Inxpect SRE 100 Series Ethernet Fieldbus Control Installation Guide

Contents

Inxpect SRE 100 Series Ethernet Fieldbus Control

Specifications

- Product Name: Inxpect SRE 100 Series, Inxpect SRE 200 Series
- **Product Type**: Safety Radar Equipment
- **Certifications:** CE conformity, UKCA conformity
- **Intended Use:** Human body detection systems certified SIL 2 according to IEC/EN 62061 and PL d according to EN ISO 13849-1
- **Component Structure**: Ruggedized control units with IP67 protection

Product Usage Instructions

Installation Instructions

- Ensure correct installation of the system by following the instructions provided in the manual.
- Avoid obstructing the sensor field of view with static objects, especially metallic objects, to maintain efficient sensor detection.

Certifications

Download all updated certifications from the official website: **InxpectDownloads**.

CE conformity and UKCA conformity are ensured for compliance with relevant directives and regulations.

Intended Use

The product functions as a human body detection system with specific safety functions:

1. Access detection function: Deactivates safety outputs when one or more persons access a hazardous area to stop machinery parts.
2. Restart prevention function: Prevents unexpected starting or restarting of machinery by keeping safety outputs deactivated upon motion detection in the dangerous area.

Component Structure

- The product includes ruggedized control units with Type B control units inside containers providing IP67 protection.
- Refer to the relevant manual for information on general functions and Type B control units not covered in this manual.

Models

The product is available in various models including C201B-RA-P, C201B-RA-F, C201B-RA-C, C202B-RA, and C203B-RA. Each model has specific control unit types and configurations.

Installation instructions

- **General warnings**
- Wrong installation and configuration of the system decreaseor inhibit both the protective function of the system and the safety of the device. Follow the instructions provided in this document for correct installation of the system.
- The presence of static objects, in particular metallic objects, within the field of view may limit the efficiency of sensor detection. Keep the sensor field of view unobstructed.

Certifications

- All updated certifications can be downloaded from https://www.inxpect.com/en/downloads.

CE conformity

- The manufacturer, Inxpect SpA, states that Inxpect SRE 100 Series and Inxpect SRE 200 Series (Safety Radar Equipment) comply with the 2014/53/EU and 2006/42/EC directives. The full EU Declaration of Conformity text is available on the company's website: **https://www.inxpect.com/en/downloads**.

UKCA conformity

- The manufacturer, Inxpect SpA, states that Inxpect SRE 100 Series and Inxpect SRE 200 Series (Safety Radar Equipment) comply with Radio Equipment Regulations 2017 and Supply of Machinery (Safety) Regulations 2008. The full UKCA Declaration of
- Conformity text is available on the company's website: **https://www.inxpect.com/en/downloads.**

Intended use

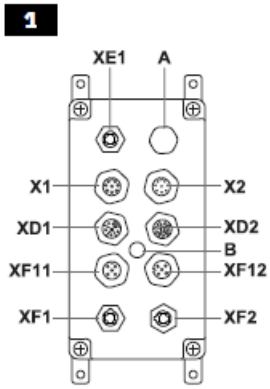
- Both Inxpect Inxpect SRE 100 Series and Inxpect SRE 200 Series are human body detection systems, certified SIL 2 according to IEC/EN 62061 and PL d according to EN ISO 13849-1.
- They perform the following safety functions:
- Access detection function: access of one or more persons to a hazardous area deactivates the safety outputs to stop the moving parts of the machinery.
- Restart prevention function: prevents unexpected starting or restarting of the machinery. Detection of motion within the dangerous area maintains the safety outputs deactivated to prevent machinery starting.

Component structure

- The ruggedized control units
- The ruggedized control units are Type B control units that are incorporated inside a container which guarantees IP67 protection.
- For information on general functions and for instructions relating to Type B control units not included in this manual, see the manual relevant to the system you use.

Models

Ruggedized control unit	Control unit model	Control unit type
C201B-RA-P	C201B	-P
C201B-RA-F	C201B	-F
C201B-RA-C	C201B	-C



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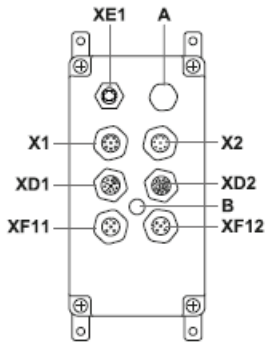

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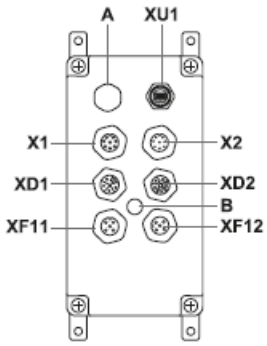

Ruggedized control unit	Control unit model	Control unit type
C202B-RA	C202B	–
C203B-RA	C203B	–

Structure

Structure		
1	**2**	**3**
C201B-RA-P C201B-RA-F *C201B-RA-C*	*C202B-RA*	*C203B-RA*

Label	Function	Description	C201B-RA-P, C201B-RA-F, C201B-RA-C	C202B-RA	C203B-RA

XE1	**CONFIG**	Ethernet connector (M12, 4P, D-coded, female)	x	x	–
XU1		USB connector (mini-USB)	–	–	x
A	**–**	Pressure relief vent	x	x	x
X1	**I/O**	Outputs connector (M12, 8P, A-coded, female)	x	x	x
X2		Inputs connector (M12, 8P, A -coded, male)	x	x	x
XD1	**POWER**	Power input connector (M12, 4P+PE, L-coded, male)	x	x	x
XD2		Power output connector (M12 , 4P+PE, L-coded, female)	x	x	x
B	**–**	Power status LED (green)	x	x	x
XF11	**SENSORS**	Sensors connector (M12, 5P, A-coded, female)	x	x	x
XF12		Sensors connector (M12, 5P, A-coded, female)	x	x	x
XF1	**FIELDBUS**	Fieldbus connector (M12, 4P, D-coded, female)	x	–	–

XF2		Fieldbus connector (M12, 4P, D-coded, female)	x	–	–

- **SRE 100 Series sensors**

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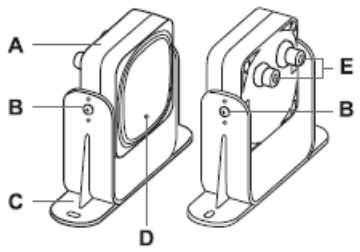

Part	Description
A	Sensor
B	Screws for fastening the sensor at a specific inclination
C	Mounting bracket
D	Status LED
E	Connectors for connecting the sensors in a chain and to the control unit

- **SRE 100 Series sensor status LED**

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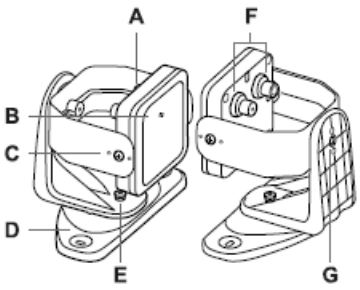


Status	Meaning
Steady on	Sensor is working. No motion detected.
Rapid flashing on (100 ms)	Sensor is detecting motion. Not available if the sensor is in muting.
Other conditions	Error

- **SRE 200 Series sensors**

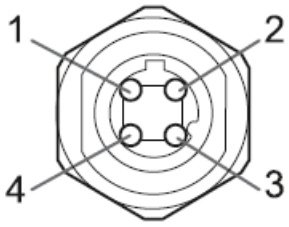
Part	Description
A	Sensor
B	Status LED
C	Tamper-proof screws to position the sensor at a specific angle around x-axis (tilt 10° steps)
D	Mounting bracket
E	Tamper-proof screw to position the sensor at a specific angle around y-axis (pan 10° steps)
F	Connectors for connecting the sensors in a chain and to the control unit
G	Tamper-proof screw to position the sensor at a specific angle around z-axis (roll 10° steps)

- **SRE 200 Series sensor status LED**

Status	Meaning
Steady blue	Sensor is working. No motion detected.
Flashing blue	Sensor is detecting motion*. Not available if the sensor is in muting. For restart prevention function, the LED keeps flashing for about 2 seconds af ter the end of a detection
Purple	Firmware update conditions
Red	Error conditions

Connector pin-outs

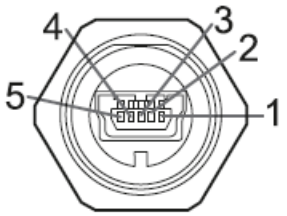
- **Ethernet (XE1) and Fieldbus (XF1/XF2) connectors**



Pin	Function
1	TX+
2	RX+
3	TX-
4	RX-

- **Note:** screw the external connector or cap with a torque of 0.6 Nm (5.3 lbs in).
- **Note**: the XE1 connector cap is included for C201B-RA and C202B-RA control units.

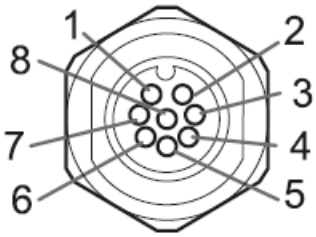
Mini-USB connector, mini-B type (XU1)



Pin	Function
1	V cc (+5 V dc)
2	D-
3	D+
4	ID
5	GND

- ***Note****: the connector cap is included for the C203B-RA control unit*

Outputs connector (X1)

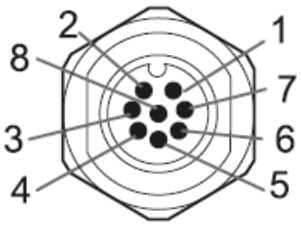


Pin	Function
1	OUTPUT 1
2	GND, common reference for all the digital outputs
3	OUTPUT 2
4	GND, common reference for all the digital outputs

Pin	Function
5	OUTPUT 3
6	GND, common reference for all the digital outputs
7	OUTPUT 4
8	GND, common reference for all the digital outputs

- **Note:** the cables used must have a maximum length of 30 m (98.4 ft).
- **Note:** screw the external connector or cap with a torque of 0.6 Nm (5.3 lbs in).

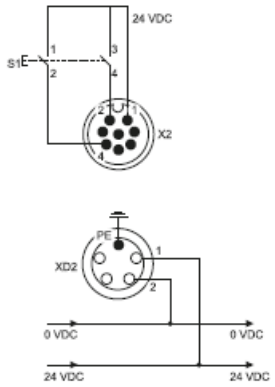
Inputs connector (X2)



Pin	Function
1	VOUT (+24 V dc)*
2	INPUT 1
3	VOUT (+24 V dc)*
4	INPUT 2
5	VOUT (+24 V dc)*
6	INPUT 3
7	VOUT (+24 V dc)*
8	INPUT 4

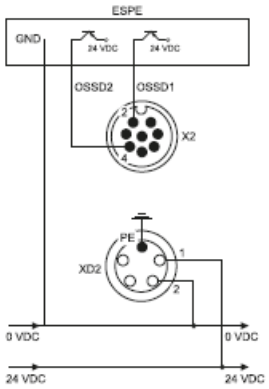
- **Note:** VOUT (+24 V dc) is useful when a free contact is connected to the input (see following example).
- **Note:** the connector cap is included

Example of free contact connected to the input



Example of OSSD connected to the input

If an OSSD is connected to the input, there is no need to connect also VOUT (+24 V dc).



Voltage and current limits for digital inputs

- The digital inputs (input voltage 24 V DC) adhere to the following voltage and current limits, in accordance with standard IEC/EN 61131-2:2003

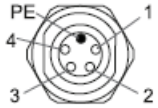
	Type 3
Voltage limits	
0	from – 3 to 11 V
1	from 11 to 30 V
Current limits	
0	15 mA
1	from 2 to 15 mA

Power input connector (XD1)

Pin	Function
1	VIN (+24 V dc)*
2	GND
3	GND
4	VIN (+24 V dc)*
PE	Earth

- **Note:** screw the external connector or cap with a torque of 0.6 Nm (5.3 lbs in).
- **Note:** pin 1 and pin 4 have the same meaning to guarantee bigger sections of (incoming) power supply for long routes

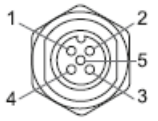
Power output connector (XD2)



Pin	Function
1	VOUT (+24 V dc)*
2	GND
3	GND
4	VOUT (+24 V dc)*
PE	Earth

- **Note:** the cables used must have a maximum length of 30 m (98.4 ft).
- **Note:** screw the external connector or cap with a torque of 0.6 Nm (5.3 lbs in).
- **Note***: pin 1 and pin 4 have the same meaning to guarantee bigger section of (outgoing) power supply. For multiple control units in a chain, it is suggested to not exceed the number of 4 control units.
- **Note**: the connector cap is included

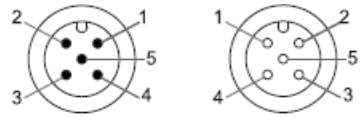
Sensors connector (XF11/XF12)



Pin	Function
1	SHIELD
2	+12 V dc output
3	GND
4	CAN H
5	CAN L

- **Note:** screw the external connector or cap with a torque of 0.6 Nm (5.3 lbs in).

Sensor M12 CAN bus connectors



Pin	Function
1	Shield
2	+12 V dc
3	GND
4	CAN H
5	CAN L

- **Note:** screw the external connector or cap with a torque of 0.6 Nm (5.3 lbs in).

Technical data

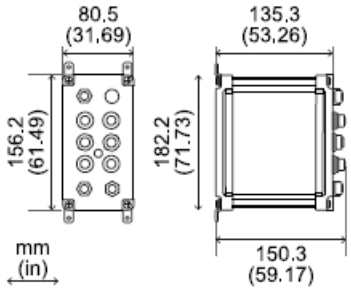
Outputs	Configurable as follows: 4 Output Signal Switching Devices (OSSDs) (used as single channels) 2 dual channel safety outputs 1 dual channel safety output and 2 Output Signal Switching Devices (OSSDs)
OSSD characteristic	Maximum resistive load: 100 KΩ Minimum resistive load: 70 Ω Maximum capacitive load: 1000 nF Minimum capacitive load: 10 nF
Safety outputs	High-side outputs (with extended protection function) Maximum power: 11.2 W Maximum total current (sum of all the OSSDs): 0.4 A The OSSDs provide wh at follows: ON-state: from Uv-1V to Uv (Uv = 24V +/- 4V) OFF-state: from 0 V to 2.5 V r.m.s.

Inputs	Configurable as follows: 4 single channel (cat. 2) type 3 digital inputs with common GND 2 dual channel (cat. 3) type 3 digital inputs with common GND 1 dual channel (cat. 3) and 2 single channels (cat. 2) type 3 digital inputs with common GND See *Voltage and current limits for digital inputs*.
Fieldbus interface (if availabl e)	Ethernet based interface with different standard Fieldbus
Power supply	24 V DC (20–28 V DC) * Maximum current: 1 A (Inxpect SRE 100 Series) Maximum current: 1.2 A (Inx pect SRE 200 Series)
Consumption	Max. 5 W
Assembly	Fixed by screws

Weight	1260 g
Screws	Stainless steel
Gasket	Silicone
Cover	Diecast aluminium ADC12
Main body	Extruded aluminium A6063S-T5
Degree of protection	IP67
Terminals	Section: 1 mm2 (16 AWG) max. Maximum current: 4 A with 1 mm2 cables (16 AWG)

Altitude	Max. 1500 m ASL
Pollution degree	2
Overvoltage category	II
Operating temperature	From -30 to +50 °C (from -22 to +122 °F)
Storage temperature	From -40 to +80 °C (from -40 to +176 °F)

- **Note*:** the unit shall be supplied by an isolated power source which complies with the standard IEC/EN 60204-1 and fulfils the requirements of
- Limited-Energy Circuit in accordance with IEC/UL/CSA 61010-1/ IEC/UL/CSA 61010-2-201 or
- Limited Power Source (LPS) in accordance with IEC/UL/CSA 60950-1 or
- (For North America and/or Canada only) a Class 2 supply source which complies with the National
- Electrical Code (NEC), NFPA 70, Clause 725.121 and Canadian Electrical Code (CEC), Part I, C22.1. (typical examples are a Class 2 transformer or a Class 2 power sources in compliance with, UL 5085- 3/ CSA-C22.2 No. 66.3 or UL 1310/CSA-C22.2 No. 223).



Installation

Materials required

- Two M4 tamper-proof screws to mount each sensor.
- Cables to connect the control unit to the first sensor and the sensors to one another.
- Depending on the model, a data USB cable (product code X0000012) or an Ethernet cable (product code X0000013) to connect the control unit to the computer.
- Four M4 fixing screws for the slots of the ruggedized control unit.
- Two bus terminators (product code: 07000003) with resistance of 120 Ω.
- A screwdriver for tamper-proof screws to be used with the Hex pin security bit supplied in the control unit package.
- (only for SRE 100 Series sensors) If necessary, to protect the sensor and to prevent reflections from generating undesired alarms, one Metal protector kit (product code: 90202ZAA) per sensor. See the instructions supplied with the kit for installation instructions.

- Note: the Metal protector kit is particularly recommended if the sensor is installed on parts that are moving, vibrating or that are near vibrating parts.

Operating system required

- Microsoft Windows 10 or later
- Apple OS X 11.0 or later
- **Install the ruggedized control unit**

1. Fix the control unit using four screws (not included) and connect to external equipment.
2. Power-up the control unit using the power input connector XD1, and make all the other required electrical connections with external equipment (see Connector pin-outs).

- **NOTICE:** the SNS input “V+ (SNS)” and the GND input “V- (SNS)” are already connected inside the control unit.
- **NOTICE:** when powered, the system takes about 2 s (for Inxpect SRE 100 Series) and 20 s (for Inxpect SRE 200 Series) to start.During that period, the outputs and the diagnostic functions are deactivated, and the green sensor status LEDs of the connected sensors inside the control unitflash.
- **NOTICE**: make sure to avoid any EMC interference during the control unit installation.
- **Install SRE 100 Series sensors**

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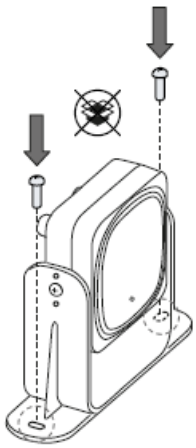
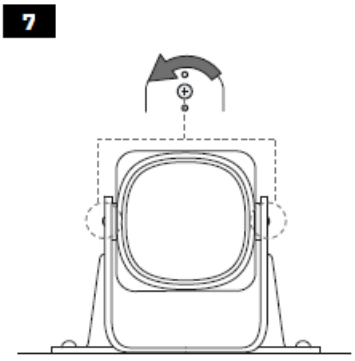


- Note: for installation with Metal protector kit (product code 90202ZAA), see the instructions supplied with the kit.

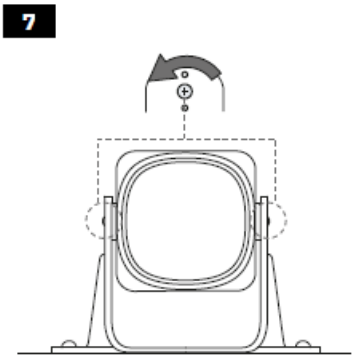
  Note: the usage of a thread-locking fluid on the threads of fasteners is suggested, especially when the sensor is installed on a moving or vibrating part of the machinery.

  Note: if the sensor is installed on parts that vibrate and objects are present in the field of view, the sensor could generate undesired alarms.

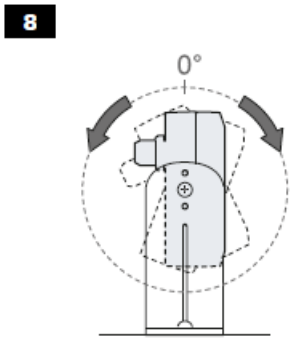
1. Position the sensor as indicated in the configuration report and fasten the bracket with two M4 tamper-proof screws.
    1. **NOTICE:** make sure the support does not inhibit machinery commands.
2. Loosen the side screws to tilt the sensor.



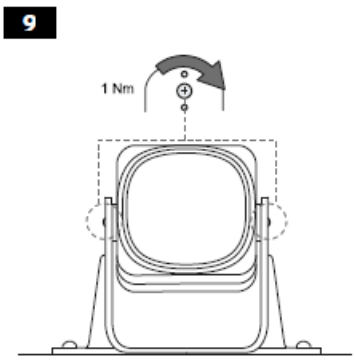
3. Tilt the sensor to the desired inclination.



Note: a notch is equal to a 10° of inclination.



4. Tighten the screws.



Install SRE 200 Series sensors

- **Note:** the usage of a thread-locking fluid on the threads of fasteners is suggested, especially when the sensor is installed on a moving or vibrating part of the machinery.
- **Note:** if no bracket is used for sensor installation, use tamper-proof screws and threadlocker.

1. Position the sensor as indicated in the configuration report and fasten the bracket with two M4 tamper-proof screws directly onto the floor or another support.

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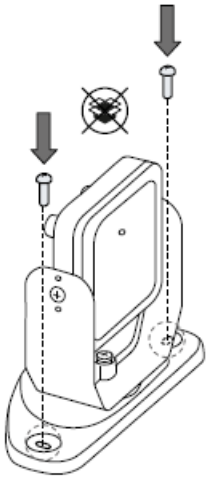

- NOTICE: make sure the support does not inhibit machinery commands.

2. With an Allen key, loosen the screw at the bottom to pan the sensor.

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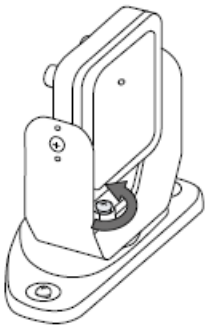

Note: to avoid damaging the bracket, loosen the screw completely before panning the sensor.

3. Pan the sensor until it reaches the desired position.

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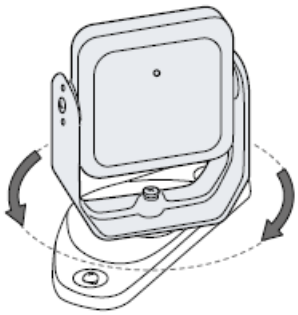

- **Note**: a notch is equal to a 10° of rotation.

4. Tighten the screw

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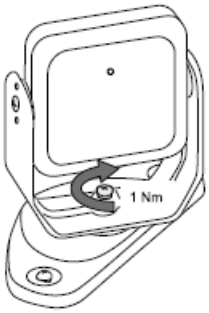

5. Loosen the tamper-proof screws to tilt the sensor.

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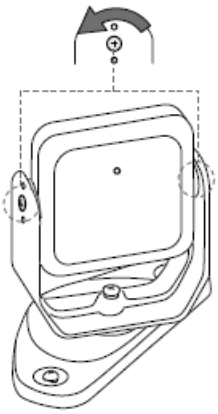

6. Tilt the sensor to the desired inclination.

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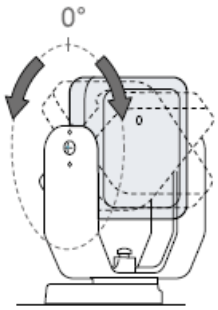

- **Note:** a notch is equal to a 10° of inclination. For a finer regulation of the sensor inclination with a 1° precision (see Inxpect SRE 200 Series Instruction manual).

7. Tighten the screws.

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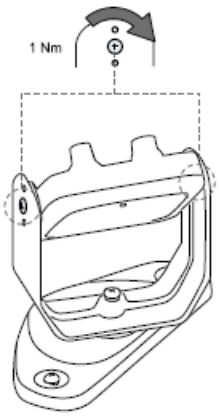
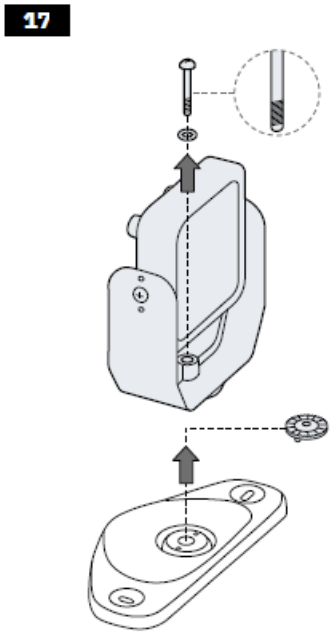
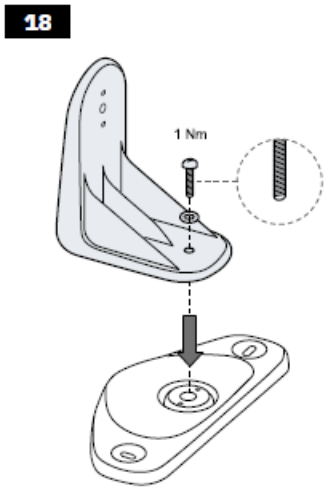


- (optional and only for SRE 200 Series sensors) Mount 3-axis bracket
- The bracket that allows rotation around the z-axis (roll) is an accessory in the package. To mount it:

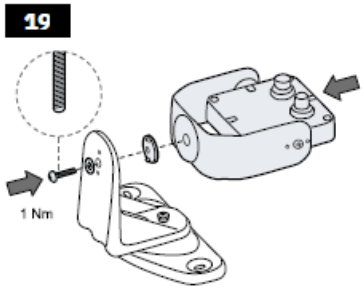
1. Unscrew the screw at the bottom and remove the bracket with the sensor and the aligning ring.



2. Attach the roll bracket to the base. Use the tamper-proof screw provided with the bracket.



3. Mount the bracket with the sensor and the aligning ring. Use the tamper-proof screw provided with the bracket.

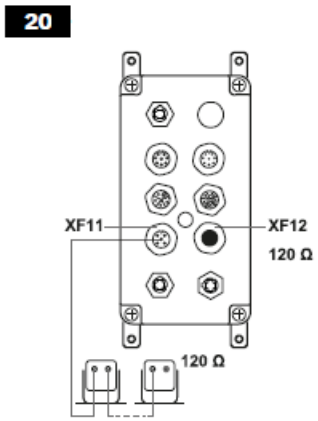


Connect the sensors to the ruggedized control unit

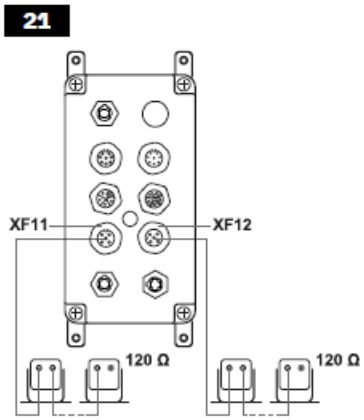
- **Note:** the total maximum length of the CAN bus line is 30 m (98.4 ft) for Inxpect SRE 100 Series and 80 m (262.5 ft) for Inxpect SRE 200 Series.
- **Note:** the DIP switch on the control unit is already in OFF position (bus terminator resistance excluded): there is

no need to include it.

- Chain with control unit at the end of the chain and a sensor with termination connector



- Chain with control unit inside of the chain and two sensors with termination connector



Insert the bus terminators

- Insert two bus terminators (product code: 07000003) as follows

If…	**Then…**
the control unit is at the end of the chain	insert one bus terminator into the free connector of the last sensor of the chain and the other one into the free connector of t he ruggedized control unit.
the control unit is inside the chain	insert one bus terminator into the free connector of the two last s ensors of the chain.

SAFTEY INFORMATION

- **Note:** if the installation fails, the dependencies needed by the application may be missing. Update your operating system or contact our Technical Support to receive assistance

1. Download the application from the https://tools.inxpect.com website and install it on the computer.
2. With Microsoft Windows operating system, download and install from the same site also the driver for USB connection

Start the application

1. Connect the control unit to the computer using a data USB cable with a mini-USB connector or the Ethernet cable (if an Ethernet port is available).
2. Supply power to the control unit.
3. Start the Inxpect Safety application.
4. Configure the system (see Instruction manual).

- **What to do next**
  Follow the instructions in the manual to configure the system, validate the safety functions and manage the configuration

- **https://tools.inxpect.com**
- **How to return the product**
- To return the product, it is suggested to send the whole ruggedized control unit to the local distributor or exclusive distributor
- **When to open the ruggedized control unit**
- NOTICE: make sure only skilled personnel open the control unit.

List of the cases

- The control unit should be opened only in the following cases:
- perform the SD Restore*. To know the procedure, see the relevant manual.
- replace the SD card*. To know the procedure, see the relevant manual.
- check the status of the LEDs. To know the meaning of the LEDS, see the relevant manual.
- **Note***: the SD card is included and already insterted.
- To open the control unit and have details about the internal connections, please follow the instructions in the relative document downloadable from Inxpect Tools (**https://tools.inxpect.com/**).

Planned maintenance

Product	Part number
USB cable	X0000012
Ethernet cable	X0000013
XD1, X2 connector cap	X0000014
XD2 connector cap	X0000015
XF1, XF2, X1, XE1, XF11 and XF12 connector cap	X0000016
XU1 connector cap	X0000017

FAQs

Q: Can I install the system without referring to the manual?

A: It is highly recommended to follow the installation instructions provided in the manual to ensure correct installation and configuration for optimal system performance and safety.

Q: How can I obtain updated certifications for the product?

A: You can download all updated certifications from the official Inxpect website at https://www.inxpect.com/en/downloads.

Documents / Resources

	INXPECT Inxpect SRE 100 Series Ethernet Fieldbus Control [pdf] Installation Guide SAF-MI-100S-200S, Inxpect SRE 100 Series Ethernet Fieldbus Control, Inxpect SRE 100 Series, Ethernet Fieldbus Control, Fieldbus Control

References

- inxpect.com
- Inxpect Tools - Inxpect Tools
- Downloads | Inxpect
- User Manual