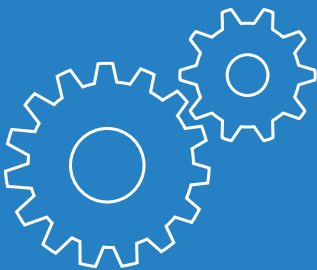


LANCOM Switches Installation Guide



Copyright

© 2019 LANCOM Systems GmbH, Wuerselen (Germany). All rights reserved.

While the information in this manual has been compiled with great care, it may not be deemed an assurance of product characteristics. LANCOM Systems shall be liable only to the degree specified in the terms of sale and delivery.

The reproduction and distribution of the documentation and software supplied with this product and the use of its contents is subject to written authorization from LANCOM Systems. We reserve the right to make any alterations that arise as the result of technical development.

Windows® and Microsoft® are registered trademarks of Microsoft, Corp.

LANCOM, LANCOM Systems, LCOS, LANcommunity and Hyper Integration are registered trademarks. All other names or descriptions used may be trademarks or registered trademarks of their owners. This document contains statements relating to future products and their attributes. LANCOM Systems reserves the right to change these without notice. No liability for technical errors and/or omissions.

Products from LANCOM Systems include software developed by the “OpenSSL Project” for use in the “OpenSSL Toolkit” (www.openssl.org).

Products from LANCOM Systems include cryptographic software written by Eric Young (eay@cryptsoft.com).

Products from LANCOM Systems include software developed by the NetBSD Foundation, Inc. and its contributors.

Products from LANCOM Systems contain the LZMA SDK developed by Igor Pavlov.

LANCOM Systems GmbH
Adenauerstr. 20/B2
52146 Wuerselen
Germany

www.lancom-systems.com/

Wuerselen, 05/2019

Introduction

Overview

LANCOM switches are the foundation for a reliable infrastructure. These switches deliver multiple intelligent features for improving the availability of your critical business applications, protecting your data, and optimizing your network bandwidth to deliver information and applications more effectively. Easy to set up and use, they provide the ideal combination of economic efficiency and technical capabilities from entry level to enterprise level networks. All models offer enhanced security and management functions. In addition, they have networking features to support common applications of data, voice, security and wireless networking.

Switch architecture

The switches perform a wire-speed, non-blocking switching fabric. This allows wire-speed transport of multiple packets at low latency on all ports simultaneously. The switch also features full-duplex capability on all ports, which effectively doubles the bandwidth of each connection. The switches use store-and-forward technology to ensure maximum data integrity. With this technology, the entire packet must be received into a buffer and checked for validity before being forwarded. This prevents errors from being propagated throughout the network.

Network management

LANCOM Systems offers three types of switches: unmanaged switches, websmart switches, and managed switches.

- Unmanaged switches are not configurable.
- Websmart switches are configurable only by their web-based GUI. Additionally, these switches offer an integrated network management agent, which allows managing via SNMP or RMON (Groups 1, 2, 3, 9).
- Managed switches support configuration via LANCOM Management Cloud (LMC), a web-based GUI, or CLI (Command Line Interface via SSH or Telnet). For outband management, these switches either provide a front-sided RJ45 console port, or a serial port at the front- or backside of the device. This port can be used for connecting a null-modem cable to a PC for configuration and monitoring purposes.



A LANCOM switch automatically contacts the LMC for 24 hours after startup (boot/reset) to successfully terminate the coupling. This enables zero-touch deployment for operation with the LMC.

Configuration options overview

	LMC	CLI	Outband	Web-based
Unmanaged switch	—	—	—	—
Websmart switch	—	—	—	■
Managed switch	■	■	■	■

Network Planning

Introduction to switching

A switch allows simultaneous transmission of multiple packets, it can partition a network more efficiently than bridges or routers. Therefore, the switch has been recognized as one of the most important device for today's networking technology.

When performance bottlenecks are caused by congestion at the network access point such as file server, the device can be connected directly to a switched port. And, by using full-duplex mode, the bandwidth of the dedicated segment can be doubled to maximize throughput. When networks are based on repeater (hub) technology, the distance between end stations is limited by a maximum hop count. However, a switch can subdivide the network into smaller and better manageable segments and recombine them to larger networks, thus removing the limitations by the maximum hop count.

A switch can be easily configured in any Ethernet, Fast Ethernet, or Gigabit Ethernet network to significantly increase bandwidth while using conventional cabling and network cards.

Application examples

The switches implement Gigabit Ethernet TP ports with auto MDIX and either fixed or slots for removable SFP modules which support comprehensive types of fiber optic connections, such as LC and BiDi-LC modules. It is not only designed to segment your network, but also to provide a wide range of options in setting up network connections. Some typical applications are described below.

Among others, the switches are suitable for the following applications:

- Remote site application is used in Enterprise or SMB
- Peer-to-peer application is used in two remote offices
- Office network

Safety instructions and intended use



In order to avoid harming yourself, third parties or your equipment when installing your LANCOM device, please observe the following safety instructions. Operate the device only as described in the accompanying documentation. Pay particular attention to all warnings and safety instructions. Use only those third-party devices and components that are recommended or approved by LANCOM Systems.

Before commissioning the device, be sure to study the Quick Reference Guide supplied with the hardware. These can also be downloaded from the LANCOM website (www.lancom-systems.com).

Any warranty and liability claims against LANCOM Systems are excluded following any usage other than the intended use described below.

Environment

LANCOM devices should only be operated when the following environmental requirements are met:

- > Ensure that you comply with the temperature and humidity ranges specified in the Quick Reference Guide for the LANCOM device.
- > Do not expose the device to direct sunlight.
- > Ensure that there is adequate air circulation and do not obstruct the ventilation slots.
- > Do not cover devices or stack them on top of one another
- > The device must be mounted so that it is freely accessible (for example, it should be accessible without the use of technical aids such as elevating platforms); a permanent installation (e.g. under plaster) is not permitted.

Power supply

Please observe the following before installation, as improper use can lead to personal injury and damage to property, as well as voiding the warranty:

- Use only the power adapter/IEC power cable mentioned in the Quick Reference Guide.
- Some models can be powered via the Ethernet cable (Power-over-Ethernet, PoE). Please observe the relevant instructions in the Quick Reference Guide for the device.
- Never operate damaged components.
- Turn the device on only if the housing is closed.
- The device must not be installed during thunderstorms and should be disconnected from the power supply during thunderstorms.
- In emergency situations (e.g. in the case of damage, ingress of liquids or objects, for example through the ventilation slots), the power supply must be disconnected immediately.
- Operate the device only with a professionally installed power supply at an any time accessible power outlet.

Applications

- The device may only be used in accordance with the relevant national regulations and under consideration of the legal situation applicable there.
- The equipment must not be used for the actuation, control, and data transmission of machinery that, in case of malfunction or failure, may present a danger to life and limb, nor for the operation of critical infrastructures such as power plants.

General safety

- › Under no circumstances should the device housing be opened and the device repaired without authorization. Any device with a case that has been opened is excluded from the warranty.
- › Notes on the individual interfaces, switches, and displays on your device are available in the supplied Quick Reference Guide.
- › Mounting, installation, and commissioning of the device may only be carried out by qualified personnel.

Installation

For safe and secure installation of your LANCOM device, please observe the safety instructions and intended use.

Selecting a site

The switch can be mounted in a standard 19-inch equipment rack or on a flat surface. Be sure to follow the guidelines below when choosing a location.

- Position the switch near the devices you want to link and near a power outlet.
- Be able to maintain the temperature of the switch within the limits listed in the Hardware Quick Reference Guide.
- Have the switch accessible for installing, cabling, and maintaining the devices.
- Allow the status LEDs to be clearly visible



Make sure the twisted-pair Ethernet cable is always routed away from power lines, radios, transmitters or any other electrical interference.

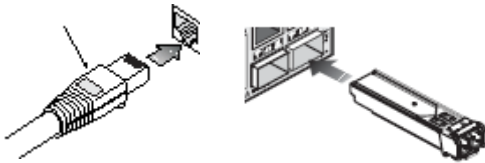


Make sure that the switch is connected to a separate grounded power outlet that provides 100 to 240VAC, 50 to 60Hz

Ethernet cabling

To ensure proper operation when installing the switch into a network, make sure that the available cables are suitable for 100BASE-TX or 1000BASE-T operation. Check the following criteria against the current installation of your network:

- > Cable type: Unshielded twisted pair (UTP) or shielded twisted pair (STP) cable with RJ-45 connectors; Category 5 or Category 5e with maximum length of 100 meters is recommend for 100BASE-TX, and Category 5e or 6 with maximum length of 100 meters is recommended for 1000BASE-T
- > Protection from radio frequency interference emissions
- > Electrical surge suppression
- > Separation of electrical wires and data – based network wiring
- > Safe connections with no damaged cables, connectors or shields



Package content and accessories

Before beginning with the installation, please check that nothing is missing from your package. Along with the LANCOM switch the box should contain the following accessories:

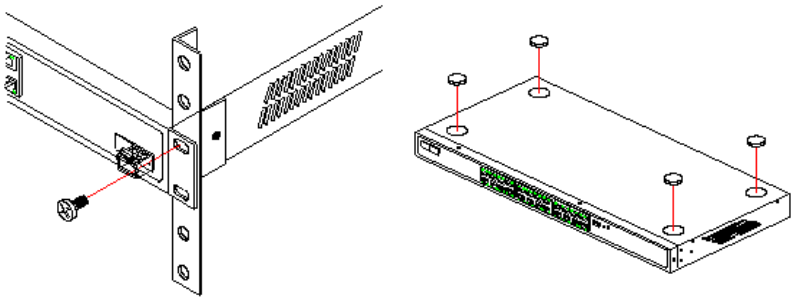
- > Power cord
- > 19'' adapter (2 pieces) and mounting materials
- > Serial cable (model dependent)
- > Printed documentation

Should anything be missing, please immediately contact your dealer or the address on the delivery note supplied with your device. Ensure that you have all accessories at hand which might be required during installation.

Mounting and connecting the LANCOM switch

Installing the LANCOM switch involves the following steps:

- Mounting – The device is designed for mounting in an available 19" unit in a server cabinet. Make use of the supplied mounting brackets for 19" cabinets. If necessary fix the rubber pads to the underside of the device to prevent any scratching to other equipment.



i Ensure that the device has sufficient ventilation to prevent damage from excessive heat build-up.

- LAN connection – Connect the network devices to the ports of the LANCOM switch by means of a suitable twisted-pair cable (TP cable). The connectors automatically detect the available data transfer speeds and the pin assignment (autosensing).

i Use only standard TP cables of category CAT 5 or better with a maximum length of 100 m to ensure the best possible data transfer. Crossover cables can be used thanks to the auto-sensing function.

- Supply power – Supply power to the device by means of the IEC power cable and/or an external power supply unit (model dependent).
- Ready for operation? – After a brief self-test, the power or system LED lights up continuously. Green Link/Act LEDs show which LAN connectors are used for a connection.

Configuration

Configuration options for websmart and managed switches

There are three different options to configure the device:

- Via a graphical user interface in a browser (WEBconfig):
This configuration option (for websmart- and managed switches) is only available if you have network access to the device's IP address from your computer.
- Via a graphical user interface in a browser (LANCOM Management Cloud – LMC):
This configuration option (only for managed switches) is only available if you have network access and both your device for configuration and the switch have a connection to the LANCOM Management Cloud.
- Configuration via console (Command Line Interface – CLI):
This method of configuration (only for managed switches), which requires a program such as SSH, Telnet, Hyperterminal, or similar, can be conducted over a network connection or with a direct connection via serial interface (RS-232).

WEBconfig

There are two ways of starting the configuration by browser:

- If you know the device's IP address, simply enter this into the address line of the browser. The factory settings for accessing the device are:
 - Before LCOS SX 4.00: User name: **admin**, password: **admin**
 - As from LCOS SX 4.00: User name: **admin**, password: **<empty>**
- If you do not have the device's IP address, LANconfig can be used to search for it. LANconfig automatically searches for all available devices in your network. Any available LANCOM routers or access points will be displayed in the list, including LANCOM switches. Double-click on this entry to start the browser automatically with the correct IP address.

What is the IP address of my LANCOM switch?

The current IP address of the LANCOM switch after being switched on depends on the network constellation.

- a Networks with DHCP server – In its factory settings, the LANCOM switch is set for auto DHCP mode, meaning that it searches for a DHCP server to assign it an IP address, subnet mask and gateway address. The assigned IP address can only be determined by using the appropriate tools (e.g. LANconfig) or via DHCP server. If the DHCP server is a LANCOM device, the IP address of the LANCOM switch can be read out from the DHCP table. If this is the case, the LANCOM switch can be accessed from any network computer that receives its IP address from the same DHCP server.
- Network without a DHCP server – If no DHCP server is present in the network, the LANCOM switch adopts the address **172.23.56.250**. If this is the case the LANCOM switch can be accessed from any network computer with its IP address set to the address range **172.23.56.x**.

LANCOM Management Cloud

In order to configure a LANCOM switch via the LANCOM Management Cloud (LMC), it must first be integrated into the LMC.

Integrating the switch into the LMC requires the switch to be connected to the Internet and able to reach cloud.lancom.de.

There are two different methods of integrating a LANCOM device into the LANCOM Management Cloud:

- Integration into the LANCOM Management Cloud by serial number and Cloud PIN
- Integration into the LANCOM Management Cloud by activation code

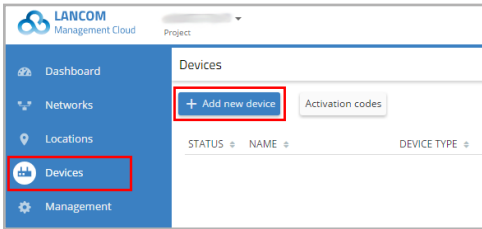
Integration into the LMC by serial number and Cloud PIN

If you have purchased a LANCOM switch that was shipped with LCOS SX (formerly LANCOM Switch OS) 3.30 or later – i.e. it is already “Cloud-ready” – all you have to do is simply add the device to a project in the LANCOM Management Cloud (Public).

You will need the serial number of the switch and the associated Cloud PIN. You can find the serial number on the bottom of the switch or in LANconfig or WEBconfig. The Cloud PIN can be found on the Cloud-ready flyer, supplied with the device.



In the LANCOM Management Cloud, open the **Devices** view and click **Add new device**.



In the next window, enter the serial number and Cloud PIN of the switch. Then confirm with the button **Add new device**.

A LANCOM switch automatically contacts the LMC for 24 hours after startup (boot/reset) to successfully conclude the pairing. After these 24 hours you can restart this period by a reset or use the following method with activation code.



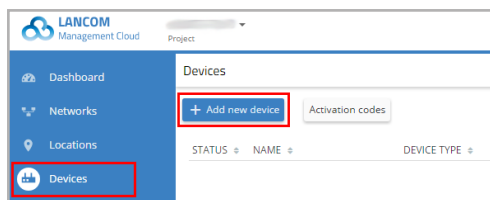
A Cloud PIN for integration into the LANCOM Management Cloud (Public) is available for all switches delivered with LCOS SX (formerly LANCOM Switch OS) 3.30 or later. If you have a device without a Cloud PIN, you can also use an activation code to register the device.

Integration into the LMC by activation code

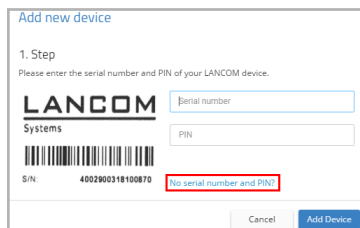
This method uses LANconfig and just a few steps to integrate one or more LANCOM devices simultaneously into the LANCOM Management Cloud.

Create an activation code

In the LANCOM Management Cloud, open the **Devices** view and click **Add new device**.



In the following window, click the link **No serial number and PIN available?**.

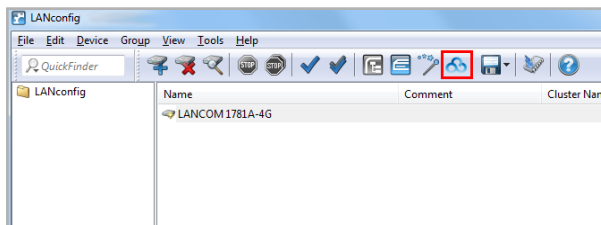


Create an activation code by following the instructions in the dialog. This activation code allows you to integrate the LANCOM switch into this project at a later time.

The **Activation code** button displays all of the activation codes for this project in the Devices view.

Using the activation code

Open LANconfig and select the desired device or devices and click the Cloud icon in the menu bar.



In the dialog window that opens, enter the activation code that you generated previously and click the button **OK**.



If you copied an activation code to the Clipboard, it is automatically entered into the field.

Once the device is paired with the LANCOM Management Cloud, it is available in the project for further configuration.

Command Line Interface via network

If you know the IP address of the managed switch (see section above) and the device is accessible from your computer via the network, you can use the command line interface via the network.

- To do this, start a console such as SSH or Telnet and enter the device's IP address as the target.
- Log on with user name and password
 - Before LCOS SX 4.00: User name: **admin**, password: **admin**
 - As from LCOS SX 4.00: User name: **admin**, password: **<empty>**

Command Line Interface via serial connection

If you do not know the IP address of the managed switch, you can use the command line interface via a serial connection.

- Use the serial configuration cable to connect the LANCOM switch to the configuration computer (see "Mounting and connecting the LANCOM switch").
- Start a terminal program on the configuration computer, such as PuTTY. Use the following parameters for the connection:
 - Baud rate: 115200
 - Stop bits: 1
 - Data bits: 8
 - Parity: N
 - Flow control: none
- Log on with user name and password
 - Before LCOS SX 4.00: User name: **admin**, password: **admin**
 - As from LCOS SX 4.00: User name: **admin**, password: **<empty>**

LANCOM Service & Support

You have chosen a LANCOM product with highest reliability. If you still encounter a problem, you are in best hands! The most important information regarding our Service and Support is summarized below, just in case.

LANCOM Support

Installation Guide/Quick Reference Guide

If you encounter any problems when installing or operating your product, the included installation guide resp. quick reference guide may help you in many cases.

Support from reseller or distributor

You can contact your reseller or distributor for support:

www.lancom-systems.com/how-to-buy/

Online Support

The LANCOM Knowledge Base, with more than 2,500 articles, is always available via our website:

www.lancom-systems.com/knowledgebase/

If you have further questions please send us your query via our portal:

www.lancom-systems.com/service-support/

Online support is free of charge at LANCOM. Our experts will respond as quickly as possible.

Firmware

The latest firmwares and documentation for all Switch products can be downloaded free of charge from the download section on our website:

www.lancom-systems.com/downloads/

Partner support

Our partners get additional support access according to their partner level.

More information can be found on our website:

www.lancom-systems.com/mylancom/

LANCOM Service

Warranty

Within the EU all LANCOM Systems products come with a voluntary manufacturer warranty. The warranty period depends on the device type:

- 2 years for all LANCOM unmanaged and websmart switches as well as accessories
- 3 years for all LANCOM routers, gateways, WLAN controllers, access points, and R&S® Unified Firewalls
- 5 years for all LANCOM managed switches

Within the EU: To apply for warranty you need an RMA number (Return of Material Authorization). In this case please contact our support team.

More information can be found under der following link:

www.lancom-systems.com/repair/

Outside EU: Please contact your reseller or distributor.

Software Lifecycle Management

LANCOM products regularly receive software updates throughout their lifetime. The LANCOM lifecycle applies to the support of products. For more information please visit the LANCOM website:

www.lancom-systems.com/lifecycle/

Options for your individual requirements

LANCOM offers individually tailored value-added services according to your needs. Little money provides best protection for your investment.

Warranty extensions for additional safeguarding for your devices:

www.lancom-systems.com/warranty-options/

Individual support contracts and service vouchers for best possible support with guaranteed response times:

www.lancom-systems.com/support-products/

Your LANCOM team