General Specifications

GS 01W03B02-01EN

FN120
Field Wireless
Communication Module

■ GENERAL

This General Specification (GS) describes the specifications for Field Wireless Communication Module. This product is based on the industrial automation wireless communication standard ISA100.11a of the International Society of Automation (ISA). ISA100.11a is approved as an International Standards (IEC 62734) by International Electrotechnical Commission (IEC). Wireless functions defined by ISA100.11a are equipped with this product. This product supports the role of a field wireless device.
When utilizing with "Field Wireless Multi-Protocol Module FN310" or "Field Wireless Multi-Function Module FN510", this product is connectable with a field wireless network as a field wireless device.
When utilzing with "Interface Adapter LN90", this product acts as a field wireless gateway.
For more details, refer to the General Specifications of "Field Wireless Multi-Protocol Module FN310" , "Field Wireless Multi-Function Module FN510" or "Interface Adapter LN90".



■ FEATURES

• Built-in high-performance wireless communication function
The high-performance built-in wireless communication module has excellent radio sensitivity and low power consumption, provides a stable wireless communication platform with excellent power saving capabilities.

• Compact and light weight
This product has been made compact and extremely lightweight as an industrial antenna with a built-in wireless communication module. As a result, flexible installation in the industrial environment is possible.

• ISA100 Wireless protocol stack
Inter module communication code -A1 is specified, this product is supplied with an ISA100 Wireless certified protocol stack with excellent reliability and scalability. ISA100 Wireless is an international, industrial wireless networking standard engineered to serve the needs of process industries.

• Built-in wireless gateway
Inter module communication code -R1 is specified, this product acts as system manager, security manager, gateway, and backbone router based on ISA100.11a. Easy to construct small scale field wireless network with combining Remote Terminal Unit (RTU) or other controller.

■ STANDARD 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

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

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□ 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 (RS485 compliant, Voltage range: 0 V - 5.3 V)
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 permits 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.

□ 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.
Please note that a part of standard below may not be applicable depends upon selected optional codes that limit an installation region.

Radio Equipment Compliance:
MIC Identification (Japan),
FCC Approval (United States),
ISED Approval (Canada), RE Directive (EU Countries)

CE Marking:
RoHS Directive: EN IEC 63000
RE Directive:
Safety: EN 61010-1, EN 62479
EMC: EN 301 489-1, EN 301 489-17, EN 61326-1 Class A Table 2, EN 55011 Class A
Radio Spectrum: EN 300 328

Canadian Safety Standards:
CSA C22.2 No.61010-1-12, CAN/CSA-C22.2 No.94.2-15

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.100g

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■ MODEL AND SUFFIX CODES

Model	Suffix Codes		Description
FN120	.....		Field Wireless Communication Module
General Specifications	Inter module communication	**-A1**	Digital communication for FN series
		-R1	Modbus communication for PLC/RTU
	Output signal	**-L**	ISA100 Wireless
	Housing material	**1**	Plastic
	Antenna	**0**	Integral antenna 2 dBi (2.4 GHz)
	---	**A**	Always A
	---	**-A**	Always A
	---	**A**	Always A
Optional Codes		/□	Optional specifications

Remote antenna cable and mounting bracket are optional parts. Please purchase them separately.

■ OPTIONAL SPECIFICATIONS (For Explosion Protected Types)

Item	Description	Code
IECEx	IECEx Intrinsic Safety*3 Applicable standards: IEC 60079-0, IEC 60079-11 Certificate number: IECEx DEK 21.0045X Specific Ex marking*2: Ex ia IIC T4 Ga, Ex ia IIIC T135°C Db Ambient Temperature: −40°C ≤ Ta ≤ +70°C (–40°F ≤ Ta ≤ +158°F) Atmospheric pressure: 80 kPa to 110 kPa Enclosure*1: IP66/IP67 in accordance with only IEC 60529 Electrical parameters: Ui = 5.88 V, Ii = 620 mA, Pi = 920 mW, Ci = 5.8 µF, Li = 3 µH Dielectric strength: 500 V AC r.m.s., 1min	**SS27**
	IECEx Increased safety*4 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 (-40°F ≤ Ta ≤ +158°F) Atmospheric pressure: 80 kPa to 110 kPa Enclosure*1: IP54 in accordance with IEC 60079-7, IP66/IP67 in accordance with IEC 60529 Dielectric strength: 500 V AC r.m.s., 1min	**SE27**
ATEX	ATEX Intrinsic Safety*3 Applicable standards: EN IEC 60079-0, EN 60079-11 Certificate number: DEKRA 21ATEX0068X Specific Ex marking*2: II 1 G Ex ia IIC T4 Ga, II 2 D Ex ia IIIC T135°C Db Ambient Temperature: −40°C ≤ Ta ≤ +70°C (–40°F ≤ Ta ≤ +158°F) Atmospheric pressure: 80 kPa to 110 kPa Enclosure*1: IP66/IP67 in accordance with only EN 60529 Electrical parameters: Ui = 5.88 V, Ii = 620 mA, Pi = 920 mW, Ci = 5.8 µF, Li = 3 µH Dielectric strength: 500 V AC r.m.s., 1min	**KS27**

*1: Only when it is connected to the connector (with cable, equipment, etc.) specified by the manufacturer.
*2: When installing the equipment, tick the explosion-proof structure of the name plate according to the environment.
*3: When inter module communication code -R1 is specified, this option is not available.
*4: Only available when inter module communication code -R1 is specified. When optional code SE27 is selected, specify the protection cap CP.

■ OPTIONAL SPECIFICATIONS

Item	Description	Code
Protection cap*1	Metal waterproof cap	**CP**

*1: When protection cap is not specified, dust-cap is attached.

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■ OPTIONAL ACCESSORIES

Item	Parts Number	Description
Romote antenna cable*1*2 (for Inter module connection -A1)	F9092CU	3 m remote antenna cable with mounting bracket and metal waterproof cap.
	F9092CV	10 m remote antenna cable with mounting bracket and metal waterproof cap.
	F9092CW	20 m remote antenna cable with mounting bracket and metal waterproof cap.
	F9092CX	3 m remote antenna cable with mounting bracket.
	F9092CY	10 m remote antenna cable with mounting bracket.
	F9092CZ	20 m remote antenna cable with mounting bracket.
Mounting bracket*1	F9092CT	Mounting bracket only.

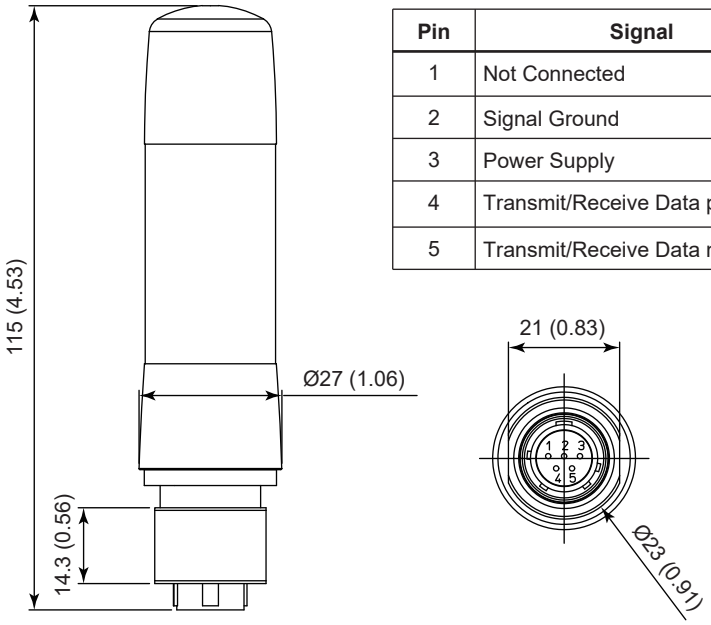
*1: The mounting bracket also includes a holder assy. This mounting bracket is for FN120 only. Not available for FN110.
*2: Inter module communication code -R1 is intended for use with model LN90. The dedicated remote antenna cable and mounting bracket are included with LN90.

■ EXTERNAL DIMENSIONS

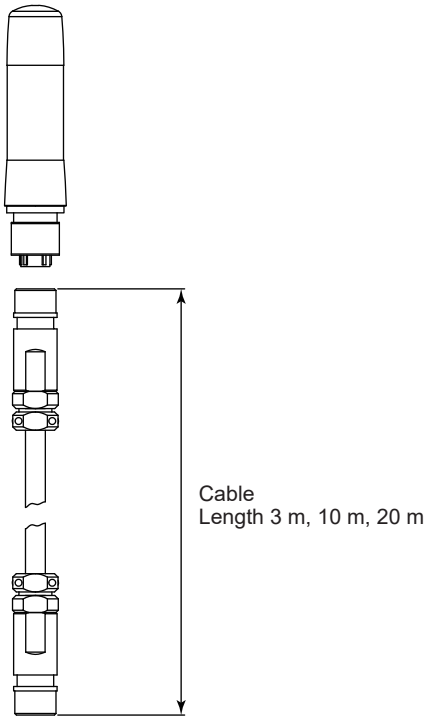
□ Body

Unit: mm (approx. inch)

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



□ Remote antenna cable

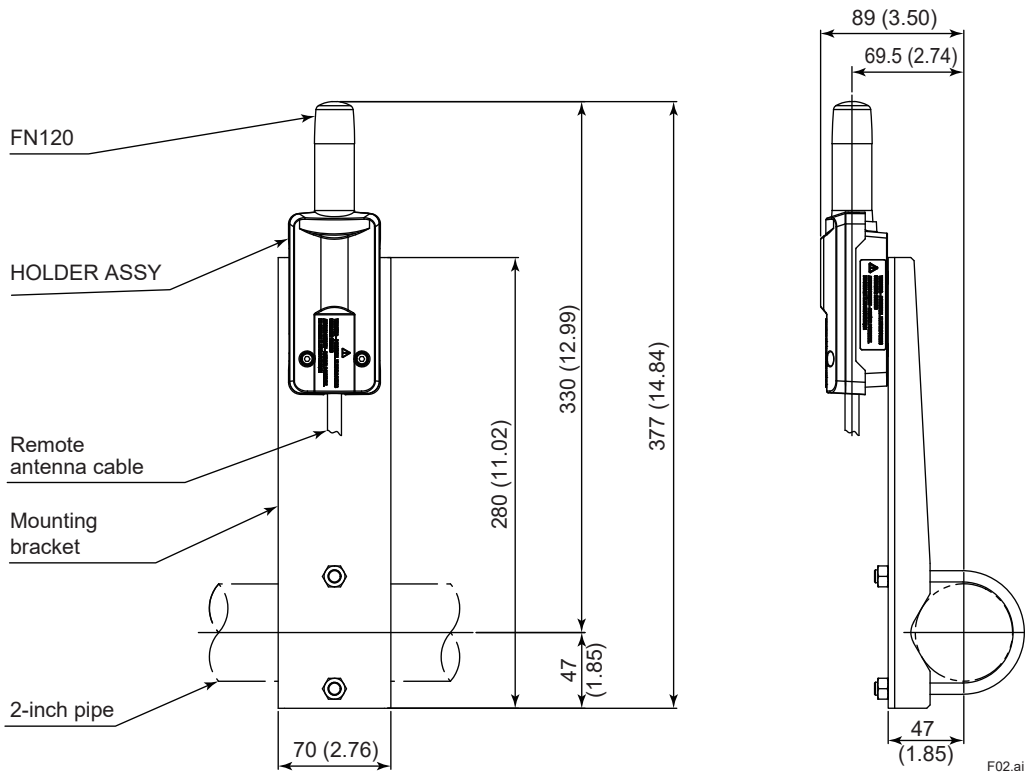


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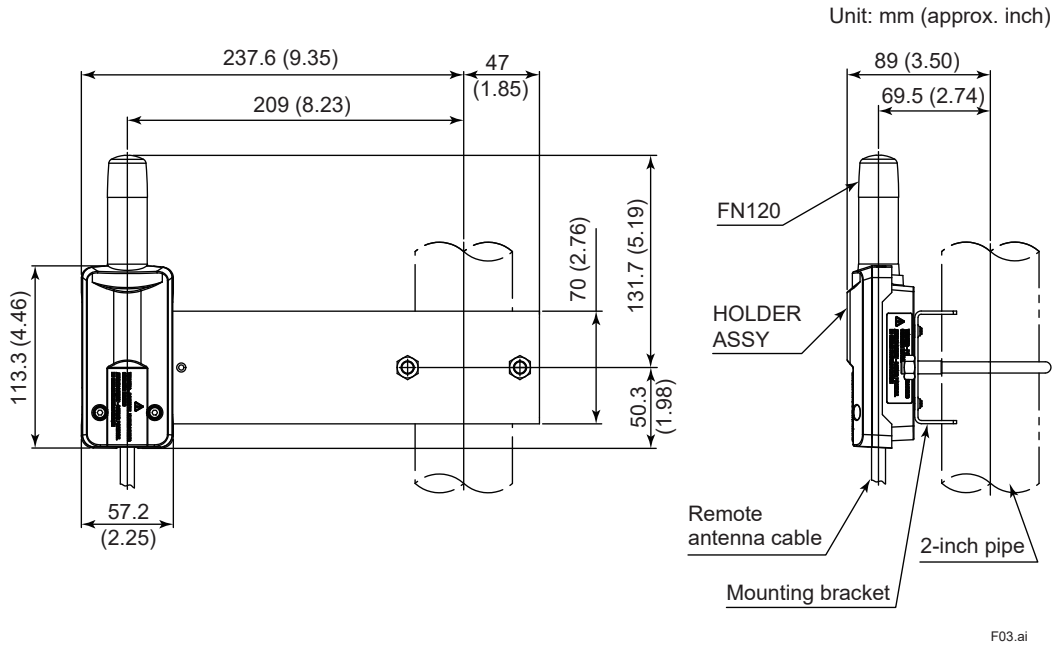
□ 2-inch pipe mounting (for horizontal piping)

Unit: mm (approx. inch)



□ 2-inch pipe mounting (for vertical piping)

Unit: mm (approx. inch)



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< Ordering Information >

Specify the following when ordering.

1. Model, suffix codes, and optional codes.
2. Tag Number*1
   If required. Specified Tag Number is printed on the nameplate. Tag Number can be specified by a combination of uppercase letters, numbers, "- (hyphen)", and "_ (underscore)" up to 16 letters. Factory default setting is blank unless otherwise specified.
3. Software Tag*1 (Device Tag)
   If required. Specify this software tag when setting a different tag from Tag Number as Software Tag (Device Tag). It can be specified by a combination of uppercase letters, numbers, "- (hyphen)", and "_ (underscore)" up to 16 letters.
4. Network ID*1
   If required. Specify the number from 2 to 65535. When not specified, it will use 1 as the default.

*1: When the intermodule communication code is -R1, specifying Tag Number, Software tag and Network ID is not available.

< Related Products General Specifications >

Field Wireless System Overview:
Refer to GS 01W01A01-01EN
Field Wireless Multi-Protocol Module FN310:
Refer to GS 01W03D01-01EN
Field Wireless Multi-Function Module FN510:
Refer to GS 01W03E01-01EN
Interface Adapter LN90:
Refer to GS 01W03L01-01EN

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< Information on 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.

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