



HIRSCHMANN

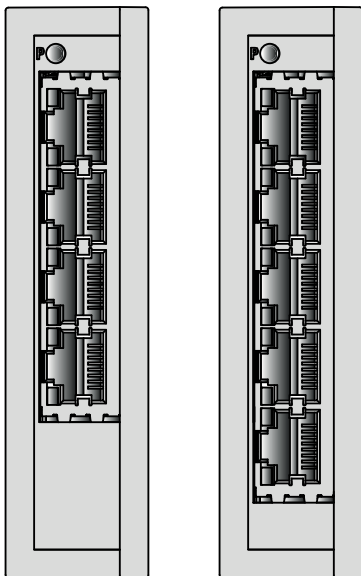
A **BELDEN** BRAND

User Manual

Installation

Lite Managed Switch

GECKO



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You can get the latest version of this manual on the Internet at the Hirschmann product site (www.hirschmann.com).

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Safety instructions

■ General safety instructions

You operate this device with electricity. Improper usage of the device entails the risk of physical injury or significant property damage. The proper and safe operation of this device depends on proper handling during transportation, proper storage and installation, and careful operation and maintenance procedures.

- Before connecting any cable, read this document, and the safety instructions and warnings.
- Operate the device with undamaged components exclusively.
- The device is free of any service components. In case of a damaged or malfunctioning the device, turn off the supply voltage and return the device to Hirschmann for inspection.



WARNING

UNCONTROLLED MACHINE ACTIONS

To avoid uncontrolled machine actions caused by data loss, configure all the data transmission devices individually.

Before you start any machine which is controlled via data transmission, be sure to complete the configuration of all data transmission devices.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

■ Qualification requirements for personnel

- Only allow qualified personnel to work on the device.

Qualified personnel have the following characteristics:

- ▶ Qualified personnel are properly trained. Training as well as practical knowledge and experience make up their qualifications. This is the prerequisite for grounding and labeling circuits, devices, and systems in accordance with current standards in safety technology.
- ▶ Qualified personnel are aware of the dangers that exist in their work.
- ▶ Qualified personnel are familiar with appropriate measures against these hazards in order to reduce the risk for themselves and others.
- ▶ Qualified personnel receive training on a regular basis.

- Certified usage
 - Use the product only for the application cases described in the Hirschmann product information, including this manual.
 - Operate the product only according to the technical specifications. See [“Technical data” on page 22.](#)
 - Connect to the product only components suitable for the requirements of the specific application case.

- National and international safety regulations

Verify that the electrical installation meets local or nationally applicable safety regulations.

- Grounding the device

The device is grounded by means of a 3-pin terminal block.

 - Ground the device before connecting any other cables.
 - Disconnect the grounding only after disconnecting all other cables.

- Supply voltage
 - Connect only a supply voltage that corresponds to the type plate of your device.
 - Every** time you connect the electrical conductors, make sure that the following requirements are met:
 - ▶ The power supply conforms to overvoltage category I or II.
 - ▶ The power supply has an easily accessible disconnecting device (e.g., a switch or a plug). This disconnecting device is clearly identified. So in the case of an emergency, it is clear which disconnecting device belongs to which power supply cable.
 - ▶ The electrical wires are voltage-free.
 - ▶ The power supply is Class 2 compliant.

Alternatively, a fuse suitable for DC voltage is located in the plus conductor of the power supply. The minus conductor is on ground potential. Otherwise, a fuse is also located in the minus conductor. Regarding the properties of this fuse: See [“General technical data” on page 22.](#)
 - ▶ The supply voltage inputs are designed for operation with safety extra-low voltage. Connect only SELV circuits with voltage restrictions in line with IEC/EN 60950-1 to the supply voltage connections.
 - ▶ The wire diameter of the power supply cable is at least 1 mm² (North America: AWG16) on the supply voltage input.
 - ▶ The wire diameter of the ground conductor is at least 1 mm² (North America: AWG16).

- ▶ The cables used are permitted for the temperature range of the application case.
- ▶ The power cords are suitable for ambient air temperatures of at least 167 °F (75 °C). The power cord wires are made of copper.
- Internal fuses are triggered only in the case of a detected error in the device. In case of damage or malfunction of the device, turn off the supply voltage and return the device to the plant for inspection.
- Enable the supply voltage for the device only when the following requirements are fulfilled:
 - ▶ the housing is closed
 - ▶ the terminal blocks are wired correctly
 - ▶ the terminal blocks for the power supply are connected

■ Installation site requirements

- Verify that there is at least 4 in (10 cm) of space above and below the device.
- Verify that there is at least 0.8 in (2 cm) of space on the right and left sides of the device.
- Only operate the device in switch cabinets which comply with the fire enclosure specifications described in EN 60950-1.

■ Device casing

Only technicians authorized by the manufacturer are permitted to open the casing.

- Never insert pointed objects (narrow screwdrivers, wires, etc.) into the device or into the connection terminals for electric conductors. Do not touch the connection terminals.
- Keep the ventilation slits free to ensure good air circulation.
- Install the device in the vertical position.

■ CE marking

The labeled devices comply with the regulations contained in the following European directive(s):

2011/65/EU (RoHS)

Directive of the European Parliament and of the Council on the restriction of the use of certain hazardous substances in electrical and electronic equipment.

2004/108/EC (EMC)

Directive of the European Parliament and the council for standardizing the regulations of member states with regard to electromagnetic compatibility.

In accordance with the above-named EU directive(s), the EU conformity declaration will be at the disposal of the relevant authorities at the following address:

Hirschmann Automation and Control GmbH
Stuttgarter Str. 45-51
72654 Neckartenzlingen
Germany
Tel.: +49 1805 141538

The product can be used in the industrial sector.

- ▶ Interference immunity: EN 61000-6-2
- ▶ Emitted interference: EN 55022

You find more information on technical standards here:

[“Underlying technical standards” on page 25](#)

Warning! This is a class A device. This device can cause interference in living areas, and in this case the operator may be required to take appropriate measures.

Note: The assembly guidelines provided in these instructions must be strictly adhered to in order to observe the EMC threshold values.

■ FCC note:

This device complies with part 15 of the FCC rules. Operation is subject to the following two conditions: (1) this device may not cause harmful interference; (2) this device must accept any interference received, including interference that may cause undesired operation.

Appropriate testing has established that this device fulfills the requirements of a class A digital device in line with part 15 of the FCC regulations.

These requirements are designed to provide sufficient protection against interference when the device is being used in a business environment. The device creates and uses high frequencies and can also radiate these frequencies. If it is not installed and used in accordance with this operating manual, it can cause radio transmission interference. The use of this device in a residential area can also cause interference, and in this case the user is obliged to cover the costs of removing the interference.

■ Recycling note

After usage, this device must be disposed of properly as electronic waste, in accordance with the current disposal regulations of your county, state, and country.

About this Manual

The documentation for your device is made up of the following documents.

General Safety Instructions	The instruction sheet "General Safety Instructions" contains safety instructions and hyperlinks to our product pages where you can download the "User Manual Installation" necessary for the installation and operation of your device.
Installation user manual	This document contains a device description, safety instructions and further information that you need for installing the device before you start configuring it.
Configuration user manual	This document contains the information that you need for starting up the device. It takes you step by step from the first startup operation through to the basic settings for operation in your environment.
Online help	The online help contains descriptions of the individual parameters that you configure via the graphical user interface. Use the "Help" button to call up the online help in the graphical user interface. The content of the online help corresponds to the information in the "References" chapter of the configuration user manual.

The Industrial HiVision network management software provides you with additional options for smooth configuration and monitoring:

- ▶ ActiveX control for SCADA integration
- ▶ Auto-topology discovery
- ▶ Browser interface
- ▶ Client/server structure
- ▶ Event handling
- ▶ Event log
- ▶ Simultaneous configuration of multiple devices
- ▶ Graphical user interface with network layout
- ▶ SNMP/OPC gateway

Legend

The symbols used in this manual have the following meanings:

▶	Listing
□	Work step
■	Subheading

1 Description

1.1 General description

The GECKO devices are designed for the special requirements of industrial automation. They meet the relevant industry standards, provide very high operational reliability, even under extreme conditions, and also long-term reliability and flexibility.

The devices allow you to set up switched industrial Ethernet networks that conform to the IEEE 802.3 standard.

You have the ability to connect end devices or other segments to the ports of the device via twisted-pair cables.

The device is mounted by latching in place on a DIN rail.

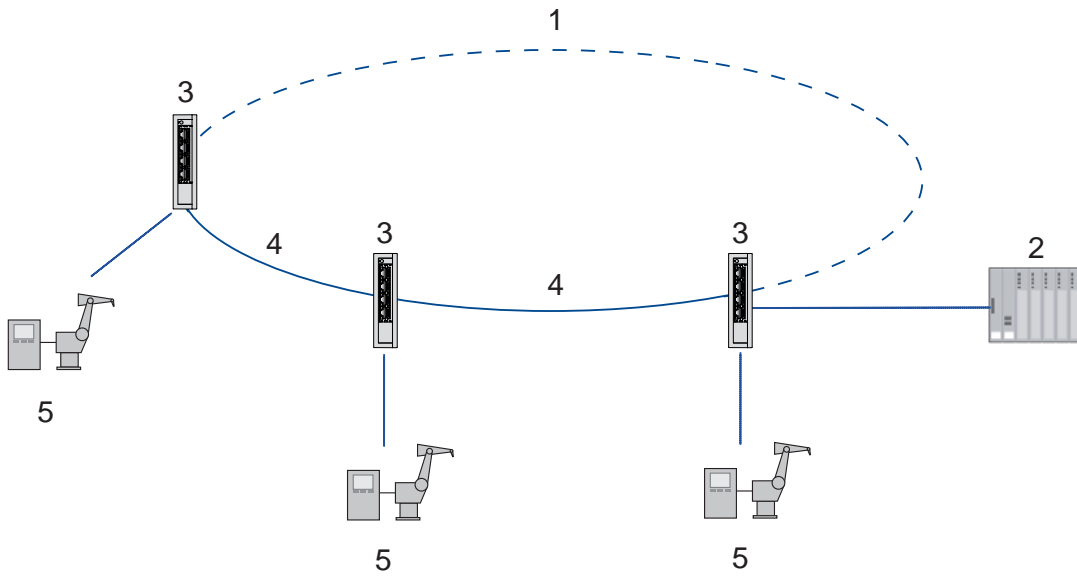
The devices work without a fan.

There are convenient options for managing the device. Administer your devices via:

- ▶ a Web browser
- ▶ network management software (e.g. Industrial HiVision)

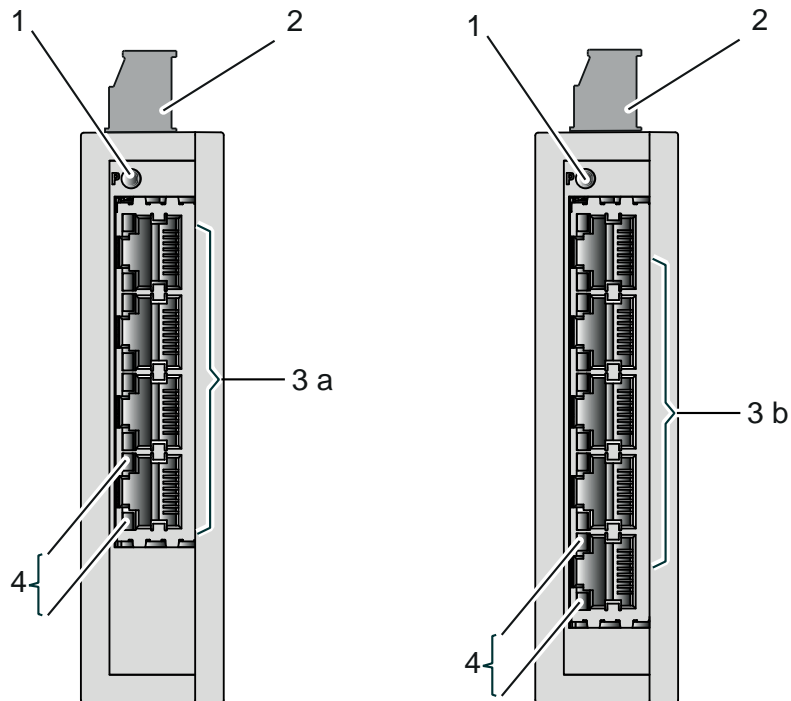
The Hirschmann network components help you ensure continuous communication across all levels of the company.

■ Example Application



-
- | | |
|---|---------------------------------------------------------------------------|
| 1 | Redundant data link
Redundancy procedure: Rapid Spanning Tree Protocol |
| 2 | Control |
| 3 | Lite Managed Switch GECKO |
| 4 | Data link |
| 5 | Production cell |
-

1.2 Device view



1	LED display element	Device Status
2	3-pin terminal block for the supply voltage and the grounding	
3 a	Ports 1 ... 4	10/100 Mbit/s twisted pair ports
3 b	Ports 1 ... 5	10/100 Mbit/s twisted pair ports
4	LED display elements	port state

1.3 Power supply

A 3-pin, pluggable terminal block is available for the power supply to the device.

For further information see [“Supply voltage” on page 5](#).

1.4 Ethernet ports

1.4.1 10/100 Mbit/s twisted pair port

This port is an RJ45 socket.

The 10/100 Mbit/s twisted pair port offers you the ability to connect network components according to the IEEE 802.3 10BASE-T/100BASE-TX standard.

This port supports:

- ▶ Autonegotiation
- ▶ Autopolarity
- ▶ Autocrossing
- ▶ 100 Mbit/s half-duplex mode, 100 Mbit/s full duplex mode
- ▶ 10 Mbit/s half-duplex mode, 10 Mbit/s full duplex mode

Delivery state: Autonegotiation activated

The pin assignment corresponds to MDI-X.

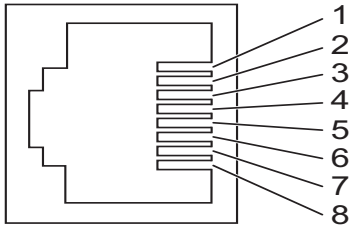
	Pin	Function
	1	RD+ Receive path
	2	RD- Receive path
	3	TD+ Transmission path
	6	TD- Transmission path
	4,5,7,8	—

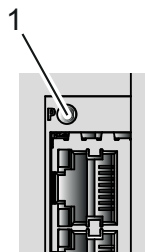
Table 1: Pin assignment of the 10/100 Mbit/ twisted pair port, RJ-45 socket, MDI-X mode

1.5 Display elements

After the working voltage is set up, the software starts and initializes itself. Afterwards, the device performs a self-test. During this process, various LEDs light up.

1.5.1 Device state

This LED provides information on the status of the power supply.

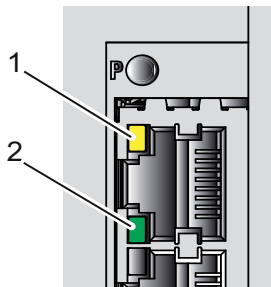


1 LED display element for device status

LED	Display	Color	Activity	Meaning
P	Power	Green	Lights up	Supply voltage is on
			None	Supply voltage is too low

1.5.2 Port state

These LEDs display port-related information.



- 1 Data rate
- 2 Link status

LED	Display	Color	Activity	Meaning
100	Data rate	Yellow	Lights up	100 Mbit/s connection
			None	10 Mbit/s connection
LS/DA	Link status data	Green	Lights up	Device detects a valid link
			flashing	Device is transmitting and/or receiving data
			None	Device detects an invalid or missing link

2 Installation

Note: Before installing and starting up the device, read the safety instructions.

See [“Safety instructions” on page 4](#).

The devices have been developed for practical application in a harsh industrial environment.

On delivery, the device is ready for operation.

Perform the following steps to install and configure the device:

- ▶ [Checking the package contents](#)
- ▶ [Installing the device onto the DIN rail](#)
- ▶ [Wiring the terminal block for the supply voltage and the grounding](#)
- ▶ [Operating the device](#)
- ▶ [Connecting data cables](#)

2.1 Checking the package contents

- Check whether the package includes all items named in the section [“Scope of delivery” on page 25](#).
- Check the individual parts for transport damage.

2.2 Installing the device onto the DIN rail

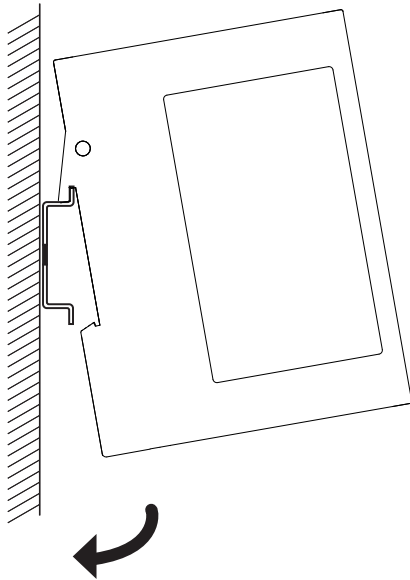
Note: To help avoid damaging the device through electrostatic charging, discharge electrostatic charges from the cover panels and the chassis, e.g. by touching a ground contact or a metal surface.

To prepare the mounting, proceed as follows:

- Remove the power connector from the device.
- Verify that there is at least 4 in (10 cm) of space above and below the device.
- Verify that there is at least 0.8 in (2 cm) of space on the right and left sides of the device.

To mount the device onto a horizontally mounted 35 mm DIN rail according to DIN EN 60715, proceed as follows:

- Slide the upper snap-in guide of the device into the DIN rail.
- Slide the bottom part of the device onto the DIN rail.



2.3 Wiring the terminal block for the supply voltage and the grounding



CAUTION

RISK OF BURNING

Never insert pointed objects (narrow screwdrivers, wires, etc.) into the device or into the connection terminals for electric conductors. Do not touch the connection terminals.

Start connecting the electrical wires only if **all** the above safety requirements are fulfilled.

[See "Supply voltage" on page 5.](#)

Failure to follow these instructions can result in injury or equipment damage.

Note: Ground the device before connecting any other cables.

Note: The shielding ground of the connectable twisted pair cables is connected to the ground connection as a conductor.

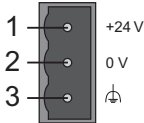
Figure	Pin assignment on the device	Specification of the supply voltage
	1 +24 V	Rated voltage range DC 12 V ... 24 V
	2 0 V	
	3 Ground connection	Voltage range DC incl. maximum tolerances 9.6 V ... 32 V

Table 2: 3-pin terminal block pin assignment

The supply voltage is electrically isolated from the housing.

To ground the device and connected the line for the supply voltage, you proceed as follows:

- Connect the wires according to the pin assignment on the device with the clamps.
- Fasten the wires connected by tightening the terminal screws.

Note: Relevant for North America:

The torque for tightening the supply voltage terminal block on the device is 4.5 lb-in (0.51 Nm).

2.4 Operating the device



WARNING

ELECTRIC SHOCK

Connect only a supply voltage that corresponds to the type plate of your device.

Failure to follow these instructions can result in death, serious injury, or equipment damage.

- Mount the terminal block for the supply voltage and the ground by plugging them in.
- Enable the supply voltage.

2.5 Connecting data cables

Note: In general, adhere to the following recommendations for data cable connections in environments with high electrical interference levels:

- Keep the length of the data cables as short as possible.
- When using copper cables, verify that there is a sufficient gap between the power supply cables and the data cables when laid over a long distance. Ideally, install the cables in separate cable channels.
- Use shielded cables.

- Connect the data cables according to your requirements.
[See “10/100 Mbit/s twisted pair port” on page 11.](#)

3 Configuration

Note: Two or more devices configured with the same IP address can cause unpredictable operation of your network.

Install and maintain a process that assigns a unique IP address to every device in the network.

- Default settings
 - ▶ IP address: The device looks for the IP address using DHCP
 - ▶ All ports: autonegotiation
 - ▶ Rapid Spanning Tree Protocol activated

- First installation

The device provides the following options for configuring the IP parameters:

 - ▶ Configuration via DHCP (state on delivery)
 - ▶ Entry with the aid of the HiDiscovery logs on the applications HiDiscovery or Industrial HiVision
 - ▶ Configuration via BOOTP

After defining the IP parameters, you start the graphical user interface:

- Start your Web browser.
- Enter the IP address of the device in the address field of the Web browser in the following form: `https://xxx.xxx.xxx.xxx`.

The Web browser sets up the connection to the device and shows the login window.

- Select the language for the graphical user interface.
- Select the user name and the password:

User name	Password (default setting)	Access role
admin	private	read and write access
user	public	read access only

- Click "OK".

The Web browser shows the window with the graphical user interface.

You will find further information on configuring the device in the "Configuration" user manual on the Internet on the Hirschmann product pages (www.hirschmann.com).

4 Monitoring the ambient air temperature

- Operate the device below the specified maximum ambient air temperature exclusively.

See [“General technical data” on page 22](#).

The ambient air temperature is the temperature of the air at a distance of 2 in (5 cm) from the device. It depends on the installation conditions of the device, e.g. the distance from other devices or other objects, and the output of neighboring devices.

5 Maintenance and service

- ▶ When designing this device, Hirschmann largely avoided using high-wear parts. The parts subject to wear and tear are dimensioned to last longer than the lifetime of the product when it is operated normally. Operate this device according to the specifications.
- ▶ Hirschmann is continually working on improving and developing their software. Check regularly whether there is an updated version of the software that provides you with additional benefits. You find information and software downloads on the Hirschmann product pages on the Internet (www.hirschmann.com).
- ▶ Depending on the degree of pollution in the operating environment, check at regular intervals that the ventilation slots in the device are not obstructed.

Note: You will find information about the complaints and returns procedures on the Internet under

<http://www.beldensolutions.com/en/Service/Repairs/index.phtml> .

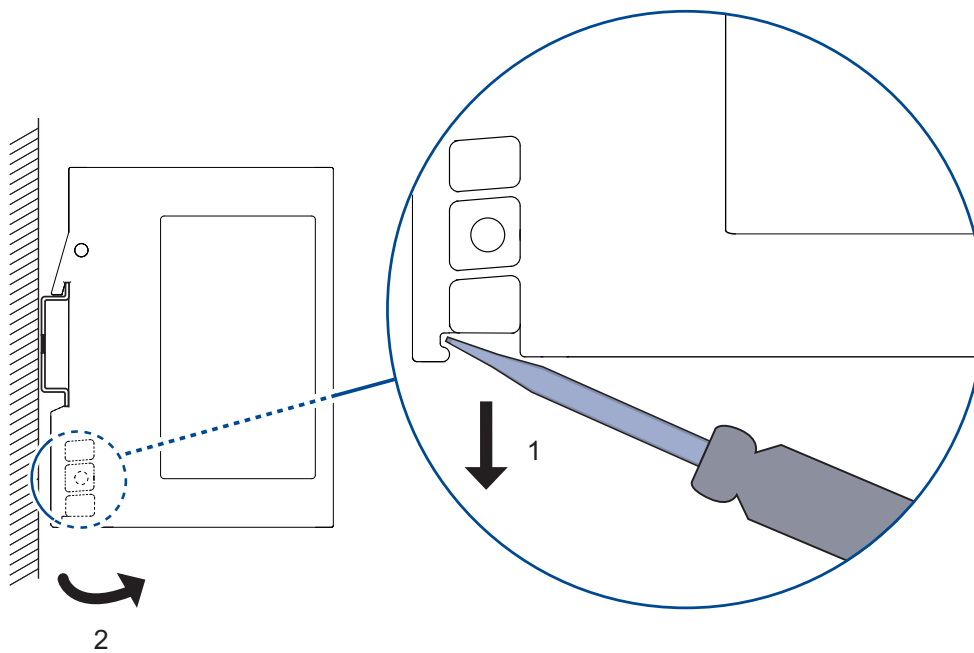
6 Disassembly

To prepare the deinstallation, you proceed as follows:

- Disconnect the data cables.
- Disable the supply voltage.
- Remove the power connector from the device.
- Disconnect the grounding.

To remove the device from the DIN rail, you proceed as follows:

- Insert a screwdriver below the housing into the indentation of the lock.
- Use the screwdriver to pull the lock downwards.
- Lift the bottom of the device away from the DIN rail.



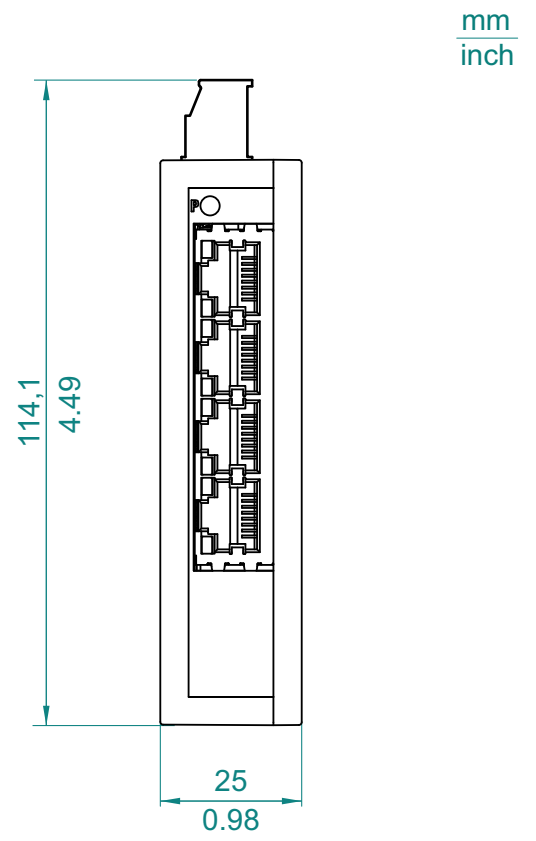
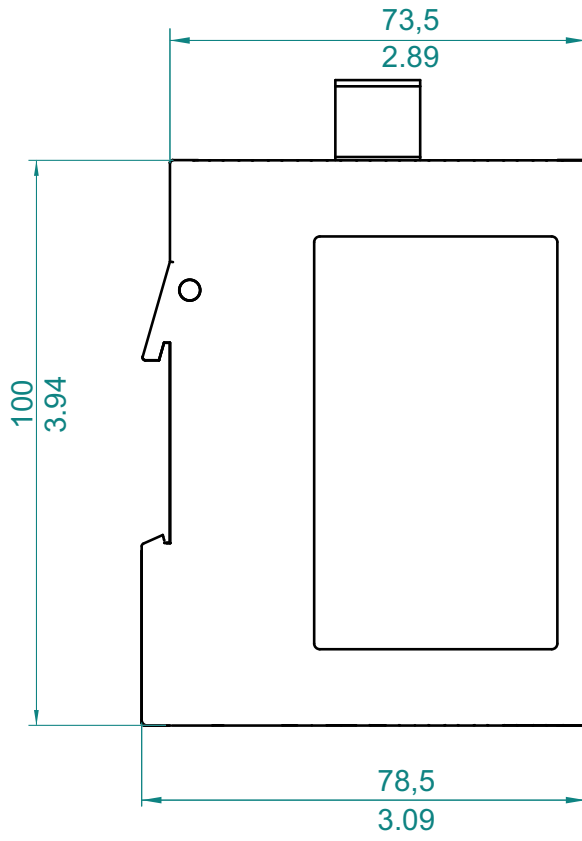
7 Technical data

■ General technical data

Dimensions W × H × D	See "Dimension drawings" on page 23.		
Weight	GECKO 4TX	3.63 oz (103 g)	
	GECKO 5TX	3.87 oz (110 g)	
Power supply	<ul style="list-style-type: none"> ▶ Safety extra-low voltage (SELV) ▶ Relevant for North America: Class 2 		
	Rated voltage range DC	12 V ... 24 V	
	Voltage range DC incl. maximum tolerances	9.6 V ... 32 V	
	Connection type	3-pin terminal block for the supply voltage and the grounding	
	Power loss buffer	> 10 ms at 20.4 V DC > 0.75 ms at 10.2 V DC	
	Overload current protection at input	Non-replaceable fuse	
	Back-up fuse	Nominal value at 24 V	1 A ... 2 A
		Nominal value at 12 V	1 A ... 2.5 A
		Characteristic:	slow blow
	Peak inrush current	< 14 A	
Climatic conditions during operation	Ambient air temperature ^{ab}	+32 °F ... +140 °F (0 °C ... +60 °C)	
	Humidity	5 % ... 95 % (non-condensing)	
	Air pressure	minimum 795 hPa (+9842 ft; +2000 m)	
Climatic conditions during storage	Ambient air temperature ^a	-40 °F ... +185 °F (-40 °C ... +85 °C)	
	Humidity	10 % ... 95 % (non-condensing)	
	Air pressure	minimum 795 hPa (+9842 ft; +2000 m)	
Pollution degree	2		
Protection classes	Degree of protection	IP30	

- a. Temperature of the ambient air at a distance of 2 inches (5 cm) from the device
b. under UL conditions: +32 °F ... +122 °F (0 °C ... +50 °C). UL evaluation was done up to +122 °F (+50 °C), not to the maximum temperature of +140 °F (+60 °C).

■ Dimension drawings



mm
inch

■ EMC and immunity

EMC interference emission

Radiated emission

EN 55022	Class A
FCC 47 CFR Part 15	Class A
EN 61000-6-4	Fulfilled

Conducted emission

EN 55022	DC supply connection	Class A
FCC 47 CFR Part 15	DC supply connection	Class A
EN 61000-6-4	DC supply connection	Fulfilled
EN 55022	Telecommunication connections	Class A
EN 61000-6-4	Telecommunication connections	Fulfilled

EMC interference immunity

Electrostatic discharge

EN 61000-4-2	Contact discharge	± 4 kV
EN 61000-4-2	Air discharge	± 8 kV

Electromagnetic field

EN 61000-4-3	80 MHz ... 2700 MHz	10 V/m
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Fast transients (burst)

EN 61000-4-4	DC supply connection	± 2 kV
EN 61000-4-4	Data line	± 4 kV

Voltage surges - DC supply connection

EN 61000-4-5	line/ground	± 2 kV
EN 61000-4-5	line/line	± 1 kV

Voltage surges - data line

EN 61000-4-5	line/ground	± 1 kV
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Conducted disturbances

EN 61000-4-6	150 kHz ... 80 MHz	10 V
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Stability

IEC 60068-2-6, test Fc	Vibration	— 5 Hz ... 8.4 Hz with 0.14 in. (3.5 mm) amplitude 8.4 Hz ... 150 Hz with 1 g
IEC 60068-2-27, test Ea	Shock	15 g at 11 ms

■ Network range

10/100/1000 Mbit/s twisted pair port

Length of a twisted pair segment	max. 100 m (for cat5e cable)
----------------------------------	------------------------------

■ Power consumption/power output

Maximum power consumption	Power output
GECKO 4TX 2.35 W	8.0 Btu (IT)/h
GECKO 5TX 1.8 W	5.8 Btu (IT)/h

■ Scope of delivery

Numb er	Article
1 ×	Device
1 ×	3-pin terminal block for the supply voltage and the grounding
1 ×	General safety instructions

■ Order number

Device	Order number
GECKO 4TX	942 104-001
GECKO 5TX	942 104-002

■ Accessories

Note: Please note that recommended accessories for the products possibly have different characteristics than the device and thus limit the application area of the overall system. For example, adding an accessory having the class of protection IP 20 to a device having the class of protection IP 65 reduces the class of protection of the overall system to IP 20.

Other accessories	Order number
Network management software Industrial HiVision	943 156-xxx
Rail Power Supply RPS 15	943 662-015
Rail Power Supply RPS 30	943 662-003
Rail Power Supply RPS 80 EEC	943 662-080
Rail Power Supply RPS 120 EEC (CC)	943 662-121

■ Underlying technical standards

Designation	
CSA C22.2 No. 142	Canadian National Standard(s) – Process Control Equipment – Industrial Products
EN 55011	Industrial, scientific and medical equipment – Radio-frequency disturbance characteristics – Limits and methods of measurement
EN 55022	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement

Designation	
EN 60950-1	Information technology equipment – Safety – Part 1: General requirements
EN 61000-6-2	Electromagnetic compatibility (EMC) – Part 6-2: Generic standards – Immunity for industrial environments
EN 61000-6-4	Electromagnetic compatibility (EMC) – Part 6-4: Generic standards – Emission standard for industrial environments
EN 61131-2	Programmable controllers – Part 2: Equipment requirements and tests
FCC 47 CFR Part 15	Code of Federal Regulations
IEC/EN 61850-3	Communication networks and systems in substations – Part 3: General requirements
IEEE 802.3	Ethernet
IEEE 802.1D	MAC Bridges (switching function)
IEEE 802.1AB	Station and Media Access Control Connectivity Discovery
UL 61010-1	Safety Requirements for Electrical Equipment for Measurement, Control and Laboratory use

The device generally fulfills the technical standards named in their current versions.

The device has an approval based on a specific standard only if the approval indicator appears on the device casing.

A Further Support

■ Technical Questions

For technical questions, please contact any Hirschmann dealer in your area or Hirschmann directly.

You will find the addresses of our partners on the Internet at

<http://www.hirschmann.com>

Contact our support at

<https://hirschmann-support.belden.eu.com>

You can contact us

in the EMEA region at

▶ Tel.: +49 (0)1805 14-1538

▶ E-mail: hac.support@belden.com

in the America region at

▶ Tel.: +1 (717) 217-2270

▶ E-mail: inet-support.us@belden.com

in the Asia-Pacific region at

▶ Tel.: +65 6854 9860

▶ E-mail: inet-ap@belden.com

■ Hirschmann Competence Center

The Hirschmann Competence Center is ahead of its competitors:

▶ Consulting incorporates comprehensive technical advice, from system evaluation through network planning to project planning.

▶ Training offers you an introduction to the basics, product briefing and user training with certification.

The current technology and product training courses can be found at

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▶ Support ranges from the first installation through the standby service to maintenance concepts.

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