



# SCALANCE X-500 Command Line Interface

Configuration Manual

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## General information

### 1.1 General information on the Command Line Interface

#### Introduction

All the configuration settings for the device can be made using the Command Line Interface (CLI). The CLI therefore provides the same options as Web Based Management (WBM). You should read the detailed explanations of the parameters in the manual "Configuration with Web Based Management".

The CLI also allows remote configuration over Telnet.

#### Starting the CLI in a Windows console

Follow the steps outlined below to start the Command Line Interface in a Windows console:

1. Open a Windows console and type in the command "telnet" followed by the IP address of the device you are configuring:

```
C:\>telnet <IP address>
```

2. Enter your login and password.

As an alternative, you can also enter the command "telnet" followed by the IP address of the device you are configuring in the Start > Run menu.

#### NOTICE

##### Requirement for use of the CLI

You should only use the command line interface if you are an experienced user.

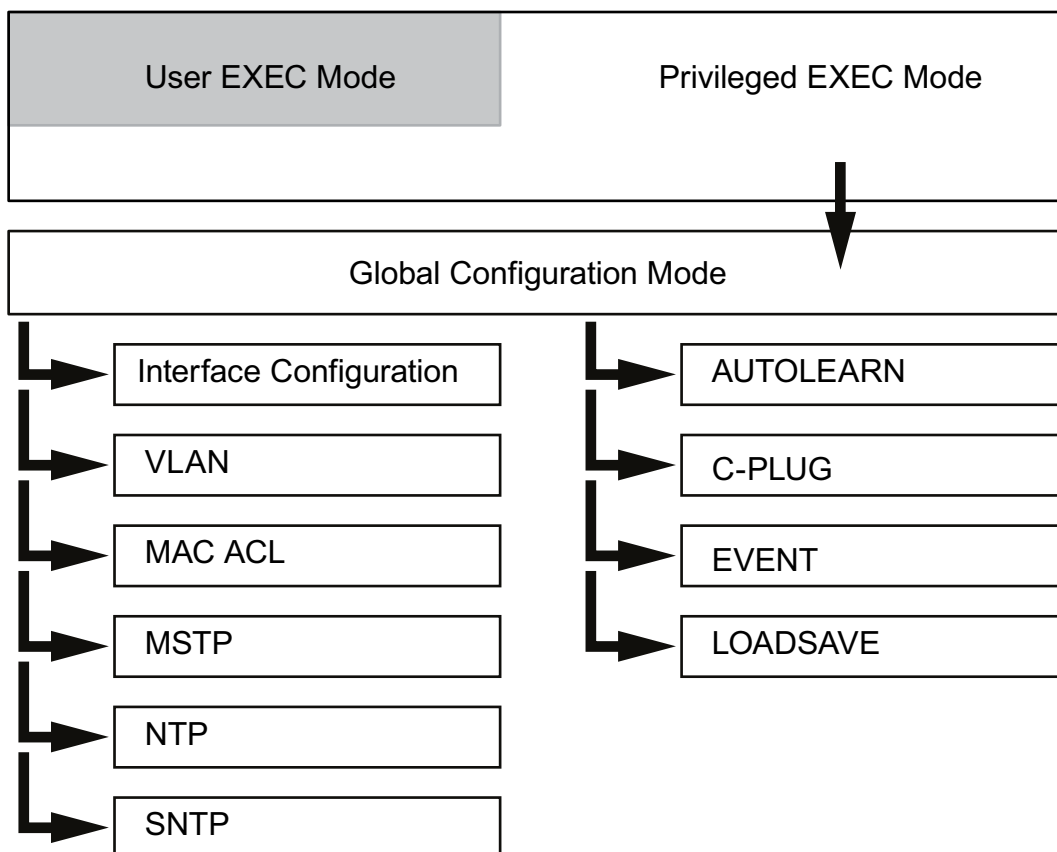
Even commands that bring about fundamental changes to the configuration are executed without a prompt for confirmation.

Errors in the configuration can mean that no further operation is possible in the entire network.

## 1.2 Structure of the Command Line Interface

### Grouping of the commands in the various modes

The commands of the Command Line Interface are grouped according to various modes. Apart from a few exceptions (`help`, `exit`), commands can only be called up in the mode to which they are assigned. This grouping allows different levels of access rights for each individual group of commands. The following graphic is an overview of the available modes.



### User EXEC mode

This mode is active after you log in with the user name `user` in a console window. In this mode, you can use `show` commands to display the current values of configuration parameters. It is not possible to modify parameters in this mode.

To be able to modify configuration parameters, you need to change to the Privileged EXEC mode.

### Privileged EXEC mode

You can only use this mode with administrator privileges. You change to this mode if you log on with the name `admin`. With the `exit` command, you return to the User EXEC mode.

## Global configuration mode

In this mode, you can make basic configuration settings. In addition to this, you can also call up modes for the configuration of special interfaces or functions, for example to configure a VLAN or a C-PLUG. You change to this mode by entering `configure terminal` in the Privileged EXEC mode. You exit this mode by entering `end`.

## Other configuration modes

From the global configuration mode, you can change to other configuration modes for special tasks. These are either general configuration modes (for example line configuration, interface configuration) or protocol-specific configuration modes (FTP, NTP).

# 1.3 The CLI command prompt

## Overview

The Command Line Interface prompt shows the following information:

- The mode in which the CLI is currently operating.  
Most commands can only be called in a particular mode. You should therefore check the CLI mode based on the command prompt.
  - User Exec mode: `CLI>`
  - Privileged Exec mode and configuration modes: `CLI(...)#`
- The selected interface when the CLI is in an Interface configuration mode.  
In the Interface configuration mode, the parameters are configured for one specific interface. The command prompt is displayed in the form `CLI(config-if-$$$)#` where the placeholder `$$$` is replaced by the identifier of the Interface. You select the Interface by setting suitable parameters for the `interface` command.
- An identifier when the Trial mode is enabled.  
If you first test changes to the configuration and then want to discard them, disable the auto save function with the `no auto-save` command. You are then in Trial mode. Changes to the configuration that you have not saved are indicated by an asterisk in front of the command prompt: `*CLI(...)#`.  
You save the changes to the configuration with the command `write startup-config`. With the `auto-save` command, you enable the auto save function again.

---

### Note

#### Upper and lower case

The Command Line Interface does not distinguish between upper case and lower case letters.

Make sure, however, that names used by the operating system or other programs are correctly written.

---

## 1.4 Symbols of the CLI commands

### Symbols for representing CLI commands

When setting parameters for CLI commands, the following characters are used:

Character	Meaning	
< ... >	mandatory parameter	Instead of the expression in parenthesis, you must enter a value
[ ... ]	optional parameter	Instead of the expression in parenthesis, you can enter a value
( ... )	Value or range of values	Enter a value to replace the expression in parenthesis
( ... - ... )	Range of values	Enter a value from this range
{ ... }	Selection list	Select one more elements from the list
{ ...   ... }	exclusive selection	Select exactly one element from this list

These characters are used in combinations to describe mandatory and optional entries.

There is a general description of some of these combinations below:

Character combinations	Meaning
< variable >	Instead of the expression in parentheses<>, enter a permitted value
< variable (a - b) >	Instead of the expression in parentheses <>, enter a value from the range "a" to "b"
[< variable 1 >< variable 2 >]	The parameter pair is optional. If you use the parameter assignment, you need to enter a permitted value to replace both expressions in parenthesis <>
[ keyword < variable (a - b)>]	The parameter assignment is optional. If you use the keyword, you need to enter a value from the range "a" to "b" to replace the expression in parenthesis <>
[ keyword < variable (a - b) unit >]	The parameter assignment is optional. If you use the keyword, you need to enter a value from the range "a" to "b" to replace the expression in parenthesis <>. "Unit" is one of the variables and is also replaced by the entry.
[keyword { A   B   C }]	The parameter assignment is optional. If you use the keyword, you need to specify exactly one of the values "A", "B" or "C"
keyword { [A] [B] [C] }	After the keyword, enter one or more of the values "A", "B" or "C"



## 1.5 Addresses and interface names

### 1.5.1 Address types, address ranges and address masks

#### Overview

Since the various types of addresses can be represented by different notations, the notations used in the Command Line Interface are shown below:

- IPv4 addresses  
Addresses for the Internet Protocol version 4 are specified in decimal notation with four numbers from the range 0 to 255 separated by a dot.  
You should also check not only that the address is formally correct but that access is permitted.
- Network masks  
A network mask is a series of bits that describes the network part of an IP address.  
The notation is normally decimal in keeping with the IP address.
- Alternative notation for network masks  
In contrast to the notation described above, network masks can also be represented as a number of 1 bits. The mask of the decimal representation 255.255.0.0 is then written as /16.
- MAC addresses  
In the syntax of the Command Line Interface, a MAC address is represented as a sequence of 6 bytes in hexadecimal format, in each case separated by a colon.  
An example of this is aa:aa:aa:aa:aa:aa.
- Multicast addresses  
Layer 2 multicast addresses as used on this device use the notation of MAC addresses.  
For permitted address ranges, check the rules or ask your network administrator.

### 1.5.2 Naming interfaces

#### Overview

The device has several types of interface that are addressed in different ways:

- Physical interfaces on the device
  - Permanently installed interfaces  
The interfaces permanently installed on the device are identified by slot 0.
  - Interface cards  
The extra locations for interface modules are identified by slot 1 and the numbers following. The numbering range depends on the hardware configuration. The numbering does not depend on the interface modules inserted in the device but is a fixed assignment.

Each slot has 4 ports numbered 1 to 4.

1.5 Addresses and interface names

These interfaces are addressed with commands with the syntax `interface<interface-type><interface-id>` or similar. Note the section below for more information on the notation of the address.

- Logical interfaces
  - VLAN
    - The device supports up to 4094 virtual networks.
    - To be able to use a VLAN, create it with the `vlan` command.
  - Aggregated links, aggregated ports, port channel, etherchannel
    - These terms are used for the same function:
    - Several ports or connections between two devices are logically bundled together (aggregated) to achieve a higher data transmission rate and a lower failure risk.
    - The device supports up to 8 channel groups that you create with the `channel-group` command.

**Naming the interface in the `interface` command and in other commands**

If you call up the `interface` command to configure an interface in the Global configuration mode, enter the interface you want to configure.

VLAN and port channel interfaces are selected using the number that you assigned in the `vlan` or `channel-group` command.

With physical interfaces, first enter the type or the speed of the interface. You can also replace the names `gigabitethernet` or `extreme-ethernet` with short IDs `gi` or `ex`.

Then enter a blank followed by the slot and port number of the Interface separated by a slash.

The permitted ranges of values depend on the hardware configuration.

This notation also applies to other commands that address an Interface.

**Example**

You call a gigabit Ethernet interface in the second port of slot 1 with the `interface gi 1/2` command.

**Identification of the interfaces in the command prompt of the Interface configuration mode**

Since you configure precisely one of the existing interfaces in the Interface configuration mode, the command prompt shows not only the mode but also the name of this interface.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

The placeholder `$$$` is replaced by the following name of the interface:

Type of interface	Command prompt
cpu0	cli(config-if-cpu0)#
vlan	cli(config-if-vlan-\$)#
port-channel	cli(config-if-po-\$)#

Type of interface	Command prompt
gigabitethernet	cli (config-if-Gi\$-\$) #
extreme-ethernet	cli (config-if-Ex\$-\$) #

The placeholders \$ or \$-\$ denote the numbering of the interface.

## 1.6 General CLI commands

This section describes commands that you can call up in any mode.

### 1.6.1 clear screen

#### Description

With this command, you clear the screen.  
The command prompt is displayed.

#### Syntax

Call the command without parameters:

```
clear screen
```

#### Result

The screen is cleared.  
The command prompt is displayed.

### 1.6.2 end

#### Description

With this command, you close all configuration modes.  
You are then in the Privileged EXEC mode.

#### Requirement

You are in a configuration mode.

#### Syntax

Call the command without parameters:

```
end
```

## Result

You are in the Privileged EXEC mode.

The command prompt is as follows:

```
cli#
```

### 1.6.3 exit

#### Description

With this command, you close the current mode.

You are then at the next higher level in the user modes.

If you are in Privileged EXEC Modus or in User EXEC Modus mode, you will be logged out.

#### Syntax

Call the command without parameters:

```
exit
```

## Result

The current mode was exited.

### 1.6.4 Help functions and supported input

The Command Line Interface provides various functions that are helpful when making entries in the command line:

- `help`
- `?`
- Command completion with the tab key
- Automatic completion of incomplete commands
- Paging in the list of most recently used commands
- Display of the list of most recently used commands (`show history`)

#### 1.6.4.1 help

#### Description

With this command, you display the help entry for a command or the command list.

### Help on a specific command

#### Syntax

Call up help with the following parameters:

```
help [command]
```

Here, you replace [command] with the command for which you require help.

If the command for which you require help consists of several words, enter these words without spaces.

#### Result

The syntax of the command is displayed.

#### Command overview

#### Syntax

If you call up help without parameters, you will obtain a list of all permitted commands in the current mode:

```
help
```

#### Result

Both the mode-specific as well as the global commands are displayed.

---

#### Note

##### Incomplete command names

If you have specified an incomplete command when calling help, a list of all commands that start with the term you have entered is created.

---

### 1.6.4.2 The command "?"

#### Description

With this command, you call up the command list.

#### Syntax

Enter a question mark to obtain a list of all permitted commands in the current mode:

```
?
```

For this command, you do not need to press the enter key.

The command executes immediately after you type the character.

Both the mode-specific as well as the global commands are displayed.

---

**Note**

**Incomplete command names**

If you have specified an incomplete command when calling the help function, a list of all commands that start with the term you have entered is created.

---

**Note**

**Output in pages**

With long lists, the results are displayed as pages.

You interrupt the output with the `q` key and show the next page with the spacebar.

---

### 1.6.4.3 Completion of command entries

#### Description

The command interpreter of the Command Line Interface supports you when you enter commands.

As soon as the first characters of the command have been entered in the input line, the system can complete the entry as long as the character string is unambiguous.

This can be repeated after entering further characters.

#### Procedure

Enter the first characters of the command.

Press the TAB key.

#### Result

The command interpreter completes the input as long as the command is unambiguous.

If you enter a character string that cannot be completed to form a command, an error message is displayed.

If the entry is not yet complete, enter further characters.

With `?`, you obtain a list of the possible commands.

Repeat this if necessary until the command is complete and can execute.

#### 1.6.4.4 Abbreviated notation of commands

##### Description

The command interpreter of the Command Line Interface also detects commands if only the first character of the command or its parts is entered.

This is only possible if all the parts of the abbreviated input can be assigned to exactly one command or to the parts of the command.

##### Example

The `show event config` command can be replaced by the expression `sh e c.`

#### 1.6.4.5 Reusing the last used commands

##### Description

The Command Line Interface saves the last used commands in a list.

You can call up to the most recently used 14 commands and use them again.

##### Procedure

You can page through the list of the commands most recently used using the arrow up and arrow down keys.

If the command you are looking for is displayed, you can edit the command line as required and execute the command with the enter key.

##### Further notes

You display the list of commands last used with the `show history` command.

#### 1.6.4.6 `show history`

##### Description

This command shows the last 14 commands you entered.

The commands are listed in the order in which they were called up. The `show history` command is listed as the last command to be entered.

The list is not deleted if you change modes.

##### Requirement

You are in the Privileged EXEC mode.

*1.6 General CLI commands*

The command prompt is as follows:

```
cli#
```

**Syntax**

Call the command without parameters:

```
show history
```

**Result**

The list of used commands is displayed.



# Configuration

This part contains the sections describing the system settings and the saving and loading of configurations and firmware.

## 2.1 System

This section describes commands with which general system properties can be displayed and configured.

### 2.1.1 The "show" commands

This section describes commands with which you display various settings.

#### 2.1.1.1 show cli-console-timeout

##### Description

This command shows the global configuration for the timeout of the CLI console.

##### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

##### Syntax

Call the command without parameters:

```
show cli-console-timeout
```

##### Result

The configuration for the timeout is displayed.

### 2.1.1.2 show coordinates

#### Description

This command shows the system coordinates.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call the command without parameters:

```
show coordinates
```

#### Result

The system coordinates are displayed.

### 2.1.1.3 show device information

#### Description

This command shows information about the device.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call the command without parameters:

```
show device information
```

#### Result

The information about the device is displayed.

#### 2.1.1.4 show versions

##### Description

This command shows the version information of the entire system.

##### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

##### Syntax

Call the command without parameters:

```
show versions
```

##### Result

The version information of the entire system is displayed.

#### 2.1.1.5 show hardware

##### Description

This command shows the type and number as well as the position of the installed interface cards of the system.

##### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

##### Syntax

Call the command without parameters:

```
show hardware
```

##### Result

The table of interface cards is displayed.

The slot ID, the status and the type or name of the card is listed.

### 2.1.1.6 show env temperature

#### Description

This command shows the temperature of the system.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call the command without parameters:

```
show env temperature
```

#### Result

The temperature of the system is displayed.

### 2.1.1.7 show interfaces

#### Description

This command shows the status and the configuration of one, several or all interfaces.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call up the command with the following parameters:

```
show interfaces
  [{
    [<interface-type><interface-id>]
    [{description|stormcontrol|flowcontrol|status}]
    |
    {vlan<vlan-id(1-4094)>}
    |
    port-channel<port-channel-id(1-8)>
  }]
```

The parameters have the following meaning:

Parameters	Description	Range of values
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name
description	Shows the description of the interface	-
stormcontrol	Shows the storm control settings	-
flowcontrol	Shows the flow control settings	-
status	Shows the status of the interface	-
vlan	Keyword for a VLAN connection	-
vlan-id	Number of the addressed VLAN	1 ... 4094
port-channel	Keyword for a port channel connection	-
port-channel-id	Number of the addressed port channel	1 ... 8

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameters from the parameter list, the status and configuration of all available interfaces will be displayed.

## Result

The status and the configuration of the selected interfaces are displayed.

### 2.1.1.8 show interfaces ... counters

#### Description

This command shows the counters of one, several or all interfaces.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

### Syntax

Call up the command with the following parameters:

```
show interfaces
    [{<interface-type><interface-id>] | {vlan<vlan-id(1-4094)>}] counters
```

The parameters have the following meaning:

Parameters	Description	Range of values
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>gigabitethernet</li> <li>extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name
vlan	Keyword for a VLAN connection	-
vlan-id	Number of the addressed VLAN	1 ... 4094

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameter from the parameter list, the entries are displayed for all available counters.

### Result

The counters of the selected interfaces are displayed.

### 2.1.1.9 show ip interface

#### Description

This command shows the configuration of one, several or all IP interfaces.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

### Syntax

Call up the command with the following parameters:

```
show ip interface [Vlan<vlan-id(1-4094)>]
    [<interface-type><interface-id>]
    [loopback<loopback-id(0-100)>]
```

The parameters have the following meaning:

Parameters	Description	Values
vlan	Keyword for a VLAN connection	-
vlan-id	Number of the addressed VLAN	1 ... 4094
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name
loopback	Keyword for a loopback	-
loopback-id	Number of the addressed loopback	0 ... 100

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameter from the parameter list, the configuration is displayed for all available IP interfaces.

## Result

The configuration of the selected IP interface is displayed.

### 2.1.1.10 show interface access lists

## Description

This command shows the access control list of one or all interfaces.

## Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

## Syntax

Call up the command with the following parameters:

```
show interface access-lists<interface-type><interface-id>]
```

The parameters have the following meaning:

Parameters	Description	Values
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameter from the parameter list, the configuration is displayed for all available IP interfaces.

**Result**

The access control list of the selected IP interface is displayed.

**2.1.1.11 show broadcast-block config**

**Description**

This command shows the broadcast blocking settings for ports.

**Requirement**

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

**Syntax**

Call up the command with the following parameters:

```
show broadcast-block config [port<interface-type><interface-id>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
port	Keyword for a port description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"><li>gigabitethernet</li><li>extreme-ethernet</li></ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

**Result**

The broadcast blocking settings for ports are displayed.



### 2.1.1.12 show multicast-block config

#### Description

This command shows the multicast blocking settings for ports.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call up the command with the following parameters:

```
show multicast-block config[port<interface-type><interface-id>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
port	Keyword for a port description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If no parameters are specified, the settings for all ports are displayed.

#### Result

The multicast blocking settings for ports are displayed.

### 2.1.1.13 show interface mtu

#### Description

With this command, you show the setting for the Maximum Transmission Unit (MTU) of the interfaces on the device.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

**Syntax**

Call up the command with the following parameters:

```
show interface mtu [{Vlan<vlan-id(1-4094)>|
                    portchannel<port-channel-id(1-8)>|
                    <interface-type><interface-id>}]
```

The parameters have the following meaning:

Parameters	Description	Range of values
vlan	Keyword for a VLAN connection	-
vlan-id	Number of the addressed VLAN	1 ... 4094
portchannel	Keyword for a port channel connection	-
port-channel-id	Number of the addressed port channel	1 ... 8
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>gigabitethernet</li> <li>extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If no parameters are specified, the settings for all interfaces are displayed.

**Result**

The settings are displayed.

**2.1.2 clear counters**

**Description**

With this command, you reset the counters of an interface.

**Requirement**

You are in the Privileged EXEC mode.

The command prompt is as follows:

```
cli#
```

**Syntax**

Call up the command with the following parameters:

```
clear counters [<interface-type><interface-id>]
```

The parameters have the following meaning:

Parameters	Description	Values
interface-type	Type or speed of the interface	<ul style="list-style-type: none"><li>• gigabitethernet</li><li>• extreme-ethernet</li></ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If no parameters are specified, the counters for all interfaces are reset.

## Result

The counters of the interface are reset.

## Further notes

You display the configured interfaces with the `show interfaces` command.

## 2.1.3 configure terminal

### Description

With this command, you change to the Global configuration mode.

### Requirement

You are in the Privileged EXEC mode.

The command prompt is as follows:

```
cli#
```

### Syntax

Call the command without parameters:

```
configure terminal
```

### Result

You are now in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

### Further notes

You exit the Global configuration mode with the `end` command.

## 2.1.4 lock

### Description

With this command, you lock the console.

### Requirement

You are in the Privileged EXEC mode.

The command prompt is as follows:

```
cli#
```

### Syntax

Call the command without parameters:

```
lock
```

### Result

The console is locked. The system expects the entry of the password.

### Further notes

You cancel the lock by entering the Login password.

## 2.1.5 logout

### Description

With this command, you exit the Command Line Interface.

If you are connected to the device via telnet, the session is closed.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

## Syntax

Call the command without parameters:

```
logout
```

## Result

The login prompt is displayed.

## 2.1.6 ping

### Description

With this command, you request a response from a device in the network.

This allows you to check whether or not another node is reachable.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

## Syntax

Call up the command with the following parameters:

```
ping [ip]<destination-address>
      [size<packet_size(0-2080)>]
      [count<packet_count(1-10)>]
      [timeout<time_out(1-100)>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
ip	Uses an IP address	-
destination address	Address of the called node	Enter a valid IP address or a valid hostname
size	Keyword for the size of the packets to be transferred	-
packet_size	Keyword for the size of the packets in bytes	0 ... 2080
count	Keyword for the number of packets to be requested	-
packet_count	Number of packets	1 ... 10
timeout	Response wait time If this time expires, the request is reported as "timed out".	-
time_out	Time to the timeout in seconds	1 ... 100

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameters from the parameter list, the default values are used.

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

Parameters	Default value
<code>packet_size</code>	40
<code>packet_count</code>	3
<code>time_out</code>	1

### Result

The messages relating to the response of the called node are displayed.

## 2.1.7 clear line vty

### Description

With this command, you close a console session on the device.

With the `forceful-clear` option, you close a session that is not reacting.

### Requirement

You are in the Privileged EXEC mode.

The command prompt is as follows:

```
cli#
```

### Syntax

Call up the command with the following parameters:

```
clear line vty {<line-number(2-9)>|all}[forceful-clear]
```

The parameters have the following meaning:

Parameters	Description	Values
<code>line-number</code>	Number of the connection that will be terminated	2 ... 9
<code>all</code>	terminates all connections	-
<code>forceful-clear</code>	closes a session that is not reacting	

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

The console session is closed.

## Further notes

You display the connection information with the `show line` command.

## 2.1.8 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 2.1.8.1 interface

#### Description

With this command, you change to the Interface configuration mode.

There you can edit the settings for one interface. You select the interface with the parameters of this command. If you specify a logical interface that does not exist, it will be created. The name of the selected interface is displayed in the command prompt.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
interface{cpu0|vlan<vlan-id(1-4094)>|port-channel<port-channel-id(1-8)>|  
    <interface-type><interface-id>}
```

The parameters have the following meaning:

Parameters	Description	Values
cpu0	The configuration mode for the "Out of Band Management interface" is called up	-
vlan	Keyword for a VLAN connection	-

Parameters	Description	Values
vlan-id	Number of the addressed VLAN	1 ... 9094
port-channel	Keyword for a port channel connection	-
port-channel-id	Number of the addressed port channel	1 ... 8
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

The placeholder \$\$\$ is replaced by the following name of the interface:

Type of interface	Command prompt
cpu0	cli(config-if-cpu0)#
vlan	cli(config-if-vlan-\$)#
port-channel	cli(config-if-po-\$)#
gigabitethernet	cli(config-if-Gi\$-\$)#
extreme-ethernet	cli(config-if-Ex\$-\$)#

The placeholders \$ or \$-\$ denote the numbering of the interface.

The ranges of values for the logical interfaces VLAN and port channel can be found in the table above. You can only call up interfaces that you created with the `vlan` or `channel-group` command.

The ranges of values from the physical interfaces depend on the hardware configuration.

## Further notes

You exit the Interface configuration mode with the `end` or `exit` command.

You delete a logical interface with the `no interface` command.

You display the status and the configuration of the interfaces with the `show interfaces` command.

### 2.1.8.2 no interface

#### Description

With this command, you delete a logical interface.



## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli (config) #
```

## Syntax

Call up the command with the following parameters:

```
no interface {vlan <vlan-id (1-4094)> | port-channel <port-channel-id (1-8)>}
```

The parameters have the following meaning:

Parameters	Description	Values
vlan	Keyword for a VLAN connection	-
vlan-id	Number of the addressed VLAN	1 ... 9094
port-channel	Keyword for a port channel connection	-
port-channel-id	Number of the addressed port channel	1 ... 8

## Result

The logical interface is deleted.

## Further notes

You configure an interface with the `interface` command.

You display the status and the configuration of the interfaces with the `show interfaces` command.

### 2.1.8.3 cli-console-timeout

## Description

With this command, you configure the time before the automatic logout after the last entry is made.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli (config) #
```

### Syntax

Call up the command with the following parameters:

```
cli-console-timeout <(60-600)>
```

The parameters have the following meaning:

Parameters	Description	Range of values
-	Time to automatic logout in seconds	60 ... 600

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The time is configured at 300 seconds.

### Result

The time is configured.

### Further notes

You can enable/disable the function for the automatic logout with the `set cli-console-timeout` command.

You can display the setting of this function and other information with the `show cli-console-timeout` command.

## 2.1.8.4 coordinates height

### Description

With this command, you enter a height coordinate.

### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

### Syntax

Call up the command with the following parameters:

```
coordinates height <string>
```

The parameter has the following meaning:

Parameters	Description	Note
string	Input box for the height coordinate	max. 32 characters

## Result

The height coordinate is created.

### 2.1.8.5 coordinates latitude

#### Description

With this command, you enter a latitude coordinate.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli (config) #
```

#### Syntax

Call up the command with the following parameters:

```
coordinates latitude <string>
```

The parameter has the following meaning:

Parameters	Description	Note
string	Input box for the latitude coordinate	max. 32 characters

## Result

The latitude coordinate is created.

### 2.1.8.6 coordinates longitude

#### Description

With this command, you enter a longitude coordinate.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli (config) #
```

**Syntax**

Call up the command with the following parameters:

```
coordinates longitude <string>
```

The parameter has the following meaning:

Parameters	Description	Note
string	Input box for the longitude coordinate	max. 32 characters

**Result**

The longitude coordinate is created.

**2.1.8.7 system contact**

**Description**

With this command, you enter contact information for the system.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call up the command with the following parameters:

```
system contact <string>
```

The parameter has the following meaning:

Parameters	Description	Note
string	Input box for contact information	max. 255 characters

**Result**

The contact information is created in the system.

### 2.1.8.8 system location

#### Description

With this command, you enter the location information for the system.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
system location <string>
```

The parameter has the following meaning:

Parameters	Description	Note
string	Input box for the location information	max. 255 characters

#### Result

The location information is created in the system.

### 2.1.8.9 system name

#### Description

This command, you enter a name for the system.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
system name <string>
```

The parameter has the following meaning:

Parameters	Description	Note
string	Input box for the name	max. 255 characters

**Result**

The name is created in the system.

**2.1.8.10 username**

**Description**

With this command, you change the password of a user.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call up the command with the following parameters:

```
username {user|admin}password<passwd>
```

The parameters have the following meaning:

Parameters	Description
user	the password for the user is changed
admin	the password for the administrator is changed
passwd	Value for the password

**Note**

**Length of the password**

The password must be at least 6 characters long.

**Result**

The password is changed.

### 2.1.8.11 set cli-console-timeout

#### Description

With this command, you enable / disable automatic logout after a certain time after the last entry on an interface.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
set cli-console-timeout {enable|disable}
```

The parameters have the following meaning:

Parameters	Description
enable	enables automatic logout
disable	disables automatic logout

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is enabled.

#### Result

The automatic logout of the interface is enabled / disabled.

### 2.1.9 Commands in the interface configuration mode

This section describes commands that you can call up in the interface configuration mode. Depending on the Interface selected, various command sets are available.

In the Global configuration mode, enter the `interface` command to change to this mode.

Commands relating to other topics that can be called in the interface configuration mode can be found in the relevant sections.

- If you exit the Interface configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the Interface configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 2.1.9.1 duplex

#### Description

Certain interfaces can be operated in full duplex mode or half duplex mode. The options here depend on the connected device.

Optical connections, for example, are always operated in full duplex mode since they have a fiber for each transmission direction.

With this command, you configure the duplex mode of an interface.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
duplex {full|half}
```

The parameters have the following meaning:

Parameters	Description
full	The Interface will be operated in full duplex mode
half	The Interface will be operated in half duplex mode

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is configured for `full`.

#### Result

The duplex mode of the interface is configured.

#### Further notes

You can reset the duplex mode of the Interface to the default value with the `no duplex` command.

### 2.1.9.2 no duplex

#### Description

With this command, you reset the duplex mode of an interface to the default value.



The default value is `full`.

## Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call the command without parameters:

```
no duplex
```

## Result

The duplex mode of the Interface is reset to the default value.

## Further notes

You configure the duplex mode of the interface with the `duplex` command.

### 2.1.9.3 mtu

## Description

With this command, you configure the size of the Maximum Transmission Unit (MTU) for an interface.

## Requirement

- The Interface must be shut down.

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call up the command with the following parameters:

```
mtu <frame-size(64-9216)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
frame-size	Size of the MTU in bytes	64 ... 9216

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The size of the MTU is configured to 1500 bytes.

## Result

The setting for the size of the MTU is configured.

## Further notes

You can shut down the interface with the `shutdown` command.

You display this setting with the `show interface mtu` command.

You display this setting and other information with the `show interfaces` command.

### 2.1.9.4 negotiation

## Description

With this command, you enable autonegotiation of connection parameters on an interface.

## Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call the command without parameters:

```
negotiation
```

## Result

The function is enabled.

## Further notes

You disable the autonegotiation of connection parameters with the `no negotiation` command.

### 2.1.9.5 no negotiation

#### Description

With this command, you disable autonegotiation of connection parameters on an interface.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call the command without parameters:

```
no negotiation
```

#### Result

The function is disabled.

#### Further notes

You enable the autonegotiation of connection parameters with the `negotiation` command.

### 2.1.9.6 set broadcast-block

#### Description

With this command, you enable / disable the broadcast forwarding or broadcast blocking on an interface.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
set broadcast-block{enable|disable}
```

The parameters have the following meaning:

Parameters	Description
enable	enables broadcast blocking
disable	disables broadcast blocking

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is disabled.

### Result

The broadcast blocking of the interface is enabled / disabled.

### 2.1.9.7 set multicast-block

#### Description

With this command, you enable / disable the multicast forwarding or multicast blocking on an interface.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
set multicast-block{enable|disable}
```

The parameters have the following meaning:

Parameters	Description
enable	enables multicast blocking
disable	disables multicast blocking

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

The function is disabled.

### Result

The multicast blocking of the interface is enabled / disabled.

### 2.1.9.8 shutdown

#### Description

With this command, you shut down an interface.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call the command without parameters:

```
shutdown
```

#### Result

The Interface is shut down.

#### Further notes

You start up the interface with the `no shutdown` command.

You can display the status of this function and other information with the `show interfaces` command.

### 2.1.9.9 no shutdown

#### Description

With this command, you start up an interface.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call the command without parameters:

```
no shutdown
```

**Result**

The Interface is started up.

**Further notes**

You can shut down the interface with the `shutdown` command.

You can display the status of this function and other information with the `show interfaces` command.

**2.1.9.10 speed**

**Description**

With this command, you configure the transmission speed of an interface.

---

**Note**

**Availability of this function**

The transmission speed can only be configured for electrical data transfer.

On optical connections, the transmission speed is fixed.

---

**Requirement**

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

**Syntax**

Call up the command with the following parameters:

```
speed {10|100|1000|10000}
```

The parameters have the following meaning:

Parameters	Description
10	Transmission speed 10 Mbps
100	Transmission speed 100 Mbps
1000	Transmission speed 1000 Mbps
10000	Transmission speed 10000 Mbps

A gigabit Ethernet port can only be configured to 10, 100 or 1000 Mbps.

## Result

The transmission speed of the interface is configured.

### 2.1.9.11 lldp

## Description

With this command, you enable the sending and receipt of LLDP packets on the interface.

## Requirement

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli (config-if-$$$)#
```

## Syntax

Call up the command with the following parameters:

```
lldp{transmit|receive}
```

The parameters have the following meaning:

Parameters	Description
transmit	the sending of LLDP packets is enabled
receive	the receipt of LLDP packets is enabled

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- Sending and receipt of LLDP packets are enabled.

---

### Note

#### Enabling both options

When you call this command, you can only select one option.

If you want to enable both options, call up the command again.

---

## Result

The setting is configured.

## Further notes

You disable the sending or receipt of LLDP packets with the `no lldp` command.

### 2.1.9.12 no lldp

#### Description

With this command, you disable the sending and receipt of LLDP packets on the interface.

#### Requirement

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
no lldp{transmit|receive}
```

The parameters have the following meaning:

Parameters	Description
transmit	the sending of LLDP packets is enabled
receive	the receipt of LLDP packets is disabled

---

#### Note

##### Disabling both options

When you call this command, you can only select one option.

If you want to disable both options, call up the command again.

---

#### Result

The setting is configured.

#### Further notes

You enable the sending or receipt of LLDP packets with the `lldp` command.



## 2.2 Load and Save

This section describes commands for copying, saving and loading files for the device.

### 2.2.1 show loadsave files

#### Description

This command shows the current Load&Save file information.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call the command without parameters:

```
show loadsave files
```

#### Result

The current Load&Save file information is displayed.

### 2.2.2 show loadsave tftp

#### Description

This command shows the current Load&Save TFTP server configuration.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call the command without parameters:

```
show loadsave tftp
```

**Result**

The current Load&Save TFTP server configuration is displayed.

**2.2.3 Commands in the global configuration mode**

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

**2.2.3.1 loadsave**

**Description**

With this command, you change to the LOADSAVE configuration mode.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call the command without parameters:

```
loadsave
```

**Result**

You are now in the LOADSAVE configuration mode.

The command prompt is as follows:

```
cli(loadsave)#
```

**Further notes**

You exit the LOADSAVE configuration mode with the command `end` or `exit`.

## 2.2.4 Commands in the LOADSAVE configuration mode

This section describes commands that you can call up in the LOADSAVE configuration mode.

In the Global configuration mode, enter the `loadsave` command to change to this mode.

- If you exit the LOADSAVE configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the LOADSAVE configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 2.2.4.1 tftp filename

#### Description

With this command, you call up the possible file types or assign a name to a file type.

#### Requirement

You are in the LOADSAVE configuration mode.

The command prompt is as follows:

```
cli (loadsave) #
```

#### Syntax

Call up the command with the following parameters:

```
tftp filename {showfiles|filetype<string(100)>name<string(100)>}
```

The parameters have the following meaning:

Parameters	Description	Values
<code>showfiles</code>	Shows the available files	-
<code>filetype</code>	Shows that the file type follows to which a name will be assigned	-
<code>string</code>	Name of the file type	max. 100 characters
<code>name</code>	Shows that the name follows that will be assigned to the file type	-
<code>string</code>	Value for the name	max. 100 characters

#### Result

The file types are displayed or the file type is assigned a name.

### 2.2.4.2 tftp load

#### Description

With this command, you call up the possible file types or load a file of a specific file type.

#### Requirement

You are in the LOADSAVE configuration mode.

The command prompt is as follows:

```
cli(loadsave)#
```

#### Syntax

Call up the command with the following parameters:

```
tftp load{showfiles|filetype<filetype>}
```

The parameters have the following meaning:

Parameters	Description	Values
showfiles	Shows the available files	-
filetype	Shows that the file type follows that will be loaded	-
filetype	Name of the file type	max. 100 characters

#### Result

The file types are displayed or the file is loaded.

### 2.2.4.3 tftp save

#### Description

With this command, you call up the possible file types or save a file of a specific file type.

#### Requirement

You are in the LOADSAVE configuration mode.

The command prompt is as follows:

```
cli(loadsave)#
```

#### Syntax

Call up the command with the following parameters:

```
tftp save {showfiles|filetype<string(100)>}
```

The parameters have the following meaning:

Parameters	Description	Values
showfiles	Shows the available files	-
filetype	Shows that the file type follows that will be loaded	-
string	Name of the file type	max. 100 characters

## Result

The file types are displayed or the file is saved.

### 2.2.4.4 tftp server

## Description

With this command, you configure the access to a TFTP server.

## Requirement

You are in the LOADSAVE configuration mode.

The command prompt is as follows:

```
cli (loadsave) #
```

## Syntax

Call up the command with the following parameters:

```
tftp server {<ipv4-addr>} [port <tcp port (1-65535)>]
```

The parameters have the following meaning:

Parameters	Description	Values
ipv4-addr	Identifies the unicast IPv4 address	Enter a valid unicast IPv4 address
port	Keyword for the port of the server via which the TFTP connection runs	-
tcp port	Number of port	1 ... 65535

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

The settings are configured.

## 2.3 Reset and Defaults

This section describes commands for restarting the device and for restoring the original configuration.

### 2.3.1 restart

#### Description

With this command, you restart the device.

Select one of the following configuration settings:

- Device restart with the current configuration
- Device restart with the basic configuration:  
The IP address and the parameters of the ring redundancy function are retained, all other configuration settings are reset to the factory configuration
- Device restart with the factory configuration

#### Requirement

You are in the Privileged EXEC mode.

The command prompt is as follows:

```
cli#
```

#### Syntax

Call up the command with the following parameters:

```
restart [{memory|factory}]
```

The parameters have the following meaning:

- if no parameters are specified: restarts the system with the current configuration

Parameters	Description
memory	Restarts the system with the basic configuration
factory	Restarts the system with the factory configuration

#### Result

The device is restarted with the selected settings.

## 2.4 Configuration Save & Restore

This section describes commands for saving and restoring configuration settings.

### 2.4.1 show running-config

#### Description

This command shows configuration settings of the device.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call up the command with the following parameters:

```
show running-config
  [{
    syslog|dhcp|stp|la|pnac|vlan<vlan-id(1-4094)>|
    interface
      {
        port-channel<port-channel-id(1-8)>|
        <interface-type><interface-id>|
        vlan<vlan-id(1-4094)>
      }
    ssh|ssl|acl|ip|snmp|radius|rmon|igmp|snmp|http|
    broadcast-blocking|multicast-blocking|locked-port|auto-logout|time|
    ntp|auto-save|panel-button|cos-map|dscp-map|output-rate-limit
  ]]
```

The parameters have the following meaning:

Parameters	Description	Range of values
syslog	Shows the configuration settings of the Syslog function	-
dhcp	shows the configuration settings of the Dynamic Host Configuration Protocol	-
stp	Shows the configuration settings of the Spanning Tree protocol	-
la	Shows the configuration settings of the Link Aggregation function	-
pnac	shows the configuration settings of the port-based network access control	-
vlan	Keyword for a VLAN connection	-

Parameters	Description	Range of values
vlan-id	Number of the addressed VLAN	1 ... 4094
interface	Shows that an interface description follows	-
port-channel	Keyword for a port channel connection	-
port-channel-id	Number of the addressed port channel	1 ... 8
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name
ssh	Shows the configuration settings of the Secure Shell protocol	-
ssl	Shows the configuration settings of the Secure Sockets Layer protocol	-
acl	Shows the configuration settings of the access control lists	-
ip	Shows the configuration settings of the Internet Protocol	-
snmp	Shows the configuration settings of the Simple Network Management Protocol	-
radius	shows the configuration settings of the Remote Authentication Dial-In User service	-
rmon	Shows the configuration settings of the Remote Monitoring function	-
igmp	Shows the configuration settings of the Internet Group Management Protocol	-
sntp	Shows the configuration settings of the Simple Network Time Protocol	-
http	Shows the configuration settings of the Hypertext Transfer Protocol	-
broadcast-blocking	Shows the configuration settings of the broadcast blocking	-
multicast-blocking	Shows the configuration settings of the multicast blocking	-
locked-port	Shows the configuration settings of the locked port function	-
auto-logout	Shows the configuration settings of the auto logout function	-
time	Shows the configuration settings of the system time	-
ntp	Shows the configuration settings of the Network Time Protocol	-
auto-save	Shows the configuration settings of the auto save function	-
panel-button	Shows the configuration settings of the Panel Button function	-
cos-map	Shows the configuration settings of the COS function	-
dscp-map	Shows the configuration settings of the DSCP map function	-
output-rate-limit	Shows the configuration settings of the output rate limit function	-

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you call up the command without parameters, only the active operational settings of all modules and all interfaces that do not match the preset values are displayed.



## Result

The selected configuration settings of the device are displayed.

## 2.4.2 write startup-config

### Description

With this command, you save the changes to the configuration in the configuration file.

The use of this command is only required in the Trial mode. You enable / disable the Trial mode with the `auto-save` command.

### Requirement

- The Trial mode is activated.

You are in the Privileged EXEC mode.

The command prompt is as follows:

```
*cli(...)#
```

### Syntax

Call the command without parameter assignment:

```
write startup-config
```

### Result

The changes are saved in the configuration file.

They are used again at system start or when using the `restart` command with the option `memory` or `factory`.

### Further notes

You enable / disable the auto save function or the Trial mode with the `auto-save` command.

## 2.4.3 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 2.4.3.1 auto-save

#### Description

The CLI can save changes to the configuration automatically.

If you first want to test changes made to the configuration so that you can discard them afterwards if necessary, you can disable the auto save function.

You are then in the Trial mode.

Changes to the configuration that you have not saved, are indicated by an asterisk in front of the command prompt: `*cli(...)#`.

You save the changes to the configuration with the `write startup-config` command.

With the `auto-save` command, you enable the auto save function.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call the command without parameters:

```
auto-save
```

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is enabled.

#### Result

The auto save function is enabled.

#### Further notes

You save changes to the configuration in the Trial mode with the `write startup-config` command.

You disable the function with the `no auto-save` command.

### 2.4.3.2 no auto-save

#### Description

With this command, you disable the auto save function.

### **Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

### **Syntax**

Call the command without parameters:

```
no auto-save
```

### **Result**

The auto save function is disabled.

### **Further notes**

You enable the function with the `auto-save` command.



## Functions specific to SCALANCE

This part contains the sections that describe functions specific to SCALANCE.

### 3.1 PROFINET IO

This section describes the commands relevant for working with the PROFINET function.

#### 3.1.1 show pniO

##### Description

This command shows the current PROFINET IO configuration.

##### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

##### Syntax

Call the command without parameters:

```
show pniO
```

##### Result

The current PROFINET IO configuration is displayed.

### 3.2 C-PLUG

The C-PLUG is an external memory card on which you can store and transport the configuration settings of the device.

This section describes the commands relevant for working with the C-PLUG.

## 3.2 C-PLUG

### 3.2.1 show cplug

#### Description

This command shows the C-PLUG information.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call the command without parameters:

```
show c-plugin
```

#### Result

The current C-PLUG information is displayed.

### 3.2.2 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

#### 3.2.2.1 cplug

#### Description

With this command, you change to the C-PLUG configuration mode.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call the command without parameters:

```
cplug
```

## Result

You are now in the C-PLUG configuration mode.

The command prompt is as follows:

```
cli (cplug)#
```

## Further notes

You exit the C-PLUG configuration mode with the `end` or `exit` command.

## 3.2.3 Commands in the C-PLUG configuration mode

This section describes commands that you can call up in the C-PLUG configuration mode.

In the Global configuration mode, enter the `cplug` command to change to this mode.

- If you exit the C-PLUG configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the C-PLUG configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 3.2.3.1 **factoryclean**

#### Description

With this command, you delete the device configuration stored on the C-PLUG.

#### Requirement

You are in the C-PLUG configuration mode.

The command prompt is as follows:

```
cli (cplug)#
```

#### Syntax

Call the command without parameters:

```
factoryclean
```

### 3.3 WBM

#### Result

The device configuration on the C-PLUG is deleted.

#### 3.2.3.2 write

#### Description

With this command, you format the C-PLUG and copy the device configuration to it.

#### Requirement

You are in the C-PLUG configuration mode.

The command prompt is as follows:

```
cli(cplug)#
```

#### Syntax

Call the command without parameter assignment:

```
write
```

#### Result

The device configuration has been copied to the formatted C-PLUG.

## 3.3 WBM

On the device, you can limit the time available for access with Web Based Management. If no entry is made for a specific time, the WBM session is closed.

This section describes commands relevant for the configuration of this feature.

### 3.3.1 show web-session-timeout

#### Description

This command shows the timeout setting for the WBM.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```



## Syntax

Call the command without parameters:

```
show web-session-timeout
```

## Result

The timeout setting for the WBM is displayed.

## 3.3.2 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 3.3.2.1 set web-session-timeout

#### Description

With this command, you enable / disable the timeout setting for the WBM.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
set web-session-timeout {enable|disable}
```

The parameters have the following meaning:

Parameters	Description
enable	Enables the timeout function for WBM
disable	Disables the timeout function for WBM

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is enabled.

### 3.4 Panel button

#### Result

The timeout function for the WBM is enabled or disabled.

#### 3.3.2.2 web-session-timeout

#### Description

With this command, you configure the timeout setting for the WBM.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
web-session-timeout <(60-3600)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
-	Time to deactivation of WBM after the last entry in seconds	60 ... 3600

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is configured to 900 seconds.

#### Result

The time for the timeout function is configured.

## 3.4 Panel button

This section describes the commands relevant for working with the Panel Button function.

### 3.4.1 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 3.4.1.1 **set panel-button control-factory-defaults**

#### Description

With this command, you enable or disable the following function of the "SELECT/SET" button:

- When display mode "1" "port status" is displayed, and the button is pressed for more than 12 seconds, there is a restart with the factory settings.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
set panel-button control-factory-defaults{enable|disable}
```

The parameters have the following meaning:

Parameters	Description
enable	Enables the function for restarting with factory settings
disable	Disables the function for restarting with factory settings

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is enabled.

#### Result

The function of the "SELECT/SET" button for restarting with factory settings is enabled / disabled.

3.4 Panel button

3.4.1.2 set panel-button control-faultmask

**Description**

With this command, you enable or disable the following function of the "SELECT/SET" button:

- If display mode "4" "fault mask" is displayed and the button is pressed for 5 - 12 seconds, the fault mask is set.

This function corresponds to calling the `power` and `link down` commands.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call up the command with the following parameters:

```
set panel-button control-faultmask{enable|disable}
```

The parameters have the following meaning:

Parameters	Description
enable	enables the function for setting the fault mask
disable	disables the function for setting the fault mask

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is enabled.

**Result**

The function of the "SELECT/SET" button for setting the fault mask is enabled / disabled.

## System time

This part contains the sections describing how the system time is obtained and the settings.

### 4.1 NTP client

This section describes commands relevant for configuration of the NTP client.

#### 4.1.1 show ntp info

##### Description

This command shows the current settings for the Network Time Protocol (NTP).

##### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

##### Syntax

Call the command without parameters:

```
show ntp info
```

##### Result

The current NTP settings are displayed.

#### 4.1.2 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 4.1.2.1 ntp

#### Description

With this command, you change to the Network Time Protocol (NTP).

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call the command without parameters:

```
ntp
```

#### Result

You are now in the NTP configuration mode.

The command prompt is as follows:

```
cli(config-ntp)#
```

#### Further notes

You exit the NTP configuration mode with the `end` or `exit` command.

### 4.1.3 Commands in the NTP configuration mode

This section describes commands that you can call up in the NTP configuration mode.

In the Global configuration mode, enter the `ntp` command to change to this mode.

- If you exit the NTP configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the NTP configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 4.1.3.1 ntp server

#### Description

With this command, you configure the connection to a server on the NTP client.

## Requirement

You are in the NTP configuration mode.

The command prompt is as follows:

```
cli(config-ntp)#
```

## Syntax

Call up the command with the following parameters:

```
ntp server{ipv4<ip_addr>} [port<integer(123,1025-36564)>] [poll<integer(64-1024)>]
```

The parameter has the following meaning:

Parameters	Description	Range of values / note
ipv4	Keyword for an IPv4 address	-
ip_addr	Value for the IPv4 address of the time server	Enter a valid IPv4 address
port	Keyword for the UDP port of the time server	-
integer	Number of port	<ul style="list-style-type: none"> <li>• 123</li> <li>• 1025 ... 36564</li> </ul>
poll	Keyword for the time after which the time of day is requested again	-
integer	Value for the time in seconds	64 ... 1024

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

At system start or when using the command `restart` with the option `memory` or `factory`, the following defaults apply:

- The port is configured to 123.

## Result

The connection to a server is configured on the NTP client.

## Further notes

You delete the connection to a server with the `no ntp server` command.

### 4.1.3.2 no ntp server

## Description

With this command, you delete the connection to a server on the NTP client.

### Requirement

You are in the NTP configuration mode.

The command prompt is as follows:

```
cli(config-ntp)#
```

### Syntax

Call up the command with the following parameters:

```
no ntp server
```

### Result

The connection to a server is deleted on the NTP client.

### Further notes

You configure the connection to a server with the `ntp server` command.

### 4.1.3.3 ntp time diff

#### Description

With this command, you configure the time difference between the device and the NTP server.

#### Requirement

You are in the NTP configuration mode.

The command prompt is as follows:

```
cli(config-ntp)#
```

#### Syntax

Call up the command with the following parameters:

```
ntp time diff<string(6)>
```

The parameter has the following meaning:

The time difference is represented as a character string with the length 6 in the format

`±HH:MM`.

Parameters	Description
+	Time zones to the west of the NTP server time zone
-	Time zones to the east of the NTP server time zone



Parameters	Description
HH	Number of hours difference
MM	Number of minutes difference

Enter the number of hours and number of minutes with two digits each.

When the system starts up or when using the `restart` command with the option `memory` or `factory` no time difference is configured.

## Result

The time difference between the device and the NTP server is configured.

## 4.2 SNTP client

This section describes commands relevant for configuration of the Simple Network Time Protocol (SNTP) client.

### 4.2.1 show sntp broadcast-mode status

#### Description

This command shows the current configuration of the broadcast mode of SNTP.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call the command without parameters:

```
show sntp broadcast-mode status
```

#### Result

The current SNTP broadcast configuration is displayed.

## 4.2.2 show sntp unicast-mode status

### Description

This command shows the current configuration of the unicast mode of SNTP.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

### Syntax

Call the command without parameters:

```
show sntp unicast-mode status
```

### Result

The current SNTP unicast configuration is displayed.

## 4.2.3 show sntp status

### Description

This command shows the settings of SNTP.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

### Syntax

Call the command without parameters:

```
show sntp status
```

### Result

The settings are displayed.

## 4.2.4 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 4.2.4.1 `sntp`

#### Description

With this command, you change to the SNTP configuration mode.

#### Requirement

You are in the Global configuration mode.  
The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call the command without parameters:

```
sntp
```

#### Result

You are now in the SNTP configuration mode.  
The command prompt is as follows:

```
cli(config-sntp)#
```

#### Further notes

You exit the SNTP configuration mode with the `end` or `exit` command.

## 4.2.5 Commands in the SNTP configuration mode

This section describes commands that you can call up in the SNTP configuration mode.

In the Global configuration mode, enter the `sntp` command to change to this mode.

- If you exit the SNTP configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the SNTP configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 4.2.5.1 set sntp client addressing-mode

#### Description

With this command, you configure the addressing mode of the SNTP client as unicast, multicast, broadcast or anycast.

#### Requirement

- The SNTP client is activated.

You are in the SNTP configuration mode.

The command prompt is as follows:

```
cli(config-sntp)#
```

#### Syntax

Call up the command with the following parameters:

```
set sntp client addressing-mode{unicast|broadcast}
```

The parameters have the following meaning:

Parameters	Description
unicast	configures the SNTP client in unicast mode
broadcast	configures the SNTP client in broadcast mode

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The addressing mode is configured to `unicast`.

#### Result

The addressing mode of the SNTP client is configured.

#### Further notes

You display this setting and other information with the `show sntp status` command.

You display the settings for the unicast mode with the `show sntp unicast-mode status` command.

You display the settings for the broadcast mode with the `show sntp broadcast-mode status` command.

## 4.2.5.2 set sntp client time zone

### Description

With this command, you configure the time zone of the system time relative to the UTC time.

### Requirement

- The SNTP server must have started up.

You are in the SNTP configuration mode.

The command prompt is as follows:

```
cli(config-sntp)#
```

### Syntax

Call up the command with the following parameters:

```
set sntp client time-zone <+/- UTC TimeDiff in Hrs:UTC TimeDiff in Min>
```

The parameters have the following meaning:

Parameters	Description
+/-	Specifies whether the time zone is after (+) or before (-) UTC time
UTC TimeDiff in Hrs	Specifies the hours time difference
UTC TimeDiff in Min	Specifies the minutes time difference

Enter the time difference as follows:

- with sign
- without spaces
- Hours and minutes both two digits (with leading zero)

### Result

The time zone of the system time of day is configured.

### Further notes

You can display the settings of this function and other information with the `show sntp status` command.

## 4.2.5.3 set sntp unicast-poll-interval

### Description

With this command, you configure the polling interval of the SNTP client in the unicast mode.

### Requirement

- The addressing mode of the SNTP client is configured as "unicast".

You are in the SNTP configuration mode.

The command prompt is as follows:

```
cli(config-sntp)#
```

### Syntax

Call up the command with the following parameters:

```
set sntp unicast-poll-interval<value(16-16284)seconds>
```

The parameter has the following meaning:

Parameters	Description	Range of values
value	Specifies the length of the polling interval in seconds	16 ... 16284

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The polling interval is configured to 64 seconds.

### Result

The polling interval of the SNTP client in unicast mode is configured.

### Further notes

You display this setting and other information with the `show sntp unicast-mode status` command.

#### 4.2.5.4 set sntp unicast-server ipv4

### Description

With this command, you configure an SNTP unicast server.

### Requirement

- The addressing mode of the SNTP client is configured as "unicast".

You are in the SNTP configuration mode.

The command prompt is as follows:

```
cli(config-sntp)#
```

## Syntax

Call up the command with the following parameters:

```
set sntp unicast-server ipv4<ucast_addr>[port<integer(1025-36564)>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
ucast_addr	Value for an IPv4 unicast address	Enter a valid IPv4 unicast address
port	Number of the port for SNTP connections	-
integer	Value for the port number	• 1025 ... 36564

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The port is configured to 123.

## Result

The SNTP unicast server is configured.

## Further notes

You can reset the setting to the default with the `no sntp unicast-server ipv4` command.

You display this setting and other information with the `show sntp unicast-mode status` command.

### 4.2.5.5 no sntp unicast-server ipv4

## Description

With this command, you delete the attributes for an SNTP unicast server and reset the address.

## Requirement

You are in the SNTP configuration mode.

The command prompt is as follows:

```
cli(config-sntp)#
```

## Syntax

Call up the command with the following parameters:

```
no sntp unicast-server ipv4<ucast_addr>
```

The parameters have the following meaning:

Parameters	Description	Range of values
ucast_addr	Value for an IPv4 unicast address	Enter a valid IPv4 unicast address

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

### Result

The SNTP unicast server is reset to the default value.

### Further notes

You configure the setting with the `set sntp unicast-server ipv4` command.

You display this setting and other information with the `show sntp unicast-mode status` command.

## 4.3 System time setting

This section describes commands relevant for the configuration of the system time.

### 4.3.1 show time

#### Description

This command shows the settings of the system clock.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call the command without parameters:

```
show time
```

#### Result

The settings for the system clock are displayed.



## 4.3.2 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 4.3.2.1 time

#### Description

With this command, you configure the way in which the system time is obtained.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli (config) #
```

#### Syntax

Call up the command with the following parameters:

```
time {manual | ntp | sntp | SINEC}
```

The parameters have the following meaning:

Parameters	Description
manual	The system time is entered by the user
ntp	The system time is obtained from an NTP server
sntp	The system time is obtained from an SNTP server
SINEC	The system time is obtained using the SIMATIC time protocol

#### Result

The method of obtaining the system time is configured.

#### Further notes

You display the settings for the system clock with the `show time` command.

### 4.3.2.2 time set

#### Description

With this command, you set the system clock.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
time set<entry><day(1-31)>  
      {january|february|march|april|may|june|july|  
       august|september|october|november|december}  
      <year(2000-2035)>
```

The parameters have the following meaning:

Parameters	Description	Range of values
entry	Time of day	hh:mm:ss Hour, minute, second each separated by ":"
day	Day of the month	1 ... 31
-	Month	january, february, march, april, may, june, july, august, september, october, november, december
year	Year	2000 ... 2035

#### Result

The system clock is set.

#### Further notes

You display the settings for the system clock with the `show time` command.

## Network structures

This part contains the sections that describe the commands for configuring and managing various network structures.

The following technologies are available:

- The establishment of independent structures even across the boundaries of subnets using virtual networks (VLANs)  
This can result in the following advantages:
  - Administration:  
Devices can be grouped together to form a logical units regardless of their physical location
  - Performance:  
By prioritizing, time-critical data (process data, streams) can be given priority for transfer
  - Security:  
The transition between VLANs can only be controlled by an administrator
- Aggregation of interfaces or connections between devices to increase the data transmission rate and reliability (link aggregation, port aggregation)
- Detection and monitoring of parallel connections or loops in an Ethernet network by setting up a tree structure (Spanning Tree)
- Improved reliability by adapting the tree structure if transmission is disrupted (Spanning Tree)
- Splitting up of the network into smaller units that are connected together via managed connection pairs (ring redundancy, standby connection)
- Improved reliability due to managed ring structures that provide an alternative data path if transmission is disrupted (ring redundancy)

### 5.1 VLAN

This section describes commands for configuring and managing virtual networks (VLANs).

#### 5.1.1 The "show" commands

This section describes commands with which you display various settings.

5.1.1.1 show mac-address-table

Description

This command shows the table with the static and dynamic unicast MAC addresses and multicast MAC addresses.

Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

cli> OR cli#

Syntax

Call up the command with the following parameters:

```
show mac-address-table [vlan<vlan-range>] [address<aa:aa:aa:aa:aa:aa>]
                        [interface <interface-type><interface-id>]
```

The parameters have the following meaning:

Parameters	Description	Values
vlan	Keyword for a VLAN or VLAN range	-
vlan-range	Number of the addressed VLAN or VLAN range	1 ... 4094
address	Keyword for a MAC address	-
aa:aa:aa:aa:aa:aa	MAC address	-
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameter from the parameter list, the entries are displayed for all available interfaces.

Result

The entries are displayed.

### 5.1.1.2 show mac-address-table dynamic multicast

#### Description

This command shows the table with the dynamic multicast MAC addresses assigned by the device.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call up the command with the following parameters:

```
show mac-address-table dynamic multicast [vlan<vlan-range>]
      [address<aa:aa:aa:aa:aa:aa>]
      [{interface<interface-type><interface-id>}]
```

The parameters have the following meaning:

Parameters	Description	Values
vlan	Keyword for a VLAN or VLAN range	-
vlan-range	Number of the addressed VLAN or VLAN range	1 ... 4094
address	Keyword for a MAC address	-
aa:aa:aa:aa:aa:aa	MAC address	-
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameter from the parameter list, the entries are displayed for all available interfaces.

#### Result

The entries are displayed.

5.1.1.3 show mac-address-table dynamic unicast

Description

This command shows the table with the dynamic unicast MAC addresses assigned by the device.

Requirement

- In "base bridge-mode", the mode for the device is set to "transparent".

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

Syntax

Call up the command with the following parameters:

```
show mac-address-table dynamic unicast [vlan<vlan-range>]
    [address<aa:aa:aa:aa:aa:aa>] [{interface<interface-type>
    <interface-id>}]
```

The parameters have the following meaning:

Parameters	Description	Values
vlan	Keyword for a VLAN or VLAN range	-
vlan-range	Number of the addressed VLAN or VLAN range	1 ... 4094
address	Keyword for a MAC address	-
aa:aa:aa:aa:aa:aa	MAC address	-
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameter from the parameter list, the entries are displayed for all available interfaces.

Result

The entries are displayed.

### 5.1.1.4 show mac-address-table static multicast

#### Description

This command shows the table with the static multicast MAC addresses.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call up the command with the following parameters:

```
show mac-address-table static multicast [vlan<vlan-range>]
      [address<aa:aa:aa:aa:aa:aa>] [{interface<interface-type><interface-id>}]
```

The parameters have the following meaning:

Parameters	Description	Values
vlan	Keyword for a VLAN or VLAN range	-
vlan-range	Number of the addressed VLAN or VLAN range	1 ... 4094
address	Keyword for a MAC address	-
aa:aa:aa:aa:aa:aa	MAC address	-
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameter from the parameter list, the entries are displayed for all available interfaces.

#### Result

The entries are displayed.

### 5.1.1.5 show mac-address-table static unicast

#### Description

This command shows the table with the static unicast MAC addresses.

**Requirement**

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

cli> OR cli#

**Syntax**

Call up the command with the following parameters:

```
show mac-address-table static unicast [vlan<vlan-range>]
    [address<aa:aa:aa:aa:aa:aa>]
    [{interface<interface-type><interface-id>}]
```

The parameters have the following meaning:

Parameters	Description	Values
vlan	Keyword for a VLAN or VLAN range	-
vlan-range	Number of the addressed VLAN or VLAN range	1 ... 4094
address	Keyword for a MAC address	-
aa:aa:aa:aa:aa:aa	MAC address	-
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameter from the parameter list, the entries are displayed for all available interfaces.

**Result**

The entries are displayed.

**5.1.1.6 show mac-address-table count**

**Description**

With this command, you show the number of MAC addresses for all or a selected VLAN.

**Requirement**

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

cli> OR cli#



## Syntax

Call up the command with the following parameters:

```
show mac-address-table count [vlan<vlan-id(1-4094)>]
```

The parameters have the following meaning:

Parameters	Description	Values
vlan	Keyword for a VLAN	-
vlan-id	Number of the addressed VLAN	1 ... 4094

If you do not select any parameter from the parameter list, the total number of entries is displayed for all VLANs.

## Result

The number is displayed.

### 5.1.1.7 show vlan

## Description

This command shows the specific information for all or a selected VLAN.

## Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

## Syntax

Call up the command with the following parameters:

```
show vlan [brief | id<vlan-range> | summary]
```

The parameters have the following meaning:

Parameters	Description	Values
brief	Shows brief information about all VLANs	-
id	Keyword for a VLAN or VLAN range	-
vlan-range	Number of the addressed VLAN or VLAN range	1 ... 4094
summary	Shows a summary of the VLANs	

If you do not select any parameter from the parameter list, the entries of all available interfaces are displayed.

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### Result

The information is displayed.

### 5.1.1.8 show vlan device info

#### Description

This command shows all the global information that is valid for all VLANs.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call the command without parameters:

```
show vlan device info
```

### Result

The information is displayed.

### 5.1.1.9 show vlan learning params

#### Description

This command shows the parameters for the automatic learning of addresses for selected or all VLANs (active and inactive VLANs).

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call up the command with the following parameters:

```
show vlan learning params[vlan<vlan-range>]
```

The parameters have the following meaning:

Parameters	Description	Values
vlan	Keyword for a VLAN or VLAN range	-
vlan-id	Number of the addressed VLAN or VLAN range	1 ... 4094

If you do not select any parameter from the parameter list, the entries of all available interfaces are displayed.

## Result

The settings are displayed.

### 5.1.1.10 show vlan port config

## Description

This command shows the VLAN-specific information for ports.

## Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

## Syntax

Call up the command with the following parameters:

```
show vlan port config[{port<interface-type><interface-id>}]
```

The parameters have the following meaning:

Parameters	Description	Values
port	Keyword for a port channel	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameter from the parameter list, the entries of all available interfaces are displayed.

## Result

The information is displayed.

### 5.1.2 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

#### 5.1.2.1 set mac-address-table aging

##### Description

With this command, you enable / disable the monitoring of the aging of MAC addresses.

##### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

##### Syntax

Call up the command with the following parameters:

```
set mac-address-table aging{enable|disable}
```

The parameters have the following meaning:

Parameters	Description
enable	Enables monitoring of aging
disable	Disables monitoring of aging

##### Result

The monitoring of aging is enabled / disabled.

#### 5.1.2.2 vlan

##### Description

With this command, you create a VLAN on the device and change to the VLAN configuration mode.

In the provider backbone bridge mode, this command is used to create user, service and backbone VLANs.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
vlan <vlan-id(1-4094)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
vlan-id	Number of the addressed VLAN	1 ... 4094

Do not enter any leading zeros with the number of the VLAN.

## Result

The VLAN is created.

You are now in the VLAN configuration mode.

The command prompt is as follows:

```
cli(config-vlan-$$$)#
```

## Further notes

You delete the VLAN with the `no vlan` command.

You can display information about the VLAN with the `show vlan` command.

### 5.1.2.3 no vlan

## Description

With this command, you delete a VLAN on the device.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

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**Syntax**

Call up the command with the following parameter:

```
no vlan <vlan-id(2-4094)>
```

Parameters	Description	Range of values
vlan-id	Number of the addressed VLAN	2 ... 4094

The VLAN with number 1 cannot be deleted.

**Result**

The VLAN is deleted

**Further notes**

With the `vlan` command, you create a VLAN on the device.

You can display information about the VLAN with the `show vlan` command.

**5.1.3 Commands in the interface configuration mode**

This section describes commands that you can call up in the interface configuration mode. Depending on the Interface selected, various command sets are available.

In the Global configuration mode, enter the `interface` command to change to this mode.

Commands relating to other topics that can be called in the interface configuration mode can be found in the relevant sections.

- If you exit the Interface configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the Interface configuration mode with the `end` command, you return to the Privileged EXEC mode.

**5.1.3.1 switchport acceptable-frame-type**

**Description**

With this command, you configure which types of frames the interface accepts.

**Requirement**

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call up the command with the following parameters:

```
switchport acceptable-frame-type{all|tagged}
```

The parameters have the following meaning:

Parameters	Description
all	All frames (with and without VLAN variables) are accepted
tagged	Only frames with VLAN variables are accepted

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is configured for `all`.

## Result

The setting is enabled.

## Further notes

You can reset the setting to the default with the `no switchport acceptable-frame-type` command.

You can display the status of this function and other information with the `show vlan port config` command.

### 5.1.3.2 no switchport acceptable-frame-type

## Description

With this command, you reset the setting for the types of frames accepted by the interface to the default value.

The default value is `all`.

The interface accepts tagged and untagged frames.

## Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call the command without parameters:

```
no switchport acceptable-frame-type
```

### Result

The setting is reset to the default value.

### Further notes

You configure the setting with the `switchport acceptable-frame-type` command.

You can display the status of this function and other information with the `show vlan port config` command.

### 5.1.3.3 switchport access vlan

#### Description

With this command, you assign an interface to a VLAN and configure the port VLAN identifier (PVID) for it.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
switchport access vlan <vlanid(1-4094)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
vlanid	Number of the addressed VLAN	1 ... 4094

### Result

The interface is assigned to the VLAN and the PVID is configured

### Further notes

You can reset the setting to the default with the `no switchport access vlan` command.

You display the setting and other information with the `show vlan port config` command.



### 5.1.3.4 no switchport access vlan

#### Description

With this command, you reset the setting for the port VLAN identifier (PVID) for an interface to the default value.

The default value is 1.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call the command without parameters:

```
no switchport access vlan
```

#### Result

The setting is reset to the default value.

#### Further notes

You configure the setting with the `switchport access vlan` command.

You can display the status of this function and other information with the `show vlan port config` command.

### 5.1.3.5 switchport priority default

#### Description

With this command, you configure the default user priority for the interface.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

**Syntax**

Call up the command with the following parameters:

```
switchport priority default <priority value(0-7)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
priority value	Value for the default user priority	0 ... 7

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The priority is configured to 0.

**Result**

The setting is configured.

**Further notes**

You reset the default user priority to the default value with the `no switchport priority default` command.

You display this setting and other information with the `show vlan port config` command.

**5.1.3.6 no switchport priority default**

**Description**

With this command, you reset the default user priority for the interface to the default value. The default value is 0.

**Requirement**

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

**Syntax**

Call the command without parameters:

```
no switchport priority default
```

**Result**

The setting is reset to the default value.

**Further notes**

You configure the default user priority with the `switchport priority default` command.

You display this setting and other information with the `show vlan port config` command.

**5.1.3.7 switchport pvid****Description**

With this command, you assign an interface to a VLAN and configure the port VLAN identifier (PVID) for it.

**Requirement**

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

**Syntax**

Call up the command with the following parameters:

```
switchport pvid <vlan-id(1-4094)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
vlan-id	Number of the addressed VLAN	1 ... 4094

**Result**

The PVID is configured

**Further notes**

You can reset the setting to the default with the `no switchport pvid` command.

You display the setting and other information with the `show vlan port config` command.

**5.1.3.8 no switchport pvid****Description**

With this command, you reset the setting for the port VLAN identifier (PVID) for an interface to the default value.

The default value is 1.

## Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call the command without parameters:

```
no switchport pvid
```

## Result

The setting is reset to the default value.

## Further notes

You configure the setting with the `switchport pvid` command.

You can display the status of this function and other information with the `show vlan port config` command.

## 5.1.4 Commands in the VLAN configuration mode

This section describes commands that you can call up in the VLAN configuration mode.

In the Global configuration mode, enter the `vlan` command to change to this mode.

Commands relating to other topics that can be called in the VLAN configuration mode can be found in the relevant sections.

- If you exit the VLAN configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the VLAN configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 5.1.4.1 ports

#### Description

With this command, you generate a static VLAN entry that specifies the use of the ports. Here, you configure the following types of ports:

- Member ports (tagged ports)  
These ports are permanently added to the list of outgoing connections
- Untagged ports  
These ports transfer data packets without a VLAN marking
- Forbidden ports  
These ports are not used for communication in a VLAN

The tagged and untagged ports specified with this command are used for outgoing data traffic.

## Requirement

You are in the VLAN configuration mode.

The command prompt is as follows:

```
cli (config-vlan-$$$)#
```

## Syntax

Call up the command with the following parameters:

```
ports
(
  [<interface-type><0/a-b,0/c, ...>]
  [<interface-type><0/a-b,0/c, ...>]
  [port-channel<a,b,c-d>]
)
[
  untagged<interface-type> <0/a-b,0/c, ...>
  (
    [<interface-type><0/a-b,0/c, ...>]
    [port-channel <a,b,c-d>]
    [all]
  )
]
[
  forbidden<interface-type><0/a-b,0/c, ...>
  [<interface-type><0/a-b,0/c, ...>]
  [portchannel<a,b,c-d>]
]
[name<vlan-name>]
```

The parameters have the following meaning:

Parameters	Description	Values
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
/a-b,0/c, ...	Port no. of the interface	Enter a valid interface name
port-channel	Keyword for a port channel	-

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Parameters	Description	Values
/a-b,0/c,...	Port no. of the interface	Enter a valid interface name
untagged	Keyword for interfaces or ports that transfer data packets without VLAN marking	-
all	Specifies that all interfaces or ports are set to "untagged"	-
forbidden	Keyword for forbidden interfaces or ports	-
name	Keyword for the name assignment	-
vlan-name	Name of the VLAN	max. 32 characters

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

**Result**

The settings are enabled.

**Further notes**

You display details of the function with the `show vlan` command.

You reset the settings with the `no ports` command.

**5.1.4.2 no ports****Description**

With this command, you reset the ports for a VLAN.

**Requirement**

You are in the VLAN configuration mode.

The command prompt is as follows:

```
cli(config-vlan-$$$)#
```

**Syntax**

Call up the command with the following parameters:

```

no ports
(
  [<interface-type><0/a-b,0/c,...>]
  [<interface-type><0/a-b,0/c,...>]
  [port-channel<a,b,c-d>]
  [all]
)
[
  untagged<interface-type> <0/a-b,0/c,...>
  (
    [<interface-type><0/a-b,0/c,...>]
    [port-channel <a,b,c-d>]
    [all]
  )
]
[
  (
    forbidden<interface-type><0/a-b,0/c,...>
    [<interface-type><0/a-b,0/c,...>]
    [portchannel<a,b,c-d>]
    [all]
  )
]
[name<vlan-name>]

```

The parameters have the following meaning:

Parameters	Description	Values
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>gigabitethernet</li> <li>extreme-ethernet</li> </ul>
/a-b,0/c,...	Port no. of the interface	Enter a valid interface name
port-channel	Keyword for a port channel	-
/a-b,0/c,...	Port no. of the interface	Enter a valid interface name
untagged	Keyword for interfaces or ports that transfer data packets without VLAN marking	-
all	Specifies that all interfaces or ports are set to "untagged"	-
forbidden	Keyword for forbidden interfaces or ports	-
name	Keyword for the name assignment	-
vlan-name	Name of the VLAN	max. 32 characters

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

The ports are reset.

## 5.1 VLAN

### Further notes

You display details of the function with the `show vlan` command.

You reset the setting with the `no ports` command.

### 5.1.4.3 name

#### Description

With this command, you assign a name to the VLAN.

#### Requirement

You are in the VLAN configuration mode.

The command prompt is as follows:

```
cli(config-vlan-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
name <vlan-name>
```

The parameter has the following meaning:

Parameters	Description	Range of values
vlan-name	Name that will be assigned to the VLAN	max. 32 characters

#### Result

The VLAN is assigned a name.

### Further notes

You delete name assignment for a VLAN with the `no name` command.

### 5.1.4.4 no name

#### Description

With this command, you delete the name assignment for a VLAN.

#### Requirement

You are in the VLAN configuration mode.



The command prompt is as follows:

```
cli(config-vlan-$$$)#
```

### Syntax

Call the command without parameters:

```
no name
```

### Result

The VLAN is assigned a name.

### Further notes

You assign the VLAN a name with the command `name`.

## 5.2 Link aggregation

This section describes commands that configure or manage the bundling of interfaces or connections between devices.

### 5.2.1 show etherchannel

#### Description

This command shows the settings of the Etherchannel.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call up the command with the following parameters:

```
show etherchannel [[channel-group-number]  
                  {detail|load-balance|port|port-channel|summary|protocol}]
```

The parameters have the following meaning:

Parameters	Description
channel-group-number	Number of the channel group
detail	Detailed display of the settings
load-balance	Shows which method of load balancing is active
port	Information on the Etherchannel port
port-channel	Information on the port channel
summary	Brief overview of the settings of a channel group
protocol	Specification of the protocol set for a channel group

If you do not select any parameters from the parameter list, the settings of all channels will be displayed in detail.

**Result**

The Etherchannel settings are displayed.

**5.2.2 show interfaces etherchannel**

**Description**

This command shows the interface-specific information for a port channel.

**Requirement**

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

**Syntax**

Call up the command with the following parameters:

```
show interfaces [<interface-type><interface-id>] etherchannel
```

The parameters have the following meaning:

Parameters	Description	Values
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select an interface, information for all interfaces is displayed.

## Result

The interface-specific information for a port channel is displayed.

### 5.2.3 show lacp

#### Description

This command shows the information about the data traffic or neighboring ports.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call up the command with the following parameters:

```
show lacp [<port-channel (1-8)>] {counters|neighbor[detail]}
```

The parameters have the following meaning:

Parameters	Description	Range of values
port-channel	Number of the channel group	1 ... 8
counters	Shows the values of the counters	-
neighbor	Displays information on neighbor ports	-
detail	Displays detailed information on neighbor ports	-

If you do not select a port channel, information for all available interfaces is displayed.

## Result

The information is displayed.

### 5.2.4 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 5.2.4.1 port-channel load-balance

#### Description

With this command, you configure the load balancing policy for the interconnected ports of the previously defined port channels.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
port-channel load-balance
    {src-mac|dest-mac|src-dest-mac|src-ip|dest-ip|src-dest-ip}
    [<port-channel-index>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
src-mac	Load balancing is based on the MAC addresses of the sources. Packets from the same host are forwarded via the same port.	-
dest-mac	Load balancing is based on the MAC addresses of the destinations. Packets to the same host are forwarded via the same port.	-
src-dest-mac	Load balancing is based on the MAC addresses of the sources and destinations.	-
src-ip	Load balancing is based on the IP addresses of the sources.	-
dest-ip	Load balancing is based on the IP addresses of the destinations.	-
src-dest-ip	Load balancing is based on the IP addresses of the sources and destinations.	-
port-channel-index	Number of the port channel	1 ... 65535

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is configured for `src-dest-mac`.

If you do not enter a value for `port-channel-index`, the setting is used for all port channels.

#### Result

The load balancing policy is set.

## Further notes

You can reset the setting for the load balancing policy to the default with the `no port-channel load-balance` command.

You can display the status of this function and other settings with the `show etherchannel` command.

### 5.2.4.2 no port-channel load-balance

#### Description

With this command, you reset the load balancing policy for the interconnected ports of the previously defined port channels to the default.

The default value is `src-dest-mac`.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
port-channel load-balance [<port-channel-index>]
```

The parameter has the following meaning:

Parameters	Description	Range of values
<code>port-channel-index</code>	Number of the port channel	1 ... 65535

If you do not enter a value for `port-channel-index`, the setting is used for all port channels.

#### Result

The load balancing policy is reset to the default value.

## Further notes

You can change the setting for the load balancing policy with the `port-channel load-balance` command.

You can display the status of this function and other settings with the `show etherchannel` command.

### 5.2.5 Commands in the interface configuration mode

This section describes commands that you can call up in the interface configuration mode. Depending on the Interface selected, various command sets are available.

In the Global configuration mode, enter the `interface` command to change to this mode.

Commands relating to other topics that can be called in the interface configuration mode can be found in the relevant sections.

- If you exit the Interface configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the Interface configuration mode with the `end` command, you return to the Privileged EXEC mode.

#### 5.2.5.1 channel-group

##### Description

With this command, you configure an Etherchannel.

##### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

##### Syntax

Call up the command with the following parameters:

```
channel-group <channel-group-number (1-8) >mode{on|active|passive}
```

The parameters have the following meaning:

Parameters	Description	Range of values
<code>channel-group-number</code>	Number of the channel group	1 ... 8
<code>on</code>	Adds the interface without LACP to a channel group. This corresponds to manual bundling.	-
<code>active</code>	The negotiation of a connection via LACP is started unconditionally	-
<code>passive</code>	The negotiation of a connection via LACP is started when an LACP packet arrives from the connection partner	-

##### Result

The Etherchannel is configured.

### 5.2.5.2 no channel-group

#### Description

With this command, you remove the interface from an Etherchannel.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call the command without parameters:

```
no channel-group
```

#### Result

The interface is deleted from the Etherchannel.

## 5.3 Spanning Tree

The Spanning Tree Protocol is used to monitor a LAN for redundant connections. These are blocked and reactivated when necessary if there are changes to the network topology.

This section describes the commands of the Spanning Tree Protocol (STP), the Rapid Spanning Tree Protocol (RSTP) and the Multiple Spanning Tree Protocol (MSTP).

<b>NOTICE</b>
<b>Avoiding bad configurations</b>
When using the commands in this section, you should take particular care because a bad configuration of this function can have serious negative affects on the network.

### 5.3.1 The "show" commands

#### 5.3.1.1 show spanning-tree

#### Description

This command shows the settings of the spanning tree function.

## Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

## Syntax

Call up the command with the following parameters:

```
show spanning-tree [{summary|blockedports|pathcost method}]
```

The parameters have the following meaning:

Parameters	Description
summary	Displays a summary
blockedports	Shows the blocked ports
pathcost method	shows whether 16-bit (short) or 32 bit (long) values are used in the calculation

## Result

The settings for the spanning tree function are displayed.

## Further notes

You can show further settings for special aspects of the Spanning Tree Protocol with the following commands:

- `show spanning-tree active`
- `show spanning-tree bridge`
- `show spanning-tree detail`
- `show spanning-tree interface`
- `show spanning-tree root`
- `show spanning-tree mst`

### 5.3.1.2 show spanning-tree mst

#### Description

This command shows various settings of the spanning tree configuration specific to a Common Internal Spanning Tree (CIST) instance or a selected instance of the Multiple Spanning Tree Protocol.



## Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

## Syntax

Call up the command with one of the following parameter assignments:

```
show spanning-tree mst [<instance-id(1-64)>] [detail]
```

The parameters have the following meaning:

Parameters	Description	Range of values
instance-id	Number of the instance or range of instances whose settings are displayed	1 ... 64
detail	Shows detailed information about the selected interface	-

## Result

The settings are displayed.

## Further notes

You display the general settings for the Spanning Tree Protocol with the `show spanning-tree` command.

### 5.3.1.3 show spanning-tree active

## Description

This command shows the settings for the active ports of the spanning tree function.

## Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

## Syntax

Call up the command with the following parameters:

```
show spanning-tree active [detail]
```

The parameter has the following meaning:

Parameters	Description
detail	Shows settings in detail

## Result

The settings for the active ports of the spanning tree function are displayed.

### 5.3.1.4 show spanning-tree bridge

## Description

This command shows the settings of the spanning tree function of the bridge.

## Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

## Syntax

Call up the command with the following parameters:

```
show spanning-tree bridge
    [{address|forward-time|hello-time|id|max-age|protocol|priority|detail}]
```

The parameters have the following meaning:

Parameters	Description
address	Shows the MAC address of the bridge
forward-time	Shows the time that the bridge is in the listening mode when changing from the blocking mode to the learning mode
hello-time	Shows the time after which the bridge sends configuration BPDUs
id	Shows the ID of the bridge
max-age	Shows the maximum age of the data packet after which it is deleted
protocol	Shows the protocol used
priority	Shows the priority of the bridge
detail	Shows detailed information about the spanning tree settings of the interface

## Result

The settings for the spanning tree function of the bridge are displayed.

### 5.3.1.5 show spanning-tree detail

#### Description

This command shows the detailed settings of the spanning tree function.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call the command without parameters:

```
show spanning-tree detail
```

#### Result

The detailed settings for the spanning tree function are displayed.

### 5.3.1.6 show spanning-tree interface

#### Description

This command shows the settings of the ports for the spanning tree function.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call up the command with the following parameters:

```
show spanning-tree interface <interface-type><interface-id>  
    [{cost|priority|portfast|rootcost|restricted-role|  
    restricted-tcn|state|stats|detail}]
```

The parameters have the following meaning:

Parameters	Description	Values
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name
cost	Shows the port costs used to calculate the lowest-cost route	-
priority	Shows the priority of the port	-
portfast	Shows whether spanning-tree portfast is enabled	-
rootcost	Shows the costs of the route to the root server	-
restricted-role	Shows whether spanning-tree restricted-role is enabled	-
restricted-tcn	Shows whether spanning-tree restricted-tcn is enabled	-
state	Shows the status of the interface	-
stats	Shows the counters of the various BPDU transmissions	-
detail	Shows detailed information about the spanning tree settings of the interface	-

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

**Result**

The settings of the ports for the spanning tree function are displayed.

**5.3.1.7 show spanning-tree root**

**Description**

This command shows the settings of the root bridge for the spanning tree function.

**Requirement**

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

**Syntax**

Call up the command with the following parameters:

```
show spanning-tree root
    [{address|cost|forward-time|id|max-age|port|priority|detail}]
```

The parameters have the following meaning:

Parameters	Description
address	Shows the MAC address of the root bridge
cost	Shows the port costs used to calculate the lowest-cost route
forward-time	Shows the time that the bridge is in the listening mode when changing from the blocking mode to the learning mode
id	Shows the ID of the root bridge
max-age	Shows the maximum age of the data packet after which it is deleted
port	Shows the interface via which the spanning tree is set up
priority	Shows the priority of the bridge
detail	Shows detailed information about the root bridge

## Result

The settings of the root bridge for the spanning tree function are displayed.

### 5.3.1.8 show spanning-tree mst configuration

## Description

This command shows various settings for an instance of the Multiple Spanning Tree Protocol.

## Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

## Syntax

Call the command without parameters:

```
show spanning-tree mst configuration
```

## Result

The settings are displayed.

## Further notes

You display the general settings for the Spanning Tree Protocol with the `show spanning-tree` command.

### 5.3.1.9 show spanning-tree mst interface

#### Description

This command shows port-specific settings of a Multiple Spanning Tree configuration.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call up the command with one of the following parameter assignments:

```
show spanning-tree mst
    [<instance-id(1-64)>] interface<interface-type><interface-id>
    [{stats|hello-time|detail}]
```

The parameters have the following meaning:

Parameters	Description	Range of values
instance-id	Number of the instance or range of instances whose settings are displayed	1 ... 64
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name
stats	Shows the number of incoming and outgoing packets for each path of the interface	-
hello-time	Shows the intervals at which the root switch sends its "Hello" message to the other switches	-
detail	Shows detailed information about the selected interface	-

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

#### Result

The settings are displayed.

#### Further notes

You display the general settings for the Spanning Tree Protocol with the `show spanning-tree` command.

## 5.3.2 clear spanning-tree detected protocols

### Description

With this command, you restart the protocol transmission process on a specific or on all interfaces and force renegotiation of the connection settings with the neighboring devices.

### Requirement

You are in the Privileged EXEC mode.

The command prompt is as follows:

```
cli#
```

### Syntax

Call up the command with the following parameters:

```
clear spanning-tree detected protocols  
    [{interface<interface-type><interface-id>}]
```

The parameters have the following meaning:

Parameters	Description	Values
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"><li>gigabitethernet</li><li>extreme-ethernet</li></ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameters from the parameter list, the process is restarted for all interfaces.

### Result

The connection settings for spanning tree are renegotiated.

## 5.3.3 clear spanning-tree counters

### Description

With this command, you reset all the statistical counters of the spanning tree function at the device and port level.

### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

### Syntax

Call the command without parameters:

```
clear spanning-tree counters
```

### Result

The counters are reset.

## 5.3.4 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 5.3.4.1 spanning-tree

#### Description

The Spanning Tree Protocol is used to monitor a LAN for redundant connections. These are blocked and reactivated when necessary if there are changes to the network topology.

With this command, you enable the spanning tree function.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call the command without parameters:

```
spanning-tree
```



## Result

The spanning tree function is enabled.

## Further notes

You disable the spanning tree function with the `no spanning tree` command.

You can display the status of this function and other information with the `show spanning tree detail` command.

You can display information about active ports with the `show spanning tree active` command.

### 5.3.4.2 no spanning-tree

## Description

With this command, you disable the spanning tree function.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call the command without parameters:

```
no spanning-tree
```

## Result

The spanning tree function is disabled.

## Further notes

You enable the spanning tree function with the `spanning tree` command.

You can display the status of this function and other information with the `show spanning tree detail` command.

You can display information about active ports with the `show spanning tree active` command.

### 5.3.4.3 spanning-tree compatibility

#### Description

With this command, you configure the compatibility version of the protocol that will be used by the spanning tree function.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
spanning-tree compatibility {stp|rst|mst}
```

The parameters have the following meaning:

Parameters	Description
stp	The version is compatible with the Spanning Tree protocol
rst	The version is compatible with the Rapid Spanning Tree protocol
mst	The version is compatible with the Multiple Spanning Tree protocol

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The compatibility version is configured to MST.

#### Result

The compatibility version of the protocol is selected.

#### Further notes

You can reset the setting to the default with the `no spanning-tree compatibility` command.

You can display the status of this function and other information with the `show spanning tree detail` command.

You can display information about active ports with the `show spanning tree active` command.

#### 5.3.4.4 no spanning-tree compatibility

##### Description

With this command, you reset the compatibility version of the protocol of the spanning tree function to the default value.

The default value is MST.

##### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli (config) #
```

##### Syntax

Call the command without parameters:

```
no spanning-tree compatibility
```

##### Result

The compatibility version is reset to the default value.

##### Further notes

You configure the setting with the `spanning-tree compatibility` command.

#### 5.3.4.5 spanning-tree priority

##### Description

With this command, you configure the priority of the device for negotiating a spanning tree configuration.

##### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli (config) #
```

##### Syntax

Call up the command with the following parameters:

```
spanning-tree [mst <instance-id>] priority <value (0-61440) >
```

The parameters have the following meaning:

Parameters	Description	Range of values
mst	Keyword for a Multiple Spanning Tree instance	-
instance-id	Number of the instance	1 ... 64
value	Value for the priority	0 ... 61440

You can only change the value for the priority in the steps of 4096.

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The priority is configured to 32768.

## Result

The priority of the device is configured.

## Further notes

You can reset the setting to the default with the `no spanning-tree mst priority` command.

You display this setting and other information with the commands that start with `show spanning tree` ....

### 5.3.4.6 no spanning-tree priority

## Description

With this command, you reset the priority of the device for negotiating a spanning tree configuration to the default value.

The default value is 32768.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
no spanning-tree[mst <instance-id>]priority
```

The parameters have the following meaning:

Parameters	Description	Range of values
mst	Keyword for a Multiple Spanning Tree instance	-
instance-id	Number of the instance	1 ... 64

## Result

The priority of the device is reset to the default value.

## Further notes

You configure the setting with the `spanning-tree mst priority` command.

You display this setting and other information with the commands that start with `show spanning tree ...`

### 5.3.4.7 spanning-tree mst configuration

## Description

With this command, you change to the MSTP configuration mode.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call the command without parameters:

```
spanning-tree mst configuration
```

## Result

You are now in the MSTP configuration mode.

The command prompt is as follows:

```
cli(config-mst)#
```

## Further notes

You exit the MSTP configuration mode with the `end` or `exit` command.

### 5.3.4.8 spanning-tree mst max-hops

#### Description

With this command, you configure the maximum number of nodes (hops) that a path can run through in an MST.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
spanning-tree mst max-hops <value(6-40)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
value	Maximum number of hops that a path can run through in an MST	6 ... 40

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The number is configured to 20.

#### Result

The setting for the maximum number of hops is configured.

#### Further notes

You can reset the setting for the maximum number of nodes to the default with the `no spanning-tree mst max-hops` command.

You display this setting and other information with the `show spanning tree mst configuration` command.

### 5.3.4.9 no spanning-tree mst max-hops

#### Description

With this command, you reset the maximum number of hops that a path in an MST can run through to the default value.

The default value is 20.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call the command without parameters:

```
no spanning-tree mst max-hops
```

## Result

The setting for the maximum number of nodes is reset to the default value.

## Further notes

You can configure the setting for the maximum number of nodes with the `spanning-tree mst max-hops` command.

You display this setting and other information with the `show spanning tree mst configuration` command.

### 5.3.4.10 `spanning-tree mst instance-id root`

## Description

With this command, you enable the transfer and receipt of Bridge Protocol Data Units (BPDU).

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
spanning-tree mst {instance-id<instance-id(1-64)>} root {primary|secondary}
```

The parameters have the following meaning:

Parameters	Description	Range of values
instance-id	Keyword for the instance	-
instance-id	Number of the instance	1 ... 64
primary	The priority of the device is so high; in other words, set to a low value, that the device can become the root of the spanning tree instance.	The priority is set to the value 24576.
secondary	The priority of the device is set so that the device can become the secondary root of the spanning tree instance if the primary root fails.	The priority is set to the value 28672.

### Result

Transmission and receipt of BPDUs is enabled.

### Further notes

You disable the transfer and receipt of BPDUs with the `no spanning-tree mst instance-id root` command.

You display this setting and other information with the commands that start with `show spanning tree` ....

#### 5.3.4.11 no spanning-tree mst instance-id root

### Description

With this command, you disable the transfer and receipt of Bridge Protocol Data Units (BPDU).

### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

### Syntax

Call up the command with the following parameters:

```
spanning-tree mst {instance-id <instance-id (1-64)>} root
```

The parameters have the following meaning:

Parameters	Description	Range of values
instance-id	Keyword for the instance	-
instance-id	Number of the instance	1 ... 64



## Result

Transmission and receipt of BPDUs is disabled.

## Further notes

You enable the transfer and receipt of BPDUs with the `spanning-tree mst instance-id root` command.

You display this setting and other information with the commands that start with `show spanning tree ...`

### 5.3.4.12 Time settings for the Spanning Tree protocol

## spanning-tree

### Description

With this command, you configure the various time settings of the spanning tree function:

- With the `forward-time` option, you configure the time after which a port changes its spanning tree status from "Blocking" to "Forwarding".
- With the `hello-time` option, you configure the time after which the bridge sends its configuration BPDUs.
- With the `max-age` option, you configure the time after which the information of the BPDUs becomes invalid.

### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

### Syntax

Call up the command with the following parameters:

```
spanning-tree{forward-time<seconds(4-30)>|hello-time<seconds(1-2)>|  
max-age<seconds(6-40)>}
```

The parameters have the following meaning:

Parameters	Description	Range of values
<code>forward-time</code>	Keyword for the time after which a port changes its spanning tree status from "Blocking" to "Forwarding"	-
<code>seconds</code>	Time after which the changeover takes place	4 ... 30

Parameters	Description	Range of values
hello-time	Keyword for the time after which the bridge sends its configuration BPDUs	-
seconds	Time after which they are sent	1 ... 2
max-age	Keyword for the time after which the information of the BPDUs becomes invalid	-
seconds	Maximum age of the BPDUs in seconds	6 ... 40

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

Parameters	Default value
forward-time	15 seconds
hello-time	2 seconds
max-age	20 seconds

**Note**

**Dependencies when setting the timing**

When changing the times, remember the following rule:

$$2 * (\text{forward-time} - 1) \geq \text{max-age}$$

$$\text{max-age} \geq 2 * (\text{hello-time} + 1)$$

**Result**

The selected setting for the time is configured.

**Further notes**

You can reset the time to the default with the `no spanning-tree` command (time settings).

You display these settings and other information with the commands that start with `show spanning tree ....`

**no spanning-tree**

**Description**

With this command, you reset the various time settings of the spanning tree function to the default value.

The default values are as follows:

Parameters	Default value
forward-time	15 seconds
hello-time	2 seconds
max-age	20 seconds

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
no spanning-tree{forward-time|hello-time|max-age}
```

The parameters have the following meaning:

Parameters	Description
forward-time	Time after which a port changes its spanning tree status from "Blocking" to "Forwarding"
hello-time	Time after which the bridge sends its configuration BPDUs
max-age	Time after which the information of the BPDUs becomes invalid

## Result

The selected setting for the time is reset to the default value.

## Further notes

You configure the time with the `spanning-tree` command (time settings).

You display these settings and other information with the commands that start with `show spanning tree ...`

### 5.3.5 Commands in the interface configuration mode

This section describes commands that you can call up in the interface configuration mode. Depending on the Interface selected, various command sets are available.

In the Global configuration mode, enter the `interface` command to change to this mode.

Commands relating to other topics that can be called in the interface configuration mode can be found in the relevant sections.

- If you exit the Interface configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the Interface configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 5.3.5.1 spanning-tree

#### Description

With this command, you configure the various properties of the spanning tree function:

- With the `cost` option, you configure the port costs used to calculate the lowest-cost route.
- With the `disable` option, you disable the interface for the spanning tree function.
- With the `link-type` option, you configure the connection status of the following network segment. The following settings are possible:
  - `point-to-point` - the interface communicates with precisely one network component
  - `shared` - the interface is connected to more than one network component
- With the `portfast` option, you enable the PortFast function on the interface. The interface is connected to an end device and can therefore ignore the waiting time before changing to Forwarding mode.
- With the `port-priority` option, you configure the priority of the interface for negotiating a spanning tree configuration.

#### Requirement

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
spanning-tree {cost<value(0-200000000)>|disable|
               link-type{point-to-point|shared}|portfast|
               port-priority<value(0-240)>}

```

The parameters have the following meaning:

Parameters	Description	Range of values
<code>cost</code>	Keyword for the costs of the port for calculating the lowest-cost route	-
<code>value</code>	Value for the costs	0 ... 200000000
<code>disable</code>	disables the interface for spanning tree	-

Parameters	Description	Range of values
link-type	Connection status of the following network segment	<ul style="list-style-type: none"> <li>point-to-point</li> <li>shared</li> </ul>
portfast	Enables the PortFast function	-
port-priority	Keyword for the priority of the interface	-
value	Value for the priority of the interface	0 ... 240 in steps of 16

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

Parameters	Default value
cost	if dynamic calculation of the path costs is not enabled: <ul style="list-style-type: none"> <li>200000 for physical interfaces</li> <li>199999 for port channels</li> </ul>
disable	The spanning tree function is enabled on the interface.
link-type	<ul style="list-style-type: none"> <li>point-to-point</li> </ul> <p>The connection is configured as <code>full-duplex</code>.</p> <ul style="list-style-type: none"> <li>shared</li> </ul> <p>in all other cases</p>
portfast	disabled
port-priority	128

---

### Note

#### Configure multiple properties

Each time the command is called, you can configure precisely one property.

If you want to configure more than one property, call up the command more than once.

---

### Result

The selected setting is configured.

### Further notes

You can reset the setting to the default with the `no spanning-tree (properties)` command.

You display these settings and other information with the commands that start with `show spanning tree ...`

### 5.3.5.2 no spanning-tree

#### Description

With this command, you reset the various properties of the spanning tree function to the default value:

The default values are as follows:

Parameters	Default value
cost	if dynamic calculation of the path costs is not enabled: <ul style="list-style-type: none"> <li>• 200000 for physical interfaces</li> <li>• 199999 for port channels</li> </ul>
disable	The spanning tree function is enabled on the interface.
link-type	<ul style="list-style-type: none"> <li>• point-to-point</li> </ul> The connection is configured as full-duplex. <ul style="list-style-type: none"> <li>• shared</li> </ul> in all other cases
portfast	disabled
port-priority	128

#### Requirement

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
no spanning-tree {cost|disable|link-type|portfast|port-priority}
```

The parameters have the following meaning:

Parameters	Description
cost	Keyword for the costs of the port for calculating the lowest-cost route
disable	enables the interface for spanning tree
link-type	Connection status of the following network segment
portfast	Disables the PortFast function
port-priority	Keyword for the priority of the interface

---

### Note

#### Configure multiple properties

Each time the command is called, you can configure precisely one property.

If you want to configure more than one property, call up the command more than once.

---

### Result

The selected setting is reset to the default value.

### Further notes

You configure the setting with the `spanning-tree` command (properties).

You display these settings and other information with the commands that start with `show spanning tree` ....

## 5.3.5.3 `spanning-tree mst`

### Description

With this command, you configure the various properties of the multiple spanning tree function:

- With the `cost` option, you configure the port costs used to calculate the lowest-cost route.
- With the `port-priority` option, you configure the priority of the interface for negotiating a multiple spanning tree configuration.
- With the `disable` option, you disable the interface for the multiple spanning tree function.

### Requirement

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli (config-if-$$$)#
```

### Syntax

Call up the command with the following parameters:

```
spanning-tree mst<instance-id(1-64)>  
    {cost<value(0-200000000)>|port-priority<value(0-240)>|disable}
```

The parameters have the following meaning:

Parameters	Description	Range of values
instance-id	Number of the addressed instance	1 ... 64
cost	Keyword for the costs of the port for calculating the lowest-cost route	-
value	Value for the costs	0 ... 200000000
port-priority	Keyword for the priority of the interface	-
value	Value for the priority of the interface	0 ... 240 in steps of 16
disable	disables the interface for multiple spanning tree	-

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

Parameters	Default value
cost	<ul style="list-style-type: none"> <li>• 200000 for physical interfaces</li> <li>• 199999 for port channels</li> </ul>
port-priority	128
disable	The multiple spanning tree function is enabled on the interface.

**Note**

**Configure multiple properties**

Each time the command is called, you can configure precisely one property.

If you want to configure more than one property, call up the command more than once.

**Result**

The selected setting is configured.

**Further notes**

You can reset the setting to the default with the `no spanning-tree mst (properties)` command.

You display these settings and other information with the commands that start with `show spanning tree ....`

**5.3.5.4 no spanning-tree mst**

**Description**

With this command, you reset the various properties of the multiple spanning tree function to the default value.

The default values are as follows:



Parameters	Default value
cost	<ul style="list-style-type: none"> <li>• 200000 for physical interfaces</li> <li>• 199999 for port channels</li> </ul>
port-priority	128
disable	The multiple spanning tree function is enabled on the interface.

## Requirement

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call up the command with the following parameters:

```
no spanning-tree mst<instance-id(1-64)>{cost|port-priority|disable}
```

The parameters have the following meaning:

Parameters	Description	Range of values
instance-id	Number of the addressed instance	1 ... 64
cost	Keyword for the costs of the port for calculating the lowest-cost route	-
port-priority	Keyword for the priority of the interface	-
disable	enables the interface for multiple spanning tree	-

## Note

### Configure multiple properties

Each time the command is called, you can configure precisely one property.

If you want to configure more than one property, call up the command more than once.

## Result

The selected setting is reset to the default value.

## Further notes

You configure the setting with the `spanning-tree mst` command (properties).

You display these settings and other information with the commands that start with `show spanning tree` ....

### 5.3.5.5 spanning-tree auto-edge

#### Description

With this command, you enable automatic discovery of a bridge connected to the interface.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call the command without parameters:

```
spanning-tree auto-edge
```

#### Result

The automatic discovery of a bridge on the interface is enabled.

#### Further notes

The automatic discovery of a bridge on the interface is enabled with the `no spanning-tree auto-edge` command.

You can display the status of this function and other information with the `show spanning tree bridge` command.

### 5.3.5.6 no spanning-tree auto-edge

#### Description

With this command, you disable automatic discovery of a bridge connected to the interface.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call the command without parameters:

```
no spanning-tree auto-edge
```

## Result

The automatic discovery of a bridge on the interface is disabled.

## Further notes

The automatic discovery of a bridge on the interface is disabled with the `spanning-tree auto-edge` command.

You can display the status of this function and other information with the `show spanning tree bridge` command.

### 5.3.5.7 `spanning-tree bpdu-transmit`

## Description

With this command, you enable or disable the BPDU transmit status at the port.

## Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call up the command with the following parameters:

```
spanning-tree bpdu-transmit{enabled|disabled}
```

The parameters have the following meaning:

Parameters	Description
enabled	BPDU packets are transmitted at the port
disabled	BPDU packets are not transmitted at the port

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is enabled.

## Result

The BPDU transmit status has switched over.

## Further notes

You can display the status of this function and other information with the `show spanning tree interface` command with the `detail` option.

### 5.3.5.8 spanning-tree bpdu-receive

#### Description

With this command, you enable / disable the BPDU receive status at the port.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
spanning-tree bpdu-receive{enabled|disabled}
```

The parameters have the following meaning:

Parameters	Description
enabled	BPDU packets are received at the port
disabled	BPDU packets are ignored at the port

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is enabled.

#### Result

The BPDU receive status is enabled / disabled.

#### Further notes

You can display the status of this function and other information with the `show spanning tree interface` command with the `detail` option.

### 5.3.5.9 spanning-tree bdpufilter

#### Description

With this command, you configure the BPDU transmission status for a port.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call up the command with the following parameters:

```
spanning-tree bpdupfilter{disable|enable}
```

The parameters have the following meaning:

Parameters	Description
disable	The transfer of BPDU packets is disabled for the port
enable	The transfer of BPDU packets is enabled for the port

At system start or when using the command `restart` with the option `memory` or `factory`, the following defaults apply:

- The function is disabled.

## Result

The BPDU transmit status is configured.

### 5.3.5.10 spanning-tree layer2-gateway-port

## Description

With this command, you configure a port as a layer 2 gateway port.

## Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call the command without parameters:

```
spanning-tree layer2-gateway-port
```

## Result

The port is configured as a layer 2 gateway port.

### Further notes

You delete the configuration of a port as a layer 2 gateway port with the command `no spanning-tree layer2-gateway-port`.

You can display other information with the `show spanning tree interface` command with the `detail` option.

### 5.3.5.11 no spanning-tree layer2-gateway-port

#### Description

With this command, you delete the configuration of the port as a layer 2 gateway port.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call the command without parameters:

```
no spanning-tree layer2-gateway-port
```

#### Result

The configuration of the port as a layer 2 gateway port is deleted.

### Further notes

You configure a port as a layer 2 gateway port with the command `spanning-tree layer2-gateway-port`.

You can display other information with the `show spanning tree interface` command with the `detail` option.

### 5.3.5.12 spanning-tree loop-guard

#### Description

This function prevents alternative ports or root ports becoming designated ports if there is a disruption of a one-way link.

With this command, you enable the function.

## Requirement

- Spanning tree is enabled.

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call the command without parameters:

```
spanning-tree loop-guard
```

## Result

The function is enabled.

## Further notes

You disable the setting with the `no spanning-tree loop-guard` command.

You can display the status of this function and other information with the following commands:

- `show spanning-tree detail`
- `show spanning-tree active detail`
- `show spanning-tree interface`

### 5.3.5.13 no spanning-tree loop-guard

## Description

This function prevents alternative ports or root ports becoming designated ports if there is a disruption of a one-way link.

With this command, you disable the function.

## Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call the command without parameters:

```
no spanning-tree loop-guard
```

## Result

The function is disabled.

## Further notes

You enable the setting with the `spanning-tree loop-guard` command.

You can display the status of this function and other information with the following commands:

- `show spanning-tree detail`
- `show spanning-tree active detail`
- `show spanning-tree interface`

### 5.3.5.14 `spanning-tree restricted-role`

## Description

With this command, you prevent the port adopting the role of root port.

## Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call the command without parameters:

```
spanning-tree restricted-role
```

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is disabled.

## Result

The port is prevented from adopting the role of root port.

## Further notes

You cancel the lock with the `no spanning-tree restricted-role` command.

You can display the status of this function and other information with the `show spanning tree detail` command.



### 5.3.5.15 no spanning-tree restricted-role

#### Description

With this command, you release the port for the role as root port.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call the command without parameters:

```
no spanning-tree restricted-role
```

#### Result

The port is released for the role of root port.

#### Further notes

You prevent the port adopting the role of the root port with the `spanning-tree restricted-role` command.

### 5.3.5.16 spanning-tree restricted-tcn

#### Description

With this command, you restrict the port for the Topology Change Notification (TCN) function. The port cannot initiate any modifications to the network topology.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call the command without parameters:

```
spanning-tree restricted-tcn
```

## Result

The port is prevented from using the TCN function.

## Further notes

You cancel the lock with the `no spanning-tree restricted-tcn` command.

You can display the status of this function and other information with the `show spanning tree detail` command.

### 5.3.5.17 `no spanning-tree restricted-tcn`

## Description

With this command, you release the port for the TCN function.

## Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call the command without parameters:

```
no spanning-tree restricted-tcn
```

## Result

The port is released for the TCN function.

## Further notes

You restrict the port for the TCN function with the `spanning-tree restricted-tcn` command.

### 5.3.5.18 `spanning-tree mst hello-time`

## Description

With this command, you configure the Hello time after which the bridge sends its configuration BPDUs.

A change to this value applies to all MST instances active on this interface.

## Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call up the command with the following parameters:

```
spanning-tree mst hello-time <value(1-2)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
value	Time after which the bridge sends its configuration BPDUs	1 ... 2

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is configured to 2 seconds.

## Result

The setting for the hello time is configured.

## Further notes

You can reset the setting for the hello time to the default with the `no spanning-tree mst hello-time` command.

You display this setting and other information with the commands that start with `show spanning tree ...`

### 5.3.5.19 no spanning-tree mst hello-time

## Description

With this command, you reset the hello time after which the bridge sends its configuration BPDUs to the default value.

The default value is 2 seconds.

## Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

**Syntax**

Call the command without parameters:

```
no spanning-tree mst hello-time
```

**Result**

The setting for the hello time is reset to the default value.

**Further notes**

You can configure the setting for the hello time with the `spanning-tree mst hello-time` command.

You display this setting and other information with the commands that start with `show spanning tree ...`

**5.3.5.20 spanning-tree mst PseudoRootId**

**Description**

With this command, you configure a pseudoroot MAC address and the priority for a spanning tree configuration.

**Requirement**

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

**Syntax**

Call up the command with the following parameters:

```
spanning-tree [mst<instance-id>]pseudoRootId
    priority<value (0-61440) >mac-address<ucast_mac>
```

The parameters have the following meaning:

Parameters	Description	Range of values
mst	Keyword for a spanning tree instance	-
instance-id	Number of the instance	1 ... 64
priority	Keyword for the priority	-
value	Value for the priority	0 ... 61440
mac-address	Keyword for the pseudoroot unicast MAC address	-
ucast_mac	MAC address of the interface	aa:aa:aa:aa:aa:aa

You can only change the value for the priority in the steps of 4096.

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The priority is configured to the priority of the device.
- The MAC address is configured to the MAC address of the device.

## Result

The pseudoroot MAC address and the priority are configured.

## Further notes

You can reset the settings to the default values with the `no spanning-tree mst pseudoRootId` command.

You display this setting and other information with the commands that start with `show spanning tree ...`

### 5.3.5.21 no spanning-tree mst PseudoRootId

## Description

With this command, you reset a pseudoroot MAC address and the priority of the spanning tree configuration to the default values.

The default values are as follows:

- The priority is configured to the priority of the device.
- The MAC address is configured to the MAC address of the device.

## Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call up the command with the following parameters:

```
no spanning-tree [mst<instance-id(1-64)>]pseudoRootId
```

The parameters have the following meaning:

Parameters	Description	Range of values
mst	Keyword for a spanning tree instance	-
instance-id	Number of the instance	1 ... 64

**Result**

The pseudoroot MAC address and the priority are rest to the defaults.

**Further notes**

You configure the settings with the `spanning-tree mst pseudoRootId` command.

You display this setting and other information with the commands that start with `show spanning tree` ....

**5.3.6 Commands in the MSTP configuration mode**

This section describes commands that you can call up in the MSTP configuration mode.

In the Global configuration mode, enter the `spanning-tree mst configuration` command to change to this mode.

- If you exit the MSTP configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the MSTP configuration mode with the `end` command, you return to the Privileged EXEC mode.

**5.3.6.1 instance**

**Description**

With this command, you assign a range of VLANs to an MST instance.

**Requirement**

You are in the MSTP configuration mode.

The command prompt is as follows:

```
cli(config-mst)#
```

**Syntax**

Call up the command with the following parameters:

```
instance <instance-id(1-64)>vlan<vlan-range>
```

The parameters have the following meaning:

Parameters	Description	Range of values
instance-id	Number of the instance	1 ... 64
vlan-range	Range of VLANs assigned to an instance	enter the range limts with a hyphen or blank

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The VLANs 1 – 4094 are assigned to instance "0".

## Result

The range of VLANs is assigned to the MST instance.

## Further notes

You cancel the assignment of the VLAN to an MST instance with the `no instance` command.

You delete the MST instance with the `no instance` command.

You display this setting and other information with the `show spanning tree mst configuration` command.

### 5.3.6.2 no instance

## Description

With this command, you cancel the assignment of a VLAN to an MST instance or delete the MST instance.

## Requirement

You are in the MSTP configuration mode.

The command prompt is as follows:

```
cli(config-mst)#
```

## Syntax

Call up the command with the following parameters:

```
no instance <instance-id (1-64)> [vlan <vlan-range>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
instance-id	Number of the MST instance	1 ... 64
vlan-range	Range of VLANs that will be deleted from the instance	enter the range limits with a hyphen or blank

If you specify a VLAN or a VLAN range, the assignment to an MST instance is canceled.

If you do not specify a VLAN, the MST instance is deleted.

**Result**

The assignment of a VLAN to an MST instance is canceled or the MST instance is deleted.

**Further notes**

You delete a VLAN of an MST instance with the `instance` command.

You display this setting and other information with the `show spanning tree mst configuration` command.

**5.3.6.3 name**

**Description**

With this command, you delete the name for the MST region.

**Requirement**

You are in the MSTP configuration mode.

The command prompt is as follows:

```
cli(config-mst)#
```

**Syntax**

Call up the command with the following parameters:

```
name <string(optional max Length)>
```

The parameters have the following meaning:

Parameters	Description	Range of values
string	Keyword for the name of the MST region	-
optional max Length	Value for the name	max. 32 characters

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The MAC address of the device is configured as name.

**Result**

The name is configured.

**Further notes**

You delete the name of the MST region with the `no name` command.

You display this setting and other information with the `show spanning tree mst configuration` command.



#### 5.3.6.4 no name

##### Description

With this command, you reset the name for the MST region to the default value.

The default value is:

- The MAC address of the device is configured as name.

##### Requirement

You are in the MSTP configuration mode.

The command prompt is as follows:

```
cli(config-mst)#
```

##### Syntax

Call the command without parameters:

```
no name
```

##### Result

The name is reset to the default value.

##### Further notes

You configure the name of the MST region with the `name` command.

You display this setting and other information with the `show spanning tree mst configuration` command.

#### 5.3.6.5 revision

##### Description

With this command, you assign a revision number to the MST region.

##### Requirement

You are in the MSTP configuration mode.

The command prompt is as follows:

```
cli(config-mst)#
```

##### Syntax

Call up the command with the following parameters:

```
revision <value(0-65535)>
```

The parameters have the following meaning:

Parameters	Description	Range of values
value	value of the revision number	0 ... 65535

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The revision number is configured to 0.

## Result

The MST region is assigned a revision number.

## Further notes

You delete the revision number with the `no revision` command.

You display this setting and other information with the `show spanning tree mst configuration` command.

### 5.3.6.6 no revision

## Description

With this command, you reset the revision number of the MST region to the default value.

The default value is 0.

## Requirement

You are in the MSTP configuration mode.

The command prompt is as follows:

```
cli(config-mst)#
```

## Syntax

Call the command without parameters:

```
no revision
```

## Result

The revision number of the MST region is reset to the default value.

## Further notes

You assign a revision number to the MST region with the `revision` command.

You display this setting and other information with the `show spanning tree mst configuration` command.

## Network protocols

This part contains the sections that describe the commands for working with the various network protocols.

### 6.1 IPv4 protocol

This section describes commands of the Internet Protocol (IP) version 4.

#### 6.1.1 show ip route

##### Description

This command shows the IP routing table.

##### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

##### Syntax

Call up the command with the following parameters:

```
show ip route [{<ip-address> [<mask>] | connected | static | summary}]
```

The parameters have the following meaning:

Parameters	Description	Range of values
ip-address	shows the information for a specific IP address	enter a valid IP address
mask	defines an address range using the subnet mask	/8, /16 or /24
connected	Shows the direct connections	-
static	Shows the static connections	-
summary	Displays a summary	-

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

The IP routing table is displayed.

### 6.1.2 show ip gateway

#### Description

This command shows the default gateway configured for the device.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call the command without parameters:

```
show ip gateway
```

## Result

The default gateway is displayed.

### 6.1.3 show ip telnet

#### Description

This command shows the admin status and the port number of the telnet server.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call the command without parameters:

```
show ip telnet
```

## Result

The admin status and the port number of the Telnet server are displayed.

### 6.1.4 show dcp server

#### Description

This command shows whether or not the DCP function is enabled on the device.  
If the DCP function is enabled, the read and write permissions are displayed.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call the command without parameters:

```
show dcp server
```

## Result

The overview of the status of the DCP function and access rights is displayed.

### 6.1.5 show dcp forwarding

#### Description

This command shows an overview of the DCP forwarding behavior on one or all interfaces.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call up the command with the following parameters:

```
show dcp forwarding [port<interface-type><interface-id>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
port	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

The overview of the DCP forwarding behavior is displayed.

## 6.1.6 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 6.1.6.1 ip route

#### Description

With this command, you configure a static entry in the IP routing table.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
ip route <prefix><mask><next-hop>
```

The parameter has the following meaning:

Parameters	Description	Range of values
<code>prefix</code>	specifies the IP address or the address range	enter a valid IP address
<code>mask</code>	specifies the subnet mask used for <code>prefix</code> . Use decimal notation.	enter a valid subnet mask
<code>next-hop</code>	specifies the IP address to which the selected addresses will be forwarded.	enter a valid IP address

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

The entry is configured.

## Further notes

You delete an entry from the IP routing table with the `no ip route` command.

You display the IP routing table with the `show ip route` command.

### 6.1.6.2 no ip route

## Description

With this command, you delete a static entry from the IP routing table.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
no ip route <prefix><mask><next-hop>
```

The parameter has the following meaning:

Parameters	Description	Range of values
<code>prefix</code>	specifies the IP address or the address range	enter a valid IP address
<code>mask</code>	specifies the subnet mask used for <code>prefix</code> . Use decimal notation.	enter a valid subnet mask
<code>next-hop</code>	specifies the IP address to which the selected addresses were forwarded.	enter a valid IP address

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

The entry is deleted.

## Further notes

You configure an entry from the IP routing table with the `ip route` command.

You display the IP routing table with the `show ip route` command.

### 6.1.6.3 ip echo-reply

## Description

To check the availability of a network node, packets of the Internet Control Message Protocol (ICMP) can be sent to it. These packets of type 8 request the recipient to send a packet back to the sender (echo reply).

With this command, you enable the ICMP echo reply messages.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call the command without parameters:

```
ip echo-reply
```

## Result

ICMP echo reply messages are enabled.

## Further notes

You disable the setting with the `no ip echo-reply` command.

You can display the setting of this function and other information with the `show ip information` command.



#### 6.1.6.4 no ip echo-reply

##### Description

With this command, you disable the ICMP echo reply messages.

##### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

##### Syntax

Call the command without parameters:

```
no ip echo-reply
```

##### Result

ICMP echo reply messages are disabled.

##### Further notes

You change the setting with the `ip echo-reply` command.

You can display the setting of this function and other information with the `show ip information` command.

#### 6.1.6.5 telnet-server

##### Description

With this command, you enable the Telnet server.

##### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

##### Syntax

Call the command without parameters:

```
telnet-server
```

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The Telnet server is enabled.

## Result

The Telnet server is enabled.

## Further notes

You disable the Telnet server with the `no telnet-server` command.

### 6.1.6.6 `no telnet-server`

#### Description

With this command, you disable the Telnet server.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call the command without parameters:

```
no telnet-server
```

## Result

The Telnet server is enabled or disabled.

## Further notes

You enable the Telnet server with the `telnet-server` command.

### 6.1.6.7 `dcp server`

#### Description

With this command, you configure the read and write permissions for the DCP server and enable it.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
dcp server{read-only|read-write}
```

The parameters have the following meaning:

Parameters	Description
read-only	only reading is permitted on the DCP server
read-write	reading and writing is permitted on the DPC server

At system start or when using the command `restart` with the option `memory` or `factory`, the following defaults apply:

- The function is configured for `read-write`.

## Result

The read and write permissions for the DPC server are configured.

The DCP server is enabled.

## Further notes

You disable the DCP server with the `no dcp server` command.

### 6.1.6.8 no dcp server

## Description

With this command, you disable the DCP server.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call the command without parameters:

```
no dcp server
```

## Result

The DCP server is disabled.

## Further notes

You enable and configure the DCP server with the `dcp server` command.

## 6.1.7 Commands in the interface configuration mode

This section describes commands that you can call up in the interface configuration mode. Depending on the Interface selected, various command sets are available.

In the Global configuration mode, enter the `interface` command to change to this mode.

Commands relating to other topics that can be called in the interface configuration mode can be found in the relevant sections.

- If you exit the Interface configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the Interface configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 6.1.7.1 ip address

#### Description

With this command, you assign an IP address to an interface.

#### Requirement

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
ip address {<ip-address><subnet-mask>|dhcp}
```

The parameters have the following meaning:

Parameters	Description	Values
ip-address	Address for the default interface	enter a valid IP address
subnet-mask	Subnet mask of the corresponding subnet	enter a valid subnet mask
dhcp	the IP address is obtained using DHCP	-

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

---

#### Note

An IP address can only be assigned to a VLAN interface or the Out-of-Band Port.

---

#### Result

The address is assigned to the interface.

NOTICE
<p><b>Effectiveness of the command</b></p> <p>The command is effective immediately.</p> <p>If you configure the interface via which you access the device, you can lose the connection!</p>

#### Further notes

You delete the settings with the `no ip address` command.

You display this setting and other information with the `show ip interface` command.

#### 6.1.7.2 no ip address

##### Description

With this command, you delete the assignment of an IP address to an interface and disable DHCP.

##### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

### Syntax

Call up the command with the following parameters:

```
no ip address<ip-address>
```

The parameter has the following meaning:

Parameters	Description	Values
ip-address	Address of the interface that will be deleted	Enter a valid IP address

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

### Result

The assignment of the address to an interface is deleted and DHCP is disabled.

<b>NOTICE</b>
<b>Effectiveness of the command</b>
The command is effective immediately.
If you configure the interface via which you access the device, you can lose the connection!

### Further notes

You configure the setting with the `ip address` command.

You display this setting and other information with the `show ip interface` command.

### 6.1.7.3 dcp forwarding

#### Description

With this command, you configure the forwarding behavior of the interface for DCP frames.

#### Requirement

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
dcp forwarding {block|forward}
```

The parameters have the following meaning:

Parameters	Description
block	DCP frames are discarded
forward	DCP frames are forwarded

At system start or when using the command `restart` with the option `memory` or `factory`, the following defaults apply:

- The function is configured for `forward`.

## Result

The forwarding behavior of the interface for DCP frames is configured.

## 6.2 DHCP client

This section describes commands of the Dynamic Host Configuration Protocol (DHCP).

### 6.2.1 show ip dhcp client stats

#### Description

With this command, you display the statistical counters of the DHCP client.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call the command without parameters:

```
show ip dhcp client stats
```

#### Result

The counters are displayed.

## 6.2.2 show ip dhcp client

### Description

With this command, you display the configuration settings of the DHCP client.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

### Syntax

Call the command without parameters:

```
show ip dhcp client
```

### Result

The configuration settings are displayed.

## 6.2.3 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 6.2.3.1 ip dhcp config-file-request

#### Description

If the DHCP config file request option is set, the device requests the TFTP address and the name of a configuration file from the DHCP server. If the device is restarted following the completed download, the configuration settings are read from this file.

With this command, you enable the DHCP config file request option.

#### Requirement

You are in the Global configuration mode.



The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call the command without parameters:

```
ip dhcp config-file-request
```

## Result

The DHCP config file request option is enabled.

## Further notes

You disable the DHCP config file request option with the `no ip dhcp config-file-request` command.

### 6.2.3.2 no ip dhcp config-file-request

## Description

With this command, you disable the DHCP config file request option.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call the command without parameters:

```
no ip dhcp config-file-request
```

## Result

The DHCP config file request option is disabled.

## Further notes

You enable the DHCP config file request option with the `ip dhcp config-file-request` command.

### 6.2.3.3 ip dhcp client mode

#### Description

With this command, you configure the type of identifier with which the DHCP client logs on with its DHCP server.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
ip dhcp client mode {mac|client-id<string>|sysname}
```

The parameters have the following meaning:

Parameters	Description	Range of values
mac	The client registers with its MAC address	-
client-id	The client registers with the assigned ID	-
string	Name of the assigned ID	max. 32 characters
sysname	The client registers with the assigned system name	-

#### Result

The registration mode of the DHCP client is configured.

## 6.3 SNMP

This section describes commands of the Simple Network Management Protocol (SNMP).

### 6.3.1 The "show" commands

This section describes commands with which you display various settings.

### 6.3.1.1 show snmp

#### Description

This command shows the status information of SNMP.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call the command without parameters:

```
show snmp
```

#### Result

The status information is displayed.

### 6.3.1.2 show snmp community

#### Description

This command shows the details of the configured of SNMP communities.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call the command without parameters:

```
show snmp community
```

#### Result

The details of the configured SNMP communities are displayed.

### 6.3.1.3 show snmp engineid

#### Description

This command shows the SNMP identification number of the device.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call the command without parameters:

```
show snmp engineID
```

#### Result

The SNMP identification number of the device is displayed.

### 6.3.1.4 show snmp filter

#### Description

This command shows the configured SNMP filters.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call the command without parameters:

```
show snmp filter
```

#### Result

The configured SNMP filters are displayed.

### 6.3.1.5 show snmp group

#### Description

This command shows the configured SNMP groups.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call the command without parameters:

```
show snmp group
```

#### Result

The configured SNMP groups are displayed.

### 6.3.1.6 show snmp group access

#### Description

This command shows the rights of the configured SNMP groups.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call the command without parameters:

```
show snmp group access
```

#### Result

The rights of the configured SNMP groups are displayed.

### 6.3.1.7 show snmp inform statistics

#### Description

This command shows the statistics of the inform messages.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call the command without parameters:

```
show snmp inform statistics
```

#### Result

The statistics of the inform messages are displayed.

### 6.3.1.8 show snmp notif

#### Description

With this command, you display the configured SNMP notification types.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call the command without parameters:

```
show snmp notif
```

#### Result

The configured SNMP notification types are displayed.

### 6.3.1.9 show snmp targetaddr

#### Description

This command shows the configured SNMP target addresses.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call the command without parameters:

```
show snmp targetaddr
```

#### Result

The configured SNMP target addresses are displayed.

### 6.3.1.10 show snmp targetparam

#### Description

This command shows the configured SNMP target parameters.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call the command without parameters:

```
show snmp targetparam
```

#### Result

The configured SNMP target parameters are displayed.

### 6.3.1.11 show snmp tcp

#### Description

This command shows the configuration for SNMP via TCP.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call the command without parameters:

```
show snmp tcp
```

#### Result

The configuration for SNMP via TCP is displayed.

### 6.3.1.12 show snmp user

#### Description

This command shows the settings for the SNMP user.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call the command without parameters:

```
show snmp user
```

#### Result

The settings for the SNMP user are displayed.



### 6.3.1.13 show snmp-server traps

#### Description

This command shows the configured SNMP traps.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call the command without parameters:

```
show snmp-server traps
```

#### Result

The enabled SNMP traps are displayed.

### 6.3.1.14 show snmp viewtree

#### Description

This command shows the settings for the SNMP tree views.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call the command without parameters:

```
show snmp viewtree
```

#### Result

The settings for the SNMP tree views are displayed.

## 6.3.2 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 6.3.2.1 snmpagent

#### Description

With this command, you enable the SNMP agent function.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call the command without parameters:

```
snmpagent
```

#### Result

The SNMP agent function is enabled.

#### Further notes

You disable the SNMP agent function with the `no snmpagent` command.

### 6.3.2.2 no snmpagent

#### Description

With this command, you disable the SNMP agent function.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call the command without parameters:

```
no snmpagent
```

## Result

The SNMP agent function is disabled.

## Further notes

You enable the SNMP agent function with the `snmpagent` command.

### 6.3.2.3 snmp agent version

## Description

With this command, you configure whether all SNMP queries or only SNMP V3 queries are processed.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
snmp agent version{v3only|all}
```

The parameters have the following meaning:

Parameters	Description
v3only	only SNMP V3 queries are processed
all	all SNMP queries are processed

At system start or when using the command `restart` with the option `memory` or `factory`, the following defaults apply:

- The function is configured for `all`.

**Result**

The setting is configured.

**6.3.2.4 snmp access**

**Description**

With this command, you configure the access to an SNMP group.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call up the command with the following parameters:

```
snmp access <GroupName>{v1|v2c|v3{auth|noauth|priv}}
 [read<ReadView|none>] [write<WriteView|none>] [notify<NotifyView|none>]
 [{volatile|nonvolatile}]
```

The parameters have the following meaning:

Parameters	Description	Range of values
GroupName	Name of the group to which access is configured	max. 32 characters
-	Selects the version of the protocol used	<ul style="list-style-type: none"> <li>v1</li> <li>v2c</li> <li>v3</li> </ul>
-	Selects the authentication method:	<ul style="list-style-type: none"> <li>auth enables MD5 or SHA as authentication method</li> <li>noauth no authentication</li> <li>priv enables authentication and encryption</li> </ul>
read	the data can be read	<ul style="list-style-type: none"> <li>ReadView</li> <li>none</li> </ul>
write	the data can be read and written	<ul style="list-style-type: none"> <li>WriteView</li> <li>none</li> </ul>

Parameters	Description	Range of values
notify	Changes can be set as a tag	<ul style="list-style-type: none"> <li>NotifyView</li> <li>none</li> </ul>
-	specifies whether the settings remain following a restart	<ul style="list-style-type: none"> <li>volatile (volatile): The default settings are used after a restart</li> <li>nonvolatile (non-volatile): The saved settings are used after a restart</li> </ul>

If optional parameters are not specified when configuring a group, the following defaults apply:

Parameters	Default value
read	none
write	none
notify	none
Storage type	nonvolatile

## Result

The settings are configured.

## Further notes

You delete the access to an SNMP group with the `no snmp access` command.

You display the configured SNMP groups with the `show snmp group` command.

You display the access configurations for SNMP groups with the `show snmp group access` command.

You display the configured SNMP tree views with the `show snmp viewtree` command.

### 6.3.2.5 no snmp access

## Description

With this command, you delete the access to an SNMP group.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli (config) #
```

## Syntax

Call up the command with the following parameters:

```
snmp access <GroupName>{v1|v2c|v3{auth|noauth|priv}}
```

The parameters have the following meaning:

Parameters	Description	Values
GroupName	Name of the group to which access is deleted	max. 32 characters
-	Selects the version of the protocol used	<ul style="list-style-type: none"> <li>• v1</li> <li>• v2c</li> <li>• v3</li> </ul>
-	Selects the authentication method:	<ul style="list-style-type: none"> <li>• auth</li> <li>• noauth</li> <li>• priv</li> </ul>

## Result

The access to an SNMP group is deleted.

## Further notes

You configure the setting with the `snmp access` command.

You display the configured SNMP groups with the `show snmp group` command.

You display the access configurations for SNMP groups with the `show snmp group access` command.

You display the configured SNMP tree views with the `show snmp viewtree` command.

### 6.3.2.6 snmp community index

#### Description

With this command, you configure the details of an SNMP community.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
snmp community index <CommunityIndex>name<CommunityName>
security<SecurityName>[context<Name>] [{volatile|nonvolatile}]
```

The parameters have the following meaning:

Parameters	Description	Range of values
CommunityIndex	Index of the community	32
name	Keyword for the name of the community	-
CommunityName	Name of the community	max. 32 characters
security	Keyword for the security name	-
SecurityName	Security name	max. 32 characters
context	Keyword for the context name	-
Name	Context name	max. 32 characters
-	specifies whether the settings remain following a restart	<ul style="list-style-type: none"> <li>volatile (volatile): The default settings are used after a restart</li> <li>nonvolatile (non-volatile): The saved settings are used after a restart</li> </ul>

If optional parameters are not specified when configuring a community, the following defaults apply:

Parameters	Default values
Storage type	nonvolatile

## Result

The settings are configured.

## Further notes

You delete the details of an SNMP community with the `no snmp community index` command.

You show the details of an SNMP community with the `show snmp community` command.

You show the status information of the SNMP communication with the `show snmp` command.

### 6.3.2.7 no snmp community index

## Description

With this command, you delete the details of an SNMP community.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli (config) #
```

**Syntax**

Call up the command with the following parameters:

```
snmp community index <CommunityIndex>
```

The parameters have the following meaning:

Parameters	Description	Range of values
CommunityIndex	Name of the community	max. 32 characters

**Result**

The details of an SNMP community are deleted.

**Further notes**

You configure the details of an SNMP community with the `snmp community index` command.

You show the details of an SNMP community with the `show snmp community` command.

You show the status information of the SNMP communication with the `show snmp` command.

**6.3.2.8 snmp group**

**Description**

With this command, you configure the details of an SNMP group.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call up the command with the following parameters:

```
snmp group <GroupName>user<UserName>security-model{v1|v2c|v3}
    [{volatile|nonvolatile}]
```

The parameters have the following meaning:

Parameters	Description	Range of values
GroupName	Name of the group	max. 32 characters
user	Keyword for the user name	-
UserName	Name of the user	max. 32 characters



Parameters	Description	Range of values
<code>security-model</code>	Specifies which security settings are used for sending	<ul style="list-style-type: none"> <li>v1</li> <li>v2c</li> <li>v3</li> </ul>
-	specifies whether the settings remain following a restart:	<ul style="list-style-type: none"> <li><code>volatile</code> (volatile): The default settings are used after a restart</li> <li><code>nonvolatile</code> (non-volatile): The saved settings are used after a restart</li> </ul>

If optional parameters are not specified when configuring a group, the following defaults apply:

Parameters	Default value
Storage type	<code>nonvolatile</code>

## Result

The details of the group are configured.

## Further notes

You delete the details of an SNMP group with the `no snmp group` command.

You display the created SNMP groups with the `show snmp groups` command.

You display the created SNMP user with the `show snmp user` command.

### 6.3.2.9 no snmp group

## Description

With this command, you delete the details of an SNMP group.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
no snmp group <GroupName>user<UserName>security-model{v1|v2c|v3}
```

The parameters have the following meaning:

Parameters	Description	Range of values
GroupName	Name of the group	max. 32 characters
user	Keyword for the user name	-
UserName	Name of the user	max. 32 characters
security-model	Specifies which security settings are used for sending	<ul style="list-style-type: none"> <li>• v1</li> <li>• v2c</li> <li>• v3</li> </ul>

## Result

The details of the group are deleted.

## Further notes

You change the details of an SNMP group with the `snmp group` command

You display the created SNMP groups with the `show snmp groups` command.

You display the created SNMP user with the `show snmp user` command.

### 6.3.2.10 snmp notify

## Description

With this command, you configure the details of the SNMP notifications.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
snmp notify <NotifyName> tag <TagName> type {Trap|Inform}
    [{volatile|nonvolatile}]
```

The parameters have the following meaning:

Parameters	Description	Range of values
NotifyName	Name of the SNMP notification	max. 32 characters
tag	Keyword for a target key	-
TagName	Name of the target key	max. 32 characters

Parameters	Description	Range of values
Type	Type of the SNMP notification	<ul style="list-style-type: none"> <li>Trap generates a trap</li> <li>Inform generates a log entry or sends an entry to the log server</li> </ul>
-	specifies whether the settings remain following a restart:	<ul style="list-style-type: none"> <li>volatile (volatile): The default settings are used after a restart</li> <li>nonvolatile (non-volatile): The saved settings are used after a restart</li> </ul>

## Result

The details of the SNMP notifications are configured.

## Further notes

You delete the details of an SNMP group with the `no snmp notify` command.

You display the configured SNMP notifications with the `show snmp notif` command.

You display the configured SNMP target addresses with the `show snmp targetaddr` command.

### 6.3.2.11 no snmp notify

## Description

With this command, you delete the details of the SNMP notifications.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
no snmp notify <NotifyName>
```

The parameters have the following meaning:

Parameters	Description	Range of values
NotifyName	Name of the notification	max. 32 characters

**Result**

The details of the SNMP notifications are deleted.

**Further notes**

You change the details of an SNMP group with the `snmp notify` command.

You display the configured SNMP notifications with the `show snmp notif` command.

You display the configured SNMP target addresses with the `show snmp targetaddr` command.

**6.3.2.12 snmp targetaddr**

**Description**

With this command, you configure the SNMP target addresses.

**Requirement**

- The SNMP target parameters are configured.

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call up the command with the following parameters:

```
snmp targetaddr <TargetAddressName>param<ParamName>{<IPAddress>}
    [timeout<Seconds (1-1500)>] [retries<RetryCount (1-3)>]
    [taglist<TagIdentifier|none>] [{volatile|nonvolatile}]
    [port<integer (1-65535)>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
TargetAddressName	Name of the target address	max. 32 characters
param	Keyword for the parameter name	-
ParamName	Name of the parameter	max. 32 characters
IPAddress	Value for the target address	Enter a valid IP address
timeout	Keyword for the time the SNMP agent waits for a response before it repeats the inform request message	-
Seconds	Time in seconds	1 ... 1500

Parameters	Description	Range of values
retries	Keyword for the maximum number of attempts to obtain a response to an inform request message	-
RetryCount	Number of attempts	1 ... 3
taglist	Keyword for	<ul style="list-style-type: none"> <li>• TagIdentifier</li> <li>• none</li> </ul>
	specifies whether the settings remain following a restart:	<ul style="list-style-type: none"> <li>• volatile (volatile): The default settings are used after a restart</li> <li>• nonvolatile (non-volatile): The saved settings are used after a restart</li> </ul>
port	Keyword for the port number at which the SNMP manager receives traps and inform messages	-
integer	Port number	1 ... 65535

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If optional parameters are not specified when configuring, the following defaults apply:

Parameters	Default value
taglist	snmp
Type of storage	volatile
port	162

## Result

The SNMP target address is configured.

## Further notes

You delete the SNMP target address with the `no snmp targetaddr` command.

You display the SNMP target address with the `show snmp targetaddr` command.

You configure the SNMP target parameters with the `snmp targetparams` command.

You display the SNMP target parameters with the `show snmp targetparam` command.

### 6.3.2.13 no snmp targetaddr

## Description

With this command, you delete the SNMP target address.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call up the command with the following parameters:

```
snmp targetaddr<TargetAddressName>
```

The parameters have the following meaning:

Parameters	Description	Range of values
TargetAddressName	SNMP target address	max. 32 characters

**Result**

The SNMP target address is deleted.

**Further notes**

You change the SNMP target address with the `snmp targetaddr` command.

You display the SNMP target address with the `show snmp targetaddr` command.

**6.3.2.14 snmp targetparams**

**Description**

With this command, you configure the SNMP target parameters.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call up the command with the following parameters:

```
snmp targetparams <ParamName>
  user <UserName>
  security-model {v1|v2c|v3{auth|noauth|priv}}
  message-processing {v1|v2c|v3} [{volatile|nonvolatile}]
```

The parameters have the following meaning:

Parameters	Description	Range of values
ParamName	Name of the SNMP parameter	max. 32 characters
user	Keyword for the user name	-
UserName	Value for the user name	max. 32 characters
security-model	Specifies whether the security settings are used according to SNMP version 1, 2c or 3	<ul style="list-style-type: none"> <li>• v1</li> <li>• v2c</li> <li>• v3</li> </ul>
	Authentication and encryption setting for v3	<ul style="list-style-type: none"> <li>• auth</li> <li>• noauth</li> <li>• priv</li> </ul>
message-processing	Specifies whether the processing of the messages is according to SNMP version 1, 2c or 3	<ul style="list-style-type: none"> <li>• v1</li> <li>• v2c</li> <li>• v3</li> </ul>
	specifies whether the settings remain following a restart:	<ul style="list-style-type: none"> <li>• volatile (volatile): The default settings are used after a restart</li> <li>• nonvolatile (non-volatile): The saved settings are used after a restart</li> </ul>

If optional parameters are not specified when configuring, the following defaults apply:

Parameters	Default values
Storage type	nonvolatile

## Result

The SNMP target parameters are configured.

## Further notes

You delete the SNMP target parameters with the `no snmp targetparams` command.

You display settings of this function with the `show snmp targetparam` command.

You configure the user profile with the `snmp user` command.

You configure a filter with the `snmp filterprofile` command.

You display the list of users with the `show snmp user` command.

### 6.3.2.15 no snmp targetparams

#### Description

With this command, you delete the SNMP target parameters.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
no snmp targetparams <ParamName>
```

The parameter has the following meaning:

Parameters	Description	Range of values
ParamName	Name of the SNMP parameter	max. 32 characters

#### Result

The SNMP target parameters are deleted.

#### Further notes

You change the SNMP target parameters with the `snmp targetparams` command.

You display settings of this function with the `show targetparam` command.

### 6.3.2.16 snmp v1-v2 readonly

#### Description

With this command, you block write access for SNMP V1 and V2 PDUs.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```



**Syntax**

Call the command without parameters:

```
snmp v1-v2 readonly
```

**Result**

Write access for SNMP V1 and V2 PDUs is blocked.

**Further notes**

You release write access for SNMP V1 and V2 PDUs with the `no snmp v1-v2 readonly` command.

**6.3.2.17 no snmp v1-v2 readonly****Description**

With this command, you release write access for SNMP V1 and V2 PDUs.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call the command without parameters:

```
no snmp v1-v2 readonly
```

**Result**

Write access for SNMP V1 and V2 PDUs is released.

**Further notes**

You block write access for SNMP V1 and V2 PDUs with the `snmp v1-v2 readonly` command.

**6.3.2.18 snmp user****Description**

With this command, you configure the details of an SNMP user.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call up the command with the following parameters:

```
snmp user <UserName> [auth{md5|sha}<passwd>[priv DES<passwd>]]
    [{volatile|nonvolatile}]
```

The parameters have the following meaning:

Parameters	Description	Range of values
UserName	Name of the user	max. 32 characters
auth	specifies that authentication takes place and which algorithm is used	<ul style="list-style-type: none"> <li>md5 (Message Digest 5)</li> <li>sha (Secure Hash Algorithm)</li> </ul>
passwd	Password for authentication	max. 32 characters
priv DES	specifies that there is encryption	-
passwd	Value for the password of the encryption	max. 32 characters
-	specifies whether the settings remain following a restart:	<ul style="list-style-type: none"> <li>volatile (volatile): The default settings are used after a restart</li> <li>nonvolatile (non-volatile): The saved settings are used after a restart</li> </ul>

If optional parameters are not specified when configuring an SNMP user, the following defaults apply:

Parameters	Default value
Authentication	None
Encryption	None
Storage type	nonvolatile

**Result**

The details of the SNMP user are configured.

**Further notes**

You delete the settings with the `no snmp user` command.

You display the configured users with the `show snmp user` command.

### 6.3.2.19 no snmp user

#### Description

With this command, you delete the details of an SNMP user.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
no snmp user <UserName>
```

The parameter has the following meaning:

Parameters	Description	Range of values
UserName	Name of the user	max. 32 characters

#### Result

The details of the SNMP user are deleted.

#### Further notes

You change the settings with the `snmp user` command.

You display the configured users with the `show snmp user` command.

### 6.3.2.20 snmp view

#### Description

With this command, you configure an SNMP view.

#### Requirement

- An SNMP group has been created
- The access to the group is configured with `snmp access`

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

### Syntax

Call up the command with the following parameters:

```
snmp view <ViewName><OIDTree>[mask<OIDMask>]{included|excluded}
    [{volatile|nonvolatile}]
```

The parameters have the following meaning:

Parameters	Description	Range of values
ViewName	Name of the SNMP view	max. 32 characters
OIDTree	Object ID	Path information of the MIB tree
mask	Keyword for the OID mask	-
OIDMask	Mask that filters access to the elements of the MIB tree	A series of "0" and "1" separated by dots in keeping with the path information of the MIB tree
-	Specifies whether the filtered elements are used or excluded	<ul style="list-style-type: none"> <li>included</li> <li>excluded</li> </ul>
-	specifies whether the settings remain following a restart:	<ul style="list-style-type: none"> <li>volatile (volatile): The default settings are used after a restart</li> <li>nonvolatile (non-volatile): The saved settings are used after a restart</li> </ul>

If optional parameters are not specified when configuring, the following defaults apply:

Parameters	Default value
OIDMask	None
View type	included
Storage type	nonvolatile

### Result

The SNMP view is configured.

### Further notes

You delete the view with the `no snmp view` command.

You display the configured view trees with the `show snmp viewtree` command.

You display the SNMP group access rights with the `show snmp group access` command.

You configure the SNMP group access rights with the `snmp access` command.

### 6.3.2.21 no snmp view

#### Description

With this command, you delete an SNMP view.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
no snmp view <ViewName><OIDTree>
```

The parameters have the following meaning:

Parameters	Description	Range of values
ViewName	Name of the view	max. 32 characters
OIDTree	Object ID	Path information of the MIB tree

#### Result

The SNMP view is deleted.

#### Further notes

You configure a view with the `snmp view` command.

## 6.4 SMTP client

This section describes commands of the Simple Mail Transfer Protocol (SMTP).

### 6.4.1 show events emailserver

#### Description

This command shows the configured e-mail servers.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

### Syntax

Call the command without parameters:

```
show events emailserver
```

### Result

The configured e-mail servers are displayed.

## 6.4.2 show events sender email

### Description

This command shows the configured e-mail sender address.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

### Syntax

Call the command without parameters:

```
show events sender email
```

### Result

The configured e-mail sender address is displayed.

## 6.4.3 show events smtp-port

### Description

This command shows the configured SNMP port.

## Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

## Syntax

Call the command without parameters:

```
show events smtp port
```

## Result

The configured SMTP port is displayed.

## 6.4.4 Commands in the Events configuration mode

This section describes commands that you can call up in the EVENTS configuration mode.

In the Global configuration mode, enter the `events` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

- If you exit the EVENTS configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the EVENTS configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 6.4.4.1 emailserver

#### Description

With this command, you configure an e-mail server entry.

#### Requirement

You are in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```

#### Syntax

Call up the command with the following parameters:

```
emailserver<ipv4><receiver mail-address>
```

The parameter has the following meaning:

Parameters	Description	Range of values
ipv4	Value for an IPv4 address	Enter a valid IPv4 address
receiver mail-address	Name of the recipient	max. 100 characters

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

An e-mail server entry is configured.

## Further notes

You delete an e-mail server entry with the `no emailserver` command.

### 6.4.4.2 no emailserver

## Description

With this command, you delete an e-mail server entry.

## Requirement

You are in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```

## Syntax

Call the command without parameters:

```
no emailserver
```

## Result

The e-mail server entry is deleted.

## Further notes

You configure an e-mail server entry with the `emailserver` command.



### 6.4.4.3 sender mail-address

#### Description

With this command, you configure the e-mail name of the sender.

#### Requirement

You are in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```

#### Syntax

Call up the command with the following parameters:

```
sender mail-address <mail-id(100)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
mail-id	E-mail name of the sender	max. 100 characters

#### Result

The e-mail name of the sender is configured.

#### Further notes

You reset the e-mail name of the sender with the `no sender mail-address`.

You display the setting with the `show events sender email` command.

### 6.4.4.4 no sender mail-address

#### Description

With this command, you reset the e-mail name of the sender.

#### Requirement

You are in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```

### Syntax

Call the command without parameters:

```
no sender mail-address
```

### Result

The e-mail name of the sender is reset.

### Further notes

You configure the e-mail name of the sender with the `sender mail-address`.

You display the setting with the `show events sender email` command.

## 6.4.4.5 smtp-port

### Description

With this command, you configure an SMTP port.

### Requirement

You are in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```

### Syntax

Call up the command with the following parameters:

```
smtp-port <integer(1-65535)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
integer	Value for the SMTP port	1 ... 65535

At system start or when using the command `restart` with the option `memory` or `factory`, the following defaults apply:

- The port is configured to 25.

### Result

An SMTP port is configured.

### Further notes

You can reset the setting to the default with the `no smtp-port` command.

#### 6.4.4.6 no smtp-port

### Description

With this command, you reset the SMTP port to the default.  
The default value is 25.

### Requirement

You are in the EVENTS configuration mode.  
The command prompt is as follows:

```
cli(config-events)#
```

### Syntax

Call the command without parameters:

```
no smtp-port
```

### Result

The SMTP port is reset to the default value.

### Further notes

You configure the setting with the `smtp-port` command.  
You display the setting with the `show smtp-port` command.

## 6.5 HTTP server

This section describes commands of the Hypertext Transfer Protocol (HTTP).

### 6.5.1 show ip http server status

### Description

This command shows the status of the HTTP server.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

### Syntax

Call the command without parameters:

```
show ip http server status
```

### Result

The status of the HTTP server is displayed.

## 6.5.2 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 6.5.2.1 set ip http

#### Description

With this command, you enable or disable HTTP on the device.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
set ip http {enable|disable}
```

The parameters have the following meaning:

Parameters	Description
enable	Enables HTTP on the device
disable	Disables HTTP on the device

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is enabled.

## Result

HTTP is enabled on the device.

## Further notes

You can display the setting of this function and other information with the `show http server status` command.

## 6.6 HTTPS server

This section describes commands of the Hypertext Transfer Protocol Secure (HTTPS).

### 6.6.1 show ip http secure server status

#### Description

This command shows the status of the HTTP secure server.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call the command without parameters:

```
show ip http secure server status
```

#### Result

The status of the HTTP secure server is displayed.

## 6.6.2 show ssl server-cert

### Description

This command shows the SSL server certificate.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

### Syntax

Call the command without parameters:

```
show ssl server-cert
```

### Result

The SSL server certificate is displayed.

## 6.7 ARP

This section describes commands of the Address Resolution Protocol (ARP).

### 6.7.1 show ip arp

#### Description

With this command, you display the IP ARP table.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call up the command with the following parameters:

```
show ip arp [{vlan<vlan-id(1-4094)>|<interface-type><interface-id>|  
            <ip-address>|<mac-address>|summary|information}]
```

The parameters have the following meaning:

Parameters	Description	Range of values
vlan	Keyword for a VLAN connection	-
vlan-id	Number of the addressed VLAN	1 ... 4094
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name
ip-address	Shows the IP addresses of the entries in the ARP table	-
mac-address	Shows the MAC addresses of the entries in the ARP table	-
summary	Shows a summary of the entries in the ARP table	-
information	Displays information on the ARP configuration	-

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameter from the parameter list, the IP ARP table is displayed.

## Result

The IP ARP table is displayed.

## 6.8 SSH server

This section describes commands of the Secure Shell (SSH) Server.

### 6.8.1 show ip ssh

#### Description

This command shows the settings of the SSH server.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call the command without parameters:

```
show ip ssh
```

## Result

The settings for the SSH server are displayed.

## 6.8.2 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 6.8.2.1 ssh-server

#### Description

With this command, you enable the SSH protocol on the device.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call the command without parameters:

```
ssh-server
```

At system start or when using the command `restart` with the option `memory` or `factory`, the following defaults apply:

- The function is enabled.

#### Result

The SSH protocol is enabled on the device.

#### Further notes

You disable the SSH protocol with the `no ssh-server` command.



## 6.8.2.2 no ssh-server

### Description

With this command, you disable the SSH protocol on the device.

### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

### Syntax

Call the command without parameters:

```
no ssh-server
```

### Result

The SSH protocol is disabled on the device.

### Further notes

You enable the SSH protocol with the `ssh-server` command.



## Layer 2 management protocols

In this part, you will find sections relating to the topics GARP, GMRP, GVRP, IGMP snooping and IGMP querying.

### 7.1 GARP

This section describes commands of the following protocols:

- GARP - Generic Attribute Registration Protocol
- GMRP - GARP Multicast Registration Protocol
- GVRP - GARP VLAN Registration Protocol

#### 7.1.1 show forward-all

##### Description

With this command, you display the entries of the GMRP forward all table.

##### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

##### Syntax

Call the command without parameters:

```
show forward-all
```

##### Result

The entries of the GMRP forward all table are displayed.

## 7.1.2 show forward-unregistered

### Description

With this command, you display the entries of the GMRP forward unregistered all table.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

### Syntax

Call the command without parameters:

```
show forward-unregistered
```

### Result

The entries of the GMRP forward unregistered table are displayed.

## 7.1.3 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 7.1.3.1 set gmrp

#### Description

With this command, you enable or disable the GMRP function for all interfaces on the device.

#### Requirement

- The GARP module is activated

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
set gmrp {enable|disable}
```

The parameters have the following meaning:

Parameters	Description
enable	Enables the function
disable	Disables the function

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is enabled.

## Result

The GMRP function is enabled or disabled.

## Further notes

If you have enabled the GARP module, you start GMRP explicitly with this command.

If you want to enable or disable the function for a specific interface on the device, use the `set port gmrp` command.

You can display the status of this function and other information with the `show vlan device info` command.

### 7.1.3.2 set port gmrp

## Description

With this command, you enable or disable the GMRP function in all VLANs that use a specific interface.

## Requirement

- The GARP module is activated

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
set port gmrp <interface-type><interface-id>{enable|disable}
```

The parameters have the following meaning:

Parameters	Description	Note
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>gigabitethernet</li> <li>extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name
enable	Enables the GMRP function	-
disable	Disables the GMRP function	-

For information on addresses and interfaces, refer to the section "Addresses and interface names".

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is enabled.

## Result

The GMRP function is enabled or disabled on the interface.

## Further notes

If you want to enable or disable the function for all interfaces on the device, use the `set gmrp` command.

You can display the status of this function and other information with the `show vlan port config` command.

### 7.1.3.3 set gvrp

## Description

With this command, you enable or disable the GVRP function for all interfaces on the device.

## Requirement

- The GARP module is activated

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
set gvrp {enable|disable}
```

The parameters have the following meaning:

Parameters	Description
enable	Enables the function
disable	Disables the function

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is enabled.

## Result

The GVRP function is enabled or disabled.

## Further notes

If you have enabled the GARP module, you start GVRP explicitly with this command.

If you want to enable or disable the function for a specific interface on the device, use the `set port gvrp` command.

You can display the status of this function and other information with the `show vlan device info` command.

### 7.1.3.4 set port gvrp

## Description

With this command, you enable or disable the GVRP function in all VLANs that use a specific interface.

## Requirement

- The GARP module is activated

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
set port gvrp <interface-type><interface-id>{enable|disable}
```

The parameters have the following meaning:

Parameters	Description	Note
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>gigabitethernet</li> <li>extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name
enable	Enables the GVRP function	-
disable	Disables the GVRP function	-

For information on addresses and interfaces, refer to the section "Addresses and interface names".

At system start or when using the command `restart` with the option `memory` or `factory`, the following defaults apply:

- The function is enabled.

## Result

The GVRP function is enabled or disabled on the interface.

## Further notes

If you want to enable or disable the function for all interfaces on the device, use the `set gvrp` command.

You can display the status of this function and other information with the `show vlan port config` command.

## 7.2 IGMP snooping

This section describes the snooping functionality of the Internet Group Management Protocol.

### 7.2.1 show ip igmp snooping

#### Description

This command shows information about IGMP snooping for all or a selected VLAN.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```



## Syntax

Call up the command with the following parameters:

```
show ip igmp snooping [Vlan<vlan id>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
vlan	Keyword for a VLAN connection	-
vlan id	Number of the addressed VLAN	1 ... 4094

## Result

The information is displayed.

## 7.2.2 show ip igmp snooping forwarding-database

### Description

This command shows the Multicast forwarding entries for all or a selected VLAN.

### Requirement

- IGS is enabled on the device

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

## Syntax

Call up the command with the following parameters:

```
show ip igmp snooping forwarding-database [Vlan<vlan id>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
vlan	Keyword for a VLAN connection	-
vlan id	Number of the addressed VLAN	1 ... 4094

## Result

The multicast forwarding entries are displayed.

### 7.2.3 show ip igmp snooping statistics

#### Description

This command shows the statistical information about IGMP snooping for all or a selected VLAN.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call up the command with the following parameters:

```
show ip igmp snooping statistics [Vlan<vlan id>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
vlan	Keyword for a VLAN connection	-
vlan id	Number of the addressed VLAN	1 ... 4094

#### Result

The information is displayed.

### 7.2.4 show ip igmp snooping switch-ip

#### Description

This command shows the IP address of the source for IGMP snooping.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call the command without parameters:

```
show ip igmp snooping switch-ip
```

**Result**

The IP address is displayed.

**7.2.5 Commands in the global configuration mode**

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

**7.2.5.1 ip igmp vlan-snooping****Description**

With this command, you enable IGMP snooping for all VLANs.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call the command without parameters:

```
ip igmp vlan-snooping
```

**Result**

IGMP snooping is enabled for all VLANs.

**Further notes**

You disable IGMP snooping with the `no ip igmp vlan-snooping` command.

**7.2.5.2 no ip igmp vlan-snooping****Description**

With this command, you disable IGMP snooping for all VLANs.

### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

### Syntax

Call the command without parameters:

```
no ip igmp vlan-snooping
```

### Result

IGMP snooping is disabled for all VLANs.

### Further notes

You enable IGMP snooping with the `ip igmp vlan-snooping` command.

## 7.2.5.3 ip igmp snooping clear counters

### Description

With this command, you delete the counters for all or a selected VLAN.

### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

### Syntax

Call up the command with the following parameters:

```
ip igmp snooping clear counters [Vlan<vlan id>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
vlan	Shows that the number of a VLAN follows	-
vlan id	Number of the addressed VLAN	1 ... 4094

If you do not select a VLAN, the counters of all VLANs will be deleted.

**Result**

The counters are deleted.

**7.2.5.4 ip igmp snooping switch-ip****Description**

With this command, you configure the IP address of the source for IGMP snooping.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli (config) #
```

**Syntax**

Call up the command with the following parameters:

```
ip igmp snooping switch-ip<switch-ipaddr>
```

The parameter has the following meaning:

Parameters	Description	Range of values
switch-ipaddr	Address of the source	Enter a valid IP address

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

**Result**

The IP address is configured.

**7.2.5.5 ip igmp snooping port-purge-interval****Description**

The time after which a port is deleted from the list if no IGMP router control packets are received is known as the purge time.

With this command, you configure this purge time for a port for a VLAN in seconds.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli (config) #
```

## Syntax

Call up the command with the following parameters:

```
ip igmp snooping port-purge-interval <(130-1225)seconds>
```

The parameters have the following meaning:

Parameters	Description	Note
-	Value for the purge time in seconds	130 ... 1225

At system start or when using the command `restart` with the option `memory` or `factory`, the following defaults apply:

- The purge time is configured to 260 seconds.

## Result

The purge time is configured.

## Further notes

You can reset the setting to the default with the `no ip igmp snooping port-purge-interval` command.

You can display the status of this function and other information with the `show ip igmp snooping globals` command.

### 7.2.5.6 no ip igmp snooping port-purge-interval

#### Description

With this command, you reset the setting for the purge time to the default value.

The default value is 260 seconds.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call the command without parameters:

```
no ip igmp snooping port-purge-interval
```

## Result

The purge time is reset to the default value.

## Further notes

You configure the setting with the `ip igmp snooping port-purge-interval` command.

You can display the status of this function and other information with the `show ip igmp snooping globals` command.

## 7.3 IGMP querier

This section describes the commands for the query functionality of the Internet Group Management Protocol (IGMP).

### 7.3.1 Commands in the VLAN configuration mode

This section describes commands that you can call up in the VLAN configuration mode.

In the Global configuration mode, enter the `vlan` command to change to this mode.

Commands relating to other topics that can be called in the VLAN configuration mode can be found in the relevant sections.

- If you exit the VLAN configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the VLAN configuration mode with the `end` command, you return to the Privileged EXEC mode.

#### 7.3.1.1 ip igmp snooping querier

### Description

With this command, you configure the IGMP snooping switch as querier for a VLAN.

### Requirement

You are in the VLAN configuration mode.

The command prompt is as follows:

```
cli(config-vlan-$$$)#
```

### Syntax

Call the command without parameters:

```
ip igmp snooping querier
```

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is disabled.

## Result

The IGMP snooping switch is configured as querier for a VLAN.

## Further notes

You delete the setting with the `no ip igmp snooping querier` command.

You can display the status of this function and other information with the `show ip igmp snooping` command.

### 7.3.1.2 no ip igmp snooping querier

## Description

With this command, you delete the configuration of an IGMP snooping switch as querier for a VLAN.

## Requirement

You are in the VLAN configuration mode.

The command prompt is as follows:

```
cli(config-vlan-$$$)#
```

## Syntax

Call the command without parameters:

```
no ip igmp snooping querier
```

## Result

The configuration of the IGMP snooping switch as querier for a VLAN is deleted.

## Further notes

You configure the setting with the `ip igmp snooping querier` command.

You can display the status of this function and other information with the `show ip igmp snooping` command.



## Load control

This part contains the sections describing the functions for controlling and balancing network load.

### 8.1 Rate control

This section describes commands for controlling and restricting the data transmission rate of an interface.

#### 8.1.1 show rate-limit output

##### Description

This command shows the packet rate for limiting the outgoing data stream of one or all interfaces.

##### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

##### Syntax

Call up the command with the following parameters:

```
show rate-limit output [interface<interface-type><interface-id>]
```

The parameters have the following meaning:

Parameters	Description	Values
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameter from the parameter list, the entries are displayed for all available interfaces.

## Result

The entries are displayed.

## 8.1.2 Commands in the interface configuration mode

This section describes commands that you can call up in the interface configuration mode. Depending on the Interface selected, various command sets are available.

In the Global configuration mode, enter the `interface` command to change to this mode.

Commands relating to other topics that can be called in the interface configuration mode can be found in the relevant sections.

- If you exit the Interface configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the Interface configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 8.1.2.1 rate-limit output

#### Description

With this command, you configure and enable the packet rate for limiting the outgoing data stream of the interface.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
rate-limit output [rate-value<Mbps(1-10000)>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
rate-value	Keyword for the value of the packet rate	-
Mbps	Value for the packet rate in packets/second	1 ... 10.000

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The packet rate is set to 0.  
The outgoing data stream is not limited.

If you do not select any parameters from the parameter list, the default value is used.

## Result

The limitation of the outgoing data stream of the interface with the packet rate is enabled.

## Further notes

You disable the function with the `no rate-limit output` command.

### 8.1.2.2 no rate-limit output

## Description

With this command, you disable the packet rate for limiting the outgoing data stream of the interface.

## Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call the command without parameters:

```
no rate-limit-output
```

## Result

The limitation of the outgoing data stream of the interface with the packet rate is disabled.

## Further notes

You enable the function with the `rate-limit-output` command.

### 8.1.2.3 storm-control

#### Description

If several packets are sent to some or all nodes in a network at the same time, processing bottlenecks may occur. To prevent this, the sending of these packets can be delayed until the network load has fallen below a threshold.

This function is known as storm control.

With this command, you enable the storm control function for broadcast, multicast or unknown unicast packets of an interface.

You configure the threshold value for the storm control function with the `storm-control level` command.

---

#### Note

#### Applications

Storm control is only supported on physical interfaces.

---

#### Requirement

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
storm-control{broadcast|multicast|dlf}
```

The parameters have the following meaning:

Parameters	Description
broadcast	Limits broadcast packets
multicast	Limits multicast packets
dlf	Limits unicast packets with unresolvable addresses (dlf = destination lookup fail)

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is disabled for all types of transmission.

---

**Note****Configuration of the threshold value**

The default value for the storm control level is 0 packets per second.

The packets are sent without any delay even when there is high network load.

To have the sending of the packets delayed when necessary, configure the threshold value with the `storm-control level` command.

---

**Result**

The storm control function is enabled.

**Further notes**

You enable the function with the `no storm-control` command.

You configure the threshold value for the storm control function with the `storm-control level` command.

**8.1.2.4 no storm-control****Description**

With this command, you disable the storm control function for broadcast, multicast or unknown unicast packets.

**Requirement**

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

**Syntax**

Call up the command with the following parameters:

```
no storm-control{broadcast|multicast|dlf}
```

The parameters have the following meaning:

Parameters	Description
broadcast	Disables broadcast storm control
multicast	Disables multicast storm control
dlf	Disables unknown unicast storm control

If you call up the function without parameters, it is disabled for all types of transmission.

## Result

The storm control function is disabled.

## Further notes

You enable the function with the `storm-control` command.

### 8.1.2.5 storm-control level

## Description

With this command, you configure the value for the storm control function.

## Requirement

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call up the command with the following parameters:

```
storm-control level <rate-value>
```

The parameters have the following meaning:

Parameters	Description	Range of values
rate-value	Value for the storm control level in packets per second	The value range depends on the port speed. The entry is rounded down to the next valid value. If small values are entered, the value is rounded up to the next valid value.

At system start or when using the command `restart` with the option `memory` or `factory`, the following defaults apply:

- The value for the storm control level is configured to 0 packets per second.  
The packets are sent without any delay even when there is high network load.

## Result

The value for the storm control function is configured.

## Further notes

You can reset the setting to the default with the `no storm-control level` command.

### 8.1.2.6 no storm-control level

#### Description

With this command, you reset the value for the storm control function to the default value. The default value for the storm control level is 0 packets per second. The packets are sent without any delay even when there is high network load.

#### Requirement

You are in the Interface Configuration mode.  
The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call the command without parameters:

```
no storm-control level
```

#### Result

The value for the storm control function is reset to the default.

#### Further notes

You configure the value for the storm control function with the `storm-control level` command.

## 8.2 Static MAC filtering

This section describes commands for filtering data packet on an interface.

### 8.2.1 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode. In Privileged EXEC mode, enter the `configure terminal` command to change to this mode. Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections. You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 8.2.1.1 mac-address-table block static multicast

#### Description

With this command, you configure a static multicast MAC address without outgoing ports.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
mac-address-table block static multicast <mcast_mac> vlan <vlan-id(1-4094)>
```

The parameters have the following meaning:

Parameters	Description	Range of values
mcast_mac	Value for a multicast MAC address	aa:aa:aa:aa:aa:aa
vlan	Keyword for a VLAN connection	-
vlan-id	Number of the addressed VLAN	1 ... 4094

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

#### Result

The static multicast MAC address is configured.

#### Further notes

You delete the static multicast MAC address with the `no mac-address-table static multicast` command.

### 8.2.1.2 mac-address-table static multicast

#### Description

With this command, you generate a static multicast MAC address entry in the forwarding database.



## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
mac-address-table static multicast<aa:aa:aa:aa:aa:aa>
  vlan<vlan-id(1-4094)>
  interface ([<interface-type><0/a-b,0/c, ...>]
    [<interface-type><0/a-b,0/c, ...>]
    [port-channel<a,b,c-d>])
  [forbidden-ports ([<interface-type><0/a-b,0/c, ...>]
    [<interface-type><0/ab,0/c, ...>]
    [port-channel <a,b,c-d>])]
```

The parameters have the following meaning:

Parameters	Description	Values or range of values
-	MAC address of the interface	aa:aa:aa:aa:aa:aa
vlan	Keyword for a VLAN connection	-
vlan-id	Number of the addressed VLAN	1 ... 4094
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
0/a-b, 0/c, ...	Slot no. and port no. of the interface	Enter a valid interface name
port-channel	Specifies the name of a port channel	a,b,c-d
forbidden-ports	Keyword for the interface description of the blocked ports	-

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

The entry is generated.

## Further notes

With the `show mac-address-table static multicast` command, you display the list of configured entries.

With the `no mac-address-table static multicast` command, you delete an entry.

### 8.2.1.3 no mac-address-table static multicast

#### Description

With this command, you delete a static multicast MAC address entry from the forwarding database.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
no mac-address-table static multicast<aa:aa:aa:aa:aa:aa>
    vlan<vlan-id(1-4094)>
```

The parameters have the following meaning:

Parameters	Description	Values or range of values
-	MAC address of the interface	aa:aa:aa:aa:aa:aa
vlan	Keyword for the number of a VLAN connection	-
vlan-id	Number of the addressed VLAN	1 ... 4094

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

#### Result

The entry is deleted.

#### Further notes

With the `show mac-address-table static multicast` command, you display the list of configured entries.

With the `mac-address-table static multicast` command, you create an entry.

### 8.2.1.4 mac-address-table static unicast

#### Description

With this command, you generate a static unicast MAC address entry in the forwarding database.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
mac-address-table static unicast<aa:aa:aa:aa:aa:aa>
  vlan<vlan-id(1-4094)>
  interface ([<interface-type><0/a-b, 0/c,...>]
            [<interface-type><0/a-b, 0/c,...>]
            [port-channel<a,b,c-d>])
```

The parameters have the following meaning:

Parameters	Description	Values or range of values
-	MAC address of the interface	aa:aa:aa:aa:aa:aa
vlan	Keyword for a VLAN connection	-
vlan-id	Number of the addressed VLAN	1 ... 4094
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
0/a-b, 0/c,...	Slot no. and port no. of the interface	Enter a valid interface name
port-channel	Specifies the name of a port channel	a,b,c-d

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

The entry is generated.

## Further notes

With the `show mac-address-table static unicast` command, you display the list of configured entries.

With the `no mac-address-table static unicast` command, you delete an entry.

### 8.2.1.5 no mac-address-table static unicast

#### Description

With this command, you delete a static unicast MAC address entry from the forwarding database.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
no mac-address-table static unicast <aa:aa:aa:aa:aa:aa>
    vlan<vlan-id(1-4094)>
```

The parameters have the following meaning:

Parameters	Description	Values
-	MAC address of the interface	aa:aa:aa:aa:aa:aa
vlan	Keyword for a VLAN connection	-
vlan-id	Number of the addressed VLAN	1 ... 4094

#### Result

The entry is deleted.

#### Further notes

With the `show mac-address-table static unicast` command, you display the list of configured entries.

With the `mac-address-table static unicast` command, you create an entry.

## 8.2.2 Commands in the interface configuration mode

This section describes commands that you can call up in the interface configuration mode. Depending on the Interface selected, various command sets are available.

In the Global configuration mode, enter the `interface` command to change to this mode.

Commands relating to other topics that can be called in the interface configuration mode can be found in the relevant sections.

- If you exit the Interface configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the Interface configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 8.2.2.1 **switchport ingress-filter**

#### **Description**

With incoming packets, the ingress filter checks whether the port on which the packet was received belongs to the sending VLAN. If this is not the case, the packet is not processed.

With this command, you enable the ingress filter.

#### **Requirement**

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### **Syntax**

Call the command without parameters:

```
switchport ingress-filter
```

#### **Result**

The ingress filter is activated.

#### **Further notes**

You disable the filter with the `no switchport ingress-filter` command.

You can display the status of the ingress filter and other settings with the `show vlan port config` command.

### 8.2.2.2 **no switchport ingress-filter**

#### **Description**

With this command, you disable the ingress filter.

#### **Requirement**

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

### Syntax

Call the command without parameters:

```
no switchport ingress-filter
```

### Result

The ingress filter is deactivated.

### Further notes

You enable the filter with the `switchport ingress-filter` command.

You can display the status of the ingress filter and other settings with the `show vlan port config` command.

## 8.3 Dynamic MAC aging

The section describes commands with which the aging of dynamically learned entries is configured in a MAC address list.

### 8.3.1 show mac-address-table aging-time

#### Description

To ensure that the address entries are up-to-date, MAC addresses are only kept in the address table for a specified time.

This command shows the time after which the MAC addresses are removed from the address table.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call the command without parameters:

```
show mac-address-table aging-time
```

## Result

The time is displayed.

### 8.3.2 show mac-address-table aging-status

#### Description

This command shows whether or not MAC aging is enabled.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call the command without parameters:

```
show mac-address-table aging-status
```

## Result

The status of the MAC aging is displayed.

### 8.3.3 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 8.3.3.1 mac-address-table aging-time

#### Description

With this command, you configure the aging of a dynamically learned entry in the MAC address list.

---

#### Note

##### Addresses with light data traffic

For addresses with low data traffic, it is recommended to enter a higher value for the aging.

---

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
mac-address-table aging-time <10-360 seconds>
```

The parameter has the following meaning:

Parameters	Description	Range of values
-	Life of the entry in seconds	10 ... 360

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is configured to 300 seconds.

#### Result

The value of the aging of a dynamically learned entry is configured.

#### Further notes

You can reset the setting to the default with the `no mac-address-table aging-time` command.

You display the setting with the `show mac-address-table aging-time` command.



### 8.3.3.2 **no mac-address-table aging-time**

#### **Description**

With this command, you reset the value for the aging of a dynamically learned entry in the MAC address list to the default value.

The default value is 300 s.

#### **Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### **Syntax**

Call the command without parameters:

```
no mac-address-table aging-time
```

#### **Result**

The value of the aging of a dynamically learned entry is reset to the default value.

#### **Further notes**

You configure the setting with the `mac-address-table aging-time` command.

You display the setting with the `show mac-address-table aging-time` command.

## 8.4 **Flow control**

The flow control function monitors the incoming data traffic of a port. If there is overload ("Congestion", "Overflow") it sends a signal to the connection partner. If the flow control function receives a signal at the sending end, it stops the data transmission to avoid loss of data.

This section describes commands of the flow control function.

### 8.4.1 **show flow-control**

#### **Description**

This command shows the settings of the flow control function.

## Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

## Syntax

Call up the command with the following parameters:

```
show flow-control [interface <interface-type><interface-id>]
```

The parameters have the following meaning:

Parameters	Description	Values
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select any parameters from the parameter list, the information for the router will be displayed.

## Result

The settings of the flow control function are displayed.

### 8.4.2 Commands in the interface configuration mode

This section describes commands that you can call up in the interface configuration mode. Depending on the Interface selected, various command sets are available.

In the Global configuration mode, enter the `interface` command to change to this mode.

Commands relating to other topics that can be called in the interface configuration mode can be found in the relevant sections.

- If you exit the Interface configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the Interface configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 8.4.2.1 flowcontrol

#### Description

The flow control function monitors a connection at the receiving end to make sure that not more data is received than can be processed. If flow control detects a threat of data overflow, the partner at the sending end is sent a signal to stop transmitting.

With this command, you configure the flow control function for an interface.

To configure the partner of a flow control send/receive pair, change to the Interface configuration mode of the relevant interface.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
flowcontrol {send|receive}{on|off|desired}
```

The parameters have the following meaning:

Parameters	Description
send	Configures the sending partner of the flow control connection on the receiving interface of the data connection
receive	Configures the receiving partner of the flow control connection on the sending interface of the data connection
on	Enables the function
off	Disables the function
desired	The function is enabled only if the partner device supports it

---

#### Note

##### Transfer direction

Note that the transmission direction of the flow control function is the opposite of the direction of data transmission.

On the receiving interface, configure `flowcontrol send` and `flowcontrol receive` on the sending interface.

---

#### Result

The settings are configured.

## Further notes

You can display the status of this function with the `show flow-control` command.

## 8.5 Service classes

This section describes commands for configuring the assignment tables for service classes and the Differentiated Services Code Point (DSCP).

### 8.5.1 show qos cos-map

#### Description

This command shows assignment table for service classes.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call the command without parameters:

```
show qos cos-map
```

#### Result

The assignment table for service classes is displayed.

### 8.5.2 show qos dscp-map

#### Description

This command shows assignment table for DSCP.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

## Syntax

Call the command without parameters:

```
show qos dscp-map
```

## Result

The assignment table for DSCP is displayed.

## 8.5.3 Commands in the Global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 8.5.3.1 qos

#### Description

With this command, you change to the QOS configuration mode.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli (config) #
```

#### Syntax

Call the command without parameters:

```
qos
```

#### Result

You are now in the QOS configuration mode.

The command prompt is as follows:

```
cli (config-qos) #
```

**Further notes**

You exit the QOS configuration mode with the command `end` or `exit`.

**8.5.4 Commands in the QOS configuration mode**

This section describes commands that you can call up in the QOS configuration mode.

In the Global configuration mode, enter the `qos` command to change to this mode.

- If you exit the QOS configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the QOS configuration mode with the `end` command, you return to the Privileged EXEC mode.

**8.5.4.1 cos-map****Description**

In a network, each data stream is assigned a service class that decides its priority. In special situations, it may be necessary to change this priority.

This change is made using a table in which the service classes are assigned to another queue.

With this command, you configure the assignment table for service classes.

**Requirement**

You are in the QOS configuration mode.

The command prompt is as follows:

```
cli(config-qos)#
```

**Syntax**

Call up the command with the following parameters:

```
cos-map <cos(0-7)> queue <queue(1-8)>
```

The parameters have the following meaning:

Parameters	Description	Range of values
<code>cos</code>	Service class	0 ... 7
<code>queue</code>	Queue that it is assigned to this service class	1 ... 8

At system start or when using the command `restart` with the option `memory` or `factory`, the following defaults apply:

- Service class 0 is assigned to queue 1.
- Service class 1 is assigned to queue 2.  
The rules apply accordingly to the service classes that follow.

## Result

The assignment table for service classes is configured.

### 8.5.4.2 dscp-map

## Description

In a network, each IP packet is assigned a DSCP code that decides its priority. In special situations, it may be necessary to change this priority.

This change is made using a table in which the DSCP codes are assigned to another queue.

With this command, you configure the assignment table for DSCP codes.

## Requirement

You are in the QOS configuration mode.

The command prompt is as follows:

```
cli(config-qos)#
```

## Syntax

Call up the command with the following parameters:

```
dscp-map < dscp (0-63) > queue <queue(1-8) >
```

The parameters have the following meaning:

Parameters	Description	Range of values
dscp	DSCP code	0 ... 63
queue	Queue that is assigned to this DSCP code	1 ... 8

At system start or when using the command `restart` with the option `memory` or `factory`, the following defaults apply:

- The DSCP codes 0 to 7 are assigned to queue 1.
- The DSCP codes 8 to 15 are assigned to queue 2.  
The rules apply accordingly to the DSCP codes following.

## Result

The assignment table for DSCP codes is configured.





## Security and authentication

This part contains the sections that describe the access rights and authentication methods.

### 9.1 User rights management

This section describes commands for access as administrator and the configuration of the authentication methods.

#### 9.1.1 show users

##### Description

This command shows the logged in users.

##### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

##### Syntax

Call the command without parameters:

```
show users
```

##### Result

The logged in users are displayed.

#### 9.1.2 whoami

##### Description

This command shows the user name of the logged in user.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

### Syntax

Call the command without parameters:

```
whoami
```

### Result

The user name of the logged in user is displayed.

## 9.2 Radius client

RADIUS (Remote Authentication Dial-In User Service) is a client/server protocol that allows the centralized authentication of users logging on in a physical or virtual network. This makes central administration of user data possible.

This section describes commands relevant for the configuration of this service.

### 9.2.1 show radius statistics

#### Description

This command shows the connection statistics from the RADIUS client to the RADIUS server.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call the command without parameters:

```
show radius statistics
```

## Result

The connection statistics are displayed.

## 9.2.2 show radius server

### Description

This command shows the RADIUS server configuration.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

### Syntax

Call up the command with the following parameters:

```
show radius server [{ucast_addr}]
```

The parameters have the following meaning:

Parameters	Description	Range of values
ucast_addr	Value for an IPv4 unicast address	Enter a valid unicast address

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If no parameters are specified, all configured RADIUS servers are displayed.

## Result

The RADIUS server configuration is displayed.

## 9.2.3 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 9.2.3.1 radius-server host

#### Description

With this command, you configure a RADIUS server entry on the RADIUS client.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
radius-server host {ipv4-address} [auth-port<number(1-65535)>]
    [retransmit<1-254>] [key<secret-key-string>] [primary]
```

The parameters have the following meaning:

Parameters	Description	Range of values
ipv4-address	Value for an IPv4 address	Enter a valid IPv4 address
auth-port	Keyword for the UDP port number for authentication	-
number	Number of port	1 ... 65535
retransmit	Maximum number of connection retries	1 ... 254
key	Keyword for communication between the authenticator and the server	-
secret-key-string	Value for the key	46 characters
primary	Identifies the RADIUS server as primary server	-

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If optional parameters are not specified when configuring, the following defaults apply:

Parameters	Default value
auth-port	1812
retransmit	3
secret-key-string	empty string

**Note****Primary server**

In a network, only one RADIUS server can be selected as the primary server.

If you select a RADIUS server as the primary server, this replaces the server that previously had the role of primary server.

**Result**

The entry for a connection between the RADIUS client and a server is configured.

**Further notes**

You delete the configuration of a RADIUS server with the `no radius-server host` command.

You show the configuration of a RADIUS server on the client with the `show radius server` command.

You show the statistical information of this function with the `show radius statistics` command.

**9.2.3.2 no radius-server host****Description**

With this command, you delete a RADIUS server entry on the RADIUS client.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call up the command with the following parameters:

```
no radius-server host {ipv4-address} [primary]
```

The parameters have the following meaning:

Parameters	Description	Range of values
ipv4-address	Value for an IPv4 address	Enter a valid IPv4 address
primary	Identifies the RADIUS server as primary server	-

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you call a command with the `primary` option, only the identification as primary server is deleted.

## Result

The entry for a connection between the RADIUS client and a server or the identification as primary server is deleted.

## Further notes

You configure the connection of a RADIUS client to a server with the `radius-server host` command.

You show the configuration of a RADIUS server on the client with the `show radius server` command.

You show the statistical information of this function with the `show radius statistics` command.

## 9.3 MAC access control list

This section describes commands for working with MAC access control lists.

### 9.3.1 show access-lists

#### Description

This command shows the configuration of the access control lists.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call up the command with the following parameters:

```
show access-lists [{mac}]<access-list-number(1-128)>
```

The parameters have the following meaning:

Parameters	Description	Range of values
mac	Selects MAC-based access lists	-
access-list-number	Number of the access control list	1 ... 128

If you do not select any parameters from the parameter list, the configuration of all access lists will be displayed.

## Result

The configuration of the access control lists is displayed.

## 9.3.2 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 9.3.2.1 mac access-list extended

#### Description

With this command, you generate a MAC access control list and change to the MAC ACL configuration mode.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
mac access-list extended<access-list-number(1-128)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
access-list-number	Number of the access control list	1 ... 128

## Result

A MAC access control list has been generated.  
You are now in the MAC ACL configuration mode.  
The command prompt is as follows:  
`cli(config-ext-macl)#`

## Further notes

You delete the MAC access control list with the `no mac access-list extended` command.  
You exit the MAC ACL configuration mode with the `exit` command.  
You display the configuration of the access control list with the `show access-lists` command.

### 9.3.2.2 no mac access-list extended

## Description

With this command, you delete a MAC access control list.

## Requirement

You are in the Global configuration mode.  
The command prompt is as follows:  
`cli(config)#`

## Syntax

Call up the command with the following parameters:

```
no mac access-list extended<short(1-128)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
short	Number of the access control list	1 ... 128

## Result

The MAC access control list is deleted.

## Further notes

You generate a MAC ACL with the `mac access-list extended` command.  
You display the configuration of the access control list with the `show access-lists` command.



### 9.3.3 Commands in the interface configuration mode

This section describes commands that you can call up in the interface configuration mode. Depending on the Interface selected, various command sets are available.

In the Global configuration mode, enter the `interface` command to change to this mode.

Commands relating to other topics that can be called in the interface configuration mode can be found in the relevant sections.

- If you exit the Interface configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the Interface configuration mode with the `end` command, you return to the Privileged EXEC mode.

#### 9.3.3.1 mac access-group

##### Description

With this command, you enable the access control of the packets of an interface.

##### Requirement

- A MAC access control list has been created.

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

##### Syntax

Call up the command with the following parameters:

```
mac access-group <access-list-number(1-128)>{in|out}
```

The parameters have the following meaning:

Parameters	Description	Values
access-list-number	Number of the access control list	1 ... 128
in	Specifies that incoming packets are filtered	-
out	Specifies that outgoing packets are filtered	-

##### Result

The packets are filtered according to the access control list (ACL).

##### Further notes

You disable the setting with the `no mac access-group` command.

You display the statistical data of the access control list with the `show access-lists` command.

### 9.3.3.2 no mac access-group

#### Description

With this command, you disable the access control of the packets of an interface.

#### Requirement

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
no mac access-group <access-list-number(1-128)>{in|out}
```

The parameters have the following meaning:

Parameters	Description	Values
access-list-number	Number of the access control list	1 ... 128
in	Specifies that incoming packets are filtered	-
out	Specifies that outgoing packets are filtered	-

#### Result

The packet filtering according to the access control list (ACL) is canceled.

#### Further notes

You enable the setting with the `mac access-group` command.

You display the configuration of the access control list with the `show access-lists` command.

### 9.3.4 Commands in the MAC ACL configuration mode

This section describes commands that you can call up in the MAC ACL configuration mode.

In the Global configuration mode, enter the `mac access-list extended` command to change to this mode.

- If you exit the MAC ACL configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the MAC ACL configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 9.3.4.1 permit

#### Description

With this command, you configure a MAC address control list that describes the MAC addresses for which incoming and/or outgoing data traffic is permitted.

The access control list contains only one entry. If you want to lock or permit further addresses, create a new access control list.

#### NOTICE

##### Processing order of the lists

The access control lists are processed in the order in which they were created.

The index number of the access control list is not used for this.

#### Requirement

You are in the MAC ACL configuration mode.

The command prompt is as follows:

```
cli(config-ext-macl)#
```

#### Syntax

Call up the command with the following parameters:

```
permit {any|host<src-mac-address>}{any|host<dest-mac-address>}
```

The parameters have the following meaning:

Parameters	Description	Values
any	permits all incoming connections	-
host	Keyword for the MAC address of an incoming connection that is permitted	-
src-mac-address	MAC address of the permitted incoming connection	Enter a valid MAC address
any	permits all outgoing connections	-
host	Keyword for the MAC address of an outgoing connection that is permitted	-
dest-mac-address	MAC address of the permitted outgoing connection	Enter a valid MAC address

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

### Result

The MAC access control list is configured.

### Further notes

You exit the MAC ACL configuration mode with the `exit` command.

You delete the MAC access control list with the `no mac access-list` extended command.

You display the configuration of the access control list with the `show access-lists` command.

### 9.3.4.2 deny

#### Description

With this command, you configure a MAC address control list that describes the MAC addresses for which incoming and/or outgoing data traffic is locked.

The access control list contains only one entry. If you want to lock or permit further addresses, create a new access control list.

<b>NOTICE</b>
<b>Processing order of the lists</b>
The access lists are processed in the order in which they were created.
The index number of the access list is not used for this.

#### Requirement

You are in the MAC ACL configuration mode.

The command prompt is as follows:

```
cli(config-ext-macl)#
```

#### Syntax

Call up the command with the following parameters:

```
deny {any|host<src-mac-address>} {any|host<dest-mac-address>}
```

The parameters have the following meaning:

Parameters	Description	Values
any	locks all incoming connections	-
host	Keyword for the MAC address of an incoming connection that is locked	-
src-mac-address	MAC address of the locked incoming connection	Enter a valid MAC address
any	locks all outgoing connections	-
host	Keyword for the MAC address of an outgoing connection that is locked	-
dest-mac-address	MAC address of the locked outgoing connection	Enter a valid MAC address

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

The MAC access control list is configured.

## Further notes

You exit the MAC ACL configuration mode with the `exit` command.

You delete the MAC access control list with the `no mac access-list extended` command.

You display the configuration of the access control list with the `show access-lists` command.

## 9.4 Port Access Control List Locked Ports

With the Port Access Control List Locked Ports, MAC addresses that do not age are collected on a port after the `start` command. With the `stop` command, these addresses are converted to static entries in the address list and the aging is reactivated for all the addresses that follow.

If the learning of addresses on this port is then disabled, data packets are only forwarded to the static addresses entered in the table.

This section describes commands relevant for the configuration of this function.

### 9.4.1 show lock port

#### Description

This command shows whether or not the learning of MAC entries is enabled or locked on an interface.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

### Syntax

Call up the command with the following parameters:

```
show lock port [<interface-type><interface-id>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
interface-type	Type or speed of the interface	<ul style="list-style-type: none"><li>gigabitethernet</li><li>extreme-ethernet</li></ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select an interface, the configuration of all interfaces is displayed.

### Result

The configuration of the interface for the learning of MAC entries is displayed.

## 9.4.2 Commands in the Global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 9.4.2.1 clear-all-static-unicast

#### Description

With this command, you delete all static unicast MAC address entries from the MAC address table.

### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

### Syntax

Call the command without parameters:

```
clear-all-static-unicast
```

### Result

The static unicast MAC address entries are deleted from the MAC address table.

## 9.4.2.2 auto-learn

### Description

With this command, you change to the AUTOLEARN mode.

### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

### Syntax

Call the command without parameters:

```
auto-learn
```

### Result

You are now in the AUTOLEARN mode.

The command prompt is as follows:

```
cli(config-auto-learn)#
```

### Further notes

You exit the AUTOLEARN configuration mode with the command `end` or `exit`.

### 9.4.3 Commands in the interface configuration mode

This section describes commands that you can call up in the interface configuration mode. Depending on the Interface selected, various command sets are available.

In the Global configuration mode, enter the `interface` command to change to this mode.

Commands relating to other topics that can be called in the interface configuration mode can be found in the relevant sections.

- If you exit the Interface configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the Interface configuration mode with the `end` command, you return to the Privileged EXEC mode.

#### 9.4.3.1 `switchport lock`

##### Description

With this command, you block the learning of MAC entries. Only the static address entries of the MAC address list are used on the port.

##### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

##### Syntax

Call the command without parameters:

```
switchport lock
```

##### Result

The learning of MAC addresses is blocked.

##### Further notes

You permit the learning of MAC addresses with the `no switchport lock` command.

#### 9.4.3.2 `no switchport lock`

##### Description

With this command, you enable the learning of MAC addresses.



## Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call the command without parameters:

```
no switchport lock
```

## Result

The learning of MAC addresses is enabled.

## Further notes

You block the learning of MAC addresses with the `switchport lock` command.

## 9.4.4 Commands in the AUTOLEARN mode

This section describes commands that you can call up in the AUTOLEARN mode.

In the Global configuration mode, enter the `auto-learn` command to change to this mode.

- If you exit the AUTOLEARN mode with the `exit` command, you return to the Global configuration mode.
- If you exit the AUTOLEARN mode with the `end` command, you return to the Privileged EXEC mode.

### 9.4.4.1 start

#### Description

With this command, you end the aging of the MAC addresses and start the permanent learning of unicast MAC entries.

#### Requirement

You are in the AUTOLEARN mode.

The command prompt is as follows:

```
cli(config-auto-learn)#
```

### Syntax

Call the command without parameters:

```
start
```

### Result

The aging of the MAC addresses is ended and the permanent learning of unicast MAC entries started.

### Further notes

You end the permanent learning of unicast MAC entries and start the aging of the MAC addresses with the `stop` command.

### 9.4.4.2 stop

#### Description

With this command, you end the permanent learning of unicast MAC entries, save the learned addresses as static addresses and start the aging of the MAC addresses.

#### Requirement

You are in the AUTOLEARN mode.

The command prompt is as follows:

```
cli(config-auto-learn)#
```

### Syntax

Call the command without parameters:

```
stop
```

### Result

The permanent learning of unicast MAC entries is ended, the learned addresses have been saved and the aging of the MAC addresses has been started.

### Further notes

You end the aging of the MAC addresses and start the permanent learning of unicast MAC entries with the `start` command.

## 9.5 Management Access Control List

This section describes the commands relevant for working with the management access control list.

### 9.5.1 show authorized-managers

#### Description

This command shows the information about the configuration of the authorized managers.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

#### Syntax

Call up the command with the following parameters:

```
show authorized-managers [ip-source<ip-address>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
ip-source	Keyword for the network or host address	-
ip-address	Value for an IP address	Enter a valid IP address

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

#### Result

The information about the configuration of the authorized managers is displayed.

### 9.5.2 Commands in the Global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 9.5.2.1 authorized-manager ip-source

#### Description

With this command, you configure the interfaces and protocols via which an authorized manager is allowed to access the device.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call up the command with the following parameters:

```
authorized-manager ip-source <ip-address>
    [{<subnet-mask>|/<prefixlength(1-32)>}]
    [interface[<interface-type<0/a-b,0/c,...>]
        [<interface-type<0/a-b,0/c,...>]]
    [vlan<a,b or a-b or a,b,c-d>]
    [cpu0]
    [service[snmp] [telnet] [http] [https] [ssh]]
```

The parameters have the following meaning:

Parameters	Description	Range of values
ip-address	Specifies the network or the IP address for which the IP manager is authorized	Enter a valid IP address or a network
subnet-mask	Subnet mask that restricts the authorization	Enter a valid mask
prefixlength	Decimal representation of the mask as a number of "1" bits	1 ... 32
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
0/a-b,0/c,...	Slot no. and port no. of the interface	Enter a valid interface name
vlan	Keyword for a VLAN connection	-
a,b or a-b or a,b,c-d	Number of a VLAN or VLAN range	enter a valid VLAN or VLAN range
cpu0	the Out of Band interface is configured as a management Interface	-
service	Specifies the services for which the manager is authorized. You can select several options.	<ul style="list-style-type: none"> <li>• snmp</li> <li>• telnet</li> <li>• http</li> <li>• https</li> <li>• ssh</li> </ul>

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

The IP address 0.0.0.0 means "any manager"

If optional parameters are not specified when configuring, the following defaults apply:

- The manager is authorized for all services.

<b>NOTICE</b>
<b>Configuration of the first entry</b>
As long as the list of authorized managers is empty, access to the system is not restricted.
As soon as the list contains an entry, access to the system is blocked for all others.
You should therefore configure the interface via which you access the system first because your access is otherwise blocked.

## Result

The interfaces and protocols via which an authorized manager is allowed to access the device are configured.

## Further notes

You delete an interface for access of an authorized manager with the `no authorized-manager ip-source` command.

You show the information about the configuration of the authorized managers with the `show authorized-manager` command.

### 9.5.2.2 no authorized-manager ip-source

#### Description

With this command, you delete an interface via which an authorized manager is allowed to access the device.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli (config) #
```

#### Syntax

Call up the command with the following parameters:

9.6 Port Based Network Access Control

```
authorized-manager ip-source <ip-address>
    [{<subnet-mask>|/<prefixlength(1-32)>}]
```

The parameters have the following meaning:

Parameters	Description	Range of values
ip-address	Specifies the network or the IP address for which the IP manager is authorized	Enter a valid IP address or a network
subnet-mask	Subnet mask that restricts the authorization	Enter a valid mask
prefixlength	Decimal representation of the mask as a number of "1" bits	1 ... 32

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

Result

An authorized manager is deleted from the list.

Further notes

You configure the interfaces and protocols via which an authorized manager is allowed to access the device with the `authorized-manager ip-source` command.

You show the information about the configuration of the authorized managers with the `show authorized-manager` command.

## 9.6 Port Based Network Access Control

This section describes commands for working with port-based network access control (PNAC).

### 9.6.1 show dot1x

Description

This command shows information about port-based network access control (PNAC).

Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

## Syntax

Call up the command with the following parameters:

```
show dot1x[{interface<interface-type><interface-id>|
           statistics interface<interface-type><interface-id>}]
```

The parameters have the following meaning:

Parameters	Description	Values
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name
statistics interface	Keyword for the display of the statistical data of the dot1x Authenticator for an interface	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

The dot1x information is displayed.

## 9.6.2 Commands in the global configuration mode

### 9.6.2.1 Introductory sentence for the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 9.6.2.2 dot1x reauthentication

## Description

With this command, you enable the function that repeats the authentication of the client by the authenticator periodically on all interfaces.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call the command without parameters:

```
dot1x reauthentication
```

## Result

Periodic authentication is enabled for all interfaces.

## Further notes

You disable the function with the `no dot1x reauthentication` command.

You can display the status of this function and other information with the `show dot1x` command.

### 9.6.2.3 no dot1x reauthentication

## Description

With this command, you disable the function that repeats the authentication of the client by the authenticator periodically.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call the command without parameters:

```
no dot1x reauthentication
```

## Result

Periodic authentication is disabled.



## Further notes

You enable the function with the `dot1x reauthentication` command.

You can display the status of this function and other information with the `show dot1x` command.

## 9.6.3 Commands in the interface configuration mode

This section describes commands that you can call up in the interface configuration mode. Depending on the Interface selected, various command sets are available.

In the Global configuration mode, enter the `interface` command to change to this mode.

Commands relating to other topics that can be called in the interface configuration mode can be found in the relevant sections.

- If you exit the Interface configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the Interface configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 9.6.3.1 dot1x port-control

#### Description

With this command, you configure port control parameter of the authenticator.

#### Requirement

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli (config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
dot1x port-control {auto|force-authorized|force-unauthorized}
```

The parameters have the following meaning:

Parameters	Description
auto	Authentication according to IEEE 802.1x is enabled for the interface. The data traffic via the interface is permitted or blocked depending on the authentication result.
force-authorized	data traffic via the interface is permitted without restrictions
force-unauthorized	data traffic via the interface is blocked

At system start or when using the command `restart` with the option `memory` or `factory`, the following defaults apply:

- The function is configured for `force-authorized`.

## Result

The port control parameter is configured.

## Further notes

You can reset the port control parameter to the default with the `no dot1x port-control` command.

You can display the status of this function and other information with the `show dot1x` command.

### 9.6.3.2 no dot1x port-control

## Description

With this command, you reset the port control parameter of the authenticator to the default value.

The default value is `force-authorized`.

With this, data traffic is permitted without restrictions.

## Requirement

You are in the Interface Configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

## Syntax

Call the command without parameters:

```
no dot1x port-control
```

## Result

The port control parameter of the authenticator is reset to the default value.

## Further notes

You configure the port control parameter with the `dot1x port-control` command.

You can display the status of this function and other information with the `show dot1x` command.

## Diagnostics

The monitoring of the system and error diagnostics are handled in different ways:

- Events and faults handling:  
Predefined events generate a message. These messages can be distributed in different ways:
  - Entry in the local log
  - Transfer to the Syslog server
  - Sending as e-mail
  - Sending as SNMP trap
- Syslog:  
Configures the transfer to the Syslog server
- Remote Monitoring (RMON):  
Variables of the Management Information Base are monitored for the violation of limit values and messages are generated if they do. These messages are collected and can be distributed in the following ways:
  - Entry in the local log
  - Sending as SNMP trap
- Port mirroring:  
Mirroring of ports to analyze the data stream without disturbing operation

### 10.1 Diagnostics

In events and faults handling, you set the events whose messages will be distributed in one of the available ways.

You configure the monitoring of certain system events and power supply and physical interfaces in the Events configuration mode.

#### 10.1.1 show events config

##### Description

This command shows the current configuration for forwarding the messages of the various event types.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

### Syntax

Call the command without parameters:

```
show events config
```

### Result

The current configuration of the events display is displayed.

## 10.1.2 show events faults config

### Description

This command shows the current configuration of the following error monitoring functions:

- Monitoring of the power supply for power outage
- Monitoring of the network connections for a change in the connection status

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

### Syntax

Call up the command with the following parameters:

```
show events faults config [{power|link}]
```

The parameters have the following meaning:

Parameters	Description
power	Monitoring of the power supply for power outage
link	Monitoring of the network connections for a change in the connection status

If no parameters are specified, the settings for both error monitoring functions are displayed.

### Result

The current configuration of the selected error monitoring function is displayed.

### 10.1.3 show events faults status

#### Description

This command shows the status messages of fault monitoring of the power supply and network connections.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call the command without parameters:

```
show events faults status
```

#### Result

The status messages of the error monitoring functions are displayed.

### 10.1.4 show logbook

#### Description

With this command, you display the content of the logbook.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

#### Syntax

Call the command without parameters:

```
show logbook
```

#### Result

The content of the logbook is displayed.

## 10.1.5 show power-line-state

### Description

This command shows the status of the power supply.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> or cli#
```

### Syntax

Call the command without parameters:

```
show power-line-state
```

### Result

The status of the power supply is displayed.

## 10.1.6 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 10.1.6.1 events

#### Description

With this command, you change to the EVENTS configuration mode.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call the command without parameters:

```
events
```

## Result

You are now in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```

## Further notes

You exit the EVENTS configuration mode with the command `end` or `exit`.

## 10.1.7 Commands in the Events configuration mode

This section describes commands that you can call up in the EVENTS configuration mode.

In the Global configuration mode, enter the `events` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

- If you exit the EVENTS configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the EVENTS configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 10.1.7.1 clear logbook

#### Description

With this command, you delete the content of the logbook.

#### Requirement

You are in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```

#### Syntax

Call the command without parameters:

```
clear logbook
```

**Result**

The content of the logbook is deleted.

**10.1.7.2 add log**

**Description**

With this command, you make an entry in the logbook.

**Requirement**

You are in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```

**Syntax**

Call the command without parameters:

```
add log <string>
```

The parameter has the following meaning:

Parameters	Description	Note
string	Entry in the logbook	max. 150 characters

**Result**

The entry has been made in the logbook.

**10.1.7.3 power**

**Description**

With this command, you configure and activate the monitoring of the power supplies.

**Requirement**

You are in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```



## Syntax

Call up the command with the following parameters:

```
power [{L1|L2}]
```

The parameters have the following meaning:

Parameters	Description
L1	Monitoring of power supply 1
L2	Monitoring of power supply 2

If you do not select any parameters from the parameter list, the default value "L1 and L2" is used.

## Result

The setting for monitoring the power supplies is configured.

## Further notes

You can display the current setting with the `show events faults config` command.

You disable the function with the `no power` command.

### 10.1.7.4 no power

## Description

With this command, you disable the monitoring of the power supplies.

## Requirement

You are in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```

## Syntax

Call up the command with the following parameters:

```
no power [{L1|L2}]
```

The parameters have the following meaning:

Parameters	Description
L1	No monitoring of power supply 1
L2	No monitoring of power supply 2

If you do not select any parameters from the parameter list, the default value "L1 and L2" is used.

**Result**

The setting for monitoring the power supplies is configured.

**Further notes**

You can display the current setting with the `show events faults config` command.

You enable the function with the `power` command.

**10.1.7.5 link****Description**

With this command, you configure and enable the monitoring of the physical network connections for cable breaks or for pulling of the connector.

**Requirement**

You are in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```

**Syntax**

Call up the command with the following parameters:

```
link {up|down} [<interface-type><0/a-b,0/c...>] [port-channel<a,b,c-d>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
up	Only the establishment of a connection is signaled	-
down	Only a break on a connection is signaled	-
interface-Type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
0/a-b,0/c...	Slot no. and port no. of the interface	Enter a valid interface name
port-channel	Keyword for a port channel address	-
a,b,c-d	Name of the port channel	-

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select an interface, the function is enabled for all available interfaces.

**Result**

The settings for monitoring the physical network connections have been configured.

## Further notes

You can display the current setting with the `show events faults config` command.

You disable the function with the `no link` command.

### 10.1.7.6 no link

## Description

With this command, you disable the monitoring of the physical network connections for cable breaks or for pulling of the connector.

## Requirement

You are in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```

## Syntax

Call up the command with the following parameters:

```
no link {up|down} [<interface-type><0/a-b,0/c...>] [port-channel<a,b,c-d>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
up	The message when establishing a connection is disabled	-
down	The message when a connection is down is disabled	-
interface-Type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> </ul>
0/a-b,0/c...	Slot no. and port no. of the interface	Enter a valid interface name
port-Channel	Keyword for a port channel address	-
a,b,c-d	Name of the port channel	-

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

If you do not select an interface, the function is disabled for all available interfaces.

## Result

The settings for monitoring the physical network connections have been configured.

### Further notes

You can display the current setting with the `show events faults config` command.

You enable the function with the `link` command.

### 10.1.7.7 send test mail

#### Description

With this command, you send an e-mail according to the currently configured SMTP settings.

#### Requirement

You are in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```

#### Syntax

Call the command without parameters:

```
send test mail
```

#### Result

An e-mail according to the currently configured SMTP settings is sent.

### Further notes

You can display the current SMTP settings with the `show events emailserver` command.

## 10.2 Syslog client

With the commands in this section, the following settings are configured:

- Transfer of the messages to the log server
- Local buffering and storage of messages
- Receipt and forwarding of messages from other devices (relay mode)

## 10.2.1 show events syslogserver

### Description

This command shows the entries of the configured log server.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> Or cli#
```

### Syntax

Call the command without parameters:

```
show events syslogserver
```

### Result

The entries of the configured log server are displayed.

## 10.2.2 Commands in the Events configuration mode

This section describes commands that you can call up in the EVENTS configuration mode.

In the Global configuration mode, enter the `events` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

- If you exit the EVENTS configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the EVENTS configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 10.2.2.1 syslogserver

#### Description

With this command, you add an entry to the Syslog forwarding table.

#### Requirement

You are in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```

## Syntax

Call up the command with the following parameters:

```
syslogserver {ipv4 address <ucast_addr>} [port <integer (0-65535) >]
```

The parameters have the following meaning:

Parameters	Description	Range of values
ipv4 address	Keyword for an IPv4 address	-
ucast_addr	Value for a unicast IPv4 address	Enter a valid IPv4 address
port	Keyword for the port of the log server on which the messages are received	-
integer	Number of port	0 ... 65535

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The port of the log server is configured to 514.

If you do not specify any parameters, the default value is used.

## Result

An entry has been added to the Syslog forwarding table.

## Further notes

You delete an entry from the Syslog forwarding table with the `no syslogserver` command.

### 10.2.2.2 no syslogserver

## Description

With this command, you delete an entry from the Syslog forwarding table.

## Requirement

You are in the EVENTS configuration mode.

The command prompt is as follows:

```
cli(config-events)#
```

## Syntax

Call up the command with the following parameters:

```
no syslogserver {ipv4 address <ucast_addr>}
```

The parameters have the following meaning:

Parameters	Description	Range of values
ipv4_address	Keyword for an IPv4 address	-
ucast_addr	Value for a unicast IPv4 address	Enter a valid IPv4 address

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

The entry is deleted from the Syslog forwarding table.

## Further notes

You add an entry to the Syslog forwarding table with the `syslogserver` command.

## 10.3 RMON

The RMON function provides commands with which variables of the Management Information Base (MIB) can be monitored for violation of limit values and to store or forward these events in the following ways:

- Entry in the local log
- Sending as SNMP trap

### 10.3.1 show rmon

#### Description

This command shows the settings of the remote monitoring function.

#### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

#### Syntax

Call up the command with the following parameters:

```
show rmon [statistics [<stats-index(1-65535)>]] [alarms] [events]
          [history [history-index(1-65535)]] [overview]
```

The parameters have the following meaning:

Parameters	Description	Range of values
statistics	Shows counts for various packet characteristics and sizes	-
stats-index	Index number for the statistical values	1 ... 65535
alarms	Shows the threshold values and event assignments for alarms	-
events	Shows the status and the actions that are triggered	-
history	Shows the stored statistical values for earlier transmission periods	-
history-index	Index number for the previous statistical values	1 ... 65535
overview	Displays an overview	-

With this command, you can display several parameters with one call.

If you do not select any parameters from the parameter list, only the `enabled / disabled` status is shown.

## Result

The settings of the remote monitoring function are displayed.

## 10.3.2 Commands in the global configuration mode

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

### 10.3.2.1 rmon alarm

#### Description

With this command, you configure an alarm for monitoring a MIB variable. The variable is checked at specific intervals to determine whether or not it has exceeded or fallen below threshold values. Events are assigned to these occurrences.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```



## Syntax

Call up the command with the following parameters:

```
rmon alarm <alarm-number><mib-object-id(255) >
  <sample-interval-time(1-65535) >
  {absolute|delta}
  rising-threshold<value(0-2147483647) >[risingevent-number(1-65535)]
  falling-threshold<value(0-2147483647) >[fallingevent-number(1-65535)]
  [owner<ownername(127) >]
```

The parameters have the following meaning:

Parameters	Description	Range of values
alarm-number	Number of the alarm	1 ... 65535
mib-object-id	Name of the MIB variable	max. 255 characters
sample-interval-time	Interval for the check [s]	1 ... 65535
absolute	The current absolute value of the monitored MIB is evaluated	-
delta	The difference between the current and the previous value of the monitored MIB is evaluated	-
rising-threshold	Threshold value for rising or high variable values	-
risingevent-number	Event number for this	1 ... 65535
falling-threshold	Threshold value for falling or low variable values	-
fallingevent-number	Event number for this	1 ... 65535
value	Relevant threshold value	1 ... 2147483647
owner	User to which the alarm is assigned	-
ownername	User name of the user	max. 127 characters

If you do not select a parameter from the parameter list, the events for high and low threshold values are assigned the lowest event number available in the event table.

---

### Note

#### MIB variables that can be monitored

With the RMON function, only MIB variables of the Ethernet interfaces can be monitored.

---

### Note

#### Magnitude of the threshold values

The threshold value for falling or low variable values should be less than the threshold value for rising or high variable values.

---

### Note

#### Conditions for working with alarms

The events assigned to the alarms are configured.

The remote monitoring function is started with the `set rmon` command.

---

**Result**

The alarm for monitoring a MIB variable is configured.

**Further notes**

You delete an alarm with the `no rmon alarm` command.

You display the list of configured RMON alarms with the `show rmon alarms` command.

**10.3.2.2 no rmon alarm**

**Description**

With this command, you delete an alarm for monitoring a MIB variable.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call up the command with the following parameters:

```
no rmon alarm <index (1-65535)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
index	Number of the alarm to be deleted	1 ... 65535

**Result**

The entry is deleted.

**10.3.2.3 rmon event**

**Description**

With this command, you configure an event in the RMON Event Table.

You specify its name and the owner and whether or not a logbook entry is made or an SNMP trap is generated.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
rmon event <number(1-65535)>[description<event-description(127)>]
      [log] [owner<ownername(127)>] [trap<community(127)>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
number	Number of the event	1 ... 65535
description	Title of the event	-
event-description	Description of the event	max. 127 characters
log	Specifies whether or not an entry will be made in the logbook of the device	-
owner	User to which the event is assigned	-
ownername	User name of the user	max. 127 characters
trap	Specifies whether an SNMP trap should be sent	-
community	Name of the community to which the SNMP trap will be sent	max. 127 characters

## Result

The event is configured.

## Further notes

You delete an entry with the `no rmon event` command.

You display the RMON Event Table with the `show rmon events` command.

You show the details of the SNMP community with the `show snmp community` command.

### 10.3.2.4 no rmon events

## Description

With this command, you delete an entry from the RMON event table.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call up the command with the following parameters:

```
no rmon events <index (1-65535)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
index	Number of the event entry to be deleted	1 ... 65535

**Result**

The entry is deleted.

**10.3.2.5 set rmon****Description**

With this command, you enable / disable the remote monitoring function.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call up the command with the following parameters:

```
set rmon {enable|disable}
```

The parameters have the following meaning:

Parameters	Description
enable	Enables the remote monitoring function
disable	Disables the remote monitoring function

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is disabled.

## Result

The remote monitoring function is enabled or disabled.

## Further notes

You can display the status of this function and other information with the `show rmon` command.

## 10.3.3 Commands in the interface configuration mode

This section describes commands that you can call up in the interface configuration mode. Depending on the Interface selected, various command sets are available.

In the Global configuration mode, enter the `interface` command to change to this mode.

Commands relating to other topics that can be called in the interface configuration mode can be found in the relevant sections.

- If you exit the Interface configuration mode with the `exit` command, you return to the Global configuration mode.
- If you exit the Interface configuration mode with the `end` command, you return to the Privileged EXEC mode.

### 10.3.3.1 rmon collection stats

#### Description

With this command, you start the recording of statistical data of an interface.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli (config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
rmon collection stats <index (1-65535)>[owner<ownername(127)>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
index	Number of the recording	1 ... 65535
owner	User to which the event is assigned	-
ownername	User name of the user	max. 127 characters

**Result**

The recording of statistical data is started.

**Further notes**

You can display the content of a recording with the `show rmon statistics` command.

**10.3.3.2 no rmon collection stats****Description**

With this command, you end the recording of statistical data of an interface.

**Requirement**

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

**Syntax**

Call up the command with the following parameters:

```
no rmon collection stats <index (1-65535)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
index	Number of the recording	1 ... 65535

**Result**

The recording of statistical data is ended.

### 10.3.3.3 rmon collection history

#### Description

With this command, you configure the collection of statistical data of the interface in a selectable number of recording intervals ("Buckets ") with a specified period.

#### Requirement

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

#### Syntax

Call up the command with the following parameters:

```
rmon collection history<index(1-65535)>
    [buckets<bucket-number(1-65535)>]
    [interval<seconds(1-3600)>]
    [owner<ownername(127)>]
```

The parameters have the following meaning:

Parameters	Description	Range of values
index	Number of the recording	1 ... 65535
buckets	Maximum number of recording intervals	-
bucket-number	Number of recording intervals	1 ... 65535
interval	Duration of an individual recording interval	-
seconds	Time in seconds	1 ... 3600
owner	User to which the event is assigned	-
ownername	User name of the user	max. 127 characters

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

Parameters	Default value
bucket-number	50
seconds	1800
ownername	monitor

If you do not select any parameter from the parameter list, the default values are used.

#### Result

The data is recorded.

**Further notes**

You can display the content of a recording with the `show rmon history` command.

**10.3.3.4 no rmon collection history****Description**

With this command, you end the recording of statistical data of the interface.

**Requirement**

You are in the interface configuration mode.

The command prompt is as follows:

```
cli(config-if-$$$)#
```

**Syntax**

Call up the command with the following parameters:

```
no rmon collection history <index>
```

The parameter has the following meaning:

Parameters	Description	Range of values
index	Number of the recording	1 ... 65535

**Result**

The data recording is ended.

**10.4 Port Mirroring**

With the port mirroring function, you copy the data stream of a port to another interface to be able to analyze this data stream without disturbing operation.

---

**Note**

Mirroring a port beyond switch core boundaries is not supported.

---



## 10.4.1 show monitor

### Description

This command shows the settings used for mirroring ports.

You obtain information about the ports at which incoming and/or outgoing data traffic is mirrored and the ports at which the mirrored data is output.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

### Syntax

Call up the command with the following parameters:

```
show monitor[{session<session-id(1)>|all}]
```

The parameters have the following meaning:

Parameters	Description	Range of values
session	Keyword for a session whose settings are displayed	-
session-id	Number of the session	1
all	Shows the settings of all sessions	-

### Result

The settings for mirroring ports are displayed.

## 10.4.2 show monitor status

### Description

This command shows the settings of the port mirroring function.

### Requirement

You are in the User EXEC mode or in the Privileged EXEC mode.

The command prompt is as follows:

```
cli> OR cli#
```

**Syntax**

Call the command without parameters:

```
show monitor status
```

**Result**

The status of the port mirroring function is displayed.

**10.4.3 Commands in the global configuration mode**

This section describes commands that you can call up in the Global configuration mode.

In Privileged EXEC mode, enter the `configure terminal` command to change to this mode.

Commands relating to other topics that can be called in the Global configuration mode can be found in the relevant sections.

You exit the Global configuration mode with the `end` or `exit` command and are then in the Privileged EXEC mode again.

**10.4.3.1 monitor session destination****Description**

With this command, you configure the destination for mirroring a port.

**Requirement**

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

**Syntax**

Call up the command with the following parameters:

```
monitor session <session-id(1)> destination
    {interface <interface-type><interface-id>}
```

The parameters have the following meaning:

Parameters	Description	Values
session-id	Number of the session	1
interface	Keyword for a an interface description	-

Parameters	Description	Values
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> <li>• portchannel</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

### Note

#### Selecting the destination port

A port that is part of a port channel cannot be configured as the destination port for a monitor session.

### Result

As soon as you have configured the settings for the port to be monitored and the destination port, the session is complete and active.

### Further notes

You delete the destination for mirroring a port with the `no monitor session ... destination` command

You end and delete a session with the `no monitor session` command.

You display the configuration settings with the `show monitor` command.

#### 10.4.3.2 no monitor session destination

### Description

With this command, you delete the destination for mirroring a port.

### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

### Syntax

Call up the command with the following parameters:

```
no monitor session <session-id(1)> destination
    {interface <interface-type><interface-id>}
```

The parameters have the following meaning:

Parameters	Description	Values
session-id	Number of the session	1
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• gigabitethernet</li> <li>• extreme-ethernet</li> <li>• portchannel</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

## Result

The destination for the mirroring of a port is deleted.

## Further notes

You configure the destination for mirroring a port with the `monitor session ... destination` command.

You end and delete a session with the `no monitor session` command.

You display the configuration settings with the `show monitor` command.

### 10.4.3.3 monitor session source

## Description

With this command, you configure the source for mirroring a port.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command for the port to be monitored with the following parameter assignment:

```
monitor session<session-id(1)>{source
  {interface<interface-type><interface-id>[{rx|tx|both}]}}
```

The parameters have the following meaning:

Parameters	Description	Values
session-id	Number of the session	1
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>• fastethernet</li> <li>• gigabitethernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name
rx	Received data traffic will be mirrored (received)	-
tx	Transmitted data traffic will be mirrored (transmitted)	-
both	Received and sent data traffic will be mirrored	-

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

At system start or when using the command `restart` with the option `memory` or `factory`, the following defaults apply:

- Received and sent data traffic will be mirrored

If you do not select any parameters from the parameter list, the default value is used.

## Result

As soon as you have configured the settings for the port to be monitored and the destination port, the session is complete and active.

## Further notes

You delete the source for mirroring a port with the `no monitor session ... source` command.

You end and delete a session with the `no monitor session` command.

You display the configuration settings with the `show monitor` command.

### 10.4.3.4 no monitor session source

#### Description

With this command, you delete the source for mirroring a port.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command for the port to be monitored with the following parameter assignment:

```
no monitor session<session-id(1)>{source
  {interface<interface-type><interface-id>[{rx|tx|both}]}}
```

The parameters have the following meaning:

Parameters	Description	Values
session-id	Number of the session	1
interface	Keyword for a an interface description	-
interface-type	Type or speed of the interface	<ul style="list-style-type: none"> <li>fastethernetgigabite</li> <li>thernet</li> </ul>
interface-id	Slot no. and port no. of the interface	Enter a valid interface name
rx	Received data traffic will be mirrored (received)	-
tx	Transmitted data traffic will be mirrored (transmitted)	-
both	Received and sent data traffic will be mirrored	-

For information on names of addresses and interfaces, refer to the section "Addresses and interface names (Page 17)".

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- Received and sent data traffic will be mirrored

If you do not select any parameters from the parameter list, the default value is used.

## Result

The source for the mirroring of a port is deleted.

## Further notes

You configure the source for mirroring a port with the `monitor session ... source` command.

You end and delete a session with the `no monitor session` command.

You display the configuration settings with the `show monitor` command.

### 10.4.3.5 no monitor session

## Description

With this command, you delete the monitor session.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call up the command with the following parameters:

```
no monitor session<session-id(1)>
```

The parameter has the following meaning:

Parameters	Description	Range of values
session-id	Number of the session	1

## Result

The monitor session is deleted.

## Further notes

You display the configuration settings with the `show monitor` command.

You configure and start mirroring of a port with the `monitor session` command.

### 10.4.3.6 monitor

#### Description

With this command, you enable the port mirroring function.

#### Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

#### Syntax

Call the command without parameters:

```
monitor
```

At system start or when using the `restart` command with the option `memory` or `factory`, the following defaults apply:

- The function is enabled.

## Result

The port mirroring function is enabled.

## Further notes

You can display the status of this function with the `show monitor status` command.

You disable the function with the `no monitor` command.

### 10.4.3.7 no monitor

## Description

With this command, you disable the port mirroring function.

## Requirement

You are in the Global configuration mode.

The command prompt is as follows:

```
cli(config)#
```

## Syntax

Call the command without parameters:

```
no monitor
```

## Result

The port mirroring function is disabled.

## Further notes

You can display the status of this function with the `show monitor status` command.

You enable the function with the `monitor` command.



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