 transponders/sec
Max. Operating Distance	Up to 10 m, depending on kind of transponder & environmental conditions
Power supply	+24 V DC ($\pm 5\%$)
Current consumption	max. 2 A
Dimensions (W x H x D)	260 x 157 x 68 mm
Weight	2000 g
Degree of protection acc. to DIN 60 529	IP64 (with protection cap) / IP53 (without protection cap)
Operating temperature	-25 °C ... +50 °C

Identification	Part number	Drawing	Dimensions in mm
UHF RFID long range Reader Ha-VIS RFID RF-R500-c-US 2 W transmission power US version	20 91 104 1104	<p>The drawing shows two views of the reader. The top view shows a rectangular device with a height of 68 mm. The front view shows a width of 241.7 mm and a height of 157.3 mm. There are two mounting holes on the front panel, with a center-to-center distance of 34 mm and a distance of 25.5 mm from the left edge to the first hole. The mounting holes have a diameter of 5 mm (ø5) and a depth of 10 mm (ø10).</p>	



RFID Reader
Ha-VIS RFID RF-R500-p-US

Technical characteristics

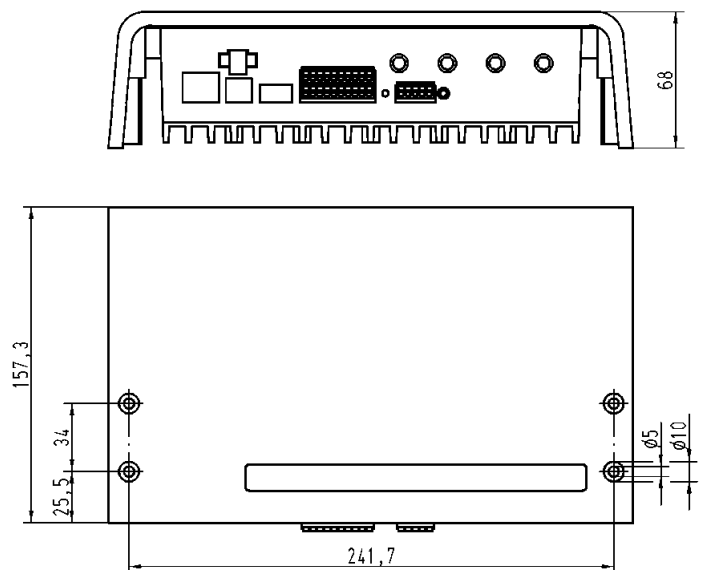
Antenna connection	4x SMA connector (50 Ohm); reader internally multiplexed
Transmitting Power	max. 4 W / max. 1 W in PoE mode
Frequency area	902 MHz ... 928 MHz
Radio license	FCC 47 CFR Part 15; IC RSS-GEN; IC RSS -210
Supply voltage on antenna outputs	24 V DC / 200 mA
Inputs	5 optocoupler (max. 24 V DC / 20 mA)
Outputs	<ul style="list-style-type: none"> • 2 optocoupler (24 V DC / 30 mA) • 3 relays (24 V DC / 1 A)
Bulk-Read capability	> 150 transponders/sec
Max. Operating Distance	Up to 16 m, depending on kind of transponder & environmental conditions
Power supply	+24 V DC ($\pm 5\%$) / Power over Ethernet (PoE)
Current consumption	max. 2 A
Dimensions (W x H x D)	260 x 157 x 70 mm
Weight	2000 g
Degree of protection acc. to DIN 60 529	IP64 (with protection cap) / IP53 (without protection cap)
Operating temperature	-25 °C ... +50 °C

Identification	Part number	Drawing	Dimensions in mm
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UHF RFID long range Reader
Ha-VIS RFID RF-R500-p-US
4 W transmission power
with PoE

US version

20 91 104 1102





Ha-VIS RFID Handheld RF-M3000

mobile UHF RFID Reader

Technical characteristics

The Ha-VIS RF-M3000 is a powerful mobile RFID Reader, approved acc. to ETSI, FCC und IC.

Properties

- Highly sensitive receiver for extended reading range
- Robuste housing
- High protection class IP65
- WLAN, Bluetooth and RFID in one handheld
- Large, very bright display
- Very long battery life (> 8 h)
- Highly modular

Standard configuration

- WIFI
- Bluetooth
- large keyboard

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS RFID Handheld RF-M3000 standard configuration (no barcode)	20 91 211 1011		
Ha-VIS RFID Handheld RF-M3001 additional to Ha-VIS RF-M3000 with: • 1D Laser Scanner	20 91 211 1111		
Ha-VIS RFID Handheld RF-M3002 additional to Ha-VIS RF-M3000 with: • 2D Imager	20 91 211 1311		
Optional: • GPS • small keyboard • GPRS • 3G HSDPA	on request		
Recommended accessories:			
High capacity battery	20 93 405 0101		
Docking Station Desktop	20 93 305 0101		
Docking Station Quad	20 93 305 0102		

Technical characteristics

Processor and memory	PXA270 624 MHz Processor 1 GB FLASH ROM 256 MB RAM
Operating system	Windows(R) CE 5
Wireless communication	WLAN 802.11 b/g Compact Flash Bluetooth® Class II, V 2.0 + EDR
Barcode scanner	1D Laser Scanner Long Range or 2D Area Imager Optional pistol grip
RFID module	UHF module Frequency 868 MHz or 915 MHz Tag supported: EPC Class 1 Gen 2; other protocols on request Reading-Writing distance up to 250 cm
External connections	Tether-Port for RS 232 and USB On-The-Go (USB 1.1) Docking-connector DC power jack
User interface	VGA colour touchscreen 3,6", resolution 480x640, TFT Sunlight readable (for outdoor use), LED backlight Touch screen pencil (stylus) or finger operation Keyboard (alphanumeric ABCDEF); alternatives on request Audio: 90 dB speaker, microphone, beeper
Programming environment	HTML, XML Mobile Devices SDK .NET and C++ via Microsoft Visual Studio® 2005 Java programming support JDK 1.2. or higher Standard Protocol APIs Windows sockets (CE.net)
Expansion slots	SD/MMC memory card slot 100-pin Expansion interface supports PCMCIA (Type II), GPRS/EDGE One Type II CF card slot
Power management	4400 mAh High capacity Accu (3,7 V) Advanced Smart Battery System Built-in Charger
Environmental	Withstands several drops from 1,8 m to polished concrete while powered on and configured with accessories Rain/Dust: IP65, IEC 60 629 Operating temperature: -20 °C ... +50 °C Storage temperature: -40 °C ... +60 °C Relative humidity: 5 % ... 95 % (non-condensing) ESD +/- 8 kV DC air discharge; +/- 4 kV DC contact
Dimensions (W x H x D)	223 mm x 75/100 mm x 31/42 mm
Approvals	Safety CSA/UL60950-1, IEC 60950-1, EN 60950-1 EMC FCC Part15 Class B EN 55022; EN 55024; EN 301 489 Laser IEC 60825-1, Class 2 FDA 21 CFR 1040.10, 1040.11 Class II Bluetooth 1.2 In-vehicle cradle: e Mark



Ha-VIS RFID Box

Technical characteristics

The Ha-VIS RFID Box offers system integrators and customers a complete RFID System “out of the Box.”

The box is made from steel. All components are preinstalled and tested. The box is ready for installation. You only have to connect power, Ethernet and antenna.

Properties

- 2 mm VA steel box
- Locked with key

Advantages

- **Completely installed RFID system in a box**
- **Tested and ready to connect**
- **Highly modular**
- **Customer specific configurations**
- **Robust Metal housing**

Standard configuration

- Ethernet Switch: Ha-VIS eCon 2050-A
- Bottom plate: Bushing; 1x M20 / 1x M25 / 4x M32

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS RFID Box standard configuration			
with RFID Reader Ha-VIS RF-R500-p-EU	20 91 421 1001		
with RFID Reader Ha-VIS RF-R500-c-EU	20 91 411 1001		
other configuration	on request		
Accessories			
Blanking pieces metal			
M20	19 00 000 5070		
M25	19 00 000 5071		
M32	19 00 000 5072		
Cable glands metal			
M20 (cable Ø 6 mm ... 12 mm)	19 00 000 5082		
M25 (cable Ø 9 mm ... 16 mm)	19 00 000 5090		
M32 (cable Ø 13 mm ... 20 mm)	19 00 000 5094		

Technical characteristics

General

Housing	VA steel, powder coated
Physical dimensions (W x H x D)	430 mm x 430 mm x 220 mm
Degree of protection	IP65
Colour	light grey (RAL 7073)
Power supply	230 V or 110 V
Over voltage protection	Class II
Cable bushings	
standard:	up to 10 bushings for Power, Ethernet, GPIOs, antenna cables
optional:	<ul style="list-style-type: none"> • Han-Yellock® 1 Han-Yellock® 60 bulkhead mounted housing for Power, Ethernet and GPIOs 1 Han-Yellock® 60 bulkhead mounted housing for up to 4 antenna cables • Han® B 1 Han® 16 B bulkhead mounted housing for Power, Ethernet and GPIOs 1 Han® 24 B bulkhead mounted housing for up to 4 antenna cables • HARTING Push Pull 1 HARTING Push Pull for Power 1 HARTING Push Pull for Ethernet up to 4 bushings for antenna cables

Installed components

standard	<ul style="list-style-type: none"> • RFID Reader Ha-VIS RF-R500-p-EU or Ha-VIS RF-R500-c-EU • Ethernet Switch Ha-VIS eCon 2050-A • Power supply <p>All components are completely connected, tested and ready for field installation.</p>
other configuration:	on request

Further components, for example Industrial PC, heater, van on request

Ha-VIS RFID Reader

standard:	<ul style="list-style-type: none"> • for harsh industrial environments • up to 16 m read range • Degree of protection up to IP64 • excellent UHF performance in metal containing • 865 MHz ... 870 MHz • 5 / 5 GPIOs • connections for Ethernet, USB, RS 232, RS 485 • up to 4 W transmission power
other configuration:	on request

Environmental conditions

Temperature range	depending on configuration
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UHF Wide range antenna
Ha-VIS RF-ANT-WR30

General description

Features

- UHF RFID wide range antenna
- Reading range up to 16 m (depending upon tag properties, environment and requirements)
- Compact construction
- Optimized for portal applications
- Suitable for industrial environments
- High IP65 protection class
- Suitable for outdoor usage

Advantages

Application fields

- Smart infrastructure
- Gate applications
- Asset management
- Machinery

Technical characteristics

Technical properties

Polarization	circular
Axial ratio	typ. 1 dB
VSWR	< 1.2:1
Impedance	50 Ohm
Front-to-back ratio	> 18 dB
Far field half-power beam width	69°
Connection	TNC socket
Protection class	IP65
Weight	approx. 1.7 kg
Dimensions (WxDxH)	270 x 270 x 45 mm
Material	
Antenna cover	tough, weather-resistant polymer blend colour RAL 7045
Chassis	Aluminium
Seals	thermoplastic elastomer
Installation	four M5 drill holes 100 x 100 mm
Temperature range	
storage	-40 °C ... +85 °C
ambient	-20 °C ... +55 °C



UHF Wide range antenna
Ha-VIS RF-ANT-WR30-EU

Technical characteristics

Frequency range	865 MHz ... 870 MHz
Antenna gain	8.5 dBic @ 866 MHz
Max. radiated power	(ETSI EN 302 208) 2 W ERP

Identification	Part number	Drawing	Dimensions in mm
UHF Wide range antenna Ha-VIS RF-ANT-WR30-EU			
EU version	20 93 201 0102		
Recommended accessories			
Antenna cables			
Ha-VIS Coax ...			
... SMA-TNC, RG58	3 m	20 93 204 0101	
... SMA-TNC, LL240flex	3 m	20 93 204 0102	
... SMA-TNC, LL240flex	10 m	20 93 204 0103	
Antenna mounting kit			
Ha-VIS RF-MOUNT-ANT-C	20 93 102 0101		



UHF Wide range antenna
Ha-VIS RF-ANT-WR30-US

Technical characteristics

Frequency range	902 MHz ... 928 MHz
Antenna gain	8.3 dBic @ 915 MHz
Max. radiated power	(FCC 15.247) 4 W EIRP

Identification	Part number	Drawing	Dimensions in mm
UHF Wide range antenna Ha-VIS RF-ANT-WR30-US			
US version	20 93 201 0103		
Recommended accessories			
Antenna cables			
Ha-VIS Coax ...			
... SMA-TNC, RG58	3 m	20 93 204 0101	
... SMA-TNC, LL240flex	3 m	20 93 204 0102	
... SMA-TNC, LL240flex	10 m	20 93 204 0103	
Antenna mounting kit			
Ha-VIS RF-MOUNT-ANT-C	20 93 102 0101		



Ruggedized UHF Wide range antenna
Ha-VIS RF-ANT-WR80-30

General description

Features

- UHD RFID wide range antenna
- Reading range up to 16 m (depending upon tag properties, environment and requirements)
- Compact design for ruggedized environmental applications
- Optimized for portal applications
- Different half power beam widths in azimuth and elevation plane
- Suitable for industrial environments
- High IP65 protection class
- Suitable for outdoor usage

Advantages

Application fields

- Smart infrastructure
- Gate applications
- Asset management

Technical characteristics

Technical properties

Polarization	circular
Axial ratio	< 2 dB
VSWR	< 1.2:1
Impedance	50 Ohm
Front-to-back ratio	> 20 dB
Far field half-power beam width	30° vertical 70° horizontal
Connection	N (female)
Protection class	IP65
Weight	approx. 3.7 kg
Dimensions (WxDxH)	557 x 262 x 59 mm

Material

Antenna cover	fiberglass radome (UV resistance), gray
Chassis	stainless steel
Plate patch	brass tin-plated
Gasket	thermoplastic elastomer

Installation four M5 drill holes 100 x 100 mm

Temperature range

storage	-40 °C ... +85 °C
ambient	-20 °C ... +65 °C



Ruggedized UHF Wide range antenna
Ha-VIS RF-ANT-WR30-EU

Technical characteristics

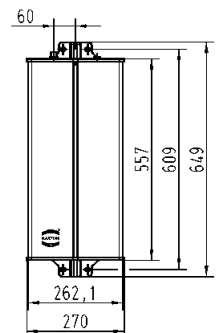
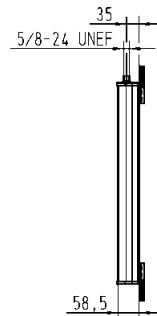
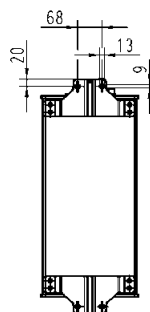
Frequency range	865 MHz ... 870 MHz
Antenna gain	11.0 dBic
Max. radiated power	(ETSI EN 302 208) 2 W ERP

Identification	Part number	Drawing	Dimensions in mm
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Ruggedized UHF Wide range antenna
Ha-VIS RF-ANT-WR80-30-EU

EU version

20 93 201 0203





Ruggedized UHF Wide range antenna
Ha-VIS RF-ANT-WR30-US

Technical characteristics

Frequency range	902 MHz ... 928 MHz
Antenna gain	10.5 dBic
Max. input power (FCC 15.247)	700 mW (28.5 dBm) conducted for a max. radiated power of 4 W EIRP

Identification	Part number	Drawing	Dimensions in mm
Ruggedized UHF Wide range antenna Ha-VIS RF-ANT-WR80-30-US US version	20 93 201 0204		



UHF Middle range antenna
Ha-VIS RF-ANT-MR20

General description

Features

- UHF RFID middle range antenna
- Reading range up to 2 m (depending upon tag properties, environment and requirements)
- Compact design for ruggedized environmental applications
- Suitable for industrial environments
- High IP67 protection class
- Suitable for outdoor usage

Advantages

Application fields

- Smart infrastructure
- Asset management

Technical characteristics

Technical properties

Polarization	circular
Axial ratio	typ. 2 dB
Impedance	50 Ohm
Front-to-back ratio	> 10 dB
Far field half-power beam width	100°
Connection	TNC socket
Protection class	IP67
Weight	approx. 0.3 kg
Dimensions (WxDxH)	156 x 126 x 25 mm

Material

Antenna cover	Tough, weather-resistant polymer blend
Colour	RAL 7045 (light grey)

Installation	four through-holes diameter 4.2 mm for M4 screws
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Temperature range

storage	-40 °C ... +85 °C
ambient	-20 °C ... +55 °C



UHF Middle range antenna
Ha-VIS RF-ANT-MR20-EU

Technical characteristics

Frequency range	865 MHz ... 870 MHz
Antenna gain	4 dBic @ 866 MHz
Max. radiated power	(ETSI EN 302 208) 0.5 W ERP
VSWR	< 1.3:1

Identification	Part number	Drawing	Dimensions in mm
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UHF Wide range antenna
Ha-VIS RF-ANT-MR20-EU

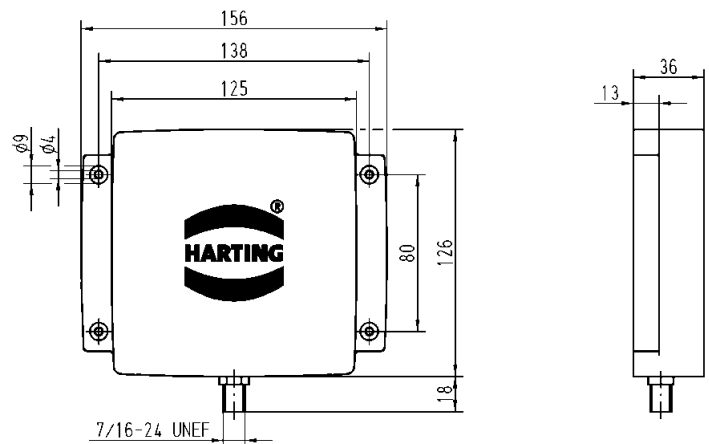
EU version

20 93 201 0301

Recommended accessories

Antenna cables

Ha-VIS Coax ...		
... SMA-TNC, RG58	3 m	20 93 204 0101
... SMA-TNC, LL240flex	3 m	20 93 204 0102
... SMA-TNC, LL240flex	10 m	20 93 204 0103





UHF Middle range antenna
Ha-VIS RF-ANT-MR20-US

Technical characteristics

Frequency range	902 MHz ... 928 MHz (FCC)
Antenna gain	2.5 dBic
Max. input power	(FCC 15.247) 1 W
VSWR	< 1.5:1

Identification	Part number	Drawing	Dimensions in mm
UHF Wide range antenna Ha-VIS RF-ANT-MR20-US US version	20 93 201 0302		
Recommended accessories Antenna cables Ha-VIS Coax ...			
... SMA-TNC, RG58 3 m	20 93 204 0101		
... SMA-TNC, LL240flex 3 m	20 93 204 0102		
... SMA-TNC, LL240flex 10 m	20 93 204 0103		



Ruggedized UHF Ultra low range antenna
Ha-VIS RF-ANT-LR10

General description

Features

- UHD RFID wide range antenna
- Compact design for ruggedized environmental applications
- Different half power beam widths in azimuth and elevation plane
- Suitable for industrial environments
- High IP67 protection class
- Suitable for outdoor usage

Advantages

Application fields

- Smart infrastructure
- Asset management

Technical characteristics

Electric properties

EIFF *	15 dB
VSWR	< 1.2:1
Impedance	50 Ohm
Range of near field tags **	3 cm
Selectivity of near field tags **	3 cm
Connection	TNC socket

Mechanical properties

Dimensions (B x H x T)	90 x 63 x 31 mm
Weight	0.1 kg
Degree of protection	IP67
Antenna cover	Tough, weather-resistant polymer blend
Colour	RAL 7045 (light grey)
Installation	Four through-holes diameter 4.2 mm for M4 screws
Operating temperature range	-20 °C ... +55 °C
Storage temperature range	-40 °C ... +85 °C

* ... The Effective Isotropic Field Factor (EIFF) shows the field isolation from far field to near field standardized to an isotropic radiator. The values were determined with 3 cm spacing.

** ... dependent upon transmission power and tag typ



Ruggedized UHF Ultra low range antenna
Ha-VIS RF-ANT-LR10

Technical characteristics

Frequency range	865 MHz ... 928 MHz
Antenna gain	-30 dBic
Max. radiated power	(compliant to FCC) 1 W

Identification	Part number	Drawing	Dimensions in mm
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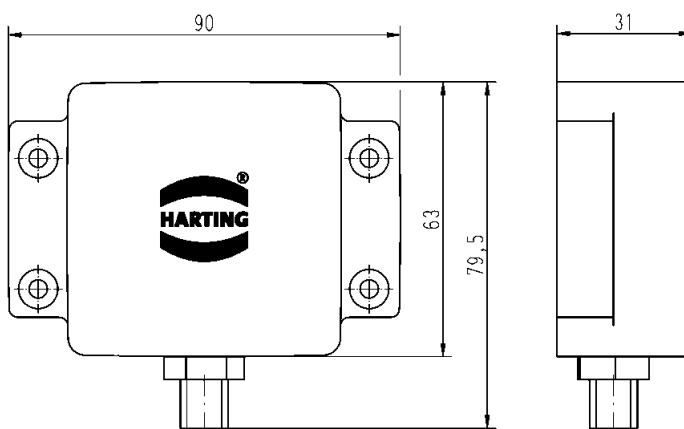
UHF Ultra low range antenna
Ha-VIS RF-ANT-LR10

20 93 201 0303

Recommended accessories

Antenna cables

Ha-VIS Coax ...		
... SMA-TNC, RG58	3 m	20 93 204 0101
... SMA-TNC, LL240flex	3 m	20 93 204 0102
... SMA-TNC, LL240flex	10 m	20 93 204 0103





Ha-VIS Coax, SMA-TNC, RG58

Low cost coax cable,
left side TNC connector, right side SMA connector

IP20	<input type="checkbox"/>	IP65 / IP67	<input type="checkbox"/>	IP65 / IP67 to IP20	<input type="checkbox"/>	Cat. 5	<input type="checkbox"/>	Cat. 6	<input type="checkbox"/>
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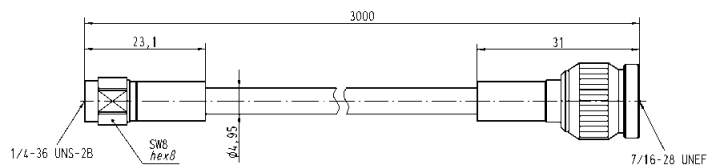
Connector types	left side TNC connector, right side SMA connector
Sheath material	PE, Black
Outer diameter	4.95 mm
Cable weight	35 kg/km
Minimum bend radius (single bend)	25 mm
Operating temperature range	-20 °C ... +70 °C
Impedance	50 Ohm
Attenuation	63 dB/100 m @ 800 MHz (depending on application and environmental conditions)
Standard lengths	3 m
Colour	Black

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS Coax, SMA-TNC, RG58

Black
20 93 204 0101

Length 3.0 m





Ha-VIS Coax, SMA-TNC, LL240 flex

Low loss coax cable,
left side TNC connector, right side SMA connector

IP20	<input type="checkbox"/>	IP65 / IP67	<input type="checkbox"/>	IP65 / IP67 to IP20	<input type="checkbox"/>	Cat. 5	<input type="checkbox"/>	Cat. 6	<input type="checkbox"/>
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Connector types	left side TNC connector, right side SMA connector
Sheath material	PE, Black
Outer diameter	5.4 ± 0.2 mm
Cable weight	39 kg/km
Minimum bend radius (single bend)	35 mm
Operating temperature range	-40 °C ... +80 °C
Impedance	50 Ohm
Screening effectiveness	> 75 dB (30 MHz ... 1000 MHz)
Attenuation	28 dB/100 m @ 800 MHz (depending on application and environmental conditions)
Standard lengths	3 m / 10 m
Colour	Black

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS Coax, SMA-TNC, LL240flex	Black		
	Length 3.0 m Length 10.0 m		



Ha-VIS Coax, SMA-N, LL240 flex

Low loss coax cable,
left side N connector, right side SMA connector

IP20	<input type="checkbox"/>	IP65 / IP67	<input type="checkbox"/>	IP65 / IP67 to IP20	<input type="checkbox"/>	Cat. 5	<input type="checkbox"/>	Cat. 6	<input type="checkbox"/>
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Connector types	left side N connector, right side SMA connector
Sheath material	PE, Black
Outer diameter	5.4 ± 0.2 mm
Cable weight	39 kg/km
Minimum bend radius (single bend)	35 mm
Operating temperature range	-40 °C ... +80 °C
Impedance	50 Ohm
Screening effectiveness	> 75 dB (30 MHz ... 1000 MHz)
Attenuation	28 dB/100 m @ 800 MHz (depending on application and environmental conditions)
Standard lengths	3 m / 10 m
Colour	Black

Identification	Part number	Drawing	Dimensions in mm
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Ha-VIS Coax, SMA-N, LL240flex	Black		
	Length 3.0 m Length 10.0 m		


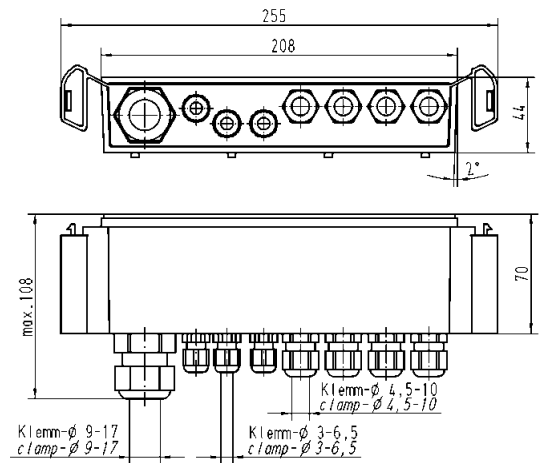
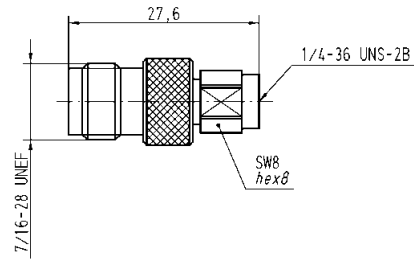


Ha-VIS Coax, TNC-N, RG213

Low loss ruggedized coax cable,
left side N connector, right side TNC connector

IP20	<input type="checkbox"/>	IP65 / IP67	<input type="checkbox"/>	IP65 / IP67 to IP20	<input type="checkbox"/>	Cat. 5	<input type="checkbox"/>	Cat. 6	<input type="checkbox"/>
Connector types	left side N connector, right side TNC connector <input type="checkbox"/>								
Sheath material	PVC, Black								
Outer diameter	10.3 ± 0.2 mm								
Cable weight	161.7 kg/km								
Minimum bend radius (single bend)	35 mm								
Operating temperature range	-55 °C ... +85 °C								
Impedance	50 Ohm								
Screening effectiveness	> 55 dB (100 MHz ... 900 MHz)								
Attenuation	22 dB/100 m @ 800 MHz (depending on application and environmental conditions)								
Standard lengths	3 m / 10 m								
Colour	Black								
Optional accessory	SMA-TNC adapter, necessary to connect to Ha-VIS RF-R500								

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS Coax, TNC-N, RG213 Length 3.0 m Length 10.0 m	Black 20 93 204 0106 20 93 204 0107		

Identification	Part number	Drawing	Dimensions in mm
<p>DIN rail Mounting kit</p> <p>Mounting kit for Ha-VIS RF-R500 for easy mounting on a DIN rail</p> <p>Inclusive necessary screws</p> 	20 93 102 0201		
<p>Protection cap for Ha-VIS RF-R500</p> <p>Protection cap for increased degree of protection from IP53 to IP64</p> <p>Easy assembly</p> <p>PG openings for different cable diameters</p>	20 93 901 0101		
<p>Adapter SMA-TNC</p> <p>necessary adapter to connect Ha-VIS coax RG213 cords to the Ha-VIS RF-R500</p>	20 93 204 0301		
<p>Antenna mounting kit</p> <p>Ha-VIS RF-MOUNT-ANT-A</p> <p>Ha-VIS RF-MOUNT-ANT-B</p>	<p>20 93 102 0103</p> <p>20 93 102 0104</p>		

Standard / Approvals

		Ha-VIS eCon 2000	Ha-VIS eCon 3000	Ha-VIS eCon 4000	Ha-VIS eCon 9000	Ha-VIS eCon 7000	Ha-VIS sCon 3000		Ha-VIS FTS 3000s
				Ha-VIS mCon 4000	Ha-VIS mCon 9000	Ha-VIS mCon 7000	Ha-VIS mCon 3000	Ha-VIS mCon 3000 NG	Ha-VIS FTS 3000
Mechanical stability									
Shock assay	IEC 60 068-2-27	X	X	X	X	X	X	X	X
Vibration	IEC 60 068-2-6	X	X	X	X	X	X	X	X
Rail standard	EN 50 155, Class 1			X	X	X	X	X	
EMC standards									
Interference immunity ESD	IEC 61 000-4-2	X	X	X	X	X	X	X	X
Interference immunity HF, radiated	IEC 61 000-4-3	X	X	X	X	X	X	X	X
Interference immunity Burst	IEC 61 000-4-4	X	X	X	X	X	X	X	X
Interference immunity Surge	IEC 61 000-4-5	X	X	X	X	X	X	X	X
Interference immunity	IEC 61 000-4-6	X	X	X	X	X	X	X	X
Emitted radiation	EN 55 011, Class	A	A	A	A	A	A	A	A
Emitted radiation	EN 55 022, Class	A	A	A	A	A	A	A	A
System perturbation	IEC 61 000-3-3								
Rail standard	EN 50 121-3-2			X	X	X	X	X	

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09 20 003 2711	01.170	09 45 452 1510	02.73	09 45 600 0119	02.48	09 45 700 5063	02.26
09 20 003 5422	02.45	09 45 452 1511	02.73	09 45 600 0128	02.51	09 45 700 5066	02.26
09 20 003 5422	02.56	09 45 452 1512	02.73	09 45 600 0130	02.47	09 45 700 5068	02.26
09 20 003 5425	01.102	09 45 452 1513	02.73	09 45 600 0131	02.49	09 45 700 5073	02.26
09 20 003 5425	01.170	09 45 452 1514	02.73	09 45 600 0132	02.48	09 45 700 5075	02.26
09 20 003 5426	01.102	09 45 452 1515	02.73	09 45 600 0134	02.48		
09 20 003 5426	01.170	09 45 452 1516	02.73	09 45 600 0135	02.50		
09 20 003 5442	02.45	09 45 452 1517	02.73	09 45 600 0136	02.39	09 45 701 1534	02.20
09 20 003 5442	02.56	09 45 452 1518	02.73	09 45 600 0137	02.49	09 45 701 1536	02.20
		09 45 452 1560	02.73	09 45 600 0138	02.52	09 45 701 1538	02.20
		09 45 452 1901	02.74	09 45 600 0139	02.48	09 45 701 1543	02.20
09 20 004 2711	01.102	09 45 452 1902	02.74	09 45 600 0140	02.47	09 45 701 1545	02.20
09 20 004 2711	01.170	09 45 452 1910	02.74	09 45 600 0141	02.49	09 45 701 1564	02.20
		09 45 452 1911	02.74	09 45 600 0142	02.48	09 45 701 1566	02.20
		09 45 452 1912	02.74	09 45 600 0144	02.48	09 45 701 1568	02.20
		09 45 452 1913	02.74	09 45 600 0145	02.50	09 45 701 1573	02.20
09 37 003 5402	02.45	09 45 452 1914	02.74	09 45 600 0146	02.39	09 45 701 1575	02.20
09 37 003 5402	02.56	09 45 452 1915	02.74	09 45 600 0147	02.49		
		09 45 452 1916	02.74	09 45 600 0148	02.52		
		09 45 452 1920	02.74	09 45 600 0149	02.48	09 45 715 1523	02.19
		09 45 452 1921	02.74	09 45 600 0156	02.39	09 45 715 1525	02.19
		09 45 452 1922	02.74	09 45 600 0158	02.52	09 45 715 1527	02.19
09 45 100 1560	02.45	09 45 452 1923	02.74	09 45 600 0200	02.40	09 45 715 1551	02.19
		09 45 452 1924	02.74	09 45 600 0220	02.40	09 45 715 1553	02.19
		09 45 452 1925	02.74	09 45 600 0230	02.40	09 45 715 1563	02.19
09 45 115 1100	02.56	09 45 452 1926	02.74	09 45 600 0240	02.40	09 45 715 1565	02.19
09 45 115 1102	02.56	09 45 452 1927	02.74			09 45 715 1567	02.19
09 45 115 1104	02.56	09 45 452 1928	02.74	09 45 600 0400	02.38	09 45 715 1572	02.19
09 45 115 1106	02.56			09 45 600 0420	02.38	09 45 715 1574	02.19
09 45 115 1560	02.45			09 45 600 0430	02.38		
		09 45 502 0000	02.75	09 45 600 0440	02.38		
		09 45 502 0001	02.75			09 45 800 0000	02.76
09 45 125 1100	02.56	09 45 502 0002	02.75	09 45 600 0501	02.37	09 45 800 0001	02.76
09 45 125 1104	02.56	09 45 502 0003	02.75	09 45 600 0502	02.35	09 45 800 0002	02.76
		09 45 502 0004	02.75	09 45 600 0521	02.37	09 45 800 0004	02.76
09 45 125 1560	02.45	09 45 502 0005	02.75	09 45 600 0522	02.35	09 45 800 0005	02.76
				09 45 600 0531	02.37	09 45 800 0020	02.76
				09 45 600 0532	02.35		
09 45 151 1120	02.53	09 45 545 1563	02.67	09 45 600 0541	02.37		
09 45 151 1121	02.53	09 45 545 1564	02.67	09 45 600 0542	02.35	09 45 820 0000	02.45
09 45 151 1122	02.54			09 45 600 0600	02.36		
				09 45 600 0620	02.36		
09 45 151 1560	02.43	09 45 600 0100	02.47	09 45 600 0630	02.36	09 45 850 0001	02.11
09 45 151 1560 XL	02.43	09 45 600 0101	02.49	09 45 600 0640	02.36	09 45 850 0001	02.43
09 45 151 1561	02.43	09 45 600 0102	02.48	09 45 600 0650	02.41	09 45 850 0001	02.53
		09 45 600 0104	02.48	09 45 600 0651	02.41	09 45 850 0001	02.54
		09 45 600 0105	02.50	09 45 600 0660	02.41	09 45 850 0001	02.60
09 45 452 0000	02.73	09 45 600 0106	02.39	09 45 600 0690	02.42	09 45 850 0002	02.11
09 45 452 1500	02.73	09 45 600 0107	02.49	09 45 600 0691	02.42	09 45 850 0002	02.43
09 45 452 1501	02.73	09 45 600 0108	02.51	09 45 600 0692	02.42	09 45 850 0002	02.53
09 45 452 1502	02.73	09 45 600 0109	02.48	09 45 600 0694	02.42	09 45 850 0002	02.54
09 45 452 1503	02.73	09 45 600 0110	02.47			09 45 850 0002	02.60
09 45 452 1504	02.73	09 45 600 0111	02.49			09 45 850 0003	02.11
09 45 452 1505	02.73	09 45 600 0112	02.48	09 45 700 5022	02.26	09 45 850 0003	02.43
09 45 452 1506	02.73	09 45 600 0114	02.48	09 45 700 5025	02.26	09 45 850 0003	02.53
09 45 452 1507	02.73	09 45 600 0115	02.50	09 45 700 5027	02.26	09 45 850 0003	02.54
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09 45 850 0005	02.53	09 47 474 7003	02.09	09 47 474 7153	02.07	09 48 474 7766 010	02.15
09 45 850 0005	02.54	09 47 474 7004	02.09	09 47 474 7154	02.07	09 48 474 7766 015	02.15
09 45 850 0005	02.60	09 47 474 7005	02.09	09 47 474 7155	02.07	09 48 474 7766 020	02.15
09 45 850 0007	02.11	09 47 474 7006	02.09	09 47 474 7156	02.07	09 48 474 7766 030	02.15
09 45 850 0007	02.43	09 47 474 7007	02.09	09 47 474 7157	02.07	09 48 474 7766 050	02.15
09 45 850 0007	02.53	09 47 474 7008	02.09	09 47 474 7158	02.07		
09 45 850 0007	02.54	09 47 474 7009	02.09	09 47 474 7159	02.07		
09 45 850 0007	02.60	09 47 474 7010	02.09	09 47 474 7160	02.07	09 48 686 8001 005	02.18
09 45 850 0008	02.11	09 47 474 7011	02.09	09 47 474 7161	02.07	09 48 686 8001 010	02.18
09 45 850 0008	02.43	09 47 474 7012	02.09	09 47 474 7162	02.07	09 48 686 8001 015	02.18
09 45 850 0008	02.53	09 47 474 7013	02.09	09 47 474 7163	02.07	09 48 686 8001 030	02.18
09 45 850 0008	02.54	09 47 474 7014	02.09			09 48 686 8001 050	02.18
09 45 850 0008	02.60	09 47 474 7015	02.09	09 47 474 7201	02.10	09 48 686 8001 075	02.18
09 45 850 0009	02.11	09 47 474 7016	02.09	09 47 474 7203	02.10	09 48 686 8001 100	02.18
09 45 850 0009	02.43	09 47 474 7017	02.09	09 47 474 7206	02.10	09 48 686 8001 150	02.18
09 45 850 0009	02.53	09 47 474 7018	02.09	09 47 474 7208	02.10	09 48 686 8001 200	02.18
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09 45 850 0009	02.60	09 47 474 7020	02.09			09 48 686 8004 010	02.18
09 45 850 0010	02.11	09 47 474 7021	02.09			09 48 686 8004 015	02.18
09 45 850 0010	02.43	09 47 474 7022	02.09			09 48 686 8004 030	02.18
09 45 850 0010	02.53	09 47 474 7023	02.09	09 47 900 0001	02.11	09 48 686 8004 050	02.18
09 45 850 0010	02.54	09 47 474 7024	02.09			09 48 686 8004 075	02.18
09 45 850 0010	02.60					09 48 686 8004 100	02.18
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		09 47 474 7102	02.07			09 48 686 8004 200	02.18
09 45 851 0000	02.67	09 47 474 7103	02.07	09 48 220 0011 010	02.24	09 48 686 8006 005	02.18
09 45 851 0001	02.67	09 47 474 7104	02.07	09 48 220 0011 015	02.24	09 48 686 8006 010	02.18
		09 47 474 7105	02.07	09 48 220 0011 030	02.24	09 48 686 8006 015	02.18
		09 47 474 7106	02.07	09 48 220 0011 050	02.24	09 48 686 8006 030	02.18
09 45 870 0002	02.07	09 47 474 7107	02.07	09 48 220 0011 075	02.24	09 48 686 8006 050	02.18
09 45 870 0002	02.09	09 47 474 7108	02.07	09 48 220 0011 100	02.24	09 48 686 8006 075	02.18
09 45 870 0003	02.07	09 47 474 7109	02.07	09 48 220 0011 200	02.24	09 48 686 8006 100	02.18
09 45 870 0003	02.09	09 47 474 7110	02.07	09 48 220 0012 010	02.24	09 48 686 8006 150	02.18
09 45 870 0006	02.07	09 47 474 7111	02.07	09 48 220 0012 015	02.24	09 48 686 8006 200	02.18
09 45 870 0006	02.09	09 47 474 7112	02.07	09 48 220 0012 030	02.24	09 48 686 8007 005	02.18
09 45 870 0007	02.07	09 47 474 7113	02.07	09 48 220 0012 050	02.24	09 48 686 8007 010	02.18
09 45 870 0007	02.09	09 47 474 7114	02.07	09 48 220 0012 075	02.24	09 48 686 8007 015	02.18
09 45 870 0008	02.07	09 47 474 7115	02.07	09 48 220 0012 100	02.24	09 48 686 8007 030	02.18
09 45 870 0008	02.09	09 47 474 7116	02.07	09 48 220 0012 200	02.24	09 48 686 8007 050	02.18
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09 45 870 0009	02.09	09 47 474 7118	02.07			09 48 686 8007 100	02.18
09 45 870 0011	02.07	09 47 474 7119	02.07			09 48 686 8007 150	02.18
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		09 47 474 7121	02.07	09 48 222 2011 015	02.22		
		09 47 474 7122	02.07	09 48 222 2011 030	02.22		
		09 47 474 7123	02.07	09 48 222 2011 050	02.22	09 48 800 0011 010	02.25
		09 47 474 7141	02.07	09 48 222 2011 075	02.22	09 48 800 0011 015	02.25
09 46 820 0000	02.56	09 47 474 7142	02.07	09 48 222 2011 100	02.22	09 48 800 0011 030	02.25
		09 47 474 7143	02.07	09 48 222 2011 200	02.22	09 48 800 0011 050	02.25
		09 47 474 7144	02.07	09 48 222 2012 010	02.22	09 48 800 0011 075	02.25
		09 47 474 7145	02.07	09 48 222 2012 015	02.22	09 48 800 0011 100	02.25
		09 47 474 7146	02.07	09 48 222 2012 030	02.22	09 48 800 0011 200	02.25
09 47 220 2003 018	02.26	09 47 474 7147	02.07	09 48 222 2012 050	02.22	09 48 800 0012 010	02.25
09 47 220 2005 018	02.26	09 47 474 7148	02.07	09 48 222 2012 075	02.22	09 48 800 0012 015	02.25
09 47 220 2007 018	02.26	09 47 474 7149	02.07	09 48 222 2012 100	02.22	09 48 800 0012 030	02.25
09 47 220 2012 018	02.26	09 47 474 7150	02.07	09 48 222 2012 200	02.22	09 48 800 0012 050	02.25
09 47 220 2014 018	02.26						

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09 48 800 0012 100	02.25	19 00 000 5080	01.102				
09 48 800 0012 200	02.25	19 00 000 5080	01.170				
		19 00 000 5082	03.48	20 76 034 0300	01.188	20 78 110 4000	01.130
		19 00 000 5090	03.48			20 78 110 4001	01.132
09 48 808 0011 010	02.23	19 00 000 5094	03.48			20 78 110 4300	01.131
09 48 808 0011 015	02.23			20 76 038 0300	01.188	20 78 110 4301	01.133
09 48 808 0011 030	02.23						
09 48 808 0011 050	02.23						
09 48 808 0011 075	02.23	19 20 003 1440	01.102	20 76 102 3100	01.83		
09 48 808 0011 100	02.23	19 20 003 1440	01.170	20 76 102 3101	01.84		
09 48 808 0011 200	02.23					20 80 000 0003	01.103
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09 48 808 0012 015	02.23			20 76 108 4000	01.146	20 80 000 0003	02.63
09 48 808 0012 030	02.23					20 80 000 0007	01.190
09 48 808 0012 050	02.23						
09 48 808 0012 075	02.23	20 16 111 2110	01.179	20 76 109 1100	01.115	20 80 010 0001	01.103
09 48 808 0012 100	02.23	20 16 111 3110	01.179	20 76 109 4101	01.153	20 80 010 0001	01.171
09 48 808 0012 200	02.23	20 16 111 4110	01.179	20 76 109 4201	01.156	20 80 010 0002	01.103
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09 48 868 6568 xxx	02.14						
09 48 868 6569 xxx	02.14						
09 48 868 6570 xxx	02.14	20 70 305 3923	01.98	20 76 110 1000	01.113	20 80 024 0002	01.103
09 48 868 6571 xxx	02.14	20 70 305 3943	01.99	20 76 110 1000	01.123	20 80 024 0002	01.171
09 48 868 6572 xxx	02.14			20 76 110 1001	01.114		
09 48 868 6573 xxx	02.14	20 70 305 4943	01.167	20 76 110 1100	01.116		
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				20 76 110 4002	01.151	20 80 300 3026	01.183
09 48 878 7584 xxx	02.12	20 70 310 3924	01.101	20 76 110 4003	01.152	20 80 300 3027	01.184
09 48 878 7585 xxx	02.12	20 70 310 3942	01.100				
09 48 878 7586 xxx	02.12	20 70 310 4924	01.169	20 76 110 4101	01.154		
09 48 878 7587 xxx	02.12	20 70 310 4945	01.168	20 76 110 4102	01.155		
09 48 878 7588 xxx	02.12						
09 48 878 7589 xxx	02.12			20 76 110 4201	01.157	20 82 000 0001	02.60
						20 82 000 0001	02.61
						20 82 000 0001	02.65
		20 74 000 3210	01.180	20 76 112 4300	01.147	20 82 000 0001	02.67
09 48 888 8574 xxx	02.13	20 74 000 4101	01.180			20 82 000 0001	02.69
09 48 888 8575 xxx	02.13					20 82 000 0001	02.70
09 48 888 8576 xxx	02.13	20 74 000 5110	01.180	20 76 116 3000	01.28	20 82 000 0001	02.71
09 48 888 8577 xxx	02.13					20 82 000 0002	02.61
09 48 888 8578 xxx	02.13					20 82 000 0003	02.60
09 48 888 8579 xxx	02.13	20 74 112 4611	01.180	20 76 207 7000	01.106	20 82 000 0003	02.61
09 48 888 8580 xxx	02.13			20 76 207 7002	01.174	20 82 000 0003	02.65
						20 82 000 0003	02.69
		20 76 000 0300	01.187	20 76 208 7002	01.175	20 82 000 0003	02.70
09 99 000 0382	02.76			20 76 208 7003	01.107	20 82 000 0003	02.71
09 99 000 0501	02.76	20 76 010 0300	01.188			20 82 000 1210	02.70
						20 82 000 1210	02.71
						20 82 000 9901	02.60
		20 76 020 0300	01.187	20 77 208 3001	01.92	20 82 000 9901	02.61
				20 77 208 3003	01.93	20 82 000 9901	02.65
19 00 000 5020	02.72	20 76 024 0300	01.187	20 77 208 3009	01.94	20 82 000 9901	02.69
19 00 000 5070	03.48					20 82 000 9901	02.70
19 00 000 5071	03.48			20 77 208 4001	01.161	20 82 000 9901	02.71
19 00 000 5072	03.48			20 77 208 4003	01.162	20 82 000 9901	02.72
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20 82 000 9915	02.72	20 82 600 2004	02.68			20 93 201 0301	03.60
20 82 000 9916	02.61	20 82 600 2006	02.68	20 92 612 0201	03.10	20 93 201 0302	03.61
20 82 000 9916	02.65	20 82 600 2008	02.68	20 92 612 0202	03.10	20 93 201 0303	03.64
20 82 000 9916	02.72	20 82 600 2010	02.68				
		20 82 600 2020	02.68	20 92 614 7055	03.36		
20 82 001 0001	02.61	20 82 600 2030	02.68			20 93 204 0101	03.64
20 82 001 0002	02.61	20 82 600 2040	02.68			20 93 204 0101	03.52
		20 82 600 2050	02.68	20 92 621 0201	03.06	20 93 204 0101	03.53
				20 92 621 0202	03.06	20 93 204 0101	03.60
20 82 005 0001	02.70			20 92 621 0901	03.24	20 93 204 0101	03.61
20 82 005 0002	02.71			20 92 621 0902	03.24	20 93 204 0101	03.66
20 82 005 1214	02.70	20 82 601 1002	02.68			20 93 204 0102	03.64
		20 82 601 1004	02.68			20 93 204 0102	03.52
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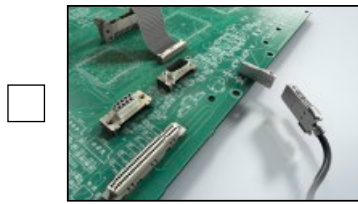
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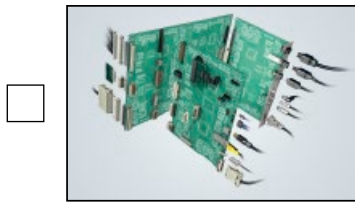


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Device Connectivity



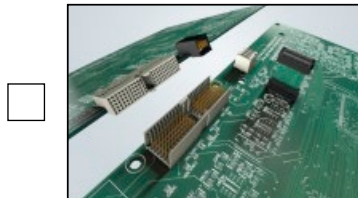
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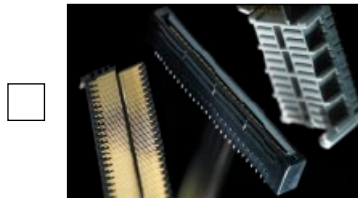
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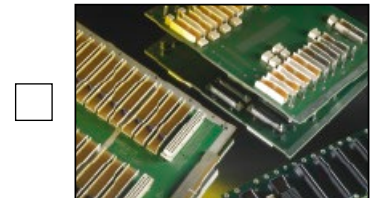
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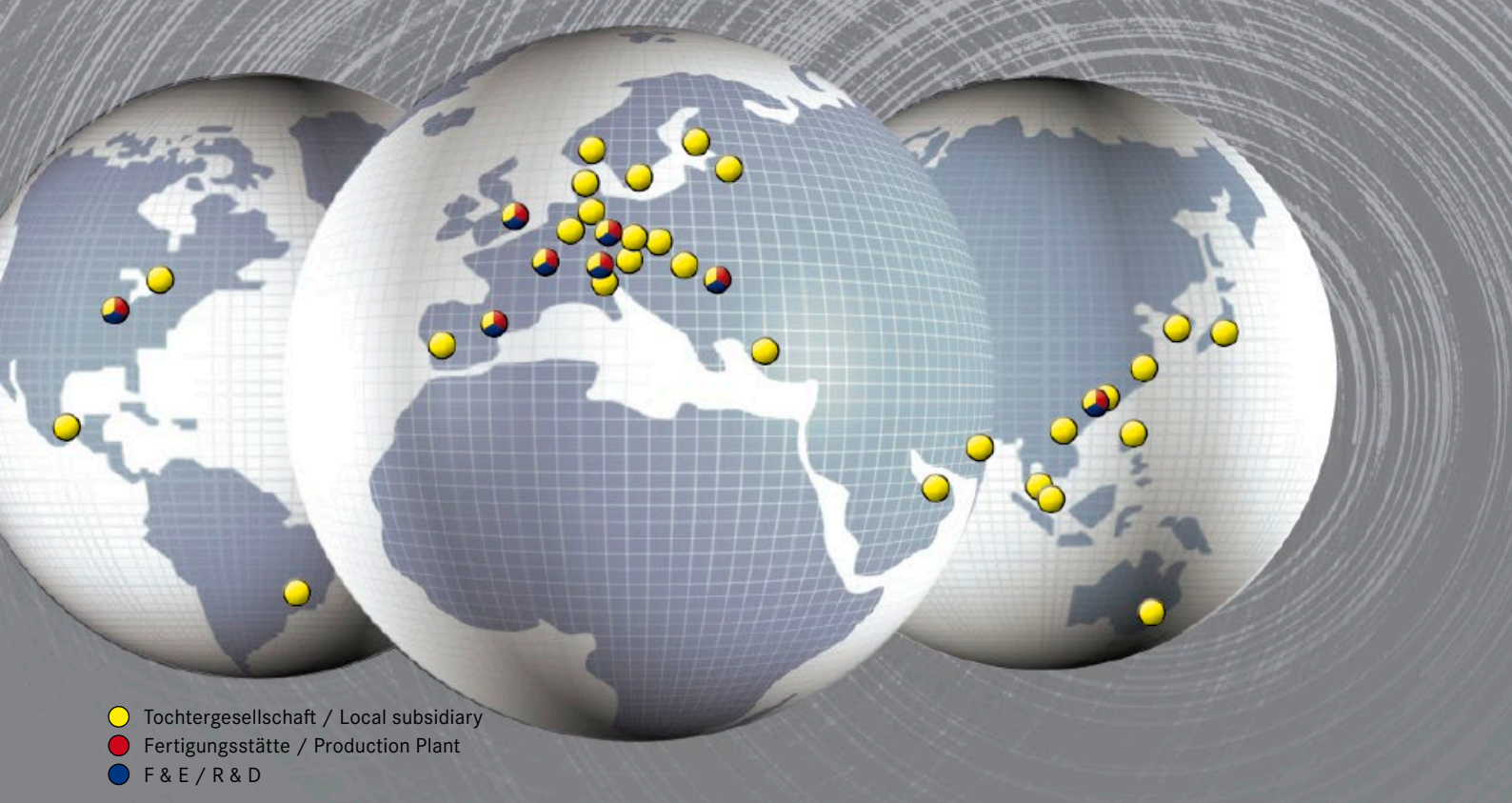
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