User's Manual

FN SERIES

FN110
Field Wireless Communication Module

IM 01W03B01-01EN

YOKOGAWA
Yokogawa Electric Corporation

IM 01W03B01-01EN
1st Edition

1. Introduction

Thank you for purchasing the Field Wireless Communication Module.
Your Field Wireless Communication Module was precisely calibrated at the factory before shipment. To ensure both safety and efficiency, please read this manual carefully before you operate the instrument.

■ **Regarding This Manual**

- This manual should be provided to the end user.
- 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.
- 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**

- 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.
- The following safety symbols are used in this manual:

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.

1.1 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 the wireless module or antenna in this instrument
- 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 the transmitter 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.

1.2 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 instrument, the customer should contact the Yokogawa representative from which this instrument was purchased or the nearest Yokogawa office.
- If a problem arises with this instrument, 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 the instrument in accordance with the design specifications.
- Use of the 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 the 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

This chapter provides important information on how to handle this product. Read this carefully before using this product.
This product is fully factory-tested upon shipment. When this product is delivered, check the appearance for damage.

2.1 Check the Model and Specifications

The model name and specifications are written on the name plate attached to the case. Verify that the specification indicated in the "Model and Suffix Code" in General Specification "GS 01W03B01-01EN" is in compliance with the specifications written on the order sheet.

2.2 Transport

To prevent damage while in transit, leave this product 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 temperature and humidity limits refer to "5.1 General Specifications".
2. If at all possible, store this product in factory-shipped condition, that is, in the original shipping container.

3. Installation

3.1 Precautions

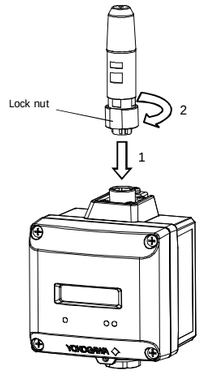
- Before installing, refer to the user's manual of the device to be connected to this product.
- For additional information on the ambient conditions allowed at the installation location, refer to "5.1 General Specifications".

3.2 Mounting

The installation procedure is the following.

1. Check the direction of the pin, inserting the connector.
2. Tighten the lock nut to a torque of 1.2 N・m.

Removal is the reverse procedure of the installation.



IMPORTANT

The connector is covered with a cap at the time of delivery. Keep the cap attached until the installation of this product to protect the inside connection part.
The unscrewed cap should be stored in order to replace it immediately after this product is removed.
If there is a possibility that get wet with water, use the protection cap of the optional specification.

CAUTION

- Use the dedicated remote antenna cable provided by Yokogawa as accessories for this product.
- The remote antenna cable and other cables should not be bundled together.

CAUTION

To maintain a good connection status between the modules, protect the connector from the corrosive atmosphere by the following treatment. When winding the tape, do not wound on the name plate.

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. Operation

For the usage of this product, refer to the user's manual of the device to be connected to this product.

5. Specifications

5.1 General Specifications

Communication Protocol:
ISA100.11a (IEEE802.15.4)
Data Rate:
250 kbps
Frequency:
2400 - 2483.5 MHz license free ISM band
Radio Security:
AES 128 bit codified
RF Transmitter Power:
12dBm (Variable)
Antenna:
2 dBi (Omni directional)
Power Supply Voltage:
2.9 - 4.8 V
Consumption Current:
Max. 60 mA
Update Period:
1to 3600 s
Connection Interface:
5-pin round connector dedicated
Wired Communication:
RS485 compliant 9600 bps
Ambient Temperature Limits:
Operating: -40 to +85°C (altitude: up to 3000 m) Storage: -40 to +85°C
Ambient Humidity Limits:
Operating:0 to 100% RH (non-condensation) Storage: 0 to 100% RH (non-condensation)
Temperature Gradient:
Operating: ±10°C/h or less Storage: ±10°C/h or less
Vibration Resistance:
0.21mm P-P (10 - 60 Hz), 3G (60 - 2k Hz)
Shock Resistance:
50G 11 ms
Grounding:
Class-D grounding (no sharing ground with others)
Weight:
100 g

5.2 Regulatory Compliance Statements

This device contains the wireless module which 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.

Japanese Radio Law:
Construction Design Attestation Number: 006-000202
R&TTE Conformity Standards: CE
EN 300 328, EN 301 489-1, EN 301 489-17

We, Yokogawa Electric Corporation hereby declare that this equipment, model FN110 is in compliance with the essential requirements and other relevant provisions of Directive 1999/5/EC.

The CE declaration of conformity for R&TTE for this product can be found at
http://www.yokogawa.com/fld/

Regulation Conformity of the Wireless Module:

FCC Approval (Part 15C)

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 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 a t his own expense.

Co-located:

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

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 20cm or more away from person's body.

IC Approval (RSS-210, RSS-102)

This device complies with Industry Canada licence-exempt RSS standard(s). Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

Le présent appareil est conforme aux CNR d'Industrie 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, et (2) l'utilisateur de l'appareil doit accepter tout brouillage radioélectrique subi, même si le brouillage est susceptible d'en compromettre le fonctionnement.

(RSS-102)

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

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'IC. Cet équipement doit être installé et utilisé en gardant une distance de 20 cm ou plus entre le dispositif rayonnant et le corps (à l'exception des extrémités : mains, poignets, pieds et chevilles).

EMC Conformity Standards:

EN61326-1 Class A, Table 2 (For use in industrial locations), EN55011 Class A, Group 1, EN61000-6-2

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.

Safety Requirements:

EN61010-1, CSA C22.2 No.61010-1

(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.

Degrees of Protection:

Waterproof and dustproof function works while in the mated state of connector.
IP66, NEMA Type 4X

Explosion-Proof Types:

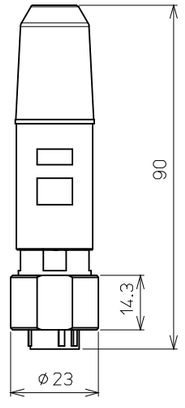
TIIS, FM, ATEX, CSA, IECEx (approvals under pending)

5.3 Model and Suffix Codes

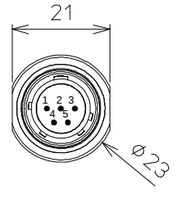
Refer to General Specification "GS 01W03B01-01EN".

5.4 External Dimensions and Pin Assignment

Units: mm



Pin	Signal
1	Not Connected
2	Ground
3	Power Supply
4	Data +
5	Data -



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