SIEMENS

SIMATIC NET

SCALANCE X204RNA
SCALANCE X204RNA EEC (HSR)

Operating Instructions

08/2012

C79000-G8976-C298-01

Legal information

Warning notice system

This manual contains notices you have to observe in order to ensure your personal safety, as well as to prevent damage to property. The notices referring to your personal safety are highlighted in the manual by a safety alert symbol, notices referring only to property damage have no safety alert symbol. These notices shown below are graded according to the degree of danger.

⚠ DANGER

indicates that death or severe personal injury **will** result if proper precautions are not taken.

⚠ WARNING

indicates that death or severe personal injury **may** result if proper precautions are not taken.

⚠ CAUTION

indicates that minor personal injury can result if proper precautions are not taken.

NOTICE

indicates that property damage can result if proper precautions are not taken.

If more than one degree of danger is present, the warning notice representing the highest degree of danger will be used. A notice warning of injury to persons with a safety alert symbol may also include a warning relating to property damage.

Qualified Personnel

The product/system described in this documentation may be operated only by **personnel qualified** for the specific task in accordance with the relevant documentation, in particular its warning notices and safety instructions. Qualified personnel are those who, based on their training and experience, are capable of identifying risks and avoiding potential hazards when working with these products/systems.

Proper use of Siemens products

Note the following:

⚠ WARNING

Siemens products may only be used for the applications described in the catalog and in the relevant technical documentation. If products and components from other manufacturers are used, these must be recommended or approved by Siemens. Proper transport, storage, installation, assembly, commissioning, operation and maintenance are required to ensure that the products operate safely and without any problems. The permissible ambient conditions must be complied with. The information in the relevant documentation must be observed.

Trademarks

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Disclaimer of Liability

We have reviewed the contents of this publication to ensure consistency with the hardware and software described. Since variance cannot be precluded entirely, we cannot guarantee full consistency. However, the information in this publication is reviewed regularly and any necessary corrections are included in subsequent editions.

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1.1 Introduction

Overview of SCALANCE X-200RNA

The SCALANCE X-200RNA product family is part of the SCALANCE X product family. Below, you will find a brief overview of this product family.

The SCALANCE X family comprises various product lines that complement each other and that are carefully tuned to specific automation tasks.

What is possible?

The devices of the SCALANCE X-200RNA product line allow the cost-effective setup of Industrial Ethernet structures with High-availability Seamless Redundancy Protocol functionality. You can also implement the transition between a PRP and an HSR network with the SCALANCE X-200RNA.

Purpose of the Operating Instructions

These Operating Instructions support you when commissioning networks with the devices of the product line SCALANCE X200RNA.

Validity of the Operating Instructions

These Operating Instructions are valid for the following devices of the SCALANCE X-200RNA product line

SIMATIC NET SCALANCE X204RNA	6GK5204-0BA00-2MB2
SIMATIC NET SCALANCE X204RNA EEC	6GK5204-0BS00-2NA3

Names of the devices in these operating instructions

The descriptions in these operating instructions always apply to the devices of the SCALANCE X-200RNA product line listed under "Validity of the Operating Instructions" in this document unless the description relates to a specific device of the product line.

Further documentation

The "SIMATIC NET Industrial Ethernet Twisted Pair and Fiber Optic Networks" manual contains additional information on other SIMATIC NET products that you can operate along with the devices of the SCALANCE X-200 product line in an Industrial Ethernet network.

Overview of the device versions

The SCALANCE X-200RNA devices are available in different versions. These are listed in the table below for a better overview:

Device name	MLFB	Supported modes	described here
SCALANCE X204RNA	6GK5204-0BA00-2MB2	HSR ↔ Standard Ethernet; HSR ↔ PRP coupling	yes
SCALANCE X204RNA EEC	6GK5204-0BS00-2NA3	HSR ↔ Standard Ethernet; HSR ↔ PRP coupling	yes
SCALANCE X204RNA	6GK5204-0BA00-2KB2	PRP ↔ Standard Ethernet	no
SCALANCE X204RNA EEC	6GK5204-0BS00-3LA3	PRP ↔ Standard Ethernet	no

Finding information

To help you to find the information you require more quickly, the manual includes not only the table of contents but also the following sections in the Appendix:

- Index
- Glossary

Audience

These Operating Instructions are intended for persons commissioning Ethernet networks with the High-availability Seamless Redundancy Protocol (HSR).

Standards and approvals

The devices of the SCALANCE X-200RNA product line meet the requirements for the CE mark. You will find detailed information in the section "Approvals and markings" in these operating instructions.

Note

The specified approvals apply only when the corresponding mark is printed on the product.

Safety notes 2

2.1 Safety notices

Important notes on using the device

Safety notices on the use of the device

The following safety notices must be adhered to when setting up and operating the device and during all associated work such as installation, connecting up, replacing devices or opening the device.

General notices

⚠ WARNING

Safety extra low voltage

The SCALANCE X204RNA is designed for operation with Safety Extra-Low Voltage (SELV) by a Limited Power Source (LPS). (This does not apply to the SCALANCE X204RNA EEC.)

This means that only SELV / LPS complying with IEC 60950 1 / EN 60950 1 / VDE 0805 1 must be connected to the power supply terminals. The power supply unit for the equipment power supply must comply with NEC Class 2, as described by the National Electrical Code (r) (ANSI / NFPA 70).

If the equipment is connected to a redundant power supply (two separate power supplies), both must meet these requirements.

⚠ WARNING

The maximum current via the terminals is 10 A. You should therefore include a fuse that trips at a current higher than 10 A. The fuse must meet the following requirements:

- Suitable for 300 VDC / 250 VAC / max. 10 A
- Breaking current at least 10 kA
- UL/CSA listed (UL 248-1 / CSA 22.2 No. 248.1)

As an alternative, the following requirements:

- Breaking current at least 10 kA
- Approved in compliance with IEC 60127-1 / EN 60127-1
- Breaking characteristics: B or C for a circuit breaker or slow-blow fuse

WARNING

Opening the device

WARNING – EXPLOSION HAZARD

DO NOT OPEN WHEN ENERGIZED.

General notices on use in hazardous areas

WARNING

Risk of explosion when connecting or disconnecting the device

WARNING – EXPLOSION HAZARD

DO NOT CONNECT OR DISCONNECT EQUIPMENT WHEN A FLAMMABLE OR COMBUSTIBLE ATMOSPHERE IS PRESENT.

WARNING

Replacing components

WARNING – EXPLOSION HAZARD

SUBSTITUTION OF COMPONENTS MAY IMPAIR SUITABILITY FOR CLASS I, DIVISION 2 OR ZONE 2.

WARNING

Requirements for the cabinet/enclosure

When used in hazardous environments corresponding to Class I, Division 2 or Class I, Zone 2, the device must be installed in a cabinet or a suitable enclosure.

General notices on use in hazardous areas according to ATEX (SCALANCE X204RNA only)

WARNING

Requirements for the cabinet/enclosure

To comply with EC Directive 94/9 (ATEX95), this enclosure must meet the requirements of at least IP54 in compliance with EN 60529.

⚠ WARNING

Suitable cables for temperatures in excess of 70 °C

If the cable or conduit entry point exceeds 70°C or the branching point of conductors exceeds 80°C, special precautions must be taken. If the equipment is operated in an air ambient in excess of 50 °C to 70 °C, only use cables with admitted maximum operating temperature of at least 80 °C.

⚠ WARNING

Protection against transient voltage surges

Take measures to prevent transient voltage surges of more than 40% of the rated voltage. This is the case if you only operate devices with SELV (safety extra-low voltage).

Safety requirements 100 to 240 VAC (SCALANCE X204RNA EEC only)

Safety requirements for installation

According to the IEC 61131-2 standard and therefore in accordance with the EU directive 2006/95/EC (Low Voltage Directive), the devices are "open equipment" and in accordance with UL/CSA certification, they are an "open type".

To fulfill requirements for safe operation with regard to mechanical stability, flame retardation, stability, and shock-hazard protection, the following alternative types of installation are specified:

- Installation in a suitable cabinet.
- Installation in a suitable enclosure.
- Installation in a suitably equipped, enclosed control room.

Network topologies and redundancy 3

3.1 Network topologies and redundancy

High-availability Seamless Redundancy Protocol (HSR)

The High-availability Seamless Redundancy Protocol is a redundancy protocol for Ethernet networks. It is defined in Part 3 of the IEC 62439 standard. The SCALANCE X-200RNA devices support the HSR method. The areas of application of HSR are distributed real-time applications with high reliability demands that depend on the high availability of the network. Compared with classic fault-tolerant networks, HSR provides bumpless redundancy. This redundancy procedure allows data communication to be maintained without interruption if there are interruptions in the network. Other redundancy procedures have a reconfiguration time of the network of, for example 200 ms (MRP, 50 nodes in the ring) or 300 ms (High Speed Redundancy, 50 nodes in the ring) and can therefore not be used for substation applications or other applications that require high network availability.
The HSR method has the advantage that the communication redundancy is achieved by the configuration as ring. This means there is no need for other standard network components (switches) within a network. The end devices that use this method are connected to the two networks via a preceding device or via two integrated device interfaces. This means that the frame of the end device can be transferred at the same time in both directions of the ring. If a transmission path were to be interrupted, the frame uses the other path to reach its destination.
The devices of the SCALANCE X-200RNA product line are used to connect end devices without integrated HSR interfaces to HSR networks.

Parallel Redundancy Protocol (PRP)

The SCALANCE X-200RNA devices that support the HSR method also allow for coupling an HSR network to a redundant PRP network. The Parallel Redundancy Protocol is a redundancy protocol for Ethernet networks. Just like HSR, it is defined in Part 3 of the IEC 62439 standard. PRP is also used for distributed real-time applications with high reliability demands that depend on the high availability of the network and also offer bumpless redundancy.
The SCALANCE X-200RNA devices with HSR function allow for the coupling to a PRP network as mentioned above. But it cannot be used to connect a PRP network to standard Ethernet devices or Ethernet networks. You can purchase SCALANCE X-200RNA devices with PRP function for this purpose. See the overview table.

Which topologies can be implemented?

With the SCALANCE X-200RNA devices, nodes or entire network segments without HSR capability can be connected to a "High-availability Seamless Redundancy Protocol" network.

The SCALANCE X-200RNA products with their HSR capability can be used to implement an integrated solution for network components and protective devices for a substation and also process application.

You also have the option for a redundant or non-redundant coupling to a PRP network.

The SCALANCE X-200RNA can manage a maximum of 1023 MAC addresses.

Note

Make sure that the maximum permitted cable lengths for the relevant devices are not exceeded. You will find the permitted cable lengths in the technical specifications.

High-availability Seamless Redundancy Protocol

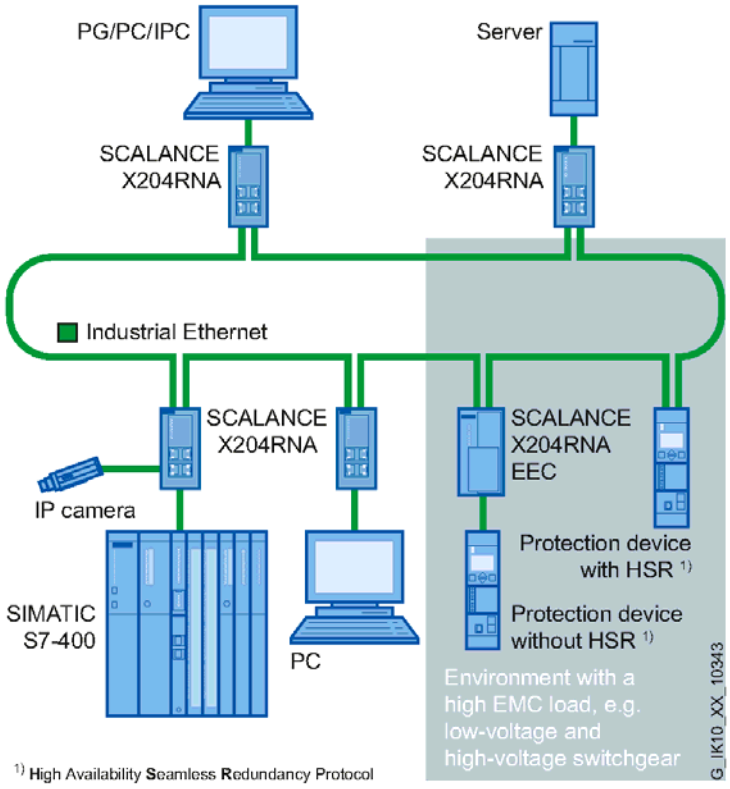


Figure 3-1 Basic diagram of a single HSR ring

With the High-availability Seamless Redundancy Protocol (HSR), each node must feed the Ethernet frames it wants to send in both directions of the ring. The HSR target device must also be connected via two ports with the ring. It receives the same frames from both directions, which means twice. The first frame is forwarded to the application. The second frame received is recognized and discarded. This achieves N-1 redundancy without reconfiguration (= bumpless switchover).

There are already end devices equipped with two Ethernet interfaces that are capable of handling the High-availability Seamless Redundancy Protocol (Double Attached Nodes HSR = DANH).

On the other hand, there are many end devices starting with S7 controllers right through to control computers that communicate using TCP-IP but do not support HSR and some even have only one Ethernet interface. With all these devices, a SCALANCE X-200RNA can be connected upstream from them.

Transition between HSR and PRP (redundant)

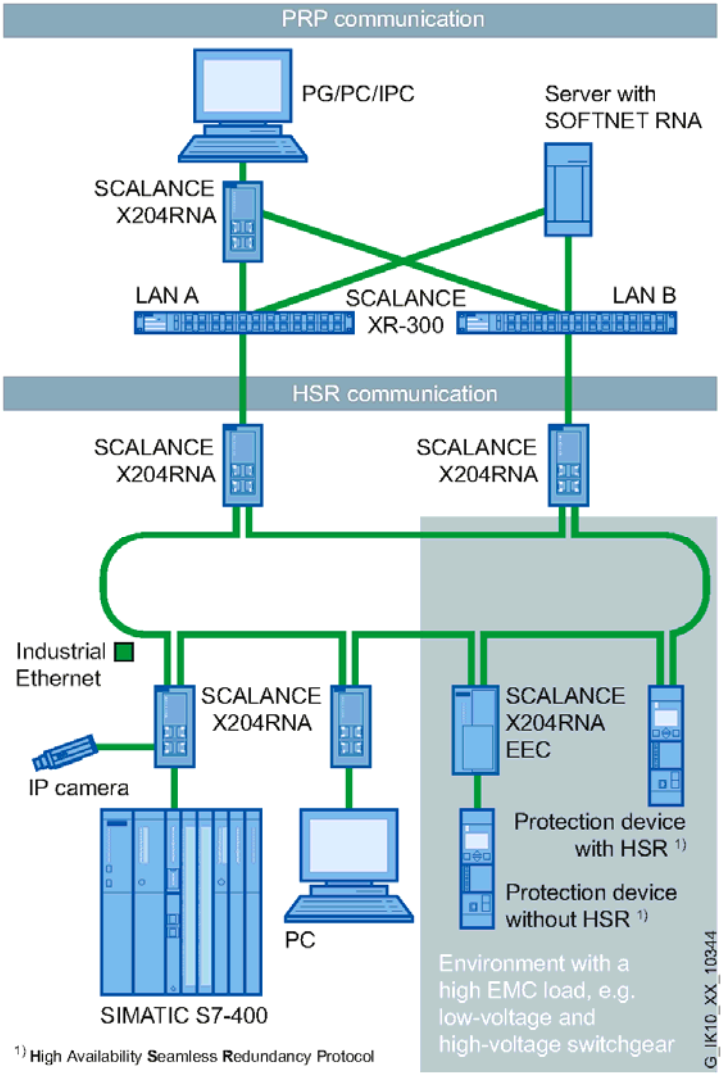


Figure 3-2 Basic diagram of the redundant HSR-PRP coupling

The SCALANCE X-200RNA devices allow for a coupling with a PRP network. This coupling is in redundant form, as described in standard IEC62439-3. This means you need two SCALANCE X-200RNA devices. One device is connected with the PRP network LAN A, the other with LAN B.
This means complete communication is still ensured even if one transition point fails. SANs connected without RedBox to the decoupled PRP network are an exception from this rule.

Transition between HSR and PRP (non-redundant)

The coupling with a PRP network can also take place non-redundantly. Only one single SCALANCE X-200RNA device is required. This device is connected with the PRP network LAN A and with LAN B.

We do not recommend this type of coupling because communication between HSR and PRP nodes is also interrupted when the transition point fails.

Product characteristics

4

4.1 Overview of the product characteristics

Overview of the product characteristics

The SCALANCE X204RNA and the SCALANCE X204RNA EEC have the same functionality and differ only in the environmental conditions, the input voltage ranges and the option of using SFP modules with the SCALANCE X204RNA EEC.

Table 4- 1 Overview of the product characteristics

	Device type SCALANCE	
	X204RNA	X204RNA EEC
SIMATIC environment	●	●
Operating temperature	-40 to +60° C	-40 to +70°C (up to 85°C/max. 16h)
Diagnostics LED	●	●
24 VDC	●	-
24 V .. 250 VDC / 100 V .. 240 V AC	-	●
Housing	Plastic	Metal
2 x 24 VDC	●	-
100 Base-T, full duplex/half duplex	●/-	●/-
10 Base-T	-	-
SFF interface for SFP modules for HSR ports	-	●
100 Base-FX for HSR ports	-	● (by means of optional SFP modules)
Signaling contact + on-site operation (set/reset button)	●	●
Diagnostics:		
via Web Based Management (WBM)	●	●
via e-mail notification (SMTP)	●	●
via SNMP V1,V2,V3 incl. Traps V2	●	●
via SYSLOG server notification	●	●
C-PLUG	●	●
IRT capability	-	-
SNTP	●	●
Testing to IEC 61850-3	-	●
Testing to IEEE 1613	-	●

Note

PROFINET controllers can communicate with PROFINET devices via the HSR and PRP network (PROFINET IO and RT). In this case all PROFINET devices (controllers and devices) must either be capable of HSR or PRP themselves or must be connected to the HSR ring or to the PRP network via a RedBox.

Within a PRP network (A or B), PROFINET controllers and devices can also communicate with each other as SANs (PROFINET IO, RT and IRT). A direct PROFINET communication relationship between DANPs and SANs or DANHs and SANs is not supported.

Table 4- 2 Overview of the connection options

Fast Ethernet	**Device type SCALANCE**	
100 Mbps	**X204RNA**	**X204RNA EEC**
TP (RJ-45)	4	2+2
Fiber multimode (duplex LC)	-	2 x SFP modules SFP991-1 multimode glass up to 3 km 6GK5991-1AD00-8AA0
Fiber single mode (duplex LC)	-	2 x SFP modules SFP991-1LD monomode glass up to 26 km 6GK5991-1AF00-8AA0
Fiber single mode (duplex LC)	-	2 x SFP modules SFP991-1LH+ monomode glass up to 70 km 6GK5991-1AE00-8AA0
Standard Ethernet ports / PRP ports	P1/A, P2/B	P1/A, P2/B
HSR ports	HSR 1, HSR 2	HSR 1, HSR 2

Note

TP connectors of SCALANCE X204RNA EEC

2x RJ45 for connecting two end devices / network structures without HSR Standard Ethernet or PRP capability and optionally 2x RJ45 or 2x SFP modules for connection to the HSR ring. If an SFP module is inserted, the corresponding RJ-45 jack is disabled.

Example: If an SFP module "HSR 1" is inserted, the TP Interface "HSR 1" has no function.

4.2 Components of the product

SCALANCE X204RNA

The following components are supplied with the SCALANCE X204RNA:

- SCALANCE X204RNA device
- 2-pin plug-in terminal block (signaling contact)
- 4-pin plug-in terminal block (redundant power supply)
- Safety notices
- CD (Operating Instructions, PST Tool)

SCALANCE X204RNA EEC

The following components are supplied with the SCALANCE X204RNA EEC:

- SCALANCE X204RNA EEC device
- 3-pin plug-in terminal block (signaling contact)
- 3-pin plug-in terminal block (power supply)
- Safety notices
- CD (Operating Instructions, PST Tool)
- Bracket for guiding the cable (mechanical protection)

Note

SFP modules are not supplied with the device.

4.3 Unpacking and checking

Unpacking, checking

1. Make sure that the package is complete.
2. Check all the parts for transport damage.

⚠ WARNING
Do not use any parts that show evidence of damage!

4.4 SCALANCE X204RNA

4.4.1 SCALANCE X204RNA product characteristics

SCALANCE X204RNA product characteristics

Possible attachments

The SCALANCE X204RNA has two RJ45 jacks for connection of end devices or network segments not capable of HSR (P1/A and P2/B) and two RJ45 jacks for connecting the High-availability Seamless Redundancy Protocol Ring (HSR 1 and HSR 2).

Figure 4-1 SCALANCE X204RNA

4.4.2 SCALANCE X204RNA TP interfaces

SCALANCE X204RNA TP interfaces

Connector pinout

On the SCALANCE X204RNA, the TP interfaces are implemented as RJ-45 jacks with the MDI-X assignment (Medium Dependent Interface Autocrossover) of a network component.

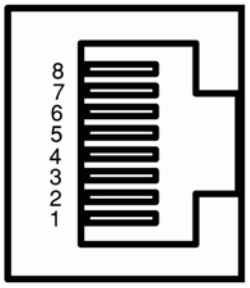


Figure 4-2 RJ-45 jack

Table 4- 3 Pin assignment

Pin number	Assignment
Pin 8	n. c.
Pin 7	n. c.
Pin 6	TD-
Pin 5	n. c.
Pin 4	n. c.
Pin 3	TD+
Pin 2	RD-
Pin 1	RD+

Note

TP cords or TP-XP cords with a maximum length of 10 m can be connected to the RJ-45 TP port.

With the IE FC cables and IE FC RJ-45 plug 180, an overall cable length of up to 100 m is permitted between two devices depending on the cable type.

Note

The interfaces of the SCALANCE X204RNA meet the requirements for environment B according to IEEE 802.3, section 33.4.1.1.

Autonegotiation

Autonegotiation means the automatic detection of the functionality of the port at the opposite end. Using autonegotiation, repeaters or end devices can detect the functionality available at the port of a partner device allowing automatic configuration of different types of device. With autonegotiation, two components connected to a link segment can exchange parameters and set themselves to match the supported communication functionality.

Note

The SCALANCE X204RNA operates permanently in autonegotiation mode and can therefore be connected to other devices that either also use the autonegotiation mode or the 100 Mbps mode FD (full duplex).

Note

The SCALANCE X204RNA is a plug-and-play device that does not require settings to be made for commissioning.

MDI / MDIX autocrossover function

The advantage of the MDI / MDIX autocrossover function is that straight-through cables can be used throughout and external Ethernet crossover cables are unnecessary. This prevents malfunctions resulting from mismatching send and receive wires. This makes installation much easier for the user.

The SCALANCE X204RNA supports the MDI / MDIX autocrossover function.

Note

Please note that the direct connection of two ports on the switch or accidental connection over several switches causes an illegal loop. Such a loop can lead to network overload and network failures.

Transmission speed

The transmission speed of the Fast Ethernet ports is 100 Mbps full duplex.

4.5 SCALANCE X204RNA EEC

4.5.1 SCALANCE X204RNA EEC product characteristics

SCALANCE X204RNA EEC product characteristics

Possible attachments

The SCALANCE X204RNA EEC has four RJ-45 jacks and two slots for SFP modules. The SFP modules can be used as an alternative to the two RJ45 jacks HSR 1 and HSR 2 and are intended for the connection to the High-availability Seamless Redundancy Protocol Ring. Standard Ethernet end devices or network segments that do not support HSR or PRP networks to be coupled are connected to the RJ45 jacks P1/A and P2/B.

Figure 4-3 SCALANCE X204RNA EEC

4.5.2 SCALANCE X204RNA EEC TP interfaces

SCALANCE X204RNA EEC TP interfaces

Connector pinout

On the SCALANCE X204RNA EEC, the TP interfaces are implemented as RJ-45 jacks with the MDI-X assignment (Medium Dependent Interface Autocrossover) of a network component.

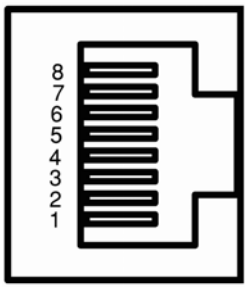


Figure 4-4 RJ-45 jack

Table 4- 4 Pin assignment

Pin number	Assignment
Pin 8	n. c.
Pin 7	n. c.
Pin 6	TD-
Pin 5	n. c.
Pin 4	n. c.
Pin 3	TD+
Pin 2	RD-
Pin 1	RD+

Note

TP cords or TP-XP cords with a maximum length of 10 m can be connected to the RJ-45 TP port.

With the IE FC cables and IE FC RJ-45 plug 180, an overall cable length of up to 100 m is permitted between two devices depending on the cable type.

Note

The interfaces of the SCALANCE X204RNA EEC meet the requirements for environment B according to IEEE 802.3, section 33.4.1.1.

Autonegotiation

Autonegotiation means the automatic detection of the functionality of the port at the opposite end. Using autonegotiation, repeaters or end devices can detect the functionality available at the port of a partner device allowing automatic configuration of different types of device. With autonegotiation, two components connected to a link segment can exchange parameters and set themselves to match the supported communication functionality.

Note

The SCALANCE X204RNA EEC operates permanently in autonegotiation mode and can therefore be connected to other devices that either also use the autonegotiation mode or the 100 Mbps mode FD (full duplex).

Note

The SCALANCE X204RNA EEC is a plug-and-play device that does not require settings to be made for commissioning.

MDI / MDIX autocrossover function

The advantage of the MDI / MDIX autocrossover function is that straight-through cables can be used throughout and external Ethernet crossover cables are unnecessary. This prevents malfunctions resulting from mismatching send and receive wires. This makes installation much easier for the user.

The SCALANCE X204RNA EEC supports the MDI / MDIX autocrossover function.

Note

Please note that the direct connection of two ports on the switch or accidental connection over several switches causes an illegal loop. Such a loop can lead to network overload and network failures.

Transmission speed

The transmission speed of the Fast Ethernet ports is 100 Mbps full duplex.

4.5.3 SCALANCE X204RNA EEC SFP interface

SCALANCE X204RNA EEC SFP interface

The SFF slots are intended for SFP transceivers with optical interface. SFP inserts with electrical interface (RJ45) are not supported.

Transmission medium and range

Table 4- 5 SFP transceiver - overview

SFP transceiver	SFP991-1	SFP991-1LD	SFP991-1LH+
Transmission medium	Multimode FO cable	Monomode FO cable	Monomode FO cable
- Wavelength - Core diameter - Outer diameter	1310 nm 50 or 62.5 µm 125 µm	1310 nm 9 µm 125 µm	1310 nm 9 µm 125 µm
Maximum range	3 km	26 km	70 km
Order number	6GK5991-1AD00-8AA0	6GK5991-1AF00-8AA0	6GK5991-1AE00-8AA0

Note

The SFP modules are not included in the scope of delivery and must be ordered separately, if needed.

Connectors

Electrical connection: SFF slot

Optical connection: Duplex LC connector

Transmission speed

The transmission speed of the optical Fast Ethernet ports is 100 Mbps.

Transmission technique

The transmission mode for 100Base-FX is specified in the IEEE 802.3 standard.

4.6 C-PLUG

CPLUG (configuration plug)

The C-PLUG is an exchangeable medium for storage of the configuration and project engineering data of the basic device. This means that the configuration data remains available if the basic device is replaced.

How it works

Power is supplied by the basic device. The C-PLUG retains all data permanently when the power is turned off.

If an empty C-PLUG (factory settings) is inserted, all configuration data of the SCALANCE X-200RNA is saved to it when the device starts up. Changes to the configuration during operation are also saved on the C-PLUG without any operator intervention being necessary.

A basic device with an inserted C-PLUG automatically uses the configuration data of the C-PLUG when it starts up. This is, however, only possible when the data was written by a compatible device type.

This allows fast and simple replacement of the basic device. If a device needs to be replaced, the C-PLUG is simply taken from the failed component and inserted in the replacement device. The first time it is started up, the replacement device has the same configuration as the failed device except for the MAC address set by the vendor.

Compatible devices

As a general rule, the data on the C-PLUG is only compatible with devices having an identical order number and the same device name.

Over and above this, the data of the SCALANCE X204RNA and the SCALANCE X204RNA is compatible.

Using a previously written C-PLUG

If you want to insert a C-PLUG that has already been used and has been written to in a SCALANCE X-200RNA with a different configuration, the existing C-PLUG data must first be deleted.

Note

The X-200 devices normally start up with the configuration of the C-PLUG, assuming this was written to by a compatible device type.

Diagnostics

Inserting a C-PLUG that does not contain the configuration of a compatible device type or general malfunctions of the C-PLUG are signaled by the diagnostics mechanisms of the SCALANCE X-200RNA (LEDs, SNMP, WBM, etc.).

Inserting in the C-PLUG slot

The C-PLUG is not supplied with the SCALANCE X-200RNA. It is available as an optional accessory.

The slot for the C-PLUG is located as follows:

- With a SCALANCE X204RNA on the front of the device
- With the SCALANCE X204RNA EEC on the top of the device

Refer to Figure 4-6 Position of the C-PLUG and SET button (Page 31)

To insert the C-PLUG, remove the protective cover. The C-PLUG is inserted in the slot.

The protective cover must then be closed correctly.

Note

The C-PLUG may only be inserted or removed when the power is off!

Removing the C-PLUG

It is only necessary to remove the C-PLUG if a fault occurs on the SCALANCE X-200RNA.

The C-PLUG can be removed from the slot using flat pliers, tweezers, or a small screwdriver.

See also

SET button (Page 30)

4.7 SET button

SET button

Button function

You can change various device settings with the button. Modified settings are retained after device power off/on.

The SELECT / SET button is used to switch over the display mode and to make other settings. After turning on the SCALANCE X-200RNA, it is in the display mode.

The button has three functions:

- Triggering a device restart
- Reset to the factory defaults All settings made are overwritten by the factory defaults.
- Define the fault mask and the display at the LEDs. The current states of all ports and the states of the power supplies L1 and L2 are included in the fault mask. The previous fault mask is then overwritten.

Different settings are made depending on how long you hold down the button:

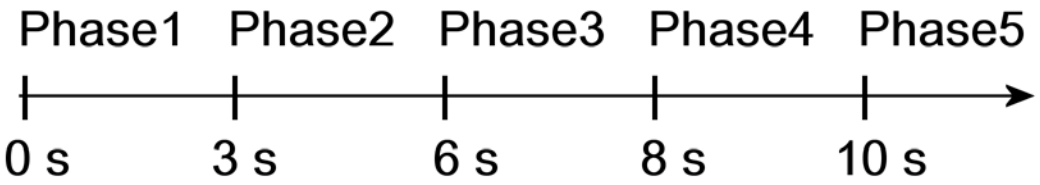


Figure 4-5 The five button phases

Time the button is pressed in seconds

Table 4- 6 Button phases

Phase	Description
1	The currently set fault mask is displayed. If no fault mask has been set, all ports flash one after the other. If you release the button in phase 1, this has no effect.
2	The LEDs of the ports at which there is currently a link flash at 2.5 Hz. If you release the button in phase 2, this has no effect.
3	The LEDs of the ports at which there is currently a link and the LEDs of the connected power supply are lit permanently. If you release the button in phase 3, the fault mask corresponding to the lit LEDs is adopted.
4	All port LEDs flash at 2.5 Hz. Releasing the button during this phase brings about a device restart (soft reset)
5	All port LEDs flash alternately yellow/green at 2.5 Hz. The device is reset to the factory defaults.

Note

On the SCALANCE X204RNA, the button is located below the C-PLUG compartment.

On the SCALANCE X204RNA EEC, the button is on the top of the device in a recess next to the C-PLUG compartment.

① C-PLUG
② SET button

Figure 4-6 Position of the C-PLUG and SET button

4.8 Displays

4.8.1 Fault indicator (yellow/red LED)

Fault indicator (yellow/red LED)

If the LED is lit red, a SCALANCE X-200RNA has detected an error/fault.

At the same time, the signaling contact opens assuming that the response of the signaling contact has not been configured differently.

The LED signals that the SCALANCE X-200RNA can adopt the following statuses:

Device type SCALANCE	LED lit red	LED lit yellow	LED not lit
X204RNA	1, 2, 3, 4, 5, 6	7	8
X204RNA EEC	1, 3, 4, 5, 6	7	8

1. Link down event on a monitored port.
2. Failure of one of the two redundant power supplies.
3. C-PLUG error
4. Device startup, the LED is lit for approx. 20 seconds.
5. Internal error.
6. A redundancy error has been detected (unexpected frames via HSR1, HSR2, P1/A or P2/B ports).
7. Redundancy warning (incorrect LAN ID at P1/A or P2/B)
8. No problem has been detected by the SCALANCE X-200RNA.

4.8.2 Power display

Power display

The LEDs signal the following statuses of the SCALANCE X-200RNA.

The status of the power supply is indicated by a green LED:

Device type SCALANCE	LED lit green	LED lit yellow	LED not lit
X204RNA	1	2	3
X204RNA EEC	4	-	5

1. Both L power supplies are connected (redundant supply).
2. One L power supply is connected (non-redundant supply).

3. Power supply L1 and L2 are not connected or supply voltages are <14 V.
4. Power supply L is connected
5. Power supply L is not connected or the supply voltage is too low.

4.8.3 Port status indication

Port status indicator (green/yellow LEDs)

The LEDs signal the following port statuses of the SCALANCE X-200RNA.

The status of interfaces is indicated by two-color LEDs:

Device type SCALANCE		LED lit green	LED lit yellow	LED flashes yellow
	Number of LEDs			
X204RNA	2 port LEDs	1	2, 3	4
	2 PRP port LEDs	1	2, 3	4
X204RNA EEX	2 port LEDs	1	2, 3	4
	2 PRP port LEDs	1	2, 3	4

1. TP link exists, no data reception.
2. TP link, data received at TP port.
3. Device startup, the LED is lit for approx. 6 seconds.
4. Setting or display of the fault mask.

4.8.4 LED displays during startup

LED displays during startup

When a device starts up, the following displays light up in the order shown:

1. Power LEDs (green) light up immediately after turning on the power.
2. Port LEDs go off, the red error LED is lit for approx. 10 seconds.
3. Following startup, the correct link status is indicated by the port LEDs after approximately 5 seconds.
4. The SCALANCE X-200RNA is now ready for operation.

Installation 5

5.1 Types of installation

Types of installation

The SCALANCE X-200RNA devices can be mounted on a 35 mm DIN rail. Wall mounting is also possible.

Note

Installation on a SIMATIC S7-300 standard rail is not possible

Note

When installing and operating the device, keep to the installation instructions and safety-related notices in this description and in the SIMATIC NET Industrial Ethernet network manual.

Unless stated otherwise, the mounting options listed below apply to all SCALANCE X-200RNA devices.

Note

Provide suitable shade to protect the SCALANCE X-200RNA devices against direct sunlight. This avoids unwanted warming of the SCALANCE X-200RNA devices and prevents premature aging of the device and cabling.

⚠ WARNING

If a SCALANCE X204RNA EEC is operated at ambient temperatures between 60 °C and 70 °C, the housing temperature may exceed 70 °C.

When installing the X204RNA EEC, select a location where only qualified service personnel or trained users have access to it.

Operation of the SCALANCE X204RNA EEC at ambient temperatures of 60 °C - 70 °C is only permitted under these conditions.

⚠ WARNING

If temperatures in excess of 70 °C occur on cables or at cable feed-in points, or the temperature at the branching point of the cables exceeds 80 °C, special measures need to be taken. If the equipment is operated at an ambient temperature of 50 °C - 60 °C, use cables with a permitted ambient temperature of at least 80 °C.

NOTICE
Do not cover the ventilation grilles During installation, select a mounting position so that the ventilation grilles are always free to achieve adequate cooling. With normal orientation, the ventilation grilles are on the top, bottom and sides (X204RNA EEC only) of the housing.

Minimum clearances

If you install the SCALANCE X-200RNA without forced ventilation or cooling, minimum clearances must be maintained to neighboring devices or the wall of the housing. By keeping to the minimum clearances, there is then an adequate stream of air for heat dissipation during operation. Keep to the following minimum clearances to neighboring devices.

Table 5- 1 Minimum clearances when installing in cabinets

Minimum clearance to devices below the X-200RNA	100 mm
Minimum clearance to devices above the X-200RNA	100 mm
Minimum lateral clearance to devices (X204RNA EEC only)	20 mm

5.2 Mounting on DIN rails

Installation

Install the SCALANCE X-200RNA on a 35 mm DIN rail complying with DIN EN 60715:

1. Place the upper catch of the device over the top of the DIN rail and then push in the lower part of the device against the rail until it clips into place.
2. Fit the connectors for the power supply.
3. Fit the connectors for the signaling contact.
4. Insert the terminal blocks into the sockets on the device.

Figure 5-1 Mounting on the DIN rail based on the example of a SCALANCE X204RNA EEC

Fitting the protective bracket

① Hang onto rail at top
② Lock in position below
③ Secure with the screw

Figure 5-2 Mounting the protective bracket on the SCALANCE X204RNA EEC

Uninstalling

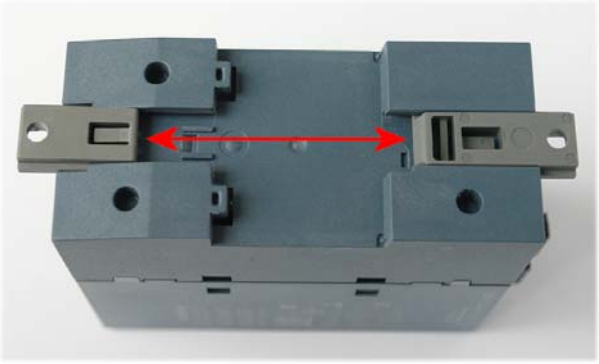
Removing a SCALANCE X-200RNA from a DIN rail:

1. First disconnect all connected cables.
2. Use a screwdriver to release the lower rail catch of the device and pull the lower part of the device away from the rail.

Figure 5-3 SCALANCE X204RNA removing from a DIN rail (35 mm)

5.3 Wall mounting

Wall mounting of a SCALANCE X204RNA



Preparation for wall mounting

Wall mounting

1. For wall mounting, use suitable mounting fittings for the wall (for example, for a concrete wall, two plugs 6 mm diameter and 30 mm long, 2 screws 3.5 mm diameter and 40 mm long).
2. Connect the electrical cable connecting cables.
3. Fit the connectors for the signaling contact.
4. Insert the terminal blocks into the sockets on the SCALANCE X204RNA.

For more exact dimensions, please refer to the section "Dimension drawings" in the manual.

Note

The wall mounting must be capable of supporting at least four times the weight of the SCALANCE X204RNA (see "Technical specifications").

Wall mounting of a SCALANCE X204RNA EEC

To mount the SCALANCE X-204RNA EEC on a wall, secure an adequately long piece of DIN rail (35 mm) to the wall. For wall mounting, use suitable mounting fittings for the wall (for example, for a concrete wall, two plugs 6 mm diameter and 30 mm long, 2 screws 3.5 mm diameter and 40 mm long).

Now mount the SCALANCE X-204RNA on the DIN rail as described in the section "DIN rail mounting" (Page 37).

Connection

6

6.1 Power supply

Power supply

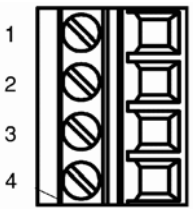
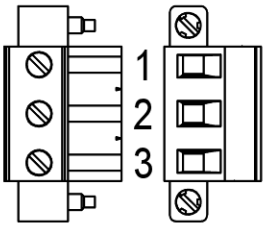
The power supply is connected using a 3- or 4-pin plug-in terminal block. Usable cable cross-section 0.25 to 2.5 mm^2. Permitted tightening torque 0.57 - 0.79 Nm (5 - 7 in.lb.).

The power supply is non-floating. The signal cables of the Ethernet TP ports are floating.

Note

Removing or inserting the power connector with the power on is not permitted.

Table 6- 1 Pin assignment

Pin number	Pin assignment of the SCALANCE X204RNA	Pin assignment of the SCALANCE X204RNA EEC
		
Pin 1	L1 +24 VDC	PE
Pin 2	M1	L1 +24 V…+250 VDC L1 100 V … 240 VAC
Pin 3	M2	N1
Pin 4	L2 +24 VDC	-

Note

Since the SCALANCE X204RNA EEC does not have a redundant power supply, the power supply must be connected between L1 and N1.

⚠ WARNING

The SCALANCE X204RNA is designed for operation with safety extra-low voltage (SELV). This means that only safety extra-low voltages (SELV) complying with IEC950/EN60950/VDE0805 can be connected to the power supply terminals.

Measures must be taken to prevent transient overvoltages of more than 40% of the rated voltage. This is the case if the devices are operated exclusively with SELV (Safety Extra Low Voltage).

The power supply unit for the SCALANCE X204RNA power supply must meet NEC Class 2, as described by the National Electrical Code(r) (ANSI/NFPA 70).

The power of all connected power supply units must total the equivalent of a power source with limited power (LPS limited power source).

If the device is connected to a redundant power supply (two separate power supplies), both must meet these requirements.

The signaling contact can be subjected to a maximum load of 100 mA (safety extra-low voltage (SELV), 24 VDC).

Never operate the SCALANCE X204RNA with AC voltage or DC voltage higher than 28.8 V DC.

24 VDC power supply

NOTICE

If the SCALANCE X204RNA is supplied over long 24 V power supply lines or networks, measures are necessary to prevent interference by strong electromagnetic pulses on the supply lines. These can result, for example, due to lightning or switching of large inductive loads.

One of the tests used to attest the immunity of the SCALANCE X204RNA to electromagnetic interference is the "surge immunity test" according to EN61000-4-5. This test requires overvoltage protection for the power supply lines. A suitable device is, for example, the Dehn Blitzductor VT AD 24 V type no. 918 402 or comparable protective element.

Vendor: DEHN+SÖHNE GmbH+Co.KG, Hans-Dehn-Str.1, Postfach 1640, D-92306 Neumarkt, Germany.

Power supply 100 .. 240 VAC / 24 .. 250 VDC

⚠ WARNING

Danger from line voltage

The SCALANCE X204RNA EEC has a power supply of 100 .. 240 VAC or 24 .. 250 VDC.

This product can only function correctly and safely if it is transported, stored, set up, and installed correctly, and operated and maintained as recommended.

Connecting and disconnecting may only be performed by an electrical specialist. Connect or disconnect power supply cables only when the power is turned off.

⚠ WARNING

The SCALANCE X204RNA EEC does not have an ATEX approval.

Devices with 100 to 240 VAC power supply or 24 .. 250 V DC are not approved for use in hazardous areas according to EC-Dir--94/9 (ATEX).

NOTICE

Securing cables with dangerous voltage

Make sure that the connector cannot be released accidentally by pulling on the connecting cable. Lay the cables in cable ducts or cable channels and secure the cables, where necessary, with cable ties.

Protective ground

⚠ WARNING

PE connector of SCALANCE X204RNA EEC

Simple grounding via the housing is inadequate. For reliable operation, the PE cable must be connected via the ground bolt. On the SCALANCE X204RNA EEC, the grounding bolt is on the bottom of the device.

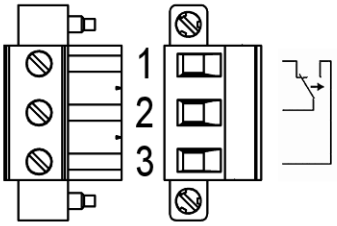
6.2 Signaling contact

Signaling contact

The signaling contact (relay contact) is a floating switch with which error/fault states can be signaled by breaking the contact.

The signaling contact is connected to a 2- or 3-pin plug-in terminal block. Usable cable cross-section 0.25 to 2.5 mm^2. Permitted tightening torque 0.57 - 0.79 Nm (5 - 7 in.lb.).

Table 6- 2 Pin assignment

Pin number	Pin assignment of the SCALANCE X 204RNA	Pin assignment of the SCALANCE X 204RNA EEC
		
Pin 1	F1 (NO contact / NC contact if a fault occurs)	F1 (NC contact / NO contact if a fault occurs)
Pin 2	F2	F2 (pole terminal)
Pin 3	-	F3 (NO contact / NC contact if a fault occurs)

The following errors/faults can be signaled by the signaling contact:

- The loss of a link on a monitored port (see section "Setting the fault mask" (Page 30)).
- The failure of one of the two redundant power supplies (X204RNA only).
- The loss of the entire power supply
- Internal error
- Incompatible C-PLUG was inserted.

The connection or disconnection of a communication node on an unmonitored port does not lead to an error message.

The signaling contact remains activated until the error/fault is eliminated or until the current status is applied as the new desired status using the button.

When the SCALANCE X-200RNA is turned off, the signaling contact is always activated (signals "error/fault").

Note

The signaling contact correlates with the red fault LED.

Exception: The absence of the power supply is signaled only by the signaling contact (no display by the fault LEDs).

Note

During startup, the signaling contract is always active (signals "error/fault").

6.3 Connecting the SFP transceiver

Connecting the SFP transceiver

The SFP modules are supplied with power via the SFF slot of the SCALANCE X204RNA EEC.

6.4 Grounding

Grounding

SCALANCE X204RNA

The housing is made of plastic. There is no need and no possibility of grounding.

SCALANCE X204RNA EEC

The device is grounded over the DIN rail. There is also a grounding bolt on the underside of the housing. Connect the grounding bolt of the device to the nearest grounding point using the grounding cable. To do this use the same wire cross-section as the power supply cable, however not smaller than 1.5 mm²/16 AWG.

Functional description and configuration using Web based Management

7

7.1 Introduction

Introduction

To make the best possible use of the technical possibilities of the SCALANCE X-200RNA devices, you can adapt the configuration of the device to the concrete situation in which it is used.

Web Based Management (WBM) accesses the configuration of the SCALANCE X-200RNA using a Web browser. An Ethernet connection to the device is necessary.

Note

To prevent unauthorized access to the SCALANCE X200RNA, there is an automatic logout after the 15 minutes or after the time configured in the Agent Timeout Configuration menu. A manual logout is also possible with the appropriate button in the user interface. Exiting the browser does does not close the session. If the browser is started again within the timeout, the session continues to be used.

Note

To use SNMP Management and traps, you require a network management station. This does not ship with IE switches.

7.2 Prerequisite

Note

The screens described in this section apply to the SCALANCE X-200RNA devices. The screens of the SCALANCE X204RNA EEC were chosen to illustrate the examples. Any significant deviations from the screens of the SCALANCE X204RNA are pointed out or shown.

Principle of Web Based Management

The SCALANCE X-200RNA devices have an integrated HTTP server for Web Based Management. If a SCALANCE X-200RNA is addressed using a Web browser, it returns HTML pages to the client computer depending on the user input.

The user enters the configuration data in the HTML pages sent by the SCALANCE X-200RNA. A SCALANCE X-200RNA evaluates this information and generates reply pages dynamically. The great advantage of this method is that apart from a Web browser, no special software is required on the client.

Requirements for Web Based Management

- A SCALANCE X-200RNA must have an IP address before you can use Web Based Management.
- To use Web Based Management, there must be an Ethernet connection between the SCALANCE X-200RNA and the client computer.
- Use of a Microsoft Internet Explorer, version 8 or higher is recommended.
- All the pages of Web Based Management require JavaScript. You should therefore make sure that Java Script is enabled in your browser settings.

  Note

  The browser must not be set so that it reloads the page from the server each time the page is accessed. The updating of the dynamic content of the page is ensured by other mechanisms. In the Internet Explorer, you can make the appropriate setting in the *Options > Internet Options > General* menu in the section *Temporary Internet Files* with the Settings button.

  Below the text *Check for newer versions of stored pages*, the *Automatically* check box must be selected.

- Web Based Management is HTTP- or HTTPS-based, so you must also enable access to port 80 or 443 if you have a firewall installed.

Starting Web Based Management and logging on

1. Enter the IP address in the address box of the Web browser. If there is a problem-free connection to the SCALANCE X-200RNA, the Logon screen of Web Based Management is displayed:

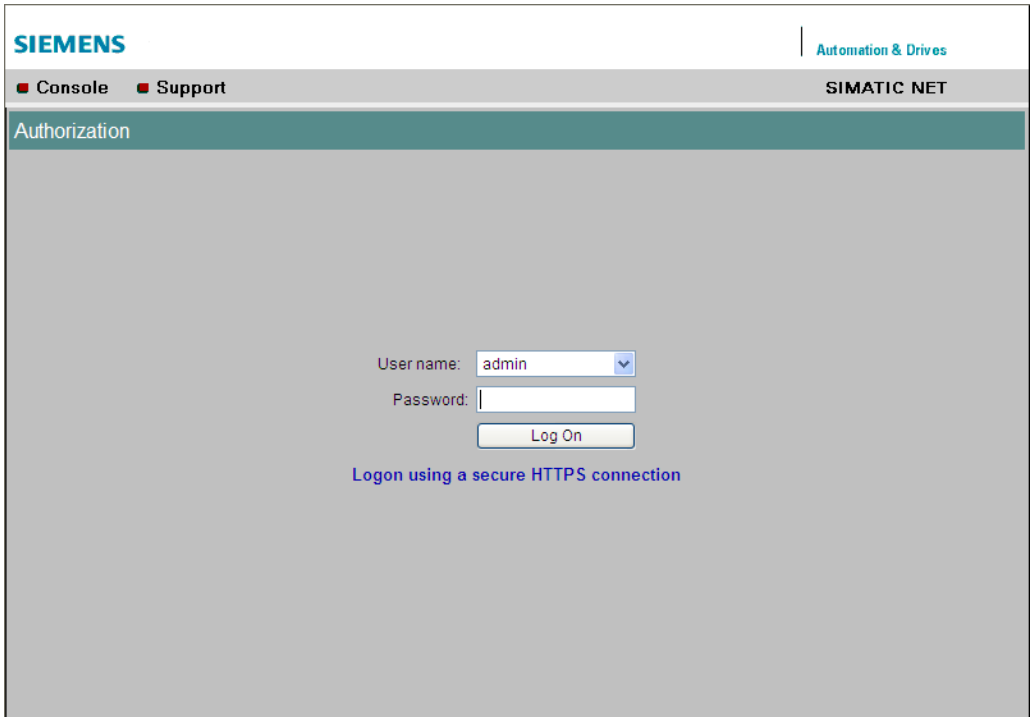


Figure 7-1 Logon dialog

2. In the "User Name" list box, select the "Admin" entry if you want to change settings of the SCALANCE X-200RNA (read and write access). If you select the "User" entry, you only have read access to the configuration data of the SCALANCE X-200RNA.
3. Enter your password. If you have not yet set a password, the default passwords as shipped apply: Enter admin if you selected "admin" as the user name or user if you selected "user".

Note

For security reasons, make sure that you change the original factory-set passwords.

4. Click the "Log On" button to start the logon.

Note

By clicking on "Logon using a secure HTTPS connection", you select a secure connection with SSL encryption.

7.3 LED simulation

Display of the operating state

Each SCALANCE X-200RNA has several LEDs that provide information on the operating state of the device. Depending on its location, direct access to the SCALANCE X-200RNA may not always be possible. Web Based Management therefore displays simulated LEDs.

The top quarter of the screen shows a schematic representation of the SCALANCE X-200RNA with the corresponding LEDs. The meaning of the LED displays is described in the section "Displays" in these Operating Instructions.

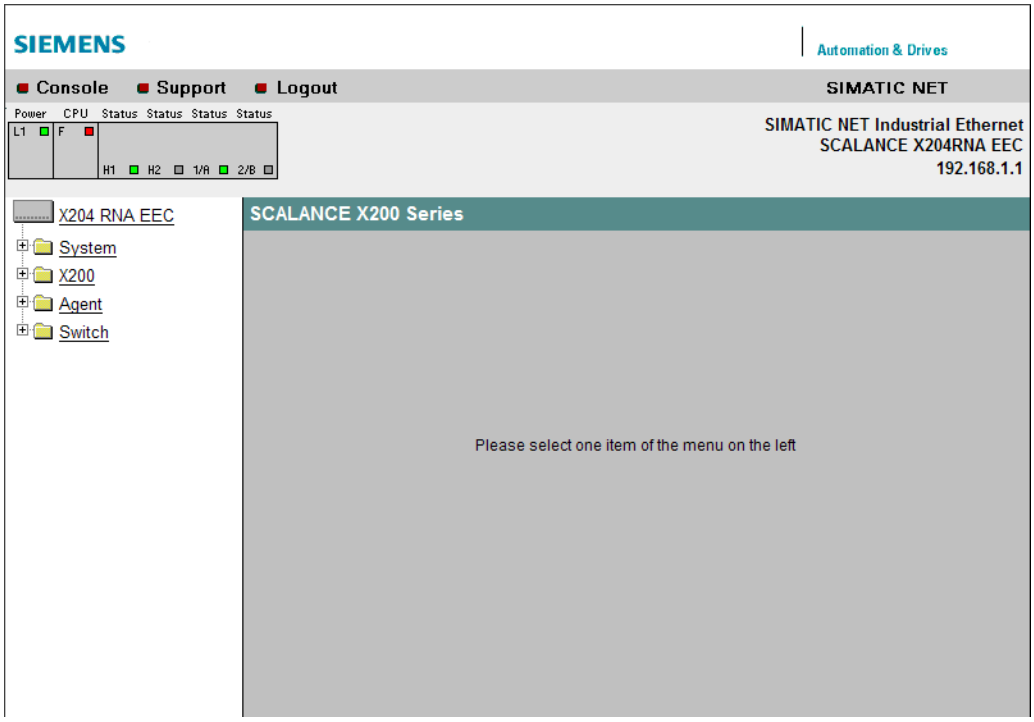


Figure 7-2 LED simulation of the SCALANCE X204RNA EEC

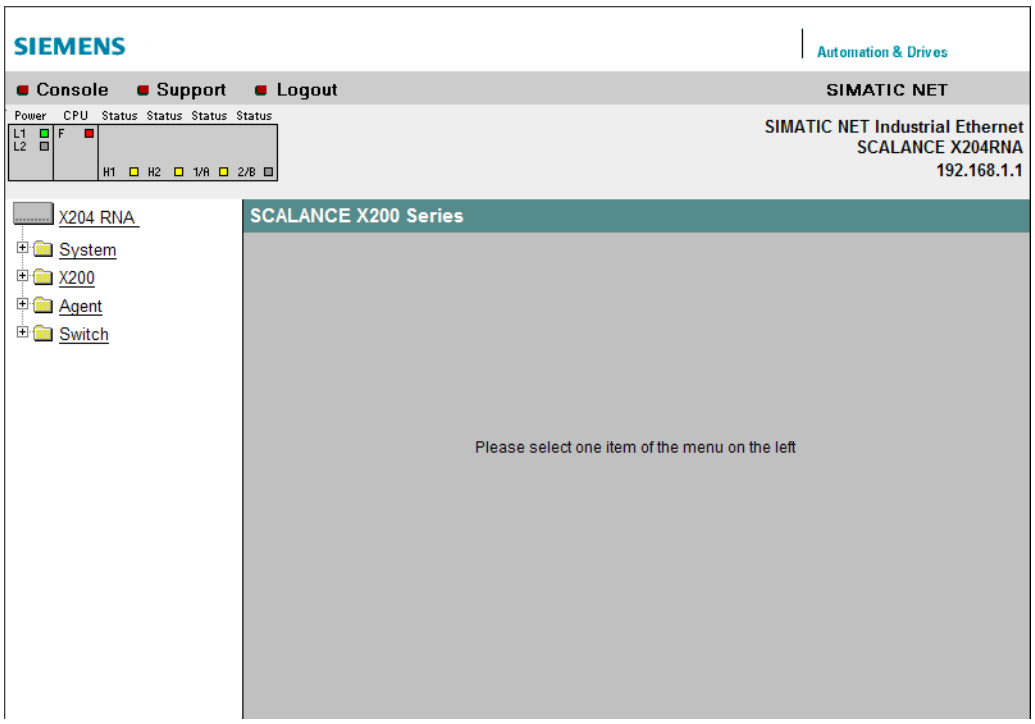


Figure 7-3 LED simulation of the SCALANCE X204RNA

7.4 Working with the WBM

Navigation bar

The upper menu bar of WBM contains the following links:

- Console
  This link opens a Telnet connection to the module.
  Note: With the Windows 7 operating systems or with Internet Explorer 8, access to the devices **via the console link** in WEB management is no longer possible.
- Support
  When you click this link, you open a SIEMENS AG support page. SIEMENS Support is, however, only accessible when your PC has a connection to the Internet.
- Logout
  By clicking on this link, you log out from the device.

Updating the display with "Refresh"

Web Based Management pages have a "Refresh" button at the lower edge of the page. Click this button to request up-to-date information from the IE switch for the current page.

Storing entries with "Set Values"

Pages in which you can make configuration settings have a "Set Values" button at the lower edge. Click this button to save the configuration data you have entered on the IE switch.

Note

Changing configuration data is possible only with the "Administrator" login.

7.5 The System menu

7.5.1 System Configuration

General device information

This screen appears if you click the *System* folder icon:

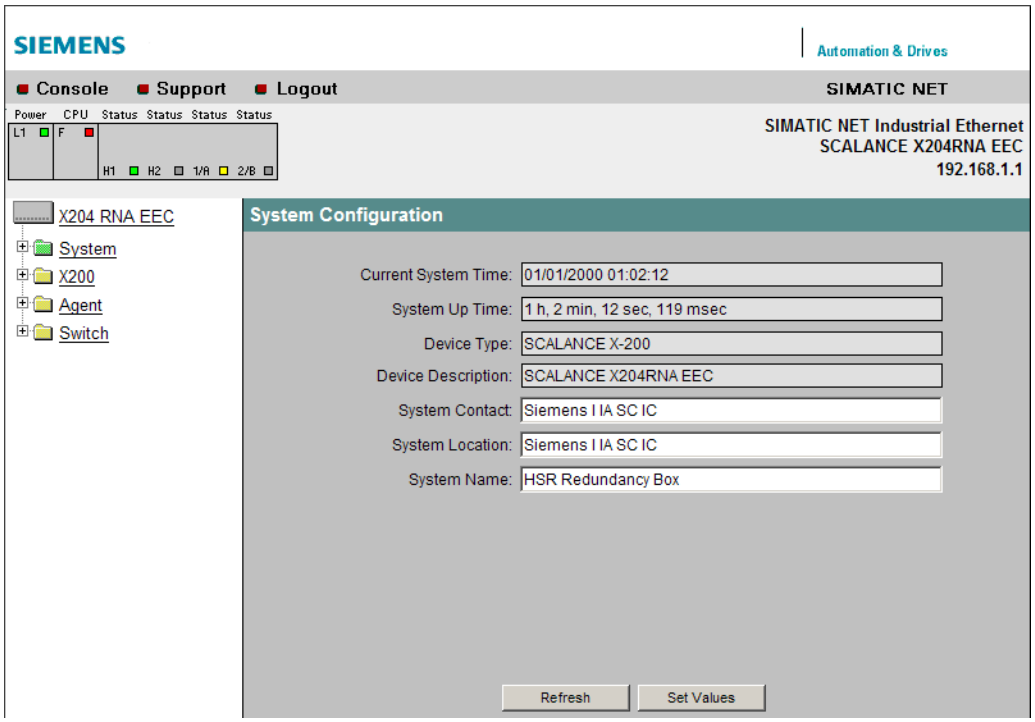


Figure 7-4 System Configuration

Current System Time(read-only)
The system time is set either by the user or is synchronized by a time-of-day frame (either SINEC H1 time frame or SNTP). You can also see when and how it was set:

- (**m**) The setting was made manually.
- (**p**) The setting was made by the Simple Network Time Protocol (SNTP).

System Up Time (read-only)
The time since the last reboot.

Device Type (read-only)
The type designation of the device.

Device Description (read-only)
The type description of the device.

System Contact
Enter the name of a contact person responsible for managing the device in this box.

System Location
In this box, you enter a location for the device, for example a room number.

System Name
Enter a description of the device in this box.

7.5.2 System Identification & Maintenance

System Identification & Maintenance

The following screen contains information on device-specific vendor and maintenance data such as the order number, serial number, version numbers etc.

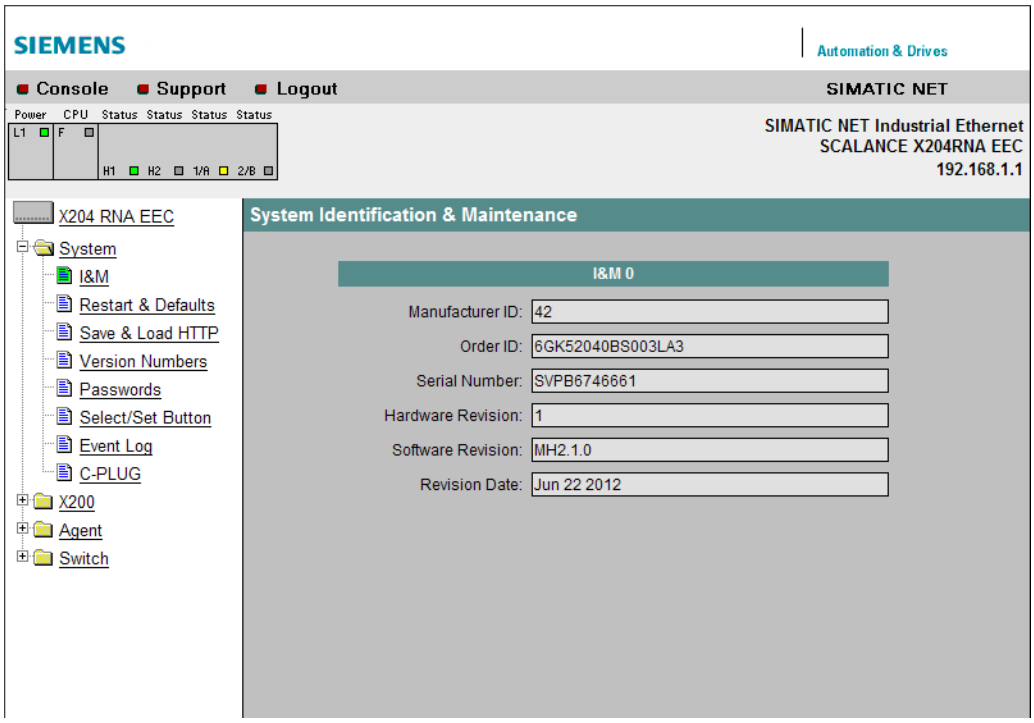


Figure 7-5 System Identification & Maintenance

I&M 0
Here, you can see the individual parameters for Identification & Maintenance.

7.5.3 System Restart & Defaults

Resetting the settings

In this menu, you will find a button for restarting the SCALANCE X-200RNA as well as options for resetting the settings of the SCALANCE X-200RNA.

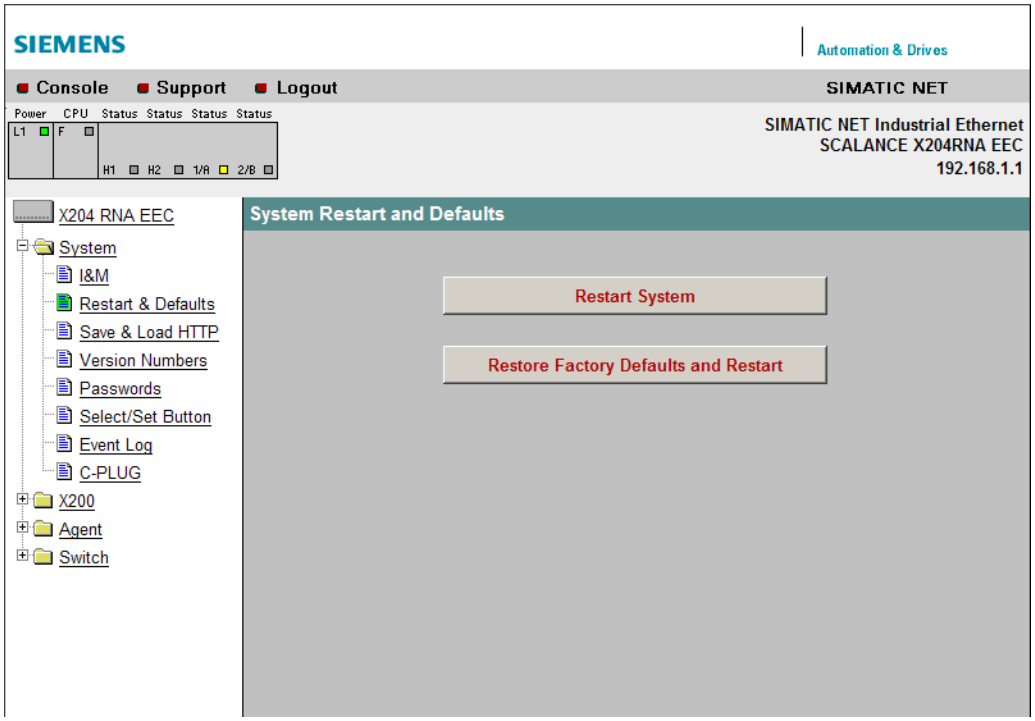


Figure 7-6 System Restart and Defaults

Note

Note the following points about restarting a SCALANCE X-200RNA:

- You can only restart the SCALANCE X-200RNA with administrator privileges.
- A SCALANCE X-200RNA should only be restarted with the buttons of this menu and not by a power cycle on the device.
- The browser must not be set so that it reloads the page from the server each time the page is accessed. The updating of the dynamic content of the page is ensured by other mechanisms. In the Internet Explorer, you can make the appropriate setting in the *Options > Internet Options > General* menu in the section *Temporary Internet Files* with the Settings button.
- Below the text *Check for newer versions of stored pages*, the *Automatically* check box must be selected.

Restart System

Click this button to restart the SCALANCE X-200RNA. You must confirm the restart in a dialog box. During a restart, the SCALANCE X-200RNA is reinitialized, the internal firmware is reloaded, and the device runs a self-test. The learned entries in the address table are deleted. You can leave the browser window open while the SCALANCE X-200RNA restarts.

Restore Factory Defaults and Restart

Click this button to restore the factory defaults for the configuration. The protected defaults are also reset. An automatic restart is triggered.

Note

By resetting all the defaults, the IP address is also lost. A SCALANCE X-200RNA can then be accessed using the Primary Setup Tool.

7.5.4 System Save & Load

System Save & Load via HTTP

The WBM allows you to store configuration information in an external file on your client PC or to load such data from an external file from the PC to the SCALANCE X-200RNA. You can also download both new firmware as well as a new FPGA configuration from suitable files on your client PC.

Note

Following a firmware update, delete the cache of the Web browser.

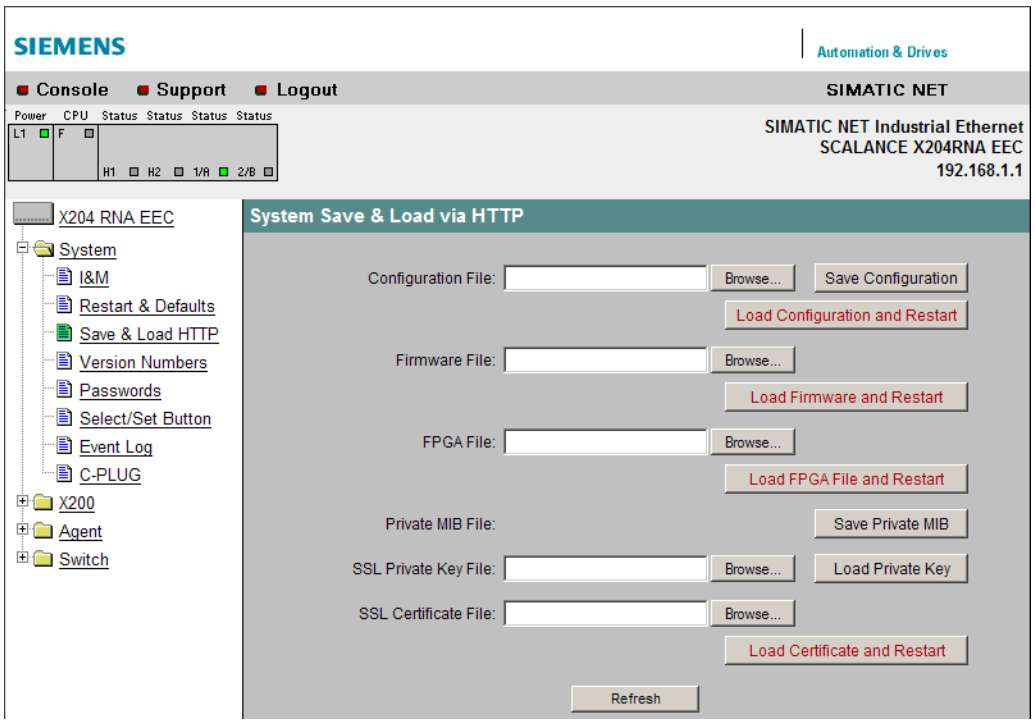


Figure 7-7 System Save & Load via HTTP

Configuration File
Name and directory path of the configuration file you want to load to the SCALANCE X-200RNA.

Firmware File
Name and directory path of the file from which you want to load the new firmware.

FPGA File
Name and directory path of the file from which you want to load the FPGA configuration.

SSL Private Key File
Name and directory path of the file from which you want to load the new SSL key.

SSL Certificate File
Name and directory path of the file from which you want to load the new SSL certificate.

How to download data using HTTP

1. In the relevant text box, enter a name and directory path for the file from which you want to take the data.
2. Start the download of the relevant file by clicking one of the buttons "Load Configuration and Restart", "Load Firmware and Restart" or "Load FPGA File and Restart", "Load Private Key" or "Load Certificate and Restart". Following the download, there is an automatic restart except with "Load Private Key" and the device starts up with the new data. Note the following:

Note

If a firmware version is loaded that is older than the current version, it is possible that the current parameter record cannot be adopted. In this case the current IP address is deleted and access using WBM, CLI or SNMP is no longer possible. This means that after downloading the firmware and restarting the device, the IP address needs to be assigned again with the Primary Setup Tool and the required parameters set again.

Note

If newer firmware and a newer FPGA version required on the device, it is advisable to download the FPGA and then the firmware following the restart.

How to save data using HTTP

1. Start the save function by clicking either the "Save Configuration" or "Save Private MIB" button.
2. You will be prompted to select a storage location and a name for the file or to accept the proposed file name.

Reusing configuration data

Saving and reading in configuration data reduces the effort if several SCALANCE X-200RNA devices have the same configuration and when IP addresses are obtained over DHCP.

Save the configuration data on your computer after you have configured a SCALANCE X-200RNA.

Download this file to all other SCALANCE X-200RNA devices you want to configure.

If individual settings are necessary for specific devices, these must be made online.

The stored configuration data is coded and, as a result, these files cannot be edited with a text editor.

7.5.5 System Version Numbers

Versions of hardware and software

This page shows the versions of the hardware and software with which the SCALANCE X-200RNA is being operated:

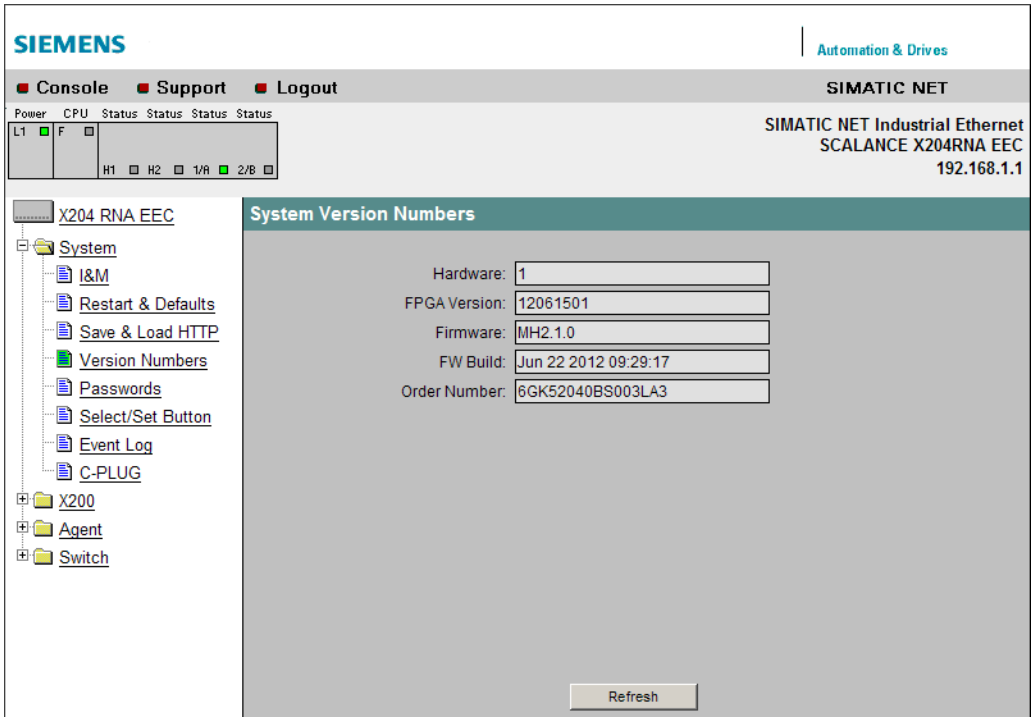


Figure 7-8 System Version Numbers

Hardware
The version of the firmware is shown here. The hardware version (= product version) it is stored permanently on the SCALANCE X-200RNA.

FPGA Version
The FPGA version is shown here.

Firmware
The version of the firmware running on the SCALANCE X-200RNA.

FW Build
The date on which the firmware running on the SCALANCE X-200RNA was created is displayed here.

Order Number
The order number of the device is shown here.

7.5.6 System Passwords

System passwords

Note

Default for the passwords when supplied

Admin password: admin

User password: user

In this dialog, if you are the administrator, you can change the passwords for Admin and User. The password can be up to a maximum of 16 characters (7-bit ASCII) long.

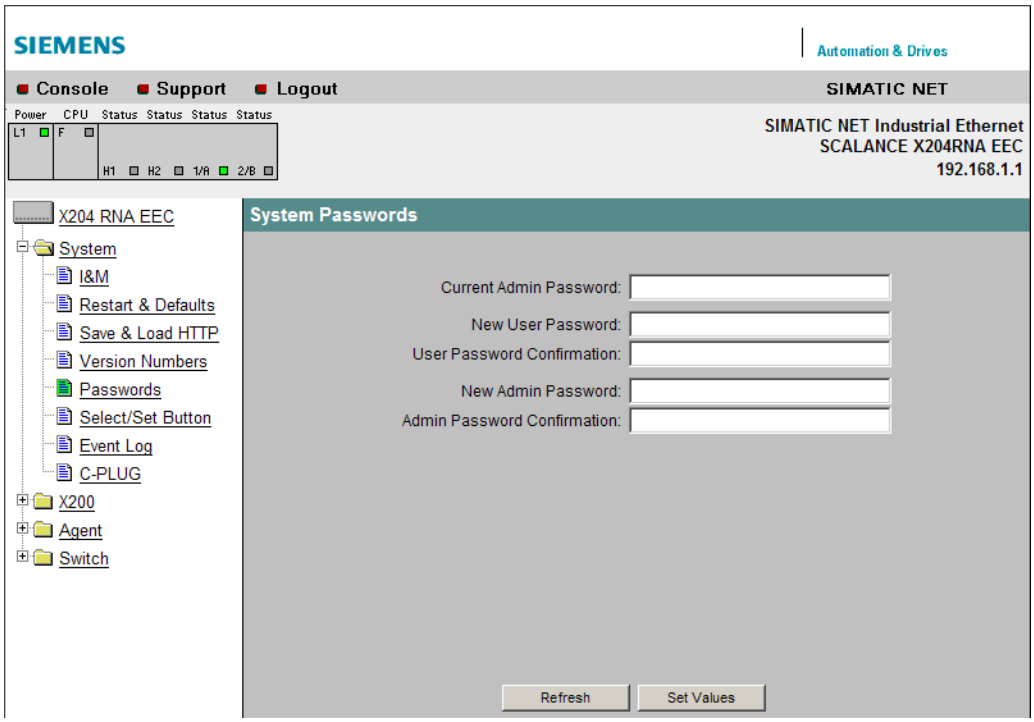


Figure 7-9 System Passwords

You apply your settings with Set Values.

7.5.7 System Select/Set Button

Configuring the Select/Set button

On the SCALANCE X-200RNA, the SELECT/SET button is used to

- Change the display mode
- Reset to the factory defaults
- Define the fault mask and the LED display

You will find a detailed description of the individual functions available with the button in the section "Set button".

On this page, the functionality of the Select/Set button can be restricted or fully disabled. This is possible for the following three functionalities:

- Restore Factory Defaults
- Enable/Disable Reset
- Set Fault Mask

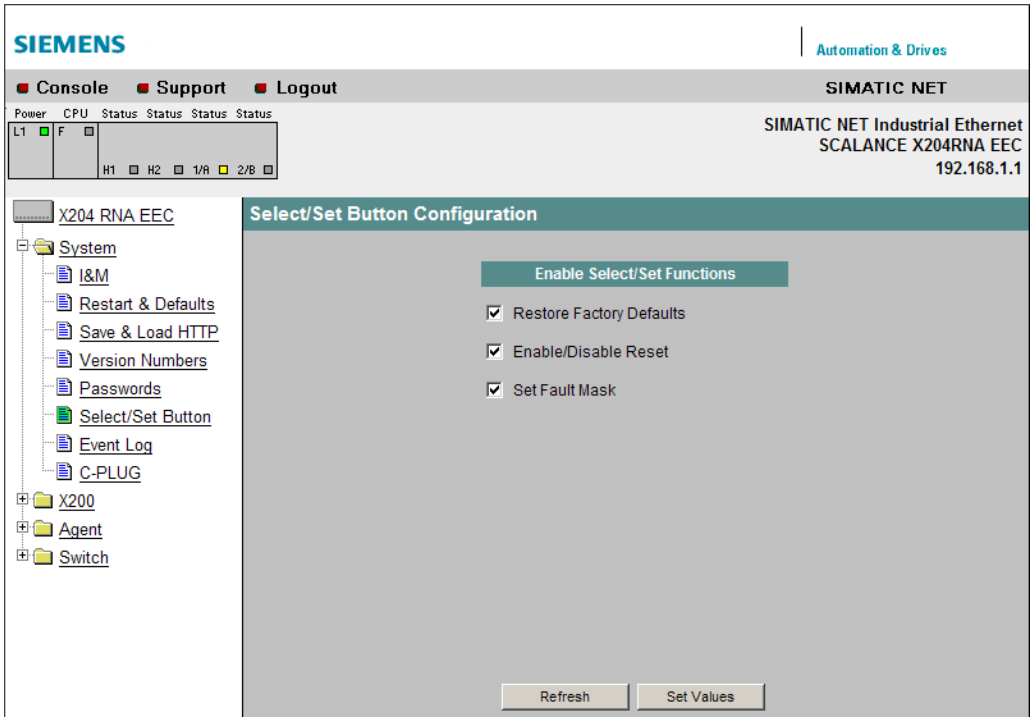


Figure 7-10 Select/Set button configuration

Enable Select/Set Functions

You can enable or disable the individual functions of the button by checking or unchecking the relevant box.

You apply your settings with Set Values.

7.5.8 System Event Log Table menu

Logging events

A SCALANCE X-200RNA allows you to log events and to display them on the page of the "Log Table" menu. This, for example, allows you to record when an SNMP authentication attempt failed or when the connection status of a port has changed. You can specify which events are logged in the "Agent Event Configuration" menu item.

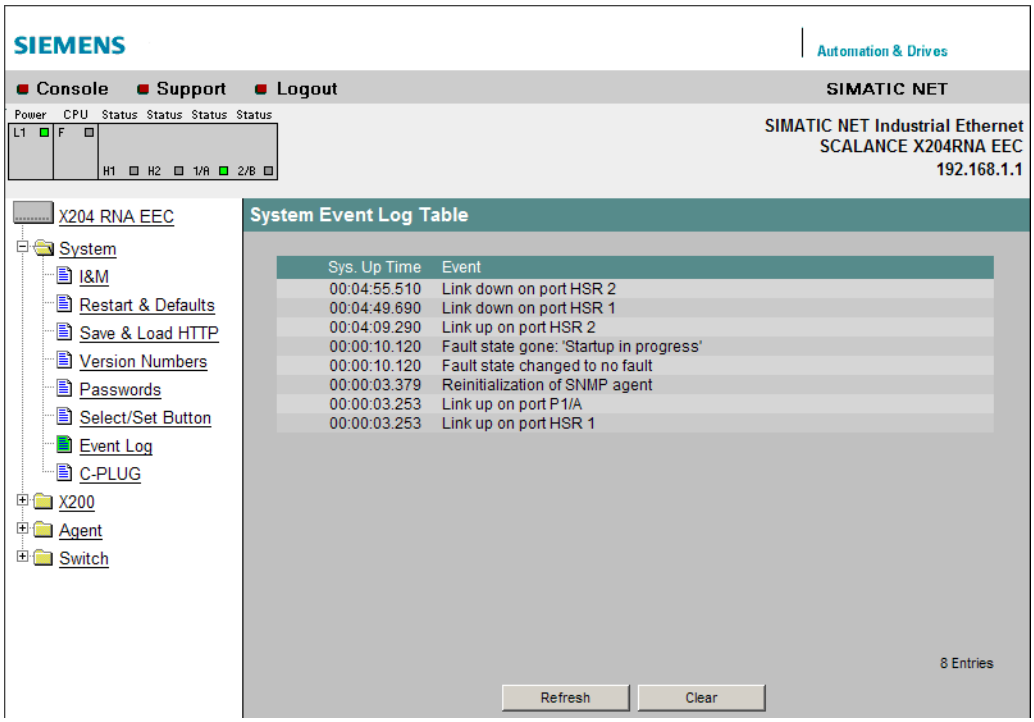


Figure 7-11 System Event Log Table

The "Sys.Up Time" column shows the time since the SCALANCE X-200RNA was last restarted in the format HH:MM:SS.

Refresh
Click on this button to refresh the display.

Clear
With this button, you can delete the content of the log table.

7.5.9 "C-PLUG Information" menu

C-PLUG Information

A SCALANCE X-200RNA allows configuration data to be stored on an external C-PLUG and configuration data to be loaded from an external C-PLUG. The C-PLUG information menu allows you to read out the inserted C-PLUG and to manage configuration data stored on it.

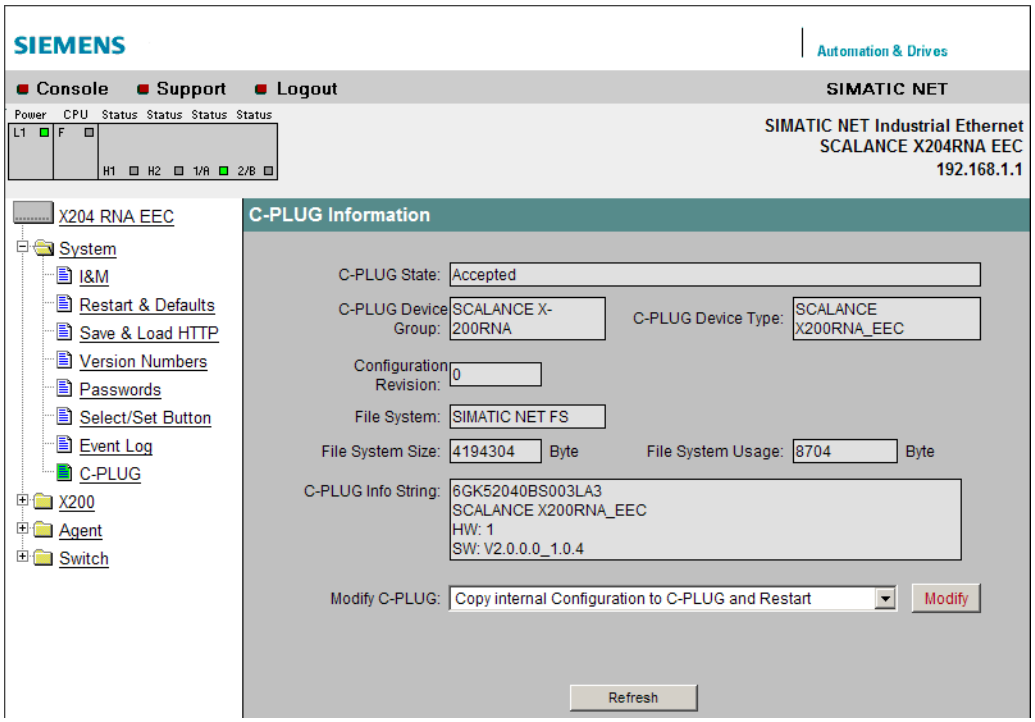


Figure 7-12 C-PLUG Information

C-PLUG State (read-only)
The status of the C-PLUG.

C-PLUG Device Group (read-only)
The module to which the C-PLUG belongs.

C-PLUG Device Type (read-only)
The device type of the C-PLUG.

Configuration Revision (readonly)
Configuration version of the C-PLUG.

File System (readonly)
Data system of the C-PLUG.

File System Size(readonly)
Size of the available data system memory of the C-PLUG.

File System Usage(readonly)
Size of the memory of the C-PLUG used by the data system.

C-PLUG Info String (read-only)
Information line of the C-PLUG.

Modify C-PLUG
Modification of the configuration stored on the C-PLUG.

- Copying the current configuration on the C-PLUG with associated restart
- Copying the factory configuration to the C-PLUG with associated restart
- Deleting the configuration stored on the C-PLUG

7.6 The X200 menu

7.6.1 X200 Status

Information on the operating status

This screen appears if you click the "X200" folder icon.

The screen shows information about the power supply and the error status.

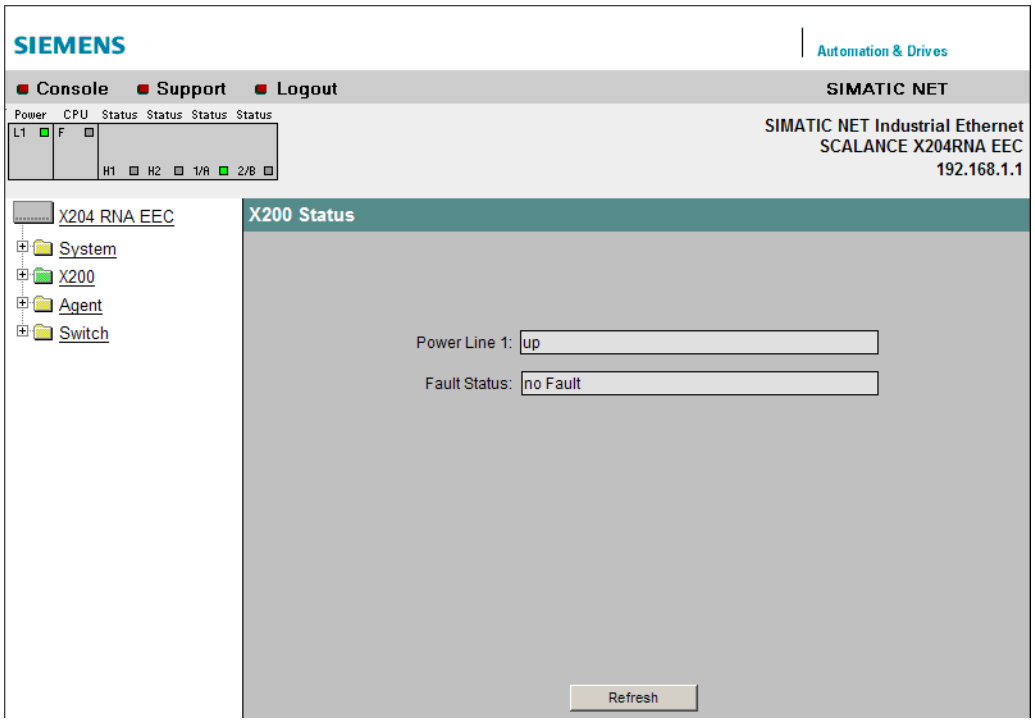


Figure 7-13 X200 Status

Power Line 1

- Up:
  Power supply 1 (line 1) is applied.
- Down:
  Power supply 1 is not applied or is below the permitted voltage.

Power Line 2 (SCALANCE X204RNA only, not illustrated)

- Up:
  Power supply 2 (line 2) is applied.
- Down:
  Power supply 2 is not applied or is below the permitted voltage.

Fault Status
The fault status of the SCALANCE X-200RNA is shown here. The following table contains **examples** of possible error messages. If more than one problem has occurred, they are listed in the text box one above the other.

Error messages	Meaning
Redundant power line down	The redundant power supply has failed.
Link down on monitored port	The connection to a monitored port is interrupted.
No Fault	The SCALANCE X-200RNA has not detected a fault (the signaling contact has not responded and the fault LED is not lit).

7.6.2 HSR Coupling Configuration

HSR Coupling Configuration

The HSR-specific parameters are entered in the Coupling Configuration screen.

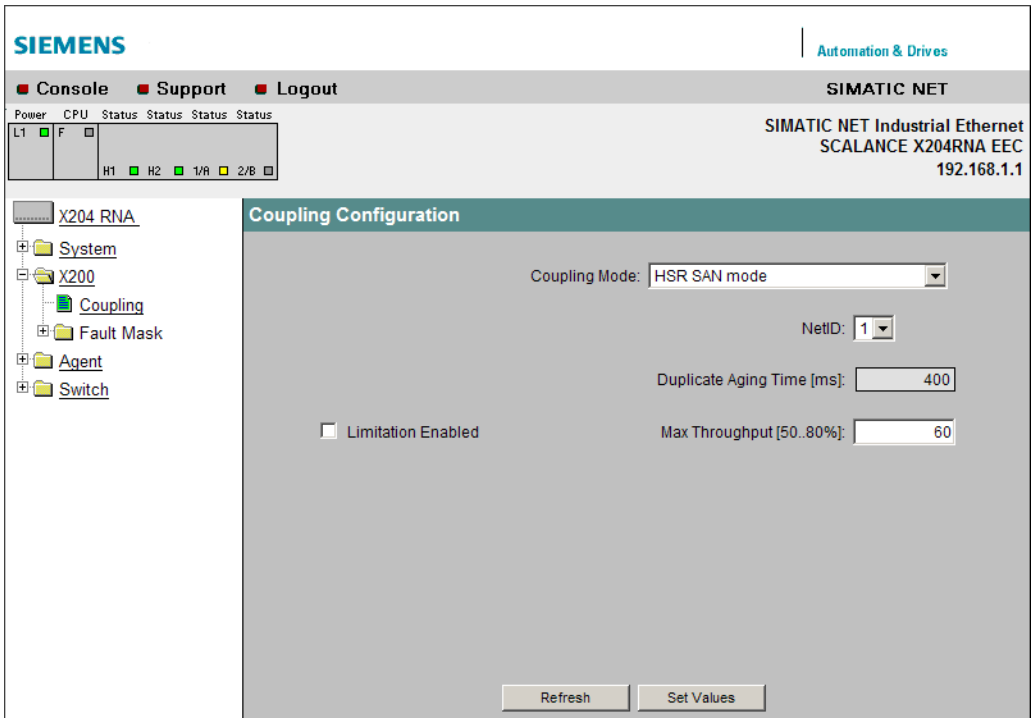


Figure 7-14 X204 Coupling Configuration

Coupling Mode

Here you can set the coupling mode between HSR and the remaining network.

Coupling Mode	Meaning
HSR SAN Mode	The HSR ring is connected with Standard Ethernet end devices or network segments (default).
Non Redundant HSR PRP coupling	Setting with non-redundant HSR<->PRP coupling. P1/A is connected with LAN A, P2/B with LAN B of a PRP network.
Redundant HSR PRP coupling, LAN A	Setting with redundant HSR<->PRP coupling. P1/A is connected with LAN A of a PRP network. P2/B is open and may not be used.
Redundant HSR PRP coupling, LAN B	Setting with redundant HSR<->PRP coupling. P1/B is connected with LAN B of a PRP network. P1/A is open and may not be used.

NetID

Here you can set the network ID of the connected PRP network. The valid value range is 1 to 6.

The NetID is used to distinguish between frames from different redundant PRP networks in an HSR ring. It is not relevant in "HSR SAN Mode".

Duplicate Aging Time

The default value from the HSR standard is 400 ms. This value cannot be changed.

Limitation / Max Throughput

By setting the check mark for "Limitation Enabled", the data throughput from the interlinks to the HSR ports is limited to the set value. The limitation can be specified with "Max Throughput". A limitation between 50 and 80% is possible. If the load on the interlinks is greater than the value set, frames are discarded. This occurs regardless of Ethertypes and any VLAN priorities.

7.6.3 Fault Mask

Function of the fault mask

With the fault mask, you specify the fault/error states to be monitored by the SCALANCE X-200RNA and that will trigger the signaling contact. Possible fault/error states are the absence of the power supply, power supply too low, or an interrupted connection or an unexpected connection established to a partner device. If the signaling contact is triggered, this causes the fault LED on the device to light up and, depending on the configuration of the event table, can trigger a trap or an entry in the log table.

Device-related link monitoring of the ports

A SCALANCE X-200RNA provides device-related link monitoring. A link-up or link-down also affects the message system if the SCALANCE X-200RNA was appropriately configured.

Setting the fault mask on the device

Optionally, the fault mask can be set using the SET/SEL button on the SCALANCE X-200RNA. For more detailed information, refer to the section "SET button".

Settings in WBM

In WBM, you can set the monitoring of the power supply (SCALANCE X204RNA only) and the device-related link monitoring. The settings are made in three separate masks:

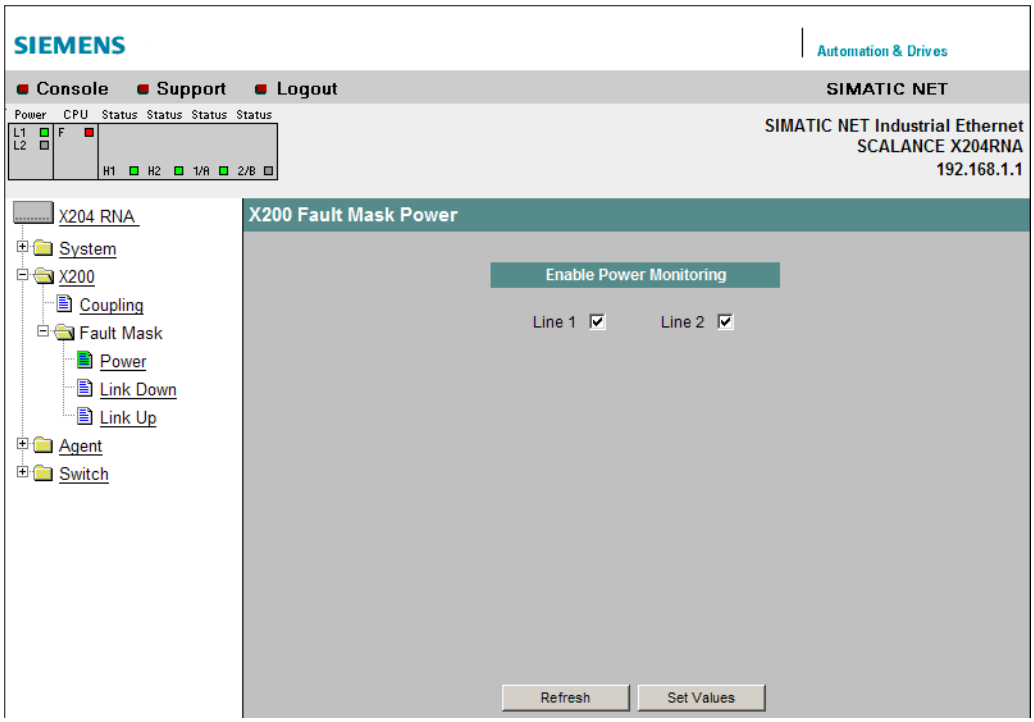


Figure 7-15 SCALANCE X204RNA Fault Mask Power Monitoring

Enable Power Monitoring (SCALANCE X204RNA only) Here, you specify which of the two power supplies of the SCALANCE X204RNA (line 1 and line 2) is monitored. A fault is then indicated by the message system when there is no power on one of the monitored lines (line 1 or line 2) or when the voltage is too low (less than 14 V). (Since the SCALANCE X204RNA EEC does not have a redundant power supply, this screen is not displayed for it).

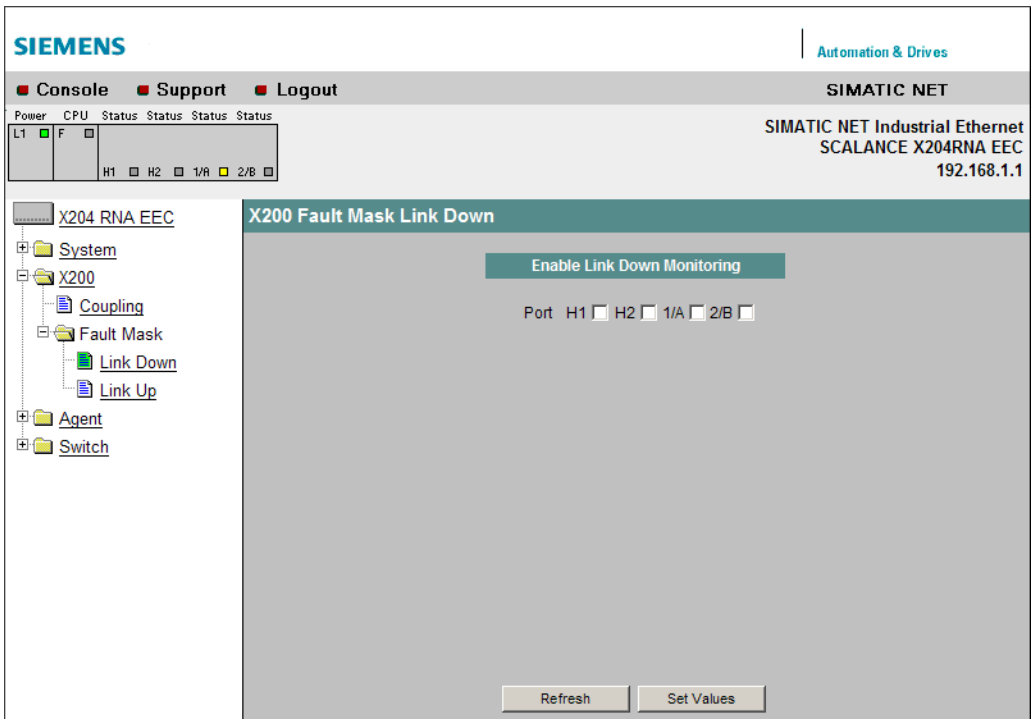


Figure 7-16 Fault Mask Link Down Monitoring

Enable Link Down Monitoring

Select the check boxes of the ports whose connection status you want to monitor. If link monitoring is activated, an error is signaled when there is no valid link at this port because, for example, the cable is not plugged in or the connected device is turned off.

An error/fault can be signaled in the following ways depending on the configuration of the SCALANCE X-200RNA: Signaling contact, fault LED, SNMP trap, entry in the log table and the syslog.

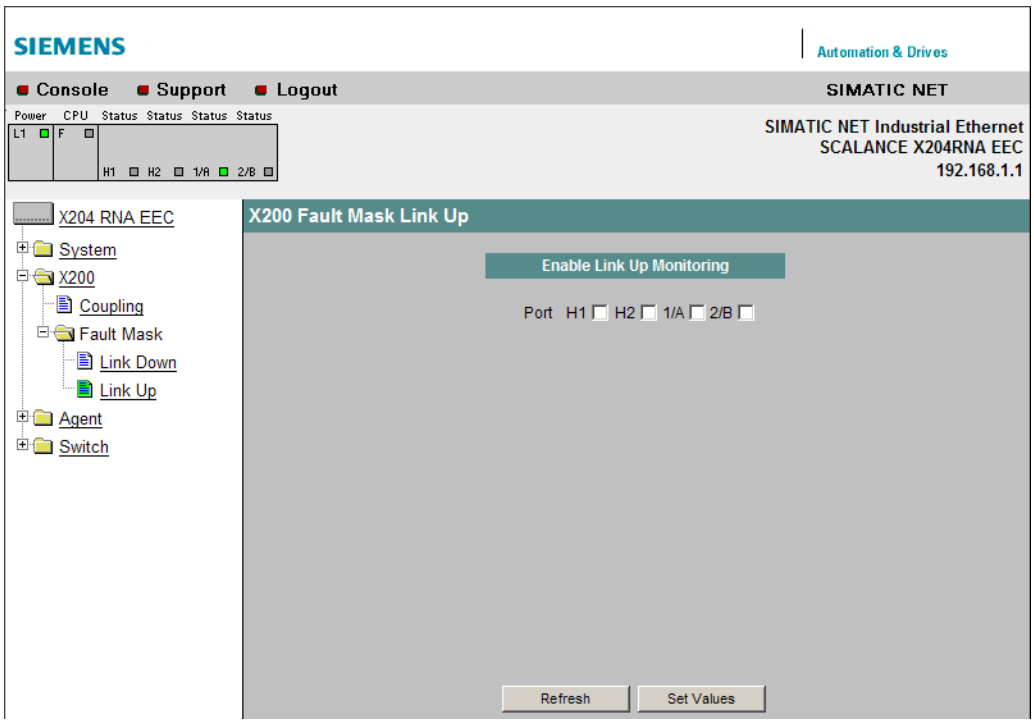


Figure 7-17 Fault Mask Link Up Monitoring

Enable Link Up Monitoring

Select the check boxes of the ports whose connection status you want to monitor. If link monitoring is activated, an error is signaled when there is a valid link at this port because, for example, the cable should not be plugged in.

An error/fault can be signaled in the following ways depending on the configuration of the SCALANCE X-200RNA: Signaling contact, fault LED, SNMP trap, entry in the log table and the syslog.

7.7 The Agent menu

7.7.1 Agent Configuration

Introduction

The "Agent Configuration" screen appears if you click the "Agent" folder icon. This screen provides options for setting the IP address. You can specify whether a SCALANCE X-200RNA obtains the IP address dynamically or you can assign a fixed address.

IP Address

Enter the IP address of the SCALANCE X-200RNA here.

Subnet Mask

Enter the subnet mask of the SCALANCE X-200RNA here.

Note

After changing the IP address, to be able to connect to the SCALANCE X-200RNA again, the new address will need to be entered in the WEB browser manually.

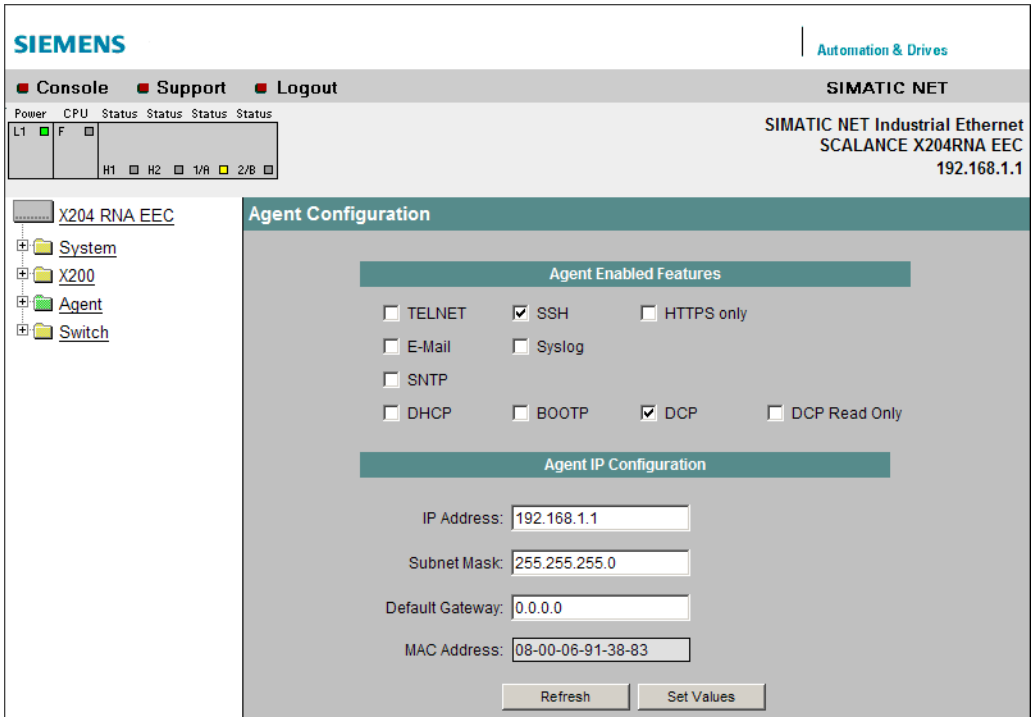


Figure 7-18 Agent Configuration

Settings for the SCALANCE X-200RNA

TELNET

Here, you specify whether or not an unencrypted connection via Telnet can be established.

SSH

Here, you specify whether or not an encrypted connection via SSH can be established.

HTTPS only

Here, you specify whether or not the WBM can only be reached via an SSL encrypted connection.

E-mail

Here, you specify whether or not events are sent to an e-mail address.

BOOTP

Here, you specify whether the IP address can be obtained using the Bootstrap Protocol.

DHCP

Here, you specify whether or not the IP address can be obtained using the Dynamic Host Configuration Protocol.

Syslog

Here, you specify whether or not events are sent to a Syslog server.

DCP

If you select this option, the device can be accessed and configured via DCP (PST Tool and STEP 7).

SNTP

Enables / disables synchronization of the IE switch system time over an SNTP server in the network.

DCP Read Only

If you select this option, the configuration data can only be read via DCP (PST Tool and STEP 7).

Default gateway

If you require the IE switch to communicate with devices (diagnostics stations, e-mail servers, etc.) in a different subnet, you will need to enter the IP address of the default gateway here.

MAC address

The MAC address of the SCALANCE X-200RNA.

7.7.2 Agent Ping

Ping

Configuration of "Ping"

The "Ping" screen appears if you click the "Agent" folder icon. In this screen, you can send a PING to another device in the network to check whether it can be reached.

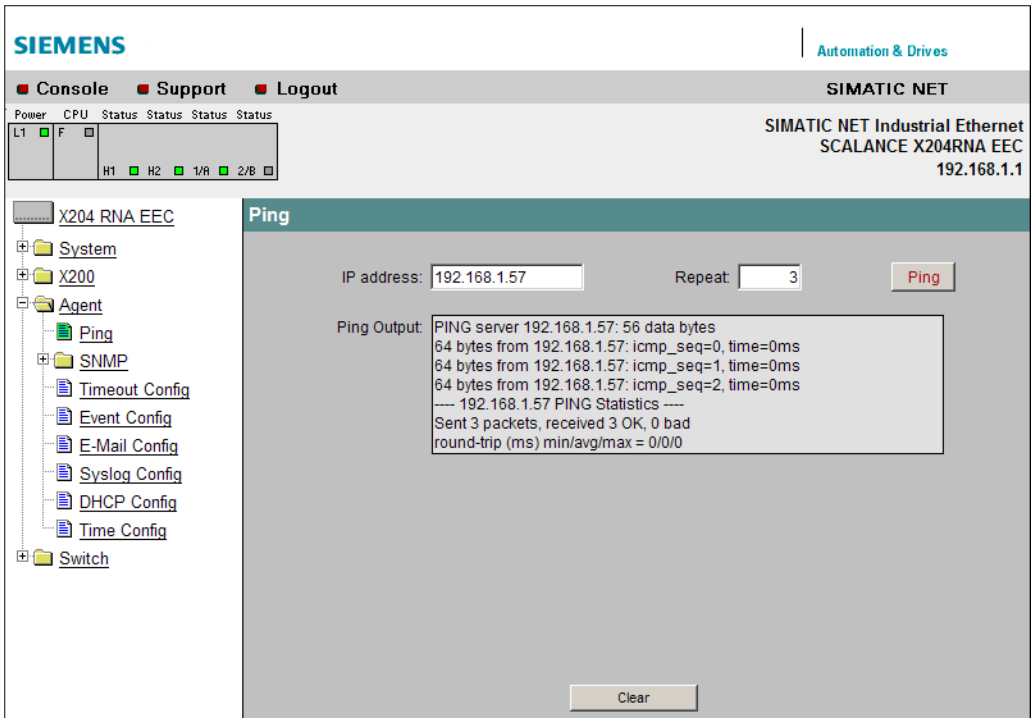


Figure 7-19 Ping

IP Address

Enter the IP address of the target device here.

Repeat

Here, enter how often the ping should be sent.

Ping

The ping is started when you click the "Ping" button.

7.7.3 Agent SNMP Configuration

How SNMP works

Using SNMP (Simple Network Management Protocol), a network management station can configure and monitor SNMP-compliant nodes, such as a SCALANCE X-200RNA. To allow this, a management agent is installed on the SCALANCE X-200RNA with which the management station exchanges data. There are three frame types:

- Read (management station fetches values from a SCALANCE X-200RNA)
- Write (management station writes values to a SCALANCE X-200RNA)
- Send events to registered nodes (traps). The agent sends messages to registered management stations.

Access permissions with SNMP

When using the SNMP protocol, you specify access permissions by means of the community string. A community string contains information about the user name and password in a string. Different community strings are defined for read and write permissions. More complex and more secure authentications are possible only in some SNMPv2 variants and in SNMPv3.

Note

To preserve security, you should not use the default values "public" or "private".

Configuration of SNMP with a SCALANCE X-200RNA

The "Agent SNMP Configuration" screen appears if you click the "SNMP" folder icon.

In the SNMP Configuration screen, you make the basic settings for SNMP. Enable the check boxes according to the SNMP functionality you want to use. For detailed settings (for example traps), there are separate menu items in WBM.

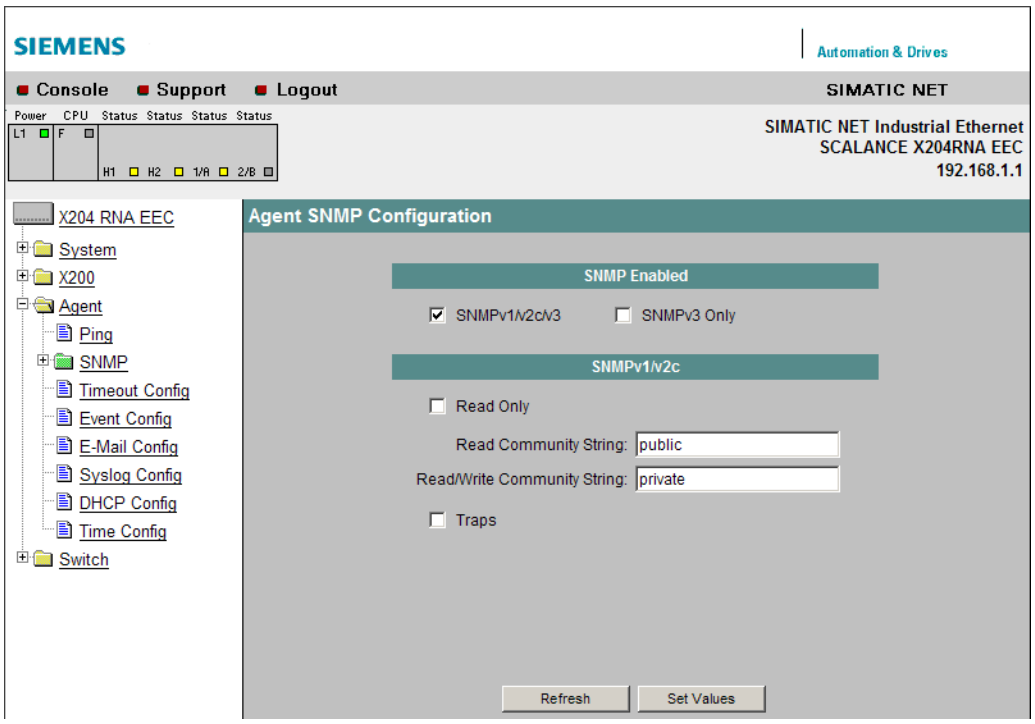


Figure 7-20 Agent SNMP Configuration

SNMPv1/v2c/v3
Here, you enable / disable SNMPv1/v2c/v3 for a SCALANCE X-200RNA.

SNMPv3 Only
Here, you enable / disable SNMPv3 Only for a SCALANCE X-200RNA.

Read Only
When this check box is selected, you can only read SNMP variables with SNMPv1/v2c.

Read Community String
Here, you enter the read community string (maximum of 63 characters) for the SNMP protocol.

Read/Write Community String
Here, you enter the write community string (maximum of 63 characters) for the SNMP protocol.

Traps
This enables / disables the sending of SNMPv1/v2c traps.

7.7.4 SNMP Trap Configuration

SNMP traps for alarm events

If an alarm event occurs, a SCALANCE X-200RNA can send traps (alarm frames) to up to 10 different (network management) stations at the same time. Traps are only sent when events as specified in the Agent Event Configuration menu occur (see Section "Agent Event Configuration").

Note

Traps are sent only when the "Traps" option was selected in "SNMP Configuration".

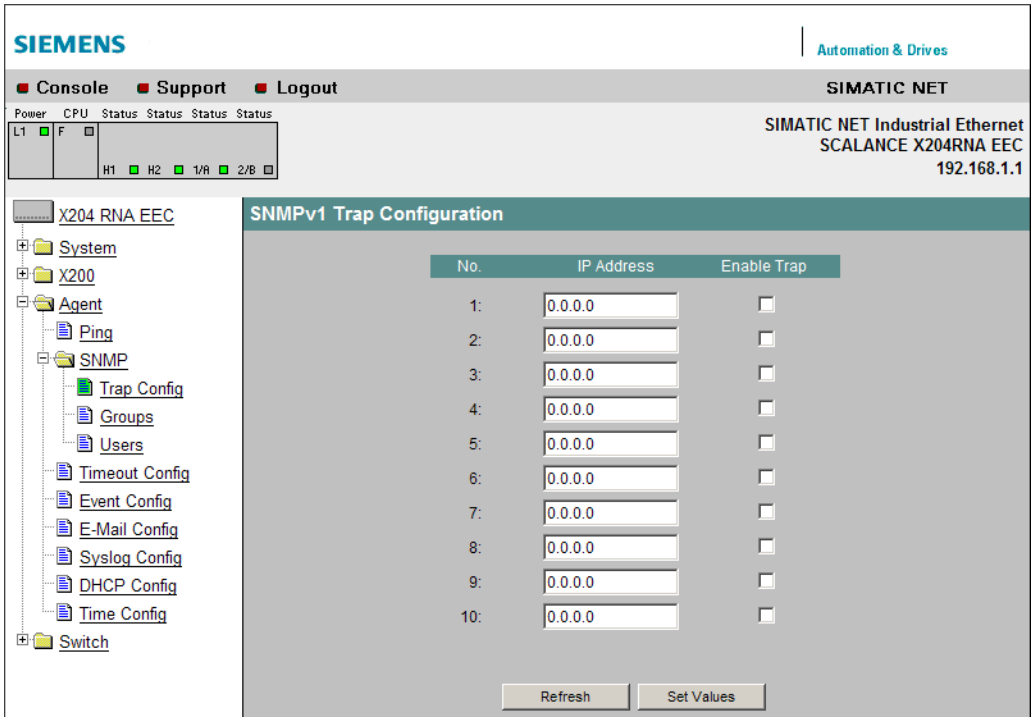


Figure 7-21 SNMPv1 Trap Configuration

IP Address
Here, you enter the addresses of the stations to which a SCALANCE X-200RNA will send traps.

Enable Trap
Click on the check box next to the IP addresses to enable the sending of traps to the corresponding stations.

7.7.5 SNMP v3 Groups

SNMP v3 Groups

The "SNMPv3 Groups" screen appears if you click the "Groups" folder icon.

It shows all existing SNMPv3 groups. The access rights of these groups can also be found in the table.

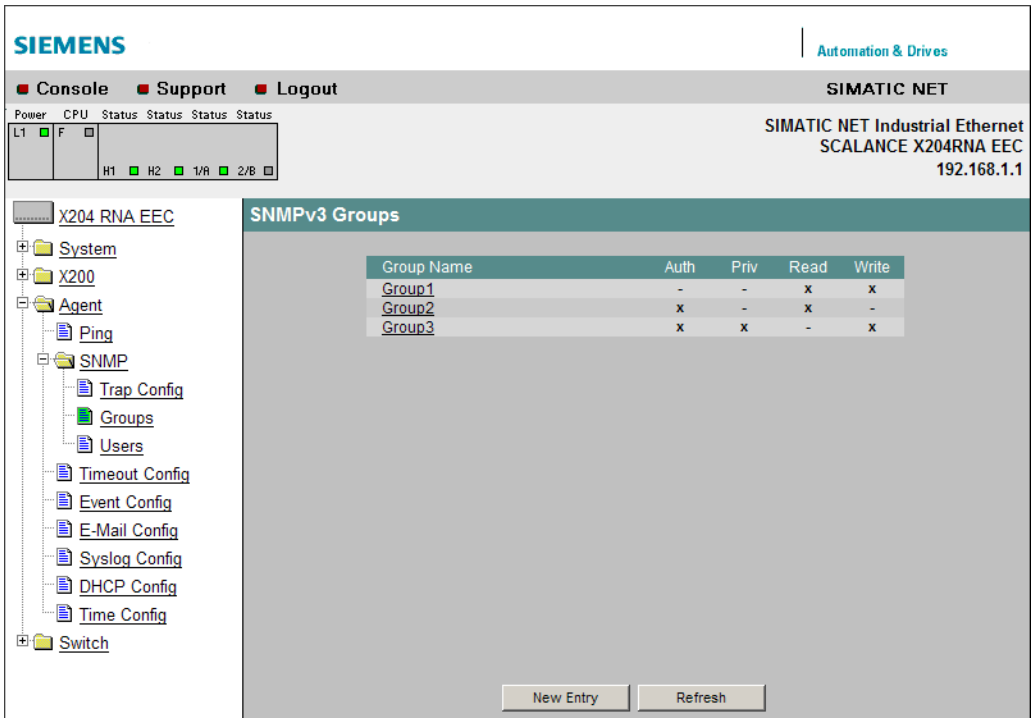


Figure 7-22 SNMPv3 Groups

By clicking the "New Entry" button or clicking on an entry, the "SNMPv3 Group Configuration" screen is displayed.

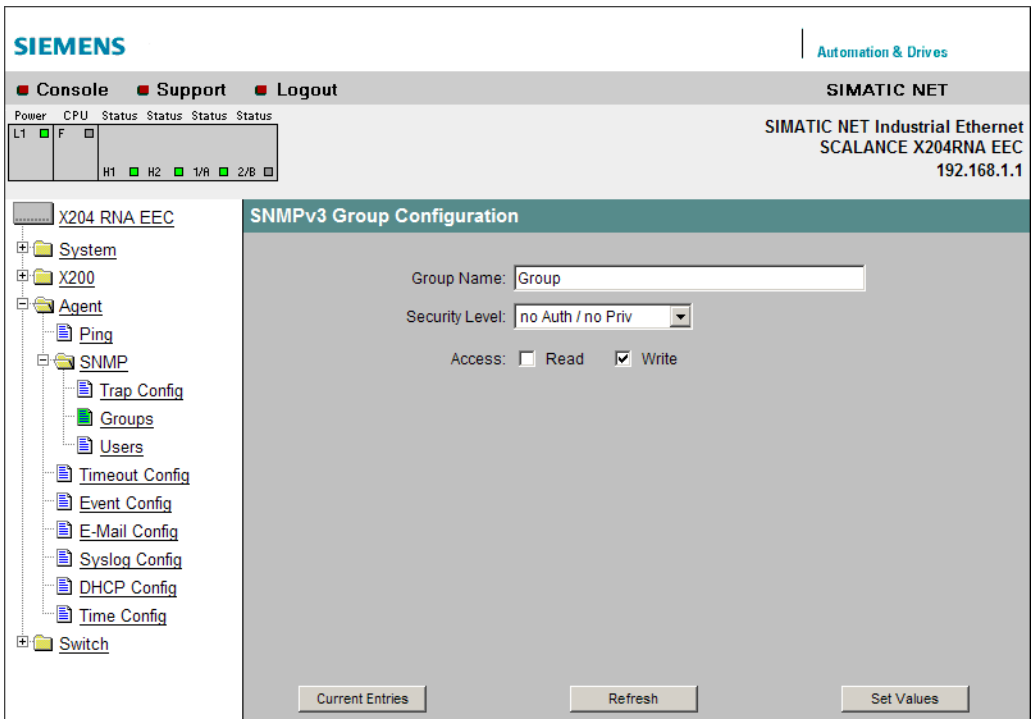


Figure 7-23 SNMPv3 Add Groups

Group Name

Here, enter the name of a new group.

Security level

Here, enter the security level of the new group.

Access

Here, enter the access rights of the new group.

Set Values

By clicking the "Set Values" button, you create a group according to the parameters set above.

Current Entries

By clicking the "Current Entries" button, you exit the "SNMPv3 Group Configuration" screen and return to the "SNMPv3 Groups" screen.

7.7.6 SNMP v3 User

SNMP v3 User

The "SNMPv3 Users" screen appears if you click the "Users" folder icon.

This shows all existing SNMPv3 users. You can also see the groups to which users belong and the security level of the user in the table.

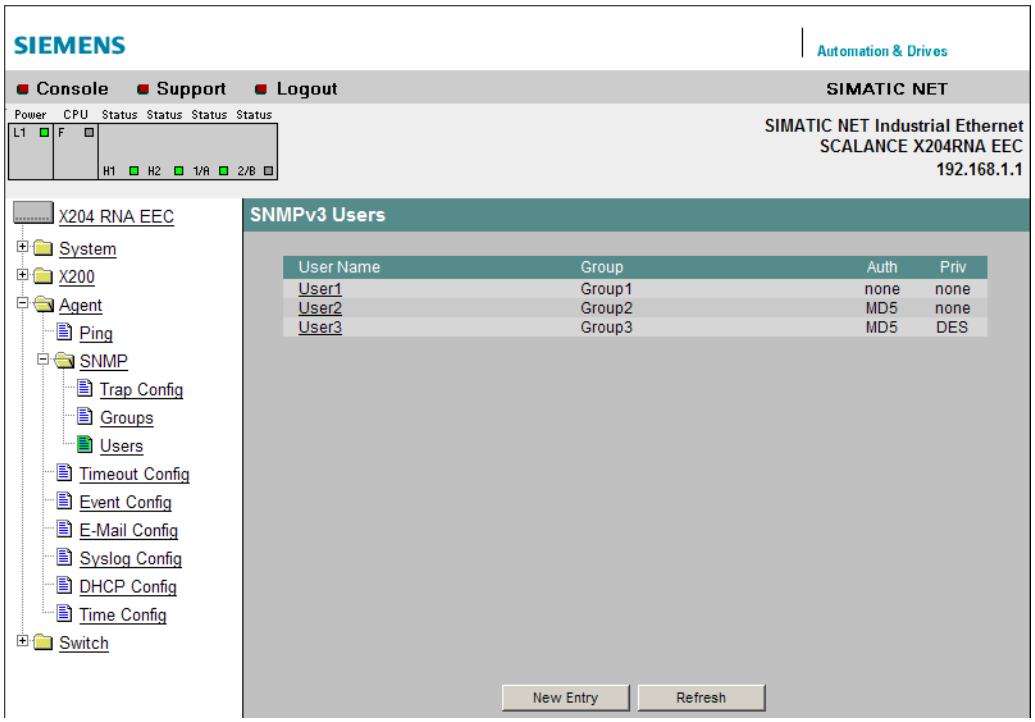


Figure 7-24 SNMPv3 Users

By clicking the "New Entry" button or clicking on an entry, the "SNMPv3 Users Configuration" screen is displayed.

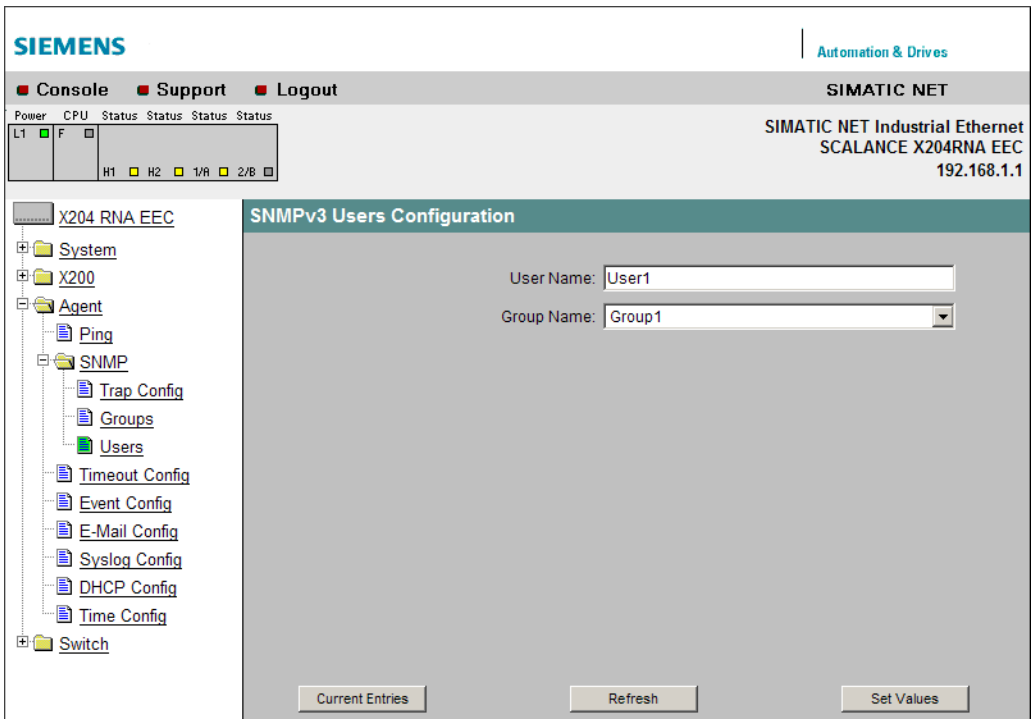


Figure 7-25 SNMPv3 Add Users

User Name

Here, you enter the name of a new user.

Group Name

Here, specify the group to which the user will belong.

Set Values

By clicking the "Set Values" button, you create a user according to the parameters set above.

Current Entries

By clicking the "Current Entries" button, you exit the "SNMPv3 Users Configuration" screen and return to the "SNMPv3 Users" screen.

7.7.7 Agent Timeout Configuration

Setting the timeout

Here, you can set the times after which there is an automatic logout in WBM.

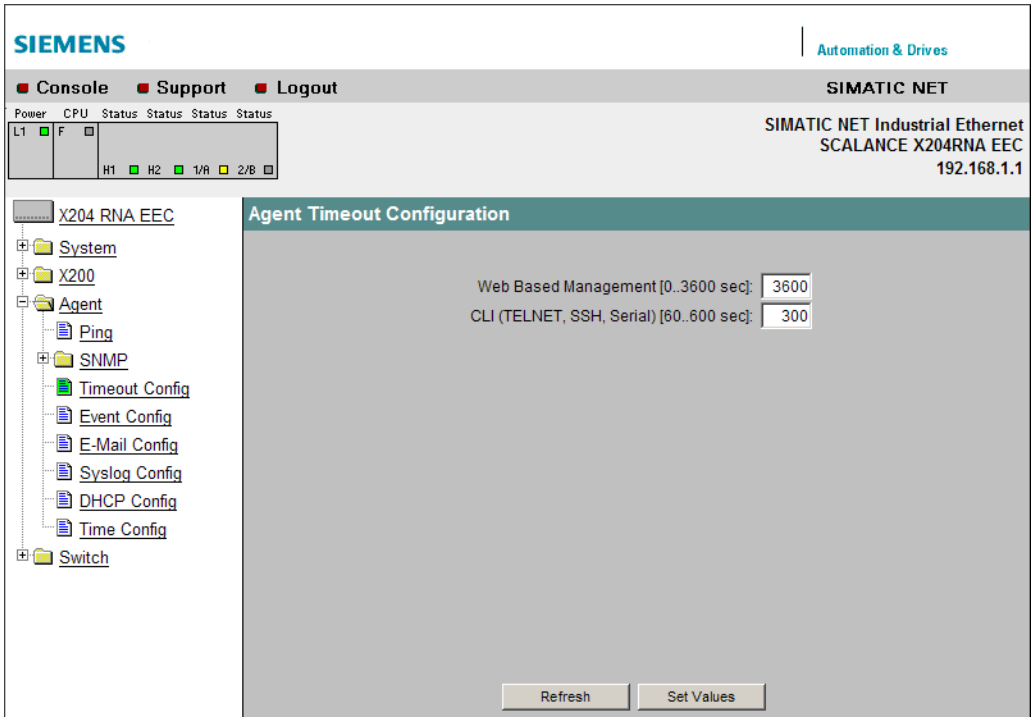


Figure 7-26 Agent Timeout Configuration

Web Based Management (sec)
Here, you specify the WBM timeout.
Permitted values for the WBM timeout: 0-3600 (seconds)

0 means: There is no automatic logout.

CLI (TELNET, SSH, Serial) (sec)
Here, you specify the CLI timeout.
Permitted values for the CLI timeout: 60-600 (seconds)

7.7.8 Agent Event Configuration

System events of the SCALANCE X-200RNA

On this page, you specify how a SCALANCE X-200RNA reacts to system events. By enabling the appropriate check boxes, you specify which events trigger which reactions on the SCALANCE X-200RNA. The following options are available:

- The SCALANCE X-200RNA sends an e-mail with the error message
- The SCALANCE X-200RNA triggers an SNMP trap.
- The SCALANCE X-200RNA writes an entry in the log file.
- The SCALANCE X-200RNA writes an entry to the Syslog server.

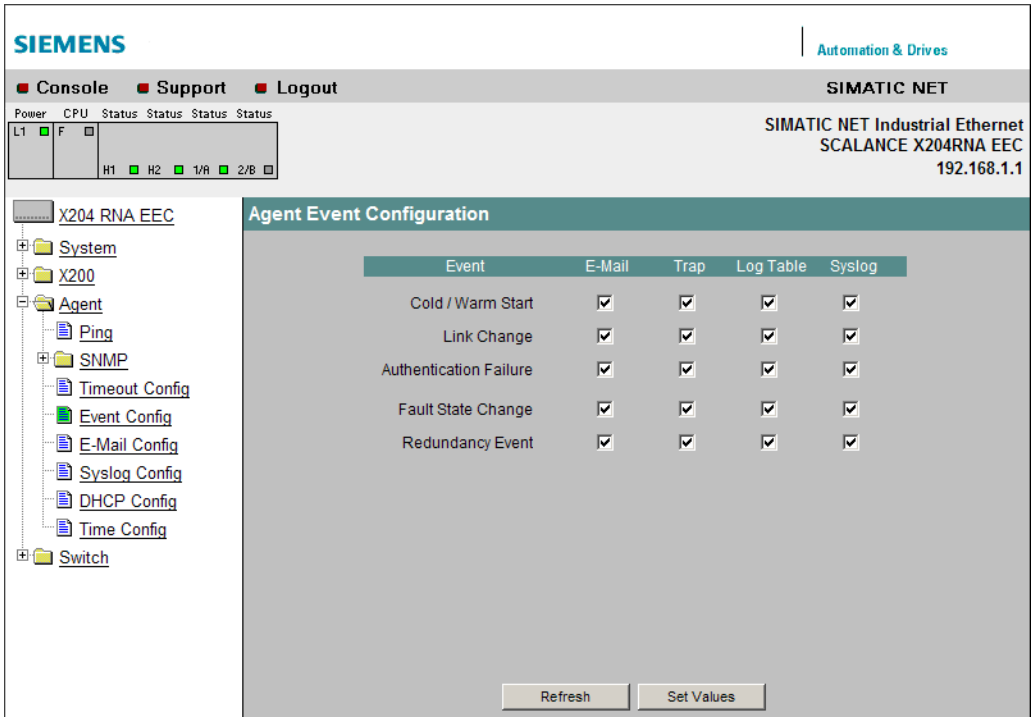


Figure 7-27 Agent Event Configuration with the SCALANCE X204 RNA EEC

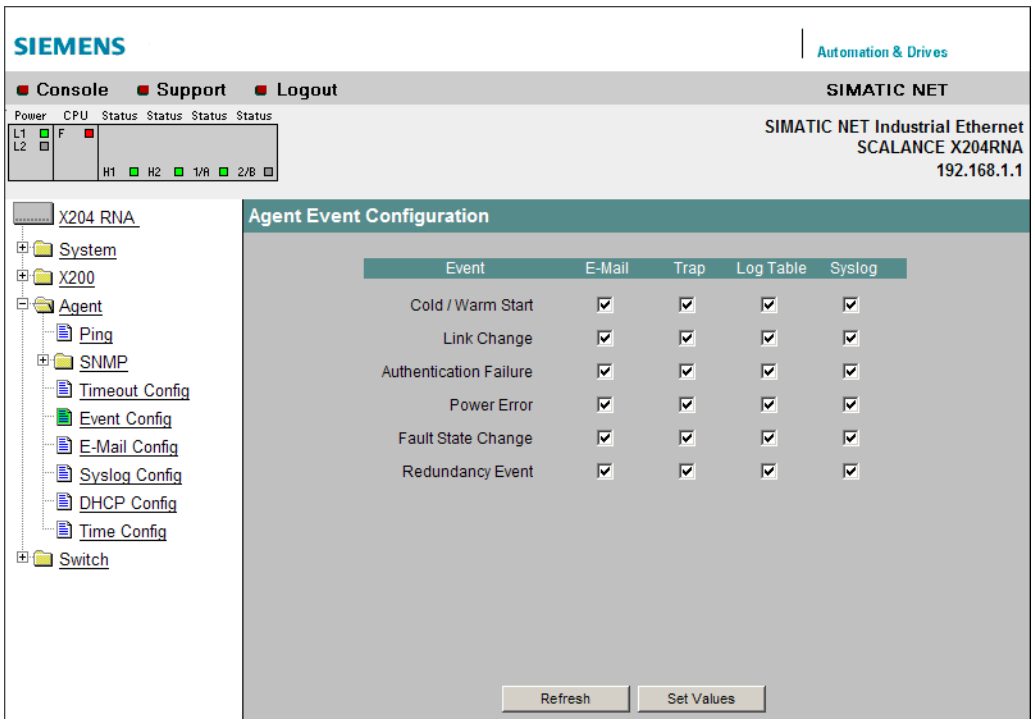


Figure 7-28 Agent Event Configuration with the SCALANCE X204 RNA

You can configure the reaction of the SCALANCE X-200RNA to the following events:

Cold / Warm Start
The SCALANCE X-200RNA was turned on or restarted by the user.

Link Change
A port has failed or data traffic is being handled again over a port that had previously failed.

Authentication Failure
There was an SNMP access with a bad password or inadequate access rights.

Power Error (SCALANCE X204RNA only)
This event occurs only when the power supply line 1 and line 2 are monitored. It indicates that there was a change to line 1 or line 2.

Fault State Change
The fault status has changed. The fault status can relate to the activated port monitoring, the response of the signaling contact or the power supply monitoring.

Redundancy Event
There are three situations that are signaled as a redundancy error.

1. The error is set when non HSR frames are received at HSR ports, for example, PRP frames or Standard Ethernet frames.
2. The error is set when unexpected frames, e.g, HSR frames, were received at P1/A or P2/B.
3. This error is also set when frames are received at P1/A or P2/B whose source MAC address is that of the own RedBox or of one of the proxies entered there.

All three errors result are signaled by the red error LED and the signaling relay. These events are reset within a few seconds, unless another error of the same kind occurs during this time period.

7.7.9 Agent E-Mail Configuration

Setting the e-mail client

Here, you can set the recipient, sender and the SMTP server.

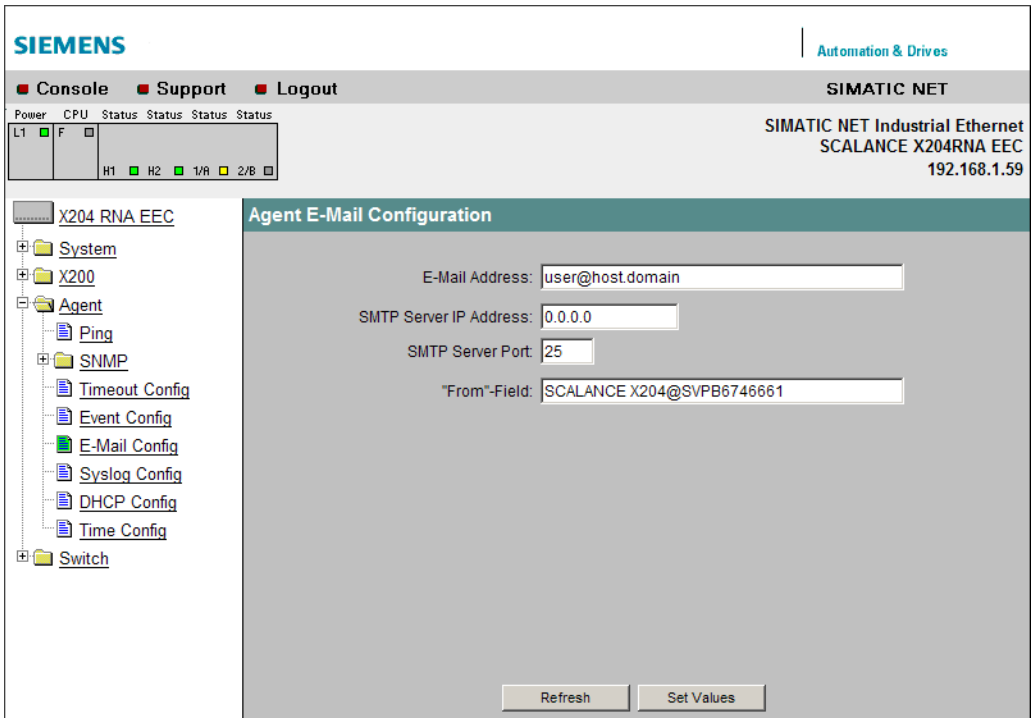


Figure 7-29 Agent E-Mail Configuration

E-mail address

Here, you specify the e-mail address of the recipient.

SMTP server IP address

Enter, the IP address of the SMTP server.

SMTP Server Port

Enter, the port of the SMTP server.

"From" Field

Here, enter the e-mail address of the sender.

7.7.10 Agent Syslog Configuration

Setting the Syslog server

Here, you can specify the address of the Syslog server.

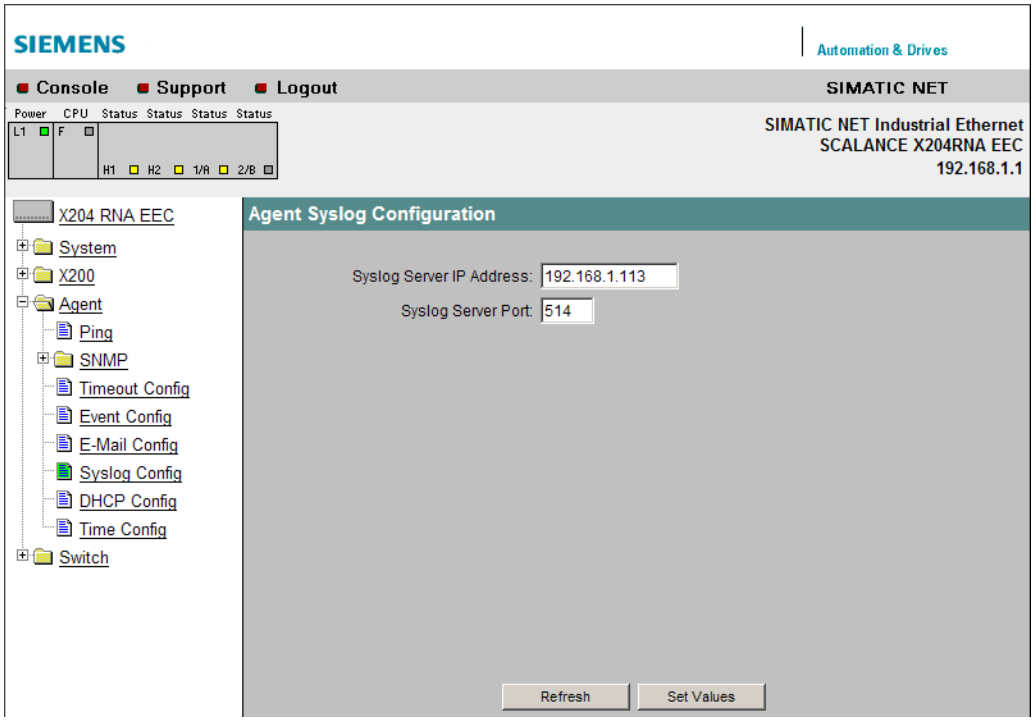


Figure 7-30 Agent Syslog Configuration

Syslog Server IP Address

Enter, the IP address of the Syslog server.

Syslog Server Port

Enter, the port of the Syslog server.

7.7.11 Agent DHCP Configuration

Setting the DHCP mode

There are several ways of identifying the SCALANCE X-200RNA in the configuration of the DHCP server:

- with the MAC address
- with a freely defined client ID
- with the system name

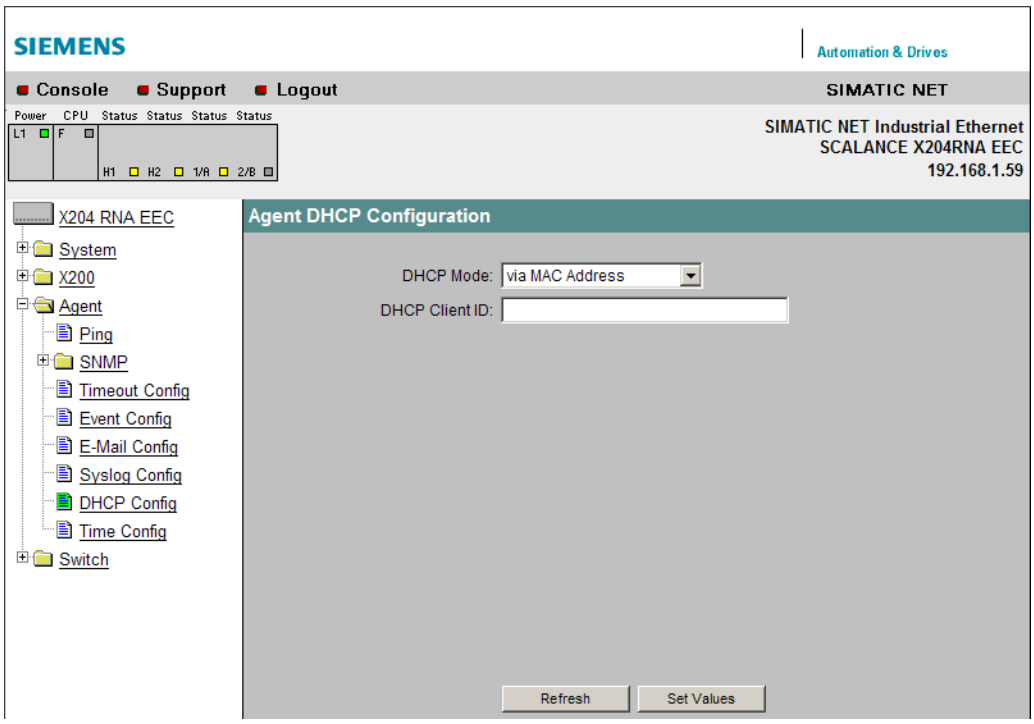


Figure 7-31 Agent DHCP Configuration

DHCP Mode

Here, you set the DHCP mode.

Note

If DHCP is not enabled in the "Agent Configuration" menu item, no mode can be selected and the text "disabled" is displayed.

DHCP client ID

For the DHCP mode "via Client ID", you can assign an identification string here that is assigned to a SCALANCE X-200RNA and will be evaluated by the DHCP server.

7.7.12 Agent Time Configuration

Time-of-day synchronization in the network

SNTP (Simple Network Time Protocol) is used for synchronizing the time in the network. The appropriate frames are sent by an SNTP server in the network. A SCALANCE X-200RNA logs on as client with this server as recipient of time-of-day frames.

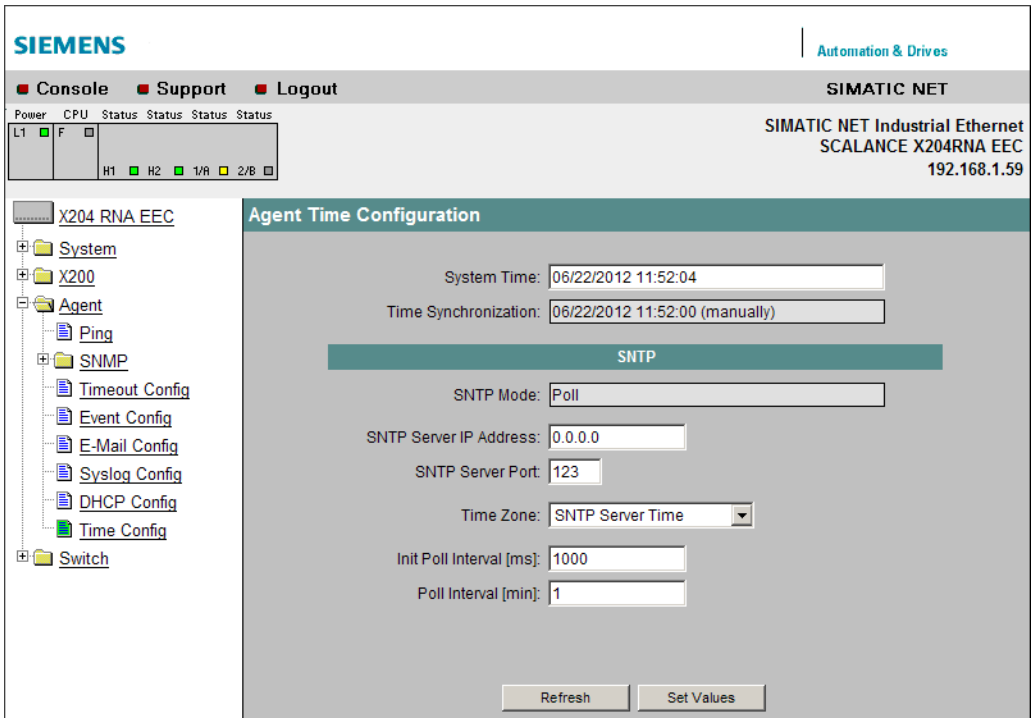


Figure 7-32 Agent Time Configuration

System Time
This box displays the current system time. If no time-of-day synchronization was possible, the box displays "Date/time not set".

You can also set the date and time manually, the required input format is MM/DD/YYYY HH:MM:SS. In this case, the text box displays the data and time along with the suffix (m). If the system time was set as a result of synchronization with a server, the suffix is (p).

Time Synchronization
This box is read-only and shows when the last time-of-day synchronization took place.

SNTP Mode
The protocol type used is displayed here:

- **Poll**
  If you choose this protocol type, you have to define further settings:
  Time zone offset, Time server, Init poll interval, Poll interval.

SNTP Server IP Address
Here, you enter the IP address of the SNTP server whose frames will be used by a SCALANCE X-200RNA to synchronize the time of day.

SNTP Server Port
Here, enter the port over which the SNTP server is available.

Time Zone
Select the time zone for the location of the SCALANCE X-200RNA because the SNTP server always sends UTC time. This time is then recalculated and displayed as the local time based on the time zone. There is no standard/daylight-saving time switchover on the SCALANCE X-200RNA.

Init poll interval
Here, you can enter the interval at which a SCALANCE X-200RNA repeats the initial poll for the system time if this was not successful the first time.

Poll interval
Once the system time has been adopted the first time from the time server, it is updated cyclically with renewed polls to the time server. Here, you specify how often the updates take place.

7.8 The Switch menu

7.8.1 Introduction

Introduction

In this menu, you set the parameters for the switch functionality (assign it to layer 2) of the SCALANCE X-200RNA. This includes the following functions:

- General switch settings such as aging.
- Display of statistical data.

7.8.2 Switch Config

Switch functionality

The "Switch Configuration" screen appears if you click the "Switch" folder icon. In this screen, you specify the aging time of the SCALANCE X-200RNA.

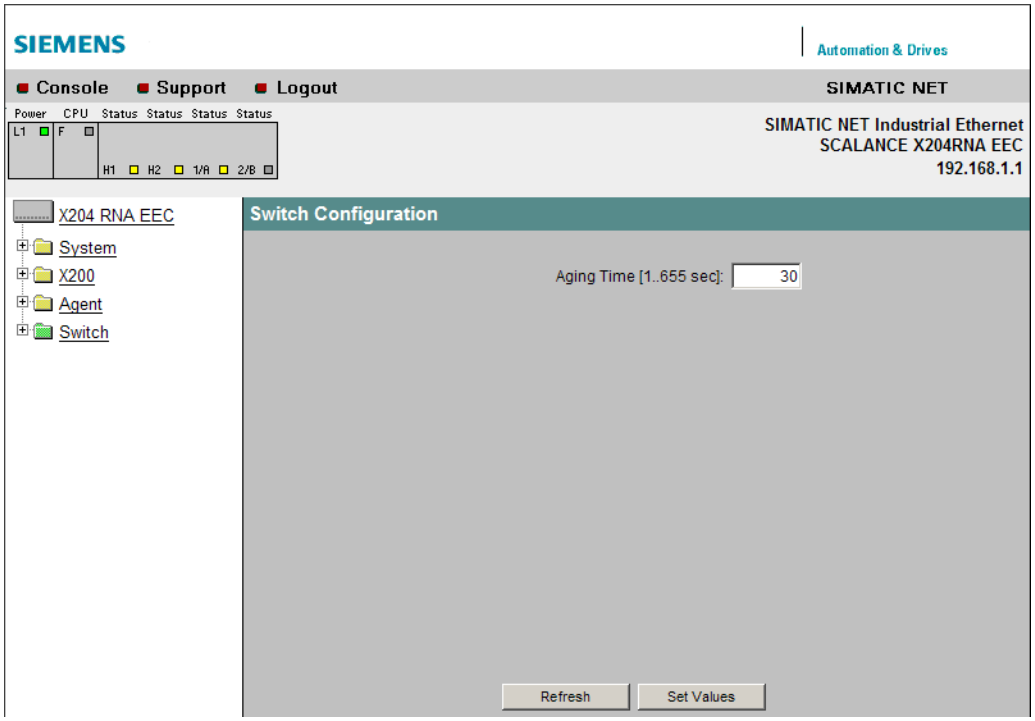


Figure 7-33 Switch Configuration

Aging Enabled

A SCALANCE X-200RNA automatically learns the source addresses of the nodes connected to it. This information is used in the SCALANCE X-200RNA to forward data frames to the nodes specifically involved. This reduces the network load for the other nodes.

If a SCALANCE X-200RNA does not receive a frame whose source address matches a learnt address within a certain time, it deletes the learnt address. This mechanism is known as aging. Aging prevents frames being forwarded incorrectly, for example when an end device (for example a programming device) is connected to a different switch port.

If the check box is not enabled, a SCALANCE X-200RNA does not delete learnt addresses automatically.

Aging Time [sec]

Here, you enter the time after which the SCALANCE X-200RNA deletes an address if it has not received frames with the corresponding sender address.

Here, the aging time can be set as required within the range from 1 to 655 seconds.

7.8.3 Port status

Overview of the configuration of the ports

The "Port Status" screen appears if you click the "Ports" folder icon.

The screen shows the configuration for data transfer for all ports of the SCALANCE X-200RNA.

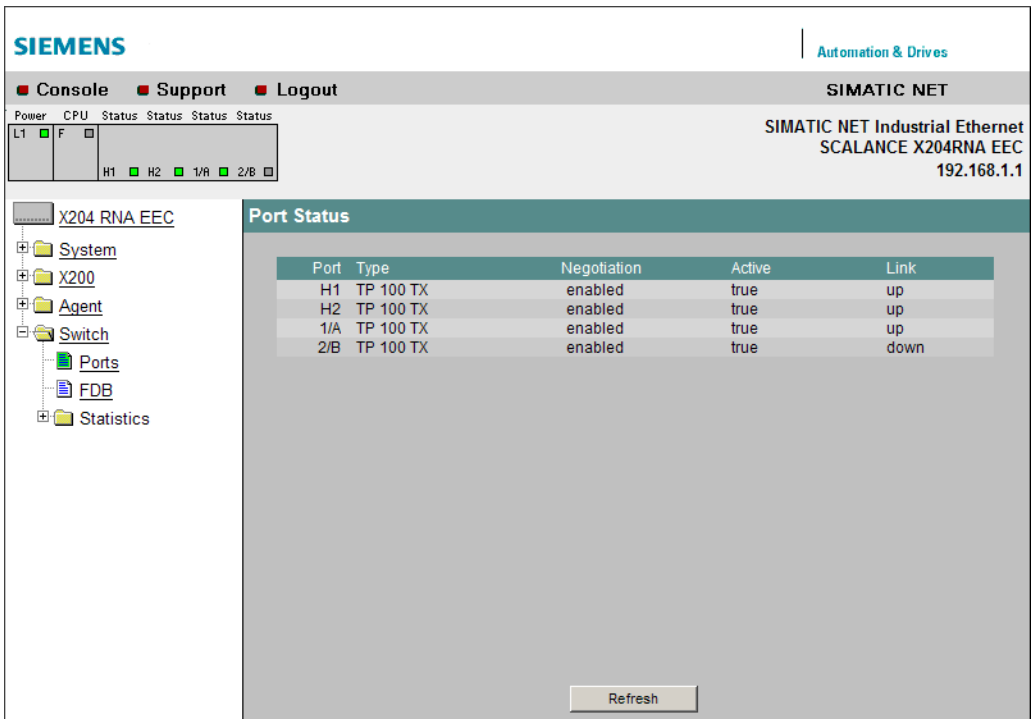


Figure 7-34 Port status

The five columns of the table display the following information:

Port
This shows the port (with the SCALANCE X204RNA also the SFP slot) to which the following information relates.

Type
Displays the type of port. This information is important because difference modules and therefore different ports can be used in some slots. The following port types are possible:

- TP 100 TX
- FO 100 FX

Negotiation
Indicates whether or not autonegotiation is enabled.

Note

Since the SCALANCE X-200RNA supports only 100 Mbps Ethernet in full duplex mode, autonegotiation is always enabled.

Active
Indicates whether or not the port is turned on (true). Data traffic is possible only over an enabled port.

Note

With the SCALANCE X-200RNA, the ports cannot be turned off.

Link
Shows the connection status to the network. The available options are as follows:

- Up
  The port has a valid link to the network, a link integrity signal is being received.
- Down
  The link is down, for example because the connected device is turned off.

7.8.4 Switch Forwarding Database

Display of the Switch Forwarding Database

The "Switch Forwarding Database" screen appears if you click the "FDB" folder icon.

The screen shows the dynamically learnt MAC addresses in the FDB table for all ports. In addition to this, to allow PRP diagnostics, the screen also shows whether the displayed MAC addresses are listed in the duplicate filter or in the proxy node table.

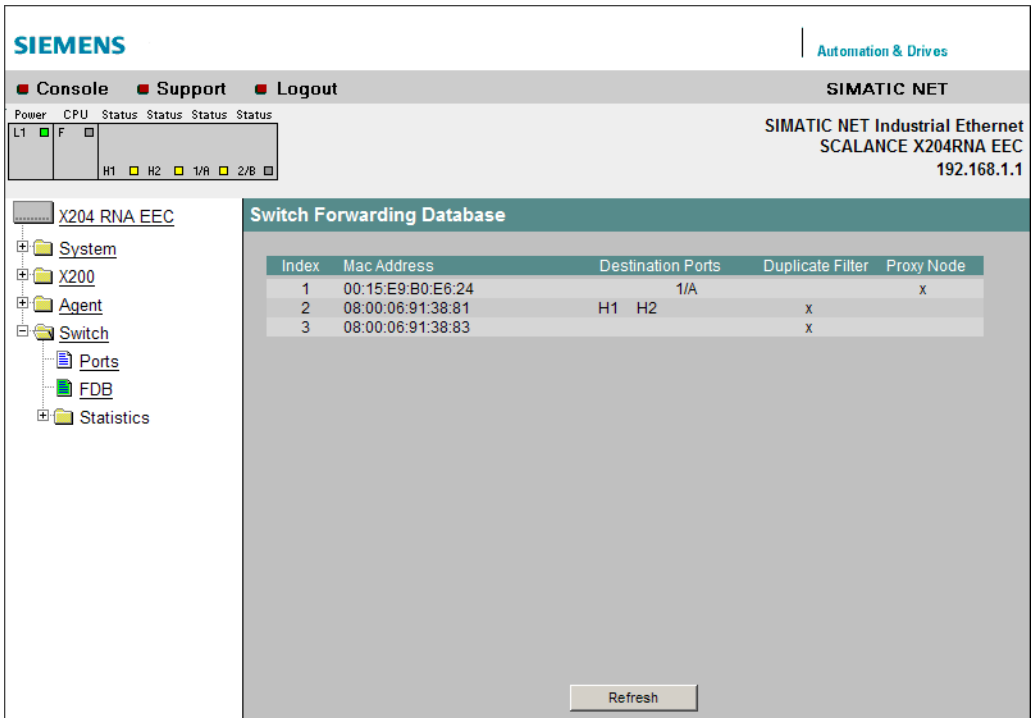


Figure 7-35 Switch Forwarding Database

The five columns of the table display the following information:

Index
Index of the entry

Mac Address
Learnt MAC address

Destination Ports
Specifies the destination port via which a frame with the learnt destination MAC address must be output.

Duplicate filter
Shows whether the MAC address is listed as a source MAC address in the duplicate filter table.

Proxy node
Shows whether the MAC address is listed as a source MAC address in the proxy node table.

7.8.5 the Statistics menu

Counting and evaluation of received frames

A SCALANCE X-204RNA has internal statistics counters with which it counts the number of received frames for each port according to the following criteria:

- Frame length
- Message frame type
- Bad frames

This information provides you with an overview of the data traffic and any problems on the network.

7.8.6 Packet Size Statistic

Received frames sorted by length

The "Packet Size Statistics" page displays how many packets of which size were received at each port.

If you click the "Reset Counters" button, you reset the counters for all ports.

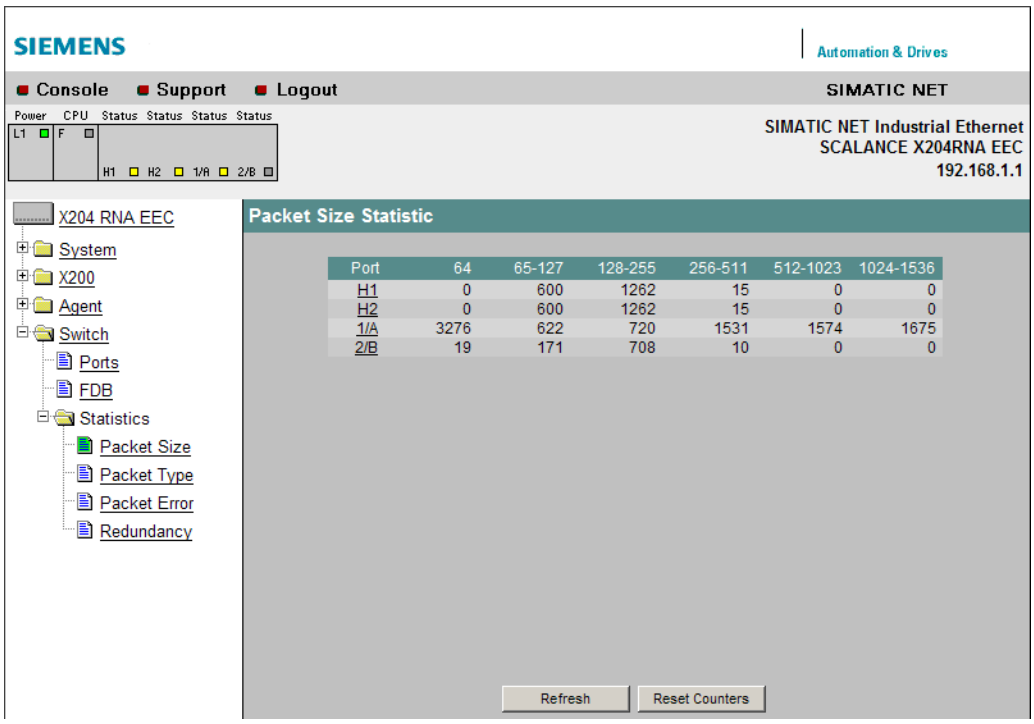


Figure 7-36 Packet Size Statistic

If you click on an entry in the Port column, the "Packet Size Statistics graphic" is displayed for the selected port. You then see a configurable graphical representation of the counter value.

Graphic representation of the statistics

This page displays the number of frames received at each port graphically. The display is dependent on the frame length. There is a separate element in the graphic for each of the following ranges:

- 64 bytes
- 65 - 127 bytes
- 128 -255 bytes
- 256 - 511 bytes
- 512 - 1023 bytes
- 1024 - 1536 bytes

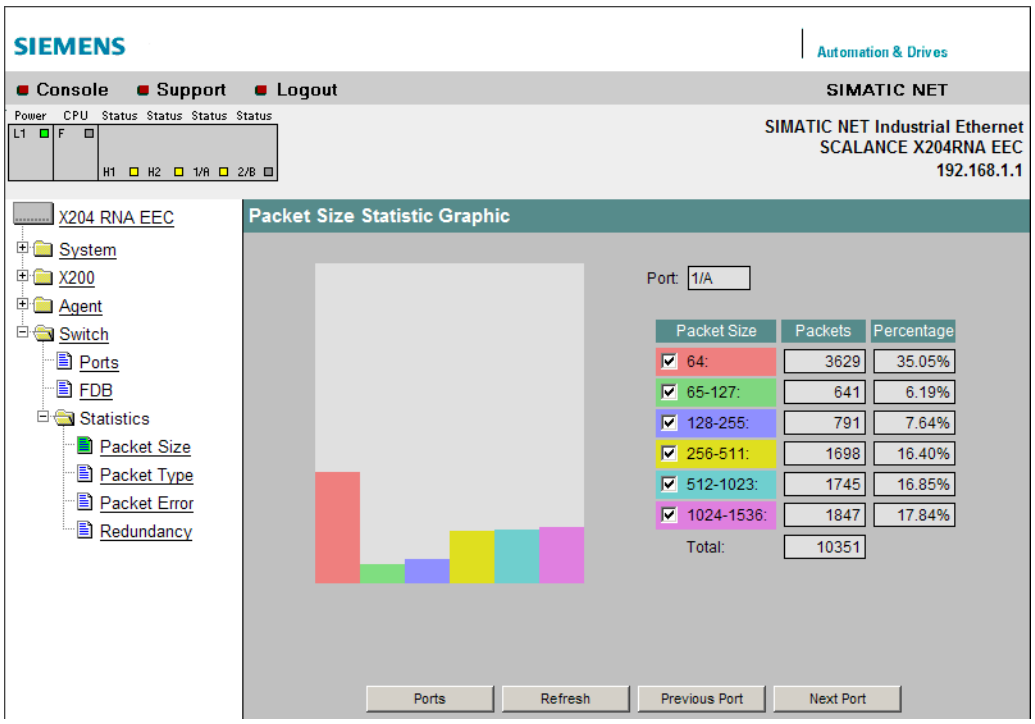


Figure 7-37 Packet Size Statistic Graphic

With the check box in the "Packet Size" column, you decide the content of the graphic. The value in the "Packets" column in the graphic is only displayed for a certain range if the appropriate check box is selected. The "Percentage" column shows the packets in a certain length range as a percentage of the total packets for this port. When the percentage is calculated, ranges are included only if their check boxes are selected.

With the "Previous Port" and "Next Port" buttons, you can change to the display of the previous or next port.

7.8.7 Packet Type Statistic

Received frames sorted by type

The "Packet Type Statistics" page displays how many frames of the type "unicast", "multicast", and "broadcast" were received and sent at each port.

If you click the "Reset Counters" button, you reset the counters for all ports.

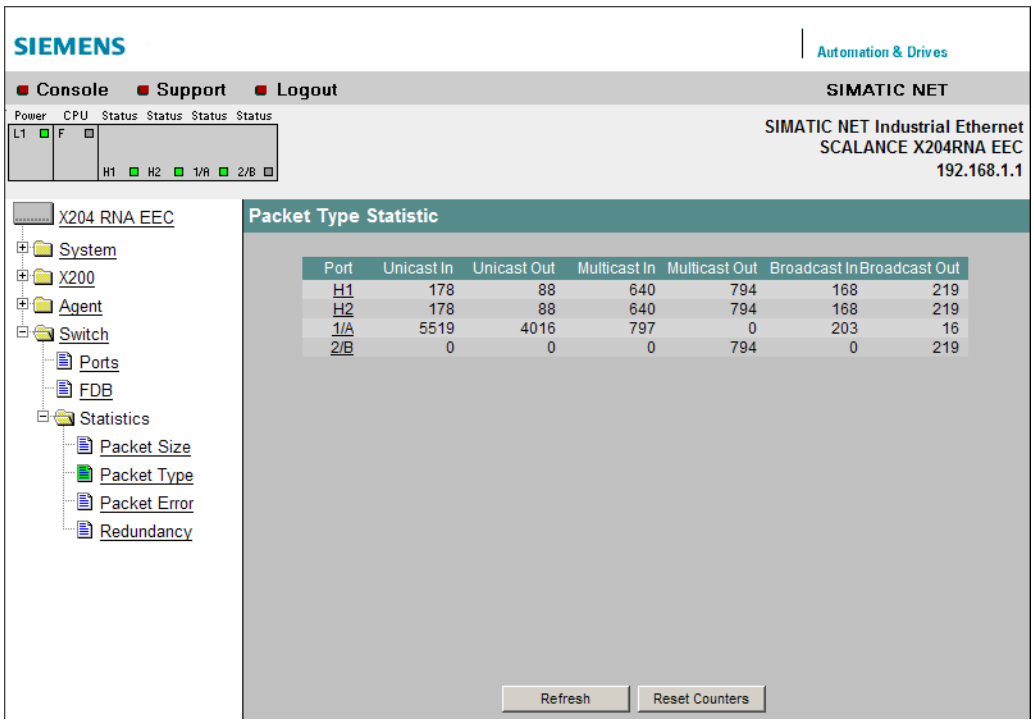


Figure 7-38 Packet Type Statistic

If you click on an entry in the Port column, the "Packet Type Statistics graphic" is displayed for the selected port. You then see a configurable graphical representation of the counter value.

Graphic representation of the statistics

This page displays the number of frames received at each port graphically. The display depends on the packet type. There is a separate element in the graphic for each of the following ranges:

- Unicast
- Multicast
- Broadcast

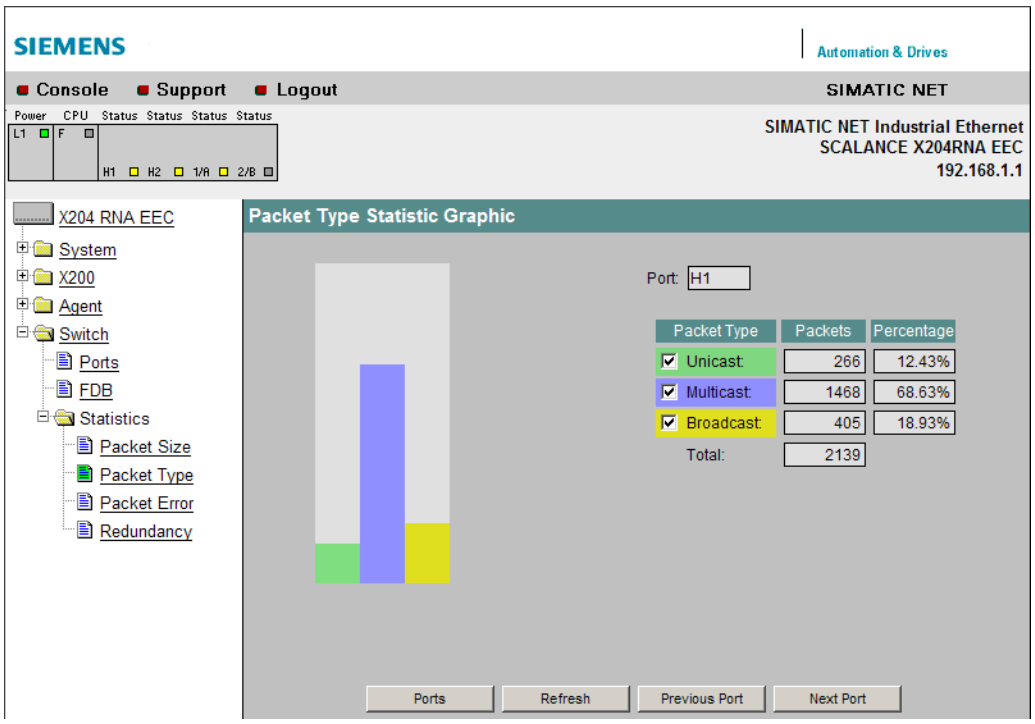


Figure 7-39 Packet Type Statistic Graphic

With the check box in the "Packet Type" column, you decide the content of the graphic. The value in the "Packets" column in the graphic is only displayed for a certain packet type if the appropriate check box is selected. The "Percentage" column shows the packets of a certain type as a percentage of the total packets for this port. When the percentage is calculated, packet types are included only if their check boxes are selected.

With the "Previous Port" and "Next Port" buttons, you can change to the display of the previous or next port.

7.8.8 Packet Error Statistic

Errors in received packets

The "Packet Error Statistics" page shows how many bad frames were received per port. The following error types are distinguished:

- Bad Frames
  Total number of bad received frames.
- CRC
  Number of frames whose content did not match the CRC checksum.
- Undersize
  Number of frames with a length less than 64 bytes.

- Oversize
  Number of frames with a length greater than 1536 bytes.
- Dropped L2
  Number of frames that were discarded at the receiving port due to lack of resources on the switch.

If you click the "Reset Counters" button, you reset the counters for all ports.

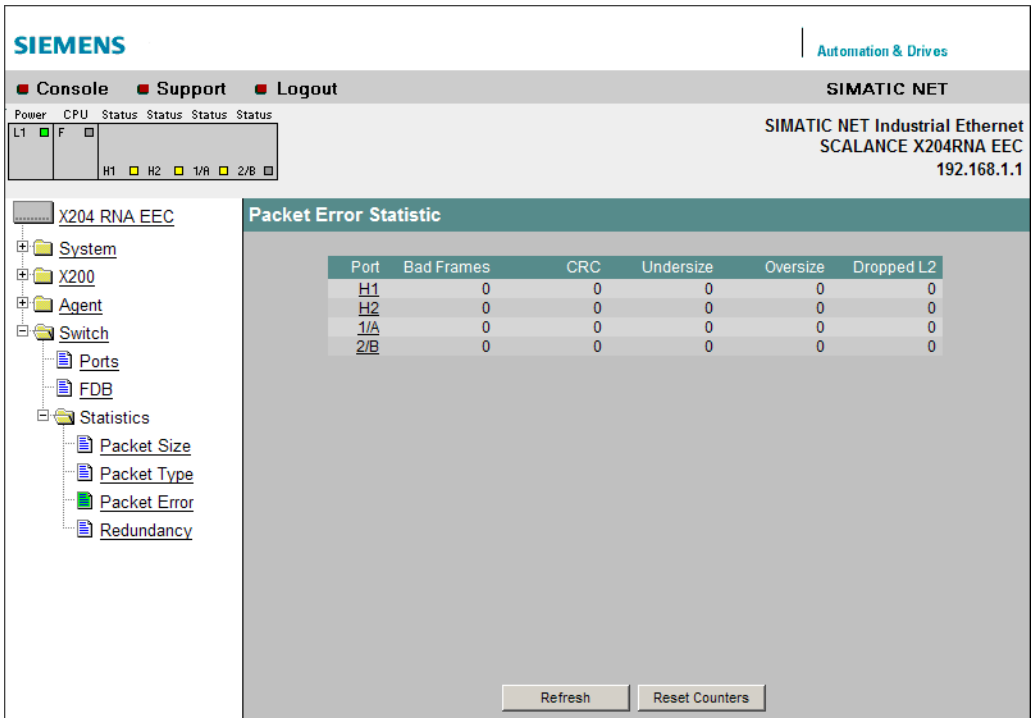


Figure 7-40 Packet Error Statistic

If you click on an entry in the "Port" column, the "Packet Error Statistics graphic" is displayed for the selected port. You then see a configurable graphical representation of the counter value.

Graphic representation of the statistics

This page displays the number of bad frames graphically. The display is dependent on the cause of the error. There is a separate element in the graphic for each of the following causes of error:

- Bad Frames
- CRC
- Undersize
- Oversize
- Dropped L2

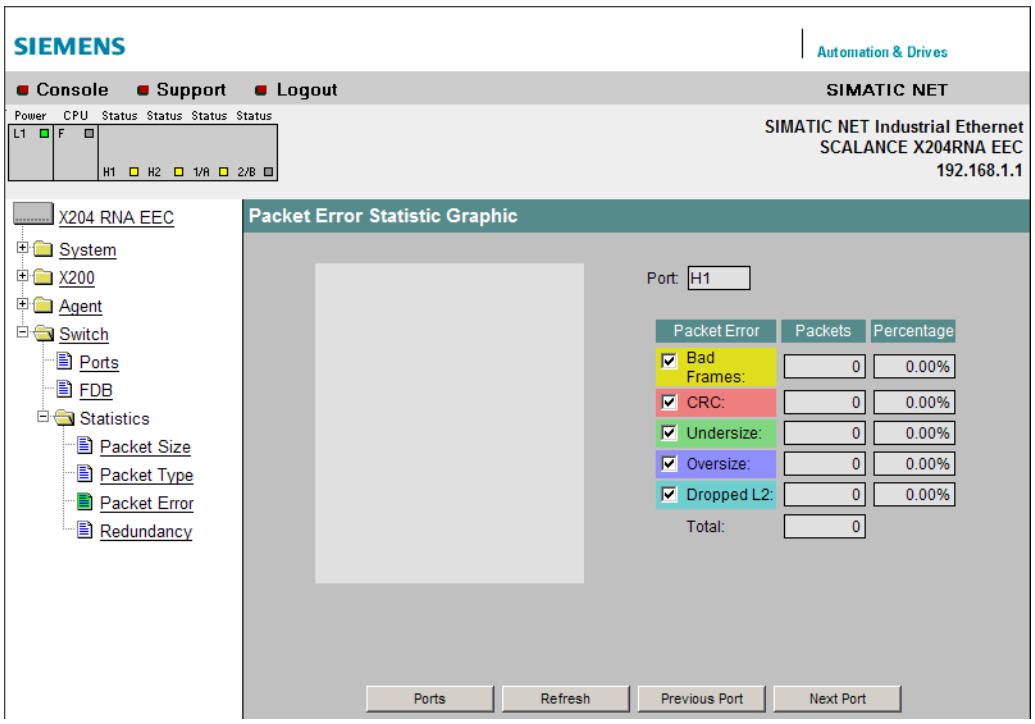


Figure 7-41 Packet Error Statistic Graphic

With the check box in the "Packet Error" column, you decide the content of the graphic. The value in the "Packets" column in the graphic is only displayed for a certain packet type if the appropriate check box is selected. The "Percentage" column shows the errors of a certain type as a percentage of the total errors for this port. When the percentage is calculated, error types are included only if their check boxes are selected.

With the "Previous Port" and "Next Port" buttons, you can change to the display of the previous or next port.

7.8.9 Redundancy Statistic

Redundancy Statistic

The "Redundancy Statistic" page shows interesting statistical data for the HSR protocol. The following events are distinguished:

- Received HSR Frames at HSR 1
  Number of valid HSR frames that were received at port HSR 1.
- Received HSR Frames at HSR 2
  Number of valid HSR frames that were received at port HSR 2.
- Received PRP A Frames at Port P1/A
  Number of valid PRP A frames that were received at port P1/A.
- Received PRP B Frames at Port P2/B
  Number of valid PRP B frames that were received at port P2/B.

- Received PRP B Frames at Port P1/A
  Number of PRP B frames that were received at port P1/A (error).
- Received PRP A Frames at Port P2/B
  Number of PRP A frames that were received at port P2/B (error).
- Received own Proxy Source MAC address
  Number of received frames with their own source MAC address (error).
- Received PRP or Standard Frames at HSR 1
  Number of valid PRP or Standard Ethernet frames that were received at HSR 1 (error).
- Received PRP or Standard Frames at HSR 2
  Number of valid PRP or Standard Ethernet frames that were received at HSR 2 (error).
- Received HSR Frames at Port P1/A
  Number of valid HSR frames that were received at port P1/A (error).
- Received HSR Frames at Port P2/B
  Number of valid HSR frames that were received at port P2/B (error).

If you click the "Reset Counters" button, you reset the counters for all ports.

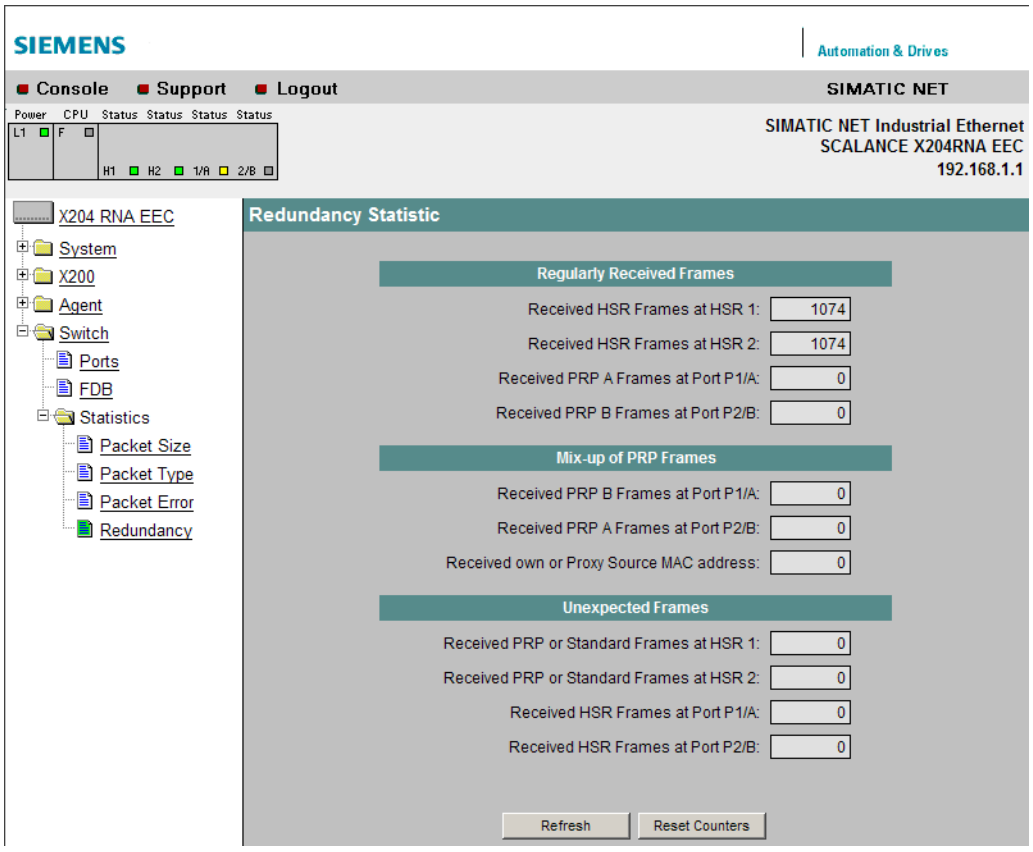


Figure 7-42 Redundancy Statistic

Approvals and marking

8

8.1 Approvals and marking

Approvals and marking

Note

The specified approvals apply only when the corresponding mark is printed on the product. You can check which of the following approvals have been granted for your product by the markings on the type plate.

Product name

Type designation	Order number
SCALANCE X204RNA	6GK5204-0BA00-2MB2
SCALANCE X204RNA EEC	6GK5204-0BS00-2NA3

EC directives

SIMATIC NET products meet the requirements and aims of the following EC directives.

Conformity certificates

You will find the EC Declaration of Conformity for this product on the Internet at the following address:

→ Entry list

→ Entry type "Certificates"

→ Type of certificate "Declaration of conformity"

Example German: "EG Konformitätserklärung SCALANCE X204RNA",

Example English: "Declaration of Conformity SCALANCE X204RNA ".

EMC directive (electromagnetic compatibility)

The SCALANCE X-200RNA devices meet the requirements of the EC directive:

2004/108/EEC "Electromagnetic Compatibility"

The product is designed for use in the following areas:

Area of application		
	RF interference level	Immunity to interference
Industry	EN 61000 6 4: 2007	EN 61000 6 2: 2005

WARNING

Personal injury and property damage can occur.

The installation of expansions that are not approved for SIMATIC NET products or their target systems may violate the requirements and regulations for safety and electromagnetic compatibility.

Only use expansions that are approved for the system.

- **Keep to the installation guidelines**
  The product meets the requirements if you adhere to the installation and safety instructions contained in this documentation and in the following documentation when installing and operating the product.
- **You can always find the latest documentation on the Internet!**
  The current descriptions of the currently available products can always be found on the Internet under the specified Internet pages:
  - Auto-Hotspot , Manual
  - Auto-Hotspot, Configuration manual
- **Working on the product**
  To protect the product from electrostatic discharge, personnel must first discharge any electrostatic charge from their body before touching the product.

Note

The product was tested with a device that also complies with the standards listed above.

When operating the product with a device that does not comply with these standards, adherence to the corresponding values cannot be guaranteed.

Explosion protection directive (ATEX)

The SCALANCE X204RNA device meets the requirements of the EC directive:

94/9/EC (ATEX95) "Equipment and protective systems intended for use in potentially explosive atmospheres"

Note

When using (installing) the SCALANCE X204RNA in hazardous area zone 2, make absolutely sure that the associated conditions are adhered to.

You will find these conditions on the SIMATIC NET Manual Collection.

- "Approval of SIMATIC/ SIMATIC NET Products for Direct Installation in Ex-Zone 2"

ATEX code:

II 3 G Ex nA IIC T4 Gc KEMA 07 ATEX 0145X

The product meets the requirements of the standards

- EN 60079-15 (electrical apparatus for potentially explosive atmospheres; Type of protection "n")
- and EN 60079-0

FM approval

The SCALANCE X204RNA meets the requirements of the standards:

- Factory Mutual Approval Standard Class Number 3611
- FM Hazardous (Classified) Location Electrical Equipment:
  Non Incendive / Class I / Division 2 / Groups A,B,C,D / T4 A and
  Non Incendive / Class I / Zone 2 / Group IIC / T4

FDA and IEC approvals

The following products meet the FDA and IEC requirements listed below.

- SFP module SFP991-1LD
- SFP module SFP991-1LH+

Figure 8-1 FDA and IEC approvals

Notice for Australia (C-Tick)

The product meets the requirements of the AS/NZS 2064 standard (Class A).

Notice for Korea (Kc)

The product meets the requirements of the Korea Certification.

UL Approval for Information Technology Equipment

Underwriters Laboratories (UL) complying with Standard UL 60950-1

UL Approval for Industrial Control Equipment

Underwriters Laboratories (UL) complying with Standard UL 508

For use in Pollution Degree 2 Environment

CSA Approval for Information Technology Equipment

CSA Certification Mark

Canadian Standard Association CSA C22.2 No. 60950-1-03

CSA Approval for Industrial Control Equipment

CSA Certification Mark

Canadian Standard Association CSA C22.2 No. 142-M1987

cULus Approval for Information Technology Equipment

Underwriters Laboratories Inc. complying with

- UL 60950-1 (Information Technology Equipment)
- CSA C22.2 No. 60950-1-03

cULus Approval for Industrial Control Equipment

Underwriters Laboratories Inc. complying with

- UL 508
- CSA C22.2 No. 142-M1987

For use in Pollution Degree 2 Environment

Table 8- 1 Approvals

Device type SCALANCE	cULus	FM	CE	C-Tick	Kc	ATEX95 Zone 2	E1
X204RNA	UL 60950 1 CSA C22.2 No. 60950 1	FM 3611 CL.1, Div.2 GP. A.B.C.D T.. CL.1, Zone 2, GP. IIC, T.. Ta:..	EN 61000-6-4, EN 61000-6-2	AS/NZS 2064 (Class A).	Korea Certification	EN 60079-15, EN 60079-0 II 3 G Ex nA IIC T.. Gc KEMA 07 ATEX 0145X	-
X204RNA EEC	UL 508 CSA C22.2 No. 142-M1987	FM 3611 CL.1, Div.2 GP. A.B.C.D T.. CL.1, Zone 2, GP. IIC, T.. Ta:..	EN 61000-6-4, EN 61000-6-2	AS/NZS 2064 (Class A).	Korea Certification	-	-

FM-/ATEX approval: For temperature information "T.." or the maximum ambient temperature "Ta:..", refer to the type plate.

Table 8- 2 Mechanical stability

Device type SCALANCE	IEC 60068-2-6 vibration	IEC 60068-2-27 shock
X204RNA	5 – 9 Hz: 3.5mm 9 – 500 Hz: 1g 1 octave/min, 20 sweeps	15 g , 6 ms duration 6 shocks per axis
X204RNA EEC	5 – 9 Hz: 3.5mm 9 – 150 Hz: 1 g 10 cycles per axis	15 g, 11 ms duration 6 shocks per axis

Technical data

9

9.1 Technical specifications

Table 9- 1 Construction

Device type SCALANCE	Dimensions (W x H x D) in mm	Weight in g	Installation options - DIN rail - Wall mounting
X204RNA	45 x 100 x 87	230	+
X204RNA EEC	70 x 147 x 123 (without protective bracket) 70 x 189 x 123 (with protective bracket)	780 (without protective bracket) 800 (with protective bracket)	+ Wall mounting with DIN rail possible

Table 9- 2 Ports

Device type SCALANCE	Connectors end devices or network components via twisted pair RJ-45 jacks with MDI X pinning 100 Mbps full duplex	Connections for end devices or network components via FO cable Duplex LC connector (with SFP module)	Connectors for the power supply Plug-in terminal block	Connectors for the signaling contact Plug-in terminal block
X204RNA	4	-	1 x 4-pin	1 x 2-pin
X204RNA EEC	2 + 2	max. 2	1 x 3-pin	1 x 3-pin

Table 9- 3 Electrical data

Device type SCALANCE	Supply voltage [tolerance range]	Power loss (typ.)	Current consumption (typ.)	Overvoltage protection at input
X204RNA	2 x 24 VDC SELV (Safety Extra Low Voltage) [19.2 .. 28.8 VDC]	3.5 W at 24 VDC	150 mA at 24 VDC	Fuse 2 A FF, can only be replaced in factory
X204RNA EEC	1 x 24 VDC (24 .. 250 VDC) [19.2 .. 300 VDC] or 1x 240 VAC (50/60 Hz) Overvoltage category II (100 .. 240 VAC) [85 .. 276 VAC]	6 W at 240 VAC	110 mA at 240 VAC 25 mA at 250 VDC 150 mA at 100 VAC 250 mA at 24 VDC	Fuse 1.25 A, can only be replaced in factory

Table 9- 4 Signaling contact

Device type SCALANCE	Voltage for the signaling contact	Current through the signaling contact	Contact type	Connectors for the signaling contact
X204RNA	max. 24 VDC	max. 100 mA	NC contact	1 x 2-pin
X204RNA EEC	max. 240 VAC	max. 100 mA	Changeover contact	1 x 3-pin

Table 9- 5 Permitted cable lengths (copper)

Device type SCALANCE	0 - 55 m IE TP torsion cable with IE FC RJ-45 Plug 180 or 0 - 45 m IE TP torsion cable with IE outlet RJ-45 + 10 m TP cord	0 - 85 m IE FC TP marine / trailing / flexible / FRNC / festoon / food cable with IE FC RJ-45 Plug 180 or 0 - 75 m IE FC TP marine / trailing / flexible / FRNC / festoon / food cable + 10 m TP cord over IE FC outlet RJ-45	0 - 100 m IE FC TP standard cable with IE FC RJ-45 plug 180 or over IE FC outlet RJ-45 with 0 90 m IE FC TP standard cable + 10 m TP cord
X204RNA	+	+	+
X204RNA EEC	+	+	+

Table 9- 6 Permitted cable lengths (fiber-optic)

SFP modules only for SCALANCE X204RNA EEC	0 - 3,000 m Glass FO cable 62.5/125 µm multimode glass fiber	0 - 26,000 m Glass FO cable 10/125 µm single mode fiber	0 - 70,000 m Glass FO cable 10/125 µm single mode fiber
SFP module SFP991-1	+	-	-
SFP module SFP991-1LD	-	+	-
SFP module SFP991-1LH+	-	-	+

Table 9- 7 Degree of protection and MTBF

Device type SCALANCE	Degree of protection	MTBF
X204RNA	IP20	92.45 years
X204RNA EEC	IP20	67.64 years

Table 9- 8 Switching properties

Device type SCALANCE	Max. number of learnable addresses	Aging time	Switching technique	Latency
X204RNA	1023	30 s	Cut-through between the ring ports HSR 1 and HSR 2.	9 µs (independent of frame length)
			otherwise Store and forward	15µs with minimum frame length (64 bytes) 135µs with maximum frame length (1530 or 1536 bytes)
X204RNA EEC	1023	30 s	Cut-through between the ring ports HSR 1 and HSR 2. Otherwise Store and forward	9 µs (independent of frame length)
			otherwise Store and forward	15µs with minimum frame length (64 bytes) 135µs with maximum frame length (1530 or 1536 bytes)

Table 9- 9 Permitted ambient conditions

Device type SCALANCE	Operating temperature	Storage/transportation temperature	Relative humidity in operation	Operating altitude at max. xx°C ambient temperature
X204RNA	-40 °C through +60 °C	-40 °C through +70 °C	‹ 95 % (no condensation)	2000 m at max. 56 °C 3000 m at max. 50 °C
X204RNA EEC	-40 °C through +70 °C (up to +85 °C / max. 16 h)	-40 °C through +70 °C	‹ 95 % (no condensation)	2000 m at max. 56 °C 3000 m at max. 50 °C

Note

Note the orientation of the installed SCALANCE X204RNA and X204RNA EEC

If a SCALANCE X204RNA or X204RNA EEC are mounted on a vertical rail, an ambient temperature of maximum +40 °C is permitted.

Accessories and compatible devices

10

10.1 Accessories

Table 10- 1 Accessories and order numbers

	Order number	Available for SCALANCE
System manual "Industrial Ethernet Network Manual"	6GK1970 1BA10 0AA0 Only available here: (http://support.automation.siemens.com/WW/view/en/27069465/)	All
IE FC Stripping Tool	6GK1901-1GA00	All
IE FC blade cassettes	6GK1901-1GB00	All
IE FC TP standard cable GP	6XV1840-2AH10	All
IE FC TP trailing cable	6XV1840-3AH10	All
IE FC TP marine cable	6XV1840-4AH10	All
IE FC TP trailing cable GP	6XV1870-2D	All
IE FC TP flexible cable GP	6XV1870-2B	All
IE FC FRNC cable GP	6XV1871-2F	All
IE TP ground cable	6XV1871-2G	All
IE FC TP festoon cable GP	6XV1871-2S	All
IE TP train cable	6XV1871-2T	All
IE FC TP food cable	6XV1871-2L	All
IE TP torsion cable	6XV1870-2F	All
Energy cable 2 x 0.75	6XV1812-8A	All
IE FC RJ-45 Plug 180 pack of 1	6GK1901 1BB10 2AA0	All
IE FC RJ-45 Plug 180 pack of 10	6GK1901 1BB10 2AB0	All
IE FC RJ-45 Plug 180 pack of 50	6GK1901 1BB10 2AE0	All
IE FC outlet RJ-45	6GK1901-1FC00-0AA0	All
TP cord RJ-45/RJ-45		
0.5 m	6XV1870-3QE30	All
1.0 m	6XV1870-3QH10	All
2.0 m	6XV1870-3QH20	All
6.0 m	6XV1870-3QH60	All
10 m	6XV1870-3QN10	All
SFP module		
SFP991-1 multimode glass up to 3 km	6GK5991-1AD00-8AA0	SCALANCE X204RNA EEC
SFP991-1LD monomode glass up to 26 km	6GK5991-1AF00-8AA0	SCALANCE X204RNA EEC
SFP991-1LH+ monomode glass up to 70 km	6GK5991-1AE00-8AA0	SCALANCE X204RNA EEC

	Order number	**Available for SCALANCE**
Glass fibers		
MM robust cable (50/125) (900 µm)	6XV1873-2R	SCALANCE X204RNA EEC
SM robust cable (4x19/125) (900 µm)	6XV1843-2R	SCALANCE X204RNA EEC
MM LC duplex plug	6GK1 901-0RB10-2AB0	SCALANCE X204RNA EEC
SM LC duplex plug	6GK1 901-0SB10-2AB0	SCALANCE X204RNA EEC
C-PLUG	6GK1900-0AB00	X-200RNA

10.2 PRP-compatible devices

**The devices listed here are compatible for use in PRP networks.
They are not suitable for use in High-availability Seamless Redundancy Protocol rings. Only devices equipped with HSR interfaces can be used in these rings. Devices that are not HSR capable, must be connected by means of a SCALANCE X-200RNA in HSR version to the HSR ring.**

Table 10- 2 They are not suitable for use in High-availability Seamless Redundancy Protocol rings. Only devices equipped with HSR interfaces can be used in these rings. Devices that are not HSR capable, must be connected by means of a SCALANCE X-200RNA in HSR version to the HSR ring. Compatible SCALANCE X devices (oversized frames - 1532 bytes)

SCALANCE X / W / CSM / CPs and PRP		
Product	**MLFB**	**As of version ..**
SCALANCE XB004-1, unmanaged IE Switch for 10/100 Mbps	6GK5004-1BD00-1AB2	ES: 01
SCALANCE XB004-1LD, unmanaged IE Switch for 10/100 Mbps	6GK5004-1BF00-1AB2	ES: 01
SCALANCE XB004-1G, unmanaged IE Switch for 10/100/1000 Mbps	6GK5004-1GL00-1AB2	ES: 01
SCALANCE XB004-1LDG, unmanaged IE Switch for 10/100/1000 Mbps	6GK5004-1GM00-1AB2	ES: 01
SCALANCE X005, IE entry level switch unmanaged	6GK5005-0BA00-1AA3	ES:07
SCALANCE XB005, unmanaged IE Switch for 10/100 Mbps	6GK5005-0BA00-1AB2	ES: 01
SCALANCE X005-TS IE entry level switch unmanaged -40 °/+75 °	6GK5005-0BA00-1CA3	ES:07
SCALANCE XB005G, unmanaged IE Switch for 10/100/1000 Mbps	6GK5005-0GA00-1AB2	ES: 01
SCALANCE XB008, unmanaged IE Switch for 10/100 Mbps	6GK5008-0BA00-1AB2	ES: 01
SCALANCE XB008G, unmanaged IE Switch for 10/100/1000 Mbps	6GK5008-0GA00-1AB2	ES: 01
SCALANCE X104-2, unmanaged IE Switch	6GK5104-2BB00-2AA3	ES: 01
SCALANCE X106-1, unmanaged IE Switch	6GK5106-1BB00-2AA3	ES: 01
SCALANCE X108, unmanaged IE Switch	6GK5108-0BA00-2AA3	ES: 01
SCALANCE X108POE, unmanaged IE Switch	6GK5108-0PA00-2AA3	ES: 01
SCALANCE X112-2, unmanaged IE Switch	6GK5112-2BB00-2AA3	ES: 01
SCALANCE X116, unmanaged IE Switch	6GK5116-0BA00-2AA3	ES: 01
SCALANCE X124, unmanaged IE Switch	6GK5124-0BA00-2AA3	ES: 01
SCALANCE X200-4P IRT, managed IE IRT Switch POF	6GK5200-4AH00-2BA3	ES: 01
SCALANCE X201-3P IRT, managed IE IRT Switch POF	6GK5201-3BH00-2BA3	ES: 01
SCALANCE X201-3P IRT, managed IE IRT Pro Switch (new)	6GK5201-3JR00-2BA6	ES: 01
SIMATIC NET, SCALANCE X202-2, IRT managed IE Switch	6GK5202-2BB00-2BA3	ES: 01
SIMATIC NET, SCALANCE X202-2P IRT managed IE IRT Switch POF	6GK5202-2BH00-2BA3	ES: 01
SIMATIC NET, SCALANCE X202-2P IRT AIDA	6GK5202-2JR00-2BA6	ES: 01
SIMATIC NET, SCALANCE XF204 managed IE Switch	6GK5204-0BA00-2AF2	V4.4
SIMATIC NET, SCALANCE X204-2,IRT managed IE Switch	6GK5204-0BA00-2BA3	ES: 01
SIMATIC NET, SCALANCE XF204 IRT managed IE Switch	6GK5204-0BA00-2BF2	ES: 01
SIMATIC NET, SCALANCE X204-IRT AIDA	6GK5204-0JA00-2BA6	ES: 01
SIMATIC NET, SCALANCE X204-2, managed IE Switch	6GK5204-2BB10-2AA3	V4.4
SIMATIC NET, SCALANCE X204-2TS, managed IE Switch	6GK5204-2BB10-2CA2	V4.4
SIMATIC NET, SCALANCE XF204-2 flat managed IE Switch	6GK5204-2BC00-2AF2	V4.4

SCALANCE X / W / CSM / CPs and PRP		
Product	**MLFB**	**As of version ..**
SIMATIC NET, SCALANCE X204-2LD, managed IE Switch	6GK5204-2BC10-2AA3	V4.4
SIMATIC NET, SCALANCE X206-1, managed IE Switch	6GK5206-1BB10-2AA3	V4.4
SIMATIC NET, SCALANCE X206-2LD, managed IE Switch	6GK5206-1BC00-2AA3	V4.4
SIMATIC NET, SCALANCE XF206-1 managed IE Switch	6GK5206-1BC00-2AF2	V4.4
SIMATIC NET, SCALANCE X206-2LD, managed IE Switch	6GK5206-1BC10-2AA3	V4.4
SIMATIC NET, SCALANCE XF208 managed IE Switch	6GK5208-0BA00-2AF2	V4.4
SIMATIC NET, SCALANCE X208, managed IE Switch	6GK5208-0BA10-2AA3	V4.4
SIMATIC NET, SCALANCE X208PRO, managed IE Switch	6GK5208-0HA00-2AA6	V4.4
SIMATIC NET, SCALANCE X212, managed IE Switch	6GK5212-2BB00-2AA3	V4.4
SIMATIC NET, SCALANCE X212-LD, managed IE Switch	6GK5212-2BC00-2AA3	V4.4
SIMATIC NET, SCALANCE X216 , managed IE Switch	6GK5216-0BA00-2AA3	V4.4
SCALANCE X224, managed IE Switch	6GK5224-0BA00-2AA3	V4.4
SCALANCE X302-7EEC; 24 VDC	6GK5302-7GD00-1EA3	V3.7.0
SCALANCE X302-7EEC ;24 V DC REDUNDANT POWER SUPPLY UNIT;	6GK5302-7GD00-2EA3	V3.7.0
SCALANCE X302-7EEC; 24 VDC POWER SUPPLY UNIT; CONFORMAL COATING;	6GK5302-7GD00-1GA3	V3.7.0
SCALANCE X302-7EEC; 24 VDC REDUNDANT POWER SUPPLY UNIT; CONFORMAL COATING;	6GK5302-7GD00-2GA3	V3.7.0
SCALANCE X302-7EEC; 100 - 240 VAC/VDC POWER SUPPLY UNIT;	6GK5302-7GD00-3EA3	V3.7.0
SCALANCE X302-7EEC; 100 - 240 VAC/VDC RED. POWER SUPPLY UNIT;	6GK5302-7GD00-4EA3	V3.7.0
SCALANCE X302-7EEC; 100 - 240 VAC/VDC POWER SUPPLY UNIT; CONFORMAL COATING;	6GK5302-7GD00-3GA3	V3.7.0
SCALANCE X302-7EEC; 100 - 240 VAC/VDC RED. POWER SUPPLY UNIT; CONFORMAL COATING;	6GK5302-7GD00-4GA3	V3.7.0
SCALANCE X307-2EEC; 24 VDC POWER SUPPLY UNIT;	6GK5307-2FD00-1EA3	V3.7.0
SCALANCE X307-2EEC; 24 VDC REDUNDANT POWER SUPPLY UNIT;	6GK5307-2FD00-2EA3	V3.7.0
SCALANCE X307-2EEC; 24 VDC POWER SUPPLY UNIT; CONFORMAL COATING	6GK5307-2FD00-1GA3	V3.7.0
SCALANCE X307-2EEC; 24 VDC REDUNDANT POWER SUPPLY UNIT; CONFORMAL COATING;	6GK5307-2FD00-2GA3	V3.7.0
SCALANCE X307-2EEC; 100 - 240 VAC/DC POWER SUPPLY UNIT;	6GK5307-2FD00-3EA3	V3.7.0
SCALANCE X307-2EEC; 100 - 240 VAC/VDC POWER SUPPLY UNIT; CONFORMAL COATING;	6GK5307-2FD00-3GA3	V3.7.0
SCALANCE X307-2EEC; 100 - 240 VAC/VDC RED. POWER SUPPLY UNIT;	6GK5307-2FD00-4EA3	V3.7.0
SCALANCE X307-2EEC; 100 - 240 VAC/VDC RED. POWER SUPPLY UNIT; CONFORMAL COATING;	6GK5307-2FD00-4GA3	V3.7.0
SCALANCE X304-2FE, managed IE Switch	6GK5304-2BD00-2AA3	V3.7.0
SCALANCE X306-1LDFE , managed IE switch	6GK5306-1BF00-2AA3	V3.7.0
SCALANCE X307-3, managed PLUS IE switch	6GK5307-3BL00-2AA3	V3.7.0
SCALANCE X307-3LD, managed PLUS IE switch	6GK5307-3BM00-2AA3	V3.7.0

SCALANCE X / W / CSM / CPs and PRP		
Product	**MLFB**	**As of version ..**
SCALANCE X308-2, managed PLUS IE switch	6GK5308-2FL00-2AA3	V3.7.0
SCALANCE X308-2LD, managed PLUS IE switch	6GK5308-2FM00-2AA3	V3.7.0
SCALANCE X308-2LH, managed PLUS IE switch	6GK5308-2FN00-2AA3	V3.7.0
SCALANCE X308-2LH+, managed PLUS IE switch	6GK5308-2FP00-2AA3	V3.7.0
SCALANCE X310-FE, managed PLUS IE switch	6GK5310-0BA00-2AA3	V3.7.0
SCALANCE X310, managed PLUS IE switch	6GK5310-0FA00-2AA3	V3.7.0
SCALANCE X320-1FE, managed IE switch	6GK5320-1BD00-2AA3	V3.7.0
SCALANCE X320-3LDFE, managed IE switch	6GK5320-3BF00-2AA3	V3.7.0
SCALANCE X308-2M , managed IE switch	6GK5308-2GG00-2AA2	V3.7.0
SCALANCE X308-2M TS, managed IE switch	6GK5308-2GG00-2CA2	V3.7.0
SCALANCE X308-2M POE , managed IE switch	6GK5308-2QG00-2AA2	V3.7.0
SCALANCE XR324-12M; MANAGED IE SWITCH, 24 VDC, cable outlet front	6GK5324-0GG00-1AR2	V3.7.0
SCALANCE XR324-12M; MANAGED IE SWITCH, 24VDC, cable outlet at rear	6GK5324-0GG00-1HR2	V3.7.0
SCALANCE XR324-12M; MANAGED IE SWITCH, 230 VAC, cable outlet front	6GK5324-0GG00-3AR2	V3.7.0
SCALANCE XR324-12M; MANAGED IE SWITCH, 230 VAC, cable outlet at rear	6GK5324-0GG00-3HR2	V3.7.0
SCALANCE XR324-4M EEC; MANAGED IE SWITCH, 1 X 24 VDC, cable outlet front	6GK5324-4GG00-1ER2	V3.7.0
SCALANCE XR324-4M EEC; MANAGED IE SWITCH, 2 X 24 VDC, cable outlet front	6GK5324-4GG00-2ER2	V3.7.0
SCALANCE XR324-4M EEC; MANAGED IE SWITCH, 1 X 24 VDC, cable outlet at rear	6GK5324-4GG00-1JR2	V3.7.0
SCALANCE XR324-4M EEC; MANAGED IE SWITCH, 2 X 24 VDC, cable outlet at rear	6GK5324-4GG00-2JR2	V3.7.0
SCALANCE XR324-4M POE; MANAGED IE SWITCH, 24 VDC, cable outlet front	6GK5324-4QG00-1AR2	V3.7.0
SCALANCE XR324-4M POE; MANAGED IE SWITCH, 24 VDC, cable outlet at rear	6GK5324-4QG00-1HR2	V3.7.0
SCALANCE XR324-12M TS; MANAGED IE SWITCH, 24 VDC, cable outlet front	6GK5324-0GG00-1CR2	V3.7.2
SIMATIC NET, SCALANCE X408-2, modular IE switch	6GK5408-2FD00-2AA2	V3.7.0
SIMATIC NET, SCALANCE X414-3E, modular IE switch	6GK5414-3FC00-2AA2	V3.7.0
SIMATIC NET, CSM module 1277 S7-1200	6GK7277-1AA10-0AA0	ES: 01
SIMATIC NET, CSM module 377 S7-300	6GK7377-1AA00-0AA0	ES: 01
SCALANCE XR552-12M; MANAGED IE SWITCH	6GK5552-0AA00-2AR2	1.0
SCALANCE XR528-6M; MANAGED IE SWITCH	6GK5528-0AA00-2AR2	1.0
CP 343-1 Lean	6GK7343-1CX10-0XE0	V2.4
CP 343-1_Bacnet	6FL4 343-1CX10-0XE0	V1.1
CP 343-1_STD	6GK7343-1EX30-0XE0	V2.4

SCALANCE X / W / CSM / CPs and PRP		
Product	**MLFB**	**As of version ..**
CP 343-1 Adv	6GK7343-1GX30-0XE0	V1.2
CP 343-1_Adv-3.0	6GK7343-1GX31-0XE0	V3.0
CP 443 1_Adv	6GK7443-1GX20-0XE0	V2.1
CP 443 1_Adv	6GK7443-1GX30-0XE0	V3.0
CP 443-1	6GK7443-1EX20-0XE0	V2.1
CP 443-1	6GK7443-1EX30-0XE0	V3.0

Explanation:

Version: With unmanaged switches, the product version of the hardware is specified because the devices do not have any firmware and device functionality is set using the hardware.

With other devices, the firmware version is specified (= V.x.x) because the device functionality is set in the firmware.

11 References

11.1 References

Sources of information and other documentation

System manual "SIMATIC NET Industrial Ethernet Network Manual"

The system manuals are only available from the CS home page.

(http://support.automation.siemens.com/WW/view/en/27069465/)

Dimension drawings

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12.1 Dimension drawings

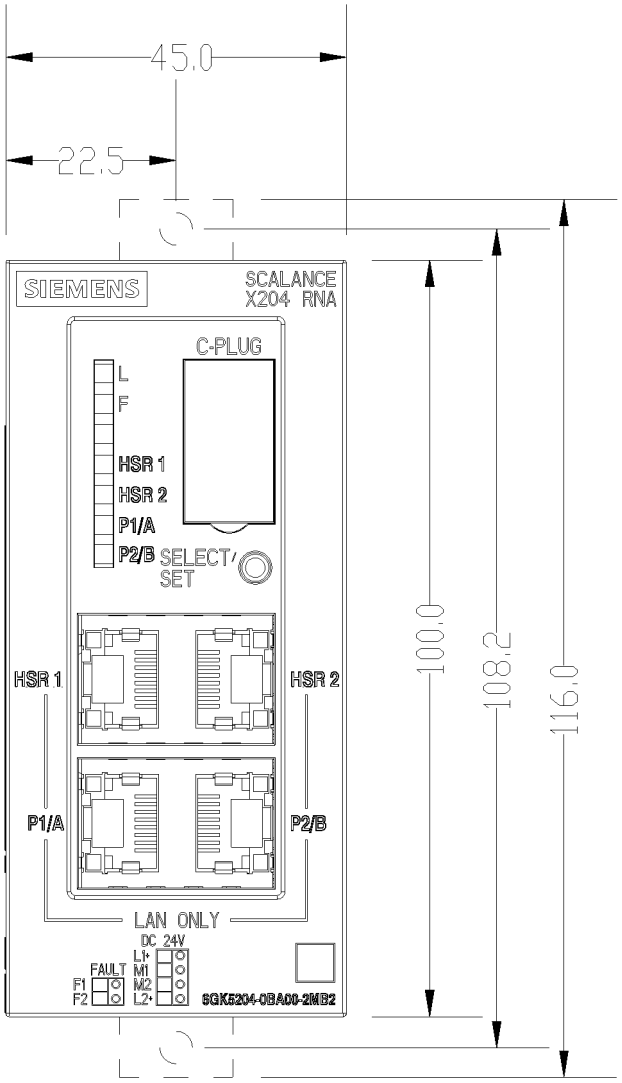

Figure 12-1 SCALANCE X204RNA, front view

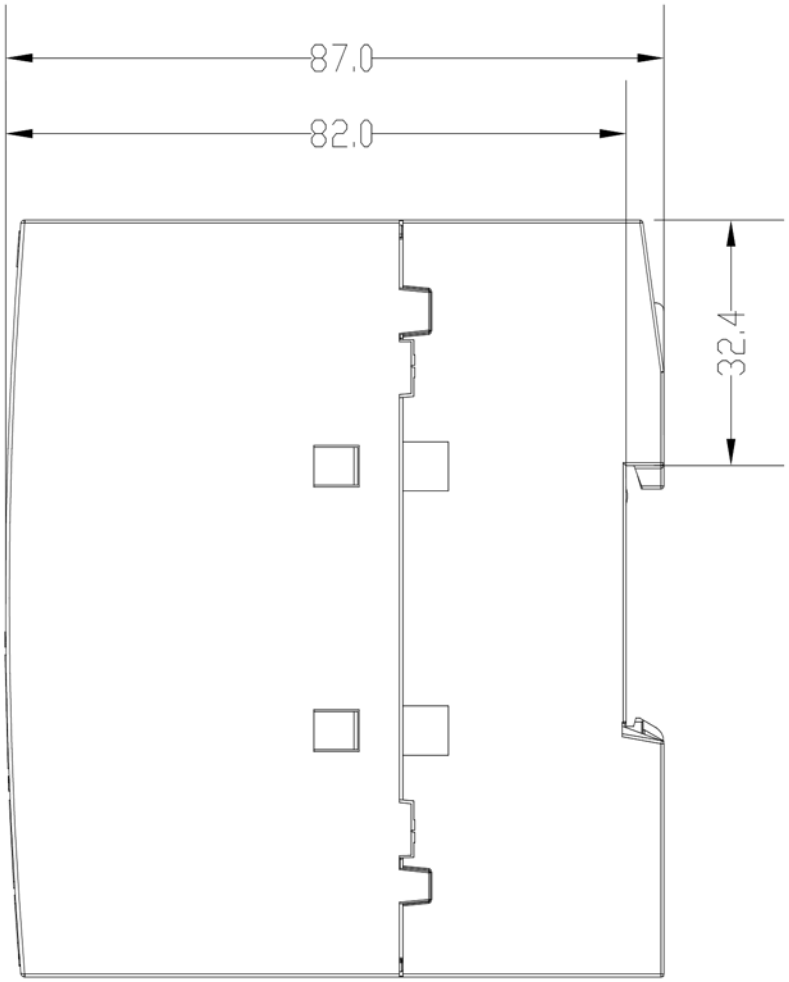

Figure 12-2 SCALANCE X204RNA, side view

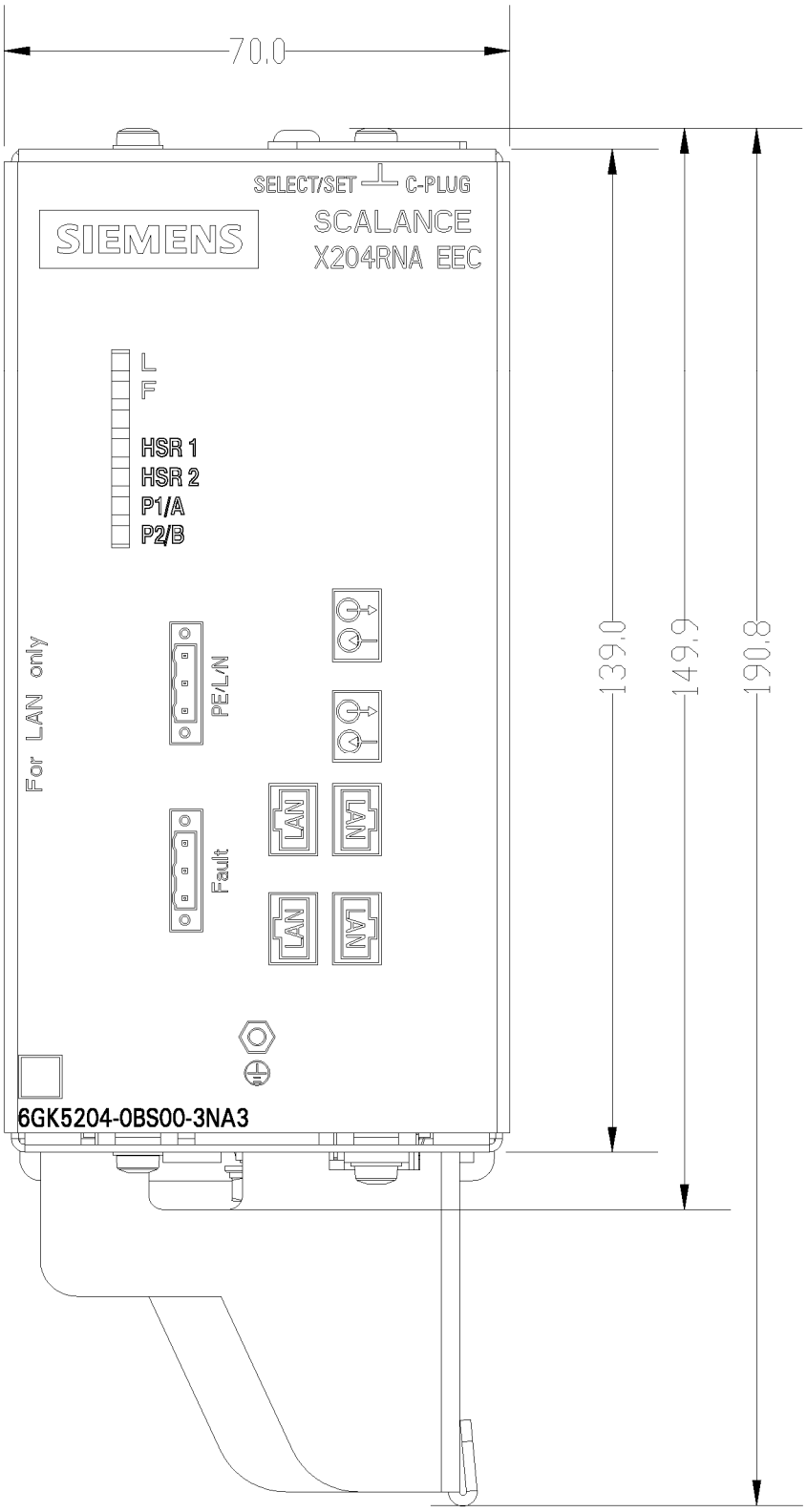

Figure 12-3 SCALANCE X204RNA EEC, front view

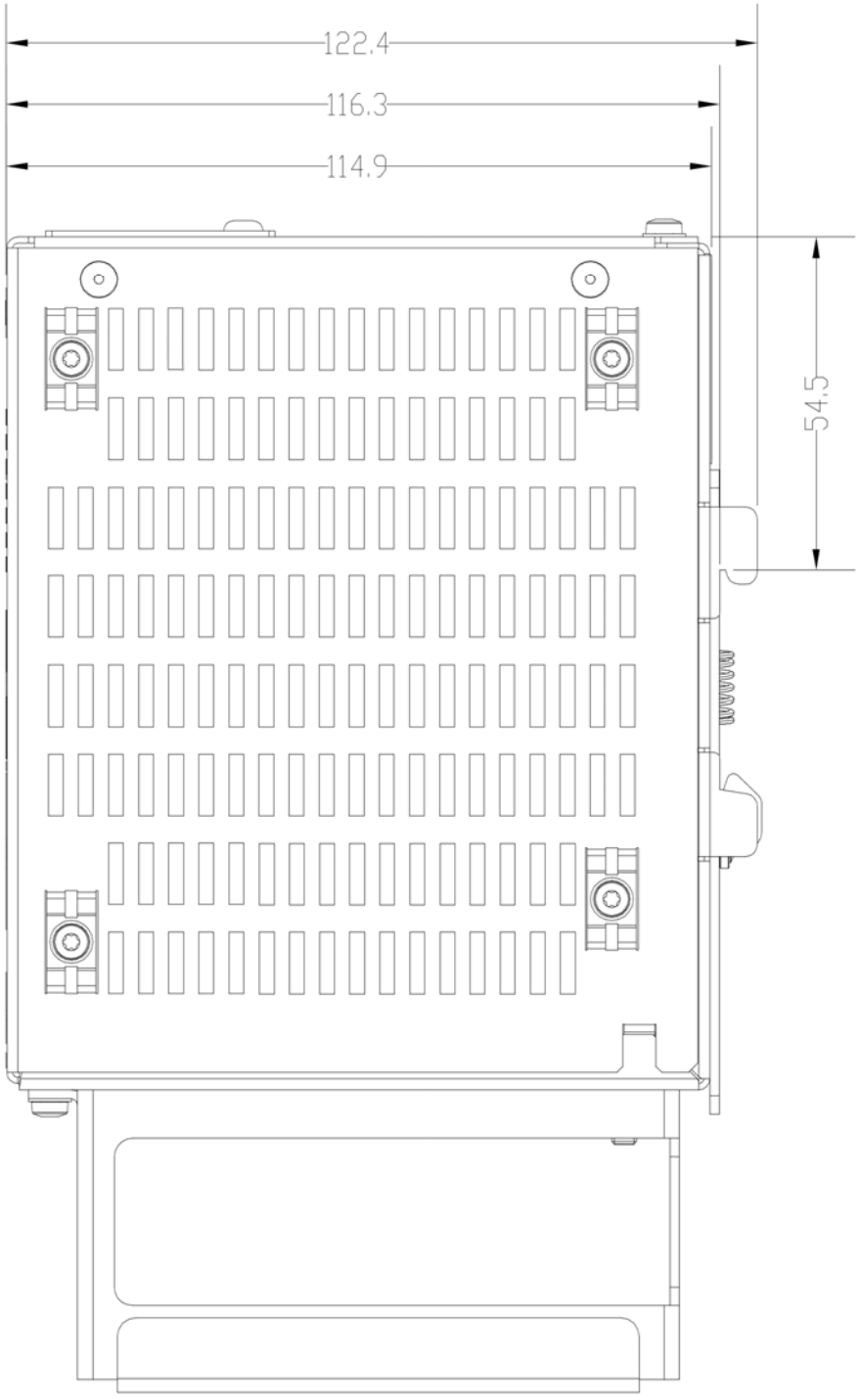

Figure 12-4 SCALANCE X204RNA EEC, side view

Glossary

Aging time

The aging time is the time after which a learned address is discarded if a SCALANCE X-200RNA has not received frames with this sender address during this time.

Autocrossover

Technique with which a TP port is automatically switched over between MDI and MDI-X assignment to make a connection independent of the port assignment of the device being attached. This means that crossover cables are not required. The autocrossover function can only be used when the port is set to autonegotiation mode.

Autonegotiation

Procedure standardized by IEEE 802.3 in which the transmission parameters (for example 10/100 Mbps, full/half duplex) are negotiated automatically between the devices.

BOOTP

A protocol for automatic assignment of IP addresses. The IP addresses are provided by a BOOTP server

CLI

Command Line Interface. Terminal-based configuration option for SCALANCE. The CLI can be used via an Ethernet connection.

C-PLUG

The C-PLUG (configuration plug) is an exchangeable medium for storage of the configuration and project engineering data. If the device is replaced, the configuration can be adopted by swapping the C-PLUG.

CRC

Cyclic Redundancy Check. A checksum used in transmission protocols to detect errors in frames.

DANH

A DANH (Double attached node implementing HSR) is a device that supports HSR and can be connected directly to an HSR ring. It can be an end device or a SCALANCE X-200 device in HSR mode.

DANP

A DANP (Double attached node implementing PSR) is a device that supports PRP and can be connected directly to a PRP network. It can be an end device or a SCALANCE X-200 device in PRP mode.

DCP

DCP (Discovery and basic Configuration Protocol) is used to detect nodes without an IP address and to assign a basic configuration to them, for example IP address.

Default gateway

A network node that forwards all frames not addressed to stations in the same LAN (subnet).

DHCP

DHCP (Dynamic Host Configuration Protocol), like BOOTP, a method for automatic assignment of IP addresses. However, with DHCP, addresses can also be assigned while the device is running.

Event

for Alarms & Events: An event is any occurrence that might be of interest to the client. Although events can also be generated due to a condition being met, they do not need to be related to conditions. Events that are not related to conditions include, for example, error messages from the communications system.

Fault mask

Specifies the desired status (good status). Deviations from this occurring during operation are handled as faults.

High Speed Redundancy

Method used on SIMATIC NET switches to increase the network availability in a ring topology.

See also ►Media redundancy.

HSR

HSR is a redundancy protocol for Ethernet networks. It is defined in the standard IEC 62439 (Industrial Communication Networks - High Availability Automation Networks) in Part 3 (Parallel Redundancy Protocol (PRP) and High-availability Seamless Redundancy Protocol (HSR)). In HSR, frames are exchanged at the same time via two sides of a ring. If a transmission path is interrupted, the frame arrives at its destination via the second path. This takes place bumpless without reconfiguration times to find new paths.

HTTP

Hypertext Transfer Protocol.

Protocol for transfer from Web sites

Media redundancy

Method for increasing availability in Industrial Ethernet networks in which devices can be reached over different paths. This might be achieved by meshing networks, arranging parallel transmission paths or by closing a linear bus topology to form a ring.

Media redundancy within a ring topology is available with SIMATIC NET products with the ►High Speed Redundancy and ►MRP methods.

Media Redundancy Protocol

A method specified in the IEC 61158 Type 10 standard for increasing network availability in a ring topology.

See also ►Media redundancy.

MIB

Managed Information Base. A tree structure containing all the data relevant for network management in SNMP.

Mirroring

A port (mirror port) with its specific data traffic can be mirrored to another port (monitor port) for test purposes. Protocol analysis devices can be connected to the monitor port, in other words, the monitor port is not available for data exchange. Mirroring has no effect on the mirror port.

MRP

→ Media Redundancy Protocol

Multicast

A frame with a multicast address is received by all nodes prepared to receive this address.

Multimode

In multimode transmission, the pulse is transferred using many modes (waves) that travel along curved paths or are reflected within the core. Attenuation is mainly caused by physical absorption and dispersion as well as by mechanical bending. The amount of attenuation depends, among other things, on the wavelength of the input light. Multimode fiber-optic cables have an outer diameter of 125 µm and 50 or 62.5 µm core diameter. Due to the larger core diameter the pulse edges degrade more than in single mode transmission resulting in shorter transmission distances.

PRP

PRP is a redundancy protocol for Ethernet networks. It is defined in the standard IEC 62439 (Industrial Communication Networks - High Availability Automation Networks) in Part 3 (Parallel Redundancy Protocol (PRP) and High-availability Seamless Redundancy (HSR)). With PRP, frames are exchanged at the same time via a two separate Ethernet networks. If a transmission path is interrupted, the frame arrives at its destination via the second path. This is bumpless without reconfiguration times to find new paths.

RMON

Remote Monitoring. RMON-compliant devices allow diagnostic data to be collected on the device and read out by a network management station. This means that network problems are detected early and can be eliminated. The particular advantage of RMON is that it is independent of location. The acquired data can be analyzed at any point in the network with suitable reporting software.

RNA

Redundant network access, connection point for connecting end devices/network segments not capable of PRP to parallel networks.

RSTP

Rapid Spanning Tree protocol. Variant of the Spanning Tree protocol optimized for speed.

This protocol prevents loops forming in multiple, redundant network connections. If there is an interruption on a connection, the network is automatically reconfigured so that there is exactly one connection between all nodes.

SAN

An SAN (Single Attached Node) is an Ethernet node that is connected to only one port via a RedBox with a PRP network or HSR ring. An SAN can also be directly connected to only one side (A or B) of a PRP network.

Secure Shell

→ SSH

Secure Socket Layer

→ SSL

Segment

In the Ethernet bus system, transceivers connected together over the bus cable along with the nodes connected over patch cables form a segment. Several such segments can be connected via repeaters. When using twisted pair and fiber-optic cables, each subsection forms a segment.

SFF

Small Form-Factor

The SFF slot is used to insert SFP modules. See also SFP.

SFP

Small Form-Factor Pluggable.

SFP is a specification for modular optical or electrical transceivers for network connections. SFP modules fit in an SFF slot and can be replaced simply and quickly (hot swapping).

Signaling contact

Floating relay contact via which the detected error states can be signaled.

Single mode

In single mode transmission, (and monomode transmission) the pulse is transmitted by a straight mode (wave). Attenuation is mainly caused by physical absorption and dispersion as well as by mechanical bending. The amount of attenuation depends, among other things, on the wavelength of the input light. The single mode fiber typically has a core diameter of 5 to 9 µm. The outer diameter is, however, once again 125 µm (compare multimode). The smaller core diameter degrades the pulse edges less than multimode transmission and allows greater transmission distances.

SNMP

Simple Network Management Protocol. Standardized protocol for transporting network management information.

SNTP

Simple Network Time Protocol

Protocol for time synchronization over networks.

SSH

Secure Shell. This allows an interactive connection to be established to another device in the LAN or on the Internet. Otherwise, the functionality corresponds to that of Telnet.

SSL

Secure Socket Layer. This protocol allows encrypted exchange of data with a server. There is also secure authentication of the server. For communication with a server over SSL, the server must have a certificate and a corresponding private key.

Store and forward

An entire frame is received, its validity checked (checksum, length etc.) and then buffered. Invalid frames are discarded, in other words, a frame is forwarded only when it is error-free.

TELNET

With this protocol, an interactive connection can be established to another device in the LAN or on the Internet. The user then has the same options as when directly connected to this device with a terminal.

TP

Twisted Pair

TP port

Port with a TP connector (RJ-45 jack)

WBM

Web Based Management. With WBM, configuration and diagnostics are handled with an Internet browser. Entries made by the user are sent to the device using the HTTP protocol and the device transfers its replies by HTTP to the user.

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