General Specifications

YFGW410
Field Wireless Management Station

GS 01W02D01-01EN

■ GENERAL

This General Specification(GS) describes the hardware specifications for Field Wireless Management Station and specifications of built-in software.

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). This product has system manager/security manager/gateway function based on ISA100.11a, and combining this with Field Wireless Access Point(YFGW510/YFGW520) and/or Field Wireless Media Converter(YFGW610) composes the field wireless system.

For outline of a field wireless system, and details of each product, see each related products General Specifications.

■ FEATURES

● High Reliability and Flexibility

Adoption of a discrete-type architecture enables a redundancy configuration by connecting two products. A highly flexible operation is also possible where the field wireless system under operation does not have to be stopped and maintenance can be performed on line.

● High-Security Communication

This product supports the access control list (IP filter and port filter), preventing unauthorized access, and role-based password-protected secure user interface. End-to-end communication of ISA100.11a is encrypted with AES 128bit. Robustness of the communication and security is validated as it achieves Achilles Level 1 Certification.

● Multi-Protocol Tunneling

This product can encapsulate foreign protocols such as HART and Modbus and transfer them between devices and host systems. By transferring safety communication protocol such as PROFIsafe between a Safety Instrumented System (SIS) and wireless safety devices and thus contributes to achieving required Safety Integrity Level (SIL) for the entire safety system.

● Effective Wireless Resource Use

This product can utilize the bandwidth of the field wireless network flexibly for achieving reliable and efficient wireless communication. Duocast function enables receiving data simultaneously with two backbone routers (BBR) connected to this product. The built-in data cache function saves bandwidth of the field wireless network and energy consumption of the field wireless devices.

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■ HARDWARE SPECIFICATIONS

■ Communication Interface

Item		Field Network Specifications		Field Wireless Backbone Specifications	Maintenance/Diagnostic Network Specifications	
Communication Interface	Standard	100BASE-TX [2]	RS-485	100BASE-TX [2]	100BASE-TX [4]	RS-232C [4][5]
	Transmission Speed	100Mbps (Auto Negotiation)	38.4Kbps [6]	100Mbps (Auto Negotiation)	100Mbps (Auto Negotiation)	115.2kbps
	Connector	RJ-45	Proprietary	RJ-45	RJ-45	RJ-11
	Cable Type	Category 5	AWG24~12	Category 5	Category 5	Proprietary
	Maximum Length	100m	1200m	100m	100m	15m
	Number of Ports	3 ports	1 port	4 ports	1 port	1 port
	Port Name	F1, F2, F3	–	B1, B2, B3, B4	M1	–
	Protection	Surge	Isolated, Surge	Surge	–	–
Communication Protocol	For I/O data and status	Modbus/TCP OPC [1][3] PROFINET	Modbus/RTU	–	–	–
	For management configuration, etc.	HTTP NTP/SNTP Proprietary [3]	–	HTTP IEEE1588PTP v2 Proprietary [3]	HTTP Proprietary [3]	–

*1: OPC interface connection is available by Field Wireless Device OPC Server (SSS7100). For details of this product, see related products General Specifications.
*2: In outdoor wiring of Field Network or Field Wireless Backbone, it is recommended to use optical fiber cables with a nonmetallic tension member, combining with YFGW610.
*3: TCP based custom protocol used for communication between this product, "Field Wireless Device OPC Server", "FieldMate Versatile Device Management Wizard", "Plant Resource Manager (PRM)", and Field Wireless Access Point. For details of each product, see related products General Specifications.
*4: Maintenance/Diagnostic Network (100BASE-TX, RS-232C) are not available for outdoor wiring.
*5: These are the serial ports for a maintenance which only our company use.
*6: User selectable from 9600bps, 19200bps or 38400bps.

■ Performance

Field Wireless Subnet:
Max 20 subnets are connectable

Field Wireless Access Point:
Max 20 Field Wireless Access Points are connectable[1]
  *1: Max 8 Field Wireless Access Points are connectable in one field wireless subnet.

Field Wireless Device:

Update rate	Network size
1 second	Max 200 devices [1]
5 seconds	Max 500 devices [2]

  *1: Max 20 devices in one field wireless subnet
  *2: Max 100 devices in one field wireless subnet

Upper Communication Interface:

Communication Protocol	Maximum connection
Modbus/TCP [1]	8 clients
Modbus/RTU [1]	1 client
OPC [2]	1 system

  *1: The amount of data that can be accessed at one time depends on the modbus client.
  *2: OPC interface connection is available by Field Wireless Device OPC Server (SSS7100).

PROFINET Interface: [Communication Protocols code: "B"]
YFGW410 is certified by PROFIBUS Nutzerorganisation e.V. (PNO) as the PROFINET IO Device with Conformance Class A and Realtime Class RT_CLASS_1. [1]
I/O data access from single PROFINET IO Controller to field wireless devices is supported. PROFIsafe transfer between an SIS and safety devices is also supported.
PROFINET function can be enabled or disabled by using Configurator. When enabled, abovementioned Network size and Maximum connection are reduced as follows:
Network size: 120 devices
Maximum connection of Modbus/TCP: 4 clients
  *1: PROFINET standard redundancy function is not supported.

Access Requests of Upper Communication Interface:
100BASE-TX : Max 240 times per second [1]
RS-485 : Max 10 times per second
  *1: Sum of access requests of field network interface.

Redundancy Architecture:
Hot standby redundancy system [1]
  *1: Applicable when Field Network is 100BASE-TX.

Switching Time for Redundancy:
1 second (After detection of failure or receiving of switching request)

Update Rate of Field Wireless Device:
User Selectable 0.5 to 3600 seconds.

Diagnosis Functions:
CPU failures, communication interface malfunctions, out of range, abnormal settings.

Software Download Function:
The product's internal software, and field wireless access point's internal software, and software within the field wireless device (communication firmware and sensor firmware) can be updated.

■ Installation Environment

Temperature Range:
Operating: -40 to +65°C (altitude : up to 2000m)
            -40 to +55°C (altitude : more than 2000m, up to 3000m)
Storage: -40 to +85°C

Humidity Range:
Operating: 5 to 95 %RH (non-condensation)
Storage: 5 to 95 %RH (non-condensation)

Temperature Gradient:
Operating: ±10°C/h or less
Storage: ±20°C/h or less

Power Supply:
Voltage Range*1 : 10.8~26.4 V DC
Rated Power Supply : 24 V DC
Momentary Power Failure : Instant Disconnection
DC Power Supply Ripple Ratio : 1%$_{p-p}$ or less
   *1:   The equipment shall not be operated outside the range.

Power Consumption:
Max. 10 W

Degrees of Protection:
IP20

Vibration Resistance:
0.15 mm P-P (5~58 Hz) , 1 G (58~150 Hz)

Shock Resistance:
15 G 11 ms

Noise Resistance:
Electric Field : 3 V/m or less (80MHz~1GHz)
Electrostatic Discharges: 4 kV or less (contact discharge), 8 kV or less (aerial discharge)

Grounding:
Class-D grounding (no sharing ground with others)

Cooling:
Natural Air Cooling

■ Regulatory Compliance Statements

CE Conformity:
• EMC Directive: EN61326-1 Class A Table 2,
                  EN55011 Class A Group 1,
                  EN61000-6-2
• RoHS Directive: EN50581
• Other Normative Standards: EN61010-1
                       (Indoor use only)

Safety Requirements:
CSA C22.2 No. 61010-1 (Indoor use only)

■ Physical Specifications

Housing Material:
Aluminum alloy plate with polyester, mint-green paint (Munsell 5.6BG 3.3/2.9 or its equivalent)

External Dimension:
150 x 60 x 140 mm (not include projection)

Weight:
Approx. 1.0 kg

Mounting:
DIN RAIL Mounting

■ SOFTWARE SPECIFICATIONS

■ Field Wireless Management Console

This software is used loading into PC connected to this product. Installing this software into PC is not available.

Configurator:
The software deals with a field wireless network configuration and support.

Monitor:
The software can perform the management and the operation status check in field wireless network and a field wireless device.

■ Specifications and System Requirements

Software License:
Field Wireless Management Console: 1 license
Configurator: 1 client
Monitor: 3 clients

Language:
Software (GUI): English
Manual: Japanese or English

Hardware Operating Environment:

Item	Recommended System Requirements
Processor	Intel Core i5-2520M or equivalent, or higher
Memory	2GB or more
Hard Disk	40GB or more (Minimum free space 15GB or more)
Display	Color: True Color (32 bits or more) Resolution: 1280 x 800 or higher
Communication Device	Ethernet Network Card

Software Operating Environment *1,*2,*3**:**

OS	Type
Windows 10 Pro*4	32/64 bit
Windows 7 Professional Service Pack 1	32/64 bit
Windows Server 2016	64 bit
Windows Server 2008 R2 Enterprise Service Pack 1	64 bit

   *1:   Japanese version and English version are supported.
   *2:   Microsoft .NET Framework 4.7.2 is required
   *3:   For 64bit OS, WOW64 (Windows 32-bit On Windows 64-bit) can be performed.
   *4:   Version 1809

■ Configuration Tool for Field Wireless Devices

FieldMate is required to configure the wireless field device parameters. Use R2.05.00 or later version for configuration via ISA100.11a wireless communication, or R2.03.00 or later version for configuration via infrared communication. For details, see FieldMate Versatile Device Management Wizard.

■ MODEL AND SUFFIX CODES

Model	Suffix Code						Descriptions
YFGW410	....						Field Wireless Management Station
General Specifications	Output signal	**-A**					Always A
	License		**-B**				Single License (10 Field wireless devices connectable) [1]
			-C				Redundant License (100 Field wireless devices connectable) [2]
			-S				Redundant License (500 Field wireless devices connectable)
	Manual Language		**0**				Japanese
			1				English
	Software Media			**0**			Provided with DVD-ROM
				1			None
	Mounting Bracket			**D**			DIN RAIL Mounting
	Sync Connector Termination				**0**		With Terminator [3]
					1		With Cable for Redundancy [4]
	---				**A**		Always A
	Communication Protocols					**A**	Modbus, OPC
						B	Modbus, OPC, PROFINET [5]
Option Codes						/□ Optional Specifications	

*1: One Field Wireless Access Point and one field wireless subnet are connectable.
*2: Two Field Wireless Access Points and one field wireless subnet are connectable.
*3: For single behavior, terminate the Sync Connector by the terminator.
*4: For redundant behavior, connect the cable for Redundancy between two YFGW410s.
*5: Applicable for License "-S".

## ■ OPTIONAL SPECIFICATIONS (For Explosion Protected Types)

Item	Specification	Code
Factory Mutual (FM)	Nonincendive Approval [1]	–
ATEX	ATEX Type n declaration [2] Applicable Standard: EN60079-0: 2012+A11:2013, EN 60079-15:2010 II 3 G Ex nA IIC T4 Gc X Amb. Temp.(Tamb): -40 to 65°C (altitude: up to 2000 m), -40 to 55°C (altitude: more than 2000 m, up to 3000 m)	**KN27**
Canadian Standards Association (CSA)	Nonincendive Approval [1]	–
IECEx	Type n Approval [2]	–

*1: To be compliant with these standards, the YFGW410 hardware needs to be installed in a lockable metal cabinet.
*2: To be compliant with these standards, the YFGW410 hardware needs to be installed in a lockable metal cabinet of IP54 or higher protection rating.
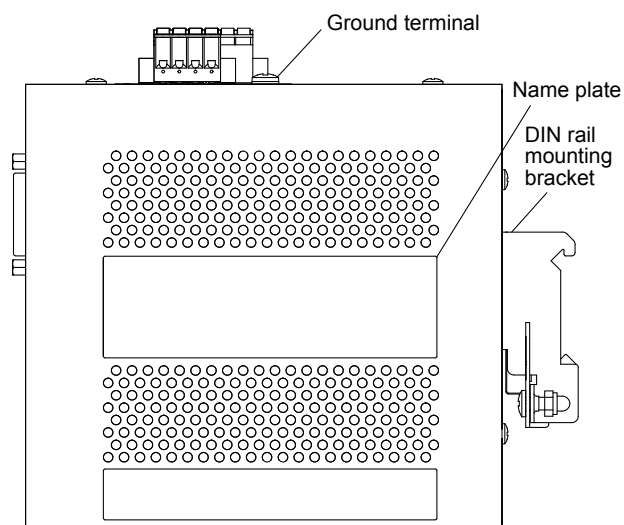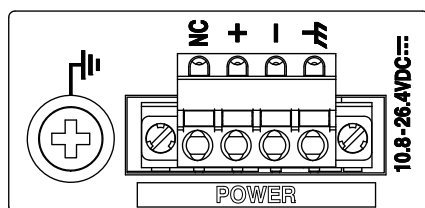
■ APPEARANCES

■ Front view
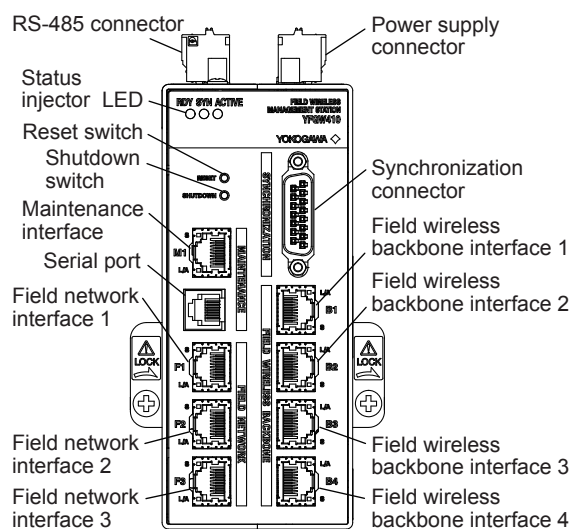
F01.ai
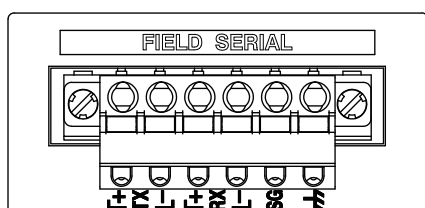
■ Right side

F02.ai

■ TERMINAL CONFIGURATIONS

■ Power supply

F03.ai

Terminal	Signal
NC	No Connection
+	24 V DC Hot
–	24 V DC Neutral
⏚	Frame Ground

■ RS-485

F04.ai

Terminal	Signal (4-wire)	Signal (2-wire)
TX +	Transmit Data positive	Transmit/Receive Data positive
TX -	Transmit Data negative	Transmit/Receive Data negative
RX +	Receive Data positive	Same as TX +
RX -	Receive Data negative	Same as TX -
SG	Signal Ground	Signal Ground
⏚	Frame Ground	Frame Ground

■ EXTERNAL DIMENSIONS

Unit : mm

DIN rail
mounting
center

140

60

80

150

24

70
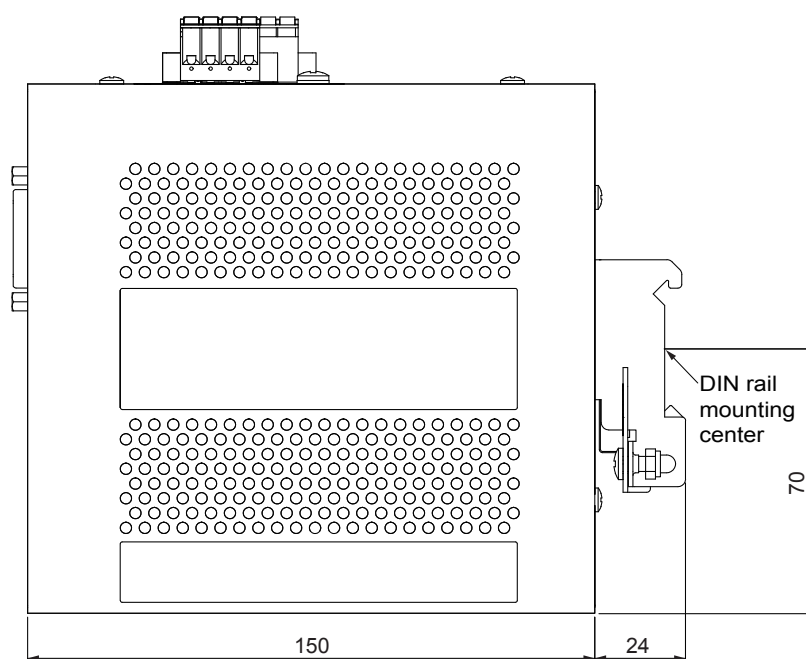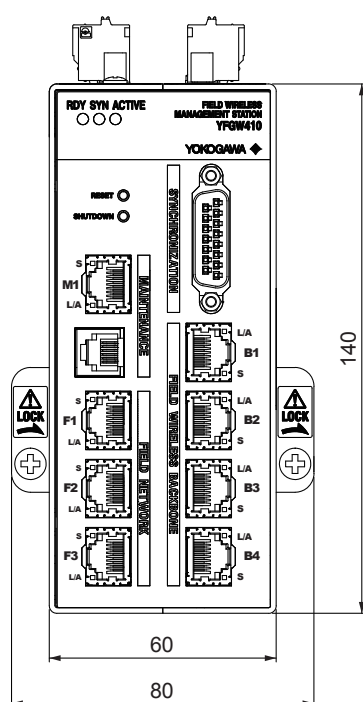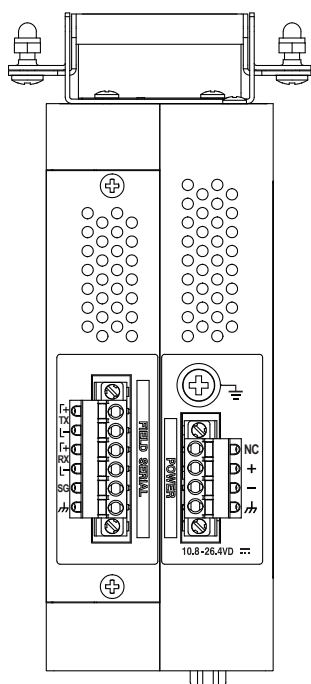
F05.ai

■ NOTES FOR OPERATION

The check process of wireless communication, the operating environment of the system, deterioration of wireless quality, and communication path error and restoration may cause data loss, retransmission of the same data, or variations in the data update time.

■ ORDERING INFORMATION

Specify the following when ordering

1. Model, suffix codes, and option codes

2. Tag Number (if required)

   Engraving on the tag plate can be specified by a combination of uppercase letters, lowercase letters, numbers, "- (hyphen)", "_ (underscore)". Factory setting is blank unless otherwise specified.

■ RELATED PRODUCTS GENERAL SPECIFICATIONS

Field Wireless System Overview:
                   Refer to GS 01W01A01-01EN
Field Wireless Access Point YFGW510:
                   Refer to GS 01W02E01-01EN
Field Wireless Access Point YFGW520:
                   Refer to GS 01W02E02-01EN
Field Wireless Media Converter YFGW610:
                   Refer to GS 01W02D02-01EN
Field Wireless Device OPC server SSS7100:
                   Refer to GS 33K20S10-50E
FieldMate Versatile Device Management Wizard:
                   Refer to GS 01R01A01-01E
Plant Resource Manager (PRM) :
                   Refer to GS 30B05A10-01EN

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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.