



SCALANCE X204RNA SCALANCE X204RNA EEC

Operating Instructions

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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
with a safety alert symbol, indicates that minor personal injury can result if proper precautions are not taken.
CAUTION
without a safety alert symbol, indicates that property damage can result if proper precautions are not taken.
NOTICE
indicates that an unintended result or situation can occur if the relevant information is not taken into account.

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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Introduction

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 Parallel Redundancy Protocol functionality.

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	6GK5204-0BA00-2KB2
SIMATIC NET SCALANCE X204RNA EEC	6GK5204-0BS00-3LA3

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.

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 Parallel Redundancy Protocol (PRP).

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.

Safety notes


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


<p> WARNING</p> <p>Safety extra low voltage</p> <p>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.)</p> <p>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).</p> <p>If the equipment is connected to a redundant power supply (two separate power supplies), both must meet these requirements.</p>
--


<p> WARNING</p> <p>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:</p> <ul style="list-style-type: none"> - Suitable for min. 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) <p>As an alternative, the following requirements:</p> <ul style="list-style-type: none"> - 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.

 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 – Installation 100 .. 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

3.1 Network topology and redundancy

Parallel Redundancy Protocol

The Parallel Redundancy Protocol is a redundancy protocol for Ethernet networks. It is defined in Part 3 of the IEC 624339 standard. The SCALANCE X-200RNA devices support the PRP-1 method. In the remainder of the text, PRP always stands for the PRP-1 protocol. The areas of application of PRP are distributed real-time applications with high reliability demands that depend on the high availability of the network. Compared with classic fault-tolerant networks, PRP 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 (HSR, 50 nodes in the ring) and can therefore not be used for substation applications or other applications that require high network availability.

The PRP method has the advantage that it uses parallel, separate networks made up of standard network components. 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 via both networks. If a transmission path is interrupted, the frame arrives at its destination via the second path.

The devices of the SCALANCE X-200RNA family are used to connect end devices without integrated PRP-1 interfaces to parallel networks.

Which topologies can be implemented?

With the SCALANCE X-200RNA devices, nodes or entire network segments without PRP-1 capability can be connected to a "Parallel Redundancy Protocol" network.

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

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.

Product characteristics

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	•	•
Diagnostics LED	•	•
24 VDC	•	-
24 V .. 250 VDC / 100 V .. 240 VAC	-	•
Housing	Plastic	Metal
2 x 24 VDC	•	-
100 Base-T, full duplex/half duplex	•/-	•/-
10 Base-T	-	-
Signaling contact + on-site operation (set/reset button)	•	•
Diagnostics: Web, SNMP	•	•
C-PLUG (not supported in implementation stage 1)	•	•
IRT capability	-	-
SNTP	•	•

Note

The networks LAN A and/or LAN B can have PROFINET or IRT functionality. These cannot, however, be transferred via the SCALANCE X-200RNA because PRP does not support this. PRP functionality is not impaired by using PROFINET or IRT components in the LAN A and LAN B networks.

4.1 Overview of the product characteristics

Table 4-2 Overview of the connection options

Fast Ethernet 100 Mbps	Device type SCALANCE	
	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
Ports	P1, P2	P1, P2
PRP ports	PRP A, PRP B	PRP A, PRP B

Note

TP connectors of SCALANCE X204RNA EEC

2 x RJ-45 for connecting two end devices / network structures without PRP-1 capability and optionally 2 x RJ-45 or 2 x SFP modules for connecting network structures capable of PRP. If an SFP module is inserted, the corresponding RJ-45 jack is disabled.

Example: If SFP module "PRP A" is inserted, the TP Interface "PRP A" 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)
- User Manual Compact (BAK)
- 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)
- User Manual Compact (BAK)
- CD (Operating Instructions, PST Tool)
- Bracket for guiding the cable (mechanical protection)

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 RJ-45 jacks for connection of end devices or network segments not capable of PRP (P1 and P2) and two RJ-45 jacks for connecting the PRP networks LAN A and LAN B (PRP A and PRP B).



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.

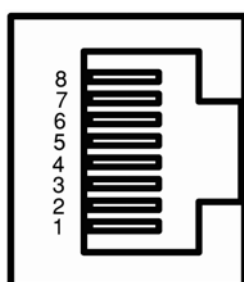


Figure 4-2 RJ-45 jack

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+

NOTICE

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 RJ-45 jacks PRP A and PRP B and are intended for the connection of the LAN A and LAN B networks. End devices or network segments without PRP capability are connected to the RJ-45 jacks P1 and P2.



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.

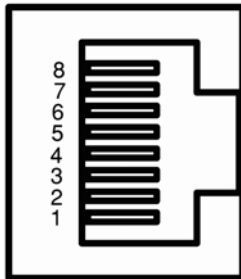


Figure 4-4 RJ-45 jack

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+

NOTICE

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 SFP slots are used to insert suitable SFP modules.

Here the use of transceivers with an optical interface is particularly practical.

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	1310 nm	1310 nm	1310 nm
- Core diameter	50 or 62.5 µm	9 µm	9 µm
- Outer diameter	125 µm	125 µm	125 µm
Maximum range	3 km	26 km	70 km
Order number	6GK5991-1AD00-8AA0	6GK5991-1AF00-8AA0	6GK5991-1AE00-8AA0

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)

Area of application

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.

If a C-PLUG is inserted, the configuration stored internally on the basic device is no longer changed. All changes made to the configuration during ongoing operation are only stored on the C-PLUG.

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

An IE Switch X-200 normally starts up with the configuration of the C-PLUG, assuming this was written to by a compatible device type.

4.6 C-PLUG

Diagnostics

Inserting a C-PLUG that does not contain the configuration of a compatible device type, inadvertently removing the C-PLUG, or general malfunctions of the C-PLUG are indicated by the diagnostic 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

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.

NOTICE

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.

If a C-PLUG has been taken out of a device, when the device is restarted, an error message is output in Web Based Management and in the Command Line Interface.

In this case, you will need to set the device to operation without C-PLUG. For further information, refer to the section "System C-PLUG WBM menu".

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:

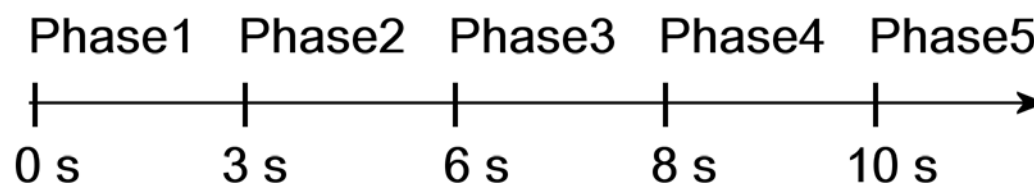


Figure 4-5 The five button phases

Time the button is pressed in seconds

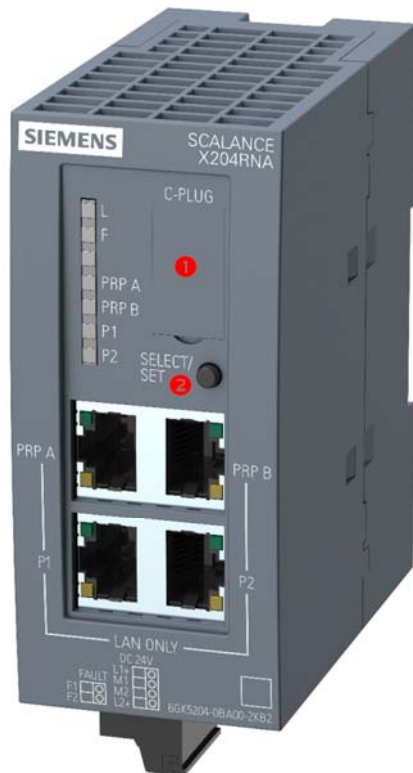
Table 4-6 Button phases

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
X204RNA EEC	1, 3, 4, 5	6	7

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 was detected.
7. 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.

4.8 Displays

- 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

5.1 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 (Page 107).

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 the cable or conduit entry point exceeds 70°C or the branching point of conductors exceeds 80°C special precautions must be taken.

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. In the standard position, 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 in a control cabinet without forced ventilation or cooling, minimum clearances must be maintained to neighboring devices or the wall of the enclosure. 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.

Minimum clearances for installation in control cabinets

Minimum clearance to devices below the switch	100 mm
Minimum clearance to devices above the switch	100 mm
Minimum clearance at the sides (X204RNA EEC)	20 mm

5.2 Din rail mounting

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:

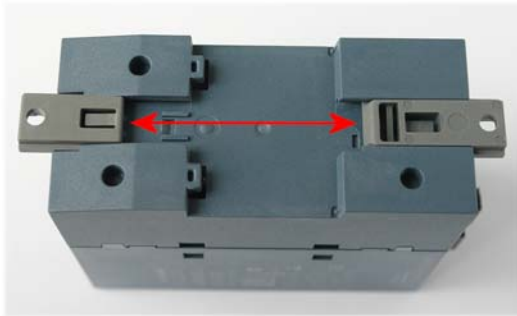
1. First disconnect all connected cables.
2. Use a screwdriver to release the lower rail catch of the device and pull the lower part of the device away from the rail.



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" (Page 109) 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 33).

Connection

6.1 Power supply

Power supply

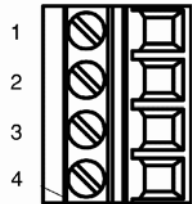
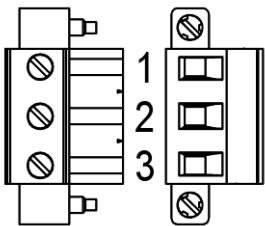
The power supply is connected using a 3- or 4-pin plug-in terminal block. Usable cable cross-section 0.25 to 2.5 mm².

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
<p>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.</p> <p>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).</p> <p>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).</p> <p>The power of all connected power supply units must total the equivalent of a power source with limited power (LPS limited power source).</p> <p>If the device is connected to a redundant power supply (two separate power supplies), both must meet these requirements.</p> <p>The signaling contact can be subjected to a maximum load of 100 mA (safety extra-low voltage (SELV), 24 VDC).</p> <p>Never operate the SCALANCE X204RNA with AC voltage or DC voltage higher than 28.8 V DC.</p>

24 VDC power supply

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


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 VDC are not approved for use in hazardous areas according to EC-Dir--94/9 (ATEX).

CAUTION
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.

Grounding

 WARNING
PE connection with SCALAMCE X204RNA EEC Grounding simply via the housing is inadequate. For safe operation, the protective ground must be connected to the grounding bolts. On the SCALANCE X204RNA EEC, the PE connector is on the bottom of the device.


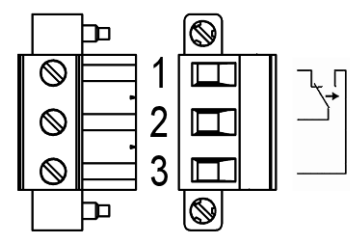
6.2 Signaling contact

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 mm².

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 27)).
- 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. Use minimum conductor size like supply line conductors, but not smaller than 1.5mm²/AWG 16.

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.

NOTICE
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 not close the session. If the browser is started again within the timeout, the session continues to be used.

Note

To use SNMP Management, RMON, 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 X200RNA 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 X200RNA 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

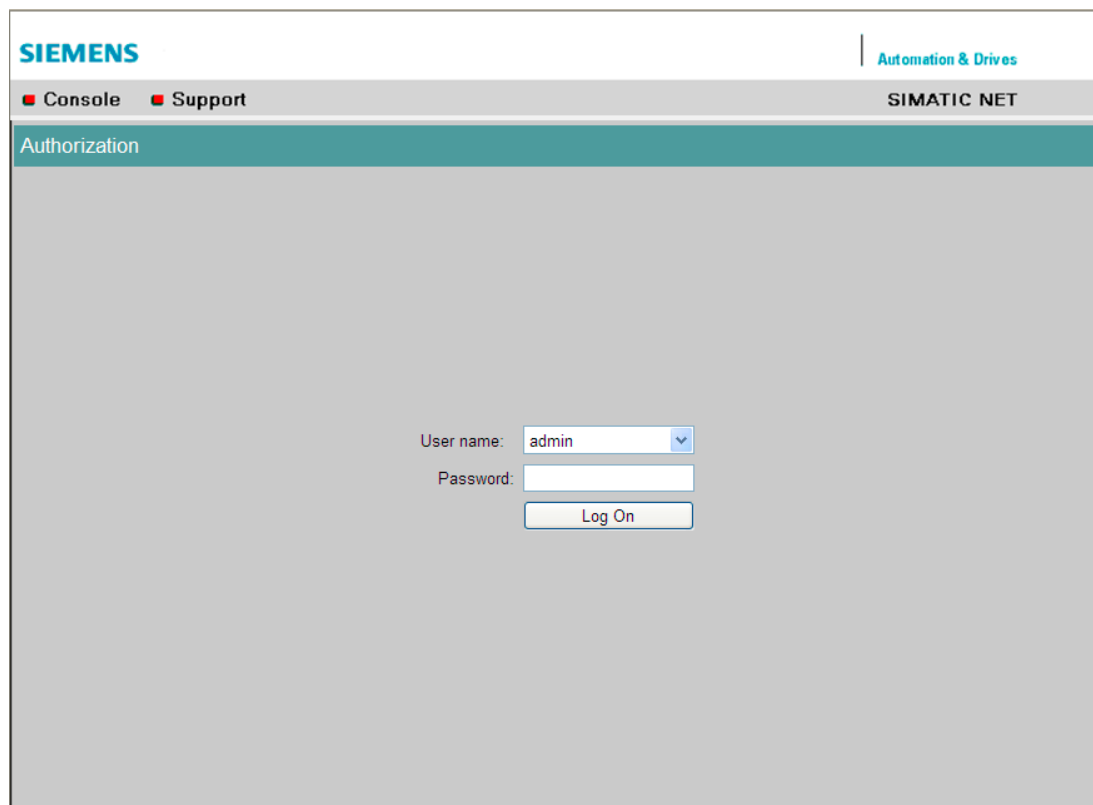
The browser must not be set so that it reloads the page from the server each time the page is accessed. The updating of the dynamic content of the page is ensured by other mechanisms. In the Internet Explorer, you can make the appropriate setting in the *Options > Internet Options > General* menu in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



The screenshot shows the Siemens SIMATIC NET web interface. At the top left is the SIEMENS logo. To its right is the text 'Automation & Drives'. Below this is a navigation bar with 'Console' and 'Support' links. The main header area contains 'SIMATIC NET'. The central part of the page is titled 'Authorization' and features a logon form. The form has a 'User name:' label followed by a dropdown menu currently showing 'admin'. Below that is a 'Password:' label followed by an empty text input field. At the bottom of the form is a 'Log On' button.

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.

7.3 LED simulation of the WBM

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" (Page 29) in these Operating Instructions.

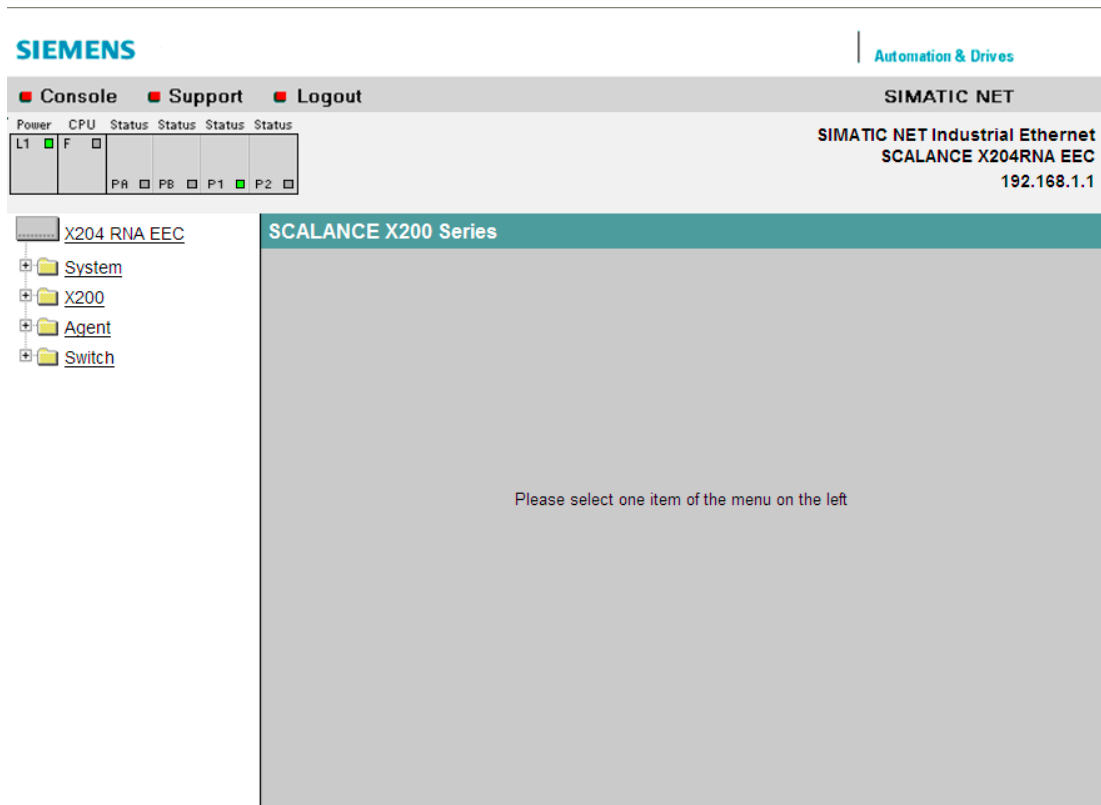


Figure 7-2 LED simulation of the SCALANCE X204RNA EEC

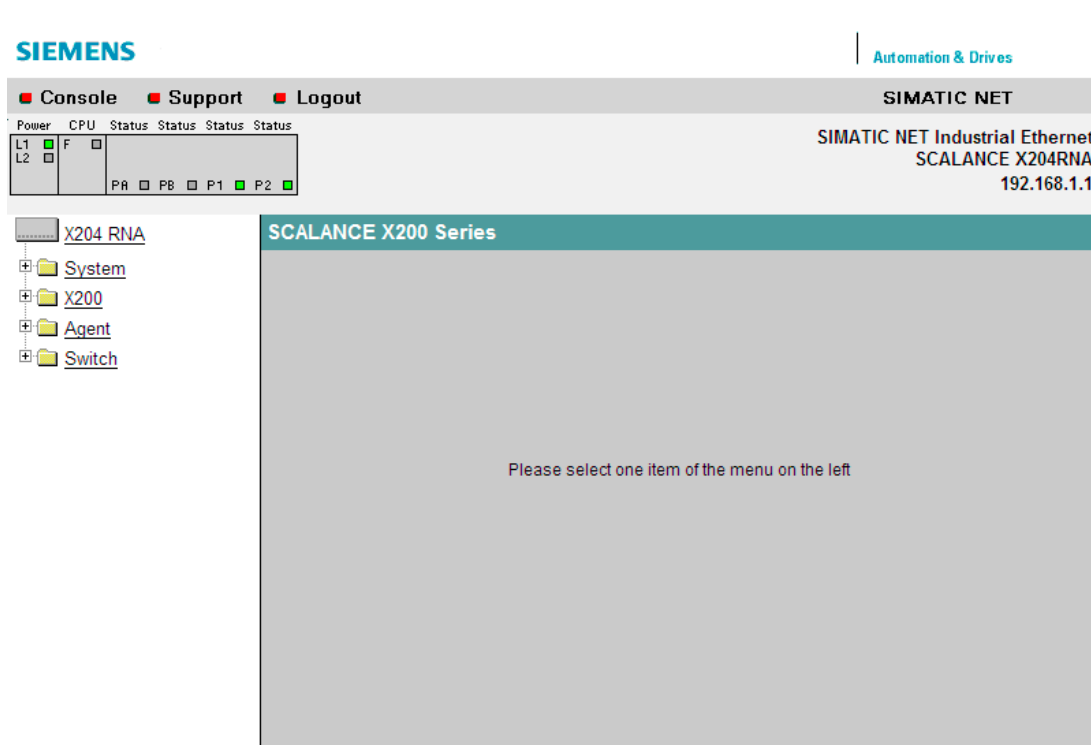


Figure 7-3 LED simulation of the SCALANCE X204RNA

7.4 Working with the WBM

Navigation bar

The upper menu bar of WBM contains the following links:

- Console
This link is not used here.
- 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:

The screenshot displays the SIMATIC NET web interface for system configuration. At the top, there is a navigation bar with 'SIEMENS' and 'Automation & Drives'. Below this, there are status indicators for 'Console', 'Support', and 'Logout', and the text 'SIMATIC NET'. A status bar shows 'SIMATIC NET Industrial Ethernet SCALANCE X204RNA EEC' and the IP address '192.168.1.1'. On the left, a tree view shows the 'System' folder selected. The main content area is titled 'System Configuration' and contains several input fields: 'Current System Time' (01/01/2000 02:13:20), 'System Up Time' (2 h, 13 min, 20 sec, 60 msec), 'Device Type' (XXXXXX), 'Device Description' (XXXX), 'System Contact' (Siemens I IA SC IC), 'System Location' (Siemens I IA SC IC), and 'System Name' (PRP Redundancy Box). At the bottom, there are 'Refresh' and 'Set Values' buttons.

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.

7.5 The System menu

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.

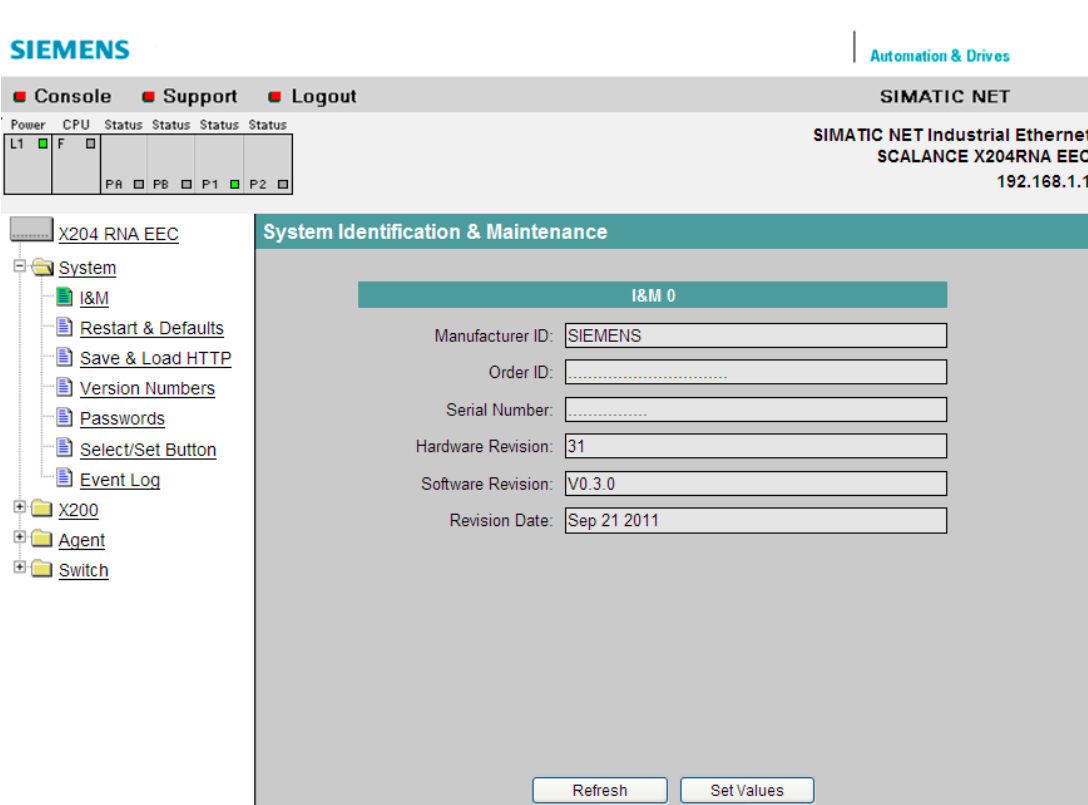


Figure 7-5 System Identification & Maintenance

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.

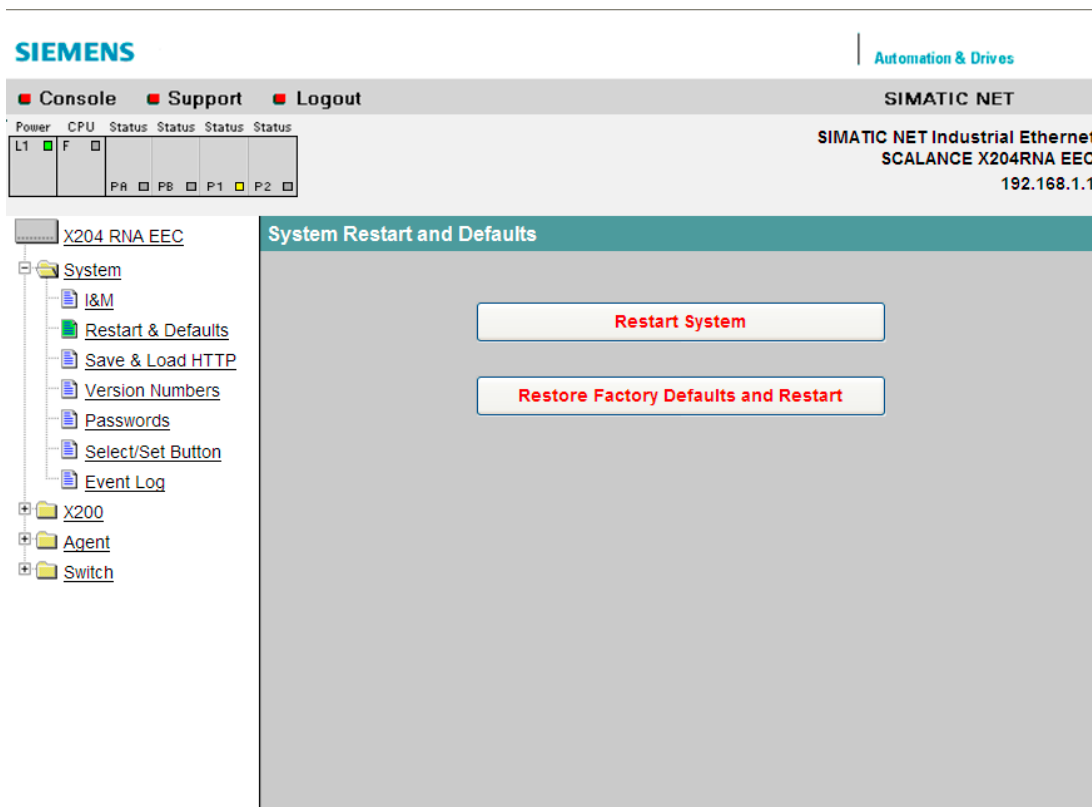


Figure 7-6 System Restart and Defaults

Note

Note the following points about restarting a SCALANCE X200RNA:

- 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.

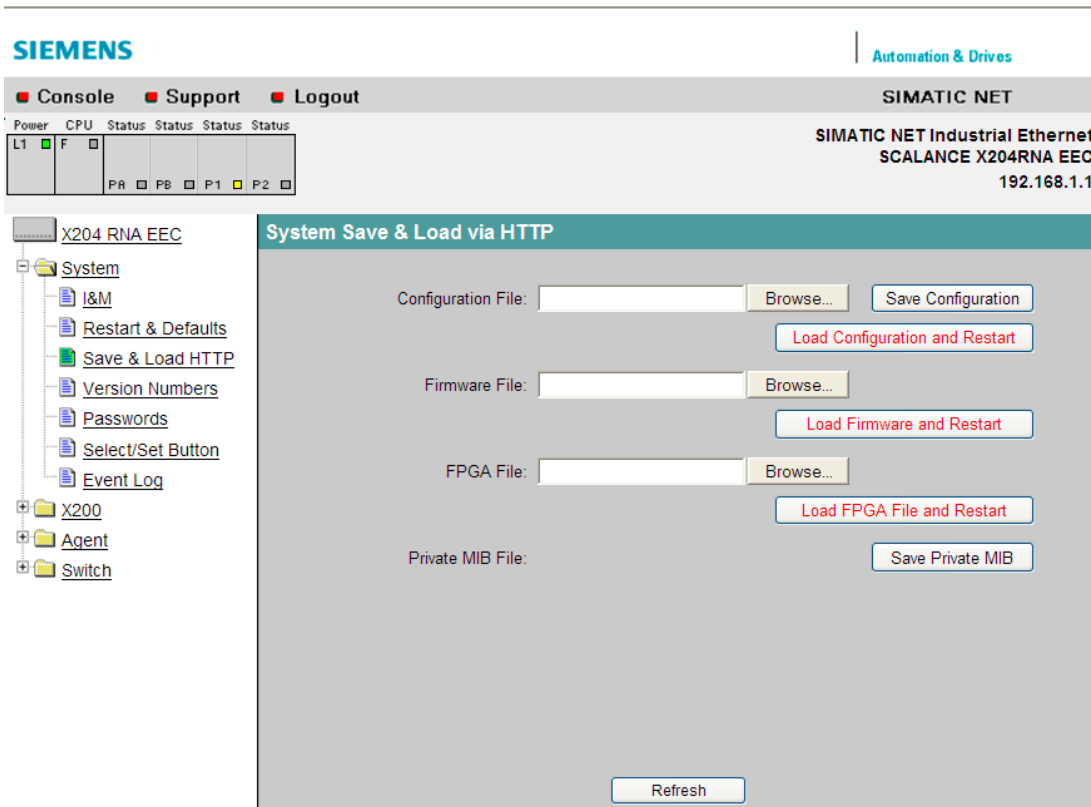


Figure 7-7 System Save & Load via HTTP

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.

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". Following the download, there is an automatic restart and the device starts up with the new data.

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:

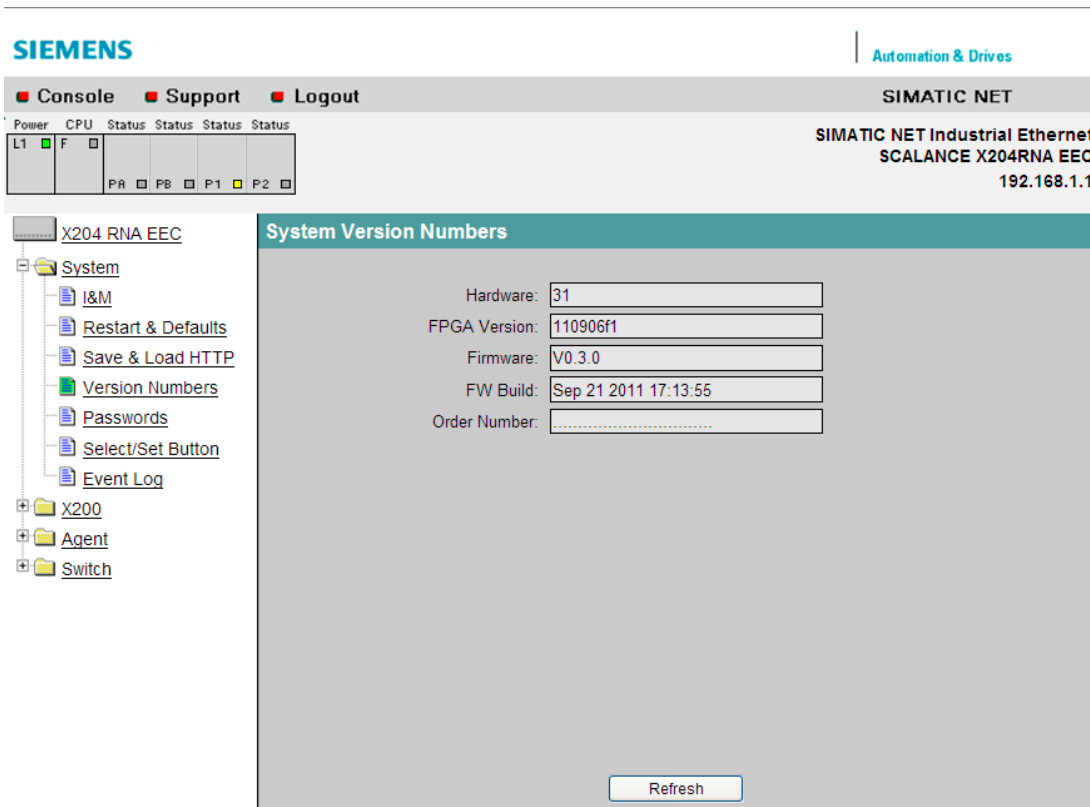


Figure 7-8 System Version Numbers

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.

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.

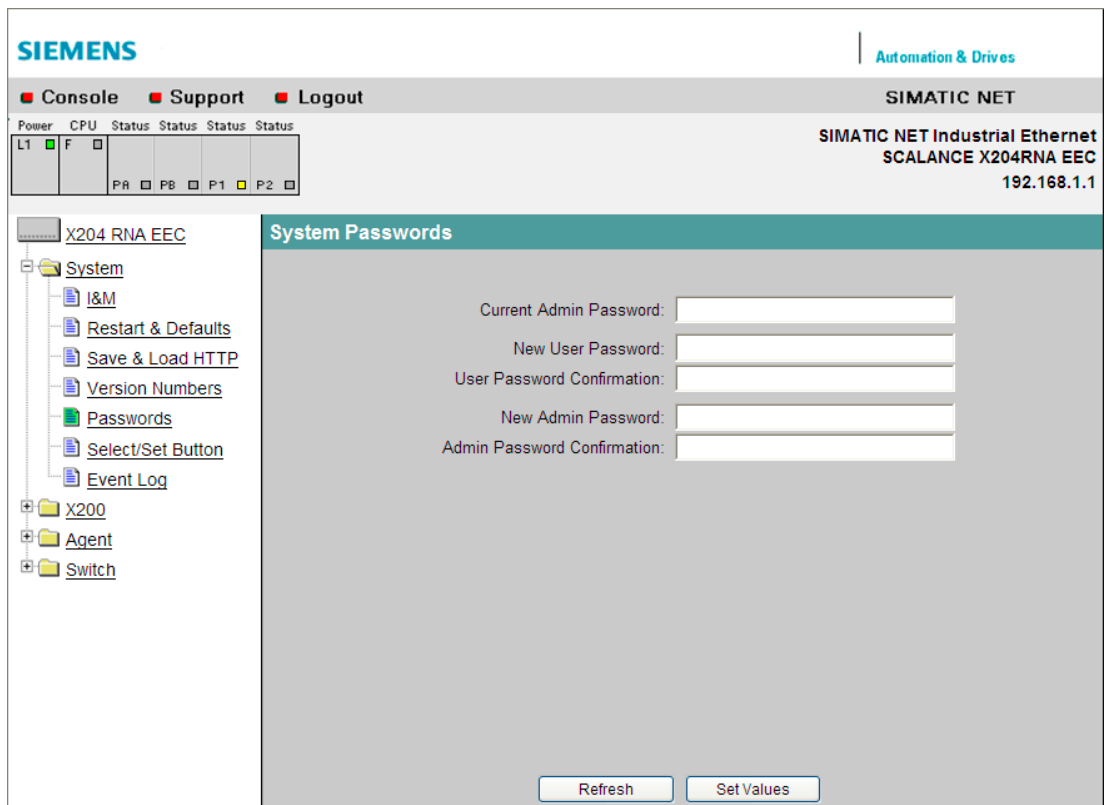


Figure 7-9 System Passwords

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 (Page 27)".

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

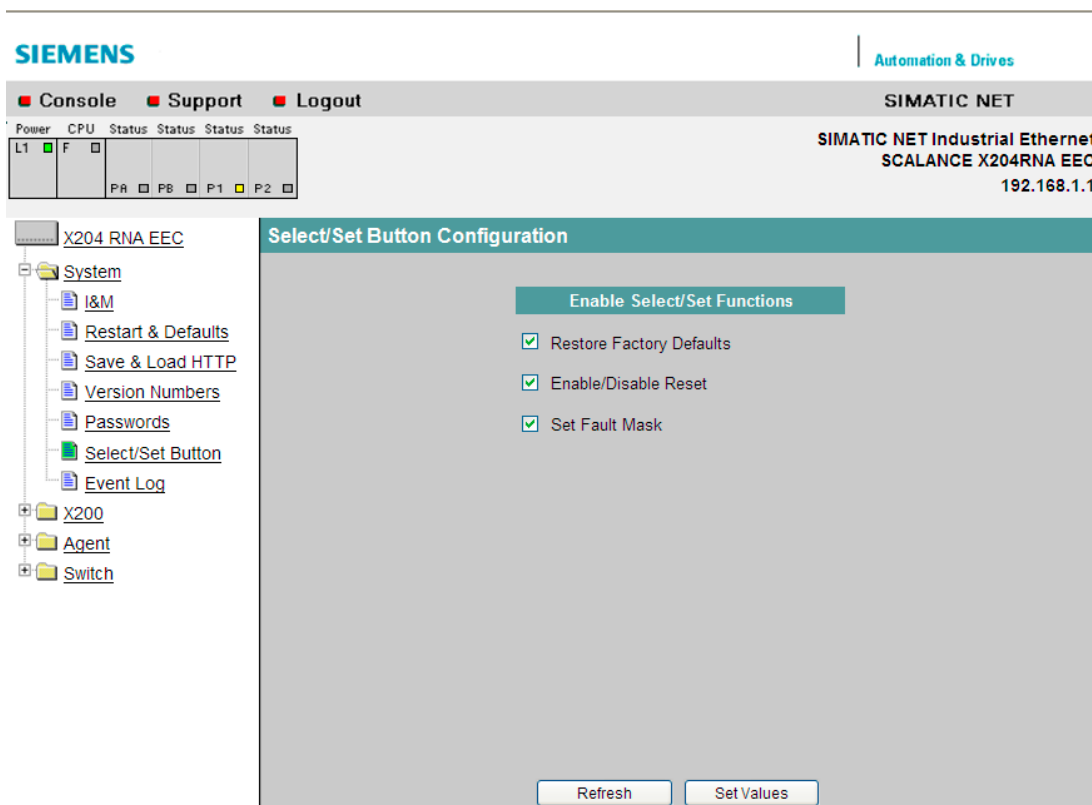


Figure 7-10 Select/Set button configuration

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.

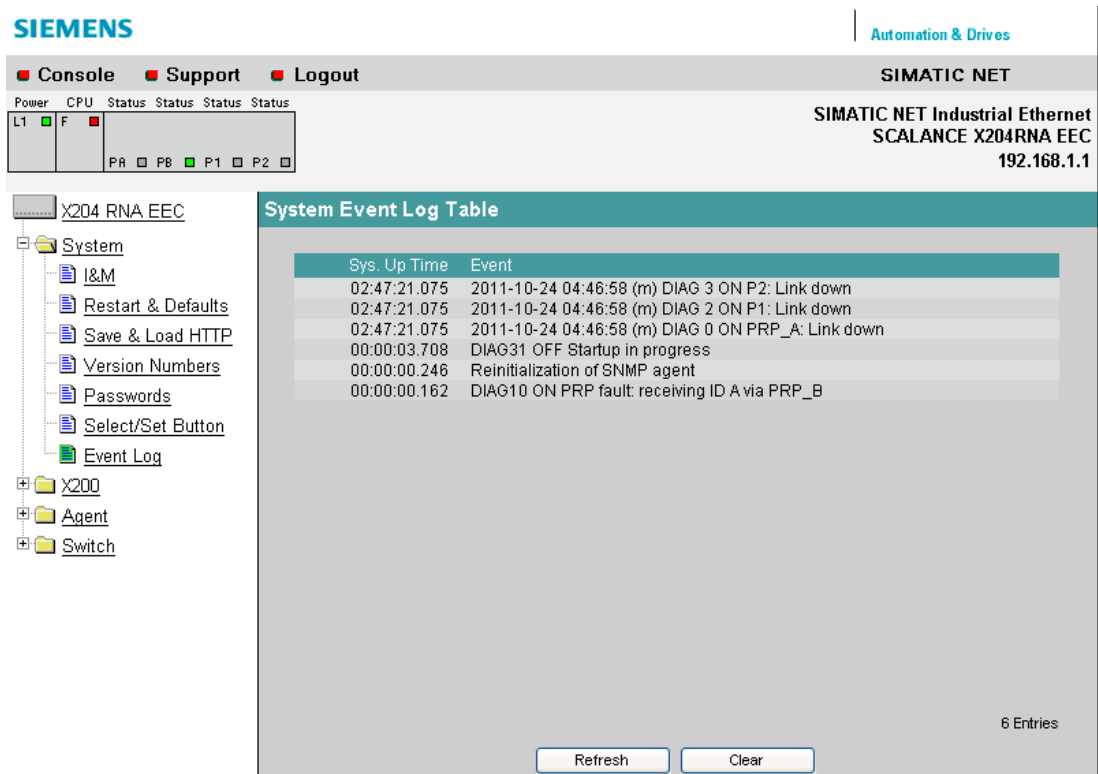


Figure 7-11 System Event Log Table

The "Restart" column indicates the device restart after which the corresponding event occurred.

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.

7.6 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.

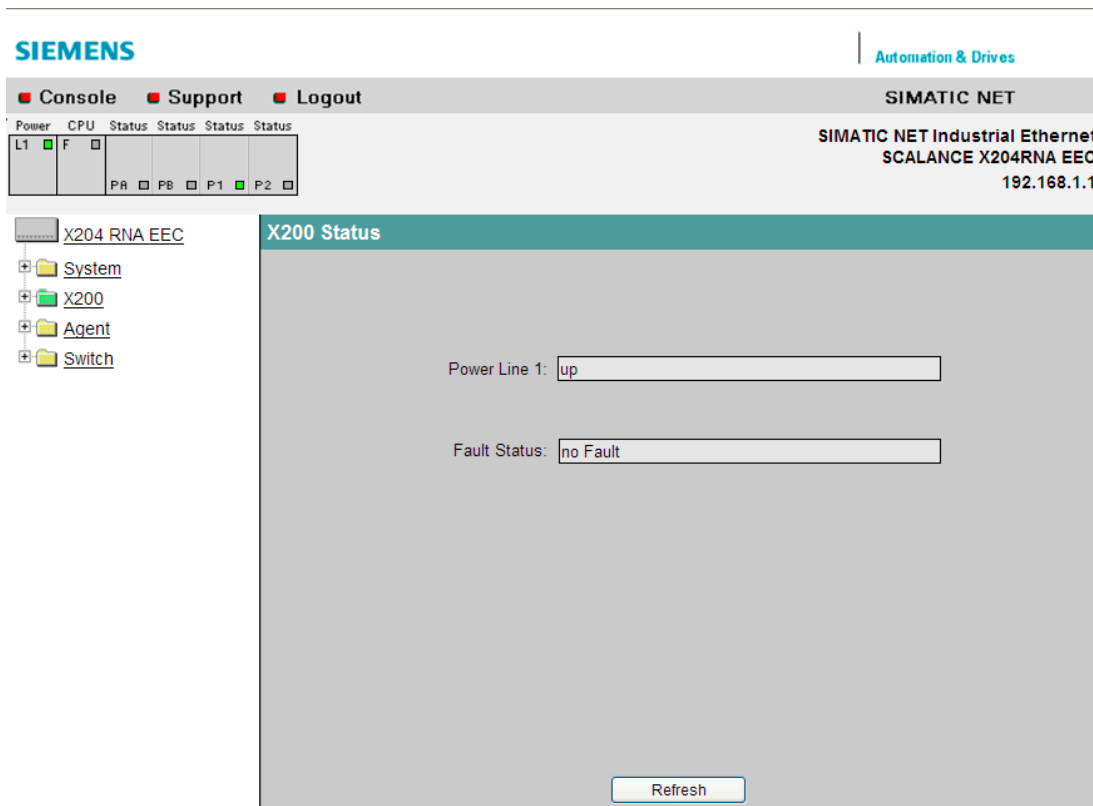


Figure 7-12 X200 Status

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 PRP configuration

PRP configuration

The PRP-specific parameters are entered in the PRP Config screen.

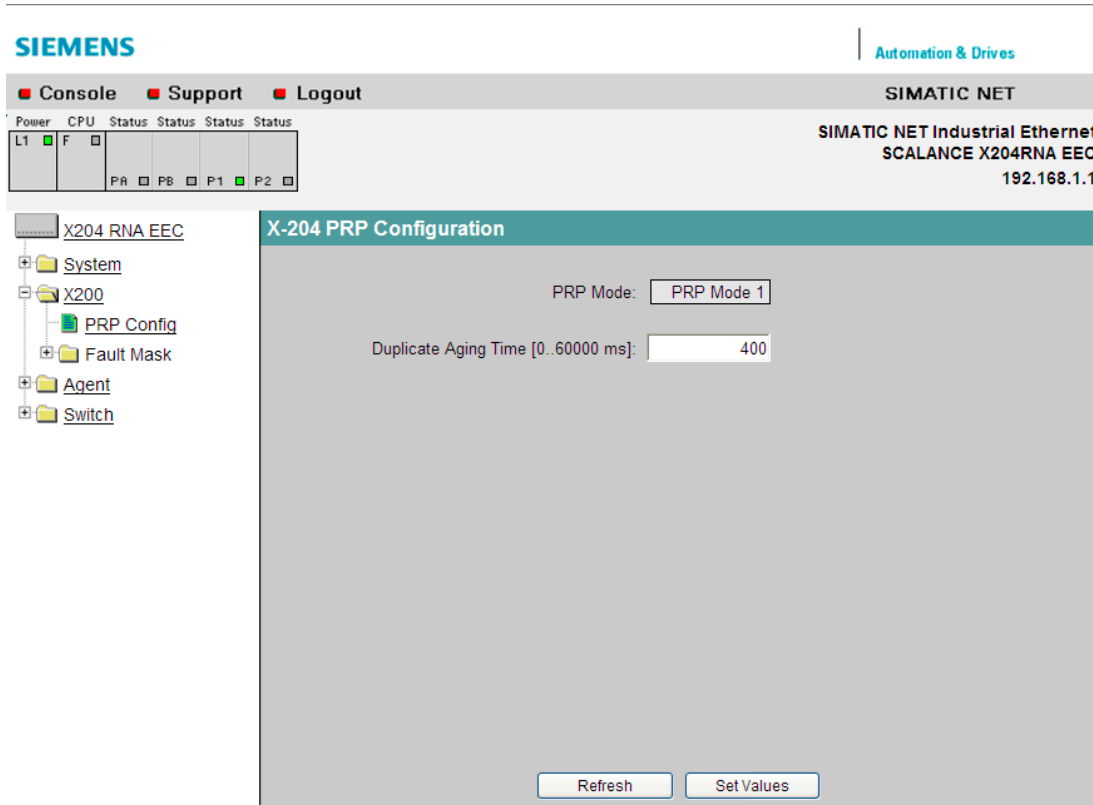


Figure 7-13 PRP configuration

PRP Mode

Shows the protocol being used (PRP Mode 1). This value cannot be changed.

Duplicate Aging Time

The duplicate aging time is entered here. The permitted values are between the 0 and 60,000 ms. The default value is 400 ms. This default value comes from the PRP standard.

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" (Page 27).

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:

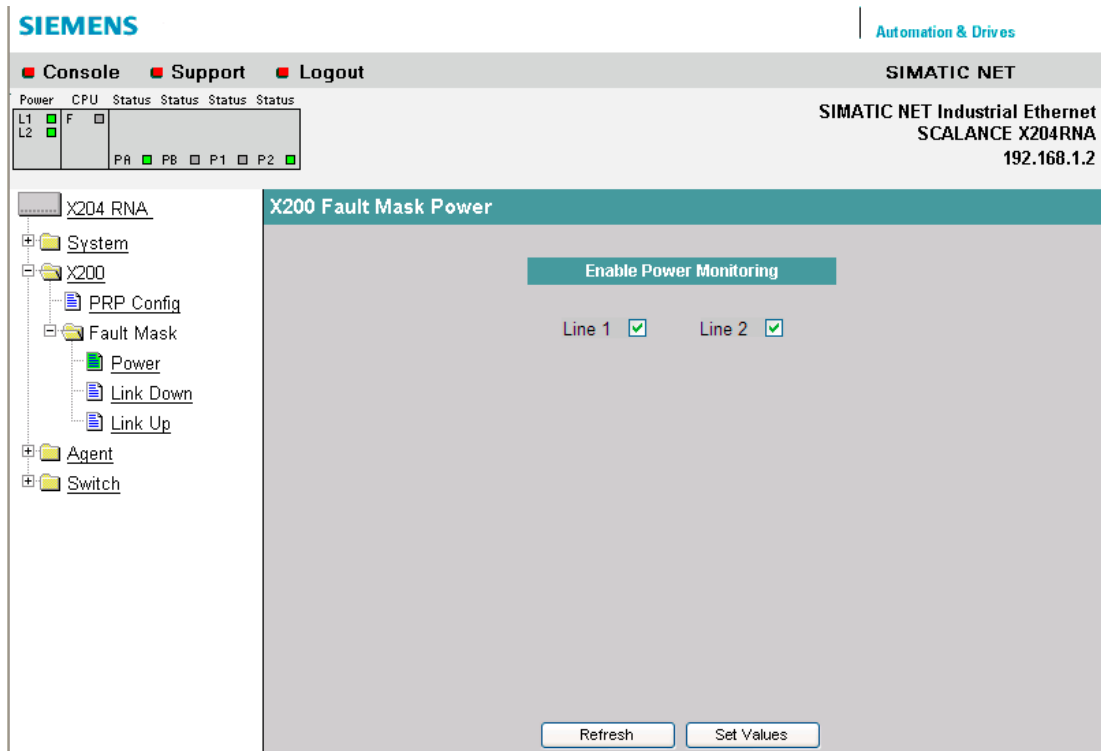


Figure 7-14 SCALANCE X204RNA Fault Mask Power Monitoring

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). (With the SCALANCE X-204RNA EEC, this screen is not displayed).

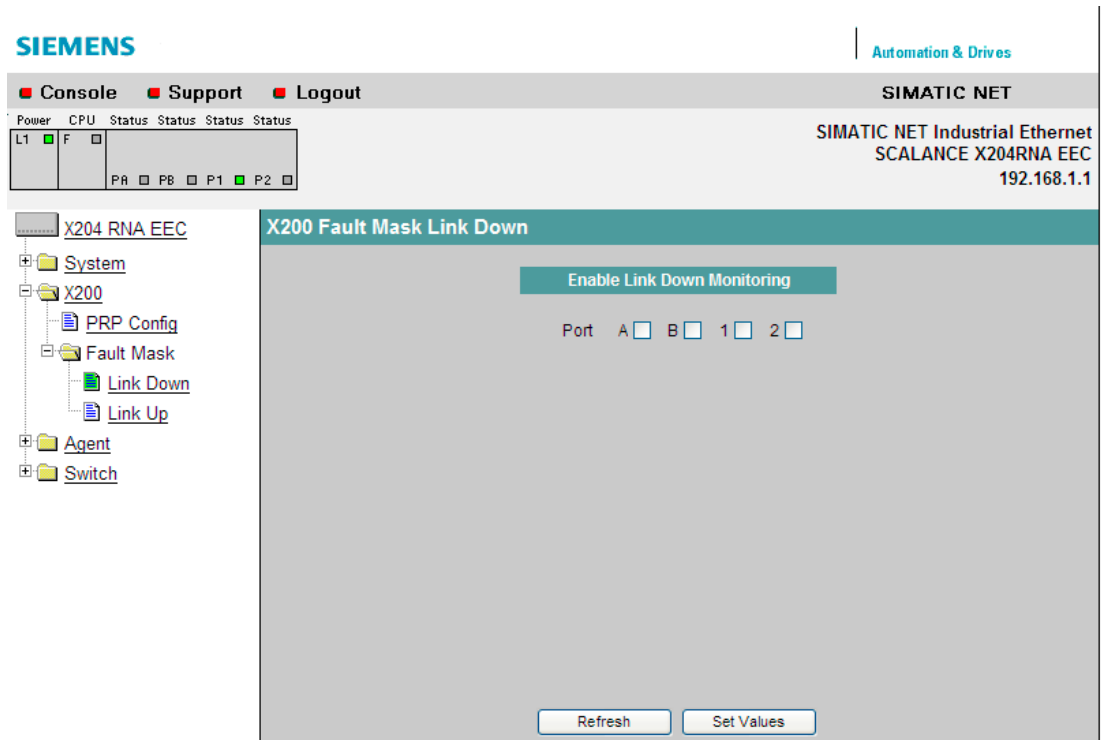


Figure 7-15 Fault Mask Link Down Monitoring

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.

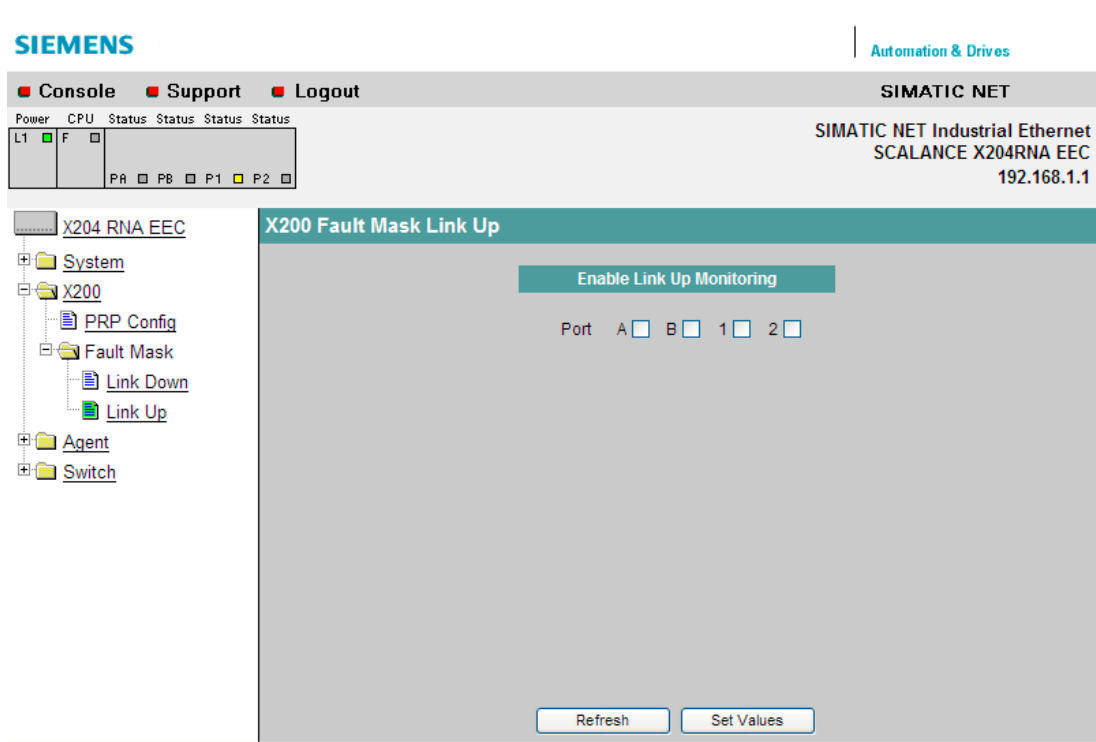


Figure 7-16 Fault Mask Link Up Monitoring

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

A change to the IP address, the subnet mask or the default gateway becomes active only following a restart of the device. As a result, as soon as one of these three values has changed, a restart is triggered when you press "Set Values". 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.

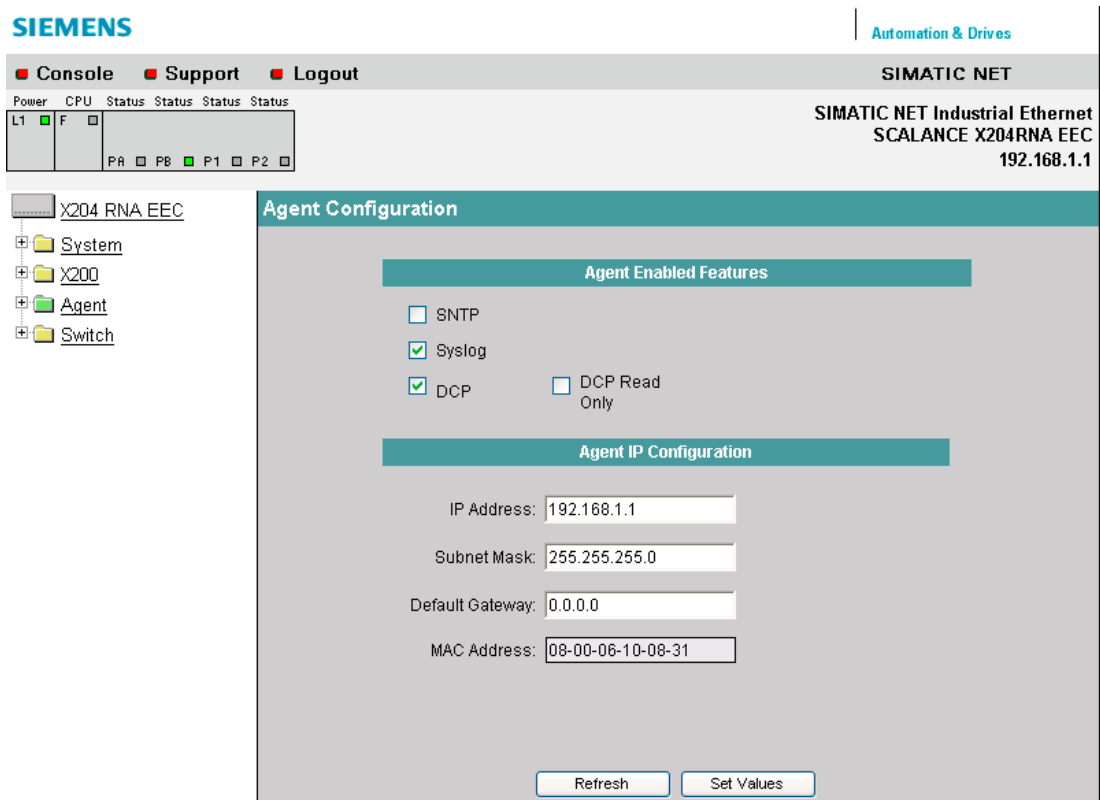


Figure 7-17 Agent Configuration

Settings for the SCALANCE X-200RNA

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 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.

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.

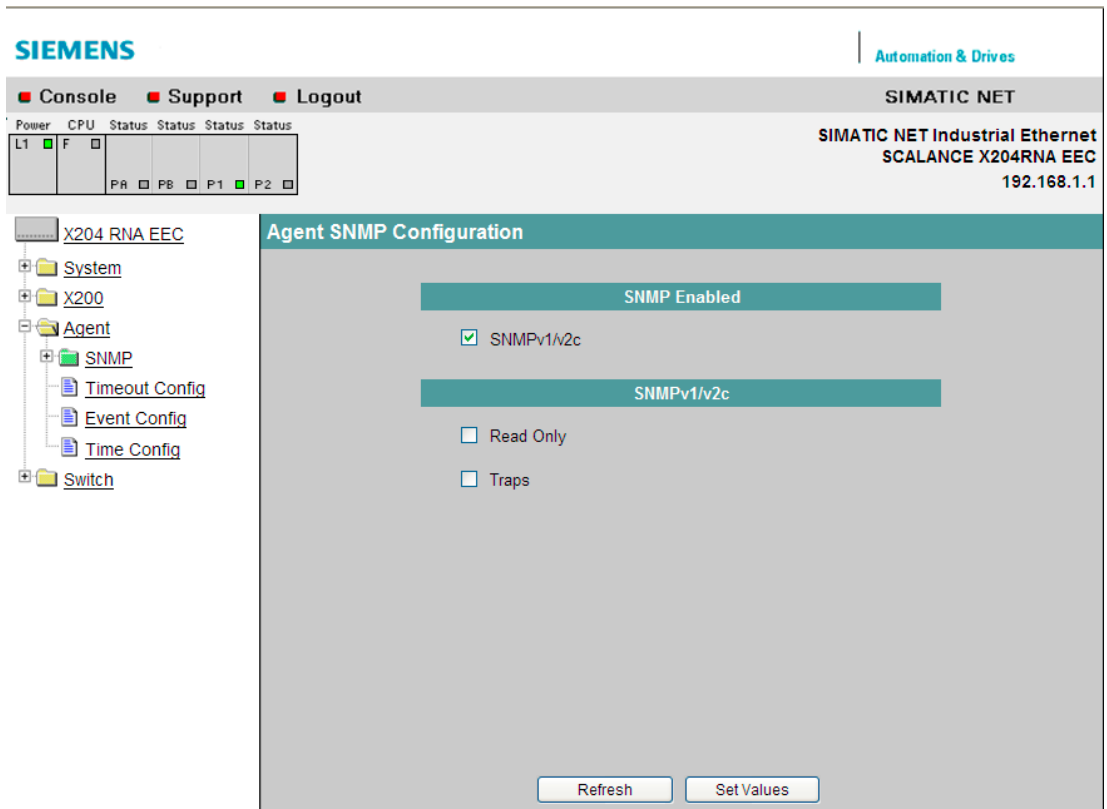


Figure 7-18 Agent SNMP Configuration

SNMPv1/v2c

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

Read Only

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

Traps

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

7.7.3 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" (Page 73)).

Note

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

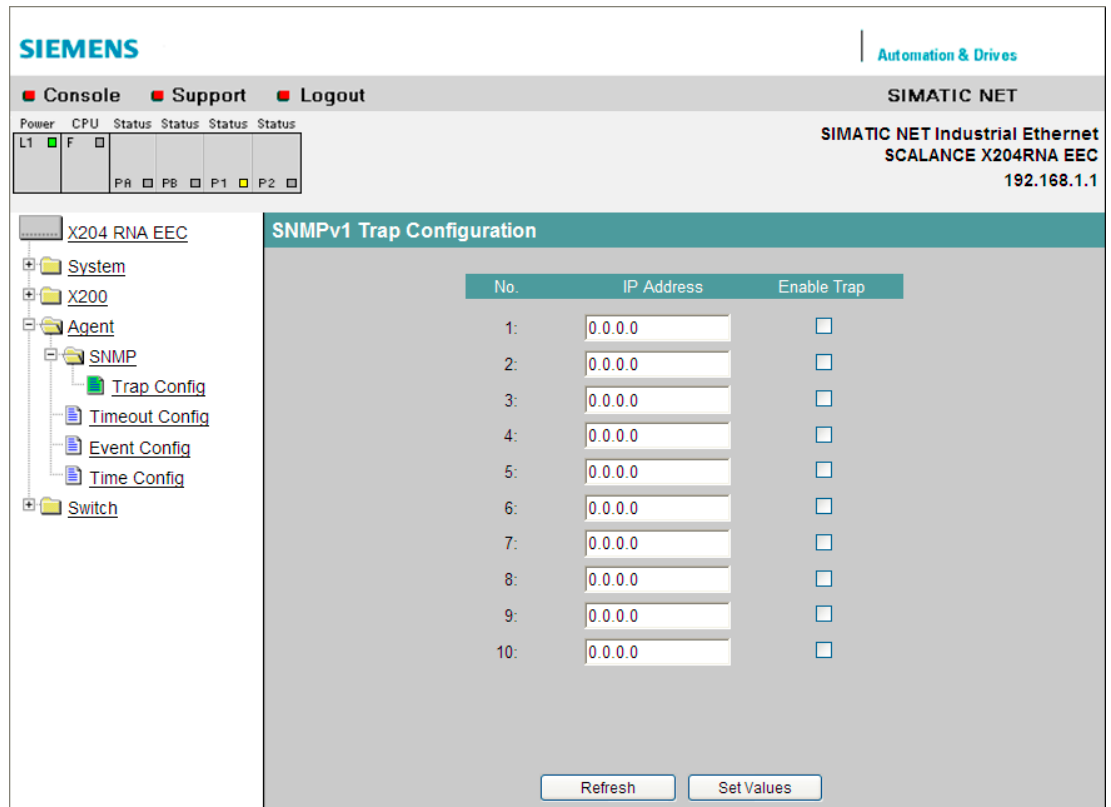


Figure 7-19 SNMPv1 Trap Configuration

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.

7.7.4 Agent Timeout Configuration

Setting the timeout

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

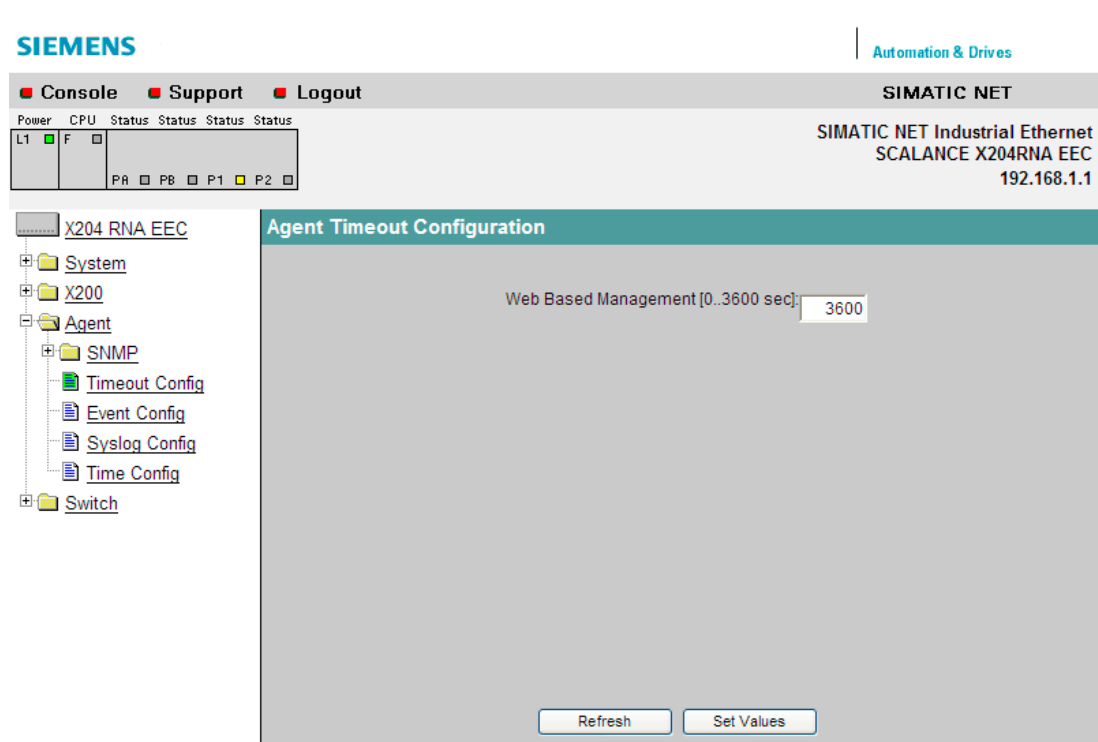


Figure 7-20 Agent Timeout Configuration

Web Based Management (sec)

Here, you specify the WBM timeout.

Permitted values for the WBM timeout: 60-3600 (seconds)

0 means: There is no automatic logout.

7.7.5 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 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.

The screenshot shows the Siemens SCALANCE X204RNA EEC web interface. The top navigation bar includes 'Automation & Drives' and 'SIMATIC NET'. Below this, there are status indicators for 'Console', 'Support', and 'Logout'. The main content area is titled 'Agent Event Configuration' and contains a table with the following data:

Event	Trap	Log Table	Syslog
Cold / Warm Start	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Link Change	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Authentication Failure	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Fault State Change	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
Redundancy Event	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

At the bottom of the configuration area, there are two buttons: 'Refresh' and 'Set Values'.

Figure 7-21 Agent Event Configuration with the SCALANCE X204RNA EEC

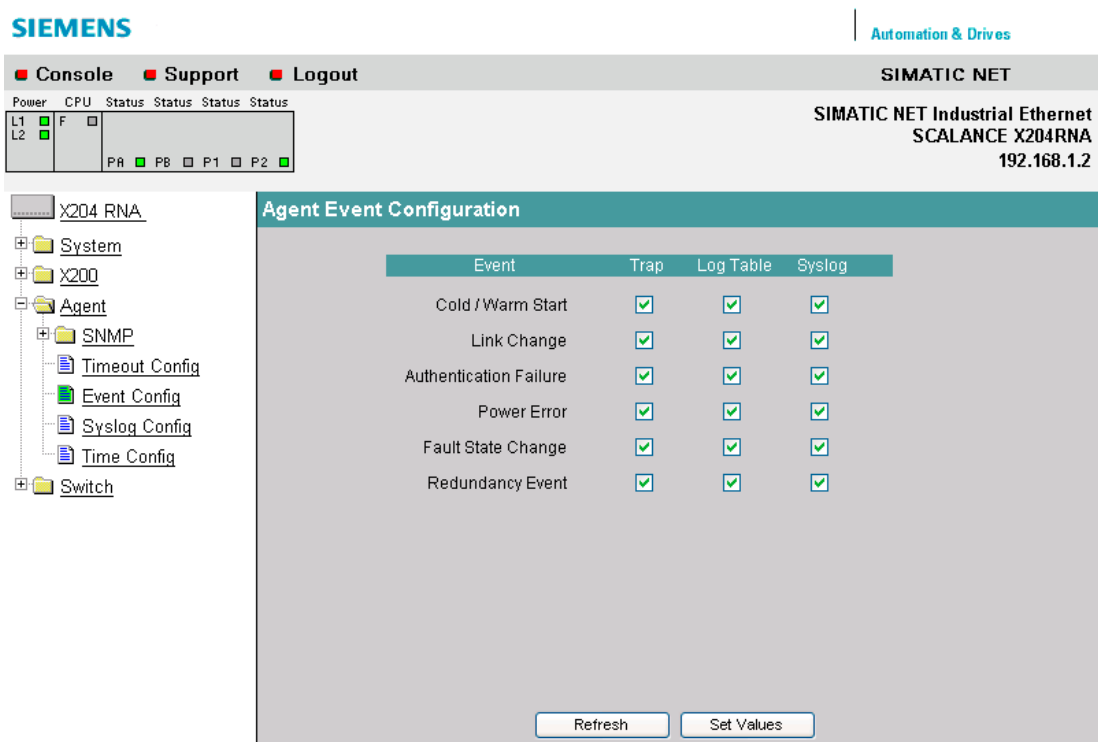


Figure 7-22 Agent Event Configuration with the SCALANCE X204 RNA

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 two situations that are signaled as a redundancy error.

1. If there is a difference in the number of PRP frames received from and A and B. The fault is set. It is reset if the difference in PRP frames received from LAN A and B remains almost the same.
2. If a PRP B frame is received at PRP A or vice versa, the error is set until no more incorrect frames are received for approximately 30 seconds.

7.7.6 Agent Syslog Configuration

Setting the timeout

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

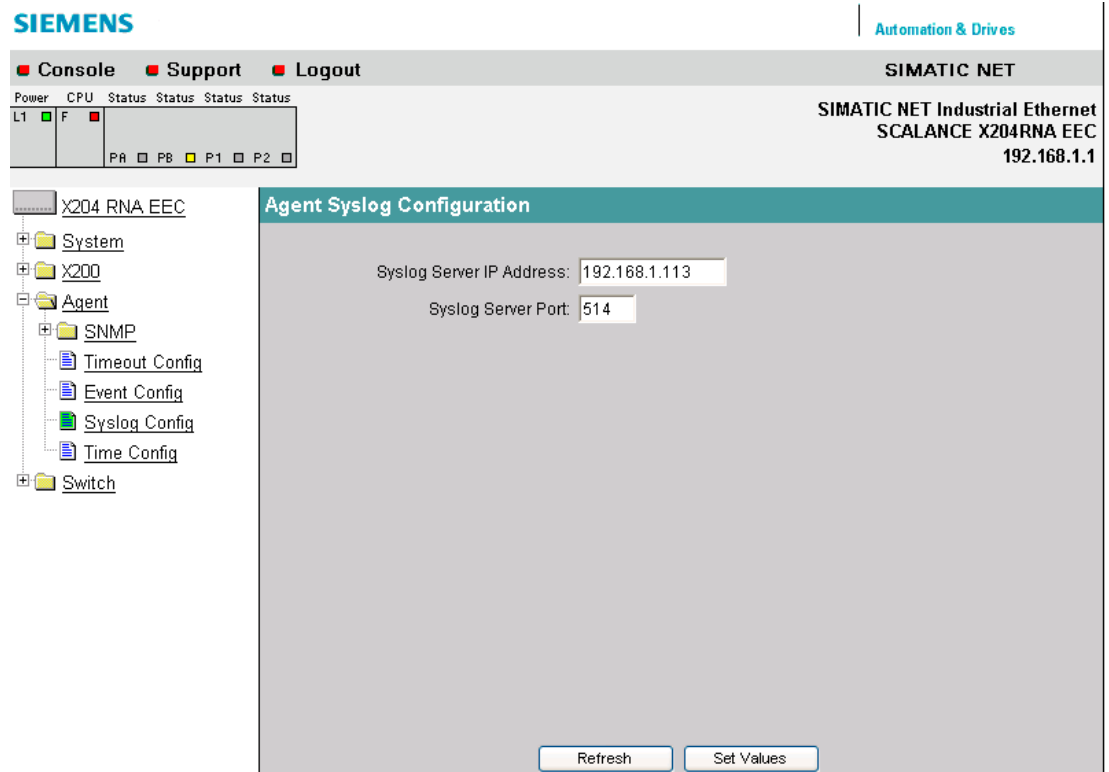


Figure 7-23 Agent Syslog Configuration

Syslog Server IP Address

Enter, the IP address of the Syslog server.

Syslog Server Port

Enter, the port of the Syslog server.

7.7.7 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.

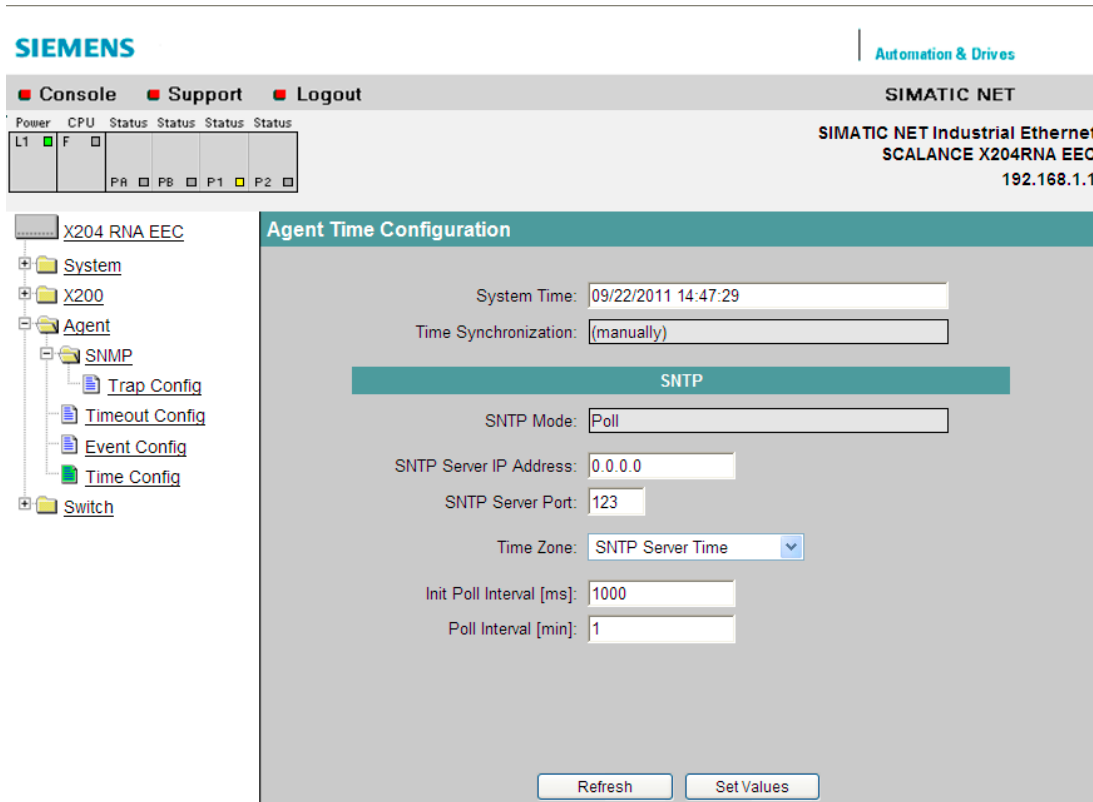


Figure 7-24 Agent Time Configuration

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.

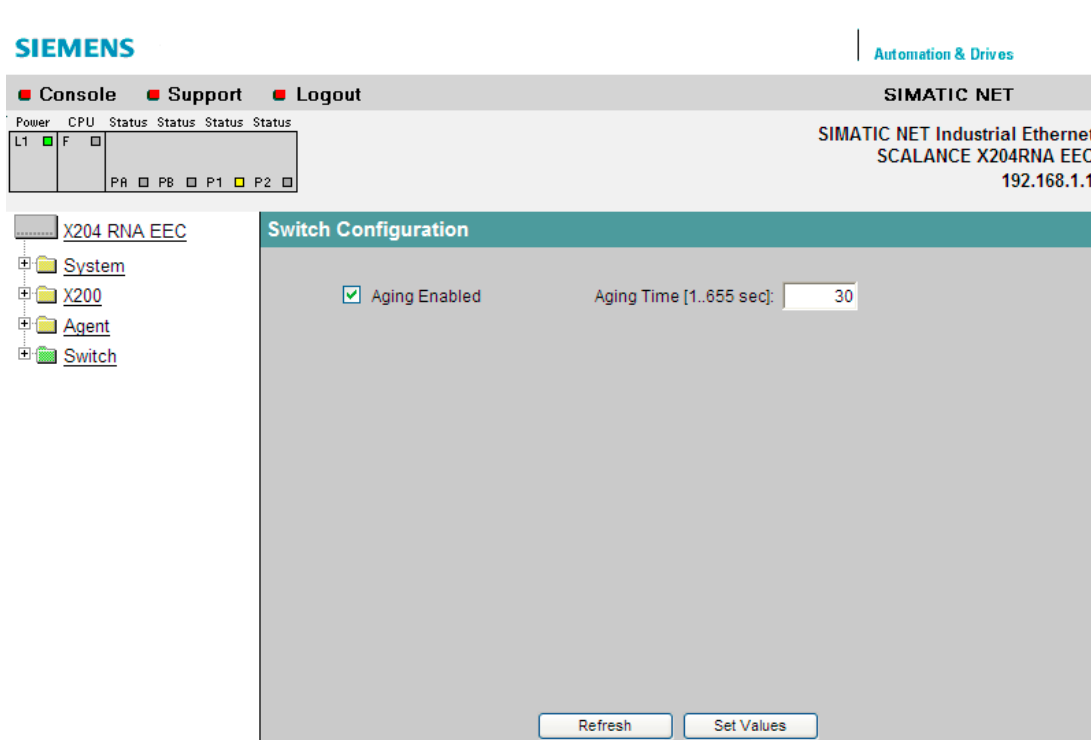


Figure 7-25 Switch Configuration

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 0 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.

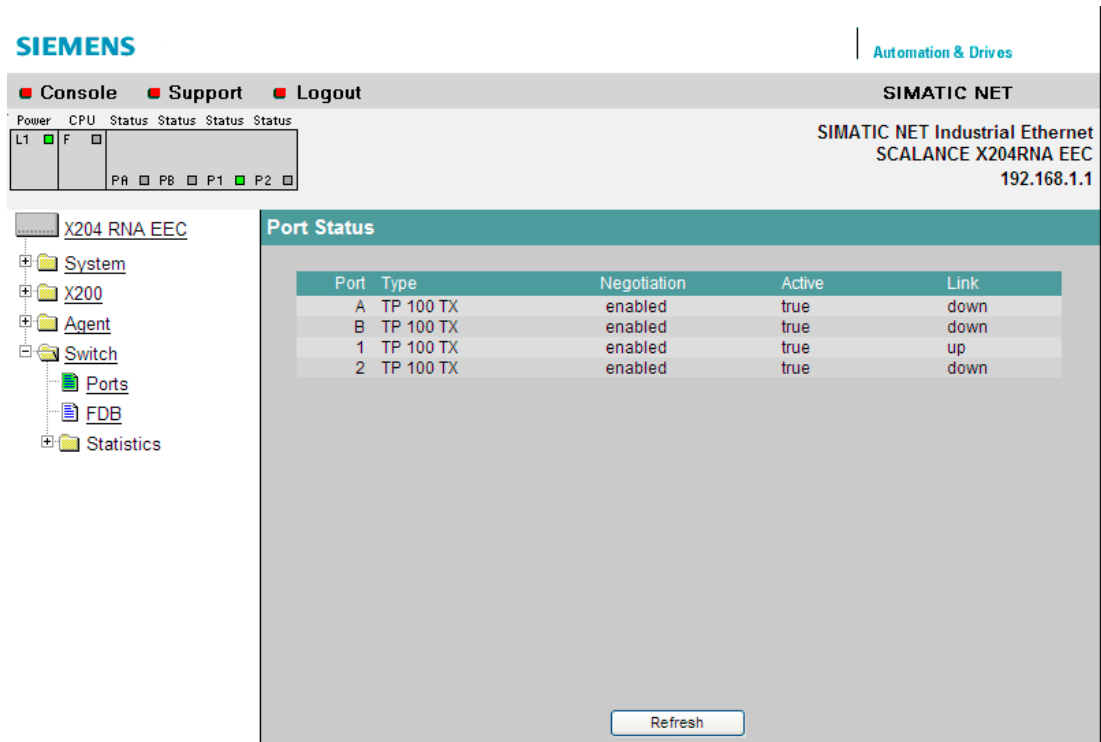


Figure 7-26 Port status

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.

Active

Indicates whether or not the port is turned on (true) or turned off (false). Data traffic is possible only over an enabled port. The communications partner of a port that is turned off indicates the connection status "Link Down".

Link

Status of the link to the network. The following alternatives are possible:

- 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.

Index	Mac Address	Destination Ports	Duplicate Filter	Proxy Node
1	00:0E:8C:90:BD:DE	A	x	
2	00:40:F4:70:F0:BC	2		x
3	08:00:06:10:08:31	A B	x	

Figure 7-27 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.

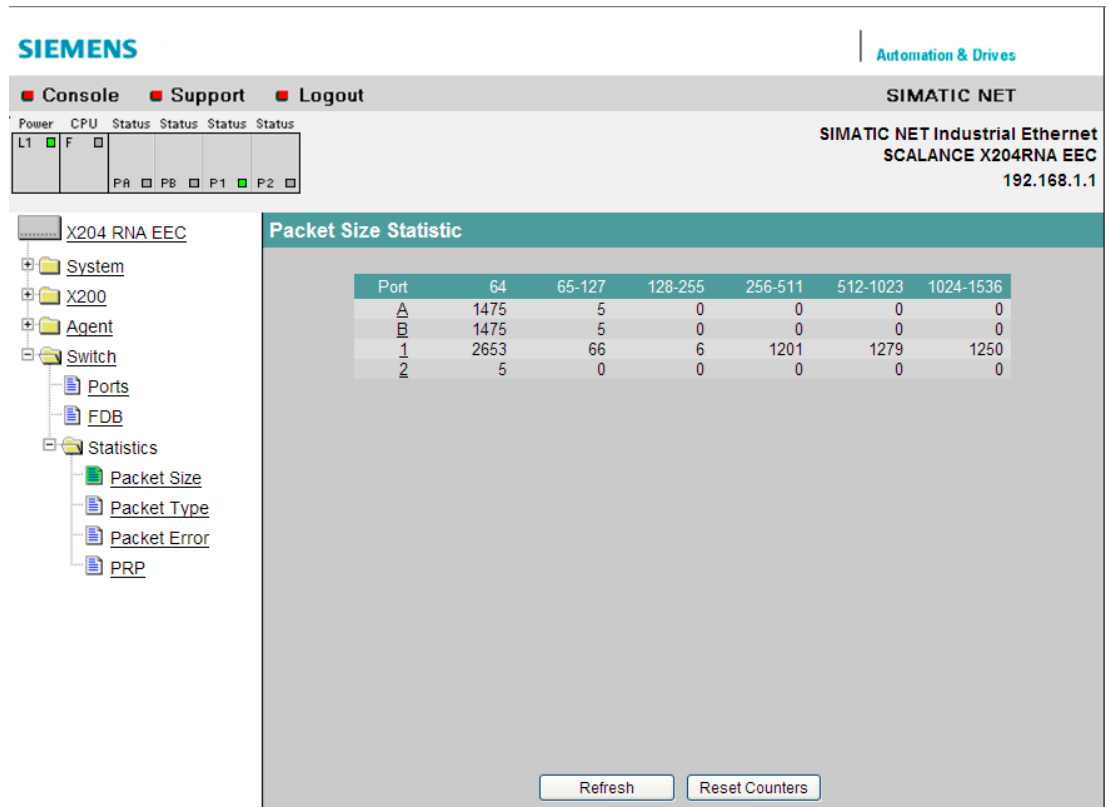


Figure 7-28 Packet Size Statistic

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

7.8 The Switch menu

- 512 - 1023 bytes
- 1024 - 1536 bytes

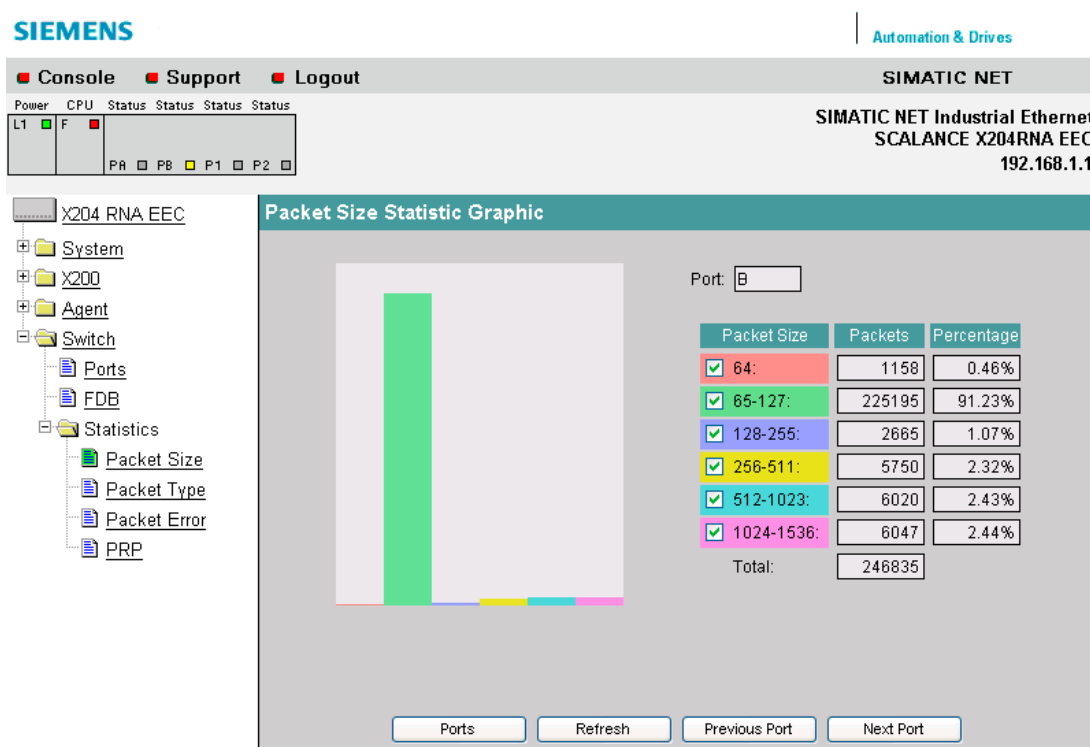


Figure 7-29 Packet Size Statistic Graphic

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.

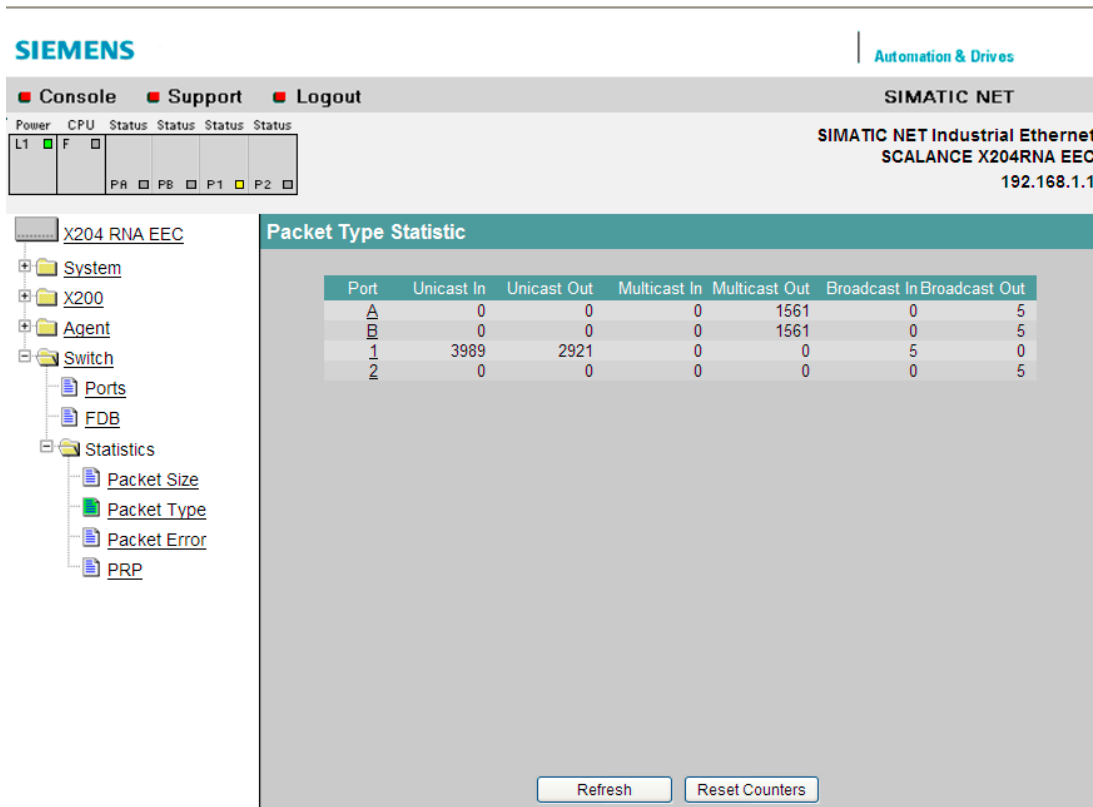


Figure 7-30 Packet Type Statistic

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

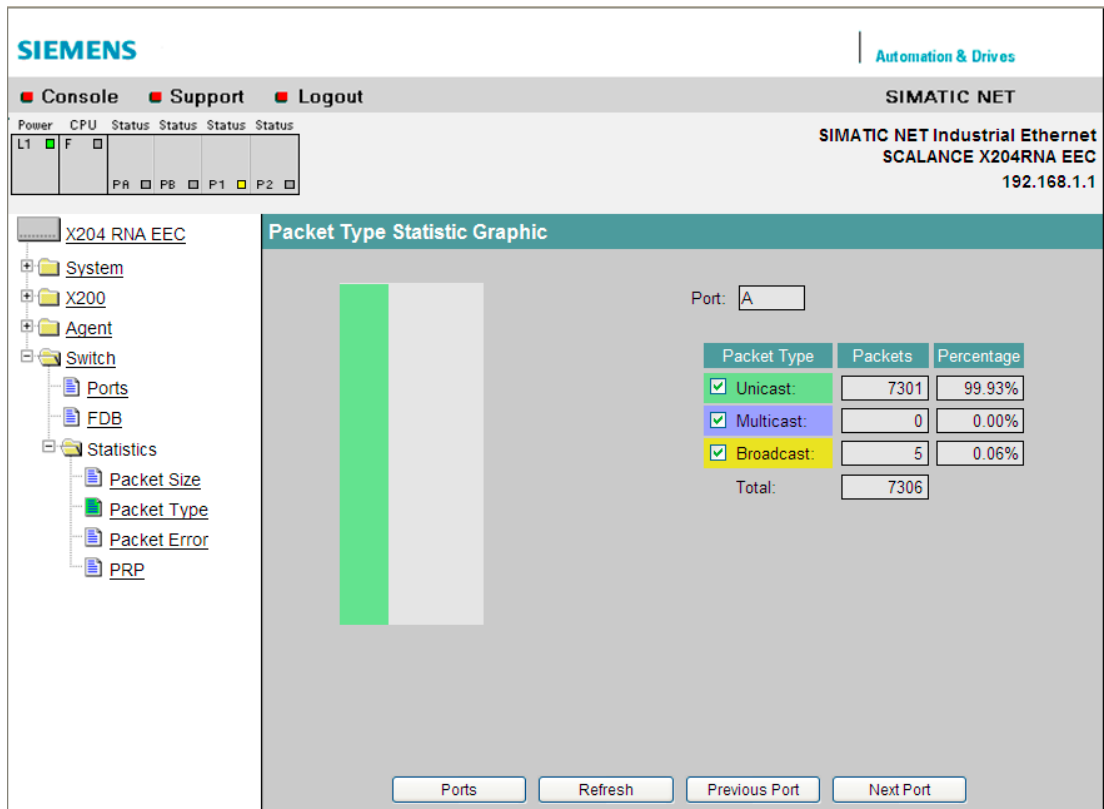


Figure 7-31 Packet Type Statistic Graphic

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.

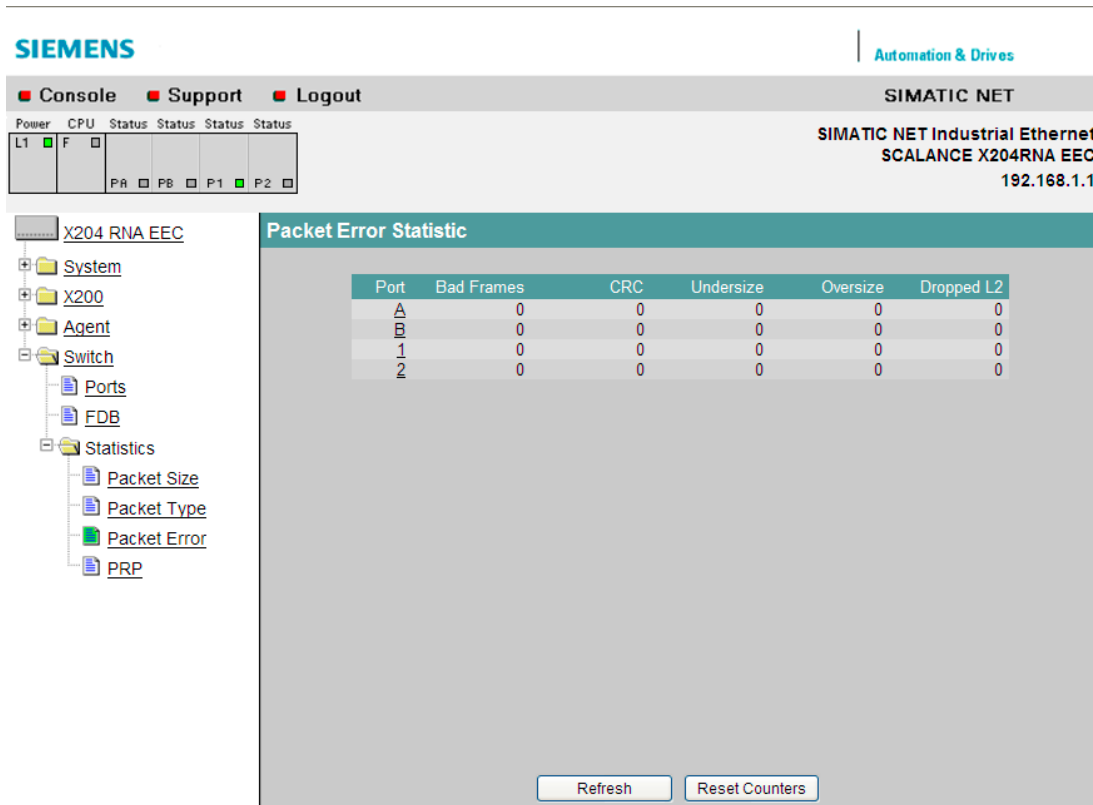


Figure 7-32 Packet Error Statistic

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

7.8 The Switch menu

- Oversize
- Dropped L2

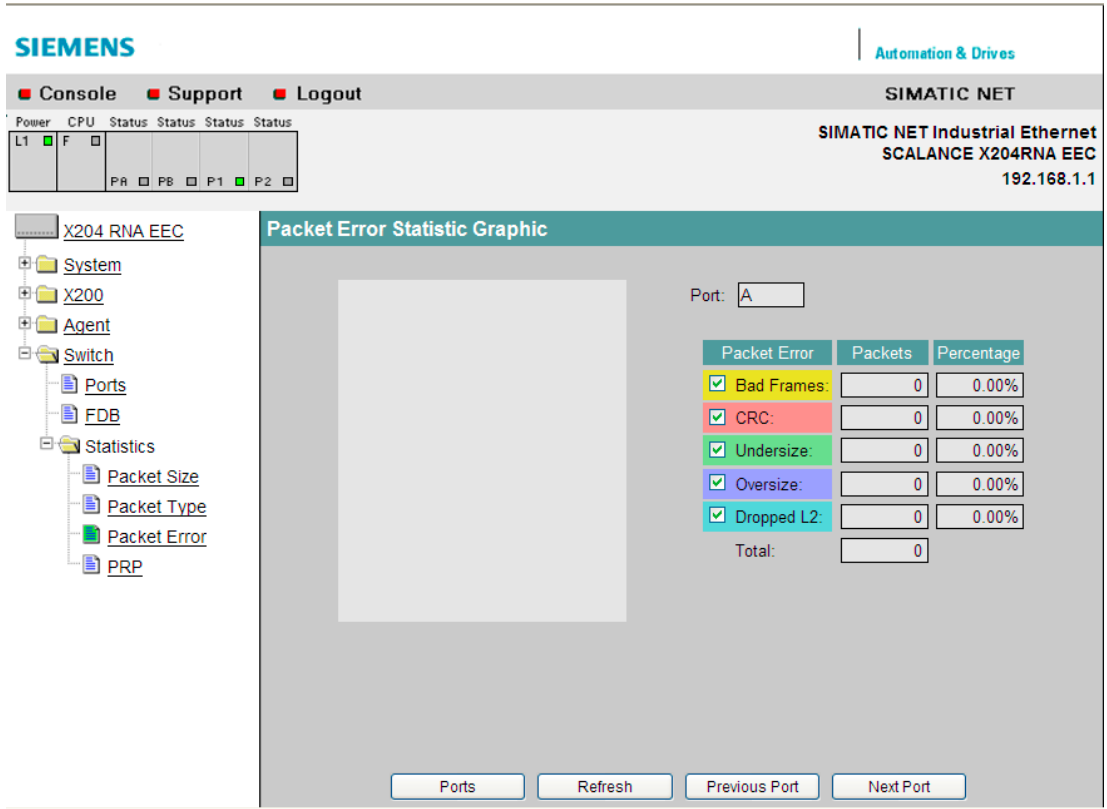


Figure 7-33 Packet Error Statistic Graphic

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 PRP Statistic

PRP Statistic

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

- Received "A Frames" at PRP A Port
Number of valid A frames received at port PRP A.
- Received "B Frames" at PRP B Port
Number of valid B frames received at port PRP B.
- Received "B Frames" at PRP A Port
Number of valid B frames received at port PRP A (error).
- Received "A Frames" at PRP B Port
Number of valid A frames received at port PRP B (error).

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

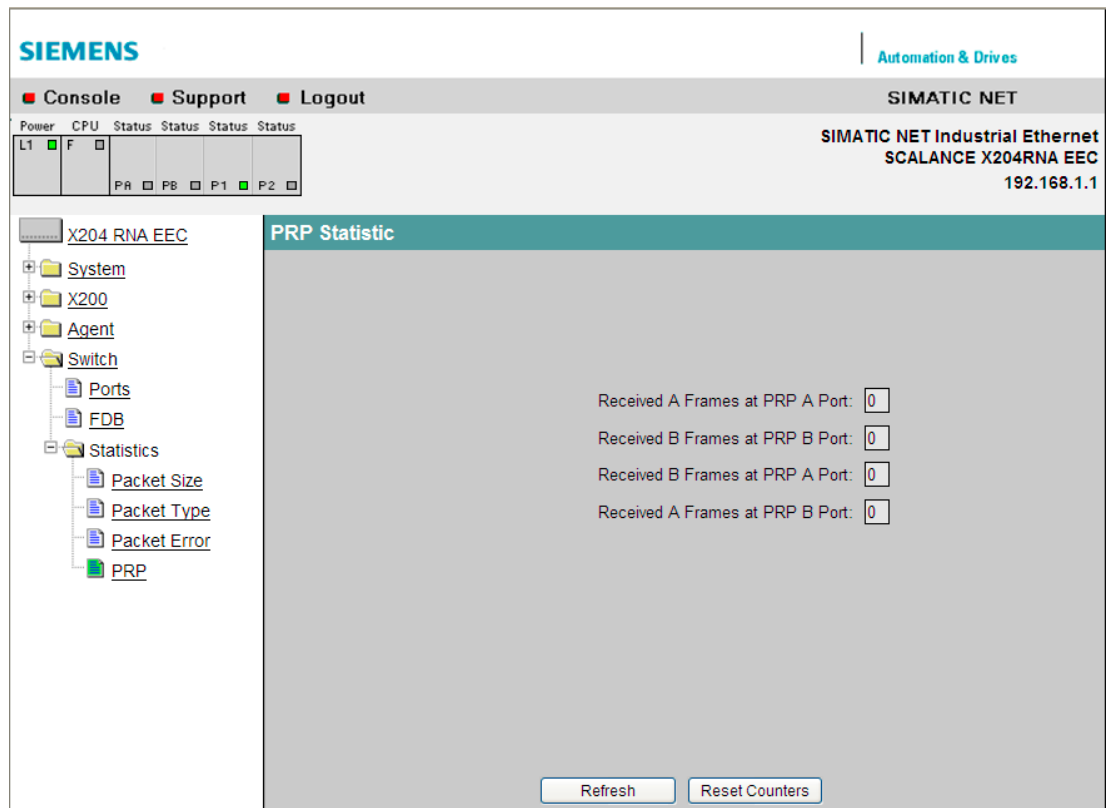


Figure 7-34 PRP Statistic

Approvals and marking

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	6GK5204-0BA00-2KB2
SCALANCE X204RNA EEC	6GK5204-0BS00-3LA3

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:

(<http://support.automation.siemens.com/WW/view/de/52323714/133400>)

- 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

<p> WARNING</p> <p>Personal injury and damage to property may occur.</p> <p>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.</p> <p>Only use expansions that are approved for the system.</p>
--

- **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:

 - SIMATIC NET Industrial Twisted Pair and Fiber Optic Networks
 (<http://support.automation.siemens.com/WW/view/en/8763736/>) , Manual
 - EMC Installation Guideline
 (<http://support.automation.siemens.com/WW/view/en/28518276/>) , 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 II T4 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

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

Table 8- 1 Certifications and 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 II T.. KEMA 07 ATEX 0145X	-
X204RNA EEC	UL 508 CSA C22.2 No. 142- M1987	-	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: 3.5 mm 9 – 500 Hz: 1g 1 octave/min, 20 sweeps	15 g , 6 ms duration 6 shocks per axis
X204RNA EEC	5 – 9 Hz: 3.5 mm 9 – 150 Hz: 1 g 10 cycles per axis	15 g, 11 ms duration 6 shocks per axis

Technical data

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

Technical data

9.1 Technical specifications

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	Store and forward	5 µs
X204RNA EEC	1023	30 s	Store and forward	5 µs

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	-40 °C through +70 °C (up to +85 °C / max. 16 h)	< 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

10.1 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 FC TP festoon cable GP	6XV1871-2S	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
Glass fibers		
MM robust cable (50/125) (900 μm)	6XV1873-2R	SCALANCE X204RNA EEC

Accessories and compatible devices

10.1 Accessories

	Order number	Available for SCALANCE
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 Compatible devices

Table 10-2 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
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

SCALANCE X204RNA SCALANCE X204RNA EEC

Operating Instructions,

10.2 Compatible devices

SCALANCE X / W / CSM / CPs and PRP		
Product	MLFB	As of version ..
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 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 X / W / CSM / CPs and PRP		
Product	MLFB	As of version ..
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
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
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:

10.2 Compatible devices

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.

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.

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

Dimension drawings

12.1 Dimension drawings

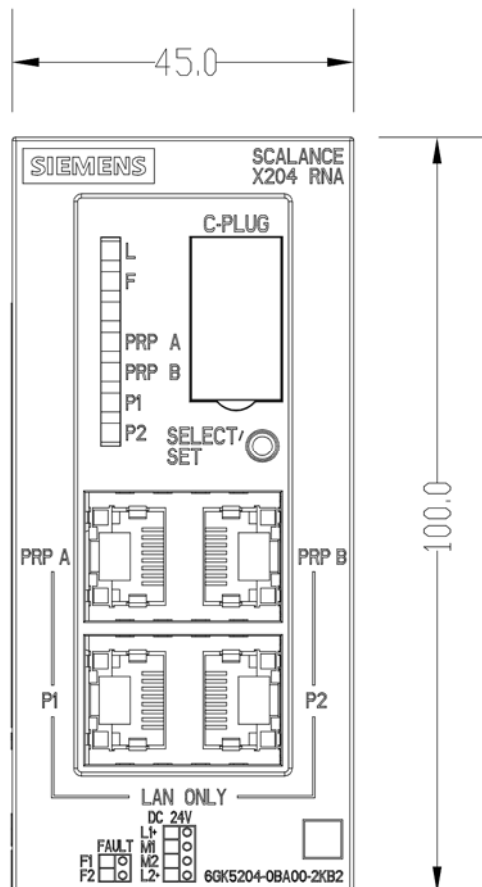


Figure 12-1 SCALANCE X204RNA, front view

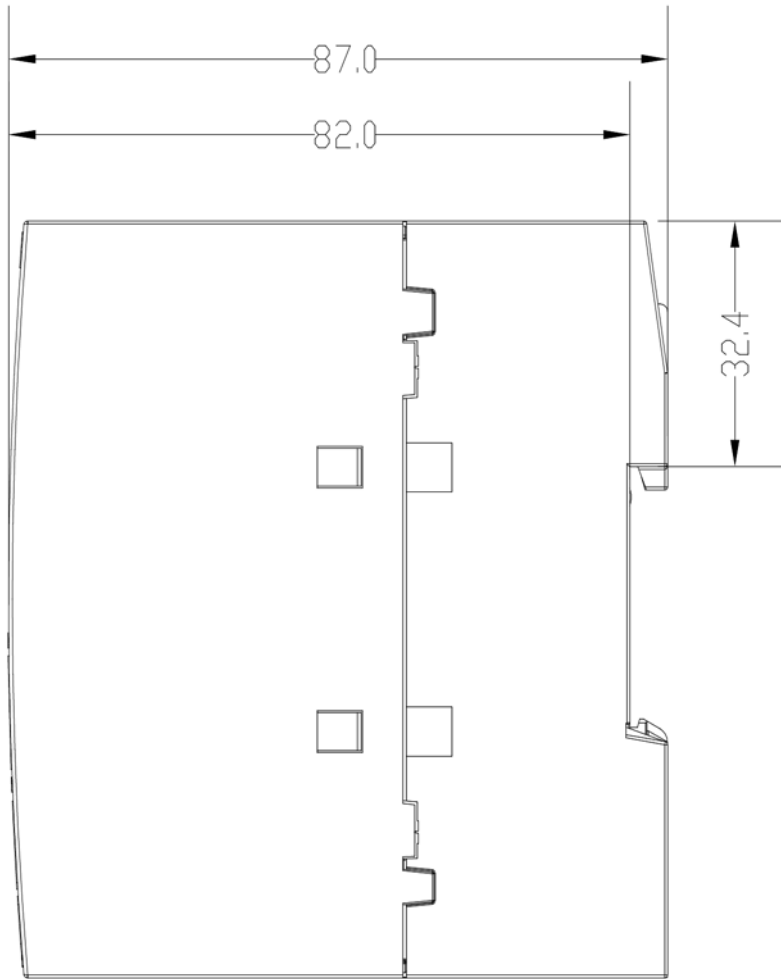


Figure 12-2 SCALANCE X204RNA, side view

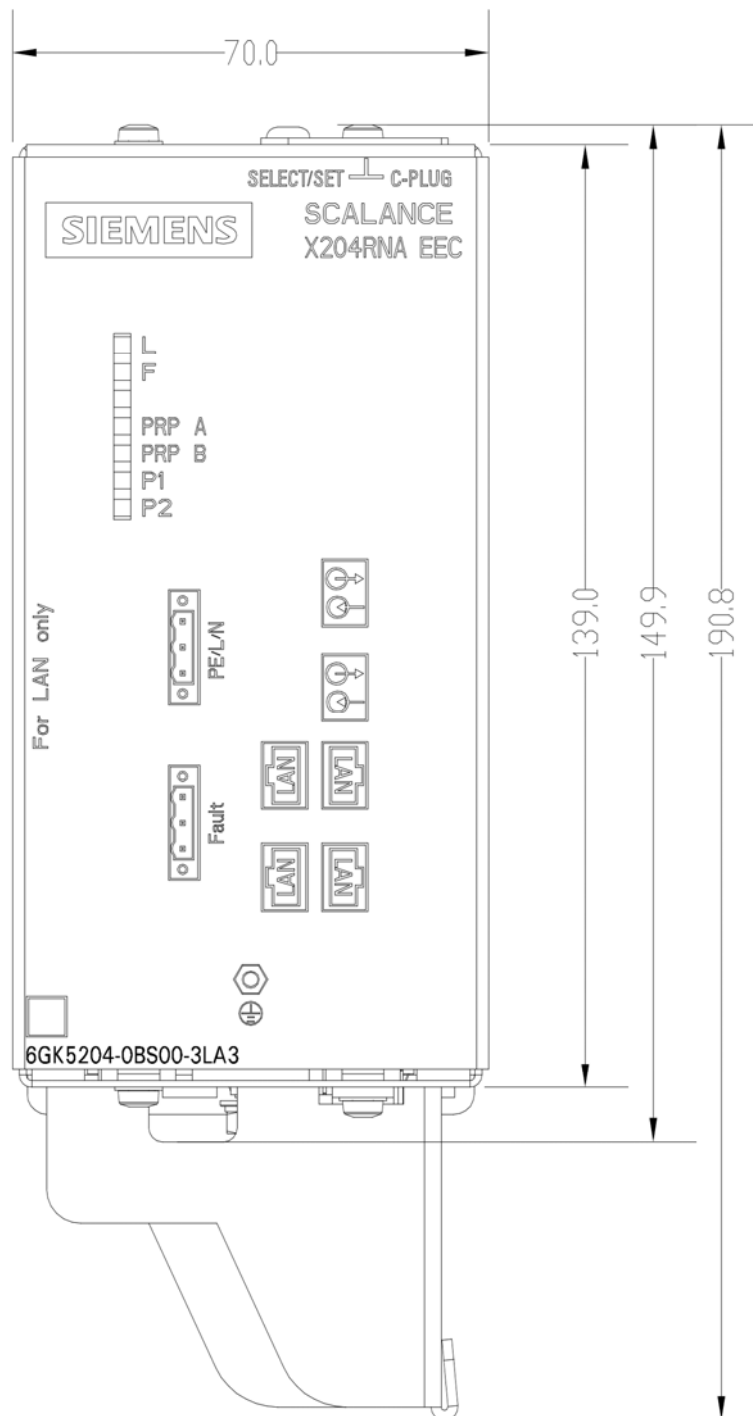


Figure 12-3 SCALANCE X204RNA EEC, front view

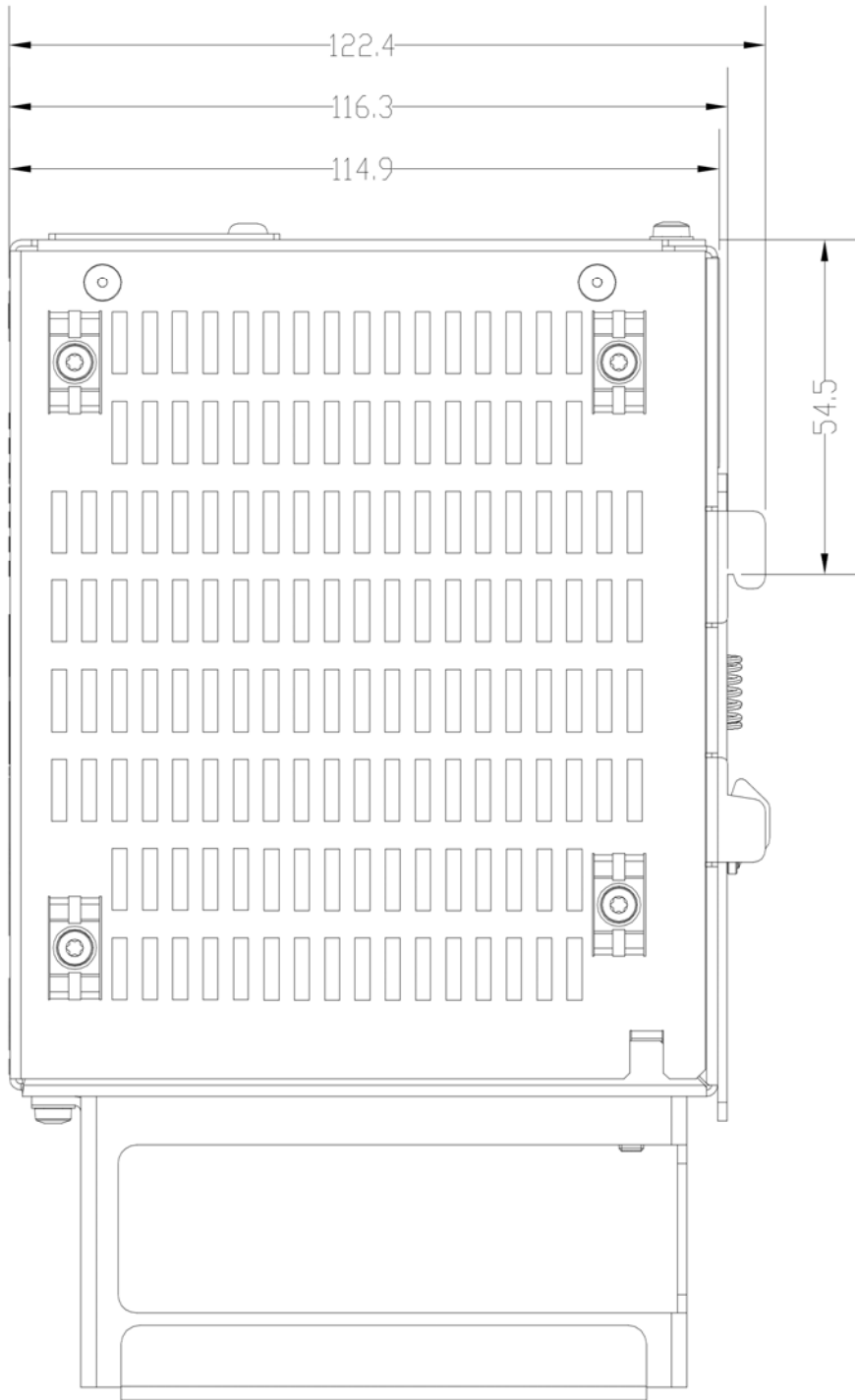


Figure 12-4 SCALANCE X204RNA EEC, side view

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.

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.

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

→ High Speed Redundancy

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 ►HSR 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.

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.

TFTP

Trivial File Transfer Protocol. A simple, UDP-based protocol for data transfer. Due to its limited size, it can also be used by network nodes with little ROM.

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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