User's Manual

FN120 Field Wireless Communication Module

IM 01W03B02-01EN

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YOKOGAWA

IM 01W03B02-01EN
4th Edition

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1. Introduction

This manual describes how to use the FN120 Field Wireless Communication Module (hereafter simply referred to as FN120). FN120 enables various sensors with digital communication interface to be operated in field wireless network by converting input/output of sensor to wireless transmission based on the wireless communication standard ISA100.11a.
Your FN120 was precisely calibrated at the factory before shipment. To ensure both safety and efficiency, please read this manual carefully before you operate the FN120.
Table 1.1 lists the documents related to this manual.

Table 1.1 Related Documents

Document Name	Document No.
General Specification Field Wireless System Overview	GS 01W01A01-01EN
General Specifications FN120 Field Wireless Communication Module	GS 01W03B02-01EN
General Specifications Field Wireless Products Optional Codes of End User Country and Sales Affiliate	GS 01W01A10-02EN
User's Manual FN120 Modbus Communication for PLC/RTU	IM 01W03B02-21EN

■ Regarding This Manual

- This manual should be provided to the end user.
- This manual and the device information attached on 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.
- In order 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 the safety.
- 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. If you need to repair or modification, please contact the nearest Yokogawa office.
- The following safety symbols are used in this manual:

WARNING / AVERTISSEMENT

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

Français:
- Indique une situation potentiellement dangereuse qui, si elle n'est pas évitée, pourrait entraîner la mort ou des blessures graves.

CAUTION / ATTENTION

English:
- 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.

Français:
- Indique une situation potentiellement dangereuse qui, si elle n'est pas évitée, peut entraîner des blessures mineures ou modérées, ou des dommages matériels. Elle peut également être utilisée pour signaler des pratiques dangereuses.

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.

⏚: Functional grounding terminal

1.1 Safe Use of This Product

For the safety of the operator and to protect the instrument and the system, please be sure to follow this manual's safety instructions when handling this instrument. If these instructions are not heeded, the protection provided by this instrument may be impaired. In this case, Yokogawa cannot guarantee that the instrument can be safely operated.
Please pay special attention to the following points:

a) Installation
- The instrument must be installed by expert engineer or skilled personnel. The procedures described about INSTALLATION are not permitted for operators.
- In case of high process temperature, care should be taken not to burn yourself because the surface of body and case reaches a high temperature.
- All installation shall comply with local installation requirement and local electrical code.
- When handling with the instrument, avoid intense vibration and shock. In particular, care should be taken not to drop the instrument because it may result in damage.

b) Wiring
- The instrument must be installed by an engineer or technician who has an expert knowledge of this instrument. Operators are not permitted to carry out wiring unless they meet this condition.

c) Operation
- Do not remove the combination device or metal waterproof cap (with optional code /CP) in wet weather or humid environment. If not connected, stated enclosure protection is not applicable.

d) Maintenance
- Please do not carry out except being written to maintenance descriptions. When these procedures are needed, please contact nearest YOKOGAWA office.
- Care should be taken to prevent the buildup of drift, dust or other material on the name plate. In case of its maintenance, soft and dry cloth is used.

e) Modification
- Yokogawa will not be liable for malfunctions or damage resulting from any modification made to this instrument by the customer.

f) Explosion Protected Type Instrument
- Users of explosion proof instruments should refer first to section 6 (Explosion Protected Instrument) of this manual.
- The use of this instrument is restricted to those who have received appropriate training in the device.

1.2 Radio Wave

IMPORTANT

- This product is equipped with a wireless module which is designated as a certification of construction type as a wireless facility for 2.4 GHz band low-power data communication system of the Radio Act.
  Refer to "5.2 Regulatory Compliance Statements" for detail. Due to the designated certification of construction type, users may be subject to legal punishment in case of disassembling or modifying this product.
- RF Transmitter power
  The RF transmitter power is fixed at 12 dBm eirp. max (including 2 dBi antenna gain). All user cannot change the RF transmitter power.
- Microwave ovens and other 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 the production line of a factory, use the same frequency band as this product. Prevent interference with other wireless stations.
- 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 used for identifying mobile objects, change the working frequency or stop the emission of radio waves immediately. For details on how to prevent radio interference, contact our service office.
- 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 out 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.

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.

1.4 Trademark and Notice

■ Trademarks

In this document, trademarks or registered trademarks are not marked with "™" or "®". Product names and company names in this document are trademarks or registered trademarks of the respective companies.

■ Notice

NO RIGHTS OR LICENSES, EXPRESS OR IMPLIED, ARE GRANTED TO USE THIRDPARTY DEVICES IN COMBINATION WITH THESE PRODUCTS IN A WIRELESS MESH NETWORK, OR TO USE THIRD-PARTY SERVICES TO ACCESS, MONITOR OR CONTROL THESE PRODUCTS IN A WIRELESS MESH NEWORK VIA THE INTERNET OR ANOTHER EXTERNAL WIDE AREA NETWORK.

■ Patent Marking

Covered by one or more claims of patents:
" http://sipcollc.com/patent-list/ " and " http://intusiq.com/patent-list/ ".

2. Notes on handling

The FN120 is fully factory-tested before shipment. When the FN120 is delivered, check the appearance for damage. Please be sure to check this chapter as it describes the precautions required for handling.

2.1 Check the Model and Specifications

The model name and specifications are written on the nameplate attached to the housing. Verify that the specification indicated in the "Model and Suffix Code" in General Specifications "GS 01W03B02-01EN" is in compliance with the specifications written on the order sheet. Manual number omitting the language code at the end is printed on the nameplate. Check the delivery by reference to the following bundled item list.
Marking of the regulatory compliance in the Figure 2.1 may depends on the order. See section 5.4 and 6 for marking details.



F01.ai

Figure 2.1 Nameplate (Typical example; details may differ)

■ Bundled items

- User's Manual (This manual)
- Safety Instruction Manual
- Open Source Software license term.
- Device Information
- Dust cap (When optional code /CP is specified, metal waterproof cap is attached.)
- EU DECLARATION OF CONFORMITY (Only if optional code /KS27 is specified.)
- QR Code label

Note: The remote antenna cable is not included.

■ Description

- MODEL: Specified MS code.
- SUFFIX: Specified MS code.
- S/N: Serial number.
- EUI64: EUI64 address.
- SUPPLY: Rated voltage. (See "5.1 Specifications" for working voltage range)
- TAG NO.: Specified tag number.
- YYYY-MM: Date of Manufacture (e.g. 2020-08).

Note: Style number is not marked on the nameplate. Not marked is "S1".

2.2 Transport

To prevent damage while in transit, leave the FN120 in the original shipping container until it reaches the installation site.

2.3 Storage

When storing FN120, 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 temperature and humidity limits refer to "5.1 Specifications".
2. If at all possible, store the FN120 in factory-shipped condition, that is, in the original shipping container.

2.4 Selecting the Installation Location

FN120 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.

NOTE

The installation location of FN120 must meet the following conditions:

- Adjust the direction of FN120 a to be in the upright position.
- Install FN120 at least 1.5 m above the ground or floor.
- Ensure that there are no obstacles such as walls or pipes within a 30 cm radius of FN120.
- Confirm that each field wireless equipment compliant with ISA100.11a can see the antenna of other devices which locate within its own communication range.
- For additional information on the ambient conditions allowed at the installation location, refer to "5.1 Specifications".
- Avoid installing in a place with a large temperature gradient or temperature fluctuation as much as possible. When receiving radiant heat from the plant side, take heat insulation measures or install it so that it is well ventilated. Also, avoid installing in a place where the hot and humid environment is continuous for a long period of time.
- Avoid installing in a corrosive atmosphere as much as possible. When using in a corrosive atmosphere, consider making it well ventilated.
- Although the structure is designed to withstand shock and vibration, install it in a place with as little shock and vibration as possible.
- FN120 satisfies the protection class of the product specifications with the device to be combined or the remote antenna cable properly attached.

3. Installation

3.1 Precautions

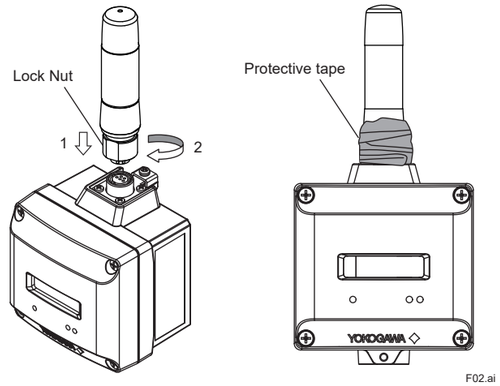
- Before installing, refer to the User's Manual of the device to be connected to the FN120.
- See section 2.4 "Selecting the Installation Location" for precautions on the installation location.
- To install FN120 with remote antenna cable, please purchase the mounting bracket. The mounting bracket for FN110 cannot be used for FN120.

3.2 Mounting

The installation procedure is as follows.

1. Check the orientation of the pins, insert FN120 into the connector on the device.
2. Tighten the lock nut to a torque of 1.2 N·m.
3. It is recommended that the connector part be protected from a corrosive atmosphere in order to maintain a good connection with the equipment for a long period of time. When wrapping the protective tape, wrap it so that the name plate is not hidden.

Removal is the reverse of the above.



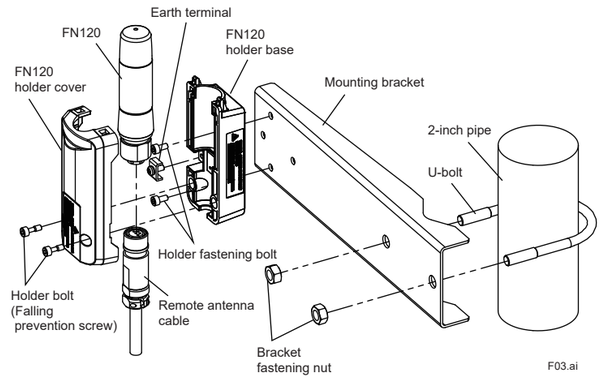
F02.ai

Figure 3.1 Installation of FN120 and Sealing of the Connector

To install FN120 with remote antenna cable, follow the procedure below.

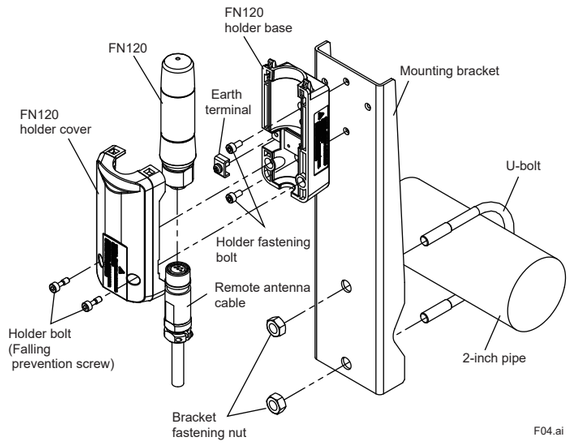
1. Assemble the mounting bracket and fix it on a 50A (2-inch) pipe.
2. Connect the FN120 and the device the dedicated remote antenna cable. Tighten the connector of the remote antenna cable with a torque of 1.2 N·m. The minimum bend radius should be more than 100 mm.
3. If necessary, take protective measures for the connector part of the remote antenna cable.
4. Fix the remote antenna cable to an appropriate structure to protect the cable from the vibration, wind, and so on. The minimum bending radius for fixing in the state maintained for a long period should be more than 100 mm.
5. Fix the FN120 to the mounting bracket. The tightening torque of the Holder bolt and Holder fasten bolt is 1.3 N·m.

Removal is the reverse of the above.



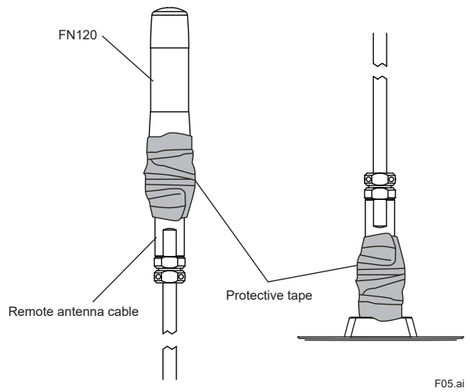
F03.ai

Figure 3.2 Vertical Pipe Mounting of FN120



F04.ai

Figure 3.3 Horizontal Pipe Mounting of FN120



F05.ai

Figure 3.4 Sealing of the Remote Antenna Cable

CAUTION / ATTENTION

English:

- Before installing, turn off the equipment to be installed.
- When installing, secure FN120 by tightening the lock nut. Tightening by screwing the housing instead of the lock nut may cause failure such as cable disconnection.
- When using the remote antenna cable, use the dedicated cable provided by Yokogawa as accessories for FN120.
- The remote antenna cable and other cables should not be bundled together.
- To maintain a good connection between the modules, protect the connector from the corrosive atmosphere by the following treatment.
  1. Clean the connection to be protected.
  2. Wind the butyl rubber self-bonding tape around the connection. See the manual of the tape about the winding.
  3. To protect the butyl rubber self-bonding tape from the environment such as ultraviolet rays and so on, wind vinyl tape (or a vinyl type self-bonding tape) on it.
  4. When the tape is necessary, prepare appropriate tape for the installing environment. Do not cover the nameplate by the tapes.

Français:

- Avant l'installation, mettez hors tension l'équipement à installer.
- Lors de l'installation, fixez le FN120 en serrant l'écrou de blocage. Un serrage en vissant le boîtier au lieu de l'écrou de blocage peut provoquer une défaillance, comme une rupture de câble.
- Lors de l'utilisation du câble d'antenne déportée, utilisez le câble dédié fourni par Yokogawa comme accessoire du FN120.
- Le câble d'antenne déportée et les autres câbles ne doivent pas être regroupés ensemble.
- Afin de maintenir une bonne connexion entre les modules, protégez le connecteur contre les atmosphères corrosives en procédant comme suit.
  1. Nettoyez la connexion à protéger.
  2. Enroulez un ruban auto-amalgamant en caoutchouc butyle autour de la connexion. Consultez le manuel du ruban pour les instructions d'enroulement.
  3. Pour protéger le ruban butyle contre les influences environnementales telles que les rayons ultraviolets, enroulez dessus un ruban vinyle (ou un ruban auto-amalgamant de type vinyle).
  4. Si du ruban est nécessaire, préparez un ruban approprié à l'environnement d'installation. Ne recouvrez pas la plaque signalétique avec les rubans.

IMPORTANT

- The connector is shipped with a dust cap. Keep the cap attached until the installation to protect the connector. The cap should be stored so that you can use it again when you detach FN120. In an extremely wet condition, use the optional protection cap (optional code /CP).
- When attaching or detaching FN120, pay sufficient attention to the surrounding environment, such as not being filled with dust or getting water droplets inside the part of connection of FN120.
- Immediately after removing FN120, attach a protection cap and be careful not to allow foreign matter to enter the connector.
- Do not connect the Earth terminal of FN120 holder to grounding unless there is a special reason, except when specified by the manual of the combination device. FN120 normally grounded at the combination device via a metal shell (and remote antenna cable).

4. Operation

FN120 is used with combination device such as FN series product (e.g., FN310 Field Wireless Multi-Protocol Module) or LN series product (e.g., LN90 Interface Adapter). FN120 is power supplied by combination device. There is not necessary to operate and setting FN120 alone. Please refer to the User's Manual of the device to be connected to FN120. If the inter module communication code is -R1, please also refer to IM 01W03B02-21EN.
A device error of FN120 is notified to the combination device (and ISA100 wireless system). For how to check for abnormality, refer to the manual of the combination device. If FN120 breaks down, replace it with a new one.

5. General Specifications

Please refer to GS 01W03B02-01EN for the latest information.

5.1 Specifications

☐ Wireless Specifications

Communication Protocol: ISA100.11a-2009 and ISA100.11a-2011* (IEEE802.15.4)
* Available only for Inter module communication code: -A1
Data Rate: 250 kbps
Frequency *: 2400 - 2483.5 MHz license free ISM band
* CH11(2405MHz) to CH25(2475MHz) of ISA100.11a can be used.
Radio Security: AES 128 bit
RF Transmitter Power: 12 dBm eirp max (including antenna gain)
Antenna: 2 dBi (Omni directional)

☐ Power Supply Specifications

Power Supply Voltage:
Rated voltage: 3.5 V DC
Working voltage: 2.9 – 5.3 V DC
Current Consumption: Max. 60 mA

☐ Performance Specifications

[Inter module communication code: -A1]

Update Period: 1 to 3600 s*
* Depends on module to connect this product. Refer to the General Specifications of the products that are connected to this product.
Digital Communication for FN series:
Communication Mode: Half-duplex communication
(RS-485 compliant, Voltage range:0V - 5.3V)
Communication Speed: 9600 bps
Communication Distance: Max 20 m (dedicated cable)
Diagnostic Functions:
Power failures, wired communication failures, firmware internal errors, memory errors, abnormal temperature
Software Download Function:
Software download function enables you to update wireless field device software via ISA100 Wireless communication.

[Inter module communication code: -R1]

Field Wireless Subnet: 1 subnet
Field Wireless Device:
Max. 20 devices (update rate: 2 to 3600 s)
Max. 10 devices (update rate: 1 s)
Modbus communication for PLC/RTU:
Communication Mode: Half-duplex communication (RS485 compliant)
Communication Speed: Max. 38400 bps
Communication Distance: Max. 20 m (dedicated cable)
Diagnostic Functions:
Firmware internal errors, memory errors, abnormal temperature

☐ 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 Limits:
Operating: 0 to 100% RH (non-condensation)
Storage: 0 to 100% RH (non-condensation)
Ambient Temperature Gradient:
Operating: ±10°C/h or less
Storage: ±20°C/h or less
Altitude: up to 3000 m
Vibration Resistance: 0.21 mm P-P (10 - 60 Hz), 3 G (60 - 2 kHz)
Shock Resistance: 50 G 11 ms (No energization, 3-way sine half wave)
Grounding:
Ground through the mating of the metal shell. Please ensure that the ground terminal is connected to an appropriate ground.
Degrees of Protection*:
IP66/IP67, Type 4X
* The protection of waterproof and dust-proof is provided only when the connector is properly connected.

☐ Physical Specifications

Connector: 5-pin round connector dedicated (Compatible with FN110)
Housing Material: Plastic (polycarbonate) and brass
Weight: Approx. 100 g

5.2 Regulatory Compliance Statements

This product satisfies the following standards.

IMPORTANT

Please check the conditions of use and precautions described in this section. If it deviates, it may not satisfy the following standard. And please confirm that an installation region fulfills an applicable standard. If additional regulatory information and approvals are required, contact a Yokogawa representative.

☐ Radio equipment compliance:

MIC Identification (Japan)

All model (MS code) of FN120 comply with certification of construction type.
Certification marking is only built-in module.
Certification No.: 006-000927

FCC Approval (United States)

Applicable when the following FCC ID markings are made on the nameplate.
Contains FCC ID: SGJ-WFC019
FN120 complies with below FCC Rules.
Part 15 Subpart B, Part 15 Subpart C

IMPORTANT

- 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.
- FCC CAUTION
  Changes or modifications not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.
- This transmitter must not be co-located or operated in conjunction with any other antenna or transmitter.

NOTE

- 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
- 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 Approval (Canada)

Applicable when the following IC Number markings are made on the nameplate.
Contains IC: 8999A-WIC017
FN120 complies with below standards.
RSS-Gen Issue 5, RSS-247 Issue 2, ICES-003 Issue 7

IMPORTANT

English:
- 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.

Français:
- 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.

NOTE

English:
- 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.

Français:
- 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.

RE Directive (EU Countries)

For details, refer to "☐ CE Marking" in this section.

☐ CE Marking:

Applicable when the CE markings are made on the nameplate. CE marking is valid only when sold in EU countries and CE marking valid countries.

Simplest EU-DoC:
Hereby, Yokogawa Electric Corporation declares that the radio equipment type FN120 is in compliance with Directive 2014/53/EU.
The full text of the EU declaration of conformity is available at the following internet address:
https://myportal.yokogawa.com/
The Authorized Representative for this product in the EEA is:
Yokogawa Europe B.V. Euroweg 2, 3825 HD Amersfoort, THE NETHERLANDS.
and the importer for this product into the EU/EEA market via the YOKOGAWA sales channel is:
Yokogawa Europe B.V. Euroweg 2, 3825 HD Amersfoort, THE NETHERLANDS.

RoHS Directive: EN IEC 63000

RE Directive:
Safety: EN 61010-1, EN 62479
(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.
(3) Indoor/Outdoor use
It can be used in indoors and outdoors.
(4) Altitude of installation site
Max. 3,000 m above sea level.
Radio Spectrum: EN 300 328
EMC: EN 301 489-1, EN 301 489-17,
EN 61326-1 Class A Table 2, EN 55011 Class A

CAUTION / ATTENTION

English:
- 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.

Français:
- Cet instrument est un produit de classe A et est destiné à être utilisé dans un environnement industriel. Veuillez utiliser cet instrument uniquement dans un environnement industriel.

<Information on EU WEEE Directive>

EU WEEE (Waste Electrical and Electronic Equipment) Directive is only valid in the EU. This instrument is intended to be sold and used only as a part of equipment which is excluded from WEEE Directive, such as large-scale stationary industrial tools, a large-scale fixed installation and so on, and, therefore, subjected to the exclusion from the scope of the WEEE Directive. The instrument should be disposed of in accordance with local and national legislation/regulations.

☐ Canadian Safety Standards:

CSA C22.2 No.61010-1-12, CAN/CSA-C22.2 No.94.2-15
(1) Pollution Degree 2
(2) Overvoltage Category I
(3) Altitude (atmosphere pressure): Up to 3000 m
(4) Humidity: 0 to 100%
(5) Electrical supply according to the product ratings
(6) Indoor/Outdoor use, CSA C22.2 No.94 Type 4X
(7) Ambient temperature: –40°C to +85°C

☐ Control of Pollution Caused by the product:

EU RoHS

This product is in conformity with the following standard: EN IEC 63000 (Technical documentation for the assessment of electrical and electronic products with respect to the restriction of hazardous substances).

China RoHS

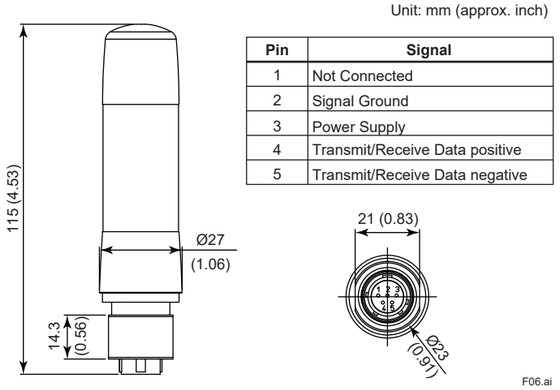
Please refer to the IM 01C00A20-01ZH for information on our management status pursuant to "Control of Pollution caused by Electronic Information Products" of the People's Republic of China. Please search for the IM number in the Yokogawa library " https://www.yokogawa.com/library/ ".

5.3 Model and Suffix Codes

Refer to the General Specification "GS 01W03B02-01EN".

5.4 External Dimensions and Pin Assignment

Unit: mm (approx. inch)



F06.ai

Pin	Signal
1	Not Connected
2	Signal Ground
3	Power Supply
4	Transmit/Receive Data positive
5	Transmit/Receive Data negative

6. Explosion Protected Instrument

6.1 IECEx Certification

6.1.1 IECEx Intrinsic Safety type

Caution for IECEx Intrinsic Safety type. Model FN120 with optional code /SS27.

(1) Specifications
- Applicable standards: IEC 60079-0, IEC 60079-11
- Certificate number: IECEx DEK 21.0045X
- Specific Ex marking: Ex ia IIC T4 Ga
  Ex ia IIIC T135°C Db
- Ambient temperature: –40°C ≤ Ta ≤ +70°C
- Atmospheric pressure: 80 kPa to 110 kPa
- Enclosure: IP66/IP67 in accordance with only IEC 60529, only when it is connected to the socket (with cable, equipment, etc.) specified by the manufacturer.
- Power supply: 3.5 V DC (Range: 2.9 V – 5.3 V DC)
- Current consumption: ≤ 60 mA
- Signals: RS485 Signals
- Dielectric strength: 500 V AC r.m.s., 1min, The circuit (JR13 pin 2 to 5) to Enclosure
- RF source: ≤ 16 dBm (≤ 40 mW)

(2) Specific conditions of use
- Precaution shall be taken to minimize the risk from electrostatic discharges on the non-metallic parts or coated parts of the equipment.
- When the equipment is mounted in an area where the use of EPL Ga equipment is required, it shall be installed in such a way that, even in the event of rare incidents, an ignition source due to impact and/or friction sparks is excluded.

(3) Installation and erection

- The equipment shall be installed in accordance with IEC 60079-14 and relevant local codes and requirements.
- When installing the equipment, the selected Type of Protection should be ticked as follows.
  - ☐ Ex ia IIC T4 Ga
  - ☑ Ex ia IIIC T135 °C Db
- See the control drawing.

(4) Use and setting-up (operation)

WARNING

- POTENTIAL ELECTROSTATIC CHARGING HAZARD
  In hazardous areas, avoid any actions which generate electrostatic charges, such as rubbing the equipment with a dry cloth.

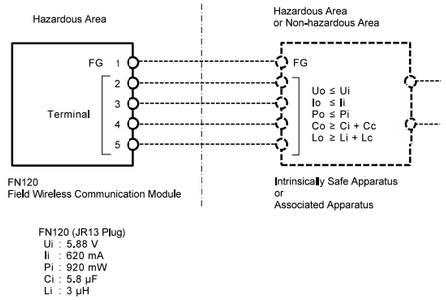
(5) Maintenance and repair

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.

(6) Control drawing

Yokogawa Electric Corporation		Model		FN120			
Title	Control drawing						
No.	IIE0046-A021	Page	1	Revision	0	Date	2021-02-26



FN120 (JR13 Plug)
Ui : 5.88 V
Ii : 620 mA
Pi : 920 mW
Ci : 5.8 µF
Li : 3 µH

DEKRA Certification B.V.
Meander 1051, 6825 MJ Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands

6.1.2 IECEx Increased Safety type

Caution for IECEx Intrinsic Safety type. Model FN120 with optional code /SE27.

(1) Specifications

- Applicable standards: IEC 60079-0, IEC 60079-7
- Certificate number: IECEx DEK 25.0019X
- Specific Ex marking: Ex ec IIC T4 Gc
- Ambient temperature: –40°C ≤ Ta ≤ +70°C
- Atmospheric pressure: 80 kPa to 110 kPa
- Enclosure: IP66/IP67 in accordance with IEC 60529 and IP54 in accordance with IEC 60079-0, only when it is connected to the socket (with cable, equipment, etc.) specified by the manufacturer.
- Power supply: 3.5 V DC (Range: 2.9 V – 5.3 V DC)
- Current consumption: ≤ 60 mA
- Signals: RS485 Signals
- Dielectric strength: 500 V AC r.m.s., 1min, The circuit (JR13 pin 2 to 5) to Enclosure
- RF source: ≤ 16 dBm (≤ 40 mW)

(2) Specific conditions of use

- The equipment satisfies the requirements for IP66/IP67 or IP54, only when it is connected to socket (with cable, equipment, etc.) specified by manufacturer.
- A portion of the enclosure is non-conducting and, under certain extreme conditions, may generate an ignition-capable level of electrostatic charges. Precaution shall be taken to minimize the risk from electrostatic discharges on the non-metallic parts of the equipment. Additionally, cleaning of the equipment should be done only with a damp cloth.
- Keep the protection cap (metal waterproof cap) closed to prevent dust, liquids, etc. form getting inside the product, and to protect it from UV right, when not installing the product.
- This product is designed to be a low-risk equipment for mechanical shock. Do not install it in an environment where it may be subjected to strong physical impact.

(3) Installation and erection

- The equipment must be installed in the holder assembly.(See Figure 3.2 or figure 3.3)
- The external connection of the equipment must be connected to socket (with cable, equipment, etc.) specified by manufacturer and tightened to a torque of 1.2 – 2.0 Nm.
- The equipment shall be installed in accordance with IEC 60079-14 and relevant local codes and requirements.

(4) Use and setting-up (operation)

WARNING

- POTENTIAL ELECTROSTATIC CHARGING HAZARD
- DO NOT CONNECT OR DISCONNECT WHEN ENERGIZED

(5) 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.

6.2 ATEX Certification

6.2.1 ATEX Intrinsic Safety type

Caution for ATEX Intrinsic Safety type. Model FN120 with optional code /KS27.

(1) Specifications

- Applicable standards: EN IEC 60079-0, EN 60079-11
- Certificate number: DEKRA 21ATEX0068X
- Specific Ex marking: II 1 G Ex ia IIC T4 Ga
  II 2 D Ex ia IIIC T135°C Db
- Ambient temperature: –40°C ≤ Ta ≤ +70°C
- Atmospheric pressure: 80 kPa to 110 kPa
- Enclosure: IP66/IP67 in accordance with only EN 60529, only when it is connected to the socket (with cable, equipment, etc.) specified by the manufacturer.
- Power supply: 3.5 V DC (Range: 2.9 V – 5.3 V DC)
- Current consumption: ≤ 60 mA
- Signals: RS485 Signals
- Dielectric strength: 500 V AC r.m.s., 1min, The circuit (JR13 pin 2 to 5) to Enclosure
- RF source: ≤ 16 dBm (≤ 40 mW)

(2) Specific conditions of use

- Precaution shall be taken to minimize the risk from electrostatic discharges on the non-metallic parts or coated parts of the equipment.
- When the equipment is mounted in an area where the use of Category 1 G equipment is required, it shall be installed in such a way that, even in the event of rare incidents, an ignition source due to impact and/or friction sparks is excluded.

(3) Installation and erection

- The equipment shall be installed in accordance with IEC 60079-14 and relevant local codes and requirements.
- When installing the equipment, the selected Type of Protection should be ticked as follows.
  - II 1 G ☑ Ex ia IIC T4 Ga
  - II 2 D ☐ Ex ia IIIC T135°C Db
- See the control drawing.

(4) Use and setting-up (operation)

WARNING

- POTENTIAL ELECTROSTATIC CHARGING HAZARD
  In hazardous areas, avoid any actions which generate electrostatic charges, such as rubbing the equipment with a dry cloth.

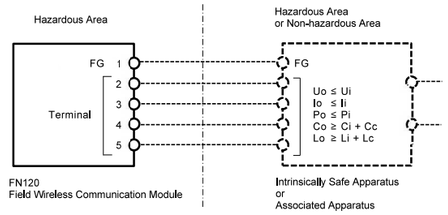
(5) Maintenance and repair

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.

(6) Control drawing

Yokogawa Electric Corporation		Model		FN120			
Title	Control drawing						
No.	IIE0046-A021	Page	1	Revision	0	Date	2021-02-26



FN120 (JR13 Plug)
Ui : 5.88 V
Ii : 620 mA
Pi : 920 mW
Ci : 5.8 µF
Li : 3 µH

DEKRA Certification B.V.
Meander 1051, 6825 MJ Arnhem
P.O. Box 5185, 6802 ED Arnhem
The Netherlands

(7) Nameplate

- Image of Nameplate (Typical example; details may differ);

MODEL	FN120
SUFFIX	-A1-L10A-AA/KS27

WARNING
POTENTIAL ELECTROSTATIC CHARGING HAZARD
READ/LISEZ IM 01W03B02-01
Contains FCC ID:SGJ-WFC019
Contains IC:8999A-WIC017
DEKRA 21ATEX0068X
CE 0344 Ex II 1 G II 2 D
☐ **Ex ia IIC T4 Ga**
☐ **Ex ia IIIC T135°C Db**
–40°C≤Ta≤+70°C
c SP® us 172608

XJFN120-0001
2020-08

S/N	91P123456
EUI64	0000:6400:0000:0000
SUPPLY	3.5 VDC ⎓ 60mA
TAG NO.	NE13A–1234

YOKOGAWA ◆ Yokogawa Electric Corporation
Made in Japan
TOKYO 180–8750
JAPAN

F07.ai

- See also Section 2.1 for a description of the items.

Revision Record

Title: FN120 Field Wireless Communication Module
Document No.: IM 01W03B02-01EN

Edition	Date	Page	Revised item
1st	Dec. 2021	—	New Publication.
2nd	Sep. 2022	—	Add the description on Explosion Protected Type.
3rd	June 2026	3	Add the description for China RoHS.
4th	Aug. 2026	—	Add inter module communication code -R1 and IECEx Increased safety type.