OsiSense™ XG

Radio Frequency Identification System

Catalog

Simply easy!

Telemecanique
Sensors

Les Classiques
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Les Classiques

Fully open RFID

Make the most of the openness of the **OsiSense XG** RFID system. This product range gives you the freedom to choose the tags you wish, and automatically adapts to your network protocol.

This range has many advantages:

Choice of tags

100% compatible with ISO standard tags (non-locked)

Simplicity and speed

30% savings in installation and setup time

Tested and approved

100% RoHS compliant; UL, CE, and FCC certified

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Choice of tags

Select from the **OsiSense XG** range of industrial tags or from the ISO standard tags (non-locked) available on the market.

> Worldwide compatibility

with 13.56 MHz standards (ISO 18000-3, ISO 15693, ISO 14443).

100% compatible

for simplifying selection

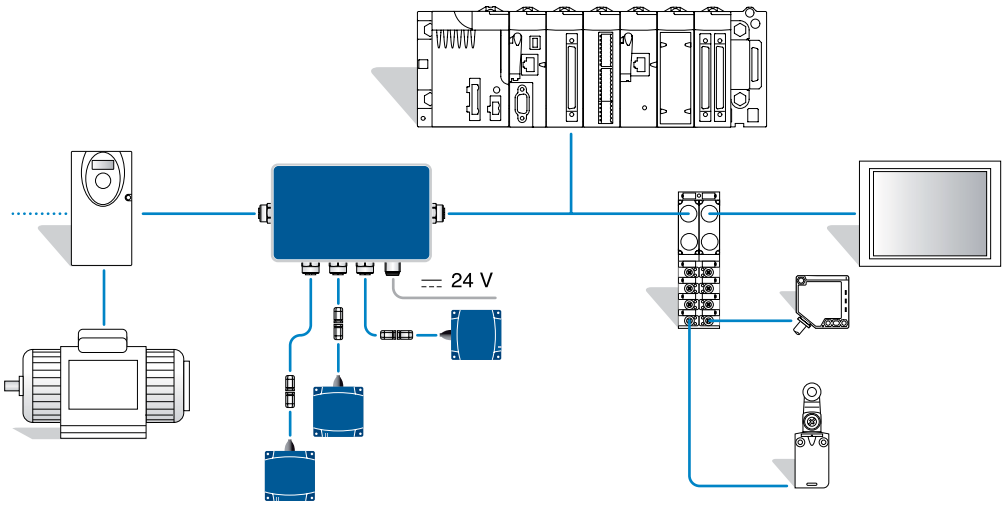
> Automatic integration into your architecture

100% compatible

for inclusion in architectures

The **OsiSense XG** RFID system simplifies access to tag data.

- Requires no specific programming
- Automatically adapts to the protocol and speed of the network (Ethernet/IP, Modbus TCP/IP, Modbus RTU, Uni-Telway, Profibus-DP).



Simplicity and speed

Forget complex connections and configurations. With **OsiSense XG**, the RFID system is quick and easy to install and set up.

> Easy to install

The station self-adapts to the environment. It fits even in confined spaces, thanks to its compactness (40 x 40 x 15 mm), mounting accessories, and quick cabling.

> Quick to connect and set up

- Connect the station to the PLC, and it's fully operational. Everything you need is integrated into the product (antenna, RFID controller, and protocol).
- Simply present the configuration badge to set the network address of the station.

30%

savings in installation and setup time

- Use the handheld terminal (XGST2422) for direct access to data in the tags.

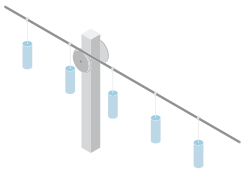
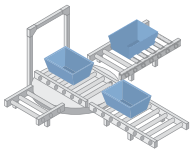
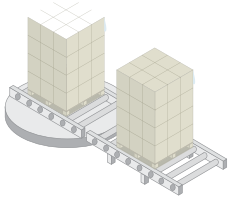
Tested and approved

Ideally suited to a variety of constraints and requirements, the **OsiSense XG** range has been comprehensively tested both in the laboratory and in the field to help ensure its reliability. The reduced consumption (< 60 mA per station) and the choice of materials for the **OsiSense XG** range make the products environmentally friendly.

100 % RoHs Compliant

Telemecanique Sensors brand is committed to reducing the environmental impact of its products

Selection guide

	Material handling				
					
Reading system	Trolley	Narrow conveyor or overhead line	Medium width conveyor	Wide conveyor	Operator
1 XGCS4901201		■			■
2 XGCS8901201		■	■	■	
3 XGCS4901201 + XGFEC540			■		
4 XGCS4901201 + XGFEC2525	■			■	
5 XGST2422					
RFID tags					
6 XGHB411346		■			
7 XGHB211345		■			
8 XGHB221346		■			
9 XGHB320345		■	■	■	
10 XGHB90E340	■		■	■	■
11 XGHB444345					
12 XGHB445345					
13 XGHB320246					
14 XGHB440245					
15 XGHB440845					
16 XGHB443245					

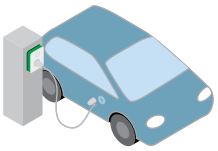
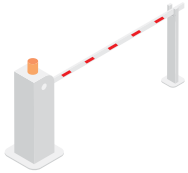
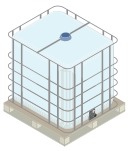
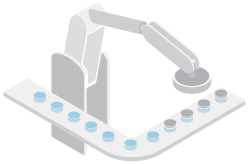
5

1 XGCS4901201

2 XGCS8901201

3 XGCS4901201 + XGFEC540

4 XGCS4901201 + XGFEC2525

Access control		Traceability		Flexible assembly	
					
Service	Vehicle	Container	Tools	Simple	Complex

Overall size of dialog zone

Length x width (mm)	Distance (mm)										
39 x 35	30–39	18	40	48	70	33	30	45	45	25	25
79 x 75	35–46	20	55	65	100	48	40	65	65	39	39
390 x 45	—	—	—	42	90	—	—	50	50	—	—
240 x 240	—	—	42	80	150	—	—	40	40	—	—
Memory capacity (bytes)	64	256	256	112	256	3408	13632	2000	2000	8192	32768
Memory type	EEPROM	EEPROM	EEPROM	EEPROM	EEPROM	EEPROM	EEPROM	FeRAM	FeRAM	FeRAM	FeRAM
	XGHB411346	XGHB211345	XGHB221346	XGHB320345	XGHB90E340	XGHB444345	XGHB445345	XGHB320246	XGHB440245	XGHB440845	XGHB443245

OsiSense XG

Radio Frequency Identification System
13.56 MHz

Operating principle

RFID is the abbreviation used for radio frequency identification systems. The frequencies range from 50 kHz to 2.5 GHz. The most widely used is 13.56 MHz.

The OsiSense XG RFID system offers functions such as object traceability, object tracking, and access control. Information is stored in an accessible memory bank using a simple radio frequency link. This memory is in the form of an electronic tag, which contains an antenna and an integrated circuit.

The tag stores information about the object that the tag is attached to. When the tag passes through a field generated by a smart antenna (reader), the tag detects the signal and exchanges the read or write data between its memory and the smart antenna.

The numerous applications include the following:

- Logistics, such as dispatch, receipt, and transit
- Tracking and sorting of baggage
- Traceability in the food processing industry
- Flexible assembly lines in the automotive sector
- Automatic tolls
- Access control

The OsiSense XG RFID system is also suited to difficult environmental conditions, such as humidity, temperature, mechanical shock, vibration, and dust.

OsiSense XG RFID

The OsiSense XG RFID system is open to the majority of ISO 18000-3, ISO 15693 and ISO 14443 electronic tags.

The system integrates Modbus™ RTU, Uni-Telway, Modbus TCP/IP, Profibus-DP, and Ethernet/IP protocols.

The range includes the following:

- Three models of 13.56 MHz compact smart antennas (read/write)
- Eleven models of 13.56 MHz electronic tags
- One handheld RFID terminal
- Three models of network connection boxes
- Two models of field expanders (accessories to adapt the shape of the dialog zone between the tag and the compact smart antenna)
- Connection and mounting accessories

Compact smart antenna, flat form 40

Setup

The OsiSense XG compact smart antennas are simple to set up, thanks to the following features:

- Integrated RFID and network functions
- No programming
- Automatic detection of the RFID electronic tags (read or write)
- Automatic setting of the communication parameters (such as speed, format, parity, and protocol)
- Configuration of the network address (1–15) using the badge included with the smart antenna
- Read/write compatibility with the majority of 13.56 MHz tags on the market
- Low sensitivity to metal environments

Installation

The OsiSense XG smart antennas are compact and robust. They can easily be integrated into flexible manufacturing production lines in the following ways:

- Quick connection using an M12 connector
- Clip-on mounting

An extensive range of connecting cables and adapter boxes lets you easily connect the OsiSense XG smart antennas to industrial communication networks.

Compact smart antenna, flat form 80

Description

OsiSense XG 13.56 MHz compact smart antennas

XGCS smart antennas can read and write to the 13.56 MHz RFID tags that comply with standards ISO 15693 and ISO 14443 A and B.

Three models of OsiSense XG compact smart antennas are available:

- Flat form 40 compact smart antenna **XGCS4901201**:
  - Dimensions: 40 x 40 x 15 mm
  - Nominal sensing distance: 18–70 mm (0.71–2.76 in.), depending on the tag
- Flat form 80 compact smart antenna **XGCS8901201**:
  - Dimensions: 80 x 80 x 26 mm
  - Nominal sensing distance: 20–100 mm (0.79–3.94 in.), depending on the tag
- Wand-style compact smart antenna **XGW4F111,** with an adjustable head to locate tags in confined places

OsiSense XG

Radio Frequency Identification System 13.56 MHz

Electronic tags

Handheld terminal

Field expanders

OsiSense XG 13.56 MHz compact smart antennas *(continued)*

■ **Functions integrated into the compact smart antennas**

OsiSense XG compact smart antennas integrate functions that simplify communication between the tags, the smart antennas, and the controller (such as a PLC or PC). These built-in functions are activated by standard requests, sent by the controller, for the reading or writing of words:

□ **Firmware version:** The smart antenna is polled to read its version.

□ **Reset:** The smart antenna is reinitialized and assumes its factory default configuration (network address at 1, transmission speed at 19,200 Bd, parameters deleted).

□ **Init:** The smart antenna is reinitialized and operates as it would after being switched off, then on (address unchanged, transmission speed unchanged, parameters deleted)

□ **Sleep mode:** Transmission of the smart antenna's electromagnetic field is activated only on receipt of a read or write instruction. This mode reduces the smart antenna's power consumption and suppresses interference when the smart antennas are close to each other.

□ **Auto Read/Write:** In this mode, as soon as a tag enters the dialog zone, the smart antenna can automatically execute up to 10 read or write instructions (up to 128 write words and up to 126 read words).

OsiSense XG RFID electronic tags

■ **XGHB electronic tags with EEPROM or FeRAM type memory** [(1)] **offer the following advantages:**

□ Fast access to data
□ Wide range of memory capacities
□ Secure access to contents
□ Batteryless operation
□ Positioning flexibility
□ Protection suited to the environment

The nominal transmission distance is 18–100 mm (0.70–3.93 in.), depending on the model of the tag and the associated compact smart antenna.

RFID handheld terminal

The **XGST2020** RFID terminal, with embedded software and an external reader, is a powerful toolbox for conducting easy and efficient operations on RFID tags. The removable external smart antenna communicates with a wide range of ISO 14443 and ISO 15693 electronic tags. It also has a wide dialog range of up to 70 mm. The integrated battery offers long life—at least one full day of intensive use.

Field expanders

Field expanders are accessories designed for conveying/handling applications that adapt the shape of the dialog field of the OsiSense smart antenna XGCS4901201 using a connection-free induction link. Two standard models are available:

■ The conveyor model **XGFEC540** detects ISO 15693 tags on a narrow strip covering the width of the conveyor (mounted between two rollers of the conveyor).

□ Dimensions: 400 x 23 x 50 mm

□ Nominal sensing distance: 30–90 mm (1.18–3.54 in.), depending on the associated tag

■ The universal model **XGFEC2525** increases the detection area and the distance of ISO 15693 tags, which then permits higher passing speeds of the tags.

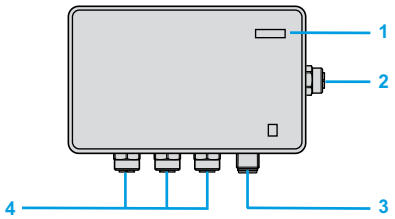
□ Dimensions: 250 x 250 x 10 mm

□ Nominal sensing distance: 26–150 mm (1.02–5.90 in.), depending on the associated tag

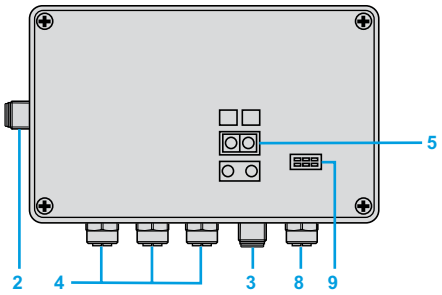
■ Read/write compatibility with most 13.56 MHz ISO 15693 tags on the market.

NOTE: These accessories are not compatible with ISO 14443 tags.

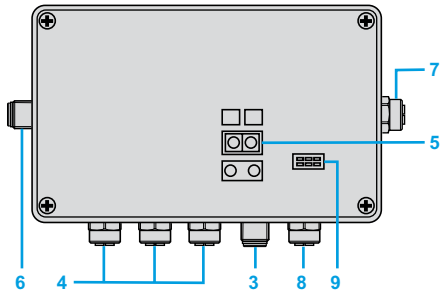
(1) ***EEPROM***: *Electrically erasable, programmable read-only memory.*
FeRAM: *Ferroelectric read-only memory (non-volatile RAM).*



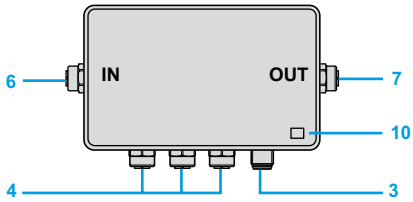
Ethernet box XGSZ33ETH



Ethernet/IP box XGSZ33EIP



Profibus-DP box: XGSZ33PDP



Connection box TCSAMT31FP

1 Power on and Ethernet signaling LEDs
2 1 Ethernet socket, M12 type, D coding
3 1 power supply socket, M12 type, 4-pin male
4 3 sockets, M12 type, female, A coding, for connecting XGCS smart antennas
5 Configuration of the network address
6 1 network input socket, M12 type, male
7 1 network output socket, M12 type, female
8 1 configuration port, M12 type, female
9 Network and connection box status LEDs
10 One green LED: Power on

Description (continued)

OsiSense XG connection boxes

Four types of quick connection boxes are available:
- Ethernet box **XGSZ33ETH** for an Ethernet Modbus TCP/IP network
- Ethernet/IP box **XGSZ33EIP** for an Ethernet/IP network
- Profibus-DP box **XGSZ33PDP** for a Profibus-DP network
- Tap-off box **TCSAMT31FP** for a Modbus or Uni-Telway communication bus

Ethernet box XGSZ33ETH

The OsiSense Ethernet box **XGSZ33ETH** connects XGCS smart antennas to an Ethernet network (Modbus TCP/IP protocol).

It provides PLC or PC access to the functions of the XGCS smart antennas:
- Reading and writing of tags
- Control and command
- Monitoring
- Diagnostics

The **XGSZ33ETH** Ethernet box is fitted with M12 connectors for the power supply, the Ethernet network, and 1–3 XGCS smart antennas (up to 8 smart antennas by daisy-chaining).

Ethernet/IP box XGSZ33EIP

The OsiSense Ethernet/IP box **XGSZ33EIP** connects XGCS smart antennas to the Ethernet/IP network.

It allows a PLC or PC to access the functions of the XGCS smart antennas:
- Reading and writing of tags
- Control and command
- Monitoring
- Diagnostics

The **XGSZ33EIP** box is fitted with M12 connectors for the power supply, the Ethernet/IP network, and 1–3 XGCS smart antennas (up to 15 smart antennas by daisy-chaining).

Profibus-DP box XGSZ33PDP

The OsiSense XG Profibus-DP box **XGSZ33PDP** connects XGCS smart antennas to a Profibus-DP network.

It provides PLC or PC access to the functions of the XGCS smart antennas:
- Reading and writing of tags
- Control and command
- Monitoring
- Diagnostics

The **XGSZ33PDP** box is fitted with M12 connectors for the power supply, the Profibus-DP network, and 1–3 XGCS smart antennas (up to 15 smart antennas by daisy-chaining).

Tap-off box TCSAMT31FP

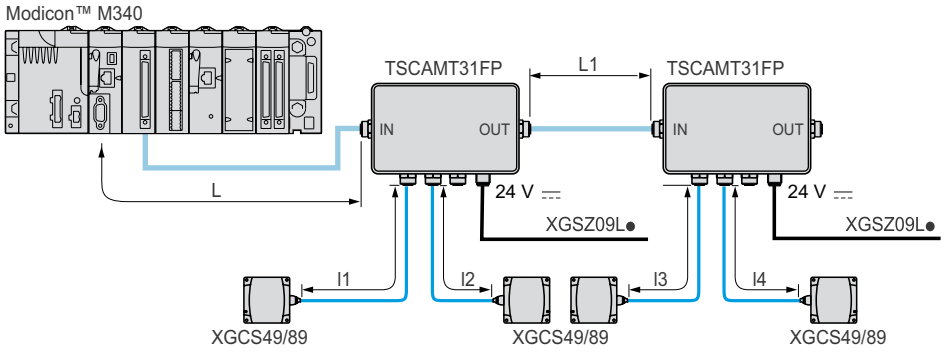
The OsiSense XG tap-off box **TCSAMT31FP** connects XGCS smart antennas to a Modbus or Uni-Telway communication bus.

The **TCSAMT31FP** box is fitted with M12 connectors for the power supply, the Modbus communication bus, and 1–3 XGCS smart antennas (up to 15 smart antennas by daisy-chaining).

It includes a dust- and damp-proof metal enclosure.

Description (continued)

Mounting example for a Modbus™ network

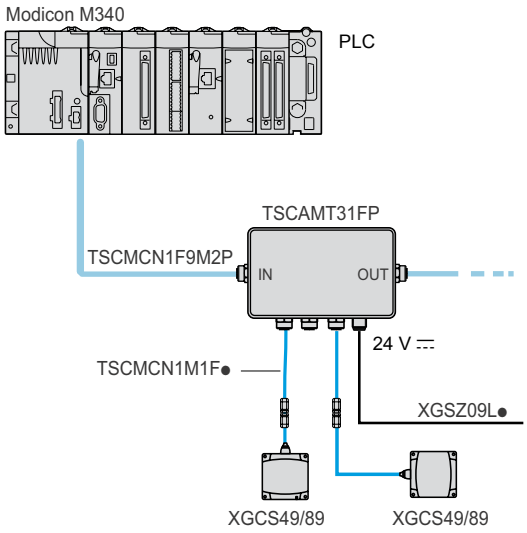


Maximum length of the bus
The maximum length of the bus (L + L1 + I4) depends on the speed of the network:
- 9,600 bd: 1000 m (3280.8 ft)
- 19,200 bd: 500 m (1640.4 ft)

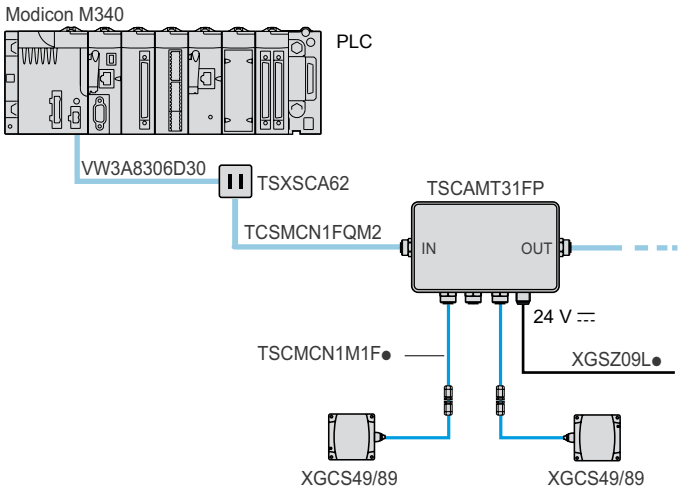
Maximum length of the tap-offs:
I1, I2, and I3: 10 m (32.8 ft)

Example of a connection to a Schneider Electric PLC

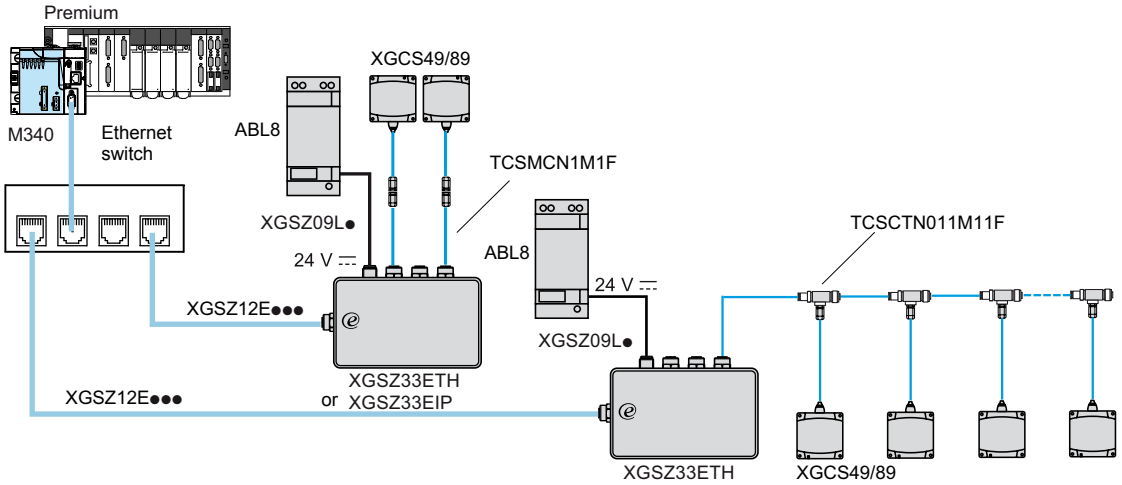
Direct connection



Connection via a TSXSCA62 junction box

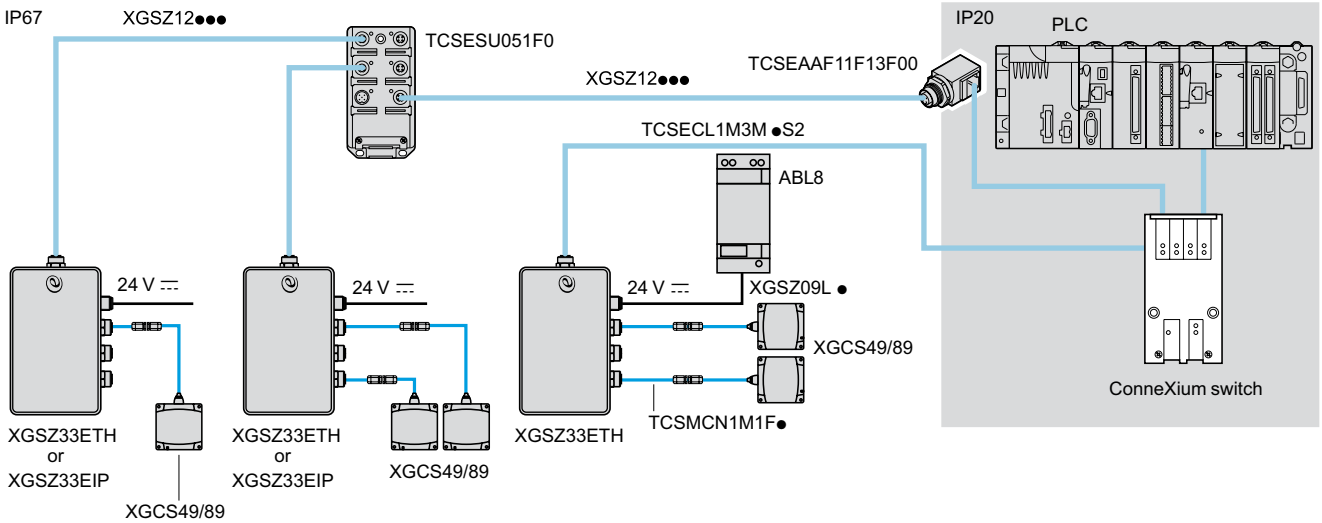


Example of a connection on an Ethernet network

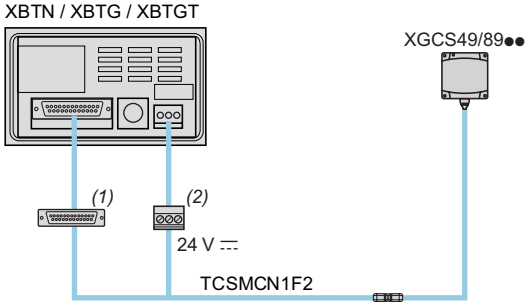


The number of smart antennas connected to each box can be increased by using M12 T-connectors (catalog number TCSCTN011M11F).
Note when using box XGSZ33ETH on Modbus/TCP: To maintain high-performance operation, connect a maximum of eight compact smart antennas. (The Ethernet box has eight communication ports that can be open simultaneously on TCP/IP.) In cases where the I/O scanning function is used (which requires an additional communication port), do not connect more than seven smart antennas. The total length of the side network for smart antennas XGCS49 and XGCS89 is limited to 160 m (525 ft).

Example of a mixed IP20 and IP67 connection on an Ethernet network



Example of a connection to a Magelis™ terminal

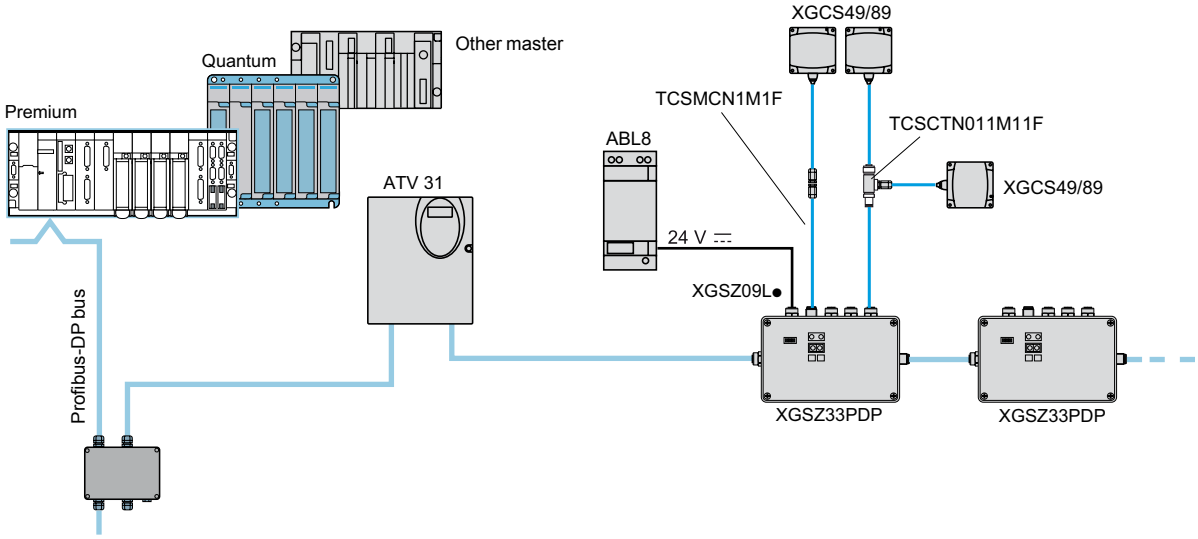


Cable TCSMCN1F2 connections

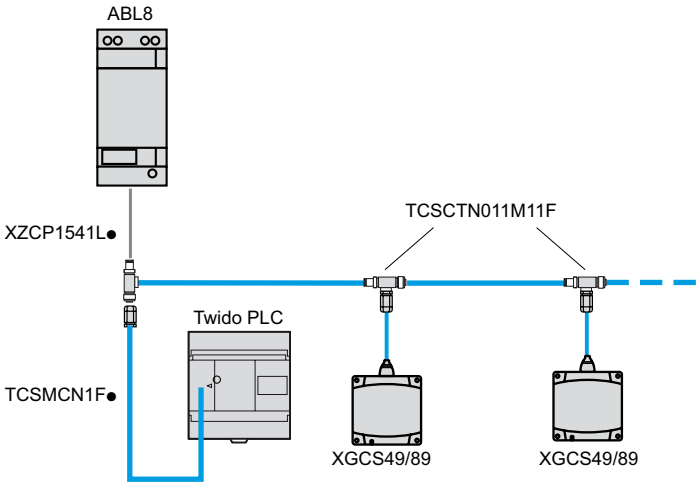
Diagram	Contact	Signal	Wire color
	1	Drain (Modbus-SHLD)	–
	2	24 V⎓	Red
	3	0 V/Modbus-GND	Black
	4	D0	White
	5	D1	Blue

(1) SUB-D 25-pin male connector.
(2) Power supply connector included with the Magelis terminal.

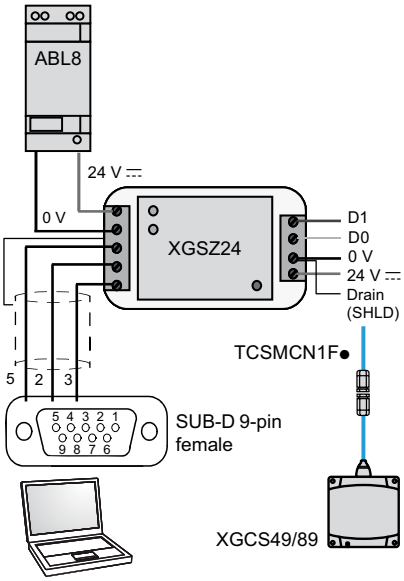
Example of an architecture in a Profibus-DP network



Example of a connection on a Twido™ PLC



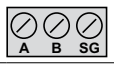
Example of a connection to a PC



Power supply cable connections

XZCP1541L●				Power supply ABL8
Diagram	**Contact**	**Signal**	**Wire color**	**Terminal block**
	1	NC	Brown	–
	2	24 V ⎓	White	24 V ⎓
	3	0 V GND	Blue	0 V GND
	4	NC	Black	–

TCSMCN1F● cable connections

TCSMCN1F●				Twido PLC (with serial interface adapter TWDNAC485T)	
Diagram	**Contact**	**Signal**	**Wire color**	**Terminal block**	**Diagram**
	1	Drain (SHLD)	–	–	
	2	24 V ⎓	Red	–	
	3	0 V GND	Black	SG	
	4	D0 V GND	White	B	
	5	D1	Blue	A	

Compact smart antennas connect directly to the Modbus port of a PLC. Up to 15 compact smart antennas can be linked to the RS-485 port using T-connectors. If the length of the network exceeds 100 m (328 ft), provide a line terminator, catalog number FTXCNTL12.
This cabling system is specific to the OsiSense XG powered network. No other Modbus slave equipment can be connected to it.

OsiSense XG
Radio Frequency Identification System
13.56 MHz
Handheld terminal

Handheld terminal

Main screen

Tag tools

Handheld terminal XGST2020

Functions

3 types of functions are embedded in the terminal:
- Direct operations on RFID tags
- Mapping (operator's predefined screens)
- Configuration

Direct operations on RFID tags

■ **Read/Write words.** Groups of up to 15 words can be read or written from a given starting address. Dates can be shown in several different formats: Decimal, Decimal signed, Binary, Decimal IP, Hexadecimal, ASCII.

■ **Tag copying** from one tag to another. The full tag memory or a partial area can be copied.

■ **Tag initialization.** The full tag memory or a defined area can be written with a value chosen by the operator.

■ **Tag Presence**. A cyclic test of the presence of the tag in front of the smart antenna connected to the terminal. An indicator light and a bargraph show the test results.

■ **Tag Identification**. The RFID protocol, the unique ID, and the user memory size of a tag in front of the smart antenna are detected by a scanner activated by the handheld terminal. The data is displayed on the screen.

Mappings

A mapping is a list of variables stored permanently in the memory of the handheld terminal for quick and easy access by the operators.

Each variable of a mapping is associated with a name. It can be shown in a format selected from numerous possibilities, both in read only or read/write mode. Creation, modification, and backup tools are embedded in the software of the handheld terminal.

Up to 256 mappings can be stored in the memory (each of them identified by a number and a name). Each mapping can contain up to 256 variables. Each variable is defined by its position in the memory of the tags, its size, and its type (word or byte) and its format on the screen.

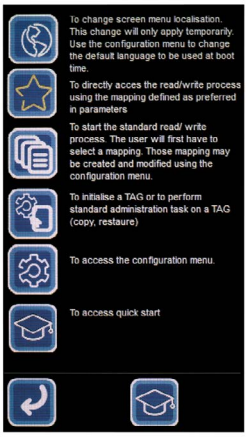
The formats supported by the handheld terminal are:

- Decimal (1 word): 0 to 65535
- Decimal (1 byte): 0 to 255
- Decimal signed (1 byte): -128 to +127
- Decimal IP (2 Words): 0.0.0.0 to 255.255.255.255
- Hexadecimal (4 bytes): 0000 to FFFF
- Boolean bit (one bit): ☐☑
- Binary (1 byte): 00000000 to 11111111
- List (1 byte): 0 to 15—a string, associated with each value of the byte, appears on the screen instead of the value of the byte.
- ASCII string: 1 to 21 characters
- Hex string: 2 to 30 hex characters (1 to 15 bytes)
- Date (8 bytes): YYYY/MM/DD
- Time (2 bytes): HH:MM

Data shown on a mapping can be stored in the memory of the terminal or written in an RFID tag.

A backup of each mapping or of all the mappings can be stored in a USB memory stick connected to the USB socket of the handheld terminal.

Mapping management



Online help

Handheld terminal XGST2020 (continued)

Functions (continued)

Configuration

■ **Updating the terminal**
This function is password protected and gives access to the following:
□ Updating the smart antenna connected to the handheld terminal
□ Changing the boot screen picture by loading a file from a USB memory stick
□ Restoring the handheld terminal to its factory settings
□ Changing the password

■ **Terminal parameters**
This function allows the modification of the following:
□ Screen localization
□ Shutdown delay
□ Preferred mapping number
□ IP and gateway addresses of the Ethernet port
□ Back-lighting level

■ **Mapping management**
This function gives access to the following:
□ Backup and restoration of all user mappings to and from a USB memory stick
□ Export and import of one user mapping to and from a USB memory stick
□ Creation, modification, copying, and erasure of the mappings. Each mapping is password protected.

Online help

Contextual online help is continuously accessible.
In addition, a tutorial on creating a mapping is accessible from the main screen.

Battery management

The handheld terminal is powered by a high capacity lithium-ion battery.
■ The status of the battery is shown on the menu screen.
□ A blue LED flashes when the battery needs recharging.
□ An orange LED flashes while the battery is charging.

PF121919

XGW4F111

PF121920

XGW4F111

Accessories

Accessories for the handheld terminal

The handheld terminal is delivered in a plastic case with the following accessories:

■ A USB charger **XGST2CH** with international plugs. It can be used in conjunction with cradle **XGST2SU** for easier connection to the handheld terminal.
■ A lithium-ion high capacity battery **XGST2BA**
■ A 2 GB USB flash memory stick **XGSZK1** for data transfer between handheld terminals or between a terminal and a PC. This memory stick also contains technical documents on the OSiSense XG RFID: catalogs, training materials, and examples.
■ A stylus for the touchscreen
■ A wrist strap for more secure handling of the terminal
■ An Allen key

Antennas

Two versions of compact smart antennas are available:
■ Compact antenna **XGCS4901201** for mounting on the back of the handheld terminal
■ Wand antenna **XGW4F111** with a flexible head for remote operation on tags located in confined places (such as under pallets)

Docking cradle

The docking cradle **XGST2SU** is recommended for easier battery charging.
It can be wall-mounted or desk-mounted.
The docking cradle is powered by the wall charger (catalog number **XGST2CH**).

OsiSense XG

Radio Frequency Identification System
13.56 MHz

Specifications of electronic tags

Tag type			XGHB411346	XGHB211345	XGHB221346	XGHB320345
Ambient air temperature	Operation	**°C (°F)**	–25 to +90 (–13 to +194)	–25 to +70 (–13 to +158)	–25 to +70 (–13 to +158)	–25 to +70 (–13 to +158)
	Storage	**°C (°F)**	–25 to +120 *(4)* (–13 to +248)	–40 to +85 (–40 to +185)	–40 to +85 (–40 to +185)	–40 to +85 (–40 to +185)
Degree of protection			IP68	IP68	IP68	IP65
Standard supported			ISO 15693	ISO 15693	ISO 15693	ISO 15693
Vibration resistance	Conforming to EN 60068.2.27		2 mm from 5–29.5 Hz / 7 gn from 29.5–150 Hz			
Shock resistance	Conforming to EN 60068.2.6		30 g / 11 ms			
	Conforming to EN 50102		Degree IK02			
Dimensions		**mm**	Ø40 x 8	M18 x 1 x 12	26 x 26 x 13	Ø30 x 3
Housing material			PBT	PBT	PBT	PC
Mounting method			Screw: two 4.2 mm holes	Screw: two 4.2 mm holes	Screw or clip	Screw
Memory capacity		**bytes**	64	256	256	112
Type of memory			EEPROM			
Type of operation			Read/Write			
Nominal sensing distance (Read/Write)	With smart antenna XGCS4901201	**mm (in.)**	40 (1.57)	18 (0.71)	40 (1.57)	48 (1.89)
	With smart antenna XGCS8901201	**mm (in.)**	63 (2.48)	20 (0.79)	55 (2.17)	65 (2.56)
	With smart antenna XGCS4901201 + field expander XGFEC540	**mm (in.)**	30–39 (1.18– 1.54)	—	—	42 (1.65)
	With smart antenna XGCS4901201 + field expander XGFEC2525	**mm (in.)**	35–46 (1.38– 1.81)	—	42 (1.65)	80 (3.15)
Number of read cycles			Unlimited			
Number of write cycles	Guaranteed minimum (per data bit, throughout the temperature range)		100,000			
	At 30°C		2.5 million typical value			
Read time		**ms**	12 + 0.825 x n *(1)*	12 + 0.825 x n *(1)*	12 + 0.825 x n *(1)*	12 + 0.825 x n *(1)*
Write time		**ms**	20 + 11.8 x n *(1)*	19 + 4.1 x n *(1)*	20 + 11.8 x n *(1)*	12 + 5.6 x n *(1)*
Maximum speed XGCS49●●	Read a serial number	**m/s**	1.8	1.8	2.8	3.1
	Read a word *(2)*	**m/s**	0.6	0.6	0.8	1.4
	Read or write 10 words *(2)*	**m/s**	0.2	0.2	0.3	0.7
Maximum speed XGCS89●●	Read a serial number	**m/s**	3	3.2	4.2	5.8
	Read a word *(2)*	**m/s**	0.9	1.1	2.6	2.7
	Read or write 10 words *(2)*	**m/s**	0.4	0.6	0.5	0.9
Data retention time			10 years			
Mounting on metal support			Yes	No	Yes *(3)*	No

(1) n = number of 16-bit words.
(2) With use of the Auto Read/Write function.
(3) Installation notes: see page 23.
(4) Storage temperature: up to 160 °C for 50 hours; up to 220 °C in cycles

XGHB90E340	XGHB444345	XGHB445345	XGHB320246	XGHB440245	XGHB440845	XGHB443245
–25 to +50 (–13 to +122)	–25 to +70 (–13 to +158)	–25 to +70 (–13 to +158)	–25 to +70 (–13 to +158)	–25 to +70 (–13 to +158)	–25 to +70 (–13 to +158)	–25 to +70 (–13 to +158)
–40 to +55 (–40 to +131)	–40 to +85 (–40 to +185)	–40 to +85 (–40 to +185)	–40 to +85 (–40 to +185)	–40 to +85 (–40 to +185)	–40 to +85 (–40 to +185)	–40 to +85 (–40 to +185)
IP65	IP68	IP68	IP65	IP68	IP68	IP68
ISO 15693	ISO 14443	ISO 14443	ISO 15693	ISO 15693	SO 14443	SO 14443
2 mm from 5–29.5 Hz / 7 gn from 29.5–150 Hz						
30 g / 11 ms			30 g / 11 ms			
Degree IK02			Degree IK02			
54 x 85.5 x 1	40 x 40 x 15	40 x 40 x 15	Ø30 x 3	40 x 40 x 15	40 x 40 x 15	40 x 40 x 15
PVC	PBT	PBT	PC	PBT	PBT	PBT
—	Screw or clip	Screw or clip	Screw	Screw or clip	Screw or clip	Screw or clip
256	3408	13632	2000	2000	8192	32768
EEPROM			FeRAM			
Read/Write			Read/Write			
70 (2.76)	33 (1.30)	30 (1.18)	45 (1.77)	45 (1.77)	25 (0.98)	25 (0.98)
100 (3.94)	48 (1.89)	40 (1.57)	65 (2.56)	65 (2.56)	39 (1.54)	39 (1.54)
90 (3.54)	—	—	50 (1.97)	50 (1.97)	—	—
150 (5.91)	—	—	40 (1.57)	40 (1.57)	—	—
Unlimited			10^{10}			
100,000			10^{10}			
2.5 million typical value			—			
12 + 0.825 x n *(1)*	9.25 + 0.375 x n *(1)*	16.25 + 0.38 x n *(1)*	7 + 2 x n *(1)*	7 + 2 x n *(1)*	6 + 0.25 x n *(1)*	6 + 0.25 x n *(1)*
20 + 11.8 x n *(1)*	13 + 0.8 x n *(1)*	20 + 0.8 x n *(1)*	7 + 2.4 x n *(1)*	7 + 2.4 x n *(1)*	6 + 0.25 x n *(1)*	6 + 0.25 x n *(1)*
5.3	3.1	2.6	2.1	2.1	2.3	2.3
1.6	1.4	1	1.5	1.5	1.8	1.8
0.6	1.2	0.9	0.6	0.6	1.7	1.7
7.1	4.8	4.2	3,5	3.5	3.8	3.8
4.0	2.7	2	2.5	2.5	3.0	3.0
0.8	1.8	1.5	1	1	2.6	2.6
10 years						
No	Yes *(3)*	Yes	No	Yes	Yes	Yes

OsiSense XG

Radio Frequency Identification System
13.56 MHz

Specifications of OsiSense XG compact smart antennas

Smart antenna type			XGCS8901201	XGCS4901201	XGW4F111
Certifications			UL, FCC part 15c, CE		
Conformity to standards			EN 301489-1, EN 301489-3, ETS 300330-1 and ETS 300330-2		
Ambient air temperature	For operation	**°C**	–25 to +70 (–13 to 158°F)		
	For storage	**°C**	–40 to +85 (–40 to 158°F)		
Degree of protection	Conforming to IEC 60529		IP65		
Vibration resistance	Conforming to EN 60068.2.27		2 mm from 5–29.5 Hz / 7 gn from 29.5–150 Hz		
Shock resistance	Conforming to EN 60068.2.6		30 g / 11 ms		
	Conforming to EN 50102		Degree IK02		
Resistance to interference	Conforming to IEC 61000		Resistance to electrostatic discharge, radiated electromagnetic fields, fast transients, electrical surges, conducted and induced interference, and network frequency magnetic fields.		
Dimensions, W x H x D		**mm**	Flat form: 80 x 80 x 26	Flat form: 40 x 40 x 15	290 x 40 x 25
RFID frequency		**MHz**	13.56		
Nominal sensing distance Depending on the associated tag		**mm (in.)**	20–100 (0.79–3.94),	10–70 (0.39–2.76)	
Type of associated tag			ISO 15693 and ISO 14443 standard tags. Automatic detection of the tag type.		
Compatible RFID microchip examples			Fujitsu (MB89R118), INSIDE (micropass) NXP (I-Code SL2, SL1, Ultralight, Std 1K/4K, Desfire), STM (CRIX4K) Texas (Tag-it HFI), µEM4135		
Nominal supply voltage		**Vdc**	24 PELV ⎓ (protective extra-low voltage)		
Supply voltage limits (including ripple)		**Vdc**	19.2–29 ⎓		
Consumption		**mA**	< 60		
Serial link	Type		RS-485		
	Protocol		Modbus RTU or Uni-Telway		Modbus RTU
	Speed	**Bauds**	9,600–115,000 (automatic detection)		
Display			1 dual color LED for the communication network: Modbus / Uni-Telway 1 dual color LED for RFID communication: presence of tag / smart antenna / tag dialog		
Connections			A single, shielded M12 connector, 5-pin male, A coding, for connection to the communication network and power supply.		
Tightening torque	Screws	**N•m**	< 3	< 1	—

Specifications of handheld terminal XGST2020

Certifications			CE
Conformity to standards			IEC 61000-6-2, IEC61000-6-4
Ambient air temperature	For operation	**°C**	0 to +45 (+32 to +113°F)
	For storage	**°C**	–20 to +45 (–4 to +113°F)
Materials	Housing		ABS
Power supply	Internal		Battery, lithium-ion 3.7 V / 4,000 mAh. Full charge duration: 8 hours
	Connector for charging		Mini USB
Autonomy	Typical		> 8 hours (reading a tag each minute, brightness of the screen = standard)
	Minimum		> 3 hours (continuous reading)
Charging time	Maximum		< 8 hours (to fully charge a completely flat battery)
Degree of protection	Conforming to IEC 60529		IP40
	Conforming to IEC 62262		IK02 (touchscreen)
	Drop test		Free fall on concrete ground: 1 m (39.37 in.)
Connection to RFID reader serial link	Connector		M12 female socket
	Type		RS485
	Protocol		Modbus RTU - Master
	Speed	**Bauds**	115,000
External port			USB for memory stick (2 GB maximum)
Operating system			Proprietary operating system
Display			Resistive OLED touchscreen: 480 x 272 pixels, 16 M colors
Signaling			Dual color (blue/orange) power status LED

Specifications of accessories

Type of accessory			XGST2CH charger set	XGST2SU docking cradle for handheld terminal XGST2020
Certifications			CE	—
Input voltage			100–240 V ⎓, 50/60 Hz, 0.3 A maximum	5 V ⎓, 1 A maximum
Outputs			5 V ⎓, 1 A maximum x 2 outputs	5 V ⎓, 0.5 A maximum
Connections	Input		Interchangeable international plugs	Connected to charger XGST2CH
	Output		Mini USB cable, length 1 m (3.28 ft)	Spring contacts

Specifications of connection boxes

Connection box type			Ethernet Modbus/TCP box XGSZ33ETH	Ethernet/IP box XGSZ33EIP	Profibus-DP box XGSZ33PDP
Certifications			UL	ODVA	Profibus
Conformity to standards			CE		
Ambient air temperature	Operation	**°C (°F)**	0 to +70 (+32 to +158)	0 to +55 (+32 to +131)	0 to +55 (+32 to +131)
	Storage	**°C (°F)**	–40 to +85 (–40 to +185)	–25 to +85 (–13 to +185)	–25 to +85 (–13 to +185)
Relative humidity		**RH**	30–95% without condensation		
Degree of protection			IP65		
Supply voltage		**V**	24 PELV ⎓ (limits 19.2–29 V). M12 connector, 4-pin male, A coding	24 PELV ⎓ (limits 21.6–26.4 V). M12 connector, 4-pin male, A coding	
Consumption (connection box only)		**W**	< 1	< 2.5	< 2.5
Smart antenna connection			M12 connector, 5-pin female, A coding. Total length of cables < 160 m (525 ft)		
Electromagnetic interference	Conforming to IEC61000		Level 3		
	Conforming to EN55022		Class B		
Protocol			Modbus TCP/IP	Ethernet/IP	Profibus-DP V1
LED display			- Ethernet network activity (RUN, green) - Collision detection (COL, red) - Diagnostics (STS, yellow) - Fault (Err, red) - Power on (green)	- Ethernet network activity (RUN, green) - Ethernet network activity (OFF, red) - Communication bus (Error, flashing red) - Modbus (RUN, green) - Gateway configuration (green)	- Profibus-DP network activity (RUN, green) - Profibus network activity (OFF, red) - Communication bus (Error, flashing red) - Modbus (RUN, green) - Gateway configuration (green)
Transparent Ready services	Class		A10	—	—
	Standard Web server		IP configuration address	—	—
	Standard communication services		Modbus messaging (read/write of words: 1–123 words per request).	Read/write of words (1–123 per request) via the periodic exchanges service.	Read/write of words (1–49 read per request) via the Profibus-DP periodic exchanges service. Profibus-DP V2 aperiodic exchanges not supported.
Connection	Physical interface		10 BASE-T/100 BASE-TX		RS485
	Data rate		10/100 Mbps		9.6–12000 kbauds, automatic detection of speed
	Medium		Ethernet cable with M12 connection, D coding, catalog number XGSZ12E●● (see page 22)		Profibus cable with M12 connection, B coding

Connection box type			Tap-off box TCSAMT31FP
Certifications			UL
Conformity to standards			CE
Ambient air temperature	For operation	**°C**	–25 to +55 (–13 to +131)
	For storage	**°C**	–40 to +85 (–40 to +185)
Relative humidity		**RH**	30–95% without condensation
Degree of protection			IP65
Supply voltage		**V**	24 PELV ⎓ (limits 19.2–29 V). M12 connector, 4-pin male, A coding
Smart antenna connection			M12 connector, 5-pin female, A coding
Electromagnetic interference	Conforming to IEC61000		Level 3
	Conforming to EN55022		Class B
LED display			Power on (green)

OsiSense XG

Radio Frequency Identification System 13.56 MHz

105909

XGCS4901201

121920A

XGW4F111

105910

XGHB44●●45

105914

XGHB90E340

105911

XGHB221346

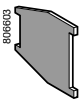
105913

XGHB320345

105912

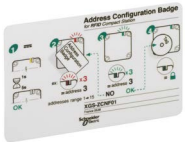
XGHB411346

806603



XGSZ05

105921



XGSZCNF01

Compact smart antennas, 13.56 MHz

Description	Protocols	Dimensions mm	Catalog number	Weight kg (lb)
Compact smart antenna Flat form 80 *(1)* M12 male connector, unterminated	Modbus RTU and Uni-Telway	80 x 80 x 26	**XGCS8901201**	0.257 (0.57)
Compact smart antenna Flat form 40 *(1)* M12 male connector, unterminated	Modbus RTU and Uni-Telway	40 x 40 x 15	**XGCS4901201**	0.057 (0.13)
Wand antenna with flexible head and 1 m cable M12 male connector, unterminated	Modbus RTU	290 x 40 x 25	**XGW4F111**	0.228 (0.50)

Electronic tags *(2)*

Tag type	Nominal sensing distance according to smart antenna (mm) XGCS49●	XGCS89●	Dimensions mm	Sold in lots of	Unit catalog number	Weight kg (lb)
Tag with EEPROM type memory						
Cylindrical 64 bytes	40	63	Ø40 x 8	1	**XGHB411346**	0.025 (0.055)
Cylindrical 256 bytes	18	20	M18 x 1 x 12	5	**XGHB211345**	0.020 (0.04)
Flat form 26 256 bytes	40	55	26 x 26 x 13	1	**XGHB221346**	0.025 (0.055)
Disc 112 bytes	48	65	Ø30 x 3	5	**XGHB320345**	0.005 (0.01)
ISO badge *(3)* 256 bytes	70	100	54 x 85.5 x 1	10	**XGHB90E340**	0.005 (0.01)
Flat form 40 3408 bytes	33	48	40 x 40 x 15	—	**XGHB444345**	0.031 (0.07)
Flat form 40 13632 bytes	30	40	40 x 40 x 15	—	**XGHB445345**	0.031 (0.07)
Tag with FeRAM type memory						
Disc 2000 bytes	45	65	Ø30 x 3	—	**XGHB320246**	0.005 (0.01)
Flat form 40 2000 bytes	45	65	40 x 40 x 15	—	**XGHB440245**	0.031 (0.07)
Flat form 40 8192 bytes	25	39	40 x 40 x 15	—	**XGHB440845**	0.031 (0.07)
Flat form 40 32768 bytes	25	39	40 x 40 x 15	—	**XGHB443245**	0.031 (0.07)

Accessories and documentation

Description	Unit catalog number	Weight kg (lb)
Key for screwing in/unscrewing Ø18 mm cylindrical tag XGHB211●● (Sold in lots of 5)	**XGSZ05**	0.011 (0.02)
Badge For the configuration of smart antenna addresses	**XGSZCNF01**	0.005 (0.01)
OsiSense XG compact smart antennas guide	**DIA4ED3051001**	0.130 (0.29)

(1) Configuration badge XGSZCNF01 included with smart antenna—installation guide ordered separately (catalog number DIA4ED3051001).
(2) Other versions (such as high temperature, adhesive, and flexible tags): consult the Customer Care Center.
(3) Customized versions on request.

OsiSense XG

Radio Frequency Identification System 13.56 MHz

105915

TCSAMT31FP

539828

539829

XGFEC2525

XGFEC540

PF121919

XGST2422

PF121917

XGST2BA

PF121918

XGST2CH

Connection boxes

Description	For use with	Supply voltage	Catalog number	Weight kg (lb)
Ethernet Modbus/ TCP box	Compact smart antennas XGCS49● and XGCS89●	24 V ⎓	**XGSZ33ETH**	1.060 (2.34)
Ethernet/IP box *(1)*	Compact smart antennas XGCS49● and XGCS89●	24 V ⎓	**XGSZ33EIP**	1.060 (2.34)
Profibus-DP box *(1)*	Compact smart antennas XGCS49● and XGCS89●	24 V ⎓	**XGSZ33PDP**	1.060 (2.34)
Tap-off box, 3-channel Modbus and Uni-Telway	Compact smart antennas XGCS49● and XGCS89●	24 V ⎓	**TCSAMT31FP**	1.060 (2.34)

Field expanders

Description	Nominal sensing distance	For use with	Catalog number	Weight kg (lb)
Conveying type field expander Dimensions (mm) 400 x 23 x 50 *(2)*	30–90 mm depending on tag used (only ISO 15693)	Smart antenna XGCS4901201 Tags XGHB90E340 XGHB320345 XGHB221346	**XGFEC540**	0.640 (1.41)
Universal type field expander Dimensions (mm) 250 x 250 x 10 *(2)*	26–150 mm depending on tag used (only ISO 15693)	Smart antenna XGCS4901201 Tags XGHB90E340 XGHB320345	**XGFEC2525**	0.565 (1.25)

OsiSense XG handheld terminal

Description	Composition	Catalog number	Weight kg (lb)
Handheld terminal RFID set in a plastic case *(3)*	■ 1 handheld terminal ■ 1 wrist strap ■ 1 lithium-ion battery ■ 1 charger battery pack ■ 1 stylus ■ 1 USB memory stick	**XGST2422**	1.000 (2.20)

***Note**: RFID antenna ordered separately (see page 14).*

Accessories

Description		Catalog number	Weight kg (lb)
Screen protection sheets Sold in lots of 5		**XGST2FP**	0.005 (0.01)
Styluses Sold in lots of 3		**XGST2ST**	0.006 (0.01)
Docking cradle		**XGST2SU**	0.086 (0.19)

Spare parts

Handheld terminal Terminal unit only (without battery, charger, or RFID reader)		**XGST2020**	0.295 (0.65)
Lithium-ion battery 3.7 V, 4000 mAh		**XGST2BA**	0.078 (0.17)
International charger pack		**XGST2CH**	0.160 (0.35)
USB memory stick 2 GB		**XGSZK1**	0.008 (0.02)

(1) Configuration file and installation guide to be downloaded from www.tesensors.com.
(2) For other dimensions consult the Customer Care Center.
(3) RFID reader ordered separately.

OsiSense XG

Radio Frequency Identification System
13.56 MHz

105925

TCSMCN1FQM2

105927

TCSMCN1F9M2P

106927

TCSCTN011M11F

535803

TCSESU051F0

535625

TCSEAAF11F13F00

106410

ABL8MEM24003

Modbus network connection accessories

Description	Application	Length m	Catalog number	Weight kg (lb)
Modbus shielded connection cable, black, IP67 M12 connectors, male/female, A coding *(1)*	RS-485 connection between a compact smart antenna and a tap-off box or between 2 tap-off boxes, TCSAMT31FP	1	**TCSMCN1M1F1**	0.080 (0.18)
		2	**TCSMCN1M1F2**	0.115 (0.25)
		5	**TCSMCN1M1F5**	0.270 (0.60)
		10	**TCSMCN1M1F10**	0.520 (1.15)
Modbus shielded pre-wired M12 connector, IP67, female/bare wires, A coding *(1)*	Connection between tap-off box TCSAMT31FP and a Modbus/Uni-Telway network (TSXSCA50 T-junction box)	2	**TCSMCN1F2**	0.115 (0.25)
		5	**TCSMCN1F5**	0.270 (0.60)
		10	**TCSMCN1F10**	0.520 (1.15)
Modbus shielded connecting cable, black, M12/SUBD-15, A coding	Connection between tap-off box TCSAMT31FP and a Modbus/Uni-Telway network (TSXSCA62 Y-junction box)	2	**TCSMCN1FQM2**	0.270 (0.60)
Modbus shielded connecting cable, black, M12/Mini-DIN 8-pin, A coding	Modbus connection between tap-off box TCSAMT31FP and a PLC (such as the Twido range)	2	**TCSMCN1F9M2P**	0.350 (0.77)
Modbus SL serial link Shielded dual twisted pair RS-485 main cables	Modbus SL Serial link	100	**TSXCSA100**	5.680 (12.52)
		200	**TSXCSA200**	10.920 (24.07)
		500	**TSXCSA500**	30.000 (66.14)
Network Tee, M12 1M/2F 5-pin, A coding	RS485 network	—	**TCSCTN011M11F**	0.035 (0.08)

Ethernet connection accessories

Ethernet connection accessories for IP67 switch

Description	End fittings	Length m	Catalog number	Weight kg (lb)
Copper connecting cables, straight	1 x IP67 M12 4-pin connector and 1 x RJ45 connector	1	**XGSZ12E4501**	—
		3	**XGSZ12E4503**	—
		10	**XGSZ12E4510**	—
	2 x IP67 M12 4-pin connectors	1	**XGSZ12E1201**	—
		3	**XGSZ12E1203**	—
		10	**XGSZ12E1210**	—
		25	**XGSZ12E1225**	—
Copper connecting cables, elbowed	1 x IP67 M12 4-pin elbowed connector and 1 x RJ45 connector	3	**XGSZ22E4503**	—
		10	**XGSZ22E4510**	—
M12 Ethernet switch IP67, ConneXium *(2)*	—	—	**TCSESU051F0**	0.210 (0.46)
M12 female/RJ45 adapter	Ethernet connection	—	**TCSEAAF11F13F00**	—

Do-It-Yourself copper Ethernet cable and connectors

With the Do-It-Yourself ConneXium range, you can construct copper Ethernet connecting cables of the required length on-site. These cables are for connecting to the Ethernet 110/100 Mbps network. The maximum length of these connecting cables is 80 m. They are quick to assemble using only a knife and ordinary wire cutters—no special tool is required.

Description	Specifications	Length (m)	Catalog number	Weight kg (lb)
Copper Ethernet cable 2 x 24 AWG shielded twisted pairs	Conforms to current standards and approvals	300	**TCSECN300R2**	—
RJ45 connector	Conforms to EIA/TIA-568-D	—	**TCSEK3MDS**	—
M12 connector	Conforms to IEC 60176-2-101	—	**TCSEK1MDRS**	—

Power supplies (Schneider Electric)

Description	Output voltage	Nominal power	Nominal current	Catalog number	Weight
	V ⎓	W	A		kg (lb)
Regulated power supply 100/240 V	24	7	0.3	**ABL8MEM24003**	0.180 (0.40)
		30	1.2	**ABL8MEM24012**	0.520 (1.15)

(1) Holder for the identification legend included with the product.
(2) Other ConneXium connection accessories: refer to www.schneider-electric.com.

OsiSense XG

Radio Frequency Identification System 13.56 MHz

XGSZ24

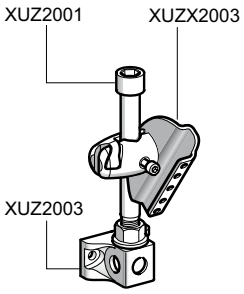
Connection accessories

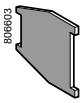
Description	Application	Length m	Catalog number	Weight kg (lb)
Pre-wired M12 connector, 4-pin female supply, A coding *(1)*	24 V ⎓ supply to connection boxes XGSZ33ETH and TCSAMT31FP	2	**XGSZ09L2**	0.115 (0.25)
		5	**XGSZ09L5**	0.270 (0.60)
		10	**XGSZ09L10**	0.520 (1.15)
M12 connector, 5-pin female, A coding	—	—	**XZCC12FDB50R**	0.050 (0.11)
M12 connector, 5-pin male, A coding	—	—	**XZCC12MDB50R**	0.050 (0.11)
Supply connector, screw terminals, M12 straight, A coding	—	—	**XZCC12FDM40B**	0.020 (0.04)
Protective cap (Sold in lots of 10)	M12 female connector	—	**ASI67FACC1**	0.013 (0.03)
Network terminator, M12 male, 120 Ω	—	—	**FTXCNTL12**	0.010 (0.02)
Line adapter, RS-232C/RS-485, without modem signals Supply: 18–30 V ⎓, Consumption: 20 mA Maximum transmission speed: 19,200 bd Mounting on 35 mm ⎍ rail			**XGSZ24**	—

XGSZ3P

Mounting accessories

Description	For use with	Catalog number	Weight kg (lb)
Clip-on 90° mounting bracket	Flat form 40 smart antenna: XGCS4901201 Flat form 40 tags: XGHB44●345	**XSZBC90**	0.060 (0.13)
	Tags XGHB221346	**XSZBE90**	0.060 (0.13)
Clip-on mounting plate	Flat form 40 smart antenna: XGCS4901201 Flat form 40 tags: XGHB44●345	**XSZBC00**	0.025 (0.055)
	Tags XGHB221346	**XSZBE00**	0.025 (0.055)
Mounting plate	For connection boxes TCSAMT31FP and XGSZ33ETH	**XGSZ3P**	0.195 (0.43)
3D mounting system *(2)*	Field expander XGFEC2525		
Support for M12 rod		**XUZ2003**	0.220 (0.49)
M12 rod		**XUZ2001**	0.050 (0.11)
Ball-joint mounting bracket		**XUZX2003**	0.220 (0.49)





XGSZ05

Additional accessories

Description	Sold in lots of	Catalog number	Weight kg (lb)
Key for screwing in and unscrewing Ø 18 mm cylindrical tags	5	**XGSZ05**	0.011 (0.02)
Identification legend for 23 x 4 mm connecting cables	200	**XGSZ08MKW**	0.056 (0.12)

(1) Holder for the identification legend included with the product.

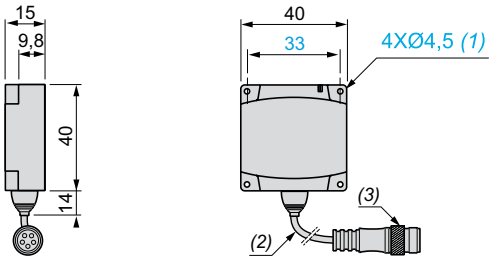
(2) To obtain a 3D mounting system, order the following: rod support **XUZ2003**, *M12 rod* **XUZ2001**, *and ball-joint mounting bracket* **XUZX2003**.

OsiSense XG

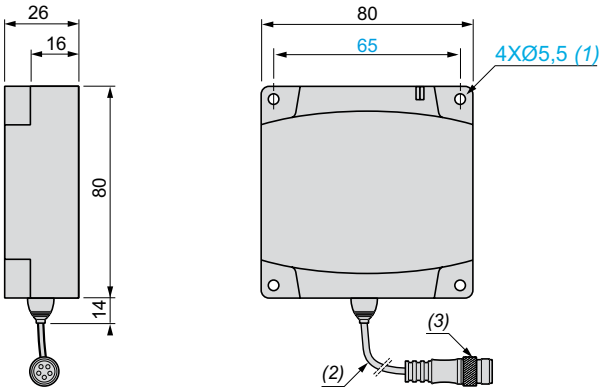
Radio Frequency Identification System
13.56 MHz

Compact smart antennas

XGCS4901201



XGCS8901201

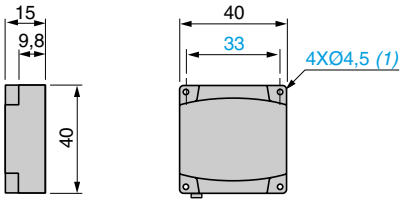


(1) For CHC type screws. *(2) Shielded cable (20 cm long).* *(3) M12 connector, 5-pin male, A coding.*

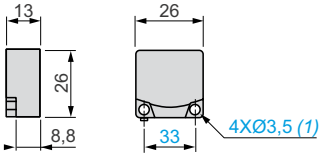
Updatable code electronic tags

Square format tags

XGHB44●●

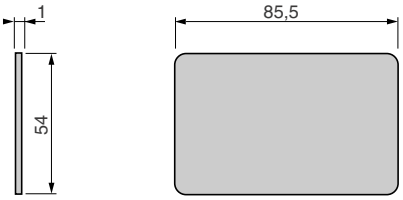


XGHB221346



Rectangular format tags

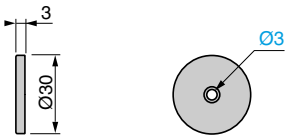
XGHB90E340



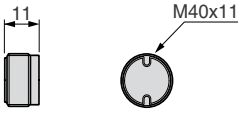
(1) For CHC type screws.

Cylindrical format tags

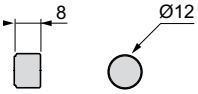
XGHB32●●



XGHB411346

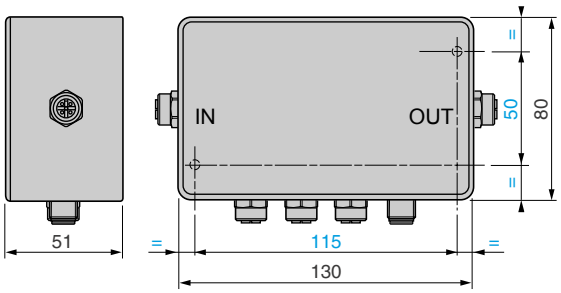


XGHB123345

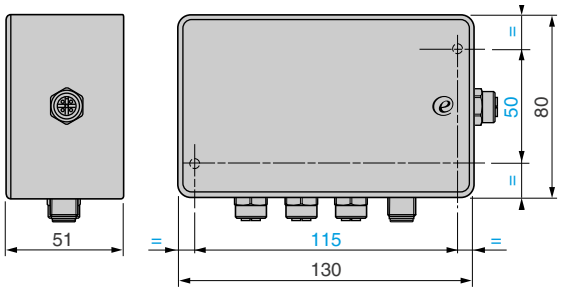


Connection boxes *(1)*

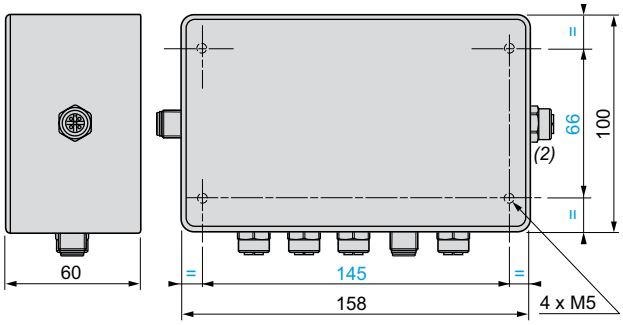
Connection box TCSAMT31FP



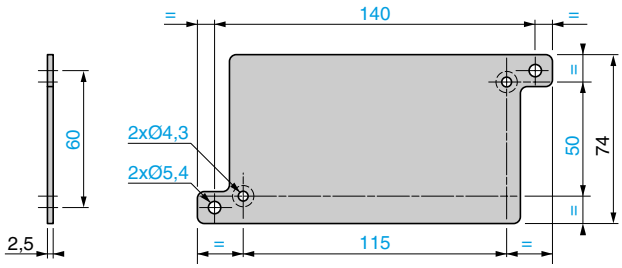
Box XGSZ33ETH (Ethernet)



Boxes XGSZ33PDP (Profibus-DP) and XGSZ33EIP (Ethernet/IP)



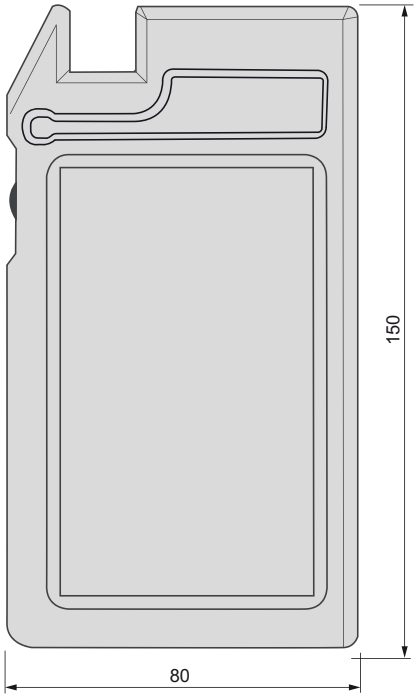
Mounting plate XGSZ3P



(1) Allow a 110 mm clearance zone for connecting the cables.
(2) This connector is only present on the Profibus-DP box.

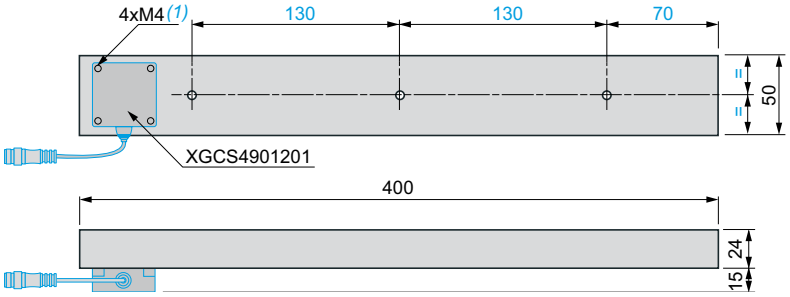
Handheld RFID terminal

XGST2020 (30 mm deep)



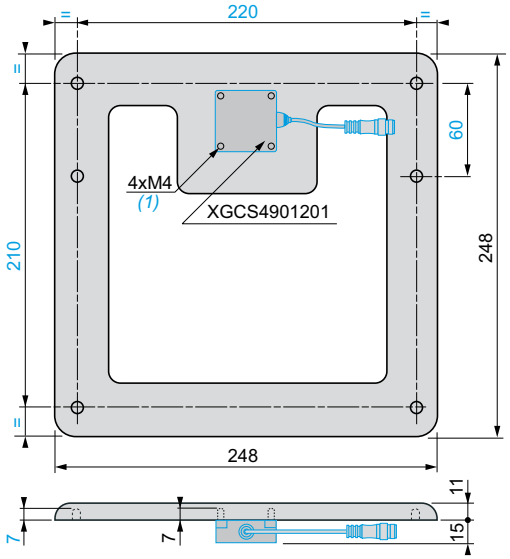
Field expanders

Conveying type XGFEC540



(1) 4 x M4 screws (included).

Universal type XGFEC2525

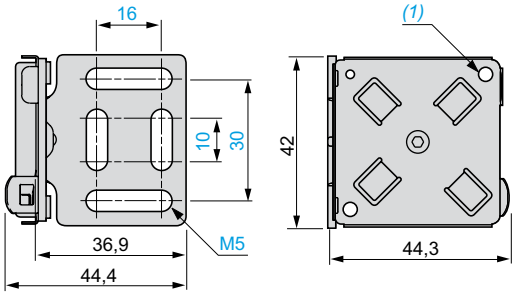


(1) 4 x M4 screws (included).

Mounting brackets

For smart antennas XGCS49●● and tags XGHB44●●

XSZBC90

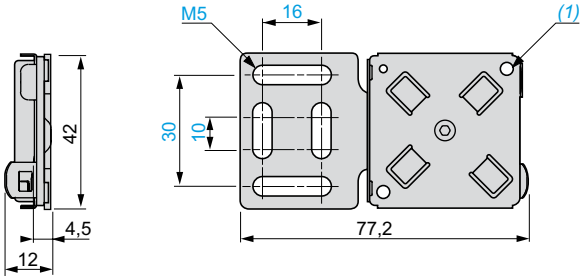


(1) 4 screws, M4 x 14 (included).

Mounting plates

For smart antennas XGCS49●● and tags XGHB44●●

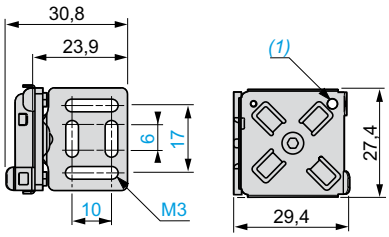
XSZBC00



(1) 4 screws, M4 x 14 (included).

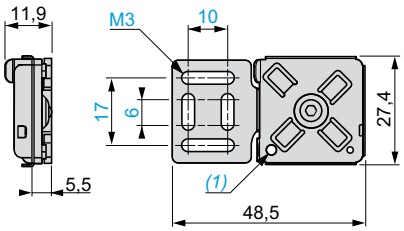
For tags XGHB221346

XSZBE90



(1) 2 screws, M3 x 12 (included).

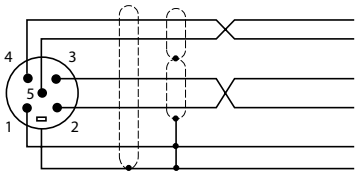
XSZBE00



(1) 2 screws, M3 x 12 (included).

Modbus connections

Smart antennas XGCS●901201



Pin no.	Modbus smart antenna signal
1	Drain (Modbus-SHLD)
2	+24 V ⎓
3	0 V/Modbus-GND
4	D0
5	D1
Connector casing	Shielding

Connection box TCSAMT31FP

Socket to smart antenna cabling

Pin no.	Signal
1 –	Drain (Modbus-SHLD)
2	+24 V ⎓
3	0 V/Modbus-GND
4	D0
5	D1

Socket to power supply cabling

Pin no.	Signal
1	+24 V ⎓
2	+24 V ⎓
3	0 V ⎓
4	0 V ⎓

Socket to another connection box cabling

Pin no.	Signal
1	Drain (Modbus-SHLD)
2	–
3	0 V/Modbus-GND
4	D0
5	D1

Socket to industrial PLC cabling

Pin no.	Signal
1	Drain (Modbus-SHLD)
2	–
3	0 V/Modbus-GND
4	D0
5	D1

Cable connections

TCSMCN1F●

Pin no.	Signal
1 –	Drain (Modbus-SHLD)
2 Red	+24 V ⎓
3 Black	0 V/Modbus-GND
4 White	D0
5 Blue	D1
Connector casing	Shielding

XGSZ09L

Pin no.	Signal
1 Red	+24 V ⎓
2 NC	
3 Black	0 V ⎓
4 NC	

Ethernet and Modbus/TCP connection

Ethernet box XGSZ33ETH

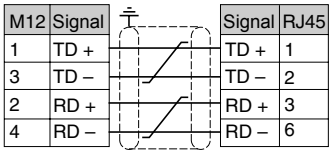
Socket to smart antenna cabling

Pin no.	Signal
1	Ground
2	+24 V ⎓
3	0 V
4	D0
5	D1

Socket to power supply cabling

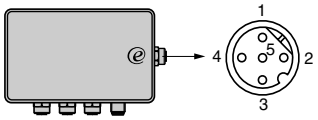
Pin no.	Signal
1	+24 V ⎓
2	+24 V ⎓
3	0 V ⎓
4	0 V ⎓

Cable TCSECL1M3M●●S2



M12	Signal	Signal	RJ45
1	TD +	TD +	1
3	TD –	TD –	2
2	RD +	RD +	3
4	RD –	RD –	6

Socket to Ethernet connection



Ethernet/IP connection

Ethernet/IP box XGSZ33EIP

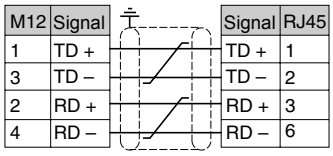
Socket to smart antenna cabling

Pin no.	Signal
1	Ground
2	+24 V ⎓
3	0 V
4	D0
5	D1

Socket to power supply cabling

Pin no.	Signal
1	+24 V ⎓
2	+24 V ⎓
3	0 V ⎓
4	0 V ⎓

Cable TCSECL1M3M●●S2



M12	Signal	Signal	RJ45
1	TD +	TD +	1
3	TD –	TD –	2
2	RD +	RD +	3
4	RD –	RD –	6

Profibus-DP connection

Profibus-DP box XGSZ33PDP

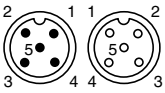
Socket to smart antenna cabling

Pin no.	Signal
1	Ground
2	+24 V ⎓
3	0 V
4	D0
5	D1

Socket to power supply cabling

Pin no.	Signal
1	+24 V ⎓
2	+24 V ⎓
3	0 V
4	0 V

Profibus-DP network connections



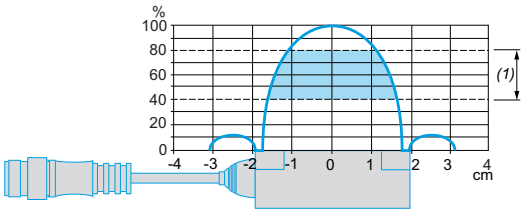
Pin no.	Signal	Description
1	VP	Line terminator polarization
2	RxD/TxD-N	Receive/transmit data (–) (red wire)
3	DGND	GND Profibus
4	RxD/TxD-P	Receive/transmit data (+) (green wire)
5	Shielding	Shielding or ground
Connector casing	Shielding	Shielding or ground

OsiSense XG

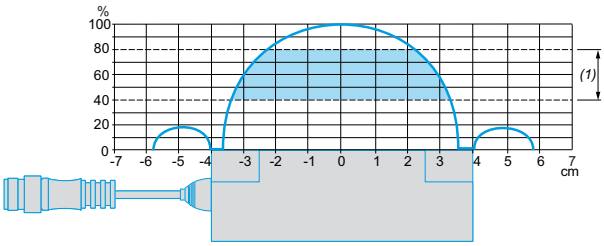
Radio Frequency Identification System
13.56 MHz

Dialog zones of compact smart antennas

XGCS4901201



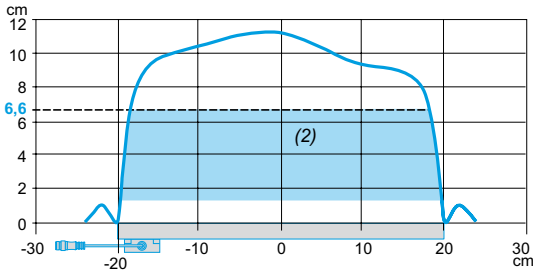
XGCS8901201

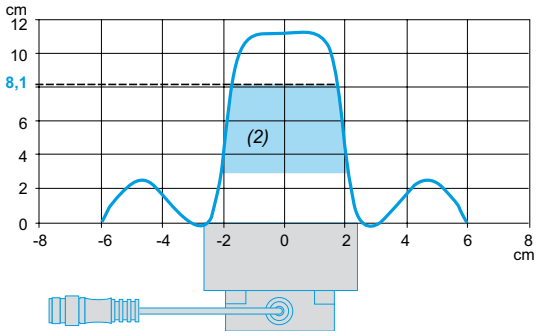


(1) Recommended crossing zone: between 0.4 and 0.8 Sn.

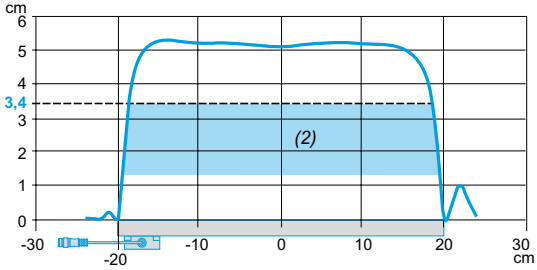
Dialog zones for field expanders

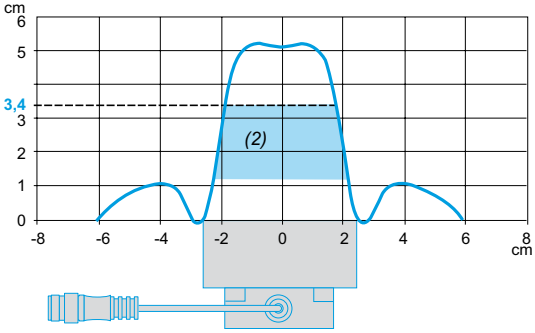
XGFEC540 + XGHB90E340



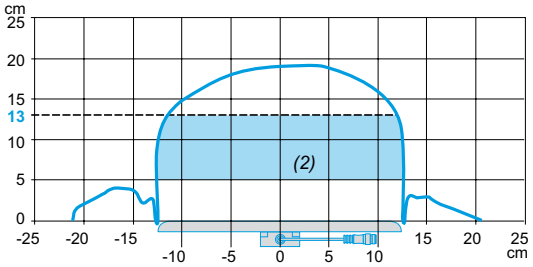


XGFEC540 + XGHB320345

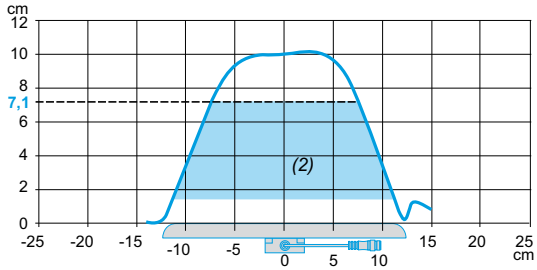




XGFEC2525 + tag XGHB90E340

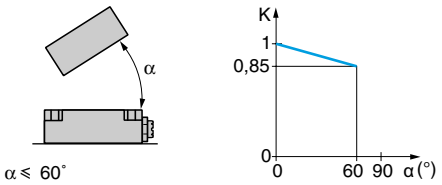


XGFEC2525 + tag XGHB320345



(2) Recommended working zone.

Angular positioning between smart antenna and tag

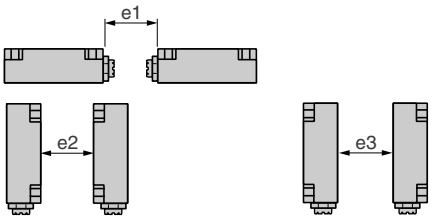


K = correction coefficient to be applied to the nominal sensing distance (Sn). Read distance = Sn × K.

Minimum mounting distances between system components

Distance between smart antennas

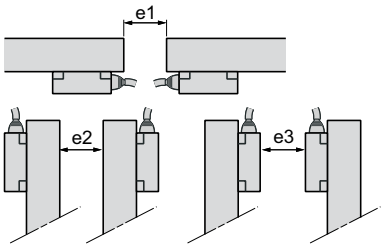
Minimum distance between 2 identical smart antennas according to their positioning and the type of tag used, mm (in.)



Tag	XGC 40 x 40 format			XGC 80 x 80 format		
	e1	e2	e3	e1	e2	e3
XGHB90E340	310 (12.2)	550 (21.7)	120 (4.7)	430 (16.9)	750 (29.5)	280 (11.0)
XGHB221346	200 (7.9)	320 (12.6)	100 (3.9)	280 (11.0)	530 (20.9)	260 (10.2)
XGHB320●●●	140 (5.5)	360 (14.2)	110 (4.3)	310 (12.2)	540 (21.3)	240 (9.4)
XGHB44●●●	90 (3.5)	190 (7.5)	30 (1.2)	310 (12.2)	400 (15.7)	160 (6.3)
XGHB123345	210 (8.3)	180 (7.1)	60 (2.4)	200 (7.9)	370 (14.6)	170 (6.7)

Distance between field expanders

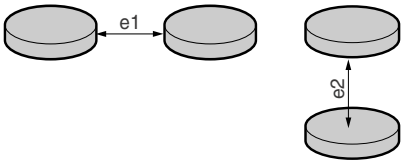
Minimum distance between 2 identical field expanders according to their positioning and the type of tag used, mm (in.)



Tag	Field expander XGFEC540			Field expander XGFEC2525		
	e1	e2	e3	e1	e2	e3
XGHB90E340	195 (7.7)	285 (11.2)	195 (7.7)	570 (22.4)	890 (35.0)	960 (37.8)
XGHB320345	420 (16.5)	540 (21.3)	450 (17.7)	720 (28.3)	1275 (50.2)	1200 (47.2)

Distance between tags

Minimum distance between 2 identical tags according to their positioning and the type of smart antenna used, mm (in.)

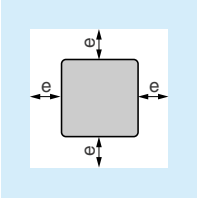


Tag	XGC 40 x 40 format		XGC 80 x 80 format	
	e1	e2	e1	e2
XGHB90E340	35 (1.4)	60 (2.4)	110 (4.3)	140 (5.5)
XGHB221346	50 (2.0)	10 (0.4)	120 (4.7)	50 (2.0)
XGHB320345	70 (2.8)	50 (2.0)	190 (7.5)	60 (2.4)
XGHB444345	20 (0.8)	10 (0.4)	70 (2.8)	40 (1.6)
XGHB445345	10 (0.4)	10 (0.4)	60 (2.4)	10 (0.4)
XGHB440845	30 (1.2)	10 (0.4)	60 (2.4)	10 (0.4)
XGHB443245	30 (1.2)	10 (0.4)	60 (2.4)	10 (0.4)

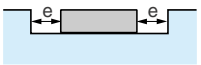
Minimum permissible mounting distances in a metal structure

Smart antennas and tags

Smart antennas XGCS49/S89 and tags XGHB221346/ XGHB44●●



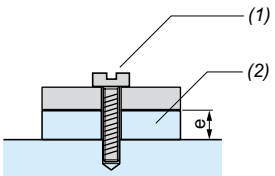
e ⩾ 20 mm (0.8 in.)



e ⩾ 20 mm (0.8 in.)

Tag XGHB32●●

No metal parts within 15 mm (0.6 in.) of the tag.



e ⩾ 15 mm (0.6 in.)

(1) Tightening torque ⩽ 1 N.m (8.9 lb-in)
(2) Insulating material.

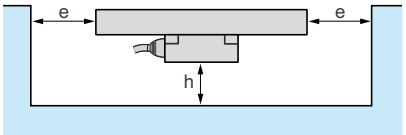
Tags XGHB90E340, XGHB211345

No metal parts within 25 mm (1.0 in.) of the tag.

Tags	Nominal sensing distance Sn, mm (in.)		Reduced sensing distance with presence of metal, mm (in.)	
	XGCS49	XGCS89	XGCS49	XGCS89
XGHB90E340	70 (2.8)	100 (3.9)	58 (2.3)	80 (3.1)
XGHB221346	40 (1.6)	55 (2.2)	30 (1.18)	33 (1.30)
XGHB320345	48 (1.89)	65 (2.6)	45 (1.77)	56 (2.2)
XGHB411346	30–39 (1.18– 1.54)	35–46 (1.38– 1.81)	24–31 (0.9–1.2)	28–37 (1.1– 1.5)
XGHB444345	33 (1.30)	48 (1.89)	28 (1.1)	34 (1.3)
XGHB445345	30 (1.18)	40 (1.6)	24 (0.9)	28 (1.1)
XGHB440245	45 (1.77)	65 (2.6)	30 (1.18)	45 (1.77)
XGHB440845	25 (1.0)	39 (1.54)	20 (0.8)	28 (1.1)
XGHB443245	25 (1.0)	39 (1.54))	20 (0.8)	28 (1.1)

Field expanders

	e, mm (in.)	**h**, mm (in.)
XGFEC540	15 (0.6)	30 (1.18)
XGFEC2525	0	75 (2.8)



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Schneider Electric USA, Inc.
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Dayton, Ohio 45420
(800) 435-2121
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Schneider Electric Canada, Inc.
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