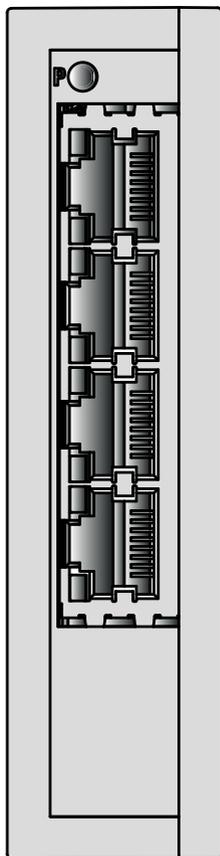


ConneXium

TCSESL Lite Managed Switch Installation Manual



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About this Manual

Validity Note

The data and illustrations found in this book are not binding. We reserve the right to modify our products in line with our policy of continuous product development. The information in this document is subject to change without notice and should not be construed as a commitment by Schneider Electric.

Product Related Information

Schneider Electric assumes no responsibility for any errors that may appear in this document. If you have any suggestions for improvements or amendments or have found errors in this publication, please notify us.

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All pertinent state, regional, and local safety regulations must be observed when installing and using this product. For reasons of safety and to ensure compliance with documented system data, only the manufacturer should perform repairs to components.

When devices are used for applications with technical safety requirements, please follow the relevant instructions.

Failure to use Schneider Electric software or approved software with our hardware products may result in improper operating results.

Failure to observe this product related warning can result in injury or equipment damage.

User Comments

We welcome your comments about this document. You can reach us by e-mail at techpub@schneider-electric.com

Related Documents

Title	Reference Number
ConneXium TCSESL Configuration User Manual	NHA24786
ConneXium TCSESL Installation Manual	NHA24763

The “Installation” user manual contains a device description, safety instructions, a description of the display, and the other information that you need to install the device.

The “Configuration” user manual contains the information you need to start operating the device. It takes you step by step from the first startup operation through to the basic settings for operation in your environment.

Key

The symbols used in this manual have the following meanings:

	Listing
	Work step
	Subheading

Safety instructions

■ Important Information

Notice: Read these instructions carefully, and look at the equipment to become familiar with the device before trying to install, operate, or maintain it. The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to call attention to information that clarifies or simplifies a procedure.



The addition of this symbol to a Danger or Warning safety label indicates that an electrical hazard exists, which will result in personal injury if the instructions are not followed.



This is the safety alert symbol. It is used to alert you to potential personal injury hazards. Obey all safety messages that follow this symbol to avoid possible injury or death.



DANGER

DANGER indicates an imminently hazardous situation which, if not avoided, **will result in** death or serious injury.



WARNING

WARNING indicates a potentially hazardous situation which, if not avoided, **can result in** death or serious injury.



CAUTION

CAUTION indicates a potentially hazardous situation which, if not avoided, **can result in** minor or moderate injury.

PLEASE NOTE: Electrical equipment should be installed, operated, serviced, and maintained only by qualified personnel. No responsibility is assumed by Schneider Electric for any consequences arising out of the use of this material.

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■ Usage



WARNING

UNINTENDED EQUIPMENT OPERATION

- Use the device only for purposes described in this documentation.

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

■ Supply voltage

For safety reasons the devices have been designed to operate at low voltages. Thus, they may only be connected to the supply voltage connections and to the signal contact with SELV circuits with the voltage restrictions in accordance with IEC/EN 60950-1.

- Relevant for North America:

The device may only be connected to a supply voltage of class 2 that fulfills the requirements of the National Electrical Code, Table 11(b). If the voltage is being supplied redundantly (two different voltage sources), the combined supply voltages must fulfill the requirements of the National Electrical Code, Table 11(b).

- Relevant for North America: For use in class 2 circuits.
Use 60/75 °C (140/167 °F) or 75 °C (167 °F) copper (Cu) wire only.
- The device does not contain any service components. If the device is not functioning correctly, or if it is damaged, switch off the voltage supply and return the device to the plant for inspection.
- Apply supply voltage to the device if terminal blocks are wired and installed correctly as described in chapter [“Wiring the terminal block for the supply voltage and grounding”](#) on page 18.



DANGER

FIRE HAZARD

- Every time you connect the electrical conductors, verify that the following requirements are met:
 - ▶ 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 power cords are suitable for ambient air temperatures of at least 167 °F (75 °C). The power cord wires are made of copper.

Failure to follow these instructions will result in death or serious injury.

■ Shielding ground

Note: The shield ground wire of the twisted pair lines is connected to the front panel as a conductor.

■ Housing



WARNING

RISK OF SPARK

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.

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



CAUTION

EQUIPMENT OVERHEATING

When installing the device, make sure any ventilation slots remain free. Maintain a clearance of at least 10 cm (3.94 in). Also, leave at least 0.8 in (2 cm) space to the right and left sides of the device.

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

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

- The ventilation slots must not be covered to promote free air circulation.
- Make sure that the electrical installation meets local or nationally applicable safety regulations.
- The clearance between the ventilation slots of the housing and other objects must be at least 10 cm (3.94 in).
- The device must be installed in the vertical position.
- If installed in a living area or office environment, the device must be operated exclusively in switch cabinets with fire protection characteristics in accordance with EN 60950-1.

■ **Environment**

The device may only be operated at the specified surrounding air temperature (temperature of the surrounding air at a distance of up to 5 cm (1.97 in) from the device) and relative air humidity specified in the technical data.

- Install the device in a location where the climatic threshold values specified in the technical data will be observed.
- Use the device only in an environment within the pollution degree specified in the technical data.

■ **General safety instructions**

Electricity is used to operate this equipment. Comply with every detail of the safety requirements specified in the operating instructions regarding the voltages to apply.

[See “Supply voltage” on page 6.](#)

- Only qualified personnel should work on this device or in its vicinity. These personnel must be thoroughly familiar with all the hazard messages and maintenance procedures in accordance with this operating manual.
- The proper and safe operation of this device depends on proper handling during transport, proper storage and assembly, and conscientious operation and maintenance procedures.
- Never start operation with damaged components.
- Any work that may be required on the electrical installation may only be carried out by personnel trained for this purpose.

■ **National and international safety regulations**

- Make sure that the electrical installation meets local or nationally applicable safety regulations.

■ **CE marking**

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

2011/65/EU and 2015/863/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.

2014/30/EU (EMC)

Directive of the European Parliament and of the Council on the harmonisation of the laws of the Member States relating 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:

Schneider Electric
35 rue Joseph Monier
CS30323
92506 Rueil-Malmaison-France

The product can be used in the industrial sector.

- ▶ Interference immunity: EN 61000-6-2
- ▶ Emitted interference: EN 55032

Note: 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**

Supplier`s Declaration of Conformity 47 CFR § 2.1077 Compliance Information

TCSESL

U.S. Contact Information

Schneider Electric United States
North American Division
Andover Research and Development Center (ARDC)
800 Federal Street
MA 01810, Andover, USA

www.se.com/contact

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 high frequencies, and 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 living area can also cause interference, and in this case the user is obliged to cover the costs of removing the interference.

1 Device description

1.1 General device description

A TCSESL switch is a compact, heavy-duty device suitable for industrial applications which can be installed on a standard DIN Rail.

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.

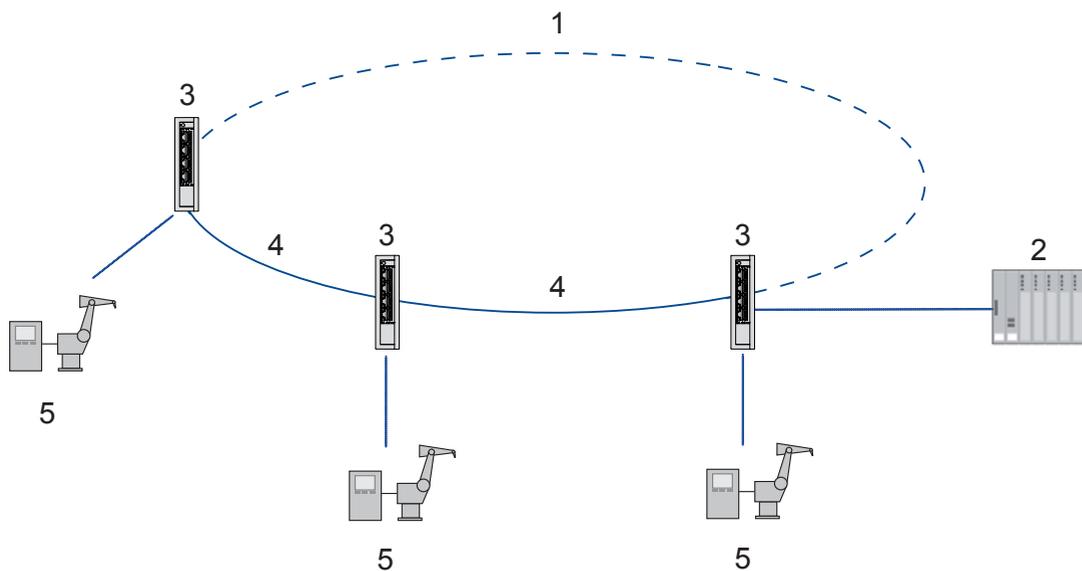
The device is mounted by latching in place on a DIN rail.

The devices work without a fan.

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

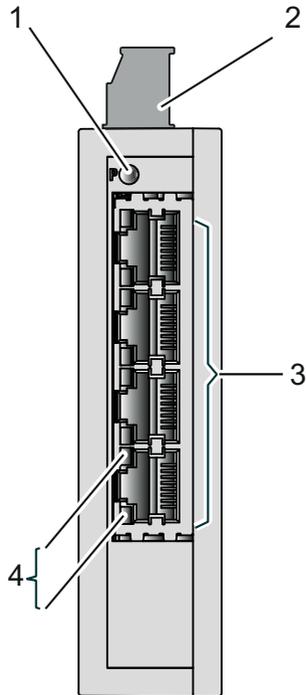
- ▶ a Web browser
- ▶ network management software (e.g. ConneXium Network Manager)

■ Example Application



1	Redundant data link Redundancy procedure: Rapid Spanning Tree Protocol
2	Control
3	ConneXium TCSESL
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	Ports 1 ... 4	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 6](#).

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 active

The pin assignment corresponds to MDI-X.

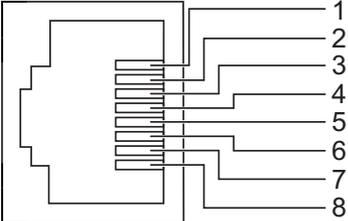
	Pin	Function
	1	RD+ Receive path
	2	RD- Receive path
	3	TD+ Transmission path
	4	
	5	
	6	TD- Transmission path
	7	
	8	

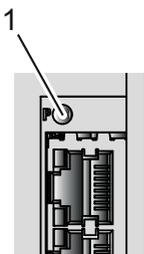
Table 1: Pin assignment of the 10/100 Mbit/ twisted pair port, RJ-45 socket, MDI-X mode

1.5 Display elements

After the supply 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.

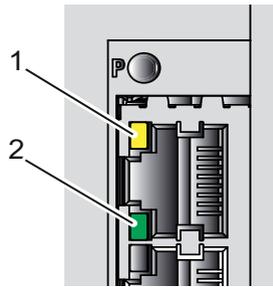


1 LED display element for device status

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.



LED	Display	Color	Activity	Meaning
1	Data rate	Yellow	Lights up	100 Mbit/s connection
			None	10 Mbit/s connection
2	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

On delivery, the device is ready for operation.

The following steps should be performed to install and configure a device:

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

2.1 Safety instructions

■ Staff qualification requirements

Only appropriately qualified staff should work on or near this equipment. Such staff must be thoroughly acquainted with all the hazard messages and maintenance measures contained in these operating instructions.

The proper and safe operation of this equipment assumes proper transport, appropriate storage and assembly, and careful operation and maintenance.

Qualified staff are persons familiar with setting up, assembling, installation, starting up, and operating this product, and who have appropriate qualifications to cover their activities, such as:

- ▶ knowledge of how to switch circuits and equipment/systems on and off, ground them, and identify them in accordance with current safety standards
- ▶ training or instruction in accordance with current safety standards of using and maintaining appropriate safety equipment
- ▶ first aid training

■ 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.

2.2 Checking the package contents

- Check that the contents of the package includes are complete (see [“Scope of delivery” on page 27](#)).
- Check the individual parts for transport damage.

2.3 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.



CAUTION

EQUIPMENT OVERHEATING

When installing the device, make sure any ventilation slots remain free. Maintain a clearance of at least 10 cm (3.94 in).

Also, leave at least 0.8 in (2 cm) space to the right and left sides of the device.

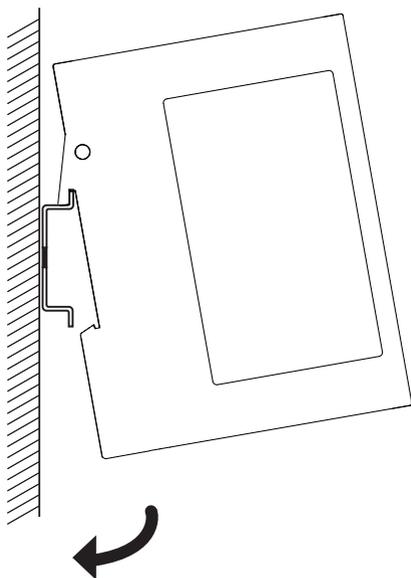
Failure to follow these instructions can result in injury or equipment damage.

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.



2.4 Wiring the terminal block for the supply voltage and grounding

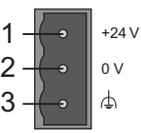
Figure	Pin assignment on the device	Specification of the supply voltage
	1 +24 V	Rated voltage range DC 12 V ... 24 V
	2 0 V	
	3 Ground connection	Voltage range DC incl. maximum tolerances 9.6 V ... 32 V

Table 2: 3-pin terminal block pin assignment

The supply voltage is electrically isolated from the housing.

To ground the device and connect 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).

2.5 Operating the device

WARNING

ELECTRIC SHOCK OR BURN

When the module is operated with direct plug-in power units, use only:

- SELV supply units that comply with IEC 60950/EN 60950 and
- (in USA and Canada) Class 2 power units that comply with applicable national or regional electrical codes

Connect the ground wire to the PE terminal (where applicable) before you establish any further connections. When you remove connections, disconnect the ground wire last.

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.

2.6 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 cable according to your requirements.
[See “10/100 Mbit/s twisted pair port” on page 13.](#)

3 Configuration

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



WARNING

UNINTENDED EQUIPMENT OPERATION

Establish and maintain a process for assigning unique IP addresses to all devices on the network.

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

■ **Default settings**

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

■ **Configuring the IP parameters**

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

- ▶ Configuration via DHCP (state on delivery)
- ▶ Configuration with the aid of the Ethernet Switch Configurator logs on the applications Ethernet Switch Configurator or ConneXium Network Manager
- ▶ Configuration via BOOTP

Further information on the basic settings of the device can be found in the “Configuration” user manual.

■ **First login (Password change)**

Perform the following steps:

- Open the Graphical User Interface or the Command Line Interface the first time you log on to the device.
- Log on to the device with the default password “private”. The device prompts you to type in a new password.
- Type in your new password.
Choose a password that contains at least 8 characters which includes upper-case characters, lower-case characters, numerical digits, and special characters.
- When you log on to the device with the Command Line Interface, then the device prompts you to confirm your new password.
- Log on to the device again with your new password.

4 Monitoring the ambient air temperature

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

See [“General technical data” on page 24](#).

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

- Depending on the degree of pollution in the operating environment, check at regular intervals that the ventilation slots in the device are not obstructed.
- Operate this device according to the specifications (see [“Technical data”](#)).

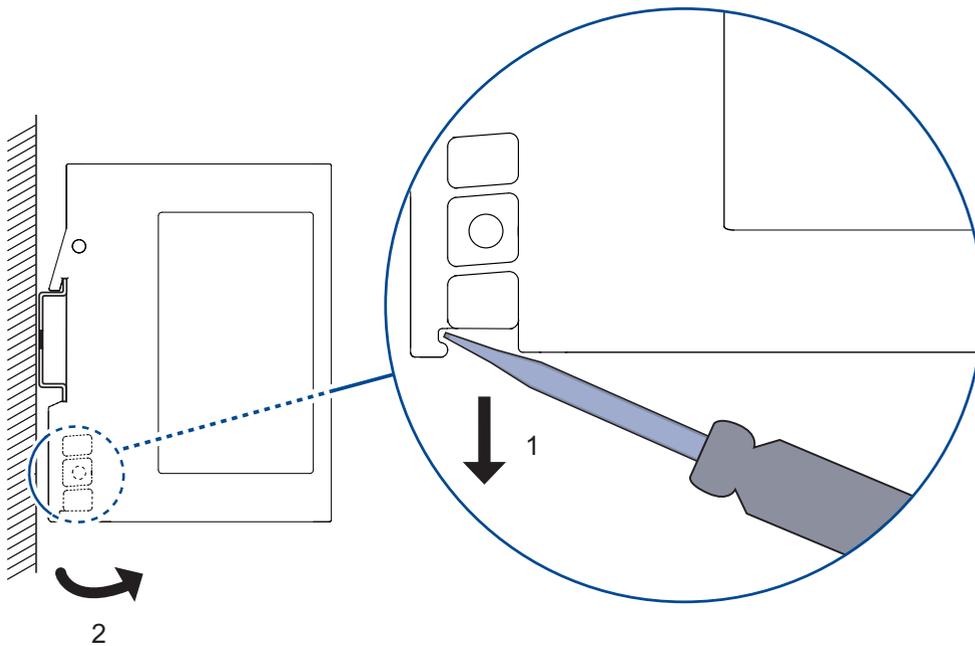
6 Disassembly

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.



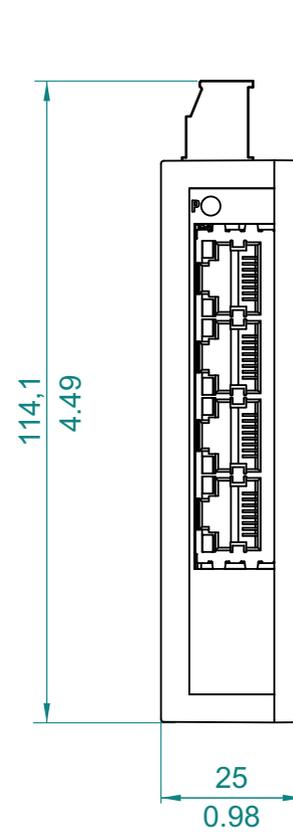
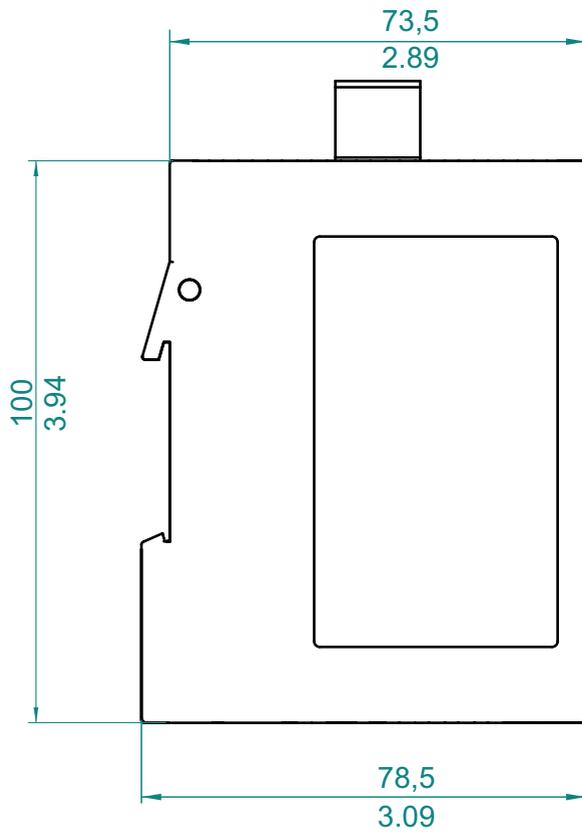
7 Technical data

■ General technical data

Dimensions W × H × D	See "Dimension drawings" on page 25.		
Weight	0.23 lb (103 g)		
Power supply	▶ 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 failure bypass	> 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 ^a	+32 °F ... +122 °F (0 °C ... +50 °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

■ Dimension drawings



mm
inch

■ EMC and immunity

EMC interference emission

Radiated emission

EN 55032	Class A
FCC 47 CFR Part 15	Class A
EN 61000-6-4	Fulfilled

Conducted emission

EN 55032	DC supply connection	Class A
FCC 47 CFR Part 15	DC supply connection	Class A
EN 61000-6-4	DC supply connection	Fulfilled
EN 55032	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 Mbit/s twisted pair port

Length of a twisted pair segment	max. 328 ft (100 m) (for cat5e cable)
----------------------------------	---------------------------------------

■ Power consumption/power output

Maximum power consumption	Power output
2.35 W	8.0 Btu (IT)/h

■ Scope of delivery

Number	Article
1 ×	Device
1 ×	3-pin terminal block for the supply voltage and the grounding

■ Order number

Device	Order number
ConneXium TCESL	TCESL043F23F0

■ 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 55032	Information technology equipment – Radio disturbance characteristics – Limits and methods of measurement
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