SIEMENS

SIMATIC NET

Industrial Ethernet switches SCALANCE X005 / X005TS

Operating Instructions

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Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury will result if proper precautions are not taken.

▲WARNING

indicates that death or severe personal injury may result if proper precautions are not taken.

ACAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

▲WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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Introduction

1.1 On the Operating Instructions

Purpose of the Operating Instructions

These operating instructions support you when commissioning the unmanaged Industrial Ethernet entry level switches SCALANCE X005 and SCALANCE X005TS (Transportation System).

Validity of the Operating Instructions

These operating instructions are valid for the following devices:

Device	Order number
SCALANCE X005	6GK5005-0BA00-1AA3
SCALANCE X005TS	6GK5005-0BA00-1CA3

Further documentation

The "SIMATIC NET Industrial Ethernet Twisted Pair and Fiber Optic Networks" manual contains additional information on other SIMATIC NET products that you can operate along with the SCALANCE X005 and SCALANCE X005TS IE switches in an Industrial Ethernet network.

You can order the manual "SIMATIC NET Industrial Twisted Pair and Fiber Optic Networks", release 05/2001, using the following order numbers:

6GK1970-1BA10-0AA0 German

6GK1970-1BA10-0AA1 English

6GK1970-1BA10-0AA2 French

6GK1970-1BA10-0AA4 Italian

You will also find this network manual on the Internet pages of Service & Support under the following entry ID: 1172207 (http://support.automation.siemens.com/WW/view/en/1172207).

You will find further information in the "System Manual Industrial Ethernet" in the Manual Collection.

You will find further information on the SCALANCE system on the Internet at www.siemens.com/scalance (www.siemens.com/scalance).

Audience

These Operating Instructions are intended for persons who commission networks with the IE switches of the SCALANCE X-000 product line.

1.1 On the Operating Instructions

SIMATIC NET glossary

Explanations of many of the specialist terms used in this documentation can be found in the SIMATIC NET glossary.

You will find the SIMATIC NET glossary here:

- SIMATIC NET Manual Collection or product DVD
 The DVD ships with certain SIMATIC NET products.
- On the Internet under the following entry ID:
 50305045 (http://support.automation.siemens.com/WW/view/en/50305045)

Security information

Siemens provides products and solutions with industrial security functions that support the secure operation of plants, solutions, machines, equipment and/or networks. They are important components in a holistic industrial security concept. With this in mind, Siemens' products and solutions undergo continuous development. Siemens recommends strongly that you regularly check for product updates.

For the secure operation of Siemens products and solutions, it is necessary to take suitable preventive action (e.g. cell protection concept) and integrate each component into a holistic, state-of-the-art industrial security concept. Third-party products that may be in use should also be considered. For more information about industrial security, visit http://www.siemens.com/industrialsecurity.

To stay informed about product updates as they occur, sign up for a product-specific newsletter. For more information, visit http://support.automation.siemens.com.

1.2 On the product

What is possible?

The SCALANCE X005 and SCALANCE X005TS IE switches allow the cost-effective installation of small Industrial Ethernet linear bus or star structures with switching functionality. The devices are designed for installation in a cabinet.

Note

It is not possible to use a SCALANCE X005 or SCALANCE X005TS in a redundant ring because they do not support redundancy.

Note

If devices are supplied over long 24 V power supply lines or networks, measures are necessary to prevent interference by strong electromagnetic pulses on the supply lines. These can result, for example, due to lightning or switching of large inductive loads.

One of the tests used to attest the immunity of these devices to electromagnetic interference is the "surge immunity test" according to EN 61000-4-5. This test requires overvoltage protection for the power supply lines. A suitable device is, for example, the Dehn Blitzductor BVT AVD 24 V type no. 918 422 or a comparable protective element.

Manufacturer:

DEHN+SÖHNE GmbH+Co.KG Hans Dehn Str.1 Postfach 1640 D-92306 Neumarkt, Germany

Components of the product

The following components are supplied with a SCALANCE X005 or SCALANCE X005TS:

- SCALANCE X005 or SCALANCE X005TS IE switch
- 2-terminal plug-in block (power supply)
- Product information

1.3 Unpacking and checking

Accessories

Component	Packaging unit	Order number
IE FC Stripping Tool	1	6GK1901-1GA00
IE FC blade cassettes	1	6GK1901-1GB00
IE FC TP standard cable GP	1	6XV1840 2AH10
IE FC TP trailing cable	1	6XV1840-3AH10
IE FC TP marine cable	1	6XV1840-4AH10
IE FC TP trailing cable GP	1	6XV1870-2D
IE FC TP flexible cable GP	1	6XV1870-2B
IE FC RJ-45 Plug 180	1	6GK1 901-1BB10-2AA0
IE FC RJ-45 Plug 180	10	6GK1 901-1BB10-2AB0
IE FC RJ-45 Plug 180	50	6GK1 901-1BB10-2AE0

1.3 Unpacking and checking

Unpacking and checking



WARNING

Do not use any parts that show evidence of damage

If you use damaged parts, there is no guarantee that the device will function according to the specification.

If you use damaged parts, this can lead to the following problems:

- Injury to persons
- Loss of the approvals
- Violation of the EMC regulations
- Damage to the device and other components

Use only undamaged parts.

- 1. Make sure that the package is complete.
- 2. Check all the parts for transport damage.



WARNING

If the SCALANCE X005TS device is operated in an ambient temperature of between 60 °C and 65 °C, the temperature of the device housing may be higher than 65 °C. The device must therefore be installed so that it is only accessible to service personnel or users that are aware of the reason for restricted access and the required safety measures at an ambient temperature of 60 °C to 65 °C.

Network topologies

Switching technology allows extensive networks to be set up with numerous nodes and simplifies network expansion.

Which topologies can be implemented?

Using the SCALANCE X005 and SCALANCE X005TS IE switches, you can implement star topologies.

Note

Keep to the maximum permitted cable lengths of the devices you are using. You will find the permitted cable lengths in the section "Technical specifications (Page 29)".

Star topology

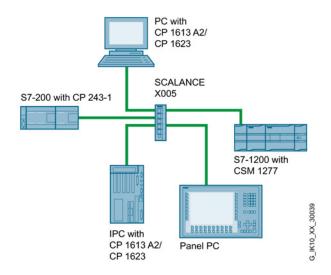


Figure 2-1 Example of a star topology with SCALANCE X005

Description of the device

3.1 Overview SCALANCE X-000

Table 3-1 Overview of the product characteristics

	X005	X005TS
SIMATIC environment	+	+
Diagnostics LED	+	+
24 VDC	+	+
2 x 24 VDC	-	-
Compact housing (securing collar, etc.)	+	+
Signaling contact + on-site operation	-	-
Diagnostics: Web, SNMP, PROFINET	-	-
C-PLUG	-	-
Ring redundancy with RM	-	-
Passive ring redundancy	-	-
Standby redundancy	-	-
IRT capability	-	-
Fast learning	-	-
Passive listening	-	-
Log table	-	-
SNTP + SICLOCK	-	-
Cut Through	-	-

Table 3-2 Overview of the connection options

	X005	X005TS
TP (RJ-45)	5	5
Fast Ethernet 10 / 100 Mbps		

3.2 Product characteristics

Possible attachments

The SCALANCE X005 and SCALANCE X005TS have five RJ-45 jacks for connection of end devices or other network segments.



Figure 3-1 SCALANCE X005

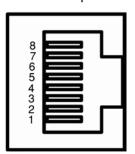
Note

The SCALANCE X005 shown above has the same construction as the SCALANCE X005TS.

3.3 TP ports (twisted pair)

RJ-45 connector pinout

With SCALANCE X005 and SCALANCE X005TS, the twisted-pair ports are designed as RJ-45 jacks with MDI-X pin assignment (Medium Dependent Interface Autocrossover) of a network component.



Pin number	Assignment
Pin 8	n. c.
Pin 7	n. c.
Pin 6	TD-
Pin 5	n. c.
Pin 4	n. c.
Pin 3	TD+
Pin 2	RD-
Pin 1	RD+

Note

Permitted cable lengths

TP cords or TP-XP cords with a maximum length of 10 m can be connected to the TP port with RJ-45 jacks.

With the IE FC cables and IE FC RJ-45 plugs 180, an overall cable length of a maximum of 100 m is permitted between two devices depending on the cable type.

Autonegotiation

With the autonegotiation mechanism, repeaters and end devices can automatically determine the transmission speed and the transmission mode of the partner port. This makes it possible to configure different devices automatically.

Two components connected to a link segment can exchange information about the data transfer and can adapt their settings to each other. The mode with the highest possible speed is set.

Note

Devices not supporting autonegotiation must be set permanently to 100 Mbps half duplex or 10 Mbps half duplex.

3.3 TP ports (twisted pair)

Auto polarity exchange

If the pair of receiving cables is connected incorrectly (RD+ and RD- interchanged), the polarity is adapted automatically.

Note

The SCALANCE X005 and SCALANCE X005TS IE switches are plug-and-play devices that require no settings during commissioning.

MDI / MDI-X autocrossover function

With the MPI/MDI-X autocrossover function, the send and receive contacts of an Ethernet port are assigned automatically. The assignment depends on the cable with which the communications partner is connected. This means that it does not matter whether the port is connected using a patch cable or crossover cable. This prevents malfunctions resulting from mismatching send and receive lines. This makes installation much easier for the user.

The SCALANCE X005 and SCALANCE X005TS devices support the MDI / MDI-X autocrossover function.

Insulation between the TP ports

There are two TP port groups:

Group 1: P1 Group2: P2 to P5

Between ports of different port groups, an insulation voltage of 1.5 kV is adhered to (corresponds to IEEE802.3, Chapter 33.4.1.1, Environment B), e.g. between P1 and P2.

The requirements for Environment A are met between ports of the same group, e.g. between P2 and P5.

NOTICE

Setting ports with a fixed configuration

Ports of partner stations with a fixed configuration must be set to 100 Mbps/ half duplex or 10 Mbps half duplex.

NOTICE

Formation of loops

Note that the direct connection of two ports or accidental connection over several switches causes an illegal loop that can cause network overload and failure.

3.4 LEDs

Power LED "L" (green LED)

The power LED shows the status of the power supply.

LED color	LED status	Meaning	
Green	Lit	Power supply is connected.	
-	Off	Power supply is not connected or <14 V.	

Port LEDs "P" (green/yellow LEDs)

The port LEDs indicate the status of the ports.

LED color	LED status	Meaning
Green	Lit	TP link exists, no data reception at port
Yellow	Lit	TP link exists, data reception at port
Yellow	Flashing	Test phase during power on

3.4 LEDs

Mounting 4

4.1 Types of installation

The devices can be installed in the following ways:

- Installation on a 35 mm DIN rail
- Installation on a SIMATIC S7-300 standard rail
- Wall mounting



Ambient temperature between 60 °C and 65 °C

If a device is operated in an ambient temperature between 60 $^{\circ}$ C and 65 $^{\circ}$ C, the temperature of the device housing may be higher than 70 $^{\circ}$ C. The device must therefore be installed so that it is only accessible to service personnel or users that are aware of the reason for restricted access and the required safety measures at an ambient temperature of 60 $^{\circ}$ C to 65 $^{\circ}$ C.



If the cable or conduit entry point exceeds 70 $^{\circ}$ C or the branching point of conductors exceeds 80 $^{\circ}$ C, special precautions must be taken. If the equipment is operated in an air ambient in excess of 50 $^{\circ}$ C to 60 $^{\circ}$ C, only use cables with admitted maximum operating temperature of at least 80 $^{\circ}$ C.

WARNING

Protective measures need to be taken to ensure that the rated voltage of the equipment cannot be exceeded by more than 40% by transient surges. This is achieved by operating the equipment only with SELV circuits (previously also PELV). Under no circumstances must transient surges exceed 119 V.

Note

When installing and operating the device, keep to the installation instructions and safety-related notices as described here and in the manual "SIMATIC NET Industrial Ethernet Twisted Pair and Fiber Optic Networks".

Note

Provide suitable shade to protect the device against direct sunlight. This avoids unwanted warming of the device and prevents premature aging of the device and cabling.

4.2 Installation on a DIN rail

Mounting

To install the device on a 35 mm DIN rail complying with DIN EN 50022, follow the steps below:

- 1. Place the second housing guide of the device on the top edge of the DIN rail.
- 2. Press the device down against the DIN rail until the spring catch locks in place.
- 3. Fit the connectors for the power supply. See also section "Power supply (Page 23)".
- 4. Insert the terminal block into the sockets on the device.

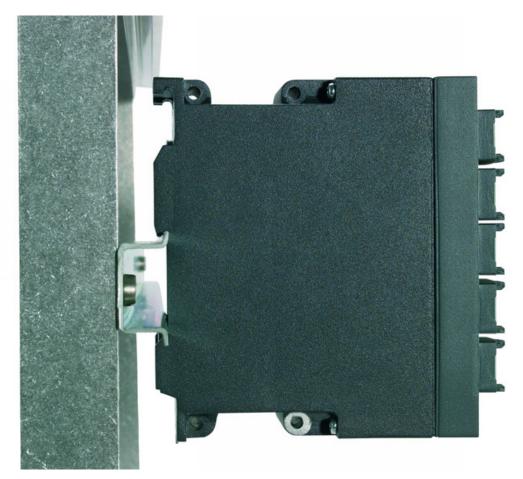


Figure 4-1 Installation on a 35 mm DIN rail

Removal

To remove the device from the DIN rail, follow the steps below:

- 1. Disconnect all connected cables.
- 2. Pull out the terminal block for the power supply.
- 3. Release the DIN rail catch on the bottom of the device using a screwdriver.
- 4. Pull the lower part of the device away from the DIN rail.



Figure 4-2 Removal from a 35 mm DIN rail

4.3 Installation on a standard rail

Installation on a SIMATIC S7-300 standard rail

To install the device on an S7-300 standard rail, follow the steps below:

- 1. Place the first housing guide of the device on the top edge of the S7-300 standard rail.
- 2. Screw the device to the underside of the standard rail (tightening torque 2 Nm).
- 3. Fit the connectors for the power supply. See also section "Power supply (Page 23)".
- 4. Insert the terminal block for the power supply into the socket on the device.



Figure 4-3 Installation on a SIMATIC S7-300 standard rail

Removal

To remove the device from the S7-300 standard rail, follow the steps below:

- 1. Disconnect all connected cables.
- 2. Release the screw on the bottom of the standard rail.
- 3. Remove the device from the standard rail.

4.4 Wall mounting

To mount the device on a wall, you require the following:

- 4 wall plugs, 6 mm in diameter and 30 mm long
- 4 screws 3.5 mm in diameter and 40 mm long

To mount the device on a wall, follow the steps below:

- 1. Prepare the drill holes for wall mounting. For the precise dimensions, refer to the section "Dimension drawings (Page 35)".
- 2. Fit the connectors for the power supply. See also section "Power supply (Page 23)".
- 3. Insert the terminal block into the sockets on the device.
- 4. Screw the device to the wall.

Note

The wall mounting must be capable of supporting at least four times the weight of the device.

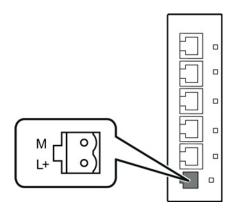
4.4 Wall mounting

Connecting up

5.1 Power supply

The power supply is connected using a 2-terminal plug-in block. The power supply is connected over a high resistance with the enclosure to allow an ungrounded set up. The power supply is non-floating.

The following figure shows the position of the power supply of the SCALANCE X005 or SCALANCE X005TS and the assignment of the terminal block.



Pin number Assignment

Pin 1 M (chassis ground)

Pin 2 L+ (24 VDC)



WARNING

Incorrect power supply

The power supply unit to supply the device must comply with NEC Class 2 (voltage range 18 - 32 V, current requirement 350 mA).

Do not operate the device with an AC voltage.

Never operate the device with DC voltages higher than 32 VDC.



WARNING

The equipment is designed for operation with Safety Extra-Low Voltage (SELV) by a Limited Power Source (LPS).

This means that only SELV / LPS complying with IEC 60950-1 / EN 60950-1 / VDE 0805-1 must be connected to the power supply terminals. The power supply unit for the equipment power supply must comply with NEC Class 2, as described by the National Electrical Code (r) (ANSI / NFPA 70).

If the equipment is connected to a redundant power supply (two separate power supplies), both must meet these requirements.

5.2 Grounding

Installation on a DIN rail

The device is grounded over the DIN rail.

S7 standard rail

The device is grounded over its rear panel and the neck of the screw.

Wall mounting

The device is grounded by the securing screw in the unpainted hole.

Note that the device must be grounded over a securing screw with as low a low resistance as possible.

If the device is mounted on a non-conductive base, a grounding cable must be fitted. The grounding cable is not supplied with the device. Connect the paint-free surface of the device to the nearest grounding point using the grounding cable.

5.3 IE FC RJ-45 Plug 180

The rugged node connectors are designed for industry with PROFINET-compliant connectors and provide additional strain and bending relief with a locking mechanism on the casing.

Fitting the IE FC RJ45 Plug 180 to the IE FC Standard Cable

You will find the notes on installation in the instructions that ship with the IE FC RJ45 Plug 180.



Figure 5-1 IE FC 45 Plug 180

Plugging in the IE FC RJ45 Plug 180

Plug the IE FC RJ45 Plug 180 into the twisted-pair port of the device until it locks in place.



Figure 5-2 Plugging in the IE FC RJ45 Plug 180

With its tight fit and locking mechanism with the PROFINET-compliant male connector IE FC RJ45 Plug 180, the securing collar on the TP port of the device ensures a rugged node attachment that provides strain and bending relief for the RJ-45 jack.

Pulling the IE FC RJ45 Plug 180

Press on the locking lever of the IE FC RJ45 Plug 180 gently to remove the plug.

If there is not enough space to release the lock with your hand, you can also use a 2.5 mm screwdriver. You can then remove the IE FC RJ45 Plug 180 from the RJ-45 jack.

5.3 IE FC RJ-45 Plug 180

Maintenance and troubleshooting

Fuses

The SCALANCE X005 and SCALANCE X005TS IE switches have a resettable fuse / PTC. If the fuse triggers (all LEDs are off despite correctly applied power supply), the device should be disconnected from the power supply for approximately 30 minutes before turning it on again.

Device defective

If a fault develops, please send the device to your SIEMENS service center for repair. Repairs on-site are not possible.

Technical specifications

Note

Unless mentioned otherwise, the technical specifications in the following table relate to the SCALANCE X005 and SCALANCE X005TS.

Table 7-1 Technical specifications of the SCALANCE X005 and SCALANCE X005TS

Technical specifications		
Order number		
SCALANCE X005	6GK5005-0BA00-1AA3	
SCALANCE X005TS	6GK5005-0BA00-1CA3	
Attachment to Industrial Ethernet		
Quantity	5	
Design	RJ-45 jack with MDI-X	pinning
Properties	Half duplex / full duplex	
Transmission rate	10/100 Mbps	
Permitted cable lengths (Ethernet)	Alternative combination	s per length range
0 85 m	Max. 85 m IE FC TF	Marine/Trailing Cable with IE FC RJ45 Plug 180
	 Max. 75 m IE FC TF IE FC RJ45 Outlet 	P Marine/Trailing Cable + 10 m TP Cord via
0 100 m	Max. 100 m IE FC TP Standard Cable with IE FC RJ45 Plug 180	
	Max. 90 m IE FC TP Standard Cable + 10 m TP Cord via IE FC RJ45 Outlet	
Electrical data		
Power supply	Voltage range	18 to 32 VDC Safe Extra Low Voltage (SELV)
	Rated voltage	24 VDC
	Design	2-terminal plug-in block
Current consumption	Typical	80 mA
Power loss at 24 VDC	Typical	2 W
Overvoltage protection at input		PTC resettable fuse (0.5 A / 60 V)
Permitted ambient conditions		
Ambient temperature	During operation (SCALANCE X005)	0 °C to +65 °C
	During operation (SCALANCE X005TS)	-40 °C to +75 °C
	During storage	-40 °C to +80 °C
	During transportation	-40 °C to +80 °C
Relative humidity	During operation	≤ 95 % no condensation
		·

Technical specifications		
Operating altitude	During operation	≤ 2,000 m above sea level at max. 46 °C ambient temperature
		≤ 2,000 m above sea level at max. 40 °C ambient temperature
Design, dimensions and weight		
Immunity		A) B) with a ferrite core on the cables Elektronik - Type: 742 711 31
RF interference level	EN 61000-6-4	
Degree of protection	IP30	
MTBF (EN/IEC 61709, 40 °C)	167.1 years	
Housing material	Basic housing	Die cast aluminum, powder coated
	Front cover	Polyphenylene ether + polystyrene (PPE+PS plastic)
Weight	550 g	
Dimensions (W x H x D)	44 x 125 x 124 mm	
Installation options	Mounting on a DIN rail	
	Mounting on an S7-300 standard rail	
	Wall mounting	
Switching properties		
Aging time	375 seconds	
Max. number of learnable MAC addresses	1024	
Response to LLDP frames	Blocking	
Response to spanning tree BPDU frames	Forwarding	
QoS priority queues	2	
		·

Note

The number of connected SCALANCE X Industrial Ethernet Switches influences the frame propagation time.

When a frame passes through the SCALANCE X005 or SCALANCE X005TS, it is delayed by the store and forward function of the switch:

- with a 64 byte frame length by approx. 10 µs (at 100 Mbps)
- with a 1500 byte frame length by approx. 130 μs (at 100 Mbps)

This means that the more SCALANCE X005 or SCALANCE X005TS devices the frame passes through, the longer the frame delay.

Approvals 8

The SIMATIC NET products described in these Operating Instructions have the approvals listed below.

Note

Issued approvals on the type plate of the device

The specified approvals apply only when the corresponding mark is printed on the product. You can check which of the following approvals have been granted for your product by the markings on the type plate.

8.1 Approvals_intro_X-000

The following approvals apply to the SCALANCE X005 and SCALANCE X005TS.

EMC directive

The devices meet the requirements of the EC Directive 2004/108/EC "Electromagnetic Compatibility".

Area of application

The devices are designed for installation in an industrial environment:

Area of application	Requirements for		
	Emission	Immunity	
Industrial area	EN 61000-6-4 : 2007 + A1 : 2011	EN 61000-6-2 : 2005 + AC : 2005	

Installation Guidelines

The devices meet the requirements if you keep to the installation instructions and safetyrelated notices as described here and in the manual "SIMATIC NET Industrial Ethernet Twisted Pair and Fiber Optic Networks

(<u>http://support.automation.siemens.com/WW/view/en/8763736</u>)" when installing and operating the device.

8.2 Note for Australia

Declaration of Conformity

The EC Declaration of Conformity is available for the responsible authorities according to the above-mentioned EC Directive at the following address:

Siemens Aktiengesellschaft Postfach 4848 D-90026 Nürnberg, Germany

Notes for the Manufacturers of Machines

The devices are not machines in the sense of the EC Machinery Directive. There is therefore no declaration of conformity relating to the EC Machinery Directive 2006/42/EC for these devices.

If the devices are part of the equipment of a machine, they must be included in the declaration of conformity procedure by the manufacturer of the machine.

8.2 Note for Australia

C-Tick

The product meets the requirements of the AS/NZS 2064 standard (Class A).

8.3 Notes on the cULus approval

cULus Approval for Information Technology Equipment

cULus Listed I. T. E.

Underwriters Laboratories Inc. complying with

- UL 60950-1 (Information Technology Equipment)
- CSA C22.2 No. 60950-1-03

Report no. E115352

8.4 Notes on the e1/E1 approval of the SCALANCE X005TS

Product name

Product	Order number	
SCALANCE X005TS	6GK5005-0BA00-1CA3	

ECE directive

The IE switch SCALANCE X005TS meets the requirements of the directive ECE R10, Rev. 3.

EC directive

The SCALANCE X005TS IE switch meets the requirements of the Directive 72/245/EEC in the form 2006/96/EC "Electromagnetic Compatibility".

8.5 Noise test of the SCALANCE X005TS

The IE switch SCALANCE X005TS was tested according to EN 60068-2-64.

Testing accuracy: IEC 60721-3-5

Severity level: Class 5M2 (for road vehicles)

8.6 Overvoltage test of the SCALANCE X005TS

The SCALANCE X005TS IE switch has passed further overvoltage tests.

Power supply = 24 VDC

Overvoltage test with:

- 36 V/1s
- 100 V/1ms (with a source resistance of 10 ohms)

8.7 Mechanical stability (in operation)

Device	DIN EN 60068-2-6 oscillation	DIN EN 60068-2-27 shock
	10 - 58.12 Hz: 0.075 mm	150 m/s², 11 ms duration
	58.12 - 500 Hz: 10 m/s²	6 shocks per axis
	10 cycles	
X005	•	•
X005 TS	•	•

8.7 Mechanical stability (in operation)

Dimension drawings

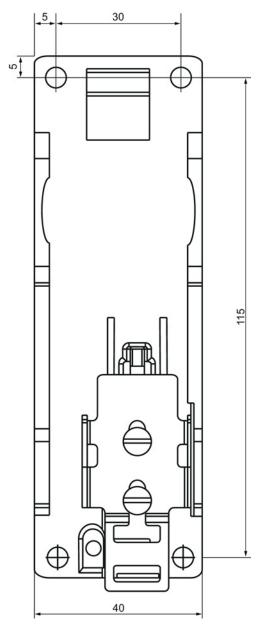


Figure 9-1 Dimension drawing, rear of SCALANCE X005 or SCALANCE X005TS

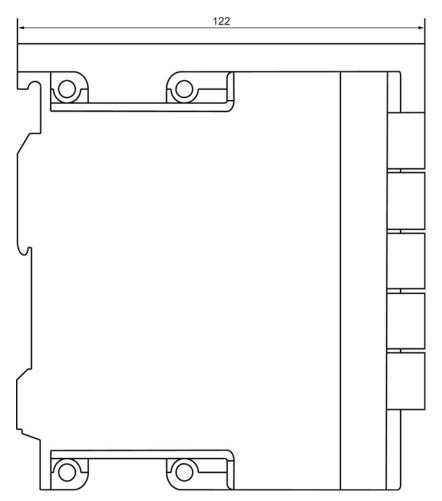


Figure 9-2 Dimension drawing, side view of SCALANCE X005 or SCALANCE X005TS

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