General Specifications

Field Wireless System Overview

GS 01W01A01-01EN

■ Outline

This General Specifications (GS) describes features of a field wireless system, system configuration a field wireless network, system configuration devices, and connection with the host system.

For product details, refer to "Relevant documents" in this document.

■ What is a field wireless network?

A field wireless network refers to a network in factories and plants based on field devices and system devices with a wireless communication function.

■ Features of field wireless network

● **High flexibility in layout**

Use of a field wireless network enables permanent or temporary installation in locations where wired instrumentation work used to be impossible or not economical.

● **Interactive full-digital network**

A wireless communication of a field wireless system is interactive full-digital network communication. This digital communication provides many information communication functions involving device status monitoring, status diagnostic monitoring, and device parameter adjustment, in addition to process values.
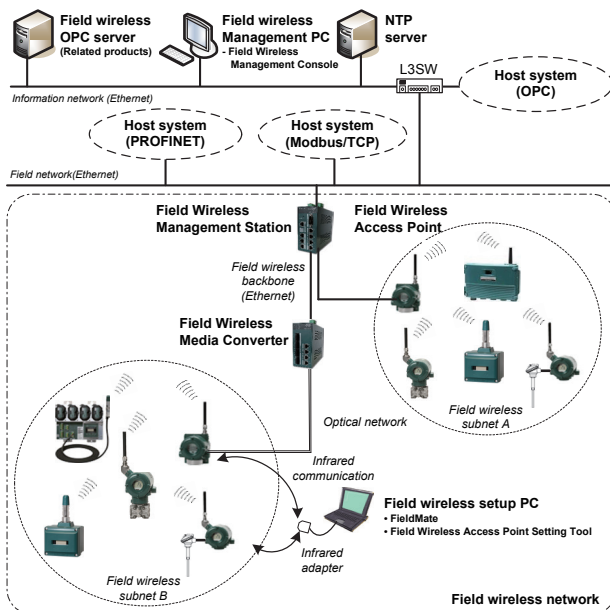
■ Yokogawa's field wireless system

□ Wireless communication protocol

Yokogawa's field wireless communication system 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).
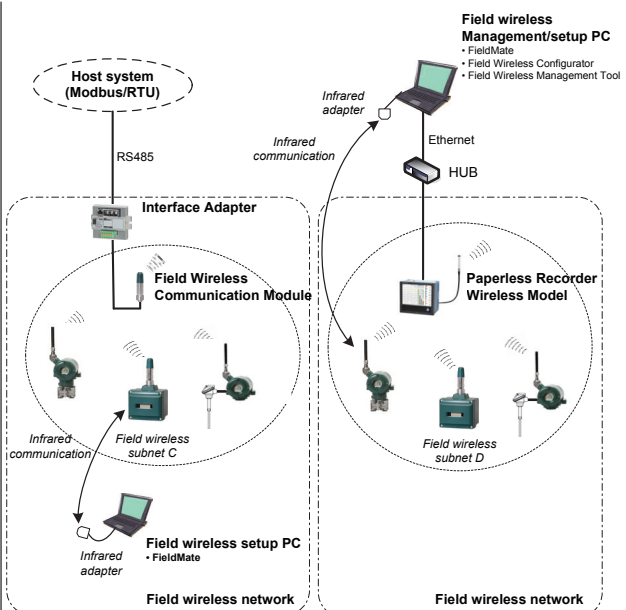
□ System configuration

A field wireless system consists of field wireless system devices such as an access point and a gateway, its lower-level wirelessly connected field wireless devices, and its upper-level PC connected. The upper-level field wireless management PC is used to perform settings and management of a field wireless network.

A field wireless system supports various system configurations, such as conection with DCS, recorder and other host systems.

<System Configuration : Large scale>

<System Configuration : Small scale>

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GS 01W01A01-01EN
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8th Edition June 2018 (KP)

● **Field Wireless Management Station**
The field wireless management station is a field wireless system device for large-scale and a High reliability plants. The field wireless management station builds flexible large-scale field wireless systems by communication to multiple field wireless subnets, and builds high reliability field wireless systems by redundant configuration.
The field wireless management station has a gateway function to connect field wireless devices to a host system via field wireless access points, a system configuration function and a management function of a field wireless network. System configuration and management of a field wireless network are performed using the field wireless management console software included in the field wireless management station. The field wireless management PC on which this software program installed is connected with a field wireless management station by Ethernet.

– **Field Wireless Management Console**
This software is embedded software of the field wireless management station. This software has a configuration function and a monitor function. A configuration function performs system configuration and maintenance of a field wireless system and field wireless system devices. A monitor function performs management and operation monitor of a field wireless system.

● **Field Wireless Access Point**
The field wireless access point has a function to connect field wireless devices and a field wireless management station. The field wireless access point connects with field wireless devices by wireless communications, and connects with a field wireless management station by Ethernet or Wireless LAN. The field wireless access point is set up by the field wireless access point configuration software included in the field wireless access point. The field wireless setup PC on which this software program installed is connected with a field wireless access point via infrared communication.

– **Field Wireless Access Point Setting Tool**
This software is used for a setup and maintenance of this product.

– **Infrared adapter**
In order to set up a field wireless access point, an infrared adapter is required for communication between a field wireless access point and the field wireless access point configuration software.
<Infrared adapter example>
ACTiSYS Infrared Adapter :
ACT-IR224UN-LN96-LE 9600bps
For details, apply to ACTiSYS.

● **Field Wireless Media Convertor**
The field wireless media convertor has a function to convert 100BASE-TX (Twisted pair cable) into 100BASE-FX (Optical fiber cable). The field wireless media convertor is used when connecting a field wireless management station and a field wireless access point with the outdoors or a long distance.

● **Field Wireless Communication Module**
The field wireless communication module supports device or gateway function, which compliant with ISA100.11a wireless communication standard. Either function can be selected when ordering.
When used as a gateway, the field wireless communication module connects interface adapter to construct a field wireless system. The field wireless communication module can be connected to host system compatible with the Modbus/RTU interface. When used as a device, the field wireless communication module combines with FN series field wireless module.

● **Paperless Recorder Wireless Model**
This product is a paperless recorder equipped with a gateway function for the ISA100 field wireless network. This product directly receives ISA100.11a signal and records field data remotely.

– **Field Wireless Configurator**
This software performs a field wireless network setting, maintenance, and other tasks.

– **Field Wireless Management Tool**
This software manages a field wireless network and field wireless devices, and checks the operating conditions.

● **Field wireless devices**

– **EJX□□□B Series of Differential Pressure / Pressure Transmitters**
Differential pressure / pressure transmitters compliant with the ISA100.11a wireless communication standard.

– **YTA510 Temperature Transmitter**
Temperature transmitter compliant with the ISA100.11a wireless communication standard.

– **YTMX580 Multi-Input Temperature Transmitter**
Multi-Input temperature transmitter compliant with the ISA100.11a wireless communication standard.

– **FN Series Field Wireless Module**
Field wireless modules has various capabilities such as wireless communication compliant with the ISA100.11a wireless communication standard, protocol conversion of Modbus or HART, and process monitoring of analog input / digital input-output.

– **ISA100.11a Registered Devices**
Field wireless system supports field devices passing the ISA100.11a conformance certification by ISA100 Wireless Compliance Institute. For details, contact Yokogawa representatives from which the instrument was purchased or the nearest Yokogawa office.

● **FieldMate**
FieldMate is setting software for field devices. In a field wireless system, FieldMate is used for the setting to link field wireless devices to a field wireless network and set parameters of field wireless devices. The field wireless setup PC on which this software program installed is connected with field wireless devices via infrared communication.
For a field wireless system, use applicable version of FieldMate and Device Files checked by the website (http://www.yokogawa.com/)

– **Infrared adapter**
In order for field wireless devices to join to a field wireless network, an infrared adapter is required for communication between a FieldMate and field wireless devices.
Refer to infrared adapter example of an access point for an infrared adapter.

● **NTP (Network Time Protocol) server**
The NTP server is a time management server for field wireless system and the host system. In order to perform time synchronization at between a field wireless system to the host system requires the NTP server connected with a field wireless management station. And, a NTP server which multiple field wireless management stations connect is sharable.

□ **Field wireless system-related products**

● **Plant Resource Manager (PRM)**
A software package to manage field devices online. PRM can monitor and manage the field wireless devices in a field wireless system.
For a field wireless system, use applicable version of PRM and Device Files checked by the website (http://www.yokogawa.com/)

● **Field wireless OPC server**
The server software for a field wireless system to provide an interface based on the specifications created by the OPC (OLE for Process Control) Foundation. This server software connects a host system with a field wireless management station via an OPC interface. Field wireless OPC server should use R2.01.01 or later.

● **YFGW Communication Package (for ALE111)**
The FCS communication package software is used to connect a field wireless system (via subsystem communication). CENTUM VP R5.01.00 or later, Ethernet communication module (ALE111) includes YFGW communication.

● **Fire and Gas Communication Module**
The fire and gas communication module is used to connect a field wireless system with ProSafe-RS. ProSafe-RS R4.03.10 or later should be used.
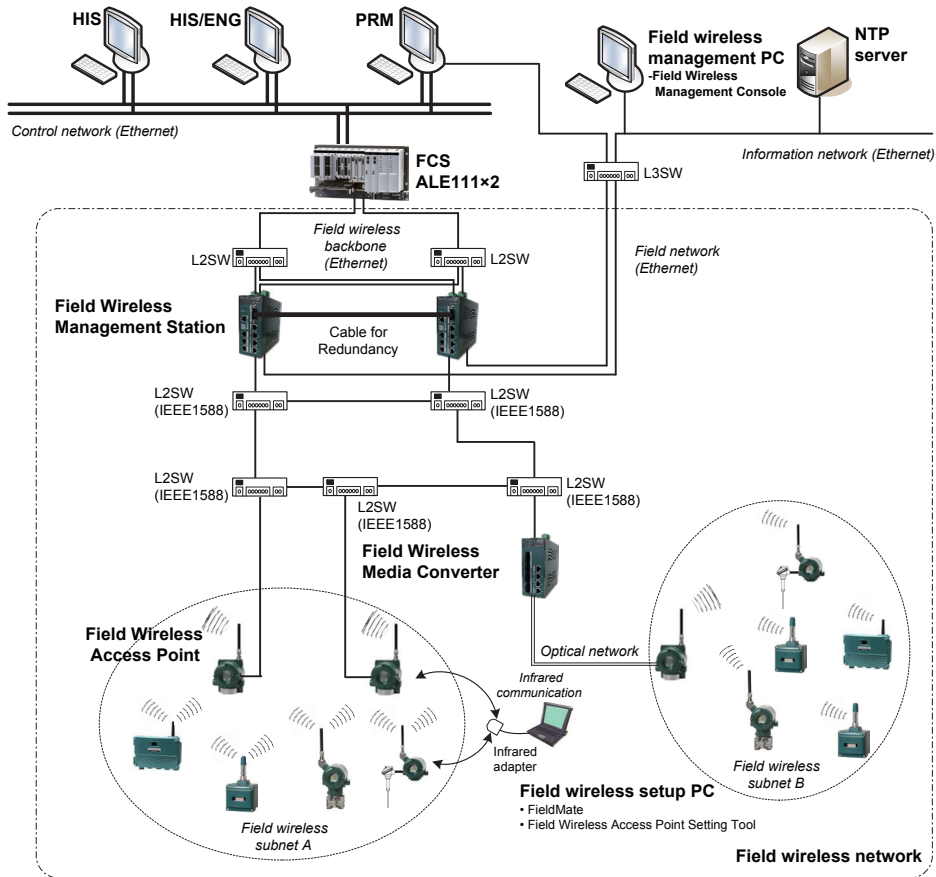
■ Connection with host system

● **CENTUM VP**
A connection with CENTUM VP enables displaying the measurement data of field devices on the CENTUM VP operation and monitoring screen. There are two ways to connect a field wireless system with CENTUM VP. One is a connection with FCS (via the subsystem communication) and the other is a connection with the General Subsystem Gateway (GSGW).
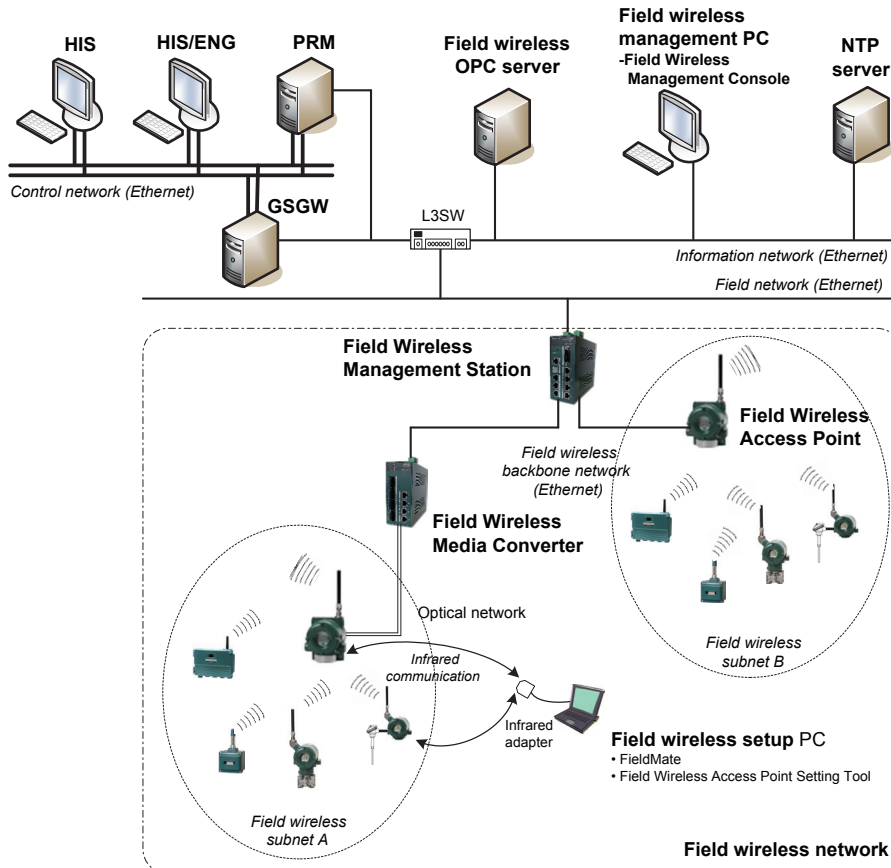The connection with FCS requires an Ethernet communication module (ALE111). The connection with a GSGW requires the field wireless OPC server. For the CENTUM VP, version R5.02.00 or later should be used.
Use Plant Resource Manager (PRM) for maintenance operation of field devices online.

<System Configuration Example: Redundant system connection with FCS (via Subsystem Communication)>

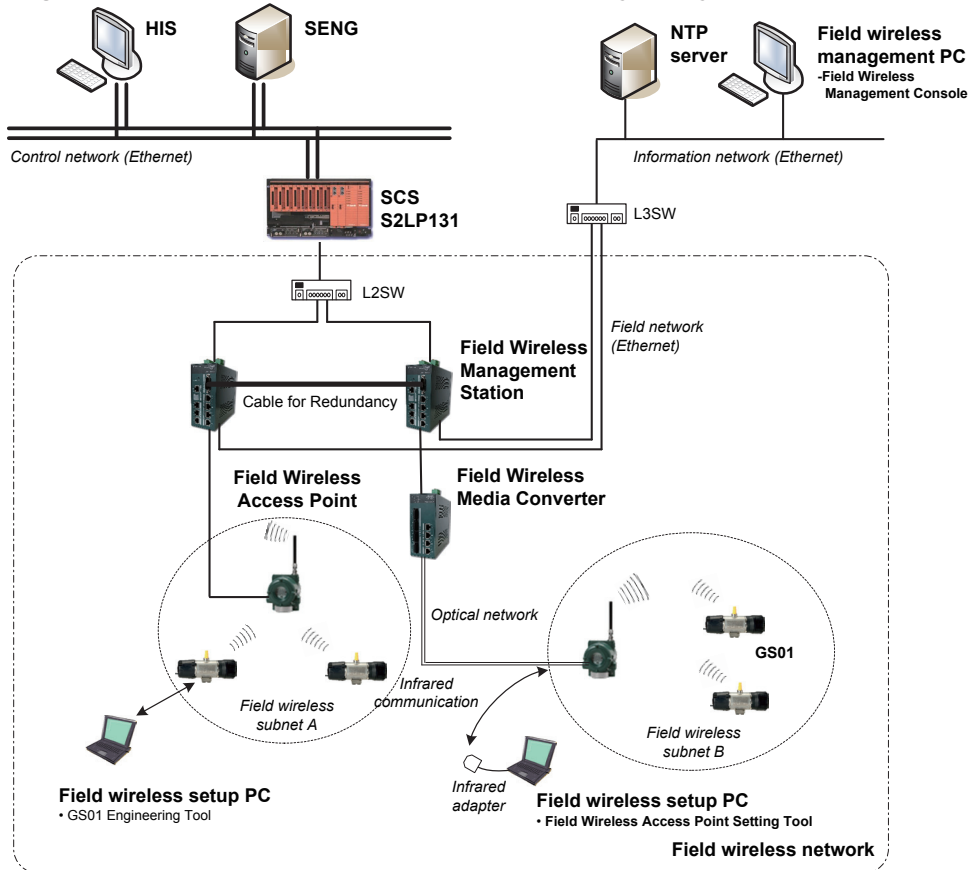**<System Configuration Example: Connection with General Subsystem Gateway (GSGW)>**

● **ProSafe-RS**

A connection with SCS enables monitoring the gas concentration value from Dräger/GasSecure GS01 wireless hydrocarbon gas detectors, and realizes SIL2 (SIL: Safety Integrity Level) capable wireless gas detection system.

The connection with SCS requires a fire and gas communication module.

For ProSafe-RS, version R4.03.10 or later should be used.

<System Configuration Example: Connection with SCS (via Safety Subsystem Communication)>

● **SCADA Systems (FAST/TOOLS, STARDOM)**
Field wireless devices data are displayed on the SCADA operation and monitoring screens using Modbus/TCP interface or OPC interface.
FAST/TOOLS can directly connect with field wireless systems via Modbus/TCP interface or OPC interface.
Also FAST/TOOLS can acquire field wireless devices data stored on STARDOM autonomous controller FCN by connecting STARDOM autonomous controller FCN using Modbus/TCP protocol. This manner prevents field data from being lost.
When using OPC interface, Field Wireless OPC Server is required. For FAST/TOOLS, version R9.02 or later should be used.
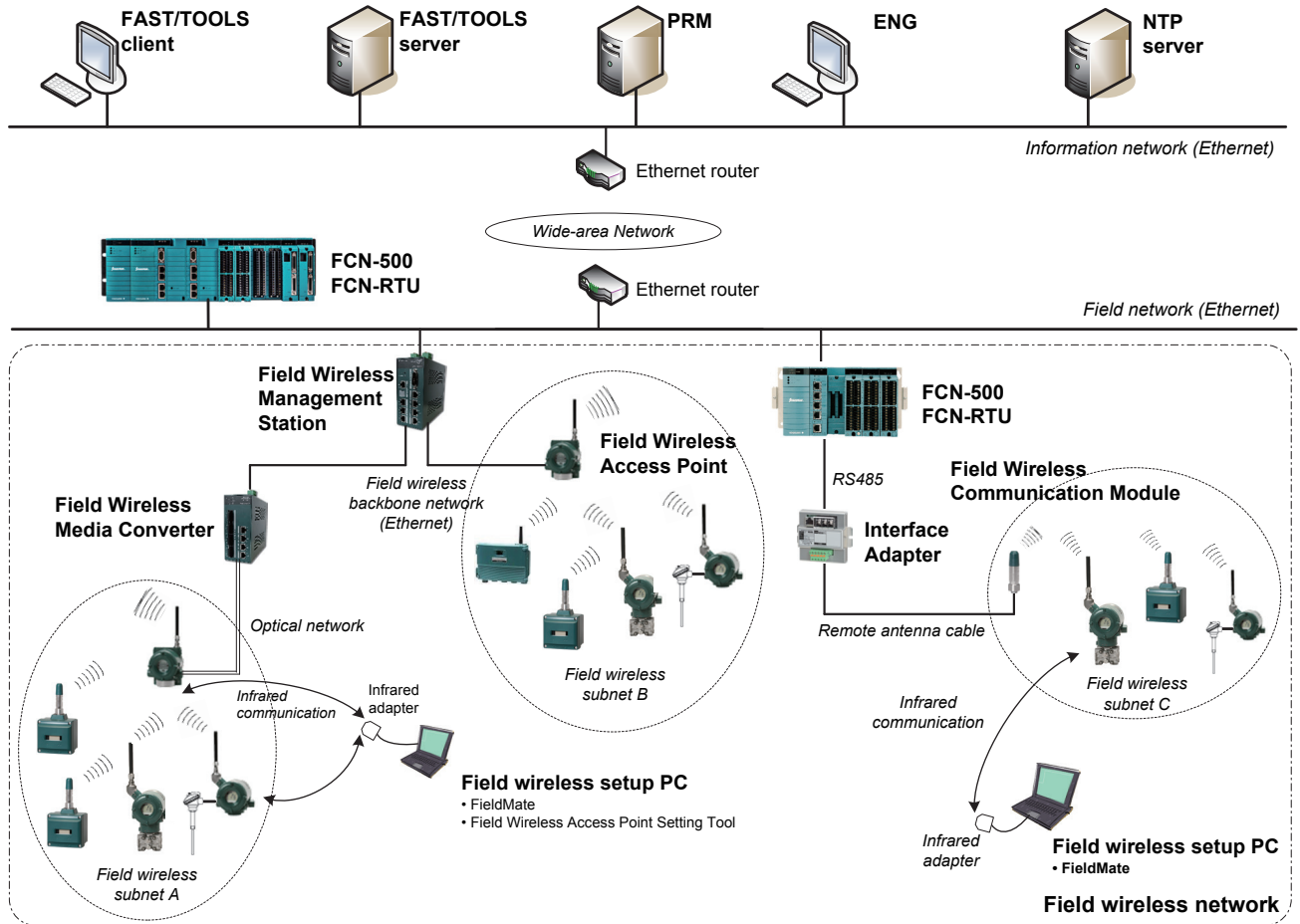
– **Connection with Field Wireless Management Station**
For STARDOM autonomous controller FCN, version R2.20.01 or later should be used. Use Plant Resource Manager (PRM) for maintenance operation of field devices online.
– **Connection with Field Wireless Communication Module**
The connection with FAST/TOOLS requires STARDOM autonomous controller FCN. For STARDOM autonomous controller FCN, version R4.02.01 or later should be used.

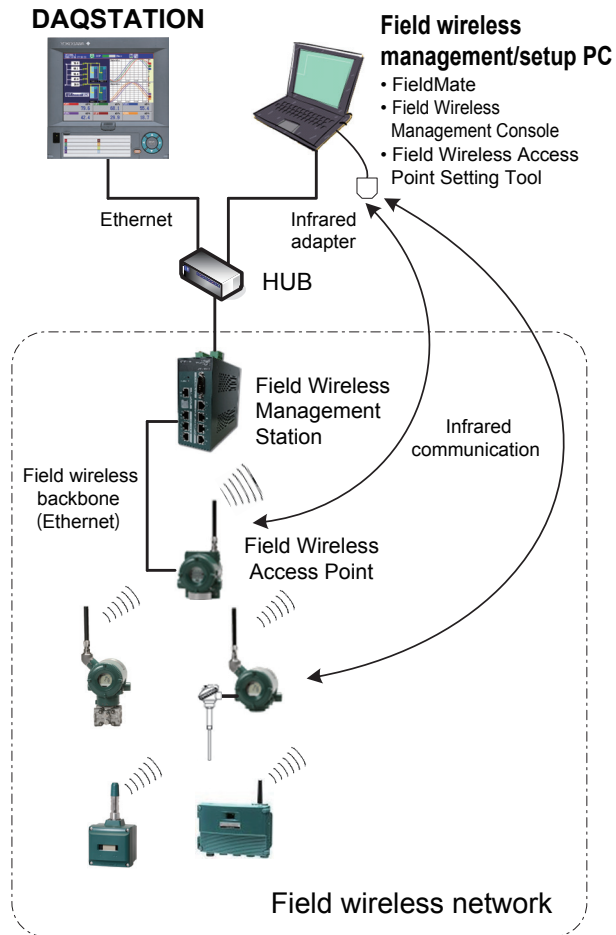**<System Configuration Example: Connection with FAST/TOOLS>**

● **DAQSTATION DX2000 Series**
Measurement data of the field wireless devices can be displayed on the display screen of the DAQSTATION DX2000 Series. The field wireless system and DAQSTATION DX2000 Series are connected via the Modbus/TCP interface.

<System Configuration Example>

■ Relevant documents

For details about the related products, refer to the following General Specifications.

Items	Models	General Specifications
Field Wireless Management Station	YFGW410	GS 01W02D01-01EN
Field Wireless Access Point	YFGW510	GS 01W02E01-01EN
	YFGW520	GS 01W02E02-01EN
Field Wireless Media Converter	YFGW610	GS 01W02D02-01EN
Paperless Recorder Wireless Model	GX20W	GS 04L51B11-01EN
Differential Pressure and Pressure Transmitters	EJX110B, EJX310B, EJX430B	GS 01C27B01-01EN
Flange Mounted Differential Pressure Transmitters	EJX210B	GS 01C27C01-01EN
Absolute and Gauge Pressure Transmitters	EJX510B, EJX530B	GS 01C27F01-01EN
Diaphragm Sealed Differential Pressure and Gauge Pressure Transmitters	EJX118B, EJX438B	GS 01C27H01-01EN
Temperature Transmitter	YTA510	GS 01C50E01-01EN
Multi-Input Temperature Transmitter	YTMX580	GS 04R01B01-01EN
Field Wireless Communication Module	FN110	GS 01W03B01-01EN
Field Wireless Multi-Protocol Module	FN310	GS 01W03D01-01EN
Field Wireless Multi-Function Module	FN510	GS 01W03E01-01EN
Interface Adapter	LN90	GS 01W03L01-01EN
FieldMate	FSA111	GS 01R01A01-01E

Items	Models	General Specifications
Plant Resource Manager	PM4S7□□□	GS 30B05A10-01EN
Field Wireless Device OPC Server	SSS7100	GS 33K20S10-50E
Ethernet Communication Module (for N-IO/FIO)	ALE111	GS 33J60G11-01EN
Fire and Gas Communication Module	S2LP131	GS 32P06K52-01EN

Items	Models	General Specifications
Integrated Production Control System CENTUM VP System Overview (R5.01.00 or later)	–	GS 33M01A10-50EN
Integrated Production Control System CENTUM VP System Overview (R6.01.00 or later)	–	GS 33J01A10-01EN
ProSafe-RS Safety Instrumented System Overview (for Vnet/IP)	–	GS 32P01B10-01EN
FAST/TOOLS	–	GS 50A01A10-01EN
STARDOM Overview	–	GS 34P02A01-02E
DAQSTATION DX2000	DX20□□	GS 04L42B01-01E

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