



■ Operating Instructions

LCOS Unmanaged Switch

4 ports / 8 ports

779200.0401, LCOS-SW-4P

779201.0401, LCOS-SW-4P

779200.0801, LCOS-SW-8P

779201.0801, LCOS-SW-8P

Version 00
23.08.2018

The company Friedrich Lütze GmbH reserves the right to make changes to its products in the interest of technical development. These changes are not necessarily documented in each individual case.

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1

Introduction

These operating instructions are part of the LCOS Unmanaged Switch.



Read and understand these instructions before installing, operating, or maintaining the equipment.

Before using the device, please read these operating instructions to avoid possible dangers and to ensure proper use.



Risk of injury and damage to property due to non-observance of the operating instructions.

Always read these operating instructions before planning the system in order to avoid or reduce risks and damage.

NOTICE

These operating instructions contain important information on safety, commissioning, operation, maintenance and disposal of the device.

Always keep the document at hand. This applies until the device is disposed of. Pass on the operating instructions if the device is sold, distributed or loaned.



You can also find these operating instructions at www.luetze.com.

In the search field, enter either the product name: **LCOS Unmanaged Switch** or the product number: **77920***

Short description LCOS Unmanaged (Industrial Ethernet) Switches

The LCOS unmanaged switches are highly suitable for use in industrial ethernet networks. In addition to durability, the units also offer more performance, such as QoS (Quality of services) or operation in Profinet and Ethernet IP. Thanks to their modular design, the units can be supplied with power in the LCOS system either by means of the existing connectors or via the energy bus. They can also be used in building automation systems due to the fact that they can run on AC voltage. The application temperature range is -25 °C to +70°C.

1.1

About these instructions

These operating instructions provide information on the handling of the LCOS Unmanaged Switch over its entire product life cycle, from delivery to disposal.

Other documents apply in addition to these operating instructions. (See also **chapter „2.7 Applicable documents“ on page 11**) in this document. Please also refer to the data sheets associated with the products.

If you have suggestions for improving this document, please contact the company Friedrich Lütze GmbH.

2 General Information

2.1 Safety instructions and technical information

This document contains several safety messages. Each safety message contains a defined signal word and a color. The color and the word are referring to an alert level. There are 4 levels. The safety messages point out hazardous situations and give information on how to avoid these.



Indicates a hazardous situation, which if not avoided will result in death or serious injury.



Indicates a hazardous situation, which if not avoided can result in death or serious injury.



Indicates a hazardous situation, which if not avoided can result in minor or moderate injury.



Indicates a situation which could damage the product or the environment. This notice does not apply to personal injury.

Additionally following symbols can be found. These refer to important technical information and instructions:



Refers to important technical information. This indicates to the user a specific action that must be performed to operate the device safely.



Refers to the use of different tools.

2.2 Copyright

This document is intended for the operator and his employees. It is forbidden to give the content to a third party, to duplicate, exploit or impart it. The Friedrich Lütze GmbH has to allow it explicit in writing.

General data, text, images and drawings are copyrighted and are liable to the industrial property right. Contravention can be prosecuted. The named brands and product names in this document are trademarks or registered trademarks by titleholder.

2.3 Disclaim of Liability

The document was written under consideration of the applied standards, regulations and the current state of technology.

The content is verified of accuracy. Discrepancies are not excluded. For those discrepancies we disclaim liability. Applicable changes and additional information will be in the next version of the document.

The Friedrich Lütze GmbH does not assume liability for any damages and accidents of following reasons:

- Nonobservance of the document
- Untrained and unqualified personnel
- Non conventional use
- Non approved reconstructions and functional modifications of the product
- Using non original or non admitted parts or equipment

2.4

Standards and norms

LCOS Unmanaged switches are state of the technology and comply with the applicable safety regulations and the corresponding harmonized European standards (EN).

EN 61131-2	Industrial-process control systems - Instruments with analogue inputs and two- or multi-state outputs - Part 2: Guidance for inspection and routine testing (IEC 65B/957/CD:2014)
EN 61000-6-2	<i>Electromagnetic compatibility (EMC) - Part 6-2: Generic standards - Immunity standard for industrial environments (IEC 77/488/CDV:2015); German version FprEN 61000-6-2:2015</i>
EN 61000-6-4	<i>Electromagnetic compatibility (EMC) - Part 6-4: Generic standards - Emission standard for industrial environments (IEC 61000-6-4:2006 + A1:2010); German version EN 61000-6-4:2007 + A1:2011</i>
UL 61010-1	<i>Safety requirements for electrical equipment for measurement, control and laboratory use - Part 1: General requirements (IEC 61010-1:2010 + Cor. :2011); German version EN 61010-1:2010</i>
UL 61010-2-201 (IEC 61010-2-201)	<i>Safety Requirements for Electrical Equipment for Measurement, Control, and Laboratory Use - Part 2-201: Particular Requirements for Control Equipment (IEC 65/582/CD:2014)</i>

(As at: 21.08.2018)

NOTICE

The current issue status of the standards as well as further information on the product can be found in the respective data sheets.



The constantly updated data sheets can be found at **www.luetze.com**

Enter either the product name: **LCOS Unmanaged Switch** or this article number: **77920*** into the search field.

Here you will always find the latest documents (e.g. operating instructions) for the products as well as further articles and technical information.

2.5 Scope of validity of the manual

These operating instructions apply exclusively to devices with the following item number(s):

- 1.) **779200.0401 / 779201.0401** - LCOS Unmanaged Switch 4 ports
- 2.) **779200.0801 / 779201.0801** - LCOS Unmanaged Switch 8 ports

The 9-digit article number of the device can be taken from the first number on the Identification label.

2.5.1 Identification label

The identification plate contains the required markings for the respective product and provides important technical data.



Note the identification label.

- The identification label should always be visual
- If there is a fault, the part number and serial number are needed.

The identification plate, which has the following structure, is located on the device:

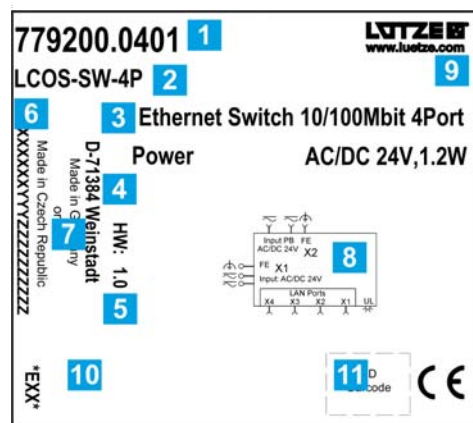


Abb. 1: Identification plate (example)

The identification label contains the following information:

1. Part number
2. Assembly designation / module description
3. Module Description
4. Version number / Firmware Version (SW) (Empty in the example)
5. Hardware Revision (HW)
6. Serial number (X) / place of manufacture (YYY) / batch identification (Z)
7. Company address / place of production (YYY: "LUT" for Weinstadt and "EQQ" for Czech Republic)
8. Block diagram
9. Company name / web address
10. Approvals / declarations of conformity (e.g. CE marking, UL, etc.)
11. 2D barcode with product information

NOTICE

Observe the original information signs, inscriptions, identification plates and stickers. Keep them in a readable condition.

2.6 Approvals

2.6.1 Notes on CE labelling

The devices comply with the provisions of the following European Directive: 89/336/EEC Council Directive on the approximation of the laws of the Member States relating to electromagnetic compatibility (amended by Directives 91/263/EEC, 92/31/EEC and 93/68/EEC).

The EU Declaration of Conformity is kept available for the competent authorities in accordance with the above-mentioned EU directives:

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NOTICE

The product can be used in industry.

- Immunity to interference: EN 61131-2:2007 Zone B
- Emitted interference:
EN 61131:2007 und CFR-47 Part 15, Subpart B, class B

Strict compliance with the assembly guidelines specified in this description and operating instructions is a prerequisite for compliance with the EMC limit values.

2.6.2

FCC Warning Statements



1. 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, and (2) this device must accept any interference received, including interference that may cause undesired operation. Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
2. Any Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTICE

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- -Reorient or relocate the receiving antenna.
- -Increase the separation between the equipment and receiver.
- -Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- -Consult the dealer or an experienced radio/TV technician for help.

2.7 Applicable documents

NOTICE

Further documents are valid in conjunction with these operating instructions. We accept no liability for damage caused by non-observance of these instructions.

2.7.1 Observe other applicable documents

When operating the LCOS Unmanaged Switch, please also observe all operating instructions enclosed with other components of your system.

NOTICE

Always keep these operating instructions and the other applicable documents (e.g. data sheets, package inserts, declarations of conformity, etc.) at hand so that they are available when required.

This applies until the device is disposed of. Hand over all documents in case of sale, distribution or rental of the device.

For reasons of clarity, we would like to point out that these operating instructions cannot describe all conceivable problems in connection with the use of this device.

Should you require further information or encounter special problems that are not dealt with in sufficient detail in the operating instructions, you can request the necessary information about service from Lütze. (See *chapter „14 Service“ on page 48*)

3 Safety

3.1 Contents of the operating instructions

NOTICE

These instructions must be read and understood before installing, operating or maintaining the device.

These operating instructions must be read and observed before any work is carried out on or with the units. This applies to all persons who come into contact with the devices. Trained personnel and specialists, especially electricians (see also chapter „3.5.1.3 Electrically qualified persons“ on page 14) who have already worked with similar equipment should also have read and understood the manual.

3.2 Applicable documents

CAUTION

Risk of injury and damage to property due to non-observance of the applicable documents*, in particular the safety instructions in the respective package inserts.

This operating instruction alone is not sufficient if the modules are operated in one system.

To avoid injury and damage, read the applicable and associated documents before you plan the system.

*A list of other applicable documents can be found in chapter „2.7 Mitgeltende Unterlagen“ on page 11

3.3 Appropriate Use

The LCOS Unmanaged Switches are designed for industrial use in factory, machine and building automation.

Due to the modular design, the devices in the LCOS system can be supplied either via existing connectors or via the power bus. Due to the possibility to supply the devices with AC, they can also be used in building automation.

WARNING

The products may only be used for the applications specified here in this operating instruction, in the catalogue and in the associated technical documentation.

Use of the device in a manner not specified by the manufacturer may impair the protection and safety provided by the device.

WARNING

The device is used exclusively for the purpose contractually agreed between manufacturer and user.

Any other use or use beyond this is considered improper use. The manufacturer is not liable for any damage resulting from this.



Correct and safe operation of the product requires proper transport, storage, installation and assembly as well as careful operation and maintenance.

The permissible ambient conditions must be observed. These data are given in the data sheets.

Also note the following:



Operate the devices only in accordance with this intended case and only in conjunction with the third-party devices and components recommended or approved by us.



The devices may only be connected to the supply voltage printed on the identification plate.

NOTICE

To reduce or avoid risks, please ask in case of doubt whether the third-party devices and components used are approved or recommended by us.

The intended use also includes the procedure according to the operating instructions.

Any other or extended use is considered improper and therefore improper. In this case, safety and its protection can be impaired. The company Friedrich Lütze GmbH is not liable for any damages arising from this.

Intended use also includes:

- Observing all notes in the operating instructions
- Observing all safety instructions

3.4 Product life

The product life cycle of LCOS Unmanaged Switches is based on the EN/IEC 61709 is calculated and defined:

3.4.1 LCOS-SW-4P / 4-Port Ethernet Switch Version

MTBF (EN/IEC 61709, 45 °C) = 378,7 Years

3.4.2 LCOS-SW-4P / 8-Port Ethernet Switch Version

MTBF (EN/IEC 61709, 45 °C) = 349,0 Years

The results are valid under the following conditions:

- *Automotive or industrial environment without extreme dust pollution and pollutants (SN 29500)*
- *45°C average ambient component temperature*
- *Continuous operation 8760 h per year*

3.5

Addressees

This operating instruction is directed towards planners, project managers and programmers, as well as to staff authorized to commission, operate and maintain the devices and systems. A distinction is made between various qualification levels of the staff.

3.5.1

Operating Personnel

The operating instructions are directed at the operator and the personnel with the following areas of competence:

Working range	Competency
Installation, transport and storage	Experts
Commissioning, decommissioning	Trained Employee
Operation	Trained Employee
Servicing and maintenance	Experts
Troubleshooting	Experts



Risk of injury by usage through insufficient qualified operating personnel!

Misusage through performed insufficient or qualified personnel can cause property damage and personal injuries.

- Tasks which apply special procedures should be done by trained and qualified employees or experts, especially electricians.

(according to EN 60204-1)

3.5.1.1

Trained Employee

The employee was trained by the employer on the task and possible hazardous situations. The employee does not have any technical knowledge.

3.5.1.2

Experts

The employee has a technical education, knowledge and/or experience in the required field. The employee is capable to perform specific operations on and with the product.

3.5.1.3

Electrically qualified persons

The employee has a technical education in the required field. The employee is capable to perform special operations on and with the product.

The different sections of the document refer to the qualification level of the operating personnel.

According to European Standard EN 50110-1:2008-09-01 Section 3.2.3

NOTICE

The individual sections refer to the qualification level of the personnel.

3.6 Responsibility of the operator

Since the device is used in a commercial area, the operator of the device is subject to the legal obligations for occupational safety:

- The operator of the device is obliged to instruct the operating personnel and to inform himself about the industrial safety regulations.
- The operator must ensure that safety, accident prevention and environmental protection regulations are observed.
- The operator must make an appropriate risk assessment on the Workplace/location to detect and warn of special hazards.
- The manual must be kept in the immediate vicinity of the device.
- The information in the operating instructions must be followed.
- The device may only be operated in technically perfect condition.

3.7 Changes and modifications to the devices



Modifications and conversions lead to personal injury and property damage!

Unauthorized modifications to the product may result in electric shock or injury and destroy the product.

- Do not make any changes or modifications to the product.
- If a modification or change cannot be avoided, have the modification approved in writing by Friedrich Lütze GmbH.

Do not make any changes or modifications to the devices that have not been expressly and in writing previously approved by Friedrich Lütze GmbH.

3.8 Safety device



Sabotage of the devices can lead to serious errors in the overall system.

Install the LCOS Unmanaged Switch in such a way that it is not freely accessible to unauthorized personnel and other persons.



Do not bypass or bypass the protective and safety devices.

Overvoltage can cause electric shocks and destroy the equipment.

3.9 Special safety notes

LCOS Unmanaged Switches are state of the technology and comply with the applicable safety regulations and the corresponding harmonized European standards (EN) - *See also chapter „2.4 Standards and norms“ on page 7.*

The following applies to the users:

- relevant and national accident prevention regulations
- EC directives or other country-specific regulations

- generally accepted safety rules
- general ESD regulations.



The unit is to be connected only to internal Ethernet networks without exiting a facility and being subjected to TNVs.

To avoid electric shock, this device may only be connected to Ethernet networks within a building that are not connected to TNV circuits. Do not use a telephone line voltage (TNV)! (This note is particularly relevant for North America and Canada.)

The input/output connections comply with the Safety Extra Low Voltage (SELV) guidelines for extra-low voltage devices. With TNV circuits, higher voltages must be expected, e.g. due to lightning strikes. Therefore, they must not be connected to SELV circuits.



Short-circuits and electric shocks due to incorrect application of the voltage!

Current can injure persons and destroy the device. Before commissioning, disconnect the entire system from the power supply and check the connections after applying power.



Accidents during installation or maintenance due to electrical voltages!

When carrying out installation or maintenance work, disconnect the modules from the power supply (pull out the mains plug). This prevents accidents caused by electrical voltages.



Risk of injury from electric current.

Current can injure persons and destroy the device. For this reason, disconnect the system from the power supply before installation.



Risk of injury and material damage through non-observance of the operating instructions.

Always read the operating instructions before planning the system in order to avoid or reduce risks and damage. (The instruction leaflet does not replace the operating instructions of the product.

You can also find these operating instructions at www.luetze.com.



For electrical welding work on frames, all assemblies and their connections must be disconnected.

If electronic assemblies are mounted on the frame, then all connections to and from these assemblies must be disconnected beforehand.

Non-observance can destroy the devices by equalising currents.

3.10 Further safety notes

NOTICE	Follow the ESD regulations.
NOTICE	Only use certified components. Only this way a reliable functioning is ensured.
NOTICE	Follow the valid safety regulations and general regulations regarding the technical standards.
NOTICE	The conductor size has to be selected dependig on the load current and must be conform with international and national ruls and standards. Attention! The supply cable must be suitable for an operating temperature range of -25 °C to +70 °C. The connecting cables must be designed for the ambient temperature.
NOTICE	For UL applications: Ambient temperature: +70 °C The device has to be installed in a fire enclosure depending on the end user application.
NOTICE	The device is intended to be used in indoor applications and be mounted in cabinets.

4 Product Overview

4.1 Construction types

4.1.1 779200.0401 - Unmanaged Switch 4 ports

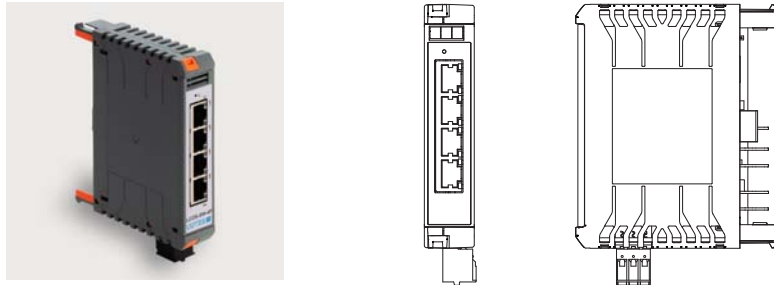


Abb. 2: 10 / 100 Mbit, auto negotiation, Auto MDI/MDI-X, QoS, unmanaged Switch 4 ports

4.1.2 779200.0801 - Unmanaged Switch 8 ports

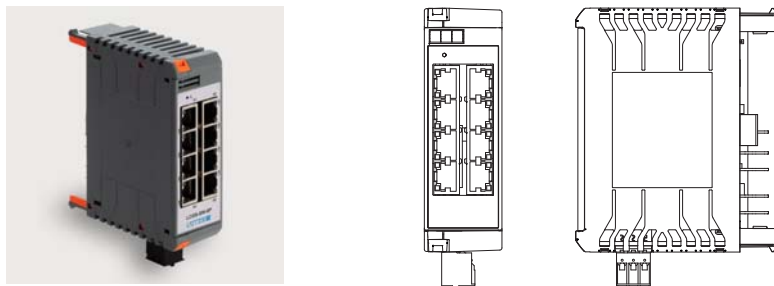


Abb. 3: 10 / 100 Mbit, auto negotiation, Auto MDI/MDI-X, QoS, unmanaged Switch 8 ports

4.1.3 779201.0401 - Unmanaged Switch 4 ports

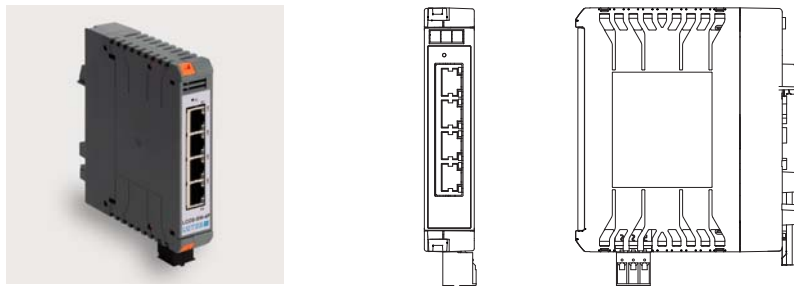


Abb. 4: 10 / 100 Mbit, auto negotiation, Auto MDI/MDI-X, QoS, unmanaged Switch 4 ports

4.1.4 779201.0801 - Unmanaged Switch 8 ports

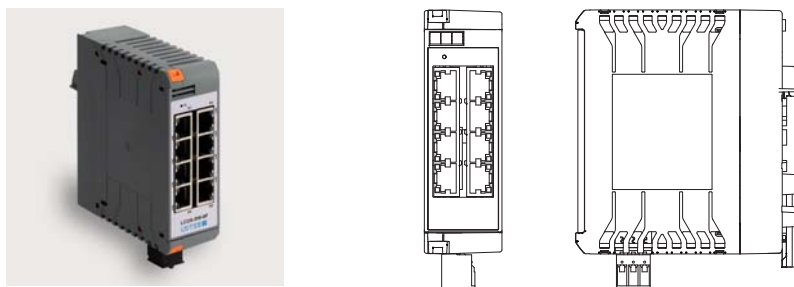


Abb. 5: 10 / 100 Mbit, auto negotiation, Auto MDI/MDI-X, QoS, unmanaged Switch 8 ports

4.2 Overview of product features

4.2.1 LCOS Unmanaged Ethernet Switches

The LCOS-SW-4P or LCOS-SW-8P Unmanaged Ethernet Switch is a switch for use in industrial environments. It supports ETHERNET 10 MBit/s and Fast ETHERNET 100 MBit/s.

The switch modules enable the construction of switched Ethernet networks according to the IEEE 802.3 or 802.3u standard with twisted-pair cables.

The switch modules can be mounted directly on the top-hat rail via a function carrier and are powered either via the LCOS power bus or the 3-pole connection terminal. With their compact design, the modules can be mounted in a terminal box.

The LCOS-SW-4P devices have four 10/100 Mbps twisted pair ports (10/100BASE-TX, RJ45 connectors) and the LCOS-SW-8P devices have eight 10/100 Mbps twisted pair ports (10/100BASE-TX, RJ45 connectors).

Twisted pair devices or other TP/TX segments can be connected to the ports. The TP ports support auto negotiation, auto polarity and auto MDI/MDI-X. In addition, the devices evaluate the Ethernet frame-based priority data (Qos) in order to forward time-critical signals more quickly.

The power consumption is significantly reduced by an automatic switch-off of the unused ports, but even at full load the power consumption of the 8 port version remains below 2W. The extended operating temperature range allows operation from - 25 °C to + 70°C ambient temperature.

4.2.2 Product Features of LCOS Unmanaged Ethernet Switches

- AC/DC 24V supply voltage
- Variable supply voltage supply
 - Power bus or
 - 3-pole plug-in terminal Push-In
- Can be used as a stand-alone module or in the "Lütze Communication System".
- Compact design and universal application
- QoS - Quality of Services
- Extended temperature range
- CE - Declaration of Conformity
- UL - Approval
- FCC - Approval

4.2.3

LCOS - Modular housing system

The LCOS Unmanaged Ethernet switches can be used either as a stand-alone module or in the "Lütze Communication System".



4.2.4

Product description of the modular housing system LCOS

LCOS is a modular housing system consisting of individual modular components that can be assembled. The functionaries and - housings, as well as various modules for data and power supply are available in different widths. The housings can be equipped with their own printed circuit boards as required. Information on the equipment and size of these can be found in the separately available "LCOS Modular housing system manual", which is available in the Lütze Online Catalogue.

A wide variety of front panels and cut-outs on the function housings provide options for operating elements and a wide variety of plug-in terminals.

In addition, the modules can be bridged and supplied via a feed module so that a complete system can be set up.

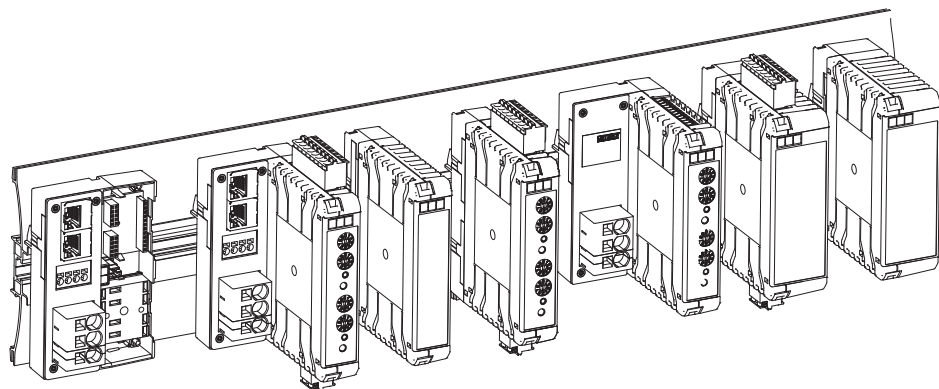
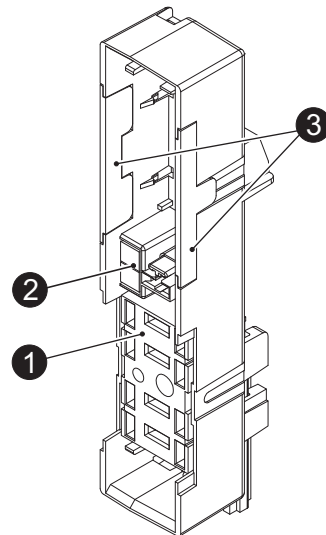


Abb. 6: Overview modular enclosure system, modules not bridged

4.3

Function carrier (with power module)

The function carrier is the basis for the LCOS Unmanaged Switch. The LCOS Unmanaged Switch is plugged onto the function carrier and can then be snapped onto the DIN rail. The power and data module for setting up the bus system is also located in the function carrier.



- | | |
|---|-----------------|
| 1 | Power module |
| 2 | Labeling Plates |
| 3 | Side covers |

5

Transport and storage



Risk of property damage. Risk of damage due to improper handling during transport and storage.

The device must be protected against moisture, unsafe packaging (mechanical damage), dust and electrostatic discharge.

Please note the following:

NOTICE

Avoid product damage due to incorrect storage conditions.

Protect the equipment from extreme temperatures and humidity. Store the units in dry rooms between -40 and 85°C. Make sure that the humidity is less than 75%.

NOTICE

Product damage due to unsafe packaging.

Make sure that the devices are securely packed for transport. This is the only way to absorb possible shocks.

NOTICE

Product damage caused by dust.

Store and transport the units in a dust-free environment.

Dust can easily settle on the electronic components and lead to a possible defect of the devices.

NOTICE

Product damage due to electrostatic discharge.

Store and transport electronic components only in an ESD safe environment and special packaging.

Proper and safe operation of the products requires proper transport, storage, installation, assembly, installation, commissioning, operation and maintenance.

6 Scope of delivery

Check the completeness of the delivery using the following list.

NOTICE

If any of the parts listed below is missing or damaged, please contact the service department. (chapter „14 Service“ on page 48)

6.1 The LCOS Unmanaged Switch consists of:

6.1.1 LCOS Unmanaged Switch

1. Device: LCOS Unmanaged (Industrial Ethernet) Switch*
2. Functional support 22.5 mm, not modularly expandable
3. (only for 779201.0401 and 779201.0801)
4. Instruction leaflet (compact operating instructions for the module)

* Part-No.	Type	Terminati- on (data)	Included accessories
779200.0401	LCOS-SW-4P	4 x RJ 45	
779200.0801	LCOS-SW-8P	8 x RJ 45	
779201.0401	LCOS-SW-4P	4 x RJ 45	LCOS-FT-PE-225-00-00-1
779201.0801	LCOS-SW-8P	8 x RJ 45	LCOS-FT-PE-350-00-00-1

6.1.2 LCOS Unmanaged Switch Documentation

1. Operating instructions (PDF, online version)
2. Data sheets (PDF, online version)



You can also find these operating instructions and data sheets at www.luetze.com.

In the search field, enter either the product name: **LCOS Unmanaged Switch** or the product number: **77920***

6.2 Accessories

NOTICE

To avoid malfunctions, only use original accessories.



In the enclosed package insert or corresponding data sheet (online) you will find the current accessories for the respective product. Depending on the version of the product, no corresponding function carriers or other accessories are included in the scope of delivery.

6.3

Checking the delivery

Check the outer packaging for possible transport damage.

Unpack the product carefully.



Observe ESD regulations when unpacking.

- Check the package for completeness.
- Check the individual parts for transport damage.



Install and use only undamaged products.

Do not use damaged parts, a function according to the specifications of the device is then no longer guaranteed.

If damaged parts are used, the following problems may occur:

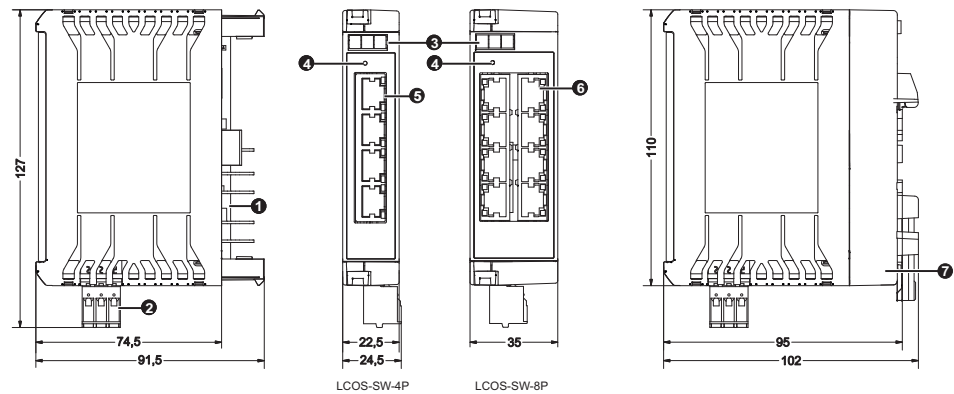
- Accidents and personal injuries
- Loss of approvals
- Violation of EMC regulations
- Damage to the device and other components



For more information, please contact the service department. (See chapter „14 Service“ on page 48)

7 Product Assembly

7.1 LCOS Unmanaged Ethernet-Switches

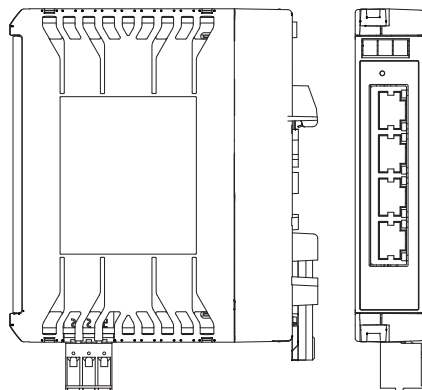


No.	Description
1	Connector X10, 5-pole (internal)**
2	X9: Push-In terminal Power Supply, 3-pole, RM 5.08
3	Labeling Plates*
4	LED power supply
5	4x Rj45
6	8x Rj45
7	Function carrier (only at 779201.0401/ 779201.0801 included)

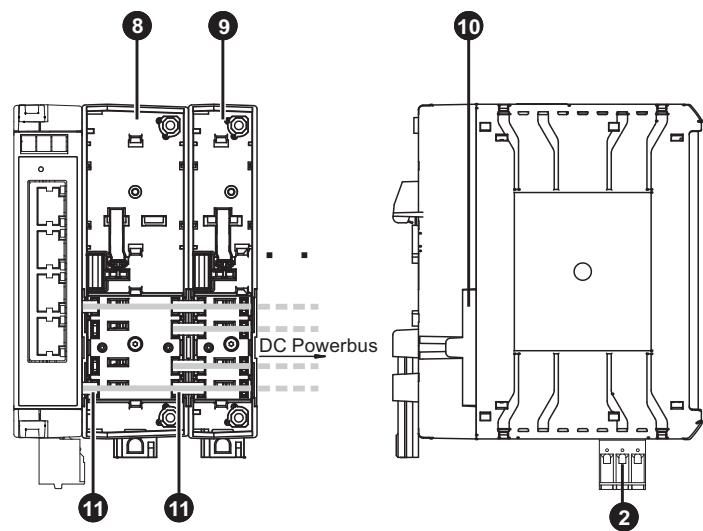
*Not in the scope of delivery, see chapter „6.2 Accessories“ on page 23.

**Internal connector to LCOS-FT... (power supply)

7.1.1 Standalone Version



7.1.2 System with Powerbus



No.	Description
8	Function carrier 35 mm, can be expanded with modules with PE direct contact, power module
9	Function carrier 22.5 mm, can be expanded with modules with PE direct contact, power module
10	Side cover for function carrier
11	Power bridge 1-pole insulated – 4x per function carrier

7.2 LED status displays

7.2.1 LED power supply

Color	Status	Activity	Operating status
green	on	ON	OK – Switch active
	off	OFF	Switch turned off – no/ low supply voltage

7.2.2 LEDs Link/Activity

Color	Status	Activity	Operating status
green	on	link established	The port of the switch is connected to a network subscriber.
	off	no link is established	The port of the switch has no connection to a network subscriber.
	blinking	active data traffic	Data is exchanged on this port of the switch.

8 Technical Data

8.1 Identification

Type:	LCOS-SW-4P / LCOS-SW-8P
Part-No.:	779200.0401 / 779200.0801 779201.0401 / 779201.0801

8.2 Description

8.2.1 LCOS-SW-4P

10 / 100 Mbit, auto negotiation, Auto MDI/MDI-X, QoS
4 Fast Ethernet ports, Broadcast storm protection
AC/DC 24 V, extended temperature range

8.2.2 LCOS-SW-8P

10 / 100 Mbit, auto negotiation, Auto MDI/MDI-X, QoS
8 Fast Ethernet ports, Broadcast storm protection
AC/DC 24 V, extended temperature range

8.3 Communication

Standard:	IEEE 802.3, 802.3u, 802.3x
LAN:	10 / 100 Base-TX
Cable length (segment):	max. 100 m
Transfer rate:	max. 100 Mbit/s
Connection technology (data):	4 x RJ45 / 8 x RJ45
Status display communication:	Link activity

8.4 Safety

Reverse voltage protection:	Yes
Isolating voltage Ethernet/ supply/FE	1000 V

8.5 General

Rated voltage U_N	AC/DC 24 V (SELV, PELV)
Rated frequency	50/60 Hz with AC supply
Operation voltage range	AC 19.2–28.8 V / DC 18–31.2 V
Connection technology (supply)	3-pin terminal clamp, push-in, RM 5.08 or via LCOS-FT Powerbus
Power consumption	1.5 W

Protection class	IP20
Over voltage category	II
Degree of pollution	2
Application height	2000 m
Relative humidity (operation)	5 % - 95 % (non-condensing)
Relative humidity (storage)	0 % - 95 % (non-condensing)
Operation temperature range	-25 °C – +70 °C
Storage temperature range	-40 °C – +85 °C
Dimensions (w × h × d)	35 x 110 x 102 mm
Housing material	PA 6.6 (UL 94 V-0, NFF I2, F2)
Mounting	connected to LCOS function carrier, hat rail mounting EN 60715
Installation position	vertically
Installation space	above: 30 mm (for mounting) below: 30 mm (for mounting) sideways: 0 mm
Standards	<i>See chapter „2.4 Standards and norms“ on page 7, compare also current data sheet.</i>
Approvals	CE cULus in preparation DNV GL in preparation FCC <i>(Compare also current data sheet.)</i>

NOTICE

The complete and current technical data can be found in the corresponding data sheets.

Specifications are subject to change without notice. Make sure you always work with the latest documents.



Data sheet
779200.0401



Data sheet
779200.0801



Data sheet
779201.0401



Data sheet
779201.0801



You can also find these operating instructions and data sheets at **www.luetze.com**.

In the search field, enter either the product name: **LCOS Unmanaged Switch** or the product number: **77920***

9

Mounting / Dismounting



Risk of injury and damage to property from electric current.

Current can injure persons and destroy the modules (assemblies).

- Disconnect the system from the power supply before assembly and disassembly.



With AC supply, an external overvoltage protection must limit the voltage between supply and VU to less than 1000 V.

NOTICE

For UL applications: Ambient temperature: +70°C

The module must be installed in a fire protection housing suitable for the end application.

NOTICE

The device is intended to be used in indoor applications and be mounted in cabinets.

NOTICE

Ensure that the electrical installation complies with local or national safety regulations.

9.1

Installation position

The LCOS Unmanaged Switch, plugged onto an LCOS function carrier, is mounted vertically on a 35 mm DIN rail (TS 35).



NOTICE

Observe the minimum distances!

Mount the unit at a distance of at least 30 mm upwards and downwards (0 mm to the side) from other units to ensure proper ventilation.

9.2

Mounting

The LCOS Unmanaged Switch has protection class IP20 when installed and is therefore suitable for use in control cabinets. The device is designed to snap onto / snap onto a 35 mm DIN rail (also called TS 35 - according to DIN EN 60715).

A top-hat rail is a mounting rail with a U-shaped or hat-like profile. In English the DIN rail is called DIN rail.

NOTICE

The device may only be installed by competent and qualified personnel. This work step may only be carried out by at least trained personnel in compliance with the safety regulations.

9.2.1

Safety notices Environment

NOTICE

The device may only be operated at the specified ambient temperature and at the specified relative humidity (non-condensing).

Select the mounting location so that the climatic limit values specified in the technical data are observed.

Use only in an environment up to pollution degree 2 (IEC 60664-1).

9.2.2 DIN rail mounting



Risk of injury and damage to property from electric current.

Current can injure persons and destroy the modules (assemblies).

- Disconnect the system from the power supply before assembly and disassembly.

NOTICE

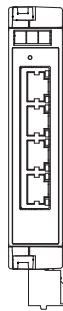
This step must be carried out by at least trained staff.

9.2.2.1 Variants of the LCOS Unmanaged Switches

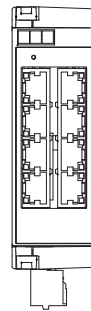
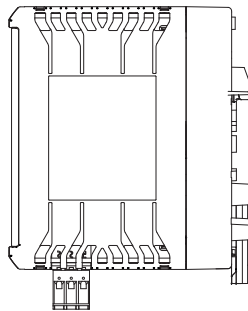


With the variants with function carriers (779201.0401 and 779201.0801), the switch can be mounted directly on a DIN rail.

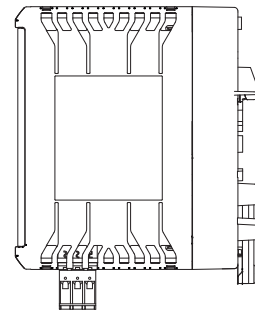
The plug-in terminal can be removed for easier wiring.



779201.0401



779201.0801



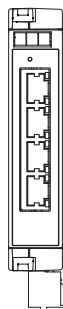
NOTICE

The variants with function carriers can also be operated on the power bus by exchanging the function carrier.

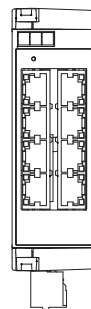
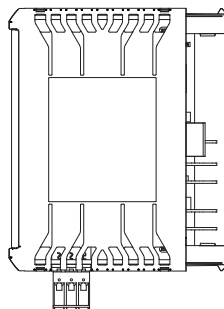


The variants without function carriers (779200.0401 and 779200.0801) can be supplied either via the power bus or the plug-in terminal.

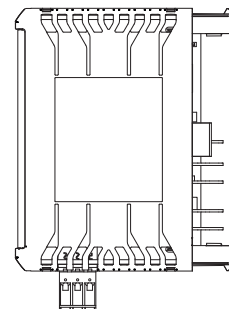
The matching function carrier is available as a separate accessory.



779200.0401



779200.0801



9.2.2.2

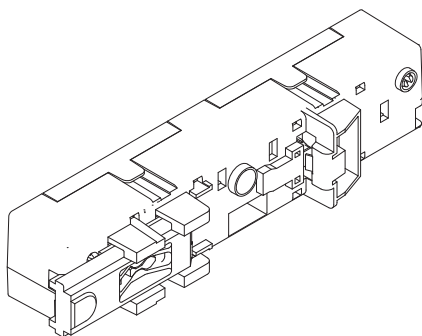
LCOS function carrier



The function carriers are delivered with open locking slides.

Check the position of the locking slide before mounting the module. The locking slides of the function carriers are in open position when delivered.

Check the position of the locking slide before mounting.



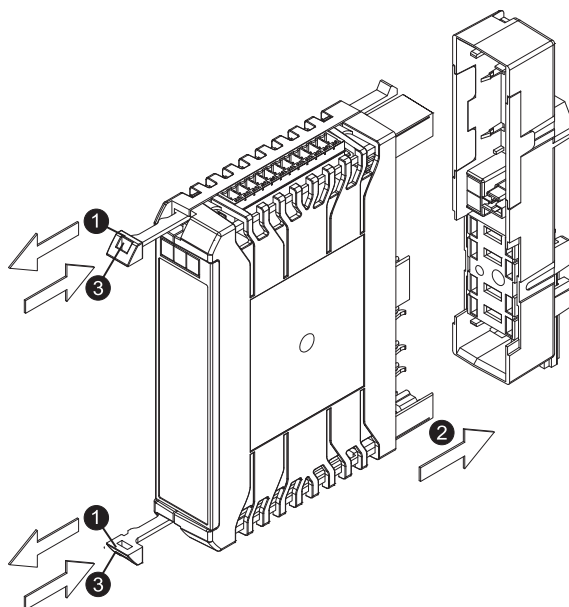
Function carrier 22.5 mm,
Locking slide in open position

9.2.2.3

Mounting the LCOS housing onto the function carrier*

How you attach the functional housing to the function carrier.

1. Pull both pull-tabs as far as possible.
2. Plug the function housing onto the function carrier.
3. Push the pull-tabs into the housing as far as possible.



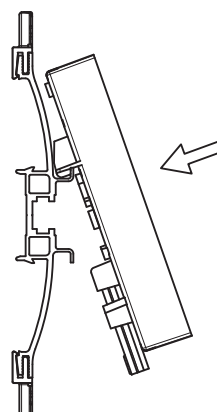
Remove the functional housing in reverse order.

* Function carrier only for 779201.0401 / 779201.0801
included in delivery, see accessories

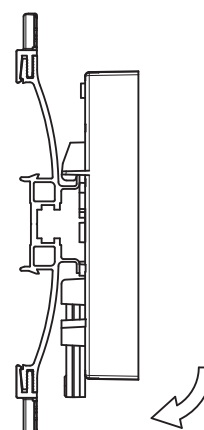
9.2.2.4

Mounting of Function carriers

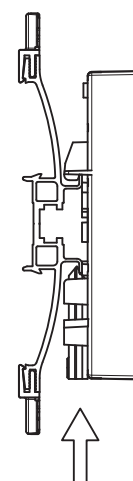
1. Place the function carrier on the upper part of the top hat rail.



2. Pivot the function carrier to the bottom of the top hat rail.



3. Push the locking slide to the top. The locking slide is locked.



9.2.3

Dismounting of function carriers from top-hat rails



Risk of injury and damage to property from electric current.

Current can injure persons and destroy the modules (assemblies).

- Disconnect the system from the power supply before assembly and disassembly.

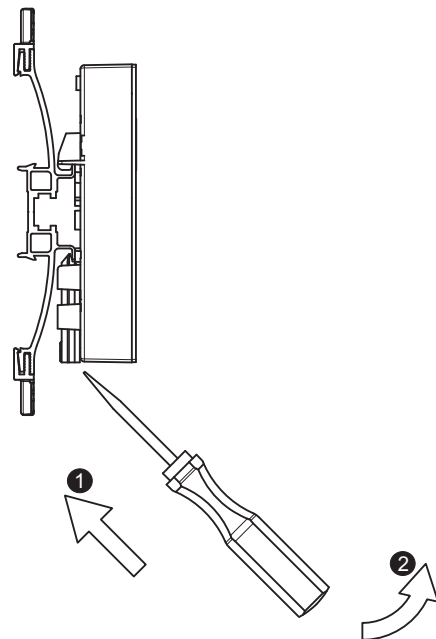
NOTICE

This step must be carried out by at least trained staff.

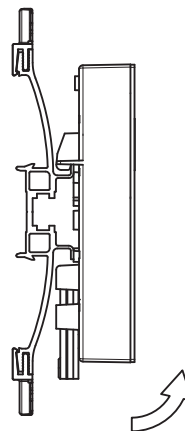


For this step you will need a 3.5 - 4 mm flat-tip screwdriver.

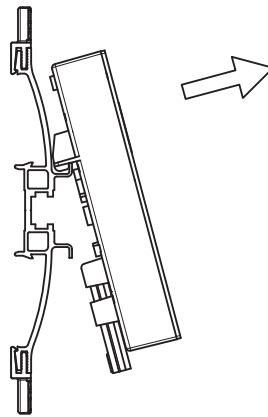
1. Put the screw driver into the notch of the locking slide.
2. Lever the screw driver up. The locking slide will unlock.



3. Pivot the function carrier to the top of the top hat rail.



4. Take the function carrier off the top hat rail.



9.3 Wiring

NOTICE

The device can be powered by function carrier LCOS-FT... to AC/DC24V, all voltages must be in conformance to SELV/PELV.

NOTICE

The conductor size has to be selected dependig on the load current and must be conform with international and national ruls and standards.

Attention! The supply cable must be suitable for an operating temperature range of -25 °C to +70 °C.

The connecting cables must be designed for the ambient temperature.

NOTICE

To ensure UL certification of the complete module, only use the plug-in terminals recommended by us.

See also chapter "6.2 Accessories" on page 23)



A screwdriver is required for wiring. (e.g. slotted screwdriver 3 mm)

- Push-In terminal

9.3.1 Safety notes Shielding ground

NOTICE

The shielding ground of the connectable twisted-pair cables is electrical-ly conductively connected to the front panel.

NOTICE

When operating the device via the plug-in terminal, connect the functional earth (FE) for proper functioning of the device.



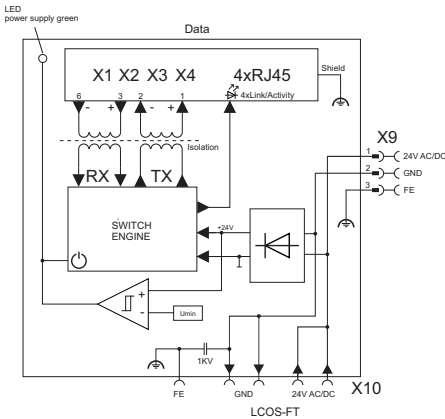
When connecting a cable segment with contacted shielding braid, check for possible ground loops.

Stripping Length			Conductor Size
	X9: 3-pole	solid	0.08 ... 2.5 mm ²
	(RM/CS 5.08)		AWG 28 – 12
	X9: 3-pole	fine stranded	0.08 ... 2.5 mm ²
	(RM/CS 5.08)	with ferrule	AWG 28 – 12

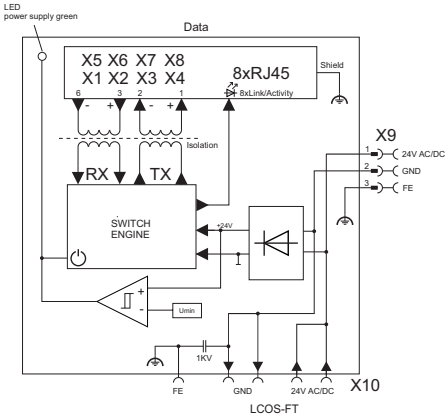
9.4

Pin assignment

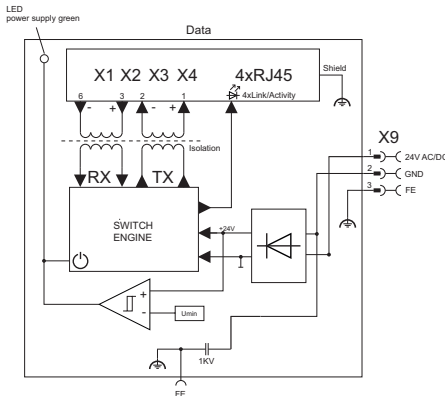
Artikel/ Part: 779200.0401
LCOS-SW-4P



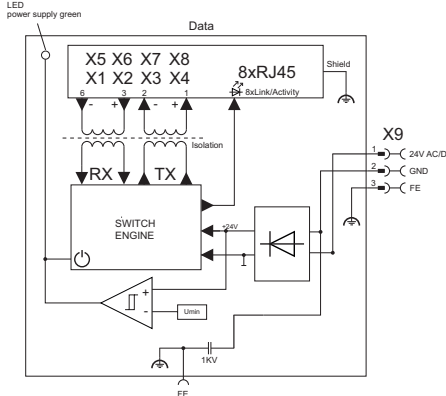
Artikel/ Part: 779200.0801
LCOS-SW-8P



Artikel/ Part: 779201.0401
LCOS-SW-4P

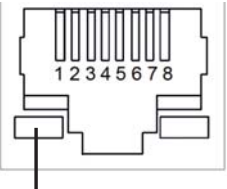


Artikel/ Part: 779201.0801
LCOS-SW-8P

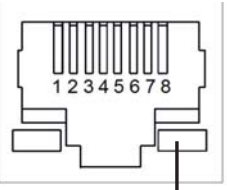


X1 ... X8

Pin	Color code wire	Assignment 10BASE-T 100BASE-T
1	WHT/ORG	TX+
2	ORG	TX-
3	WHT/GRN	RX+
4	BLU	
5	WHT/BLU	RX-
6	GRN	
7	WHT/BRN	
8	BRN	



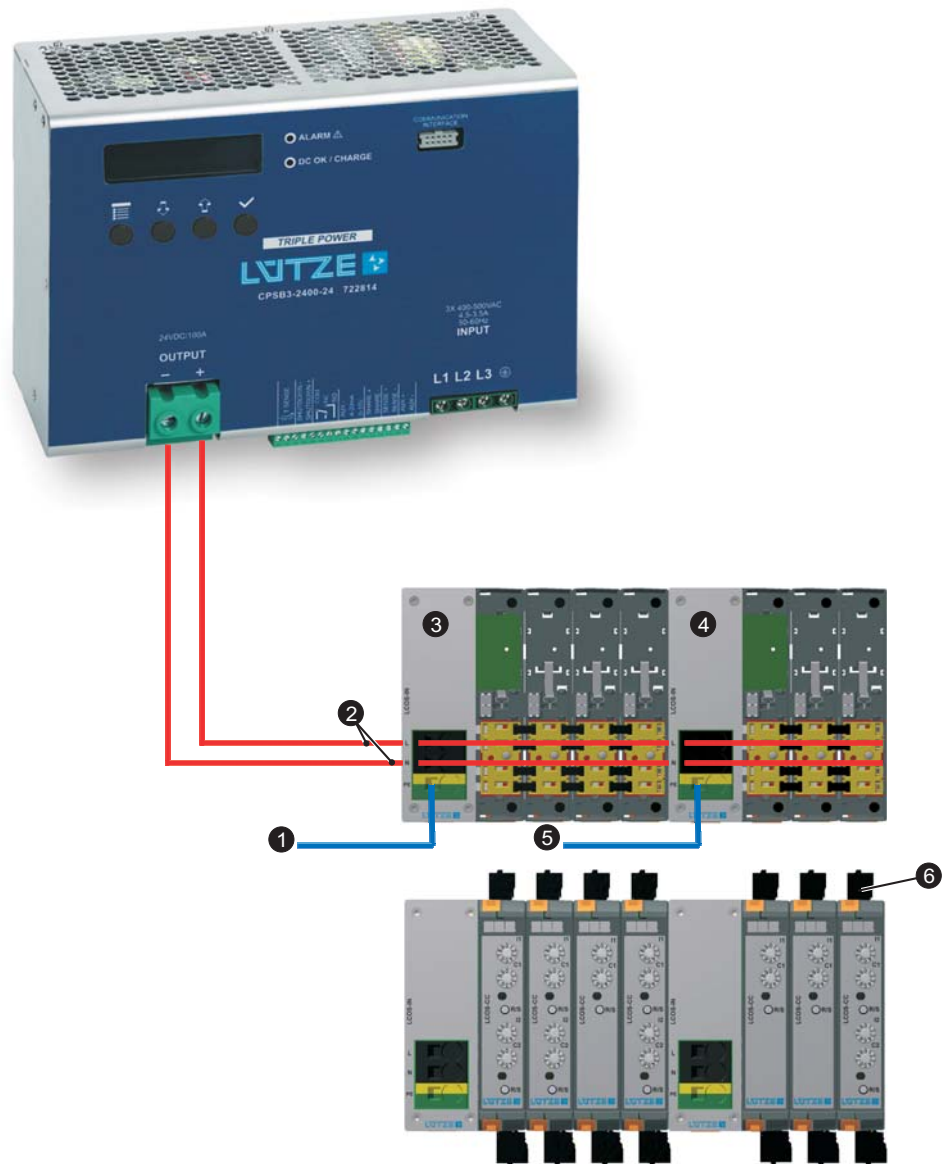
Link 4 Port Switch



Link 8 Port Switch

9.5

Further information on the LCOS system (basics)



System configuration

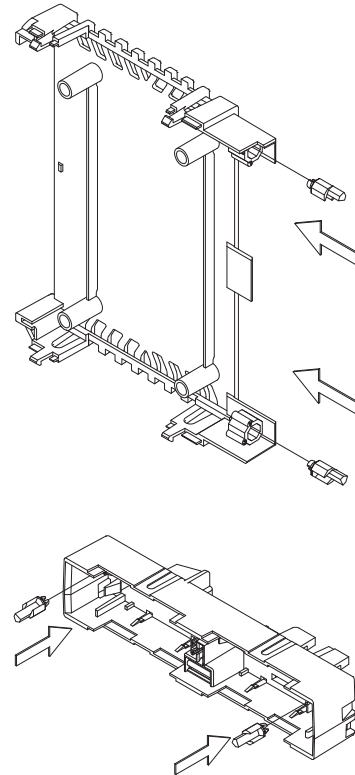
- | | |
|---|-------------------------------------|
| 1 | PE connection |
| 2 | Supply voltage |
| 3 | Supply module |
| 4 | Supply module - intermediate supply |
| 5 | PE connection |
| 6 | Load Connection |

9.6

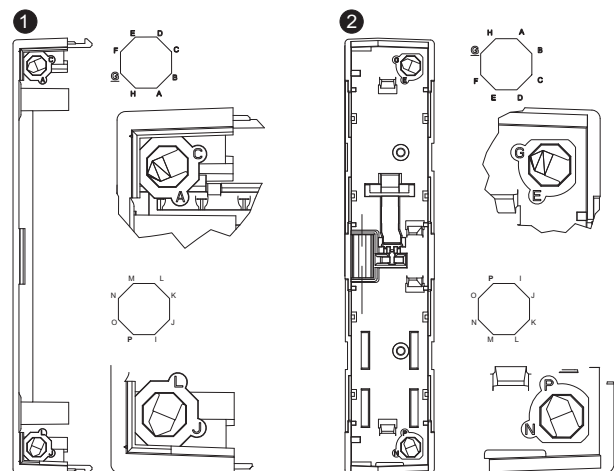
Coding of LCOS modules

To assign the function housing to the regarding function carrier and also to prevent mistakes when assembling the modules, the function housing and the function carrier can be coded.

1. Plug the coding pins into the slots of the function housing and the carrier.



2. Set the coding pins of the function housing (1) and the carrier (2) to the same position.
In the example on the right, position G was chosen.



9.7

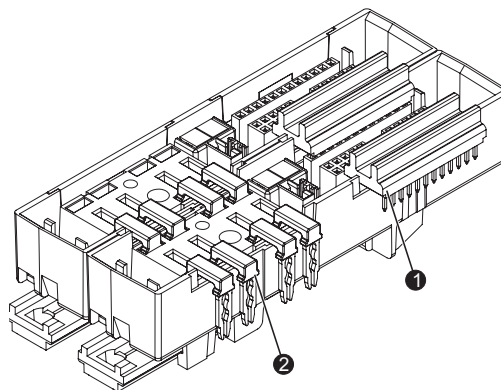
Installing Data and Power Bridges

In the LCOS system it is possible to bridge single modules.

Connect the modules regarding the application with

1. a data bridge or
2. a power bridge.

Different combinations are possible.



Two bridged function carriers 22.5 mm,
The carrier to the right is not displayed.



Further information on the LCOS system can be found at www.luetze.com

In the search field, enter either the product name: **LCOS System** or this article number: **780700.575.1**

Here you will also find the LCOS System Manual "**LCOS Modular housing system manual**" in the download area.

10 Commissioning - Hardware

NOTICE

Commissioning of the hardware may only be carried out by qualified personnel in compliance with the safety regulations.

10.1 Safety notes Power supply

WARNING

Only switch on a device when the housing is closed.

WARNING

Electric shocks and short-circuits due to incorrect voltage application.

Before commissioning, disconnect the entire system from the power supply and check the connections after applying power.

WARNING

The devices may only be connected to the supply voltage printed on the identification plate.

WARNING

The devices are designed for operation with safety extra-low voltage.

Accordingly, only SELV/PELV voltage circuits may be connected to the supply voltage connections.

WARNING

The earth connection of the device serves exclusively as functional earth (FE) according to EN 61131-2.

CAUTION

Make sure that peripherals are suitable for the application environment.

CAUTION

The connecting cables must be designed for the ambient temperature.

NOTICE

If the switches are supplied with AC, surge voltages of up to 2000 V can be expected between the active conductors and earth.

However, since the isolation voltage between functional earth (FE) and active conductors is only 1000 V, external overvoltage protection is required between the functional earth and at least one active conductor.

This overvoltage protection must limit the voltage to 1000 V.

Varistors of type 7N431K can be used for this purpose, for example.

The supply voltage is galvanically isolated from the housing. The devices can be supplied either via the energy bus X10 or the connection terminal X9. The power bus and the connection terminal are internally connected. Polarity is irrelevant.

10.2

Safety notes Housing



Risk of electric shock!

The housing may only be opened by technicians authorised by Lütze.



The upper and lower ventilation slots must not be covered so that the air can circulate freely.

The distance to the ventilation slots of the housing must be at least 30 mm.

Never insert pointed objects (narrow screwdrivers, wires or similar) into the inside of the product! There is a risk of electric shock.



The housing must be installed in a vertical position.

11 Operation

The device is delivered ready for operation.



Operation must be carried out by at least trained personnel.



Do not touch the housing during operation or shortly after switching off. Hot surfaces can cause injuries.



Proper and safe operation of the product requires careful operation and maintenance.



With the connection of the supply voltage you put the switch into operation.

11.1 Functional description

The ports of the LCOS Switch represent a terminal device connection for the connected LAN segment. You can connect individual devices or entire network segments.

11.2 Frame-Switching functionalities

11.2.1 Store and Forward

All data received by a switch is stored and checked for validity. Invalid and faulty data packets are discarded. Valid data packets are forwarded. Data packets with a length of up to 1552 bytes are supported. The packet buffer size is 448k bits.

11.2.2 Multi-address capability

A switch learns all source addresses per port. Only packages with

- unknown addresses
- these addresses or
- a multi-/broadcast address

in the destination address field are sent to this port.

Up to 1000 addresses can be stored simultaneously. This is necessary if more than one terminal is connected to one or more ports. This allows several independent subnets to be connected to one switch.

11.2.3 Tagging (IEEE 802.1Q)

For the VLAN and prioritisation functions, the IEEE 802.1 Q standard provides that the VLAN tag is integrated into a MAC data frame. The VLAN tag consists of 4 bytes (2 bytes Tag Protocol Identifier TPID, 2 bytes Tag Control Information TCI). It is inserted between the source address field and the type field. Data packets with VLAN tag are transmitted unchanged by the switch.

11.3 Specific functions of the Ethernet interface

11.3.1 Polarity reversal (Auto-Polarity)

If the pair of receiving lines is incorrectly connected (RD+ and RD- reversed), the polarity is automatically reversed.

11.3.2 Auto MDI-MDIX

The switch detects the transmit and receive line pair. The switch automatically switches the port output and port input to the corresponding line pairs. Therefore, it does not matter whether you use a cross-over or uncrossed cable to connect a device.

11.4 Other functions and features

11.4.1 Undervoltage cutoff

The switch switches off when the voltage falls below a certain level to prevent malfunctions.

11.5 Display elements

See chapter „7.2 LED status displays“ on page 26.

11.6 Interfaces

11.6.1 10/100 Mbit/s connection (TP Port)



The unit is to be connected only to internal Ethernet networks without exiting a facility and being subjected to TNVs.

To avoid electric shock, this device may only be connected to Ethernet networks within a building that are not connected to TNV circuits. Do not use a telephone line voltage (TNV)! (This note is particularly relevant for North America and Canada.)

The input/output connections comply with the Safety Extra Low Voltage (SELV) guidelines for extra-low voltage devices. With TNV circuits, higher voltages must be expected, e.g. due to lightning strikes. Therefore, they must not be connected to SELV circuits.

Four (LCOS-SW-4P) or eight (LCOS-SW-8P) ports allow the connection of end devices or independent network segments according to the IEEE 802.3 100BASE-TX / 10BASE-T standards.

Pin assignment of the RJ45 socket: See chapter „9.4 Pin assignment“ on page 37.

12

Maintenance - Hardware

The device is maintenance-free. Therefore, no inspection and maintenance intervals are necessary for ongoing operation. Opening or penetrating the device with any objects will void the warranty.



Switch off the input voltage before installation, maintenance or conversion work and secure it against unintentional restarting.



Prevent foreign objects from entering the device, especially metal parts such as screwdrivers, paper clips or needles, etc.



Do not make any changes or attempt to repair the unit. Do not open the device!

NOTICE

The replacement of defective hardware must be carried out by qualified personnel.

NOTICE

In the event of malfunctions or damage, switch off the supply voltage immediately and send the device to the factory for inspection.

NOTICE

The device does not contain any service components.

For general questions about the product or repair requests, please contact us:

Friedrich Lütze GmbH
 Bruckwiesenstraße 17-19
 71384 Weinstadt
 GERMANY / DEUTSCHLAND
 Telefon: +49 7151 60530
 Telefax: +49 7151 6053277
 E-Mail: info@luetze.de

13

Final Shutdown and Disposal

Mind the valid environmental standards of your country for the final shutdown and disposal.

For the final shutdown the product has to be disassembled. Electric Parts must be disposed according to the national electronic scrap regulation. Dispose the product according to the terms of use and legal liability on your own cost and exempt the Friedrich Lütze GmbH from the responsibilities of §10 passage 2 ElektroG (Take-back obligation of the manufacturer) and any third party in this content.

If the product is handled to a commercial third party without any contractual acceptance of the disposal, you have to take back the product after the final shutdown on your own cost and legal liability.

The entitlement of indemnity from the Friedrich Lütze GmbH by the customer does not prescribe before two years after the final shut down of the product. The two year deadline of the suspension of statute for limitations can start with a written message about the terms from you to the Friedrich Lütze GmbH.

14

Service

NOTICE

The device does not contain any service components.

In the event of malfunctions or damage, switch off the supply voltage immediately and send the device to the factory for inspection.

For general questions about the product or repair requests, please contact us:

Friedrich Lütze GmbH

Bruckwiesenstraße 17-19

71384 Weinstadt

GERMANY / DEUTSCHLAND

Telefon: +49 7151 60530

Telefax: +49 7151 6053277

E-Mail: info@luetze.de

15 Appendix

15.1 Overview of other applicable documents

Here is an overview of the other applicable documents for the LCOS Unmanaged Switches:

15.1.1 LCOS-SW-4P - 4-Port Ethernet Switch - 779200.0401

1. These operating instructions
2. Data sheet for 779200.0401
3. Type Test Certification for 779200.0401
4. Material Confirmation for 779200.0401
5. CE certification
6. UL certification
7. FCC Test Report

15.1.2 LCOS-SW-4P - 4-Port Ethernet Switch - 779201.0401

1. These operating instructions
2. Data sheet for 779201.0401
3. Type Test Certification for 779201.0401
4. Material Confirmation for 779201.0401
5. CE certification
6. UL certification
7. FCC Test Report

15.1.3 LCOS-SW-8P - 8-Port Ethernet Switch - 779200.0801

1. These operating instructions
2. Data sheet for 779200.0801
3. Type Test Certification for 779200.0801
4. Material Confirmation for 779200.0801
5. CE certification
6. UL certification
7. FCC Test Report

15.1.4

LCOS-SW-8P - 8-Port Ethernet Switch - 779201.0801

1. These operating instructions
2. Data sheet for 779201.0801
3. Type Test Certification for 779201.0801
4. Material Confirmation for 779201.0801
5. CE certification
6. UL certification
7. FCC Test Report

15.2

Explanation of abbreviations used

Acronym	Meaning
AC	alternating current, term for alternating current, in particular according to specifications for alternating voltage
DC	the term direct current for direct current; it is also used for direct voltage
DIN	The German Institute for Standardization e.V. (DIN) is the most important national standards organisation in the Federal Republic of Germany.
ElektroG	The Electrical and Electronic Equipment Act (ElektroG) implements the WEEE directive of the EU on handling electronic waste in Germany.
EMC	Electromagnetic compatibility; it refers to the absence of interference between electrical or electronic equipment and its environment.
EN	European standard, the standardization of CEN, CENELEC and ETSI
ESD	E lectrostatic D ischarge - Electrostatic discharges are voltage punctures caused by large potential differences.
FE	F unctional e arth is often used to install an electrical system in an electromagnetically compatible manner (EMC). Grounding one or more points in a network, in a system or in equipment for purposes other than electrical safety.
IEC	International E lectrotechnical C ommission, a standardization body for electrical engineering
IEV	International E lectrotechnical V ocabulary, IEV. The International Electrotechnical Dictionary is published by the International Electrotechnical Commission (IEC) to standardize the terminology of electrical engineering. (http://www.electropedia.org/)
IP20	„International P rotection“, or „Ingress Protection“, international classification of protection of electrical equipment against dust and water
LED	Light-emitting diode

Mbit	The unit of measurement is called "bit" and has - according to IEC - "bit" as a unit symbol. Here used for the specification of data rates e.g. Mbit/s for megabits per second. (Mega stands for one million).
PE	P rotective E arth, for protective conductors in electrical engineering
Rx	Receiving line
TS 35	DIN rail (35 mm) - DIN rail is a mounting rail with a U-shaped profile. (The profile resembles a hat.)
Tx	Transmission line
ZIP	The ZIP file format (zipper) is a format for losslessly compressed files, a data compression format

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Revision history

Revision	Description	Date
0.00	New document	23/08/2018

Subject to technical changes. These operating instructions must be kept for further use!



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