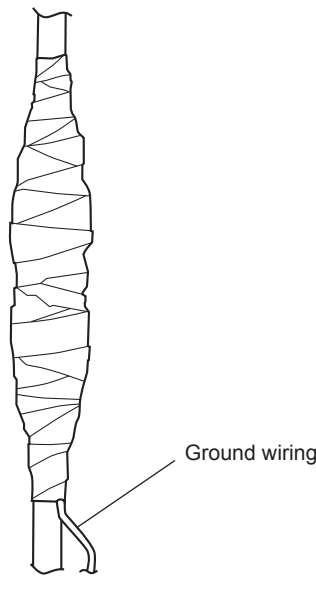


- **Waterproofing antenna cables and connectors**

Make sure that the antenna, extension cables and arrestor wiring including the grounding cable are connected properly. Protect the connectors and the arrestor with tape. As described in C5.4.1 Mounting ISA100.11a Antenna to YFGW510, wind self-bonding tape and vinyl tape around connections.



FC0510.ai

Figure C5-10 Sealing external antenna wiring

- **Fastening antenna wiring**

After taping, fasten the cables to a solid structure to protect against vibration and wind. Ensure that the radii of bends in the cables do not fall below the limits above.

C5.4.3 Installation and Wiring of Wireless LAN Antenna

The wireless LAN antenna must be connected to YFGW510 using an extension cable in order to prevent interference with the ISA100.11a antenna and to mount the antenna vertically. To fasten the antenna, use the brackets provided with the extension cable.

Basically, the wireless LAN antenna must be at least 1 m away from the ISA100.11a antenna. In a redundant wireless LAN system, the wireless LAN antennas must be at least 30 cm away from each other. When wireless LAN antennas or the ISA100.11a antenna is located near a mounting pipe or any other metal object, allow clearance of at least 30 cm.

■ Installing wireless LAN antennas

Install the wireless LAN antenna in an appropriate location for wireless communication, referring to requirements on distance from the ISA100.11a antenna, and C3.1 Requirements for Installation Locations. Make sure that the mounting of the antenna on a 2-inch pipe has enough strength to withstand strong winds and vibration. The antenna must be kept upright.

- **Fastening wireless LAN antenna**

Fasten the wireless LAN antenna to the pipe using the brackets provided with the antenna. When mounting on a vertical pipe, make sure that the antenna stands higher than the top of the pipe.

- WLAN specification (single communications)

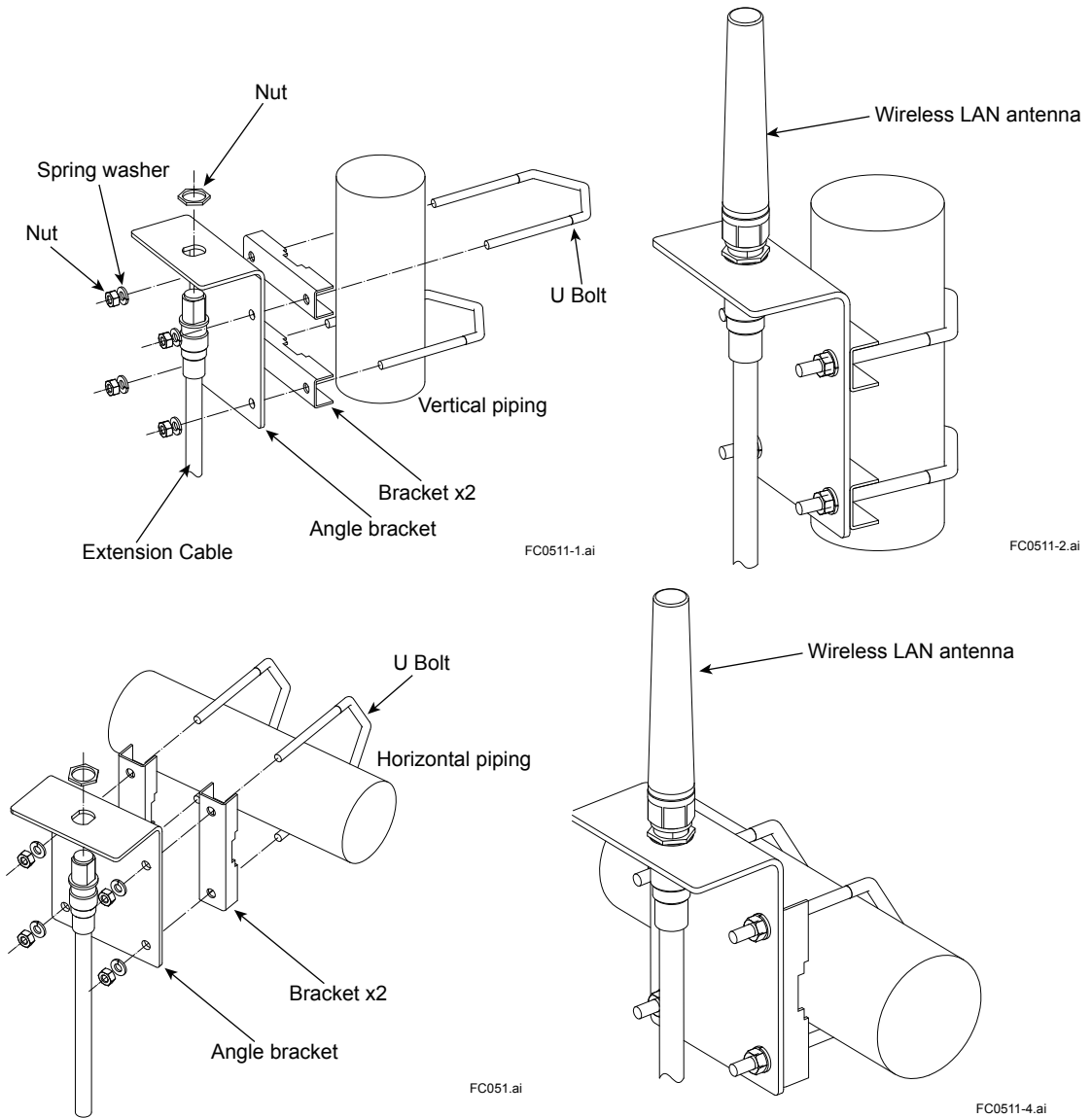
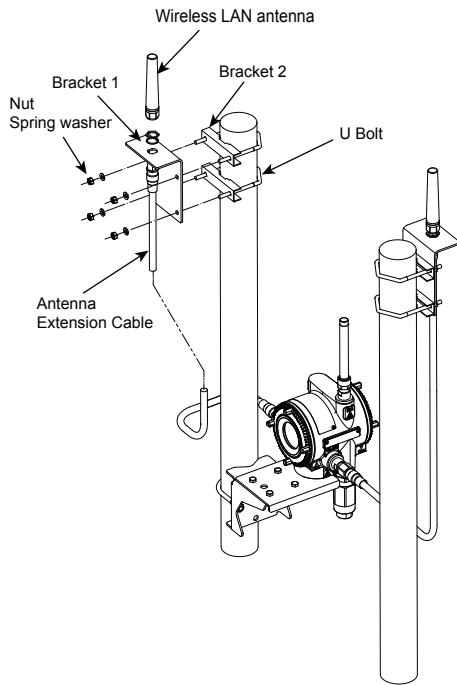
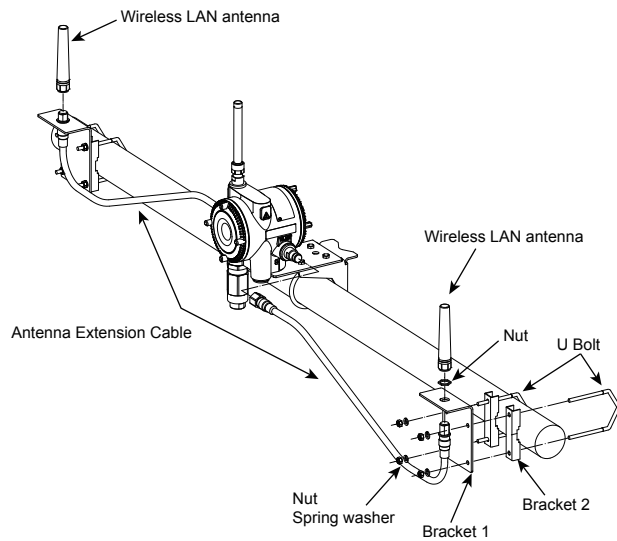


Figure C5-11 Connecting brackets to fasten the wireless LAN specification antenna

- WLAN specification (redundant communications)



Mounting YFGW510 to the vertical piping



Mounting YFGW510 to the horizontal piping

FC0512.ai

Figure C5-12 Connecting brackets to fasten the WLAN redundant specification antenna

● **Wireless LAN antenna fastening procedure**

1. Fix the antenna extension cable to the bracket 1 with the provided nut as shown in the figure above.
2. Fix the bracket 1 to the 2-inch (2B) pipe by using the provided a pair of U bolts and bracket 2.
3. Screw the antenna into the antenna connector of the antenna extension cable on the bracket 1.
Tighten the antenna connector with a torque of 2 to 3 N·m.
4. Protect the joint of the antenna and the connector with tape to increase environmental resistance. For details on taping, see C5.4.1 Mounting ISA100.11a antenna to YFGW510.

■ Wiring of wireless LAN antenna and improvement of environmental resistance

● Specification of extension cable for wireless LAN antenna (Use only the cables included as option.)

- Specification: 8D-SFA(PE)
 - Outside Diameter: 11.1 mm
 - Minimum Bend Radius: 67 mm (when fixing)
167 mm (when wiring)
 - Cable End Treatment: N type connector, one end is male and the other is female.
- * “When fixing” shows the bending radius for fixing (the state is maintained for a long time). “When wiring” shows the bending radius while checking the wiring position. This bending radius is set larger than that for fixing in order to prevent damage to the cable because the cable is likely to be repeatedly bent when checking the final wiring position.

● Wiring procedure of wireless LAN antenna

1. Use the provided extension antenna cable to connect the antenna connector with the external antenna. Tighten the connector of the antenna extension cable with a torque of 2 to 3 N·m. Refer to the specification about the limitation of bend radius when fixing or wiring.
2. When using two extension cables, the provided arrester should be inserted between these cables.
3. Before the wiring work, confirm the polarities (male/female) of the connectors of antenna, extension antenna cable, and arrester. Tighten the connector of the antenna extension cable with a torque of 2 to 3 N·m.

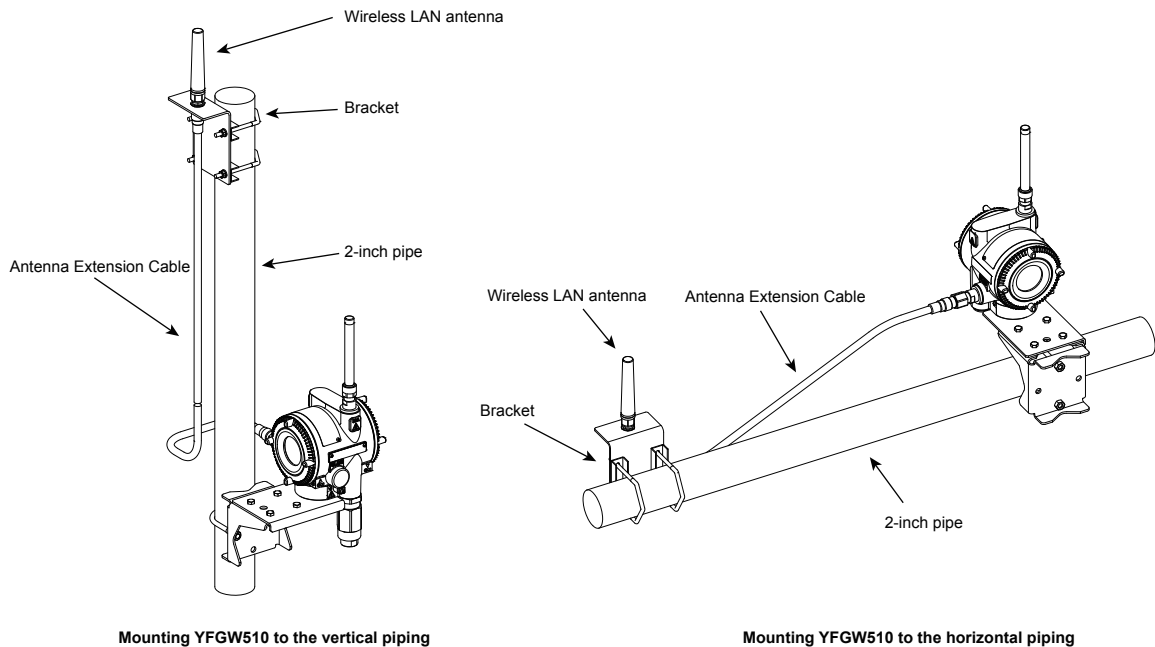
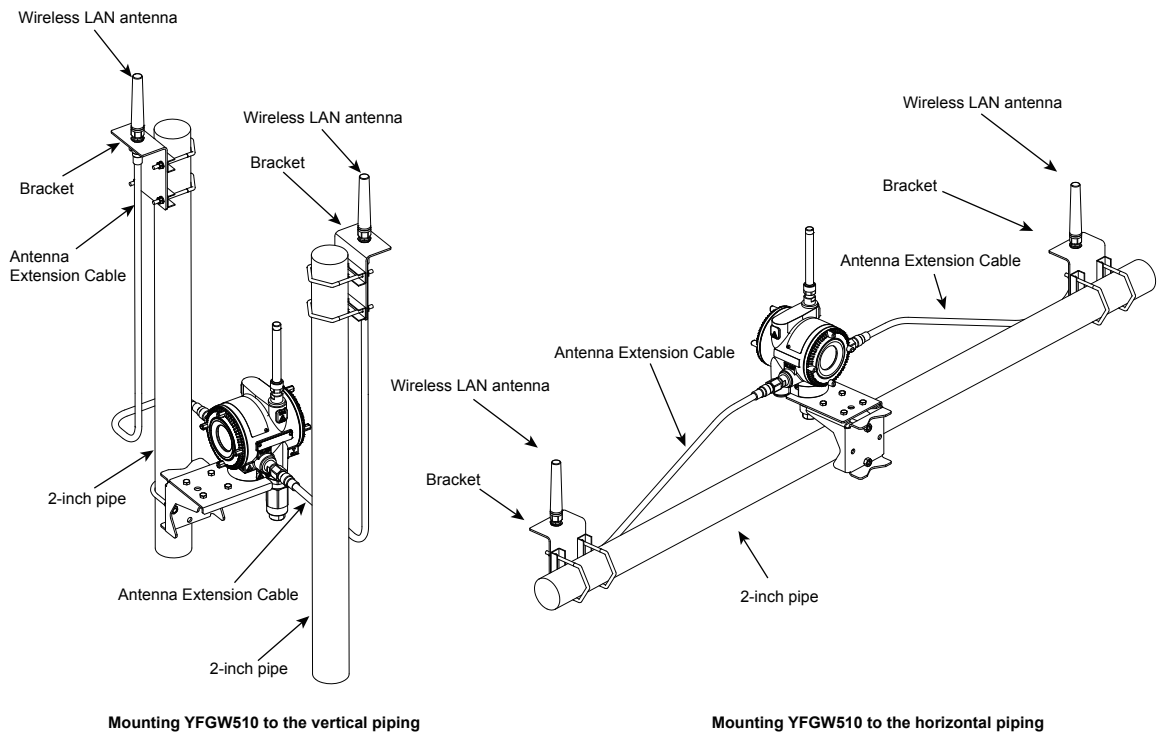


Figure C5-13 Wiring of wireless LAN antenna (single communications)

FC0513.ai



FC0514.ai

Figure C5-14 Wiring of wireless LAN antenna (redundant communications)

● **Ground wiring of arrestor**

Place an arrestor between two extension cables. Connect the grounding cable to the ground terminal of the arrestor.

Connect the grounding cable to the ground terminal on the main body. Class D grounding (the third class grounding) with the grounding resistance of 100 Ω or less is necessary. Do not share the ground with other devices.

● **Grounding cable (Insulated for industrial equipment)**

Examples

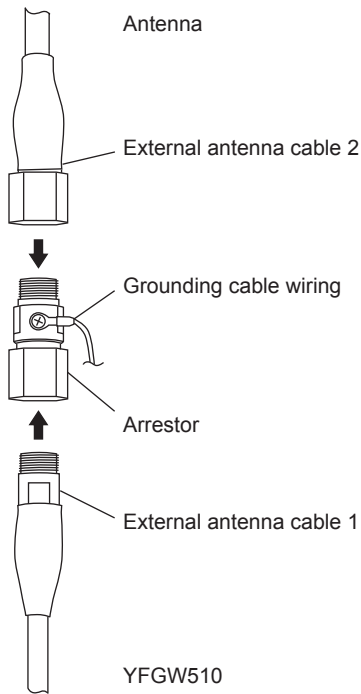
- 600 V polyvinyl chloride insulated wires (IV): JIS C3307
- Polyvinyl chloride insulated wires for electrical apparatus (KIV): JIS C3316
- 600 V grade heat-resistant polyvinyl chloride insulated wires (HIV): JIS C3317
- Heatproof vinyl insulated wires VW-1 (UL1015/UL1007)

Wire size

- Core: AWG14 to 13 (2 to 2.6 mm²)

Terminal treatment

- Ring terminal for M4: With insulation covers

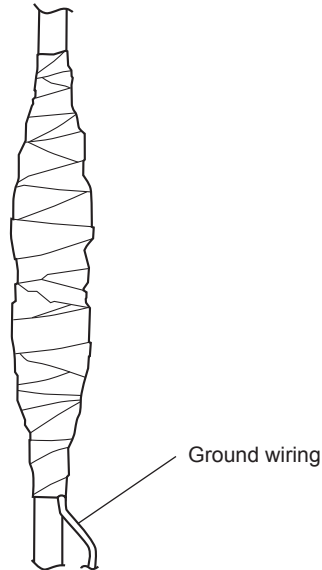


FC0515.ai

Figure C5-15 Wiring for arrestor

● **Waterproofing antenna cables and connectors**

Make sure that the antenna, extension cables and arrestor wiring including the grounding cable are connected properly. Protect the connectors and the arrestor with tape. As described in C5.4.1 Mounting ISA100.11a Antenna to YFGW510, wind self-bonding tape and vinyl tape around connections.



FC0516.ai

Figure C5-16 Sealing for antenna wiring

● **Fastening wireless LAN antenna wiring**

After taping, fasten the cables to a solid structure to protect against vibration and wind. Ensure that the radii of bends in the cables do not fall below the limits above.

C6. Explosion Proof Wiring

- Explosion proof approval is pending -
Remainder of page intentionally left blank

PART-D. SETUP

D1. Initial Configuration

Initial configuration is required to connect YFGW510 to YFGW410.

To set the initial configuration, install the field wireless access point setup tool (setup tool) provided with YFGW510 on a PC and connect the infrared adapter of the PC to YFGW510.

The table below shows the essential items to set in the initial configuration.

Setting item	Description	Scope
Device tag	The device tag of YFGW510	All models
Password to YFGW410	Password to connect to YFGW410	
Login password	Password to log in to the field wireless access point setup tool	
SSID1	Identification code of the wireless LAN	All models with wireless LAN specification
Encryption 1	Encryption method	
Network key 1	Initial encryption key	
Band 1	Frequency band of the wireless LAN	
Channel 1	Channel of the wireless LAN	
Data rate 1	Communications rate of the wireless LAN	
SSID2	Identification code of the wireless LAN	All models with redundant wireless LAN specification
Encryption 2	Encryption method	
Network key 2	Initial encryption key	
Band 2	Frequency band of the wireless LAN	
Channel 2	Channel of the wireless LAN	
Data rate 2	Communications rate of the wireless LAN	

Note: The default settings are provided in the descriptions below.

D2. Setup Tool

This chapter provides system requirements and installation procedures for the field wireless access point setup tool.

D2.1 System Requirements

- Basic license of software provided with YFGW510: 1 licensee
- Language:
 - Software (GUI): English
 - User's manual: Japanese or English (to be specified at the time of order)

D2.1.1 Hardware

- Recommended system requirements of PC

Item	System requirements
CPU	Intel Core 2 Duo 2.66 GHz or equivalent minimum
RAM	2 GB minimum
Hard disk	40 GB minimum (at least 15 GB free space)
Display	1280 × 800 high color, 32-bit
Communications device	Ethernet network card USB 2.0 port

- Infrared adapter

The following infrared adapter is recommended for this field wireless access point setup tool. The adapter is not provided with YFGW510 or setup tool. The Infrared adapter is available as an extra option.

Recommended Infrared adapter

Item	System requirements
Manufacturer	ACTISYS
Product name	IR224UN
Model No.	ACT-IR224UN-LN96-LE
Baud rate	9600 bps

D2.1.2 Software

Software requirements*1*2*3

Supported OS *1	Type
Windows7 Professional Service Pack 1	32/64-bit
Windows Vista Business Edition Service Pack 2	32-bit
Windows Server 2008 Enterprise Service Pack 2	32-bit
Windows Server 2008 R2 Enterprise	32/64-bit

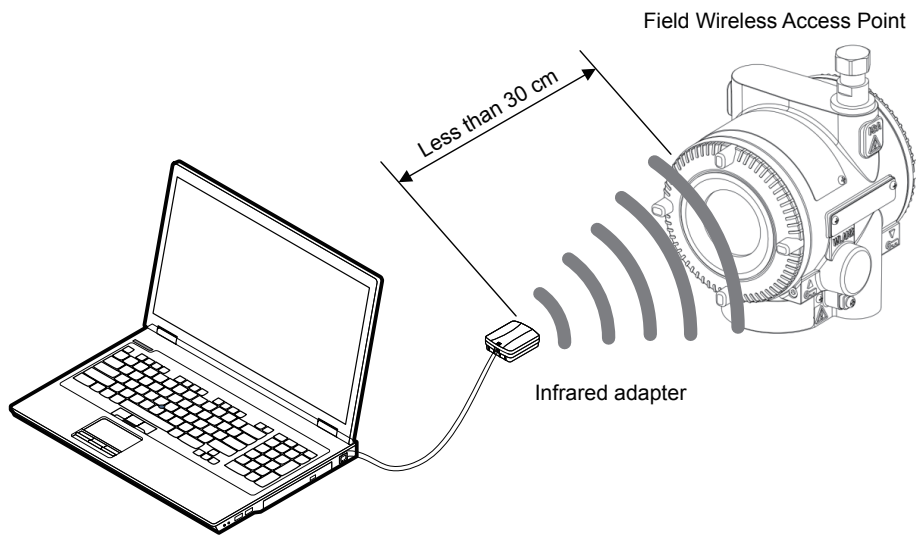
*1: Japanese or English version is supported.

*2: Microsoft .NET Framework 3.5 Service Pack 1 is required.

*3: The 64-bit operating systems run on WOW64 (Windows 32-bit On Windows 64-bit).

D2.1.3 Connection Example

To use the setup tool, infrared communication between the PC and YFGW510 is required. Connect the Infrared adapter to a USB port on the PC. Place the Infrared adapter close to the infrared photoreceiver of YFGW510 and ensure that they face each other. For distance between YFGW510 and the Infrared adapter, see the table below.



Field wireless access point setup tool

FD0201.ai

Figure D2-1 Connection example for field wireless access point setup tool

Table D2-4 Communications distance between YFGW510 and Infrared adapter

Item	Communications distance
Recommended communications distance	Within 20 cm
Maximum communications distance	30 cm

D2.2 Installation Procedure

Install the field wireless access point setup tool and Infrared adapter driver on the PC.

D2.2.1 Driver for Infrared adapter

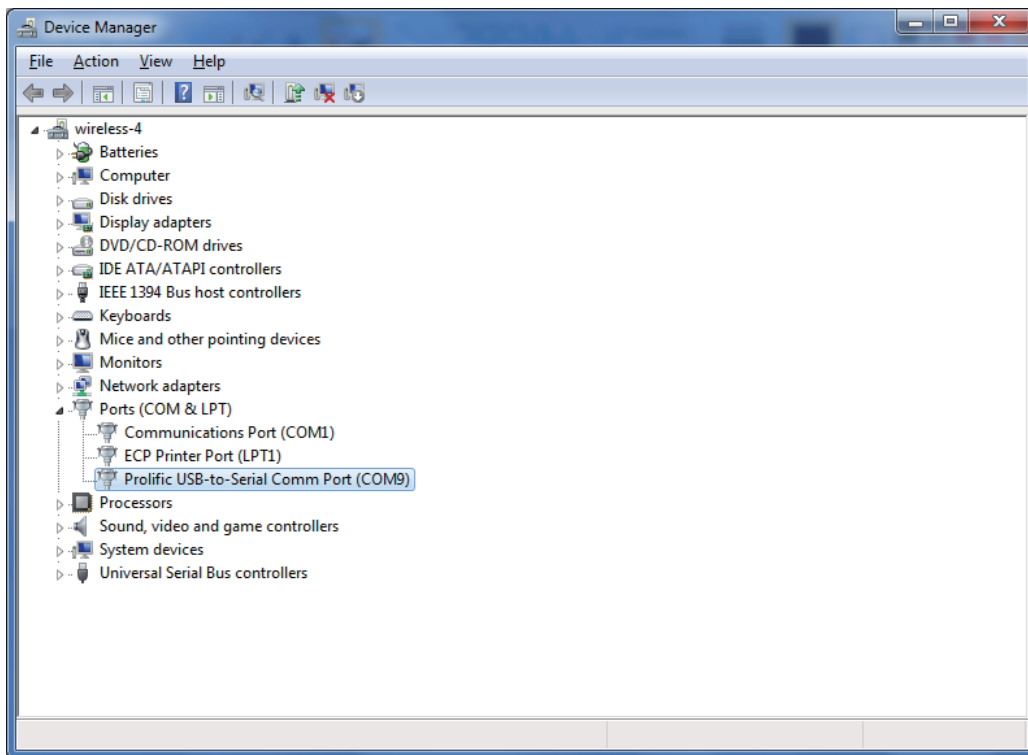
- **Installing the driver**

Install the driver by the means provided with the Infrared adapter, referring to the user’s manual of ACTiSYS

- **Checking the device**

Connect the Infrared adapter to a USB port on the PC. Check the Device Manager to see whether the PC has detected the Infrared adapter. To display the Device Manager, select Control Panel on the menu, select Hardware and Sound, then Device Manager. The window, as shown in Figure D2-2, will appear.

When the PC has detected the Infrared adapter, Prolific USB-to-Serial Comm Port(COMx) will appear under COM port. The letter “x” represents the COM port number. Write down this number. The COM port number assigned to the Infrared adapter is needed at the start of setup. In the example shown in Figure D2-2, the adapter is assigned to COM9.



FD0202.ai

Figure D2-2 Example of Device Manager window

D2.2.2 Field Wireless Access Point Setup Tool

- **Installation**

Insert the DVD, provided along with YFGW510, into the PC. Copy the folder containing the setup tool program (YFGW510Tool.exe and FWMCCCommon.dll) into a folder on the PC hard drive. This program will not change the registry information of Windows.

- **Starting the setup tool**

Double-click the YFGW510Tool.exe icon to start the tool.

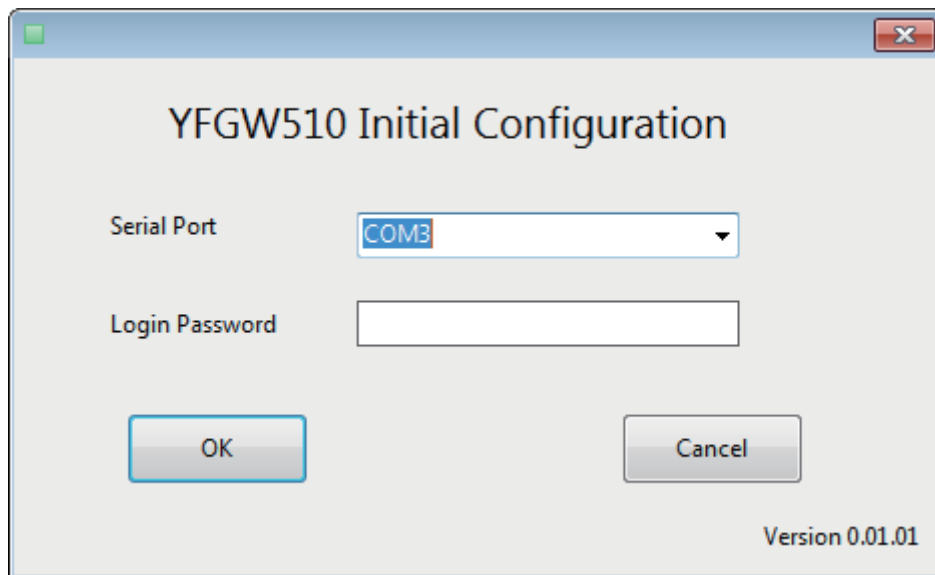
When the program has started, the login window, as shown in Figure D2-3, appears and prompts you to enter the COM port number of the Infrared adapter and the password to log in to YFGW510.



IMPORTANT

When using the field wireless access point setup tool, must close FieldMate and the other application that connected to the infrared adapter.

In after, communication between the PC running the tool and YFGW510 must be kept available via the infrared adapter.



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Figure D2-3 Login window

The table below shows the setting items and their default settings.

Item	Number of characters	Default setting
Serial Port	The number of the port the Infra-red adapter is connected to	The smallest COM number among those devices
Login Password	Up to 8 one-byte alphanumeric characters or other symbols (e.g., !,\$,#)	yokogawa

In the Serial Port field, enter the COM port number of the Infrared adapter. Open the drop-down list, then select the COM port number to which the Infrared adapter is connected.

When beginning the program for the first time, enter the default login password in the Login Password field.

Click the [OK] button. The Change Login Password window as shown in Figure D2-5 will appear if the field wireless access point setup tool is communicating with YFGW510.

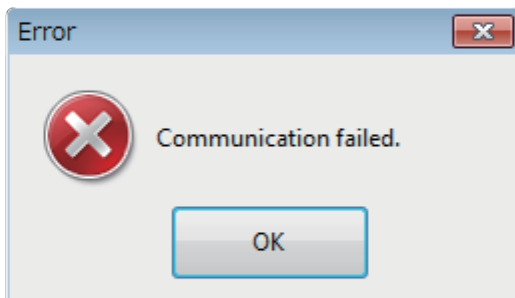
Click the [Cancel] button to exit the setup tool. The window will close.



IMPORTANT

- If the wrong password is entered three times straight, YFGW510 will not accept another login attempt for 30 minutes. Type in the password carefully.
- Keep the login password safe. It is necessary for setting up the field wireless access point.

After clicking the [OK] button, if there is a problem in communication between the field wireless access point setup tool and YFGW510, the Error window as shown in Figure D2-4 will appear.



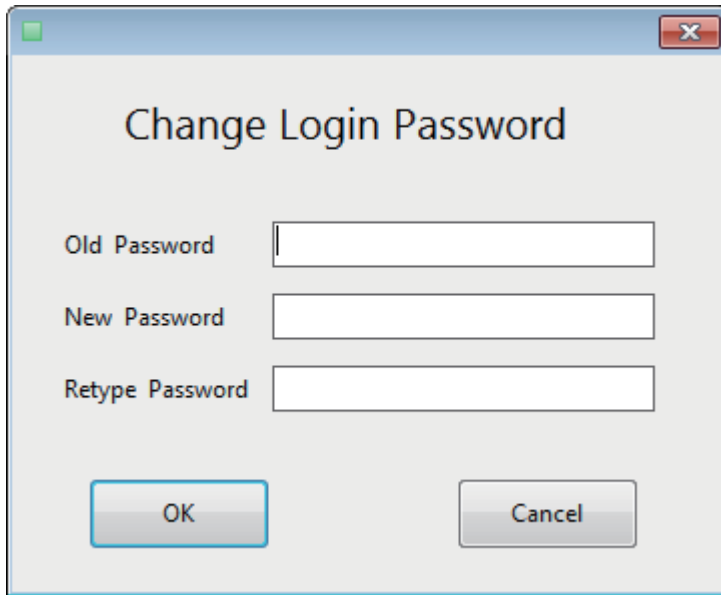
FD0204.ai

Figure D2-4 Communication Error window

Check the adapter COM port number, and positions in the front window of YFGW510.

After the problem has been solved, click the [OK] button. The window will close.

Go back to the window as shown in Figure D2-3. Check the entered information and click the [OK] button to proceed.



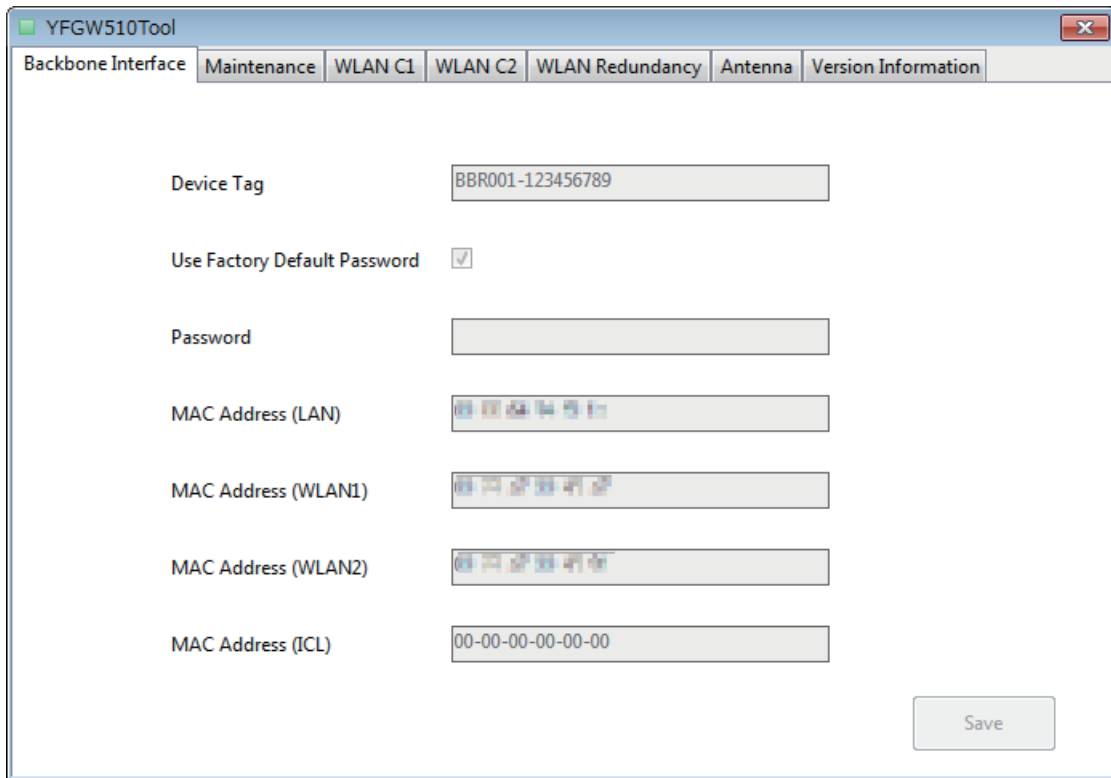
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Figure D2-5 Change Login Password window

Change the default login password to a new password to ensure security. Enter the current password (default) in the Old Password field, then type a new password in the New Password and Retype Password fields.

Click the [OK] button. When the password has been successfully changed, the main window as shown in Figure D2-6 will appear.

Click the [Cancel] button to exit the program. All windows will close.



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Figure D2-6 Main window

The Backbone Interface tab of the setup tool’s main window is always shown at startup of the set-up tool. The window is also shown in Display mode with the parameter fields and buttons grayed out.

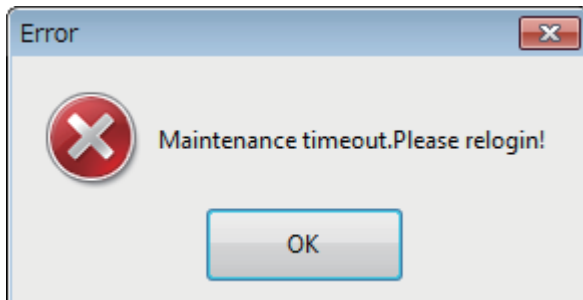
● **Problem with infrared communications**

If, after login to YFGW510, an infrared communication failure occurs while attempting to access YFGW510 via the setup tool as described in D3 Configuration Method, the communication error window shown in Figure D2-4 appears similarly when an error occurs during login to Configuration tool.

After verifying and fixing the problem, click the [OK] button to close the window. In this case, retry to log in again.

● **Setup tool operation timeout**

If there is no operation for five minutes during the configuration of the field wireless access point setup tool indicate a timeout error shown in Figure D2-7, will appear on top of the main screen. In this case, retry to log in again.



FD0207.ai

Figure D2-7 Timeout error window

D3. Configuration Method

This section describes initial configuration of YFGW510 using the field wireless access point setup tool.

D3.1 Window Design

The main window of the field wireless access point setup tool consists of the following seven tabs.

Table D3-1 shows the summary of the setting functions of each tab.

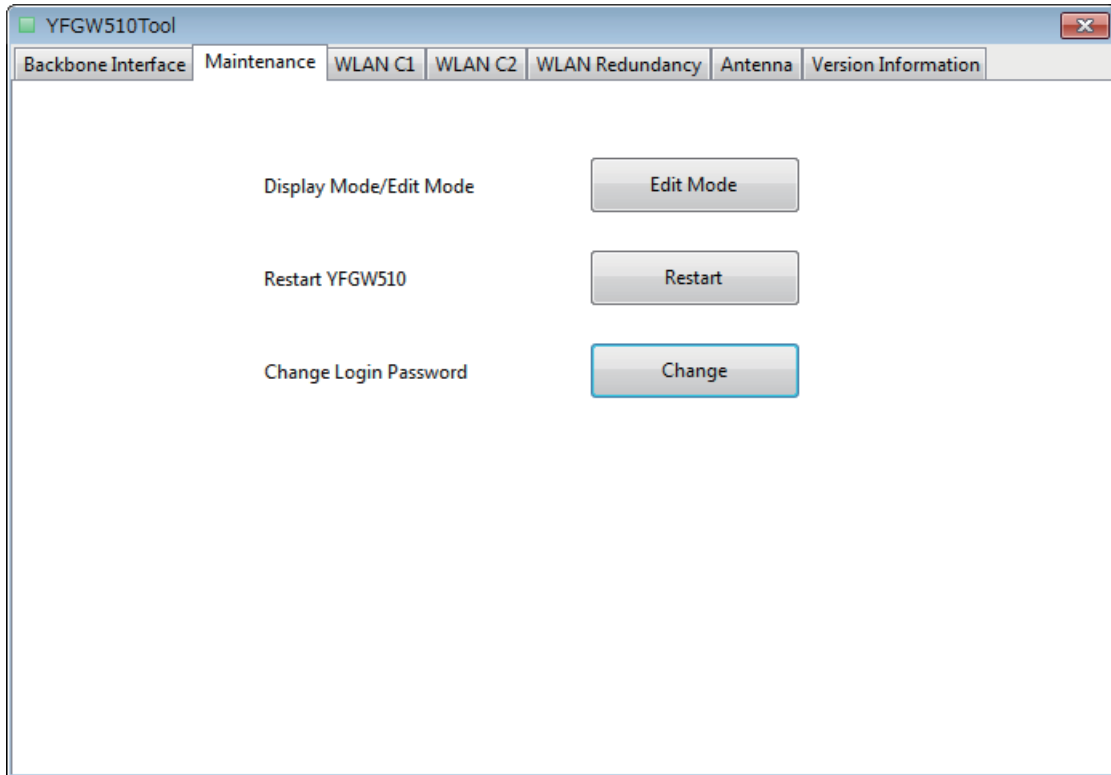
Table D3-1

Tab Name	Functions
Backbone Interface	Setting of a device tag and password for YFGW410 connection
Maintenance	Display/Edit mode switching, restart and login password modification
WLAN C1	Setting of wireless LAN 1 (LED indication: C1)
WLAN C2	Setting of wireless LAN 2 (LED indication: C2)
WLAN Redundancy	Setting of wireless LAN redundant communication
Antenna	Maintenance use only. The tab cannot be opened.
Version Information	Viewing of the version information

D3.2 Display/Edit Mode Switching

The field wireless access point setup tool has two operation modes: Display, to view the setting information, and Edit, to configure YFGW510. The setup tool always starts up in Display mode. To allow for YFGW510 configuration, the mode needs to be switched to Edit.

To change modes, select the [Maintenance] tab as shown in Figure D3-1.



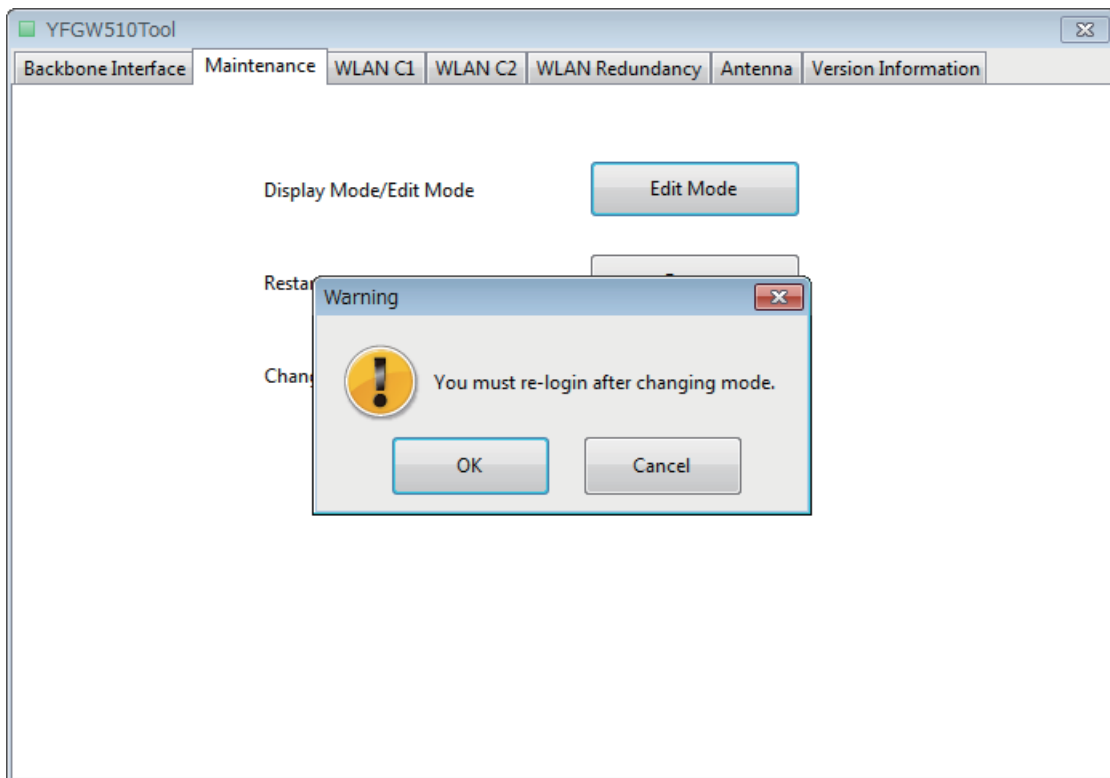
FD0301.ai

Figure D3-1 Maintenance tab

Click the button in the [Display Mode/Edit Mode] field to select the target mode.

If the button reads "Edit Mode", the setup mode is Display. Otherwise, the current mode is Edit.

Clicking the [Edit Mode] button displays a confirmation dialog box as shown in Figure D3-2.



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Figure D3-2 Setup mode change confirmation dialog box

Clicking the [OK] button navigates to the login window shown in Figure D2-3. Log in again and setup will start up in Edit mode.

Clicking the [Cancel] button terminates the mode switching.

Setup starts up in Display mode even if the mode was Edit at the last logoff; so, it is necessary to change modes every time the YFGW510 setting modification is required.

If configuration have been completed, restart the YFGW510 click the Restart button.

For other button functions, see D3.4 Maintenance.



IMPORTANT

Wait at least one minute after power-on, change to Edit mode YFGW510.

If you change to Edit mode at less than one minute may not start correctly.

In this case, restart the YFGW510.

D3.3 Backbone Interface

The [Backbone Interface] tab allows a change in settings for the YFGW510 connection to the field wireless backbone network. Figure D3-3 shows the [Backbone Interface] tab in Edit mode.

The screenshot shows a configuration window titled 'YFGW510Tool' with a tabbed interface. The 'Backbone Interface' tab is active. The settings are as follows:

- Device Tag: BBR001-123456789
- Use Factory Default Password:
- Password: (empty field)
- MAC Address (LAN): (empty field)
- MAC Address (WLAN1): (empty field)
- MAC Address (WLAN2): (empty field)
- MAC Address (ICL): 00-00-00-00-00-00

A 'Save' button is located at the bottom right of the window.

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Figure D3-3 Backbone Interface tab

The following are items that need to be set in YFGW510.

Item	Descriptions	Initial Value
Device Tag	Enter the YFGW510 device tag.	Blank
Use Factory Default Password	Select whether to use the factory-set default password for the connection to YFGW410. If checked, the factory-set default password will be used.	Checked
Password	If the [Use Factory Default Password] checkbox is not selected (the default password is not used), enter any password.	Blank

● Device tag setting regulation

The device tag for the Field Wireless Access Point has the following restrictions. No string outside of these restrictions can be accepted.

- Up to sixteen characters
- Alphanumeric characters, hyphens and underscores only
- Single-byte, uppercase only

● Password setting regulation

The password for the connection to YFGW410 on the Field Wireless Access Point has the following restrictions. No string outside of these restrictions can be accepted.

- Up to sixteen characters
- From “A” to “F” and numeric characters only (case sensitive)

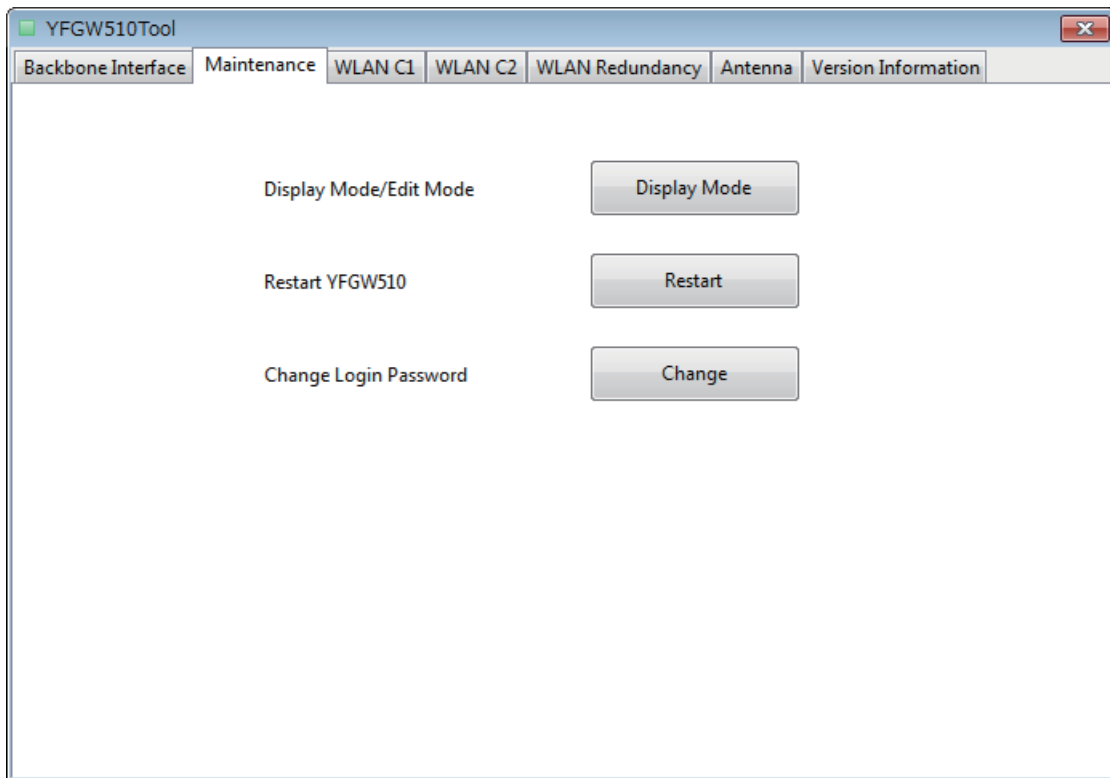
After entering all required items, click the [Save] button to store settings in YFGW510.

The following is information about YFGW510. No setting is required.

Items	Descriptions
MAC Address (LAN)	Wired LAN MAC address
MAC Address (WLAN1)	Wireless LAN 1 MAC address
MAC Address (WLAN2)	Wireless LAN 2 MAC address
MAC Address (ICL)	00-00-00-00-00-00 fixed

D3.4 Maintenance

Clicking the [Maintenance] tab displays the controls shown in Figure D3-4.



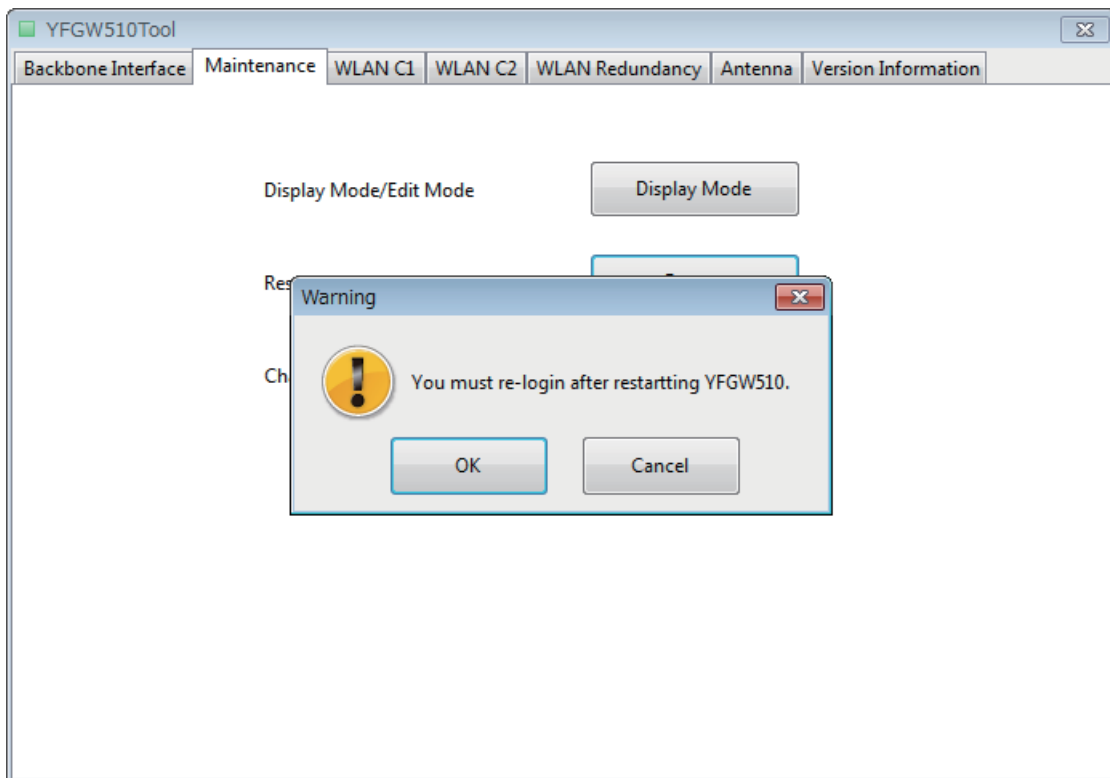
FD0304.ai

Figure D3-4

The following describes the functions of the buttons on this tab.

Button Name	Function
Display Mode/Edit Mode	Clicking the button switches Display/Edit mode for the setup tool. For details, see D3.2 Display/Edit Mode Switching.
Restart YFGW510	Clicking the button restarts YFGW510.
Change Login Password	This button allows the modification of the YFGW510 login password. Clicking the button displays the window shown in Figure D2-5. For details, see Field Wireless Access Point Setup Tool in D2.2.2.

Clicking the [Restart YFGW510] button displays a confirmation dialog box as shown in Figure D3-5.



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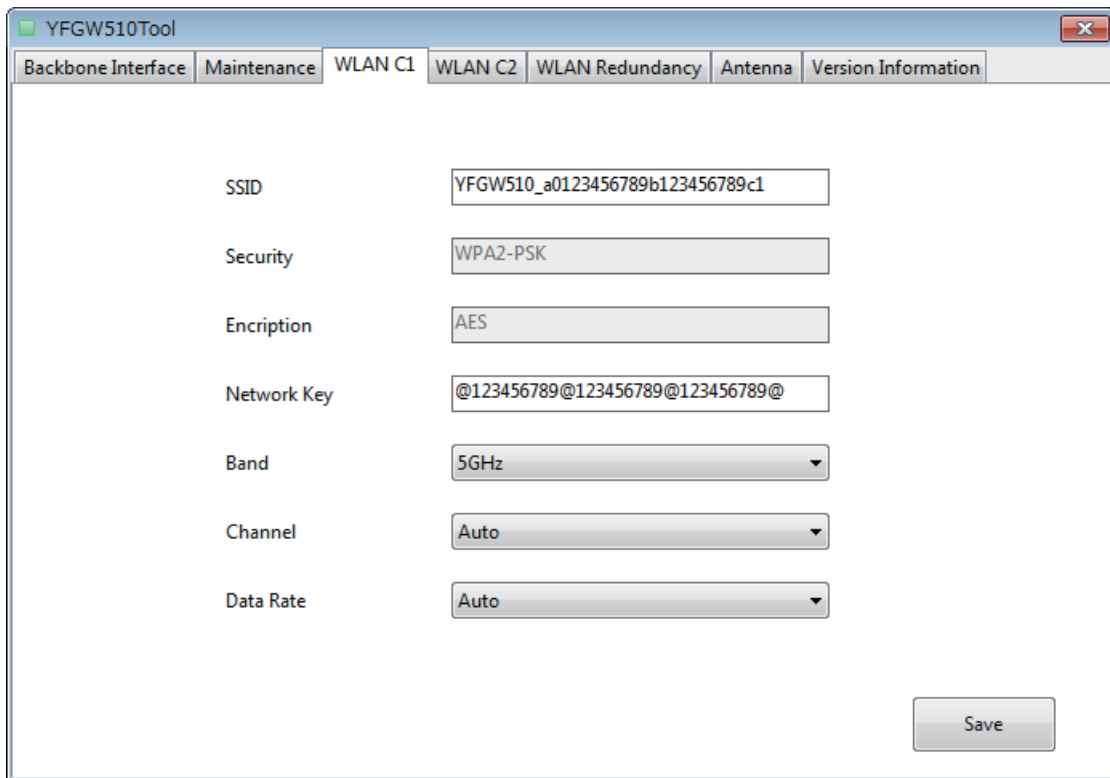
Figure D3-5 YFGW510 Restart confirmation dialog box

Clicking the [OK] button restarts YFGW510 and navigates to the login window shown in Figure D2-3.

Clicking the [Cancel] button terminates the process and closes the confirmation dialog box.

D3.5 Setting of Wireless LAN 1 (WLAN C1)

Clicking the [WLAN C1] tab displays the controls and information shown in Figure D3-6.



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Figure D3-6 WLAN C1 tab

This tab allows the setting of wireless LAN 1.

The setting items are as follows.

Item	Descriptions	Initial Value
SSID	Wireless LAN identification code. Enter the same value as the SSID of wireless LAN access point being connected.	Blank
Security	Display-only, security method	WPA2-PSK
Encryption	Display-only, encryption method	AES
Network Key	Encryption key. Enter the same value as the encryption key of wireless LAN access point being connected.	Blank
Band	Wireless LAN frequency band. Select either 2.4 GHz or 5 GHz.	"2.4 GHz"
Channel	Wireless LAN channel. Select the channel to be used in wireless LAN. The selectable channels vary depending on the frequency band. For details, see Band and channel setting regulation.	"Auto"
Data Rate	Wireless LAN communication data rate. Select the data rate of wireless LAN. The selectable data rates vary depending on the frequency band. For details, see Data rate setting regulation.	"Auto"

● SSID setting

The SSID for the Field Wireless Access Point has the following restrictions:

- Up to 31 characters
- Single-byte, alphanumeric characters and other marks and signs (e.g., "!", "\$", "#")

● **Network key setting**

The network key to be set for the Field Wireless Access Point has the following restrictions:

- Up to 31 characters
- Single-byte alphanumeric characters and other marks and signs (e.g., “!”, “\$”, “#”)
- Band and channel setting regulation

The following table shows the selectable channels.

2.4 GHz Band		5 GHz Band			
Channel	Center Frequency (GHz)	Channel	Center Frequency (GHz)	Channel	Center Frequency (GHz)
Auto	—	Auto	—	116	5.580
1	2.412	36	5.180	120	5.600
2	2.417	40	5.200	124	5.620
3	2.422	44	5.220	128	5.640
4	2.427	48	5.240	132	5.660
5	2.432			136	5.680
6	2.437	52	5.260	140	5.700
7	2.442	56	5.280		
8	2.447	60	5.300	149	5.745
9	2.452	64	5.320	153	5.765
10	2.457			157	5.785
11	2.462	100	5.500	161	5.805
12	2.467	104	5.520	165	5.825
13	2.472	108	5.540		
14	2.484	112	5.560		

- Data rate setting regulation

The following table shows the selectable communication data rates.

Data Rate (Mbps)	Band	
	2.4 GHz	5 GHz
Auto	Y	Y
1	Y	N
2	Y	N
5.5	Y	N
11	Y	N
6	Y	Y
9	Y	Y
12	Y	Y
18	Y	Y
24	Y	Y
36	Y	Y
48	Y	Y
54	Y	Y

Note: “Y” means selectable, “N” not selectable.

After entering all the required items, click the [Save] button to store settings in YFGW510.

In the 5GHz band, must keep the data rate of less than 12 Mbps.

D3.6 Setting of Wireless LAN 2 (WLAN C2)

Clicking the [WLAN C2] tab displays the controls and information shown in Figure D3-7.

Field	Value
SSID	YFGW510_b0123456789b123456789c1
Security	WPA2-PSK
Encryption	AES
Network Key	@123456789@123456789@123456789@
Band	5GHz
Channel	Auto
Data Rate	Auto

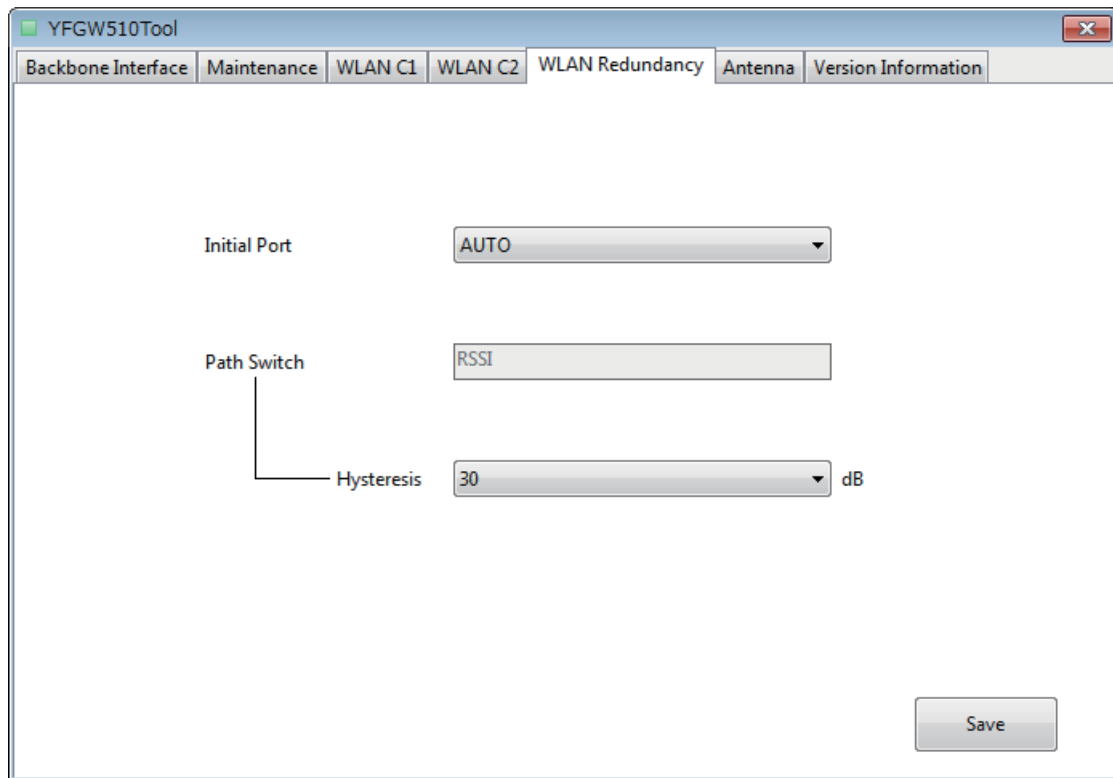
FD0307.ai

Figure D3-7 WLAN C2 tab

This tab allows the settings for wireless LAN 2. The procedure for setting items is the same as for the wireless LAN 1. For details, see D3.5 Setting of Wireless LAN 1 (WLAN C1).

D3.7 Setting of WLAN Redundancy

Clicking the [WLAN Redundancy] tab displays the controls shown in Figure D3-8.



FD0308.ai

Figure D3-8 WLAN Redundancy tab

This tab allows the setting for wireless LAN redundancy.

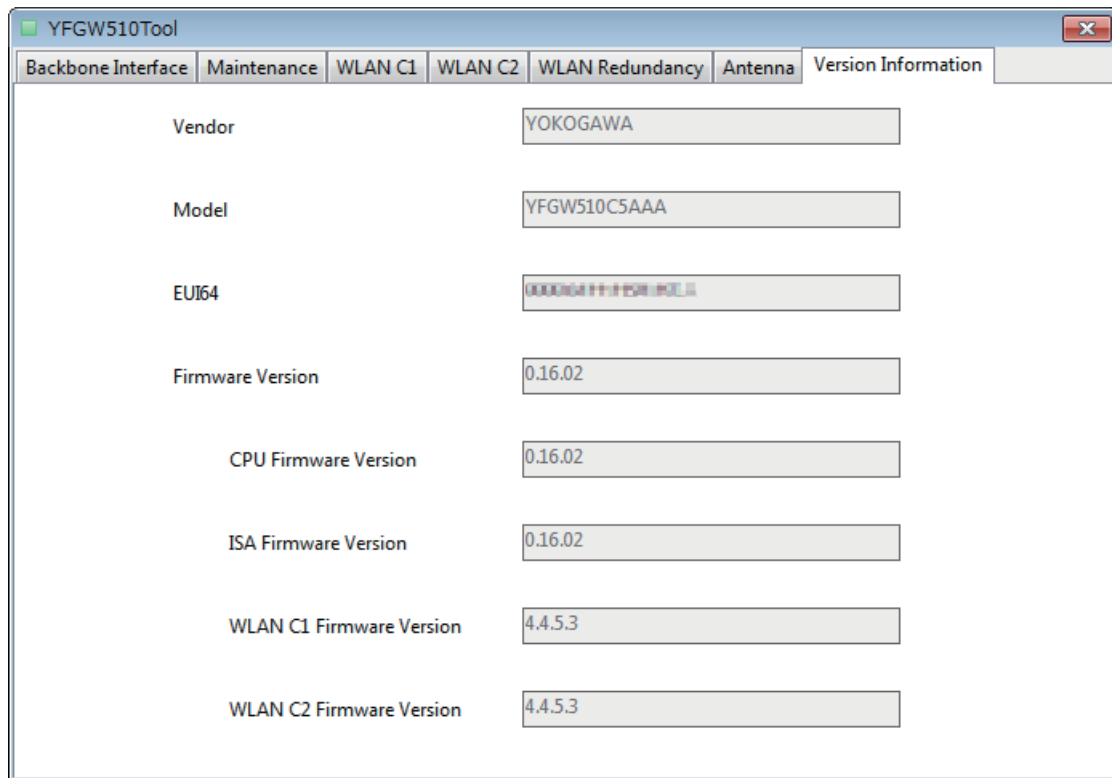
The setting items are as follows.

Item	Descriptions	Initial Value
Initial Port	Select a wireless LAN port to be used at startup. If "AUTO" is set, a wireless LAN port with high RSSI is automatically selected.	"AUTO"
Path Switch	Select the communication path switching standard. YFGW510 supports RSSI.	"RSSI"
Hysteresis	If RSSI is selected for the communication path switching standard, specify the hysteresis width in dB.	30

After entering all the required items, click the [Save] button to store settings in YFGW510.

D3.8 Version Information

Clicking the [Version Information] tab displays the information shown in Figure D3-9.



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Figure D3-9 Version Information tab

This tab displays information about the YFGW510 Field Wireless Access Point, such as the vendor name, model name and firmware versions. The tab has no setting items.

The following table shows items that can be viewed on this tab.

Item	Descriptions
Vendor	Vendor name
Model	Model name followed by part of the specification code
EUI64	EUI64
Firmware Version	Firmware version of the entire YFGW510
CPU Firmware Version	Firmware version of the CPU
ISA Firmware Version	Firmware version of the field wireless communication chip
WLAN C1 Firmware Version	Firmware version of the communication chip for wireless LAN 1
WLAN C2 Firmware Version	Firmware version of the communication chip for wireless LAN 2

PART-E. OPERATION AND MAINTENANCE

For information about routine maintenance, or for YFGW510 additions or replacements, consult, in advance, the YFGW410 User's Manual (IM 01W02D01-01EN).

E1. Routine Maintenance

For problems during routine maintenance, check the host system monitoring YFG510, and the device information for the Field Wireless Management Console monitor provided with the YFGW410.

For details on the Field Wireless Management Console, maintenance procedures and error prevention, see the YFGW410 User's Manual (IM 01W02D01-01EN).

During maintenance of YFGW510, check the installation and operation statuses of the main body as component to the field wireless system hardware.

Confirm that the main body is correctly installed, free of dirt and that power and communication cables are securely connected. If the main body is dirty or dusty, wipe it out by using a soft cloth moistened with water or mild soap water.

E2. Additions and Replacements

For instructions on adding or replacing YFGW510, see the YFGW410 User's Manual (IM 01W02D01-01EN).

E3. Maintenance in Hazardous Areas

In maintenance, check for loose power supply wiring, ground wiring or network cable connection.

During maintenance and repair activities, if there is need to access the system in hazardous areas via an YFGW510 communication port, PCs and other devices used must comply with the explosion-proof requirements. For details, please contact Yokogawa Electric Corporation.

Explosion-proof instruments must retain their intended properties before and after maintenance. Otherwise, hazardous conditions can arise. Be sure to consult with Yokogawa Electric Corporation for any repair and alteration.

For other field wireless system hardware components, see respective user's manuals.

E4. Components Having Defined Life Spans

YFGW510 includes no components having defined life spans that need replacing.

For reference, the following are precautions for such components.



IMPORTANT

Precautions for components having defined life spans

- “Components having defined life spans” are those expected to wear out or break down within a 10-year period of use or in storage under normal conditions. Components designed for a life span of at least 10 years are excluded from the category.
 - The “recommended replacement cycle” is the interval between preventive maintenance for components having defined life spans. It does not guarantee breakdown-free operation during that period.
 - The recommended replacement cycle is a guideline. The actual replacement cycle may vary depending on the environmental conditions of use, such as ambient temperature.
 - The recommended replacement cycle is subject to change according to performance in the field.
-

PART-F. TROUBLESHOOTING

This section describes troubleshooting for YFGW510. If any abnormalities are identified in YFGW510 through investigation and in accordance with procedures described in the YFGW410 User's Manual (IM 01W02D01-01EN), check the following.

F1. Status Information

The YFGW510 operational status information is shown in the backbone router status (BBR_STATUS) in the Modbus register.

The status data structure and the contents are as follows.

Modbus Address	Name	Data Format	Contents
n	Data status	Unsigned 16	0x0080, fixed: normal
n + 1	Backbone router status	Unsigned 16	Backbone router status (0: connected/1: not connected)
n + 2 to n + 8		Unsigned 16	0, fixed (reserved bits)

Only the status having a Modbus address of (n + 1) is used. This indicates whether YFGW510 is connected to YFGW410 correctly.

F2. Status Indication and Responsive Measures

There are six status indicator LEDs installed on the front of YFGW510: [ACT], [LAN], [ISA100], [WLAN-C1], [WLAN-C2] and [WLAN-AP].

■ YFGW510 operational status indication

The following is the LED that indicates the YFGW510 operational status.

LED	Power off	Starting up	Connect- ing	Normal	Mainte- nance	Abnormal
ACT	OFF	Orange	Orange blink	Green	Red blink	Red

The LED blinks red when the device mode is changed to offline via the infrared adapter using the setup tool to configure YFGW510.

If the LED lights red, check the field wireless backbone network cable connection and communication devices such as the Layer 2 switch, etc., and fix any abnormalities. If there is no abnormality found in cable connection, check the backbone router status information described in F1. Status Information and the Field Wireless Management Console monitor device information. Any abnormality found may indicate the breakdown of YFGW510. For details of the YFGW510 device replacement method, see the YFGW410 User's Manual (IM 01W02D01-01EN).

■ Communication status indication

The following are the LEDs that indicate communication status.

LED	Power off	Starting up	Signal search	Link down	Link up	Commu- nicating	Mainte- nance	Abnor- mal
LAN	OFF	OFF	N/A	OFF	Green	Green blink	OFF	Red
ISA100	OFF	OFF	N/A	N/A	Green	Green blink	OFF	Red
WLAN-C1	OFF	OFF	Orange blink	OFF	Green blink	Green	OFF	Red
WLAN-C2	OFF	OFF	Orange blink	OFF	Green blink	Green	OFF	Red
WLAN-AP	—	—	—	—	—	—	—	—

■ [LAN] LED

If the LED turns off during operation, it may indicate that communication between YFGW510 and the YFGW410 field wireless backbone network has been terminated. Investigate the communication cable connection and the status of communication devices such as the Layer 2 switch, etc., and re-establish communication.

If the LED lights red, it may indicate the breakdown of the communication function of YFGW510. Replace the main body or consult with Yokogawa Electric Corporation.

■ [ISA100] LED

If the LED turns off during operation, it may indicate that communication between YFGW510 and all field wireless network devices has been terminated. Investigate the connection of the ISA100.11a antenna and the condition of the antenna extension cables, and re-establish communication. If no abnormality is found in the antenna, check the status of field wireless devices and any disturbances in wireless communication routes, and fix any problems to re-establish the communication.

If the LED lights red, it may indicate the breakdown of the communication function of YFGW510. Replace the main body or consult with Yokogawa Electric Corporation.

■ [WLAN-C1]/[WLAN-C2] LED

If the LED turns off during operation, it may indicate that communication between the field wireless backbone LAN and the wireless LAN access point has been terminated. Investigate the connection of the wireless LAN antenna and the condition of the antenna cables, and re-establish communication. If no abnormality is found in the antenna, check for any disturbances in wireless communication routes and fix any problems to re-establish communication.

If the LED lights red, it may indicate the breakdown of communication functions. Replace the communication devices or consult with Yokogawa Electric Corporation.

■ [WLAN-AP] LED

This LED is not used in YFGW510.

PART-G. SPECIFICATIONS

G1. Standard Specifications

G1.1 Communication Interface Specifications

Item		Field Network Specifications	Field Wireless Backbone Specifications ^{*1}		
Communication Interface	Standard	IEEE802.15.4	IEEE802.11a/b/g ^{*2}	100BASE-TX	100BASE-FX
	Frequency	2400~2483.5MHz	b/g: 2400-2483.5MHz a: 5150-5850MHz	-	
	Raw data rate	250kbps	1~54Mbps	100Mbps	100Mbps
	Radio Security	AES128bit	WPA2-PSK	-	
	RF Transmitter Power	Max 10dBm	Max 15dBm	-	
	Connector	N type	N type	RJ-45	SC connector [single pole × 2] ^{*3}
	Cable Type	coaxial	coaxial	Category 5	Multimode fiber (50/125μm or 62.5/125μm)
	Antenna	+2dBi	-	-	
	Remote Antenna	+2dBi, +6dBi, +9dBi	+2dBi, +6dBi, +9dBi	-	
	Maximum length	500m ^{*4}	b/g: 500m ^{*4} a: 200m ^{*4}	100m	2000m
	Port	1 port	Max 2 port	1 port	1 port
	Protection	-	-	Surge	-
Communication Protocol	Field Wireless	ISA100.11a	-		
	Management, configuration, etc.	-	IEEE 1588PTP v2 ^{*5} , Proprietary ^{*6}		

- *1: In outdoor wiring to Field Network or 100BASE-FX of Field Wireless Backbone, use optical fiber cables with a nonmetallic tension member, combining with YFGW610
- *2: This product requires a wireless LAN access point for connection with YFGW410 in the wireless LAN in field wireless backbone.
- *3: 2-pole SC connector cannot be used due to the conduit hole size limitation. SC connector should use Short Boot type.
- *4: The maximum length needs perfect conditions without an obstruction for radio wave transmission, using a standard antenna (2dBi). The maximum length changes with the environmental conditions and installation situations of a site.
- *5: Installation of these multiple product and YFGW410 in one field wireless subnet requires direct connection or the connection via IEEE1588PTP basis products.
- *6: TCP based custom protocol used for communication between this product and YFGW410.

■ Communication interface specifications for YFGW510 configuration

Interface	Item	External Specifications	Remarks
Infrared communication	Communication protocol	IrDA-SIR Ver. 1.2	
	Wavelength	870 nm	
	Maximum transmission speed	9600 bps	
	Maximum transmission distance	30 cm	
	Number of ports	1	
	Purpose	Initial configuration of YFGW510	

G1.2 General Specifications

■ Performance

Network Size:

Max 100 field wireless devices are connectable

Display:

2-color luminescence LED displays the operating state of this product, and the operating state of wireless communications and cable communications.

Diagnosis Function:

CPU failures, communication interface malfunctions, outside the range, abnormal settings.

Software Download Functions:

The software inside this product and the software (communication firmware, sensor firmware) inside wireless field device can update via YFGW410.

■ Installation Environment

Temperature Range:

Operating: -40 to +65°C (altitude: 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: 10.0~26.4 V DC
Rated Voltage: 24 V DC
Momentary Power Failure: Instant Disconnection
DC Power Supply Ripple Ratio: 1%p-p or less

Power Consumption:

Max. 3.5 W

Degrees of Protection:

IP66, NEMA4X

Vibration resistance:

0.21 mm P-P (10~60 Hz), 3G (60~2k Hz)

Shock resistance:

50G 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

■ Physical Specifications

Connections:

Refer to "MODEL AND SUFFIX CODES."

Housing Material:

Low copper cast aluminum alloy with Polyurethane, mint-green paint (Munsell 5.6BG 3.3/2.9 or its equivalent)

Name plate and tag:

SUS304 tag plate

Weight:

3.0 kg (without mounting bracket, and process connector.)

■ Software Specifications

● Field Wireless Access Point Setting Tool

This software is used for a setup and maintenance of this product. PC on which this software program installed is connected with this product via infrared communication.

● Specifications and System Requirements

Software license:

1 license

Language:

Software (GUI): English
Manual: Japanese or English

Hardware Operating Environment:

Item	Recommended System Requirement
Processor	Intel Core 2 Duo 2.66GHz or more
Memory	2GB or more
Hard Disk	40GB or more (Minimum free space 15GB or more)
Display	1280 x 800 High color, 32-bit
Communication Device	Ethernet Network Card

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

OS	Kind
Windows7 Professional Service Pack 1	32/64bit
Windows Vista Business Edition Service Pack 2	32bit
Windows Server 2008 Enterprise Service Pack 2	32bit
Windows Server 2008 R2 Enterprise	32/64bit

*1: Japanese version or English version are supported.

*2: Microsoft .NET Framework 3.5 Service Pack 1 is required.

*3: For 64bit OS, WOW64 (Windows 32-bit On Windows 64-bit) can be performed.

G1.3 Regulatory Compliance Statements

■ Regulatory Compliance Statements

This device contains the wireless module.
The wireless module satisfies the following standards.

- * The specific radio equipment (Approval Number: ISA100.11a: 007-AA00110, Wireless LAN: 007-AA0065/66) which received the technical standard satisfied certification based on the Radio Law is used for this product.
- * Please confirm that a installation region fulfills a standards, require additional regulatory information and approvals, contact to Yokogawa Electric Corporation.

R&TTE Conformity Standards: CE

EN 300 328, EN 301 893, EN60950-1, EN 301 489-1, EN 301 489-17

Regulation Conformity of the Wireless Module

- FCC Approval (Part 15C, Part 15E)
- IC Approval (RSS-210)

EMC Conformity Standards

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

Safety Requirements:

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

Explosion-Proof Types:

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

G2. Model, Suffix Codes and Option Codes

Model	Suffix Codes	Description
YFGW510	Field Wireless Access Point
Output signal	-A	ISA100.11a
	-C	ISA100.11a, IEEE802.11a/b/g ^{*1}
Communication interface	1	100 BASE-TX
	2	100 BASE-FX
	5	Wireless LAN
Housing	1	Low copper cast aluminum alloy
Electrical Connection	0	G1/2 female, two electrical connections, without blind plugs
	2	1/2NPT female, two electrical connections, without blind plugs
	4	M20 female, two electrical connections, without blind plugs
	5	G1/2 female, two electrical connections, one blind plug ^{*1}
	7	1/2 NPT female, two electrical connections, one blind plug ^{*1}
	9	M20 female, two electrical connections, one blind plug ^{*1}
	A	G1/2 female, two electrical connections, one SUS316 blind plug ^{*1}
	C	1/2 NPT female, two electrical connections, one SUS316 blind plug ^{*1}
	D	M20 female, two electrical connections, one SUS316 blind plug ^{*1}
---	A	Always A
License	-S	Software license
Manual language	0	Japanese
	1	English
Software media	0	Provided with DVD-ROM
	1	None
Mounting bracket	B	SUS304 2-inch pipe mounting (for horizontal piping) ^{*2}
	D	SUS304 2-inch pipe mounting (for vertical piping) ^{*2}
	J	SUS316 2-inch pipe mounting (for horizontal piping) ^{*2}
	K	SUS316 2-inch pipe mounting (for vertical piping) ^{*2}
	N	None
ISA100.11a antenna	1	Integral antenna +2dBi (2.4GHz)
	A	Antenna adaptor: N-type connector ^{*3*4}
Wireless LAN antenna (1) ^{*5}	N	None
	3	Integral antenna +2dBi (2.4GHz), antenna cable 3m
	4	Integral antenna +2dBi (2.4GHz, 5GHz), antenna cable 3m
	A	Antenna adaptor: N-type connector ^{*3*4}
Wireless LAN antenna (2) ^{*5}	N	None
	3	Integral antenna +2dBi (2.4GHz) , antenna cable 3m ^{*6}
	4	Integral antenna +2dBi (2.4GHz, 5GHz), antenna cable 3m ^{*6}
	A	Antenna adaptor: N-type connector ^{*3*4*6}
---	A	Always A
---	A ..	Always A
Option codes		/□Optional specifications

- *1: Select in a wireless LAN client (communication interface code 5).
- *2: A bolt is required for wall attachment.
- *3: Select an antenna and an antenna cable. For details, refer to the accessory.
- *4: In order for the wireless output of an antenna to get the maximum which the area permits, adjustment by service of Yokogawa Electric Corporation is required.
- *5: Wireless LAN antenna cannot perform direct connection to this product.
- *6: Select only by 3, 4, and A of wireless LAN antenna (1).

OPTIONAL SPECIFICATION (For Explosion Protected type)

Item	Description	Code
TIIS Certification	Flameproof Approval	-
Factory Mutual (FM)	Nonincendive, Explosionproof Approval	-
ATEX	Type n Declaration, Flameproof Approval	-
Canadian Standards Association (CSA)	Nonincendive, Flameproof Approval	-
IECEX	Type n, Flameproof Approval	-

OPTIONAL SPECIFICATIONS

Item	Description		
Coating	Coating change	High anti-corrosion coating	X2

ACCESSORY

Item	Parts Number	Description
External antenna cable	F9915KU	3m with mounting bracket
	F9915KV	13m (3m+10m) with arrestor and mounting bracket
Antenna	F9915KW	2dBi Standard Antenna (2.4GHz)
	F9915KY	6dBi High gain antenna (2.4GHz)
	F9195VG	9dBi High gain antenna (2.4GHz)
	F9195VA	2dBi Standard Antenna (2.4GHz,5GHz)

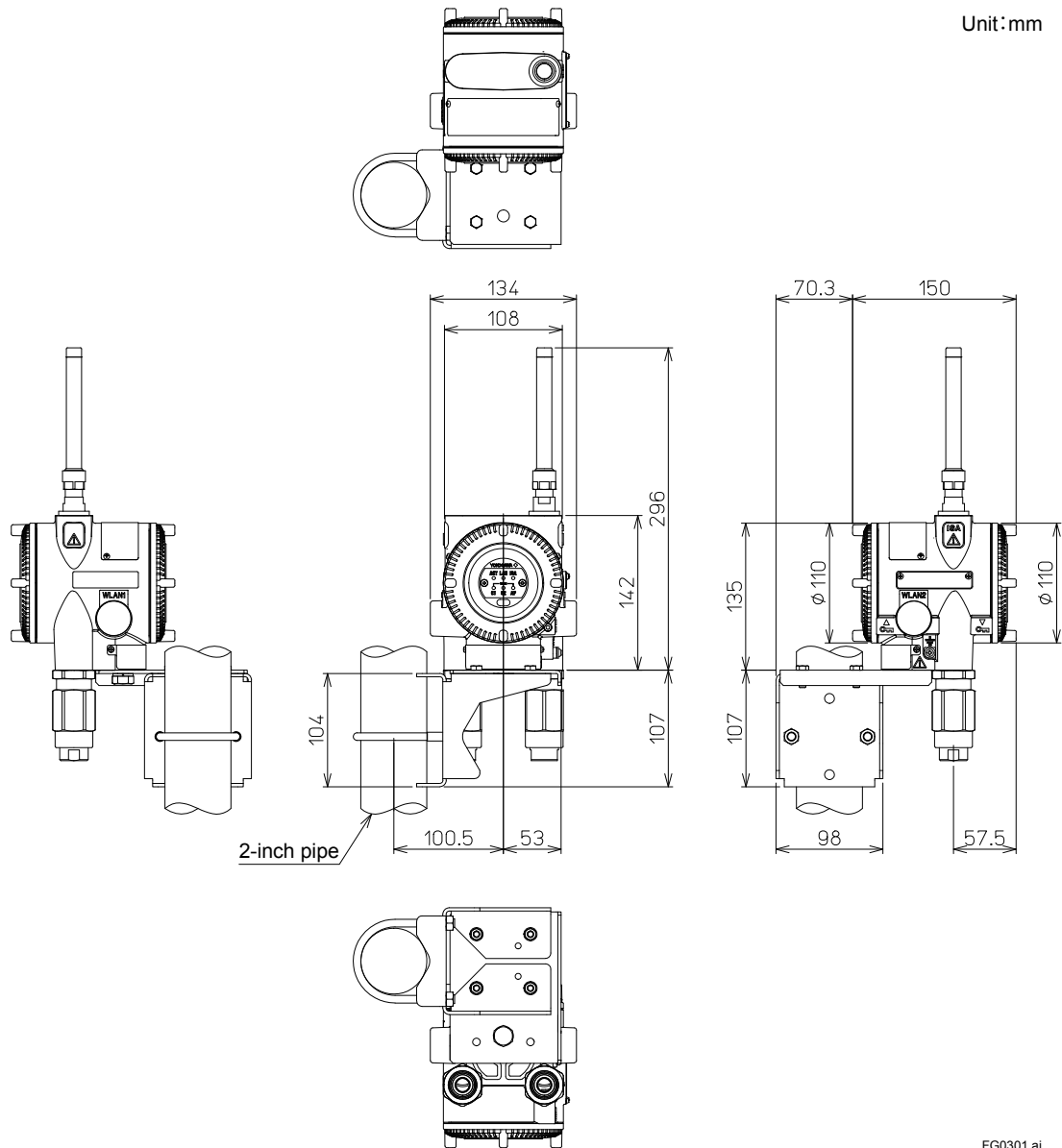
*1: Standard antenna cannot perform direct connection to this product at wireless LAN.

*2: High gain antenna cannot perform direct connection to this product.

G3. External Dimensions

G3.1 100BASE-TX/100BASE-FX Specifications

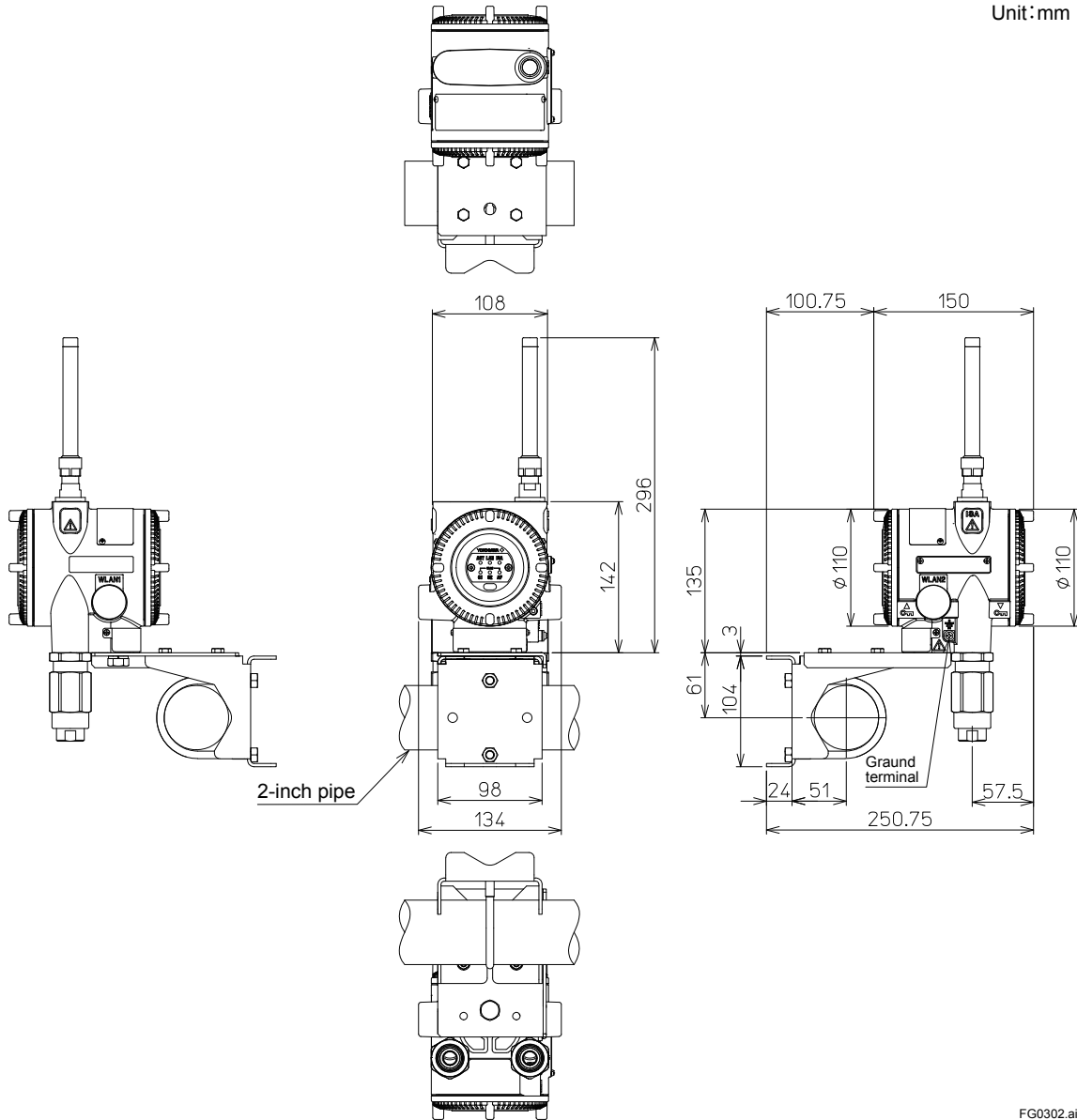
■ Vertical pipe mounting



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■ Horizontal pipe mounting

Unit: mm

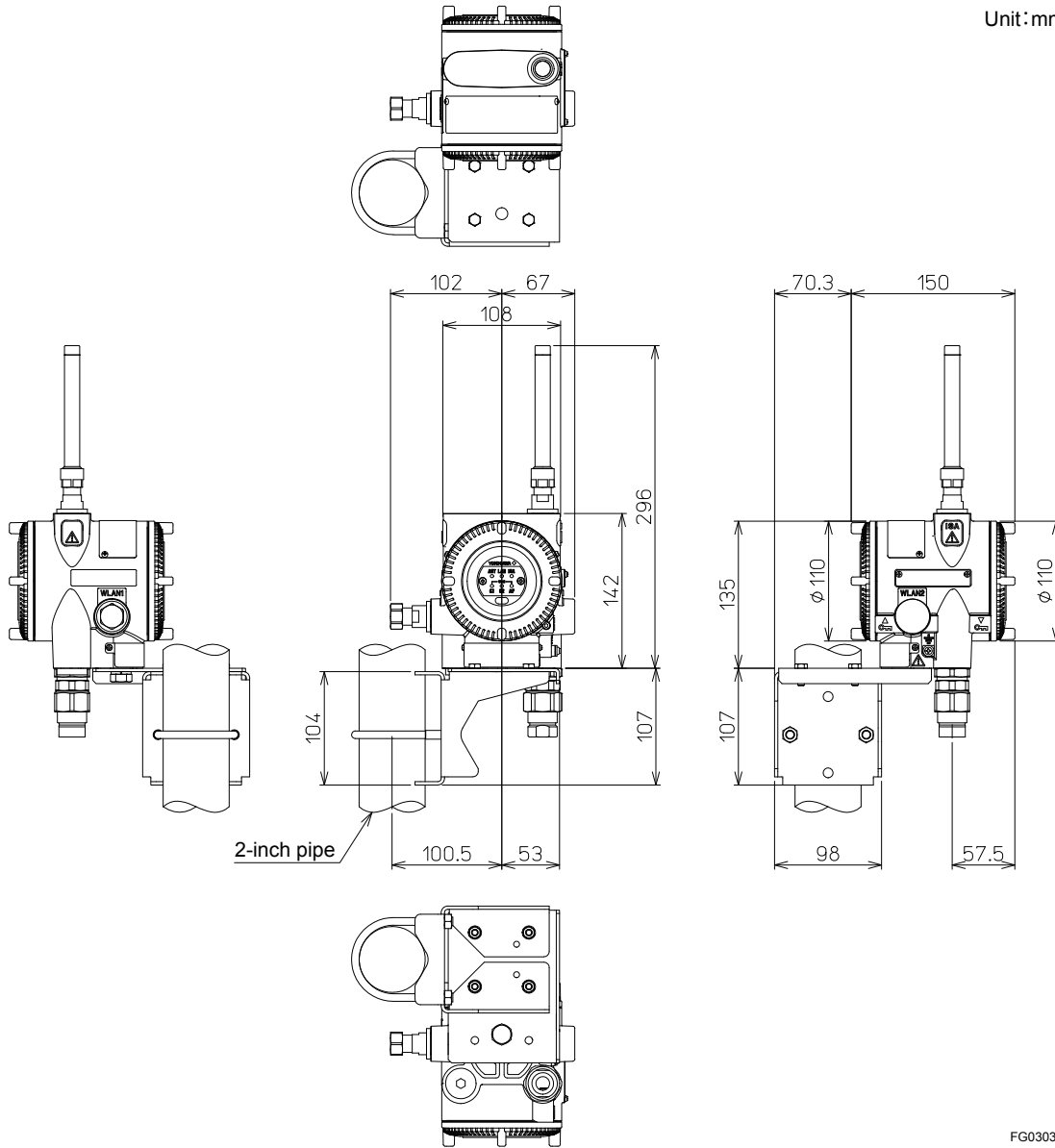


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G3.2 Single Communication Wireless LAN Client Specifications

■ Vertical pipe mounting

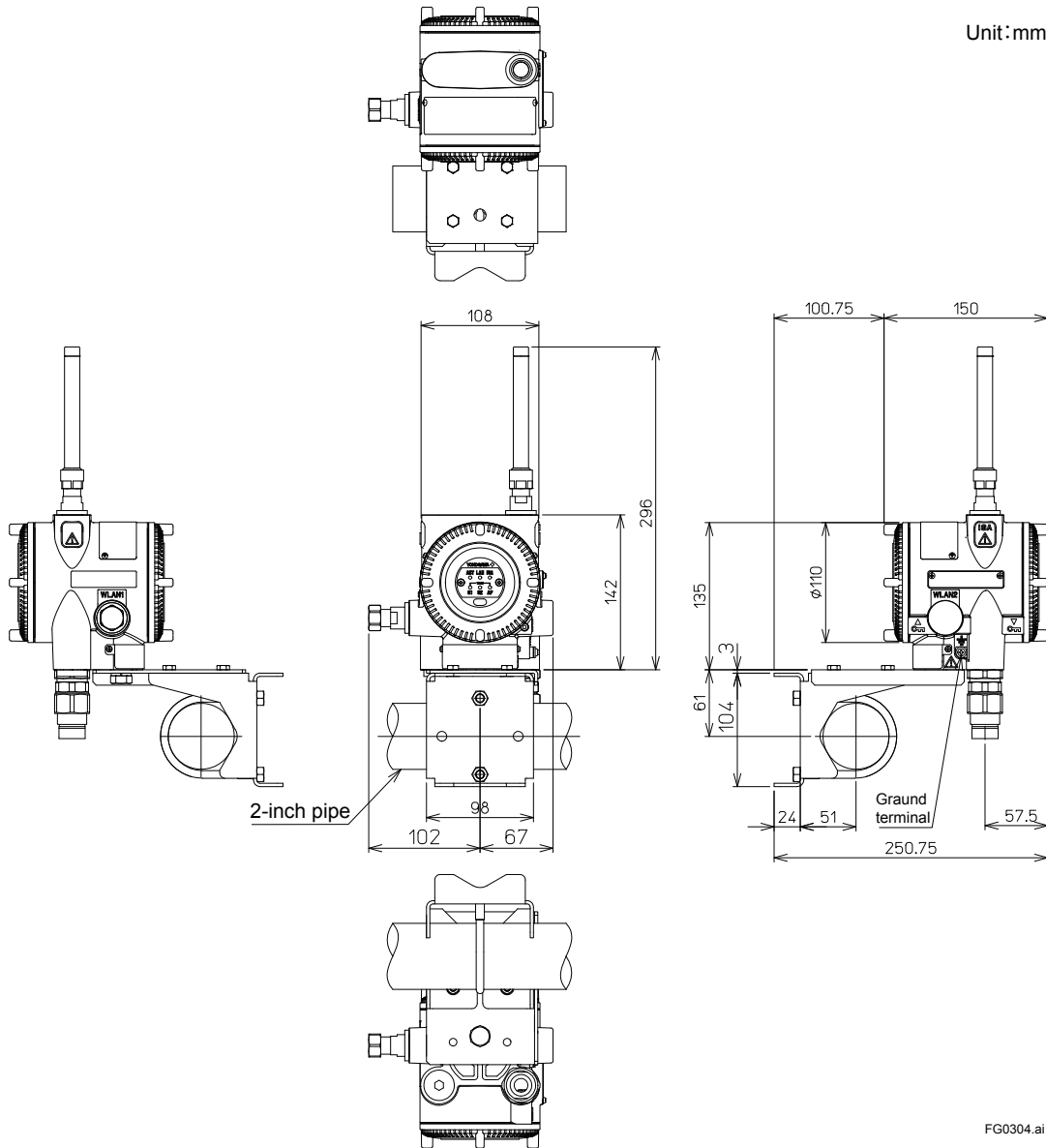
Unit:mm



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■ Horizontal pipe mounting

Unit:mm

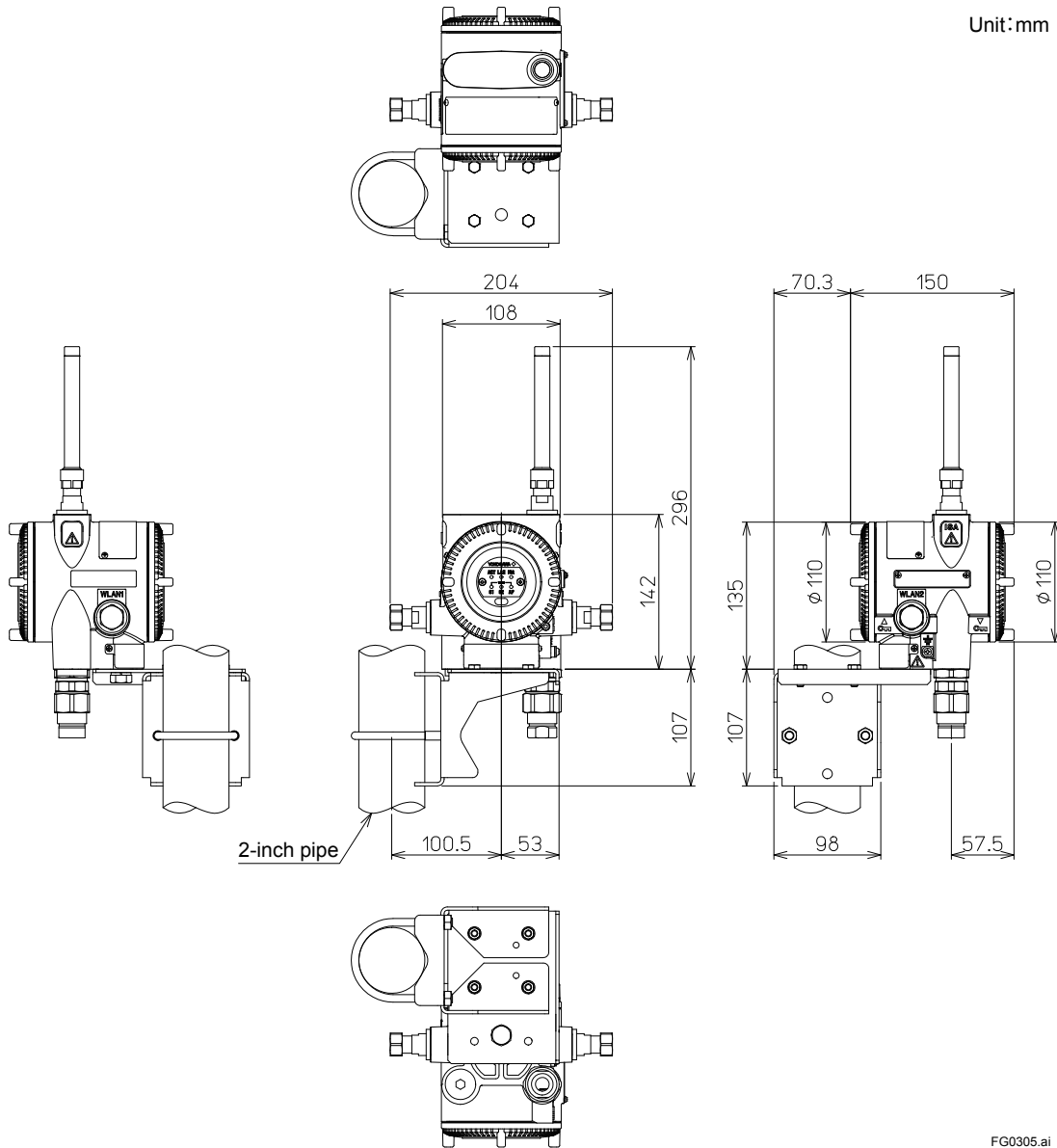


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G3.3 Redundant Communication Wireless LAN Client Specifications

■ Vertical pipe mounting

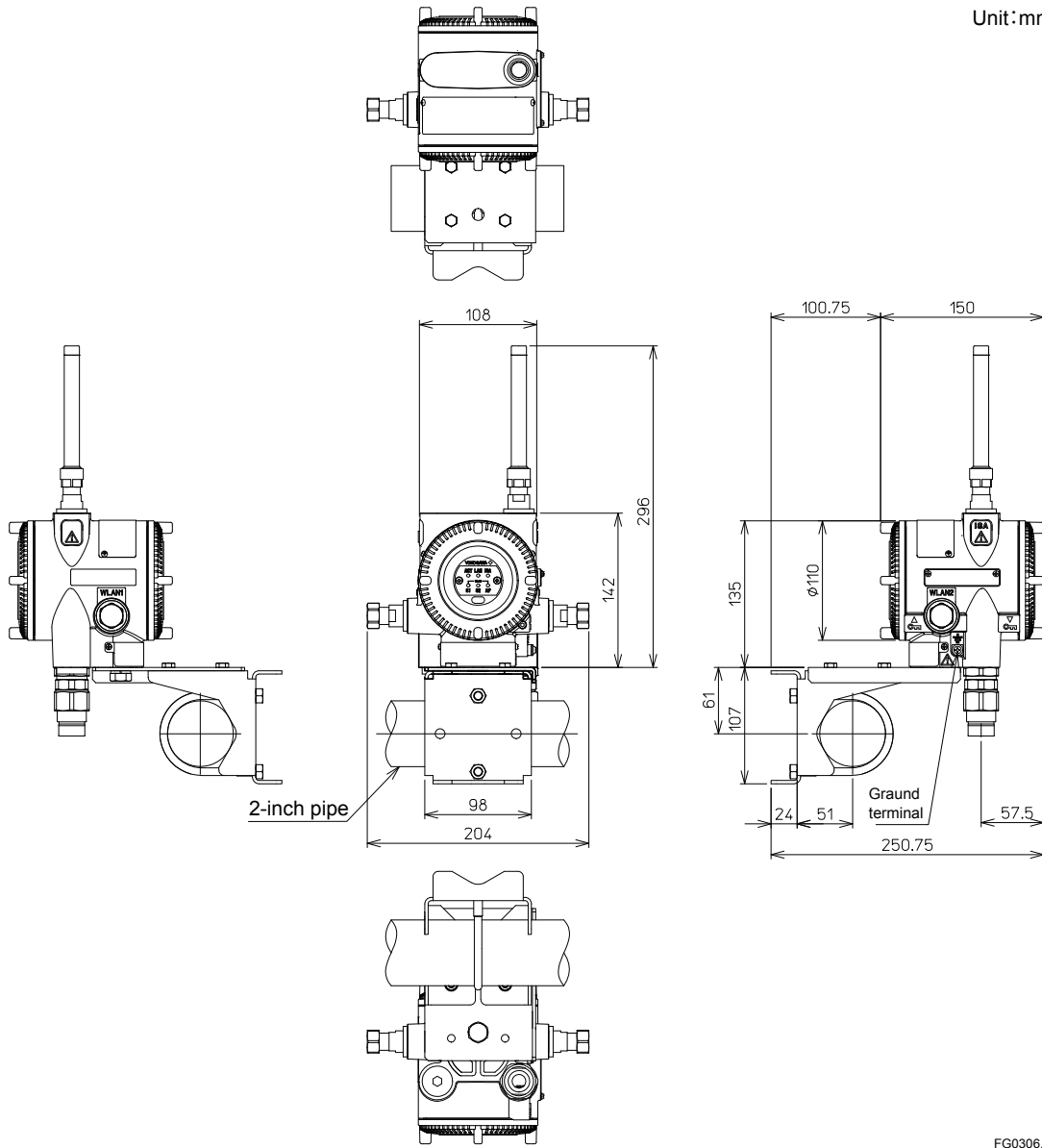
Unit:mm



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■ Horizontal pipe mounting

Unit:mm



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