

Sensors

Proximity, Photoelectric, and Ultrasonic Sensors, Limit Switches, Pressure Sensors, Machine Safety, Encoders, RFID, and Machine Cabling



10—OsiSense® XG Radio Frequency Identification System 13.56 MHz

Selection guide	10/2
■ Introduction, Description	10/4
■ Specifications	10/10
■ Catalog Numbers	10/12
■ Dimensions	10/16
■ Connections	10/18
■ Operating Curves	10/20
■ Installation Information	10/21

OsiSense® XG

Radio Frequency Identification System
13.56 MHz

Applications Numerous and varying applications in the industrial, logistic and building sectors: flexible production workshops, traceability, access control, etc.

Compact stations, 13.56 MHz **Flat form 40** **Flat form 80**





Dimensions, W x H x D (mm)	40 x 40 x 15	80 x 80 x 26
Protocols	Modbus® RTU and Uni-Telway™	
Nominal sensing distance depending on associated tag, mm (in.)	18 to 70 (0.71 to 2.76)	20 to 100 (0.79 to 3.94)
Station type	XGCS4901201	XGCS8901201
Page	10/16	

Electronic tags **Flat form 40** **ISO badge (1)** **Disc** **Flat form 26** **Cylindrical**



Dimensions, W x H x D (mm)	40 x 40 x 15					54 x 85.5 x 0.8	Ø 30 x 3	Ø 30 x 3	26 x 26 x 13	M18 x 1 x 12
Type of memory	EEPROM		FeRAM			EEPROM		FeRAM	EEPROM	
Memory capacity (bytes)	3,408	13,632	2048	8192	32,768	256	112	2048	256	256
Nominal sensing distance, mm (in.) (3)	With station XGCS49●		—			70 (2.76)		45 (1.77)		18 (0.71)
	With station XGCS89●		—			100 (3.94)		65 (2.56)		20 (0.79)
Time (ms) (4)	Read (2)		9.25 + 0.375 x n	16.25 + 0.375 x n	2 x n	6 + 0.25 x n	6 + 0.25 x n	12 + 0.825 x n		2 x n
	Write (2)		13 + 0.8 x n	20 + 0.8 x n	2.4 x n	6 + 0.25 x n	6 + 0.25 x n	20 + 11.8 x n	12 + 5.6 x n	2.4 x n
Tag type	XGH B444345	XGH B445345	XGH B440245	XGH B440845	XGH B443245	XGH B90E340	XGH B320345	XGH B320246	XGH B221346	XGH B211345
Page	16									

(1) Customized versions on request.
 (2) n = number of 16-bit words.
 (3) Metal mounted: See the sensing distances under "Minimum permissible mounting distances in a metal structure" on page 10/21.
 (4) Does not include the network transfer time.

Connection boxes	Ethernet box	Tap-off box	PROFIBUS® box
			
Protocols	Modbus TCP/IP	Modbus and Uni-Telway	PROFIBUS-DP
Associated compact stations	XGCS49● and XGCS89●		
Supply voltage	24 Vdc		
Connection box type	XGSZ33ETH	TCSAMT31FP	XGSZ33PDP
Page	6		

Field expanders	Conveying type	Universal type
		
Dimensions, W x H x D (mm)	400 x 23 x 50	250 x 250 x 10
Dialogue area, W x H (mm)	380 x 45	230 x 230
Associated compact stations	XGCS4901201	
Nominal sensing distance depending on associated tag (mm)	30 to 90	26 to 150
Field expander type	XGFEC540	XGFEC2525
Page	7	

Portable terminal	For 13.56 MHz RFID diagnostics
	
Function	Read/Write operations on electronic tags and diagnostics on compact stations
Operating system	Microsoft Windows CE.NET Professional version 4.2
Terminal type	XGSTP401
Page	10/13

OsiSense XG accessories	Cables, adaptors, mounting plates, etc.
Pages	10/13 to 10/15

Operating principle

RFID is a term used for radio frequency identification systems. The frequencies range between 50 kHz and 2.5 GHz. The most widely used is 13.56 MHz.

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

The tag contains the information associated with the object to which the tag is attached. When a tag passes through the field generated by the reader station, it detects the signal and exchanges the read or write data between its memory and the reader station.

The applications are numerous and include the following:

- Logistics: dispatch, receipt, transit
- Tracking and sorting of baggage
- Automatic tolls
- Access control

The OsiSense XG radio frequency identification system is also suited to difficult environments (humidity, temperature, mechanical shock, vibration, dust, etc.).

OsiSense XG Radio Frequency Identification System

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

The XG RFID system integrates Modbus RTU, Uni-Telway, Modbus TCP/IP, and PROFIBUS-DP protocols.

The OsiSense XG RFID system offer includes:

- Two models of 13.56 MHz compact stations (read/write)
- Six models of 13.56 MHz electronic tags
- One portable RFID diagnostics terminal
- Three models of network connection boxes
- Two models of field expanders (accessories that allow you to adapt the shape of the dialog zone between the tag and the compact station)
- Connection and mounting accessories

Setup

XG RFID compact stations 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 (speed, format, parity, protocol, etc.)
- Configuration of the network address (1 to 15) using the badge included with the station
- Read/write compatibility with the majority of 13.56 MHz tags on the market
- Low sensitivity to metal environments

Installation

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

- quick connection using the M12 connector
- clip-on mounting

An extensive range of connecting cables and adapter boxes allow the OsiSense XG stations to be easily connected to communication networks.

Description

XG RFID 13.56 MHz compact stations (1)

XGCS stations allow the reading and writing of 13.56 MHz RFID tags that comply to standards ISO 15693 and ISO 14443 A and B.

2 models of XG RFID compact stations are available:

- Format C compact station: XGCS490●●●●:
 - Dimensions (mm): 40 x 40 x 15
 - Nominal sensing distance: 18–70 mm (0.71–2.76 in.), depending on the associated tag
- Format D compact station: Station XGCS890●●●●:
 - Dimensions (mm): 80 x 80 x 26
 - Nominal sensing distance: 20–100 mm (0.79–3.94 in.), depending on the associated tag

(1) For station and tag selection according to passing speeds, see page 10/19.



Compact station, Flat form 40



Compact station, Flat form 80

OsiSense® XG

Radio Frequency Identification System

13.56 MHz

XG RFID 13.56 MHz compact stations (continued)

■ **Functions integrated into compact stations:** XG RFID compact stations integrate functions that simplify communication among the tags, the stations, and the controller (PLC, PC, etc.). These built-in functions are activated by standard reading/writing of word requests sent by the PLC:

- **Firmware version:** the station is interrogated to read its version
- **Reset:** the station is reinitialized and assumes its factory default configuration (network address at 1, transmission speed at 19,200 Bd, parameters deleted)
- **Init:** the station is reinitialized and operates as if reconnected to the supply (address unchanged, transmission speed unchanged, parameters deleted)
- **Sleep mode:** the transmission of the electromagnetic field of the station is only activated on its receipt of a read or write instruction. This mode reduces the power consumption of the station and enables the suppression of interference when the stations are close to each other
- **Auto Read/Write:** This mode enables the station to automatically execute up to 10 read or write instructions (up to 128 write words and up to 126 read words) in a tag as soon as it enters the dialog zone

XG RFID electronic tags (1)

XGHB electronic tags offer the following advantages:

- fast access to the data
- wide range of memory capacities
- security of access to the contents
- operation without battery
- positioning flexibility
- protection suited to the environmental conditions

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

Portable 13.56 MHz RFID diagnostics terminal

The portable terminal **XGSTP401** is designed for use in industrial applications. Its rugged structure combined with its numerous functions make it suitable for applications in difficult environments. It operates on Microsoft® Windows® CE.NET Professional version 4.2 operating system. The 13.56 MHz RFID function and OsiSense XG RFID system software installed on the portable terminal allow maintenance operations to be performed on the electronic tags and compact stations.

Transfer of data to a PC is made via an RS-232 communication port.

The portable terminal **XGSTP401** comprises a:

- 1 CF (Compact Flash) format expansion connector
- 2 Color touchscreen
- 3 Keypad (45 keys)
- 4 RS-232 port

The following accessories are included with the terminal:

- PC connecting cable
- OsiSense XG RFID system software (installed)
- battery, universal battery charger, 3 styluses, protective cover
- user guide

Field expander

Field expanders are accessories designed to operate with the XG RFID stations. They allow you to adapt the shape of the dialog field of XGCS4901201 stations to conveying/handling applications. The concept is a connection-free induction link between the station and the field expander. Two standard models are available:

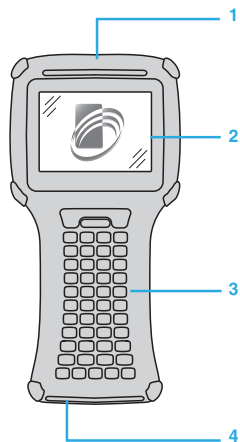
- The conveyor model **XGFEC540** detects ISO 15693 tags on a narrow strip covering the width of the conveyor (mounted between two rollers of the conveyor)
 - Dimensions (mm): 400 x 23 x 50
 - Nominal sensing distance: 30–90 mm (1.18–3.54 in.) depending on the associated tag
- The universal model **XGFEC2525** increases the detection area and distance of ISO 15693 tags, which also permits higher passing speeds of the tags
 - Dimensions: 250 x 250 x 10
 - Nominal sensing distance: 26–150 mm (1.02–5.90 in.) depending on the associated tag
- Read/write compatibility with the majority of the 13.56 MHz/ISO 15693 tags on the market

(NOTE: These accessories are not compatible with ISO 14443 tags)

(1) For station and tag selection according to passing speeds, see page 10/19.



Electronic tags



Portable diagnostics terminal



Field expanders

OsiSense® XG

Radio Frequency Identification System

13.56 MHz

XG RFID connection boxes

Three types of quick connection boxes are available:

- Ethernet box **XGSZ33ETH** for an Ethernet Modbus TCP/IP network
- Tap-off box **TCSAMT31FP** for a Modbus or Uni-Telway communication bus
- PROFIBUS box **XGSZ33PDP** for a PROFIBUS-DP network

Ethernet box XGSZ33ETH

The XG RFID Ethernet box **XGSZ33ETH** allows you to connect XGCS stations to an Ethernet network (Modbus TCP/IP protocol).

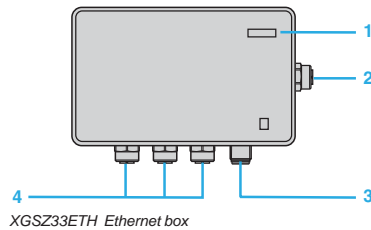
It provides PLC or PC access to the following functions of XGCS stations:

- reading/writing of tags
- control and checking
- monitoring
- diagnostics

The **XGSZ33ETH** Ethernet box is fitted with M12 connectors. It is used to connect the power supply, the Ethernet network, and 1–3 XGCS stations.

It comprises a sealed metal enclosure fitted with the following:

- 1 Power On and Ethernet signaling LEDs
- 2 One Ethernet socket, M12 type, D coding
- 3 One power supply socket, M12 type, 4-pin male
- 4 3 sockets, M12 type female, A coding, for connecting 1–3 XGCS stations.



XGSZ33ETH Ethernet box

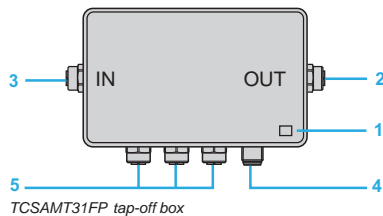
Tap-off box TCSAMT31FP

The XG RFID tap-off box **TCSAMT31FP** allows you to connect XGCS stations to a Modbus or Uni-Telway communication bus.

The **TCSAMT31FP** tap-off box is fitted with M12 connectors. It is used to connect the supply, the Modbus communication bus, and 1–3 XGCS stations.

It comprises a sealed metal enclosure fitted with the following:

- 1 One green LED indicator: Power On
- 2 One network output socket, M12 type 5-pin female, A coding
- 3 One network input socket, M12 type 5-pin male, A coding
- 4 One power supply socket, M12 type 4-pin male, A coding
- 5 3 sockets, M12 type female, A coding, for connecting 1–3 compact XGCS stations



TCSAMT31FP tap-off box

PROFIBUS box XGSZ33PDP

The XG RFID PROFIBUS box **XGSZ33PDP** allows you to connect XGCS stations to a PROFIBUS-DP network.

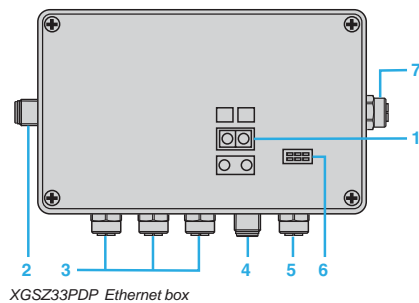
It provides PLC or PC access to the functions of XGCS stations:

- reading/writing of tags
- control and checking
- monitoring
- diagnostics

The **XGSZ33PDP** PROFIBUS box is fitted with M12 connectors. It is used to connect the power supply, the PROFIBUS-DP network, and 1–3 XGCS stations.

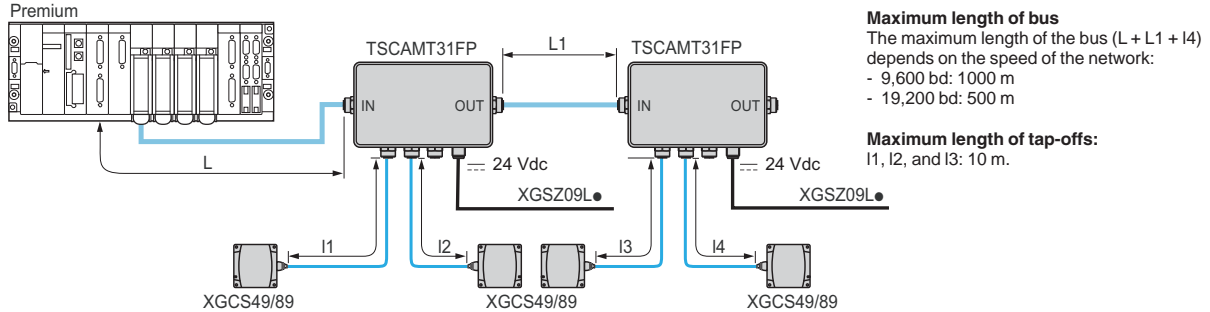
It comprises a sealed metal enclosure fitted with the following:

- 1 Two coding wheels for configuration of the network address
- 2 One PROFIBUS network input socket, M12 type 5-pin male, B coding
- 3 3 sockets, M12 type female, A coding, for connecting 1–3 XGCS stations
- 4 One power supply socket, M12 type 4-pin male, A coding
- 5 One configuration port (M12 type female, A coding)
- 6 PROFIBUS network, Modbus network, and connection box status signaling LEDs
- 7 One PROFIBUS network output socket, M12 type 5-pin female, B coding.



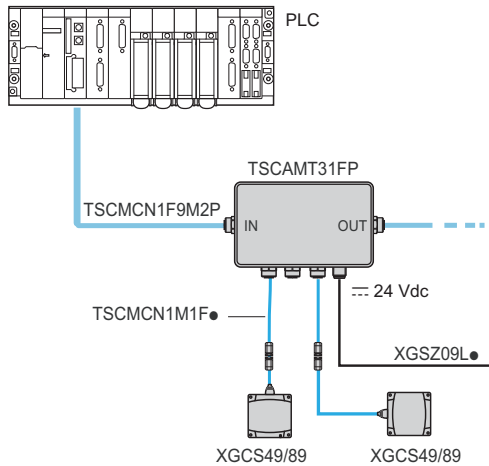
XGSZ33PDP Ethernet box

Mounting example for Modbus® network

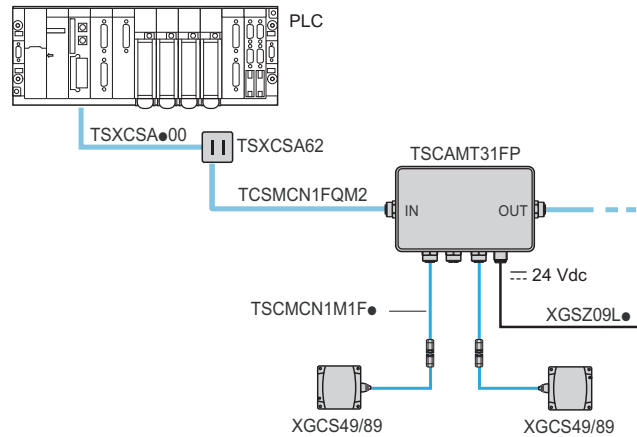


Example of connection to a Schneider Electric PLC

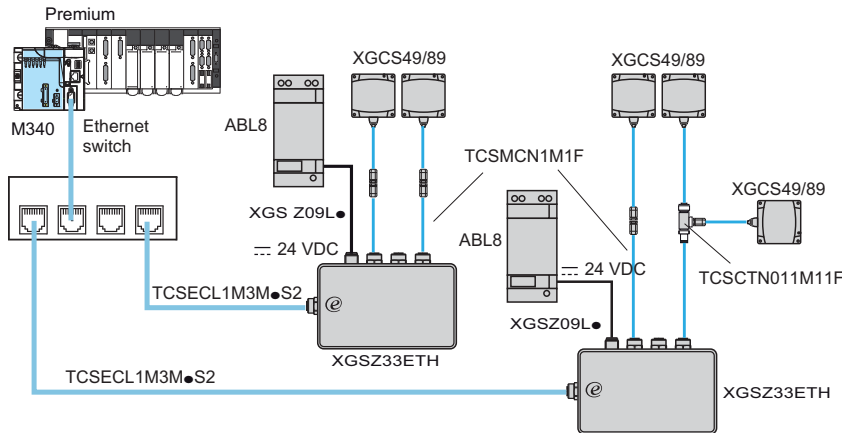
Direct connection



Connection via a TSXCSA62

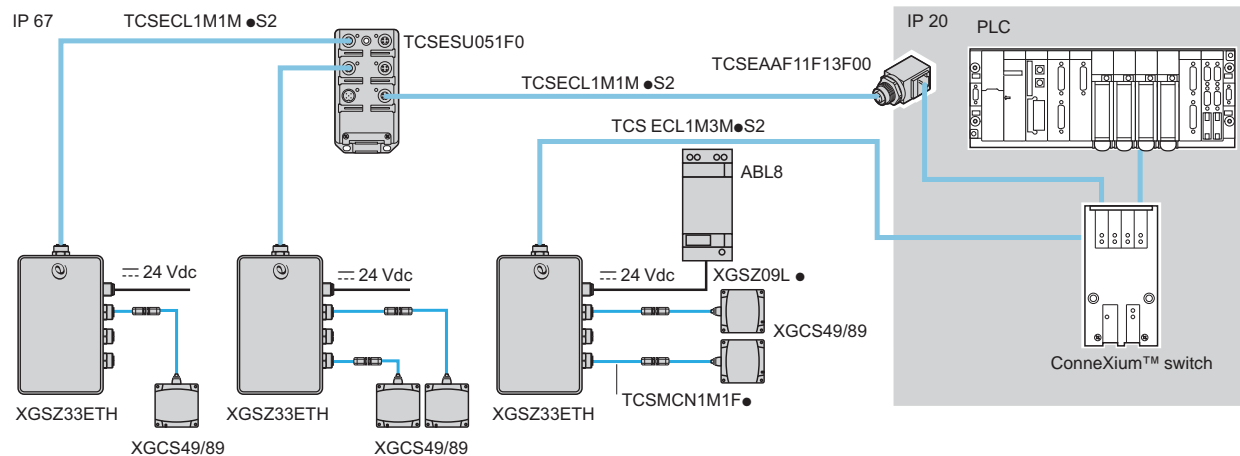


Example of a connection on an Ethernet Modbus® TCP/IP network

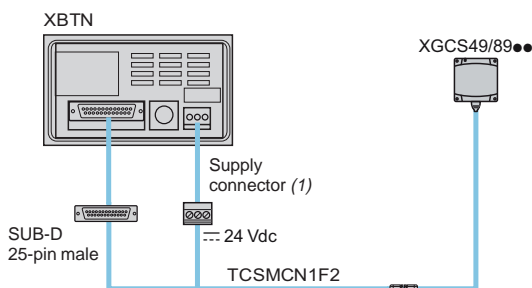


The number of stations connected to each box can be increased by using the M12 T-connector (catalog number TCSCN1M11F). To maintain high-performance operation, we recommend that a maximum of 8 compact stations be connected (the Ethernet box has eight communication ports that can be simultaneously open 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 stations. The total length of the station side network for XGCS stations (XGCS49 and XGCS89) is limited to 160 m.

Example of a mixed IP 20 and IP 67 connection on an Ethernet Modbus® TCP/IP network



Example of a connection to a Magelis® terminal

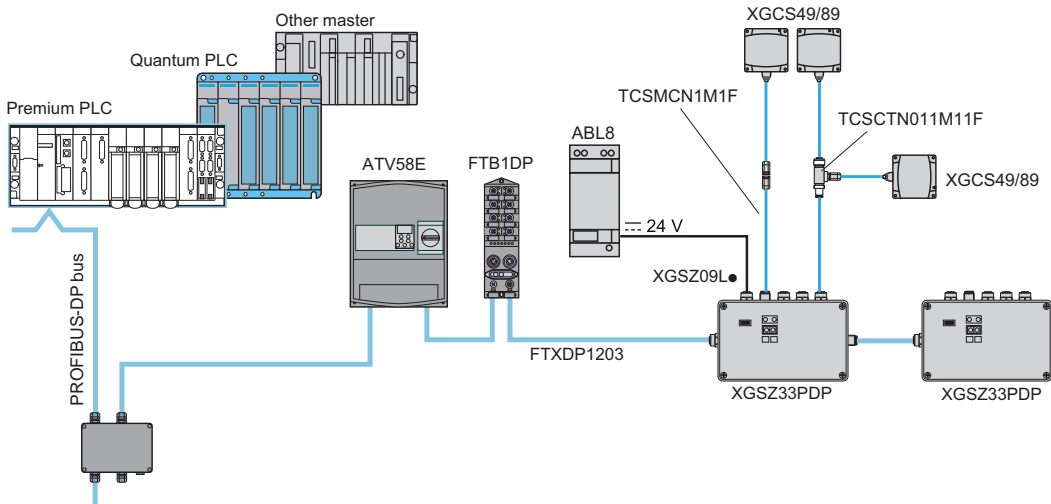


Cable TCSCN1F2 connections

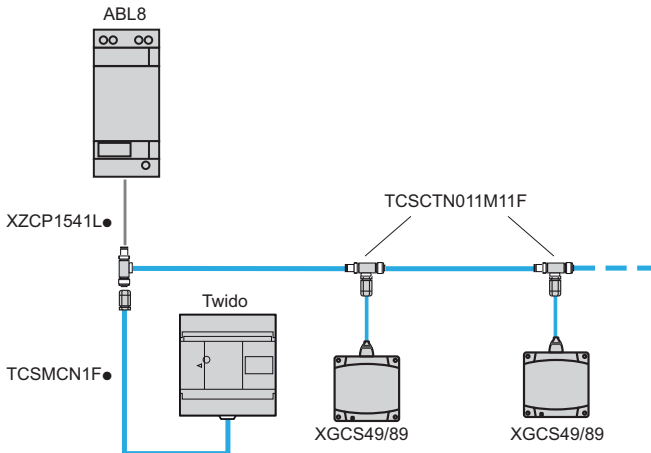
Scheme	Contact	Signal	Wire color
	1	Drain (Modbus-SHLD)	—
	2	24 Vdc	Red
	3	0 V Modbus-GND	Black
	4	D0	White
	5	D1	Blue

1) Magelis® terminal supply connector (included with the Magelis terminal).

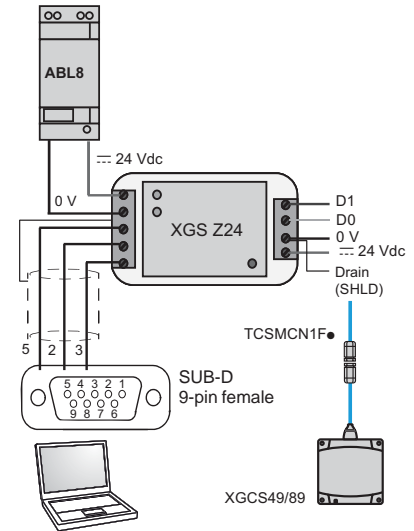
Example of an architecture in a PROFIBUS network



Example of a connection on a Twido® PLC



Example of a connection to a PC



Power supply cable connections

XZCP1541L				Power supply ABL8	
Scheme	Contact	Signal	Wire color	Terminal	
	1	NC	Brown	-	
	2	24 Vdc	White	24 Vdc	
	3	0 V GND	Blue	0 V GND	
	4	NC	Black	-	

TCSCMN1F cable connections

TCSCMN1F				Twido® PLC	
Scheme	Contact	Signal	Wire color	Terminal	Scheme
	1	Drain (SHLD)	-	-	
	2	24 Vdc	Red	-	
	3	0 V GND	Black	SG	
	4	D0	White	B	
	5	D1	Blue	A	

The compact stations can be directly connected to the Modbus port of a PLC. Up to 15 compact stations can be linked to the RS-485 port using T-connectors. (In cases where the length of the network exceeds 100 m, fit a line terminator, catalog number FTXCNTL12.) This cabling system is specific to the OsiSense® XG RFID System (powered network). No other Modbus slave equipment can be connected to it.

Specifications of XG RFID compact stations			
Station type		XGC S4901201	XGC S8901201
Certifications		UL, FCC part 15c	
Conformity to standards		CE, EN 301489-1, EN 301489-3, ETS 300330-1 and ETS 300330-2	
Ambient air temperature	For operation	°C (°F)	-25 to +70 (-13 to +158)
	For storage	°C (°F)	-40 to +85 (-40 to +185)
Degree of protection	Conforming to IEC 60529	IP 67	
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 IK 02	
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 40: 40 x 40 x 15 Flat form 80: 80 x 80 x 26
RFID frequency		MHz	13.56
Type of associated tag			ISO 15693 and ISO 14443 standard tags. Automatic detection of the type of tag
Compatible RFID microchip examples			Texas (Tag-it HFI); Philips (SL2, SL1, Ultralight, Std 1K/2K, Desfire; STM (CR1X4K); INSIDE (micropass)
Nominal sensing distance	Depending on associated tag	mm (in.)	18–70 (0.71–2.76) 20–100 (0.79–3.94)
Nominal supply voltage		Vdc	--- 24 PELV (Protective Extra Low Voltage)
Supply voltage limits (including ripple)		Vdc	--- 19.2–29
Consumption		mA	< 60
Serial links	Type		RS-485
	Protocol		Modbus RTU or Uni-Telway
	Speed	Bd	9,600–115,200 (automatic detection)
Display			1 dual color LED for the communication network: Modbus/Uni-Telway 1 dual color LED for the RFID communication (Presence of tag / Station/tag dialog)
Connections			M12, 5-pin male, shielded connector. Only for connection to the communication network and the supply.
Tightening torque	Screws	Nm	< 1 < 3

Specifications of XG RFID electronic tags								
Tag type		XGHB444345	XGHB445345	XGHB90E340	XGHB320345	XGHB221346	XGHB211345	
Ambient air temperature	For operation	°C (°F)	-25 to +70 (-13 to +158)	-25 to +50 (13 to +122)	-25 to +70 (-13 to +158)			
	For storage	°C (°F)	-40 to +85 (-40 to +185)	-40 to +55 (-40 to +131)	-40 to +85 (-40 to +185)			
Degree of protection			IP 68	IP 65		IP 68		
Standard supported			ISO 14443	ISO 15693				
Vibration resistance	Conforming to EN 60068.2.27	2 mm from 5 to 29.5 Hz / 7 gn from 29.5 to 150 Hz						
Shock resistance	Conforming to EN 60068.2.6	30 g/11 ms						
	Conforming to EN 50102	Degree IK 02						
Dimensions		mm	40 x 40 x 15	40 x 40 x 15	54 x 85.5 x 1	Ø 30 x 3	26 x 26 x 13 M18 x 1 x 12	
Housing material			PBT	PBT	PVC	PVC	PBT PBT	
Mounting method			Screw or clip	Screw or clip	–	Screw	Screw or clip Screw in	
Memory capacity		bytes	3,408	13,632	256	112	256	
Type of memory			EEPROM					
Type of operation			Read/Write					
Type of associated station			XGC S●●●●●●●●					
Nominal sensing distance (Read/Write)	With station XGC S49	mm (in.)	33 (1.30)	30 (1.18)	70 (2.76)	48 (1.89)	40 (1.57)	18 (0.71)
	With station XGC S89	mm (in.)	48 (1.89)	40 (1.57)	100 (3.94)	65 (2.56)	55 (2.17)	20 (0.79)
	With station XGC S49011201 + field expander XGFEC540	mm (in.)	–	–	90 (3.54)	42 (1.65)	–	–
	With station XGC S49011201 + field expander XGF EC2525	mm (in.)	–	–	150 (5.91)	80 (3.15)	42 (1.65)	–
Number of read cycles			Unlimited					
Number of write cycles	Minimum		100,000 per data bit throughout the temperature range					
	At 30 °C (86 °F)		2.5 million (typical value)					
Read time		ms	9.25 + 0.375 x n (1)	16.25 + 0.375 x n (1)	12 + 0.825 x n (1)			
Write time		ms	13 + 0.8 x n (1)	20 + 0.8 x n (1)	20 + 11.8 x n (1)	12 + 5.6 x n (1)	20 + 11.8 x n (1) 19 + 4.1 x n (1)	
Data retention time			10 years					
Mounting on metal support			Yes (2)		No	Yes (2) No		

(1) n = number of 16-bit words.
(2) Installation notes: see page 21.

Specifications of XG RFID connection boxes					
Connection box type			Tap-off box TCSAMT31FP	Ethernet box XGSZ33ETH	PROFIBUS box XGSZ33PDP
Certifications			UL		
Conformity to standards			CE		
Ambient air temperature	For operation	°C (°F)	-25 to +55 (-13 to +131)	0 to +70 (32 to +158)	0 to +55 (32 to +131)
	For storage	°C (°F)	-40 to +85 (-40 to +185)	-40 to +85 (-40 to +185)	-25 to +85 (-40 to +185)
Relative humidity		RH	30 to 95% without condensation		
Degree of protection			IP 65		
Supply voltage		Vdc	--- 24 PELV (limits 19.2–29 V), M12, 4-pin male, A coding, connector		--- 24 PELV (limits 21.6–26.4 V), M12, 4-pin male, A coding, connector
Consumption (connection box only)		W	–	< 1	< 2.5
Station connection			M12 5-pin female, A coding, connector		
Electromagnetic interference	Conforming to IEC 61000		Level 3		
	Conforming to EN 55022		Class B		
LED display			Power on (green)	- Ethernet network activity (RUN, green) - Collision detection (COL, red) - Diagnostics (STS, yellow) - Error (Err, red) - Power on (green)	- PROFIBUS 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	–
	Basic Web server		–	IP configuration address	–
	Basic communication service		–	Modbus messaging (reading/writing of words: 1 to 123 words per request)	Reading/writing of words (1 to 49 per request) via the PROFIBUS-DP periodic exchanges service. PROFIBUS-DP V2 aperiodic exchanges not supported
Connection	Physical interface		–	10 BASE-T/100BASE-TX	–
	Transfer rate		–	10/100 Mbps	9.6–12,000 Kbd: automatic detection of speed
	Medium		–	Ethernet cable with M12 connection, catalog number TCS ECL1M1●S2 (Schneider Electric ConneXium™ range)	RS-485 twisted pair

Specifications of portable 13.56 MHz RFID diagnostics terminal					
Conformity to standards			CE, FCC class A, Part 15225		
Ambient air temperature	For operation	°C (°F)	0 to +50 (32 to +122)		
	For storage	°C (°F)	-25 to +55 (-13 to +131)		
Relative humidity		RH	5–95% without condensation		
Degree of protection			IP 65		
Supply voltage			7.2 V NiMH type rechargeable battery (included with terminal) External: --- 11-18 Vdc		
Operating time			4 hours continuous operation (tag dialog)		
Operating system			Microsoft Windows CE.NET Professional version 4.2		
Processor			Intel Xscale® PXA255 CPU, 400 MHz		
Memory	RAM		SDRAM 64 Mb (16 Mb reserved for operating system)		
	Storage		Internal compact Flash: 512 Mb standard + Slot for compact Flash card (such as memory, wi-fi, Ethernet, or Bluetooth)		
Display	Screen		Color touchscreen: 72 mm x 54 mm, QVGA TFT		
	Resolution		320 x 240 pixels		
Keypad			45 booted keys		
Signaling			5 LEDs + 1 charging LED		

OsiSense® XG

Radio Frequency Identification System

13.56 MHz



XGCS4901201



XGHB44●345



XGHB90E340



XGHB221346



XGHB211345



XGHB320345



TCSAMT31FP

Compact stations, 13.56 MHz

Description	Protocols	Dimensions mm	Catalog number	Weight kg (lb)
Compact station Flat form 40 (1) M12 male connector on flying lead	Modbus RTU and Uni-Telway	40 x 40 x 15	XGC S4901201	0.057 (0.126)
Compact station Flat form 80 (1) M12 male connector on flying lead	Modbus RTU and Uni-Telway	80 x 80 x 26	XGC S8901201	0.257 (0.567)

Electronic tags

Tag type	Nominal sensing dist.		Dimensions mm	Sold in lots of	Unit catalog number	Weight kg (lb)
	XGCS49●	XGCS89●				
Flat form 40 3,408 bytes EEPROM	33 mm (1.30 in.)	48 mm (1.89 in.)	40 x 40 x 15	—	XGHB444345	0.031 (0.068)
Flat form 40 13,632 bytes EEPROM	30 mm (1.80 in.)	40 mm (1.57 in.)	40 x 40 x 15	—	XGHB445345	0.031 (0.068)
Flat form 40 2 KB FeRAM	45 mm (1.77 in.) (2)	65 mm (2.56 in.) (2)	40 x 40 x 15	—	XGHB440245	0.031 (0.068)
Flat form 40 8 KB FeRAM	—	39 mm (1.54 in.)	40 x 40 x 15	—	XGHB440845	0.031 (0.068)
Flat form 40 32 KB FeRAM	—	39 mm (1.54 in.)	40 x 40 x 15	—	XGHB443245	0.031 (0.068)
ISO badge (3) 256 bytes EEPROM	70 mm (2.76 in.)	100 mm (3.94 in.)	54 x 85.5 x 1	10	XGHB90E340	0.005 (0.011)
Disc 112 bytes EEPROM	48 mm (1.89 in.)	65 mm (2.56 in.)	∅ 30 x 3	5	XGHB320345	0.005 (0.011)
Disc 2 KB FeRAM	45 mm (1.77 in.)	65 mm (2.56 in.)	∅ 30 x 3	5	XGHB320246	0.005 (0.011)
Flat form 26 256 bytes EEPROM	40 mm (1.57 in.)	55 mm (2.17 in.)	26 x 26 x 13	1	XGHB221346	0.025 (0.055)
Cylindrical 256 bytes EEPROM	18 mm (0.71 in.)	20 mm (0.79 in.)	M18 x 1 x 12	5	XGHB211345	0.020 (0.044)

Connection boxes

Description	For use with	Supply voltage	Catalog number	Weight kg (lb)
Ethernet box 3-channel Integrated Ethernet port (10/100 Mbps) Modbus TCP/IP protocol Class A10	Compact stations XGCS49● and XGCS89●	∓ 24 Vdc	XGSZ33ETH	1.060 (2.337)
Tap-off box 3-channel Modbus and Uni-Telway	Compact stations XGCS49● and XGCS89●	∓ 24 Vdc	TCSAMT31FP	1.060 (2.337)
PROFIBUS box 3-channel PROFIBUS-DP protocol (4)	Compact stations XGCS49● and XGCS89●	∓ 24 Vdc	XGSZ33PDP	1.060 (2.337)

(1) Configuration badge XGSZCNF01 included with station—installation guide must be ordered separately (catalog number DIA4ED3051001).

(2) Metal mounted: 30 mm (1.18 in.) with XGCS49●; 45 mm (1.77 in.) with XGCS89●.

(3) Customized versions on request.

(4) Download GSD configuration file (SE100BBB.gsd) from www.Schneider-Electric.com (Products and services/Automation and control/Detection/RFID).

OsiSense® XG

Radio Frequency Identification System

13.56 MHz



XGFEC540



XGFEC2525

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 (1)	30–90 mm (1.18–3.54 in.) depending on tag used (only ISO 15693)	Station XGCS4901201 Tags XGHB90E340 XGHB320345 XGHB221346	XGFEC540	0.640 (1.411)
Universal type field expander Dimensions (mm) 250 x 250 x 10 (1)	26–150 mm (1.02–5.91 in.) depending on tag used (only ISO 15693)	Station XGCS4901201 Tags XGHB90E340 XGHB320345	XGFEC2525	0.565 (1.466)



XGSTP401



XGSTP41BA

Terminal and accessories

Description	Application	Catalog number	Weight kg (lb)
Portable 13.56 MHz RFID diagnostics terminal (2)	Read/write operations on electronic tags and diagnostics on compact stations Operating system: Microsoft Windows CE.NET Professional version 4.2	XGSTP401	0.943 (2.079)
Battery pack charger	Portable terminal	XGSTP41CH	0.675 (1.488)
Battery, 7.2 V NiMH	Portable terminal	XGSTP41BA	0.168 (0.370)
Compact Flash memory expansion	Portable terminal Capacity = 128 Mb	XBTZGM128	0.050 (0.110)



XGSZCNF01

Configuration badge (replacement)

Description	Application	Catalog number	Weight kg (lb)
Badge	Configuration of station addresses	XGSZCNF01	0.005 (0.011)

Documentation

Description	Catalog number	Weight kg (lb)
XG RFID compact stations guide	DIA4ED3051001	0.130 (0.029)

(1) For other dimensions, please consult your local sales office.

(2) Includes OsiSense® XG RFID system software (installed), universal battery charger, PC connecting cable, 3 styluses, protective cover, battery, and user guide.



TCSMCN1FQM2



TCSMCN1F9M2P



TCSEU051F0



TCSEAAF11F13F00



ABL8MEM24003

Modbus® network connection accessories

Description	Application	Length m	Catalog number	Weight kg (lb)
Modbus shielded connecting cable, black, IP 67 M12 connectors, male/female, A coding (1)	RS-485 connection between a compact station and a tap-off box	1	TCSMCN1M1F1	0.080 (0.176)
		2	TCSMCN1M1F2	0.115 (0.254)
	TCSAMT31FP or	5	TCSMCN1M1F5	0.270 (0.595)
	between 2 tap-off boxes	10	TCSMCN1M1F10	0.520 (1.146)
Modbus shielded pre-wired M12 connector, IP 67, female/bare wires, A coding (1)	Connection between tap-off box TCSAMT31FP and Modbus/Uni-Telway network (TSXSCA50)	2	TCSMCN1F2	0.115 (0.254)
		5	TCSMCN1F5	0.270 (0.595)
		10	TCSMCN1F10	0.520 (1.146)
Modbus shielded connecting cable, black, M12/SUB-D15, A coding	Connection between tap-off box TCSAMT31FP and Modbus/Uni-Telway network (TSXSCA62)	2	TCSMCN1FQM2	0.270 (0.595)
Modbus shielded connecting cable, black, M12/Mini-DIN 8-way, A coding	Modbus connection between tap-off box TCSAMT31FP and a PLC (such as Twido®)	2	TCSMCN1F9M2P	0.350 (0.772)
	Modbus SL serial link cable (Shielded dual twisted pair RS-485 main cables)	Modbus SL serial link	100	TSXCSA100
		200	TSXCSA200	10.920 (24.074)
		500	TSXCSA500	30.000 (66.139)

Ethernet connection accessories

Ethernet connection accessories for IP 67 switch

Description	End fittings	Length m	Catalog number	Weight kg
Copper connecting cables, straight	1 x IP 67 M12 4-pin connector and 1 x RJ45 connector	1	TCSECL1M3M1S2	–
		3	TCSECL1M3M3S2	–
		10	TCSECL1M3M10S2	–
		25	TCSECL1M3M25S2	–
		40	TCSECL1M3M40S2	–
	2 x IP 67 M12 4-pin connectors	1	TCSECL1M1M1S2	–
		3	TCSECL1M1M3S2	–
		10	TCSECL1M1M10S2	–
		25	TCSECL1M1M25S2	–
		40	TCSECL1M1M40S2	–
M12 Ethernet switch IP 67, ConneXium™ (2)	–	–	TCSEU051F0	0.210 (0.463)
M12 female/RJ45 adapter	Ethernet connection	–	TCSEAAF11F13F00	–

Do-It-Yourself Ethernet copper cable and connectors

The Do-It-Yourself ConneXium™ Ethernet system allows Ethernet copper connecting cables to be prepared on-site in the required length. The cables are intended for connection to the Ethernet 10/100 Mbps network. The maximum length of the connecting cables made in this way is 80 m. The cabling can be quickly assembled using a knife and ordinary wire cutters—no special tools required.

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

Power supplies

Description	Output voltage	Nominal power	Nominal current	Catalog number	Weight kg (lb)
	--- Vdc	W	A		
Regulated power supply 100/240 Vac	24	7	0.3	ABL8MEM24003	0.180 (0.397)
		30	1.2	ABL8MEM24012	0.520 (1.146)

(1) Holder for identification legend included with product.

(2) Other ConneXium™ connection accessories: refer to www.Schneider-Electric.com.

PROFIBUS-DP connection accessories

Description	Composition	Type	Length m	Catalog number	Weight kg (lb)
Connecting cable for connection between PROFIBUS box XGS Z33DP and PROFIBUS-DP network	Fitted with 2 x M12 5-pin connectors	Straight	0.3	FTXDP1203	0.040 (0.088)
			0.6	FTXDP1206	0.070 (0.154)
			1	FTXDP1210	0.100 (0.220)
			2	FTXDP1220	0.160 (0.353)
			3	FTXDP1230	0.220 (0.485)
		Elbowed	0.3	FTXDP3203	0.040 (0.088)
			0.6	FTXDP3206	0.070 (0.154)
			1	FTXDP3210	0.100 (0.220)
			2	FTXDP3220	0.160 (0.353)
			3	FTXDP3230	0.220 (0.485)
5	FTXDP3250	0.430 (0.948)			
M12 connector, 5-pin male, B coding	–	–	FTXDP12M5	0.050 (0.110)	
M12 connector, 5-pin female, B coding	–	–	FTXDP12F5	0.050 (0.110)	
Network terminator, M12 connector	–	–	FTXDPTL12	0.010 (0.022)	
Cable without end fittings	–	–	100	TSXPBSCA100	–
	–	–	400	TSXPBSCA400	–

Other connection accessories

Description	Application	Length m	Catalog number	Weight kg (lb)
Pre-wired M12 4-pin female supply connector, A coding (1)	--- 24 V supply to connection boxes XGS Z33ETH and TCS AMT31FP	2	XGSZ09L2	0.115 (0.254)
		5	XGSZ09L5	0.270 (0.595)
		10	XGSZ09L10	0.520 (1.146)
M12 5-pin female, A coding, connector	–	–	FTXCN12F5	0.050 (0.110)
M12, 5-pin male, A coding, connector	–	–	FTXCN12M5	0.050 (0.110)
Network T connector, M12, 1 RS-485 network male/2 female 5-pin, A coding	–	–	TCS CTN011M11F	0.035 (0.070)
Supply connector, screw terminals, M12 straight, A coding	–	–	XZC C12FDM40B	0.020 (0.044)
Protective cap (Sold in lots of 10)	M12 female connector	–	FTXCM12B	0.100 (0.220)
Network terminator, M12 male, 120 Ω	–	–	FTXCNTL12	0.010 (0.022)
Line adapter, RS-232C/RS-485, without modem signals. Supply: --- 18–30 Vdc. Consumption: 20 mA. Maximum transmission speed: 19,200 bd. Mounting on 35 mm rail.	–	–	XGSZ24	–

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

Mounting accessories

Description	For use with	Catalog number	Weight kg (lb)
Clip-on 90° mounting bracket	Flat form 40 station: XGCS4901201	XSZBC90	0.060 (0.132)
	Flat form 40 tags: XGHB44●345		
Clip-on mounting plate	Tags XGHB221346	XSZBE90	0.060 (0.132)
	Flat form 40 station: XGCS4901201	XSZBC00	0.025 (0.055)
	Flat form 40 tags: XGHB44●345		
Mounting plate	Tags XGHB221346	XSZBE00	0.025 (0.055)
	Connection boxes TCSAMT31FP and XGSZ33ETH	XGSZ3P	0.195 (0.430)
3D Mounting kit (2)	Field expander XGFEC2525		
Support for M12 rod		XUZ2003	0.220 (0.485)
M12 rod		XUZ2001	0.050 (0.110)
Ball-joint mounted mounting bracket		XUZ2003	0.220 (0.485)

(2) For a 3D mounting kit, order the following: rod support XUZ2003, M12 rod XUZ2001, and ball-joint mounting bracket XUZ2003.

Other accessories

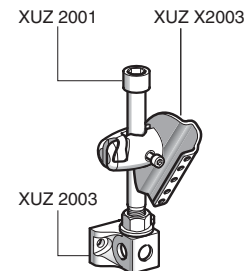
Description	Sold in lots of	Catalog number	Weight kg
Key for screwing in/unscrewing Ø18 mm cylindrical tag	5	XGSZ05	0.011 (0.024)
Identification legend for 23 x 4 mm connecting cables	200	XGSZ08MKW	0.056 (0.123)



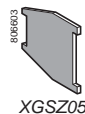
TCS CTN011M11F



XGSZ3P



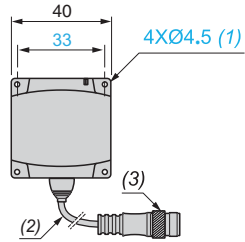
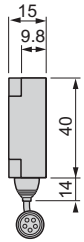
XUZ 2003



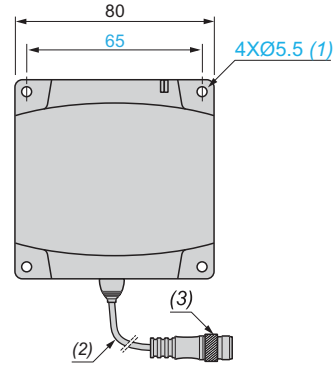
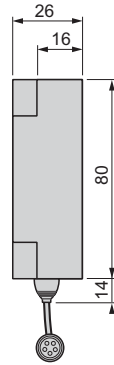
XGSZ05

Compact stations (mm)

XGCS4901201



XGCS8901201



(1) For CHC type screws.

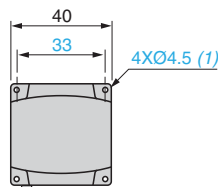
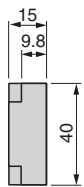
(2) Shielded cable (length: 20 cm).

(3) M12 5-pin male, A coding, connector.

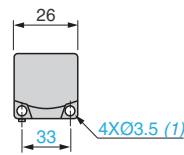
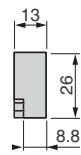
Read/write electronic tags (mm)

Square format tags

XGHB44•345



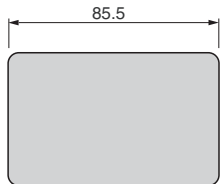
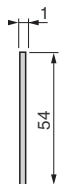
XGHB221346



(1) For CHC type screws.

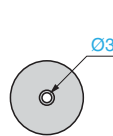
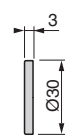
Rectangular format tags

XGHB90E340

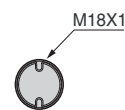


Cylindrical format tags

XGHB320345

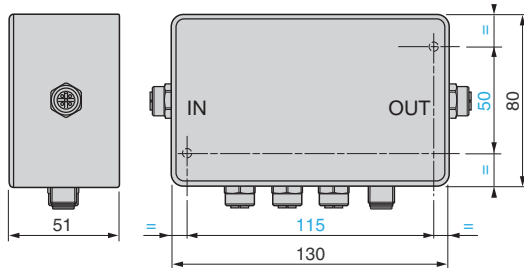


XGHB211345

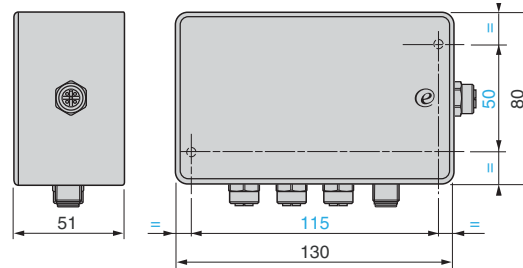


Connection boxes (mm) (1)

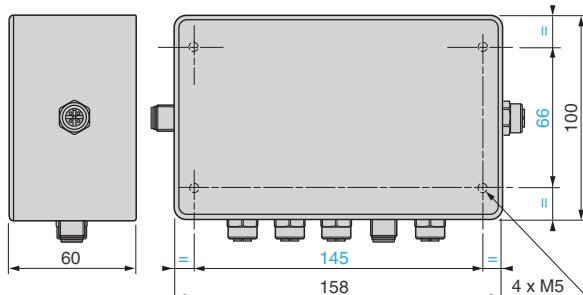
Tap-off box TCSAMT31FP



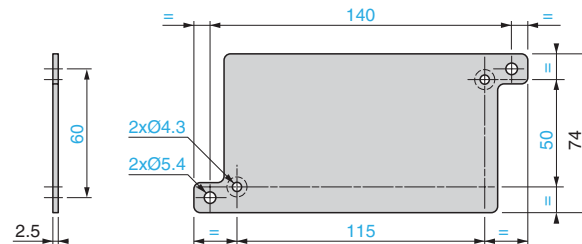
Ethernet box XGSZ33ETH



PROFIBUS box XGSZ33PDP



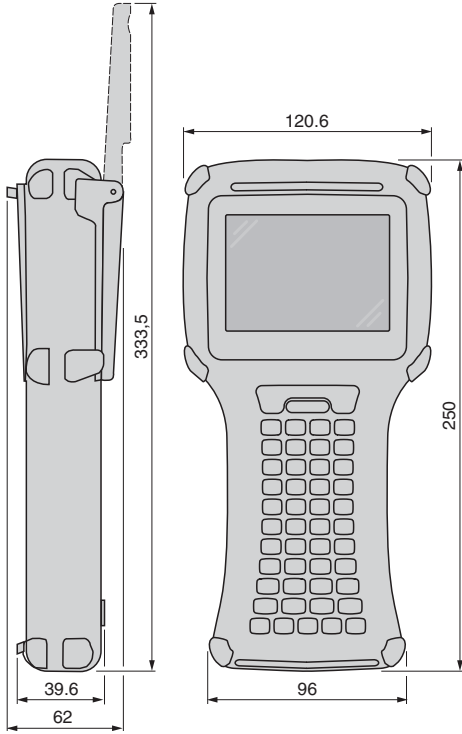
Mounting plate XGSZ3P



(1) Allow a 110 mm clearance zone for connecting the cables.

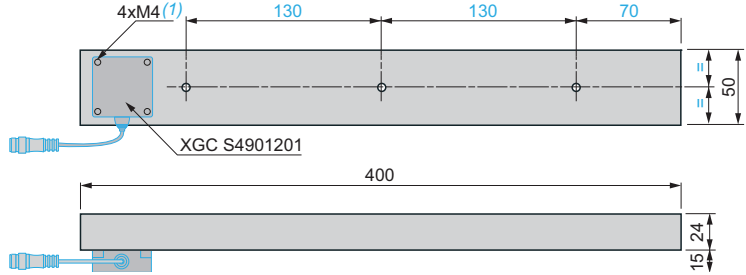
Portable RFID diagnostics terminal (mm)

XGSTP401



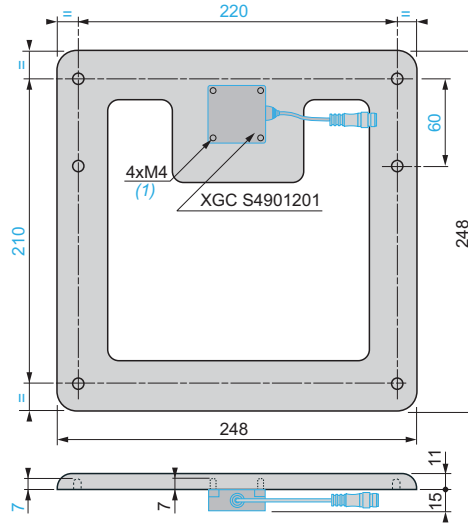
Field expanders (mm)

Conveying type XGSEC540



(1) Four M4 screws (included).

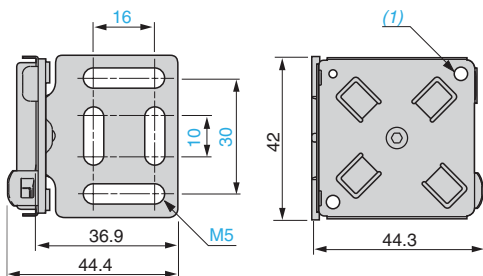
Universal type XGSEC2525



(1) Four M4 screws (included).

Mounting brackets (mm)

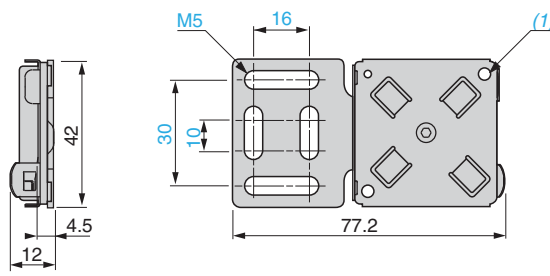
XSZBC90



(1) Four M4 x 14 screws (included).

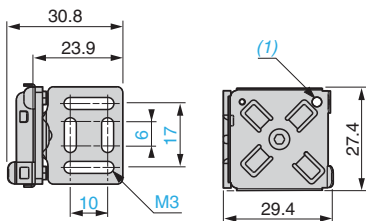
Mounting plates (mm)

XSZBC00



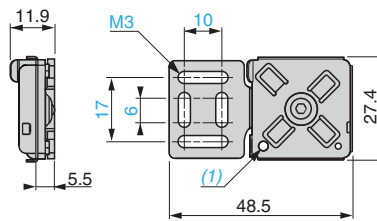
(1) Four M4 x 14 screws (included).

XSZBE90



(1) Two M3 x 12 screws (included).

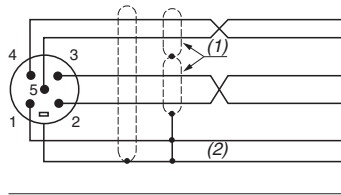
XSZBE00



(1) Two M3 x 12 screws (included).

Modbus connections

XGCS stations ●901201



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

(1) Shielding per pair.
(2) General cable shielding.

Tap-off box TCSAMT31FP

Socket to station cabling

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

Socket to power supply cabling

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

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

TCS MCN1F●

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

XGS Z09L

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

Ethernet connection

Ethernet box XGSZ33ETH

Socket to station cabling

Pin no.	Signal
1	– GND
2	⎓ +24 Vdc
3	0 Vdc
4	D0
5	D1

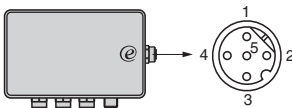
Socket to power supply cabling

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

Cable XGSZ09L connections

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

Ethernet socket connection



Cable TCS ECL1M3M●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 box XGSZ33PDP

Socket to station cabling

Pin no.	Signal
1	GND
2	⎓ +24 Vdc
3	0 Vdc
4	D0
5	D1

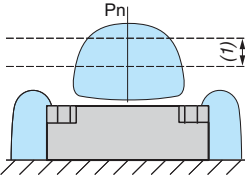
Socket to power supply cabling

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

PROFIBUS-DP network connections

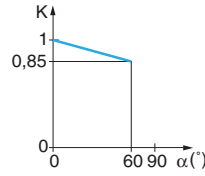
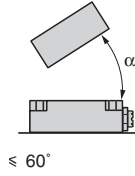
Input	Output	Pin no.	Signal	Description
1	2	1	VP	Line terminator polarisation
2	3	2	RxD/TxD-N	Receive/transmit data (-) (red wire)
3	4	3	DGND	GND PROFIBUS
4	5	4	RxD/TxD-P	Receive/transmit data (+) (green wire)
		5	Shielding	Shielding or GND
		Connector casing	Shielding	Shielding or GND casing

Detection zones of compact stations



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

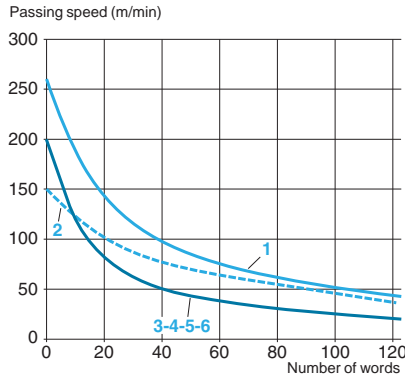
Angular positioning between station and tag



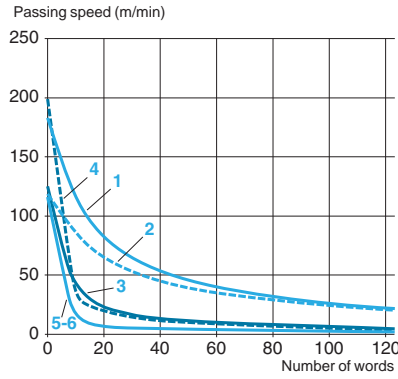
K = correction coefficient to be applied to the nominal sensing distance. Read distance = nominal sensing distance x K.

Station and tag selection according to passing speeds

Read time with station XGC S49●●●●●

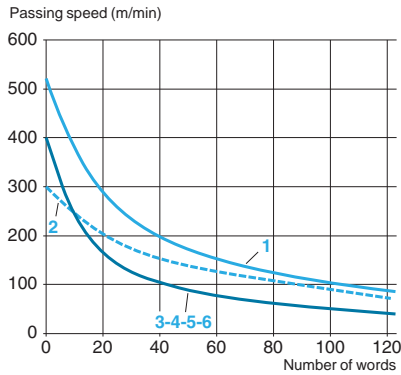


Write time with station XGC S49●●●●●

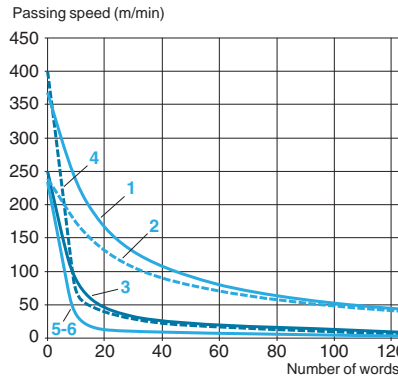


- 1 XGHB444345
- 2 XGHB445345
- 3 XGHB211345
- 4 XGHB320345
- 5 XGHB90E340
- 6 XGHB221346

Read time with station XGC S89●●●●●



Write time with station XGC S89●●●●●

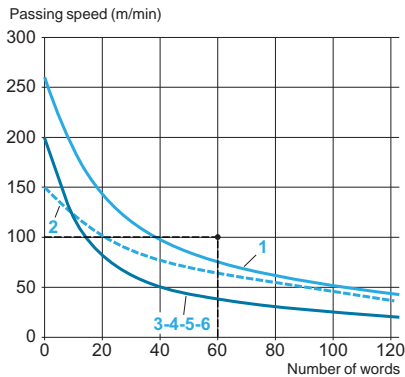


- 1 XGHB444345
- 2 XGHB445345
- 3 XGHB211345
- 4 XGHB320345
- 5 XGHB90E340
- 6 XGHB221346

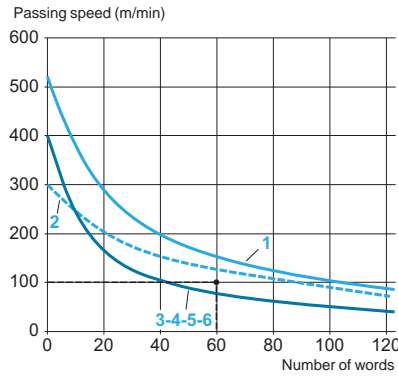
Application example

Read time with station XGC S49●●●●●

On an assembly line, the object passing speed is 100 m/min. The application requires that 60 words be read.



Write time with station XGC S89●●●●●



- 1 XGHB444345
- 2 XGHB445345
- 3 XGHB211345
- 4 XGHB320345
- 5 XGHB90E340
- 6 XGHB221346

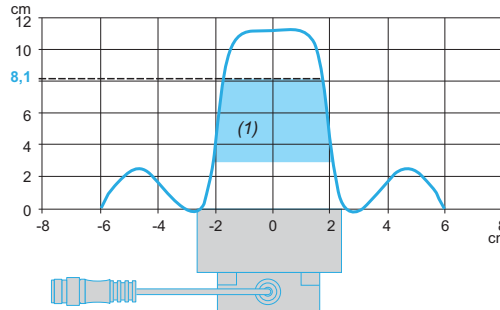
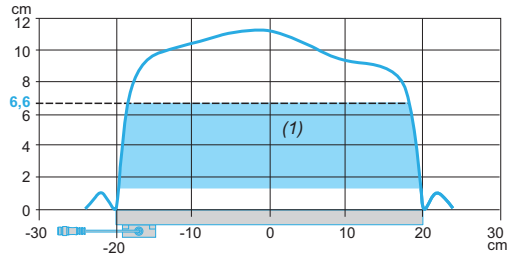
Station XGC S49 cannot be used; no OsiSense® XG tag can be read under these conditions (Speed/Number of words).

Station XGC S89 can be used; only tags XGHB444345 and XGHB445345 meet the requirements (Speed/Number of words).

Dialog zones for field expanders

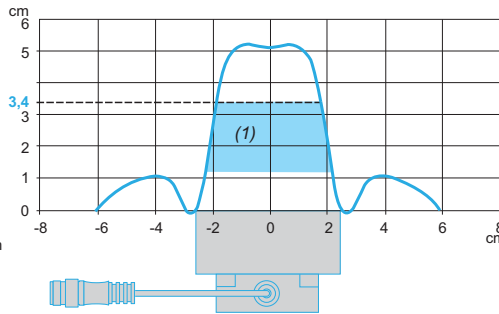
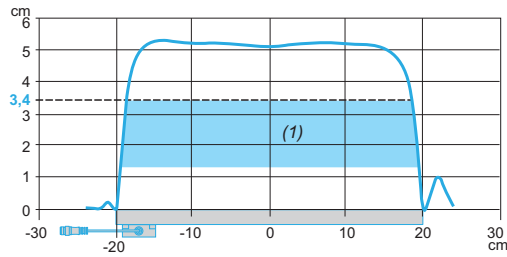
Field expander + electronic tag

XGFEC540 + XGHB90E340



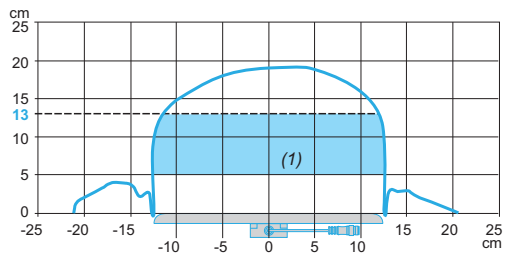
(1) Recommended working zone.

XGFEC540 + XGHB320345

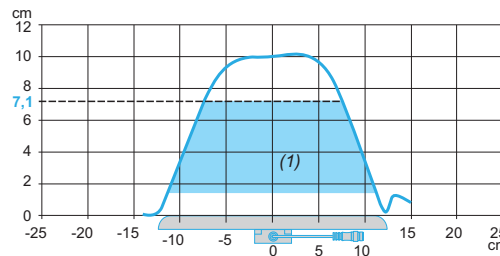


(1) Recommended working zone.

XGFEC2525 + XGHB90E340



XGFEC2525 + tag XGHB320345

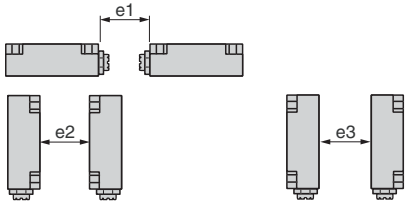


(1) Recommended working zone.

Minimum mounting distances between system components

Distance between stations (mm)

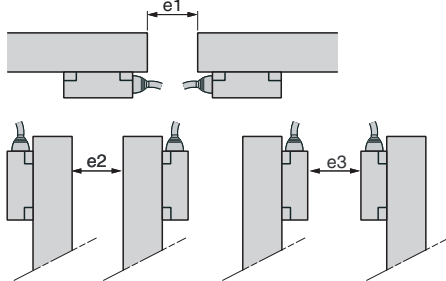
Minimum distance between 2 identical stations in relation to their positioning and the type of tag used



Tag	Flat form 40 XGCS4 station			Flat form 80 XGCS8 station		
	e1	e2	e3	e1	e2	e3
XGHB90E340	310	550	120	430	750	280
XGHB221346	200	320	100	280	530	260
XGHB320345	140	360	110	310	540	240
XGHB211345	210	180	60	200	370	170
XGHB444345	90	190	30	310	400	160
XGHB445345	110	170	30	310	380	160

Distance between field expanders

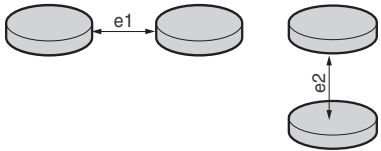
Minimum distance between 2 field expanders in relation to their positioning and the type of tag used



Tag	Field expander XGFEC540			Field expander XGFEC2525		
	e1	e2	e3	e1	e2	e3
XGHB90E340	195	285	195	570	890	960
XGHB320345	420	540	450	720	1275	1200

Distance between tags (mm)

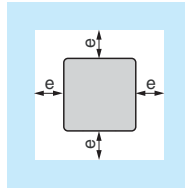
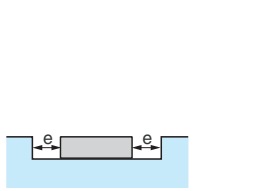
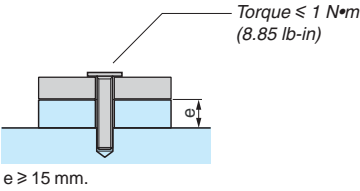
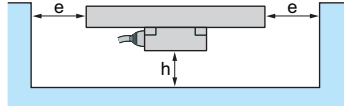
Minimum distance between 2 identical tags in relation to their positioning and the type of station used



Tag	Flat form 40 XGCS4 station		Flat form 80 XGCS8 station	
	e1	e2	e1	e2
XGHB90E340	35	60	110	140
XGHB221346	50	10	120	50
XGHB320345	70	50	190	60
XGHB211345	40	10	120	20
XGHB444345	20	10	70	40
XGHB440245	—	—	60	10
XGHB440845	—	—	60	10
XGHB443245	—	—	60	10
XGHB445345	10	10	60	10
XGHB320246	—	—	60	10

Minimum permissible mounting distances in a metal structure

Stations and tags

<p>XGCS stations 49/89 and Tags XGHB221346/B444345/B445345</p>  <p>e ≥ 20 mm.</p>	<p>Tag XGHB320345</p>  <p>e ≥ 20 mm.</p>	<p>Tag XGHB90E340</p>  <p>e ≥ 15 mm.</p> <p>Torque ≤ 1 Nm (8.85 lb-in)</p>	<p>Tags XGHB90E340 and XGHB211345</p> <p>No metal parts within 25 mm of the tag.</p> <p>Field expanders</p> <table border="1"> <thead> <tr> <th></th> <th>e (mm)</th> <th>h (mm)</th> </tr> </thead> <tbody> <tr> <td>XGFEC540</td> <td>15</td> <td>30</td> </tr> <tr> <td>XGFEC2525</td> <td>0</td> <td>75</td> </tr> </tbody> </table> 		e (mm)	h (mm)	XGFEC540	15	30	XGFEC2525	0	75
	e (mm)	h (mm)										
XGFEC540	15	30										
XGFEC2525	0	75										

Sensing distance

Tags	Nominal sensing distance, mm (in.)		Reduced sensing distance with the presence of metal, mm (in.)	
	XGCS49	XGCS89	XGCS49	XGCS89
XGHB90E340	70 (2.76)	100 (3.94)	58 (2.28)	80 (3.15)
XGHB221346	40 (1.57)	55 (2.17)	30 (1.18)	33 (1.30)
XGHB320345	48 (1.89)	65 (2.56)	45 (1.77)	56 (2.20)
XGHB211345	18 (0.71)	20 (0.79)	16 (0.63)	15 (0.59)
XGHB444345	33 (1.30)	48 (1.89)	28 (1.10)	34 (1.34)
XGHB440245	45 (1.77)	65 (2.56)	30 (1.18)	45 (1.77)
XGHB440845	—	39 (1.54)	—	28 (1.10)
XGHB443245	—	39 (1.54)	—	28 (1.10)
XGHB445345	30 (1.18)	40 (1.57)	24 (0.94)	28 (1.10)
XGHB320246	45 (1.77)	65 (2.56)	—	28 (1.10)
