

OMC System Software

High-performanceHMI

WLCon Software

User Manual

Notices
<ul style="list-style-type: none"> ● The reproduction, transmission or use of this document or its contents is not permitted without express written authority. ● Information and specifications in this document are subject to change without notice. ● While information in this document is well edited and checked, mistake or omission may exist. Please don't hesitate to contact SUPCON if you have any question about this document. ● Please contact SUPCON via email "SMS@supcon.com" if you have any question.

Trademarks
<p>Trademarks or marks SUPCON, SPlant, Webfield, ESP-iSYS, MultiF, InScan, SupField are all registered, registering or using by Zhejiang SUPCON Technology Co., Ltd., which owns the properties of all trademarks or marks above. Without the written authority from Zhejiang SUPCON Technology Co., Ltd, no individual or company shall use any trademarks or marks above. We reserve the right to take legal action for any individual or company using trademarks or marks above illegally.</p>






Symbol Definition	
	WARNING: Indicates information that a potentially hazardous situation which, if not avoided, could result in serious injury or death.
	RISK OF ELECTRICAL SHOCK: Indicates information that Potential shock hazard where HAZARDOUS LIVE voltages greater than 30V RMS, 42.4V peak, or 60V DC may be accessible.
	ESD HAZARD: Indicates information that Danger of an electro-static discharge to which equipment may be sensitive. Observe precautions for handling electrostatic sensitive devices
	ATTENTION: Identifies information that requires special consideration.
	TIP: Identifies advice or hints for the user.

Table of Contents

WLCon Software User Manual.....	1
Section 1 Overview.....	1
1.1 System Structure Diagram.....	1
1.2 System Components	2
Section 2 Configuration Flow	4
Section 3 Prerequisites.....	5
3.1 Installing WLCon	5
3.2 Preparing GSD Files.....	5
Section 4 Adding Master Station Communication Module	6
Section 5 Communication Configuration	7
5.1 Starting WLCon	7
5.2 Configuring the Master Station	7
5.3 Importing GSD File	8
5.4 Adding and Configuring Slave Station	8
5.5 Saving Configuration	11
Section 6 Tag Configuration	12
6.1 Prerequisites	12
6.2 Adding Tags through Communication Tag Strategy	12
6.3 Manually Adding/Modifying Tags	14
6.4 Usage of Different Communication Tags	14
Section 7 Compiling and Downloading Configuration	16
Section 8 Online Diagnosis and Device Management.....	17
8.1 Device Statuses.....	17
8.2 List of Unauthorized and Authorized Exceptions	17
8.3 Online Diagnosis	18
8.4 I/O Monitor.....	18
8.5 Real-time Diagnosis	19
8.5.1 Diagnosing GW042	19
8.5.2 Diagnosing Other Wireless Devices	21

Table of Contents

Section 9 Other Functions	23
Section 10 Revision History	24

WLCon Software User Manual

Section 1 Overview

WLCon software allows you to configure the settings of wireless devices.

SUPCON provides wireless devices including wireless gateway GW042, wireless adaptor ADP01, wireless temperature transmitter TM52W0, and more. SUPCON industrial wireless sensing solution utilizes wireless devices to realize the data acquisition and wireless transmission of wireless temperature and pressure transmitters, as well as common instruments (if used with wireless adaptors). The collected data is sent to the control system through Ethernet, or 4G/5G network.

1.1 System Structure Diagram

The figure below shows a typical network structure of the DCS integrated wireless devices.

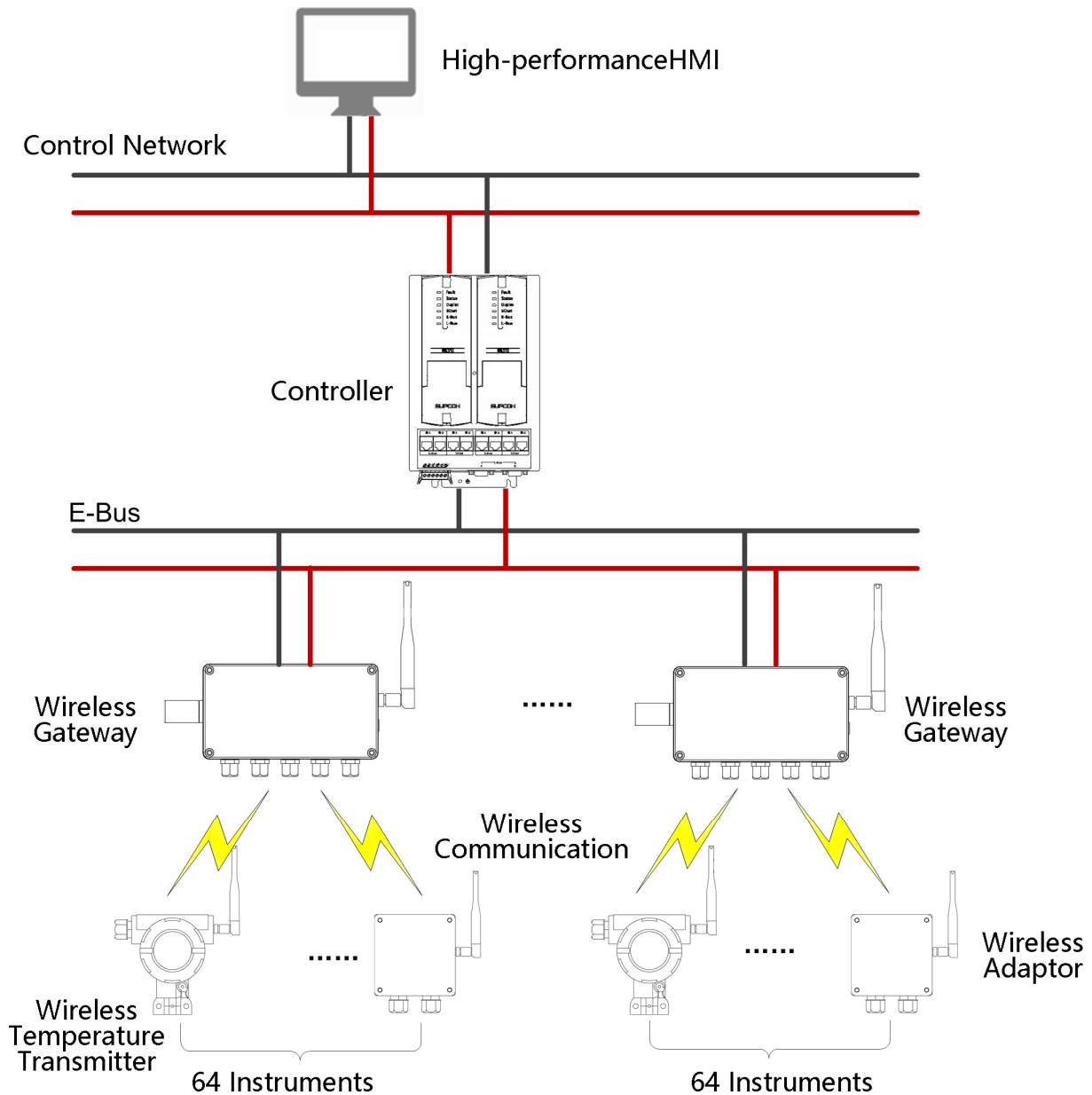


Figure 1-1 A typical network structure using SUPCON wireless devices

1.2 System Components

In the above figure, the system consists of:

- **Controller**
The controller connects with the wireless gateway by means of E-Bus network, to receive data from the wireless instruments and send commands to the instruments.
- **Wireless Gateway**
The wireless gateway serves as a bridge that connects the control system and field wireless instruments. It connects with the controller through E-Bus network and with the field devices by means of wireless network.

- **Wireless Adaptor**

The wireless adaptor measures field current and HART signals, converts these signals into wireless signals, and sends them to the wireless gateway.

- **Wireless Instruments**

Wireless instruments adopt standard industrial wireless protocols to collect field signals and to send real-time data and diagnostics to the wireless gateway. By receiving commands from the gateway, it helps achieve wireless control in the field.



Tips:

- For more information on wireless gateways, refer to **GW042 Series User Manual**.
 - For more information on wireless adaptors, refer to ***ADP01-1AI-WSN-S User Manual***.
 - For more information on wireless instruments, refer to ***TM52W0 User Manual***.
-

Section 2 Configuration Flow

To connect wireless devices with DCS, follow the steps shown in the figure below.

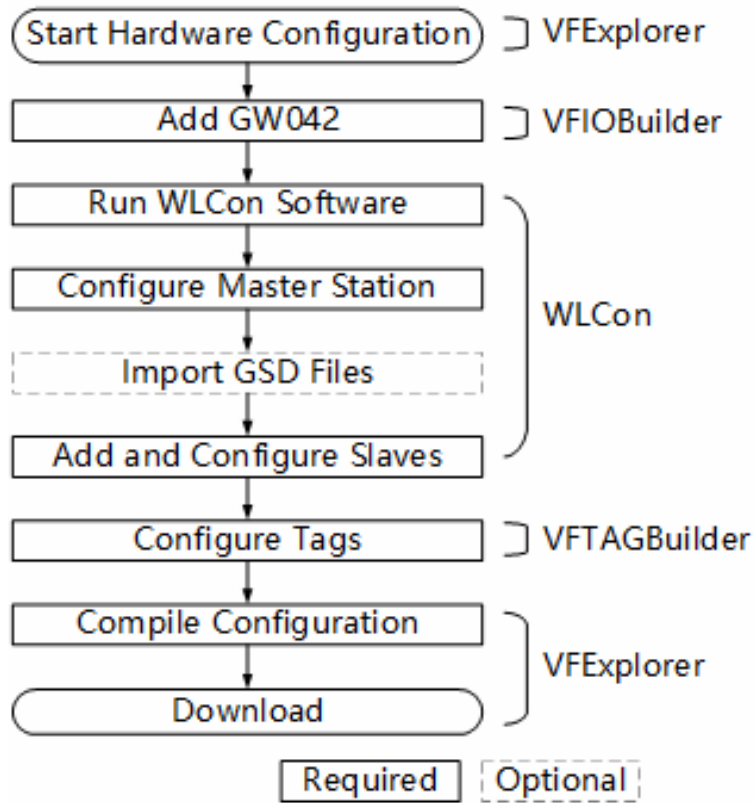


Figure 2-1 Typical configuration flow of wireless devices

Section 3 Prerequisites

Install the WLCOn software and prepare GSD files before starting configuration.

3.1 Installing WLCOn

WLCOn software is integrated into VFIOBuilder of High-performanceHMI software. You do not need to install it separately and it cannot be uninstalled separately.

Follow the installation guide to install the DCS system software.

3.2 Preparing GSD Files

Acquire the GSD files from your supplier. Read carefully the user manuals of corresponding devices.

WLCOn software offers GSD files for common devices, which are stored in "DPCOn\WSNConfig\Profibus\GSD" of software package directory. If you want to import other GSD files, refer to Importing GSD File.



Tip:
The provided GSD files are for reference only.

Section 4 Adding Master Station Communication Module

Add a master station communication module, such as GW042 WSN, before starting configuration.

- 1) Start VFExplorer software.

Select **OMC > VFExplorer** from the start menu.

- 2) Open control station configuration.

Open the default project and select a control station. Double-click **Hardware Configuration**.

- 3) Add GW042.

Right-click on the controller, and click **Add**. The **Add Module** window will pop up. Select **GW042 WSN Communication Module** and configure its address. Click **Add** to add it to the navigation tree.

- 4) Right-click on the GW042 node and click **Communication Configuration** to open WLCOn software.

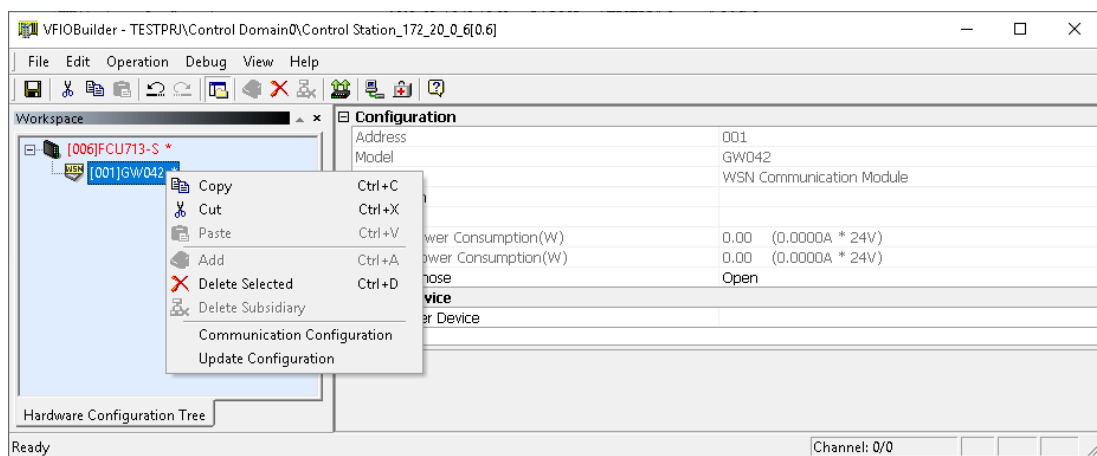


Figure 4-1 Add GW042 and start communication configuration



Attention:

GW042 only can be added in Hardware Configuration and configured in WLCOn. You cannot add or configure it by importing the hardware configuration.

Section 5 Communication Configuration

This section takes GW042 WSN communication module as the example to describe how to use WLCOn for wireless device configuration.

5.1 Starting WLCOn

In Figure 4-1, click **Communication Configuration**. The main window of WLCOn will be displayed.

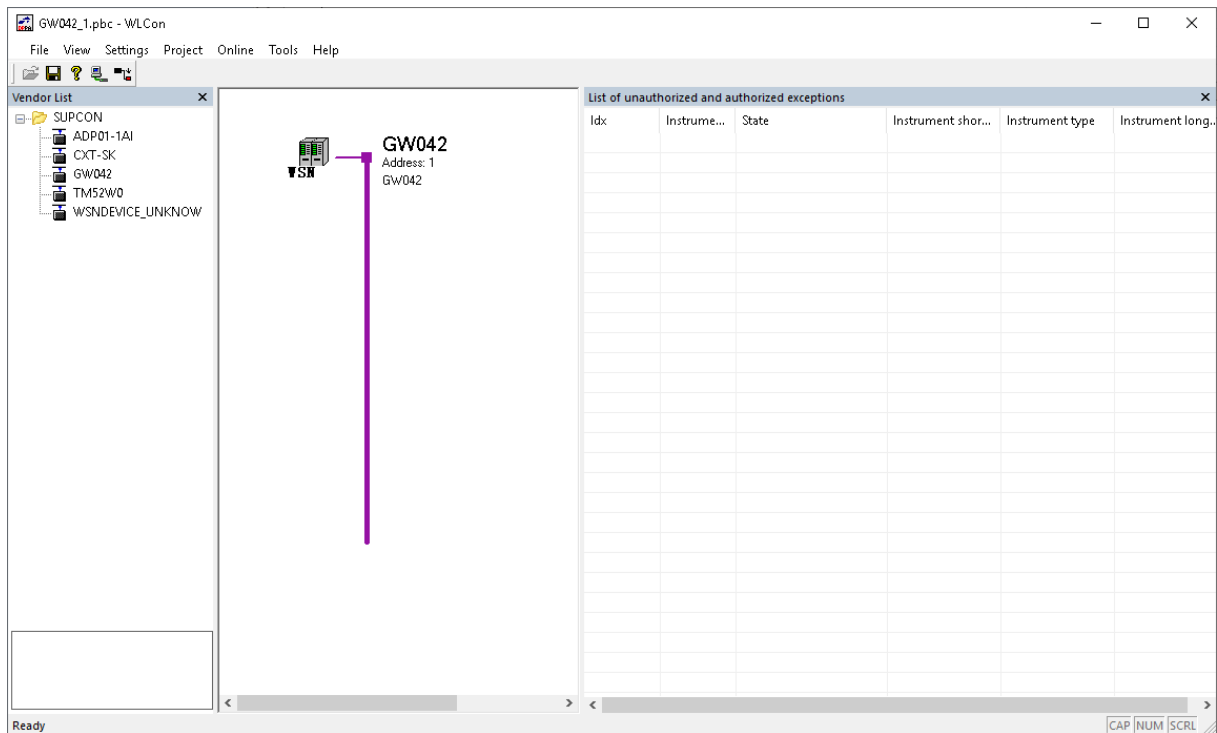
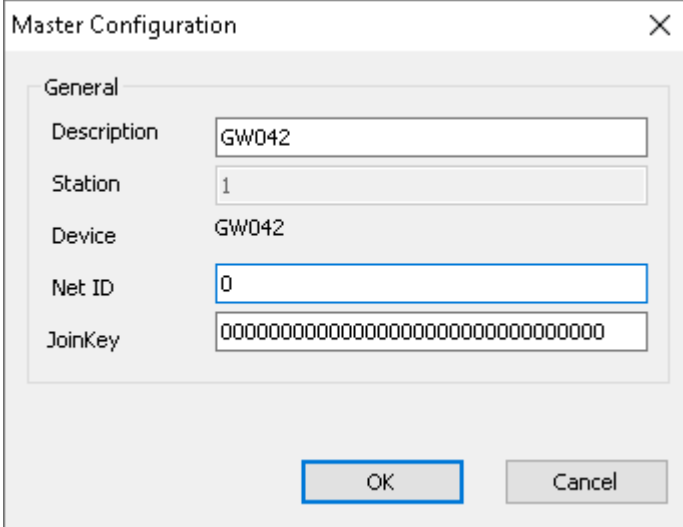


Figure 5-1 WLCOn main window

5.2 Configuring the Master Station

- 1) Double-click the icon of master station to open **Master Configuration** window.



The image shows a 'Master Configuration' dialog box with a close button (X) in the top right corner. It contains a 'General' tab with the following fields:

- Description: GW042
- Station: 1
- Device: GW042
- Net ID: 0
- JoinKey: 00000000000000000000000000000000

At the bottom, there are 'OK' and 'Cancel' buttons.

Figure 5-2 Master configuration

- 2) Specify **Net ID** and **JoinKey**.

Net ID and JoinKey of field instruments that are added under the master station must be the same as the master station; otherwise, they cannot communicate with each other.

5.3 Importing GSD File

WLCOn recognizes wireless devices by means of a GSD file. Before adding a wireless device, make sure its GSD file is imported.

- 1) Select Import GSD command.

In WLCOn software, select **File > Import GSD**. In the pop-up window, select the GSD file.

- 2) Start importing.

After you select a GSD file, WLCOn will start importing the file and recognizing the device.

- 3) After import, restart WLCOn to make the changes take effect.



Tip:

During import, the software may display a prompt saying the dib file does not exist. If the file cannot be included, select Cancel. It will not impact the import process.

5.4 Adding and Configuring Slave Station



Attention:

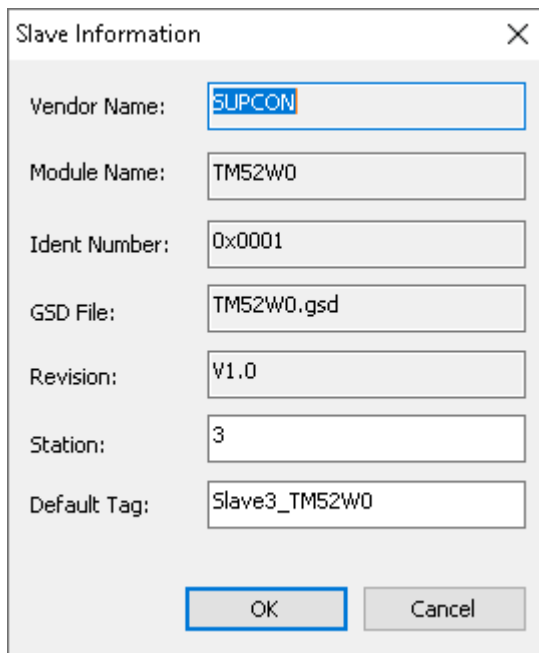
The characteristics of the slave stations are different. Please conform to the user manuals of the corresponding slave devices when configuring the slave stations.

WLCOn provides multiple methods to add slave stations. For example, you can select a slave station from the vendor list and drag it to the diagram, or right-click the bus and click **Insert Slave**.

The following steps show an example of adding TM52W0 as the slave station and illustrate how to configure it.

1) Add Slave Station

Select the slave station (such as TM52W0) from the vendor list. Click and drag it to the bus. The **Slave Information** window is displayed. Enter "3" in the **Address** field and "Slave3_TM52W0" for **Default Tag**. Click **OK**.

A screenshot of the 'Slave Information' dialog box. It contains several text input fields: 'Vendor Name' with 'SUPCON', 'Module Name' with 'TM52W0', 'Ident Number' with '0x0001', 'GSD File' with 'TM52W0.gsd', 'Revision' with 'V1.0', 'Station' with '3', and 'Default Tag' with 'Slave3_TM52W0'. At the bottom are 'OK' and 'Cancel' buttons. The 'OK' button is highlighted with a blue border.

Vendor Name:	SUPCON
Module Name:	TM52W0
Ident Number:	0x0001
GSD File:	TM52W0.gsd
Revision:	V1.0
Station:	3
Default Tag:	Slave3_TM52W0

Figure 5-3 Slave information window

2) Add a module to the slave station.

Double-click the slave station to open **Slave Configuration** window.

Some fields are updated from the GSD file, such as the maximum number of modules, and module type (4byte+1byte and 4byte). Here byte refers to the status code or unit.

You can add field modules as needed. The figure below is an example of adding four 4-byte input modules to the slave station.

Slave Configuration

General

Current Slave

3 \ TM52W0

Device

TM52W0

GSD File

TM52W0.gsd

☒ Activate device in actual configuration

Parameter Data...

Station Address

3

Tag

Tag Write

Slave3_TM52W0

Long addr

Input&Output Info

Max. Lenth of	20	Bytes	Length of in-/output	16	Bytes
Max. Lenth of input	20	Bytes	Length of input data	16	Bytes
Max. Lenth of output	0	Bytes	Length of output data	0	
Max. Number of Modules	4	Bytes	Number of modules	4	

Module	Inputs	Outputs	In/Out	Identifier	
4byte+1byte	5 byte			0x94	
4byte	4 byte			0x93	

Append Module

Remove Module

Remove All

Insert Module

user define module

Slot	Idx	Module	Input Addr.	Inputs	Output A...	Outputs	
Slot1	1	4byte	0	4byte			
Slot2	1	4byte	0	4byte			
Slot3	1	4byte	0	4byte			
Slot4	1	4byte	0	4byte			

OK

Cancel

Figure 5-4 Configure I/O module

3) Configure sampling data.

Click **Parameter Data**. In the pop-up window, configure wireless instruments through GSD file.

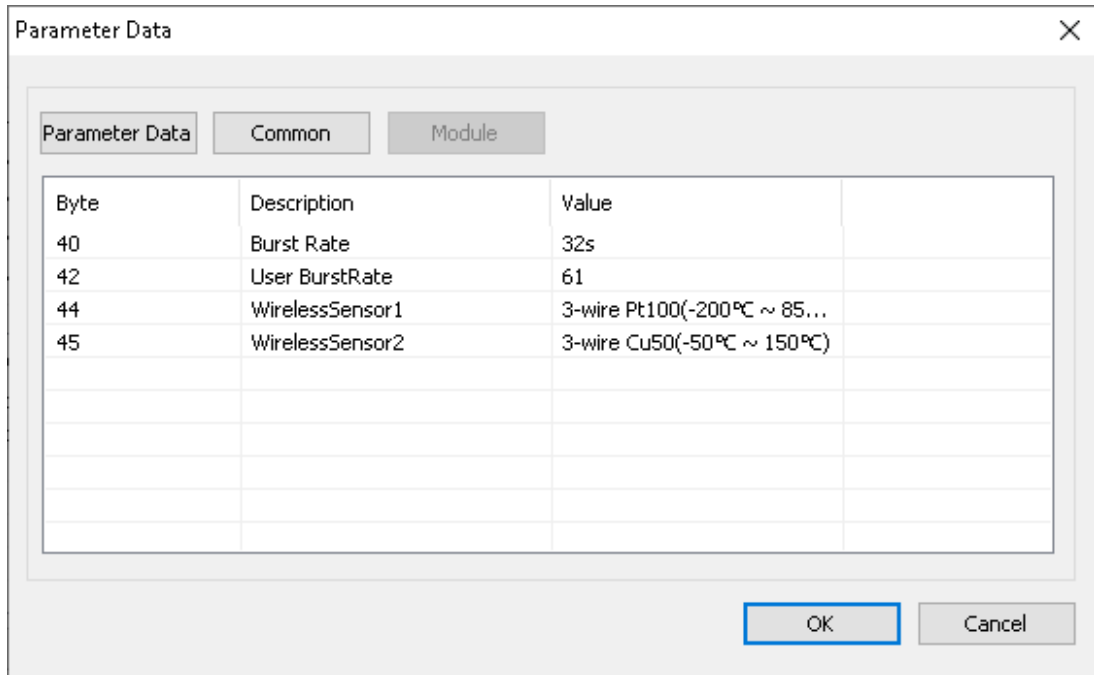


Figure 5-5 GSD parameter data

- 4) Configure the corresponding values of the four bytes, as shown in the figure above.

5.5 Saving Configuration

After finishing communication configuration, click  to save it. Close WLCOn software and go back to VFIOBuilder.

Section 6 Tag Configuration

After finishing wireless device configuration, configure the tags of wireless device in VFTAGBuilder, including adding wireless tags and configuring tag properties.

6.1 Prerequisites

Before configuring wireless tags, make sure you have:

- 1) Updated the configuration.
In VFIOBuilder, right-click "GW042" and select "Update Configuration".
- 2) Saved hardware configurations.
Select **File > Save** to save the configurations.

6.2 Adding Tags through Communication Tag Strategy

- 1) Open Communication Tag Strategy window.
In VFTAGBuilder, select **Operation > Scan Tags from Channel > Communication Tag Strategy**.
- 2) Select the slave station the tags belong to.
Select the slave and its slots from the left navigation tree. Figure 6-1 Takes slave 002 and slot 00 as an example.
- 3) Configure tag strategy.
Add strategy: click a slot and select the tag type and status code for it. Click **Add Strategy**.
Modify a strategy: select a strategy and modify its tag type or status code. Click **Modify Strategy**.
Delete a strategy: select a strategy and click **Delete Strategy**.
- 4) After setting up tag strategies, click **OK** and go back to VFTAGBuilder software.

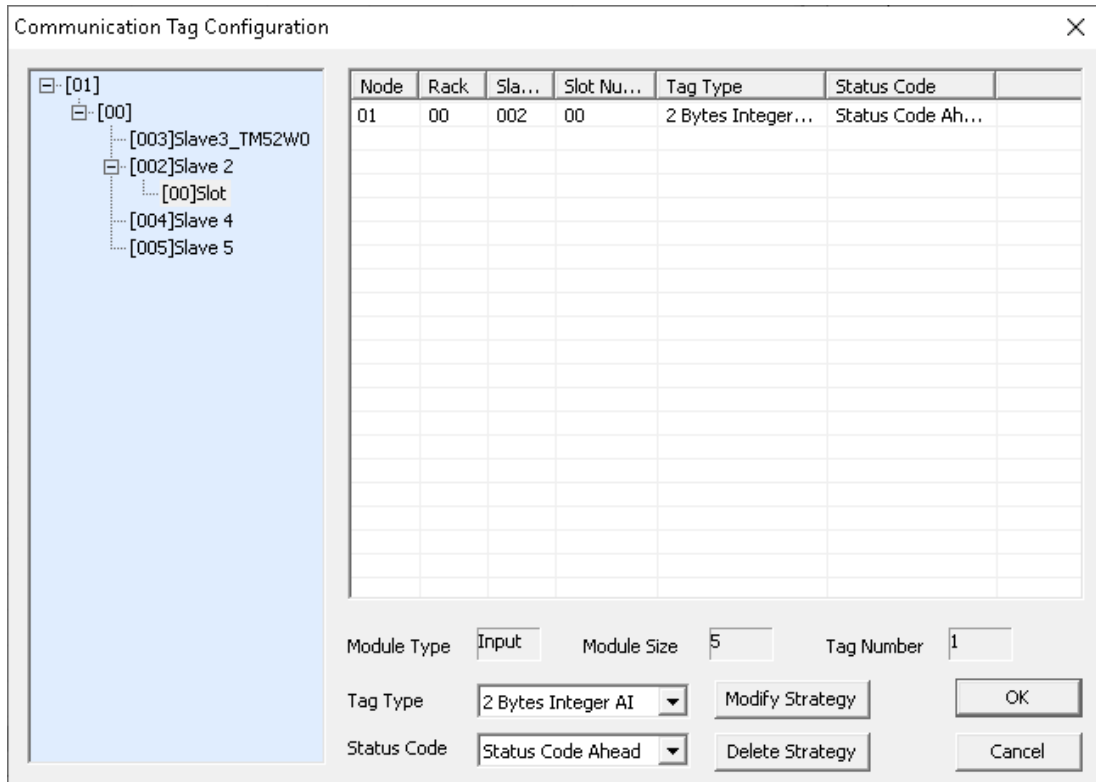


Figure 6-1 Configure communication tag strategy



Attention:

A slot can only have one tag strategy.

- 5) Add tags.

After configuring the strategies, you can add tags to your configuration in VFTAGBuilder.

Select **Operation > Scan Tags from Channel**. Click **Scan New Added** to start scanning and adding tags. After scanning, the window is shown like Figure 6-2.

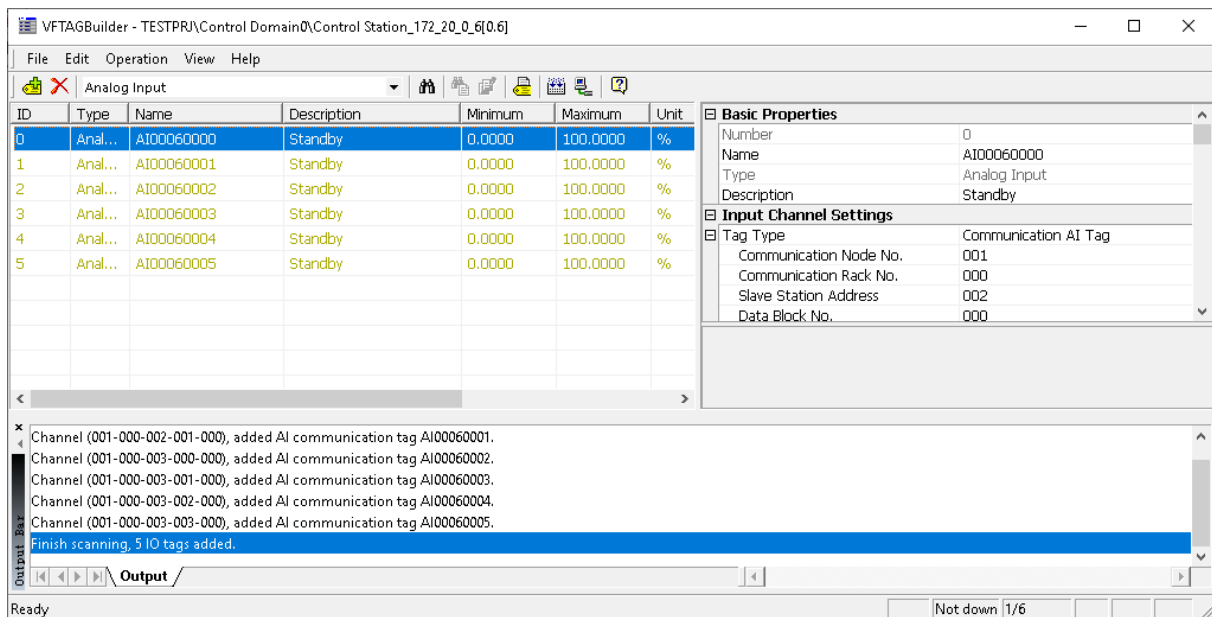


Figure 6-2 Tag scanning complete

6.3 Manually Adding/Modifying Tags

You can manually add or modify tags in VFTAGBuilder. Here takes AI communication tags as an example to describe how to manually add wireless communication tags.

- 1) Select tag type.

In VFTAGBuilder, select **Analog Input** from the drop-down list, and select **Operation > Add Tag**. A new tag is added to the list.

- 2) Configure tag properties.

Select the newly added tag and configure its properties on the right pane.

6.4 Usage of Different Communication Tags

- AI/AO tag parameters
 - Input/Output Channel Settings

Communication Node No.: the node address of GW042 on E-Bus network, which is the address set during the hardware configuration.

Communication Rack No.: specify the communication rack number of the tag. 000 by default.

Slave Station Address: address of the slave station.

Data Block No.: slot number in hardware configuration

The Offset Address of the Tag in the Data Block: offset address of the analog tag in the data block. Unit: byte

- Communication Parameter Settings

Data Type: 5 types are available.

Status Code Location: "No Status Code", "Status Code Ahead", "Status Code Behind" are available. For slave signals, select **No Status Code**.

Data Format: select the conversion type.

- Input/Output Original Code Settings
Set the upper and lower limit of the original code. Original code varies with slave stations.
- DI/DO tag parameters
 - Communication Node No.: the node address of GW042 on E-Bus network, which is the address set in hardware configuration.
 - Communication Rack No.: specify the communication rack number of the tag. 000 by default.
 - Slave Station Address: address of the slave station.
 - Data Block No.: slot number in hardware configuration
 - The Offset Address of the Tag in the Data Block: offset address of the digital tag in the data block. Unit: bit

Section 7 Compiling and Downloading Configuration

After configuration is finished, close VFIOBuilder and go back to VFExplorer. Save, compile, and download the configuration. Online download and offline download are available for downloading system configuration.

- Online download: When there is no major change in configuration and the online device is not modified, carry out online download. Online download can ensure that the unmodified device, its commands and relation between the commands and the tag remain unchanged.
- Offline download: When there is major change in the configuration, for example, modification to the hardware structure of the system and the system forbids the user to carry out online download to ensure site safety. When it is ensured that there will be no major problem, offline download can be selected.



Attention:

- After configuring the wireless tags, do not switch to another tag when you are editing a tag.
 - The method of calling wireless tags in DCS configuration and custom programs is the same as calling custom variables.
-

Section 8 Online Diagnosis and Device Management

WLCOn offers online diagnosis and device management functions in debug mode. In WLCOn, select **Online > Debug Mode**. The debug interface is similar to the figure below.

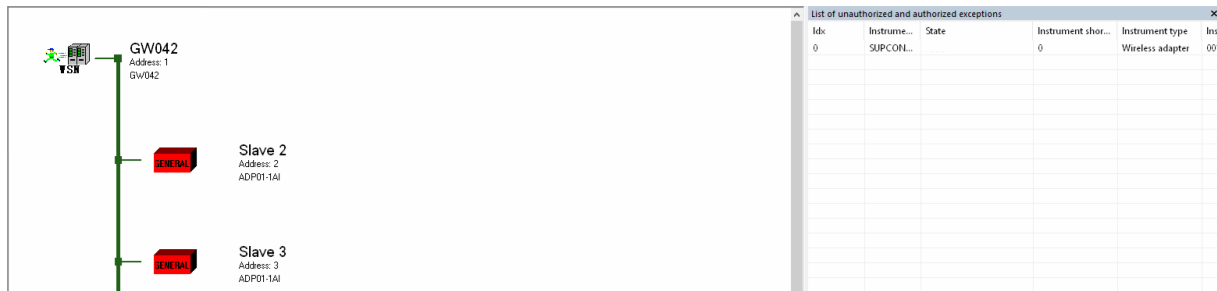


Figure 8-1 Device status and authorization status in debug mode

8.1 Device Statuses

See the following table for descriptions of these icons.

Table 8-1 Icons and descriptions

Icon	Description
	Slave in non-debug mode
	Slave communication is normal in debug mode
	Slave communication is abnormal (slave offline, instrument mismatch) in debug mode
	Master in non-debug mode
	Master communication is normal in debug mode
	Master communication is abnormal (slave offline) in debug mode

8.2 List of Unauthorized and Authorized Exceptions

In online mode, the controller periodically scans the wireless gateway and its slave stations. The gateway will send the information of authorized and unauthorized devices. The controller determines if the device is authorized based on the sent data.

- For authorized devices, you can view them on the web client of the gateway. For details, refer to *GW042 Series User Manual*.

- For unauthorized devices, you can view them on the right pane in WLCOn software in debug mode. See Figure 8-1.

8.3 Online Diagnosis

In debug mode, click the master station icon and select **Online > Diagnose**. Or, you can right-click on the icon and select **Diagnose**. **Diagnose Information** window will be displayed. Click **Reset** to update the statistics.

Diagnose Information

Diagnose Statistics

Reset

Left Module/Card

WSN Master State: ☒ Primary ☐ Backup ☐ Not exist

Message Type	quantity
Number of data packets that s...	67
Number of data packets actua...	64
Number of online requests	1
Online times	1
Number of command packets s...	15
Number of response packets r...	14
Number of ack packets not rec...	2
Last communication time	2008-01-03 04:39:13

Right Module/Card

WSN Redun State: ☐ Primary ☐ Backup ☒ Not exist

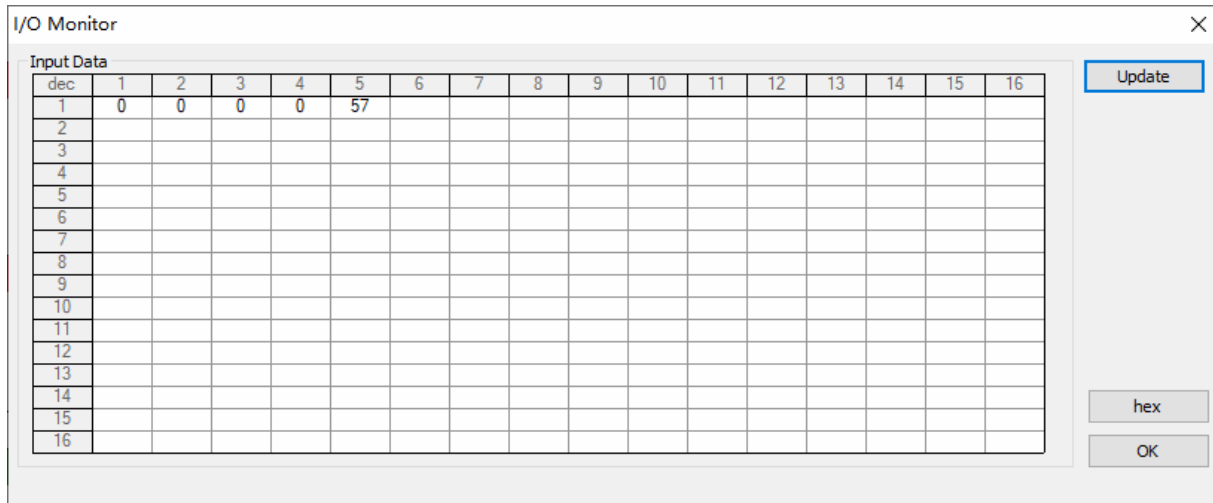
Message Type	quantity
Number of data packets that s...	0
Number of data packets actua...	0
Number of online requests	0
Online times	0
Number of command packets s...	0
Number of response packets r...	0
Number of ack packets not rec...	0
Last communication time	1970-01-01 08:00:00

OK

Figure 8-2 Master diagnosis information

8.4 I/O Monitor

In debug mode, click a slave station and select **Online > I/O Monitor**. Or, right-click on the icon and select **I/O Monitor**.



dec	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
1	0	0	0	0	57											
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																

Figure 8-3 I/O tag real-time value

Click **Update**, then the real-time input and output data will be displayed. Click Hex to convert the decimal values to hexadecimal values.

8.5 Real-time Diagnosis

Diagnosis software offers real-time diagnosis function over GW042, ADP01, TM52W0, and other wireless modules. Diagnosis items include network overall status, diagnostics of GW042 and its slave wireless devices.

In the real-time monitoring software, select **System Status** from the drop-down list. Select the current control station, the diagnosis information will be displayed.

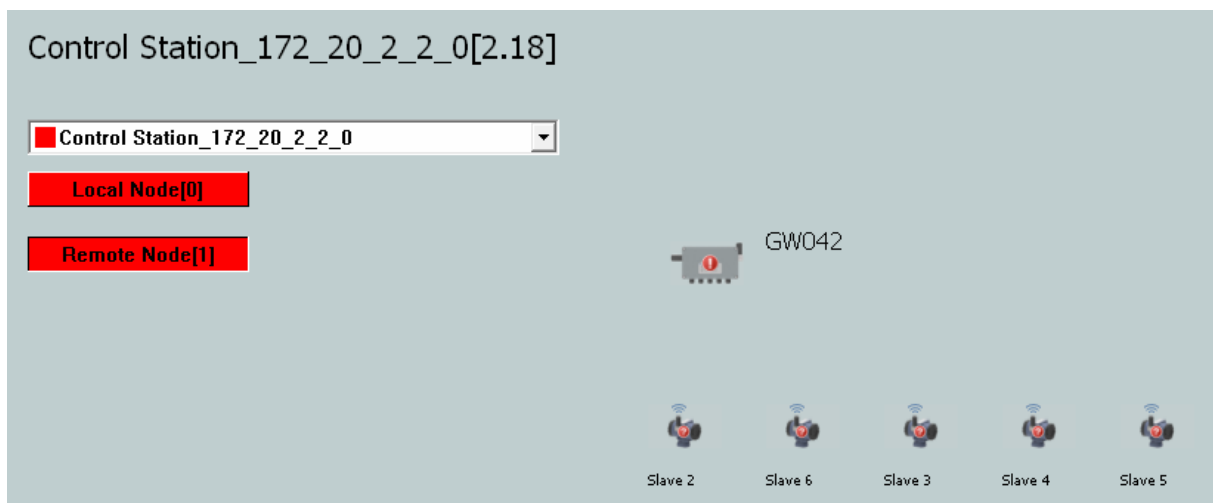


Figure 8-4 Overall diagnosis result

8.5.1 Diagnosing GW042

In the diagnosis screen, double-click GW042 to display its details. Diagnosis items include working

status, power status, communication status, and more.

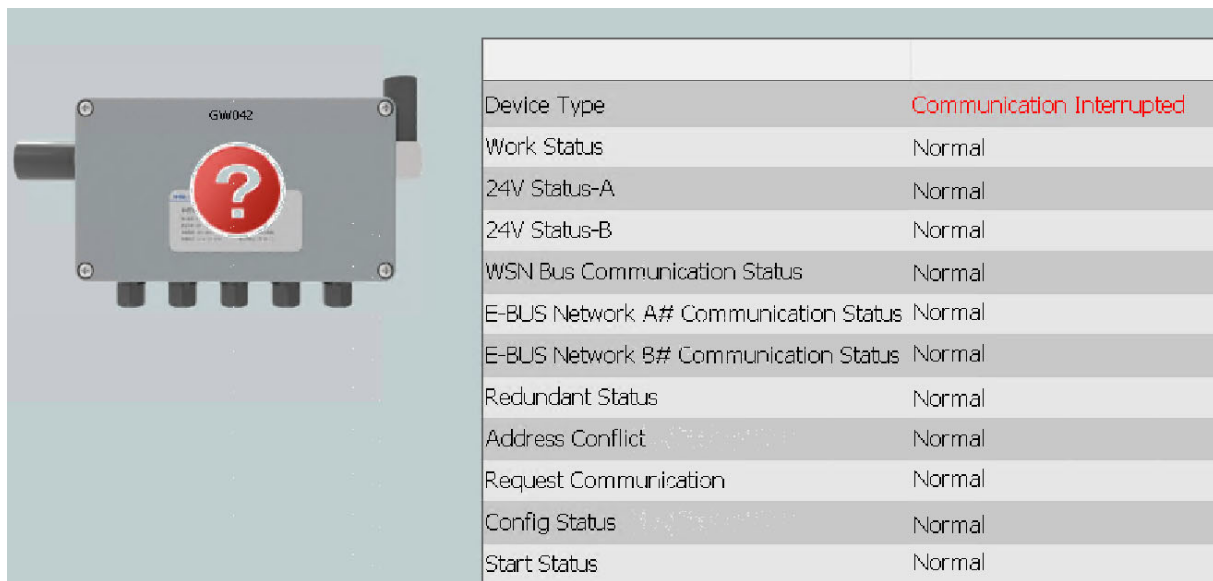


Figure 8-5 Example of GW042 diagnostic information

The table lists the meaning of the diagnostic items, possible reasons, and solutions.

Item	Meaning	Possible Reasons	Solutions
Device type	Module type. Displays fault if the hardware is inconsistent with the configuration.	Hardware is inconsistent with the configuration.	Check the hardware and software configuration.
Work status	Displays working or standby.	—	—
24V Status-A	Displays power voltage status. Shows fault if the voltage is not within the range of 20 V to 28 V.	Power fault Module hardware fault	1. Check the power wiring 2. Check if the power module is faulty 3. Replace the module
24V Status-B	Displays power voltage status. Shows fault if the voltage is not within the range of 20 V to 28 V.	Power fault Module hardware fault	1. Check the power wiring 2. Check if the power module is faulty 3. Replace the module
WSN Bus communication status	Displays the connection status of WSN bus.	Wireless environment abnormal Module hardware fault	1. Check if the wireless instrument is working normally. If it is normal but the status is offline, then the wireless network is abnormal. 2. Check the wireless environment to see if there is blockage or electromagnetic interference between the instrument and GW042. 3. If the fault still persists, the module might be faulty. Replace the module.

Item	Meaning	Possible Reasons	Solutions
E-Bus Network A# communication status	Displays fault when the E-Bus A communication port is faulty or not connected.	Module bus A fault Controller bus A fault Module hardware fault	1. Check if the E-Bus A indicator on the module is normal. If not, check if the wiring is normal. 2. Check E-Bus A is normal, check the controller E-Bus A. 3. Reset 4. Replace the module
E-Bus Network B# communication status	Displays fault when the E-Bus B communication port is faulty or not connected.	Module bus B fault Controller bus B fault Module hardware fault	1. Check if the E-Bus B indicator on the module is normal. If not, check if the wiring is normal. 2. Check E-Bus B is normal, check the controller E-Bus B. 3. Reset 4. Replace the module
Redundant status	Displays if the current device is redundantly configured.	—	—
Address conflict	Displays fault when there is IP address conflict.	Module with the same address exists on the network.	Check the indicators of all nodes on the network. If the E-Bus indicator of any module is flashing, and the E-Bus communication of the two channels are all normal, they might share the same address. Correct the IP address.
Request communication	Displays the communication request status of this node.	Hardware fault	1. Reset the module. 2. Replace the module
Config status	Displays if the current device is configured	Hardware fault	1. Reset the module. 2. Replace the module
Start status	Displays if the current device is started. If the device is started, shows started; if it is not started or there is no communication data, shows not started.	Hardware fault	1. Reset the module. 2. Replace the module


8.5.2 Diagnosing Other Wireless Devices

On the overall diagnosis screen, double-click a slave of GW042, then the detailed diagnostic information is shown. The diagnostic information of other devices includes fault status and connection status. See figure below.

AM741-S DP Slave Station[(0.6)-1-0-2]

Slave 2

ADP01-1AI



		Tag Name	Real-time Value	Description
Module Fault Level	Normal			
Module Connect Test	Normal			

Figure 8-6 Example of diagnosing a wireless device

The table below lists the diagnostic items, possible reasons, and solutions.

Item	Meaning	Possible Reasons	Solutions
Module fault level	Displays if the module is faulty.	Displays "normal" or "???".	Check the hardware and software configuration.
Module connect test	Shows the wireless connection of the module	WSN bus or the module is abnormal.	1. Check whether the wireless instrument is working normally. If the instrument is normal but the status displays ???, it means the wireless network is abnormal. 2. Check the wireless environment to see if there is blockage or electromagnetic interference between the instrument and GW042. 3. If the fault still persists, the module might be faulty. Replace the module.

Section 9 Other Functions

Table 9-1 introduces other menus and commands in WLCOn software.

Table 9-1 Other menus and commands

Menu	Command	Description
Settings	Preference	View the GSD file path and type.
Project	Property	Configure the general and communication properties. Communication properties are different for different systems.
Tools	Device Table	View the device list on the bus.
	Address Table	View the device address list on the bus.
	GSD Explorer	Select a GSD file to view its information.
Help	About WLCOn	View the software version, and more.

Click **Project > Property** to open Project Property window. Click **Communication** node to view the communication properties of the current module and controller.

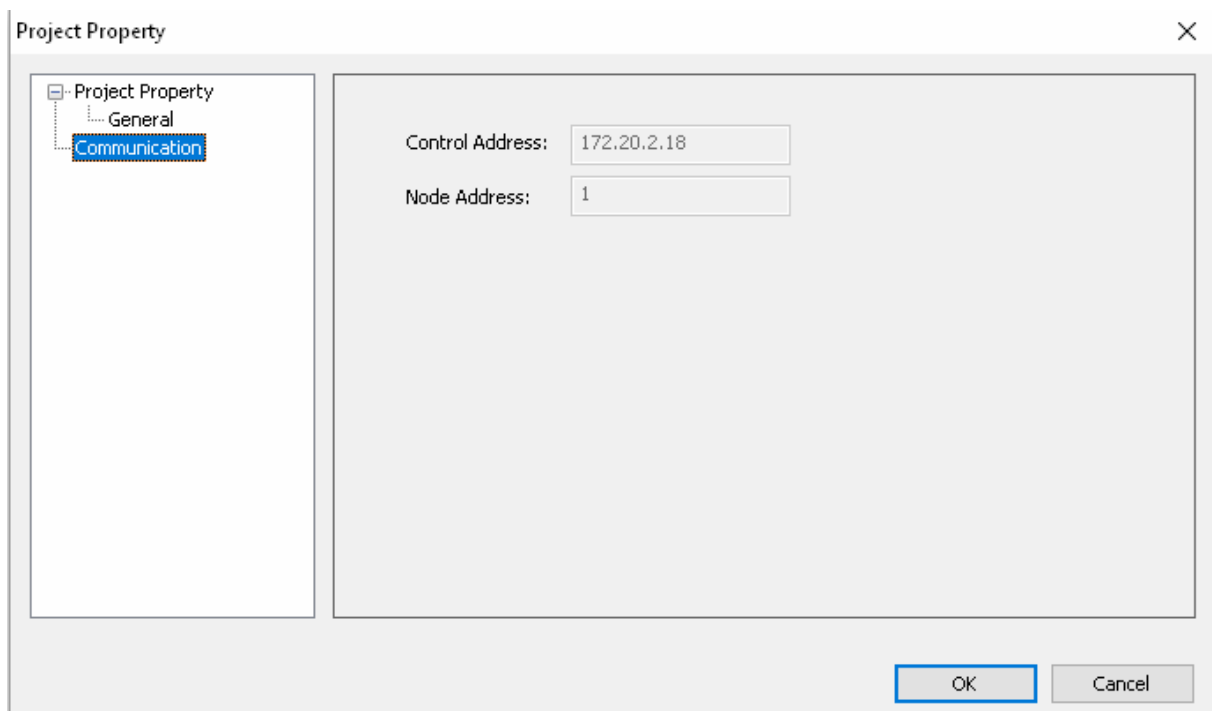


Figure 9-1 Communication properties

Section 10 Revision History

Table 10-1 Revision history

Version	Applicable product model	Remarks
V1.0 (20230318)	OMC High-performanceHMI V4.70.00.00	First release.
V1.1 (20230830)	OMC High-performanceHMI V5.10.00.00-M	Updated screenshots.