User's Manual

Sushi Sensor

XS110A
Wireless Communication Module

IM 01W06D01-01EN

YOKOGAWA

IM 01W06D01-01EN
7th Edition

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7th Edition: Sep. 2023

1. Introduction

Thank you for purchasing XS110A Wireless Communication Module. This manual provides important information and installation and maintenance instructions for using the XS110A Wireless Communication Module (Hereinafter, it is described as XS110A.) correctly and safely.
The XS110A can be connected to an XS-series Measurement Module.
The battery mounted on the XS110A supplies power to the connected Measurement Module.
The function description, setting, operation, and maintenance of the XS-series are described in the Sushi Sensor Series Software Edition (IM01W06C01-01EN), so be sure to read it and use it correctly.
The Sushi Sensor Series Software Edition (PDF files) can download from our company home page (http://www.sushisensor.com/).

Table 1.1 Related Documents

Document Name	Document No.
General Specifications XS110A Wireless Communication Module	GS 01W06D01-01EN
User's Manual Sushi Sensor Series Software Edition	IM 01W06C01-01EN

■ Regarding This Manual

- This manual should be provided to the end user.
- This manual and the identification tag attached on the packing box are essential parts of the product; keep them in a safe place for future reference.
- The contents of this manual are subject to change without prior notice.
- All rights reserved. No part of this manual may be reproduced in any form without Yokogawa's written permission.
- Yokogawa makes no warranty of any kind with regard to this manual, including, but not limited to, implied warranty of merchantability and fitness for a particular purpose.
- If any question arises or errors are found, or if any information is missing from this manual, please inform the nearest Yokogawa sales office.
- The specifications covered by this manual are limited to those for the standard type under the specified model number break-down and do not cover custom-made instruments. When products whose suffix code or optional codes contain code "Z" and an exclusive document is attached, please read it along with this manual.
- Please note that changes in the specifications, construction, or component parts of the instrument may not immediately be reflected in this manual at the time of change, provided that postponement of revisions will not cause difficulty to the user from a functional or performance standpoint.

■ Safety, Protection, and Modification of this Product

- This product is designed to be used by a person with specialized knowledge.
- To protect the operator, product, and system controlled by the product, observe the safety precautions described in this manual. If users handle contrary to these instructions, we cannot guarantee safety.
- The Modification of the product is strictly prohibited.
- Repair or modification to this instrument by customer will cause a malfunction of explosion protect function and hazardous situation. If you need to repair or modification, please contact the nearest Yokogawa office.

- The following safety symbols are used in this manual:

WARNING

Indicates a potentially hazardous situation which, if not avoided, could result in death or serious injury.

CAUTION

Indicates a potentially hazardous situation which, if not avoided, may result in minor or moderate injury or physical damage. It may also be used to alert against unsafe practices.

IMPORTANT

Indicates that operating the hardware or software in this manner may damage it or lead to system failure.

NOTE

Draws attention to information essential for understanding the operation and features.

■ Trademarks

- Sushi Sensor is a registered trademark of Yokogawa Electric Corporation.
- The registered trademarks or trademarks of the respective companies in the text do not bear the mark of ™ or ®.

1.1 Safe Use of This Product

- Users of explosion protected instruments should refer first to “2.6 Explosion Protected Instrument”.
- The use of this instrument is restricted to those who have received appropriate training for the device.
- Take care not to create sparks when accessing the instrument or peripheral devices in a hazardous location.
- Repair or modification to this instrument by customer will cause a malfunction of explosion protect function and hazardous situation. If you need to repair or modification, please contact the nearest Yokogawa office.

1.2 Radio Waves

This product is designated as a certification of construction type as a wireless facility for 800 MHz band and 900 MHz band low-power data communication system of the Radio Act.
Refer to “7.6 Regulatory Compliance Statements” for detail.
For detail on each countries area code, frequency and LoRaWAN regional parameter, refer to the table in “7.1 General Specifications”. For area code 2, Sweden and Greece do not allow full use of the 863 to 870 MHz band. Detail of the restrictions, refer to EC Decision 2006/771/EC (as amended).

IMPORTANT

- Due to the designated certification of construction type, users may be subject to legal punishment in case of disassembling or modifying this product.
- Preventing interference with other wireless stations Industrial, scientific, and medical equipment, as well as local wireless stations (license required) and specific low power wireless stations (license not required) for identifying mobile objects used in factory production lines, use the same frequency band as this product.
- Check that local wireless stations and specific low-power wireless stations are not being used in the vicinity before using this product.
- If this product causes radio interference in a local wireless station, stop the emission of radio waves immediately. For details on how to prevent radio interference, contact our service office.

1.3 Warranty

- The warranty shall cover the period noted on the quotation presented to the purchaser at the time of purchase. Problems occurring during the warranty period shall basically be repaired free of change.
- If any problems are experienced with this product, the customer should contact the Yokogawa representative from which this product was purchased or the nearest Yokogawa office.
- If a problem arises with this product, please inform us of the nature of the problem and the circumstances under which it developed, including the model specification and serial number. Any diagrams, data and other information you can include in your communication will also be helpful.
- The party responsible for the cost of fixing the problem shall be determined by Yokogawa following an investigation conducted by Yokogawa.

■ The purchaser shall bear the responsibility for repair costs, even during the warranty period, if the malfunction is due to:

- Improper and/or inadequate maintenance by the purchaser.
- Malfunction or damage due to a failure to handle, use, or store this product in accordance with the design specifications.
- Use of this product in question in a location not conforming to the standards specified by Yokogawa, or due to improper maintenance of the installation location.
- Failure or damage due to modification or repair by any party except Yokogawa or an approved representative of Yokogawa.
- Malfunction or damage from improper relocation of this product in question after delivery.
- Reason of force majeure such as fires, earthquakes, storms/floods, thunder/lightening, or other natural disasters, or disturbances, riots, warfare, or radioactive contamination.

2. Notes on Handling

The XS110A is fully factory-tested before shipment. When the XS110A is delivered, check the appearance for damage.
This section describes the precautions required to handle this product. Before use, read this section thoroughly. For information about other items, refer to the relevant sections. Regarding the tools to be used, please use tools that are suitable for the shape.

2.1 Check the Model and Specifications

The model name and specifications are written on the nameplate attached to the case. Verify that the specification indicated in the “Model and Suffix Code” in General Specifications “GS 01W06D01-01EN” complies with the specifications written on the order sheet.

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2.2 Transport

To prevent damage while in transit, leave the XS110A in the original shipping container until it reaches the installation site.

2.3 Storage

When an extended storage period is expected, observe the following precautions.

(1) Choose a storage location that satisfies the following requirements.
- A location that is not exposed to rain or water.
- A location subject to a minimum of vibration or impact.
- The following temperature and humidity range are recommended.
  - Temperature: –40 to 85°C (–40 to 185°F)
  - Humidity: 0 to 100% RH (non-condensation)

(2) When storing the XS110A, repack it carefully in the packaging that it was originally shipped with.

(3) Preferably remove the batteries for storage. For maximum battery life, the storage temperature should not exceed 30°C.

NOTE

When storing this product over a long period, it is recommended to put the instrument in OFF Mode to conserve the battery. For details on how to switch to OFF Mode, refer to “IM 01W06C01-01EN”.

2.4 Selecting the Installation Location

This product is designed to withstand severe environmental conditions. However, to ensure that it will provide years of stable and accurate performance, take the following precautions when selecting the installation location.

■ Wireless Communication

Install where are no obstacles for radio waves such as walls or pipes around the product as possible.
Also, avoid using it for a long time with unstable communication.

■ Ambient Temperature

Avoid locations subject to wide temperature variations or a significant temperature gradient. If the location is exposed to radiant heat from plant equipment, provide adequate thermal insulation and/or ventilation.

■ Ambient Atmospheric

Do not install the product in a location with a corrosive atmosphere. If this cannot be avoided, ensure there is adequate ventilation.
Also, avoid gas, liquid, or solids containing organic solvents and acidic/alkaline chemicals from adhering to the product.

■ Shock and Vibration

It is designed to be resistant to shock and vibration. However, it is recommended that the XS110A be installed in a location that is subject to a minimum amount of impact and vibration.

2.5 Restrictions on Use of Radio Transceivers

IMPORTANT

Although this product has been designed to resist high frequency electrical noise, if a radio transceiver is used near this product or its external wiring, this product may be affected by high frequency noise pickup. To test this, start from a distance of several meters and slowly approach this product with the transceiver while observing the measurement loop for noise effects. Thereafter use the transceiver outside the range where the noise effects were first observed.

2.6 Explosion Protected Instrument

2.6.1 ATEX Intrinsic Safety

Technical data:

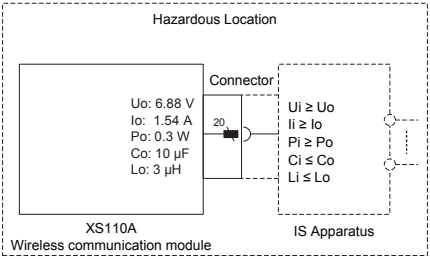
- Certificate number: DEKRA 20ATEX0024 X
- Applicable standards: EN IEC 60079-0:2018, EN 60079-11:2012
- Ex marking: Ex II 2 G Ex ib IIC T4 Gb
- Ambient temperature: –40 to 75°C (–40 to 167°F)*
  *: Additionally, limited by the ambient temperature range of the equipment connected to XS110A.
- Electrical parameters:
  Connector
  Uo = 6.88 V, Io = 1.54 A, Po = 0.3 W, Co = 10 μF, Lo = 3 μH
- Enclosure: IP66/IP67 when accordance with EN 60529 when combined with certified equipment.

Certification information:

WARNING

A modification of the equipment would no longer comply with the construction described in the certificate documentation.

Control drawing:



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Specific conditions of use:

Precautions shall be taken to minimize the risk from electrostatic discharge of non-metallic parts.

WARNING

- POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS*1
- DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT
- USE ONLY SPECIFIED BATTERY – SEE INSTRUCTIONS*2

*1: Refer to “Specific conditions of use” in this section.

*2: Refer to “Replacing the Battery” in this section.

Installation:

The equipment must be installed in accordance with EN 60079-14, local requirements, and the control drawing.

Operation:

WARNING

- When the equipment is used in hazardous locations, avoid any actions which generate electrostatic charges, such as rubbing with a dry cloth.
- When using Sushi Sensor APP to the explosion protected instrument, the Android device must comply with the following.
  - ➢ When using the 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 NFC link in a hazardous area, only Android devices confirmed by Yokogawa Electric Corporation can be used.
  - ➢ If additional information and approvals for Android device are required, contact a Yokogawa representative.

Maintenance and repair:

WARNING

Only personnel authorized by Yokogawa Electric Corporation can repair the equipment.

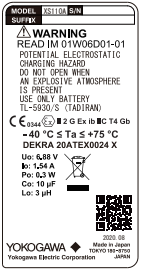
Replacing the Battery:

WARNING

Be sure to replace the battery in a safe location. Doing so in an explosive area could cause an explosion.

Use the following batteries.
TL-5930/S, SL-2780/S (Tadiran) or SB-D02 (Vitzrocell)

Nameplate:



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2.6.2 IECEx Intrinsic Safety

Technical data:

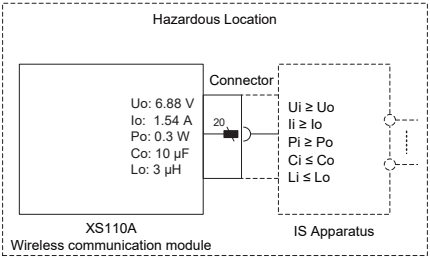
- Certificate number: IECEx DEK 19.0027X
- Application Standard: IEC 60079-0 Ed. 7.0 (2017),
  IEC 60079-11 Ed. 6.0 (2011)
- EX marking: Ex ib IIC T4 Gb
- Ambient temperature: –40 to 75°C (–40 to 167°F)*
  *: Additionally, limited by the ambient temperature range of the equipment connected to XS110A.
- Electrical parameters:
  Connector
  Uo = 6.88 V, Io = 1.54 A, Po = 0.3 W, Co = 10 μF, Lo = 3 μH
- Enclosure: IP66/IP67 when accordance with IEC 60529 when combined with certified equipment.

Certification information:

WARNING

A modification of the equipment would no longer comply with the construction described in the certificate documentation.

Control drawing:



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Specific conditions of use:

Precautions shall be taken to minimize the risk from electrostatic discharge of non-metallic parts.

WARNING

- POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS*1
- DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT
- USE ONLY SPECIFIED BATTERY – SEE INSTRUCTIONS*2

*1: Refer to “Specific conditions of use” in this section.

*2: Refer to “Replacing the Battery” in this section.

Installation:

The equipment must be installed in accordance with IEC 60079-14, local requirements, and the control drawing.

Operation:

WARNING

- When the equipment is used in hazardous locations, avoid any actions which generate electrostatic charges, such as rubbing with a dry cloth.
- When using Sushi Sensor APP to set the parameter of the explosion protected instrument, the Android device must comply with the following.
  - ➢ When using the 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 NFC link in a hazardous area, only Android devices confirmed by Yokogawa Electric Corporation can be used.
  - ➢ If additional information and approvals for Android device are required, contact a Yokogawa representative.

Maintenance and repair:

WARNING

Only personnel authorized by Yokogawa Electric Corporation can repair the equipment.

Replacing the Battery:

WARNING

Be sure to replace the battery in a safe location. Doing so in an explosive area could cause an explosion.

Use the following batteries.
TL-5930/S, SL-2780/S (Tadiran) or SB-D02 (Vitzrocell)

2.6.3 FM intrinsic safety

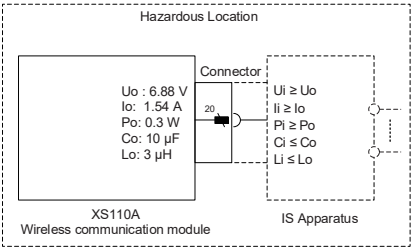
Technical data:

- 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)*
  *: Additionally, limited by the ambient temperature range of the equipment connected to XS110A.
- Enclosure: Type 4X when combined with certified equipment.

Control drawing:

Yokogawa Electric Corporation		Model		XS110A series			
Title	Control drawing (XS110A)						
No.	IFM0054-A031	Page	1	Revision	0	Date	2020-05-22

* The description in the following may be replaced by technically equivalent ones.



Notes:
1. IS Apparatus must be FM-approved.
2. WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS
3. WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT
4. WARNING – USE ONLY SPECIFIED BATTERY – SEE INSTRUCTIONS

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Specific conditions of use:
A portion of the enclosure is non-conducting and, under certain extreme conditions, may generate an ignition-capable level of electrostatic charges. The user shall ensure that the equipment is not installed in a location where it may be subjected to external conditions (such as high-pressure steam) which might cause a build-up of electrostatic charges on non-conducting surfaces. Additionally, cleaning of the equipment should be done only with a damp cloth.

WARNING

- POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS*1
- DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT
- USE ONLY SPECIFIED BATTERY – SEE INSTRUCTIONS*2

*1: Refer to “Specific conditions of use” in this section.
*2: Refer to “Replacing the Battery” in this section.

Installation:
The equipment must be installed in accordance with NFPA70, local electrical code, local requirements, and the control drawing.

Operation:

WARNING

- When the equipment is used in hazardous locations, avoid any actions which generate electrostatic charges, such as rubbing with a dry cloth.
- When using Sushi Sensor APP to the explosion protected instrument, the Android device must comply with the following.
  - ➢ When using the 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 NFC link in a hazardous area, only Android devices confirmed by Yokogawa Electric Corporation can be used.
  - ➢ If additional information and approvals for Android device are required, contact a Yokogawa representative.

Maintenance and repair:

WARNING

- A modification of the equipment would no longer comply with the construction described in the certificate documentation.
- Only personnel authorized by Yokogawa Electric Corporation can repair the equipment.

Replacing the Battery:

WARNING

Be sure to replace the battery in a safe location. Doing so in an explosive area could cause an explosion.

Use the following batteries.
TL-5930/S or SL-2780/S (Tadiran) or SB-D02 (Vitzrocell)

2.6.4 CSA intrinsic safety

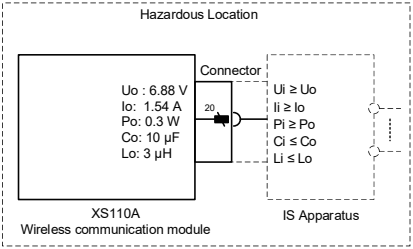
Technical data:

- 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)*
  *: Additionally, limited by the ambient temperature range of the equipment connected to XS110A.
- Enclosure: Type 4X when combined with certified equipment.

Control drawing:

Yokogawa Electric Corporation		Model		XS110A series			
Title	Control drawing (XS110A)						
No.	ICS0041-A031	Page	1	Revision	0	Date	2020-07-17

* The description in the following may be replaced by technically equivalent ones.



Notes:

1. WARNING – POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS
   AVERTISSEMENT – DANGER POTENTIEL DE CHARGES ÉLECTROSTATIQUES –VOIR INSTRUCTIONS
2. WARNING – DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT
   AVERTISSEMENT – NE PAS OUVRIR EN PRÉSENCE D'UNE ATMOSPHÈRE EXPLOSIVE
3. WARNING – USE ONLY SPECIFIED BATTERY – SEE INSTRUCTIONS
   AVERTISSEMENT – UTILISER UNIQUEMENT DES ACCUMULATEUR SPÉCIFIQUE –VOIR INSTRUCTIONS

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* Remplacer "DES ACCUMULATEUR" par "UNE BATTERIE"

Specific conditions of use:

- Precautions shall be taken to minimize the risk from electrostatic discharge of non-metallic parts.
- XS110A - Wireless Communication Module is to be used in conjunction with XS530 - Pressure Measurement Module, or XS550 - Temperature Measurement Module.

WARNING / AVERTISSEMENT

- POTENTIAL ELECTROSTATIC CHARGING HAZARD – SEE INSTRUCTIONS*1
- DANGER POTENTIEL DE CHARGES ÉLECTROSTATIQUES – VOIR INSTRUCTIONS*1
- DO NOT OPEN WHEN AN EXPLOSIVE ATMOSPHERE IS PRESENT
- NE PAS OUVRIR EN PRÉSENCE D'UNE ATMOSPHÈRE EXPLOSIVE
- USE ONLY SPECIFIED BATTERY – SEE INSTRUCTIONS*2
- UTILISER UNIQUEMENT UNE BATTERIE SPÉCIFIQUE –VOIR INSTRUCTIONS*2

*1: Refer to "Specific conditions of use" in this section.
*2: Refer to "Replacing the Battery" in this section.

Installation:

The equipment must be installed in accordance with C22.1 Canadian electrical code, relevant local codes, local requirements, and the control drawing.

Operation:

WARNING

- When the equipment is used in hazardous locations, avoid any actions which generate electrostatic charges, such as rubbing with a dry cloth.
- When using Sushi Sensor APP to the explosion protected instrument, the Android device must comply with the following.
  - ➢ When using the 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 NFC link in a hazardous area, only Android devices confirmed by Yokogawa Electric Corporation can be used.
  - ➢ If additional information and approvals for Android device are required, contact a Yokogawa representative.

Maintenance and repair:

WARNING

- A modification of the equipment would no longer comply with the construction described in the certificate documentation.
- Only personnel authorized by Yokogawa Electric Corporation can repair the equipment.

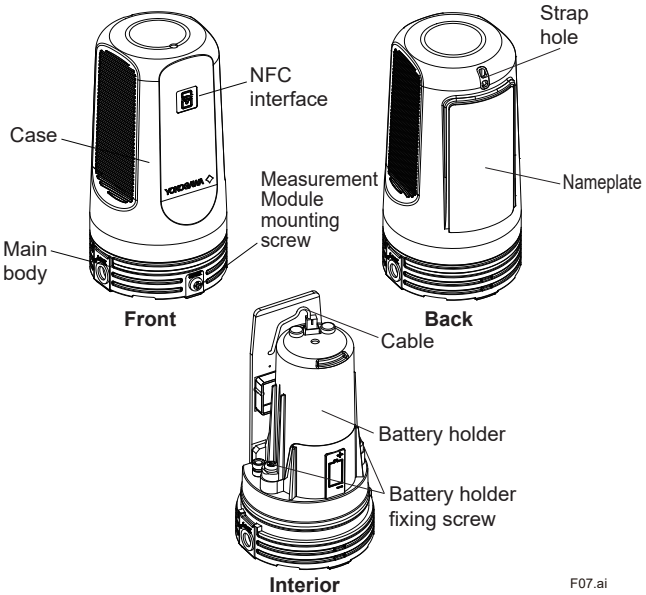
Replacing the Battery:

WARNING

Be sure to replace the battery in a safe location. Doing so in an explosive area could cause an explosion.

Use the following batteries.
TL-5930/S or SL-2780/S (Tadiran) or SB-D02 (Vitzrocell)

3. Component Names



4. Installation

The XS110A does not include batteries when shipped from the factory. Install the battery to the XS110A according to the procedure in Section 6.1. After installing the battery, mount the XS110A on the Measurement Module. Refer to the User's Manual of the Measurement Module connected to the XS110A for installation precautions.
Refer to Chapter 7 "General Specifications" for the ambient conditions of the installation site.

CAUTION

When installing in a hazardous location, use both XS110A and Measurement Module with explosion-proof products.

IMPORTANT

- There are three screws to fix the XS110A. Two XS110A fixing screws for the measuring module and one measuring module fixing screw for the XS110A. After mounting the XS110A with the Measuring Module, tighten these screws properly.
- For the XS110A fixing screws, turn the screws to the left and pull them out. Pay attention to the direction of screws rotation. Turn them 1/4 left from where they come into contact to tighten them. At this time, check that the head of the XS110A fixing screws is flashed with the surface of the XS110A.

- Turn the measuring module fixing screw to the right. Tighten the screw with a torque of 1.4 N/m.

5. Operation

To perform the setting and status check of the product, use an Android device with the NFC interface. Download Sushi Sensor App from Google Play.
Sushi Sensor App provides the following functions.

- Network setting
- Sensor setting
- Status check of communication, sensor, battery life, etc.
- Switch to OFF Mode

For details, refer to “IM 01W06C01-01EN”.
Check the firmware version of Measurement Module with Sushi Sensor App and update it to the latest firmware before use.

6. Maintenance

6.1 Replacing the Battery

The XS110A can be replaced with a new battery. The XS110A does not include batteries when shipped from the factory. Install the battery in the XS110A according to the procedure in this section. If the XS110A is installed on the Measurement Module, remove the XS110A according to the user manual of the Measurement Module. Refer to 6.2 for the battery that can be mounted on the XS110A.

■ Workflow

IMPORTANT

- This product contains parts that can be damaged by static electricity. When replacing a battery, take precautions such as using a grounded wrist strap to avoid handling electronic parts or touching the board circuit patterns.
- When putting on or removing the Case, pay great attention to the environmental conditions to prevent dust and water droplets entering the product.
- Take sufficient care not to apply excessive force to the circuit board, hit the board with tools, or stick foreign objects or dirt to the board.
- Be careful not to force the cable to scratch it, break it, or pull it out of the battery holder.

Follow the procedure below to replace the battery.

1. Loosen the case fixing screw (2 places) on the underside of the XS110A.
2. Remove the case and body. If it is difficult to open the case by hand, use a flat blade screwdriver as shown in Fig. 6-2. The case can be easily opened by holding it in the groove between the case and the body and pushing it upward.
3. While holding the top surface of the battery holder with your hand, loosen the battery holder fixing screw (2 places) alternately.
4. If the battery is stored, remove it by lifting the battery that is stored with the battery holder.
5. Insert the new replacement battery into the battery holder with the positive electrode facing up, as shown in Figure 6-3.
6. With the top of the battery holder held down by hand, alternately tighten the battery holder fixing screw (2 places) with a torque of 1.4 N·m.
7. Put the case into the body without any gap.
8. Tighten the case fixing screw (2 places) on the bottom of the XS110A to fix the case with a torque of 1.4 N·m.
9. Initialize the battery life using Sushi Sensor App. For details about how to initialize the battery life, refer to “IM 01W06E01-11EN”.

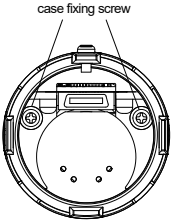


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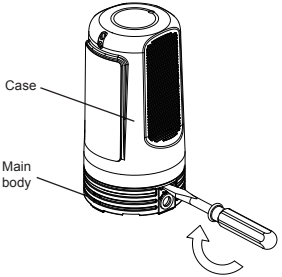
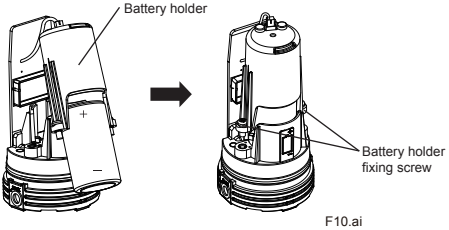
Figure 6-1 Bottom of XS110A



F09.ai

Figure 6-2 Removing the case and body



F10.ai

Figure 6-3 How to insert the battery

6.2 Handling the Battery

This product uses one lithium thionyl chloride primary battery. A single battery contains approximately 5 grams of lithium.
Under normal conditions, the battery materials are self-contained and are not reactive as long as the battery integrity is maintained. Care should be taken to prevent thermal, electrical or mechanical damage. Battery should be stored in a clean and dry area. For maximum battery life, storage temperature should not exceed 30°C.

WARNING

handling of batteries

The following precautions must be observed to safely and effectively use a battery pack. Improper use may lead to fluid leakage, excessive heat, ignition, or explosion.

- Never charge it.
- Don't cut short-circuit it.
- Do not disassemble, transform, or modify it.
- Do not heat it or throw it in a fire.
- Do not soak it in fresh water or seawater.
- Do not expose to extreme high temperatures during use, storage, or transportation.

CAUTION

Observe the following precautions for the safe disposal of battery.

- Do not incinerate the battery, and do not expose it to a high temperature of 100°C or more. This may lead to fluid leakage or explosion.
- Dispose of the battery according to lows and regulations.

■ Batteries

Part No.: F9915NR (2 batteries)

Alternatively, following batteries may be purchased and used.

- Tadiran TL-5930/S or SL-2780/S
- VITZROCELL SB-D02

Transportation of products containing a lithium battery:

This product contains a lithium battery. When transporting this product with the battery installed, set this product to OFF mode to prevent the battery from draining. For details about how to change to OFF mode, refer to “IM 01W06C01-01EN”. Transportation of primary lithium batteries is restricted by regulations issued by the U.S. Department of Transportation, the International Air Transport Association (IATA), the International Civil Aviation Organization (ICAO), and the European Ground Transportation of Dangerous Goods (ARD). It is the responsibility of the shipper to ensure compliance with these and any other local requirements. Consult current regulations and requirements before shipping.

How to replace and dispose of the battery:

(Only valid in the EU for EU Battery Directive/Regulation and in the UK for UK battery regulation.)

This is an explanation about the EU Battery Directive/Regulation and UK Battery Regulation.

The battery is included in this product.

When you remove the battery from this product and dispose of them,discard them in accordance with domestic law concerning disposal.

Take the right action on waste batteries,because the collection system in the EU or UK on waste batteries are regulated.

Battery type: Primary lithium-thionyl chloride battery

Notice:

The symbol (see above) means they shall be sorted out and collected as ordained in the EU Battery Directive.

How to remove battery safely:

Refer to subsection 6.1 “Replacing the Battery”.

7. General Specifications

Please refer to “GS 01W06D01-01EN” for the latest information.

7.1 STANDARD SPECIFICATIONS

■ WIRELESS SPECIFICATIONS

Communication protocol:

LoRaWAN Class A,
For detail on channel plan, refer to Table 7-1.

Data Rate:

250 to 21900 bps*

*: Available data rate vary depending on the country.

Frequency:

Refer to Table 7-1.

Radio Security:

AES 128-bit encryption

RF Transmitter Power:

Max. 7 dBm

Antenna:

Built-in Omnidirectional antenna

■ POWER SUPPLY SPECIFICATIONS

Battery:

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

■ PERFORMANCE SPECIFICATION

Update Period:

1 minute to 3 days

Battery characteristics:

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

■ FUNCTIONAL SPECIFICATION

Output signal:

LoRaWAN
For detail on channel plan and available countries and regions, refer to Table 7-1.

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 (Atmospheric pressure):

[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 mmP-P (10 to 60 Hz),
3 G (60 to 2 kHz)

Shock Resistance:

50 G 11 ms (3 directions/3 times)

■ PHYSICAL SPECIFICATIONS

Housing Material:

Plastic (PC)

Weight:

300 g (0.66 lb)*
*: Without battery

Table 7-1. Area code specifications

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

*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.

7.2 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 later
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.

■ 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

7.3 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 AU915
		6			Australia, New Zealand AS923-1
		7			South Korea KR920
		8			India IN865
		9			Brazil AU915
		F			China CN470
		G			Argentina AU915
		H			Nigeria, Saudi Arabia 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
—				-A	Always A
Housing*8 material				5	Plastic (PC)
Power source				D	Battery powered (Battery not included)
—				A	Always A

*1: Applicaable when Area Code is 2,3 or F.
*2: Applicable when area code is 2, 4 or H. Area code H is Saudi Arabia.
*3: Applicable when Area Code is 4, 5, 6, 8, G or H.
*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 from adhering to the case.

7.4 OPTIONAL ACCESSORIES

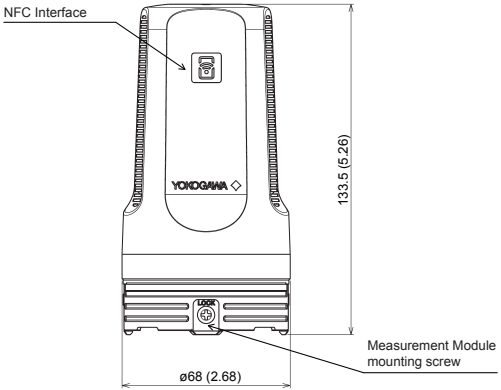
Item	Parts Number	Description
Batteries*1	F9915NR	Lithium-thionyl chloride batteries*2, 2 pieces*3

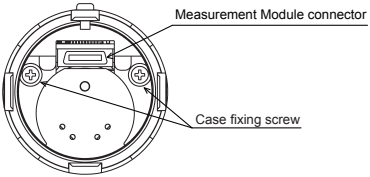
*1: Alternatively, Tadiran TL-5930/S, SL-2780/S or VITZROCELL SB-D02 batteries can be purchased from your local distributor.
*2: Tadiran TL-5930/S
*3: This product works with one size D battery, but the accessory is a set of two.

7.5 Outline

● Main body

Units: mm (approx. inch)





F11.ai

7.6 Regulatory Compliance Statements

This product 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 (EU Countries)

Hereby, Yokogawa Electric Corporation declares that the radio equipment type XS110A complies with Directive 2014/53/EU. The full text of the EU declaration of conformity is available at the following internet address:
https://partner.yokogawa.com/global/

■ FCC compliance (United States)

FCC ID: SGJ-WFC017

FCC Approval

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

Co-located:

This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

FCC WARNING

Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

NOTE

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment.
This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

RF Exposure Compliance:
This equipment complies with FCC radiation exposure limits set forth for an uncontrolled environment and meets the FCC radio frequency (RF) Exposure Guidelines. This equipment should be installed and operated keeping the radiator at least 20 cm or more away from person's body.

■ ISED compliance (Canada)

IC: 8999A-WIC016
This device contains licence-exempt transmitter(s)/receiver(s) that comply with Innovation, Science and Economic Development Canada's licence-exempt RSS(s).
Operation is subject to the following two conditions:

(1) This device may not cause interference.
(2) This device must accept any interference, including interference that may cause undesired operation of the device.

French:

L'émetteur/récepteur exempt de licence contenu dans le présent appareil est conforme aux CNR d'Innovation, Sciences et Développement économique Canada applicables aux appareils radio exempts de licence. L'exploitation est autorisée aux deux conditions suivantes :

(1) L'appareil ne doit pas produire de brouillage;
(2) L'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

RF Exposure Compliance:

This equipment complies with ISED radiation exposure limits set forth for an uncontrolled environment and meets RSS-102 of the ISED radio frequency (RF) Exposure rules. This equipment should be installed and operated keeping the radiator at least 20 cm or more away from person's body.

French:

Cet équipement est conforme aux limites d'exposition aux rayonnements énoncées pour un environnement non contrôlé et respecte les règles d'exposition aux fréquences radioélectriques (RF) CNR-102 de l'ISDE. Cet équipement doit être installé et utilisé en gardant une distance de 20 cm ou plus entre le radiateur et le corps humain.

CE Conformity*1:

The Authorized Representative for this product in the EEA is:
Yokogawa Europe B.V. Euroweg 2, 3825 HD Amersfoort, THE NETHERLANDS.

EU RoHS Directive compliant

RE Directive:

Safety: EN61010-1 (Indoor/Outdoor use)*2, EN62479*2

(1) Pollution Degree 2

"Pollution degree" describes the degree to which a solid, liquid, or gas which deteriorates dielectric strength or surface resistivity is adhering. "2" applies to normal indoor atmosphere. Normally, only non-conductive pollution occurs.Occasionally, however, temporary conductivity caused by condensation must be expected.

(2) Installation Category I

"Overvoltage category (Installation category)" describes a number which defines a transient overvoltage condition. It implies the regulation for impulse with stand voltage. "I" applies to electrical equipment which is supplied from the circuit when appropriate transient overvoltage control means (interfaces) are provided.

*1: When area code is 2, and 4 or H (only Type = K2), CE mark is given on the marking. When area code is 4 or H, it cannot be used in Europe Economics Area.

*2: When area code is 2 or H (only Type = K2), EN61010-1 and EN62479 are applied.

EMC:

EN 301 489-1, EN 301 489-3, EN61326-1 Class A Table 2, EN61326-2-3, EN55011 Class A

CAUTION

This instrument is a Class A product, and it is designed for use in the industrial environment. Please use this instrument in the industrial environment only.

Radio Spectrum:

EN 300 220-2 (Band h1.3 in table 1 of CEPT ERC Rec. 70-03), EN 300 330

The full text of the EU declaration of conformity is available at the following internet address:

https://partner.yokogawa.com/global/

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.

Nigeria Communication Commission (NCC):

Connection and use of this communications equipment is permitted by the Nigerian Communications Commission

■ Waste Electrical and Electronic Equipment (WEEE), Directive

(Only valid in the EU for EU WEEE Directive and in the UK for UK WEEE Regulation.)
This product complies with the WEEE Directive marking requirement.
The following marking indicates that you must not discard this electrical/electronic product in domestic household waste.
Product Category
With reference to the equipment types in the WEEE directive, this product is classified as
“Small equipment”.
Do not dispose of this product in domestic household waste.
When disposing of products in the EEA or UK, contact your local Yokogawa office or UK office respectively.

■ Thailand (NBTC) Regulations

กสทช.

เครื่องวิทยุคมนาคมนี้ ได้รับยกเว้น ไม่ต้องได้รับใบอนุญาตให้มี ใช้ซึ่งเครื่องวิทยุคมนาคม หรือตั้งสถานีวิทยุคมนาคมตามประกาศ กสทช. เรื่อง เครื่องวิทยุคมนาคม และสถานีวิทยุคมนาคมที่ได้รับยกเว้นไม่ต้องได้รับใบอนุญาตวิทยุคมนาคม ตามพระราชบัญญัติวิทยุคมนาคม พ.ศ. 2498

กสทช. | โทรคมนาคม
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Call Center 1200 (โทรฟรี)

■ 微功率短距离设备声明

- 使用微功率短距离无线电发射设备应当符合国家无线电管理有关规定
- 这个产品符合“微功率短距离无线电发射设备目录和技术要求”民用计量仪表技术要求，用于LoRa无线通信用。采用内置天线。使用方法请参考本使用手册。
- 不得擅自改变使用场景或使用条件、扩大发射频率范围、加大发射功率（包括额外加装射频功率放大器），不得擅自更改发射天线。
- 不得对其他合法的无线电台（站）产生有害干扰，也不得提出免受有害干扰保护。
- 应当承受辐射射频能量的工业、科学及医疗 (ISM) 应用设备的干扰或其他合法的无线电台（站）干扰。
- 如对其他合法的无线电台（站）产生有害干扰时，应立即停止使用，并采取措施消除干扰后方可继续使用。
- 在航空器内和依据法律法规、国家有关规定、标准划设的射电天文台、气象雷达站、卫星地球站（含测控、测距、接收、导航站）等军民用无线电台（站）、机场等的电磁环境保护区域内使用微功率设备，应当遵守电磁环境保护及相关行业主管部门的规定。
- 禁止在以机场跑道中心点为圆心、半径 5000 米的区域内使用各类模型遥控器。
- 使用时温度和电压的环境条件参见一般规格。

■ 電子情報製品污染制御管理弁法（中国版 RoHS）

产品中有害物质或元素的名称及含量

型号	部件名称	有害物质					
		铅 (Pb)	汞 (Hg)	镉 (Cd)	六价铬 (Cr(VI))	多溴联苯 (PBB)	多溴二苯醚 (PBDE)
XS110A	壳体(塑料)	○	○	○	○	○	○
	壳体(金属)	○	○	○	○	○	○
	基板组件	×	○	○	○	○	○
	电缆	○	○	○	○	○	○

○：表示该部件的所有均质材料中的有害物质的含量均在GB/T26572 标准中所规定的限量以下。

×：表示至少该部件的某些均质材料中的有害物质的含量均在GB/T26572 标准中所规定的限量以上。

环保使用期限：

该标识适用于SJ /T11364 中所述，在中华人民共和国销售的电子电气产品的环保使用期限。

注）该年数为“环保使用期限”，并非产品的质量保证期。

Revision Information

Title: XS110A Wireless Communication Module

Reference Number: IM 01W06D01-01EN

Edition	Date	Page	Revision Item
1st	July 2020	-	New publication
2nd	Feb.2021	1-4, 7-2, 7-4, 7-10	Add South Korea, Australia and New Zealand
3rd	Mar. 2021	1-4, 7-2, 7-4 2-9~11	Add Brazil, Chile, Argentina Add FM Explosion Protected Type
4th	Aug. 2021	2-11, 7-2, 7-4 2-4,2-7,2-10 7-4 7-8	Add CSA intrinsic safety Correction of words Add General purpose for Europe Changed the description of RoHS Directive.
5th	Nov. 2021	7-2, 7-4	Add Australia to AS923-1 and India.
6th	May 2022	2-2, 4-1, 6-2, 6-3, 7-1, 7-2, 7-4, 7-5, 7-10	Add notes. Correction of words. Add Nigeria.
7th	Sep. 2023	2-1, 6-4, 6-5, 7-3, 7-5, 7-9, 7-10, 7-11, 7-12, 7-13	Add notes. Add China and Saudi Arabia. Revise the list of area code specification. Add regulation information of UK. Correction of words.

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