

**OMC System Software**

**High-performanceHMI**






**Diagnosis Software**

**User Manual**

**IM41S74-E**

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

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# Diagnosis Software User Manual

## Section 1 Function Feature

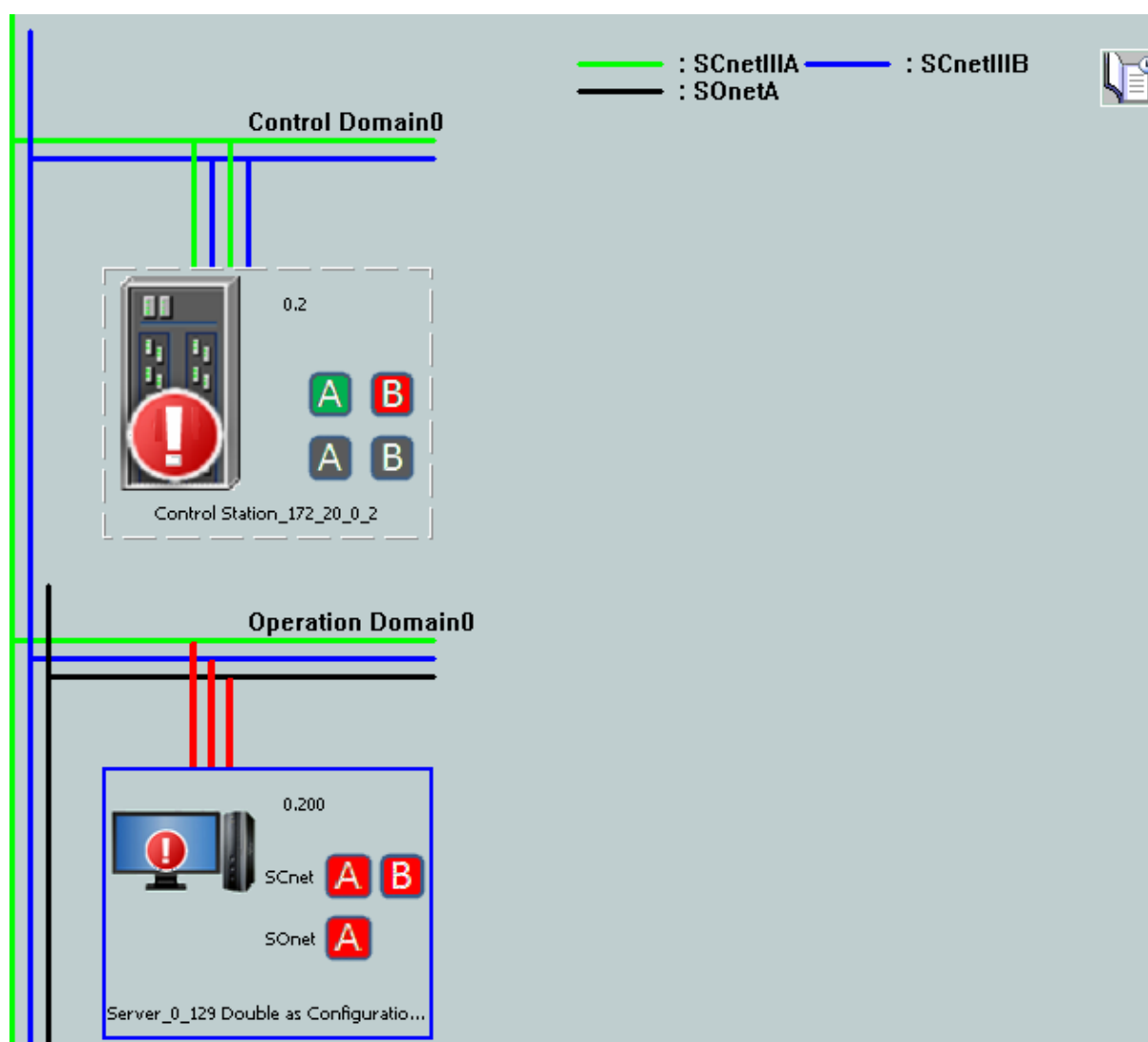
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System Status Diagnosis is a significant function of the High-performanceHMI System Software, and is an important tool for system debugging and status analysis. System status diagnosis mainly consists of 2 parts: real-time status supervision and history record query. The main objects of real-time status supervision include the running status and communication situation of system components such as operation domain, control domain, process control domain, control station, controller, communication node, I/O module, etc. History record query can check the faults which occur in the control station during a certain time, and display their information including occurring moment, device, address, diagnosis result and recovery time, etc.

## Section 2 Introduction to View

Select “System Status” command in toolbar of real-time monitoring software and the main view of the system status diagnosis will be displayed, as shown in Figure 2-1. The history records of system network structure, control station, operation station, controller, process control network, communication node, I/O module status as well as the whole system status can be observed in each view of system status diagnosis.

As the figure below, the control system uses the network of SCnetIIIA and SCnetIIIB to communicate with operation domain. Thus, network line mark and network topology in the figure only display the network of SCnetIIIA and SCnetIIIB.



**Figure 2-1 Main View of the System Status**

System diagnosis software supports to diagnose the network in project configuration, the system and various node devices subordinated to the system and operation domain.

## 2.1 View Description

- Network Structure view (main view of the system status)

User can check the whole operation status and the communication among all system nodes connected to current operation domain.
- Control Station view

User can check the information of each node (cabinet) about the power supply, fan, temperature and the like within the control station.
- Controller view

User can check the information of running status, hardware, configuration, communication, version, statistics, time record and local I/O connection module.
- Process Control Network view

User can check the diagnosis data of controller network port, hardware address and protocol address of the controller, protocol address of the network time synchronization server, network connection status, network node overloaded alarming, and IP node conflict alarm.
- Communication Node view

User can check devices type, request communication, configuration status, startup status, redundancy configuration, work status, power supply status, L-BUS communication status, E-BUS communication status.
- IO module view

User can check the work status of IO modules, level of module faults, module auxiliary power supply, Module link check, module address check, module bus communication status, module type consistency check, module configuration consistency check, and channel status.
- Operator Station (Engineer Station) view

User can check types, currently running configuration information, computer operation information of the operator station (engineer station).
- History view

User can check the history record of system status, shown as figure below.

Current Search Condition(s)		Time[2015-09-09_00:00/2015-11-09_09:23]:Details [All]:		Pre	Next	Quick Find	Find	Refresh	Export
Raised Time	Device	Address	Diagnose Result	Fault Level	Status	Cleared Time	Parameter		
2015-11-09_09:47:28	Node	0-4-0(Left)	0#1#Rack L-BUS B ... Fault				00000000		
2015-11-09_09:47:28	Node	0-4-0(Left)	0#1#Rack L-BUS A ... Fault				00000000		
2015-11-09_09:35:19	PC	0-247	Diagnosis Service St... Prompt				563FF854		
2015-11-06_17:55:53	Main Controller	0-4	Controller Lost	Serious Fault	Doubt...		00000000		
2015-11-06_17:55:53	Main Controller	0-2	Controller Lost	Serious Fault			00000000		
2015-11-06_16:27:10	PC	0-247	Operation Station Ti... Fault		Doubt...		00000000		
2015-11-06_16:23:53	Node	0-4-0(Left)	0#1#Rack L-BUS B ... Fault		Doubt...		00000000		
2015-11-06_16:23:53	Node	0-4-0(Left)	0#1#Rack L-BUS A ... Fault		Doubt...		00000000		
2015-11-06_16:22:39	PC	0-247	Diagnosis Service St... Prompt				563C634C		
2015-11-06_11:59:44	Main Controller	0-4	Controller Lost	Serious Fault	Doubt...		00000000		
2015-11-06_11:59:44	Main Controller	0-2	Controller Lost	Serious Fault	Doubt...		00000000		
2015-11-06_09:39:33	PC	0-247	Diagnosis Service St... Prompt				563C04D2		
2015-11-05_16:02:22	PC	0-247	Diagnosis Service St... Prompt				563B0D0B		
2015-11-05_15:17:50	PC	0-247	Diagnosis Service St... Prompt				563B029B		
2015-11-05_13:15:42	PC	0-247	Diagnosis Service St... Prompt				563AE5FB		
2015-11-05_12:53:51	Node	0-4-0(Left)	0#1#Rack L-BUS A ... Fault		Doubt...		00000000		
2015-11-05_12:53:51	Node	0-4-0(Left)	0#1#Rack L-BUS B ... Fault		Doubt...		00000000		
2015-11-05_11:06:26	PC	0-247	Diagnosis Service St... Prompt				563AC7AF		
2015-11-05_09:00:53	PC	0-247	Operation Station Ti... Fault		Doubt...		00000000		
2015-11-05_08:55:57	PC	0-247	Diagnosis Service St... Prompt				563AA91B		
2015-11-05_02:48:28	PC	0-247	Diagnosis Service St... Prompt				563A52FA		
2015-11-05_02:46:36	Main Controller	0-4	SNTP Fault	Warning	Doubt...		00000000		
2015-11-05_02:46:36	PC	0-247	OS Configuration In... Prompt				00000002		
2015-11-05_02:41:23	PC	0-247	Switch to Master Do... Prompt				000009C4		

**Figure 2-2 System Status History Record Query**



**Tip:**

Click “Export” button in the figure above. The history record of system status can be exported as the form of .csv file.

## 2.2 Buttons and Status Markers Instruction

All buttons in system status view are interpreted in Table 2-1.

**Table 2-1 Buttons instruction**





Button	Instruction
	Real-time/history alternation button
	Turn to the main view of system status
	Turn to upper view

All the status markers are interpreted in Table 2-2.



Following icons refer to different fault status of diagnosis item. Operation node, controller, IO connection module and IO module correspond to some diagnosis items separately, which will be shown in interfaces of system status diagnosis software. For example, when faults occur to controller or IO module, corresponding icons will be shown in the main interface of cabinet. Each diagnosis item corresponds to a fault level, which include options 100, 200, 300 and above 300. the fault level of 100 is normal, and has no icon.

**Table 2-2 Status markers instruction**

Button	Instruction
	Component is in serious fault status (fault level is 300 or above).
	Component is out of communication.
	Component is in fault status (fault level is 200~300, not include 300).
	Component is in unknown status.

## 2.3 Instruction of All Kinds of Status Indicator Light

### 2.3.1 Indicator Lights on the Controller Panel

**Table 2-3 Indicator lights on the controller panel**

Name	Status and Instruction
Hardware fault indicator light (Fault)	Off: Controller hardware is normal. Red: Controller hardware has fault.
Status indicator light (Status)	On: Configuration is normal. Twinkling: Controller configuration is abnormal, or updating, or recovering.
Redundancy work indicator light (Duplex)	Green: In Operation Off: Standby
Network indicator light (SCnet)	Green: Dual-net is normal, its communication CPU exchange with SCnet is normal and has no address conflict. Off: Interruption in dual-net, or interaction fault between controller's CPU and SCnet communication CPU Twinkling: Interruption of single network or Ethernet address conflict
Extended bus indicator light	Green: Dual-net is normal. Off: Fault in dual-net, or interaction fault between controller's CPU and I/O communication CPU Twinkling: Fault in single network.
Local bus indicator light (L-Bus)	Green: Dual-net is normal Off: Fault in dual networks, or interaction fault between controller's CPU and IO communication CPU. Fault in one pair of local I/O bus. Twinkling: Fault in single network.

## 2.3.2 Indicator Lights on the I/O Link Module Panel

**Table 2-4 Indicator lights on the I/O link module panel**

Name	Status and Instruction
Hardware fault indicator light (Fault)	Off: normal Red: hardware fault
Status indicator light (Status)	On: configuration complete Twinkling: not configured
Redundancy work indicator light (Duplex)	On: in operation Off: standby
Extended bus indicator light (E-Bus)	On: normal Off: communication interruption Twinkling: communication abnormal
Local bus indicator light (L-Bus)	On: normal Off: communication interruption Twinkling: communication abnormal

## 2.3.3 Indicator Lights on the I/O Module Panel

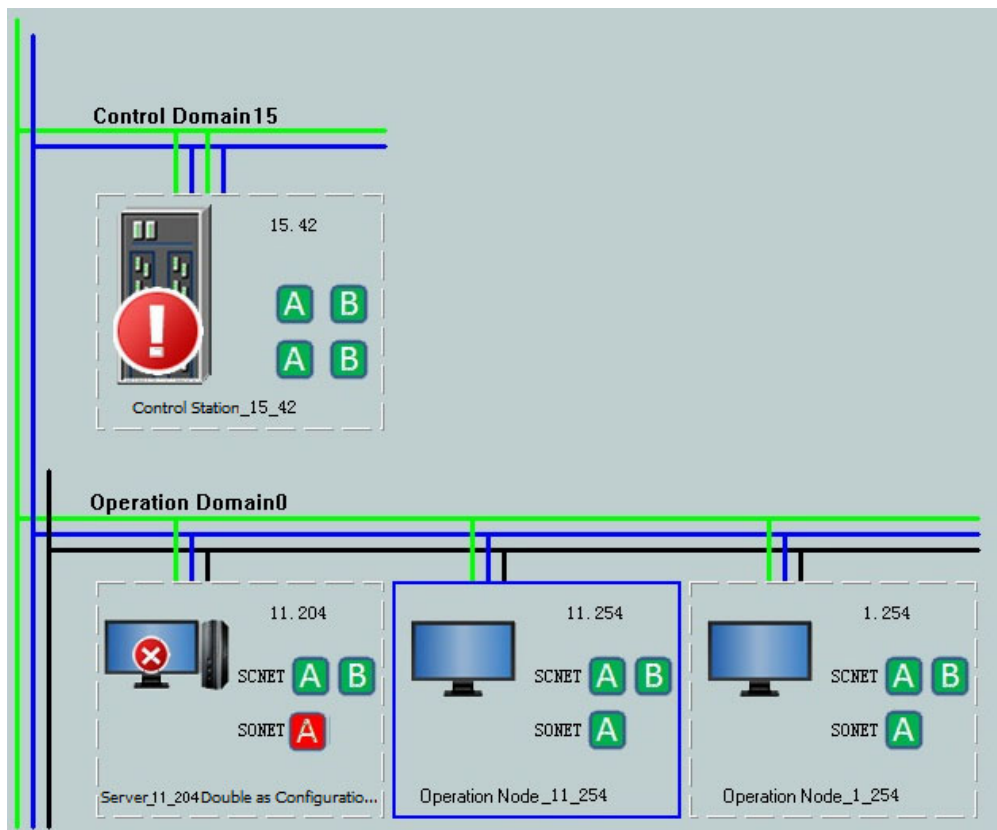
**Table 2-5 Indicator lights on the I/O module panel**

Name	Status and Instruction
Hardware fault indicator light(fault)	Off: normal Yellow: slight fault Red: Serious fault
Status indicator light(Status)	On: normal, started up Off: being started
Redundancy work indicator light (Duplex)	On: in operation Off: standby
Local bus indicator light (L-Bus)	On: normal Off: communication interrupted Twinkling: communication abnormal
Auxiliary power indicator light(Supply)	On: normal Off: auxiliary power abnormal

## 2.4 Status View Entrances

### 2.4.1 Status Diagnosis Views Entrances of Control Station/ Control Station Network/ Operation Nodes

Double click the icon in the system main view and enter the corresponding view, as shown in Figure 2-3.



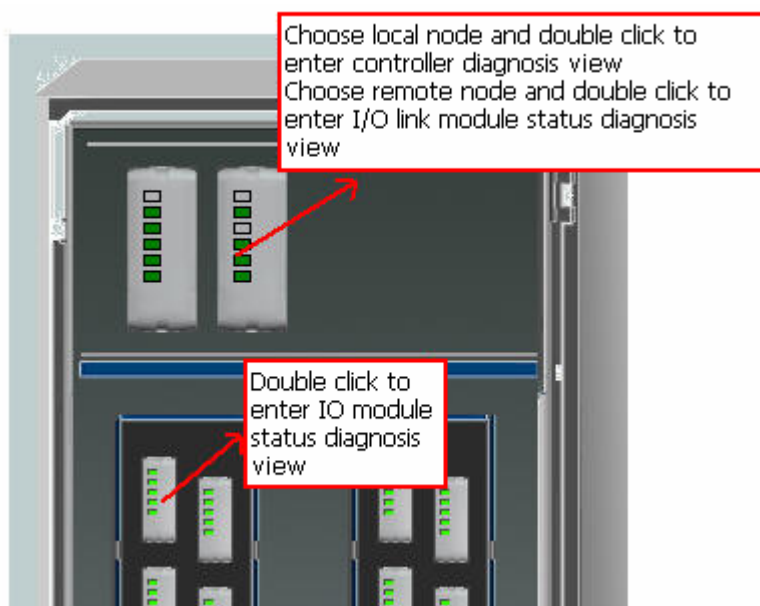
**Figure 2-3 Status Diagnosis View Entrances of Control Station, Control Station Network, and Operation Nodes**

Meaning of lines and icons in the system status view:

- : SCnetIII A
- : SCnetIII B
- : SOnet
- and : refer to the status of SCnetA and SCnetB separately, red means abnormal, green means normal.

#### 2.4.2 Status Diagnosis Views Entrances of Controller/ I/O Link Module/ I/O Module

Double click the graph in the control station view and enter the corresponding view, as shown in Figure 2-4.




**Figure 2-4 Status Diagnosis Views Entrances of Controller, I/O Link Module, and I/O Module**

## 2.5 Enter the Diagnosis View from Tag Panel

The device diagnosis view can be entered from the related tag's Panel.

### 2.5.1 Enter the Diagnosis View from IO Tag Panel

There is the button  on the extend panel of the tags including the AI tags, AO tags, DI tags and DO tags. Click the button, enter the diagnosis view of the IO module related to the IO tag, as shown in the figure below.

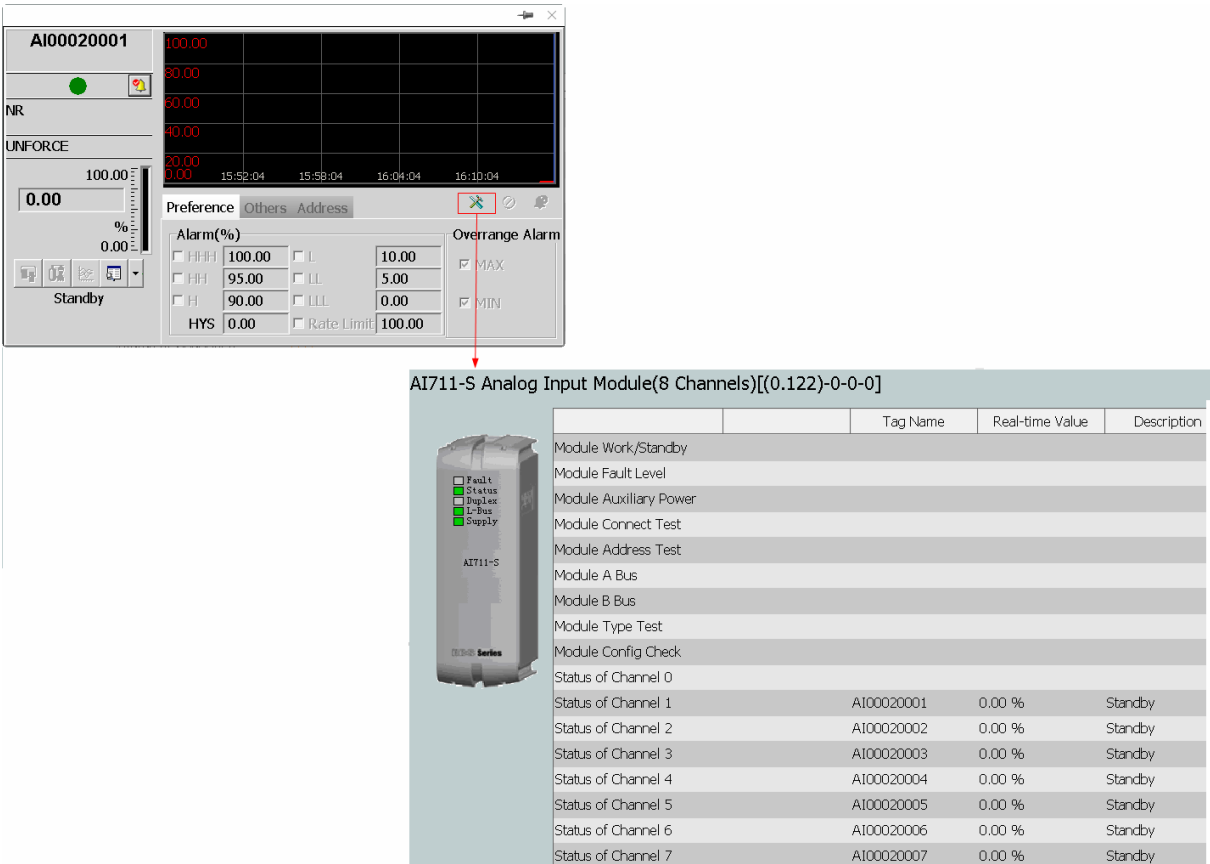



Figure 2-5 Example of Enter the Diagnosis View from IO Tag Panel

There are channel tags and their values in the IO module diagnosis view. Double click the channel, the channel tag's panel will be popup.

2.5.2 Enter the Diagnosis View from Communication IO Tag Panel

There is the button  on the extend panel of the communication tags. Click the button, enter the diagnosis view of the communication module related to the communication tag, as shown as figure below.

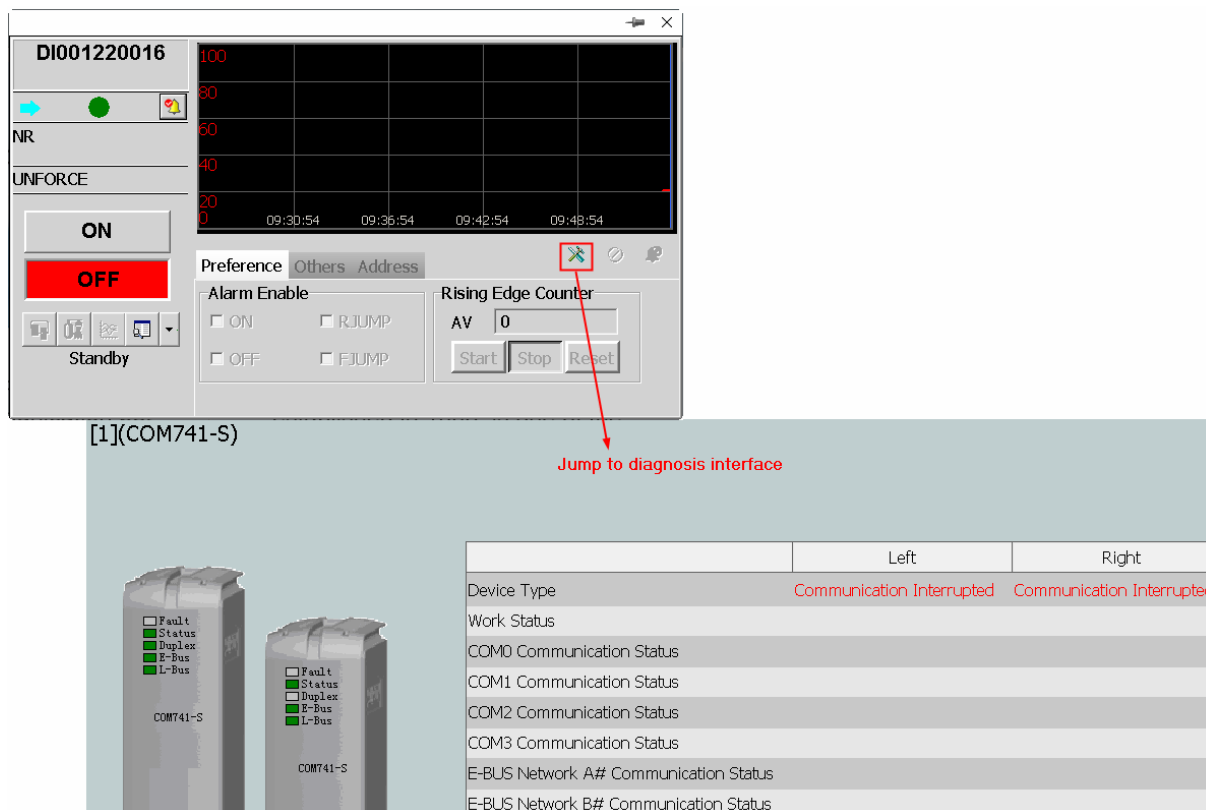


Figure 2-6 Example of Enter the Diagnosis View from Communication IO Tag Panel

## Section 3 System Status

Automatic self-diagnose function exists in processes from signal channel to I/O module, from I/O module to controller, and from control station to operator station (engineer station). Diagnosis results can be displayed by LED lights on the hardware module. Also, these diagnosis results will be transmitted to the operator station (engineer station) immediately to be alarmed, displayed and recorded, in order to assist user in finding and solving the system problems as soon as possible. The control system mainly consists of various types of I/O module, I/O link module, process control network, main controller, operator station (engineer station), and sever. The following parts are instructions of the various statuses which may occur in each unit of the system, combined with corresponding status view.

### 3.1 Network Structure

The system status main view displays the topology of the whole network in current operation domain, as shown in Figure 3-1.

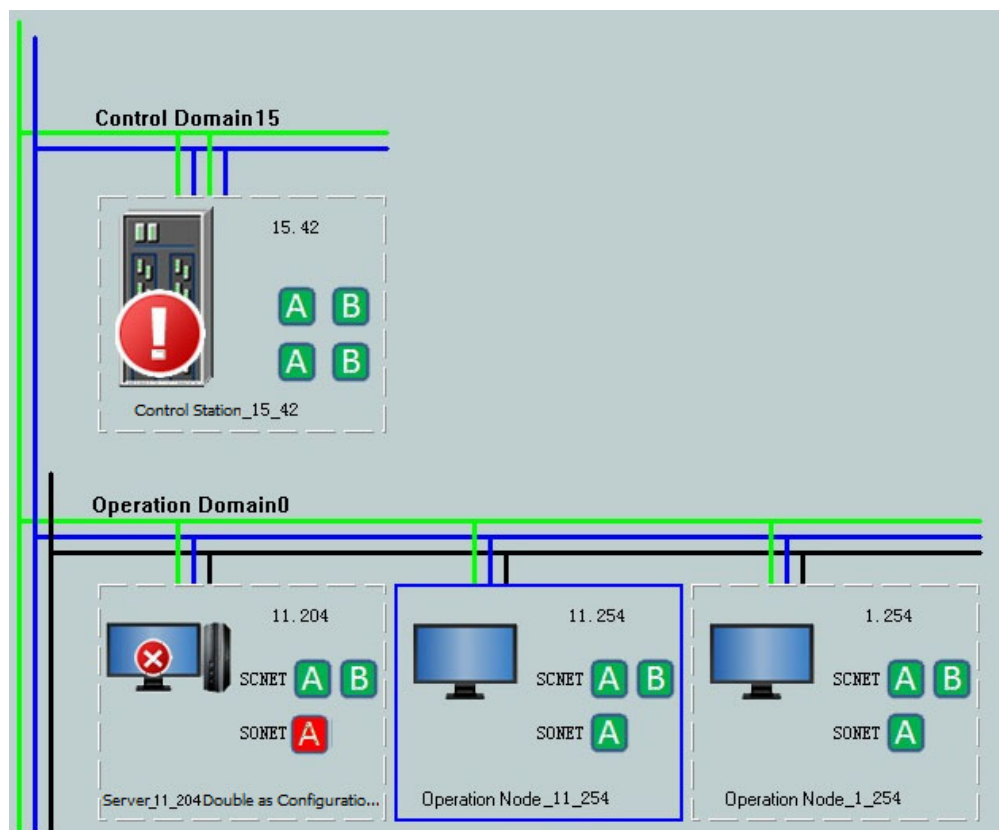


Figure 3-1 Network Topology of the System Status View

### 3.2 Control Station

The control station view displays the current status of local nodes (cabinets) and remote nodes (cabinets), as shown in Figure 3-2.



**Figure 3-2 Control Station Total Information Display**

Control station view mainly displays the status of each node (cabinet) within the control station. User can switch the control stations within current control domain, according to the options on the pull-down menu at the left top corner. Node 0 refers to local node of local control station. Nodes 1~7 mean refer to nodes of local control station. Nodes in fault status are displayed in red (component of node is in serious fault status), and yellow (component of node is in fault status). By selecting a node, status of each I/O module on both front and rear racks of the corresponding cabinet can be displayed. Connection line shows redundancy configuration of I/O module.

If applying DI module to acquire cabinet status (power, fan, temperature alarm), it should be counted in system alarm. The configuration is shown as follows.

1. Name the DI tags according to criterion in tag configuration software, the forma is shown as follows.
  - Fan tag description: fan. Tag name: CABIN\_FAN\_ domain address\_station address\_node number
  - Temperature tag description: temperature. Tag name: CABIN\_TEMP\_ domain address\_station address\_node number



- Power 0 tag description: power 0. Tag name: CABIN\_PWR0\_ domain address\_station address\_node number
- Power 1 tag description: power 1. Tag name: CABIN\_PWR1\_ domain address\_station address\_node number
- Power 2 tag description: power 2. Tag name: CABIN\_PWR2\_ domain address\_station address\_node number
  - Tag description: rack power 0. Tag name: CABIN\_RACK0\_ domain address\_station address\_node number
- Tag description: rack power 1. Tag name: CABIN\_RACK1\_ domain address\_station address\_node number
  - Tag description: rack power 2. Tag name: CABIN\_RACK2\_ domain address\_station address\_node number
  - Tag description: rack power 3. Tag name: CABIN\_RACK3\_ domain address\_station address\_node number

Tag description can be self-defined as required, name above just example. Domain address is indicated by decimal integer of two-digits, station address is indicated by decimal integer of three-digits, and node number is indicated by decimal integer of one-digit.

For example: diagnosis of fan, temperature, power0, power1, power2, rack power0, rack power1, rack power2, rack power3 in domain0, station2, cabinet2 (node number is 1; start from 00), the tags are named as follows:

- CABIN\_FAN\_00\_002\_1
- CABIN\_TEMP\_00\_002\_1
- CABIN\_PWR0\_00\_002\_1
- CABIN\_PWR1\_00\_002\_1
- CABIN\_PWR2\_00\_002\_1
- CABIN\_RACK0\_00\_002\_1
- CABIN\_RACK1\_00\_002\_1
- CABIN\_RACK2\_00\_002\_1
  - CABIN\_RACK3\_00\_002\_1

2. Type some information in "tag description", and it would be displayed in the cabinet diagnosis view of system status diagnosis software.
3. Cabinet status diagnosis tags should not be configured alarm (such as On, OFF alarm), otherwise it would confuse the tag alarm.




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**Tip:**

**When tag values of corresponding tags are OFF, alarm appears; when ON, it turns to normal.**

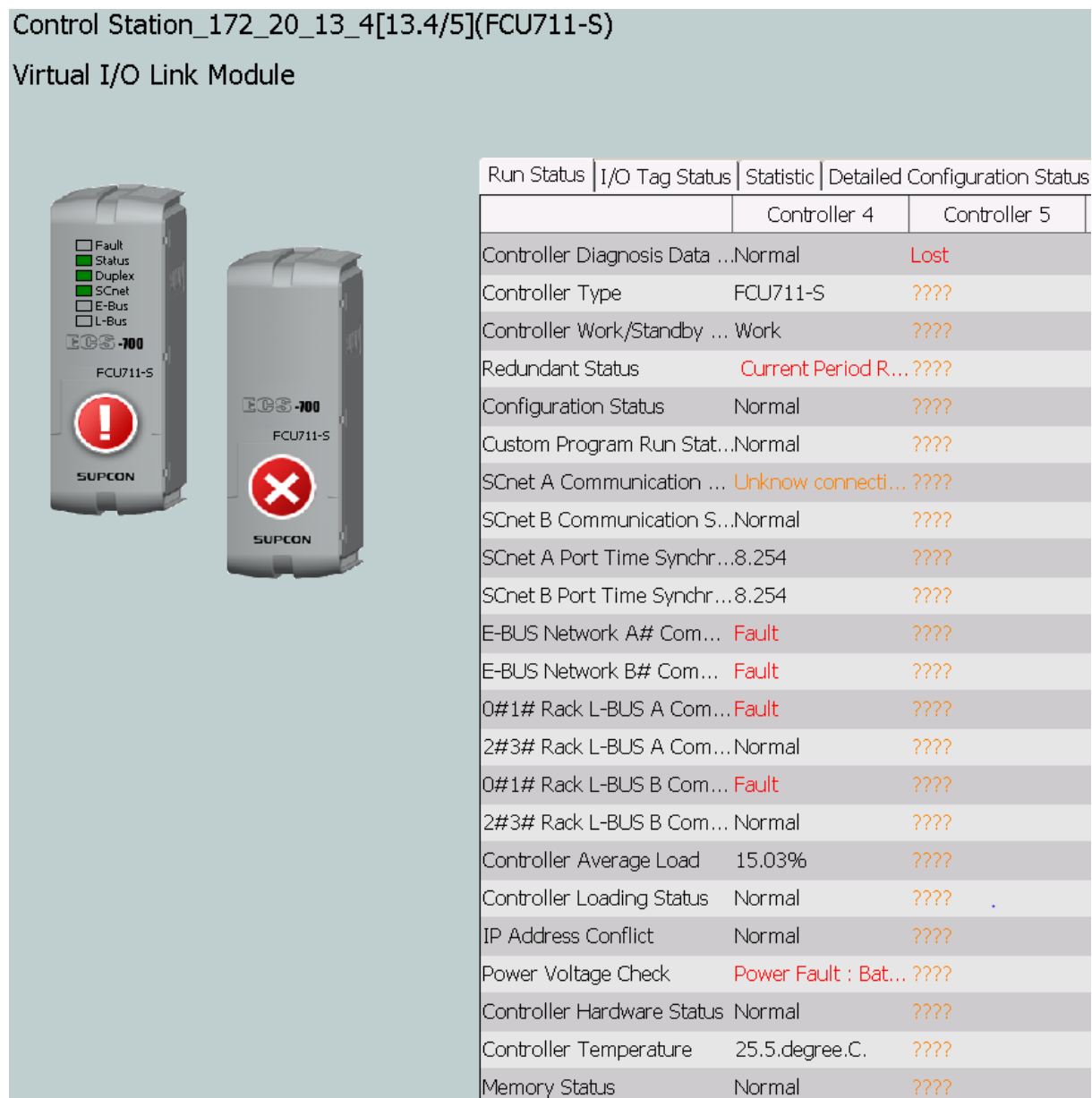
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### 3.3 Controller

Controller diagnosis view clearly displays the work situation of the main controller in current control station. The contents of main controller diagnosis include: running status, I/O tag status, statistics

information, detail configuration status.

Double click the controller figure, and the user can enter the controller diagnosis view. By selecting labels on the controller diagnosis view, user can check various diagnosis information of the main controller, as shown in Figure 3-3.



**Figure 3-3 Main Controller Diagnosis**

### 3.3.1 Running Status

The diagnosis results of main controller running status are shown in Figure 3-3. The meanings, fault reason and troubleshooting are shown below:

**Table 3-1 Running status diagnosis items of controller**

Diagnosis Item	Meaning and Contents	Fault Reason	Troubleshooting
Controller Diagnosis Communication Status	When communication status of controller diagnosis data is normal, parse each diagnosis item. When diagnosis data communication pauses, the controller diagnosis data communication status will show "Pause", and other diagnosis items are shown as "???", which means that no diagnosis data is received.	1. Switch fault 2. Controller SCnet dual-network fault or crisscross 3. Operation station SCnet dual-network fault or crisscross 4. Controller doesn't exist 5. Dial error for controller address	1. If all controllers of the operation station are lost, please check whether the network cards and wires of SCnet-A and SCnet-B are normal. 2. If the same controller in several operation stations is lost, please check whether the controller is existed, the address dial is correct, SCnet is crisscross, and SCnet wire is normal.
Controller Type	When actual hardware controller type is same with configuration, it shows the current control type. When actual hardware controller type is different with configuration, it shows that the types are different.	Actual hardware controller type is different with configuration.	Check actual hardware controller type.
Controller Work/ Standby Status	Reflect the work status of current controller: Work controller shows as work, backup controller shows as backup.	Redundant switch	No need to process if everything is normal.
Redundant Status	Reflect the redundancy of current controller.	1. Power on redundancy is interrupted abnormally. 2. Controller base fault 3. Controller redundant channel hardware fault	1. Perform a whole power on copy for controller with fault when plugging out and inserting again. 2. If fault still exists after plugging controller out and inserting again, change the controller. 3. If fault still exists after changing the controller, change the controller base.

Diagnosis Item	Meaning and Contents	Fault Reason	Troubleshooting
Configuration Status	Reflect the work status of current controller: Configuration normal: normal Configuration fault: fault	1. Configuration download or power on copy is interrupted abnormally. 2. Memory fault of controller saved configuration. 3. Configuration fault, please refer to detail items.	1. If configurations of both 2 redundant controllers are abnormal, please check the configuration and re-download. 2. If configuration of only one controller is abnormal, please plug out the controller and insert again, and check whether the configuration is normal after power on copy is completed. 3. If configuration fault still exists after re-download or power on copy, change the controller.
User Program Running Status	When custom program runs abnormally, it shows abnormal.	1. Custom program configuration error 2. Power on copy stops abnormally. 3. Controller hardware fault	1. Download after checking and modifying configuration. 2. Plug out and insert the controller with fault to perform a whole power on copy. 3. Change controller.
SCnet-A Communication Status	If SCnet-A next connects not smoothly or has network crisscross, it shows fault.	Network fault Controller hardware fault	1. Check network. 2. If not network fault, change controller.
SCnet-B Communication Status	If SCnet-B next connects not smoothly or has network crisscross, it shows fault.	Network fault Controller hardware fault	1. Check network. 2. If not network fault, change controller.
SCnet-A Port Time Synchronization	—	1. Time synchronization server fault 2. Controller SCnet network fault 3. Controller hardware fault	1. Check whether the time synchronization server is normal, and whether the time synchronization for other control station or operation station is normal. 2. Check whether the SCnet wire, port and port connecting switch are normal. 3. Change controller.
SCnet-B Port Time Synchronization	—	1. Time synchronization server fault 2. Controller SCnet network fault 3. Controller hardware fault	1. Check whether the time synchronization server is normal, and whether the time synchronization for other control station or operation station is normal. 2. Check whether the SCnet wire, port and port connecting switch are normal. 3. Change controller.

Diagnosis Item	Meaning and Contents	Fault Reason	Troubleshooting
E-BUS A Net Communication Status	It shows fault when communication between E-BUS A and controller failed.	<ol style="list-style-type: none"> <li>1. A-net wire fault</li> <li>2. A-net chip fault</li> <li>3. A-net port fault in switch</li> <li>4. A-net has network storm</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether A-net wire is normal, replace bad wire.</li> <li>2. Connect other ports of switch.</li> <li>3. Check A-net load, if there is abnormal node sending many data packages, please resolve this problem first.</li> <li>4. Change the controller.</li> </ol>
E-BUS B Net Communication Status	It shows fault when communication between E-BUS B and controller failed.	<ol style="list-style-type: none"> <li>1. B-net wire fault</li> <li>2. B-net chip fault</li> <li>3. B-net port fault in switch</li> <li>4. B-net has network storm</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether B-net wire is normal, replace bad wire.</li> <li>2. Connect other ports of switch.</li> <li>3. Check B-net load, if there is abnormal node sending many data packages, please resolve this problem first.</li> <li>4. Change the controller.</li> </ol>
0#1# Rack L-BUS A Communication Status	L-BUS A communication of 0# and 1# racks is abnormal when fault occurs.	<ol style="list-style-type: none"> <li>1. L-BUS A communication wire fault</li> <li>2. L-BUS A interface fault on controller base</li> <li>3. 0#1# racks aren't inserted by IO module.</li> <li>4. IO rack fault</li> <li>5. Controller L-BUS A communication chip fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fasten the loose L-BUS A wire.</li> <li>2. Check whether pin in L-BUS A wire interface or pin in IO rack L-BUS A interface is normal, if the condition is not good, replace the L-BUS A wire or IO rack.</li> <li>3. If L-BUS A-net and B-net on 0#1# racks both have faults, check whether 0#1# racks are inserted by IO modules.</li> <li>4. Change the controller.</li> </ol>
2#3# Rack L-BUS A Communication Status	L-BUS A communication of 2# and 3# racks is abnormal when fault occurs.	<ol style="list-style-type: none"> <li>1. L-Bus communication wire fault</li> <li>2. L-Bus interface fault on controller base</li> <li>3. 2#3# racks aren't inserted by IO module.</li> <li>4. IO rack fault</li> <li>5. Controller L-BUS A communication chip fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fasten the loose L-Bus wire.</li> <li>2. Check whether pin in L-Bus wire interface or pin in IO rack L-Bus interface is normal, if the condition is not good, replace the L-Bus wire or IO rack.</li> <li>3. If L-BUS A-net and B-net on 2#3# racks both have faults, check whether 2#3# racks are inserted by IO modules.</li> <li>4. Change the controller.</li> </ol>
0#1# Rack L-BUS B Communication Status	L-BUS B communication of 0# and 1# racks is abnormal when fault occurs.	<ol style="list-style-type: none"> <li>1. L-Bus communication wire fault</li> <li>2. L-Bus interface fault on controller base</li> <li>3. 0#1# racks aren't inserted by IO module.</li> <li>4. IO rack fault</li> <li>5. Controller L-BUS B communication chip fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fasten the loose L-Bus wire.</li> <li>2. Check whether pin in L-Bus wire interface or pin in IO rack L-Bus interface is normal, if the condition is not good, replace the L-Bus wire or IO rack.</li> <li>3. If L-BUS A-net and B-net on 0#1# racks both have faults, check whether 0#1# racks are inserted by IO modules.</li> <li>4. Change the controller.</li> </ol>

Diagnosis Item	Meaning and Contents	Fault Reason	Troubleshooting
2#3# Rack L-BUS B Communication Status	L-BUS B communication of 2# and 3# racks is abnormal when fault occurs.	<ol style="list-style-type: none"> <li>1. L-Bus communication wire fault</li> <li>2. L-Bus interface fault on controller base</li> <li>3. 2#3# racks aren't inserted by IO module.</li> <li>4. IO rack fault</li> <li>5. Controller L-BUS B communication chip fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Fasten the loose L-Bus wire.</li> <li>2. Check whether pin in L-Bus wire interface or pin in IO rack L-Bus interface is normal, if the condition is not good, replace the L-Bus wire or IO rack.</li> <li>3. If L-BUS A-net and B-net on 2#3# racks both have faults, check whether 2#3# racks are inserted by IO modules.</li> <li>4. Change the controller.</li> </ol>
Controller Average Load	Show average load of controller.	—	—
Controller Load Status	Show CPU load real-time.	<ol style="list-style-type: none"> <li>1. Configuration is oversize.</li> <li>2. Custom program phase layout is unreasonable.</li> <li>3. Custom programming is unreasonable.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check the configuration, if points and custom program numbers are both oversize, please change the configuration.</li> <li>2. Adjust the phase layout of custom program, to equilibrate loads.</li> <li>3. Check whether the custom program has programming error like endless loop, if yes please modify the configuration and re-download.</li> </ol>
IP Address Conflict Status	Judge the address conflict of controller node IP address on SCnet-A and SCnet-B.	IP address dial of 2 non-redundant controller in the same network is same.	<ol style="list-style-type: none"> <li>1. Open the cabinet to find the controller with flashing SCnet light.</li> <li>2. Check whether the SCnet dual-net is correct, if yes, the controller has address conflict.</li> <li>3. Check whether the address dial of controller is correct.</li> <li>4. Modify controller IP address as designed.</li> </ol>
Power Voltage Check <sup>Note1</sup>	Controller will detect battery voltage, I/O pin voltage, CPU core voltage, 24VA power voltage and 24VB power voltage. If fault is found, it shows that the corresponding voltage is abnormal.	<ol style="list-style-type: none"> <li>1. Controller battery fault <ol style="list-style-type: none"> <li>a. Not install battery.</li> <li>b. Battery is installed wrong.</li> <li>c. Not move the battery insulated gasket.</li> <li>d. Hardware circuit fault</li> </ol> </li> <li>2. 24V A/B fault <ol style="list-style-type: none"> <li>a. Power fault</li> <li>b. Controller hardware fault</li> </ol> </li> </ol>	<ol style="list-style-type: none"> <li>1. Battery fault <ol style="list-style-type: none"> <li>a. Check whether battery is installed correct.</li> <li>b. Check whether the battery insulated gasket has been moved.</li> <li>c. Change battery.</li> <li>d. Change controller.</li> </ol> </li> <li>2. 24V A/B fault. <ol style="list-style-type: none"> <li>a. Check whether power wire is loose.</li> <li>b. Check whether power module has fault.</li> <li>c. Change controller.</li> </ol> </li> </ol>

Diagnosis Item	Meaning and Contents	Fault Reason	Troubleshooting
Controller Hardware Status	Show controller hardware status.	Controller hardware fault	1. Restart controller and check whether it is normal. 2. Change controller.
Controller Temperature	Show real-time controller temperature.	No fault	No need to process if everything in the field is normal.
Memory Status	When controller self-detects fault, it shows SRAM fault, SDRAM fault, FLASH fault, SCNET_DPRAM fault and SBUS_DPRAM fault.	Controller hardware fault	1. Restart controller and check whether it is normal. 2. Change controller.
Controller Time	Show the time of current controller.	No fault	No need to process if everything in the field is normal.
Pulse Per Second Synchronization Status	Display the current status of input PPS of controller.	Input wiring fault of PPS. Time synchronization server fault. Time assign unit fault.	1. Check the time synchronization server working normally or not. 2. Check the LNK711 working normally or not. 3. Check the wiring is ok or not.
SCnet-A Port Hardware Address	Show A port hardware address.	—	—
SCnet-B Port Hardware Address	Show B port hardware address.	—	—

Note: normal ranges for voltages are shown below:

- Battery voltage: when  $T = -10^{\circ}\text{C}$ , alarm in the case of less than 2.5V. If the temperature rise  $10^{\circ}\text{C}$ , the alarming voltage will rise 0.1V, when  $T \geq 20^{\circ}\text{C}$ , alarm in the case of less than 2.8V.
- IO pin voltage : 3.1V~3.5V
- CPU core voltage: 1.7V~1.9V
- 24VA power supply voltage: 18V~35V
- 24VB power supply voltage: 20V~28V

If one voltage is out of the above corresponding range, the corresponding status displays "Abnormal".

### 3.3.2 I/O Tag Status

Hardware information diagnosis view are shown in Figure 3-4.

Run Status	I/O Tag Status	Statistic	Detailed Configuration Status
		Controller 4	Controller 5
AO/DO Tag in Fault Safet...	Yes		Yes
I/O tag in OOS status	No		No
I/O tag in forced status	No		No
Analog Tag Over the Span	No		No
DI Tag Dithering	No		No

**Figure 3-4 I/O tag status**

Diagnosis information meaning, fault reason and troubleshooting of I/O tag status are shown below.

**Table 3-2 Instruction for I/O tag status diagnosis**

Items	Instruction	Fault Reason	Troubleshooting
Whether have AO/DO tags in fault status	Show yes when there are AO/DO tags in controller in fail-safe status.	No fault	No need to process if everything in the field is normal.
Whether have I/O tag in OOS status	Show yes when there is I/O tag in controller in OOS status.	No fault	No need to process if everything in the field is normal.
Whether have I/O tag in force status	Show yes when there is I/O tag in controller in force status.	No fault	No need to process if everything in the field is normal.
Whether have analog tag over-range	Show yes when there is analog tag in controller over-range.	No fault	No need to process if everything in the field is normal.
Whether have DI tag dithering	Show yes when there is DI tag dithering in controller.	No fault	No need to process if everything in the field is normal.

### 3.3.3 Statistics Information

Diagnosis view of statistics information is shown in Figure 3-5.



Run Status	I/O Tag Status	Statistic	Detailed Configuration Status
		Controller 4	Controller 5
Control CPU Software Ver...	1.1.1		1.1.1
SCNet Communication CP...	1.1.9		1.1.9
I/O Communication CPU ...	1.1.A		1.1.A
Controller Reset Time	2000-01-01 00:0...	2000-01-01 00:0...	
Power Interrupted Time	2000-01-01 00:0...	2000-01-01 00:0...	
Controller Cold Start Time	2000-01-01 00:0...	2000-01-01 00:0...	
Controller Warm Start Time	2000-01-01 00:0...	2000-01-01 00:0...	
Controller Reset Mode	Unknown		Unknown
Controller Reset Reason	Unknown		Unknown
Controller Multicast Data ...	6		6

**Figure 3-5 Statistics Information Diagnosis**

**Table 3-3 Instruction for controller statistics information diagnosis**

Items	Instruction
Control CPU Software Version	Show controller software version when leaving factory. The controller version will be shown as "???" when controller diagnosis data communication is interrupted.
SCnet Communication CPU Software Version	Show controller software version when leaving factory. The controller version will be shown as "???" when controller diagnosis data communication is interrupted.
IO Communication CPU Software Version	Show controller software version when leaving factory. The controller version will be shown as "???" when controller diagnosis data communication is interrupted.
Controller Reset Time	Record the latest reset time of controller.
Controller Power off Time	Record the latest power off time of controller.
Controller Cold Startup Time	Record the latest cold startup time of controller.
Controller Warn Startup Time	Record the latest warm startup time of controller.
Controller Reset Mode	Record the latest reset mode of controller. Controller reset mode includes warn startup, cold startup and instant reset: Warn startup refers to power on reset. Cold startup refers to that controller power off time is larger than cold startup time. Instant reset refers to that power off time is less than cold startup time.
Controller Reset Reason	Record the latest reset reason for controller. Reset reasons includes power off, custom program abnormal, delay reset set by program, processor abnormal, software reset, system program update and unknown reason.

Items	Instruction
Controller Multicast Data Package	Record the package number of ordinary multicast data in a multicast period. Update once in each multicast period.

### 3.3.4 Detail Configuration Status

Diagnosis view for configuration information is shown in Figure 3-6.

Run Status	I/O Tag Status	Statistic	Detailed Configuration Status
		Controller 4	Controller 5
Configuration Status Flag	Normal	Normal	Normal
Config Data Status	Normal	Normal	Normal
Config Buffer Data Status	Normal	Normal	Normal
Custom Program Temp D...	Normal	Normal	Normal
Communication Module C...	Normal	Normal	Normal
I/O Module Config Status	Normal	Normal	Normal
Tag Config Status	Normal	Normal	Normal
Custom Program Call List ...	Normal	Normal	Normal
System Function Block Lib...	Normal	Normal	Normal
Industry Function Block Li...	Normal	Normal	Normal
Custom Function Block Li...	Normal	Normal	Normal

**Figure 3-6 Configuration information diagnosis**

Diagnosis information meaning, fault reason and troubleshooting of configuration information are shown below.

**Table 3-4 Instruction for configuration information diagnosis**

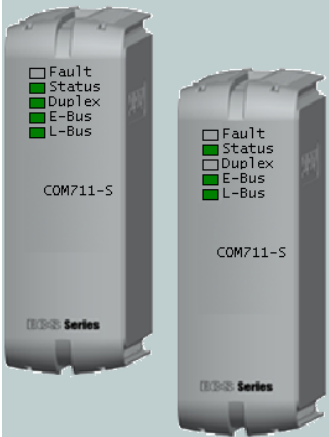
Items	Instruction	Fault Reason	Troubleshooting
Configurati on Status Sign	Reflect the configuration status in controller. It shows configuration fault when there is no configuration in controller or the configuration has fault. Configuration faults include configuration invalid, hardware configuration error, tag configuration error, custom program error, other errors, configuration abnormal caused by power on redundancy, different work/standby configurations.	1. Configuration Lost: never downloaded configuration or was power off when short of battery voltage. 2. Power on copy or configuration download is interrupted abnormally. 3. Controller hardware fault.	1. Re-download configuration. 2. Plug out and insert controller, then perform whole power on copy. 3. Change controller.
Configurati on Data Status	Reflect the configuration data region status of controller. It shows fault when configuration data region is incomplete.	Controller hardware fault.	1. Restart the controller to view its condition. 2. Change controller.

Items	Instruction	Fault Reason	Troubleshooting
Configuration Buffer Data Status	Reflect the configuration buffer region status of controller. It shows fault when configuration buffer region is incomplete.	Controller hardware fault	1. Restart the controller to view its condition. 2. Change controller.
Custom Program Temporary Data Status	It shows fault when stack overflowing caused by abnormal custom program configuration.	Controller hardware fault	1. Restart the controller to view its condition. 2. Change controller.
I/O Connection Module Configuration Status	Reflect the configuration status of current I/O connection module. It shows fault when current configuration of I/O connection module is different with controller.	Hardware fault	Reset Change Module
Custom Program Schedule Table Status	It shows abnormal when custom program schedule table is abnormal.	1. Configuration data in controller is rewritten abnormally. 2. Memory error in controller.	1. If 2 redundant controller both report fault, remove one and perform single module work. Reset the single work controller, then insert the backup controller. 2. Download configuration offline. 3. Change controller.
System Function Block Library Status	Reflect the status of current system function block library. It shows abnormal when function block library self-check has fault.	1. Power on copy or configuration download is interrupted abnormal. 2. Memory error in controller.	1. Re-download configuration or plug out and insert controller, and perform a whole power on copy. 2. Change controller.
Industry Function Block Status	Status of industry current system function block library. It shows abnormal when function block library self-check has fault.	1. Power on copy or configuration download is interrupted abnormal. 2. Memory error in controller.	1. Re-download configuration or plug out and insert controller, and perform a whole power on copy. 2. Change controller.
User Function Block Library Status	It shows abnormal when custom program runs abnormal.	1. Power on copy or configuration download is interrupted abnormal. 2. Memory error in controller.	1. Re-download configuration or plug out and insert controller, and perform a whole power on copy. 2. Change controller.

### 3.4 Remote Communication Node (Take I/O Communication as Example)

I/O communication module is the node of extended I/O bus E-BUS in system, and is the hinge of information transmission between controller and I/O module. The status diagnosis of I/O communication module includes device type, work status, 24Va status, 24Vb status, 0#1# rack L-BUS A communication status, 2#3# rack L-BUS A communication status, 0#1# rack L-BUS B communication status, 2#3# rack L-BUS B communication status, E-BUS A communication status, E-BUS B communication status, redundancy, address conflict, request communication, configuration status and startup status. Diagnosis view is shown in Figure 3-7.

[1](COM711-S)



	Left	Right
Device Type	I/O Connecting M..	I/O Connecting M..
Request Communication	No Request	No Request
Configuration Status	Unconfigured	Unconfigured
Start Status	Started	Started
Redundant Configuration	Redundancy	Redundancy
Work Status	Work	Standby
24Va Status	Normal	Normal
24Vb Status	Normal	Normal
L-BUS0 Communication Status	Normal	Normal
L-BUS1 Communication Status	Normal	Normal
L-BUS2 Communication Status	Normal	Normal
L-BUS3 Communication Status	Normal	Normal
Side Network A# Port Status	Normal	Normal
Side Network B# Port Status	Normal	Normal

**Figure 3-7 Status Diagnosis of I/O Link Module**

Diagnosis information meaning, fault reason and troubleshooting of remote communication node are shown below.

**Table 3-5 Instruction of remote communication node diagnosis**

Items	Instruction	Fault Reason	Troubleshooting
Device TypeNote2	Show device type of IO connection module. It shows fault when real hardware is different with configuration.	Real hardware is different with configuration.	Check consistency of hardware and configuration.
Work Status	Show work/ standby status of current device.	—	—
24Va Status	Show power voltage status. It shows fault when voltage is out of the range 20V~28V.	1. Power Fault 2. Module Hardware Fault	1. Check whether power wire is loose. 2. Check whether power module has fault. 3. Change module.
24Vb Status	Show power voltage status. It shows fault when voltage is out of the range 20V~28V.	1. Power Fault 2. Module Hardware Fault	1. Check whether power wire is loose. 2. Check whether power module has fault. 3. Change module.
0#1# Rack L-BUS A Communication Status	When showing fault, L-BUS A communication in 0# and 1# racks are abnormal.	1. L-BusA communication wire fault in 0#1# racks. 2. L-BusA interface fault in module base. 3. 0#1# racks are not inserted by IO modules. 4. IO rack has fault. 5. Module L-Bus communication chip fault.	1. Check whether 0#1#L-BusA wire is loose, fasten it if yes. 2. Check whether the pins on 0#1#L-BusA wire interface or on L-BusA interface of IO rack are normal. If the condition is not good, please change L-Bus wire or IO rack. 3. If L-BUS A and B nets of 0#1# racks all have faults, check whether 0#1# racks are inserted by IO module. 4. Change IO connection module.

Items	Instruction	Fault Reason	Troubleshooting
2#3# Rack L-BUS A Communication Status	When showing fault, L-BUS A communication in 2# and 3# racks are abnormal.	<ol style="list-style-type: none"> <li>1. L-BusA communication wire fault in 2#3# racks.</li> <li>2. L-BusA interface fault in module base.</li> <li>3. 2#3# racks are not inserted by IO modules.</li> <li>4. IO rack has fault.</li> <li>5. Module L-BUS A communication chip fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether 2#3#L-BusA wire is loose, fasten it if yes.</li> <li>2. Check whether the pins on 2#3#L-BusA wire interface or on L-BusA interface of IO rack are normal. If the condition is not good, please change L-Bus wire or IO rack.</li> <li>3. If L-BUS A and B nets of 2#3# racks all have faults, check whether 2#3# racks are inserted by IO module.</li> <li>4. Change IO connection module.</li> </ol>
0#1# Rack L-BUS B Communication Status	When showing fault, L-BUS B communication in 0# and 1# racks are abnormal.	<ol style="list-style-type: none"> <li>1. L-BusB communication wire fault in 0#1# racks.</li> <li>2. L-BusB interface fault in module base.</li> <li>3. 0#1# racks are not inserted by IO modules.</li> <li>4. IO rack has fault.</li> <li>5. Module L-BusB communication chip fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether 0#1#L-BusB wire is loose, fasten it if yes.</li> <li>2. Check whether the pins on 0#1#L-BusAB wire interface or on L-BusB interface of IO rack are normal. If the condition is not good, please change L-Bus wire or IO rack.</li> <li>3. If L-BUS A and B nets of 0#1# racks all have faults, check whether 0#1# racks are inserted by IO module.</li> <li>4. Change IO connection module.</li> </ol>
2#3# Rack L-BUS B Communication Status	When showing fault, L-BUS B communication in 2# and 3# racks are abnormal.	<ol style="list-style-type: none"> <li>1. L-BusB communication wire fault in 2#3# racks.</li> <li>2. L-BusB interface fault in module base.</li> <li>3. 2#3# racks are not inserted by IO modules.</li> <li>4. IO rack has fault.</li> <li>5. Module L-BusB communication chip fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether 2#3#L-BusB wire is loose, fasten it if yes.</li> <li>2. Check whether the pins on 2#3#L-BusAB wire interface or on L-BusB interface of IO rack are normal. If the condition is not good, please change L-Bus wire or IO rack.</li> <li>3. If L-BUS A and B nets of 2#3# racks all have faults, check whether 2#3# racks are inserted by IO module.</li> <li>4. Change IO connection module.</li> </ol>
E-BUS A Communication Status	Show fault when E-BUS A communication port has fault or unconnected.	<ol style="list-style-type: none"> <li>1. Module bus A fault.</li> <li>2. Controller bus A fault.</li> <li>3. Module hardware fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether module indicator E-busA is normal. If not, check whether wiring is normal.</li> <li>2. If E-busA is normal, check whether controller E-BusA has fault.</li> <li>3. Reset</li> <li>4. Change module</li> </ol>
E-BUS B Communication Status	Show fault when E-BUS B communication port has fault or unconnected.	<ol style="list-style-type: none"> <li>1. Module bus B fault.</li> <li>2. Controller bus B fault.</li> <li>3. Module hardware fault.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether module indicator E-busB is normal. If not, check whether wiring is normal.</li> <li>2. If E-busB is normal, check whether controller E-BusB has fault.</li> <li>3. Reset</li> <li>4. Change module</li> </ol>
Redundancy	Show whether current device is redundant.	—	—
Address Conflict	Show fault when IP address conflicts.	There is module with same dial in the network.	Check indicators of all nodes in network, find out the module shoes indicator is flashing, while EBUS diagnosis 2 channels are both normal, they may be modules with same dial. Check the design and modify the wrong dial address.
Request Communication	Show node communication quest status.	Hardware Fault	<ol style="list-style-type: none"> <li>1. Reset</li> <li>2. Change module</li> </ol>

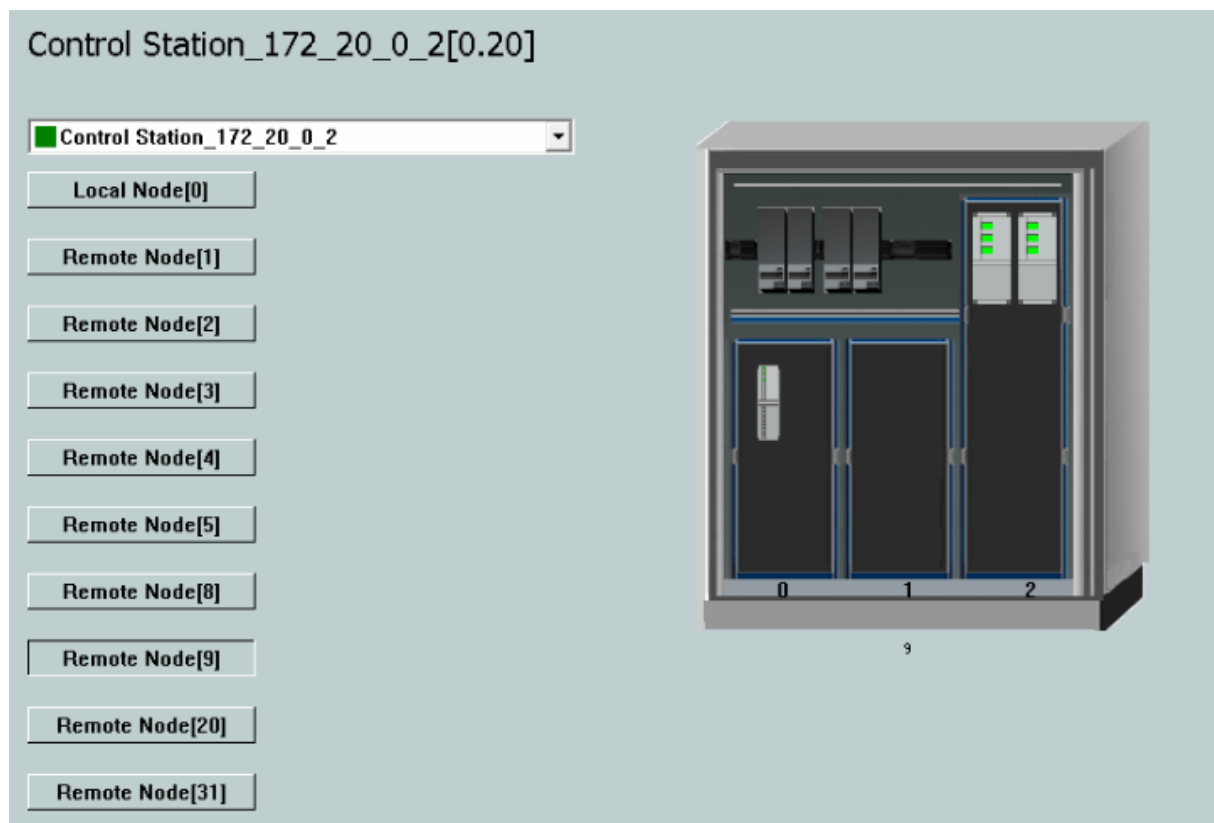
Items	Instruction	Fault Reason	Troubleshooting
Configuration Status	Show whether current device has configuration. It shows "No Configuration" when device has no configuration, and shows "Configured" when device is configured.	Hardware Fault	1. Reset 2. Change module
Startup Status	Show whether the device is started. It shows "Started" when the device has started, and shows "Unstarted" when the device isn't started or has no communication data.	Hardware Fault	1. Reset 2. Change module

Note2: Device types of I/O connection module include I/O communication module, MODBUS communication module, PROFIBUS communication module. The device type will be shown when connected. Different communication modules have different diagnostic information. For details, refer to *Troubleshooting and Maintenance Guide*.

### 3.5 SmartEIO Modules

The SmartEIO module UIO811-S is connected to the system through the I/O link module COM812-S. In the diagnosis software, you can view the status of the SmartEIO modules.

In the diagnostic diagram of the control station where SmartEIO is located, select the remote node where COM812-S is located to enter the SmartEIO diagnostic screen. As shown in the figure below, "Remote Node [9]" is the remote node where COM812-S is located.

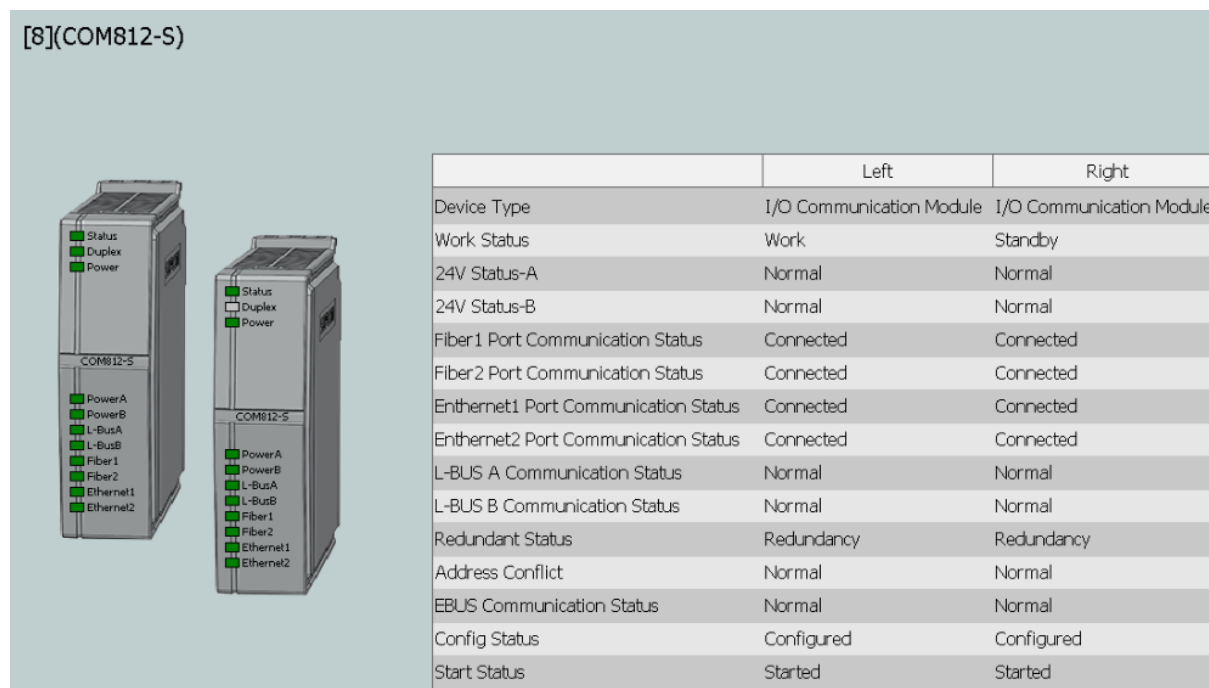


**Figure 3-8 Overview of the status of SmartEIO modules**

The interface shown in the above figure contains the status of both COM812-S and UIO811-S. Please refer to Table 2-2 for the meaning of the status icons. Double-click the module to enter the detailed diagnostic interface of that module.

### Detailed Diagnosis of COM812-S

The detailed diagnostic screen of COM812-S is shown in the following figure.



**Figure 3-9 Detailed diagnostic interface of COM812-S**

The table below lists the detailed diagnostic information of the COM812-S module.

**Table 3-6 Diagnostic information of COM812-S**

Items	Instruction	Fault Reason	Troubleshooting
Device Type	Show device type of IO link module. It shows fault when real hardware is different with configuration.	Real hardware is different with configuration.	Check consistency of hardware and configuration.
Work Status	Show work/standby status of current device.	—	—
24V Status-A	Show power voltage status. It shows fault when voltage is out of the range 20V~28V.	<ul style="list-style-type: none"> <li>Power Fault</li> <li>Module Hardware Fault</li> </ul>	1. Check whether power wire is loose. 2. Check whether power module has fault. 3. Change module.
24V Status-B	Show power voltage status. It shows fault when voltage is out of the range 20V~28V.	<ul style="list-style-type: none"> <li>Power Fault</li> <li>Module Hardware Fault</li> </ul>	1. Check whether power wire is loose. 2. Check whether power module has fault. 3. Change module.
Fiber1/2 Port Communication Status	Displays the status of Fiber 1/2 on the module as connected or disconnected.	<ul style="list-style-type: none"> <li>Interface failure</li> <li>Fiber cable failure</li> <li>Communication object failure.</li> </ul>	If the connection is actually established but it displayed as disconnected, check the fiber connection and communication object.

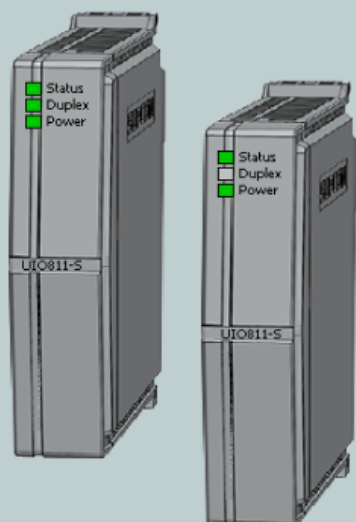


Items	Instruction	Fault Reason	Troubleshooting
Ethernet1/2 Port Communication Status	Displays the status of Ethernet 1/2 on the module as connected or disconnected.	<ul style="list-style-type: none"> <li>● Interface failure</li> <li>● Cable failure</li> <li>● Communication object failure.</li> </ul>	If the connection is actually established but it displayed as disconnected, check the Ethernet connection and communication object.
L-BUS A/B Communication Status	Display the wiring status of the 6-PIN interface of the module as normal or abnormal.	6-PIN interface connection cable	When "Abnormal" is displayed, check the wiring status of the 6-PIN interface.
Redundant Status	Show whether current device is redundant.	—	—
Address Conflict	Show fault when IP address conflicts.	There is a module with same address on the network.	Check indicators of all nodes on the network to see if any EBUS LED is flashing on a module with both EBUS channels being normal. This may be the module with same address. Check the design and correct the wrong address.
EBUS Communication Status	Show the E-Bus cable connection status.	E-Bus connection cable	<ol style="list-style-type: none"> <li>1. If "Abnormal" is displayed, check the E-Bus cable connections, and verify if the switch and communication objects are working properly.</li> <li>2. If fault still persists, it may be a malfunction of the I/O connection module, which should be replaced.</li> </ol>
Config Status	Show whether current device has configuration. It shows "No Configuration" when device has no configuration, and shows "Configured" when device is configured.	Hardware Fault	<ol style="list-style-type: none"> <li>1. Reset</li> <li>2. Change module</li> </ol>
Start Status	Show whether the device is started. It shows "Started" when the device has started, and shows "Unstarted" when the device isn't started or has no communication data.	Hardware Fault	<ol style="list-style-type: none"> <li>1. Reset</li> <li>2. Change module</li> </ol>

### Detailed Diagnosis of UIO811-S

The detailed diagnostic screen of UIO811-S is shown in the following figure.

## UIO811-S Universal I/O Module[(0.20)-8-0-0/1]



	Left	Right
Module Work/Standby	Work	Standby
Module Fault Level	Normal	Normal
Module Auxiliary Power	Normal	Normal
Module Connect Test	Normal	Normal
Module Address Test	Normal	Normal
Module A Bus	Normal	Normal
Module B Bus	Normal	Normal
Module Type Test	Matched	Matched
Module Config Check	Normal	Normal
Status of Channel 0	Normal	----
Status of Channel 1	Normal	----
Status of Channel 2	Normal	----
Status of Channel 3	Normal	----
Status of Channel 4	Normal	----
Status of Channel 5	Normal	----
Status of Channel 6	Normal	----
Status of Channel 7	Normal	----
Status of Channel 8	Normal	----
Status of Channel 9	Normal	----
Status of Channel 10	Normal	----
Status of Channel 11	Normal	----
Status of Channel 12	Normal	----
Status of Channel 13	Normal	----
Status of Channel 14	Normal	----

Figure 3-10 Detailed diagnostic interface of UIO811-S

The table below lists the detailed diagnostic information of the UIO811-S module.

Table 3-7 Diagnostic information of UIO811-S

Items	Instruction	Fault Reason	Troubleshooting
Module Work/Standby	When the module is in operation, it displays "work". When the module is in backup status, it displays "Standby". The backup status is only valid for redundant module and is invalid for non-redundant module.	—	—

Items	Instruction	Fault Reason	Troubleshooting
Module Fault Level	It is classified into three levels: serious fault, slight fault and no fault. When the common channel is damaged, the I/O module function is viewed as invalid, it displays "serious fault". When a channel in module is invalid but not extensive, and the module can remain in operation, it displays "slight fault". When the whole module is normal, it displays "normal".	Hardware Fault	1. Reset 2. Change module
Module Auxiliary Power	When there is no assistant power, it displays "fault". When there is assistant power supply, it displays "normal".	Auxiliary Power Wiring Fault 2. Hardware Fault	Check whether power wiring is loose. Check whether power module has fault. 3. Change module.
Module Connect Test	When the communication between I/O module and I/O link module is normal, it displays "normal". When the communication is interrupted, it displays "module lost".	No Module Bus Fault Hardware Fault	Check whether all slots are inserted by modules in cabinet.
Module Address Test	When there are I/O module address conflicts, it displays "fault". Otherwise, it displays "normal".	Hardware Fault	Reset Change module Change base
Module A/B Bus	When fault occurs to connection line DB15 on the left side of I/O link module or the module is lost, it displays "fault".	Rack Bus A/B Fault Hardware Fault	Check whether all modules in rack have bus A/B fault, if yes, check if the contact of the L-Bus interface is normal and if the L-Bus cable is normal. If fault still exists, re-insert the I/O module. 3. If the above two methods do not work, change the module
Module Type Test	When I/O module installed is consistent with the hardware configuration, it displays "matched". When the I/O module installed is inconsistent with the hardware configuration, it displays "mismatched".	Module type is different with configuration.	Check whether module inserted in cabinet is in same model with configuration.
Module Config Check	When the controller and I/O module configuration check is correct, it displays "Correct". When the configuration check is wrong, it displays "Error".	Hardware Fault	Reset Change module
Status of Channel	When the channel of the I/O module is at fault, such as no signal input or I/O hardware fault, it displays "Invalid". When there is signal input to the I/O module and the input is correct, it displays "Normal". When the module is in backup status, the channel status displays "----". When a channel in configuration is set as not open, it displays "----". Display the tag name, real-time value and description of the channel.	Channel Wiring Fault External Signal Fault 3. Hardware Fault	Check whether wiring is correct. Check whether external signal is normal. 3. Change module.

### 3.6 Heterogeneous Communication Modules and Slave Modules

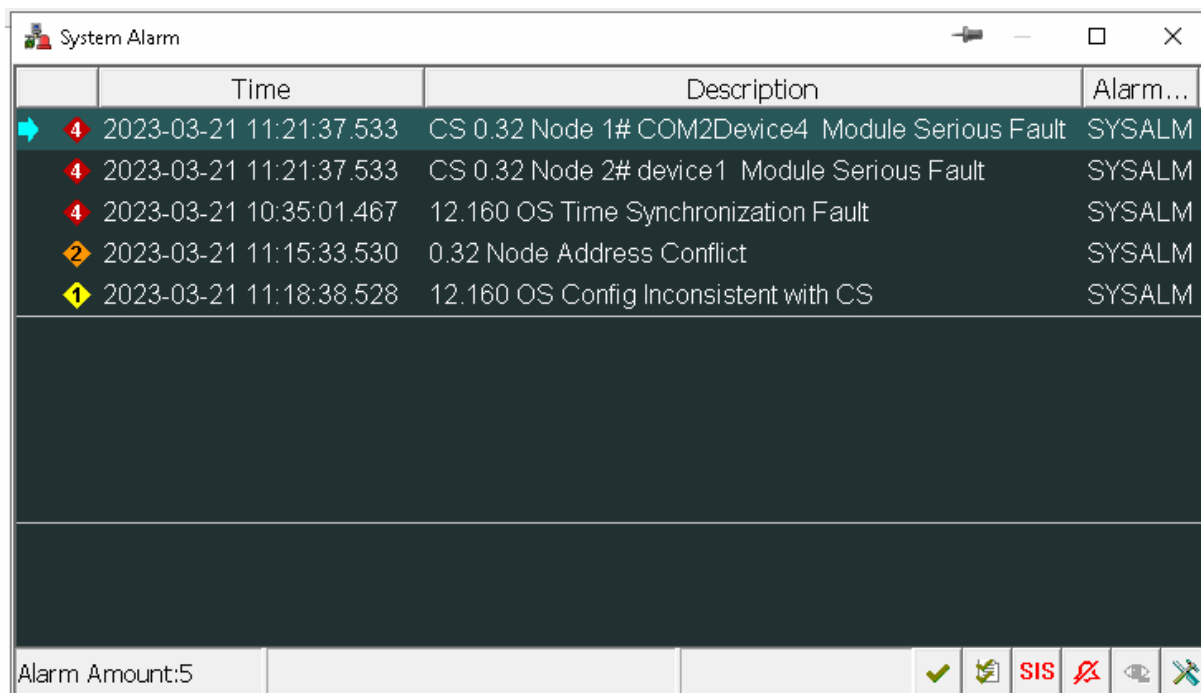
When the system is monitoring field PROFIBUS, PROFINET devices, a heterogeneous communication module is required for the connection of field devices. With the modules in place, the controller can collect the data and working status of field devices. You can view the status in diagnosis software.






#### Diagnosis of Slave Stations of Heterogeneous Communication Network

You can acquire the fault information of COM721-S, COM722-S, COM723-S, COM725-S, COM741-S, COM742-S and their slave devices from system alarm list in High-performanceHMI.

System alarm supports two formats:

- When the description of the slave device is not set:  
Displayed as "control station+communication module address+slave address+fault description". For example, "CS0.32 Node 1# COM2 Device 4 Module Serious Fault" shows the alarm "Module Serious Fault" from COM2 Device 4 (slave address), Node 1# (communication module address), CS 15.2 (control station address).
- When the description of the slave device is set:  
Displayed as "control station+communication module address+slave description+fault description". For example, "CS0.32 Node 1# Device 4 Module Serious Fault" shows the alarm "Module Serious Fault" from Device 4 (slave description), Node 1# (communication module address), CS 15.2 (control station address).



	Time	Description	Alarm...
	2023-03-21 11:21:37.533	CS 0.32 Node 1# COM2Device4 Module Serious Fault	SYSALM
	2023-03-21 11:21:37.533	CS 0.32 Node 2# device1 Module Serious Fault	SYSALM
	2023-03-21 10:35:01.467	12.160 OS Time Synchronization Fault	SYSALM
	2023-03-21 11:15:33.530	0.32 Node Address Conflict	SYSALM
	2023-03-21 11:18:38.528	12.160 OS Config Inconsistent with CS	SYSALM

Alarm Amount:5














Figure 3-11 Example of system alarm list

## Overall Diagnosis over PROFINET Communication Network

The diagnosis software provides the network structure and working diagram of COM723-S module and its slaves. In the figure below, COM723-S is set as the remote node 31. The diagnostics of the communication module, switch, and slave device, as well as the network connection are displayed.

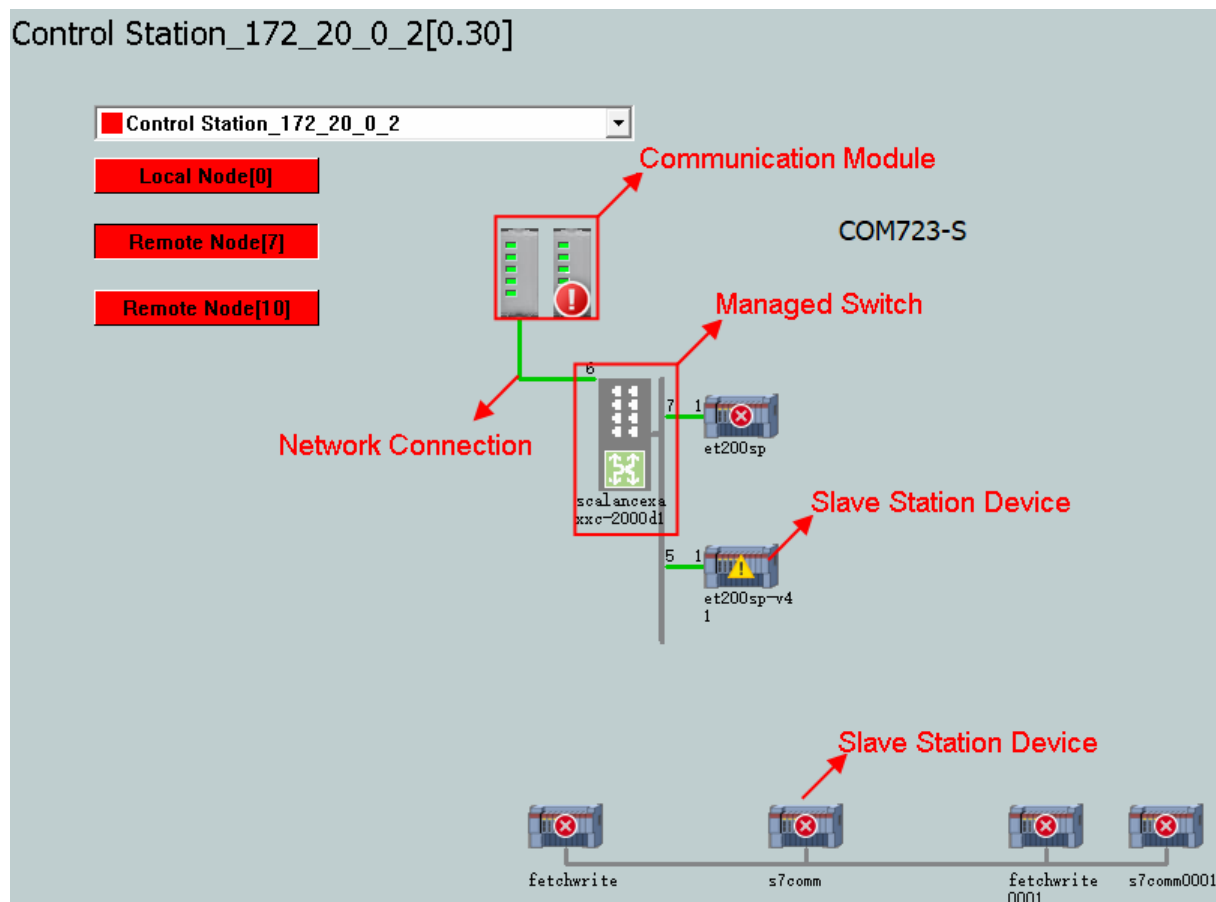


Figure 3-12 PROFINET heterogeneous network diagnosis

## 3.7 I/O Module

I/O module status diagnosis is aimed at conducting status diagnosis to each I/O module installed on control system rack, and delivering diagnoses data for analysis and displaying them in the system status view.

The instruction of status diagnosis of I/O module takes AI711 for example. Diagnosis view is shown in Figure 3-13.

## AI711-S Analog Input Module(8 Channels)[(13.4)-1-0-0]

Virtual I/O Link Module

Virtual I/O Link Module



		Tag Name	Real-time Value	Description
Module Work/Standby	????			
Module Fault Level	????			
Module Auxiliary Power	????			
Module Connect Test	????			
Module Address Test	????			
Module A Bus	????			
Module B Bus	????			
Module Type Test	????			
Module Config Check	????			
Status of Channel 0	????	AI13040008	0.00 %	Standby
Status of Channel 1	????	AI13040009	0.00 %	Standby
Status of Channel 2	????	AI13040010	0.00 %	Standby
Status of Channel 3	????	AI13040011	0.00 %	Standby
Status of Channel 4	????	AI13040012	0.00 %	Standby
Status of Channel 5	????	AI13040013	0.00 %	Standby
Status of Channel 6	????	AI13040014	0.00 %	Standby
Status of Channel 7	????	AI13040015	0.00 %	Standby

**Figure 3-13 Status Diagnosis of AI711**

Diagnosis information meaning, fault reason and troubleshooting of I/O module are shown below.

**Table 3-8 Instruction of I/O module diagnosis**

Items	Instruction	Fault Reason	Troubleshooting
Module Work/Standby	When the module is in operation, it displays "work". When the module is in backup status, it displays "Standby". The backup status is only valid for redundant module and is invalid for non-redundant module.	—	—
Module Fault grade	It is classified into three levels: serious fault, slight fault and no fault. When the common channel is damaged, the I/O module function is viewed as invalid, it displays "serious fault". When a channel in module is invalid but not extensive, and the module can remain in operation, it displays "slight fault". When the whole module is normal, it displays "normal".	Hardware Fault	1. Reset 2. Change module
Module Assistant Power	When there is no assistant power, it displays "fault". When there is assistant power supply, it displays "normal".	1. Auxiliary Power Wiring Fault 2. Hardware Fault	1. Check whether power wiring is loose. 2. Check whether power module has fault. 3. Change module.
Module Connect Test	When the communication between I/O module and I/O link module is normal, it displays "normal". When the communication is interrupted, it displays "module lost".	No Module Bus Fault Hardware Fault	Check whether all slots are inserted by modules in cabinet.
Module Address Test	When there are I/O module address conflicts, it displays "fault". Otherwise, it displays "normal".	Hardware Fault	Reset Change module Change base

Items	Instruction	Fault Reason	Troubleshooting
Module A/B Bus	When fault occurs to connection line DB15 on the left side of I/O link module or the module is lost, it displays "fault".	Rack Bus A/B Fault Hardware Fault	1. Check whether all modules in rack have bus A/B fault, if yes, check if the contact of the L-Bus interface is normal and if the L-Bus cable is normal. 2. If fault still exists, re-insert the I/O module. 3. If the above two methods do not work, change the module
Module Type Test	When I/O module installed is consistent with the hardware configuration, it displays "matched". When the I/O module installed is inconsistent with the hardware configuration, it displays "mismatched".	Module type is different with configuration.	Check whether module inserted in cabinet is in same model with configuration.
Module Configuration Check	When the controller and I/O module configuration check is correct, it displays "Correct". When the configuration check is wrong, it displays "Error".	Hardware Fault	Reset Change module
Channel Status	When the channel of the I/O module is at fault, such as no signal input or I/O hardware fault, it displays "Invalid". When there is signal input to the I/O module and the input is correct, it displays "Normal". When the module is in backup status, the channel status displays "----". When a channel in configuration is set as not open, it displays "----". Display the tag name, real-time value and description of the channel.	1. Channel Wiring Fault 2. External Signal Fault 3. Hardware Fault	1. Check whether wiring is correct. 2. Check whether external signal is normal. 3. Change module.

### 3.8 Operator Station (Engineer Station)

Operator station (engineer station) diagnosis is to diagnose all the operation nodes in current operation domain and judge whether all operator stations (engineer station) and servers are running normally.

User can enter an operation node diagnosis view by double clicking the corresponding operation station (engineer station) or sever in system status view.

The contents of diagnosis include type, software version, operation domain name, host name, operation team name, user name, current configuration ID, operation system, free configuration disk space (M), CPU Usage, all physical memory, used physical memory, system time synchronization, consistency with configuration server, configuration consistency with control station, master sever IP and slave server IP of operation domain, validity of synchronization server, SCnet A communication, SCnet B communication, SOnet A communication. Diagnosis view of data server (operation station) is shown in Figure 3-14.

Server_0_130 Double as Configuration Server	
Type	Server, History Data Server, Config Server
Version	VisualField V3.20.01.00
Operation Domain	[OA0]local
Computer Name	ES645923
Operation Team	Team0001
User	Admin
Current Config ID	12F4CC467D1240EA4DFFF6B97D9B58DB
Operation System	Windows Server 2008 (64-bit)
Disk Free Space(M)	159029M
CPU Usage	0%
All Physical Memory(M)	2045M
Use Physical Memory(M)	1747M
System Time Synchroniza...	Synchronization
Consistency with Config S...	Consistent
Config Consistent with CS	8.4
Configuration Data Consis...	Unknown:zhenghaojia
Master Server	172.30.16.184
Slave Server	Unconfigured
Time Synchronization Ser...	Normal
Record Status of Trend Se...	Normal

**Figure 3-14 Data Server (Operator Station) Diagnosis**

Diagnosis information meaning, fault reason and troubleshooting of operation station are shown below.

**Table 3-9 Instruction of operation station diagnosis**

Items	Instruction	Fault Reason	Troubleshooting
Type	Describe server contents, such as configuration server and history data server, etc.	—	—
Software Version	Describe software version.	—	—
Operation Domain Name	Describe operation domain name.	—	—
Host Name	Describe host name.	—	—
Operation Team Name	Describe operation team name.	—	—
User Name	Current user name.	—	—
Current Configuration ID	Describe current configuration ID.	—	—
Operation System	Describe Operation System model.	—	—
Free Configuration Disk Space (M)	Small free configuration disk space for running configuration may cause fault in monitoring software.	—	—



Items	Instruction	Fault Reason	Troubleshooting
CPU Usage	CPU load on operator station (engineer station) will influence the performance of monitoring software, high load for long time may cause fault in monitoring software.	—	—
All Physical Memory (M)	All available physical memory.	—	—
Used Physical Memory (M)	Current used physical memory.	—	—
System Time Synchronization	Show time synchronization of operator station (engineer station) and control station.	1. Current operation station time isn't synchronized. 2. A controller time isn't synchronized (parameter is control station address).	1. Check whether the time of operation station is correct. If it is wrong, please check whether "Operation Station Time Synchronization" is normal. If it is abnormal, please process as "Operation Station Time Synchronization Abnormal". 2. If "Operation Station Time Synchronization" is normal, please check the time synchronization of specified controller, please process as "Controller Time Synchronization Abnormal".
Consistency With Configuration Server	Show consistency of running configuration of operator station (engineer station) with configuration server.	1. Configuration server does not publish all after updating configuration. 2. Operation network fault in the operation station. 3. CfgDown process fault in the operation station or configuration server.	1. Publish configuration for the operation station. 2. Check whether operation network of operation station is normal. 3. Restart CfgDown.exe in configuration server if all operation stations in the domain have prompts. If only some operation stations have prompts, Restart CfgDown.exe on those operation stations.
Configuration Consistency With Control Station	Show consistency of running configuration with control station.	1. Controller doesn't download the latest configuration. 2. Configuration of operation station isn't published as the latest, while controller has been downloaded by other operation station.	1. Download the latest configuration to controller. 2. Check whether the operation station has latest configuration, if not, please publish the configuration.
Master Server IP of Operation Domain	Show master server IP of operation domain.	—	—
Slave Server IP of Operation Domain	Show slave server IP of operation domain.	—	—


Items	Instruction	Fault Reason	Troubleshooting
Validity of Synchronization Server	Show invalid if time synchronization server cannot be found.	<ol style="list-style-type: none"> <li>1. Time synchronization server isn't set.</li> <li>2. Synchronization program in time synchronization server.</li> <li>3. SCnet and SOnet fault connecting time synchronization server.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether the network communication of operation station is normal, if not, please restore the network fault as "Network Communication Fault".</li> <li>2. Check whether the time server address in system configuration is correct, if not, please modify the configuration.</li> <li>3. Check whether SCnet or SOnet of time server communicate normally, if not, please restore the network fault as "Network Communication Fault".</li> <li>4. Check whether the time synchronizations of other operation stations are correct, if yes, restart the VFTIMEsync.exe of operation station with fault. If all other operation stations have fault, restart the VFTIMEsync.exe of time synchronization server.</li> <li>5. Contact SUPCON to view the time synchronization program log.</li> </ol>
SCnet A Communication	Operation station SCnet A communication fault.	<ol style="list-style-type: none"> <li>1. Whether the wiring of operation station A port is normal.</li> <li>2. Whether the switch connecting operation station A port is normal.</li> <li>3. Operation station IP settings are wrong.</li> <li>4. Whether there is only one operation station in whole segment, i.e. no other device communicate with it.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether the wiring of SCnet-A port, wire and switch connecting SCnet-A port is correct.</li> <li>2. Check whether IP of operation station is set correct.</li> <li>3. Whether no other device communication (maybe only one operation station is configured in the field, or other devices are all interrupted). This case doesn't matter.</li> </ol>
SCnet B Communication	Operation station SCnet B communication fault.	<ol style="list-style-type: none"> <li>1. Whether the wiring of operation station B port is normal.</li> <li>2. Whether the switch connecting operation station B port is normal.</li> <li>3. Operation station IP settings are wrong.</li> <li>4. Whether there is only one operation station in whole segment, i.e. no other device communicate with it.</li> </ol>	<ol style="list-style-type: none"> <li>1. Check whether the wiring of SCnet-B port, wire and switch connecting SCnet-B port is correct.</li> <li>2. Check whether IP of operation station is set correct.</li> <li>3. Whether no other device communication (maybe only one operation station is configured in the field, or other devices are all interrupted). This case doesn't matter.</li> </ol>

Items	Instruction	Fault Reason	Troubleshooting
SOnet A Communication	Operation station net A communication fault.	1. Whether the wiring of operation station A port is normal. 2. Whether the switch connecting operation station A port is normal. 3. Operation station IP settings are wrong. 4. Whether there is only one operation station in whole segment, i.e. no other device communicate with it.	1. Check whether the wiring of SOnet-A port, wire and switch connecting SOnet-A port is correct. 2. Check whether IP of operation station is set correct. 3. Whether no other device communication (maybe only one operation station is configured in the field, or other devices are all interrupted). This case doesn't matter.
XX component	Displays the status of each component. If the key service or process of this component is running, "Server" is displayed. Otherwise, "/" is displayed.		

## 3.9 History Record

User can query the history status diagnosis records of operation domain and control domain. Specifically, user can query the diagnosis result by setting the start-time, end-time and station address.

### 3.9.1 View History Record

- Click  (switch button for real-time/ history) to open the system status history record search interface, as shown in



**Figure 3-15 System status history record**

- Click "Find" to pop up the system history status filter interface, as shown in Figure 3-16.

**Figure 3-16 System status history record filter**

3. Select time, content and position as required and click “OK”.
4. Pop up the filter results shown in Figure 3-17.

Current Search Condition(s) Time[2015-09-09 00:00:00/2015-11-09 09:49:23]::Details [All]:

Raised Time	Device	Address	Diagnose Result	Fault Level	Status	Cleared Time	Parameter
2015-11-09_09:47:28	Node	0-4-0(Left)	0#1#Rack L-BUS B ...	Fault			00000000
2015-11-09_09:47:28	Node	0-4-0(Left)	0#1#Rack L-BUS A ...	Fault			00000000
2015-11-09_09:35:19	PC	0-247	Diagnosis Service St...	Prompt			563FF854
2015-11-06_17:55:53	Main Controller	0-4	Controller Lost	Serious Fault	Doubt...		00000000
2015-11-06_17:55:53	Main Controller	0-2	Controller Lost	Serious Fault			00000000
2015-11-06_16:27:10	PC	0-247	Operation Station Ti...	Fault	Doubt...		00000000
2015-11-06_16:23:53	Node	0-4-0(Left)	0#1#Rack L-BUS B ...	Fault	Doubt...		00000000
2015-11-06_16:23:53	Node	0-4-0(Left)	0#1#Rack L-BUS A ...	Fault	Doubt...		00000000
2015-11-06_16:22:39	PC	0-247	Diagnosis Service St...	Prompt			563C634C
2015-11-06_11:59:44	Main Controller	0-4	Controller Lost	Serious Fault	Doubt...		00000000
2015-11-06_11:59:44	Main Controller	0-2	Controller Lost	Serious Fault	Doubt...		00000000
2015-11-06_09:39:33	PC	0-247	Diagnosis Service St...	Prompt			563C04D2
2015-11-05_16:02:22	PC	0-247	Diagnosis Service St...	Prompt			563B0D0B
2015-11-05_15:17:50	PC	0-247	Diagnosis Service St...	Prompt			563B029B
2015-11-05_13:15:42	PC	0-247	Diagnosis Service St...	Prompt			563AE5FB
2015-11-05_12:53:51	Node	0-4-0(Left)	0#1#Rack L-BUS A ...	Fault	Doubt...		00000000
2015-11-05_12:53:51	Node	0-4-0(Left)	0#1#Rack L-BUS B ...	Fault	Doubt...		00000000
2015-11-05_11:06:26	PC	0-247	Diagnosis Service St...	Prompt			563AC7AF
2015-11-05_09:00:53	PC	0-247	Operation Station Ti...	Fault	Doubt...		00000000
2015-11-05_08:55:57	PC	0-247	Diagnosis Service St...	Prompt			563AA91B
2015-11-05_02:48:28	PC	0-247	Diagnosis Service St...	Prompt			563A52FA
2015-11-05_02:46:36	Main Controller	0-4	SNTP Fault	Warning	Doubt...		00000000
2015-11-05_02:46:36	PC	0-247	OS Configuration In...	Prompt			00000002
2015-11-05_02:41:23	PC	0-247	Switch to Master Do...	Prompt			000009C4

Total:240

**Figure 3-17 System status history record filter results**

Contents in system status history record contains following items:

- Diagnosed device types of control domain in history records of system status include PC, controller, node, I/O module and so on.
- Types of address of system status history record including:
  - When the device is main controller or PC, the address type is “Domain Address-Station Address.”
  - When the device is node, the address type is “Domain Address-Station Address-Node Address in the Station”.
  - When the device is I/O module, the address type is “Domain Address-Station Address-Node Address in the Station-Rack Serial Number-Module Address”.
  - When the device is redundant device, it distinguished by L (left side) and R (right side).
- The specific faults occur to device at current address are listed in the diagnose items, including control network fault, each diagnosed item of main controller, each diagnosed item of node and each diagnosed item of I/O module.
- The diagnosis result column displays the judgment corresponding with currently diagnosed device.
- Fault Levels include “Prompt”, “Warning”, “Fault” and “Serious Fault”, the seriousness increases one by one.
- When a record is “Suspicious”, it will be shown in “Status” bar, other status will not be shown.
- The parameters in history records of system status are recorded in hex. Details of system status parameters are shown in Table3-10.

**Table3-10 System parameter table**

Diagnosed Items	Parameter Definition
Control network communication interruption	Controller communication diagnosis count
All IO module faults	Module address(0~15)
IO module channel fault	Channel address
Node fault	IO link module address(0~7)
User program configuration fault	Controller upload the original data
Controller reset(cold, warm)	Reset reason 0: Unknown reason 1: System program update 2: Software reset 3: Reset resulted from abnormality 4: Delay reset set by the program 5: Custom program 6: Power-failure

For example:

Diagnosed Items	Parameter Definition	Meaning
Local SCnetA Communication interruption	001DDA3C	Local SCnetA Communication interruption 1956412 times
Configuration Inconsistency between Operator Station and Control Station	00000A02	Domain 10, Station 2 Configuration Inconsistency
Operator Station Communication Interruption	0000BDE3	Operator Station Communication Interruption 48611 times

While querying the history records of system status, user needs to input the start-time, end-time, and select the target station address, then click "Find" button. Then the view will display all history records which satisfy the query settings. After user clicks each label on the history record view, the records can be sorted in corresponding way.

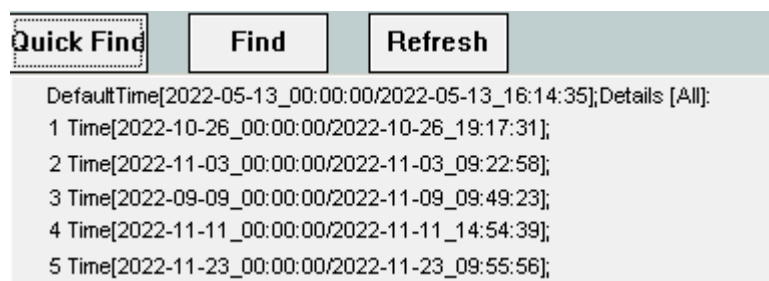


**Tip:**

The generation time or restore time will not be recorded when they cannot be accessed, only contents like address, diagnosis items, diagnosis result and parameter can be recorded.

### 3.9.2 Search History Record Quickly

The search strategy used will be recorded in system status history record search interface, and can be reused by "Quick Search" for history record next time.



**Figure 3-18 Quick search system history status**

## 3.10 Diagnosis FF System

The FF diagnosis system can be used to diagnose the FF H1 interface module, FF H1 network and FF devices.

User can enter the system diagnosis interface by selecting the "System Status" from the menu bar of monitoring interface. Double click the FF H1 interface module AM712-S in the system diagnosis interface to enter the FF diagnosis interface, as shown in Figure 3-19.

### 3.10.1 Main interface

The diagnosis screen of FF system is shown in Figure 3-19.

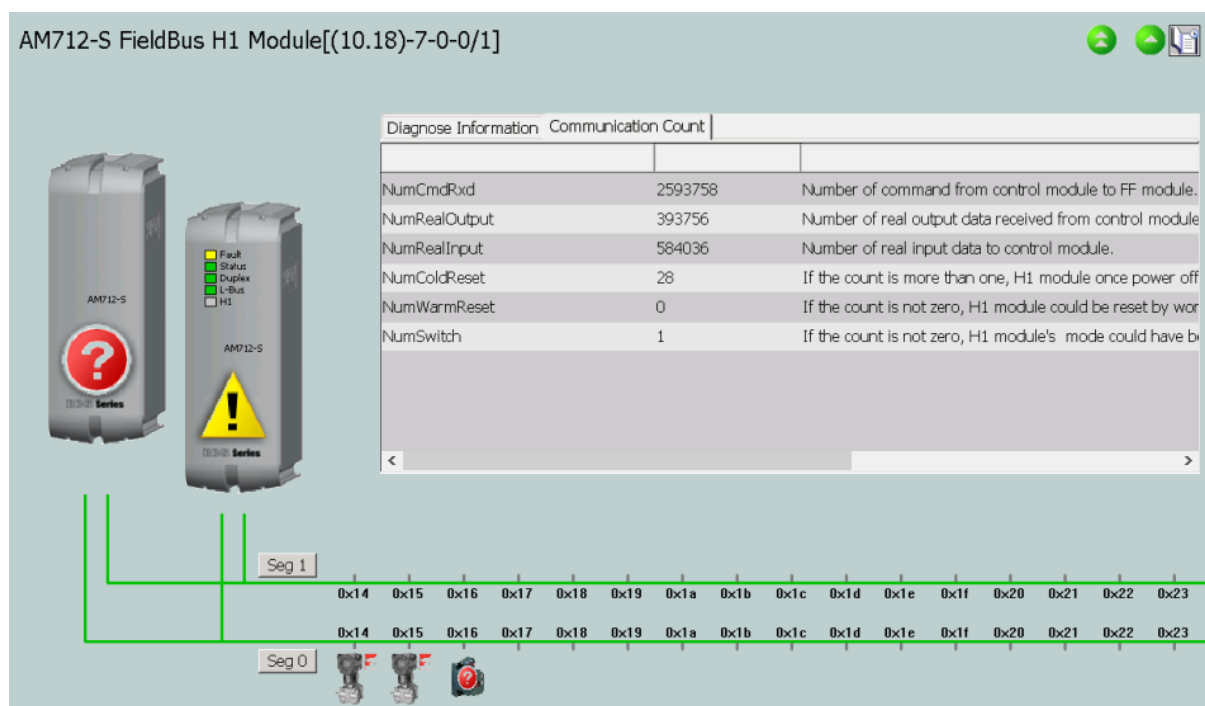


Figure 3-19 FF system diagnosis interface

### 3.10.2 Diagnose FF H1 Interface Module AM712-S

The diagnosis information of AM712-S contains basic information of modules and communication statistics. In the Control station view of system diagnosis software, double click the corresponding position of AM712-S in the cabinet to enter the diagnosis interface.

#### Basic Information

The basic diagnosis information interface of AM712-S is displayed in Figure 3-20.

Diagnose Information	Communication Count	
	Left	Right
Module Work/Standby	????	Work
Module Fault Grade	????	Slight Fault
Module Auxiliary Power	????	Fault
Module Connect Test	Module Lost	Normal
Module Address Test	????	Normal
Module A Bus	????	Normal
Module B Bus	????	Normal
Module Type Test	????	Matched
Module Config Check	????	Right

**Figure 3-20 Basic diagnosis information of AM712-S**

The following information is mainly included in the diagnosis interface.

Diagnosis Item	Description
Left side	Diagnosis information of FF H1 interface module on the left of control station cabinet.
Right side	Diagnosis information of FF H1 interface module on the right of control station cabinet. The FF system shown in Figure 3-20 does not have interface module on the right side, so the content shown in the right column is "???". The standby FF H1 interface module is not currently deployed, so the content displayed in the right column is "???".
Module Work/standby	Diagnose whether the AM712-S is a working module or standby module.
Module Fault Grade	Divide into light faults and heavy faults.
Module Auxiliary Power	Divide into fault and normal.
Module Connect Test	There are two types of normal and loss. Only the FF H1 interface module on the left side is deployed in Figure 3-20, so the result of "module connection detection" on the right side is "module loss".
Module A Bus	Display the bus condition of L-BUS A
Module B Bus	Display the bus condition of L-BUS B
Module Type Test	Display "match" or "unmatch". Indicate that the module type is consistent or inconsistent with module type in the configuration.
Module Config Check	Display "right" or "wrong". Indicate whether the configuration within the module is consistent with the configuration within the controller.

### communication statistics

The communication statistic interface of AM712-S is shown in Figure 3-21.



Diagnose Information Communication Count		
NumCmdRxd	2593758	Number of command from control module to FF module.
NumRealOutput	393756	Number of real output data received from control module
NumRealInput	584036	Number of real input data to control module.
NumColdReset	28	If the count is more than one, H1 module once power off
NumWarmReset	0	If the count is not zero, H1 module could be reset by wor
NumSwitch	1	If the count is not zero, H1 module's mode could have be

**Figure 3-21 Communication statistic interface of AM712-S**

The following communication statistics are mainly included in statistic interface.

Statistic Item	Description
NumCmdRxd	Display the total number of management commands received by AM712-S from the software and controller.
NumRealOutput	The received data of AM712-S sent by the controller FCU712.
NumRealInput	The received data of FCU712 sent by the controller AM712-S.
NumColdReset	Record the number of cold start of AM712-S
NumWarmReset	Record the number of hot start of AM712-S
NumSwitch	Record the number of redundant module switching when the module has a redundant switch.

### 3.10.3 Diagnose FF Network

The diagnostic information of FF network mainly contains the status information of network and the statistics of packet count on the network. The diagnosis view of FF network can be accessed by double-clicking "Network 0" or "Network 1" in the FF system diagnosis interface. The diagnosis screen is shown in Figure 3-22.

Seg 0 [(10.18)-7-0-0-0]

Reset

Segment Diagnose Information

NetWork Status	Normal	
NumFMSInitsReqSent	444	Number of Initiated requests that from H1 card to fieldbus device. If the count is increasing steadily only
NumFMSInitsPosConRxd	442	Number of initiates positive confirmation from fieldbus device to h1 card.Normally, It is equal to NumFMSInitsReqSent
NumFMSInitsNegConRxd	0	Number of initiate negative confirmation from fieldbus device to h1 card. Because of VCR Configuration'
NumAbortSent	404	Number of abort sent to fieldbus device. If the count is increasing steadily only on single device, then th
NumAbortRxd	4	Number of abort sent to fieldbus device. Normally, the number is zero.If the count is increasing steadily
NumServRequestSent	662244	Number of request sent to fieldbus device. Normally the count is equal to NumServPosConRxd. If this
NumServPosConRxd	586073	Number of serve positive responses from fieldbus device to H1 card.Normally the count is equal to Nu
NumServNegConRxd	76146	Number of serve negtive responses from fieldbus device to H1 card.
NumRequestTimeOut	0	Number of H1 card's request timeouts because of no responses from live fieldbus device. If the count is
StackError	0	Number of invalid PDUs from fieldbus.If the count is not zero, then the device's stack could be with conf
NumAckEventNotifySent	76221	If the count is increasing , means the fieldbus device has alerts.
NumH1LinkPowerOff	0	If count is increasing steadily, segment may have communication problems.
NumDLRecQueueFull	0	Total number of data link packets overloaded because received buffer in H1 card was full. If count is inc
NumAllPDUsSent	48154224	Total number of PDU sent to fieldbus.Normally, the number is increasing steadily. If the number keep s
NumPDUsSentFail	0	Total number of sent PDUs to fieldbus fail.Normally, the number is zero. If the number is increasing ste
NumAllPDUsRxd	22563908	Total number of PDU received from fieldbus.Normally, when fieldbus powered and has devices, the num
NumErrorPDU Rxd	45	Number of Err PDU received from fieldbus.If the number is increasing, H1 card may have communicac

Figure 3-22 FF system diagnosis information

Diagnose Item	Description
NetWork Status	The work status of FF H1 network. For example, the bus is not powered.
NumFMSInitsReqSent	<p>The total number of packets sent by the FF device to the AM712-S, requesting to establish connection.</p> <ul style="list-style-type: none"> <li>The count of single FF device continues to increase and may be due to the abnormal FF device.</li> <li>The count of multiple FF devices increases and may be due to the abnormal FF H1 network.</li> </ul>
NumFMSInitsPosConRxd	<p>The total number of positive response packets that FF device send s to the AM712-S to establish connection.</p> <ul style="list-style-type: none"> <li>If the difference between the count and the NumFMSInitsReqSent in FF device continues to increase, the device may be abnormal.</li> <li>If the difference between the count and NumFMSInitsReqSent of multiple FF devices continues to increase, the FF H1 network may be abnormal.</li> </ul>
NumFMSInitsNegConRxd	<p>The total number of negative response packets that the FF device sends to AM712-S to establish connection.</p> <ul style="list-style-type: none"> <li>The count of single FF device continues to increase and may be due to the abnormal FF device.</li> <li>The count of multiple FF devices increases and may be due to the abnormal FF interface device.</li> </ul>
NumAbortSent	<p>The total number of packets sent by AM712-S to the FF device for the disconnect request.</p> <ul style="list-style-type: none"> <li>The count of single FF device continues to increase and may be due to the abnormal FF device.</li> <li>The count of multiple FF devices increases and may be due to the abnormal FF network.</li> </ul>

Diagnose Item	Description
NumAbortRxd	<p>The total number of packets sent by the FF device to the AM712-S meter for the disconnect request. Usually, the FF device does not actively disconnect.</p> <ul style="list-style-type: none"> <li>● The count of single FF device continues to increase and may be due to the abnormal FF device.</li> <li>● The count of multiple FF devices increases and may be due to the abnormal FF H1 network.</li> </ul>
NumServRequestSent	<p>The acknowledgement service request count sent by the FF H1 interface module, includes the system management service request and the FMS request service, and does not include the establishment of connection request and the service request of broadcast type. Usually the count is equal to NumServPosConRxd.</p> <ul style="list-style-type: none"> <li>● If the difference between the count and the NumFMSInitsReqSent in FF device continues to increase, the device may be abnormal.</li> <li>● If the difference between the count and NumFMSInitsReqSent of multiple FF devices continues to increase, the FF H1 network may be abnormal.</li> </ul>
NumServPosConRxd	<p>The total number of positive response packets sent by the FF device to AM712-S. Usually the count is equal to NumFMSInitsReqSent.</p> <ul style="list-style-type: none"> <li>● If the difference between the count and the NumFMSInitsReqSent in FF device continues to increase, the device may be abnormal.</li> <li>● If the difference between the count and NumFMSInitsReqSent of multiple FF devices continues to increase, the FF H1 network may be abnormal.</li> </ul>
NumServNegConRxd	<p>The total number of reply negative response packets sent by the FF device to the AM712-S service request. If the mode of FF function block is automatic, the FF device replies to the negative response of the write service.</p>
NumRequestTimeOut	<p>The FF device data link layer is online, but there is no corresponding number of service requests. The count of single FF device continues to increase and may be due to the abnormal FF device. The count of multiple FF devices increases and may be due to the abnormal FF network.</p>
StackError	<p>The total number of error packets received by AM712-S for the FF device. If the count is not 0, it indicates that the communication stack of the FF device has a consistency error. Please contact the FF device vendor.</p>
NumAckEventNotifySent	<p>The total number of alarm packets that the FF device broadcasts to the bus. When there is broadcast type alarm information of the FF device on the FF H1 network, the count is increased.</p>
NumH1LinkPowerOff	<p>If the count continues to increase, it indicates that there is a connection problem on the FF H1 network.</p>
NumDLRecQueueFull	<p>The count increases when the number of buffers of FF H1 interface module needs to be increased and the processing speed needs to be increased.</p>
NumAllPDUssent	<p>The count continues to increase under normal circumstances. When the FF H1 interface module is abnormal or the FF H1 network is abnormally powered, the count is no longer increased.</p>
NumPDUsSentFail	<p>The number of failures that the FF H1 interface module sends packets to the FF H1 network. The count is 0 under normal circumstances. When the FF H1 interface module is abnormal, the count continues to increase.</p>

Diagnose Item	Description
NumAllPDUsRxd	<p>The count of packets on the FF H1 network received by FF H1 interface module.</p> <ul style="list-style-type: none"> <li>● The count continues to increase when there is a connected FF device on the FF H1 network.</li> <li>● When the count of single FF device does not increase, it may be that the FF H1 interface module is abnormal or the FF device communication is abnormal.</li> <li>● When the count of multiple FF devices does not increase, the FF H1 interface module may be abnormal.</li> </ul>
NumErrorPDURxd	<p>The count of error packets received by the FF H1 interface module. When the count continues to increase, the data reception of FF H1 interface module may be abnormal, the signal of FF H1 network may be interfered, and the instrument connected to the FF H1 network may exceed the load (16 units).</p>

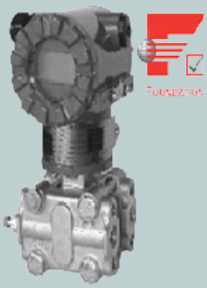
### 3.10.4 Diagnose FF device

The diagnostic information of FF device mainly include basic information and diagnostic information of instruction communication. The FF device diagnostic view can be accessed by double-clicking on the specific FF device in the FF system diagnosis interface. The diagnosis screen is shown in Figure 3-23.

#### Basic Information

The basic information of FF device is shown in Figure 3-23.

ABB\_001F\_A [(10.18)-7-0-0-0-0x15]



Device Basic Information	Device Diagnose Information
Device ID	000320001F0000003K65...
PD Tag	ABB_001F_A ...
DeviceLink Type	Master Device
Manufacturer	ABB Instrumentation
Device Type	TTX300
Device Revision	0x01
DD Revision	0x01

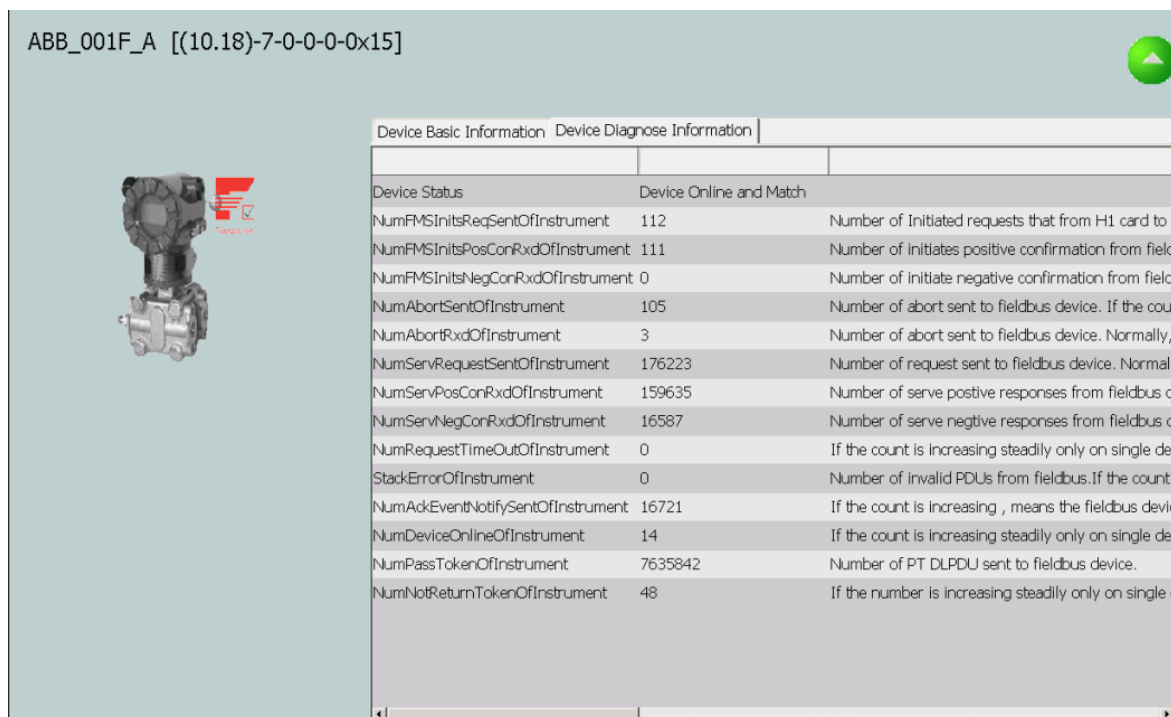
**Figure 3-23 Basic information of FF device**

As shown in Figure 3-23, the basic information of FF device mainly includes the following:

Diagnose Item	Description
Device ID	The encoding of FF device. It is unique in the world.
PD Tag	PDTAG of FF device.
DeviceLink Type	Master or basic device.
Manufacturer	Vendor of FF device.
Device Type	The type of device defined by the FF device vendor.
Device Revision	The version number of device defined by the FF device vendor.
DD Revision	The DD version number defined by the FF device vendor.

## Diagnosis Information

Figure 3-24 shows the communication diagnosis information of FF device.



**Figure 3-24** Diagnosis information of FF device

As shown in Figure 3-24, the diagnosis information of FF device mainly includes the following:

Diagnose Item	Description
Device Status	Include instrument offline, instrument online and matching, and instrument online and mismatching.
NumFMSInitsReqSentOfInstrument	The total number of packets sent by the FF device to AM712-S requesting to establish connection.
NumFMSInitsPosConRxdOfInstrument	The total number of positive response packets that the FF device sends to AM712-S to establish connection.
NumFMSInitsNegConRxdOfInstrument	The total number of negative response packets that the FF device sends to AM712-S to establish connection.
NumAbortSentOfInstrument	The total number of packets sent by the AM712-S to FF device for the disconnect request.
NumAbortRxdOfInstrument	The total number of packets sent by the FF device to AM712-S for the disconnect request.
NumServRequestSentOfInstrument	The total number of packets sent by AM712-S to FF device for confirming service request.
NumSerPosConRxdOfInstrument	The total number of positive response packets sent by the FF device to AM712-S.
NumServNegConRxdOfInstrument	The total number of replies with negative response packets sent by the FF device to AM712-S for service request.
NumRequestTimeOutOfInstrument	The FF device data link layer is online, but there is no corresponding number of service requests.
StackErrorOfInstrument	The total number of error packets received by the AM712-S for the FF device.

Diagnose Item	Description
NumAckEventNotifySentOfInstrument	The total number of alarm packets that the FF device broadcasts to the bus.
NumDeviceOnlineOfInstrument	The number of times that FF device is online at the link layer.
NumPassTokenOfInstrument	The total number of tokens received by the FF device.
NumNotReturnTokenOfInstrument	The total number of tokens that the FF device does not reply.

**Tips:**

Please analyze the data according to the prompt information in the right side of diagnosis data of FF device in the diagnosis software.

### 3.10.5 Import FF Alarm Resolution to FF Alarm Server


The resolution of FF alarm description can be imported to FF alarm server by the FF alarm tool in the system software of High-performanceHMI.

**Tips:**

After the FF alarm is successfully imported, user do not need to import it again if the DD file is not updated.

The time to import FF alarm to the FF alarm server varies depending on the number of imported DD files. When all files are imported, it may take a while.

Import the FF alarm to the FF alarm server by the following steps:

1. Choose **Start > OMC High-performanceHMI System Tool >FF Alarm Tool** from the start menu of Windows.
2. Click  to select the path where the DO file of FF device is located. By default, the DD file of FF device is placed in "C: \OMC\VisualField4\FFbuilder\DDDData".
3. Click "Import" button to import the FF alarm to FF alarm server.

## 3.11Diagnosis Window of Interconnected ECS-100/ JX-300XP/ JX-300X System and OMC System

ECS-100/JX-300XP/JX-300X system can be connected to OMC system by system interconnected module, and the status diagnosis windows of system interconnected module, data transmission module and I/O module can be viewed in the system status diagnosis window of OMC system.

### 3.11.1 System Interconnected Main Window

System interconnected main window is shown below.

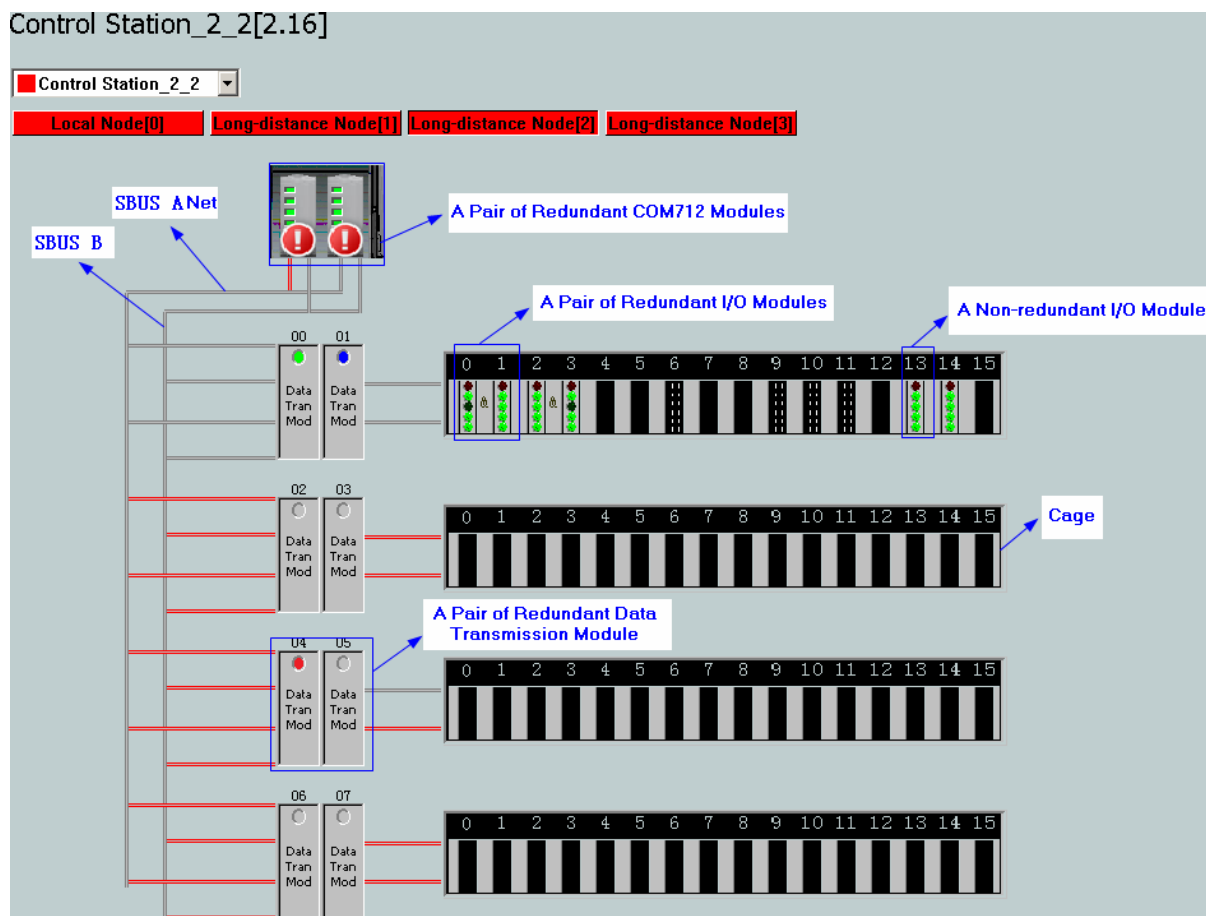


Figure 3-26 Diagnosis Window of System Interconnected Module

#### Display of COM712

When the module has fault, it displays as



When the module is normal, it displays as



When there is no module or the module has no communication, it displays as



When the connection between module and SBUS A network is normal, the connection lines are in grey.

When the connection between module and SBUS A network is abnormal, the connection lines are in red and flash.

When the connection between module and SBUS B network is normal, the connection lines are in grey.

When the connection between module and SBUS B network is abnormal, the connection lines are in red and flash.

### Display of data transmission module

If it is work module, its indicator light is shown in green.

If it is standby module, its indicator light is shown in blue.

When the module has fault, its indicator light is shown in red.

When there is no module or the module has no communication, its indicator light is shown in grey.

When the connection between module and SBUS network is normal, the connection lines are in grey.

When the connection between module and SBUS network is abnormal, the connection lines are in red and flash.

When the connection between data transmission module and I/O module is normal, the connection line is in grey.

When the connection between data transmission module and I/O module is abnormal, the connection line is in red and flash.

### Display of I/O module

The slot in cage of module without configuration is shown in black.

When the module has been added in the configuration, while it is not installed in real, or it has no communication, the slot will flash.

The module has 5 indicator lights (just like the real module) to display its work status. The status and its indicated meanings are shown below.

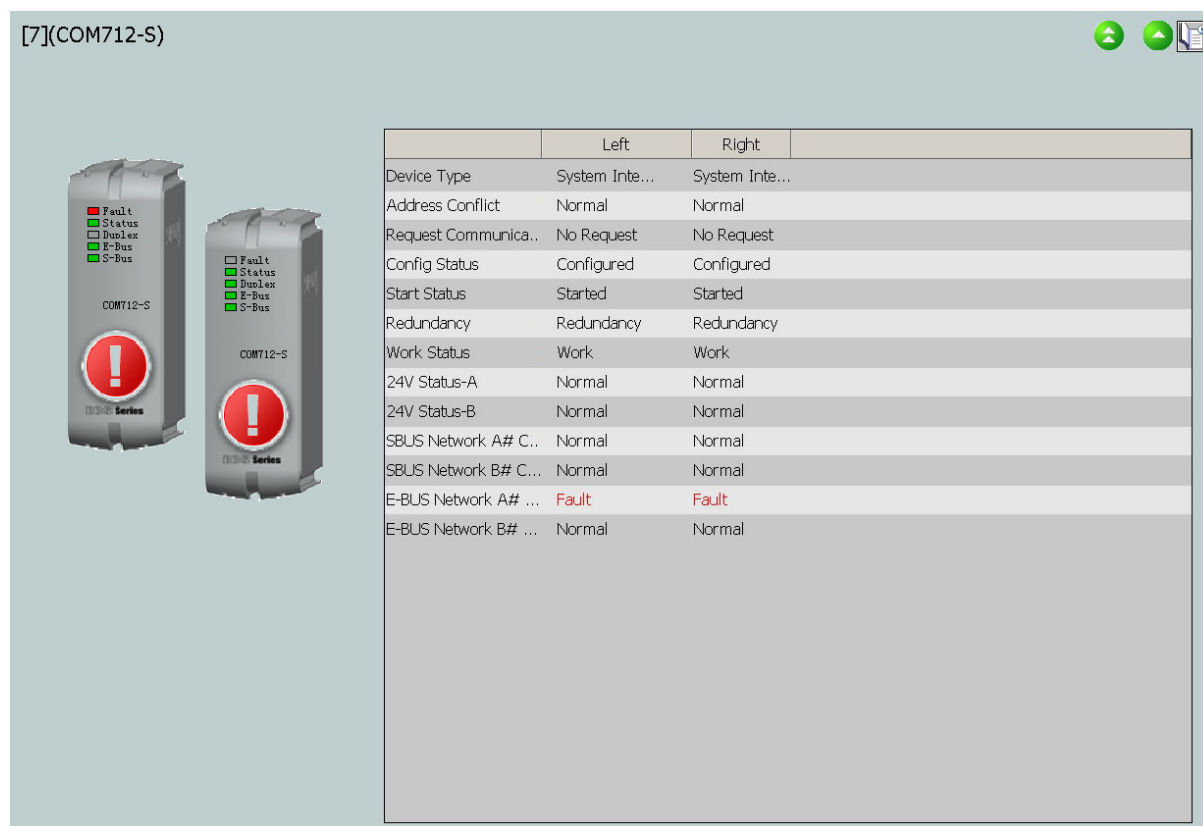
**Table 3-20 Status Instruction of I/O Module Indicator Lights**

No.	Name	Status and Instruction	
1	FAIL	Normally On and in Red	Module fault or configuration checking inconsistency
		Normally Off	Normal
2	RUN	Flash in Green	Running
3	WORK	Normally On and in Green	Work module
		Normally Off	Standby module
4	COM	Flash in Green	Normal
		Normally On and in Green	Configuration checking error
5	POWER	Normally On and in Green	Power supply normally



### 3.11.2 Diagnosis Window of System Interconnected Module

Double-click the COM712 module as shown in Figure 3-15 and enter the COM712 module diagnosis window, as shown below.



**Figure 3-27 Diagnosis Window of System Interconnected Module**

Diagnosis results of COM712 include:

**Table 3-21 Instruction for COM712 diagnosis items**

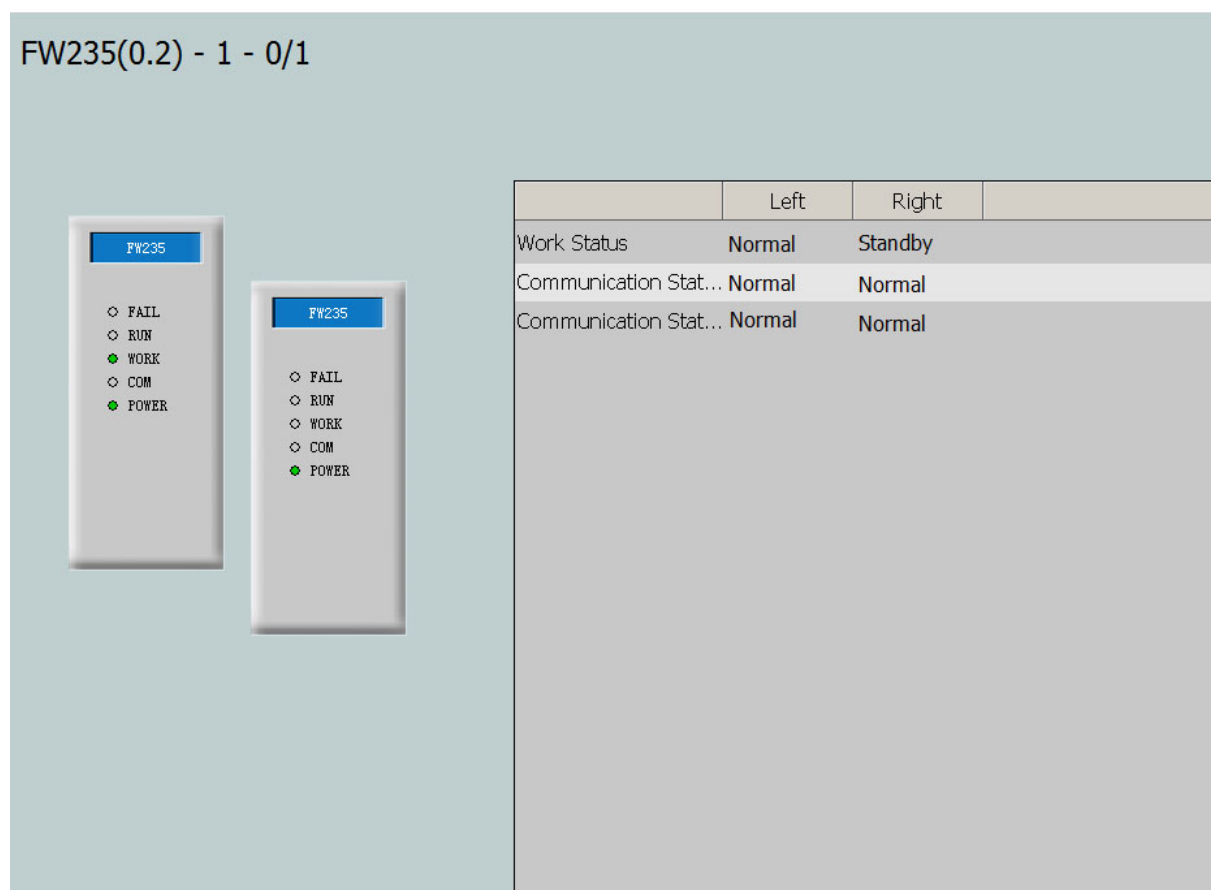
Items	Instruction	Fault Reason	Troubleshooting
Device Type	Show device type. Display the device type when different device is connected.	—	—
Work Status	Show the work/ standby status for device.	—	—
24Va Status	Show power voltage status. Show "Fault" when voltage is not in 20V~28V.	1. Power Fault 2. Module Hardware Fault	1. Check whether power wire is loose. 2. Check whether power module has fault. 3. Change module.
24Vb Status	Show power voltage status. Show "Fault" when voltage is not in 20V~28V.	1. Power Fault 2. Module Hardware Fault	1. Check whether power wire is loose. 2. Check whether power module has fault. 3. Change module.

Items	Instruction	Fault Reason	Troubleshooting
SBUS A Communication Status	When the COM712 is failed to communicate with data transmission module by SBUS A, it is shown as "Fault".	1. Wire fault 2. Interface fault 3. Not connect data transmission module 4. Module hardware fault	1. Check whether SBUS A wire is loose, fasten it if yes. 2. Check whether pins in module SBUS A wire interface or IO rack SBUS A interface are normal, if they are bent or broken, please change the SBUS A wire or IO rack. 3. Check whether data transmission module is online. 4. If not reasons above, change the system interconnected module.
SBUS B Communication Status	When the COM712 is failed to communicate with data transmission module by SBUS B, it is shown as "Fault".	1. Wire fault 2. Interface fault 3. Not connect data transmission module 4. Module hardware fault	1. Check whether SBUS B wire is loose, fasten it if yes. 2. Check whether pins in module SBUS B wire interface or IO rack SBUS B interface are normal, if they are bent or broken, please change the SBUS B wire or IO rack. 3. Check whether data transmission module is online. 4. If not reasons above, change the system interconnected module.
E-BUS A Communication Status	When the COM712 is failed to communicate with controller by E-BUS A, it is shown as "Fault".	1. Module bus A fault 2. Controller bus A fault 3. Module hardware fault	1. Check whether the indicators of module E-busA are normal. If not, check whether the wiring is normal. 2. If E-busA is normal, check whether controller E-BusA has fault. 3. Reset 4. Change module
E-BUS B Communication Status	When the COM712 is failed to communicate with controller by E-BUS B, it is shown as "Fault".	1. Module bus B fault 2. Controller bus B fault 3. Module hardware fault	1. Check whether the indicators of module E-busB are normal. If not, check whether the wiring is normal. 2. If E-busB is normal, check whether controller E-BusB has fault. 3. Reset 4. Change module
Overall Status of Data Transmission Module	If communication fault occurs between any data transmission module of COM712 and controller or I/O module, it is shown as "Fault", or it is shown as "Normal".		
Redundancy	If the module is redundant, it is shown as "Redundancy", or it is shown "Non-Redundant".	—	—
Address Conflict		Modules with same dial are existed in the network.	Check indicators of all nodes in network, the module whose EBUS indicator is flashing, while the EBUS diagnosis 2-channel is normal, may has repeated dial. Check the design and reset the dial address.

Items	Instruction	Fault Reason	Troubleshooting
Request Communication	Display the status of requesting node communication.	Hardware Fault	1. Reset module 2. Change module
Config Status	Display the configuration of current device. If the device has no configuration, it is shown as "Unconfigured". When the device has configuration, it is shown as "Configured".	Hardware Fault	1. Reset module 2. Change module

### 3.11.3 Diagnosis Window of Data Transmission Module

Double-click the data transmission module, which shown in Figure 3-15, and enter the diagnosis window of data transmission module, as shown below.



**Figure 3-28 Data Transmission Module (Take FW235 as an Example)**

Status diagnosis of data transmission module includes:

**Table 3-22 Instruction for diagnosis items of data transmission module**

Items	Instruction
-------	-------------

Items	Instruction
Work Status	It displays "Work" when the data transmission module is in work status and displays "Standby" when it is in standby status. The standby status is only valid for redundant configuration module, but invalid for non-redundant configuration module.
Communication Status with Host Computer	It displays "Normal" when the communication between data transmission module and COM712 is normal, or it displays "Fault".
Communication Status with I/O module	It displays "Normal" when the communication between data transmission module and I/O module is normal, or it displays "Fault".

If there is no real module or no communication, all lights will be off and the diagnosis results are "????".

The status and its indicated meanings are shown below.

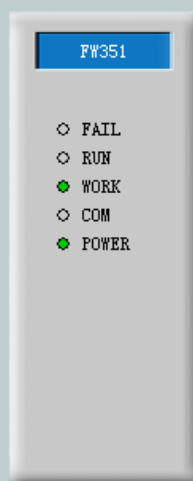
**Table 3-3 Status Instruction of I/O Module Indicator Lights**

No.	Name	Status and Instruction	
1	FAIL	Flash in Red	Communication fault with the host computer
		Normally Off	Normal
2	RUN	Flash in Green	Running
		Normally Off	Abnormal
3	WORK	Normally On and in Green	Work module
		Normally Off	Standby module
4	COM	Flash in Green	Normal
		Normally Off	Abnormal
5	POWER	Normally On and in Green	Power supply normally
		Normally Off	Abnormal

### 3.11.4 Diagnosis Window of I/O Module

Double-click the I/O module as shown in the Figure 3-15 and enter the diagnosis window of I/O module, as shown below.

## FW351 Standard Signal Input Module (8 Channels)[(2.16)-2-0-0]



Work Status	Work
Fault Level	Normal
Connection Status	Normal
Configuration Check...	Correct
Status of Channel 0	Invalid
Status of Channel 1	Invalid
Status of Channel 2	Invalid
Status of Channel 3	Invalid
Status of Channel 4	Invalid
Status of Channel 5	Invalid
Status of Channel 6	Invalid
Status of Channel 7	Invalid

**Figure 3-29 Status Diagnosis Window of I/O Module (Take FW351 as an Example)**

The instruction, fault reason and troubleshooting are shown below:

**Table 3-11 Instruction for diagnosis items of I/O module**

Items	Instruction	Fault Cause	Solution
Work Status	It displays "Work" when the I/O module is in work status and displays "Standby" when it is in standby status. The standby status is only valid for redundant configuration module, but invalid for non-redundant configuration module.	-	-
Fault Level	Module fault level includes serious fault and normal fault.	Hardware fault	1. Reset 2. Change the module
Connection Status	It displays "Module Lost" when the module is not installed or has no communication.	<ul style="list-style-type: none"> <li>Card is not installed correctly.</li> <li>Card connection line is fault.</li> </ul>	<ul style="list-style-type: none"> <li>Re-plug the card to ensure proper installation.</li> <li>Reconnect the network cable to ensure proper connection.</li> </ul>
Configuration Check Status	It displays "Configuration Check Correctly" when the configuration check of main controller and I/O module is correct, or it displays "Error".	Hardware fault	1. Reset 2. Change the module

Items	Instruction	Fault Cause	Solution
Status of Channel	<p>It displays "Invalid" when the I/O module has channel fault, for example, there is no real signal to input or some hardware faults have happened to the I/O module. It displays "Valid" when I/O module has real and correct signal.</p> <p>It displays "Invalid" when the module is in the status of standby.</p>	<ul style="list-style-type: none"><li>● Channel wiring fault</li><li>● External signal fault</li><li>● Hardware fault</li></ul>	<ol style="list-style-type: none"><li>1. Check if the wiring is correct.</li><li>2. Check if the external signal is normal.</li><li>3. Change the card.</li></ol>

## Section 4 System Diagnosis Tags Provided by OPC

High-performanceHMI supports OPC communication. VFOPCSvr, High-performanceHMI internal installed OPC server, supports transmitting tag and domain variables to OPC client. And VFOPCSvr supports cross-domain referred, that is, the referred tags also can be transmitted to OPC client.

Besides the analogy input, analogy output, digital input and digital output, VFOPCSvr also can provide the system diagnosis tags.



### Attention:

**System diagnosis tags do not support cross-domain referred.**


### 4.1 Enable System Diagnosis Tag

Before OPC sever transmitted, system diagnosis tags should be enabled manually by following steps:

- 1) In High-performanceHMI installed path, for example "C:\OMC\VisualField4\", double click the configuration file "OPCConfig.ini".
- 2) Modify the item value of "SYSOPENENABLE" as 1, as shown as figure below, save and close the file.

```
[OPCDA]
; When =1, DA is ReadOnly.
ReadOnly=0
; When =1, Display Point2Point tag field.
DisplayP2PField=0
;When =1, Open System Diagnose Tag.
SYSOPENENABLE=1
```

**Figure 4-1 Modify OPC Configuration File**

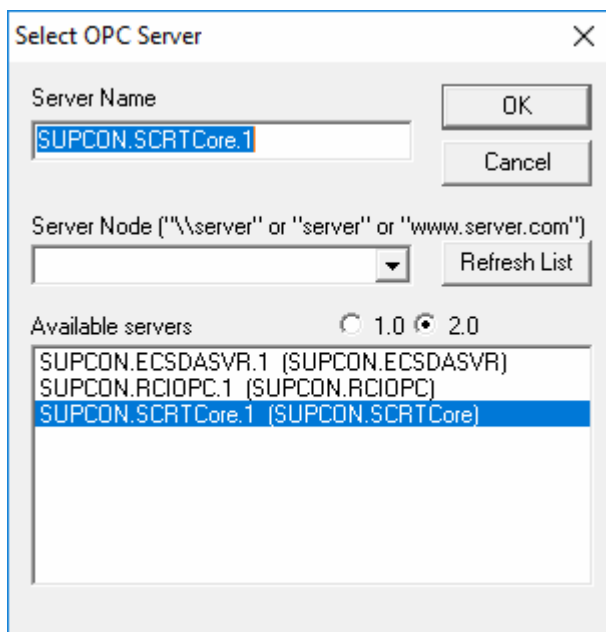
- 3) Right click the icon  in system tray and select the command "Exit", and reconnect OPC client with VFOPCSvr. Or restart VFOPCSvr by double click VFOPCSvr.exe in High-performanceHMI install path (for example C:\OMC\VisualField4\).

### 4.2 View Tag Information

OMC system diagnosis tag can be transmitted by OPC. Here describes the detail operation steps,

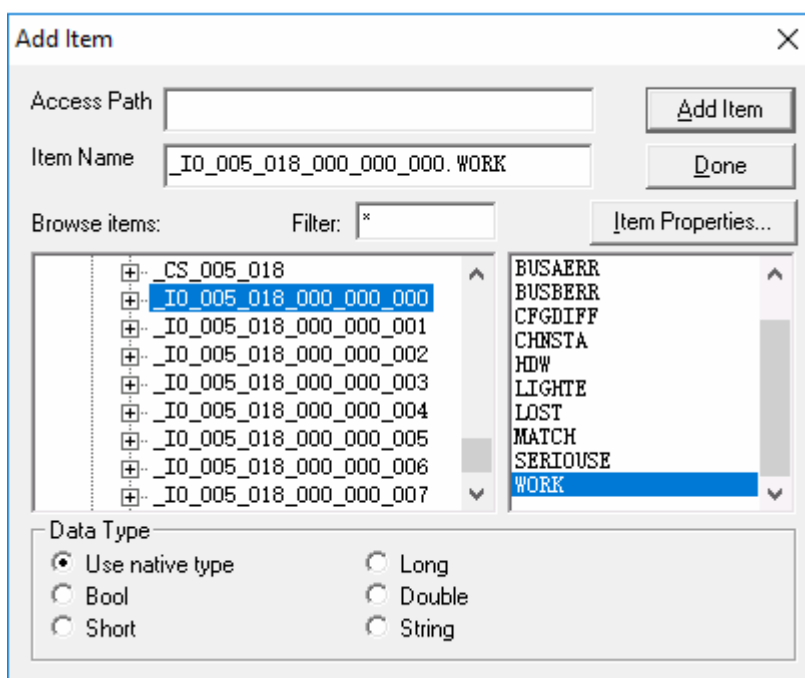
taking Standard OPC Client as example.

- 1) Select the command "OPC // Connect..." in the menu of FactorySoft OPC Client, and popup the dialog box shown as figure below.



**Figure 4-2 Select OPC Server**

- 2) Select "SUPCON.SCRTCore.1" and click "OK". After successfully connected, select the command "OPC/Add Item..." in the menu, and the dialog box popup shown as figure below.



**Figure 4-3 Add Item Dialog Box**

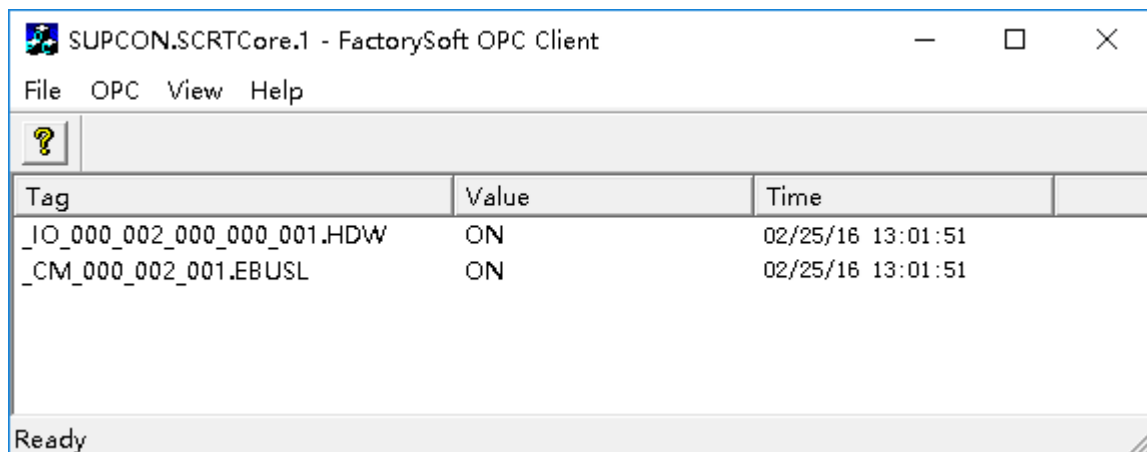
In the list of "Browse items", the tags used the "\_" as the beginning are system diagnosis tag. As shown as above, "\_IO\_005\_018\_000\_000\_000.WORK" represents this tag



belongs to IO modules, the numbers indicate the IO module address, and the suffix "WORK" is the selected field of the tag. For detailed information about various reference tags, refer to Diagnosis Tag Type.

3) Select tag from tag list and select field from the right area and click " Add Item ", add all the required tags and Click "Done".

4) The subscribed tags will be added to tag list of OPC client main interface, as shown as figure below. And the tag list shows the relationship between value and status.



The screenshot shows a window titled "SUPCON.SCRTCore.1 - FactorySoft OPC Client". It has a menu bar with "File", "OPC", "View", and "Help". Below the menu bar is a toolbar with a question mark icon. The main area contains a table with three columns: "Tag", "Value", and "Time". The table lists two tags: "\_IO\_000\_002\_000\_000\_001.HDW" and "\_CM\_000\_002\_001.EBUSL", both with a value of "ON" and a timestamp of "02/25/16 13:01:51". The status bar at the bottom says "Ready".

Tag	Value	Time
_IO_000_002_000_000_001.HDW	ON	02/25/16 13:01:51
_CM_000_002_001.EBUSL	ON	02/25/16 13:01:51

Figure 4-4 OPC Tag List

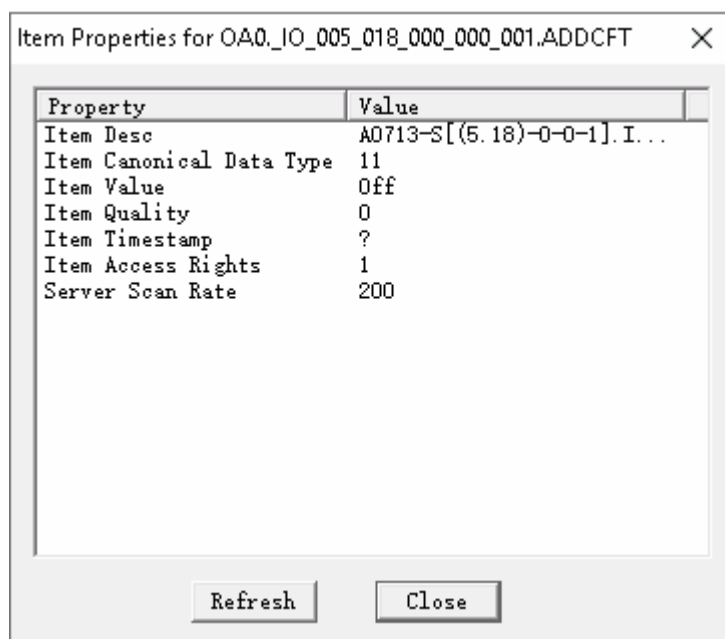


**Tips:**

OPC server provides the value of diagnosis tag in the format of 0 and 1, and OPC client display tag value in the format of ON and OFF. ON means that the diagnosis value is 1, and OFF means that the diagnosis value is 0.

Tag's detail information can be acquired by following steps:

Right click a tag in the list, and select " item properties" command in its right menu, popup the tag's detail information as shown as below. In the pop-up dialog box, the tag's properties including date type, access right, description, and so on will be shown. Click "Refresh" to update the tag's information.



**Figure 4-5 Tag's Detail Information**

## 4.3 Diagnosis Tag Type

VFOPCSvr can connect with multiple OPC client programs at the same time, and each connection can exchange multiple dynamic data (tags) at the same time.

VFOPCSvr supports the transfer of diagnostic data of controllers, operating stations, IO connection modules and IO modules.

### 4.3.1 Controller Diagnosis Tags

In the High-performanceHMI system, the format of the diagnostic tag of the controller is "diagnostic name + domain address + station address + attribute name". For example, "\_CS\_017\_002.SCNETA ", where: \_CS means the tag is the controller diagnostic tag, 017 means the 17th domain, 002 means the No. 2 control station, and SCNETA means the control A network communication status.

In the table below, the controller diagnostic tags that can be transferred by VFOPCSvr are listed.

**Table 4-1 Controller's diagnosis tags**

Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
Controller module on the left side, hardware fault	_CS_ domain address _ station address.HDWL	CS_002_004.HDWL	OFF: normal ON: fault	suppressed by controller A/B network communication fault
Controller module on the right side, hardware fault	_CS_ domain address _ station address.HDWR	CS_002_002.HDWR	OFF: normal ON: fault	suppressed by controller A/B network communication fault
Controller module on the left side, configuration fault	_CS_ domain address _ station address.CFGL	_CS_002_002.CFGL	OFF: normal ON: fault	suppressed by controller A/B network communication fault

Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
Controller module on the right side, configuration fault	_CS_ domain address _ station address.CFGR	CS_002_0 02.CFGR	OFF: normal ON: fault	suppressed by controller A/B network communication fault
Controller module on the left side, SCNet A network communication fault	_CS_ domain address _ station address.SCNETA L	_CS_002_ 002.SCNE TAL	OFF: normal ON: fault	/
Controller module on the right side, SCNet A network communication fault	_CS_ domain address _ station address.SCNETA R	CS_002_0 04.SCNET AR	OFF: normal ON: fault	/
Controller module on the left side, SCNet B network communication fault	_CS_ domain address _ station address.SCNETB L	CS_002_0 02.SCNET BL	OFF: normal ON: fault	/
Controller module on the right side, SCNet B network communication fault	_CS_ domain address _ station address.SCNETB R	CS_002_0 02.SCNET BR	OFF: normal ON: fault	/
Controller module 24Va fault	_CS_ domain address _ station address.PWA	CS_002_0 02.PWA	OFF: normal ON: fault	suppressed by controller A/B network communication fault
Controller module 24Vb fault	_CS_ domain address _ station address.PWB	CS_002_0 02.PWB	OFF: normal ON: fault	suppressed by controller A/B network communication fault
Controller module on the left side, work/backup mark	_CS_ domain address _ station address.WORKL	CS_002_0 02.WORK L	OFF: standby ON: work	suppressed by controller A/B network communication fault
Controller module on the right side, work/backup mark	_CS_ domain address _ station address.WORKR	CS_002_0 02.WORK R	OFF: standby ON: work	suppressed by controller A/B network communication fault
Controller module on the left side, L-BUS (OMC) communication status	_CS_ domain address _ station address.LBUSL	CS_002_0 02.LBUSL	OFF: normal ON: fault	suppressed by controller A/B network communication fault
Controller module on the right side, L-BUS (OMC) communication status	_CS_ domain address _ station address.LBUSR	_CS_002_ 002.LBUS R	OFF: normal ON: fault	suppressed by controller A/B network communication fault
Controller module on the left side, E-BUS communication status	_CS_ domain address _ station address.EBUSL	CS_002_0 02.EBUSL	OFF: normal ON: fault	suppressed by controller A/B network communication fault
Controller module on the right side, E-BUS communication status	_CS_ domain address _ station address.EBUSR	_CS_002_ 002.EBUS R	OFF: normal ON: fault	suppressed by controller A/B network communication fault
Controller module on the left side, SNTPL fault	_CS_ domain address _ station address.SNTPL	CS_002_0 02.SNTPL	OFF: normal ON: fault	suppressed by controller A/B network communication fault

Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
Controller module on the right side, SNTP fault	_CS_ domain address _ station address.SNTPR	_CS_002_002.SNTPR	OFF: normal ON: fault	suppressed by controller A/B network communication fault
Controller module on the left side, Power fault	_CS_ domain address _ station address.BATL	_CS_002_002.BATL	OFF: normal ON: fault	suppressed by controller A/B network communication fault
Controller module on the right side, Power fault	_CS_ domain address _ station address.BATR	CS_002_002.BATR	OFF: normal ON: fault	suppressed by controller A/B network communication fault
Whether the AO/DO tag is in a fault state	_CS_ domain address _ station address . TAGFSL	_CS_002_002 . TAGFSL	ON: fault OFF: normal	Whether there is an AO/DO tag in the left controller in the output readback state
	_CS_ domain address _ station address . TAGFSR	_CS_002_002 . TAGFSR	ON: fault OFF: normal	Whether the right controller has AO/DO tag in output readback state
Whether the I/O tag number is in OOS state	_CS_ domain address _ station address . IOTAGFBL	_CS_002_002 . IOTAGFBL	ON: fault OFF: normal	Whether the I/O tag number of the left controller is in the prohibited state
	_CS_ domain address _ station address . IOTAGFBR	_CS_002_002 . IOTAGFBR	ON: fault OFF: normal	Whether the I/O tag number of the right controller is in the prohibited state
Whether the I/O tag is in a forced state	_CS_ domain address _ station address . IOTAGFCL	_CS_002_002 . IOTAGFCL	ON: fault OFF: normal	Whether the left controller has an I/O tag in a forced state
	_CS_ domain address _ station address . IOTAGFCR	_CS_002_002 . IOTAGFCR	ON: fault OFF: normal	Does the right controller have an I/O tag in a forced state?
Whether there is an analog number over-range	_CS_ domain address _ station address . AITAGOL	_CS_002_002 . AITAGOL	ON: fault OFF: normal	Whether the left controller has an analog number over the range
	_CS_ domain address _ station address . AITAGOR	_CS_002_002 . AITAGOR	ON: fault OFF: normal	Does the right controller have an analog number over-range
Whether there is DI tag jitter	_CS_ domain address _ station address . DITAGDL	_CS_002_002 . DITAGDL	ON: fault OFF: normal	Whether the left controller has DI tag jitter
	_CS_ domain address _ station address . DITAGDR	_CS_002_002 . DITAGDR	ON: fault OFF: normal	Does the right controller have DI tag jitter
Control CPU software version	_CS_ domain address _ station address . CCPUV ERL	_CS_002_002 . CCPUV ERL	Controller CPU version in STRING format	CPU software version of the left controller
	_CS_ domain address _ station address . CCPUV ERR	_CS_002_002 . CCPUV ERR		CPU software version of the right controller

Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
Control network communication CPU software version	_CS_ domain address _ station address . NCPUV ERL	_CS_ 002 _ 002 . NC PUVERL	STRING form of control network communication CPU versio n	The software version of the left control network communication CPU
	_CS_ domain address _ station address . NCPUV ERR	_CS_ 002 _ 002 . NC PUVERR		The right control network communication CPU sof tware version
IO communication CPU software version	_CS_ domain address _ station address . IOCPU VERL	_CS_ 002 _ 002 . IO CPUVERL	STRING format IO commun ication CPU version	The IO communication module CPU software version of the left controller
	_CS_ domain address _ station address . IOCPU VERR	_CS_ 002 _ 002 . IO CPUVERR		The CPU software version of the IO communication module connected to the right controller
The status of the fault light of the card picture	_CS_ domain address _ station address . HDWE RRTL	_CS_ 002 _ 002 . HD WERRTL	ON: fault OFF: normal	The overall flag of the left controller hardware error
	_CS_ domain address _ station address . HDWE RRTR	_CS_ 002 _ 002 . HD WERRTR	ON: fault OFF: normal	The overall flag of the right controller hardware error
Memory status	_CS_ domain address _ station address . MEMST EL	_CS_002_ 002. MEMSTEL	ON: fault OFF: normal	Hardware fault (FLASH fault) Hardware fault SRAM fault)
	_CS_ domain address _ station address . MEMST ER	_CS_002_ 002. MEMSTER	ON: fault OFF: normal	Hardware fault (SDRAM fault) Hardware fault (SCnetDPRAM fault) Hardware fault (SCBUSDPRAM fault)
Controller clock	_CS_ domain address _ station address . CSTIM EL	_CS_002_ 002. CSTIMEL	STRING local time	Time format: year-month-day hour: minute: second
	_CS_ domain address _ station address . CSIME R	_CS_002_ 002. CSTIMEL R		
Controller hardware status	_CS_ domain address _ station address . HDWST AL	_CS_002_ 0HDWSTA L	ON: fault OFF: normal	Hardware fault (CPU pin voltage fault) Hardware fault (CPU core voltage fault) Hardware fault (CPU interaction fail with control network communication) Hardware fault (CUP interaction fail with I/O communication) Hardware fault (Real-time clock fault)
	_CS_ domain address _ station address . HDWST AR	_CS_002_ 002. HDWSTAR	ON: fault OFF: normal	
Controller temperature	_CS_ domain address _ station address . TEMPL	_CS_ 002 _ 002 . TE MPL	The current temperature of the controller in the form of FLOAT .	The current temperature of the left controller

Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
	_CS_ domain address _ station address . TempR	_CS_ 002 _ 002 . TempR		The current temperature of the right controller
User program running status	_CS_ domain address _ station address . UPROG RL	_CS_ 002 _ 002 . UPROGRL	ON: fault OFF: normal	Whether the configuration of the left controller is faulty (user program is shielded)
	_CS_ domain address _ station address . UPROG RR	_CS_ 002 _ 002 . UPROGRR	ON: fault OFF: normal	Whether the configuration of the right controller is faulty (user program is shielded)
Configuration status flag	_CS_ domain address _ station address . CFGSTAL	_CS_ 002 _ 002 . CFGSTAL	ON: fault OFF: normal	CFGSTAL represents the configuration status of the left controller, and CFGSTAR represents the configuration status of the right controller. The configuration status includes: Configuration failure (no configuration) Configuration failure (hardware configuration error) Configuration failure (tag configuration error) Configuration failure (error in the user program) Configuration failure (other configuration errors) Configuration failure (caused by power-on redundancy) Configuration failure (working / standby inconsistency)
	_CS_ domain address _ station address . CFGSTAR	_CS_ 002 _ 002 . CFGSTAR		
Configuration data status	_CS_ domain address _ station address . CFGDATAL	_CS_ 002 _ 002 . CFGDATAL	ON: fault OFF: normal	Configuration failure of the left controller (configuration data error)
	_CS_ domain address _ station address . CFGDATAR	_CS_ 002 _ 002 . CFGDATAR	ON: fault OFF: normal	Configuration failure of the right controller (configuration data error)
Configuration buffer data status	_CS_ domain address _ station address . CFGBUFDL	_CS_ 002 _ 002 . CFGBUFDL	ON: fault OFF: normal	Configuration failure of the left controller (error in configuration buffer data)
	_CS_ domain address _ station address . CFGBUFDR	_CS_ 002 _ 002 . CFGBUFDR	ON: fault OFF: normal	The configuration fault of the right controller (configuration buffer data error)
Temporary data status of user program	_CS_ domain address _ station address . UPROGDL	_CS_ 002 _ 002 . UPROGDL	ON: fault OFF: normal	The user program of the left controller runs incorrectly

Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
	_CS_ domain address _ station address . UPROG DR	_CS_ 002 _ 002 . UP ROGDR	ON: fault OFF: normal	The user program of the right controller runs incorrectly
Communication module configuration status	_CS_ domain address _ station address . DTCFGL	_CS_ 002 _ 002 . DT CFGL	ON: fault OFF: normal	Configuration failure of the left controller (node configuration error)
	_CS_ domain address _ station address . DTCFGR	_CS_ 002 _ 002 . DT CFGR	ON: fault OFF: normal	Configuration failure of the right controller (node configuration error)
IO module configuration status	_CS_ domain address _ station address . IOCFGL	_CS_ 002 _ 002 . IO CFGL	ON: fault OFF: normal	The configuration of the left controller is faulty (the IO module configuration error)
	_CS_ domain address _ station address . IOCFGR	_CS_ 002 _ 002 . IO CFGR	ON: fault OFF: normal	The configuration of the right controller is faulty (the IO module configuration error)
Tag configuration status	_CS_ domain address _ station address . TAGCFGSL	_CS_ 002 _ 002 . TA GCFGSL	ON: fault OFF: normal	TAGCFGSL represents the tag configuration status of the left controller, and TAGCFGSR represents the tag configuration status of the right controller. The configuration status includes: Configuration failure ( DI tag) Configuration failure ( AI tag ) Configuration failure ( DO tag ) Configuration failure ( AO tag number) Configuration failure (multicast switch tag number) Configuration failure (multicast analog quantity tag) Configuration failure (multicast integer tag number) Configuration failure (Interactive switch number between pages) Configuration failure (interactive analog quantity tag number between pages) Configuration failure (interactive integer number between pages)
	_CS_ domain address _ station address . TAGCFGSR	_CS_ 002 _ 002 . TA GCFGSR	ON: fault OFF: normal	



Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
User program schedule status	_CS_ domain address _ station address . USCHE L	_CS_ 002 _ 002 . US CHEL	ON: fault OFF: normal	Configuration failure of the left controller (error in the user program schedule)
	_CS_ domain address _ station address . USCHE R	_CS_ 002 _ 002 . US CHER	ON: fault OFF: normal	Configuration failure of the right controller (error in the user program schedule)
System function block library status	_CS_ domain address _ station address . SYSLIB L	_CS_ 002 _ 002 . SY SLIBL	ON: fault OFF: normal	Configuration failure of the left controller (system function block library error)
	_CS_ domain address _ station address . SYSLIB R	_CS_ 002 _ 002 . SY SLIBR	ON: fault OFF: normal	Configuration failure of the right controller (system function block library error)
Industry function block library status	_CS_ domain address _ station address . INDLIB L	_CS_ 002 _ 002 . IN DLIBL	ON: fault OFF: normal	Configuration failure of the left controller (industry function block library error)
	_CS_ domain address _ station address . INDLIB R	_CS_ 002 _ 002 . IN DLIBR	ON: fault OFF: normal	Configuration failure of the right controller (error in the industry function block library)
User function block library status	_CS_ domain address _ station address . USELIB L	_CS_ 002 _ 002 . US ELIBL	ON: fault OFF: normal	Configuration failure of the left controller (error in the user function block library)
	_CS_ domain address _ station address . USELIB R	_CS_ 002 _ 002 . US ELIBR	ON: fault OFF: normal	Configuration failure of the right controller (error in the user function block library)
Redundant state	_CS_ domain address _ station address . REDUS TAL	_CS_ 002 _ 002 . RE DUSTAL	ON: fault OFF: normal	REDUSTAL represents the redundancy status of the left controller, and REDUSTAR represents the redundancy status of the right controller. The redundancy status includes: Redundancy failure (power-on redundancy failure) Redundancy failure (real-time redundancy failure in this cycle) Redundancy failure (real-time redundant buffer overflow) Redundancy failure (cycle synchronization status failure)
	_CS_ domain address _ station address . REDUS TAR	_CS_ 002 _ 002 . RE DUSTAR	ON: fault OFF: normal	
IP address conflict status	_CS_ domain address _ station address . IPCFTL	_CS_ 002 _ 002 . IPC FTL	ON: fault OFF: normal	The IP address of the left controller conflicts
	_CS_ domain address _ station address . IPCFTR	_CS_ 002 _ 002 . IPC FTR	ON: fault OFF: normal	The IP address of the right controller conflicts



Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
Control network A network port clock synchronization	_CS_ domain address _ station address . TSYNC AL	_CS_ 002 _ 002 . TS YNCAL	ON: fault OFF: normal	Clock synchronization failure of the left controller A network
	_CS_ domain address _ station address . TSYNC AR	_CS_ 002 _ 002 . TS YNCAR	ON: fault OFF: normal	Network clock synchronization failure of the right controller A
Control network B network port clock synchronization	_CS_ domain address _ station address . TSYNC BL	_CS_ 002 _ 002 . TS YNCBL	ON: fault OFF: normal	Clock synchronization failure of the left controller B network
	_CS_ domain address _ station address . TSYNC BR	_CS_ 002 _ 002 . TS YNCBR	ON: fault OFF: normal	Network clock synchronization failure of the right controller B
Control network A communication status	_CS_ domain address _ station address . SCNET AFL	_CS_ 002 _ 002 . SC NETAFL	ON: fault OFF: normal	SCNETAFL is used to indicate the A network communication status of the left controller , and SCNETAFR is used to indicate the A network communication status of the right controller . The communication status includes: SCnet A network port failure SCnet A network port is not connected Control network A failure (reserved) The communication between the controller and the current operating station SCnet A network is interrupted SCnet A network is overloaded
	_CS_ domain address _ station address . SCNET AFR	_CS_ 002 _ 002 . SC NETAFR	ON: fault OFF: normal	
Control network B communication status	_CS_ domain address _ station address . SCNET BFL	_CS_ 002 _ 002 . SC NETBFL	ON: fault OFF: normal	SCNETBFL is used to indicate the communication status of the left

Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
	_CS_ domain address _ station address . SCNET BFR	_CS_ 002 _ 002 . SC NETBFR	ON: fault OFF: normal	controller B network, and SCNETBFR is used to indicate the communication status of the right controller B network. The communication status includes: SCnet B network port failure SCnet B network port is not connected Control network B failure (reserved) The communication between the controller and the current operating station SCnet B network is interrupted SCnet B network is overloaded
Controller diagnostic data communication status	_CS_ domain address _ station address . LOSTL	_CS_ 002 _ 002 . LO STL	ON: fault OFF: normal	The left controller is missing
	_CS_ domain address _ station address . LOSTR	_CS_ 002 _ 002 . LO STR	ON: fault OFF: normal	The right controller is missing
Controller type	_CS_ domain address _ station address .CTDIFF L	_CS_ 002 _ 002 . CT DIFFL	ON: fault OFF: normal	The type of the left controller is inconsistent with the configuration
	_CS_ domain address _ station address .CTDIFF R	_CS_ 002 _ 002 . CT DIFFR	ON: fault OFF: normal	The type of the right controller is inconsistent with the configuration
Controller load status	_CS_ domain address _ station address . LOADL	_CS_ 002 _ 002 . LO ADL	ON: fault OFF: normal	The left controller program is blocked The left controller is overloaded
	_CS_ domain address _ station address . LOADR	_CS_ 002 _ 002 . LO ADR	ON: fault OFF: normal	The right controller program is blocked Right controller overload
Second pulse synchronization status	_CS_ domain address _ station address . PPSL	_CS_ 002 _ 002 . PP SL	ON: fault OFF: normal	The second pulse synchronization failure of the left controller, the second pulse synchronization is not enabled
	_CS_ domain address _ station address . PPSR	_CS_ 002 _ 002 . PP SR	ON: fault OFF: normal	The second pulse synchronization failure of the right controller, the second pulse synchronization is not enabled

### 4.3.2 Communication Module's Diagnosis Tags

In the High-performanceHMI system, the diagnostic tag of the communication module uses the

format "diagnostic name + domain address + station address + communication module address + attribute name", such as " \_CM\_017\_002\_000.WORK ", where: \_CM indicates that the tag is a communication module The diagnostic tag, 017 indicates the 17th domain, 002 indicates the No. 2 control station, 000 indicates the communication module address, and WORK indicates the working status of the module.

In the table below, the diagnostic tags of the IO communication module that can be passed by VFOPCSvr are listed .

**Table 4-2 I/O communication module diagnosis tag**

Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
Controller module on the left side, work/standby mark	_CM_ domain address _ station address . _communi cation module address. WORKL	_CM_002_000_004.WORKL (002 is control domain address, 000 is control station address, 004 is communication module address)	OFF: standby ON: work	Suppressed by controller A/B communication fault, communication module lost, E-BUS communication status
Controller module on the right side, work/standby mark	_CM_ domain address _ station address . _communi cation module address. WORKR	_CM_002_002_004.WORKR	OFF: standby ON: work	Suppressed by controller A/B communication fault, communication module lost, E-BUS communication status
Communication module on the left side gets lost	_CM_ domain address _ station address . _communi cation module address. LOSTL	_CM_002_002_004.LOSTL	OFF: normal ON: fault	Suppressed by controller A/B communication fault, E-BUS communication status
Communication module on the right side gets lost	_CM_ domain address _ station address . _communi cation module address. LOSTR	_CM_002_002_004.LOSTR	OFF: normal ON: fault	Suppressed by controller A/B communication fault, E-BUS communication status
Communication module on the left side gets lost(only for COM812, AEP6208, AEP6101)	_CM_ domain address _ station address . _communi cation module address.ULOSTL	_CM_002_002_004.ULOSTL	OFF: normal ON: fault	Suppressed by controller A/B communication fault, E-BUS communication status
Communication module on the right side gets lost(only for COM812, AEP6208, AEP6101)	_CM_ domain address _ station address . _communi cation module address.ULOSTR	_CM_002_002_004.ULOSTR	OFF: normal ON: fault	Suppressed by controller A/B communication fault, E-BUS communication status
48Va Status(for APL Power Switch)	_CM_ domain address _ station address . _communi cation module address.PW48A	_CM_002_002_004.PW48A	OFF: normal ON: fault	Suppressed by controller A/B communication fault, E-BUS communication status

Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
48Vb Status(for APL Power Switch)	_CM_domain address _ station address . _communi cation module address.PW48B	_CM_002_002 _004. PW48B	OFF: normal ON: fault	Suppressed by controller A/B communication fault, E-BUS communication status
Communication module on the left side LBUS (OMC) fault (COM741, COM721, COM722 don't support)	_CM_domain address _ station address . _communi cation module address. LBUSL	_CM_002_002 _004.LBUSL	OFF: normal ON: fault	Suppressed by controller A/B communication fault, communication module lost, E-BUS communication status
Communication module on the right side LBUS (OMC) fault (COM741, COM721, COM722 don't support)	_CM _domain address _ station address . _communi cation module address. LBUSR	_CM_002_002 _004.LBUSR	OFF: normal ON: fault	Suppressed by controller A/B communication fault, communication module lost, E-BUS communication status
Communication module on the left side E-BUS communication status	_CM_domain address _ station address . _communi cation module address. EBUSL	_CM_002_002 _004.EBUSL	OFF: normal ON: fault	Suppressed by controller A/B communication fault, communication module lost, E-BUS communication status
Communication module on the right side E-BUS communication status	_CM _domain address _ station address . _communi cation module address. EBUSR	_CM_002_002 _004.EBUSR	OFF: normal ON: fault	Suppressed by controller A/B communication fault, communication module lost, E-BUS communication status
Communication module 24Va fault (COM741 doesn't support)	_CM _domain address _ station address . _communi cation module address. PWA	_CM_002_002 _004.PWA	OFF: normal ON: fault	Suppressed by controller A/B communication fault, communication module lost, E-BUS communication status
Communication module 24Vb fault (COM741 doesn't support)	_CM _domain address _ station address . _communi cation module address. PWB	_CM_002_002 _004.PWB	OFF: normal ON: fault	Suppressed by controller A/B communication fault, communication module lost, E-BUS communication status
Address conflict	_CM _domain address _ station address . _communi cation module address. WORKL	_CM_002_002 _004. ADDCF T	ON: fault OFF: normal	Node address conflict
Request communication	_CM_domain address _ station address _ communic ation module address .REQCOM	_CM_002_002 _004. REQCO M	ON: fault OFF: normal	Request communication
Configuration status	_CM_domain address _ station address _ communic ation module address .CFGST	_CM_002_002 _004. CFGST	ON: Configured OFF: Unconfigured	Configuration status
Start state	_CM_domain address _ station address _ communic ation module address .BOOT	_CM_002_002 _004. BOOT	ON: Start OFF: Unstarted	Start state
Redundant state	_CM_domain address _ station address _ communic ation module address .REDUST	_CM_002_002 _004. REDUS T	ON: Redundant OFF: stand-alo ne	Redundant state

Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
E-BUS A network communication status	_CM_ domain address _ station address _ communic ation module address .NETAL	_CM_002_002 _004. NETAL	ON: fault OFF: normal	E-BUS A network failure on the left
	_CM_ domain address _ station address _ communic ation module address .NETAR	_CM_002_002 _004. NETAR	ON: fault OFF: normal	E-BUS A network failure on the right
E-BUS B network communication status	_CM_ domain address _ station address _ communic ation module address .NETBL	_CM_002_002 _004. NETBL	ON: fault OFF: normal	E-BUS B network failure on the left
	_CM_ domain address _ station address _ communic ation module address .NETBR	_CM_002_002 _004. NETBR	ON: fault OFF: normal	E-BUS B network failure on the right
0#1# Rack L-BUS A communication status	_CM_ domain address _ station address _ communic ation module address .CAN01AL	_CM_002_002 _004. CAN01A L	ON: fault OFF: normal	L-BUS A failure of the left 0#1# frame
	_CM_ domain address _ station address _ communic ation module address .CAN01AR	_CM_002_002 _004. CAN01A R	ON: fault OFF: normal	Right 0 # 1 # rack L-BUS A failure
2#3# Rack L-BUS A communication status	_CM_ domain address _ station address _ communic ation module address .CAN23AL	_CM_002_002 _004. CAN23A L	ON: fault OFF: normal	L-BUS A failure of the left 2#3# frame
	_CM_ domain address _ station address _ communic ation module address .CAN23AR	_CM_002_002 _004. CAN23A R	ON: fault OFF: normal	Right side 2#3# rack L-BUS A failure
0#1# Rack L-BUS B communication status	_CM_ domain address _ station address _ communic ation module address .CAN01BL	_CM_002_002 _004. CAN01B L	ON: fault OFF: normal	L-BUS B failure of the left 0#1# frame
	_CM_ domain address _ station address _ communic ation module address .CAN01BR	_CM_002_002 _004. CAN01B R	ON: fault OFF: normal	Right 0 # 1 # rack L-BUS B failure
2#3# Rack L-BUS B communication status	_CM_ domain address _ station address _ communic ation module address .CAN23BL	_CM_002_002 _004. CAN23B L	ON: fault OFF: normal	L-BUS B failure of 2#3# rack on the left
	_CM_ domain address _ station address _ communic ation module address .CAN23BR	_CM_002_002 _004. CAN23B R	ON: fault OFF: normal	Right side 2#3# rack L-BUS B failure

Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
Auxiliary power supply 1	_CM_domain address _ station address _ communic ation module address .ASSIPOW 1	_CM_002_002 _004. ASSIPO W1	ON: fault OFF: normal	Cabinet auxiliary power supply 1 alarm
Auxiliary power supply 2	_CM_domain address _ station address _ communic ation module address .ASSIPOW 2	_CM_002_002 _004. ASSIPO W2	ON: fault OFF: normal	Cabinet auxiliary power supply 2 alarm
System power 1	_CM_domain address _ station address _ communic ation module address .SYSPOW1	_CM_002_002 _004. SYSPO W1	ON: fault OFF: normal	Cabinet system power supply 1 alarm
System power 2	_CM_domain address _ station address _ communic ation module address .SYSPOW2	_CM_002_002 _004. SYSPO W2	ON: fault OFF: normal	Cabinet system power supply 2 alarm
Fan quality 1	_CM_domain address _ station address _ communic ation module address .CABFAN1	_CM_002_002 _004. CABFA N1	ON: fault OFF: normal	Cabinet fan 1 failure
Fan quality 2	_CM_domain address _ station address _ communic ation module address .CABFAN2	_CM_002_002 _004. CABFA N2	ON: fault OFF: normal	Cabinet fan 2 failure
Fan quality 3	_CM_domain address _ station address _ communic ation module address .CABFAN3	_CM_002_002 _004. CABFA N3	ON: fault OFF: normal	Cabinet fan 3 failure
Fan quality 4	_CM_domain address _ station address _ communic ation module address .CABFAN4	_CM_002_002 _004. CABFA N4	ON: fault OFF: normal	Cabinet fan 4 is faulty
Cabinet temperature	_CM_domain address _ station address _ communic ation module address .TEMP	_CM_002_002 _004. TEMP	Cabinet temperature value displayed by DINT data	Cabinet temperature

### 4.3.3 IO Module's Diagnosis Tags

In the High-performanceHMI system, the format of the diagnostic tag of the IO connection module is "diagnostic name + domain address + station address + communication module address + rack address +IO module address + attribute name". For example,

"\_IO\_017\_002\_003\_000\_001.MATCH ", where: \_IO means the tag is the diagnostic tag of the IO module, 017 means the 17th domain, 002 means the 2nd control station, 003 means the communication module address, 000 means the rack address, 001 means the IO module

Address, MATCH means the IO card matches.

In the following table, the diagnostic tags of the IO modules that can be transferred by VFOPCSvr are listed.

**Table 4-3 IO Module's Diagnosis Tags**

Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
IO module fault	_IO _ domain address _ station address _ communication module address _ rack address _ channel address .HDW	_IO_002_001_004_005_00 0.HDW (002 is control domain address, 001 is control station address, 004 is communication module address, 005 is rack address, 000 is I/O module address)	ON: fault OFF: normal	Suppressed by controller A/B network communication failure, communication module loss, E-BUS communication status
Module work / standby	_IO _ domain address _ station address _ communication module address _ rack address _ channel address .WORK	_IO_002_002_004_005_00 2.WORK	OFF : Standby ON : Work	Suppressed by controller A/B network communication failure, communication module loss, E-BUS communication status
Module failure level	_IO _ domain address _ station address _ communication module address _ rack address _ channel address . Serious	_IO_002_002_004_005_00 2. SERIOUSE	ON: fault OFF: normal	IO module serious failure
	_IO _ domain address _ station address _ communication module address _ rack address _ channel address . Light	_IO_002_002_004_005_00 2. LIGHT	ON: fault OFF: normal	IO module minor failure
Module auxiliary power	_IO _ domain address _ station address _ communication module address _ rack address _ channel address . ASSIP OW	_IO_002_002_004_005_00 2. ASSIPOW	ON: fault OFF: normal	IO module auxiliary power detection
Module connection detection	_IO _ domain address _ station address _ communication module address _ rack address _ channel address . LOST	_IO_002_002_004_005_00 2. LOST	ON: fault OFF: normal	IO module is missing



Diagnosis item description	Tag reference format	Tag reference example	Display value	Description
Module address detection	_IO _ domain address _ station address _ comm unication module address _ rack address _ channel address . ADDCF T	_IO_002_002_004_005_00 2. ADDCFT	ON: fault OFF: normal	IO module address conflict
Module A bus	_IO _ domain address _ station address _ comm unication module address _ rack address _ channel address . BUSAE RR	_IO_002_002_004_005_00 2. BUSAERR	ON: fault OFF: normal	A bus failure
Module B bus	_IO _ domain address _ station address _ comm unication module address _ rack address _ channel address . BUSBE RR	_IO_002_002_004_005_00 2. BUSBERR	ON: fault OFF: normal	B bus failure
Module type detection	_IO _ domain address _ station address _ comm unication module address _ rack address _ channel address . The MATCH	_IO_002_002_004_005_00 2. MATCH	ON: fault OFF: normal	Type does not match
Module configuration verification	_IO _ domain address _ station address _ comm unication module address _ rack address _ channel address . CFGDI FF	_IO_002_002_004_005_00 2. CFGDIFF	ON: fault OFF: normal	Configuration check is inconsistent
Channel status	_IO _ domain address _ station address _ comm unication module address _ rack address _ channel address . CHNST A	_IO_002_002_004_005_00 2. CHNSTA	ON: fault OFF: normal	IO module channel diagnosis

**Tip:**

- Distributed I/O module COM715-S'S subordinate device doesn't support



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**diagnostic tags.**

- **COM712-S module doesn't support "Data transmission module total status" diagnostic tags.**
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#### 4.3.4 Operational Station Diagnostic Tags

In the High-performanceHMI system, the diagnostic tag format operator station uses the formula "Diagnostic name + third IP address + the fourth IP address + attribute name." For example, "\_OS\_001\_166.SCNETA ", where: \_OS means the tag is the operator station diagnostic tag , 001\_166 means the last two digits of the IP are 1.166 operator station, and SCNETA means operation A network communication .

In the table below, the operator station diagnostic tags that can be transmitted by VFOPCSvr are listed

**Table 4-4 Operational station diagnostic tags**

Diagnosis content	Tag reference format	Example	Diagnostic item	Display value
Control A network communication	_OS_ operator station address _ domain addresses . The NET 20 is	_OS_001_166.NET 20	Operation station SCnet A network communication failure ( no 20 network report failure )	ON: fault OFF: normal
Control B network communication	_OS_ operator station address _ domain addresses . The NET 21 is	_OS_001_166.NET 21	Operation station SCnet B network communication failure ( no 21 network report failure )	ON: fault OFF: normal
Operating station lost	_OS_ operator station address _ domain address .LOST	_OS_001_166. LOST	Operating station lost	ON: fault OFF: normal
operating system	_OS_ operator station address _ domain address .WINVER	_OS_001_166. WINVER	Operating system version	The operating system version is displayed as a string.
Package version	_OS_ operator station address _ domain address .VFVER	_OS_001_166. VFVER	High-performance HMI version	Display the High-performanceHMI s software package version in string format .

Diagnosis content	Tag reference format	Example	Diagnostic item	Display value
CPU usage (%)	_OS_ operator station address _ domain address .CPU	_OS_001_166 .CPU	Operation station CPU	DINT form displays the current CPU usage rate.
All physical memory (M)	_OS_ operator station address _ domain address .TOTAL MEM	_OS_001_166.TOTAL MEM	All physical memory	DINT form shows all current physical memory.
Use physical memory (M)	_OS_ operator station address _ domain address .USEM EM	_OS_001_166.USEM EM	Operating station memory	The DINT form shows the physical memory currently in use.
Configuration disk free space (M)	_OS_ operator station address _ domain address .FDISK	_OS_001_166.FDISK	The remaining space of the disk where the configuration is located	DINT form displays the current remaining space of the configuration disk.
Information A Network Communication	_OS_ operator station address _ domain address .NET30	_OS_001_166.NET30	Operation station SOnet A network communication failure ( no 30 network report failure )	ON: fault OFF: normal
Information B network communication	_OS_ operator station address _ domain address .NET31	_OS_001_166.NET31	Operation station SOnet B network communication failure ( no 31 network report failure )	ON: fault OFF: normal
Time synchronization between upper and lower computers	_OS_ operator station address _ domain addresses . The TIMED	_OS_001_166 .TIME D	The operating station clock is not synchronized with the controller	ON: fault OFF: normal
Consistency with configuration server configuration	_OS_ operator station address _ domain addresses . CFG GSDIFF	_OS_001_166. CFGS DIFF	The configuration of the operating station is inconsistent with the configuration server	ON: fault OFF: normal
Consistency with lower computer configuration	_OS_ operator station address _ domain address .CFGC DIFF	_OS_001_166.CFGC DIFF	Operation station configuration is inconsistent with control station	ON: fault OFF: normal

## Section 5 Revision

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*Table 5-1 Retrofit list of the version*

Document version	Applicable software version	Remarks
V1.0 (20230301)	OMC High-performanceH MI V4.70.00.00	First release
V1.1 (20230830)	OMC High-performanceH MI V5.10.00.00-M	Updated screenshots. Added descriptions of heterogeneous communication and slave station diagnosis.