General Specifications

XS110A
Wireless Communication Module

Sushi Sensor

GS 01W06D01-01EN

■ GENERAL

This General Specifications (GS) describes the specifications for Wireless Communication Module. The XS110A Wireless Communication Module has battery-powered, and long-range wireless communication features. This product acts as a pressure sensor in combination with "XS530 Pressure Measurement Module" and acts as a temperature sensor in combination with "XS550 Temperature Measurement Module" and thermocouples. This product supplies power from a replaceable built-in battery to a measurement module.

LPWA (Low Power Wide Area) enables a long-range reachability for low power devices, to realize wide area coverage and easy installation.

For more details, refer to the General Specifications of the related products.

■ FEATURES

- **Long-Distance Communication on License-free Bands**

The XS110A has a long-distance communication feature and it enables easy installation for all over a plant. This module improves efficiency of plant maintenance by gathering various data in combination with a measurement module. The data can be utilized for early anomaly detection and prediction of equipment failure.

- **Excellent Environmental Resistance with Battery Powered**

The XS110A supplies power to a measurement module from a built-in battery. In combination with a measurement module, it acts as a battery-powered wireless sensor with the environmental resistance which is required for plant installation. Without any power cabling works, it can be installed everywhere in a plant.

- **Supporting Hazardous Location Installation**

The XS110A in combination with a measurement module can be installed in hazardous areas, such as petrochemical plants, paint plants, steel plants, where flammable gas or vapor may exist.

- **Configuration and Status Monitoring Using Smartphone**

Using an Android-based smartphone with NFC (Near Field Communication) interface makes configuration and status monitoring of sensors simple and intuitive.



■ STANDARD SPECIFICATIONS

☐ WIRELESS SPECIFICATIONS

Communication Protocol:
LoRaWAN Class A
For details on the channel plan and the LoRaWAN version, refer to Table 1.

Modulation Method:
LoRa modulation

Data Rate:
250 to 21900 bps*
*: Available data rate vary depending on the country.

Frequency:
Refer to Table 1.

Radio Security:
AES 128-bit encryption

RF Transmitter Power:
Max. 7 dBm
Max. 5 dBm (Only area code F)

Antenna:
Built-in Omni-directional antenna

☐ POWER SUPPLY SPECIFICATIONS

Battery:
Lithium thionyl chloride battery (size D): 1 unit
Rated voltage: 3.6 V
Rated capacity: 19 Ah

YOKOGAWA

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☐ PERFORMANCE SPECIFICATION

Battery Characteristics:
The battery life of XS110A depends on connected Measurement Module.
Refer to the General Specifications of each Measurement Module.

Update Period:
1 minute to 3 days

☐ FUNCTIONAL SPECIFICATION

Output Signal:
LoRaWAN
For details on the channel plan, the LoRaWAN version, available countries and regions, refer to Table 1.

NFC Interface:
NFC Forum Type 2 Tag

Diagnostics Function:
Battery alarm*, internal temperature, wireless communication failures, memory failures, Measurement Module connection failure
*: The difference between the actual battery level and the battery level estimated from the usage status may be large.

Software Download Features:
Allows the user to update the software of the sensor via the NFC interface.

Power Supply to the Measurement Module:
Supply voltage: 3.3 V
Supply current: 50 mA

☐ INSTALLATION ENVIRONMENT

Ambient Temperature Limits:
Operating: –40 to 85°C (–40 to 185°F)
Storage: –40 to 85°C (–40 to 185°F)

Ambient Humidity:
0 to 100% RH (non-condensation)

Temperature Gradient:
Operating: Within ± 10°C/h
Storage: Within ± 20°C/h

Altitude:
[Type Code: 00] Up to 3000 m
[Type Code: K2, S2, F1, C1, P1, U1, N1]
80 to 110 kPa (Up to 2000 m*)
*: Ta : over 10°C

Vibration Resistance:
0.21 mm P-P (10 to 60 Hz),
3 G (60 to 2 kHz)

Shock Resistance:
50 G 11 ms (3 directions/3 times)

☐ REGULATORY COMPLIANCE STATEMENTS

This device satisfies the following standards.
*: Please confirm that an installation region fulfills an applicable standard. If additional regulatory information and approvals are required, contact a Yokogawa representative.

Telecommunication Compliance:
Refer to Table1.

CE Conformity*1:
RE Directive:
Safety: EN61010-1 (Indoor/Outdoor use), EN62479
EMC: EN 301 489-1, EN 301 489-3,
EN61326-1 Class A Table 2, EN61326-2-3,
EN55011 Class A
Radio Spectrum: EN 300 220-2 (Band h1.3 in the table 1 of CEPT ERC Rec. 70-03), EN 300 330
Cybersecurity: EN 18031-1*
*: Firmware revision R3.01.13 or later
ATEX Intrinsic Safety:
Refer to Table 2.
EU RoHS Directive compliant
*1: When area code is 2, 4, C or H (only Type = K2), CE mark is given on the marking. When area code is 4, C or H, it cannot be used in European Economic Area.

Canadian Safety Standards:
CAN/CSA-C22.2 No.61010-1
CSA-C22.2 No.94.2
IEC 60529
Pollution degree 2
Overvoltage category I

Degrees of Protection:
IP66/IP67 and Type 4X
Apply when connected to the Measurement Module.

KC Marking:
Trade Name: Yokogawa Electric Corp.
Equipment Name: Wireless Communication Module
Manufacturer: Yokogawa Electric Corp.

☐ PHYSICAL SPECIFICATIONS

Housing Material:
Plastic (PC)

Weight:
300 g (0.66 lb)*
*: Without battery

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■ SOFTWARE SPECIFICATIONS

☐ SUSHI SENSOR APP

This software is used to perform the setting and status check of this product via the NFC interface.

Operating Environment:

Item	Recommended System Requirements
OS	Android 5.1.1 or higher
CPU	Snapdragon 800 or better
Resolution	1280 x 720 dots or more
NFC	Readers, Writer
GPS	Optional

Note of Available Android Device:
When using the Sushi Sensor App, the Android device must comply with the following requirements.

- When using an NFC link in a non-hazardous area, the maximum magnetic field strength generated by the Android device is 18 A/m (r.m.s.) or less (Compliant with ISO / IEC 14443).
- When using an NFC link in a hazardous area, only an Android device confirmed by Yokogawa Electric Corporation can be used.
- If additional information and approvals for Android devices are required, contact a Yokogawa representative.

☐ KEY CARD EDITOR

This software writes the security information used in the authentication and encryption process of LoRaWAN communication to the key card.

Item	Recommended System Requirements
OS	Android 5.1.1 or later
CPU	Snapdragon 800 or better
Resolution	1280 x 720 dots or more
Supported NFC cards	• MIFARE Ultralight • MIFARE Classic

Table 1 Area code specifications

Area Code	Frequency	Telecommunication Compliance*3	LoRaWAN Version	Channel Plan	Countries and Regions*3
2	863 to 870 MHz*1	RE Directive	V1.0.4	EU868	Europe
3	902 to 928 MHz*2	FCC/ISED Approval	V1.0.2	US915	North America
4	919 to 925 MHz*2	SIRIM Type Approval	V1.0.2	AS923-1	Malaysia, Singapore, Thailand
5	915 to 928 MHz	RCM	V1.0.2	AU915	Australia, Chile, Peru
6	915 to 928 MHz	RCM	V1.0.2	AS923-1	Australia, New Zealand
7	920.9 to 923.3 MHz	KC Marking	V1.0.2	KR920	South Korea
8	865 to 867 MHz	WPC Type Approval	V1.0.2	IN865	India
9	915 to 928 MHz	ANATEL Approval	V1.0.2	AU915	Brazil
C	920 to 923MHz	SDPPI Type Approval	V1.0.2	AS923-2	Indonesia, Vietnam
F	470 to 510 MHz	State Radio Regulation of China	V1.0.2	CN470	China
G	915 to 928 MHz	ENACOM Approval	V1.0.2	AU915	Argentina, Colombia
H	863 to 870 MHz*2	NCC Type Approval	V1.0.2	EU868	Nigeria, Saudi Arabia, UAE, Qatar, Bahrain, Kuwait

*1: This wireless frequency can be used throughout Europe, although there are some restrictions in Sweden and Greece.
*2: Available frequency bands vary depending on the country.
*3: The representative telecommunication compliance, countries and regions are listed. If you would like other available countries, contact a Yokogawa representative.

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Table 2 Specification for explosion protected type

Item	Description	Type
IECEx intrinsic safety	Certificate number: IECEx DEK 19.0027X*1 Applicable standards: IEC 60079-0 Ed. 7.0 (2017), IEC 60079-11 Ed. 6.0 (2011) Ex marking: Ex ib IIC T4 Gb Ambient temperature: −40 to 75°C (−40 to 167°F)*2 Electrical parameters: Connector Uo = 6.88 V, Io = 1.54 A, Po = 0.3 W, Co = 10 µF, Lo = 3 µH Enclosure: IP66/IP67 in accordance with only IEC 60529 when combined with certified equipment.	**S2**
ATEX intrinsic safety	Certificate number: DEKRA 20ATEX0024 X Applicable standards: EN IEC 60079-0:2018, EN 60079-11:2012 Ex marking: Ⓔx II 2 G Ex ib IIC T4 Gb Ambient temperature: −40 to 75°C (−40 to 167°F)*2 Electrical parameters: Connector Uo = 6.88 V, Io = 1.54 A, Po = 0.3 W, Co = 10 µF, Lo = 3 µH Enclosure: IP66/IP67 in accordance with only EN 60529 when combined with certified equipment.	**K2**
FM intrinsic safety	Certificate number: FM20US0109X Applicable standards: FM 3600:2018, FM 3610:2018, FM 3810:2018, ANSI/UL 60079-0 Ed. 7 (2019), ANSI/UL 60079-11 Ed. 6 (2018), ANSI/UL 61010-1 Ed. 3 (2012), NEMA 250:1991 Ex marking: IS CL I/II/III DIV 1 GP ABCDEFG T4, CL I ZN 0 AEx ia IIC T4 Ga Ambient temperature: –40 to 75°C (–40 to 167°F)*2 Electrical parameters: Connector Uo = 6.88 V, Io = 1.54 A, Po = 0.3 W, Co = 10 µF, Lo = 3 µH Enclosure: Type 4X when combined with certified equipment.	**F1**
CSA intrinsic safety	Certificate number: CSA21CA80063719X Applicable standards: C22.2 No. 60079-0:19, CAN/CSA-C22.2 No. 60079-11:14, CAN/CSA-C22.2 No. 61010-1-12, C22.2 No. 94.2-15 Ex marking: Ex ia IIC T4 Ga, IS CL I/II/III DIV 1 GP ABCDEFG T4 Ambient temperature: –40 to 75°C (–40 to 167°F)*2 Electrical parameters: Connector Uo = 6.88 V, Io = 1.54 A, Po = 0.3 W, Co = 10 µF, Lo = 3 µH Enclosure: Type 4X when combined with certified equipment.	**C1**
South Korea intrinsic safety	Certificate number: 20-AV4BO-0550X (XS110A+XS530) 20-AV4BO-0551X (XS110A+XS550) Applicable standards: Notice of Ministry of Labor 2020-33 Harmonized with IEC 60079-0 Ed.7.0 (2017), IEC 60079-11 Ed.6.0 (2011) Ex marking: Ex ib IIC T4 Ambient temperature: −40 to 75°C*2 Enclosure: IP66/IP67 in accordance with only IEC 60529 when combined with certified equipment.	**P1**
INMETRO intrinsic safety	Certificate number: DEKRA 23.0024X Applicable standards: ABNT NBR IEC 60079-0:2020 Versão Corrigida:2023 ABNT NBR IEC 60079-11:2013 Versão Corrigida:2017 Ex marking: Ex ib IIC T4 Gb Ambient temperature: –40 to 75°C*2 Electrical parameters: Connector Uo = 6.88 V, Io = 1.54 A, Po = 0.3 W, Co = 10 µF, Lo = 3 µH Enclosure: IP66/IP67 in accordance with only ABNT NBR IEC 60529 when combined with certified equipment.	**U1**

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NEPSI intrinsic safety	CCC certificate number: 2025322310006675 Certificate number: GYJ25.1079X Applicable standards: GB/T 3836.1-2021, GB/T 3836.4-2021 Ex marking: Ex ib IIC T4 Gb Ambient temperature: −40 to 75°C Electrical parameters: Connector Uo = 6.88 V, Io = 1.54 A, Po = 0.3 W, Co = 10 µF, Lo = 3 µH Enclosure: IP66/IP67 in accordance with only IEC 60529 when combined with certified equipment.	**N1**

*1: Referred from ECAS-Ex (UAE) and PESO (India) certificate.
*2: Additionally, limited by the ambient temperature range of the equipment connected to XS110A.

■ MODEL AND SUFFIX CODES

Model	Suffix Codes	Description
XS110A		Wireless Communication Module
Inter-module communication	-A	Digital communication for XS-series
Area	2	Europe EU868
	3	North America US915
	4	Malaysia, Singapore, Thailand AS923-1
	5	Australia, Chile, Peru AU915
	6	Australia, New Zealand AS923-1
	7	South Korea KR920
	8	India IN865
	9	Brazil AU915
	C	Indonesia, Vietnam AS923-2
	F	China CN470
	G	Argentina, Colombia AU915
	H	Nigeria, Saudi Arabia, UAE, Qatar, Bahrain, Kuwait EU868
Type	00	General Purpose*1
	K2	ATEX intrinsic safety*2
	S2	IECEx intrinsic safety*3
	F1	FM intrinsic safety*4
	C1	CSA intrinsic safety*7
	P1	South Korea intrinsic safety*5
	U1	INMETRO intrinsic safety*6
	N1	NEPSI intrinsic safety*9
—	-A	Always A
Housing*8 material	5	Plastic (PC)
Power source	D	Battery powered (Battery not included)
—	A	Always A

*1: Applicable when area code is 2, 3, 4, 8 or F.
*2: Applicable when area code is 2, 4, C or H. Area code H is applied to Saudi Arabia, Qatar, Bahrain and Kuwait.
*3: Applicable when area code is 4, 5, 6, 8, G or H. Area code H is applied to Nigeria, Saudi Arabia, Qatar and UAE.
*4: Applicable when area code is 3 and sales country is United States.
*5: Applicable when area code is 7.
*6: Applicable when area code is 9.
*7: Applicable when area code is 3 and sales country is Canada.
*8: Avoid the components of organic solvents and acidic/alkaline chemicals adhering to the case.
*9: Applicable when area code is F.

■ OPTIONAL ACCESSORIES

Item	Parts Number	Description
Batteries*1	F9915NR	Lithium-thionyl chloride batteries*2, 2 pieces*3

*1: Alternatively, Tadiran TL-5930/S, SL-2780/S or VITZROCELL SB-D02 batteries can be purchased from your local distributor.
*2: Tadiran TL-5930/S
*3: This product works with one size D battery, but the accessory is a set of two.

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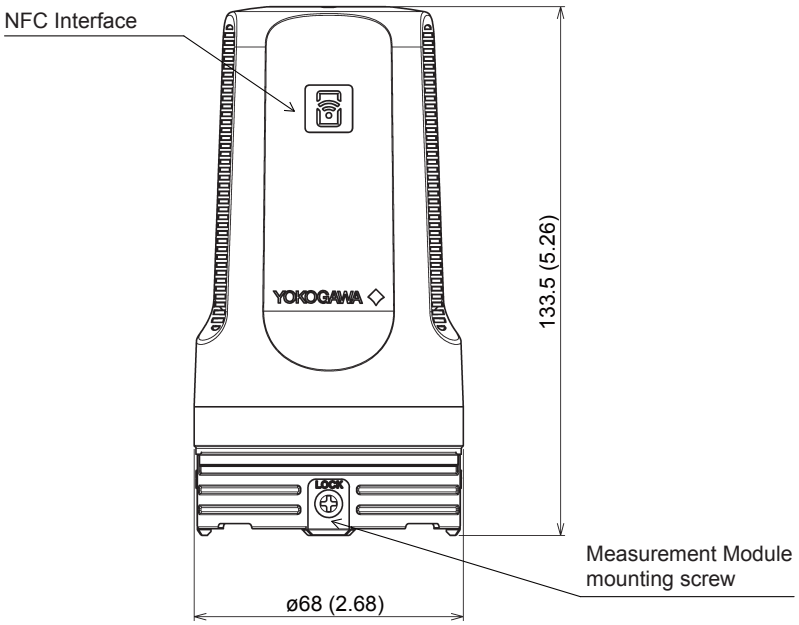
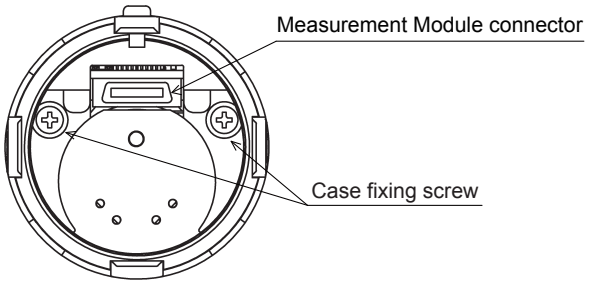
■ DIMENSIONS

● **Main body**

Units: mm (approx. inch)





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<Ordering Information>

1. Model, suffix codes, and option code

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<Related Products General Specifications>

XS530 Pressure Measurement Module:
Refer to GS 01W06F01-01EN

XS550 Temperature Measurement Module:
Refer to GS 01W06F02-01EN

XS822 Steam Trap Monitoring Module:
Refer to GS 01W06G01-01EN

XS540 Vibration Measurement Module:
Refer to GS 01W06F03-01EN

XS01VT Vibration Pickup:
Refer to GS 01W06H01-01EN

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