



Switch16/Com3 esd-Netintegrator (COM-Server)

Software Manual

to Product Switch16/Com3 (esd order No.: A.1109.01)



NOTE

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This manual contains important information and instructions on safe and efficient handling of the esd-Netintegrator (COM-Server). Carefully read this manual before commencing any work and follow the instructions.
The manual is a product component, please retain it for future use.

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Document file:	I:\Texte\Doku\MANUALS\SONSTIGE\Switch16-Com3\Englisch\Switch16-Com3_Software-Manual_en_11.odt
Date of print:	2019-03-14
Document type number:	DOC0800

Described software:	Firmware functionality of SW16C3
Firmware revision:	20181217083548

Document History

The changes in the document listed below affect changes in the hardware as well as changes in the description of the facts, only.

Rev.	Chapter	Changes versus previous version	Date
1.0	-	First English manual for Switch16/Com3 esd-Netintegrator	2019-01-25
1.1	-	Order No. of Switch16/Com3 Software Manual changed to A.1109.23	2019-03-14

Technical details are subject to change without further notice.

Classification of Notes

This manual contains noticeable descriptions for a safe use of the esd-Netintegrator (COM-Server) and important or useful information.

NOTICE

Notice statements are used to notify people on hazards that could result in things other than personal injury, like property damage.



NOTICE

This NOTICE statement contains the general mandatory sign and gives information that must be heeded and complied with for a safe use.

INFORMATION



INFORMATION

Notes to point out something important or useful.

Typographical Conventions

Throughout this manual the following typographical conventions are used to distinguish technical terms.

Convention	Example
File and path names	<code>/dev/null</code> or <code><stdio.h></code>
Function names	<code>open()</code>
Programming constants	<code>NULL</code>
Programming data types	<code>uint32_t</code>
Variable names	<code><i>Count</i></code>

Number Representation

All numbers in this document are base 10 unless designated otherwise. Hexadecimal numbers have a prefix of 0x. For example, 42 is represented as 0x2A in hexadecimal format.

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1. Overview

This document describes the firmware functionality of the Switch16/Com3 esd-Netintegrator (COM-Server).

The following figure shows a simplified block circuit diagram of the COM-Server:

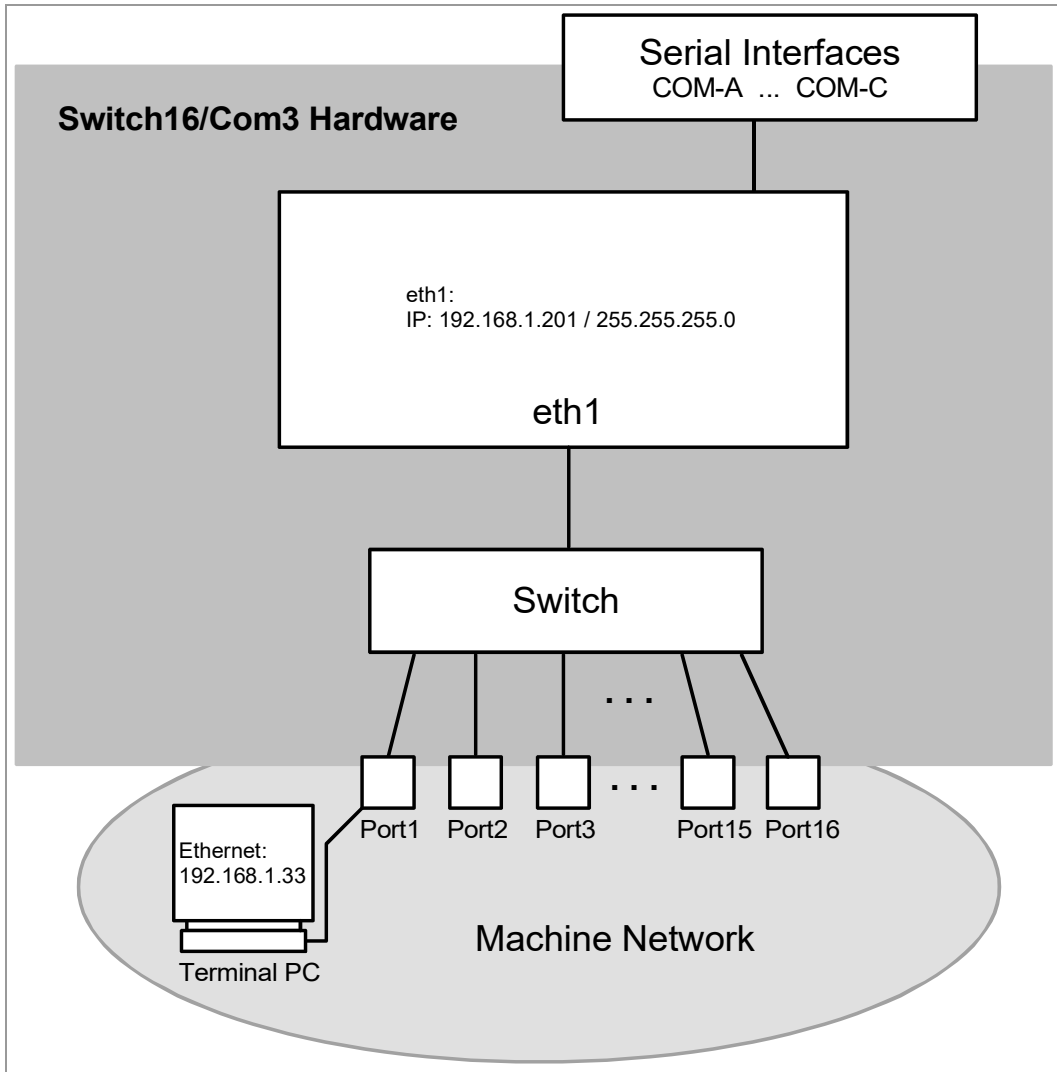


Figure 1: Net interfaces, COM ports, switch

2. Basic Functions

2.1 Internal Access on COM-Server

Per default the COM-Server is accessible from the machine network under the IP address 192.168.1.201.

Example: Call of the configuration web interface via URL `http://192.168.1.201` with a web-browser.
Default: User name: admin
 Password: esd

You will be asked for the user name and the password.

2.2 DHCP in Network

The IP address in the network can be assigned dynamically via the DHCP protocol. As default the static IP address 192.168.1.201 is used.

2.2.1 Transfer of the Device Name to the DHCP Server

The COM-Server transfers its device name to the DHCP Server. On delivery the name contains the hostname (sw16c3) and the serial number (e.g.:AA000001) of the device (sw16c3-XX000000). The name can be changed with the configuration web interface.

3. Configuration Web Interface

The Switch16/Com3 esd-Netintegrator (COM-Server) can be configured with a comfortable web interface. For the configuration a common web browser can be used. To start the program enter the network address of the COM-Server into the URL field of your browser. The IP address has been assigned per DHCP or has been statically configured. The program window of the Switch16/Com3 esd-Netintegrator (COM-Server) is displayed.

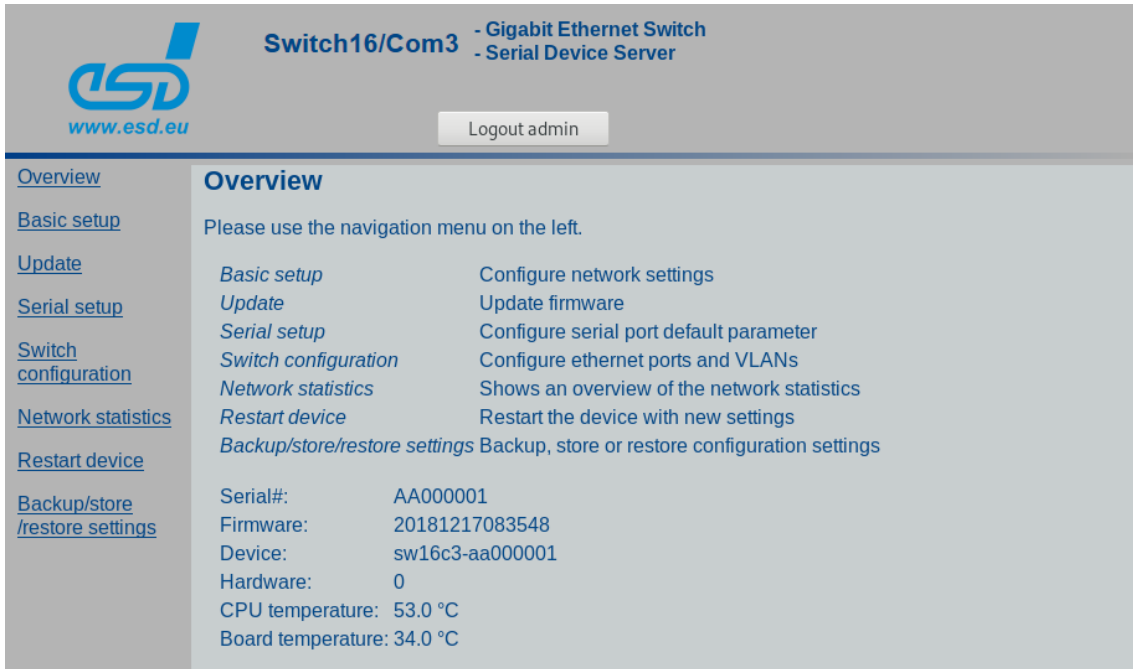


Figure 2: Program window, start page (*Overview*)

The navigation menu is shown on the left of the esd-Netintegrator (COM-Server) program window. The *Overview* page shows a listing of the menu items and their description.

Menu items	Description	See page
<i>Overview</i>	- Overview (start page with information)	
<i>Basic Setup</i>	- Configure network settings	9
<i>Update</i>	- Update firmware	11
<i>Serial Setup</i>	- Configure default parameters of the serial ports	12
<i>Switch Configuration</i>	- Configure Ethernet ports and VLANs	14
<i>Network Statistics</i>	- Shows an overview of the network statistics	
<i>Restart Device</i>	- Restart the device with new settings	15
<i>Backup/Store/Restore Settings</i>	- Backup, store or restore configuration settings	16

Below the list of the menu items the following information is shown:

- Serial#:** Serial number (e.g.: AA000001)
 - Firmware:** Firmware version (e.g.: 20181217083548)
 - Device:** Device name (used as DHCP-ID, e.g. sw16c3-aa000001)
 - Hardware:** Hardware revision of the Switch16/Com3
 - CPU temperature:** Temperature measured in the CPU
 - Board temperature:** Temperature measured on the PCB
- The list will be updated every 10 seconds (AutoRefresh).

3.1 Basic Setup

On the *Basic Setup* page the network settings can be configured.

The *Basic Setup* page is divided in the fields *Configuration Password* and *Machine Network Settings*.

Figure 3: Basic Setup

3.1.1 Basic Setup: Configuration Password

Password The configuration password (see Figure 3) protects the access to the configuration web interface.

Default: esd

To change your password enter the new password in the fields

Password: and *Password (repeat):* .

Click the button *Save changes* below to save your changes in the the corresponding field.

With clicking the button *Defaults* the default settings are loaded.



NOTICE

If you change the password, make a note of it for later! Make sure that you have the correct password for future applications. There is no possibility to find it out later.



INFORMATION

There is also guest access with limited rights. Its username is "guest" with the password "guest".


3.1.2 Basic Setup: *Machine Network Settings*

Figure 4: *Machine Network Settings* Field (Example)

In the field *Machine Network Settings* you can configure the external network interface, see also Figure 3.

DHCP [ENABLED, DISABLED]
 This entry configures the external network interface for the DHCP protocol. If DHCP is enabled, the settings for the static IP address in the external network are ignored.
 Default: DISABLED

DHCP Client Id (Host name) The device contacts the DHCP server with this identifier.
 Example: sw16c3-aa000001



NOTICE
 Please note that all devices used in a network must have different names! On delivery the constant sw16c3 and the serial number (e.g.:AA000001) of the device are used.

IP address IP address in the machine network.
 Default: 192.168.1.201

Netmask Net mask in the machine network.
 Default: 255.255.255.0

Gateway Default gateway in the machine network.
 If this setting is not needed, the IP address of the COM-Server has to be entered.
 Default: 192.168.1.1

Domain The domain name of the machine network
 Default: empty

Nameserver The nameserver IP of the machine network
 Default: empty

Click the button *Save changes* below to save your changes in the the corresponding field. With clicking the button *Defaults* the default settings are loaded.

3.2 Update

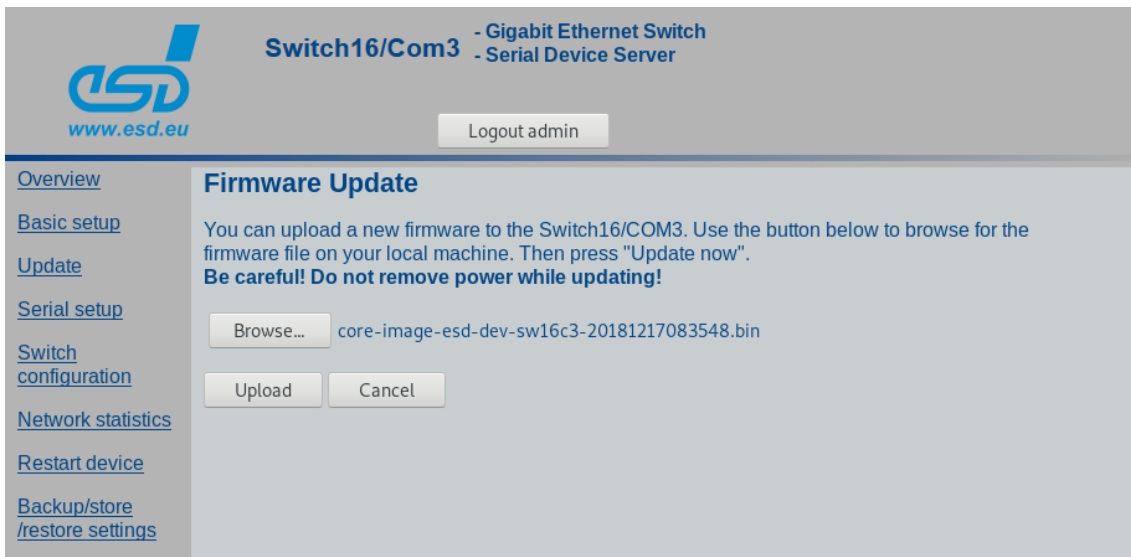


Figure 5: Firmware Update

For an update of the device firmware select the menu item *Update*. On the *Firmware Update* page, click on the button (*Browse...* in this example), to browse for the firmware update file on your local machine. The name of the button depends on the browser used.

A dialogue window is opened. Select the firmware file in the dialogue window and confirm your choice with „OK“.

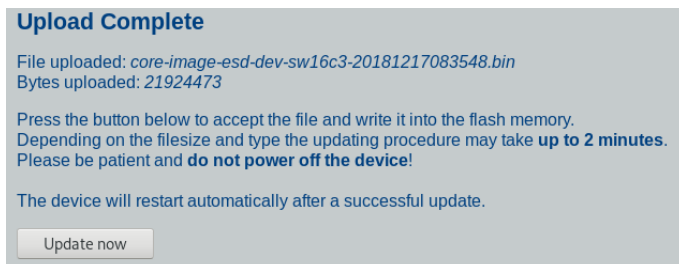



Figure 6: Upload

Now you can click the button *Update now* on the *Firmware Update* page, to start the transmission of the firmware file into the flash memory.



NOTICE
 The update process may take up to two minutes.
Do not disconnect the device from the power supply voltage during the update!

The successful completion of the upload will be displayed. The device restarts automatically after a successful update.

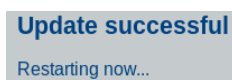


Figure 7: Update successful

3.3 Serial Setup

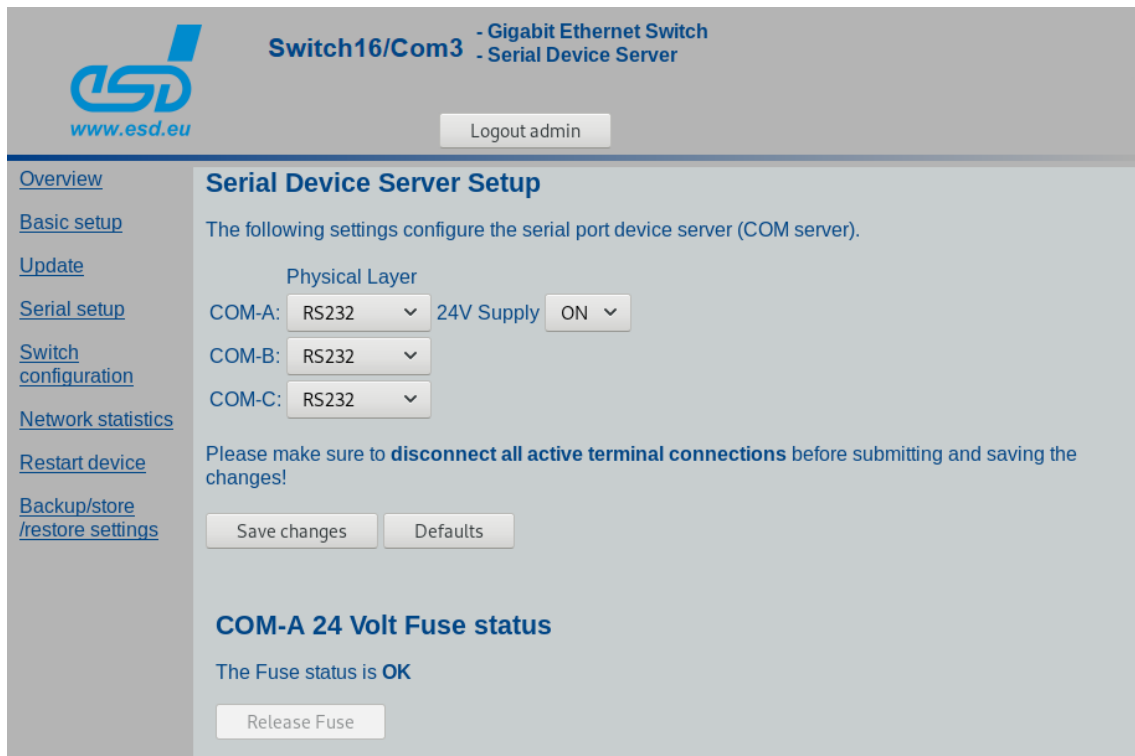


Figure 8: Serial Device Server Setup

On the *Serial Device Server Setup* page the properties of the serial interfaces COM-A to COM-C can be configured.

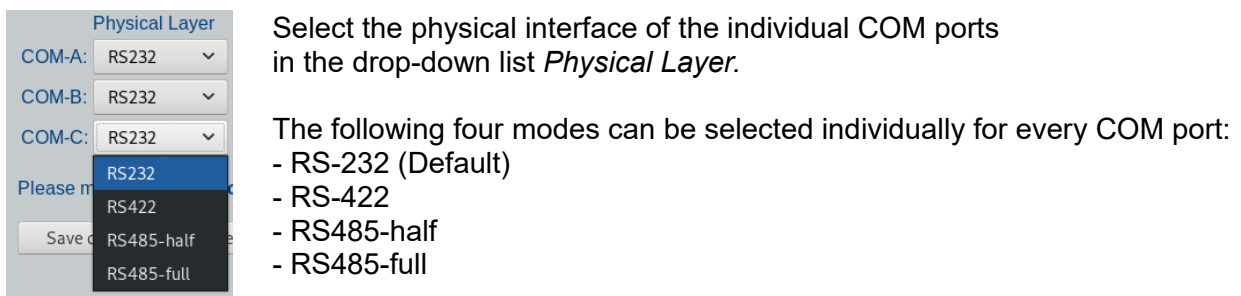


Figure 9: Physical layer (detail)

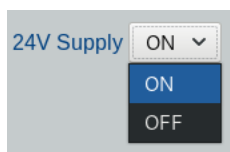
If you want to use the 24V supply read chapter “24 V Supply” on page 13 for further information.

3.4 24 V Supply

At the COM-A interface it is possible to output a 24V supply voltage on pin 9.

i **INFORMATION**
 On delivery the COM-A hardware interface is configured with full enabled handshake and the 24V Supply can not be used!
 If you want to use the 24V supply the 24V jumper inside of the Switch16/Com3 has to be set accordingly. The configuration of the 24V jumper is described in the Switch16/Com3 Hardware Manual.

If the 24V supply is enabled via the jumper, you can use the 24V Supply as described in the following.



The 24V supply voltage is fused and can be switched on or off via the drop-down-list *24V Supply* in the web interface if the. Per default the 24V supply voltage is off.

Figure 10: Switch 24V on/off

! **NOTICE**
 Disconnect all active terminal connections before you click the button *save the changes* to submit and save the changes!

Click on the button *Save changes* to save the settings.
 To reload the default configuration for all COM ports click on the *Defaults* button.
 The changes will only take effect after a restart.

3.4.1 COM-A 24 Volt Fuse Status

If the 24 V power supply voltage on COM-A is enabled via the drop-down-list *24V Supply*, the status of the fuse is displayed under *COM-A 24V Fuse status*.

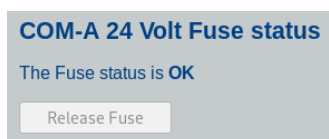
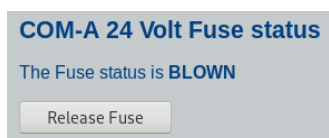


Figure 11: Fuse status OK



A triggered fuse is displayed accordingly under *COM-A 24V Fuse status* and can be reset via the *Release Fuse* button.

Figure 12: Fuse status Blown

3.5 Switch Configuration

Port	Default VLAN ID	Discard Untagged	802.1Q Aware	Force to 100MBit/s	Port based VLAN															
					1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
2	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
3	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
4	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
5	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
6	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
7	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
8	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
9	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
10	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
11	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
12	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
13	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>		
14	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>		
15	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		
16	1	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>		

Figure 13: Switch Configuration

Select this menu item to configure the properties of the 16 ports of the integrated Ethernet switches.

- Port** Port number
- Default VLAN ID** The VLAN ID that is used internally if the incoming packet has no VLAN tag or if it has a tag and the 802.1q Aware mode is disabled. Values from 1 up to and including 4095 are allowed.
- Discard Untagged** Incoming packets without VLAN tag are discarded.
- 802.1Q Aware** The VLAN tag of incoming packets are used for selecting the VLAN. Packets without VLAN tag will be assigned the default VLAN ID.
- Force to 100MBits/s** The link will be forced to 100MBit/s instead of autonegotiation.
- Port Based VLAN** Frames, coming from a port, will egress to any other port mentioned in the row of the port in the field *Port Based VLAN* if the check box of the other port is enabled.
 For example: Frames, coming from *Port 1*, will egress to a port mentioned in row number 1 (port 2 to 16) if the check box of this port is enabled.



NOTICE

To ensure the conversation of port x with port y in both directions, you have to enable the checkbox of port x (in row x, column y) and the checkbox of port y (in row y, column x).



INFORMATION

Given the internal architecture of the switch hardware, port 1 through 8 cannot individually be enabled to egress on port 9 through 16. The same concerns port 9 through 16 to be enabled for port 1 through 8.

3.6 Restart Device



Figure 14: *Restart Device*

On the *Restart Device* page click on the button *Restart* to confirm the restart.
After the restart changes will become effective.

If you want to leave the page without restarting the device, click on *Return to Web-Interface*.

3.7 Backup/Store/Restore Configuration Settings

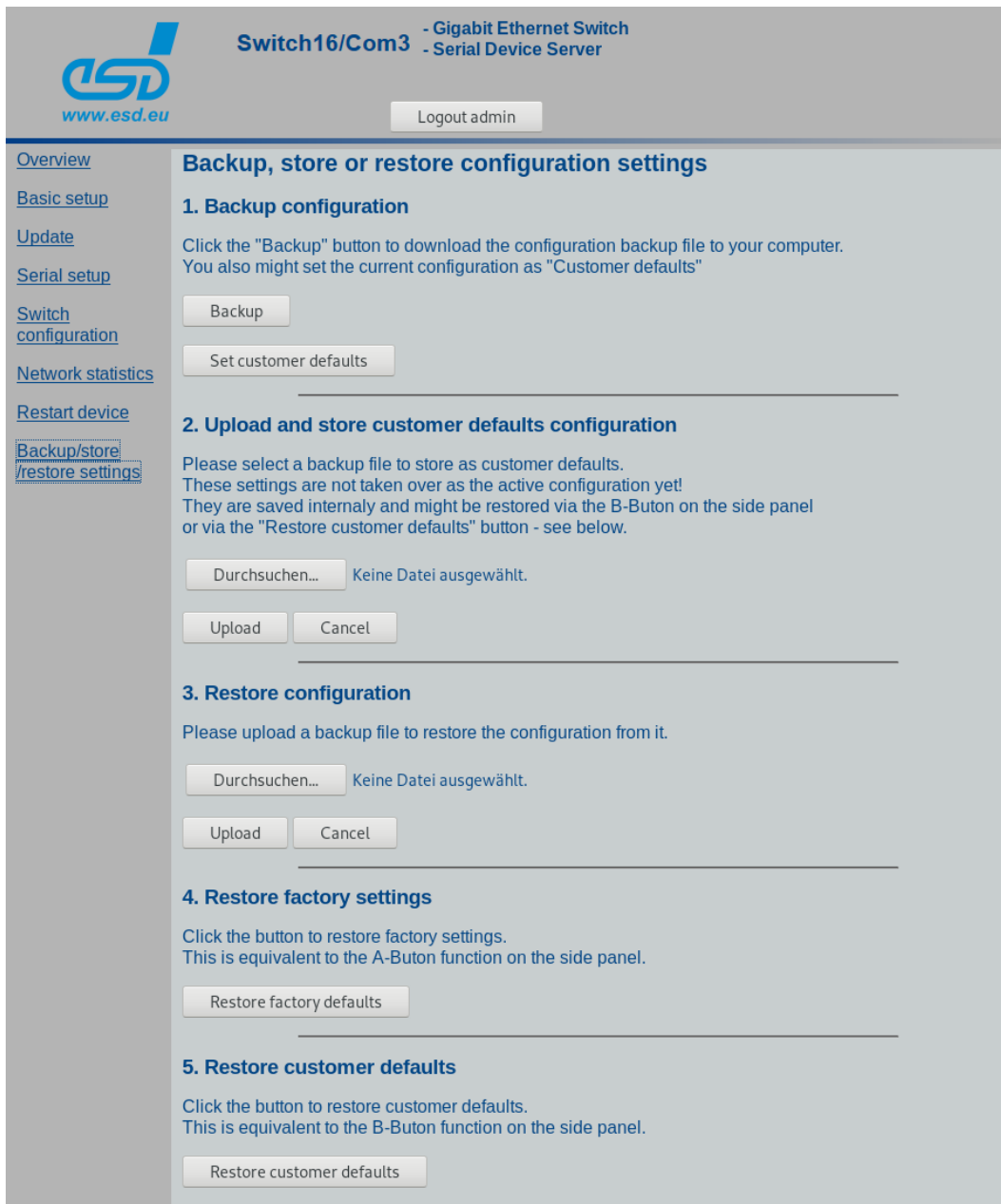


Figure 15: Backup/Restore Configuration

On the *Backup/store/restore settings* page you can backup the configuration data in a backup file (`config.bin`) store or restore the configuration data. The *Backup/store/restore settings* page is divided in the fields *Backup configuration*, *Upload and store customer defaults configuration*, *Restore configuration*, *restore factory settings* and *Restore customer defaults*.

3.7.1 Backup Configuration

Click the button *Backup* in the field *Backup configuration* to create the backup file. On success you will see the following message.

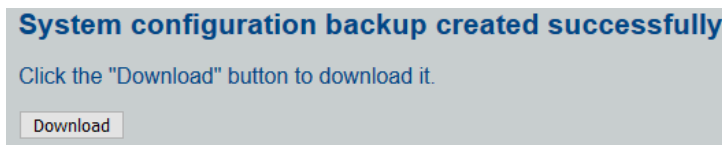


Figure 16: Download Backup file

Click *Download* now to download the `config.bin` file to your PC.

3.7.2 Upload and Store Customer Default Configuration

To upload a customer defaults configuration click on the button (*Browse.. in this example*) in the field *Upload and store customer defaults configuration* to open your browser. Select the configuration file (e.g. `config.bin`) and confirm your selection. On success you will see the following message.

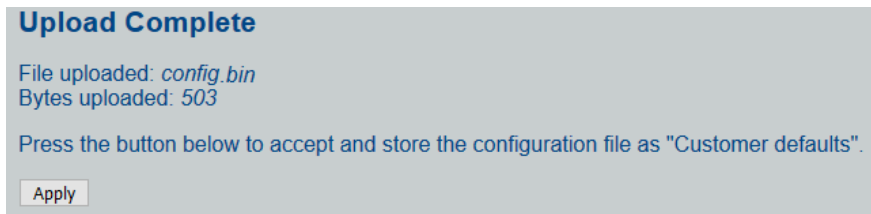


Figure 17: Customer defaults file upload

Press the *Apply* button to store the configuration file as “Customer defaults”. On success you will get the following message.



Figure 18: Customer defaults file stored

3.7.3 Restore Configuration

To restore the configuration click on the button (*Browse.. in this example*) in the field *Restore configuration*. The name of the button depends on the browser used. Select your `config.bin` file via your browser and confirm your choice with clicking on *Upload*.

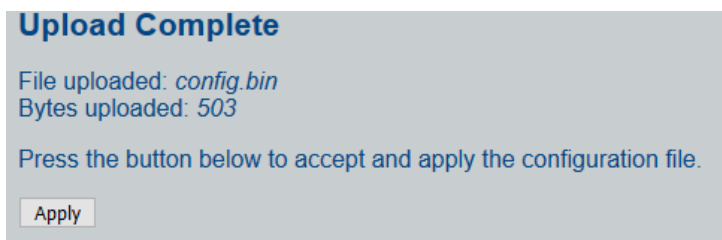


Figure 19: Restore configuration

Now click on the *Apply* button to accept and apply the configuration file. On success you will get the following message.

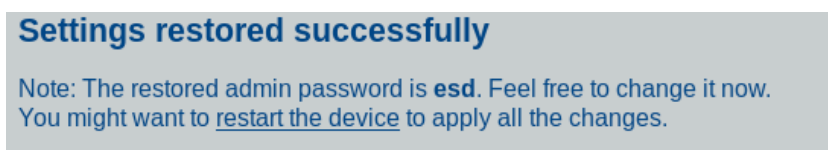



Figure 20: Settings restored



NOTICE If you change the admin password, make a note of it for later! Make sure that you have the correct password for future applications. There is no possibility to find it out later.

3.7.4 Restore Factory Settings

The configuration of the device can be reset to the factory settings.

Factory settings	Note/Description	See page
<i>User name:</i> admin		7
<i>Password:</i> esd		
<i>Static IP address:</i> 192.168.1.201		
<i>DHCP:</i> Disabled		10
<i>DHCP Client ID:</i> sw16c3	After restoring the factory settings you have to make sure, that all devices in a network have individual names. E.g.: On delivery the constant sw16c3 and the serial number (e.g.:AA000001) of the device are used.	
<i>Netmask:</i> 255.255.255.0		
<i>Gateway:</i> 192.168.1.1		
<i>Domain:</i>	No entry	
<i>Nameserver:</i>	No entry	12
<i>COM PORTS</i>		
<i>COM-A:</i> RS232,		
<i>COM-B:</i> RS232		
<i>COM-C:</i> RS232		
<i>COM-A 24V Suppy:</i> OFF		

Click on button *Restore Factory Settings* to reload the factory settings. After restoring the factory settings the following message is displayed:



Figure 21: Factory settings restored

Click on [restart the device](#) for a restart.

INFORMATION
It is absolutely necessary to restart the device after restoring. The factory settings will only be valid after a restart.

3.7.5 Restore Customer Defaults

To restore the customer defaults click the button *Restore customer defaults*. After restoring the customer settings the following message is displayed:

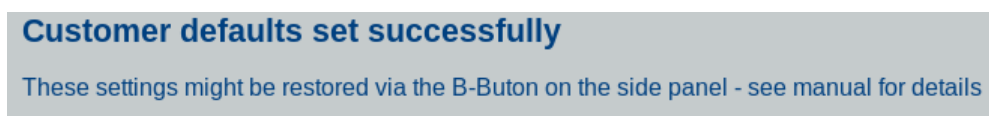


Figure 22: Customer defaults restored

4. Special Functions

4.1 COM Port Rerouting

The serial interfaces of the COM-Server (COM-A ... COM-C) can be used in the internal machine network via a special driver software (esd PCOMM) as virtual interface on a PC.

The following four modes can be selected individually for every COM port in the *Serial Device Server Setup* (see page 12 Figure 9).

- RS-232 (Default)
- RS-422
- RS485-half (half duplex)
- RS485-full (full-duplex)