

# 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 detail on channel plan, 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

##### 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

□ 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 detail on channel plan and 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

**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]  
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

□ 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:**

RE Directive (EEA and EFTA Countries),  
FCC Approval (United States),  
ISED Approval (Canada)  
KC Marking (South Korea)  
RCM (Australia and New Zealand)

**CE Conformity:**

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

**ATEX Intrinsic Safety:**

Refer to Table 2.

EU RoHS Directive compliant

**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

## ■ 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 Sushi Sensor APP to the Android device must comply with the following.

- 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.

**Table 1 Area code, frequency and Channel Plan**

Area Code	Frequency	Channel Plan	Countries and Regions
2	863 to 870 MHz *1	EU868	Europe
3	902 to 928 MHz *2	US915	North America
4	919 to 925 MHz *2	AS923-1	Singapore, Malaysia, Thailand
5	915 to 928 MHz	AU915	Australia, Chile
6	915 to 928 MHz	AS923-1	New Zealand
7	920.9 to 923.3 MHz	KR920	South Korea
9	915 to 928 MHz	AU915	Brazil
G	915 to 928 MHz	AU915	Argentina

\*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.

### □ 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	<ul style="list-style-type: none"> <li>• MIFARE Ultralight</li> <li>• MIFARE Classic</li> </ul>

**Table 2 Specification for explosion protected type**

Item	Description	Type
IECEx intrinsic safety	<p>Certificate number: IECEx DEK 19.0027X</p> <p>Applicable standards: IEC 60079-0 Ed. 7.0 (2017), IEC 60079-11 Ed. 6.0 (2011)</p> <p>Ex marking: Ex ib IIC T4 Gb</p> <p>Ambient temperature: -40 to 75°C (-40 to 167°F) *</p> <p>Electrical parameters: Connector U<sub>o</sub> = 6.88 V, I<sub>o</sub> = 1.54 A, P<sub>o</sub> = 0.3 W, C<sub>o</sub> = 10 μF, L<sub>o</sub> = 3 μH</p> <p>Enclosure: IP66/IP67 in accordance with only IEC 60529 when combined with certified equipment.</p>	<b>S2</b>
ATEX intrinsic safety	<p>Certificate number: DEKRA 20ATEX0024 X</p> <p>Applicable standards: EN IEC 60079-0:2018, EN 60079-11:2012</p> <p>Ex marking: Ⓜ II 2 G Ex ib IIC T4 Gb</p> <p>Ambient temperature: -40 to 75°C (-40 to 167°F) *</p> <p>Electrical parameters: Connector U<sub>o</sub> = 6.88 V, I<sub>o</sub> = 1.54 A, P<sub>o</sub> = 0.3 W, C<sub>o</sub> = 10 μF, L<sub>o</sub> = 3 μH</p> <p>Enclosure: IP66/IP67 in accordance with only EN 60529 when combined with certified equipment.</p>	<b>K2</b>
FM intrinsic safety	<p>Certificate number: FM20US0109X</p> <p>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</p> <p>Ex marking: IS CL I/II/III DIV 1 GP ABCDEFG T4, CL I ZN 0 AEx ia IIC T4 Ga</p> <p>Ambient temperature: -40 to 75°C (-40 to 167°F)*</p> <p>Electrical parameters: Connector U<sub>o</sub> = 6.88 V, I<sub>o</sub> = 1.54 A, P<sub>o</sub> = 0.3 W, C<sub>o</sub> = 10 μF, L<sub>o</sub> = 3 μH</p> <p>Enclosure: Type 4X when combined with certified equipment.</p>	<b>F1</b>
CSA intrinsic safety	<p>Certificate number: CSA21CA80063719X</p> <p>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</p> <p>Ex marking: Ex ia IIC T4 Ga, IS CL I/II/III DIV 1 GP ABCDEFG T4</p> <p>Ambient temperature: -40 to 75°C (-40 to 167°F) *</p> <p>Electrical parameters: Connector U<sub>o</sub> = 6.88 V, I<sub>o</sub> = 1.54 A, P<sub>o</sub> = 0.3 W, C<sub>o</sub> = 10 μF, L<sub>o</sub> = 3 μH</p> <p>Enclosure: Type 4X when combined with certified equipment.</p>	<b>C1</b>
South Korea intrinsic safety	<p>Certificate number: 20-AV4BO-0550X (XS110A+XS530) 20-AV4BO-0551X (XS110A+XS550)</p> <p>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)</p> <p>Ex marking: Ex ib IIC T4</p> <p>Ambient temperature: -40 to 75°C *</p> <p>Enclosure: IP66/IP67 in accordance with only IEC 60529 when combined with certified equipment.</p>	<b>P1</b>
INMETRO intrinsic safety	<p>Certificate number: DEKRA 20.0013X</p> <p>Applicable standards: ABNT NBR IEC 60079-0:2020 ABNT NBR IEC 60079-11:2013 Versão Corrigida:2017</p> <p>Ex marking: Ex ib IIC T4 Gb</p> <p>Ambient temperature: -40 to 75°C *</p> <p>Electrical parameters: Connector U<sub>o</sub> = 6.88 V, I<sub>o</sub> = 1.54 A, P<sub>o</sub> = 0.3 W, C<sub>o</sub> = 10 μF, L<sub>o</sub> = 3 μH</p> <p>Enclosure: IP66/IP67 in accordance with only ABNT NBR IEC 60529 when combined with certified equipment.</p>	<b>U1</b>

\* 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	Singapore, Malaysia, Thailand AS923-1
	5	Australia, Chile AU915
	6	New Zealand AS923-1
	7	South Korea KR920
	9	Brazil AU915
	G	Argentina AU915
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
—	-A	Always A
Housing material	5	Plastic (PC)
Power source	D	Battery powered (Battery not included)
—	A	Always A

\*1: Applicable when Area Code is 2 or 3.

\*2: Applicable when Area Code is 2 or 4.

\*3: Applicable when Area Code is 4, 5, 6 or G.

\*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.

## ■ 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.

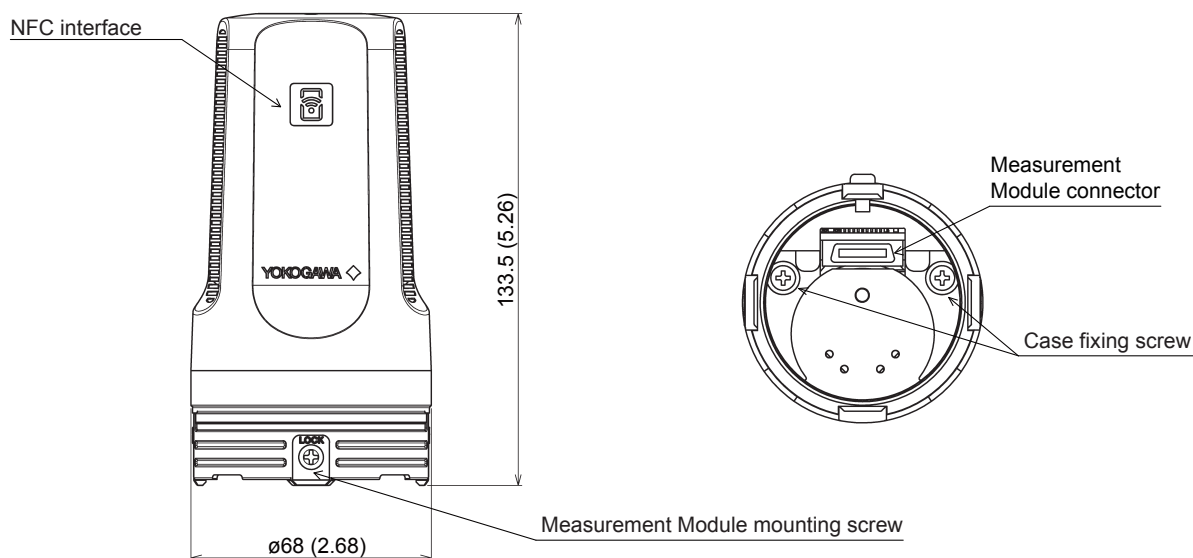
\*2: Tadiran TL-5930/S

\*3: This product works with one size D battery, but the accessory is a set of two.

## ■ DIMENSIONS

### ● Main body

Units: mm (approx. inch)



F01.ai

### <Ordering Information>

1. Model, suffix codes, and option code

### <Trademarks>

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- The name, LoRa, and related logo are registered trademarks or trademarks of Semtech Corporation and/or its subsidiaries.
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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