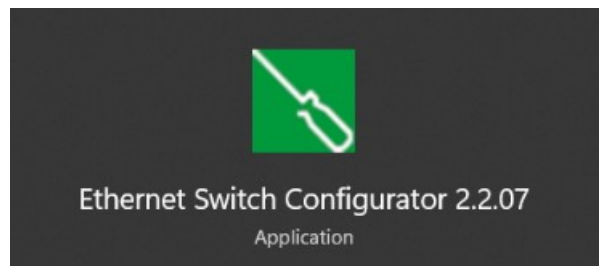


EVlink Pro AC Ring Topology commissioning guide

DOCA0362EN-00
09/2024



1 Legal information

The information provided in this document contains general descriptions, technical specifications and/or recommendations related to the products/solutions.

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Failure to follow these instructions can result in personal injury or equipment damage.

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2 Precautions

2.1 Important information

Read these instructions carefully and examine the equipment to become familiar with the device before installing, operating, repairing, or maintaining it.

The following special messages may appear throughout this documentation or on the equipment to warn of potential hazards or to draw your attention to those that clarify or simplify a procedure.



The addition of this symbol to a “Danger” or “Warning” safety label indicates the presence of an electrical hazard that could result in personal injury if the instructions are not followed.



This is the symbol for a safety alert. It is used to warn you about the potential risk of injury. Obey all safety messages that come with this symbol to avoid injury or death.

DANGER

DANGER indicates a dangerous situation which, if not avoided, can lead to **death, serious injury, equipment damage or loss of permanent data.**

WARNING

WARNING indicates an imminently hazardous situation which, if not avoided, can cause **death, serious injury, equipment damage or loss of permanent data.**

CAUTION

CAUTION indicates a dangerous situation which, if not avoided, can lead to **minor to moderate injuries or equipment damage.**

NOTICE

NOTICE concerns matters not related to the risk of personal injury. The alert symbol must not be associated with this term.

2.2 Important note

Electrical equipment must only be installed, operated, maintained and repaired by qualified personnel. Schneider Electric cannot be held responsible for the consequences of improper use of the equipment.

A qualified person is someone who has the necessary skills and knowledge to install and start up electrical equipment and who has received the safety training to identify and limit the risks involved.

3 Guide overview

3.1 Scope

This document provides you with information to guide through the commissioning of a ring topology cable network for EVlink Pro AC chargers. It contains generic information for configuring the switch in your installation, as well as examples based on a MODICON switch.

This document explains how to:

- Update the AC Pro and activate the RSTP protocol using eSetup
- Install the switch configuration software on your PC
- Configure the MODICON switch used to form a ring topology

This document is intended for CCC2s support technicians, system integrators, and technicians in charge of installing and commissioning EVlink Pro AC chargers.

3.2 Online information

The technical information on the equipment described in this guide is also available online. To obtain it, go to the Schneider Electric website www.se.com.

The information contained in this guide may be updated at any time.


Schneider Electric recommends downloading the latest version of the document available on www.se.com/ww/en/download.

3.3 Documentation

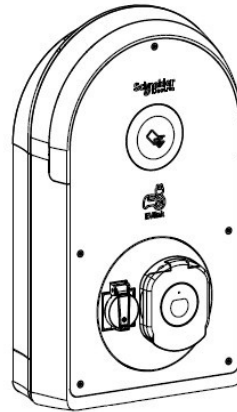
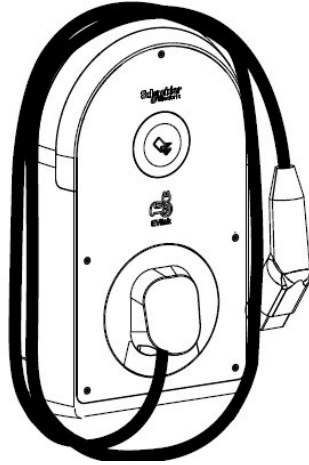
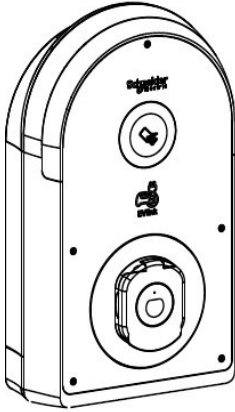
Document Title	Reference	Language	Where to download it
eSetup - How to configure Ethernet communication parameters with eSetup		EN	https://www.youtube.com/watch?v=Sq7sAegko_w&t=89s
MODICON Networking Catalog 2022	DIA6ED2140903FR	EN	DIA6ED2140903EN - Catalog: Modicon Networking

You can download these technical documents and other technical information from the www.se.com/ww/en/download.

3.4 Software and applications mentioned in the guide

Name of application	Where to download it
ConneXium Switch Configurator Software	ConneXium Switch Configurator Software Schneider Electric (se.com)
eSetup	 <p>AppStore/PlayStore</p>
EVlink Pro AC - Firmware	EVlink Pro AC - Professionals Schneider Electric France (se.com)

4 Product family



EVB3S 07N4A

EVB3S 07N4AM

EVB3S 07N40M

EVB3S 11N4A

EVB3S 22N4B

EVB3S 22N4A

EVB3S 22N40M

EVB3S 22N40MR

EVB3S 22N4

EVB3I 22N40M

EVB3I 22N40MB

EVB3I 22NC0M

EVB3I 22NC0MB

EVB3S 07NCA

EVB3S 07NCAM

EVB3S 11NCA

EVB3S 22NCA

EVB3S 22NCB

EVB3S 22NC0M

EVB3S 07N4EAM

EVB3S 07N4EA

EVB3S 07N40EM

EVB3S 11N4FB

EVB3S 22N4E

EVB3S 22N4EA

EVB3S 22N4EB

EVB3S 22N4FB

EVB3S 22N40EM

EVB3S 22N40FM

5 Prerequisites

Before installing a ring topology network, ensure the following requirements are met for the equipment to be included in the ring.

5.1 EVlink Pro AC chargers

- EVlink Pro AC chargers are wired for power
- The eSetup application version is at least **13.1.3**
- The firmware version of the EVlink Pro AC chargers is at least **1.3.8 for all ring chargers.**

Updating the firmware and entering parameters in eSetup determines whether the chargers are integrated into a ring topology.

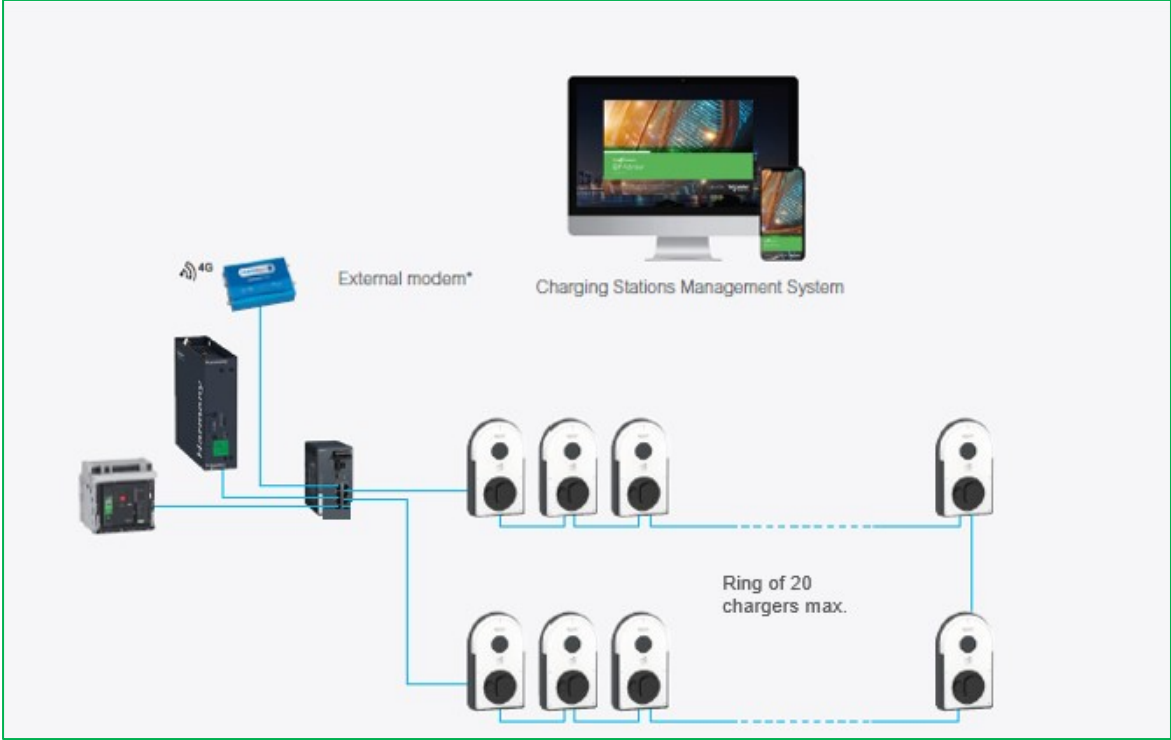
5.2 Network cabling

- The network of chargers is daisy chained with **a maximum of 20 chargers** per daisy chain
- **The loop is open at switch level**

5.3 Manageable switch

- The manageable switch is compatible with the **RSTP** protocol; the STP protocol is not supported
- The RSTP configuration of the manageable switch can be modified
- The manageable switch authorizes BPDU frames (anti-loop protection such as “Cisco BPDU Guard / BPDU Filter” are disabled) on ports connected to the loop.

Configuring the manageable switch determines the proper operation of the ring topology.



6 Step 1 - Configuring EVlink Pro AC chargers with eSetup

6.1 Prerequisites

- The firmware version installed on EVlink Pro AC chargers is at least **1.3.8**
- The eSetup application version is at least **13.1.3**

Otherwise, when configuring a ring topology, a pop-up appears on the application and asks to update the Pro AC firmware to proceed with its configuration.

Documentation for updating the EVlink Pro AC charger: [EVlink Pro AC – Professionals](#)

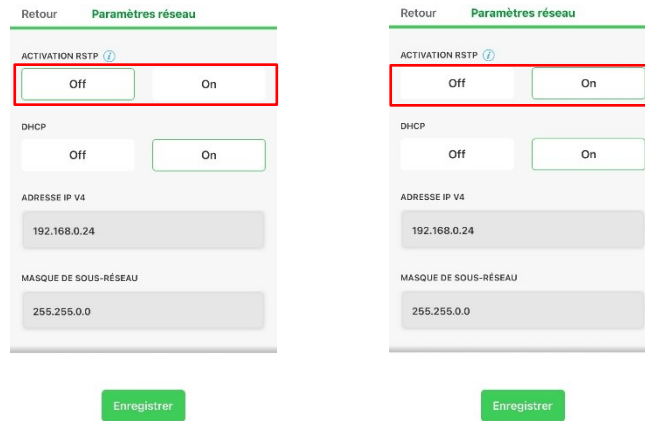
Video tutorial: [RSTP activation for a ring topology](#)

6.2 Configuration of chargers with eSetup

6.2.1 Checking the installation



6.2.2 Enabling RSTP



To activate the RSTP protocol, click "Activate RSTP": ON:

7 Step 2 - Configuring the switch

7.1 Generic configuration of a manageable switch

The following configuration is suitable for transforming an existing network into a ring topology.

7.1.1 Connecting to the management interface

On a computer that is connected to the manageable switch or LAN network, open a web browser and enter the IP address of the manageable switch. Enter the user ID and password that are known or provided in the switch user guide (default identifiers).

7.1.2 Configuring the switch for a ring topology

1. Enable protocol support for the **Rapid Spanning Tree Protocol (RSTP)**. The Spanning Tree Protocol (STP) is not supported for the creation of a ring topology on EVlink Pro AC chargers
2. Configure the following RSTP parameters according to the values indicated:

Parameter	Value
Bridge Priority	< 32768
Max age	≥ Number of chargers in the ring + 1

For example, the following RSTP configurations meet the expected values for a ring topology of 20 chargers:

Parameter	Value
Bridge Priority	4096
Max age	21

3. Disable **anti-loop protection** features (such as “Cisco BPDU Guard / BPDU Filter” or equivalent) on the switch ports connected to the ring.

7.1.3 Saving the new configuration

Save the new manageable switch configuration. Restart the product, if necessary, to apply the changes.

8 Example configuration: using a Schneider Electric MODICON manageable switch

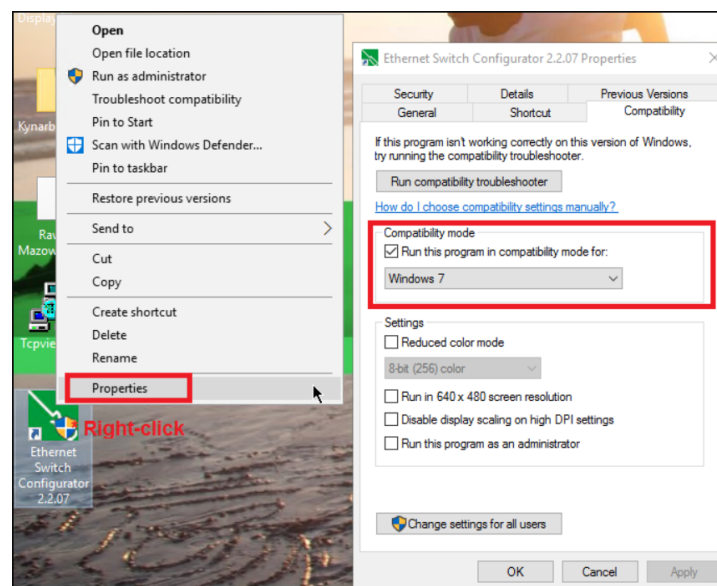
The following configuration is recommended for any new installation. The Schneider Electric MODICON managed switch has been tested and validated for optimum use of a ring topology of EVlink Pro AC chargers.

8.1 Recommendations for configuring IP addresses

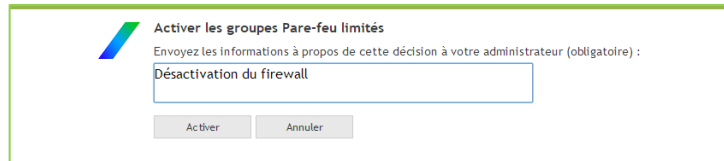
Device	IP address
EV Charging Expert	192.168.0.128
Gateway	192.168.0.254
Remote access	192.168.0.253
MODICON switch	192.168.0.100

8.2 PC configuration recommendations for installing the MODICON Switch configuration software

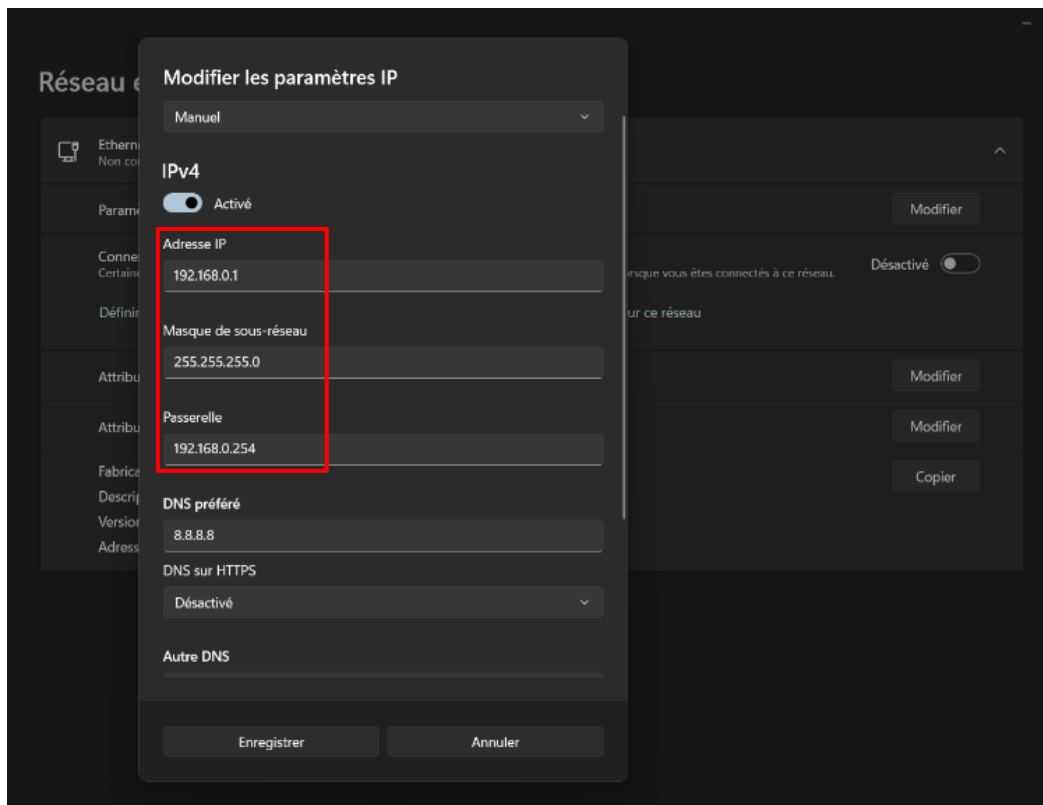
1. To install the "Ethernet Switch Configurator 2.2.07" software, make sure that you are the **administrator of your PC**.
2. The software must be launched in **Windows 7** compatibility mode



- To use the software, firewalls (e.g., Trellix) must be disabled or configured to allow communication on the LAN.



- The Ethernet network parameters of the PC must be modified as follows if a DHCP server is missing:
 - IP address: 192.168.0.1
 - Subnet mask: 255.255.255.0
 - Gateway: 192.168.0.254



- Check that the network configuration is taken into account:

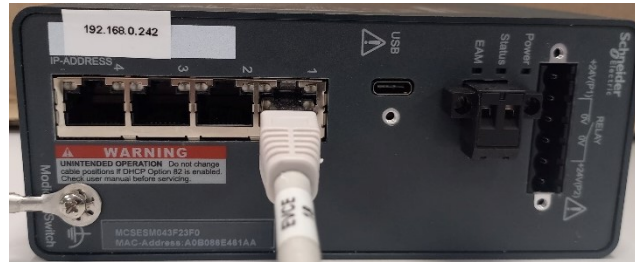
```

Carte Ethernet Ethernet :

Suffixe DNS propre à la connexion. . . . :
Adresse IPv6 de liaison locale. . . . . : fe80::5f7f:211b:80b6:4f41%22
Adresse IPv4. . . . . : 192.168.0.1
Masque de sous-réseau. . . . . : 255.255.255.0
Passerelle par défaut. . . . . :
    
```

8.3 Installing the MODICON Switch

1. Install the MODICON switch and connect it to the LAN



NOTICE

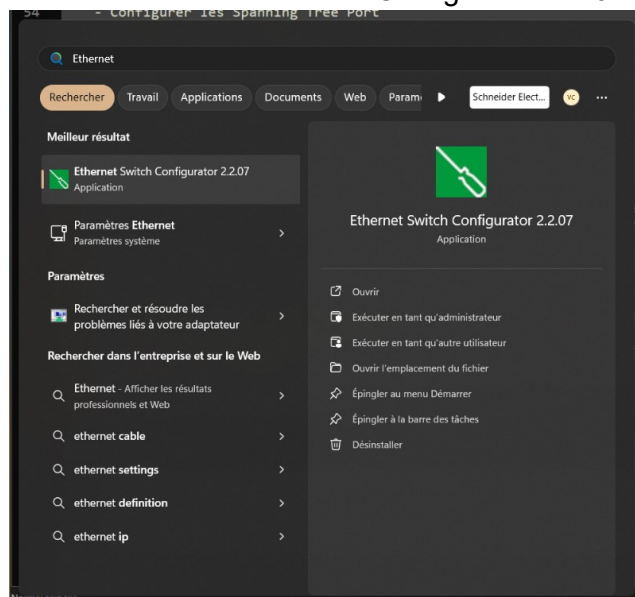
Leave the network loop open in the switch.
It will be closed once the configuration is complete.

2. Power on the equipment
3. Connect the device with an RJ45 cable

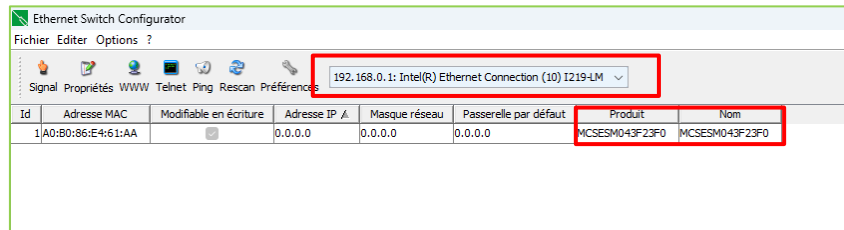


8.4 Switch detection

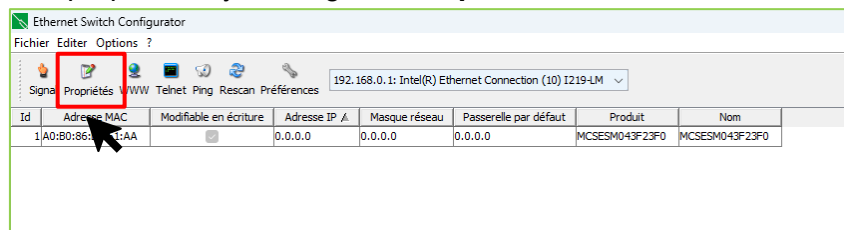
1. On the PC, launch the “Ethernet Switch Configurator 2.2.07” software



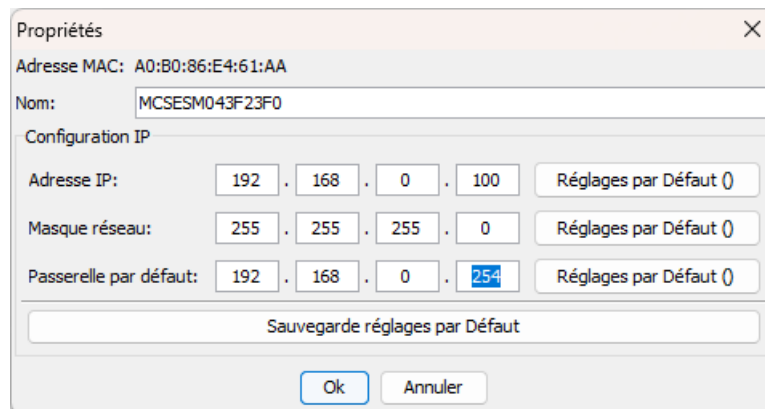
- The software automatically runs a network scan that identifies the switch to be configured.



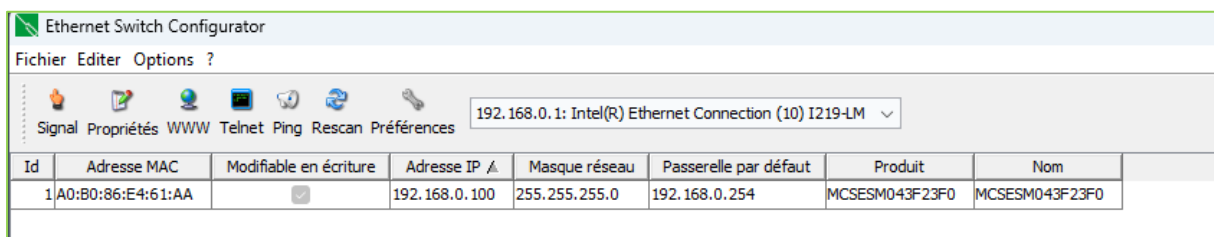
- Edit the properties by clicking the "Properties" menu



- Configure the switch network parameters (according to initial recommendations):

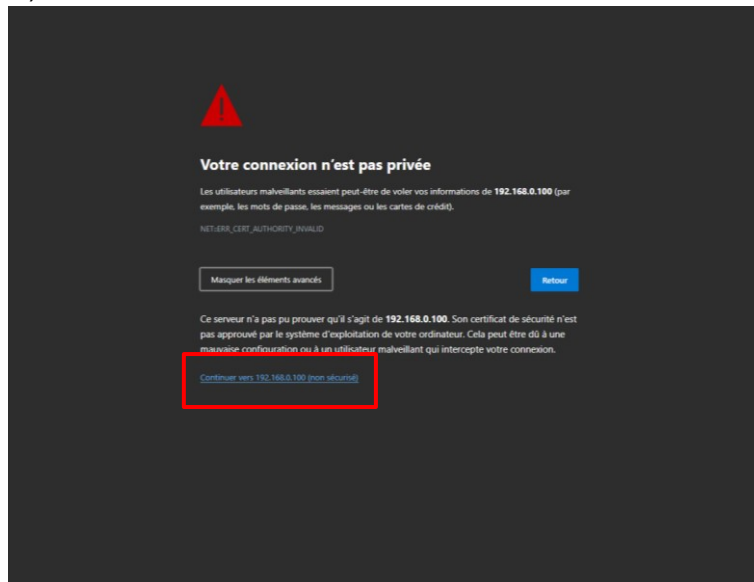


- Check that the switch's network configuration is properly applied.



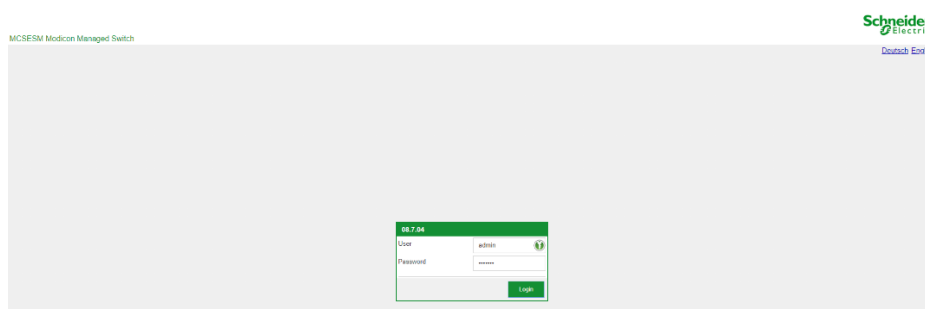
8.5 Connection to MODICON Switch web pages

1. On the PC, launch a web browser and enter the switch IP address
2. Confirm the connection to the server by clicking "Continue to 192.168.0.100" (unsecured)

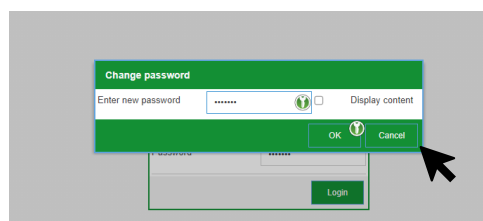
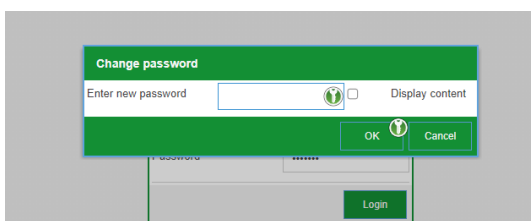


3. Enter the user ID and password that are known or provided in the switch user guide (default identifiers)

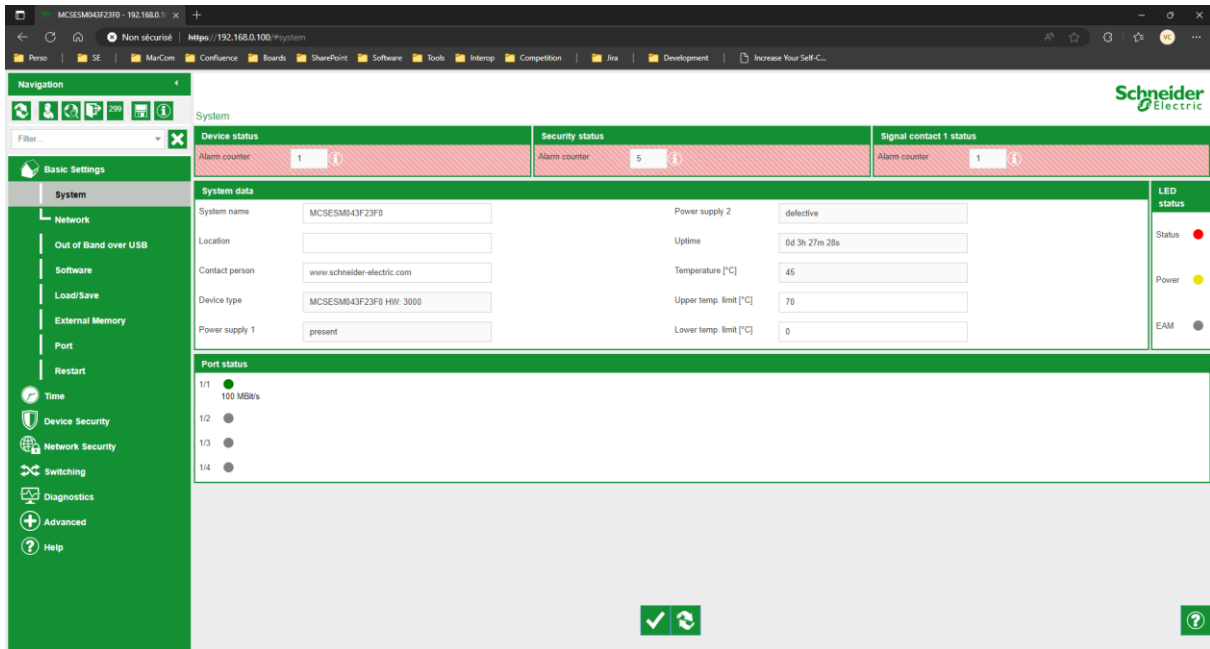
User ID: **admin**
 Password: **private**



4. Change the password and confirm



5. Display of the main screen



8.6 Configuration of the switch for a ring topology: RSTP Priority and Max age

Configuration of **Spanning Tree parameters - RSTP**

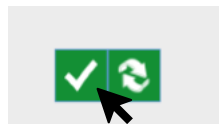
In the menu **Switching** check the default values indicated by the configuration tool for configuring the Bridge, and modify the value "**Priority**" and the value "**Max Age**" as follows:

Fields	Value
Priority	4096
Hello time	2s
Forward delay	15s
Max age	21

The screenshot shows the 'Spanning Tree Global' configuration page. The left navigation menu has 'Switching' selected, with 'Global' highlighted. The main content area is divided into sections: 'Operation' (On/Off, rstp, Send trap), 'Bridge configuration' (Bridge ID: 32768 / a0 b0 86 e4 61 aa, Priority: 32768, Hello time: 2s, Forward delay: 15s, Max age: 20), 'Root information' (Root ID: 32768 / a0 b0 86 e4 61 aa, Priority: 32768, Hello time: 2s, Forward delay: 15s, Max age: 20), and 'Topology information' (Bridge is root: checked, Root port: no Port, Root path cost: 0, Topology changes: 0, Time since topology change: 0d 0h 00m 30s). A black box with the text 'Default values' is overlaid on the Bridge configuration section. At the bottom right, there are two green buttons: a checkmark and a refresh icon.

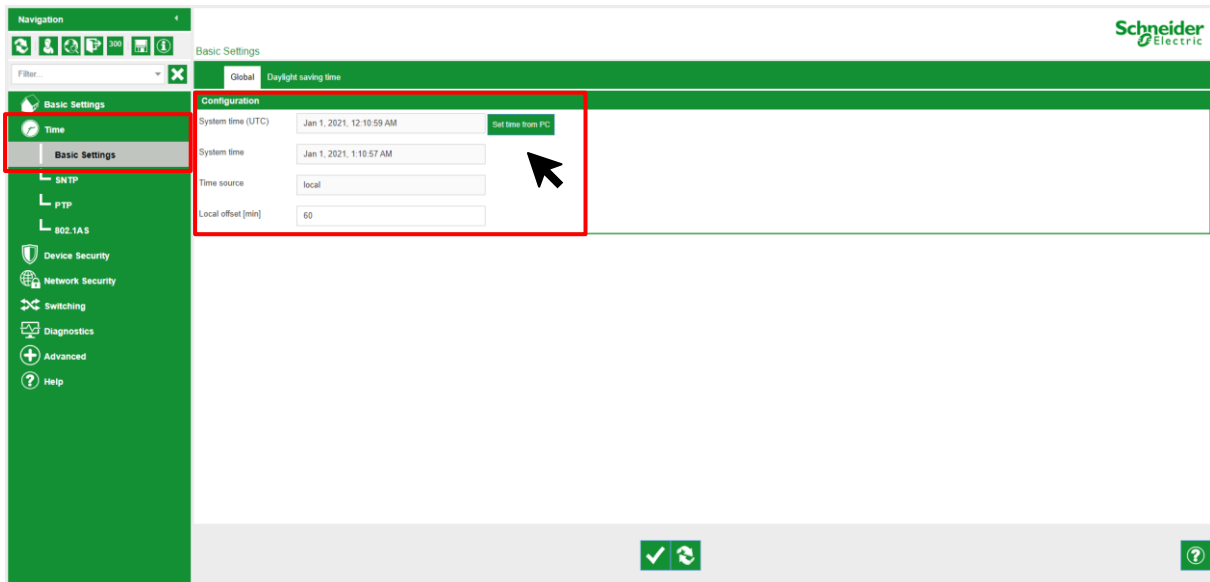
The screenshot shows the 'Spanning Tree Global' configuration page with updated parameters. The left navigation menu has 'Switching' selected, with 'Global' highlighted. The main content area is divided into sections: 'Operation' (On/Off, rstp, Send trap), 'Bridge configuration' (Bridge ID: 32768 / a0 b0 86 e4 61 aa, Priority: 4096, Hello time: 2s, Forward delay: 15s, Max age: 21), and 'Topology information' (Bridge is root: checked, Root port: no Port, Root path cost: 0, Topology changes: 0, Time since topology change: 0d 0h 00m 30s). The 'Priority' and 'Max age' fields are highlighted with red boxes. At the bottom right, there are two green buttons: a checkmark and a refresh icon.

Save the new parameters

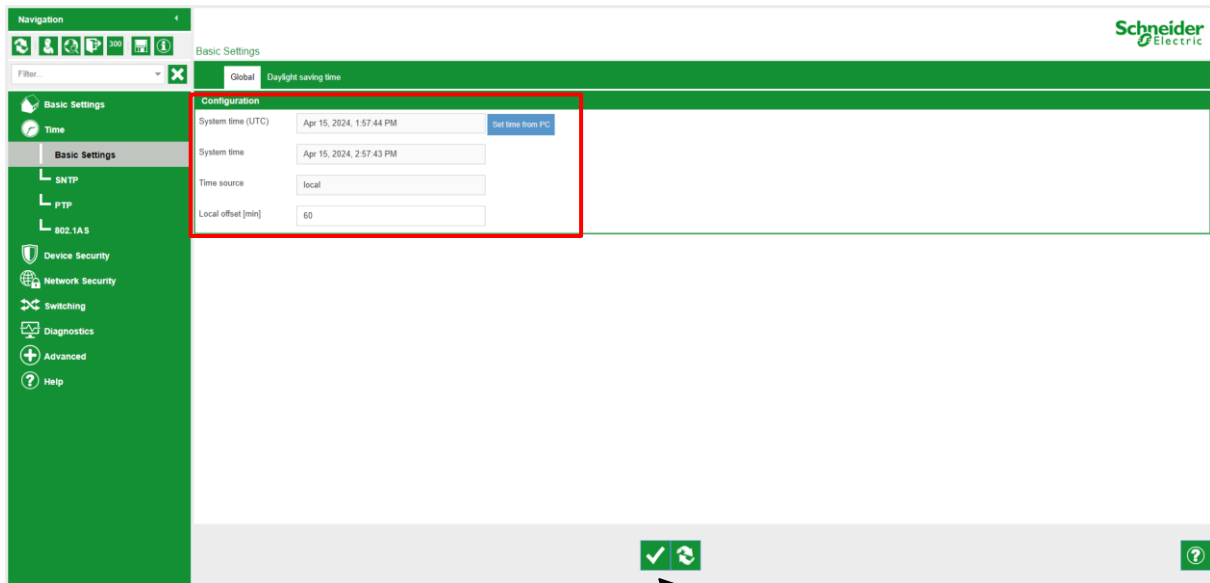


8.7 Date and time update

In the **Time/basic settings** menu, update the indicated values using the PC clock

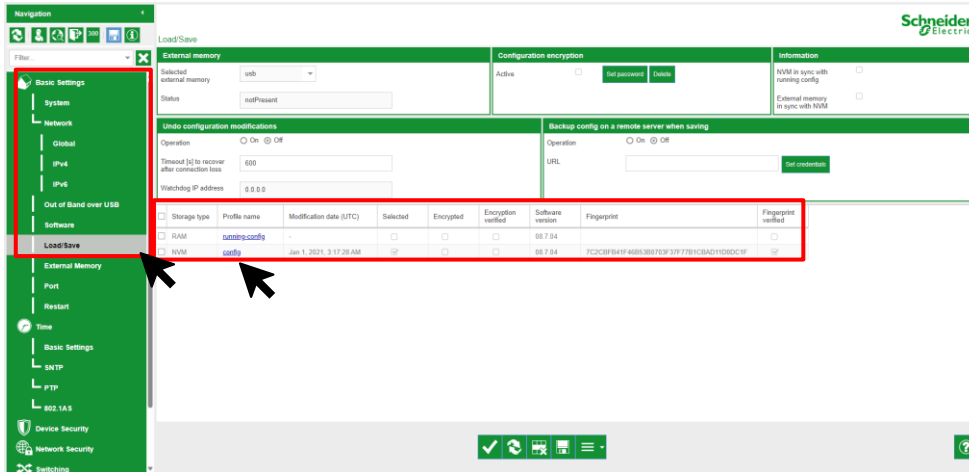


Save

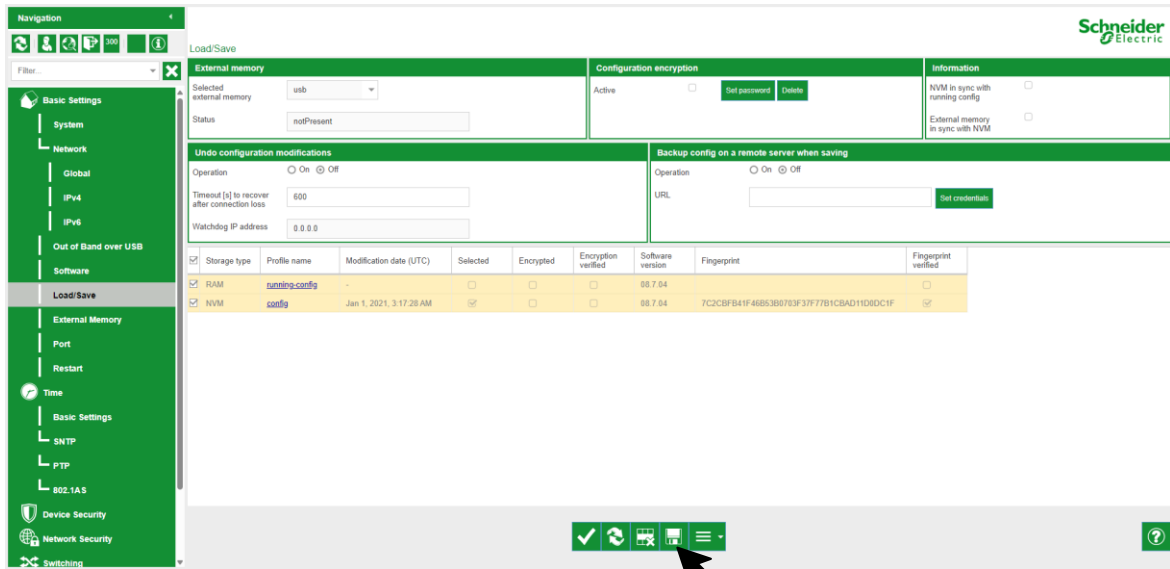


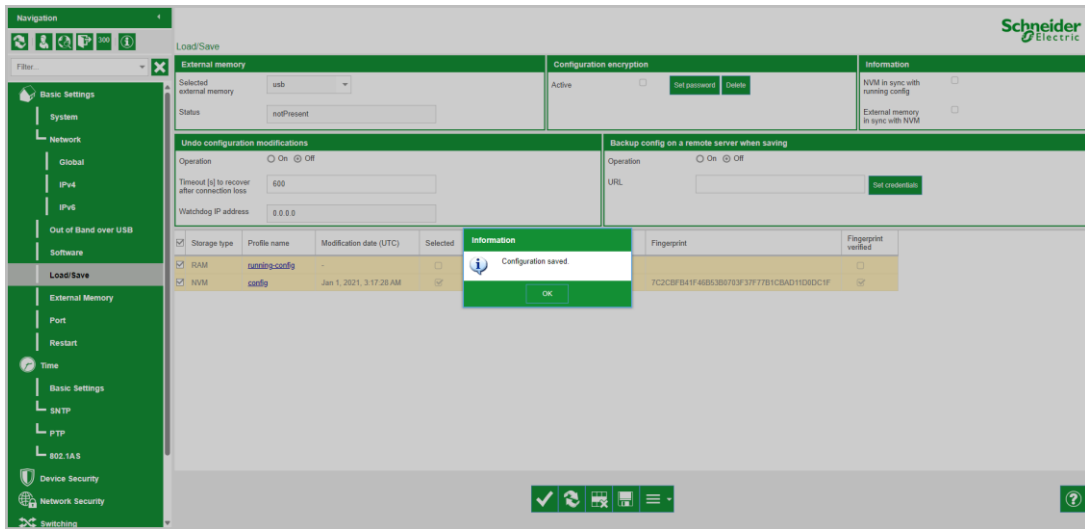
8.8 Saving the new configuration

In the "Basic Settings/Load/save" menu, select the configuration information



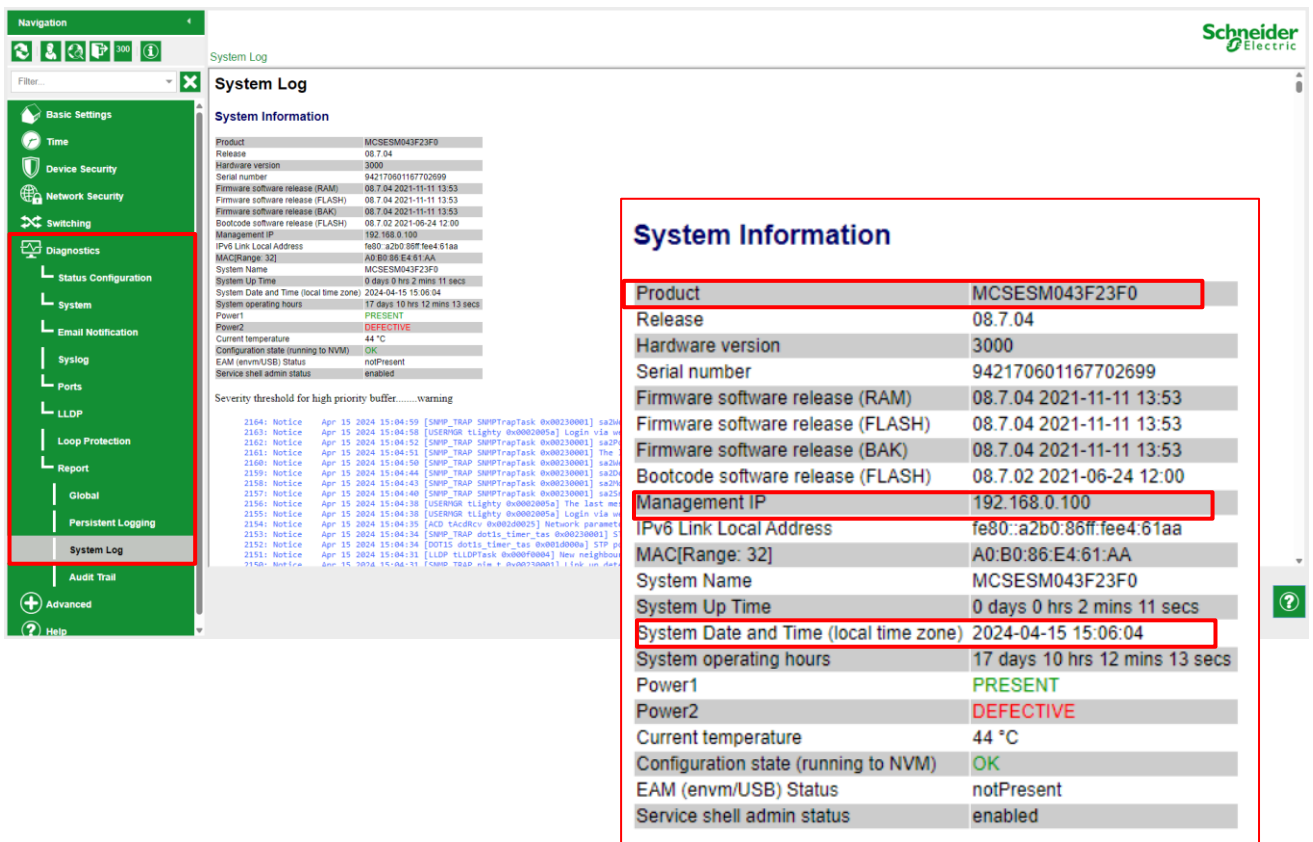
Click the save icon





8.9 Checking the SYSLOG system

Open the "Diagnostics/Report/system Log" menu to check that the changes appear in the System Log report:



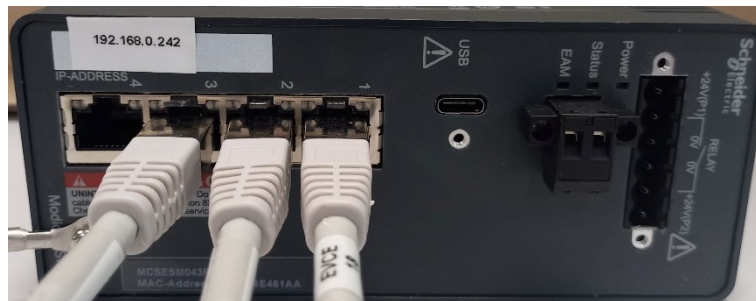
9 Step 3 - Setting up the ring network

9.1 Closing the loop

Close the network loop by connecting both ends of the existing daisy chain to two ports on the manageable switch.

Ensure that the manageable switch is still connected to the LAN network and/or the EV Charging Expert.

For example, on a Schneider Electric MODICON manageable switch:



9.2 Checking correct operation

Check that the ring topology is working correctly:

- All EVlink Pro AC chargers are operational (green LED).
- All EVlink Pro AC chargers are connected to EV Charging Expert and/or the charging operator (CPO) and are available in the remote management interface.

10 F.A.Q.

10.1 What is the RSTP configuration of an EVlink Pro AC charger?

When the RSTP protocol is activated using eSetup on an EVlink Pro AC charger, the following RSTP configuration is applied:

Parameter	Value
Bridge Priority	32768

This configuration is identical for all chargers and cannot be modified.

Other RSTP parameters such as "Max age", "Hello time" or "Forward Delay" are configured by the ring's "Root Bridge", i.e. the manageable switch - as it has a higher priority than the chargers.

The two Ethernet ports on the EVlink Pro AC charger have the same "Port Priority".

10.2 Why are network communications with the chargers in a ring topology degraded?

When network communications with the chargers in a ring are degraded, it is likely that the ring is affected by a **broadcast storm**.

The most common symptoms for detecting a broadcast storm are:

- Network exchanges with chargers slow or impossible
- Frequent disconnections of the chargers from the local/remote supervision
- Continuous, rapid flashing of activity indicators on the ports of the manageable switch connected to the ring

RSTP is designed to prevent a broadcast storm on the ring. If a broadcast storm occurs, it means that RSTP is not working properly.

To facilitate the investigation, **temporarily disconnect the network loop** at one of the ports on the manageable switch to stop the broadcast storm.

Then check that:

- RSTP is enabled on the manageable switch and configured as described in this document.
- All charging stations in the ring have been configured with eSetup and RSTP is enabled.
- **No other equipment that is incompatible with RSTP is connected in the ring**

All equipment in the ring supports RSTP when the network loop is closed.

10.3 Why are one or more chargers at the ends of the ring topology disconnected from the LAN?

The RSTP “Max age” parameter setting of the manageable switch is incorrect. The value of this parameter must be equal to or greater than: **(Number of chargers in the ring + 1)**.

For example, if the ring has 20 chargers, then the value of the RSTP parameter “Max age” of the manageable switch must be 21 or higher.

10.4 How do I add one or more chargers to an existing ring topology?

This procedure also applies to replacing chargers in the ring with new chargers.

- **Disconnect the network loop at one of the ports on the manageable switch.**
- Install and connect the chargers according to their future position in the ring.
- Power on the chargers.
- Configure the chargers using eSetup. **Enable RSTP**. Restart the chargers.
- Close the network loop by connecting both ends of the existing daisy chain to two ports on the manageable switch.
- Check that the chargers are working and connected to the EV Charging Expert and/or the charging operator (CPO).

10.5 How do I delete the ring topology?

To delete a ring topology:

- **Disconnect the network loop at one of the ports on the manageable switch.**
- Configure the chargers using eSetup. **Disable RSTP**. Restart the chargers.
- Optionally, disable RSTP support in the manageable switch management interface.

To restore a ring topology, follow the instructions in this document again.