General Specifications

Field Wireless System Overview

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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.

■ 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

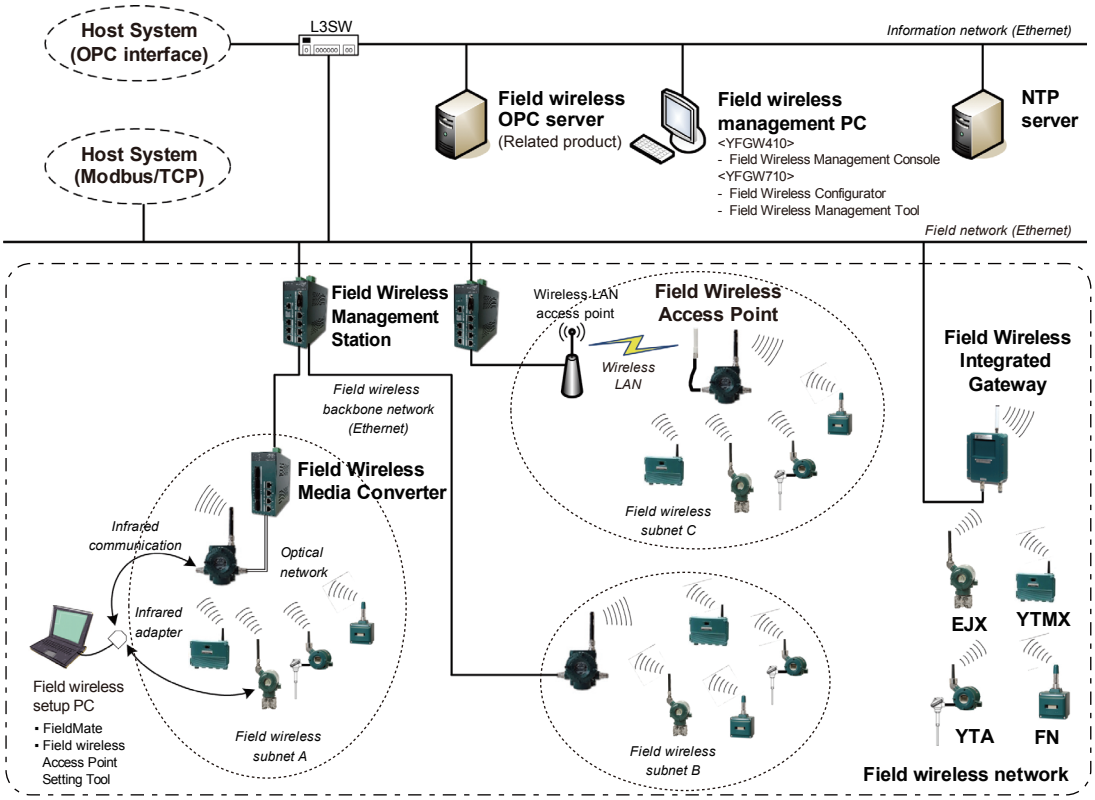
□ Wireless communication protocol

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 by Ethernet.
The upper-level field wireless management PC is used to perform settings and management of a field wireless network.
A host system and a field wireless system connect by Ethernet via Modbus/TCP interface or the OPC interface provided by the field wireless OPC server.

<System Configuration>



● **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.

For details, see Field Wireless Management Station (GS01W02D01-01EN).

● **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.

For details, see Field Wireless Access Point (GS01W02E01-01EN).

– **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.
For details, see Filed Wireless Media Convertor (GS01W02D02-01EN).

● **Field wireless integrated gateway**
The field wireless integrated gateway is a field wireless system device for middle-scale and middle-scale plants. The field wireless integrated gateway has a gateway function to connect field wireless devices and a host system, and a field wireless network setting and a management function. A field wireless network setting and management are performed using the field wireless configurator and the field wireless management tool software included in the field wireless integrated gateway. The field wireless management PC on which these software programs are installed is connected by Ethernet.

– **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.

For details, see Field Wireless Integrated Gateway (GS 01W01F01-01EN).

● **Field wireless devices**

– **EJX-B Series of Differential Pressure / Pressure Transmitters**
Differential pressure / pressure transmitters compliant with the ISA100.11a wireless communication standard. For details, see EJX-B Series Differential Pressure / Pressure Transmitter specifications (GS 01C27B01-01EN, GS 01C27C01-01EN, GS 01C27F01-01EN, and GS 01C27H01-01EN).

– **YTA510 Temperature Transmitter**
Temperature transmitter compliant with the ISA100.11a wireless communication standard. For details, see YTA510 Temperature Transmitter (GS 01C50E01-01EN).

– **YTMX580 Multi-Input Temperature Transmitter**
Multi-Input temperature transmitter compliant with the ISA100.11a wireless communication standard. For details, see YTMX580 Multi-Input Temperature Transmitter (GS 04R01B01-01EN).

– **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.
For details, see FN Series of Field Wireless Module specifications (GS 01W03B01-01EN, GS01W03D01-01EN, and GS01W03B01-01EN)

– **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.

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- **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.field-wireless.com/)
  For details, see FieldMate Versatile Device Management Wizard (GS 01R01A01-01E).

– **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 or a field wireless integrated gateway. And, a NTP server which multiple field wireless management stations or field wireless integrated gateways 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.field-wireless.com/)
  For details, see Plant Resource Manager (GS 33Y05Q10-32E).
- **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 or a field wireless integrated gateway via an OPC interface. Field wireless OPC server should use R2.01.01 or later.
  For details, see Field Wireless Device OPC Server (GS 33M20S20-40E).
- **YFGW Communication Package (for ALE111)**
  The FCS communication package software is used to connect a field wireless system with CENTUM VP R4.02.30 or later FCS (via subsystem communication).
  For details, see YFGW Communication Package (for ALE111) (GS 33M15D60-40E).
  Moreover, CENTUM VP R5.01.00 or later, general specifications of Ethernet communication module (ALE111) includes YFGW communication package.
  For details, see Model ALE111 Ethernet communication Module (for FIO) (GS 33K50G11-50E).

■ 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). And YFGW communication package (for ALE111) is also required at the CENTUM VP R4.The connection with a GSGW requires the field wireless OPC server.
  For the CENTUM VP, version R4.02.30 or later should be used. And, in the case which a field wireless management station and CENTUM VP R5 connect, CENTUM VP should use R5.02.00 or later. And also, connection with field wireless devices with an output function and a redundant function of the field wireless management station require the CENTUM VP version R5.02.00 or later.
  For details, see Integrated Production Control System CENTUM VP System Overview (For R4.02.30 or later: GS 33M01A10-40E. For R5.01.00 or later: GS 33K01A10-50E, GS 33K01A20-50E). Use Plant Resource Manager (PRM) for maintenance operation of field devices online.

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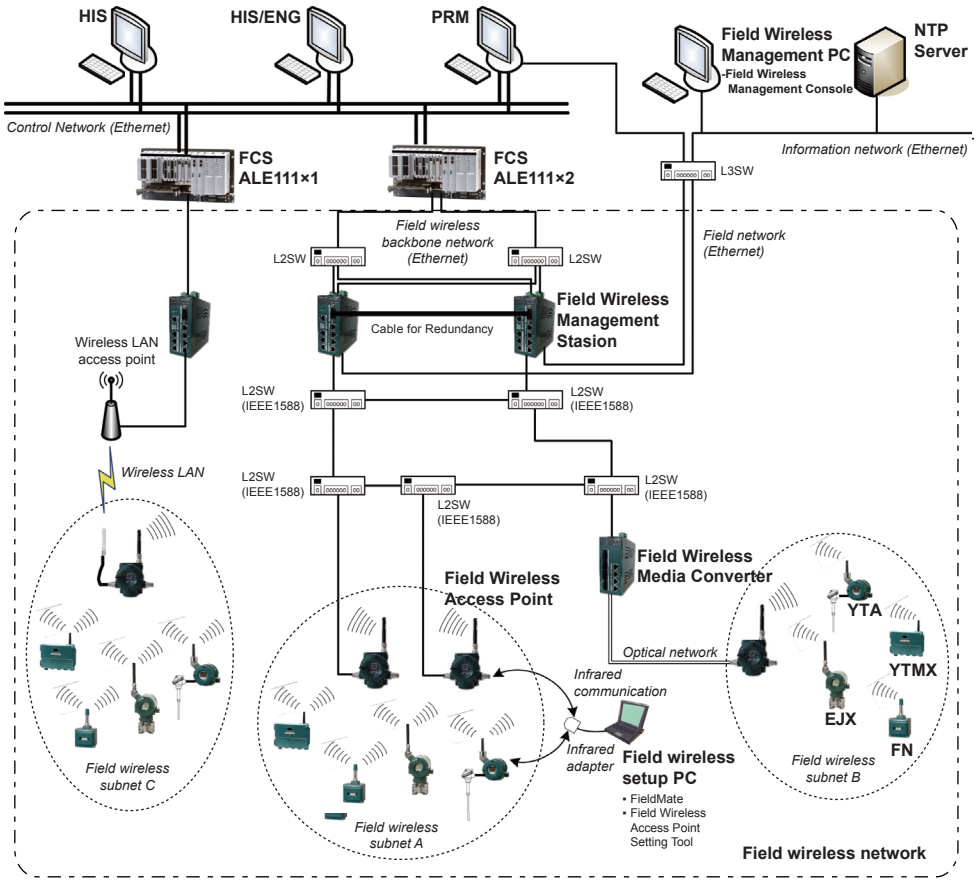
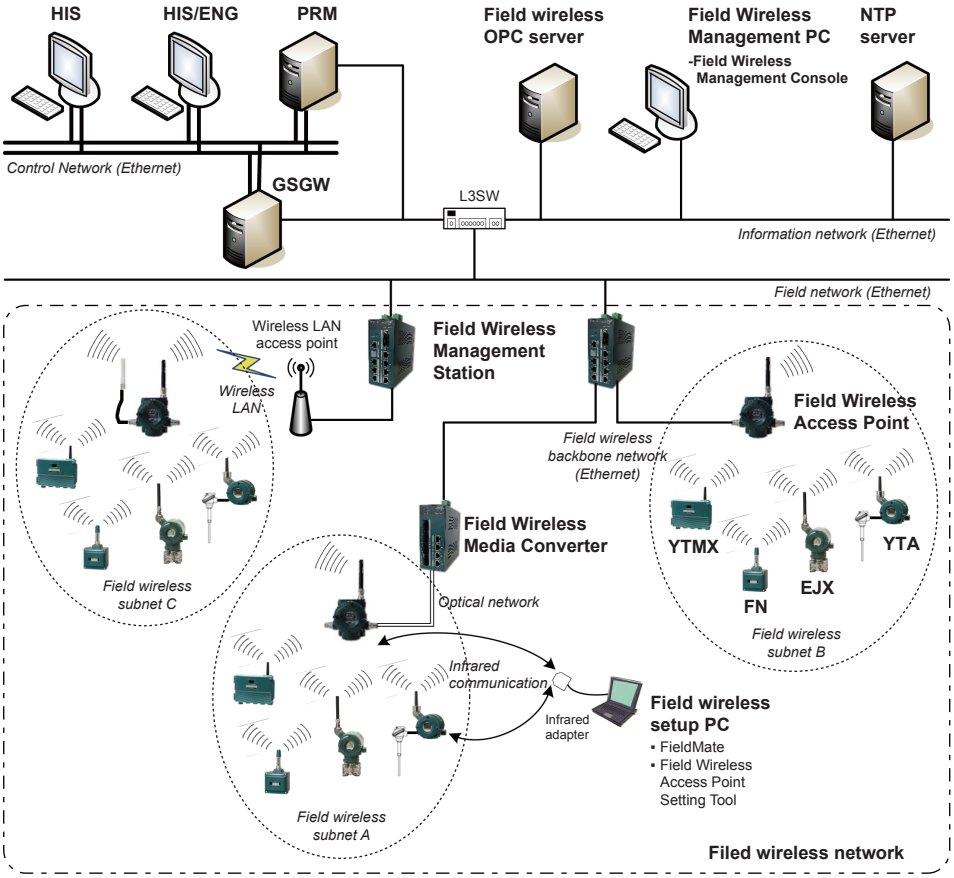
<System Configuration Example: Redundant system connection with FCS (via Subsystem Communication)>



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



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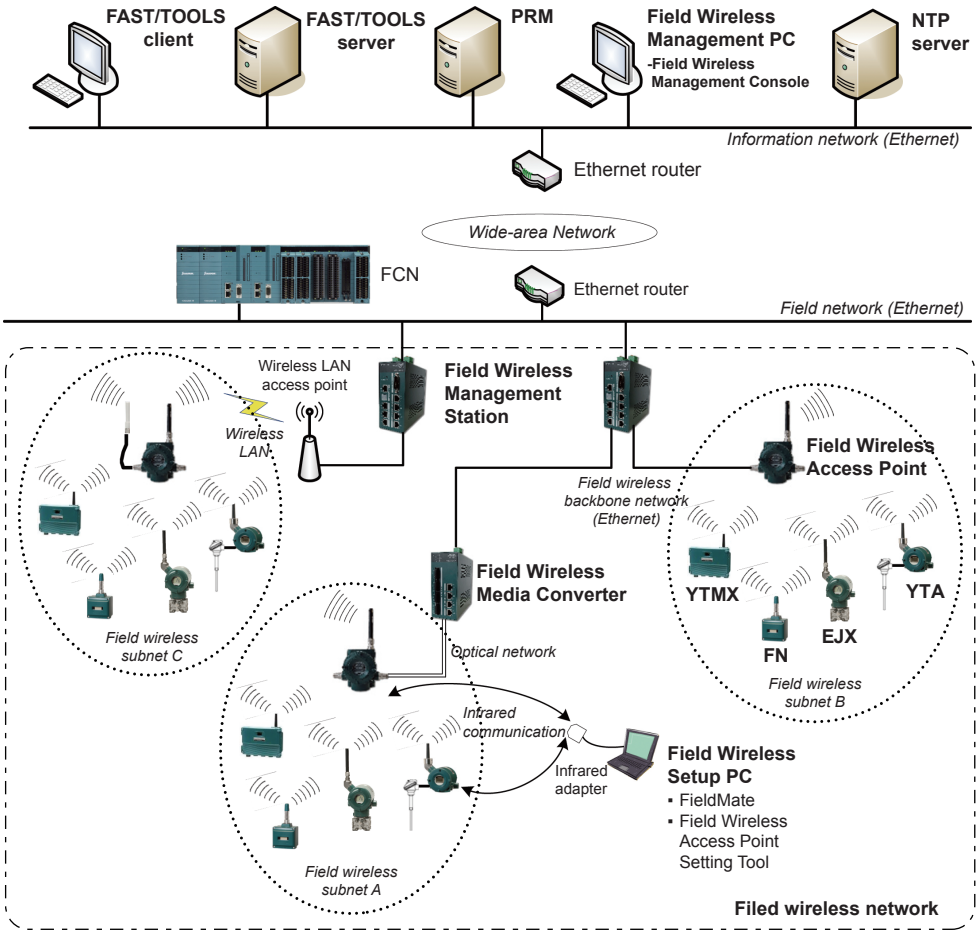
- **SCADA Systems (FAST/TOOLS, STARDOM)**
  Field wireless devices data are displayed on the SCADA operation and monitoring screens using Modbus/TCP interface or OPC interface.
  FAST/TOOLS can directly connect with field wireless systems via Modbus/TCP interface or OPC interface. Also FAST/TOOLS can acquire field wireless devices data stored on STARDOM autonomous controller FCN/FCJ by connecting FCN/FCJ 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.
  Refer to FAST/TOOLS General Specification (GS 50A01A10-01E) for details of FAST/TOOLS.
  For STARDOM autonomous controller FCN/FCJ, version R2.20.01 or later should be used.
  Refer to STARDOM General Specification (GS 34P02A01-02E) for details of STARDOM.
  Use Plant Resource Manager (PRM) for maintenance operation of field devices online.

<System Configuration Example: Connection with FAST/TOOLS via Modbus/TCP Interface>



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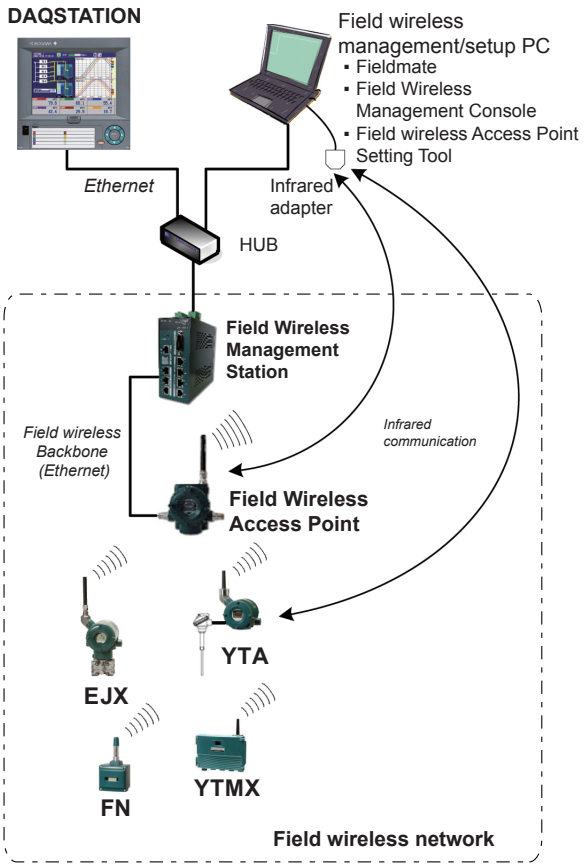
● **DAQSTATION DX2000 Series**
Measurement data of the field wireless devices can be displayed on the display screen of the DAQSTATION DX2000 Series. The field wireless system and DAQSTATION DX2000 Series are connected via the Modbus/TCP interface.
For details, see DAQSTATION DXAdvanced DX2000 (GS 04L42B01-01E).

<System Configuration Example>



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