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

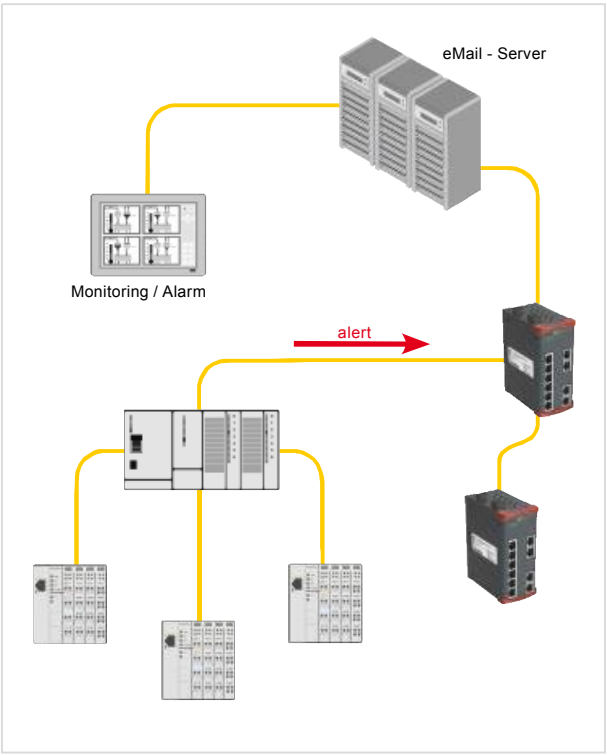
The reliability and operational availability of industrial Ethernet networks are highly associated with the possibility of management and diagnosis functionalities. For most applications it is mandatory to have an overview of what is happening in the network anytime. To assure a trouble free data flow,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

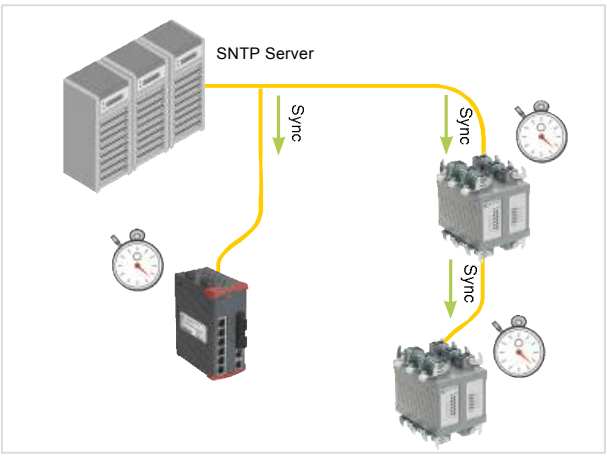
Certain network or Ethernet switch events may require the attention of service personnel. It is possible to select several events according to the requirements, which will cause a notification to a remote monitoring station if they occur. This notification can be done by sending an eMail or a SNMP trap.

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 mechanismus



Time synchronization with SNTP

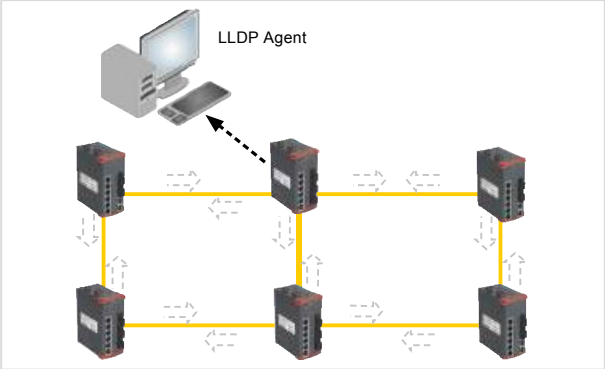
Management Software Overview

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.



LLDP – Neighbor information exchange

Port-Based Access Control with 802.1x

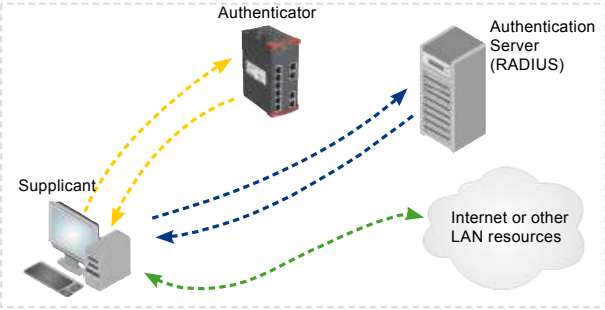
With the affiliation of the common office communication with the industrial networks, security and flexibility become more and more important for industrial Ethernet networks and applications. The demand of security and reliability is increasing rapidly. Therefore, industrial Ethernet networks need an 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.

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

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.

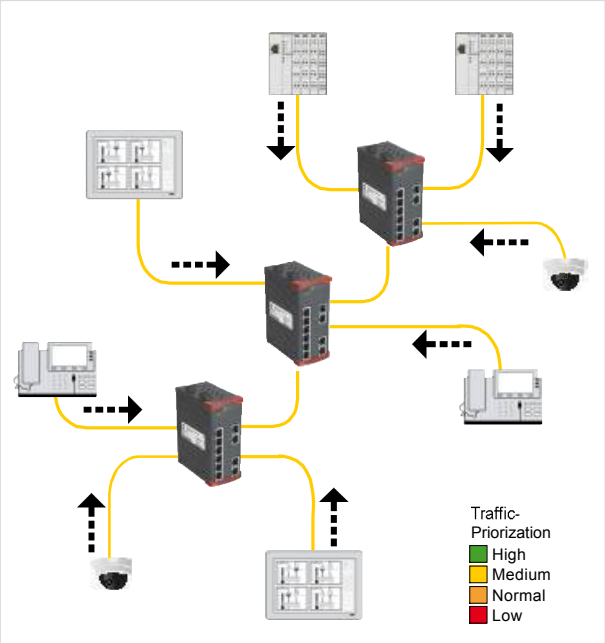


802.1X based user authentication procedure

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 priorization 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 adapted to the requirements of the application.

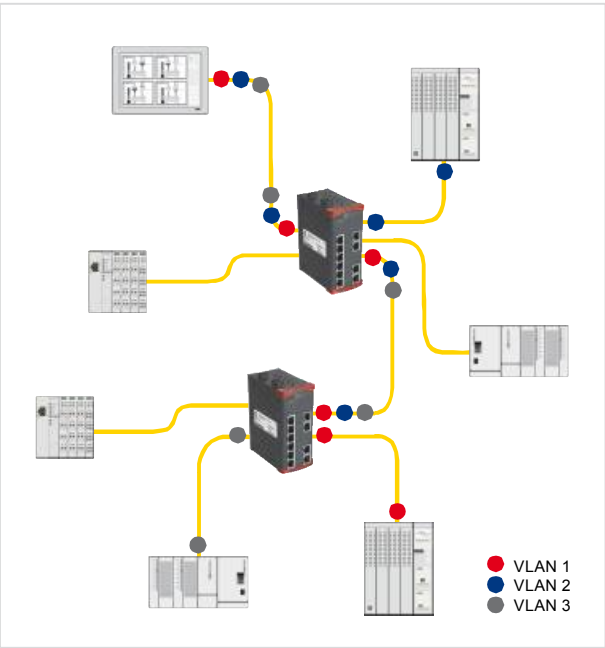


Traffic priorization for time critical applications

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



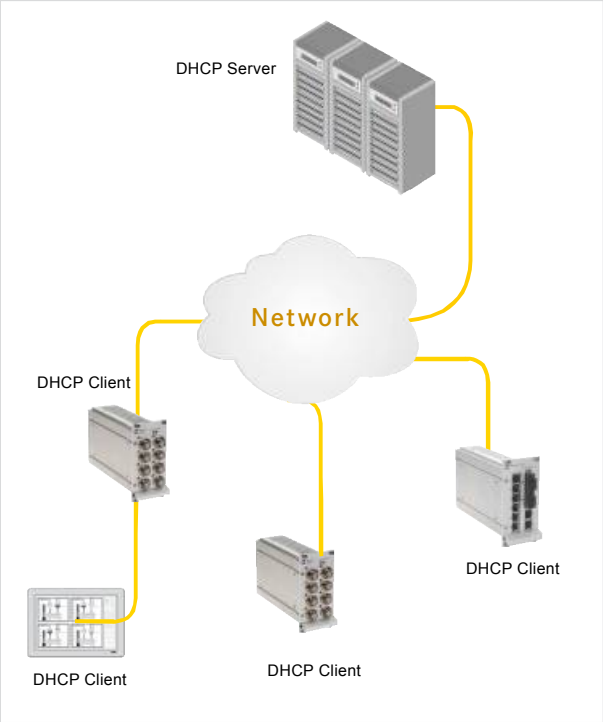
Traffic management with VLANs

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.

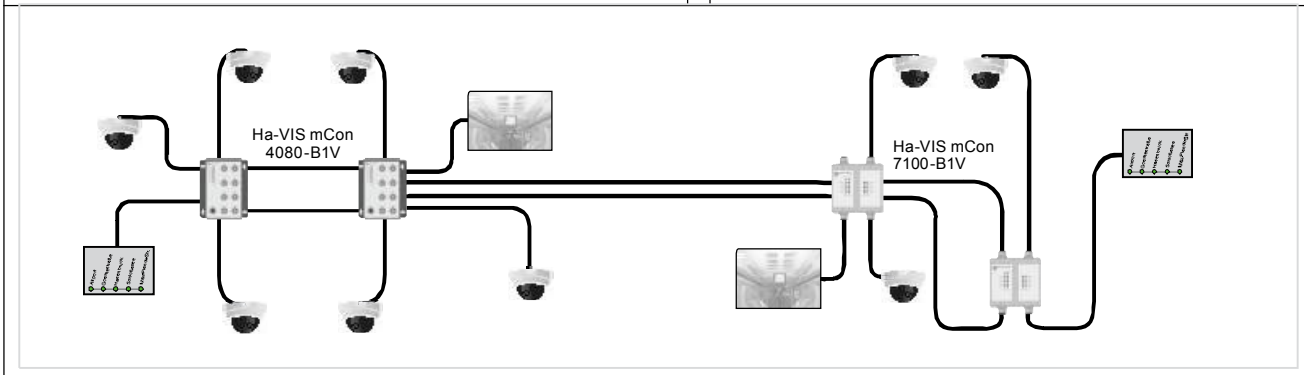


Location-dependent IP address assignment

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.

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.



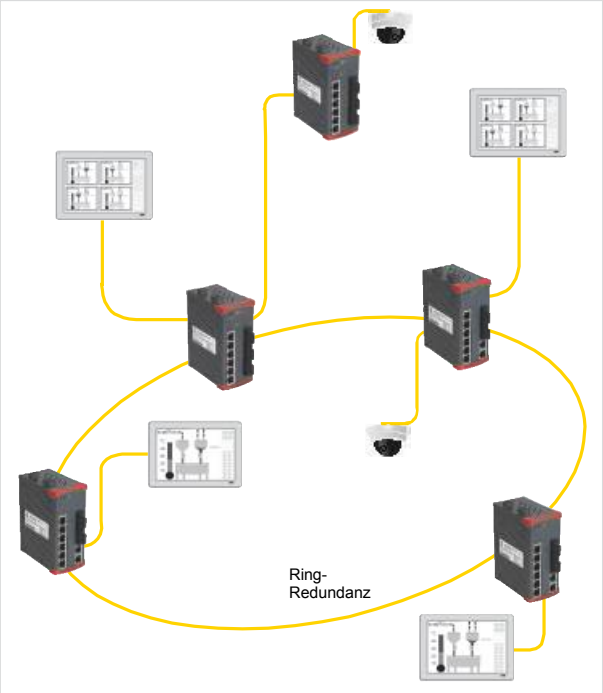
Multicast application with multiple sources and receivers

Management Software Overview

Rapid Spanning Tree

A continuous and failure tolerant network is an essen-tial 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



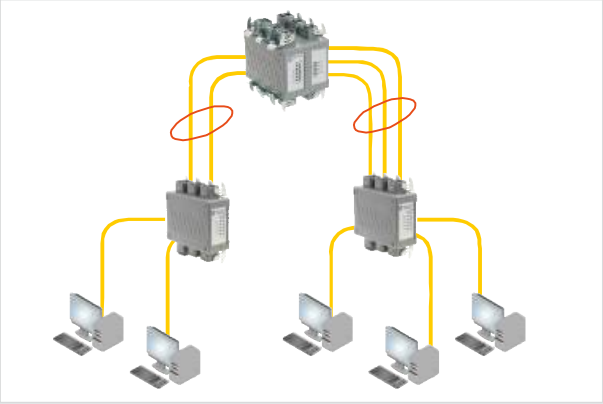
High availability with RSTP

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



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)]	

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

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 commsioning
- 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)	• 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)	• 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)	• Devive operates without failures – Green • Power supply in the admissible range – Green • Low voltage – Red • Diagnostics failure – Red • PROFINET failure / diagnosis – Red/Green flashing

Configuration

Slot for SD cards (back side)	• 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	• 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 • 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)

		Industrial	*Railway*	*Maritime*
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)

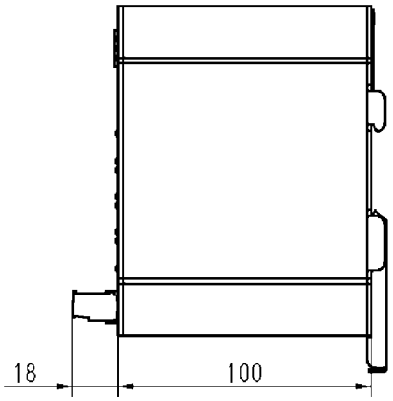
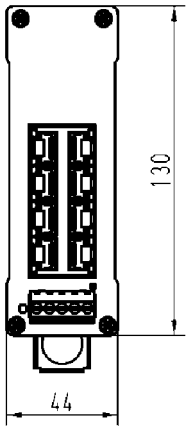
Management software	Full managed via web interface, SNMP and CLI

Ha-VIS mCon 3080-A

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 X	EtherNet/IP compatible X

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

Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3080-A Ethernet Switch, full managed 8 RJ45 ports including Set for assembly on standard rail	20 76 108 4000		

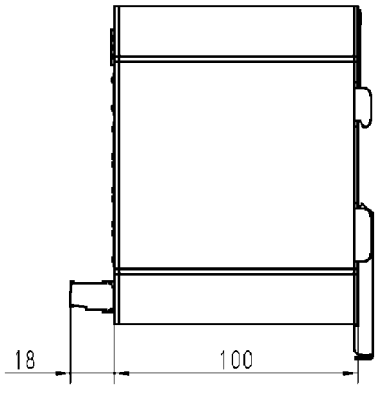
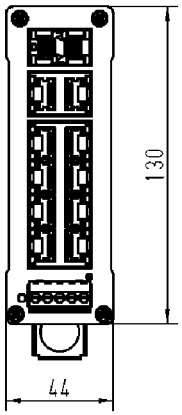
Ha-VIS mCon 3102-AASFP

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
		X	X

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)	• 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	• 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	• 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.

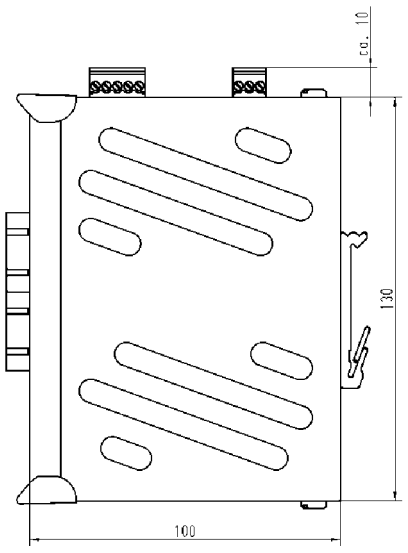
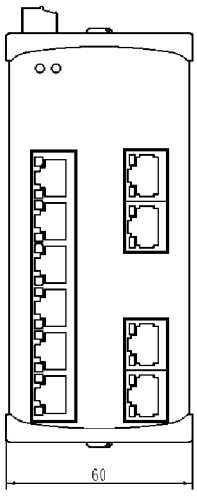
Number of ports	2x / 3x 100Base-FX
Cable types according to IEEE 802.3	• Multimode fibre, 1300 nm; 50 µm / 125 µm or 62.5 µm / 125 µm • Singlemode fibre, 1300 nm; 9 µm (for AF versions only)
Data rate	100 Mbit/s
Maximum cable length	• 2000 m (Multimode) • 15 km (Singlemode)
Termination	SC-D female / ST female
Diagnostics (LED)	• Status Link - Green • Data transfer (Act) - Green flashing
Wavelength	1300 nm
Transceive power T(X) max. (dynamic)	• -14 dBm (50 µm / 125 µm) • -14 dBm (62.5 µm / 125 µm)
Transceive power T(X) min.	• -23.5 dBm (50 µm / 125 µm) • -20 dBm (62.5 µm / 125 µm)
Receive power RX typical (dynamic)	• -33.9 dBm (window) • -35.2 dBm (centre)
Receive power RX max. (dynamic)	-14 dBm
Signal detection (dynamic)	-33 dBm
Topology	• 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	EtherNet/IP compatible
		X	X

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

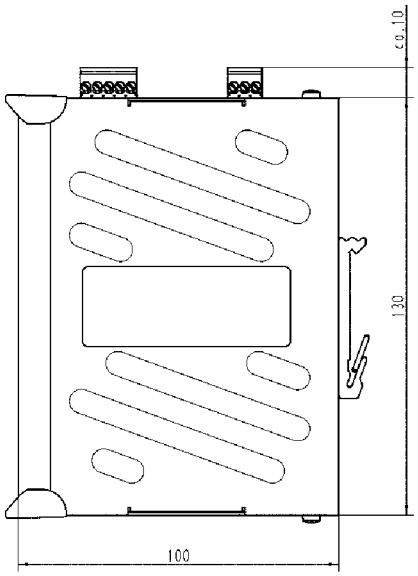
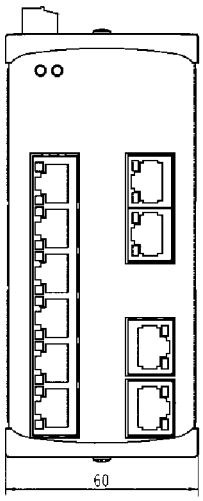
Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3100-AV Ethernet Switch with 10 RJ45 ports	20 76 110 4002		
including set for assembly on standard rail			

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	EtherNet/IP compatible
		X	X

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

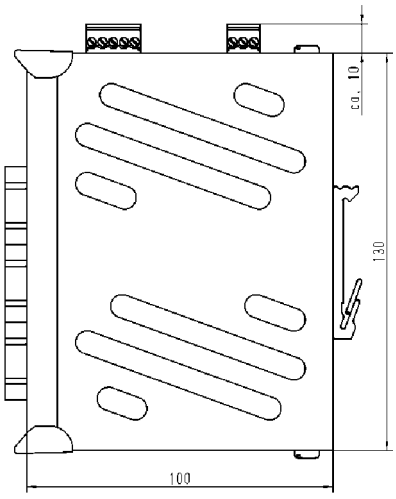
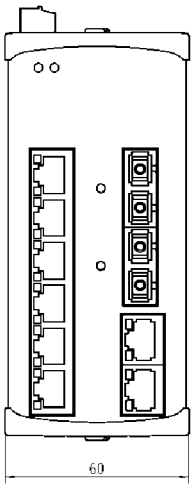
Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3100-AAV Ethernet Switch with 10 RJ45 ports	20 76 110 4003		
including set for assembly on standard rail			

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	EtherNet/IP compatible
		X	X

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

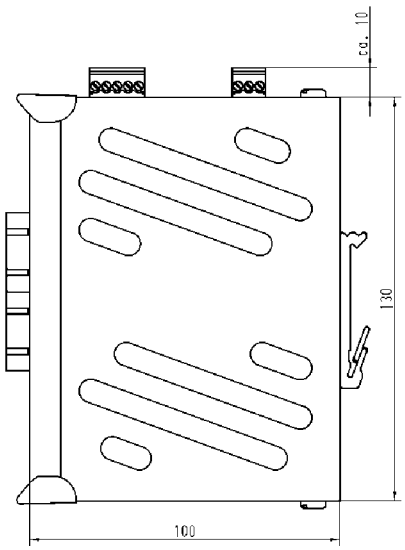
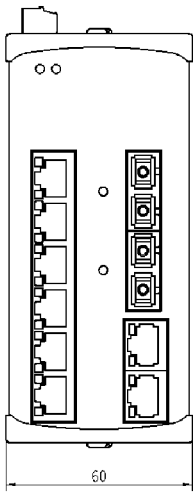
Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3063-ADV Ethernet Switch with 6 RJ45 ports 3 F.O. ports	20 76 109 4101		
including set for assembly on standard rail			

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	EtherNet/IP compatible
		X	X

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

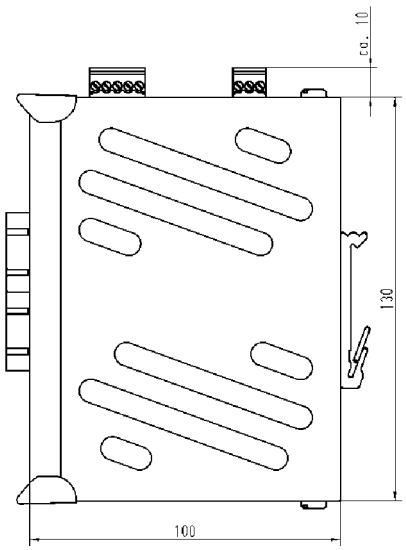
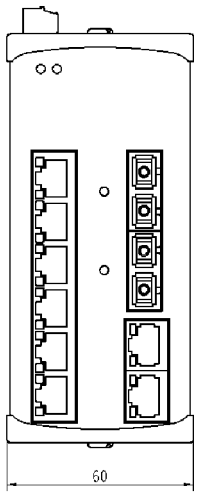
Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3082-ADV Ethernet Switch with 8 RJ45 ports 2 F.O. ports	20 76 110 4101		
including set for assembly on standard rail			

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	EtherNet/IP compatible
		X	X

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

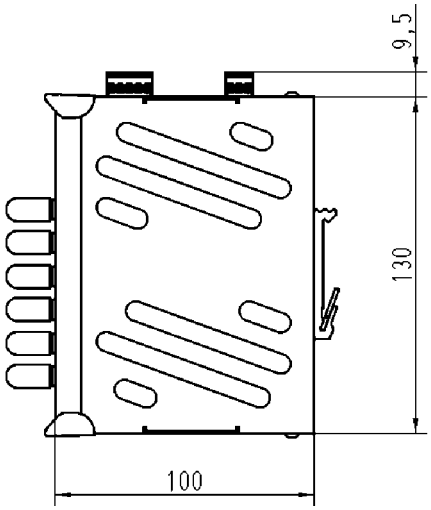
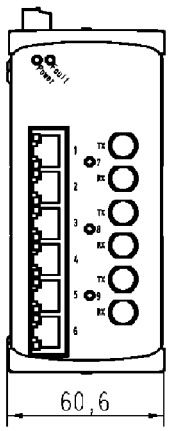
Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3082-AFV Ethernet Switch with 8 RJ45 ports 2 F.O. ports	20 76 110 4102		
including set for assembly on standard rail			

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	EtherNet/IP compatible
		X	X

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

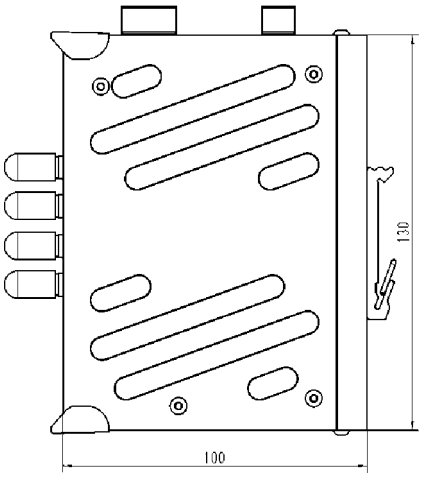
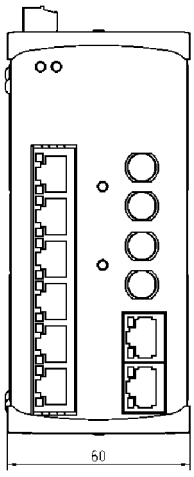
Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 3063-AEV Ethernet Switch with 6 RJ45 ports 3 F.O. ports	20 76 109 4201		
including set for assembly on standard rail			

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	EtherNet/IP compatible
		X	X

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	20 76 110 4201		
including set for assembly on standard rail			

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 adantages 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
- Additonal 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)	• Status Link - Green • Data transfer (Act) - Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow, 10 Mbit/s: Green • Error - Red
Topology	• 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	• Status Link - Green • Data transfer (Act) - Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow 10 Mbit/s: Green
PoE	• no PoE device - OFF • PoE device with failure - Red • PoE device connected - Green
Topology	• 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)	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

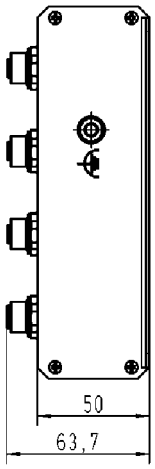
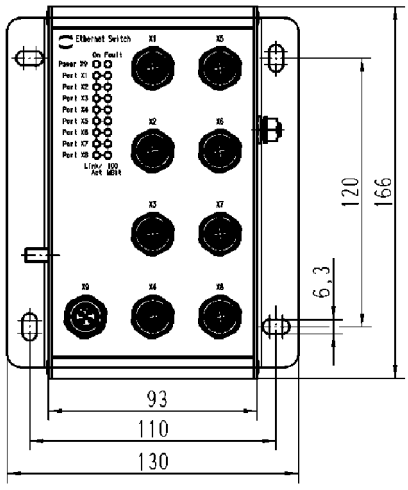
Environmental conditions

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	EtherNet/IP compatible
		X	X

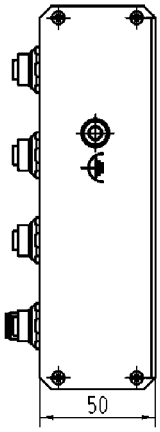
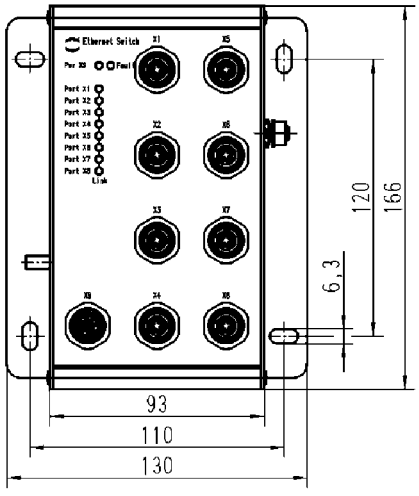
Number of ports, Copper / Termination	8x 10/100Base-T(X) / M12 D-coding (female)
Input voltage / Termination	24 / 48 V DC / M12 A-coding, male, for redundant power supply
Permissible range (min./max.)	12 V ... 60 V DC
Input current	approx. 165 mA (at 24 V DC)
Housing material	metal, powder-coated
Dimensions (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	20 77 208 4001		
for wall mounting			

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

Managed	IP40	PROFINET compatible	EtherNet/IP compatible
		X	X

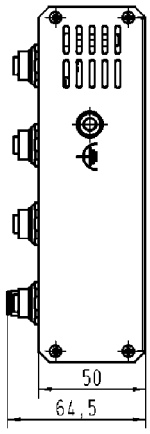
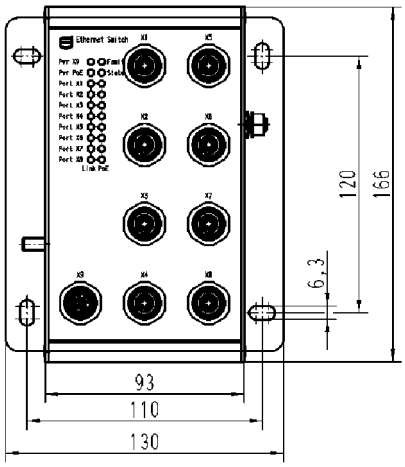
Number of ports, Copper / Termination	8x 10/100Base-T(X) / M12 D-coding (female)
Input voltage / Termination	72 / 110 V DC / M12 A-coding, male, for redundant power supply
Permissible range (min./max.)	50.4 V ... 137.5 V DC
Input current	approx. 48 mA (at 110 V DC)
Housing material	metal, powder-coated
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 X	EtherNet/IP compatible X

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)	• 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	• 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	• 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)	• 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	• 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	• 35 mm top-hat rail acc. to EN 60 715 • Wall mounting, flat assembly • Wall mounting, vertical assembly	• 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

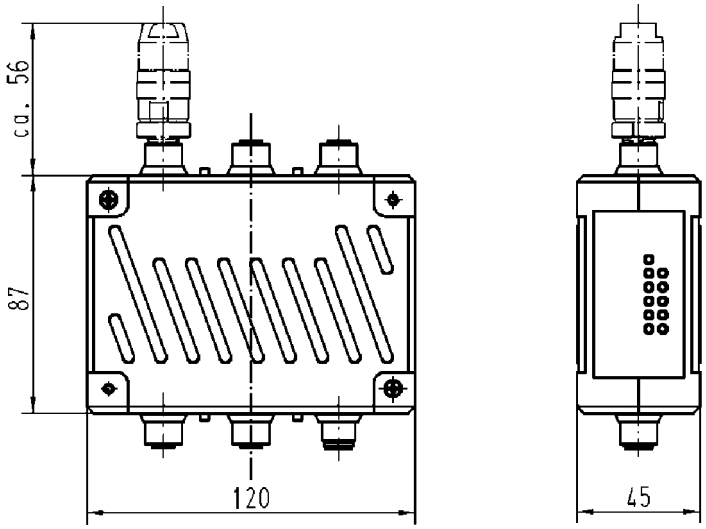
Working temperature	-40 °C ... +70 °C
Stock temperature	-40 °C ... +85 °C
Relative humidity	10 % ... +95 % (non-condensing)

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	EtherNet/IP compatible
		X	X

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

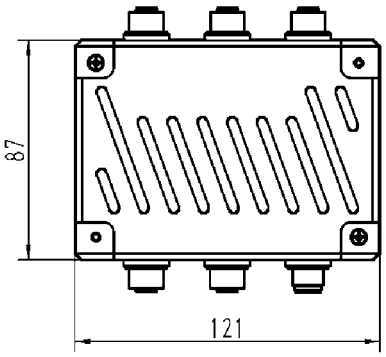
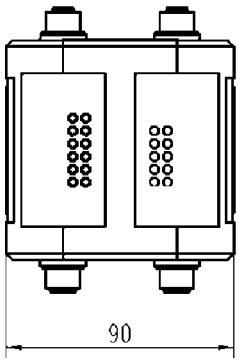
Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 7050-B1V Ethernet Switch with 5 ports M12 D-coding	20 70 305 4943		

Ethernet Switch
Ha-VIS mCon 7100-B1V

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

Managed	IP65 / IP67	PROFINET compatible X	EtherNet/IP compatible X

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

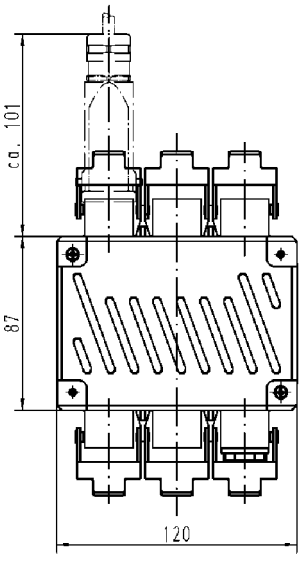
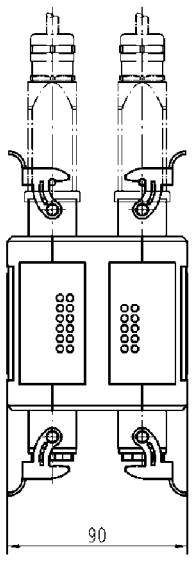
Identification	Part number	Drawing	Dimensions in mm
Ha-VIS mCon 7100-B1V Ethernet Switch with 10 ports M12 D-coding	20 70 310 4945		

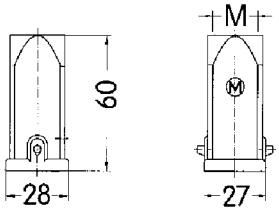
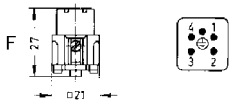
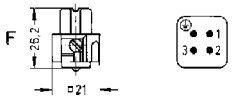
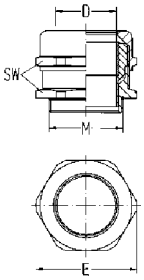
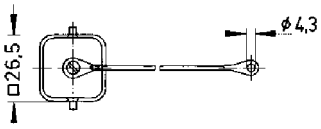
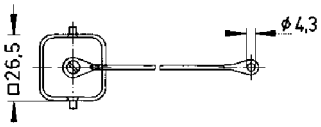
Ethernet Switch
Ha-VIS mCon 7100-AAV

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

Managed	IP65 / IP67	PROFINET compatible	EtherNet/IP compatible
		X	X

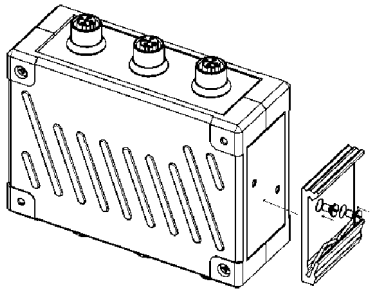
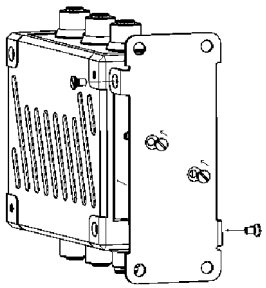
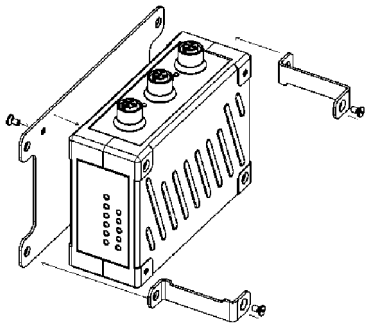
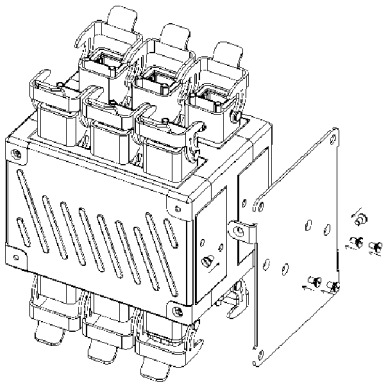
Number of ports, Copper / Termination	8x 10/100Base-T(X) / Han® 3 A RJ45 (female) 2x 10/100/1000-Base-T(X) / Han® 3 A RJ45 (female)
Input voltage / Termination	24 / 48 V DC / Han® 4 A, male, for redundant power supply
Permissible range (min./max.)	12 V ... 60 V DC
Input current	approx. 260 mA (at 24 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
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		
HARAX® M12-L Circular Connectors D-coding, female (Ha-VIS mCon 7100-B1V only)	21 03 281 2405		
Protection cover M12 for Ethernet	21 01 000 0003		

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

Assembly

Identification	Part number	Drawing	Dimensions in mm
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)	• Status Link - Green • Data transfer (Act) - Green flashing • Data transfer rate (Speed) - 100 Mbit/s: Yellow 10 Mbit/s: OFF
Topology	• Line • Ring • Star • mixed

Power supply

Input voltage	24 / 48 V DC (8 V ... 60 V DC) - redundant
Termination	• 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

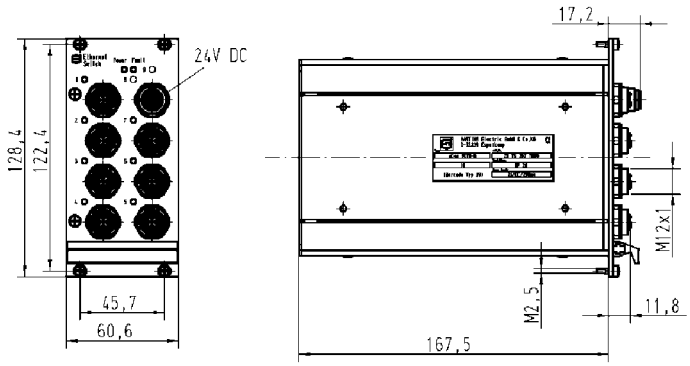
Environmental conditions

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	EtherNet/IP compatible
		X	X

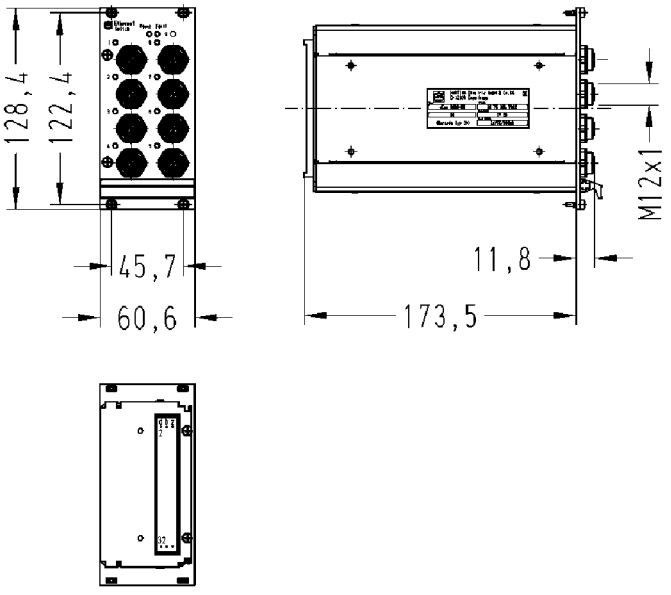
Number of ports, Copper / Termination	7x 10/100Base-T(X) / M12 D-coding (female)
Input voltage / Termination	24 / 48 V DC / M12 A-coding, male
Permissible range (min./max.)	8 V ... 60 V DC
Input current	approx. 130 mA (at 24 V DC)
Housing material	aluminium, anodised
Dimensions (W x H x D)	60.6 mm (3 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		

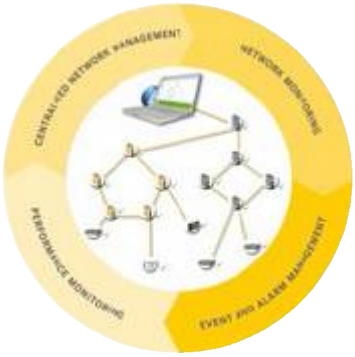
Ethernet Switch
Ha-VIS mCon 9080-B1V
8-port Ethernet Switch for installation in a 19'' rack

Managed	IP20	PROFINET compatible	EtherNet/IP compatible
		X	X

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.

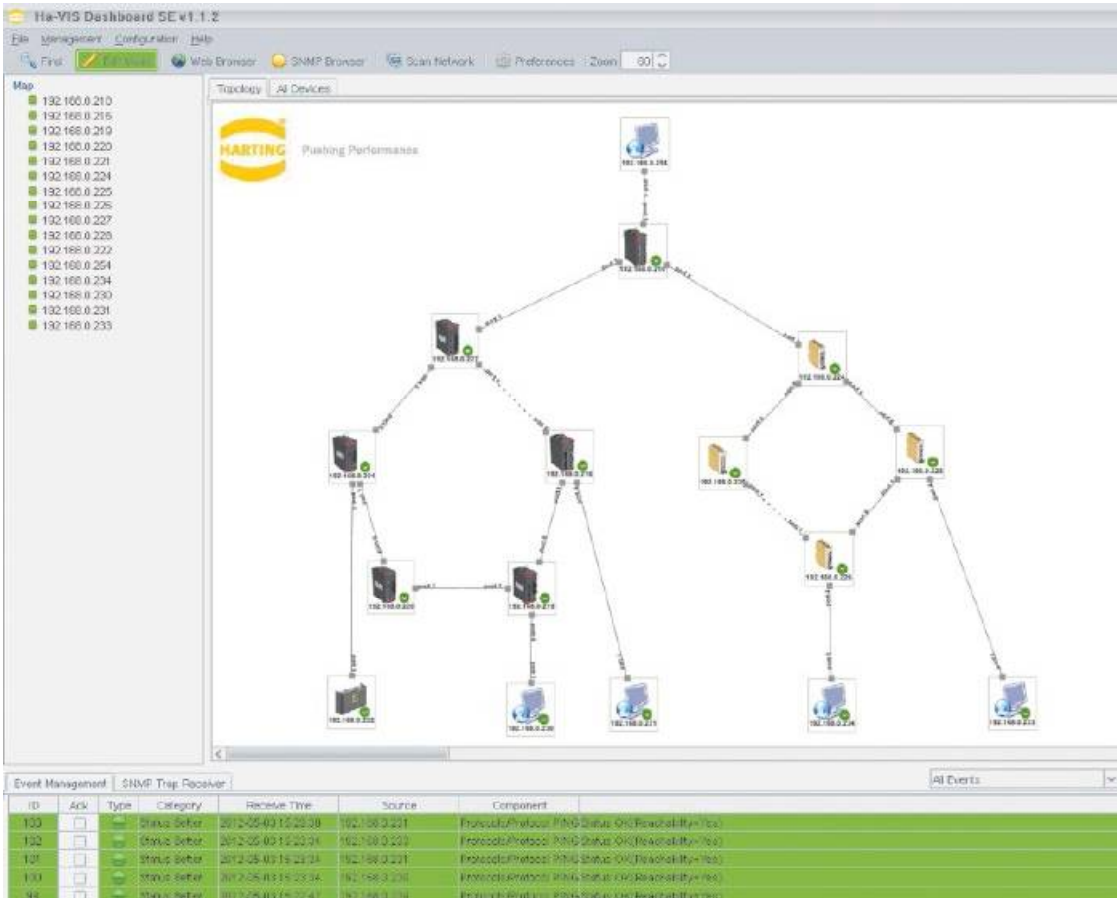
The Ha-VIS Dashboard detects managed network devices and is capable of representing the network topology automatically. All intelligent HARTING network devices can be centrally monitored and administrated.

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.

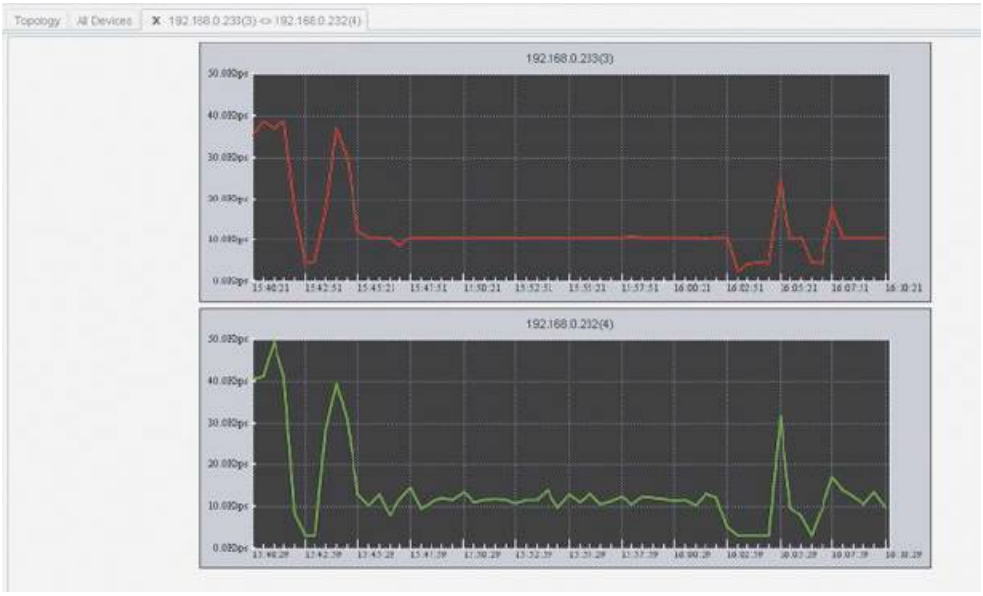
To improve clarity, events which have already been processed can be manually confirmed by the user. Custom filters can be created to filter out certain types of event messages



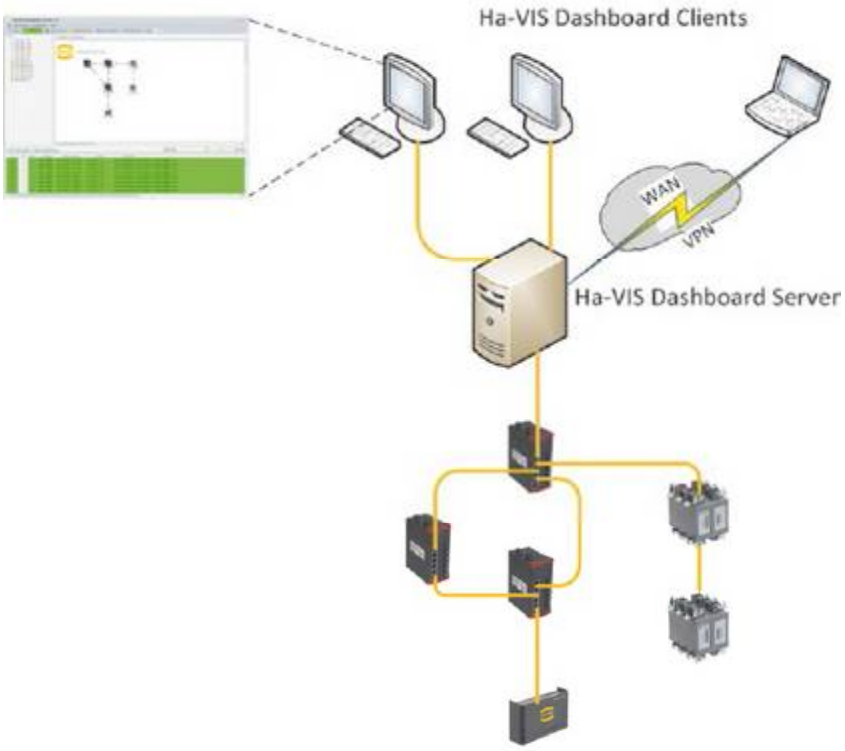
The Ha-VIS Dashboard features web-based configuration, SNMP, Telnet and SSH for configuring network devices.

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

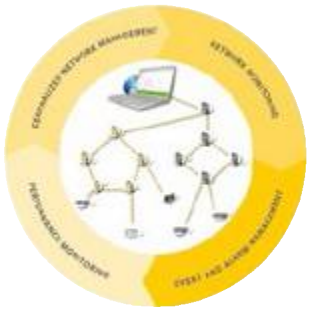
Software

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
Ha-VIS Dashboard *			
Ha-VIS Dashboard License 64	20 16 111 2110		
Ha-VIS Dashboard License 128	20 16 111 3110		
Ha-VIS Dashboard License 256	20 16 111 4110		

* ... The basic version is included in the scope of delivery of Ethernet Switches of the Ha-VIS mCon series.