

6.5 SCALANCE X-200/X-200 IRT

6.5.1 Certifications and approvals, degree of protection X-200

Overview

The following tables apply to the SCALANCE X models

- X200-4PIRT
- X201-3PIRT
- X202-2IRT, X202-2PIRT
- X204IRT, X204-2, X204-2LD
- X206-1, X206-1LD
- X208, X208PRO
- X212-2, X212-2LD
- X216
- X224

Table 6-26 Approvals

c-UL-us	UL 60950; CSA C22.2 No. 60950 UL 60950-1; CSA C22.2 No. 60950-1 for IRT devices
c-UL-us for hazardous locations	UL 1604, UL 2279Pt.15
FM	FM 3611
C-TICK	AS/NZS 2064 (Class A)
CE	EN 61000-6-2, EN 61000-6-4
ATEX Zone 2 ¹	EN60079-15II 3 G EEx nA II T..KEMA 03 ATEX 1226 X

¹For temperature information "T.." or the maximum ambient temperature "Ta:..", refer to the type plate.

Degree of protection

Tested to IP30.

Except for X208PRO: Tested to IP65.

See also

General information on approvals and certifications (Page 230)

6.5.2 X-200 installation instructions and guidelines

Installation of SCALANCE X-200 switches

The switches are installed in the same way as the SCALANCE X-100 line apart from the exception below.

Ring port settings

By default, the following ring ports are set:

X208	X208PRO	X216	X224	X204-2	X206-1	X212-2	X204-2 LD	X206-1 LD	X212-2 LD
P1, P2	P1, P2	P1, P2	P1, P2	P5, P6	P1, P2	P1, P2	P5, P6	P1, P2	P1, P2

X202-2IRT	X204IRT	X204IRT PRO	X202-2P IRT PRO	X202-2P IRT	X201-3P IRT	X200-4P IRT
P3, P4	P1, P2	P1, P2	P3, P4	P3, P4	P3, P4	P3, P4

On a SCALANCE X-200, these ports are enabled as ring ports when the module is supplied. Without deactivating them, they can also be used as normal ports, for example, in a tree structure.

The ports of a SCALANCE X-200 that will be used as ring ports must be configured using the WBM if they are not default ring ports.

6.5.3 X-200 operator controls and displays

6.5.3.1 SCALANCE X-200 button

Button function

Using the button, you can display and modify the set fault mask. The fault mask setting is retained after device power off/on.

After pressing and holding down the button, the currently valid fault mask is displayed for approximately 3 seconds. The LEDs of the monitored ports flash at a frequency of 5 Hz.

To change the fault mask, keep the button pressed. After a further 3 seconds, the current link status of the ports is displayed and the power supply LEDs flash at a frequency of 2.5 Hz. Keep the button pressed. After a further 3 seconds, this status is adopted and saved as the new fault mask. The monitored ports now are indicated by permanently lit LEDs until the button is released. As long as the LEDs are still flashing, however, the saving of the mask can be stopped by releasing the button.

If an empty fault mask is set (no port is monitored) or you want to set an empty mask, the 2 port LEDs flash on and off alternately.

At the same time, the monitoring of the connected power supply is set with the fault mask. The existence of the two power sources is monitored only if they are connected when the fault mask is saved.

The failure of the link of one of the monitored ports or one of the monitored power supplies is indicated by the red fault LED lighting up. At the same time, the signaling contact opens.

Port monitoring and power supply monitoring are not activated when the device is delivered (factory default), the redundancy manager is disabled.

The following applies to IE Switches X-200 (except SCALANCE X208 PRO): If the button is pressed for 2-3 seconds longer, the RM LED starts to flash for approx. 2 seconds. If the button is released during this time, the RM is disabled. If you hold down the button, the RM LED lights up permanently and the RM is enabled. If the button is pressed longer (15 seconds), the device is reset to "factory defaults". This is indicated by all the Port LEDs (green) flashing. During this activity, the device must not be turned off.

Note

On the SCALANCE X204 IRT PRO, SCALANCE X202-2P IRT PRO and SCALANCE X208 PRO, the button is beneath the C-PLUG cover on the rear of the device.

6.5.3.2 Fault indicator (red LED)

Fault indicator (red LED)

If the red LED is lit, the IE Switch X-200 has detected a problem.
The signaling contact opens at the same time.

The LED signals that the IE Switch X-200 can adopt the following statuses:

Device type SCALANCE	LED lit red	LED flashing red	LED not lit
X208	1, 2, 3, 4	9	10
X208PRO	1, 2, 3, 4	9	10
X216	1, 2, 3, 4	9	10
X224	1, 2, 3, 4	9	10
X204-2	1, 2, 3, 4	9	10
X206-1	1, 2, 3, 4	9	10
X212-2	1, 2, 3, 4	9	10
X204-2 LD	1, 2, 3, 4	9	10
X206-1 LD	1, 2, 3, 4	9	10
X212-2LD	1, 2, 3, 4	9	10
X202-2IRT	1, 2, 3, 4, 5, 6, 7	9	10
X204IRT	1, 2, 3, 4, 5, 6, 7	9	10
X204 IRT PRO	1, 3, 4, 5, 6, 7	9	10
X202-2P IRT PRO	1, 3, 4, 5, 6, 7, 8	9	10
X202-2P IRT	1, 2, 3, 4, 5, 6, 7, 8	9	10
X201-3P IRT	1, 2, 3, 4, 5, 6, 7, 8	9	10
X200-4P IRT	1, 2, 3, 4, 5, 6, 7, 8	9	10

1. Link down event on a monitored port.
2. Failure of one of the two redundant power supplies.

Note

SCALANCE X204 IRT PRO and SCALANCE X202-2P IRT PRO have no redundant power supply.

3. C-PLUG
4. Device startup, the LED is lit for approx. 20 seconds.
5. Device is in PROFINET mode:
 - a) There is no connection to the controller
 - b) There is a connection to the controller, there is also a configured diagnostic interrupt, for example power fail interrupt, C-PLUG interrupt etc.
6. Redundancy manager connected through.
7. Switchover of standby connection.
8. Maintenance request or maintenance requirement.
9. An internal fault was detected. Inform the maintenance personnel and, if necessary, send the device in for repair.
10. No fault detected by the IE Switch X-200.

6.5.3.3 Power display

Power display

The LEDs signal that the IE Switch X-200 can adopt the following statuses:

The status of the power supply is indicated by two green LEDs or one green/yellow LED:

Device type SCALANCE	Green LED lit	Yellow-green LED		LED not lit
		LED lit green	LED lit yellow	
X208	-	2	3	4
X208PRO	1	-	-	4
X216	-	2	3	4
X224	-	2	3	4
X204-2	-	2	3	4
X206-1	-	2	3	4
X212-2	-	2	3	4
X204-2 LD	-	2	3	4
X206-1 LD	-	2	3	4
X212-2LD	-	2	3	4
X202-2IRT	-	2	3	4
X204IRT	-	2	3	4
X204 IRT PRO	-	2	3	4
X202-2P IRT PRO	-	2	3	4
X202-2P IRT	-	2	3	4
X201-3P IRT	-	2	3	4
X200-4P IRT	-	2	3	4

1. Power supply L1 or L2 is connected.
2. Both L power supplies are connected (redundant supply).
3. One L power supply is connected (non-redundant supply).
4. Power supply L1 and/or L2 not connected or <14 V.

Note

SCALANCE X204 IRT PRO and SCALANCE X202-2P IRT PRO have no redundant power supply.

6.5.3.4 Port status indicator (green/yellow LEDs)

Port status indicator (green/yellow LEDs)

The LEDs signal that the IE Switch X-200 can adopt the following statuses.
The status of the interfaces is indicated by two-color LEDs:

Device type SCALANCE		LED lit green	LED lit yellow	LED flashes yellow	LED flashes green
	Number of port LEDs				
X208	8 port LEDs	1	2, 3	4	5, 6
X208PRO	8 port LEDs	1	2, 3	4	5
X204-2	6 port LEDs	1	2, 3	4	5, 6
X206-1	7 port LEDs	1	2, 3	4	5, 6
X204-2 LD	6 port LEDs	1	2, 3	4	5, 6
X206-1 LD	7 port LEDs	1	2, 3	4	5, 6
X202-2IRT	4 port LEDs	1	2, 3	4	5, 6
X204IRT	4 port LEDs	1	2, 3	4	5, 6
X204 IRT PRO	4 port LEDs	1	2, 3	4	5, 6
X202-2P IRT PRO	4 port LEDs	1	2, 3	4	5, 6
X202-2P IRT	4 port LEDs	1	2, 3	4	5, 6
X201-3P IRT	4 port LEDs	1	2, 3	4	5, 6
X200-4P IRT	4 port LEDs	1	2, 3	4	5, 6
X216	16 port LEDs	1	2, 3	4	5, 6
X212-2	14 port LEDs	1	2, 3	4	5, 6
X212-2LD	14 port LEDs	1	2, 3	4	5, 6
X224	24 port LEDs	1	2, 3	4	5, 6

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.
5. The "Show Location" function was enabled over Ethernet (for example, PST tool).
The button was pressed for longer than 15 seconds to reset the configuration.
6. PROFINET IO operation was started with the PN IO controller, the attempt to change the fault mask with the button was rejected by all the port LEDs flashing once.

6.5.3.5 Redundancy manager indicator (green LED)

Redundancy manager indicator (green LED)

The LED signals that the IE Switch X-200 can adopt the following statuses:

Device type SCALANCE	LED lit green	LED flashes green	LED not lit
X208	1	2	3
X208PRO	-	-	-
X216	1	2	3
X224	1	2	3
X204-2	1	2	3
X206-1	1	2	3
X212-2	1	2	3
X204-2LD	1	2	3
X206-1LD	1	2	3
X212-2LD	1	2	3
X202-2IRT	1	2	3
X204IRT	1	2	3
X204 IRT PRO	1	2	3
X202-2P IRT PRO	1	2	3
X202-2P IRT	1	2	3
X201-3P IRT	1	2	3
X200-4P IRT	1	2	3

1. Redundancy manager RM is enabled.
2. Redundancy manager is switched over.
3. Redundancy manager is disabled.

Note

The redundancy manager indicator and the standby indicator are implemented as a dual LED, the indicator color changes depending on the function (Redundancy function -> green, standby function -> yellow).

6.5.3.8 LED display during startup

LED display during startup

Device type SCALANCE	When the device starts up, the following LEDs light up in the following order:
	1. Power LEDs (green) light up immediately after turning on the power. 2. Port LEDs (yellow) light up for approx. 6 seconds, the red LED is off. 3. Port LEDs go off, the red error LED is lit for approx. 20 seconds. 4. After the port LEDs go off, the correct link status is displayed after approx. 2 seconds. 5. The IE Switch X-200 is now ready for operation.
X208	+
X208PRO	+
X216	+
X224	+
X204-2	+
X206-1	+
X212-2	+
X204-2 LD	+
X206-1 LD	+
X212-2LD	+
X202-2IRT	+
X204IRT	+
X204 IRT PRO	+
X202-2P IRT PRO	+
X202-2P IRT	+
X201-3P IRT	+
X200-4P IRT	+

6.5.4 Connector pin assignments X-200

General

The pin assignment of the SCALANCE X-200 devices is the same as with other SCALANCE X devices.

Pin assignments of the SCALANCE X208 PRO

Due to the use of M12 connectors, the SCALANCE X208 PRO is waterproof according to IP65. At the same time, the requirements for CAT5 are met.

See also

Common connector pin assignments of SCALANCE X devices (Page 230)

6.5.5 Dimension drawing X-200

General dimension drawings

You will also find dimension drawings for most SCALANCE X-200 devices in the section with the reference data of the SCALANCE X-100 line. (See below)

Dimension drawings SCALANCE X208PRO

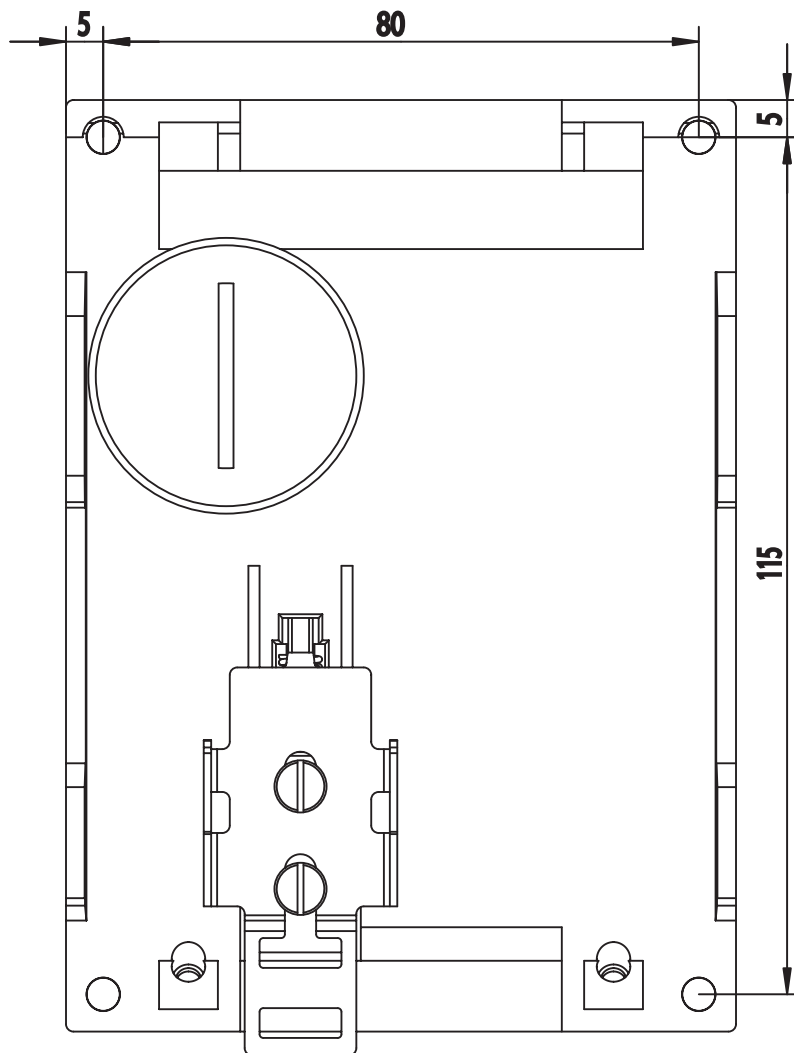


Figure 6-20 Dimension drawing SCALANCE X208PRO

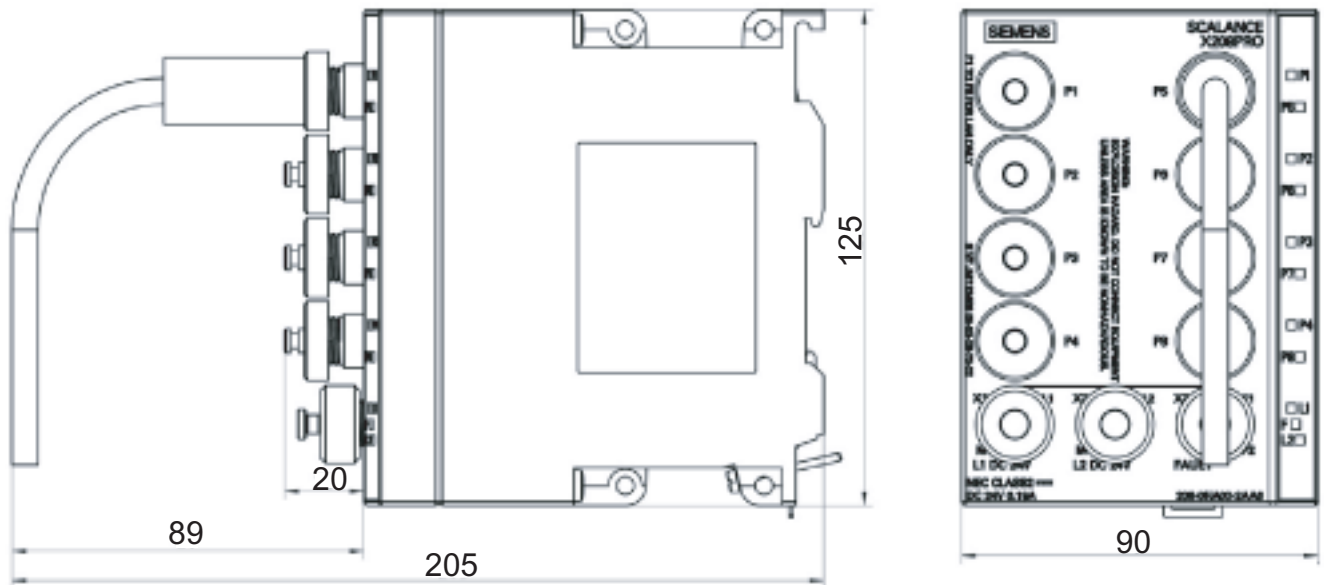


Figure 6-21 SCALANCE X208PRO_M12 bending radius

See also

SCALANCE X-100, SCALANCE X-200 and SCALANCE S dimension drawings (Page 244)

6.5.6 X-200 technical specifications

Technical specifications of the SCALANCE X-200 devices without optical interface and with interface for multimode FO cable

Table 6-27 Electrical data

	SCALANCE X 204-2	SCALANCE X206-1	SCALANCE X208	SCALANCE X20 8PRO
Power supply	2 x 24 V DC (18 - 32 V DC) safety extra-low voltage (SELV)			
Power loss at 24 V DC	6.36 W	5.28 W	3.84 W	4.4 W
Current consumption at 24 V DC	265 mA	220 mA	160 mA	185 mA
Overvoltage protection at input	PTC resettable fuse (0.6 A / 60 V)			
Voltage at signaling contact	24 V DC			
Current through signaling contact	max. 100 mA			
Transmission rate	10/100 Mbps			
Aging time	30 seconds			
Interference emission	EN 61000-6-4 Class A			
Immunity	EN 61000-6-2			
MTBF	74.64 years	78.71 years	83.71 years	115.48 years

Table 6-28 Environmental conditions

	SCALANCE X 204-2	SCALANCE X206-1	SCALANCE X208	SCALANCE X20 8PRO
Operating temperature	-10 °C - +60 °C		-20 °C - +60 °C	-20 °C - +70 °C
Storage/transport temperature	-40 °C - +70 °C			
Relative humidity in operation	< 95% (no condensation)			
Operating altitude	2000 m at max. 56 °C ambient temperature 3,000 m at max. 50 °C ambient temperature			

Table 6-29 Mechanical data

	SCALANCE X 204-2	SCALANCE X206-1	SCALANCE X208	SCALANCE X20 8PRO
Dimensions (W x H x D) mm	60 x 125 x 124			90 x 125 x 124
Weight	780 g			1000 g
Installation options	• DIN rail • S7-300 standard rail • Wall mounting			

Technical specifications of the SCALANCE X216, X212-2 and X224 devices

Table 6-30 Electrical data

	SCALANCE X216	SCALANCE X212-2	SCALANCE X224
Power supply	2 x 24 V DC (18 - 32 V DC) safety extra-low voltage (SELV)		
Power loss at 24 V DC	5.76 W	7.92 W	8.40 W
Current consumption at 24 V DC	240 mA	330 mA	350 mA
Overvoltage protection at input	PTC resettable fuse (1.1 A / 33 V)		
Voltage at signaling contact	24 V DC		
Current through signaling contact	max. 100 mA		
Transmission rate	10/100 Mbps		
Aging time	30 seconds		
Interference emission	EN 61000-6-4 Class A		
Immunity	EN 61000-6-2		
MTBF	52.07 years	51.18 years	45.87 years

Table 6-31 Environmental conditions

	SCALANCE X216	SCALANCE X212-2	SCALANCE X224
Operating temperature	0 °C - +60 °C		
Storage/transport temperature	-40 °C - +70 °C		
Relative humidity in operation	< 95% (no condensation)		
Operating altitude	2000 m at max. 56 °C ambient temperature 3,000 m at max. 50 °C ambient temperature		

Table 6-32 Mechanical data

	SCALANCE X216	SCALANCE X212-2	SCALANCE X224
Dimensions (W x H x D) mm	120 x 125 x 124		180 x 125 x 124
Weight	1200 g		1600 g
Installation options	• DIN rail • S7-300 standard rail • Wall mounting		

Technical specifications of the SCALANCE X200 LD devices

Table 6-33 Electrical data

	SCALANCE X204-2LD	SCALANCE X206-1LD	SCALANCE X212-2LD
Power supply	2 x 24 V DC (18 - 32 V DC) safety extra-low voltage (SELV)		
Power loss at 24 V DC	6.36 W	5.28 W	7.92 W
Current consumption at 24 V DC	265 mA	220 mA	330 mA
Overvoltage protection at input	PTC resettable fuse (1.1 A / 33 V)		
Voltage at signaling contact	24 V DC		max. 28.8 V DC
Current through signaling contact	max. 100 mA		
Transmission rate	10/100 Mbps		
Aging time	30 seconds		
Interference emission	EN 61000-6-4 Class A		
Immunity	EN 61000-6-2		
MTBF	74.64 years	78.71 years	51.18 years

Table 6-34 Mechanical data

	SCALANCE X204-2LD	SCALANCE X206-1LD	SCALANCE X212-2LD
Dimensions (W x H x D) mm	60 x 125 x 124		120 x 125 x 124
Weight	780 g		1200 g
Installation options	• DIN rail • S7-300 standard rail • Wall mounting		

Table 6-35 Environmental conditions

	SCALANCE X204-2LD	SCALANCE X206-1LD	SCALANCE X212-2LD
Operating temperature	0 °C - +60 °C		
Storage/transport temperature	-40 °C - +70 °C		
Relative humidity in operation	< 95% (no condensation)		
Operating altitude	2000 m at max. 56 °C ambient temperature 3,000 m at max. 50 °C ambient temperature		

Order numbers

SCALANCE X204-2	6GK5204-2BB10-2AA3
SCALANCE X206-1	6GK5206-1BB10-2AA3
SCALANCE X208	6GK5208-0BA10-2AA3
SCALANCE X208PRO	6GK5208-0HA00-2AA6
SCALANCE X216	6GK5216-0BA00-2AA3
SCALANCE X212-2	6GK5212-2BB00-2AA3
SCALANCE X224	6GK5224-0BA00-2AA3

Table 6-42 "LD" devices

SCALANCE X204-2LD	6GK5204-2BC10-2AA3
SCALANCE X206-1LD	6GK5206-1BC10-2AA3
SCALANCE X212-2LD	6GK5212-2BC00-2AA3

Table 6-43 "IRT" devices

SCALANCE X204IRT	6GK5204-0BA00-2BA3
SCALANCE X202-2IRT	6GK5202-2BB00-2BA3
SCALANCE X202-2P IRT	6GK5202-2BH00-2BA3
SCALANCE X201-3P IRT	6GK5201-3BH00-2BA3
SCALANCE X200-4P IRT	6GK5200-4AH00-2BA3

Web Based Management

Note

You will find information on configuring the SCALANCE X switches using Web Based Management in the relevant operating instructions.