YAMATAKE

Control Valve Maintenance Support System Valstaff Application for FOUNDATION Fieldbus System

Model: VMS103

User's Manual

Yamatake Corporation

CM2-VMS103-2001
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Introduction

Thank you for your purchasing of this control valve maintenance support system "Valstaff" (hereafter referred to as "Valstaff").

This manual describes how to operate the Valstaff Fieldbus system of the Valstaff-series using the FOUNDATION FieldBus for the communication protocol with field devices, particularly, Valstaff application (model VMS103), a main configuration element.

The Valstaff must be operated correctly while referring to this instruction manual to make the control valve maintenance effective and efficient.

Safety precautions

Outline

To safely use this system, it is necessary to perform the proper installation and operation, and appropriate maintenance.

Before starting the installation work, operation, and maintenance work, thoroughly read the safety precautions shown in the instruction manual to fully understand their contents.

Safety precautions

In this manual, the following symbol marks are used to safely operate this product.

WARNING
Warnings are indicated when mishandling this product might result in death or serious injury to the user.

CAUTION
Cautions are indicated when mishandling this product might result in minor injury to the user, or only physical damage to this product.

To safely operate this product, strictly observe the following safety precautions.

Yamatake Corporation shall not be held responsible for troubles arising from negligence of the cautions.

Cautions on safe work

- For configuration element devices supplementary described in this manual requiring the power OFF before starting the wiring work, carry out the wiring work with the POWER turned OFF.
  For details about handling of these devices, refer to relevant manuals for these devices.

- For the field installation type devices supplementary described in this manual having the flameproof construction, never open the cover during operation (power is being supplied).
  For details about handling of these devices, refer to relevant manuals for these devices.

Scope of this manual

- This manual describes how to operate the Valstaff Fieldbus system of the Valstaff-series using the FOUNDATION Fieldbus for the communication protocol with field devices, particularly, Valstaff application (model No. VMS103), a main configuration element.

- Even though this manual includes the description about operational explanation of the system configuration elements other than the model VMS103, such description includes the contents for limited purpose, such as basic information provided by Yamatake Corporation for understanding of the Valstaff Fieldbus system or operation of configuration devices.
  For details about handling of the following system configuration element devices other than the model VMS103, get the instruction manuals provided by each device manufacturer and thoroughly read them to fully understand their contents.

- For details about operation of the smart valve positioners, component elements of the Valstaff Fieldbus system, refer to the following instruction manuals published by Yamatake Corporation.
  Model AVP303/304/203/204: CM2-AVP303-2001

- The model VMS103 is application software that runs on Microsoft Windows XP Professional Edition SP2 (hereafter referred to as "Windows").
  The contents of this manual are intended for personnel who have already understood the basic knowledge about Windows (general concept, such as drive, file, folder, and Window operation), as well as basic knowledge necessary for this operation (mouse operation, keyboard operation, and media handling, etc.).
  For details about basic knowledge on Windows, refer to generally available technical books.

- For details about how to operate the IBM PC AT compatible personal computer (hereafter referred to as "PC") you want to install the model VMS103, refer to the instruction manual supplied with the PC.

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Chapter 1: About Valstaff

1-1: What is "Valstaff"?

1-1-1: Overview of Valstaff

This control valve maintenance support system "Valstaff" is so designed that it supports the decision making necessary for the control valve maintenance job and promotes to make the maintenance job efficient. By communicating with the smart valve positioner (hereafter referred to as "positioner" in this manual) that is mounted on control valve, the following functions are achieved.

- The information about operation status of the control valve is collected during operation of the plant and such information is edited, saved, and controlled on the Valstaff application. With such operation, the deterioration of the control valve can be predicted and whether or not a trouble occurs is judged.
- The inspection request is sent from the Valstaff application and the response to this request is recorded to quantify the performance of the control valve.
- The positioner can be adjusted or set easily through the Valstaff application and manage this information.
- The integrated control of the information on control valve maintenance is performed electronically.

The Valstaff Fieldbus system utilizes the FOUNDATION Fieldbus for its communication technology. A system can be configured with positioners, Valstaff application, and Fieldbus related devices.

1-1-2: Valstaff system configuration elements

1-1-2-1: Valstaff application model VMS103

This Valstaff application is a Windows application that collects, edits, displays, and saves the information on control valve transmitted from the positioner.

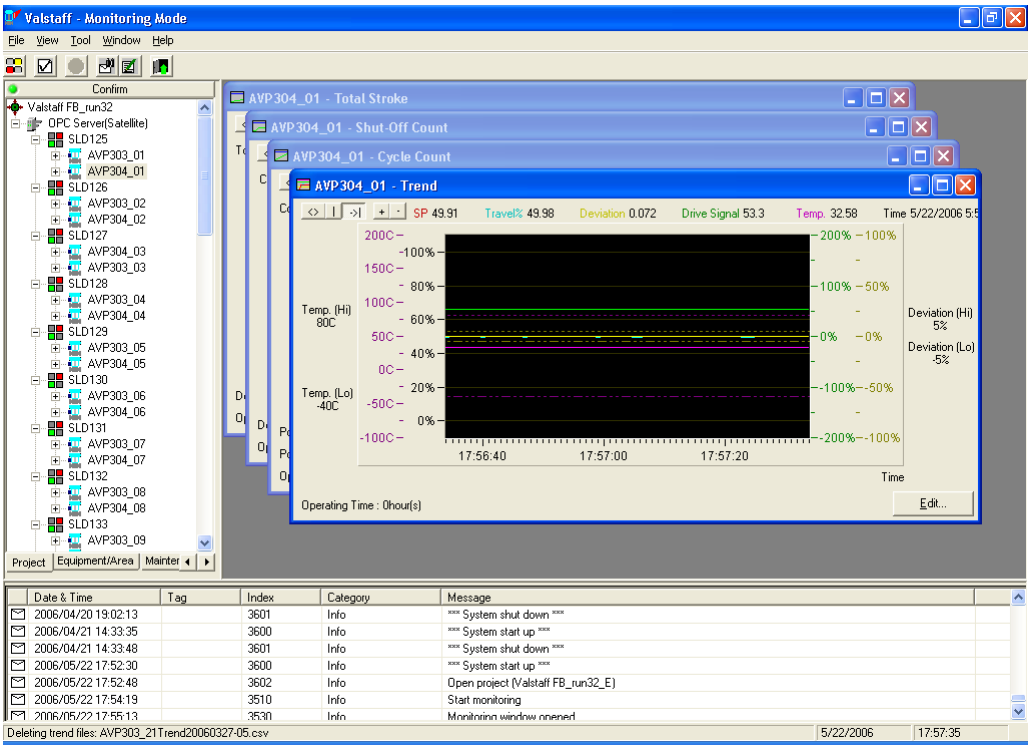

Figure 1-1 Valstaff application (Example: "Monitoring mode" window)

1-1-2-2: Positioner

A positioner applicable to the Valstaff Fieldbus well as collection and transmission of four information on operation status of the control valve and response function to various commands sent from the Valstaff application.

Products to be combined with the Valstaff Fieldbus system are the following four models of Yamatake's positioner products.

- SVP3000 Alphaplus series FOUNDATION Fieldbus model.

  Model AVP303(general type)

  Model AVP203(remote type)

- SVP3000 Alphaplus series 4 to 20mA analog signal /FOUNDATION Fieldbus Hybird model.

  Model AVP304(general type)

  Model AVP204(remote type)

Figure 1-2 Model AVP303/304(general type)

Figure 1-3 Model AVP203/204 (remote type)

1-1-2-3: Smart linking device (H1 Fieldbus/Ethernet converter model SLD100)

The model SLD is a protocol converter supporting the H1 Fieldbus specifications of the FOUNDATION Fieldbus standard. A model SLD is inserted into the H1 Fieldbus 1 segment to convert variables and data of the H1 Fieldbus unit into the data that can be handled in the Ethernet.

Up to 32 model SLDs can be connected to a Valstaff 1 system. Therefore, a number from 01 (hex) to 20 (hex) (32) must be assigned to each of the model SLD. For how to set such an address, refer to the instruction manual for model SLD (No. CM1-SLD100 - 2001).

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Figure 1-4 Smart linking device model SLD100

1-1-3: System configuration of Valstaff

Systems shown in Figure 1-5 and 1-6 are configured with units and devices described in "1-1-2: Valstaff system configuration elements".

For details, refer to chapters after "Chapter 3: Installing the Valstaff".

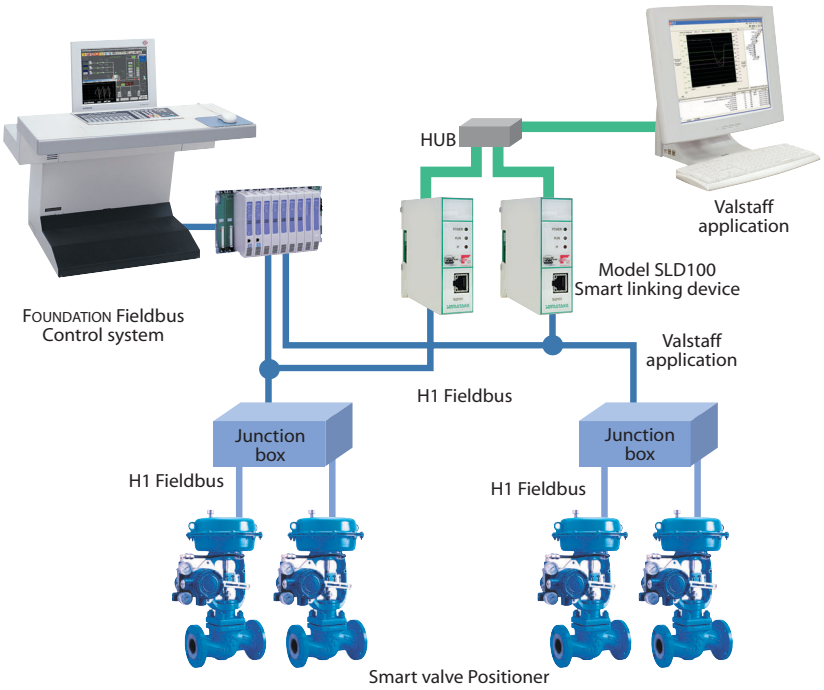

Figure 1-5 System configuration with Fieldbus system

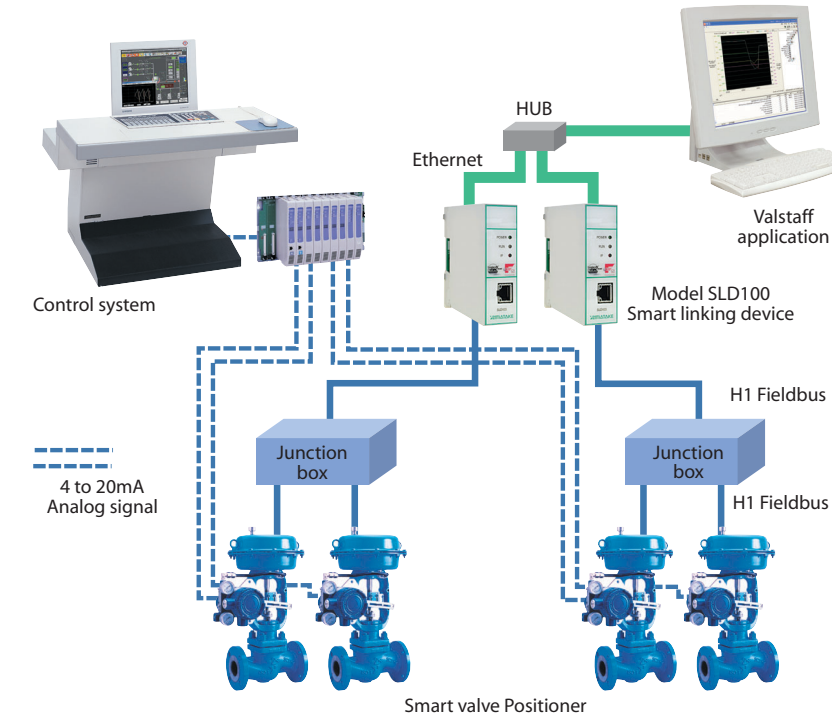

Figure 1-6 System configuration with Hybrid system

1-1-4: Operation modes and functions of Valstaff

To start up the Valstaff application for the first time, start up [System Setup] and register the system configuration to be operated from the application into the Valstaff application. After the system configuration has been registered, move to the "Mode Selection" window, from which you can transit to relevant mode, in which you can execute a desired function of the Valstaff.

Four kinds of modes are provided, "Operation setup mode", "Monitoring mode", "Test mode", and "SVP configuration/Calibration mode". Figure 1-7 shows the concept of the transition among these modes.

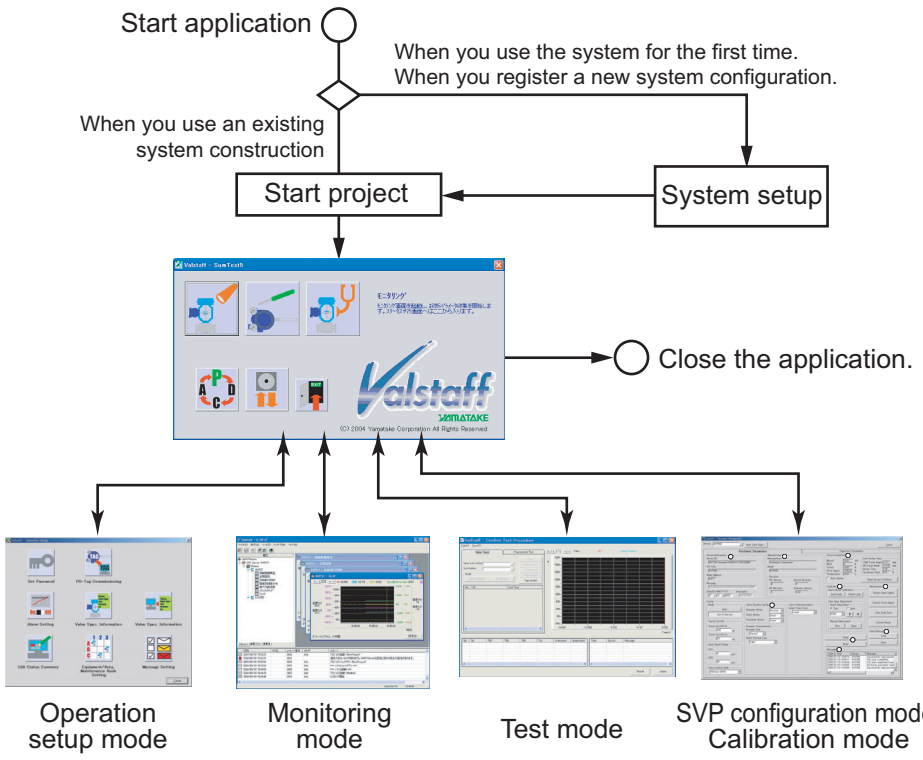

Figure 1-7 Valstaff mode transition and major functions

1-1-5: User levels of Valstaff

In the Valstaff, three kinds of user levels are set by considering the technical knowledge level and influence on the plant operation when operating a certain function.

1-1-5-1: About "Engineer"

"Engineer" is a user level having the highest authority of the Valstaff's user levels. "Engineer" is intended for users in charge of operation needing the high knowledge level, such as system setup. "Engineer" includes the authorities of low-user levels, "supervisor" and "operator".

1-1-5-2: About "Supervisor"

"Supervisor" is a medium user level of three user levels set in the Valstaff.

"Supervisor" is intended for users having proper knowledge about implementation of the maintenance and operation needing consideration of the plant operation status, such as alarm necessity setup or implementation of the test in the test mode.

"Supervisor" includes the authority of "operator", a low-user level.

1-1-5-3: About "Operator"

"Operator" is a user level having the lowest authority of Valstaff's user levels. With this user level, browsing functions, such as monitoring in the monitoring mode can be performed, but the operation (execution of the test or positioner calibration) affecting the plant operation status cannot be performed. "Operator" is intended for users in charge of data browsing.

Appropriate user levels necessary to operate functions are set for all functions of the Valstaff. When logging in a function with a certain user level, it is required to input relevant preset password.

The user having a higher level can log in functions set for the lower user level with this password. For example, when the user having the "engineer" authority wants to perform operations needing "supervisor" user level and it is prompted to input the password, such user can log in a desired operation with the "engineer" password.

The "engineer" password must be distributed to each user who uses the Valstaff by considering the characteristics of each user level.

The following default passwords have been set for "engineer" and "supervisor" users before shipment from the factory.

Engineer: Yamatake

Supervisor: Valstaff

For details about how to change the password, refer to “6-4: Running the Set Password” on page 6-5.

1-2: Hardware requirements

1-2-1: Requirements for personal computer

Table 1-1 shows the requirements for a personal computer you want to install the Valstaff application. Before installing the Valstaff application, make sure that a personal computer you want to use satisfies the requirements.

Table 1-1 Required specifications of personal computer

Model	DOS/V machine
CPU	Pentium4, 1.8 GHz or higher
RAM	256 MB or more
Required hard disk capacity	For Valstaff installation: 12 MB For saving diagnostic data per unit: 1 MB /year/64 units For saving trend data: 10 GB /year/64 units
Required hard-ware	CD-ROM drive
	USB connection removable HDD (for data backup /load)
	Color monitor (1024 × 768 pixel or more, 65536 display colors or more)
	LAN Interface RJ45 connector/10 BASE-T/100 BASE-TX (for Ethernet connection)
	USB port (for license key insertion)
Operating sys-tem	Microsoft Windows XP Professional SP2 (the Japanese or English version)

1-2-2: Requirements for smart valve positioner

Table 1-2 shows the positioner models and internal software version of each model, which can be used by combining them with the Valstaff application. Make sure that the positioner satisfies these requirements.

Table 1-2 List of positioner models

Model	Note
AVP303	Software ver. 2.1 or later
AVP203	
AVP304	Software ver.1.1 or later
AVP204	

For details about the positioner model, check the product nameplate put on the product or the installation drawings to make sure that proper model is used.

For the internal software version, all models with manufacture date of july 2005 or later are manufactured with appropriate software version. Check the product nameplate or delivery specification to make sure that the manufacture date is proper.

1-2-3: Related units

1-2-3-1: H1 Fieldbus/Ethernet converter

Use Yamatake's smart linking device for H1 Fieldbus and Ethernet converter. If a combination of H1 Fieldbus and Ethernet converter other than the above is required, contact Yamatake Corporation.

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Table 1-3 H1 Fieldbus/Ethernet converter

Manufacturer	Product name, mode, etc.
Yamatake Corporation	Smart linking device SLD100-XXX

1-2-4: Installation

For details about how to install a personal computer you want to install the Valstaff application, refer to the instruction manual for personal computer.

Additionally, for details about how to install units and devices making up the Valstaff Fieldbus system, refer to the instruction manuals for relevant units and devices.

Note *Never connect the personal computer, in which the Valstaff application has been installed, to an external network, such as Internet or Intranet, etc. It is not assumed that this product is used with various measures to keep the network security. Therefore, note that Yamatake shall not guarantee a trouble arising from the connection with the Internet/Intranet.*

1-3: Software requirements

1-3-1: Requirements for operating system

The Valstaff application is run properly on the personal computer, in which the operating system shown in Table 1-1 has been installed. Make sure that the personal computer you want to use satisfies the requirements.

1-3-2: Requirements for related software

The Valstaff application is operated with a combination of applications shown in Table 1-4. In addition to the Valstaff application, you must install such applications into the personal computer you want to use. These applications are included in the Valstaff application installation CD-ROM.

Table 1-4 Related software

Related software	FF OPC server
	Super Pro license key driver

Note *Do not install any application other than Windows application and applications shown below into the personal computer you want to install the Valstaff application.*

- *Valstaff application*
- *FF OPC server*
- *Super Pro license key driver*
- *Hybrid FB configurator (to use hybrid positioner AVP304/204 type)*
- *Driver for USB hard disk drive used for data backup amd loading (when necessary)*

Note that a trouble arising from installation of other application, which occurs in this product, is beyond the guarantee.

1-3-3: Setting up the power supply option

When the Valstaff application is used in a PC, the setting to prevent the operation of the PC from stopping must be made. Select [Control Panel] → [Properties] in Power Option → [Power Schemes]. Then set "System standby" to "Never" and uncheck "Enable hibernation" for [Hibernate].

Chapter 2: About Product Package

2-1: About contents of product package

When purchasing the Valstaff application model VMS103, items shown in "2-1-1: Installer CD-ROM" to "2-1-3: Quick start guide", which have been stored in a plastic outer packing case, are delivered. When you receive the package you have ordered, make sure that all items are stored in the package before using them.

2-1-1: Installer CD-ROM

This CD-ROM includes the Valstaff application, installer for related software shown in "1-3-2: Requirements for related software", and instruction manual in the PDF file format.

Figure 2-1 Valstaff application installer CD-ROM

2-1-2: License key

This license key is an USB port insertion type license key, which is required for each personal computer you want to install the Valstaff application.

This license key is absolutely necessary to start up the Valstaff application.

Figure 2-2 License key

2-1-3: Quick start guide

This quick start guide is a simple guidebook, which is printed on A4-paper sheets, that summarizes the requirements necessary to install the Valstaff application and how to install the Valstaff application into the personal computer. Refer to the quick start guide when installing the Valstaff application.

2-2: About storage of product

To store the product, you must properly fix the product in the plastic case, in which the product has been packed at delivery, and store it in an indoor place where the temperature and humidity are not high.

You can make a copy of the installer CD-ROM only once for the backup or storage purpose. When necessary, make a copy and store it carefully.

Chapter 3: Installing the Valstaff

3-1: Installation

⚠ WARNING
To start the installation work, always log in Windows with the user having the administrator authority.For details about Windows user and its authority, see the manual for personal computer you are using, as well as manual for Windows.

3-1-1: Environment necessary for installation

To use the Valstaff, the following environment is required. You must prepare the necessary environment before installing the Valstaff application.

Table 3-1 Specifications of personal computer connected

Model	DOS/V machine
CPU	Pentium4, 1.8 GHz or higher
RAM	256 MB or more
Required hard disk capacity	For Valstaff installation: 12 MB For saving diagnostic data per unit: 1 MB /year/64 units For saving trend data: 10 GB /year/64 units
Required hardware	CD-ROM drive
	USB connection removable HDD (for data backup /load)
	Color monitor (1024 × 768 pixel or more, 65536 display colors or more)
	LAN Interface RJ45 connector/10 BASE-T/100 BASE-TX (for Ethernet connection)
	USB port (for license key insertion)
Operating system	Microsoft Windows XP Professional SP2 (the Japanese or English version)

3-1-2: Installation procedure

After the installer has been started up, perform the installation work in the following order:

· Valstaff

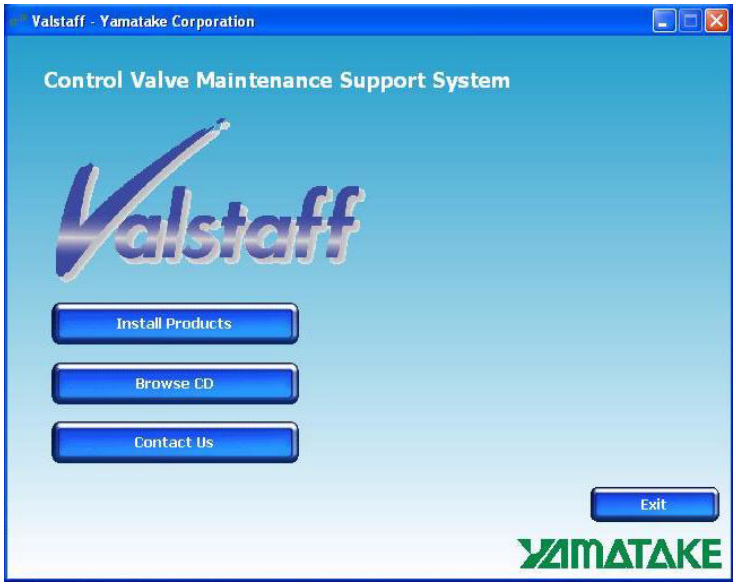
· FF OPC server

· Super Pro driver

· Hybrid FB configurator

After the installation work is completed, be sure to restart the personal computer

3-1-3: Starting up the installer

Step	Procedure
1	Insert the Valstaff install CD into the CD-ROM drive.
2	The installer will be started up automatically (Figure 3-1). If the installer is not started up, double-click "AutoRun\AutoRun.exe" in the CD-ROM drive using Explorer.  *Figure 3-1 "Initial" window of installer*
3	When clicking [Install] button in Figure 3-1, the window shown in Figure 3-2 will appear. This shows that preparations necessary to install the Valstaff application, FF OPC server, license key driver, and Hybrid FB configurator (for hybrid positioner) have been completed.  *Figure 3-2 "Install Products" window*

3-1-4: Installing the Valstaff application

Step	Procedure
1	Click [Valstaff] in the "Install Products" window (Figure 3-2). The Valstaff installer will be started up.
2	The "InstallShield Wizard" window (Figure 3-3) will appear. Click the [Next] button.
3	The "License Agreement" window (Figure 3-4) will appear. After checking the contents of the license agreement, check on [◉ I accept the terms in the license agreement] and click the [Next] button.

Figure 3-3 "InstallShield Wizard" window

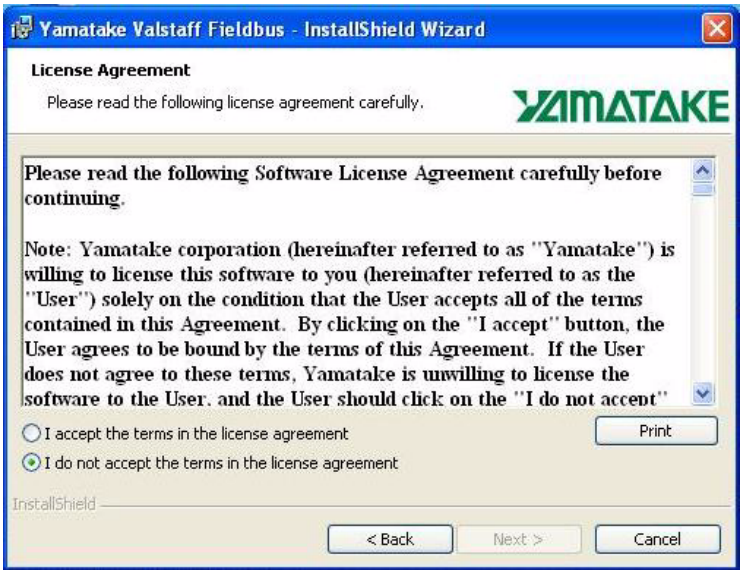


Figure 3-4 "License Agreement" window

Step	Procedure
4	The "Customer Information" window (Figure 3-5) will appear. Input a user name and an organization, and then click the [Next] button.
5	The "Ready to Install the program" window (Figure 3-6) will appear. Click the [Install] button. The installation will be started.

Figure 3-5 "Customer Information" window

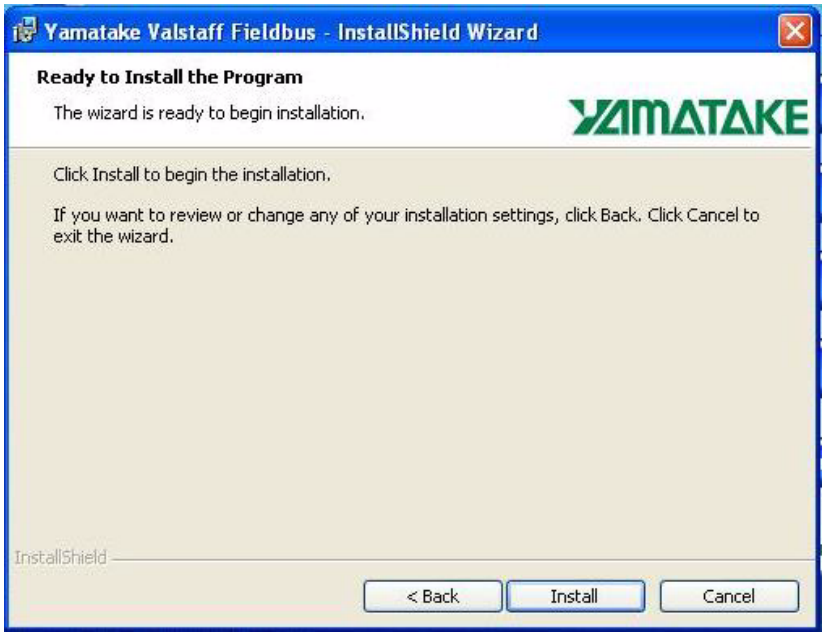


Figure 3-6 "Ready to Install the program" window

Step	Procedure
6	When the installation is completed, the "InstallShield Wizard Completed" window (Figure 3-7) will appear. Click the [Finish] button to exit the installation.

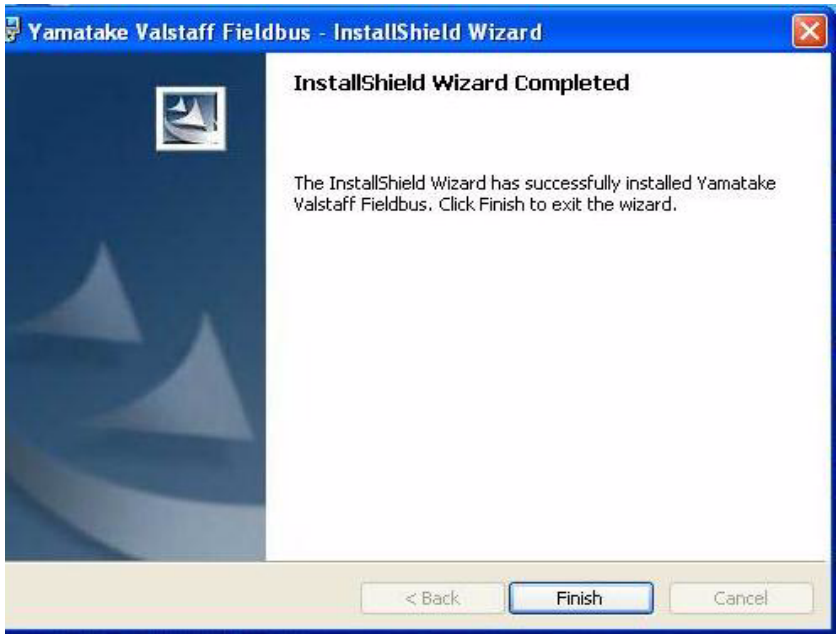


Figure 3-7 "InstallShield Wizard Completed" window

3-1-5: Installing the FF OPC server

Step	Procedure
1	Click [FF OPC Server] in the "Install Products" window (Figure 3-2). The FF OPC server installer will be started up.
2	The "InstallShield Wizard" window (Figure 3-8) will appear. Click the [Next] button.
3	The "License Agreement" window (Figure 3-9) will appear. After checking the contents of the license agreement, check on [◉ I accept the terms in the license agreement.] and click the [Next] button.

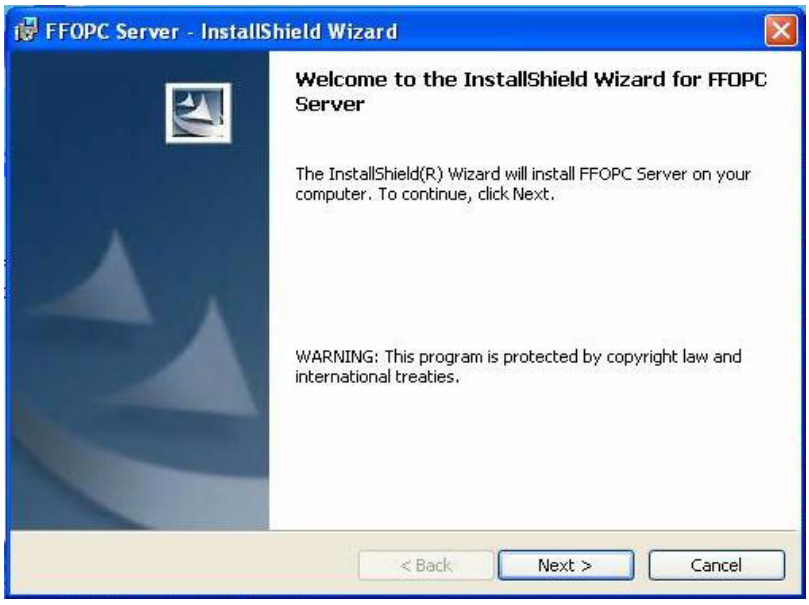


Figure 3-8 "InstallShield Wizard" window

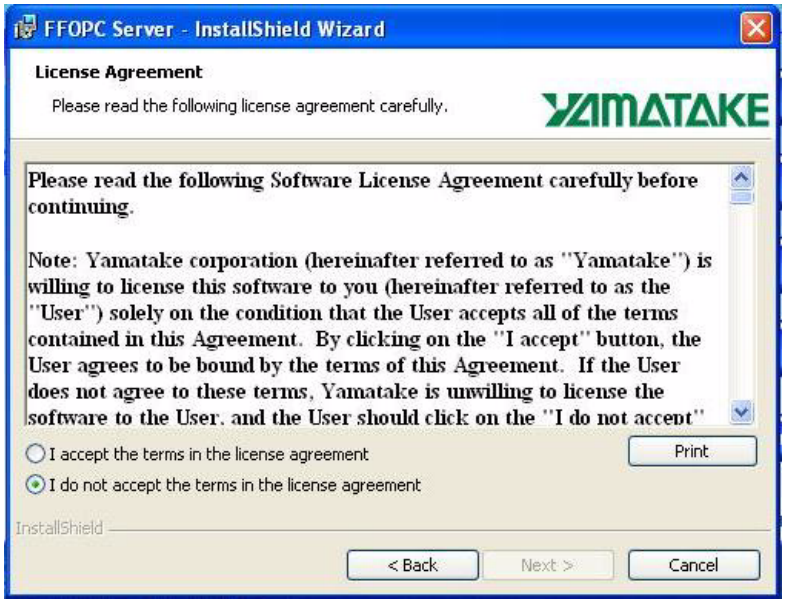
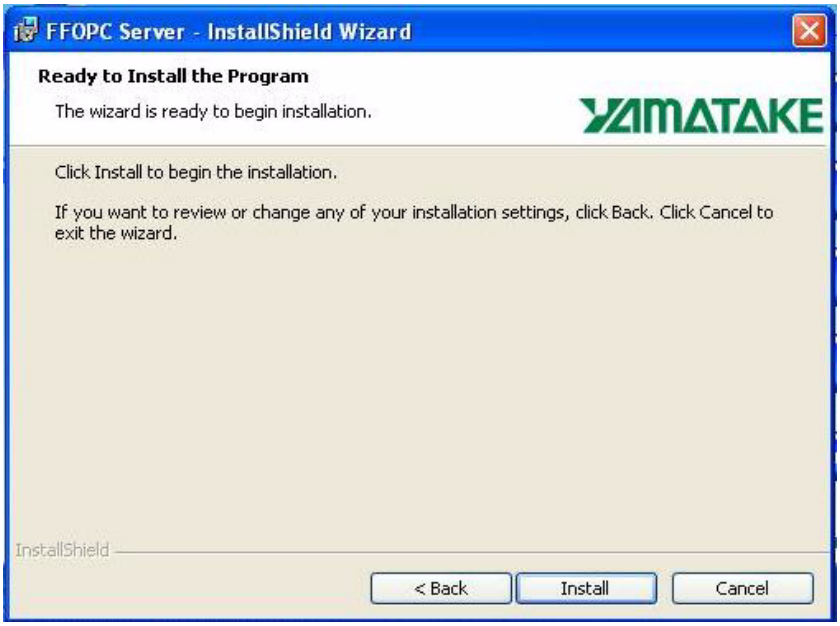


Figure 3-9 "License Agreement" window

Step	Procedure
4	The "Customer information" window (Figure 3-5) will appear. Input a user name and an organization, and then Click the [Next] button.  *Figure 3-10 "Customer information" window*
5	The "Ready to Install the program" window (Figure 3-11) will appear. Click the [Install] button. The installation will be started.  *Figure 3-11 "Ready to Install the Program" window*

6	When the installation is completed, the "InstallShield Wizard Completed" window (Figure 3-12) will appear. Click the [Finish] button to exit the installation.

Figure 3-12 "InstallShield Wizard Completed" window

3-1-6: Installing the license key driver

Step	Procedure
1	Click [SuperPro driver] in the "Install Products" window (Figure 3-2). The license key driver installer will be started up.
2	The "InstallShield Wizard" window (Figure 3-13) will appear. Click the [Next] button.

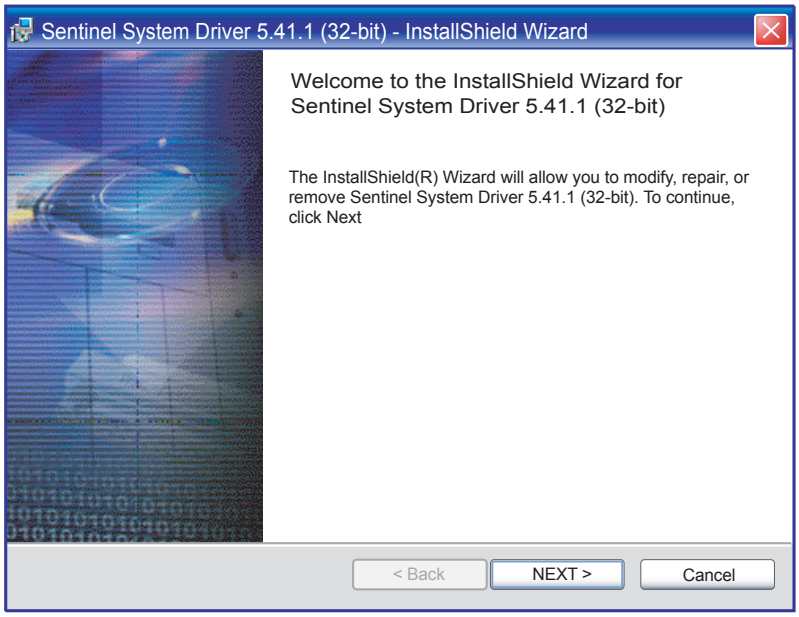


Figure 3-13 "InstallShield Wizard" window

3	The "License Agreement" window (Figure 3-14) will appear. After checking the contents of the license agreement, check on [◉ I accept the terms in the license agreement] and click the [Next] button.

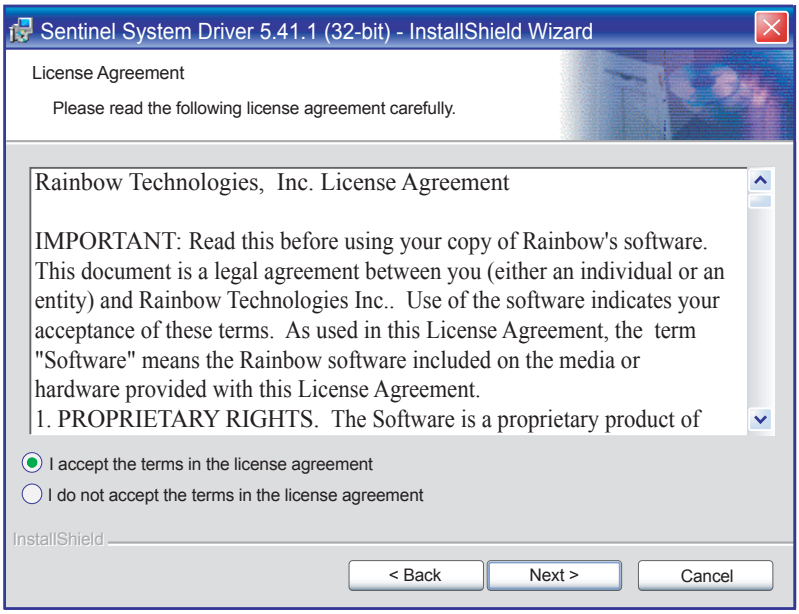


Figure 3-14 "License Agreement" window

Step	Procedure
4	The "Destination Folder" setup window (Figure 3-15) will appear. In this window, click the [Next] button.

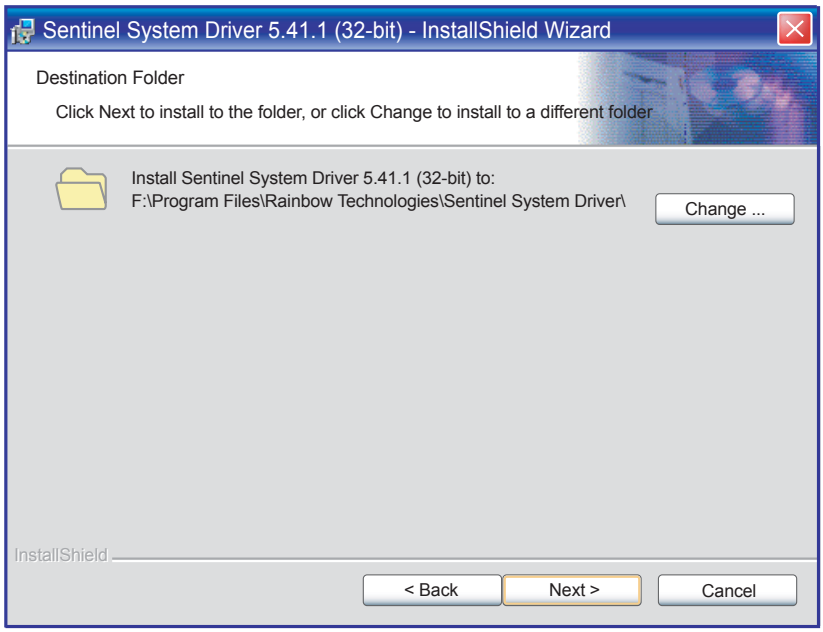


Figure 3-15 "Destination Folder" setup window

5	The "Setup Type" setup window (Figure 3-16) will appear. Check on [◉ Complete] and click the [Next] button.

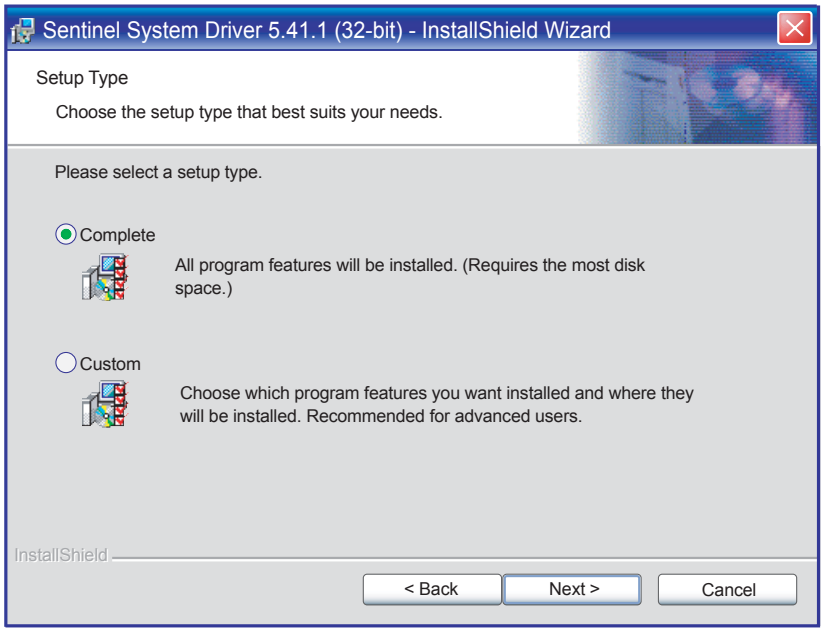


Figure 3-16 "Setup Type" setup window

Step	Procedure
6	The "Ready to Install the program" window (Figure 3-17) will appear. Click the [Install] button. The installation will be started.

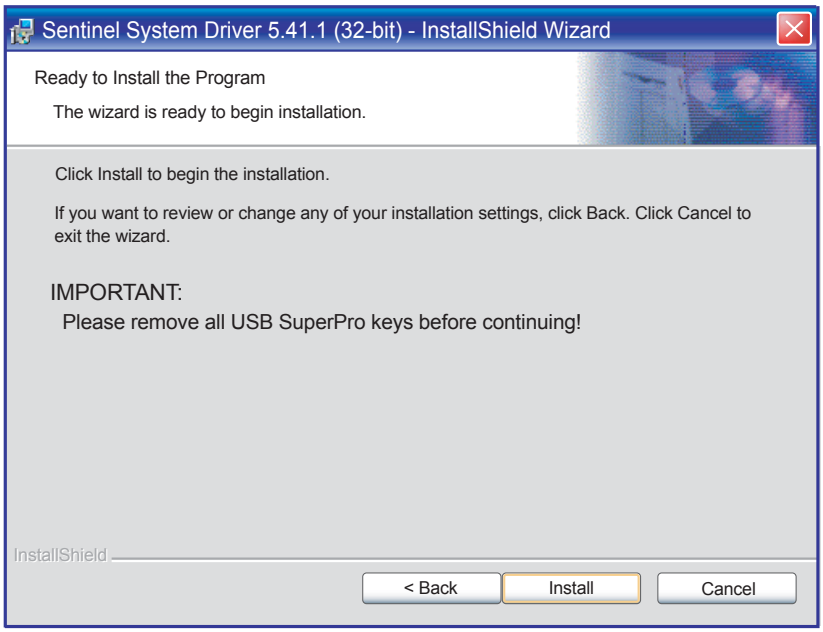


Figure 3-17 "Ready to Install the program" window

7	When the installation is completed, the "InstallShield Wizard Completed" window (Figure 3-18) will appear. Click the [Finish] button to exit the installation.

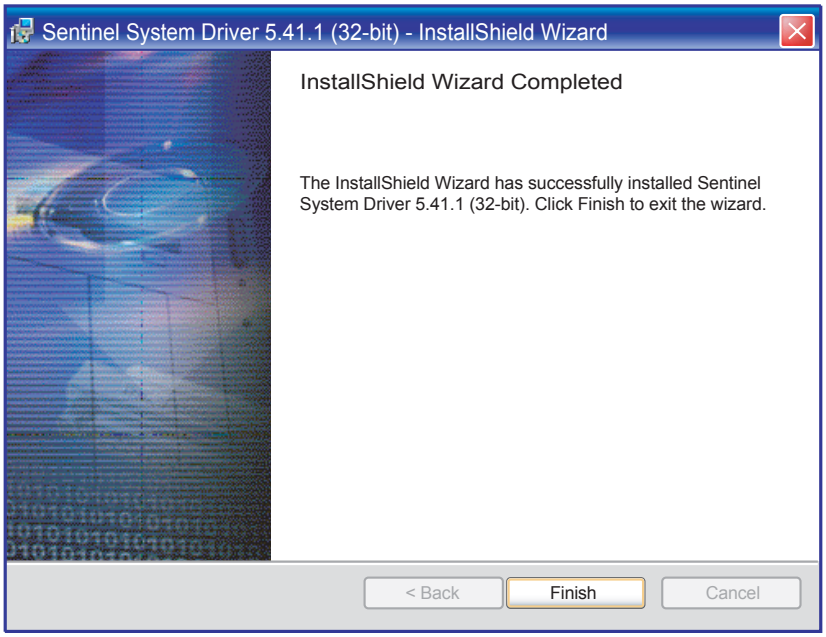
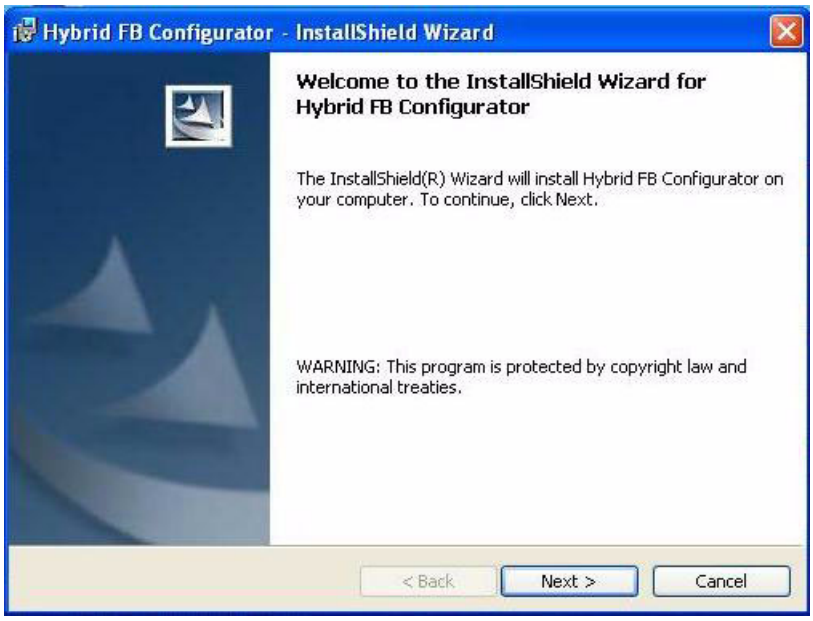
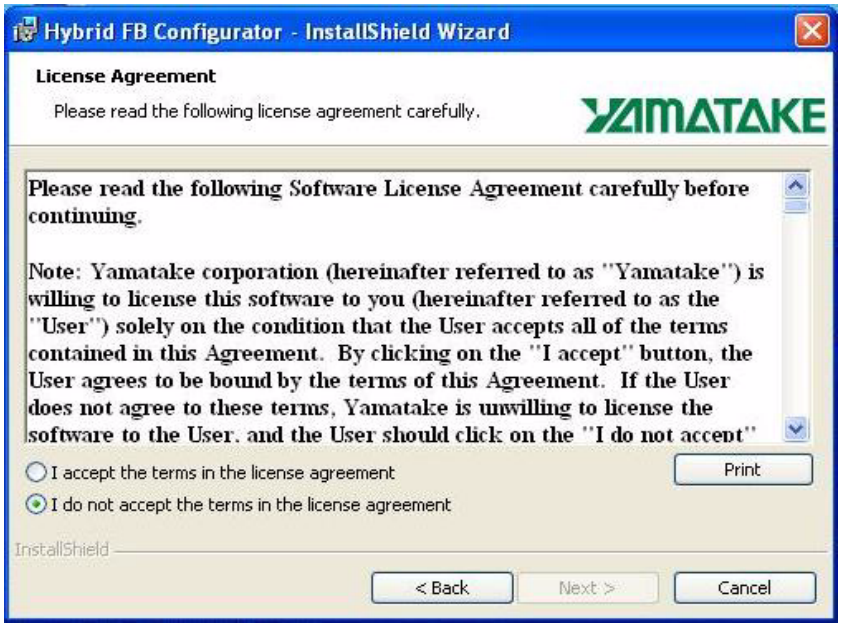


Figure 3-18 "InstallShield Wizard Completed" window

3-1-7: Installing the Hybrid FB configurator

Step	Procedure
1	Click Hybrid FB configurator on the installation screen (Figure 3-2). The installer for is then started up.
2	The Welcome screen (Figure 3-19) appears. Click the [Next] button.  *Figure 3-19 "InstallShield Wizard" window*
3	When the installation is completed, the "InstallShield Wizard Completed" window (Figure 3-20) will appear. Click the [Finish] button to exit the installation.  *Figure 3-20 "License Agreement" window*

Step	Procedure
4	The "Ready to Install the program" window (Figure 3-21) will appear. Click the [Install] button. The installation will be started.

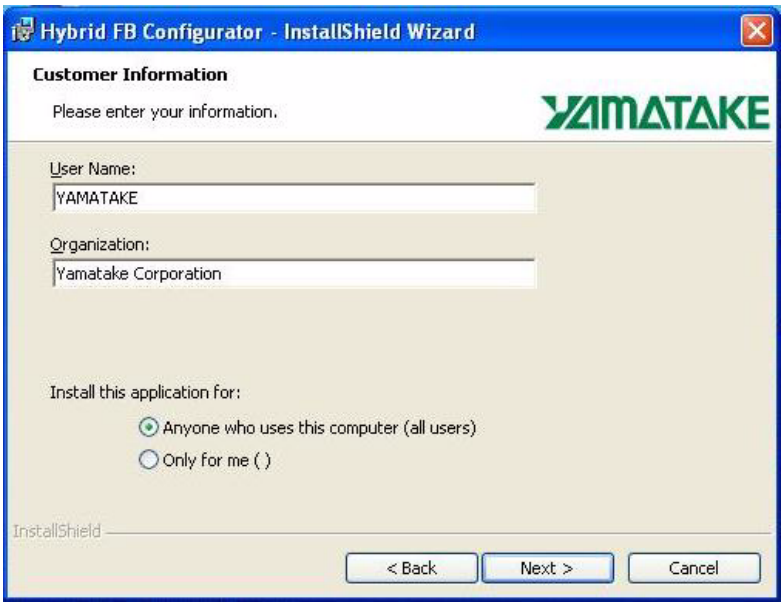
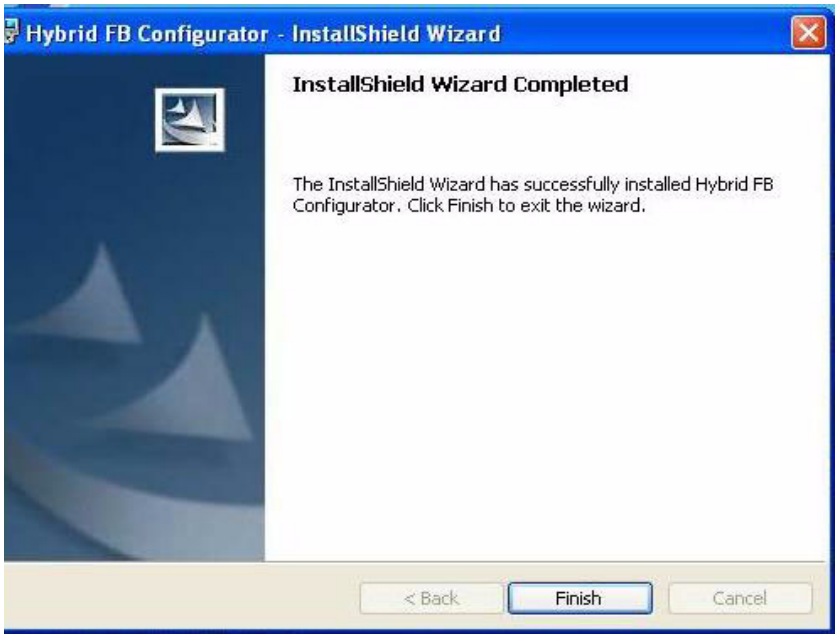
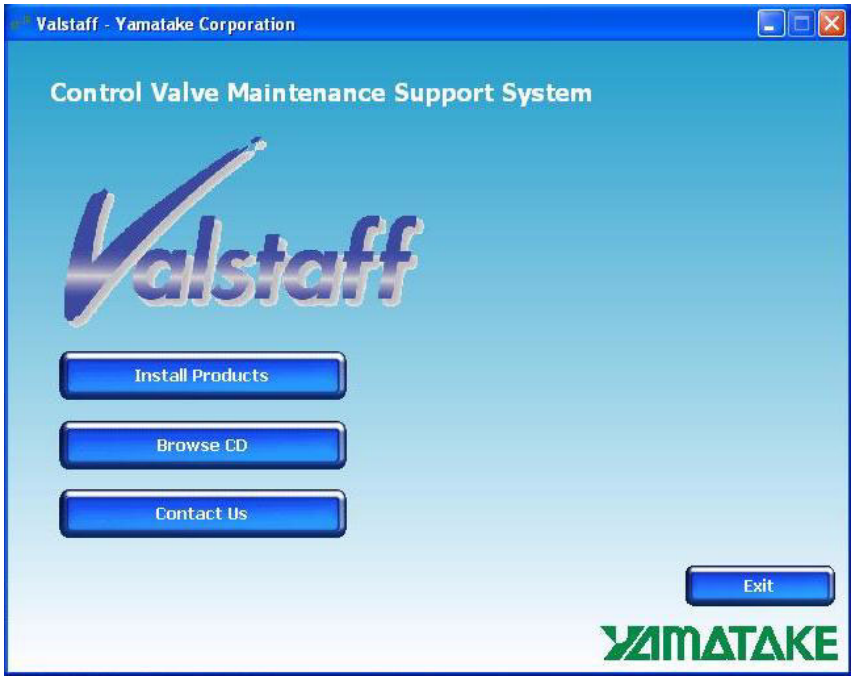


Figure 3-21 "Customer Information" window

5	When the installation is completed, the "InstallShield Wizard Completed" window (Figure 3-22) will appear. Click the [Finish] button to exit the installation.

Figure 3-22 "Ready to Install the Program" window

Step	Procedure
6	When the installation is completed, the "InstallShield Wizard Completed" window (Figure 3-23) will appear. Click the [Finish] button to exit the installation.  *Figure 3-23 "InstallShield Wizard Completed" window*
7	Click [Menu] in the installation window.  *Figure 3-24 Installation window*

Step	Procedure
8	Click [Exit] in the initial window of the installer to exit the installer.  *Figure 3-25 The initial window of the installer*

3-1-8: Re - Start

After installation Completion, please start with the personal computer again.

3-2: Checking the installation

3-2-1: Checking the Valstaff application

Step	Procedure
1	When the installation has been completed successfully, the following folder is created and necessary files are copied into this folder. Make sure that this folder is created. (Drive, in which Windows has been installed. Example: "C:") ¥Program files¥Yamatake Corporation¥Valstaff Fieldbus
2	On the desktop, the Valstaff application icon is created. Make sure that the Valstaff icon exists on the desktop.  Valstaff Fieldbus
3	The Valstaff group is created in [Programs] selected from the [Start] menu on the Windows desktop. The Yamatake Valstaff Fieldbus application is registered in the Yamatake Corporation group. Make sure that the Valstaff Fieldbus application is registered properly.
4	Start up [Add/Remove Programs] in the Control Panel. The list of currently installed applications in the personal computer you are using will appear. Make sure that the Valstaff is registered in this list.

3-2-2: Checking the FF OPC server

Step	Procedure
1	When the installation has been completed successfully, the following folder is created and necessary files are copied into this folder. Make sure that this folder is created. (Drive, in which Windows has been installed. Example: "C:") ¥Program files¥Yamatake Corporation¥FF OPC Server
2	The Valstaff group is created in [Programs] selected from the [Start] menu on the Windows desktop. FF OPC Svr is registered in the Yamatake Corporation group. Make sure that the FF OPC server is registered properly.
3	Start up [Add/Remove Programs] in the Control Panel. The list of currently installed applications in the personal computer you are using will appear. Make sure that "FF OPC Server" and "Yamatake Fieldbus OPC Server" are registered in this list.

3-2-3: Checking the license key driver

Step	Procedure
1	When the installation has been completed successfully, the following folder is created and necessary files are copied into this folder. Make sure that this folder is created. (Drive, in which Windows has been installed. Example: "C:") ¥Program files¥Rainbow Technologies¥Sentinel¥System Driver
2	Start up [Add/Remove Programs] in the Control Panel. The list of currently installed applications in the personal computer you are using will appear. Make sure that the Sentinel Super Driver 5.41.1 is registered in this list.

3-2-4: Checking Hybrid FB configurator

Step	Procedure
1	When the installation has been completed successfully, the following folder is created and necessary files are copied into this folder. Make sure that this folder is created. (Drive, in which Windows has been installed. Example: "C:") ¥Program files¥Yamatake Corporation¥Hybrid FB Contigurator
2	On the desktop, the Valstaff application icon is created. Make sure that the Valstaff icon exists on the desktop.  Hybrid FB config
3	The Valstaff group is created in [Programs] selected from the [Start] menu on the Windows desktop. The Valstaff application is registered in the Yamatake Corporation group. Make sure that the Hybrid FB Configurator is registered properly.
4	Startup [Add/Remove Programs] in the Control Panel. The list of currently installed applications in the personal computer you are using will appear. Make sure that the Hybrid FB Configurator is registered in this list.

Chapter 4: Starting up the Valstaff Application

4-1: Before starting up the Valstaff application

4-1-1: About network configuration

4-1-1-1: Configuration with the FOUNDATION Fieldbus system

Construct a network configuration while referring to Figure 4-1. For details, refer to the User's Manual for relevant product.

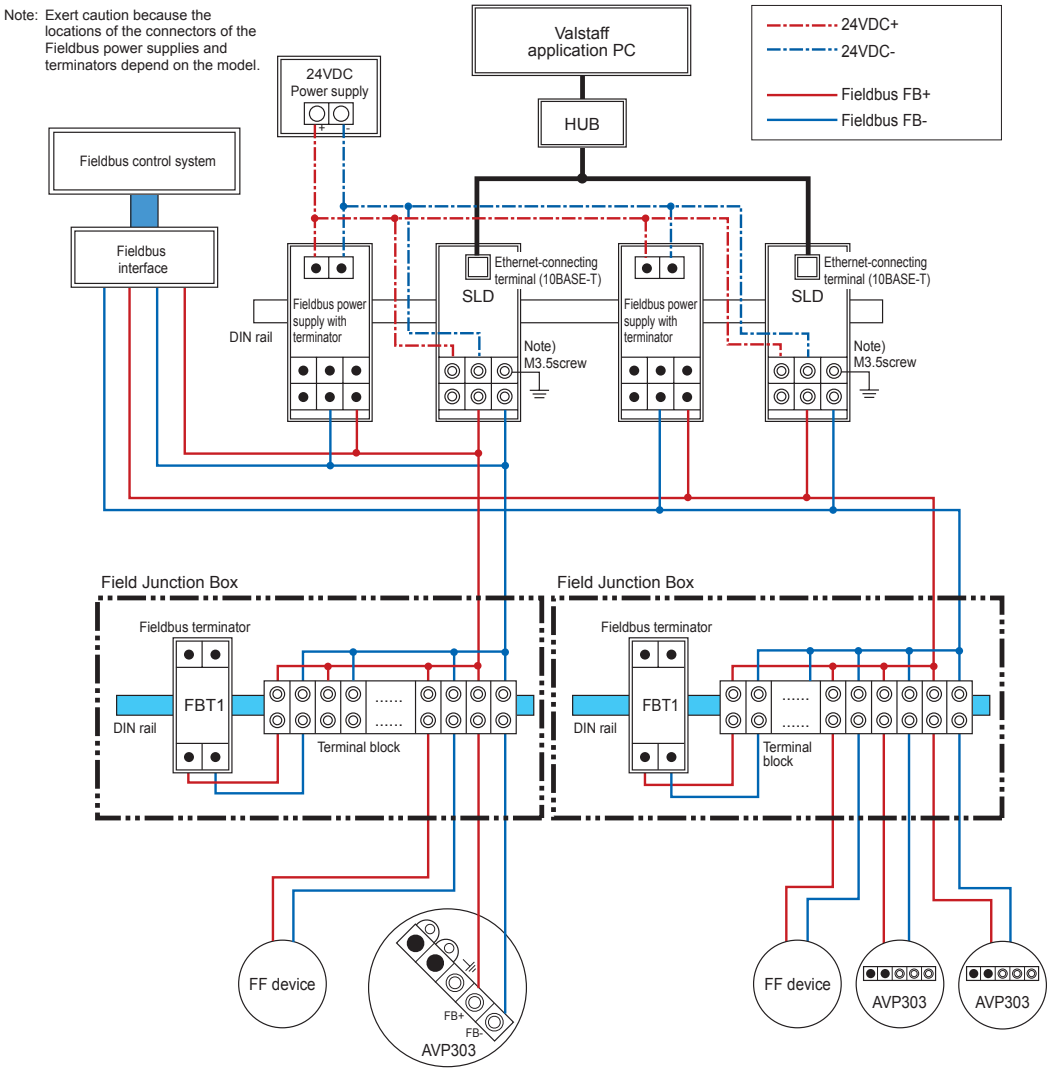


Figure 4-1 Connection of FOUNDATION Fieldbus system

4-1-1-2: Analog signal (4 to 20 mA)/FOUNDATION Fieldbus hybrid system configuration

Construct a network configuration while referring to Figure 4-2. For details, refer to the User's Manual for relevant product.

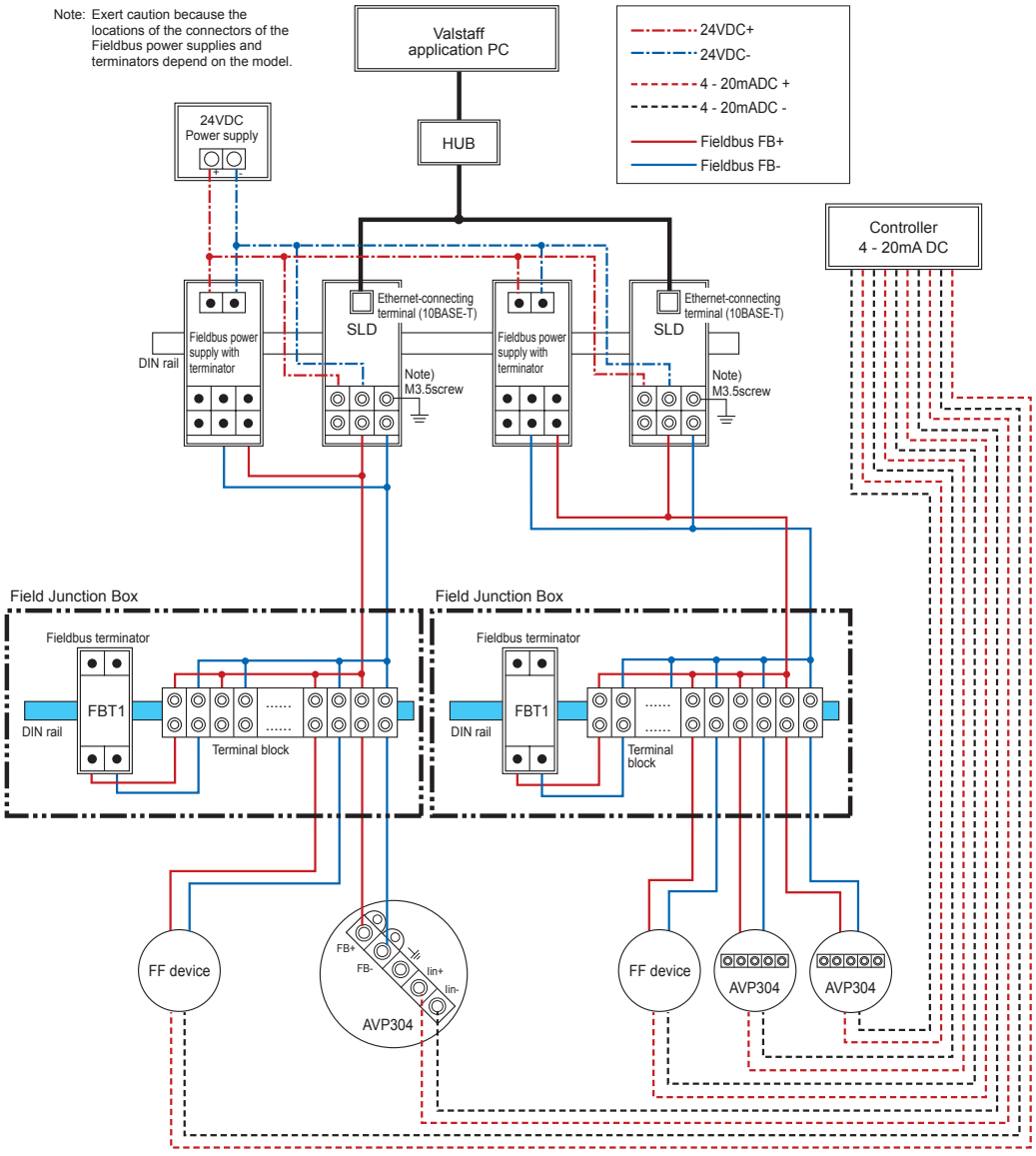


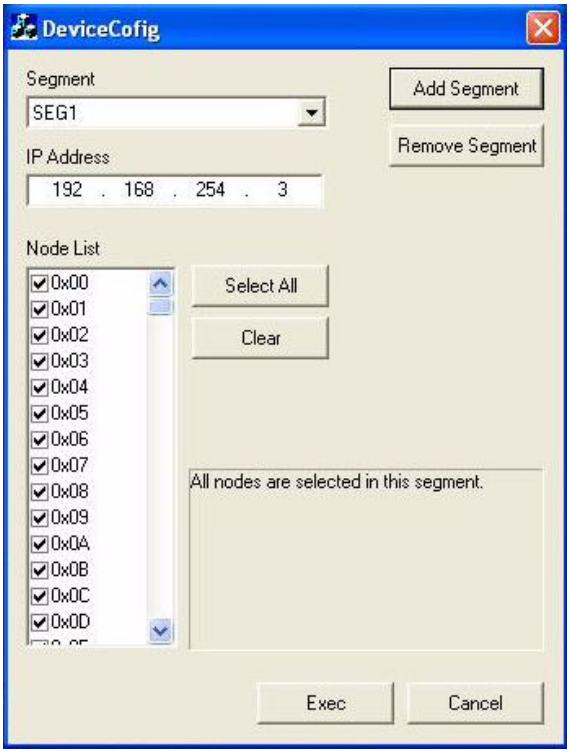
Figure 4-2 Analog signal (4 to 20 mA)/FOUNDATION Fieldbus hybrid system configuration

4-1-2: About FF OPC server setup

4-1-2-1: Outline

To properly communicate between the Valstaff application and FF device, it is necessary that the information regarding FF device and FF OPC network configuration is set up correctly on the FF OPC server. This Chapter describes how to set up this information.

4-1-2-2: Setting up configuration file of FF OPC server

Step	Procedure
1	Select [Start] → [Programs] → [Yamatake Corporation] → [FFOPC] → [Setting of configuration file] from the Windows desktop.
2	The Device Config screen is open. Click the adding segment button for the number of model SLDs, and then set the segment name (up to 32 characters) and IP address. The segment name must be the same as the Path of the segment parameter of project in the Valstaff application. For the IP address, enter 192.168.254. □ □ □, where the portion □ □ □ is a value set up by the rotary switch of model SLD. When entering the value, prevent the IP address from duplicating other segments. Select All is chosen for List of Nodes. Do not change this choice. If it is changed, communications cannot be provided.  *Figure 4-3 Opening splash*

4-1-3: Setting an IP address for the personal computer

Set an IP address in Network Connections of Network and Internet Connections and in properties of Internet Protocol (TCP/IP) in properties of Local Area Connection.

192.168.254. □ □ □

Specify a number for the □ □ □ part to set an IP address. Exert caution so that the same IP address as that of any of the model SLD units is not specified.

No setup operation is required for the subnet mask, default, gateway and DNS server.

4-1-4: Registering MAC addresses for the model SLD units

Register in the PC a MAC address for each of the model SLD units.

For a model SLD unit, a MAC address is required in the initial setup operation or when it is to be added or replaced.

Notes:
When this setting is not made, a problem may be generated in communications with the model SLD unit. Be sure to register a MAC address when a model SLD unit is to be added or replaced.

(1) Connect all of the model SLD units to Ethernet and take the necessary measures to make them ready for communications.

(2) Select [Start] → [Programs] → [Yamatake Corporation] → [FFOPC] → [CreateArpTable] to activate the registration tool.

(3) Follow the messages below that are displayed.

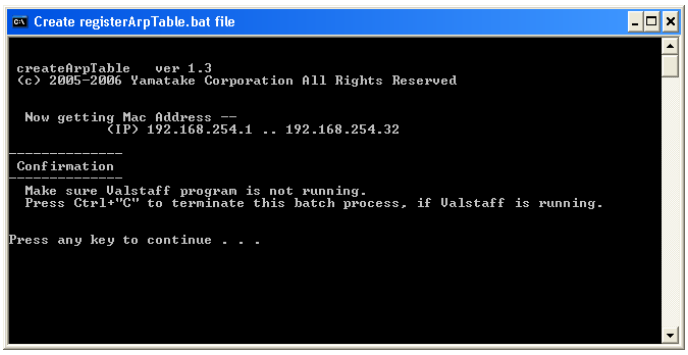
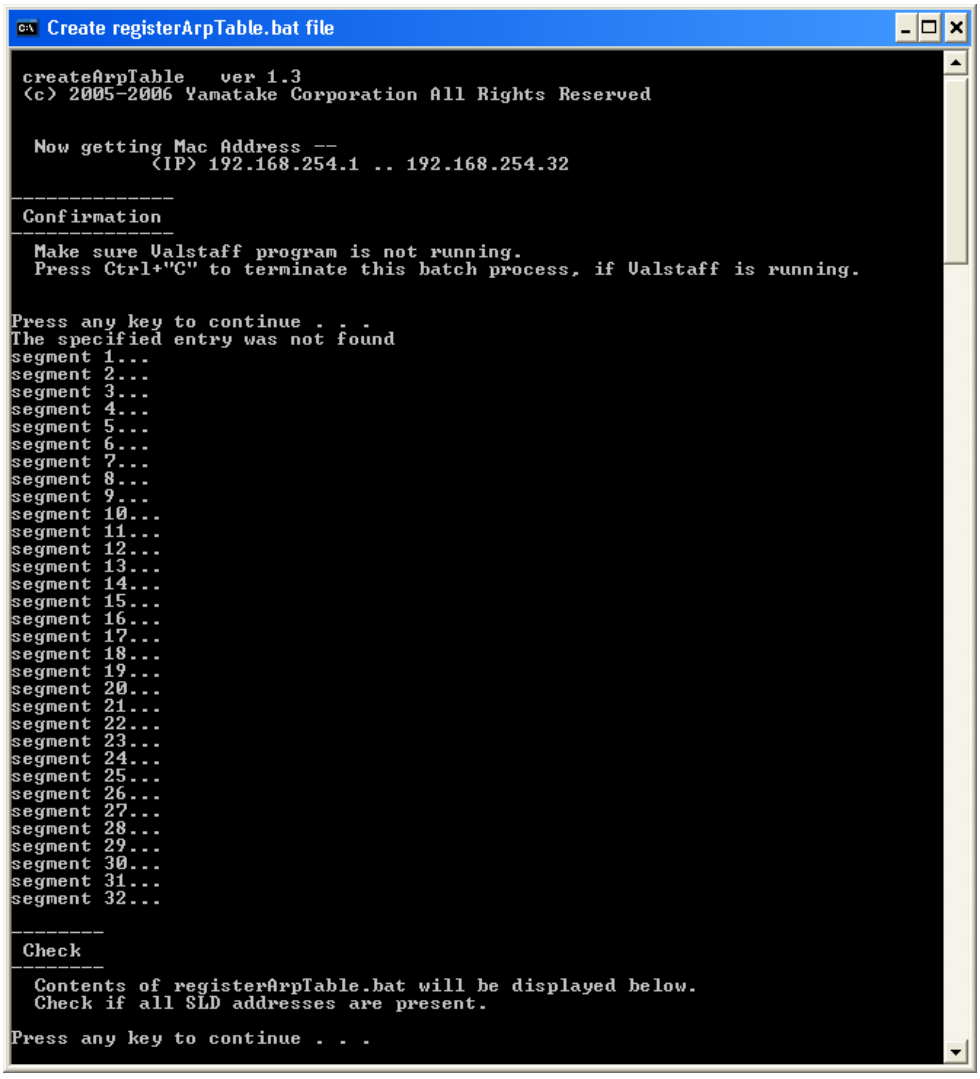
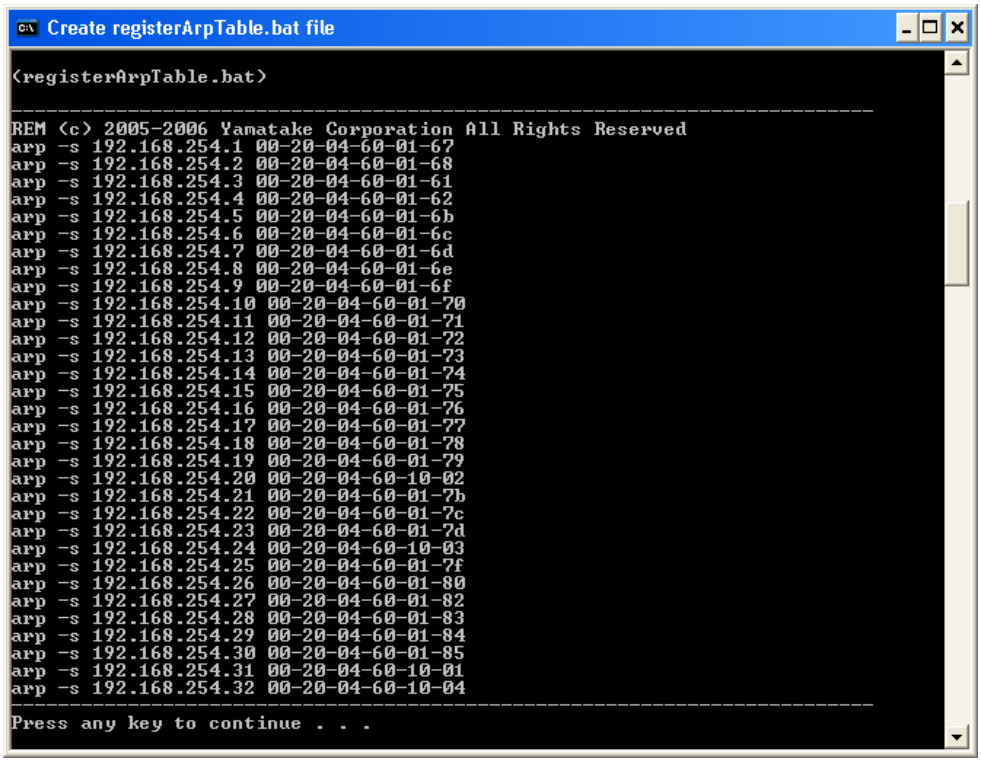


Figure 4-4

After a while, the message below is displayed. Then follow the message.
(The message may appear in about seven minutes.)



(4) Details of the registered MAC addresses are displayed as in the following figure:



Check whether all of the IP addresses registered in the operation that has been performed to set up the configuration file of the FF OPC server are listed. Then close the window following the messages displayed.

(5) If some of the IP addresses are not listed, check whether communications with the corresponding model SLD units are enabled or incorrect IP addresses have been set. Then perform the operations to register the MAC addresses again.

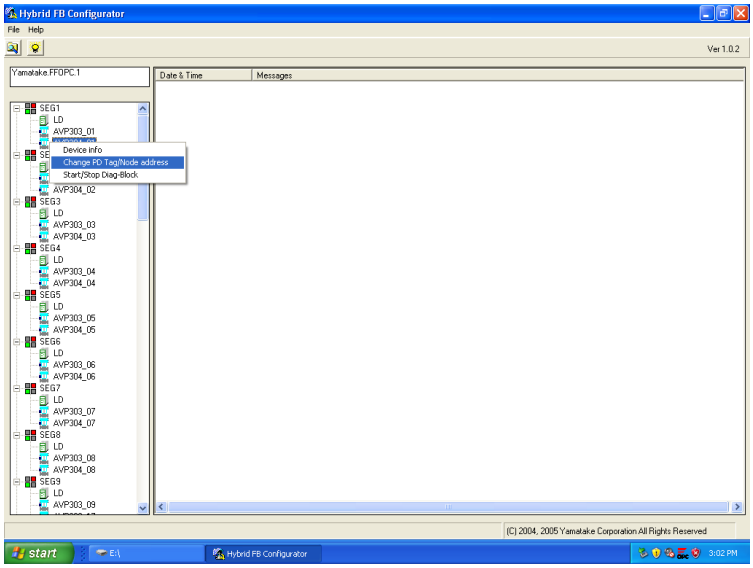
4-1-5: Setting up a hybrid positioner (when the AVP304/ 204 hybrid positioner is used)

· To make the necessary settings, conduct the following work in advance: Connect the positioner and the corresponding model SLD unit, turn the power supply on and supply an input current of 4 mA or more to the positioner.

· Double-click the [Hybrid FB Configurator] icon on the desktop to activate the setup tool. (Communications to check the connection are made before the activation operation is started.)

4-1-5-1: Setting a PD tag and a node address

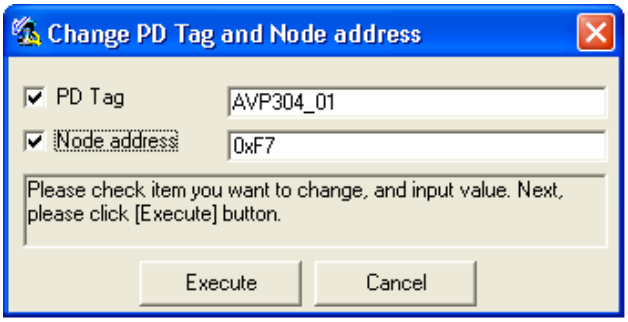
(1) Right-click a positioner in the tree window on the left side and click [Change PD Tag and Node address].



(2) To set a PD tag, click the [PD Tag] check box and enter a PD tag. Then click [Execute] to actually set the PD tag entered.

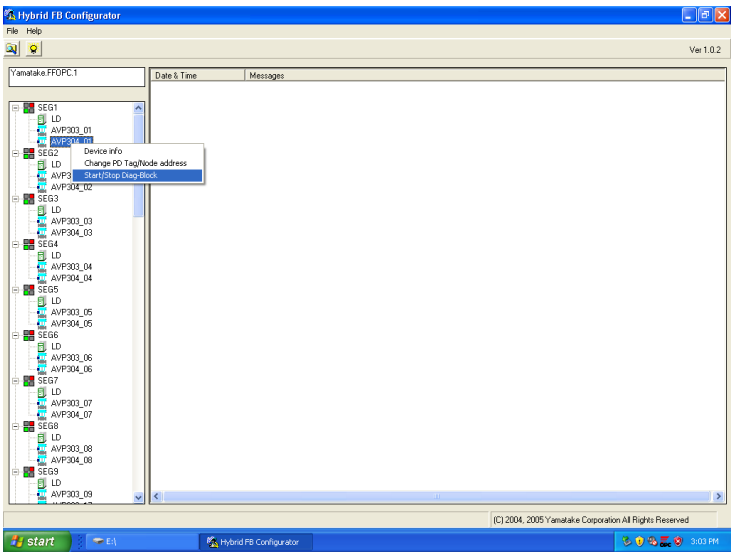
(3) To set a node address, click the [Node address] check box and enter a node address. Enter a number from 0xF7 to 0xF0 for each segment of the address. Then click [Execute] to actually set the address entered.

(4) A PD tag and a node address can be set in the same window using the operations described above.



4-1-5-2: Starting/stopping the diagnosis block

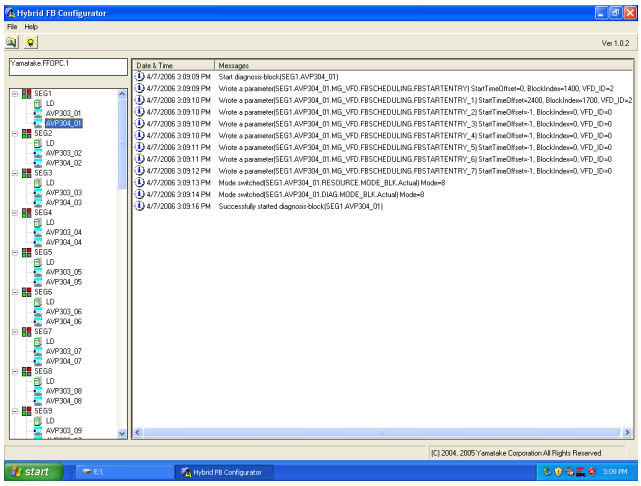
(1) Right-click a positioner in the tree window on the left side and click [Start/Stop Diag-Block].



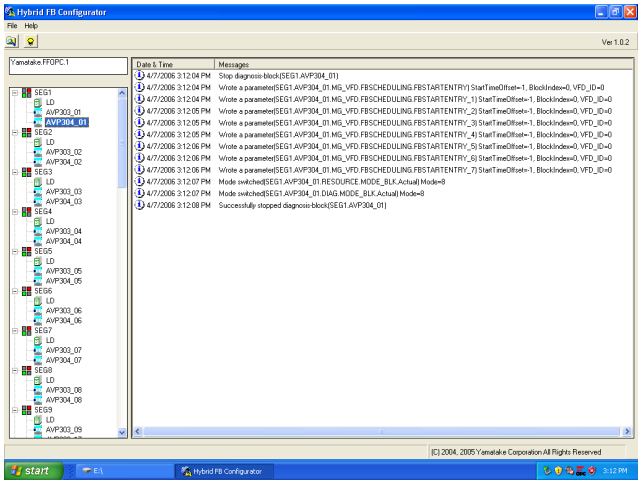
(2) Click [Start] to start the diagnosis or [Stop] to stop it. The current status is displayed in the status field of the window that appears. Therefore, for which of them is to be clicked, refer to what is displayed in the field.

(3) When [Start] or [Stop] is clicked, one of the following windows, corresponding to the window that has been clicked, is displayed, and whether the diagnosis operations have been completed successfully is displayed there.

[When [Start] is clicked]



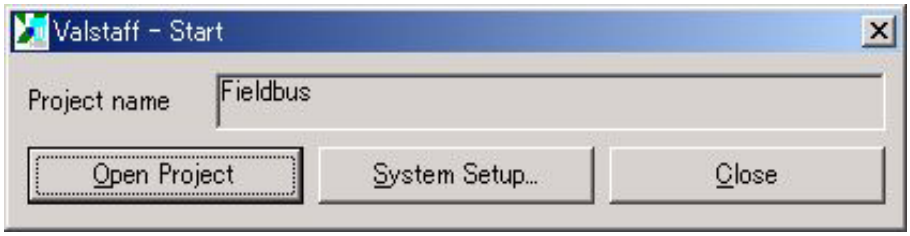
[When [Stop] is clicked]



4-1-6: License key

Insert the license key into a USB port of the PC. The license key driver is provided with no specific setting item.

4-2: Starting up the Valstaff application

Step	Procedure
1	Double-click the [Valstaff fieldbus] icon on the desktop to start up the Valstaff application.  Valstaff Fieldbus
2	When the Valstaff application is started up, the following opening splash will appear (Figure 4-5).  *Figure 4-5 Opening splash*
3	After that, the "Valstaff Start" window will appear (Figure 4-6). When the "Valstaff Start" window appears, this shows that the Valstaff application is started up correctly.  *Figure 4-6 "Valstaff Start" window*
4	To create a new project, click the [System Setup...] button. After that, you must create a necessary project while referring to "Chapter 5: System Setup".

Step	Procedure
5	To use an existing project, clicking the [Open Project] button to start up Valstaff displays the dialog "Start monitoring." Then click the [OK] button. The following menu screen will appear.

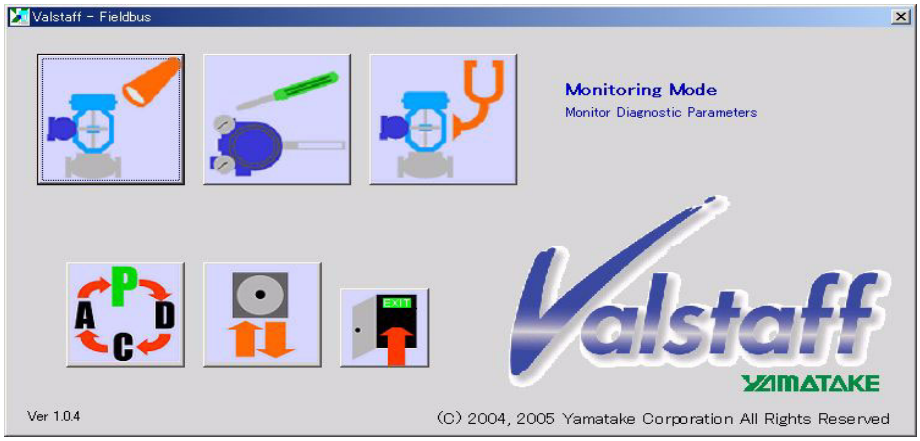


Figure 4-7 Valstaff menu screen

4-3: Checking the Valstaff application startup

4-3-1: About startup window

When the opening splash and the Valstaff Start window described in "4-2: Starting up the Valstaff application", Starting up the Valstaff application, appear, this shows that the Valstaff is started up correctly. Make sure that these two windows appear.

Note *When no MAC address has been registered for a model SLD unit or the MAC address has not been registered correctly, the following message is displayed. Click "OK" here.*

Figure 4-8-1

Then the following message is displayed. Also click "OK" here.

Close Valstaff that has been started up, before starting the operation described in "4-1-4: Registering MAC addresses for the model SLD units."

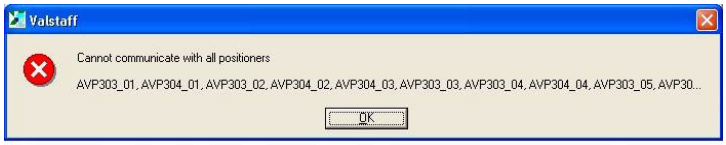


Figure 4-8-2

Note *When the operation of the PC or the Valstaff application ends abnormally, the following message is displayed when the Valstaff is started up next time. Then restart the PC and after that, start up the Valstaff again.*

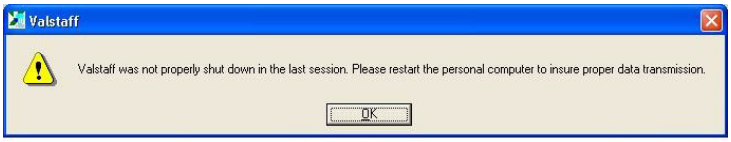


Figure 4-8-3

4-3-2: About FF OPC server startup status

The FF OPC server is displayed on an icon in the Windows task bar. Confirm that the FF OPC server has been started up on the icon in the task bar.

The icon turns red with the FF OPC server started up. It turns green with the server not started up.

Chapter 5: System Setup

5-1: What is a system setup?

In this system setup, you must make two settings described below.

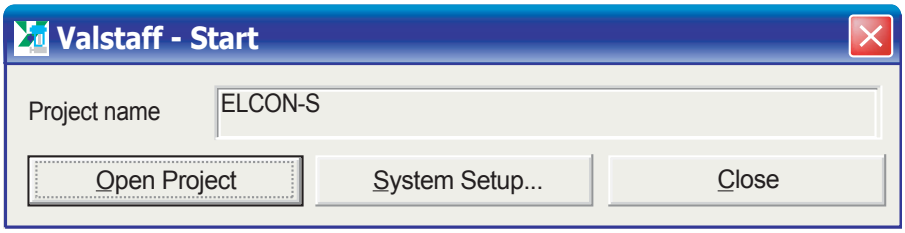
- Network configuration necessary to communicate the Valstaff application with the field positioner is registered into the Valstaff application.
- Language and unit system to be used for the Valstaff application are set.

To register the network configuration into the Valstaff application, you must create a communication environment setup file called "project".

As this project is created correctly, the communication with the field positioner becomes possible. By selecting a language or unit system, the window can be changed to that displayed in English or inch. The default settings are Japanese and metric system.

You must make the settings appropriately by considering the operation place or operator.

5-2: Starting up the system setup

Step	Procedure
1	Double-click the [Valstaff Fieldbus] icon on the desktop to start up the Valstaff application. 
2	When the Valstaff application is started up, the opening splash will appear.  *Figure 5-1 "Valstaff Start" window*
3	Click the [System Setup...] button to start up the system setup.

Step	Procedure
4	When the system setup operation has been started up, the following setup window is displayed.

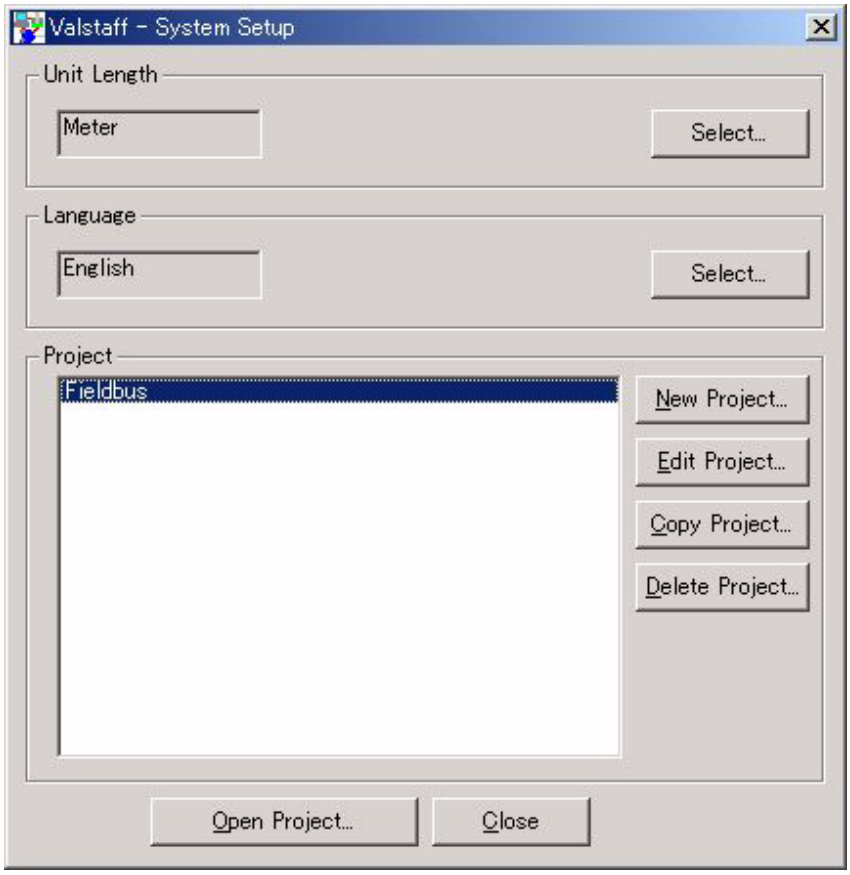


Figure 5-2 "System Setup" window

(i) "Unit Length" field ..... Shows the currently selected unit system.
(ii) [Select] button ..... Changes the currently selected unit system. You can select either the metric system or inch system.
(iii) "Language" field..... Shows the currently selected language.
(iv) [Select] button ..... Changes the currently selected language. You can select either Japanese or English.
(v) "Project" list..... Shows the list of projects currently created in the Valstaff application.
(vi) Project operation buttons
[New Project] button ..... To create a project newly, click this button.
[Edit Project] button ..... To change or edit an existing project, select a project you want to edit in the list and click this button.
[Copy Project] button ..... To make a copy of the existing project, select a project you want to make a copy in the list and click this button.
[Delete Project] button ..... To delete a project in the "Project" list, select a project you want to delete in the list and click this button.
(vii) [Open Project] button ..... When clicking this button after you have selected a project you want to start up in the "Project" list, the selected project is then started up.
(viii)[Close] button ..... When clicking this button, the system setup is exited and the window is returned to the "Valstaff Start" window.

5-3: Creating a project

5-3-1: What is a project?

This project shows the physical configuration of the network consisting of the Valstaff and positioners.

The following shows the elements making up the network.

(1) FF OPC server

(2) The personal computer you want to install the Valstaff application.
(3) SLD(Smart linking device)

"Path"

(4) Positioner

Above elements (2) to (3) are called "Path", a general name of intermediate elements made under the server.

The project shows the network configuration to be actually used between the Valstaff application and positioner with a combination of the server, Path and IP Address.

5-3-2: About project creation

To create a project, two kinds of work must be carried out. One is that a network configuration described previously is created. The other is that the FF OPC server setting shown in "4-1-2: About FF OPC server setup" is made influenced on the project you have created.

When the FF OPC server is set up, specific names can be given to segments of the network in use to identify them in interfaces of the FF OPC server. When creating a project of the Valstaff application, you must set the same name as this specific name you want to set on the FF OPC server for the Path names at necessary locations.

5-3-3: About PD tag

The positioner corresponding to the FOUNDATION Fieldbus connectable with Valstaff has a parameter called "PD tag."

The PD tag is saved into the memory of the field device and the personal computer application, such as Valstaff application, as electronics information.

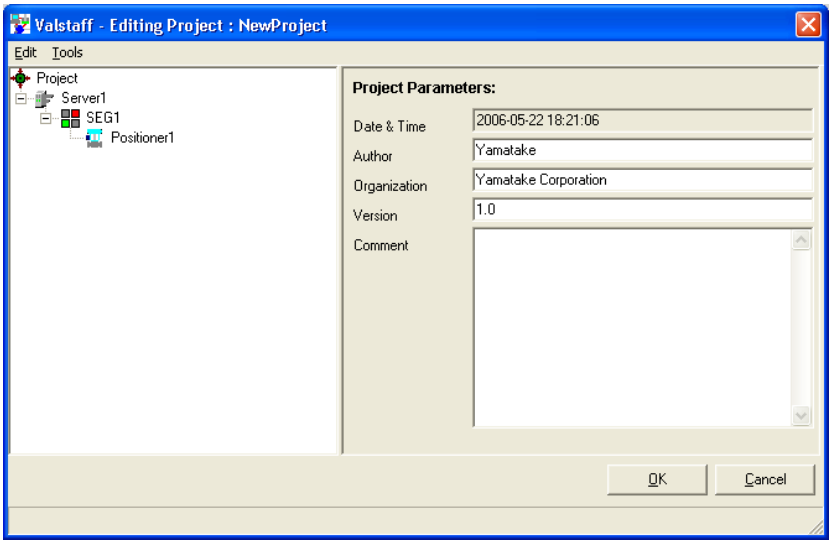
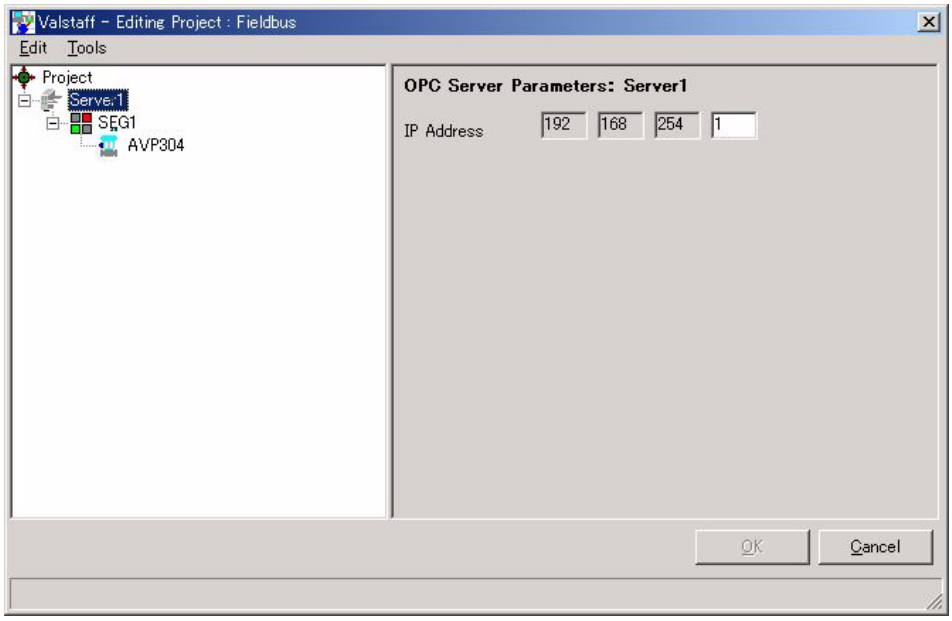
Generally, the same or similar TAG numbering assigned to each unit according to the instrumentation design and the necessity of its control in the actual world is performed, and then these numbers are used as ID Nos. of the units on the network through the fieldbus communication.

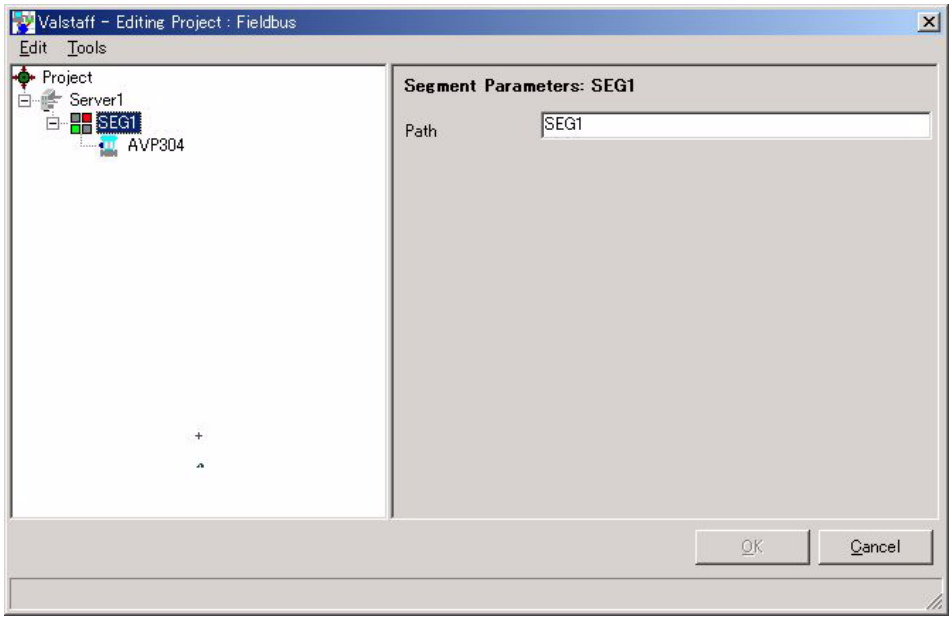
In the Valstaff, the reliability of the communication connection is guaranteed by keeping the identification between the PD tag to be registered into the field positioner and the PD tag to be registered into the project.

Therefore, when creating a project, you must set the PD tag properly.

5-3-4: Creating a project

Step	Procedure
1	Click the [New Project...] button in the "System Setup" window. (Figure 5-2)
2	The "New Project" dialog box will appear, allowing you to select a template. Select the [Fieldbus] template and click the [OK] button.  *Figure 5-3 "New Project" dialog box*
3	The "Project Name" input dialog box will appear. Input for the project name and click the [OK] button.  *Figure 5-4 "Project Name" input dialog box*

Step	Procedure
4	The "Editing Project" window for the Fieldbus project using the template will appear.  *Figure 5-5 "Editing Project" window for the project for the* Fieldbus *using the template* "Date & Time", "Author", "Organization", "Version" and "Comment" fields are provided. These fields are prepared for the purpose of the user's control. When necessary, input appropriate information. Note that this information does not affect the network communication.
5	Click [Server1] in the project tree and then input in accordance with the IP address which last three digits are set in the personal computer.  *Figure 5-6 Inputting of Server 1 IP address*

Step	Procedure
6	Click [SEG1] in the project tree and then enter the Path name into the Path field. The Path name to be entered in this window must be the same as the FF OPC server segment name described in , in "Chapter 4-1-2-2: Setting up configuration file of FF OPC server." If the FF OPC server was set up in advance, refer to the settings of the FF OPC server and set the same name as the segment name. If the project was edited in advance, record the Path name set in this window, and then set the same name for the segment name of the FF OPC server.  *Figure 5-7 Inputting of SEG 1 Path name*
7	Click the [OK] button in the "Editing Project" window to exit editing the project for the Fieldbus.

5-3-5: Operating a project

This section describes common operations necessary to create a project.

5-3-5-1: Adding a SEG (segment) or positioner

Step	Procedure
1	In the project tree, select a server to which an SEG other than a positioner is to be added or a SEG to which a positioner is to be added.
2	From the right-click button menu, select [New (W)] -> [SEG] or [New (W)] -> [Positioner], and then select the Path of the newly created SEG. After that, an SEG or positioner is then created.
3	The newly created SEG or positioner is highlighted. When necessary, set an appropriate display name. For the display name, up to 32 characters can be input.
4	Set the Path of the newly created SEG or the PD-TAG and the type of newly created positioner.

5-3-5-2: Deleting a SEG (segment) or positioner

Step	Procedure
1	Select a SEG or positioner you want to delete in the project tree.
2	From the right-click button menu, select [Delete (D)] or press the {Delete} key on the keyboard.
3	The "Confirmation" dialog box will appear. Click [Yes]. The SEG or positioner you have selected is then deleted.
4	When pressing the {Delete} key with the {Ctrl} key kept pressed, the "Confirmation" dialog box does not appear, and then the Path or positioner you have selected is deleted directly.

5-3-5-3: Changing a SEG (segment) or positioner display name

The "display name" for an SEG or positioner is used for displaying the SEG or positioner on the tree.

Step	Procedure
1	Select an SEG or positioner on the project tree.
2	From the right-click button menu, selecting [Rename (M)] can change a name. Up to 32 characters can be input for the name. The positioner name does not need to be the same as the PD tag.
3	When a desired Path or positioner is selected, pressing the {Enter} key on the keyboard will also put the selected Path or positioner in the name change status. **Note** *You cannot input a space first.*

5-3-5-4: Making a copy of a SEG (segment) or positioner

Copying a SEG (segment) or positioner

Step	Procedure
1	Select a SEG or positioner in the project tree.
2	From the [Edit (E)] window menu, select [Copy (C)]. The Path or positioner you have selected is then copied.

Pasting a SEG (segment) or positioner

Step	Procedure
1	Select a server or SEG where you want to register the SEG or positioner copied in the project tree.
2	From the [Edit (E)] window menu, select [Paste (P)]. If a SEG is copied, all positioners under the copied [SEG] are copied to a position under the selected SEG.

Dragging & dropping a SEG (segment) or positioner

When dragging & dropping a SEG or positioner to another Path with the {Ctrl} key kept pressed, a copy can be made. After this operation has been performed, the tree is automatically developed so that the copied Path or positioner is displayed. The copied Path or positioner is then put in the selected status.

5-3-5-5: Moving a SEG(segment) or positioner

A SEG or positioner can be moved with the mouse drag & drop operation.

After this operation has been performed, the tree is automatically developed so that the moved Path or positioner is displayed. The moved Path or positioner is then put in the selected status.

When moving a SEG or positioner to a position under a SEG including one or more child Path or positioner with the {Shift} key kept pressed, the tree is not developed.

When dragging a positioner with the {Alt} key kept pressed, you can drop it on the positioner in the tree.

After this operation has been performed, the positioner you have dragged is moved to a position located before the positioner you have dropped.

When dragging & dropping a SEG on another Path with the {Alt} key kept pressed, the Path you have dragged is moved to a position located before the Path you have dropped.

5-4: Selecting a unit of length

Step	Procedure
1	Click in the system-setup window the [Select...] button for the length unit.
2	The dialog box for selecting a length unit appears. Select there Meter (metric system) or Inch (inch system) from the pull-down menu. Then click the [OK] button.

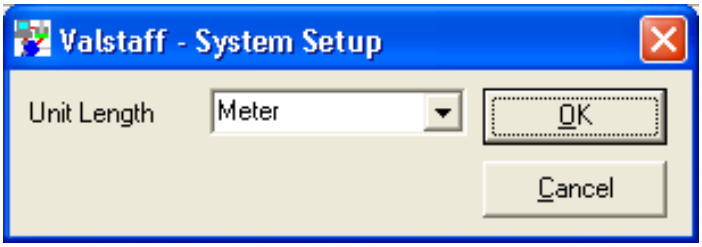


Figure 5-8 The dialog box for selecting a length unit

5-5: Selecting a language

Step	Procedure
1	Click the [Select...] button in the "Language" area in the "System Setup" window. (Figure 5-2 on page 5-2)
2	The "Language" select dialog box will appear. From the pull-down menu, select "Japanese" or "English", and then click the [OK] button.  *Figure 5-9 "Language" select dialog box*

5-6: Starting up a project

When clicking the [Open Project] button in the "System Setup" window. You can start up the Valstaff application using the project you have created or edited.

5-7: Exiting the system setup

Clicking the [Close] button in the "System Setup" window will exit the system setup.

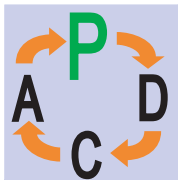
Chapter 6: Operation Setup Mode

6-1: What is an operation setup mode?

In this operation setup mode, you must perform the commissioning of the network setup, register various kinds of maintenance related information, and select whether or not the message and/or alarm are needed, which are necessary to start the control valve maintenance operation utilizing the Valstaff.

6-2: Starting up the operation setup

6-2-1: Starting up the operation setup



Click the operation setup button shown in the "Valstaff Menu" window.

6-2-2: "Operation Setup" menu window

As the operation setup is started up, the following window will appear.

Clicking a desired button will run relevant function.

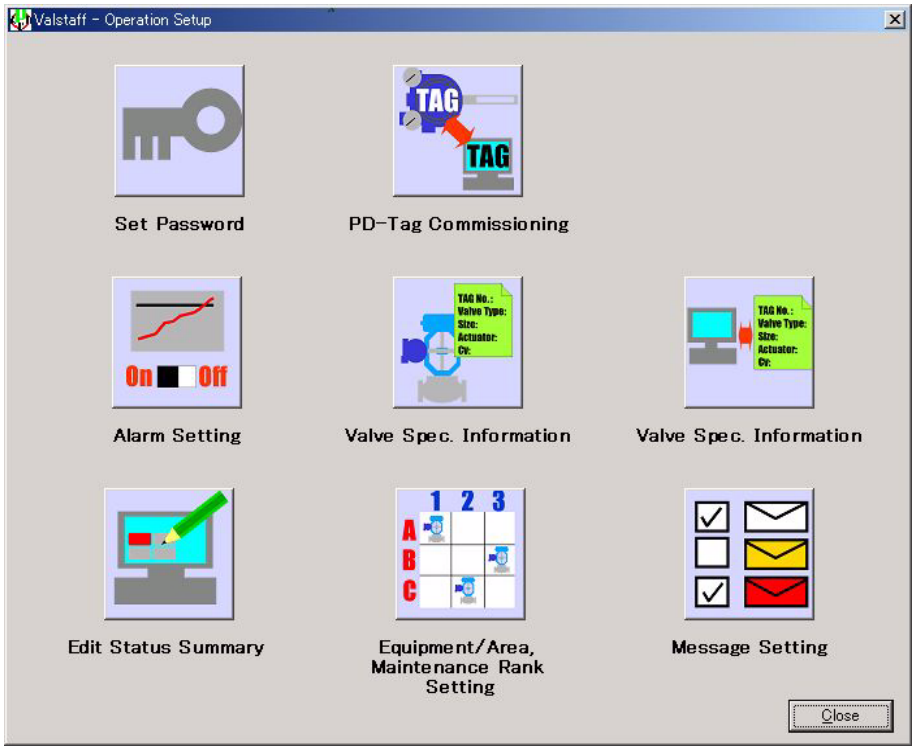
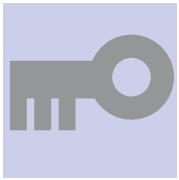


Figure 6-1 "Operation Setup" mode start window

6-3: Outline of operation setup functions

6-3-1: Set Password



A password to log in the higher user level is set. The default passwords have been set as shown below.

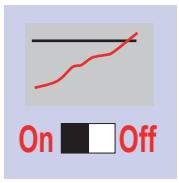
User level	Default password
Engineer:	Yamatake
Supervisor:	Valstaff

For details about user levels, refer to "1-1-5: User levels of Valstaff".

6-3-2: PD Tag Commissioning

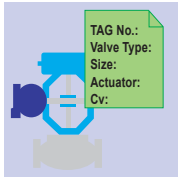
It is checked whether or not the information registered in the project created in the Valstaff application is matched with the information registered in the field positioner. The information to be checked is the PD tag, Model No, unit ID, manufacturer, and S/W revision. With this commissioning, the reliability of access from the Valstaff application to the positioner with the PD tag used as ID is guaranteed.

6-3-3: Alarm Setting



Diagnostic parameter alarm of the positioner obtained in the monitoring mode is set. When it is set that the alarm is needed, a threshold value is set and the alarm setup file is registered into the project.

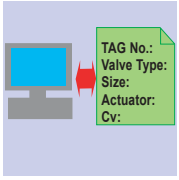
6-3-4: Valve Spec. Information



The specification information of the control valve, which is controlled by the Valstaff application, is registered.

The specification information corresponds to each item of the control valve specification defined by the IEC.

6-3-5: Valve Spec. Information



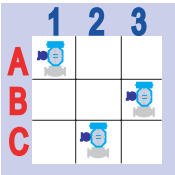
The control valve specification information created by selecting [Valve Spec. Information] is made linked with the PD tag registered in the project.

After this operation has been completed, you can browse the control valve specification information while the operation is running in the monitoring mode or SVP configuration/calibration mode.

6-3-6: Edit Status summary

Units and devices necessary to display the status summary window during execution of the monitoring mode are grouped based on the control unit.

6-3-7: Equipment/Area, Maintenance Rank Setting



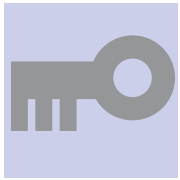
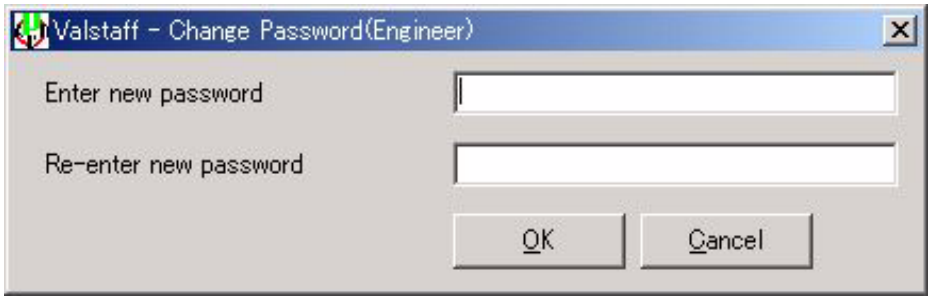
The display of the status tree window during execution of the monitoring mode is changed from the tree display based on the network configuration to the tree display classified by the equipment/ area, maintenance rank.

With this function, the units and devices are classified based on the equipment/area, maintenance rank and they are registered into the system.

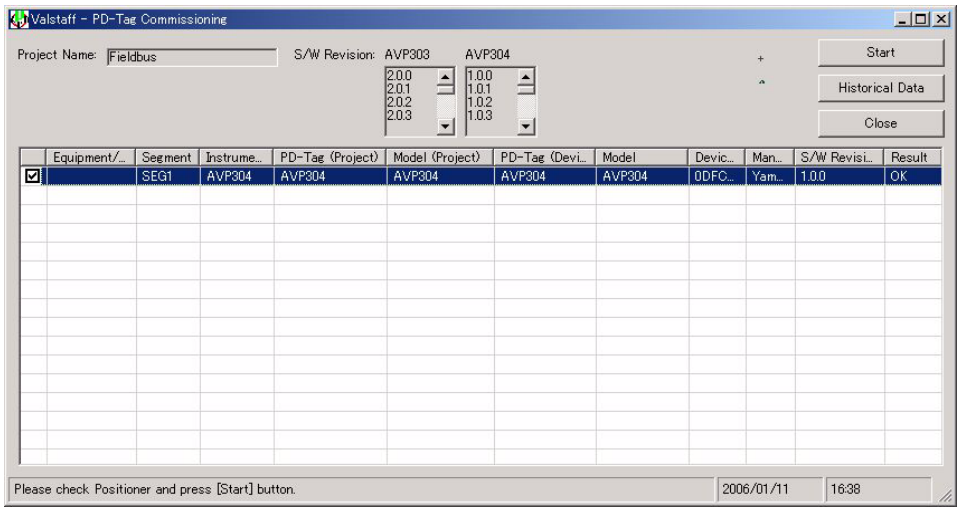
6-3-8: Message Setting

It is set whether or not the messages to be displayed in the message list during execution of the monitoring mode are needed

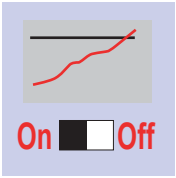
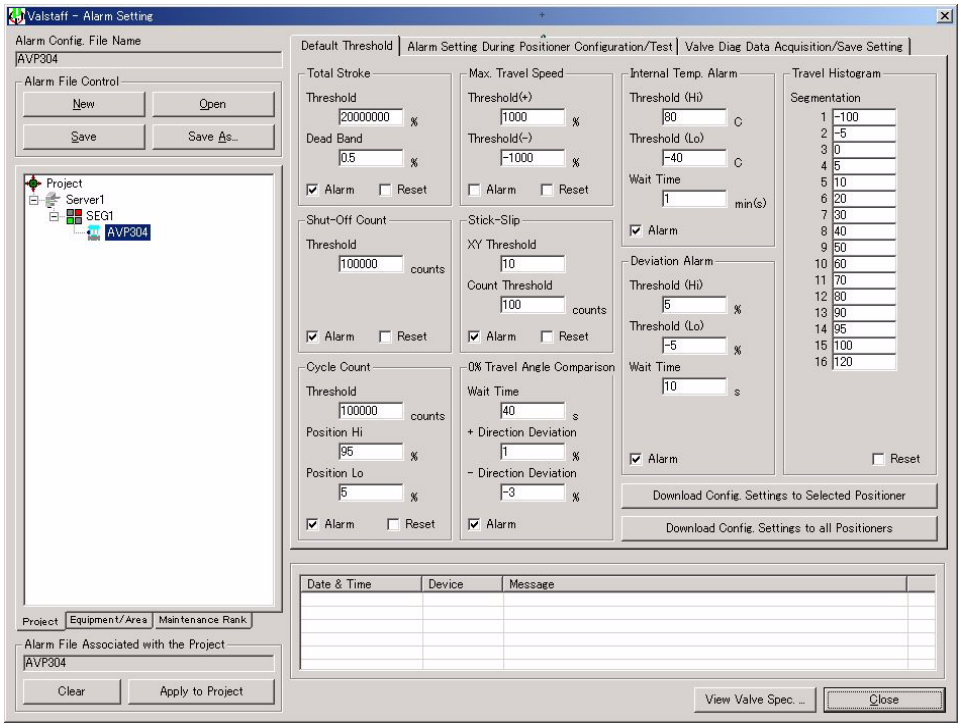
6-4: Running the Set Password

Step	Procedure
1	 Click the [Set Password] button in the "Operation Setup" menu window.
2	The "Set Password" window will appear.  *Figure 6-2 "Set Password" window* Select a user level you want to set a password and click the [Change Password...] button.
3	The "Change Password" dialog box will appear.  *Figure 6-3 "Change Password" window* Input a password in the "Enter new password" field.
4	To verify the password, input the same password again in the "Re-enter new password" field.
5	When the password input in <step 3> is matched with that input in <step 4>, this password is then registered as password for logging in the selected user level.
6	Click the [Close] button in the "Set Password" window to exit the password setting.

6-5: Running the PD Tag Commissioning

Step	Procedure
1	 Click the [PD Tag Commissioning] button in the "Operation Setup" menu window.
2	The "PD Tag Commissioning" window will appear.  *Figure 6-4 "PD Tag Commissioning" window*
3	Select a positioner for the PD tag commissioning and click the check box at the left end of the window to check it on.
4	Click the [Start] button. The "Confirmation" dialog box will appear. Click [Yes] to start the PD tag commissioning.
5	When the PD tag commissioning is completed, the commissioning results, "OK" or "NG", are shown in the "Result" field at the right end of the window. The positioner with "OK" indicated shows that the PD tag commissioning has been completed.
6	If "NG" is indicated, this shows that the information of the project of the Valstaff application is different from the information of the field positioner. If this occurs, take appropriate measures, such as changing of the PD tag or changing of field device to positioner, which can be connected to the Valstaff application.
7	Click the [Close] button to exit the PD tag commissioning.

6-6: Running the Alarm Setting

Step	Procedure
1	 Click the [Alarm Setting] button in the "Operation Setup" menu window.
2	The "Alarm Setting" window will appear. In the left portion of the window, the tree of the positioners controlled by the currently opened project is shown. In the right portion of the window, the following three setup item groups are changed by selecting a desired tab. **<"Default Threshold" tab>**  *Figure 6-5 "Alarm Setting" window ("Default Threshold" tab)* • In this setting window, you can set a threshold value for each diagnostic parameter inside the positioner, set whether or not an alarm is given if the parameter exceeds the threshold value, reset the data accumulated in each diagnostic parameter, and set related configuration items (items to specify operating conditions for each diagnostic parameter). (Continued)

Step	Procedure
(2)	**<"Alarm Setting During Positioner Configuration and Test" tab>**

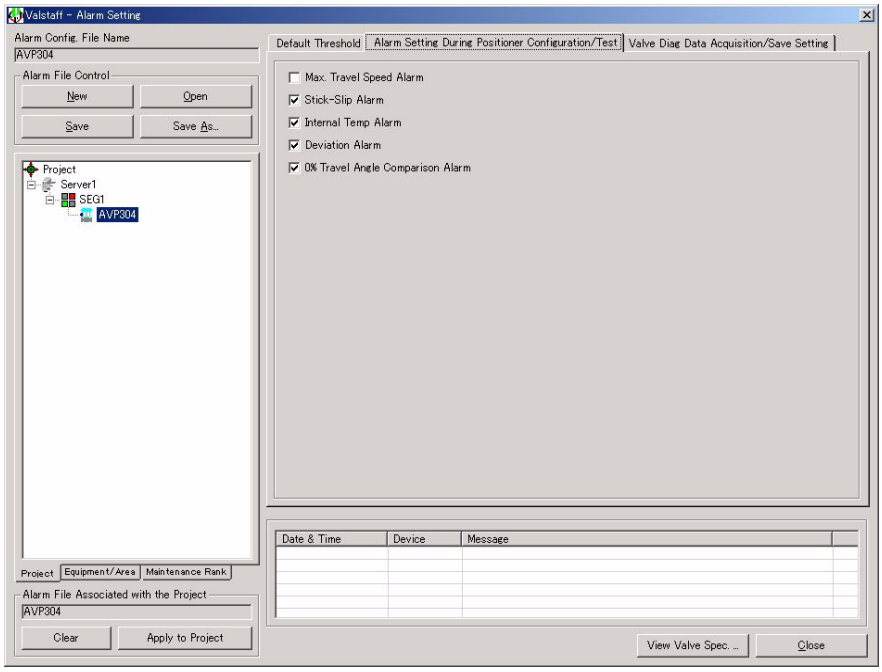


Figure 6-6 "Alarm Setting" window ("Alarm Setting During Positioner Configuration and Test" tab)

- It is set whether or not the alarm is given during adjustment and inspection. It is recommended that data giving an alarm during normal operation should also give an alarm with this setting. In this alarm setting, total stroke integration, total shut-off count, and total cycle count fixed with an alarm given, and cannot be set.

(Continued)

Step	Procedure
(3)	**<"Valve Diagnostic Data Acquisition Setting" tab>**

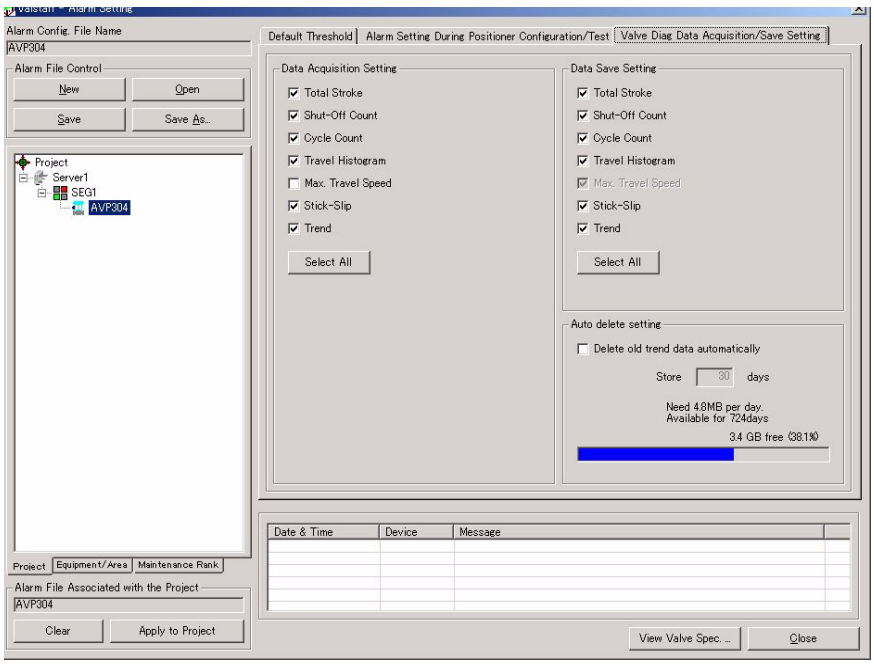


Figure 6-7 "Alarm Setting" window ("Valve Diagnostic Data Acquisition Setting" tab)

- The settings are made to collect and store the diagnostic data of the positioner selected in the tree. With the settings, it is set whether or not the Valstaff application collects the diagnostic data from the relevant positioner during execution of the monitoring mode and whether or not the diagnostic parameter is stored.

3	Create an alarm setup file. Click the [New] button in the "Alarm File Control" area. Various settings are indicated with the default values, and then a new file is created. To edit the existing alarm setup file, click the [Open] button. Select an appropriate alarm setup file and click the [OK] button.
4	Make alarm settings necessary during execution of the monitoring mode while referring to "6-6-1: Setting up threshold values of diagnostic parameters" to "6-6-6: Setting up the valve diagnostics parameter acquisition". When setting an individual alarm setting by selecting a positioner from the project tree, click the [Download Config. Settings to Selected Positioner] button of the [Default Threshold] tab to make the settings influenced on the positioner. To set all positioners of the project at once, click the [Download Config. Settings to all Positioners] button of the [Default Threshold] tab to make the project with settings you have opened influenced on all positioners.
5	After the alarm settings have been completed, save the alarm setup file. Click the [Save] button or [Save As...] button in the "Alarm File Control" area to save the alarm setup file.

Step	Procedure
6	To make the information of the alarm setup file valid, register the alarm setup file you have saved into the project. Click the [Apply to Project] button to apply the information of the alarm setup file to the project.
7	Click the [Close] button to exit the alarm setting.

6-6-1: Setting up threshold values of diagnostic parameters

Step	Procedure
1	Click the [Default Threshold] tab to display the "Default Threshold" setup window.
2	Input appropriate values in the "Threshold Value" field of diagnostic parameters.
3	Click the [Download Config. Settings to Selected Positioner] or [Download Config. Settings to all Positioners] button of the [Default Threshold] tab to register the threshold values you have input into the positioner.

6-6-2: Setting up related configuration items of diagnostic parameters

Step	Procedure
1	Click the [Default Threshold] tab to display the "Default Threshold" setup window.
2	Input appropriate values in the spare setup field of diagnostic parameters.
3	Click the [Download Config. Settings to Selected Positioner] or [Download Config. Settings to all Positioners] button of the [Default Threshold] tab to register the threshold values you have input into the positioner.

6-6-3: Setting up alarms of diagnostic parameters

Step	Procedure
1	Click the [Default Threshold] tab to display the "Default Threshold" setup window.
2	Click the "Alarm" check field of each diagnostic parameter needing the alarm to make the setting that the alarm is needed. If the alarm is not needed, click the check field to check it off.
3	Click the [Download Config. Settings to Selected Positioner] or [Download Config. Settings to all Positioners] button of the [Default Threshold] tab to register the alarm settings you have input into the positioner.

6-6-4: Resetting the diagnostic parameter data

Step	Procedure
1	Click the [Default Threshold] tab to display the "Default Threshold" setup window.
2	Click the "Reset" check field of each diagnostic parameter needing the parameter reset to make the setting that the reset is needed. If the reset is not needed, click the check field to check it off.
3	Click the [Download Config. Settings to Selected Positioner] or [Download Config. Settings to all Positioners] button of the [Default Threshold] tab to reset the diagnostic parameter data.

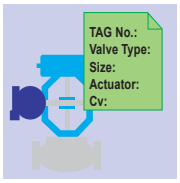
6-6-5: Setting up alarms during positioner configuration and test

Step	Procedure
1	Click the [Alarm Setting During Positioner Configuration and Test] tab to display the "Alarm Setting During Positioner Configuration and Test" window.
2	Click the check field of the diagnostic parameter you want to give the alarm during positioner configuration and test, and make the setting. If you want to give the alarm, check on the check box. On the contrary, if you do not want to give the alarm, check off the check box.
3	Click [Save] to save the settings that have been made.
4	Click [Apply to Project] to apply the setting file to the project.

6-6-6: Setting up the valve diagnostics parameter acquisition

Step	Procedure
1	Click the [Valve Diag Date Acquisition/Save Setting]tab to display this window.
2	Click the check box of the parameter you want to collect during execution of the monitoring mode and of the parameter you want to store in the personal computer. Then register the settings for collection or storage.
3	If a check mark is placed in the check box for trend data deletion setting, the trend data stored in the personal computer can automatically be deleted in order, starting from the older data. In this case, the data storage period can be set by days, and older trend data is automatically deleted. Set the data storage period by using examples from the allowable data storage period that is calculated from the necessary disk capacity per day and the free space of the personal computer hard disk. This function is provided to prevent the hard disk of the personal computer from overflowing. Back up the data regularly.
4	Click [Save] to save the settings that have been made.
5	Click [Apply to Project] to apply the setting file to the project.

6-7: Running the Valve Spec. Information

Step	Procedure
1	 Click the [Valve Spec. Information] button in the "Operation Setup" menu window.
2	The "Valve Spec. Information Management" window will appear.
3	Click the [Open] button in the "Valve Spec. Information Management" window to open an object file.

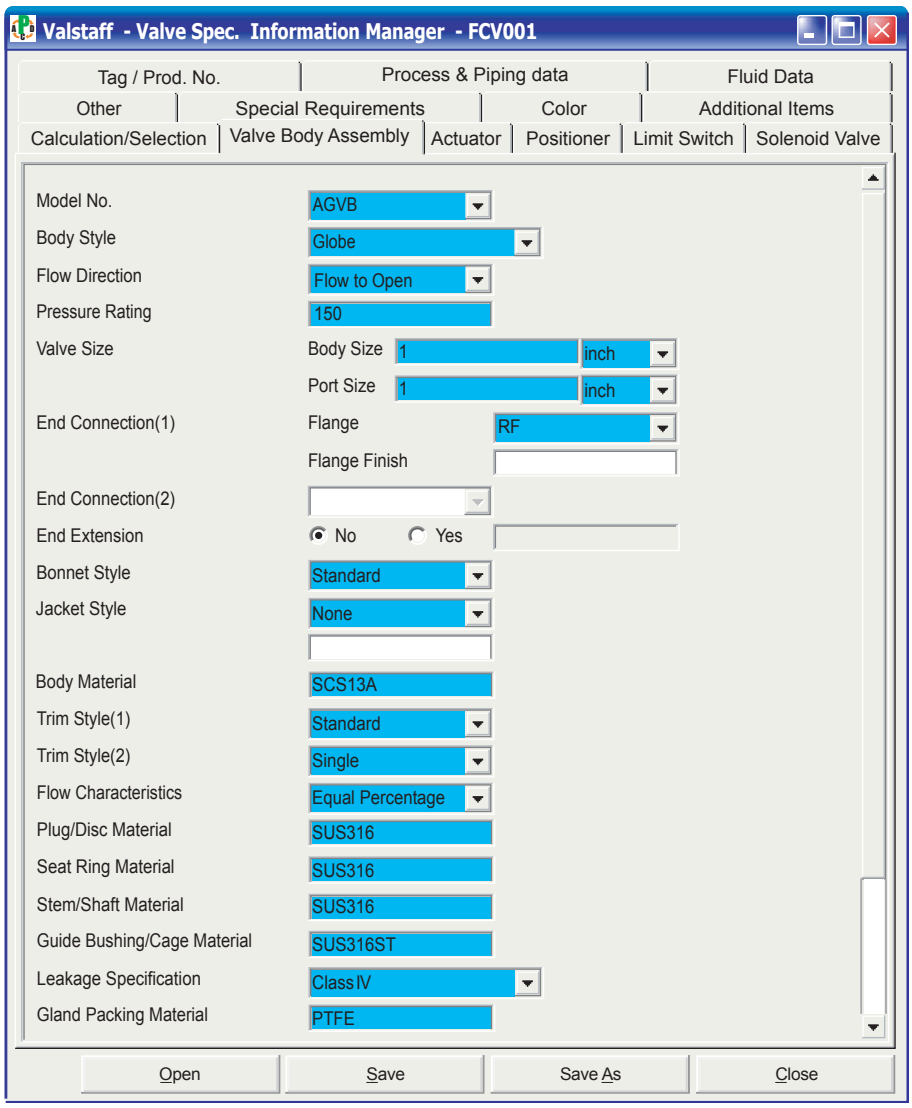
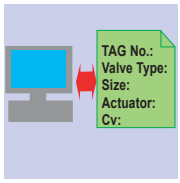


Figure 6-8 "Valve Spec. Information Management" window

Step	Procedure
4	To display the page for a specification item, select the corresponding tab placed in the upper portion of the window. Register the necessary specifications for the valve there. If a combo box is provided with a free space, new data can be entered there. The item for which new data has been entered is added to the list of the selected items. (Use "[Ctrl] + [left-clicking]" to delete an item from the list.)
5	After the registration has been completed, save the data as the control valve specification file. To save the data as a new file, click the [Save As] button to save the specification file with a new file name. (The default file name is "TAG No.".)
6	To overwrite the specification information after changing the information of the opened specification file to the same file, click the [Save] button to overwrite the information.
7	After the registration has been completed, click the [Close] button to exit the Valve Spec. Information.

6-8: Running the Valve Spec. Information

Step	Procedure
1	 Click the [Valve Spec. Information] button in the "Operation Setup" menu window.
2	The "Valve Spec. Data Link" window will appear.

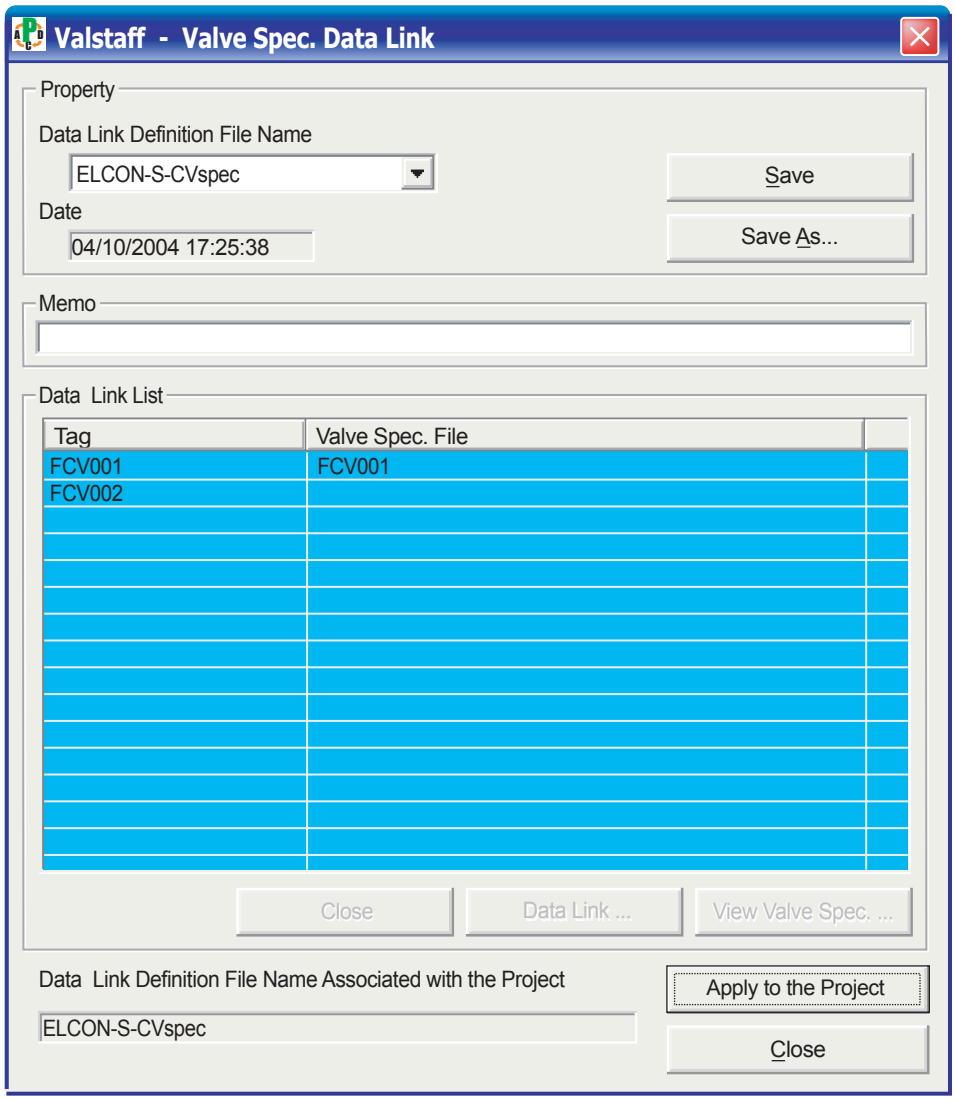
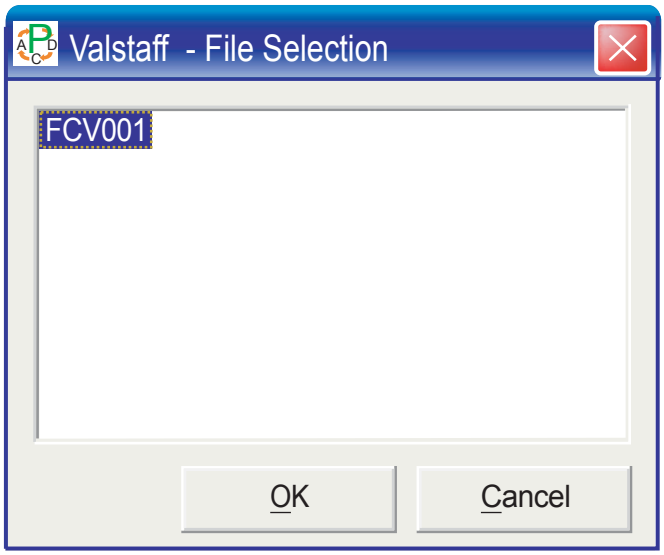
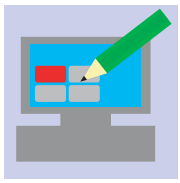
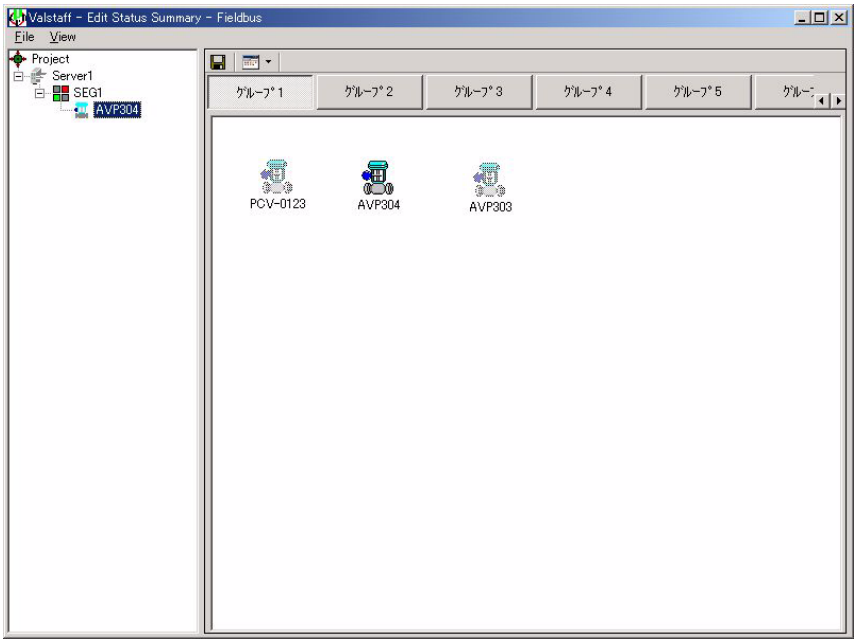


Figure 6-9 "Valve Spec. Data Link" window

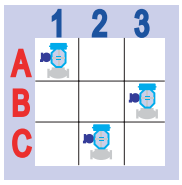
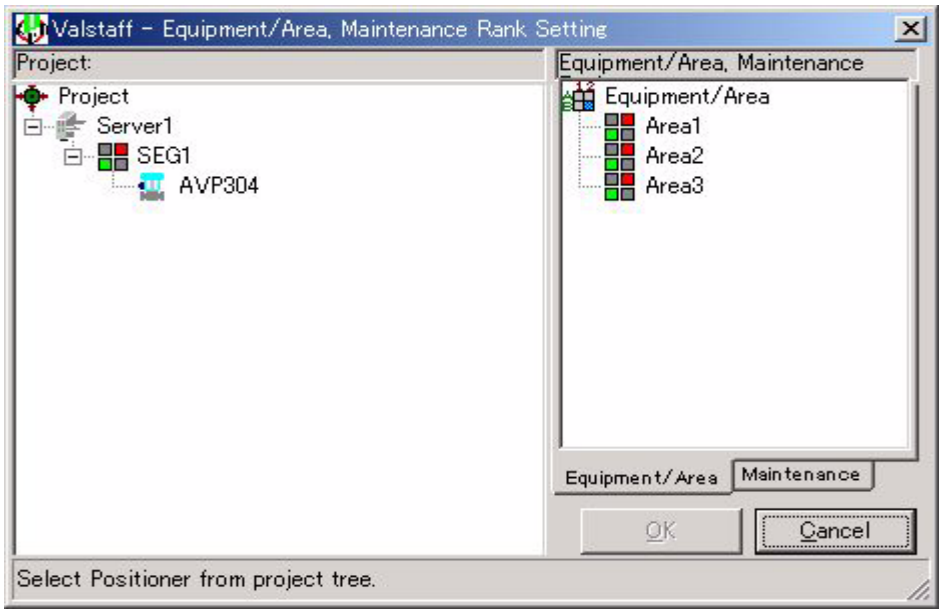
In the Data Link List, the PD tags of the positioners controlled by the currently opened project are shown.

Step	Procedure
3	Create a data link definition file, into which the link data is saved. To create a new file, input a new file name in the "Data Link Definition File Name" field, and then click the [Save As…] button to save the definition file. To edit an existing definition file, select a desired definition file you want to edit from the list in the "Data Link Definition File Name Associated with the Project" field.
4	Make the control valve specification file linked with the positioner controlled by the project. From the tags shown in the "Data Link List" area, select a positioner you want to register the valve specification file.
5	Click the [Data Link] button. The "File Selection" dialog box will appear. In this dialog box, the valve specification files, which have been created in section “6-7: Running the Valve Spec. Information” on page 6-13, are listed up.  *Figure 6-10 "File Selection" dialog box* Select a specification file, which is made linked with the positioner, and click the [OK] button.
6	Repeat steps 4 and 5 to make all necessary valve specification files linked with the positioner. After the linking has been completed, click the [Save] button to save the data into a data link definition file.
7	Click the [Apply to the Project] button to make the link definition file applicable to the currently opened project.
8	Click the [Close] button to exit the Valve Spec. Data Link.

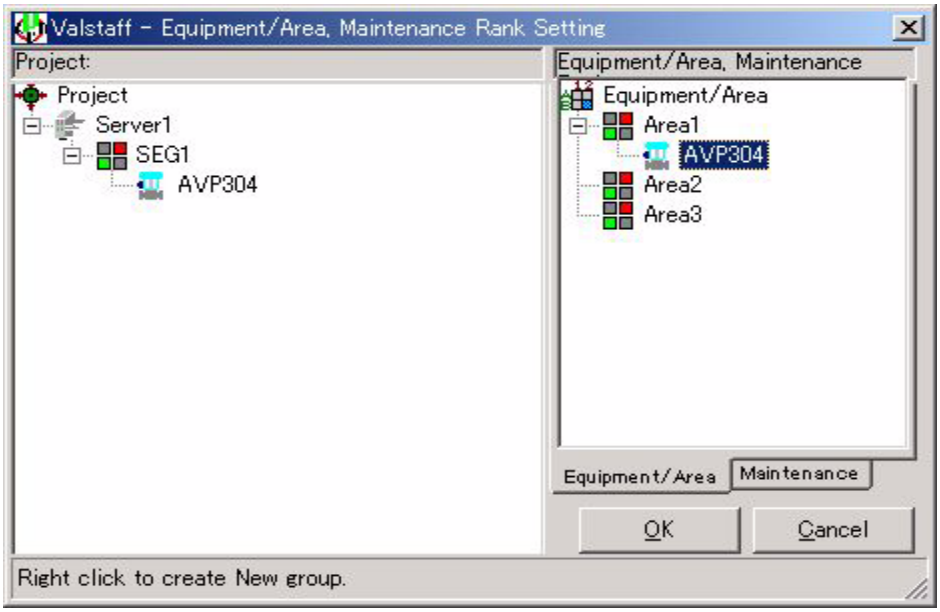
6-9: Running the Edit Status summary

Step	Procedure
1	 Click the [Edit Status summary] button in the "Operation Setup" menu window.
2	The "Edit Status summary" window will appear.  *Figure 6-11 "Edit Status summary" window* In the left portion of the window, the tree of the positioners registered in the project is shown. In the right portion of the window, group selection buttons becoming the control unit and the edit space by group are displayed.
3	Click relevant [Group (No.)] button to select a desired group you want to edit. From the [View] menu, select [Change Group Name?] and register a group name suitable for the control unit.
4	From the project tree, select Positioner you want to register it into the group, and then drag and drop it in the edit space to register it to the group.
5	Perform the steps 3 and 4 for necessary positioners. • To delete a positioner from the group, right-click the positioner in the edit space and select [Delete]. • To describe remarks about edit status, select [Properties] from the [File] menu and save such remarks as comment. • To change the status summary icon display method, select an appropriate display method from the [View] menu or right-click a blank spot in the edit space to select a desired display method. • To move the positioner registered in a certain group to other group, select the positioner icon and drag & drop it on the group button to move it.
6	From the [File] menu, select [Exit] to exit the Edit Status summary.

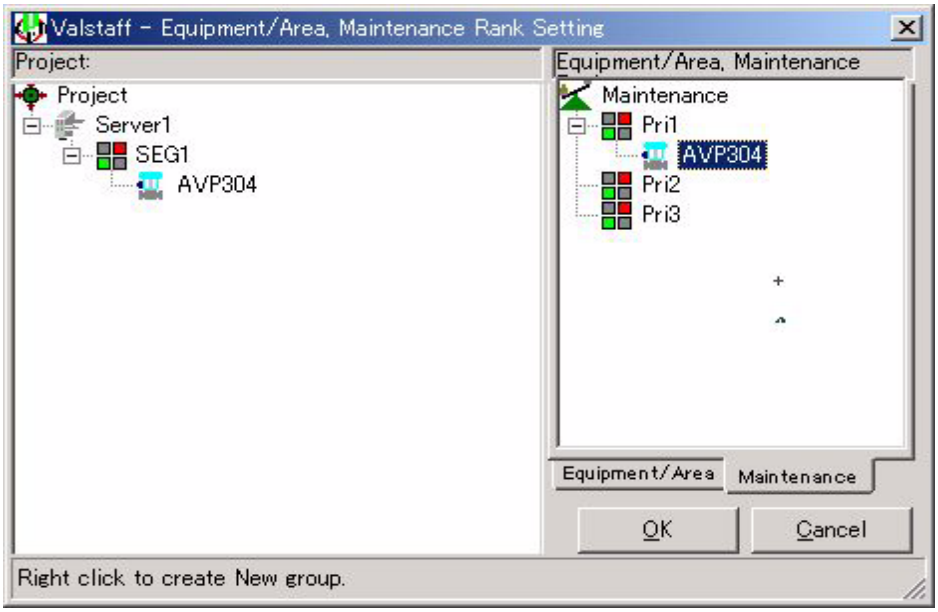
6-10: Running the Equipment/Area, Maintenance Rank Setting

Step	Procedure
1	 Click the [Equipment/Area, Maintenance Rank Setting] button in the "Operation Setup" menu window.
2	The "Equipment/Area, Maintenance Rank Setting" window will appear.  *Figure 6-12 "Equipment/Area, Maintenance Rank Setting" window* In the left portion of the window, the tree showing the network configuration is displayed. In the right portion of the window, the space registering the equipment and area information or the space registering the maintenance rank is changed by selecting relevant tab.

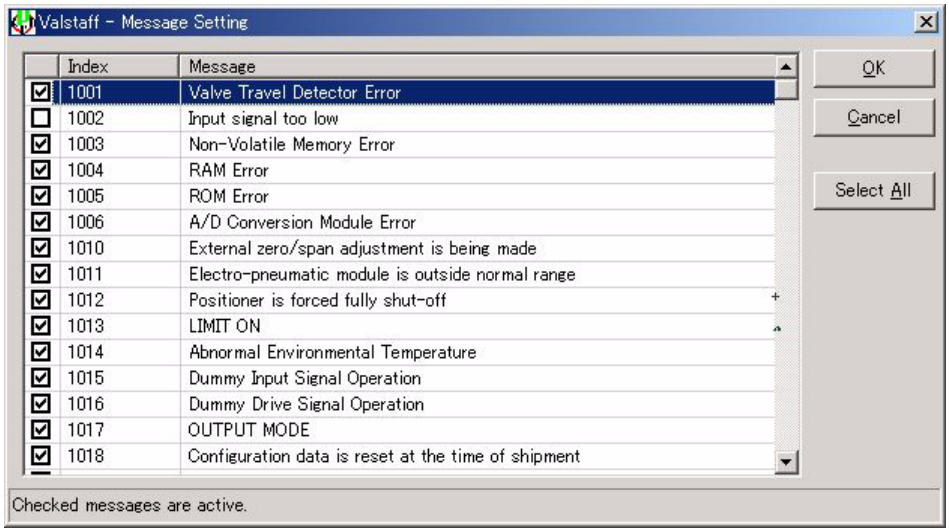
6-10-1: Setting up the Equipment/Area

Step	Procedure
1	Register the control unit of the Equipment/Area. Select the [Equipment/Area] tab to display the Equipment/Area edit space.  *Figure 6-13 "Equipment/Area, Maintenance Rank Setting" window (Equipment/Area)*
2	Right-click the [Equipment/Area] icon. The [New Group] menu will appear. When selecting this [New Group] menu, a new group is created under the [Equipment/Area] icon. To create a new group having a lower group concept, right-click the group to display [New Menu] and select it.
3	Set an appropriate name for the group. Select a desired group and click the group name part to highlight it. After that, change the name to an appropriate group name.
4	From the project tree, select a desired positioner and drag & drop it in an appropriate Equipment/Area group to register the positioner into the Equipment/Area group. • To cancel a positioner registered in the Equipment/Area group, right-click a positioner to display the [Release] menu. Select this menu to cancel the registration.

6-10-2: Setting up the Maintenance Rank

Step	Procedure
1	Register the control unit of the Maintenance Rank. Select the [Maintenance] tab to display the Maintenance Rank edit space.  *Figure 6-14 "Equipment/Area, Maintenance Rank Setting" window (Maintenance Rank)*
2	Right-click the [Maintenance] icon. The [New Group] menu will appear. When selecting this [New Group] menu, a new group is created under the [Maintenance] icon. To create a new group having a lower group concept, right-click the group to display [New Menu] and select it.
3	Set an appropriate name for the group. Select a desired group and click the group name part to highlight it. After that, change the name to an appropriate group name.
4	From the project tree, select a desired positioner and drag & drop it in an appropriate Maintenance group to register the positioner into the Maintenance group. • To cancel a positioner registered in the Maintenance group, right-click a positioner to display the [Release] menu. Select this menu to cancel the registration.

6-11: Running the Message Setting

Step	Procedure
1	 Click the [Message Setting] button in the "Operation Setup" menu window.
2	The "Message Setting" window will appear.  *Figure 6-15 "Message Setting" window* In this window, the check boxes, indexes, and messages are listed up.
3	Click the check box of a desired message to be displayed in the message list in the monitoring mode to make the display setting.
4	After whether or not necessary messages are displayed have been set, click the [OK] button to exit the operation.

6-12: Exiting the Operation Setup mode

Clicking the [Close] button in the "Operation Setup" menu window will exit the Operation Setup mode.

Chapter 7: Monitoring Mode

7-1: What is a monitoring mode?

In this monitoring mode, the trend data, such as various diagnostic parameters, control valve travel values, and temperature values is collected at periodic intervals, these collected parameters are displayed, and the status, alarm, and message are displayed corresponding to the diagnostic results. Additionally, the alarm used for the diagnosis can also be set. As described above, the statuses of the control valve and positioner during normal operation are monitored at real-time in this monitoring mode.

7-2: Starting up the monitoring mode

7-2-1: Starting up the monitoring mode

Click the monitoring mode button in the "Valstaff Menu" window.

7-2-2: "Monitoring Mode" window

When the monitoring mode is started up, the window shown in Figure7-1 will appear.

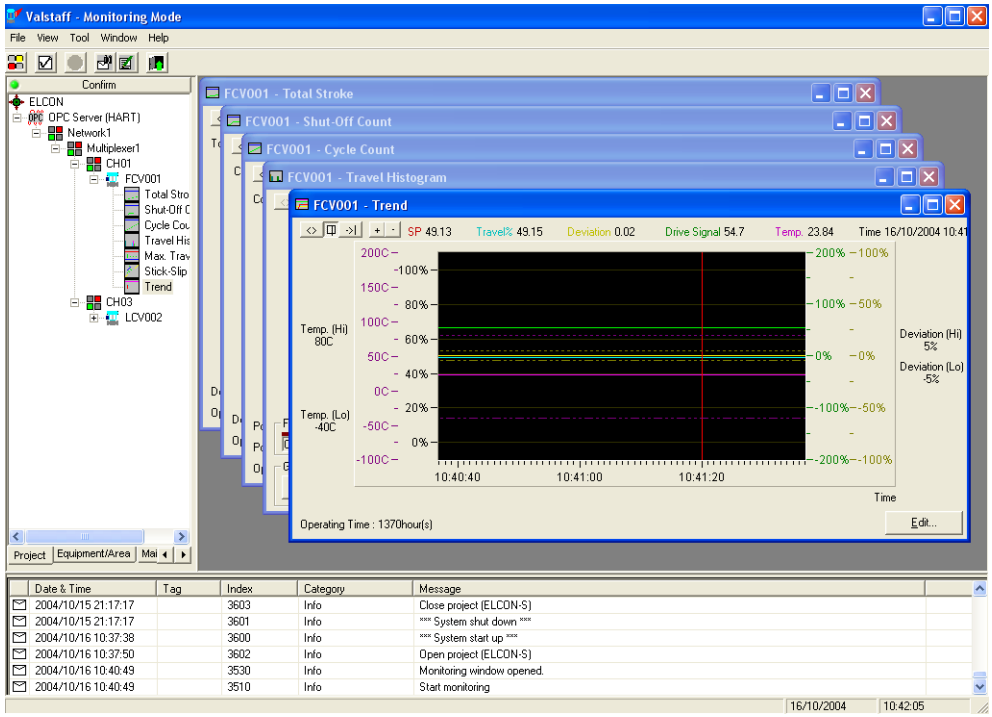


Figure 7-1 "Monitoring Mode" window

This "Monitoring Mode" window is composed of three areas, status tree (upper left portion), tool space (upper right portion), and message list (lower portion). Additionally, the size of each area can be changed. In the monitoring mode, generally, the status of each device is monitored through this window, diagnostic parameters are displayed, and alarms are displayed in this window. Necessary operations can be performed according to the status of each device. For details about display contents and how to operate, refer to “7-5: Graph functions of diagnostic parameters” on page 7-10.

7-3: Overview of functions in the monitoring mode

7-3-1: Graph functions of diagnostic parameters

(Display and edit functions)

Figure 7-2 shows an example of the diagnostic window. The graph of the diagnostic parameter is displayed at the center of the window. The icons used to operate the graph are arranged at the upper left position. The button used to transit to the alarm or graph axis setup window is located at the lower right portion. For details about display contents of the diagnostic window and how to operate the window, refer to "7-5: Graph functions of diagnostic parameters."

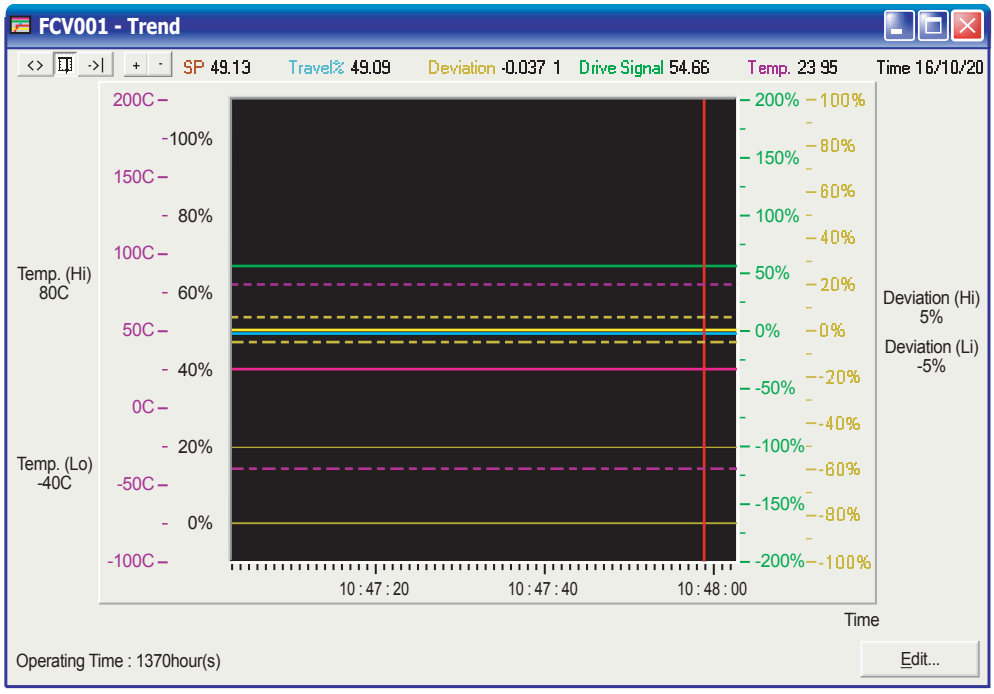


Figure 7-2 Example of diagnostic parameter window

7-3-2: Alarm functions of diagnostic parameters

(Display, edit, and search functions)

You can set a threshold value used to detect an alarm for each diagnostic parameter. Additionally, if the value of each diagnostic parameter reaches its set threshold value, the relevant alarm is shown in the status tree and message list. Since you can set whether or not the alarm is detected for each diagnostic parameter, it is also possible to detect only the necessary alarms. Furthermore, you can develop from the message in the message list to the window for the device in which the alarm is occurring, allowing you to quickly locate the unit in which the alarm is occurring, and to check the status.

7-3-3: Self-diagnostic functions of positioner

(Display, edit, and search functions)

In the positioner, the self-diagnosis is performed to check that the positioner functions correctly. As a result of the self-diagnosis, if an error is detected, relevant alarm corresponding to the cause of each error is given. In the Valstaff, these self-diagnostic alarms are shown in the status tree and message list. Additionally, you can set whether or not the message about this self-diagnostic alarm is displayed by the cause of each alarm, allowing you to suppress unnecessary alarms.

7-3-4: Message functions

(Display, edit, search, and setup change functions)

The message list window is located at the lower portion of the "Monitoring" window. In this message list window, the messages, such as diagnostic alarm, positioner self-diagnostic results, and operation log are displayed. On the message, the icon, date & time, tag name, message No., category, and message context are displayed. In the message window, you can display all messages, but you can also display only the necessary messages. Additionally, you can insert a desired message into the message list as user message. You can sort the messages in the message list window by icon, tag name, and/or category. Additionally, you can also search for a message by specifying a desired character string.

7-3-5: Status summary function (Display function)

This status summary function is used to list up the statuses of the control valves and positioners using icons. Normally, therefore, you can check whether or not an alarm occurs in the control valve or positioner through the list window by monitoring the "Status summary" window. If any alarm occurs, relevant icon starts blinking to inform that the alarm occurs. When selecting the blinking icon, the message about the alarm will appear at the lower portion of the window. When performing the check operation while the icon is blinking, the indication of the icon is changed from "blinking" to "lit". Additionally, when double-clicking the message part in the "Status summary" window, the window is changed to the "Status Tree" window, in which the status tree of the related control valves is shown, allowing you to check the cause of the alarm occurrence in detail.

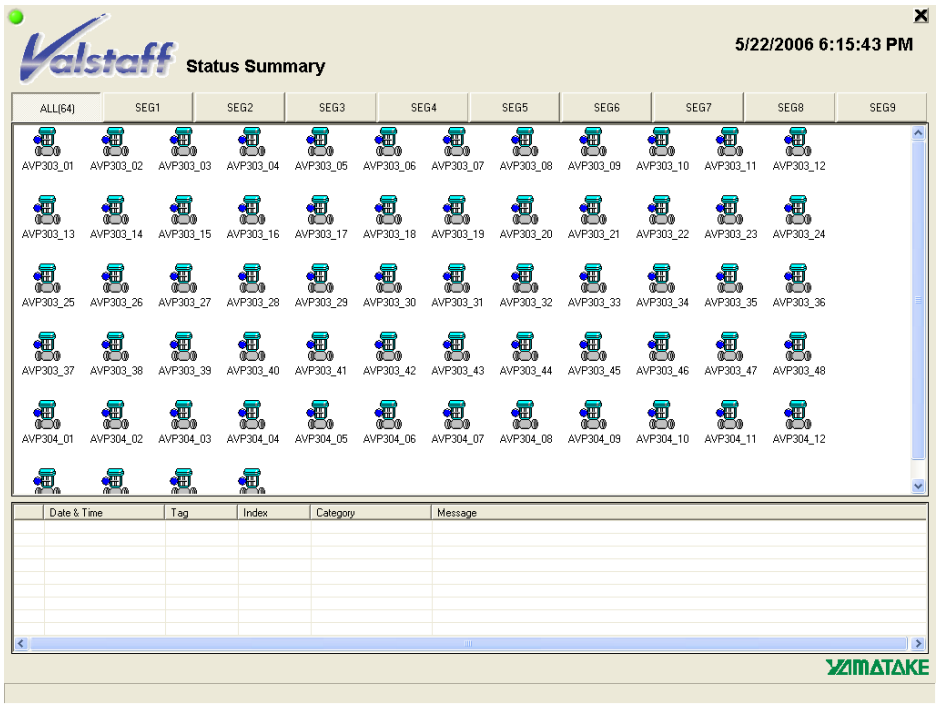


Figure 7-3 "Status summary" window

7-3-6: View Valve Spec. function (Display function)

Select a positioner in the status tree and select [Valve Spec…] from the right-mouse button menu. The "View Valve Spec." dialog box will appear. In this "View Valve Spec." dialog box, the data you have input in the "Valve Spec. Information Management" window is shown. Additionally, select a positioner in the status tree and select [Positioner Configuration] from the right-mouse button menu. The "Positioner Parameters" dialog box will appear. In the "Positioner Parameters" dialog box, you can check the data you have saved in the "Positioner Configuration/Calibration" mode.

The data to be displayed is the data you have saved into the file. This data is not the data loaded from the selected positioner.

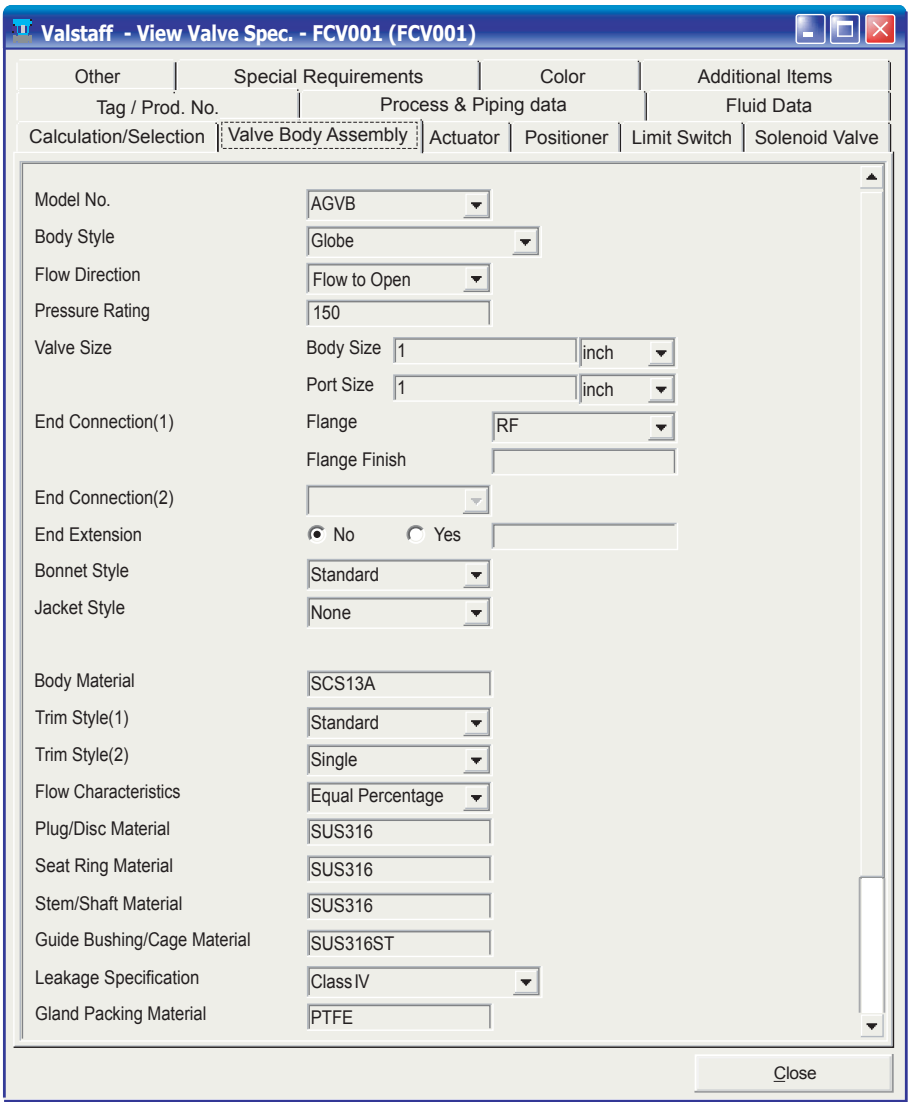


Figure 7-4 "View Valve Spec." window

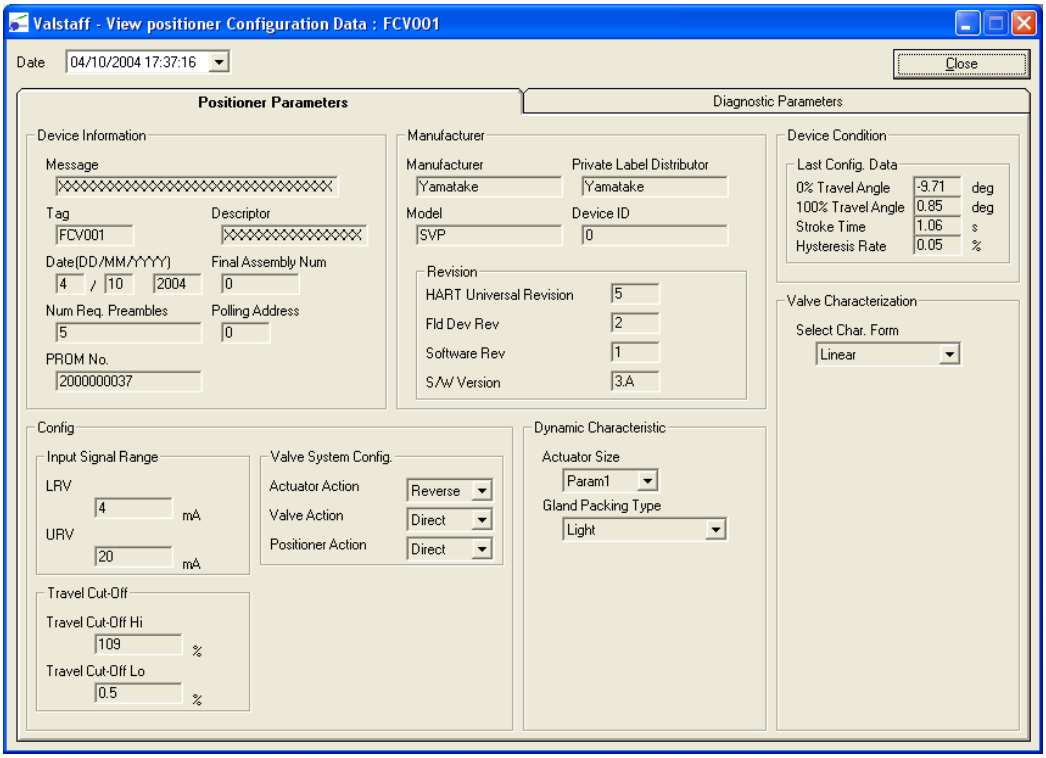


Figure 7-5 "Positioner Parameters" window

7-4: About diagnostic parameters

7-4-1: Diagnostic parameters

The diagnostic parameters are indexes to grasp the level of degradation in the quality of each valve or whether or not an abnormality is involved in each valve. Calculation operations for parameter values are performed in each positioner. When an alarm must be set for a parameter, the threshold for the parameter and the alarm generation status indicating whether or not the threshold has been exceeded are saved in the positioner as data. The Valstaff application obtains these statuses through communications with the positioners and displays them in the monitoring mode window.

7-4-2: Kinds of diagnostic parameters

7-4-2-1: Total stroke parameter

The positioner senses the positional information (valve travel value) of the valve shaft at intervals of 40msec. and keeps these values in %. By totaling changes in this positional information, this calculation value is determined as total stroke parameter value (%). To convert the total stroke parameter value into the actual stroke length, multiplying the total stroke parameter value by the stroke [mm] will obtain the actual stroke length. Additionally, you can set a dead zone, for example, a stroke of less than 1% is not added to the total stroke. It is assumed that this total stroke parameter value is used for diagnosis of sliding parts, such as gland packing according to the total stroke of the valve shaft.

7-4-2-2: Total shut-off parameter

In response to the shut-off request, the positioner counts the number of forced fully closed cycles. To judge the forced fully closed status, the status is judged as fully closed status when the forced fully closed status (MEASUREMENT_STATUS\SHUT_ON) is ON and the input signal (FINAL_VALUE) is the forced fully closed value (FINAL_VALUE_CUTTOFF _LO) or less.

This parameter is used as an index to check the wear and plastic deformation of the seat ring of the control valve.

7-4-2-3: Cycle count parameter

The number of control valve reverse operation cycles is counted.

The Hi value (CYCLE_COUNT_HI) and Lo value CYCLE_COUNT_LO) are set to desired levels. If the valve shaft position (FINAL_POSITION_VALUE) is moved to a position beyond this set area, it is determined that the valve shaft is reversed, and then the count (CYCLE_COUNT) is incremented. If the valve shaft position becomes beyond the Hi value and it becomes beyond the Hi value again even though the valve shaft position does not become beyond the Lo value, this operation is not counted. That is, the cycle count is counted when the valve shaft position becomes beyond the Hi value and Lo value alternately.

This cycle count can be used to diagnose sliding parts, such as gland packing.

7-4-2-4: Travel histogram parameter

The area from the fully closed position of the valve shaft to its fully open position is classified into 16 bands (travel areas). What band (travel classification) the control valve is used is counted, like histogram and this data is displayed as travel histogram.

According to this travel histogram, the most frequently used travel area can be understood and this data can be used to judge selection of the port diameter or valve structure. Additionally, you can adapt changes in travel histogram to estimate changes in operation status of the process.

7-4-2-5: Max. travel speed parameter

According to changes in valve shaft position measured by the positioner at intervals of 40 msec., the travel speed of the valve shaft by unit time is measured. You can set threshold values in the open direction and close direction for this valve shaft travel speed. If the valve shaft travel speed exceeds the threshold value, relevant alarm occurs.

7-4-2-6: Stick-slick diagnostic parameters

The travel distance (= speed) DX per unit time is calculated according to the positional information detected by the positioner at intervals of 40msec. Furthermore, according to the square value of the average speed value and square average value of this speed, the occurrence of the stick-slip is found.

You can set a desired stick-slip value used to occur the alarm as a threshold value. This parameter is effective to diagnose the sticking or galling inside the control valve.

7-4-2-7: Deviation diagnostic parameters

The Valstaff can collect the set travel value, control valve travel value, EPM duty, and temperature as trend data.

Furthermore, such data can be displayed and an alarm is given if the deviation between the travel set value and control valve travel value exceeds the set threshold value. With the deviation diagnosis alarm, it can be judged whether or not the most basic characteristics of the control valve operation are correct.

7-5: Graph functions of diagnostic parameters

7-5-1: Common graph operations

As the monitoring mode is started up, the following window will appear.

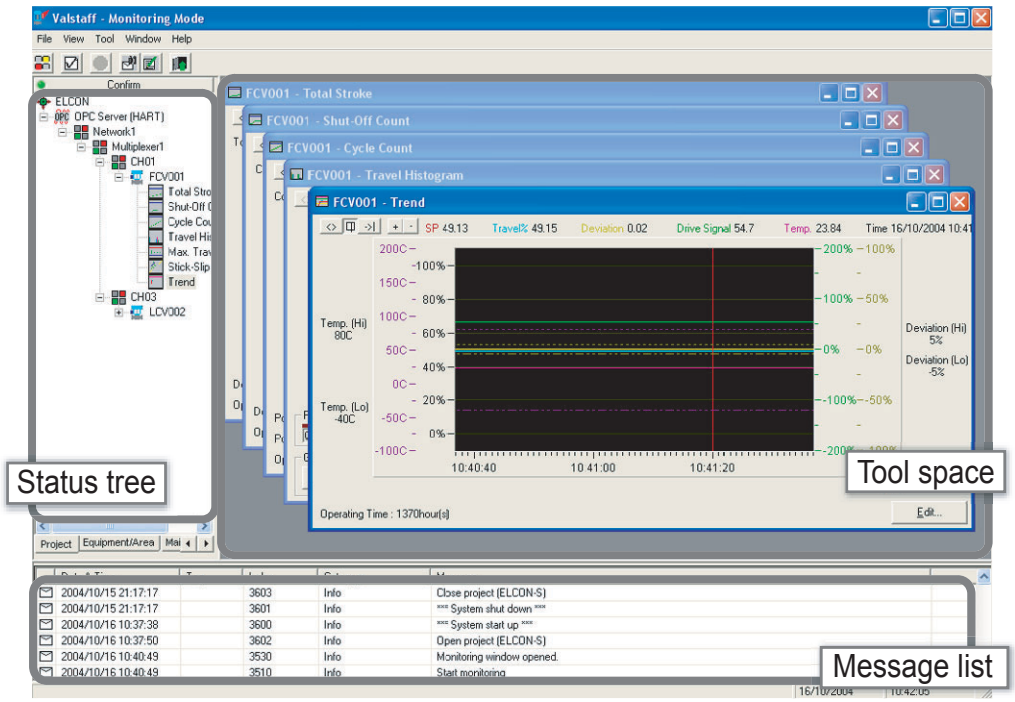


Figure 7-6 "Monitoring Mode" window

The "Monitoring Mode" window is composed of three areas, status tree (upper left portion), tool space (upper light portion), and message list (lower portion). Additionally, you can change the size of each area. The following briefly describes the window by area.

Status tree

Three trees, such as Project, Equipment/Area, and Maintenance are displayed by selecting a desired tab.

- **Displaying the tree by selecting the [Project] tab**
  When selecting the [Project] tab, each control valve is displayed with the same tree structure as that created by editing the project.
- **Displaying the tree by selecting the [Equipment/Area] tab**
  When selecting the [Equipment/Area] or [Maintenance] tab, each control valve is displayed with the same tree structure as that created by the operation setup.
- **Selecting diagnostic parameters**
  Diagnostic parameters, which can be displayed, are developed under each control valve. When double-clicking a desired diagnostic parameter name, the graph of the diagnostic parameter is displayed in the tool space area.

- **Displaying the alarm**

  If an alarm occurs in the control valve, the indication of the icon is changed, showing that the alarm is occurring. The indicated icon may vary depending on the type of the occurring icon or whether or not the check operation is provided, allowing you to easily understand the alarm occurrence status. The indication of the icon of the upper level layer, to which the control valve belongs, may vary according to the alarm occurrence of the control valve. If alarms occur in multiple control valves, the icon of the upper level layer shows the highest level. If the check operation is not performed after the alarm has occurred, the icon indication starts blinking.

  When the check operation is started, this icon indication is changed to the lit indication. To check the alarm, right-click the icon showing that the alarm is occurring with the mouse. The [Confirm] indication on the Popup menu becomes active. Selecting this indication allows you to perform the check operation. Additionally, you can also check all alarms at once by clicking the [Confirm] button at the upper portion of the status tree.

- **Displaying the graphs of the diagnostic parameters at once**

  When selecting [View All Diagnostic Parameters] from the menu, all diagnostic windows other than the trend display are displayed in the tool space.

- **Displaying the positioner self-diagnosis information**

  When selecting [Positioner Status] from the menu, the "Positioner Self-diagnosis" dialog box will appear, allowing you to check the self-diagnosis results of the positioner.

- **Displaying the "Message" dialog box**

  When selecting [Positioner Messages] from the menu, the message dialog box about the selected positioner appears, allowing you to check the messages that have occurred so far.

- **Displaying the positioner setup data**

  When selecting [Positioner Configuration] from the menu, the "Positioner Configuration/Calibration Data" dialog box will appear, allowing you to check the configuration/calibration data. However, the displayed data is the data when writing the positioner parameters after the calibration has been performed in the positioner configuration/calibration mode or various parameters have been set.

- **Displaying the control valve specifications**

  When selecting [Valve Spec.] from the menu, the "View Valve Spec." dialog box will appear. In this dialog box, the specifications of the control valve linked with the selected positioner are displayed.

Tool space

In this tool space, the graphs of various diagnostic parameters are displayed.

- **Operating the diagnostic parameter graph display**

  The diagnostic parameter graphs are displayed in the sub-window format, and then they can be arranged in the tool space freely. Multiple diagnostic windows can also be arranged by selecting [Cascade (C)], [Tile Holizontal (H)], or [Tile Vertical (V)] from the [Window] menu.

  The diagnostic windows can be made as icons within the tool space. By selecting [Arrange Icons (A)] from the [Window] menu, you can arrange the icons.

Message list

The list of alarms is displayed. The display item is composed of [Date&Time], [Tag], [Index], [Category], and [Message] columns.

The [Category] column provides [System Error], [Positioner Self-diagnosis], [CV Diagnosis], [Test], [Auto Setup], [Configuration/Calibration], [Communication Error], [Comment], and [Info].

- **Selecting relevant positioner from the alarm message**

  When double-clicking an alarm, the status tree is developed so that relevant devices are shown in the status tree.

- **Maximum number of messages to be displayed**

  The maximum number of messages to be displayed in the message list is 1000 lines.

  When right-clicking anywhere in the message list, the Popup menu will appear, allowing you to perform the following operations.

- **Inserting a comment**

  When selecting [Insert Comment (C)] from the Popup menu, the "Insert Comment" dialog box will appear, allowing you to input a desired comment in the message list.

- **Searching for a message**

  When selecting [Find Message] from the Popup menu, the "Find Message" dialog box will appear. By inputting a search character string, you can search for a message.

- **Hiding a message display**

  When selecting [Hide this message index] from the Popup menu, the "Hide Message Confirmation" dialog box will appear, allowing you to hide the message. When the operator has "user-level", the "Log-in" dialog box will appear before the "Confirmation" dialog box appears.

- **Setting the message display active/inactive**

  When selecting [Property of list...] from the Popup menu, the "Message Display Active/Inactive Setting" dialog box will appear, allowing you to select messages to be displayed and messages to be hidden.

  When the operator has "user-level", the "Log-in" dialog box will appear before the "Message Display Active/Inactive Setting" dialog box appears.

- **Selecting a positioner of the status tree from the message**

  When selecting [Select Positioner:] from the popup menu, the tree is developed so that relevant devices are displayed in the status tree.

7-5-2: Displaying the graphs

Figure 7-7 shows an example of the diagnostic parameter window. The graph of the diagnostic parameter is shown at the center of the screen and icons necessary to operate the graph are arranged at the upper left portion. A button necessary to transit to the alarm or graph axis setup screen is located at the lower right portion. For details about each diagnostic parameter window, refer to "7-5: Graph functions of diagnostic parameters" on page 7-10.

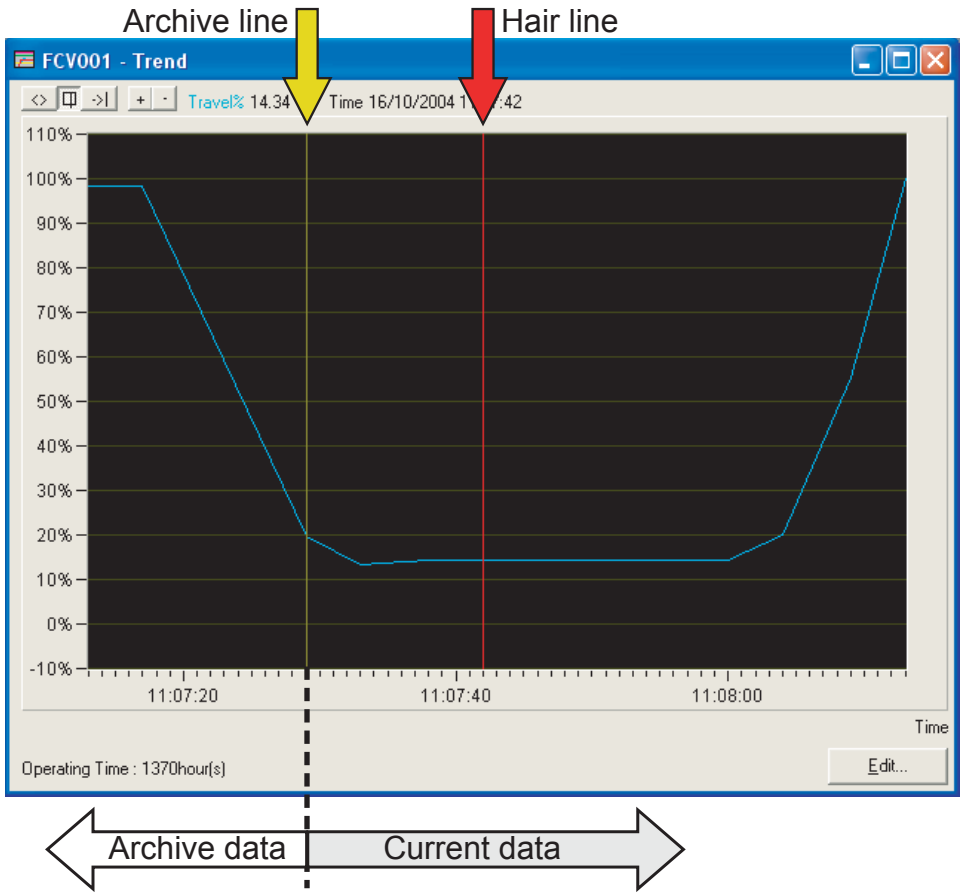


Figure 7-7 Diagnostic parameter graph display

Table 7-1 Description of graph operation icons

Icon	Mode name	Description
<>	Scroll mode	Scrolls the time axis.
|	Hair line movement mode	Moves the hair line with the mouse.
->|	Current display mode	Scrolls the graph automatically every time the data is plotted on the graph. In this mode, the hair line is not shown.
+	Enlarge mode	Enlarges a desired portion, which is selected with the mouse.
-	Return to original status	Returns the set display area to the initial status.

Table 7-2 Description of graph display

Current data	Data to be plotted after opening the window.
Archive data	Data before opening the window.
Hair line	This line can be moved on the graph. The hair line can be moved to only positions where the data is plotted. The hair line is not shown in the current display mode.
Archive line	This line shows the borderline between the archive data and current data. This archive line shows the end position of the archive data and it cannot be moved.

7-5-3: Displaying the graph of the total stroke parameter

Figure 7-8 shows the graph display of the total stroke parameter. In this graph, the total stroke of the control valve and threshold value used to detect an alarm are shown. Additionally, dead band used to make the totaling of the micro stroke disabled and operating time are also shown. You can select%-display or actual stroke display of the total stroke value by the setting.

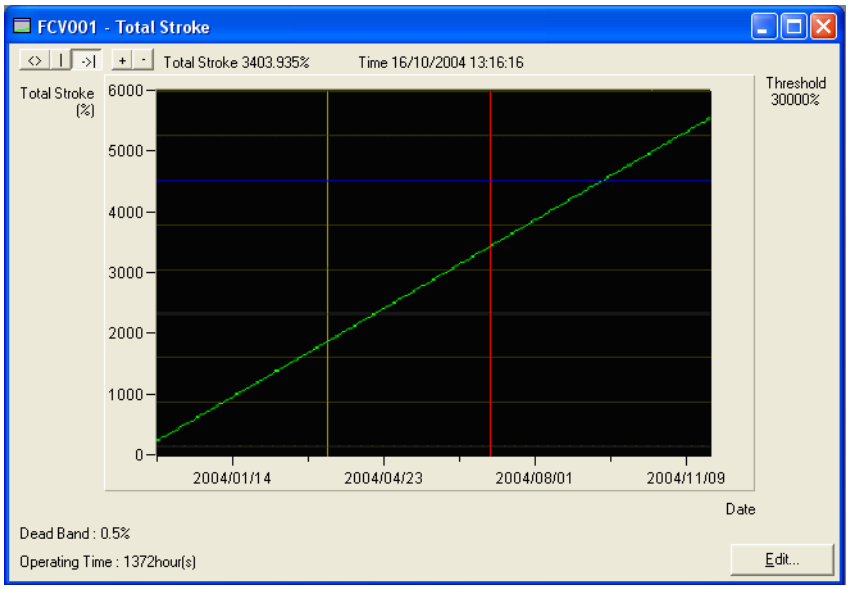


Figure 7-8 Graph of total stroke parameter

Table 7-3 Total stroke parameters

<> | ->| + -	Selects a desired graph operation mode (Refer to “7-5-2: Displaying the graphs” on page 7-13.)
Total Stroke	Shows the latest total stroke value in the current display mode and the total stroke value on the hair line in the hair line movement mode.
Time	Shows the time of the latest data in the current display mode and the time of the data on the hair line in the hair line movement mode.
Y-axis of graph	Shows the total stroke (%) or distance (mm, m, km).
X-axis of graph	Shows the time or date.
Threshold Value	Shows the threshold value, which has been set by the user.
Dead Band	Shows a dead band, where data is not totaled as total stroke.
Operating Time	Shows the operating time of the positioner. (Unit: hr.)
[Edit] button	Opens the "Custom Dialogue" box of the window.

7-5-4: Editing the graph of the total stroke parameter

Figure 7-9 shows the various setup window about the total stroke parameter diagnosis. In the setup window, you can set up a threshold value used to detect the diagnostic alarm, a dead band, and a graph display method.

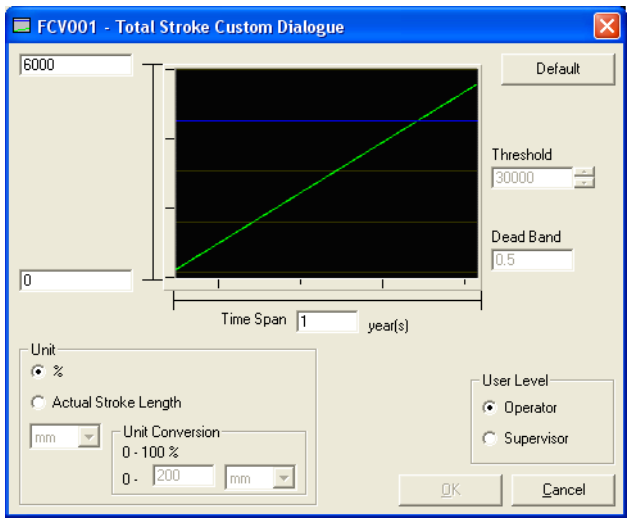


Figure 7-9 "Total Stroke Custom Dialogue" window

The threshold value and dead band cannot be used unless the user level is "Supervisor". To change the threshold value, following three kinds of methods are provided, a) moving the threshold value on the graph with the mouse, b) inputting a numeric value from the input field, and c) increasing or decreasing the value with the up/down button. The units of the Y-axis of the graph, threshold value, and dead band value are automatically converted so that they are linked with the display unit. If the display unit is the actual stroke length, the setting range becomes the value, which is converted by the display unit. In the "Unit Conversion" area, you must set a conversion value necessary to convert the value in % into the actual stroke length. In the "Dead Band" area, you must set a dead band where data is not totaled on the total stroke. The following Table shows the default set values and effective ranges.

Table 7-4 Default values and effective ranges of total stroke parameter set values

Name	Default value	Range
Y-axis of graph (High limit)	40000000[%]	0 ≤ High limit ≤ 1E+9 [%] (However, high limit > low limit)
Y-axis of graph (Low limit)	-10[%]	-1E+8 ≤ Low limit < 1E+9 [%] (However, high limit > low limit)
X-axis of graph	1 year	0.001 to 10 years
Threshold value	20000000	0 to 1E+9[%]
Dead band	0.5	0 to 100[%]
Unit	%	% or actual stroke length
Actual stroke length	mm	mm, m, km
Display conversion	200	1 to 5000[mm]
Conversion unit	m m	mm, m

7-5-5: Displaying the graph of the shut-off count parameter

Figure 7-10 shows the graph display of the shut-off count parameter. In the graph, the number of control valve fully closed cycles and the threshold value used to detect an alarm are shown. Additionally, the defined fully-closed state of the valve and operating time are also shown.

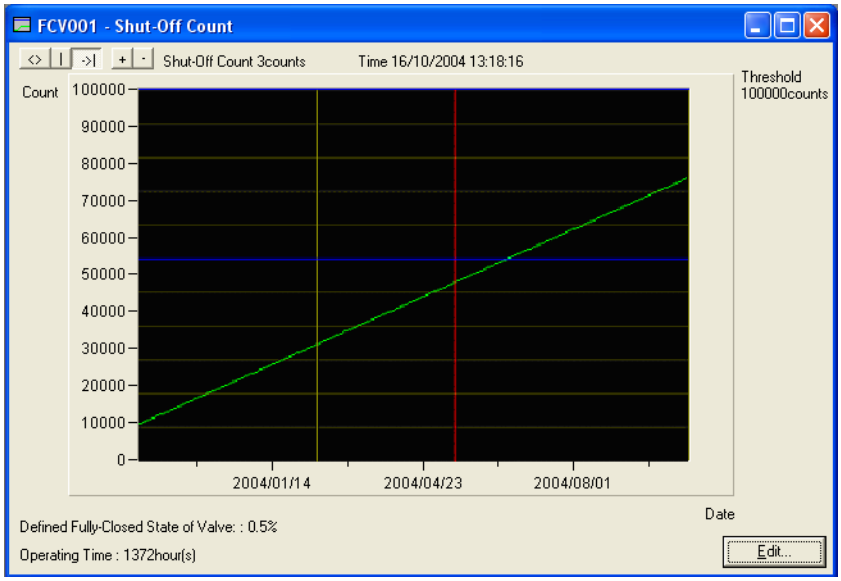


Figure 7-10 Graph of shut-off count parameter

Table 7-5 Shut-off count parameters

<> | ->| + -	Selects a desired graph operation mode (Refer to "7-5-2: Displaying the graphs" on page 7-13.)
Shut-Off Count	Shows the latest shut-off count value in the current display mode and the shut-off count value on the hair line in the hair line movement mode.
Time	Shows the time of the latest data in the current display mode and the time of the data on the hair line in the hair line movement mode.
Y-axis of graph	Shows the shut-off count.
X-axis of graph	Shows the time or date.
Threshold Value	Shows the threshold value, which has been set by the user.
Defined Fully-Closed State of Valve	Travel value determined as fully close state (Display only)
Operating Time	Shows the operating time of the positioner. (Unit: hr.)
[Edit] button	Opens the "Custom Dialogue" box of the window.

7-5-6: Editing the graph of the shut-off count parameter

Figure 7-11 shows the various setup window about the shut-off count parameter diagnosis. In the setup window, you can set up a threshold value used to detect the diagnostic alarm, a travel value determined as fully closed state, and a graph display method.

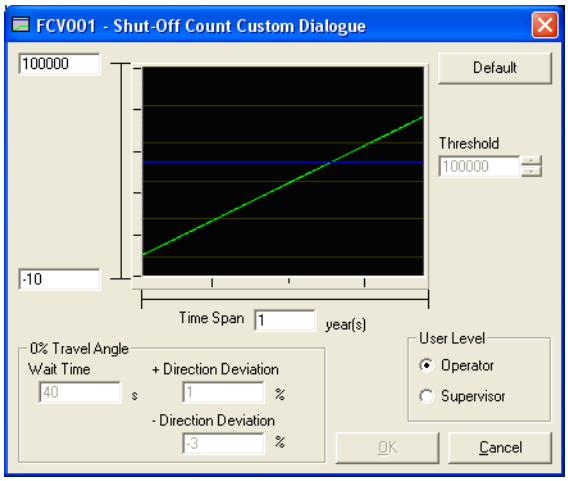


Figure 7-11 "Shut-Off Count Custom Dialogue" window

To set a threshold value and 0% travel angle, you must change the user level to "Supervisor". To change the threshold value, following three kinds of methods are provided, a) moving the threshold value on the graph with the mouse, b) inputting a numeric value from the input field, and c) increasing or decreasing the value with the up/down button. Additionally, you can set the Y-axis and X-axis of the graph display.

In this window, you can set the 0% travel angle comparison diagnosis. In the 0% travel angle comparison diagnosis, a deviation amount is set in %, which is used as an alarm from the zero-point position in the positive or negative direction. Furthermore, a period of wait time to continue the deviation amount is set. In the 0% travel angle comparison diagnosis, if the set deviation amount is detected continuously for a set period of time, the diagnosis alarm is given. The following Table shows the default set values and effective ranges.

Table 7-6 Default values and effective ranges of shut-off diagnostic parameters

Name	Default value	Range
Y-axis of graph (High limit)	100000	-10000 < High limit ≤ 100000 (However, high limit > low limit)
Y-axis of graph (Low limit)	-10	-10000 ≤ Low limit < 100000 (However, high limit > low limit)
X-axis of graph	1 year	0.001 to 10 years
Threshold value	100000	0 to 100000

Table 7-7 Default values and effective ranges of 0% travel angle

Name	Default value	Range
Wait Time	40	0 to 3600, ∞ (Digits after the decimal point are not provided.)
+ Direction deviation	1	0 to 100, ∞ (Digits after the decimal point are not provided.)
- Direction deviation	-3	-100 to 0, -∞ (Digits after the decimal point are not provided.)

7-5-7: Displaying the graph of the cycle count parameter

Figure 7-12 shows the graph display of the cycle count parameter. In the graph, the number of control valve cycle count cycles and the threshold value used to detect an alarm are shown. Additionally, the high limit and low limit values to be determined as cycle count, as well as operating time are also shown.

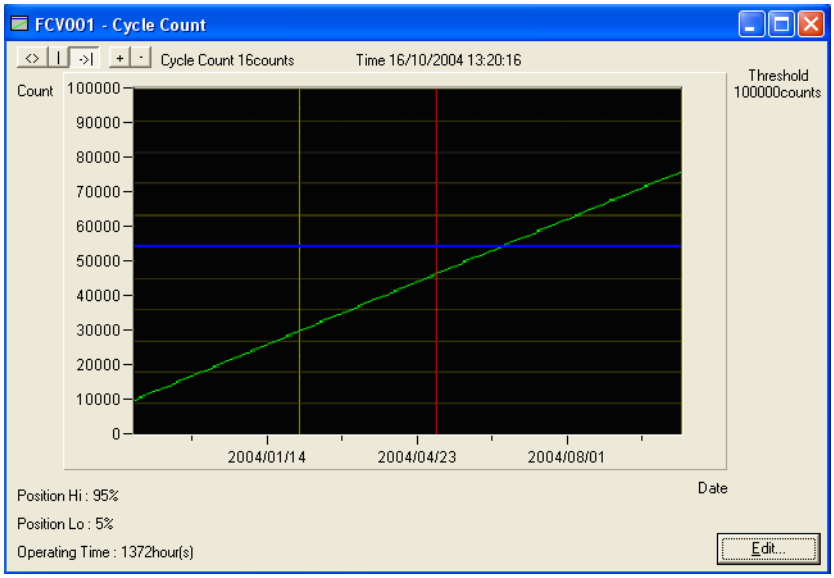


Figure 7-12 Graph of cycle count parameter

Table 7-8 Cycle count parameters

<> | ->| + -	Selects a desired graph operation mode (Refer to "7-5-2: Displaying the graphs" on page 7-13.)
Cycle Count	Shows the latest cycle count value in the current display mode and the cycle count value on the hair line in the hair line movement mode.
Time	Shows the time of the latest data in the current display mode and the time of the data on the hair line in the hair line movement mode.
Threshold Value	Shows the threshold value, which has been set by the user.
Position Hi	High limit travel (CYCLE_COUNT_HI) determined as cycle count.
Position Lo	Low limit travel (CYCLE_COUNT_LO) determined as cycle count.
Operating Time	Shows the operating time of the positioner. (Unit: hr.)
[Edit] button	Opens the "Custom Dialogue" box of the window.

7-5-8: Editing the graph of the cycle count parameter

Figure 7-13 shows the various setup window about the cycle count parameter diagnosis. In the setup window, you can set up a threshold value used to detect the diagnosis alarm, high limit and low limit values used to detect the cycle count, and a graph display method.

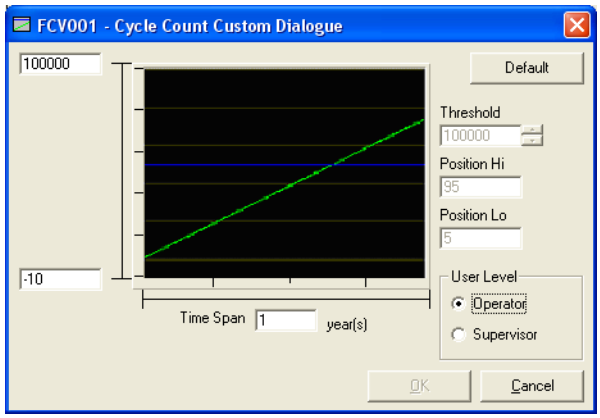


Figure 7-13 "Cycle Count Custom Dialogue" window

To set a threshold value, and high limit (Position Hi) and low limit (Position Lo) values used to detect the cycle count, you must change the user level to "Supervisor". To change the threshold value, following three kinds of methods are provided, a) moving the threshold value on the graph with the mouse, b) inputting a numeric value from the input field, and c) increasing or decreasing the value with the up/down button. Additionally, you can set the Y-axis and X-axis of the graph display. The following Table shows the default set values and effective ranges.

Table 7-9 Default values and effective ranges of cycle count set values

Name	Default value	Range
Y-axis of graph (High limit)	100000	-10000 < High limit ≤ 100000 (However, high limit > low limit)
Y-axis of graph (Low limit)	-10	-10000 ≤ Low limit < 100000 (However, high limit > low limit)
X-axis of graph	1 year	0.001 to 10 years
Threshold value	100000	
Position Hi	95	-10 < Hi value ≤ 100, Hi value = ∞ (However, Hi value > Lo value)
Position Lo	5	-10 ≤ Lo value < 100, Lo value = -∞ (However, Hi value > Lo value)

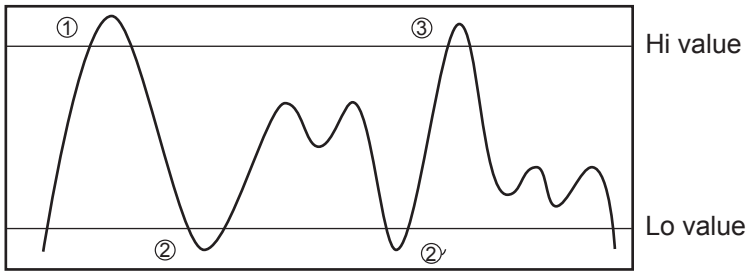


Figure 7-14 Cycle counting method

In the above Figure, the number of counts is "3". ②' is not counted.

7-5-9: Displaying the graph of the travel histogram parameter

Figure 7-15, 7-16, and 7-17 show the graph display of the travel histogram parameter. The graph shows the histogram by valve travel, that the information on valve shaft position from the fully opened position to fully closed position is classified into 16 bands. Three kinds of graph displays can be changed, the travel histogram (3D) shown by three axes consisting of the frequency, segment, and time (Figure 7-15), travel histogram (2D) that the total count obtained for one year is shown by the frequency and segment (Figure 7-16), and line graph by segment shown by frequency and time (Figure 7-17).

Travel Histogram (3D) display

The travel histogram by month is shown.

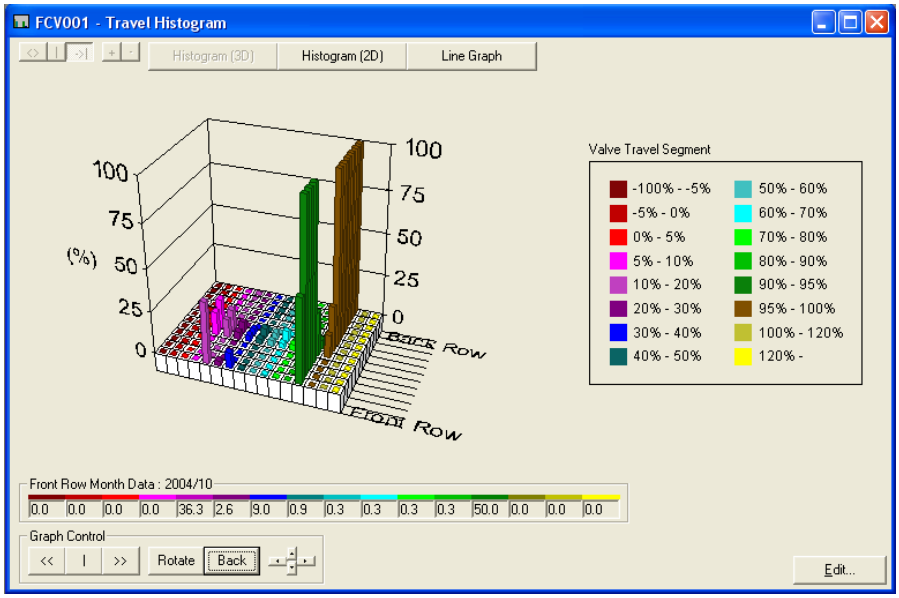


Figure 7-15 Travel Histogram (3D) display

Table 7-10 Travel histogram (3D) display

<> | ->| + -	These buttons are not used for the histogram (3D) display.
Y-axis of graph	Frequency
X-axis of graph (1)	Segment (separated by 16)
X-axis of graph (2)	Time (month)
[Edit] button	Opens the "Custom Dialogue" box of the window.
<< | >>	<<: Moves the histogram display area one forward in the time-axis direction. | : Displays the current value on the top. >>: Moves the histogram display area one backward in the time-axis direction.
Rotate Back	[Rotate]: Rotate the graph (This button is changed to [Stop] during rotation.) [Back]: Returns the graph to its previous display position.
	Rotates the graph manually.
[Histogram (3D)]	This button cannot be used in the histogram (3D) display.
[Histogram (2D)]	Changes to the histogram (2D) display.
[Line Graph]	Changes to the line graph display.

Travel Histogram (2D) display

The total values of the travel histogram for one year are displayed.

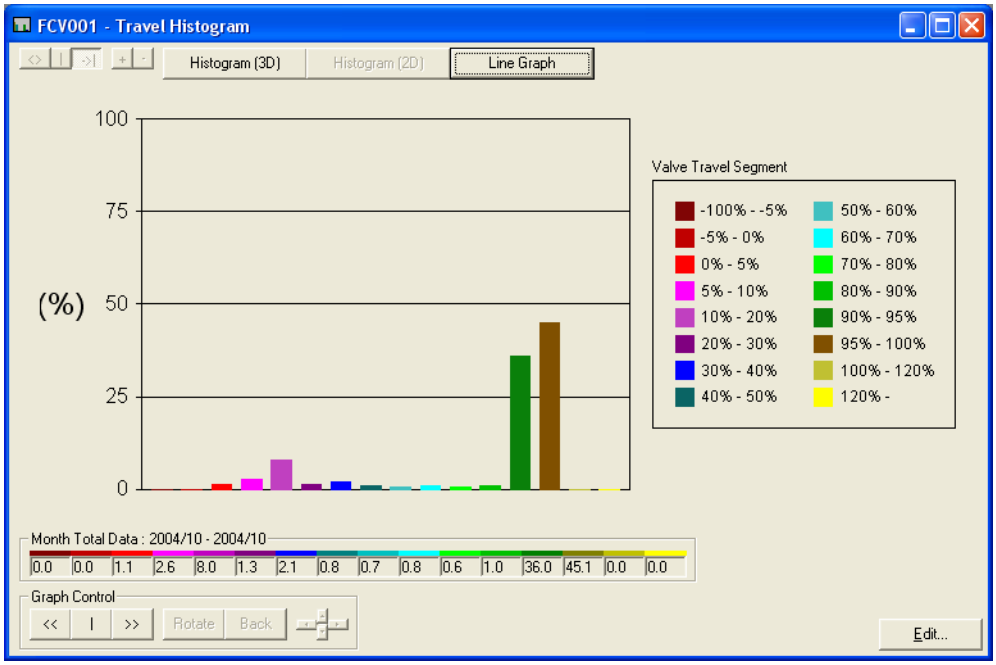
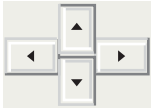


Figure 7-16 Travel Histogram (2D) display

Table 7-11 Travel histogram (2D) display

<> | ->| + -	These buttons are not used for the histogram (2D) display.
Y-axis of graph	Frequency
X-axis of graph	Segment (separated by 16)
Graph legends	Time (month)
[Edit] button	Opens the "Custom Dialogue" box of the window.
<< | >>	<<: Moves the histogram display area one forward in the time-axis direction. | : Displays the current value on the top. >>: Moves the histogram display area one backward in the time-axis direction.
Rotate Back	These buttons cannot be used in the histogram (2D) display.
	This button cannot be used in the histogram (2D) display.
[Histogram (3D)]	Changes to the histogram (3D) display.
[Histogram (2D)]	This button cannot be used in the histogram (2D) display.
[Line Graph]	Changes to the line graph display.

Line graph display

The line graph of the travel histogram by month is displayed.

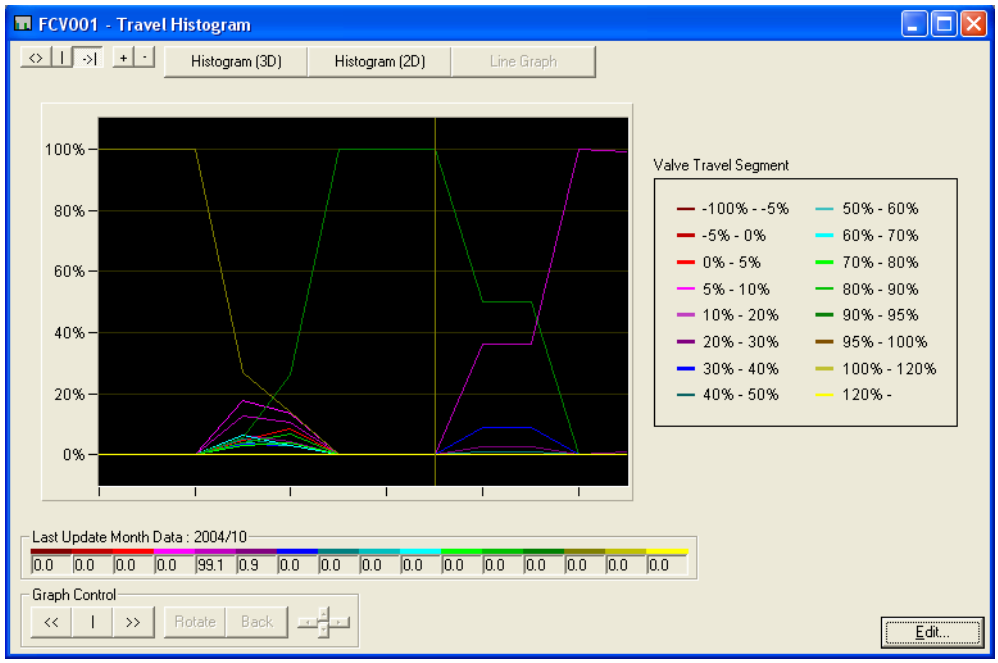


Figure 7-17 Line graph display of travel histogram

Table 7-12 Line graph of travel histogram

<> | ->| + -	Selects a graph operation mode. (Refer to "7-5-2: Displaying the graphs" on page 7-13.)
Y-axis of graph	Frequency
X-axis of graph	Time (month)
Hair line	This line can be moved on the graph. The numeric values of the time and date are displayed on the graph.
[Edit] button	Opens the "Custom Dialogue" box of the window.
<< | >>	<<: Moves the histogram display area one forward in the time-axis direction. | : Displays the current value on the top. >>: Moves the histogram display area one backward in the time-axis direction.
Rotate Back	This button cannot be used in the line graph display.
	This button cannot be used in the line graph display.
[Histogram (3D)]	Changes to the histogram (3D) display.
[Histogram (2D)]	Changes to the histogram (2D) display.
[Line Graph]	This button cannot be used in the line graph display.

7-5-10: Editing the graph of the travel histogram parameter

Figure 7-18 shows the various setup window about the travel histogram parameter diagnosis. In the setup window, travel values (segmentation) are set to classify the travel histogram into 16 segments. Additionally, a time span used to display the line graph is also shown.

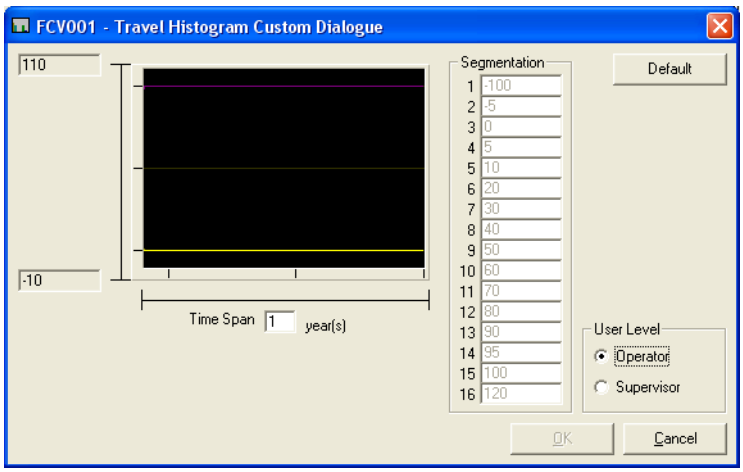


Figure 7-18 "Travel Histogram Custom Dialogue" window

To set a segmentation (travel classification value), you must change the user level to "Supervisor". For segmentation values, you can input numeric values from input fields to change the currently set values. Additionally, you can also set up the time axis (display range) of the line graph. The following Table shows the default values and effective ranges of the set values.

Table 7-13 Default values and effective ranges of set values

Name	Default value	Range
Y-axis	110 -10	Fixed.
X-axis	1 year	1 to 10 years
Segmentation	-100 -5 0 5 10 20 30 40 50 60 70 80 90 95 100 120	-100 to 300 [%]

7-5-11: Displaying the graph of the maximum travel speed

Figure 7-19 shows the graph display of the maximum travel speed parameter. In the graph, the maximum travel speed values by the unit time when the valve shaft of the control valve is moved are shown in the positive direction (open direction) and negative direction (close direction). Additionally, threshold values used to detect an alarm and operating time are also shown.

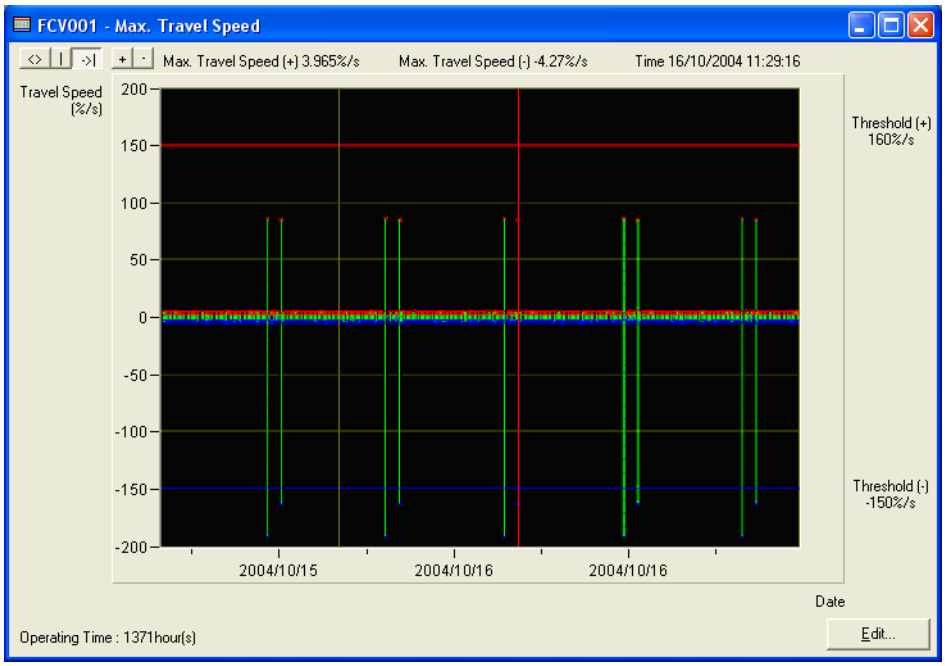


Figure 7-19 Maximum travel speed graph display

Table 7-14 Maximum travel speed graph

<> | ->| + -	Selects a desired graph operation mode. (Refer to "7-5-2: Displaying the graphs" on page 7-13.)
Travel Speed (+/-)	Shows the latest maximum travel speed in the current display mode and the maximum travel speed on the hair line in the hair line movement mode.
Time	Shows the time of the latest data in the current display mode and the time of the data on the hair line in the hair line movement mode.
Y-axis of graph	Shows the total stroke (%) or distance (mm/s, m/s).
X-axis of graph	Shows the time or date.
Threshold Value (+/-)	Shows the threshold value, which has been set by the user.
Operating Time	Shows the operating time of the positioner. (Unit: hr.)
[Edit] button	Opens the "Custom Dialogue" box of the window.

7-5-12: Editing the graph of the maximum travel speed parameter

Figure 7-20 shows the various setup screen about the maximum travel speed parameter diagnosis. In the setup window, threshold values used to detect the diagnosis alarm and the display unit of the travel speed are set. Additionally, you can also set a graph display method.

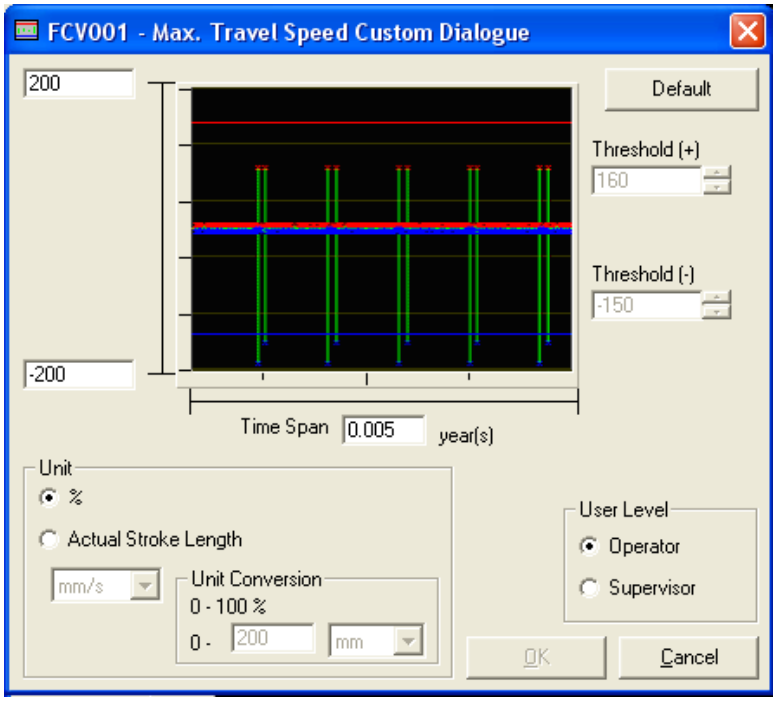


Figure 7-20 "Maximum Travel Speed Custom Dialogue" window

To set threshold values, you must change the user level to "Supervisor". To change the threshold value, following three kinds of methods are provided, a) moving the threshold value on the graph with the mouse, b) inputting a numeric value from the input field, and c) increasing or decreasing the value with the up/down button. Additionally, you can also select a desired display unit, that is, the maximum travel speed is displayed in % or in actual stroke length. The units of the Y-axis of the graph and threshold values are automatically converted so that they are linked with the display unit. Additionally, you can set the Y-axis and X-axis of the graph display. The following Table shows the default set values and effective ranges.

Table 7-15 Default values and effective range of maximum travel speed set values

Name	Default value	Range
Y-axis of graph (High limit)	1000	-1000 < High limit ≤ 1000 [%/s] (However, high limit > low limit)
Y-axis of graph (Low limit)	-1000	-1000 ≤ High limit < 1000 [%/s] (However, high limit > low limit)
X-axis of graph	1 year	0.001 to 10 years
Threshold value (+)	1000	0 to 1000[%/s]
Threshold value (-)	-1000	-1000 to 0[%/s]
Unit	%	% or actual stroke length
Actual stroke length	mm/s	mm/s, m/s
Display conversion	200	1 to 5000[mm]
Conversion unit	mm	mm, m

7-5-13: Displaying the graph of the stick-slip diagnostic parameter

Figure 7-21 and 7-22 show the graph display of the stick-slip diagnostic parameter. Two kinds of graph display methods are provided, histogram display format (Figure 7-21) and trend display format (Figure 7-22). Indexes showing the stick status of the valve are displayed on the graph. Additionally, threshold values used to detect an alarm, index values if they exceed the threshold values, the number of cycles exceeding the threshold value, the number of limit cycles determined as alarm, and operating time are also displayed.

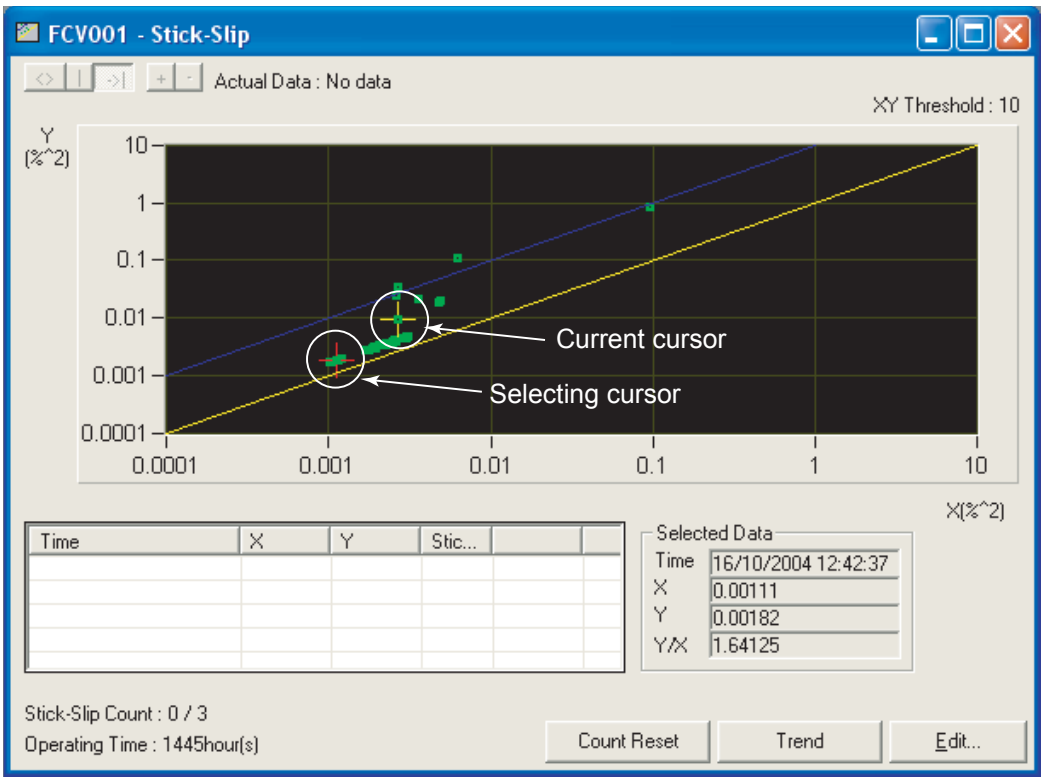


Figure 7-21 Stick-slip diagnosis graph display (Histogram display)

Table 7-16 Stick-slip diagnosis graph (Histogram display)

<> | ->| + -	These buttons are not used for the histogram display.
Actual Data	Time and Y/X data at final plot
Selected Data	Time on the hair line, and X, Y, and Y/X data
List	List of time, X, and Y data when the data exceeds the threshold value.
Stick-slip count	Numbers of cycles exceeding the threshold value and limit cycles
Y-axis of graph	Y
X-axis of graph	X
Threshold value	Shows the set threshold value.
Operating Time	Shows the operating time of the positioner. (Unit: hr.)
[Count Reset] button	Resets the count.
[Trend] button	Changes to the trend display.
[Edit] button	Opens the "Customize Dialogue" box of the window.

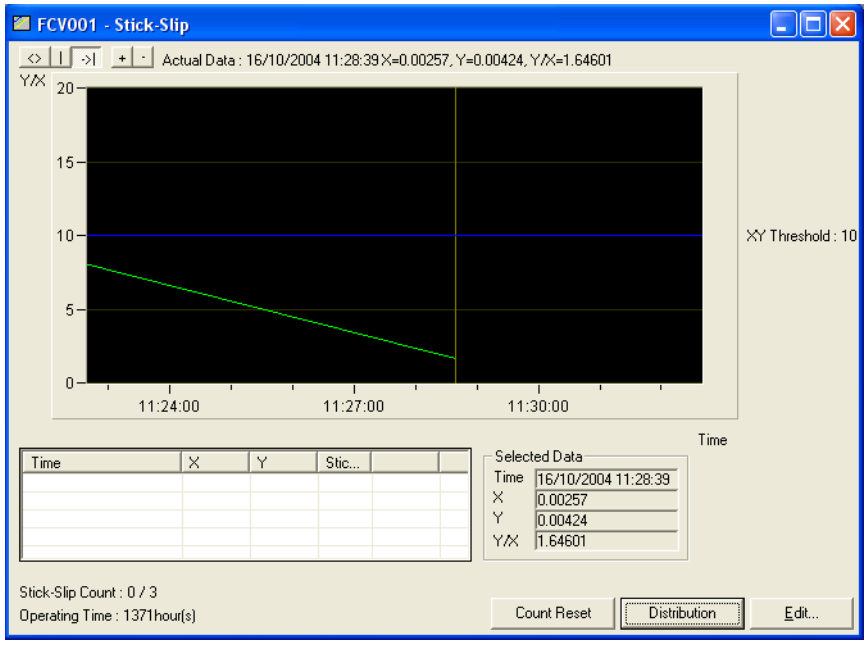


Figure 7-22 Stick-slip diagnosis graph display (Trend display)

Table 7-17 Stick-slip diagnosis graph (Trend display)

<> | ->| + -	Selects a desired graph operation mode. (Refer to "7-5-1: Common graph operations" on page 7-10.)
Actual Data	Time and Y/X data at final plot
Selected Data	Time on the hair line, and X, Y, and Y/X data
List	List of time, X, and Y data when the data exceeds the threshold value.
Stick-Slip Count	Numbers of cycles exceeding the threshold value and limit cycles
Y-axis of graph	Y/X
X-axis of graph	Time
Threshold value	Shows the set threshold value.
Operating Time	Shows the operating time of the positioner. (Unit: hr.)
[Count Reset] button	Resets the count.
[Distribution] button	Changes to the trend display.
[Edit] button	Opens the "Customize Dialogue" box of the window.

7-5-14: Editing the graph of the stick-slip diagnostic parameter

Figure 7-23 shows the various setup window about the stick-slip diagnostic parameter. In the setup window, you can set up a threshold value used to detect the diagnostic alarm and the number of limit cycles actually determined as alarm. Additionally, you can also set a graph display method.

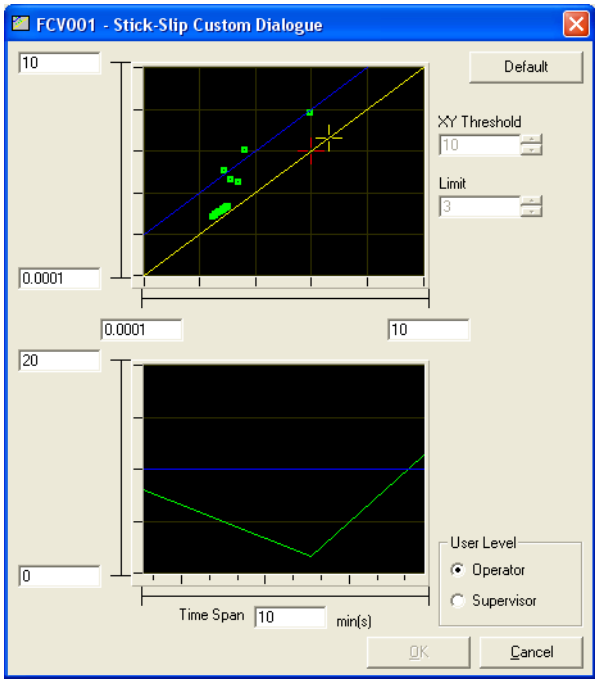


Figure 7-23 "Stick-Slip Custom Dialogue" window

To set the threshold value and the number of limit cycles, you must change the user level to "Supervisor". To change the threshold value, three kinds of methods are provided, <step 1> moving the threshold value on the graph with the mouse, <step 2> inputting a numeric value from the input field, and <step 3> increasing or decreasing the value with the up/down button. Additionally, you can set the Y-axis and X-axis of the graph display. The following Table shows the default set values and effective ranges.

Table 7-18 Default values and effective ranges of stick-slip diagnostic set values

Name	Default value	Range
Y-axis of histogram graph (high limit)	10	0.000001 < High limit ≤ 100 [%^2] (However, high limit > low limit)
Y-axis of histogram graph (low limit)	0.0001	0.000001 ≤ Low limit < 100 [%^2] (However, high limit > low limit)
X-axis of histogram graph (high limit)	10	0.000001 < High limit ≤ 100 [%^2] (However, high limit > low limit)
X-axis of histogram graph (low limit)	0.0001	0.000001 ≤ Low limit < 100 [%^2] (However, high limit > Low limit)
Y-axis of trend graph (high limit)	20	0 < High limit ≤ 100000000 (However, high limit > Low limit)
Y-axis of trend graph (low limit)	0	0 ≤ Low limit < 100000000 (However, high limit > low limit)
X-axis of trend graph	10 min.	1 to 144000 min.
Threshold value	10	1 to 100000000
Limit	3	0 to 100000 cycles

7-5-15: Displaying the graph of the trend

Figure 7-24 shows the graph display of the trend. On the graph, SP (set travel value), travel value, deviation, duty value (drive signal), and temperature are shown. The trend data is collected only when the "Trend" window is opened. As the "Trend" window is closed, it is stopped to collect the trend data. Additionally, you can display the trend of only one positioner. You cannot collect and display the trend data of multiple positioners at the same time.

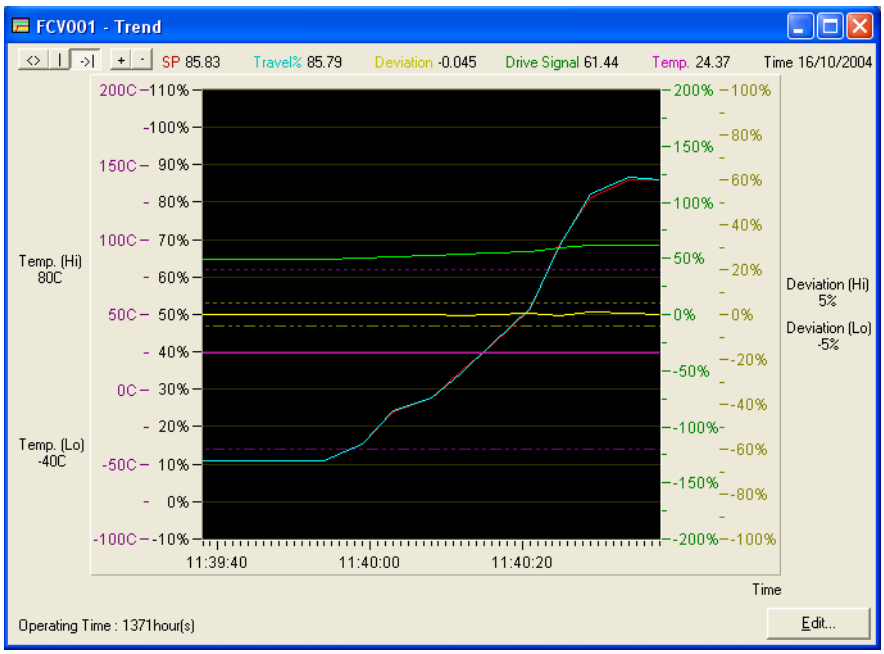


Figure 7-24 Trend graph display

Table 7-19 Trend graph

<> | ->| + -	Selects a desired graph operation mode. (Refer to "7-5-1: Common graph operations" on page 7-10.)
SP, Travel%, Deviation, Drive signal, Temp.	Shows the latest value in the current display mode and the value on the hair line in the hair line movement mode.
Time	Shows the time of the latest data in the current display mode and the time of the data on the hair line in the hair line movement mode.
Y-axis of graph	SP, travel value, deviation: (%), or distance (mm, m), temperature: (°C), Duty: (%)
X-axis of graph	Shows the time.
Threshold values (deviation and temperature)	Shows the set threshold values.
Operating Time	Shows the operating time of the positioner. (Unit: hr.)
[Edit] button	Opens the "Custom Dialogue" box of the window.

7-5-16: Editing the graph of the trend

Figure 7-25 shows the various setup window about the "Trend" display window. In this setup window, you can set threshold values used to detect the deviation alarm or temperature alarm and wait time until it is determined that the actual alarm occurs. Additionally, you can also set a graph display method.

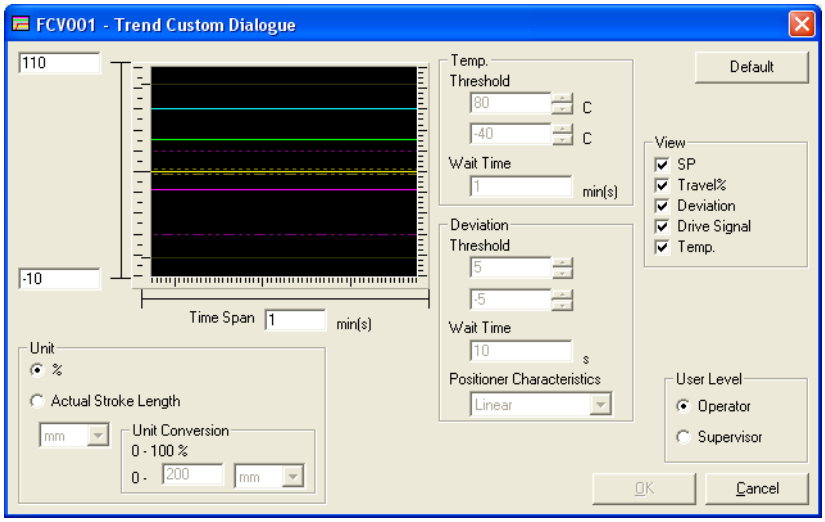


Figure 7-25 "Trend Custom Dialogue" window

To set threshold values and wait time levels, you must change the user level to "Supervisor". To change the threshold value, following three kinds of methods are provided, a) moving the threshold value on the graph with the mouse, b) inputting a numeric value from the input field, and c) increasing or decreasing the value with the up/down button. Additionally, you can set the Y-axis, X-axis, and display unit of the graph display. The units of the Y-axis of the graph and threshold value are displayed so that they are linked with the display unit. The following shows the default values and effective ranges of the set values.

Table 7-20 Default values and effective ranges of trend set values

Name	Default value	Range
Y-axis of graph (High limit)	110[%]	-100 < High limit ≤ 200 [%] (However, high limit > low limit)
Y-axis of graph (Low limit)	-10[%]	-100 ≤ Low limit < 200 [%] (However, high limit > low limit)
X-axis range of graph	1 min.	1 to 480 min.
Temperature threshold value (Hi)	80[°C]	-100 < Hi ≤ 200 [°C] (However, Hi > Lo)
Temperature threshold value (Lo)	-40[°C]	-100 ≤ Lo < 200 [°C] (However, Hi > Lo)
Temperature wait time	1 min.	1 to 10000 min.
Deviation threshold value (Hi)	5[%]	-100 < Hi ≤ 200 [°C] (However, Hi > Lo)
Deviation threshold value (Lo)	-5[%]	-100 ≤ Lo < 200 [°C] (However, Hi > Lo)
Deviation wait time	10[s]	0 to 19800[s]
Positioner characteristics	LIN	LIN, QO, EQ, USER
Display unit	%	%, actual stroke length
Actual stroke length	mm	mm, m
Unit conversion	200	1 to 5000[mm]
Display conversion unit	mm	mm, m

7-6: Positioner self-diagnostic function

7-6-1: Displaying the positioner self-diagnosis results

Select a positioner in the status tree and press the right mouse button. The pull-down menu will appear. From the menu, select [Positioner Status...]. The positioner self-diagnosis results will be shown in the dialog box. You can also select a positioner in the "Status summary" window and display the positioner self-diagnosis results by selecting relevant menu from the pull-down menu that appears when clicking the right mouse button.

For details about display contents, refer to Table 11-1, "Messages in monitoring mode", in "Chapter 11: Appendix". Additionally, if an error is found in the self-diagnosis results, relevant message is shown in the message list.

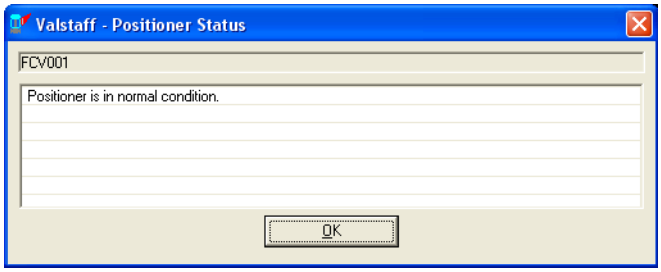


Figure 7-26 Self-diagnosis is determined as correct

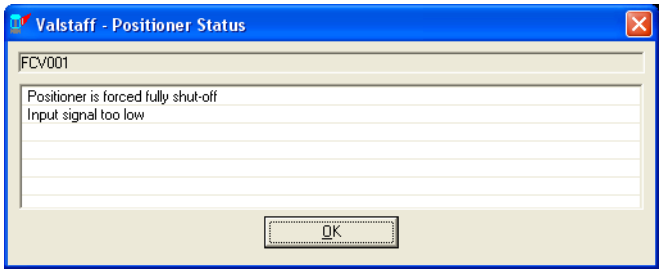


Figure 7-27 Self-diagnosis is determined as faulty

Figure 7-26 shows that all self-diagnosis results are determined as correct. Figure 7-27 shows that an error is found in the self-diagnosis results. If an error is found, all causes of this error are displayed. When clicking the [OK] button, the dialog box showing the self-diagnosis results will be closed.

7-6-2: Setting whether or not the message showing the positioner self-diagnosis results is needed

If an error occurs in the self-diagnosis of the positioner, you can set whether or not this message is shown in the message display by the cause of the error. If an error occurs, the message of which is set at "non-display", the message is not displayed in the message list. Additionally, the icon in the status tree is also kept correct and it does show the alarm. For details about how to set whether or not the message is displayed, see section “7-7-3: Setting whether or not a message is displayed” on page 7-34.

7-7: Message function

7-7-1: Message list window

Figure 7-28 shows the message list window. The message list window is located at the lower portion of the "Monitoring" window.

The messages, such as diagnostic alarm, positioner self-diagnosis results, and operation log are shown in the message list window.

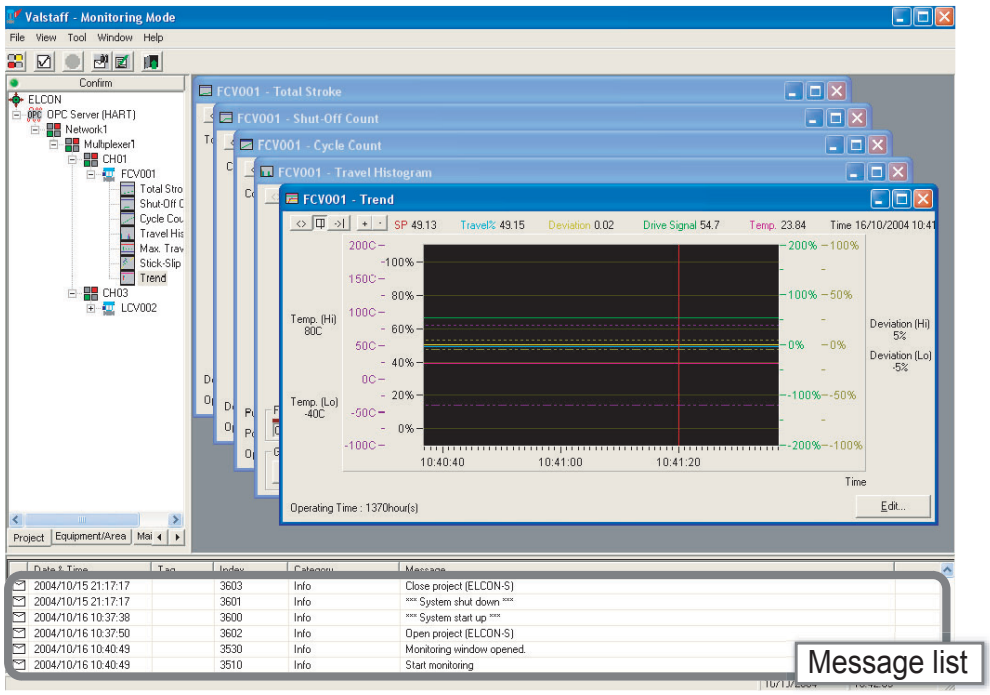


Figure 7-28 Message list window

7-7-2: Kinds of messages

For messages, [System error], [Positioner Self-diagnosis], [CV Diagnosis], [Test], [Auto Setup], [Configuration/Calibration], [Communication Error], [Comment], and [Info] categories are provided. Several kinds of messages are defined for each category.

The list of messages is shown in "Chapter 11: Appendix". Refer to this list when necessary.

7-7-3: Setting whether or not a message is displayed

When selecting [Property of list…] from the menu displayed by right-clicking in the field of the message list, the "Message Setting" dialog shown in Figure 7-29 will appear..

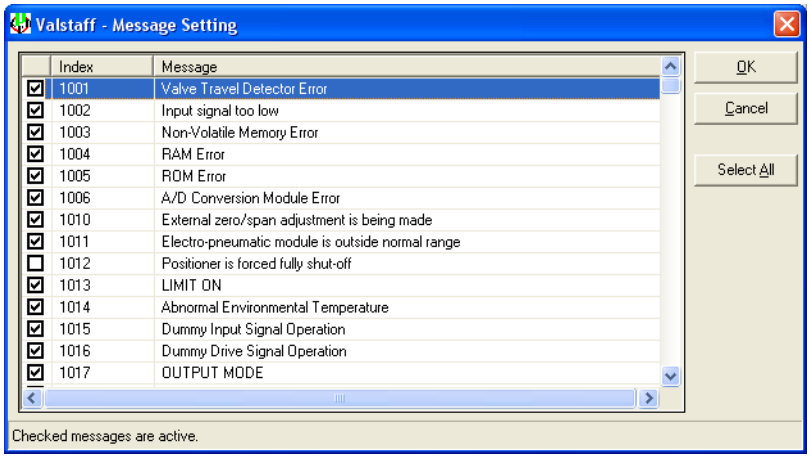


Figure 7-29 "Message Setting" dialog box

In the "Message Setting" dialog box, you must check on the check boxes of the messages you want to display. Only the messages you have checked on are shown in the message list, and those you have not checked on are not displayed.

Additionally, when selecting [Hide this message index…] from the right-clicked menu in the message list field, the "Hide this Message Index" dialog will appear.

When clicking [OK] in this dialog box, it is set that the relevant message is to be hidden.

.

Figure 7-30 "Hide this Message Index" dialog box

7-7-4: Displaying messages

In the message, the icon, Date & Time, Tag name, Index, Category, and Message are shown. Up to 1000 messages are displayed in the message list.

Right-click anywhere in the message list. The Popup menu will appear.

Or, you can display only the messages about the positioner you have selected.

Select a desired positioner from the status tree and select [Positioner Messages] from the right-mouse button menu. The "Positioner Messages" dialog box shown in Figure 7-31 will appear. Only the messages about the selected positioner are shown in this dialog box. When the selected positioner is returned to the normal status, these messages will be cleared. Additionally, you can check an alarm in this dialog box.

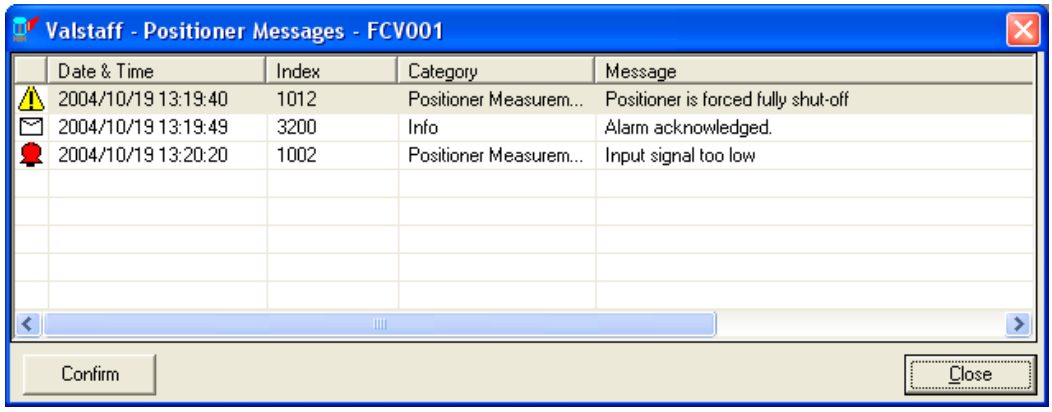


Figure 7-31 "Positioner Messages" dialog box

7-7-5: Finding a message

7-7-5-1: Finding through the dialog box

You can find a message based on the keyword from those displayed in the message list.

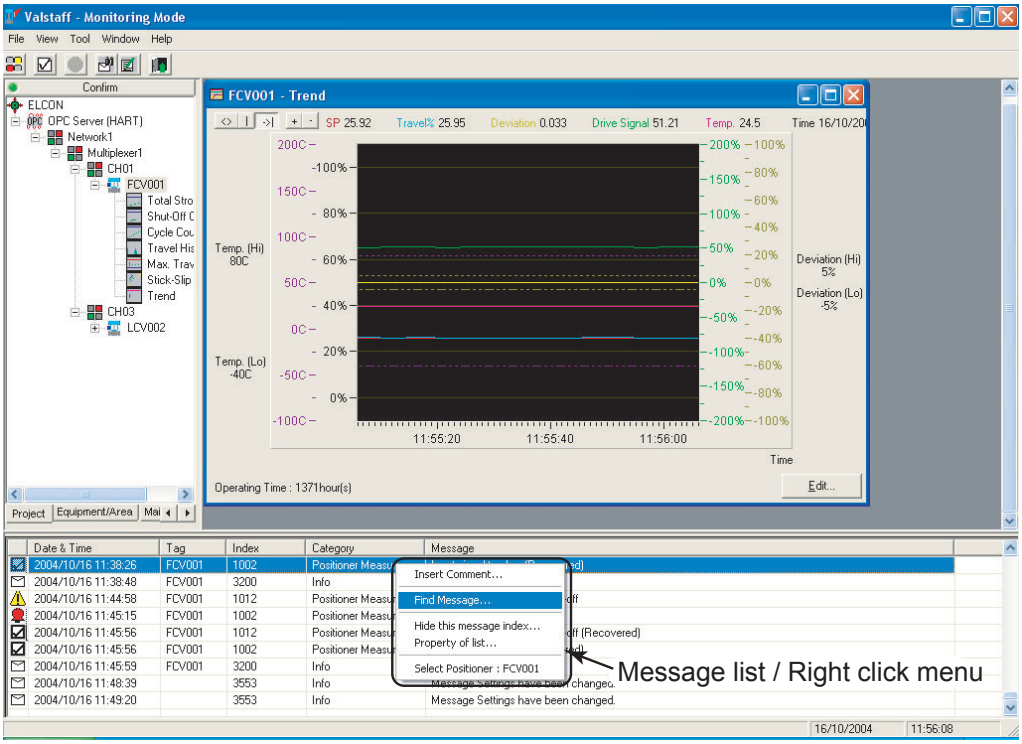


Figure 7-32 Finding message

When selecting [Find Message (F)...] from the right-mouse button menu in the message list, the "Find" dialog box shown in Figure 7-33 will appear. In this dialog box, you must set a character string you want to find and finding conditions to start finding messages.

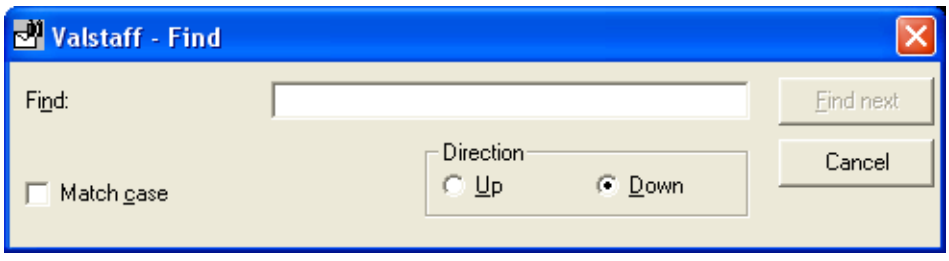


Figure 7-33 "Find" dialog box

7-7-5-2: Finding by sort

You can sort the messages shown in the message list by item. By selecting an appropriate sort item, you can display the messages with they classified.

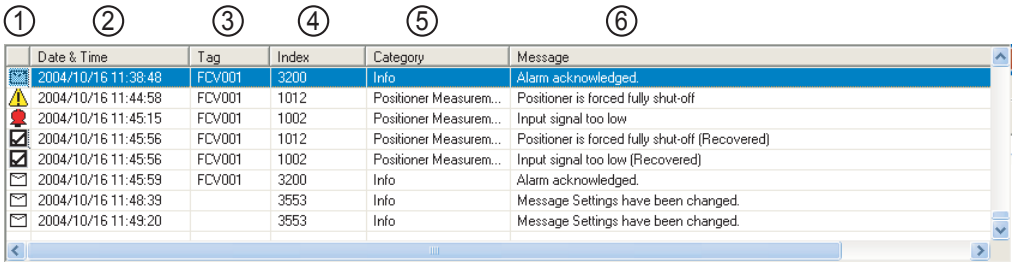


Figure 7-34 Sorting messages in message list

The following shows the items to be used for the sort. Clicking an index of the item in the message list you want to classify will start sorting. First, the messages are sorted in the ascending order. When clicking an index again, the messages are sorted in the descending order. If a new message occurs after the sort has been completed, it is added to the last.

1) Sorting by icon type
2) Sorting by date & time
3) Sorting by tag name
4) Sorting by message No.
5) Sorting by category
6) Sorting by message

7-7-6: Inserting a comment

Right-click anywhere in the message list and select [Insert Comment (C)...] from the right-mouse button menu. The "Insert Comment" dialog box will appear, allowing the user to input a desired comment in the message list.

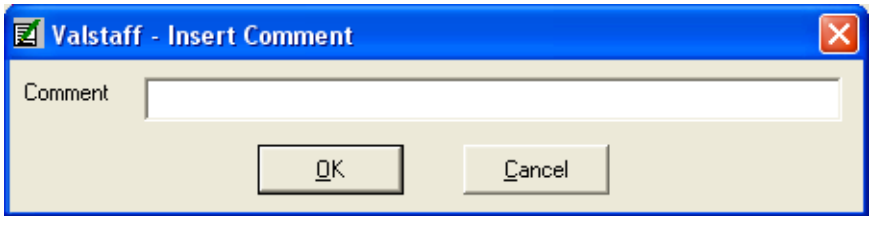


Figure 7-35 "Insert Comment" dialog box

7-8: Status summary function

7-8-1: Starting up the status summary

In the "Monitoring" window, select the [Tool (T)] menu? [Status summary]. The "Status summary" window will be started up.

7-8-2: "Status summary" window

Figure 7-36 shows the "Status summary" window. This "Status summary" window is a full-screen display without window frames. When clicking the ☒ (close) button at the upper right corner of the window or when pressing the [ESC] key, the "Status summary" window will be closed and the window will be returned to the "Monitoring" window.

In the summary view window, the status of the positioner is shown using the icon. When pressing a desired group button at the upper portion of the summary view window, you can change the display group. For details about how to register what positioner into what group, refer to “6-9: Running the Edit Status Summery” on page 6-17, Operation setup mode.

When the icon is blinking, selecting such icon will show the messages about the cause of the blink display in the message list window at the lower portion of the window.

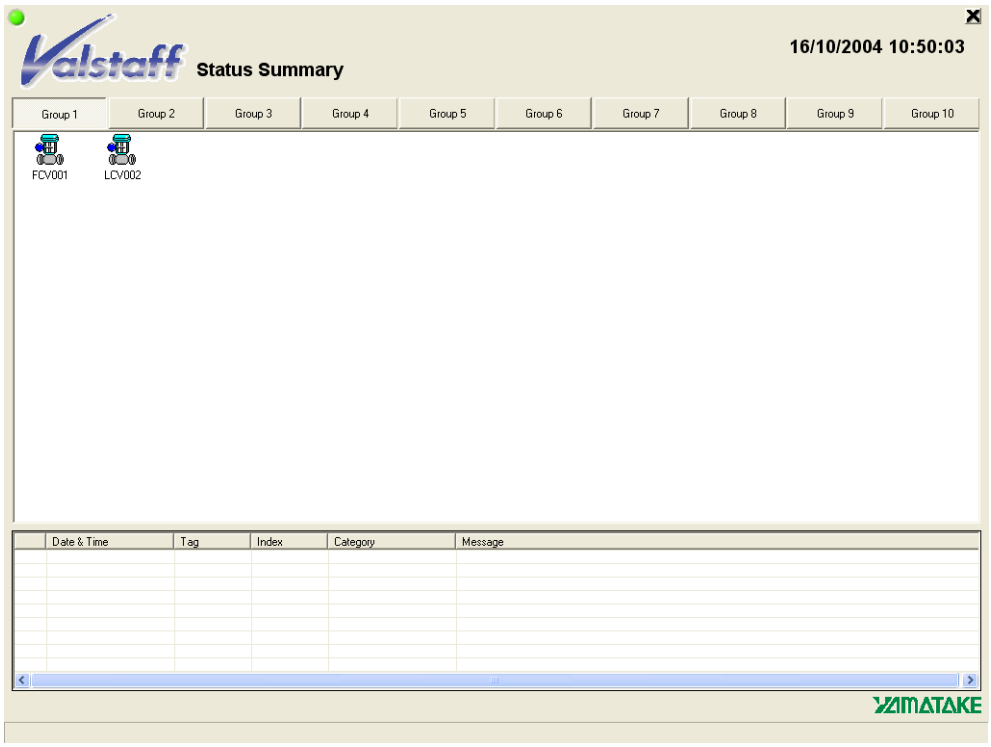
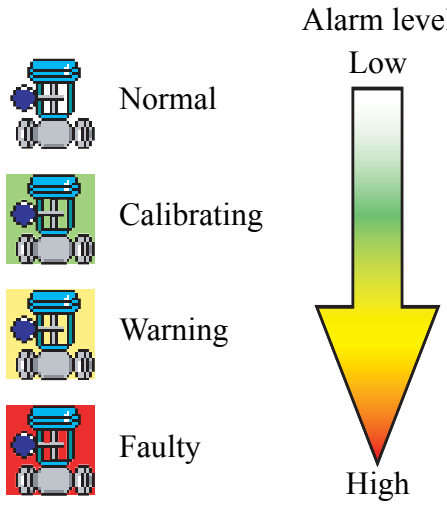


Figure 7-36 "Status summary" window

Four kinds of icon statues are shown in the summary view window as shown below.



The indication of the icon is changed as shown below according to the alarm occurrence and alarm check.

Icon is changed.
According to the status of the positioner, the indication of the icon is changed. If multiple alarms occur at the same time, the icon having the highest alarm level is shown.

Icon is blinking.
If an alarm having the warning alarm level or higher occurs, such icon starts blinking. At this time, when the user checks the alarm, the icon indication is changed from "blinking" to "lit". If an alarm occurs newly while the user is checking the alarm, the icon having the highest alarm level of all currently occurring alarms starts blinking regardless of the alarm level of newly occurred alarm.

Message is displayed.
When selecting the blinking icon, its alarm contents are displayed in the message list window. When double-clicking a message, the "summary Status" window is closed and the window is returned to the "Monitoring" window.

Automatic scroll
If the positioner, in which the alarm occurs, becomes beyond the display area of the "Status summary" window and it cannot be displayed unless the window is scrolled, the window is scrolled automatically. If there are multiple positioners, in which the alarm occurs, the window is scrolled so that the positioner, in which the latest alarm occurs, is displayed.

7-8-3: Checking the alarm

Select a positioner icon in the summary view window and right-click it. The Popup menu will appear. When selecting [Confirm] from the Popup menu, you can check the alarm occurring in the selected positioner. After that, the blinking indication is changed to the lit indication.

7-8-4: Displaying the positioner self-diagnosis results

Select a positioner icon in the summary view window and right-click it. The Popup menu will appear. When selecting [Positioner Status] from the Popup menu, the positioner self-diagnosis results are shown in the dialog box. For details about display contents, refer to the instruction manual for positioner.

7-9: Device specification information view function

7-9-1: Displaying the control valve specification

Select a positioner in the status tree and select [Valve Spec...] from the right-mouse button menu. The "View Valve Spec." dialog box will appear.

In the "View Valve Spec." dialog box, the data you have input in the "Valve Spec. Information Management" window is shown. The data you have input in "Valve Spec. Information Management" window is made linked with the positioner in the "Valve Spec. Data Link" window. For details about how to link the control valve specifications with the positioner, refer to “6-3-5: Valve Spec. Information” on page 6-3, Operation setup mode. Figure 7-37 shows the "View Valve Spec." dialog box.

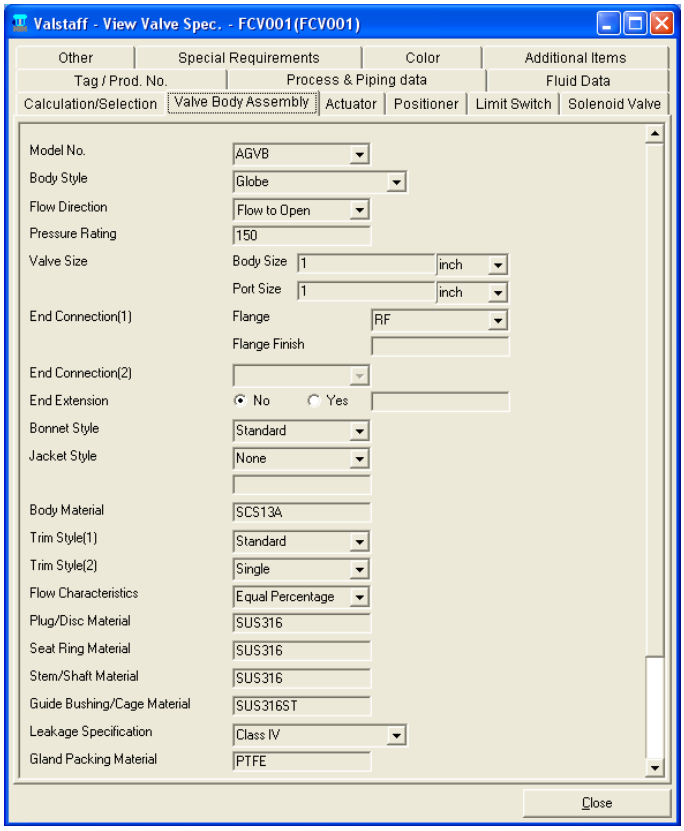


Figure 7-37 "View Valve Spec." dialog box

7-9-2: Displaying the positioner configuration data

Select a positioner in the status tree and select [Positioner Configuration] from the right-mouse button menu. The "View Positioner Configuration Data" dialog box will appear. In the "View Positioner Configuration Data" dialog box, you can check the data you have saved in the configuration/calibration window. In the configuration/calibration window, you can save the data after arranging the data by date & time. In the "View Positioner Configuration Data" dialog box, you can display desired contents, which have been saved into the file, by selecting "date & time". For details about display contents, refer to “9-5-2: Running the parameter management” on page 9-18, Positioner configuration/calibration mode.

The valve positioner configuration data to be displayed is only the data, which has been saved into the file, and is not the data actually read from the positioner you have selected.

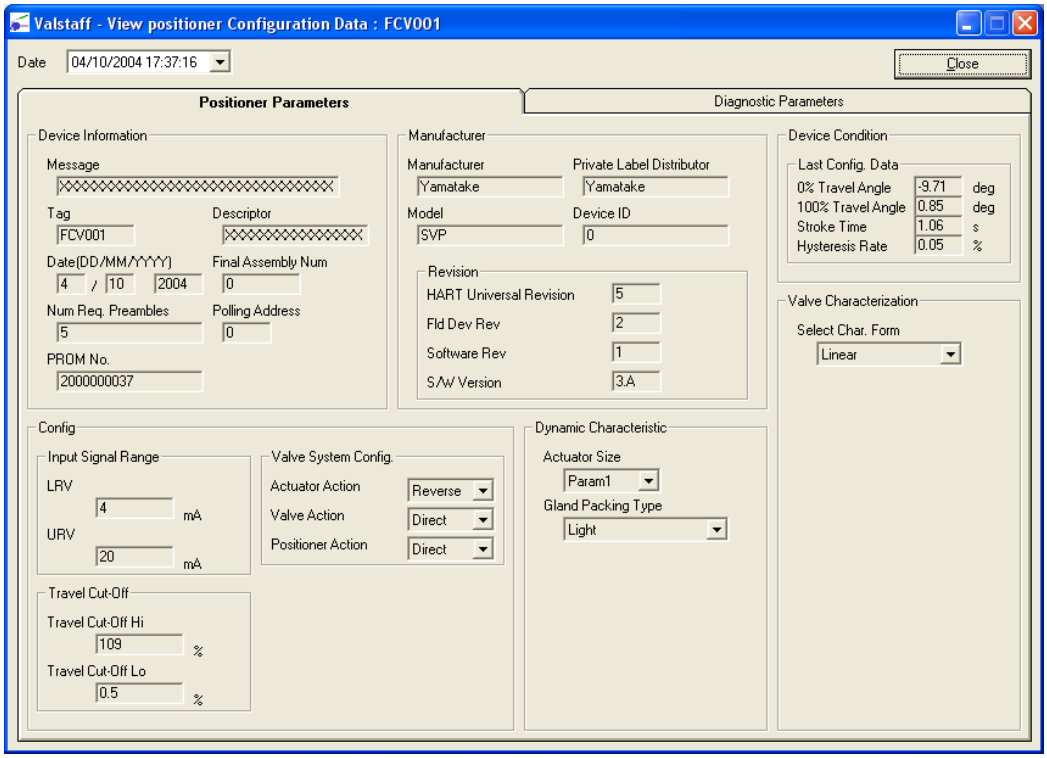


Figure 7-38 "View Positioner Configuration Data" dialog box

7-10: Exiting the monitoring mode

When selecting [Exit] from the [File] menu or when clicking the ☒ (close) button at the upper right corner of the window, the monitoring mode will be exited.

Chapter 8: Test Mode

8-1: What is a test mode?

In this test mode, the step input signal is applied to the positioner to record the response of the control valve if the plant is stopped. As the response results are summarized to data, you can standardize the test. Two kinds of tests are provided as shown below.

• Solo test, in which one control valve is tested once.

• Programmed test, in which multiple (or one) control valves are tested continuously.

As a result of the test, the test results are displayed graphically to judge whether or not the control valve is operated correctly and to quantify the performance of the control valve using the dynamic characteristic data.

⚠ CAUTION

In the test mode, the control valve is opened or closed regardless of the signal from the controller.This operation may hinder the plant operation or give hazard to operators around the control valve. Therefore, take appropriate measures so that the safety of the plant operation or operators can be kept even though the valve is operated in the test mode.

8-2: Starting up the test mode

8-2-1: Starting up the test mode

Click the test mode button in the "Valstaff Menu" window.

8-2-2: "Test Mode" window

When logged in the test mode, the "Test Mode" window will appear.

By selecting the [Solo Test] tab or [Programmed Test] tab at the upper left portion of the window, relevant window is shown.

8-2-2-1: "Solo Test" window

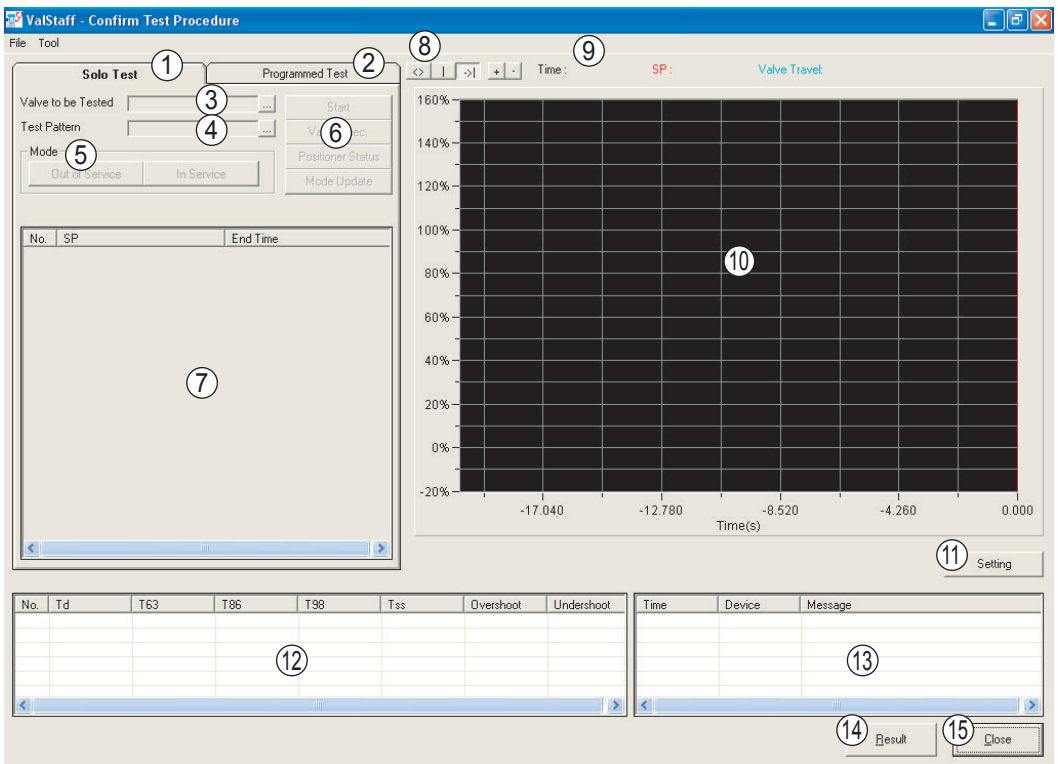


Figure 8-1 "Test Mode" window (Solo Test)

① **[Solo Test] tab**

To start the solo test, clicking this tab will display the "Solo Test" window.

② **[Programmed Test] tab**

To start the programmed test, clicking this tab will display the "Programmed Test" window.

③ **"Valve to be tested" field and control valve select button**

In the "Valve to be tested" field, the tag of the control valve to be tested is shown.

Clicking the control valve select button will display the "Control Valve Select" dialog box. After that, select a control valve to be tested from the control valves registered in the project.

④ **"Test Pattern" field and test pattern select button**

In the "Test Pattern" field, the test pattern you have selected is shown.

Clicking the test pattern select button will display the "Test Pattern Select" dialog box. After that, you can edit the test pattern that applies to the selected control valve.

⑤ **Mode change buttons**

With these buttons, you can change the positioner mode (Out of Service or In Service). "In Service" means a mode, in which the operation follows the control output signal from the controller. In this mode, the positioner does not respond to the test command from the Valstaff application.

"Out of Service" means a mode for the test or configuration/calibration, in which the operation follows the control signal from the controller and the positioner also responds to the command from the Valstaff application.

When running the test mode, the positioner must be put in the "Out of Service" status.

⑥ **Solo Test operation buttons**

- **[Start] button**
  When clicking this button after the control valve to be tested has been selected and the test pattern has been edited completely, the test is started. This button is changed to the [Stop] button during testing. Clicking the [Stop] button will stop the test.
- **[Valve Spec.] button**
  When clicking this button, the control valve specification data linked with the selected control valve is shown. To display the control valve specifications, it is absolutely necessary that the control valve specifications are registered and they are made linked with the positioner in the operation setup mode.
- **[Positioner Status] button**
  When clicking this button, the communication with the selected positioner is performed to display the self-diagnosis results.
- **[Mode Update] button**
  When clicking this button, the mode of the selected control valve is read.

⑦ **Test status display window**

The test pattern to be applied is shown in this window.

⑧ Graph mode change buttons

These buttons are operation buttons for the test response waveform graph.

Table 8-1 Graph operation buttons

Icon	Mode name	Description
<>	Scroll mode	Scrolls the time axis.
|	Hair line movement mode	Moves the hair line with the mouse.
->|	Current display mode	Scrolls the graph automatically every time the data is plotted on the graph. In this mode, the hair line is not shown.
+	Enlarge mode	Enlarges a desired portion, which is selected with the mouse.
-	Return to original status	Returns the set display area to the initial status.

⑨ Test data display fields

The graph data (elapsed time, SP value, valve travel) values at the hair line position, and the log file name are shown.

⑩ Test result display window

The response waveform of the valve travel to the step input signal is displayed in this window.

⑪ [Setting] button

Clicking this button will display the graph setting window.

⑫ Dynamic characteristic data display window

In this window, the response results to the step input signal are displayed using the data becoming the indexes of the dynamic characteristics, such as delay time, time constant, and overshoot.

⑬ Message window

In this window, the transition of the testing control valve status is displayed using messages.

⑭ [Result] button

Clicking this button will start up the "Test Result" window.

The same window as that called up by selecting [Test Result] from [Tool] menu is shown.

⑮ [Close] button

Clicking this button will close the "Solo Test" window and exit the test mode.

8-2-2-2: "Programmed Test" window

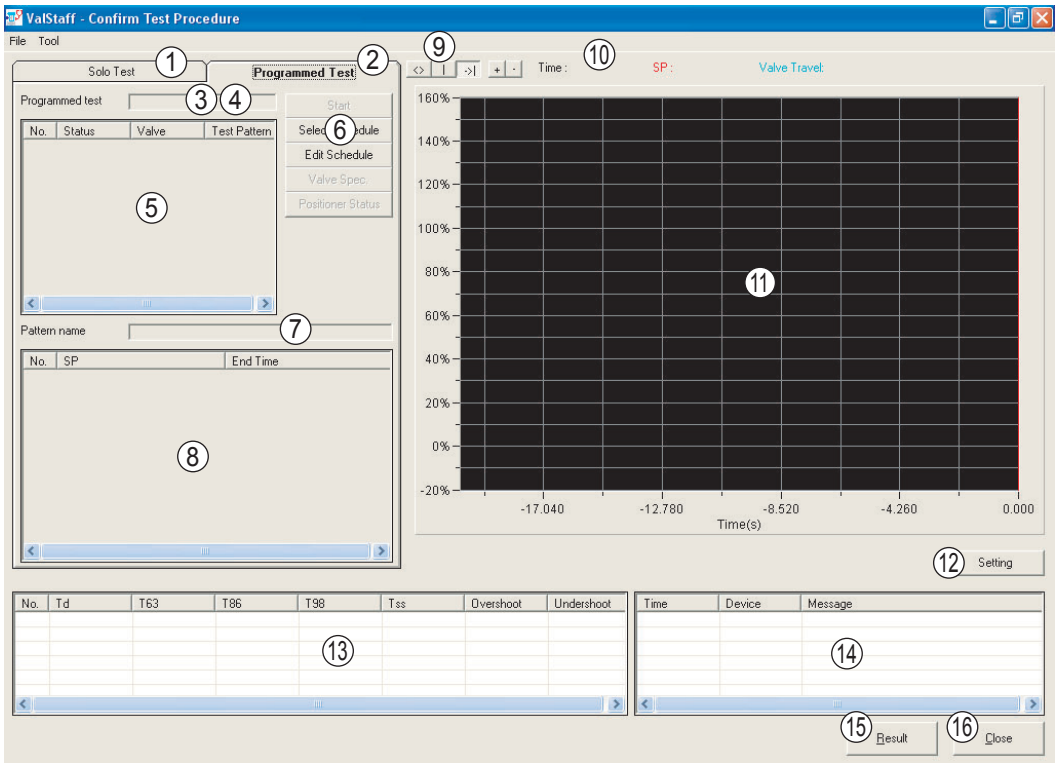


Figure 8-2 "Test Mode" window (Programmed Test)

① **[Solo Test] tab**

To start the solo test, clicking this tab will display the "Solo Test" window.

② **[Programmed Test] tab**

To start the programmed test, clicking this tab will display the "Programmed Test" window.

③ **"Valve to be tested" field**

In this field, the tag name of the connected control valve is shown.

④ **"Programmed test" field**

In this field, the selected test list name is shown.

⑤ **Programmed test list window**

In this window, the tag names of control valves and test pattern names registered in the programmed test are shown.

After each test has been completed, the results of each test ("succeeded" or "failed") are shown.

⑥ **Programmed test operation buttons**

- **[Start] button:** When clicking this button after the programmed test list has been selected completely, the programmed test is started. This button is changed to the [Stop] button during testing. Clicking the [Stop] button will stop the test.
- **[Select Schedule] button:** When clicking this button, the "Select Valve Test Pattern" window will be started up.
- **[Edit Schedule] button:** When clicking this button, the "Edit Valve Test Pattern" window is started up.
- **[Valve Spec.] button:** When clicking this button, the control valve specification data linked with the selected control valve is shown. To display the control valve specifications, it is absolutely necessary that the control valve specifications are registered and they are made linked with the positioner in the operation setup mode.
- **[Positioner Status] button:** When clicking this button, the communication with the selected positioner is performed to display the self-diagnosis results.

⑦ **"Pattern name" field**

In this field, the name of the currently running test pattern is shown.

⑧ **Test status display window**

In this window, the status of the currently running test (test pattern) is shown.

⑨ **Graph mode change buttons**

These buttons are operation buttons for the response waveform graph of the test. For details, refer to Table 8-1.

⑩ **Test data display fields**

The graph data (elapsed time, SP value, valve travel) values at the hair line position, and the log file name are shown.

⑪ **Test result display window**

The response waveform of the valve travel to the step input signal is displayed in this window.

⑫ **[Setting] button**

Clicking this button will display the graph setting window.

⑬ **Dynamic characteristic data display window**

In this window, the response results to the step input signal are displayed using the data becoming the indexes of the dynamic characteristics, such as delay time, time constant, and overshoot.

⑭ **Message window**

In this window, the transition of the testing control valve status is displayed using messages.

⑮ **[Result] button**

Clicking this button will start up the "Test Result" window.

The same window as that called up by selecting [Test Result] from [Tool] menu is shown.

⑯ **[Close] button**

Clicking this button will close the "Programmed Test" window and exit the test mode.

8-3: Overview of test mode functions

In the test mode, the step input signal is applied to the control valve to display the response to this input signal on the Valstaff application. The test results are saved automatically. When necessary, you can call up desired test results into the window at any time and compare the latest inspection results with the past inspection results.

About step input

The step input is specified with a combination of the set point (SP) and end time. (Refer to Figure 8-3, Example of step input.) You can define a step width by specifying a dummy input signal (%) to be applied to the control valve as set point (SP). Additionally, you can specify a period of end time, that is, how many seconds the dummy input signal (%) is kept and whether or not the response data is saved.

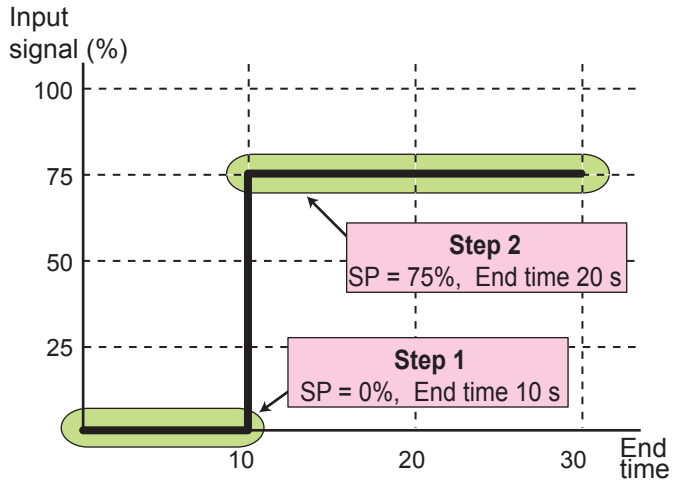


Figure 8-3 Example of step input

Note

In the step response test to be performed with the Valstaff application combined with the positioner, the dummy input signal (for details, refer to "9-5-2-6-1: Operating the maintenance mode with the dummy input signal" on page 9-35.) is applied to the inside of the positioner to obtain the response to this input signal.

Therefore, this step response test is different from the general test, in which the response to the external input signal is checked. Furthermore, it cannot be determined whether or not an appropriate valve travel to the externally input signal is obtained. The test to be performed with the Valstaff is used as a method to evaluate the performance of individual control valve.

About response results

You can evaluate the response results to the step input by means of two methods. One is an evaluation using the index data showing the dynamic characteristics and the other is a visual evaluation to compare changes in step response locus.

The following shows the dynamic characteristic index data obtained by the Valstaff application and its contents. (Refer also to Figure 8-4, Dynamic characteristic index data.)

- Td : Waste time. A period of time to reach the 10%-level of the step width after the step input has been applied.
- T63 : A period of time to reach the 63.2%-level of the step width after the step input has been applied.
- T86 : A period of time to reach the 86.5%-level of the step width after the step input has been applied.
- T98 : A period of time to reach the 98.2%-level of the step width after the step input has been applied.
- Tss : Setting time. A period of time necessary to set to ±1% or less of the step width after the step input has been applied.
- Overshoot : An overshoot amount. Overshoot amount (%F.S.) assuming that the step width is determined to the full-span.
- Undershoot : An undershoot amount. Undershoot amount (%F.S.) assuming that the step width is determined to the full-span.

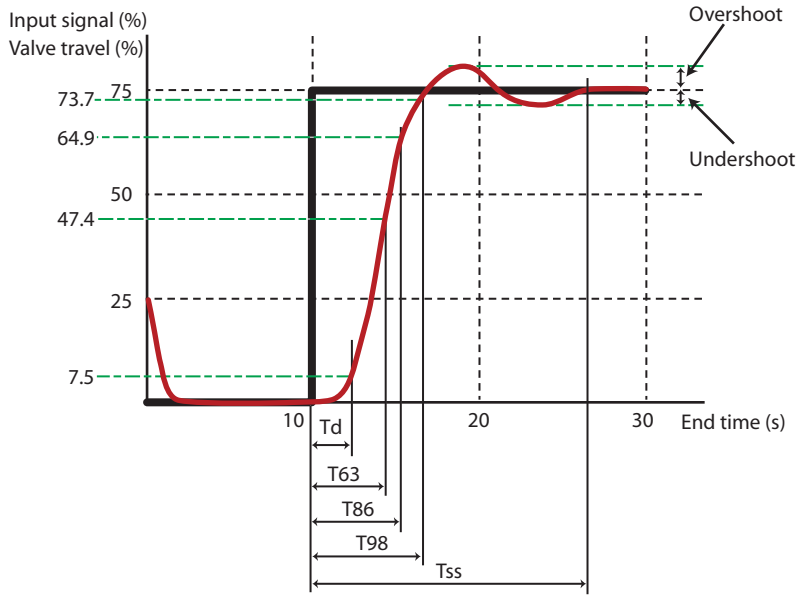


Figure 8-4 Dynamic characteristic index data

The trend of the locus of the step response is displayed in the test result display window as shown in Figure 8-1 or Figure 8-2. In the window, the results of only the latest test are displayed. To overlap the locus of the past test with the same test pattern applied, start up the test result window.

About test pattern

The test pattern is a pattern of the step input signal shown in “About step input” on page 8-7 or Figure 8-3. You can register multiple step input signal patterns and control them within one test pattern.

You must design a test pattern and save it into the Valstaff application before starting the test by considering the stroke time to be determined by the size of the control valve or actuator and the dynamic characteristic index you want to control.

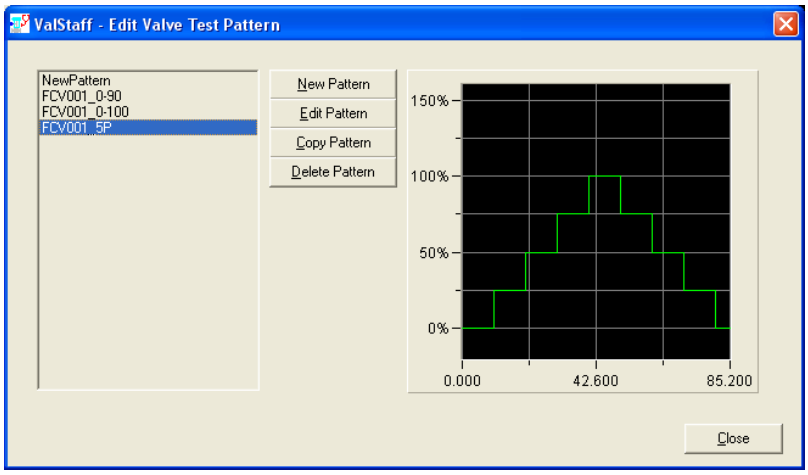


Figure 8-5 Example of "Edit Valve Test Pattern" window

8-3-1: Solo test

This solo test is a function that executes the test every time one test pattern is applied to one control valve.

8-3-2: Programmed test

This programmed test is a function that executes the test by applying one or multiple test patterns to multiple control valves continuously.

In the programmed test, you must make test patterns and programmed test list before starting the actual test.

In the programmed test list, you must register control valves to be tested and test patterns to be applied to the control valves before starting the actual test. When starting the test after the programmed test list has been made, the test is run continuously along the list.

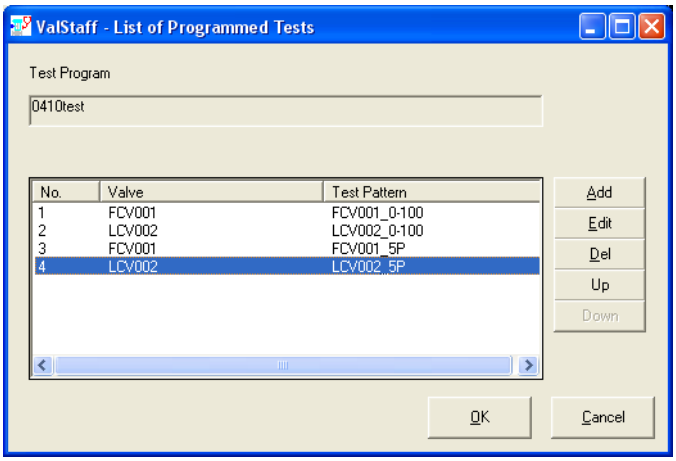


Figure 8-6 Example of "List of Programmed Tests" edit window

8-3-3: Displaying the test results

8-3-3-1: Displaying the test results using the dynamic characteristic index data

The dynamic characteristic index data is shown at the lower left portion of the "Solo Test" window or "Programmed Test" window.

8-3-3-2: Displaying the graph

The graph of the test results is displayed at the upper right portion of the "Solo Test" or "Programmed Test" window.

8-3-3-3: Displaying multiple test results at the same time

When clicking the [Result] button in the "Solo Test" window or "Programmed Test" window, multiple test results can be displayed at the same time.

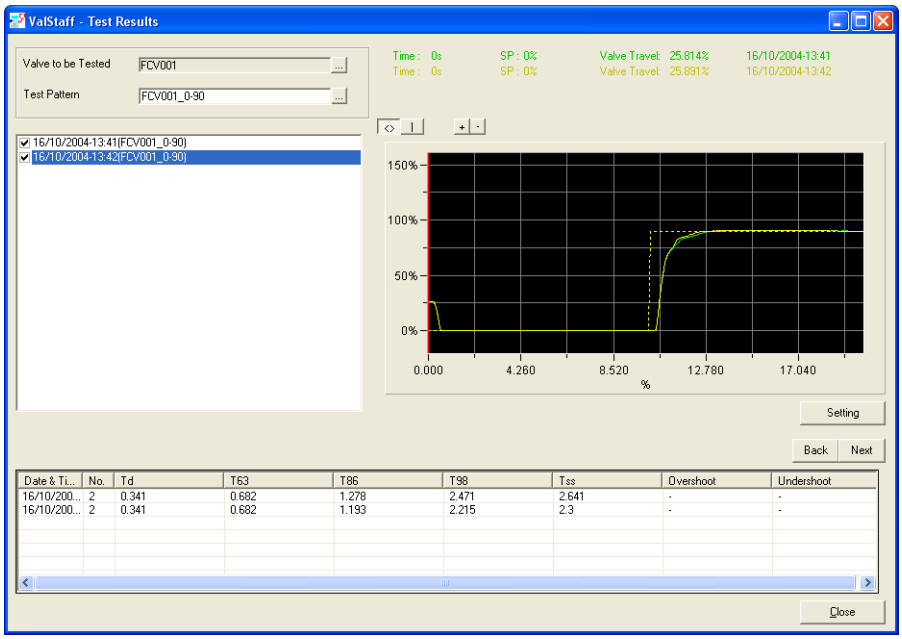
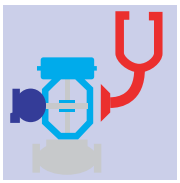


Figure 8-7 Example of multiple test results simultaneous display

8-4: Running the solo test

8-4-1: Starting up the solo test

Step	Description
1	 Click the test mode start button in the "Valstaff Start" window.
2	When clicking the [Solo Test] tab, the "Solo Test" window will appear.

8-4-2: Creating and editing a test pattern

Step	Description
1	From the menu at the upper portion of the window, select [Edit Valve Test Pattern] from [Tool] menu to display the "Edit Valve Test Pattern" window (1).

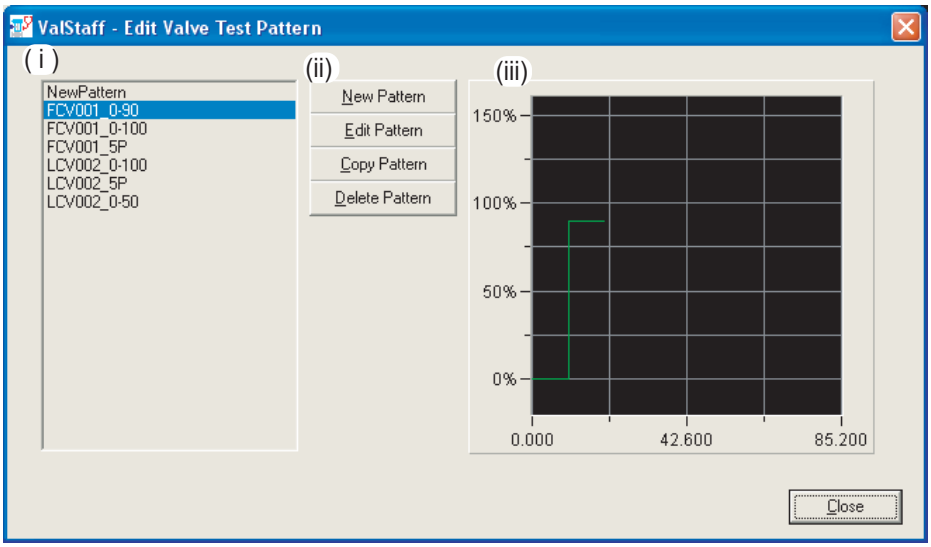


Figure 8-8 "Edit Valve Test Pattern" window (1)

(i) Test pattern list window
In this window, the names of registered test patterns are listed up.

(ii) Edit buttons

- **[New Pattern] button**
  To newly create a test pattern, click the [New Pattern] button.
- **[Edit Pattern] button**
  To edit an existing test pattern, click the [Edit Pattern] button.
- **[Copy Pattern] button**
  To make a copy of an existing test pattern, click the [Copy Pattern] button.
- **[Delete Pattern] button**
  To delete an existing test pattern, click the [Delete Pattern] button.

(iii) Test pattern pre-view window
Click a test pattern listed up in the test pattern list window to select it.
The preview of the test pattern you have selected will appear.

2	To newly create a test pattern, click the [New Pattern] button. To make a copy of an existing test pattern, click the [Copy Pattern] button. The "Test Pattern Name" input dialog box will appear. (Refer to Figure 8-9.)

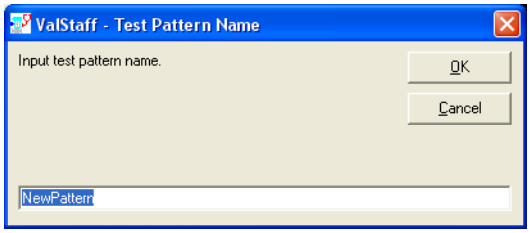


Figure 8-9 "Test Pattern Name" input dialog box

Step	Description
3	Input a test pattern name in the input field of the "Test Pattern Name" input dialog box and click the [OK] button.
4	In the test pattern list window of the "Edit Valve Test Pattern" window (1), click a test pattern name you want to create or edit, and then click the [Edit] button.
5	The "Valve Test Pattern Edit" window (2) will appear.

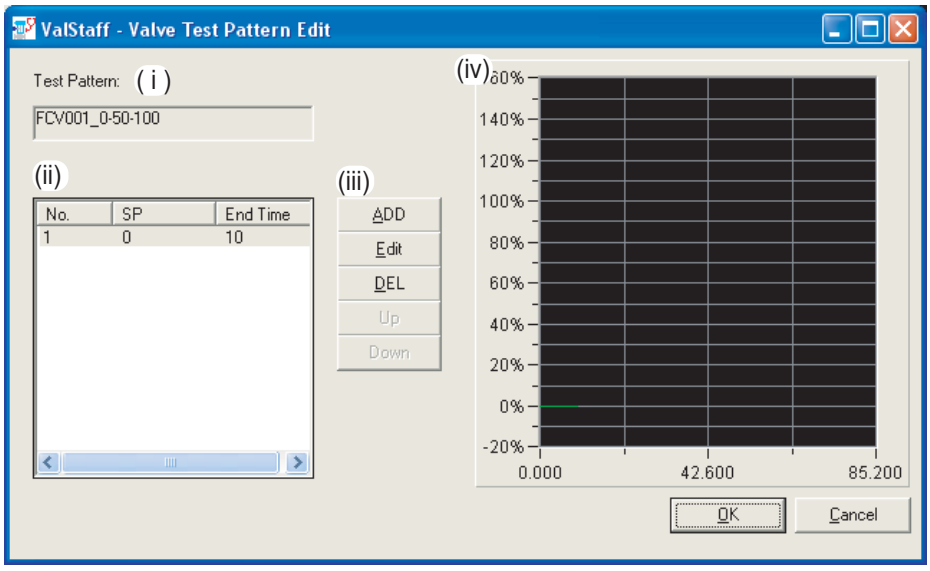


Figure 8-10 "Valve Test Pattern Edit" window (2)

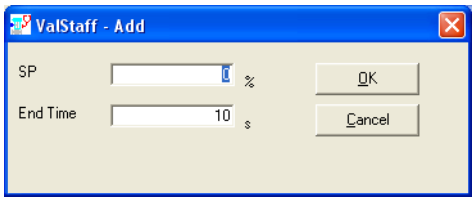
(i) "Test Pattern" field

In this field, the test pattern name you have selected in the "Edit Valve Test Pattern" window (1) is shown.

(ii) Test pattern window

In this window, the step No. of the selected test pattern, and SP and end time of each step are listed up. The list of the step shown in this window becomes relevant test pattern.

(Continued)

Step	Description
(5)	**(iii) Test pattern operation buttons** • **[ADD] button** One new step is added onto the step selected in the test pattern list window. When clicking the [ADD] button, the pattern input dialog box (refer to Figure 8-11) will appear. In this dialog box, SP and end time are registered.  *Figure 8-11 Pattern input dialog box* After you have input the SP and end time, click the [OK] button to add a new step into the test pattern list window. • **[Edit] button** The step selected in the test pattern list window is edited. When clicking the [Edit] button, the pattern input dialog box shown in Figure 8-11 will appear. In this dialog box, the current SP and end time are shown. After you have edited the SP and end time, click the [OK] button. The step you have edited is then shown in the test pattern list window. • **[DEL] button** The step selected in the test pattern list window is deleted. • **[Up] button** The step selected in the test pattern list window is moved up one step. • **[Down] button** The step selected in the test pattern list window is moved down one step. **(iv) Test pattern preview window** The preview of the test pattern currently being edited is shown.
6	Follow the <steps 1> to <step 5> to create a test pattern and click the [OK] button in the "Valve Test Pattern Edit" window (2).
7	Clicking the [Close] button in the "Edit Valve Test Pattern" window (1) will exit creating or editing the test pattern.

8-4-3: Selecting a control valve to be tested

8-4-3-1: Selecting a control valve in the select window

Step	Description
1	Click the device select button on the right of the "Valve to be tested" field to display the "Device Select" window.
2	In the "Device Select" window, click a desired control valve to select it and click the [OK] button.

8-4-4: Running the Solo Test

Step	Description
1	Click the test pattern select box on the right of the "Test Pattern" field to display the "Select Valve Test Pattern" window. In the test pattern list window, click a test pattern you want to apply to select it and click the [OK] button.

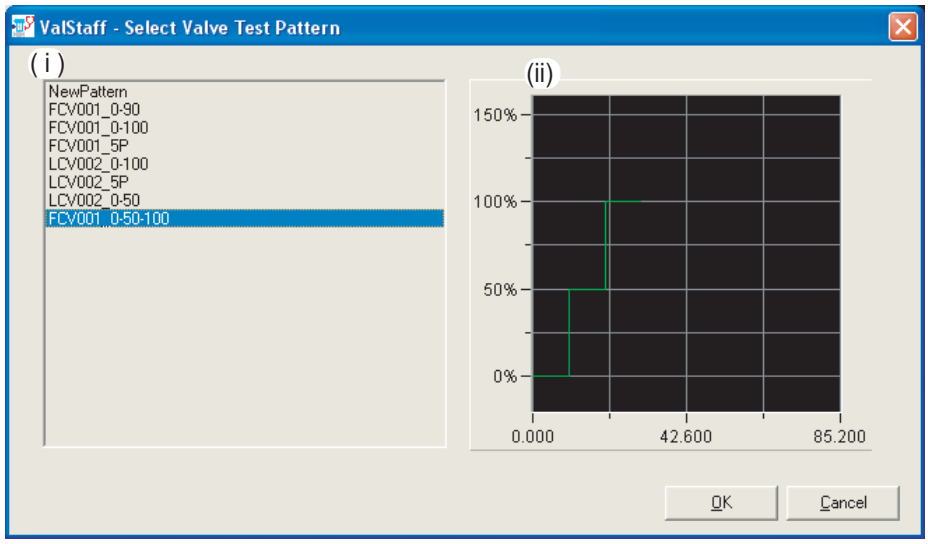


Figure 8-12 "Select Valve Test Pattern" window

(i) Test pattern list window

(ii) Test pattern preview window

Step	Description
2	The test pattern you have selected in <step 1> is shown in the "Test Pattern" field of the "Solo Test" window. After checking that the test pattern is correct, click the [Start] button. **⚠ CAUTION** In the solo test, the control valve is opened or closed regardless of the signal from the controller.This operation may hinder the plant operation or give hazard to operators around the control valve. Therefore, take appropriate measures so that the safety of the plant operation or operators can be kept even though the solo test is performed.
3	The safety confirmation message will appear. When selecting [Yes] for all messages, the solo test is then started.
4	The behavior of the control valve corresponding to the applied step is displayed dynamically in the test result display window during test. Make sure that the test is conducted correctly.
5	After the test has been completed, the test mode of the positioner is reset, and then the positioner is returned to the normal operation status.

8-4-5: Saving the solo test results

After the test has been completed, the dynamic characteristic index data and response waveform data are automatically saved in the CSV file format. The test result data is saved into the file with a name of "Tag name_ test start date & time.csv" in the specified folder.

8-4-6: Displaying the test results

8-4-6-1: Displaying the dynamic characteristic data

The dynamic characteristic index data obtained from the test is shown in the dynamic characteristic data display window.

No.	Td	T63	T86	T98	Tss	Overshoot	Undershoot
2	0.426	0.596	0.682	1.108	4.004	4.448	-
3	0.341	0.682	1.022	1.534	4.345	2.432	-

Figure 8-13 Dynamic characteristic index data in dynamic characteristic data display window

8-4-6-2: Displaying the graph

The response waveform is shown in the test result display window.

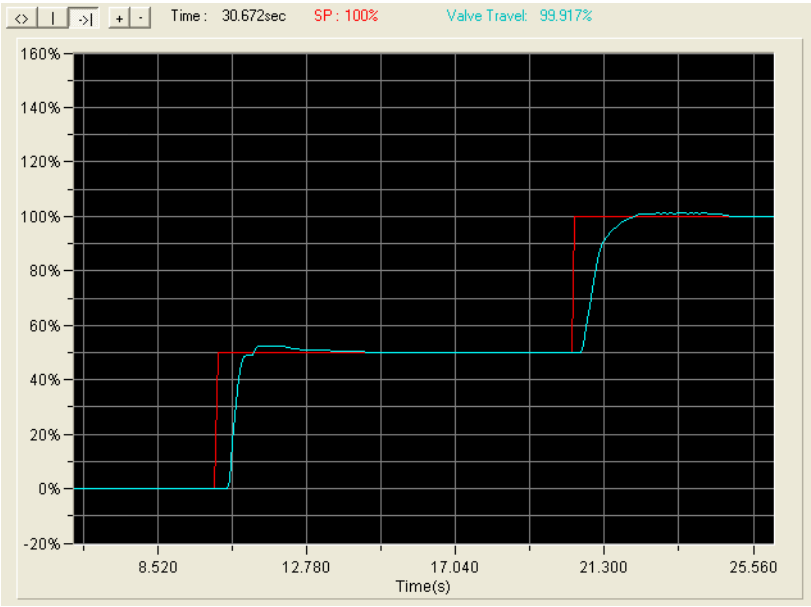


Figure 8-14 Response waveform in test result display window

When necessary, change the graph display with the graph display operation buttons while referring to Table 8-1. You can change the display method of the graph display in the "Valve Test Setting" window.

Click the [Setting] button to display the "Valve Test Setting" window.

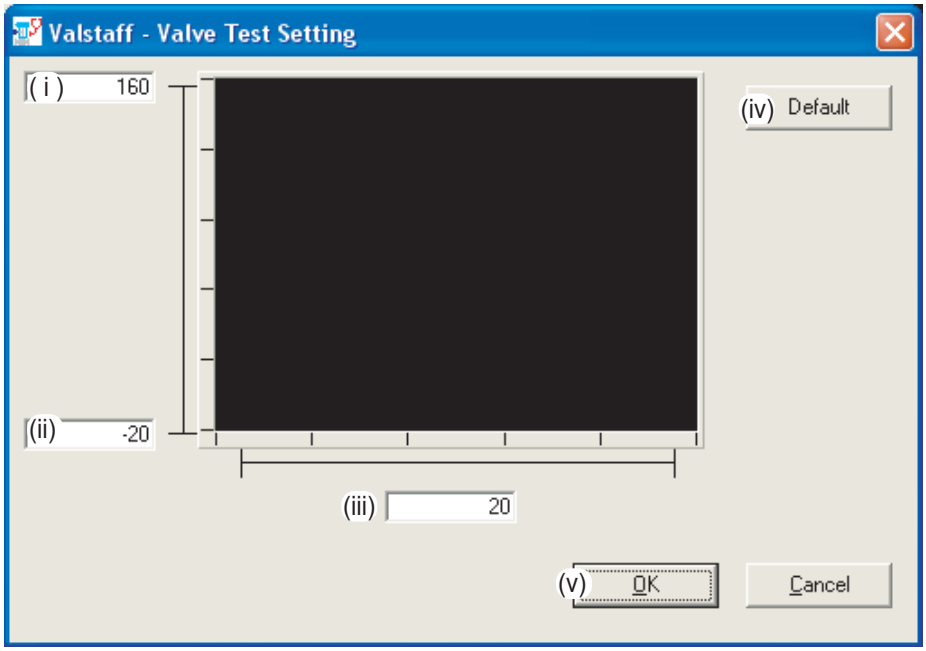


Figure 8-15 "Valve Test Setting" window

(i) Maximum value (%) of valve travel and SP Initial value: 160%

(ii) Minimum value (%) of valve travel and SP Initial value: - 20%

(iii) Maximum value of end time (sec.) Initial value: 20 sec.

(iv) [Default] button

Clicking this [Default] button will return all values to their default values (initial values).

(v) [OK] button in "Valve Test Setting" window

Clicking this [OK] button will influence the changed contents on the graph display in the "Solo Test" window. Clicking the [Cancel] button will return the values to their original values.

8-4-6-3: Displaying multiple test results at the same time

This function reads the test results, which have been saved in the past, to display their graphs. Up to four test results can be displayed graphically at the same time.

Step	Description
1	Click the [Result] button in the "Solo Test" window.
2	The "Test Results" window will appear.

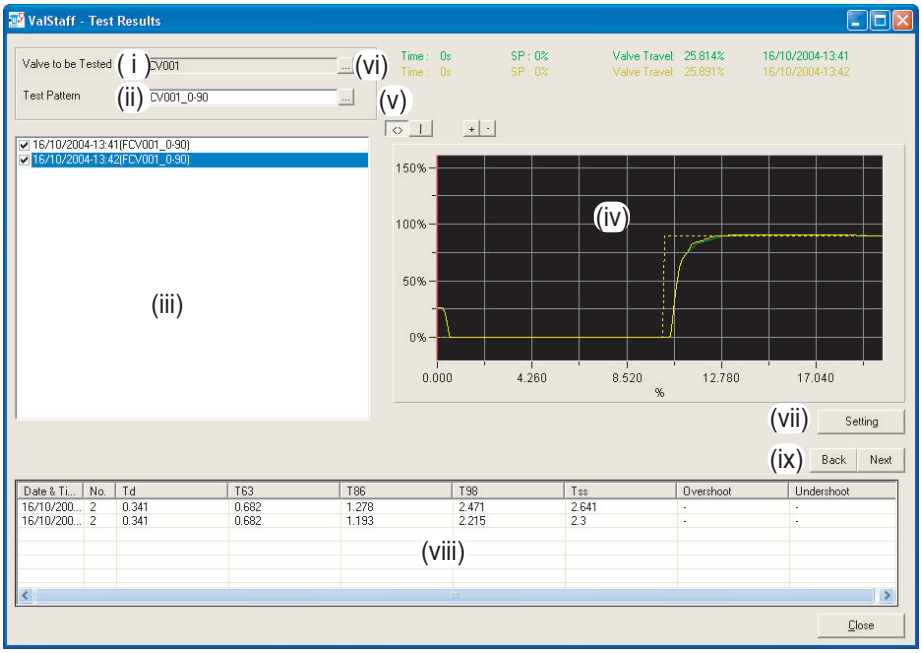


Figure 8-16 "Test Results" window

(i) "Valve to be tested" field and control valve select button

(ii) "Test Pattern" field and test pattern select button

(iii) Test result list display window

The test data logs meeting the object control valve and test pattern you have selected are shown in the chronological order. When checking on the check box on the left of the list, the graph and dynamic characteristic data of the test log you have checked on are displayed.

(iv) Graph data display fields

The graph data (elapsed time, SP value, valve travel) values at the hair line position, and the log file name are shown.

(v) Graph mode change buttons

The graph is operated with these buttons. For details, refer to Table 8-1.

(vi) Test result display window

The graph of the test result you have selected in the test result list display window is displayed. When selecting multiple test data logs, the graphs are displayed in different colors. The color of the graph becomes the same as that of the graph data display field (iv).

(Continued)

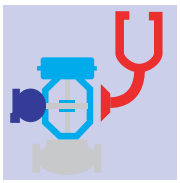
Step	Description
(2)	**(vii) [Setting] button** You can change the graph display method in the "Valve Test Setting" window. When necessary, change the graph display method while referring to Figure 8-15. **(viii) Dynamic characteristic data display window** In this window, the dynamic characteristic data shown in “About response results” on page 8-7 is displayed. The display shown in this widow may vary depending on the number of test data logs you have selected in the test result list window. When selecting one test data log, the dynamic characteristic indexes of all steps included in the applied test pattern are displayed. When selecting multiple test data logs, the dynamic characteristic index to the first step of the applied test pattern is displayed. After that, every time the step is moved with the test result display update buttons (ix), the dynamic characteristic index to relevant step is changed and it is displayed. **(ix) Test result display update buttons** When multiple test logs are displayed in the test result list window, the step shown in the test result display window and dynamic characteristic data display window is changed. Clicking the [Next] button will change to the display of the next step. Clicking the [Back] button will change to the display of the previous step.
3	Click the object control valve select button. Select a control valve you want to display.
4	Click the test pattern select button. Select a test pattern you want to display.
5	In the test result list display window, the test data logs meeting the object control valve and test pattern you have selected are listed up in the chronological order. When clicking the check box on the left of the test data log you want to display, the test results are displayed.
6	Clicking the [Close] button will close the "Test Results" window.

8-4-7: Exiting the solo test

Clicking the [Close] button in the "Solo Test" window will exit the solo test.

8-5: Running the programmed test

8-5-1: Starting up the programmed test

Step	Description
1	 Click the test mode start button in the "Valstaff Start" window.
2	When clicking the [Programmed Test] tab, the "Programmed Test" window will appear.

8-5-2: Creating and editing a test pattern

Create a test pattern of the control valve for the programmed test while referring to “8-4-2: Creating and editing a test pattern” on page 8-12.

8-5-3: Creating a programmed test list

Step	Description
1	Click the [Edit Schedule] button to display the "Edit Valve Test Schedule" window (1).

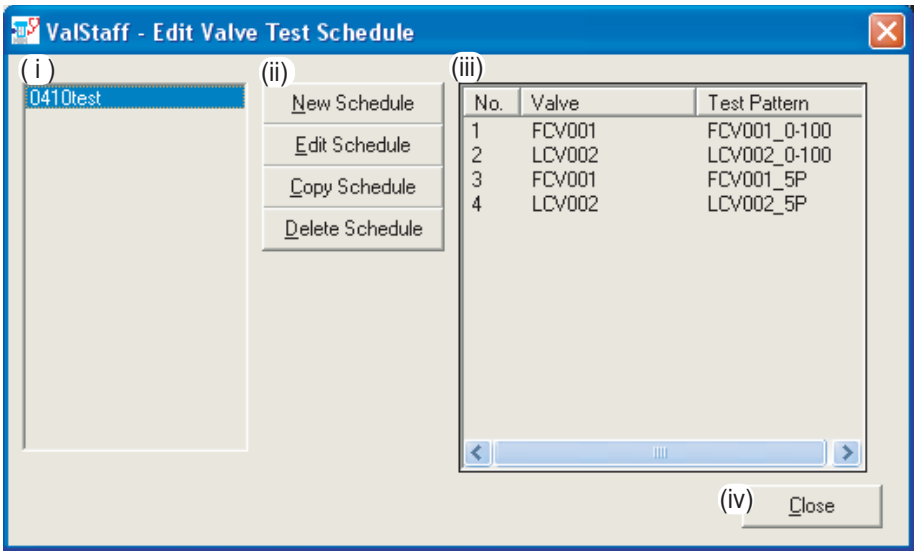


Figure 8-17 "Edit Valve Test Schedule" window (1)

(i) Programmed test list window

In this window, the names of registered programmed test lists are listed up.

(ii) Edit buttons

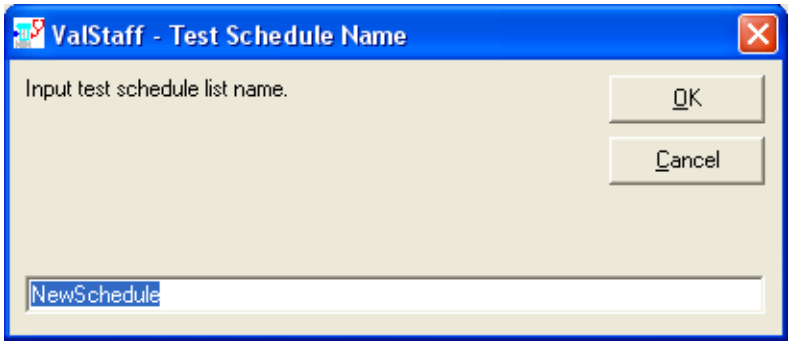
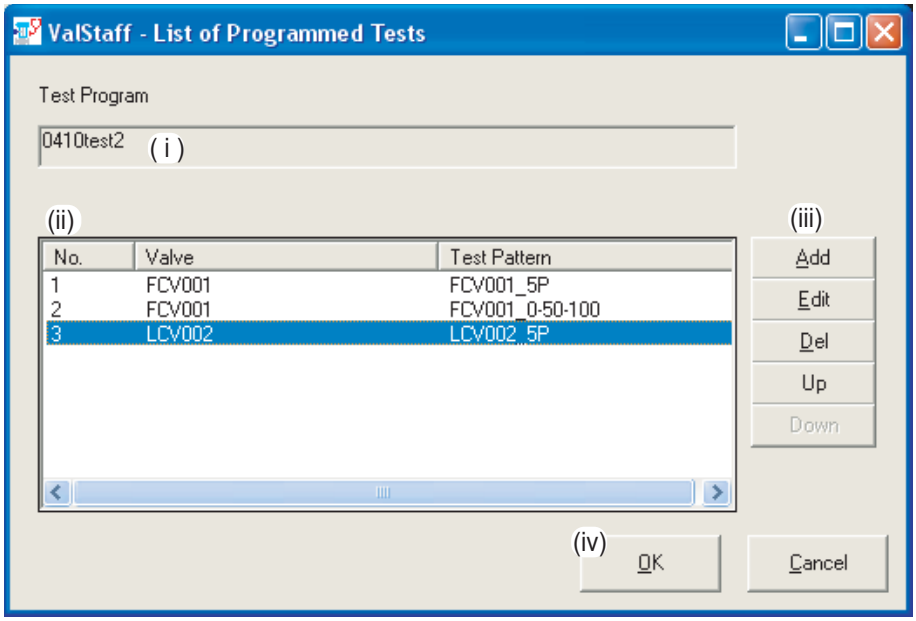
- **[New Schedule] button**
  To newly create a programmed test list, click the [New Schedule] button.
- **[Edit Schedule] button**
  To edit an existing programmed test list, click the [Edit Schedule] button.
- **[Copy Schedule] button**
  To make a copy of an existing programmed test list, click the [Copy Schedule] button.
- **[Delete Schedule] button**
  To delete an existing programmed test list, click the [Delete Schedule] button.

(iii) Test list contents display window

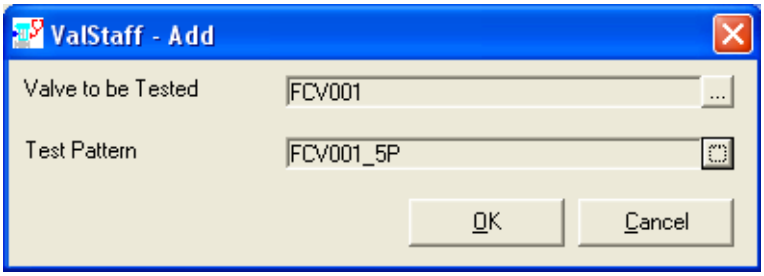
The contents of the programmed test list selected in the programmed test list window (programmed test No., control valve to be tested, test pattern to be applied) are shown.

(iv) [Close] button

Clicking this button will close the "Edit Valve Test Schedule" window.

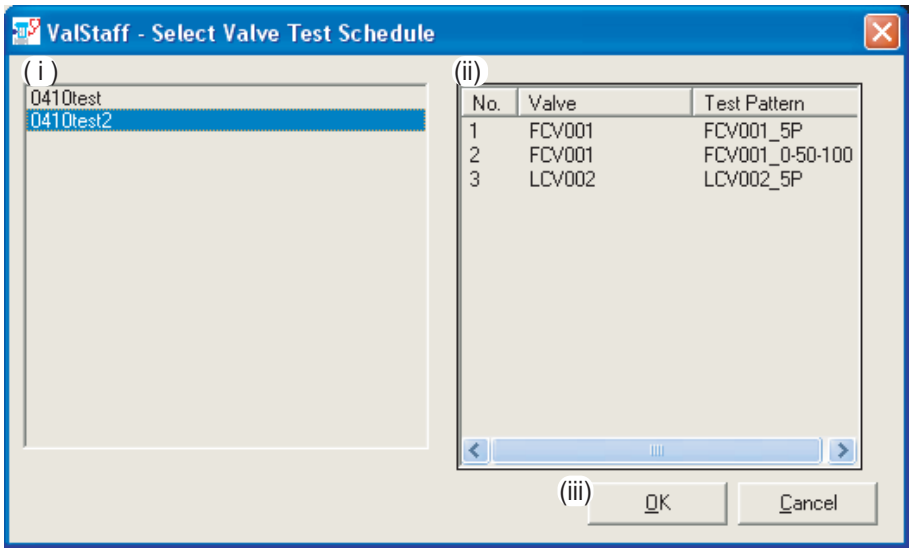
Step	Description
2	To newly create a programmed test list, click the [New Schedule] button. To make a copy of an existing programmed test list, click the [Copy Schedule] button. The "Test Schedule Name" input dialog box will appear. (Refer to Figure 8-18.)  *Figure 8-18 "Test Schedule Name" input dialog box*
3	Input a programmed test list name in the input field of the "Test Schedule Name" input dialog box and click the [OK] button.
4	In the programmed test list window of the "Edit Valve Test Schedule" window (1)", click a programmed test list name you want to create or edit, and then click the [Edit] button.  *Figure 8-19 "List of Programmed Tests" window (2)* **(i) "Test Schedule" field** In this field, the programmed test list name you have selected in the "Edit Valve Test Schedule" window (1) is shown.

(Continued)

Step	Description
(4)	**(ii) Programmed test list window** Control valves to be tested and test patterns to be applied to control valves registered in the programmed test list you have selected are displayed. Connections of items (combination of object control valves and test patterns) shown in this window will become relevant programmed test list. **(iii) Programmed test list operation buttons** • **[Add] button** This button is used to add one new item onto the item selected in the programmed test list window. When clicking the [Add] button, the item input/edit dialog box (refer to Figure 8-20) will appear, allowing you to register an object control valve and a test pattern.  *Figure 8-20 Item input/edit dialog box* Click the control valve select button on the right of the "Valve to be tested" field to select a desired control valve to be tested. Click the test pattern select button on the right of the "Test Pattern" field to select a desired test pattern. After you have selected the control valve to be tested and test pattern, click the [OK] button to add a new item in the programmed test list. • **[Edit] button** This button is used to edit the item selected in the programmed test list window. When clicking the [Edit] button, the item input/edit dialog box shown in Figure 8-20 will appear. In this dialog box, the selected control valve to be tested and test pattern are shown. After you have edited the control valve to be tested and the test pattern, click the [OK] button to display the item after editing is shown in the test list window. • **[Del] button** The item selected in the programmed test list window is deleted. • **[Up] button** The item selected in the programmed test list window is moved up one item. • **[Down] button** The item selected in the programmed test list window is moved down one item. **(iv) [OK] button in "List of Programmed Tests" window (2)** When clicking [OK], the contents of the programmed test list are saved and the "List of Programmed Tests" window (2) will be closed. When clicking [Cancel], the contents of the programmed test list are cancelled and the "List of Programmed Tests" window (2) will be closed.

Step	Description
5	Follow the <steps 1> to <step 4> to create a programmed test list and click the [OK] button in the "List of Programmed Tests" window (2).
6	Clicking the [Close] button in the "Edit Valve Test Schedule" window (1) will exit creating or editing the programmed test list.

8-5-4: Running the programmed test

Step	Description
1	Click the test list select button to display the "Select Valve Test Schedule" window. In the programmed test file list window, select a programmed test list to be applied and click the [OK] button.  *Figure 8-21 "Select Valve Test Schedule" window* **(i) Programmed test file list window** **(ii) Test list window**
2	In the "Programmed Test" window, the programmed test list you have selected in <step 1> is shown in the "Programmed test" field. In the programmed test list window, the contents of the programmed test list are shown. After checking that the selected programmed test list is correct, click the [Start] button. **⚠ CAUTION** In the programmed test, the control valve is opened or closed regardless of the signal from the controller.This operation may hinder the plant operation or give hazard to operators around the control valve. Therefore, take appropriate measures so that the safety of the plant operation or operators can be kept even though the programmed test is performed.
3	The safety confirmation message will appear. When selecting [Yes] for all messages, the programmed test is then started.
4	The behavior of the control valve corresponding to the applied test pattern is displayed dynamically in the test result display window during test. Make sure that the test is conducted correctly.
5	After the test has been completed, the test mode of the positioner is reset, and then the positioner is returned to the normal operation status.

8-5-5: Saving the programmed test results

After the test has been completed, the dynamic characteristic index data and response waveform data are automatically saved in the CSV file format. The test result data is saved into the file with a name of "Tag name_ test start date & time.csv" in the specified folder.

8-5-6: Displaying the test results

8-5-6-1: Displaying the dynamic characteristic data

The dynamic characteristic index data obtained from the test is shown in the dynamic characteristic data display window. Refer to Figure 8-13.

8-5-6-2: Displaying the graph

The response waveform is shown in the test result display window. Refer to Figure 8-14.

When necessary, change the graph display with the graph display operation buttons while referring to Table 8-1. You can change the display method of the graph display in the "Valve Test Setting" window. Refer to "8-4-6-2: Displaying the graph".

8-5-6-3: Displaying multiple test results at the same time

This function reads the test results, which have been saved in the past, to display their graphs. Up to four test results can be displayed graphically at the same time.

Step	Description
1	Click the [Result] button in the "Programmed Test" window.
2	The "Test Results" window will appear.

Subsequently, refer to "8-4-6-3: Displaying multiple test results at the same time".

8-5-7: Exiting the programmed test

Clicking the [Close] button in the "Programmed Test" window will exit the programmed test.

8-6: Exiting the test mode

Clicking the [Close] button in the "Solo Test" window or "Programmed Test" window will exit the test mode.

Chapter 9: Positioner Configuration / Calibration Mode

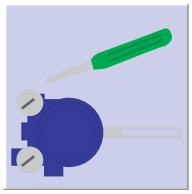
9-1: What is a positioner configuration/ calibration mode?

In this positioner configuration/calibration mode, two kinds of functions are provided. One is a function that performs various configurations/calibrations and settings of the positioner so that they meet the main unit of the control valve to be combined. The other is a function that sets operating conditions for diagnostic parameters to be handled in the Valstaff application.

⚠ CAUTION
In the positioner configuration/calibration mode, the control valve is opened or closed regardless of the signal from the controller.This operation may hinder the plant operation or give hazard to operators around the control valve. Therefore, take appropriate measures so that the safety of the plant operation or operators can be kept even though the valve is operated in the positioner configuration/ calibration mode.

9-2: Starting up the positioner configuration/ calibration mode

9-2-1: Starting up the positioner configuration/calibration mode



Click the configuration/calibration mode button in the "Valstaff Menu" window.

9-2-2: Configuration/calibration mode menu window

When the configuration/calibration mode is started up, the following "Positioner Configuration/Calibration" mode window will appear.Clicking the [Auto Setup] or [Parameter Management] button will start relevant function.

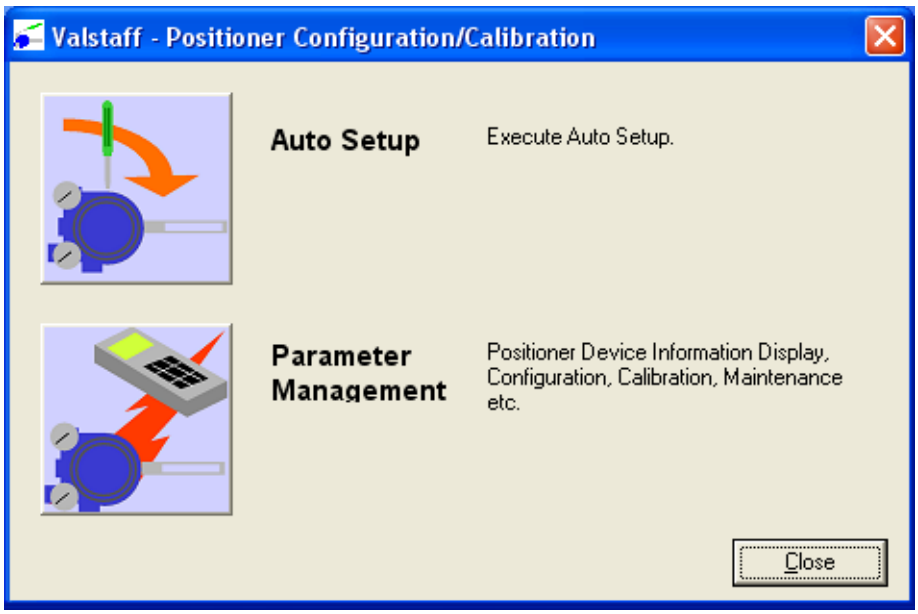
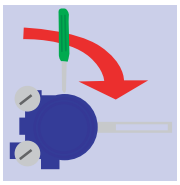


Figure 9-1 "Positioner Configuration/Calibration" mode start window

9-2-3: "Auto Setup" window



Click the [Auto Setup] button in the "Positioner Configuration/ Calibration" mode start window as shown in Figure 9-1. The "Auto Setup" window will appear.

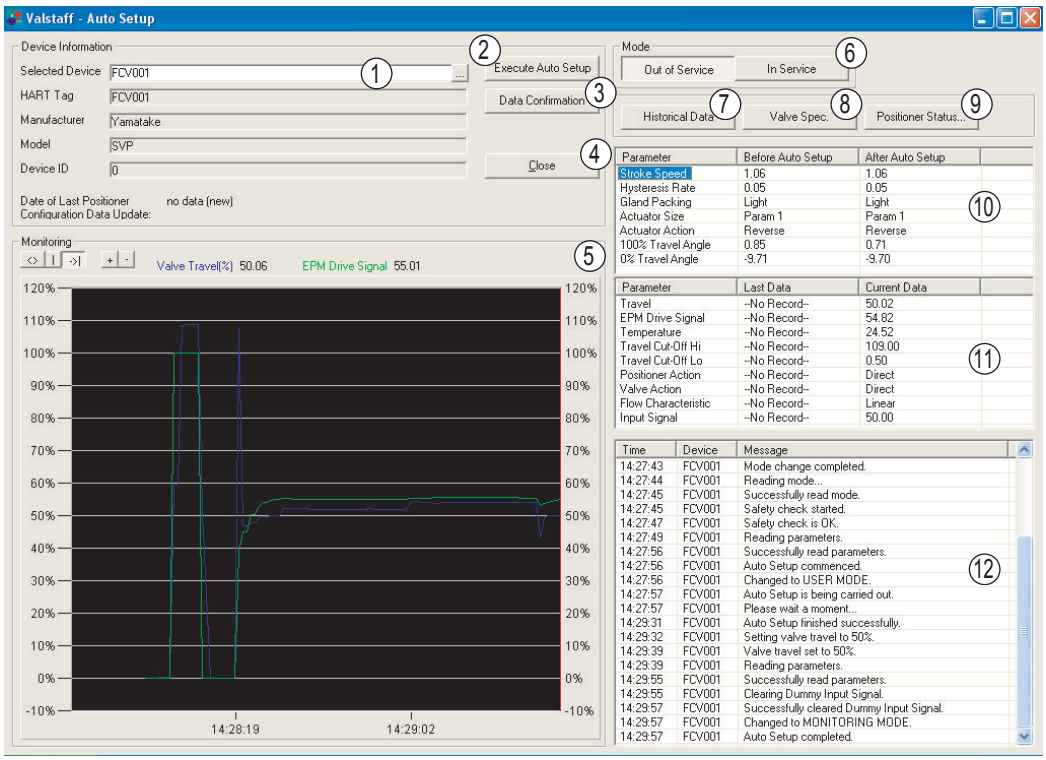
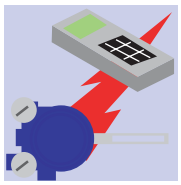


Figure 9-2 "Auto Setup" window

9-2-4: "Parameter Management" window



Click the [Parameter Management] button in the "Positioner Configuration/Calibration" mode start window as shown in Figure 9-1.
The "Parameter Management" window will appear.
The [Positioner Parameters] tab and [Diagnostic Parameters] tab are provided at the upper portion of the window.
Click the [Positioner Parameters] tab to display the "Positioner Parameter Management" window.

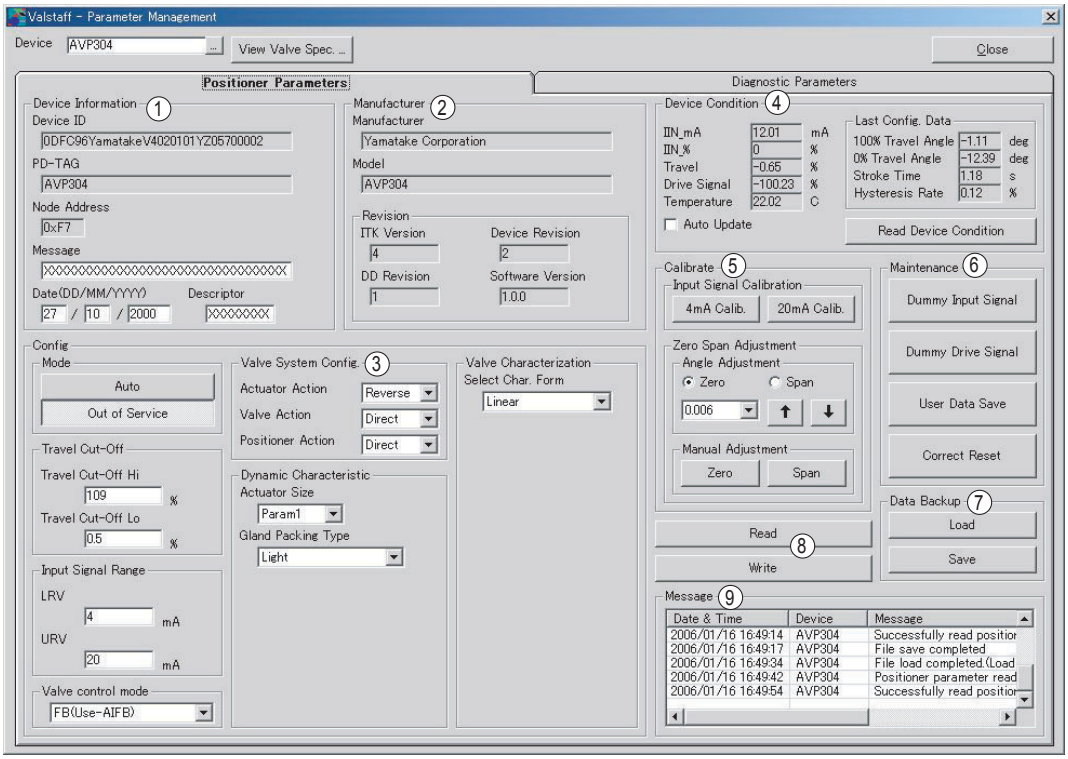
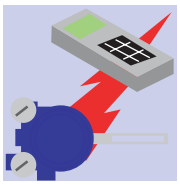


Figure 9-3 "Positioner Parameter Management" window

9-2-5: "Diagnostic Parameter Management" window



Click the [Parameter Management] button in the "Positioner Configuration/Calibration" mode start window as shown in Figure 9-1.
The "Parameter Management" window will appear.
The [Positioner Parameters] tab and [Diagnostic Parameters] tab are provided at the upper portion of the window.Click the [Diagnostic Parameters] tab to display the "Diagnostic Parameter Management" window.

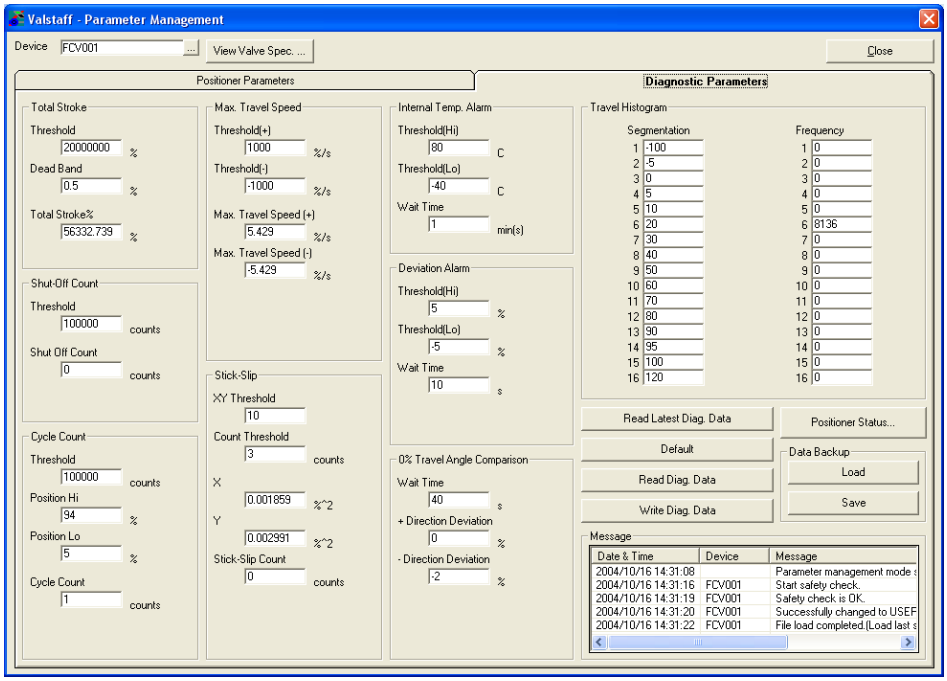


Figure 9-4 "Diagnostic Parameter Management" window

9-3: Overview of functions in the positioner configuration/calibration mode

9-3-1: Functions in the "Auto Setup" window

You can start the following operations with the buttons and through the windows in the "Auto Setup" window shown in Figure 9-2.

No.	The Buttons & Operations
①	**Positioner select button** Clicking this button to display the "Positioner Selection" dialog box. After that, you can select a positioner for the auto setup from the positioners registered in the project.
②	**[Execute Auto Setup] button** After selecting a positioner for the auto setup, click this button to start the auto setup.
③	**[Data Confirmation] button** When clicking this button, the communication with the positioner you have selected is started to read the internal data of the positioner (PD tag, device information, etc.), and then such data is displayed in the window.
④	**[Close] button** Clicking this button will exit the auto setup and return to the "Configuration/ Calibration" mode menu window.
⑤	**Monitoring window** This window monitors the behavior of the positioner while the auto setup is running.
⑥	**Mode change button** This button is used to change the positioner mode ("Out of Service" or "In Service"). "In Service" means a mode, in which the operation follows the control signal from the controller. In this mode, the positioner responds to the adjustment commands from the Valstaff application. "Out of Service" means a mode for the test and configuration/calibration, in which the operation follows the control signal from the controller and it also responds to the command from the Valstaff application. Before starting the auto setup, you must put the positioner in the "Out of Service" mode.

No.	The Buttons & Operations
⑦	**[Historical Data] button** When clicking this button, the operation speed and inherent hysteresis index measured by executing the previous auto setup, set gland packing type, actuator size, actuator action, and set zero-point and span angle are displayed as historical data.
⑧	**[Valve Spec.] button** When clicking this button, the control valve specification data linked with the selected positioner is displayed. To display the control valve specifications, you must register the control valve specifications and make the specifications linked with the positioner in the operation setup mode.
⑨	**[Positioner Status] button** When clicking this button, the communication with the selected positioner is started to display the self-diagnosis results.
⑩	**Positioner data display window (1)** In this window, the configuration items of the positioner for the auto setup and measurement values (average operation speed and inherent hysteresis index) used as background of the adjustment are displayed. In the "Before Auto Setup" fields, the past auto setup results, which have been saved by clicking the [Historical Data] button ⑦, are displayed. In the "After Auto Setup" fields, the latest auto setup results are displayed. By comparing the data before the auto setup with the data after the auto setup, it can be judged whether or not the configuration/calibration is correct or whether or not an error related to the measurement value occurs.
⑪	**Positioner data display window (2)** In this window, other positioner configuration/calibration items and positioner statuses related to the configuration/calibration items, which are linked with the configuration/calibration items conducted through the auto setup, are displayed.
⑫	**Message window** The transition of the positioner status during auto setup is displayed using the messages.

9-3-2: Functions in the "Positioner Parameter Management" window

You can start the following operations through the windows in the "Positioner Parameter Management" window shown in Figure 9-3.

No.	Description
①	**"Device Information" window** In this window, you can display or change the device information defined by the FOUNBDATION Fieldbus communication standard.

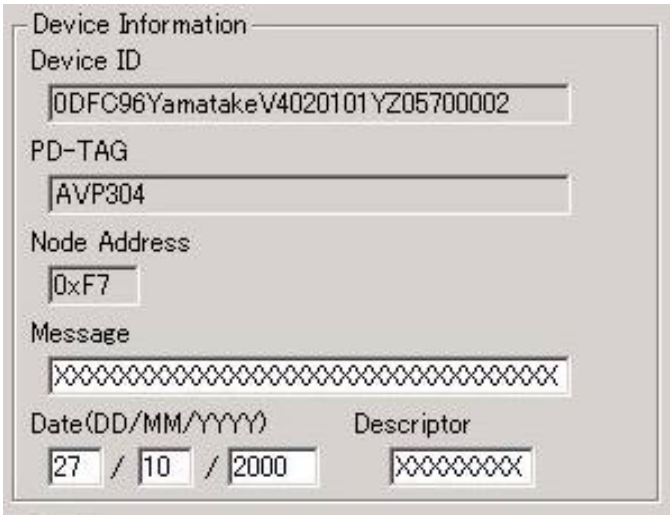


Figure 9-5 "Device Information" window

- **Device ID:** This field shows an ID number registered in the positioner.
- **PD Tag:** This field shows the PD tag.
- **Node Address:** This field shows a node address of the FOUNDATION Fieldbus.
- **Message:** You can freely describe information on device configuration/calibration using up to 32 alphanumeric characters.
- **Descriptor:** You can freely describe information on device using up to 16 alphanumeric characters.
- **Date:** You can freely describe necessary date, such as operation start date and last configuration/calibration date, like day (2-digit)/month (2-digit)/ year (4-digit) in that order.

No.	Description
②	**"Manufacturer" window** In this window, the manufacturer defined by the FOUNDATION Fieldbus standard and the information on this device are displayed.

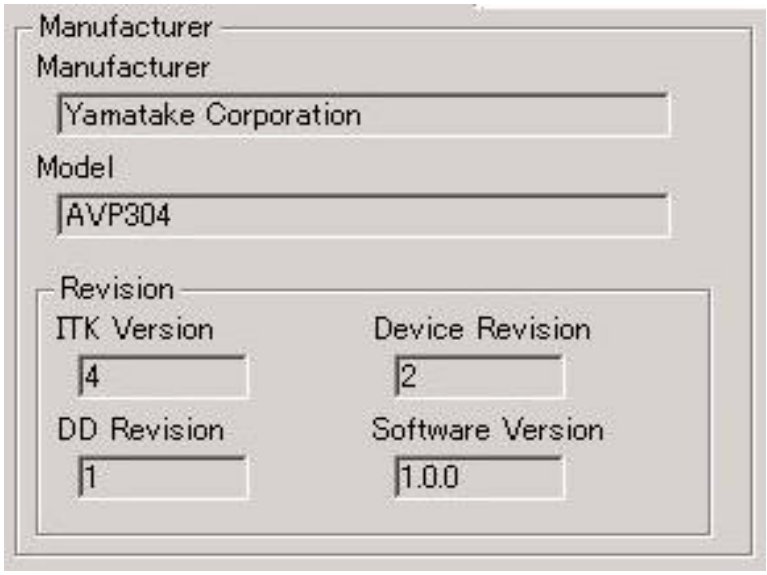
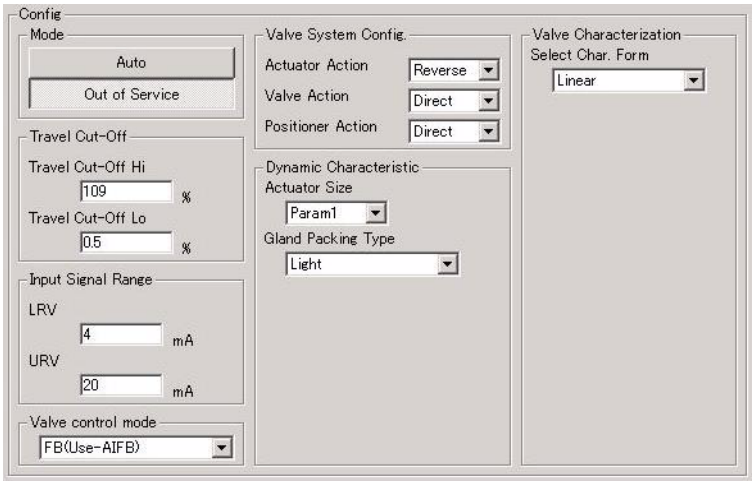
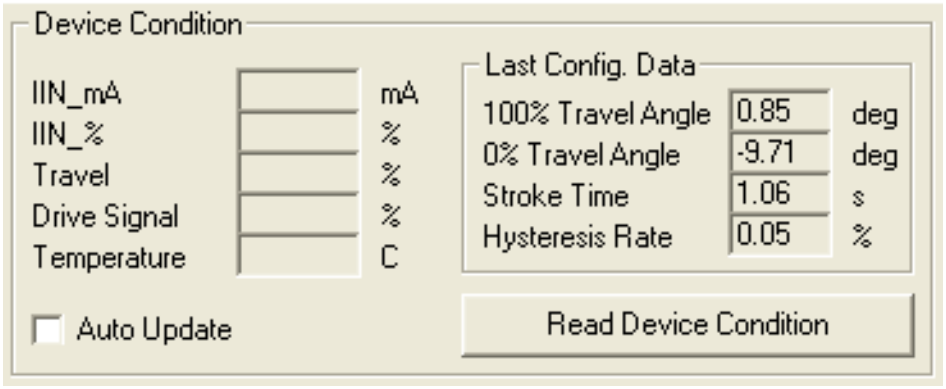
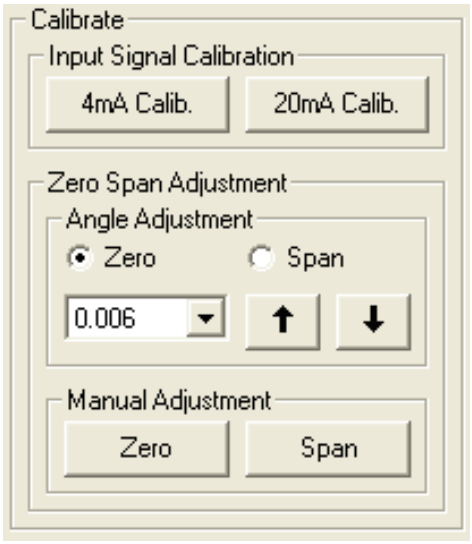
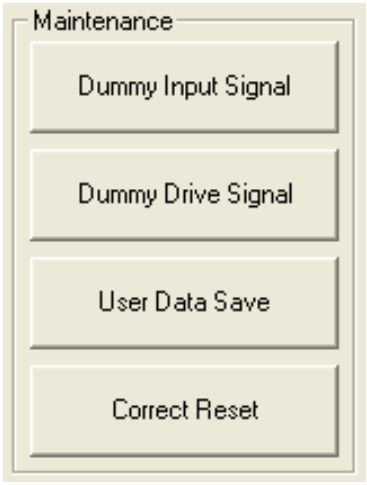
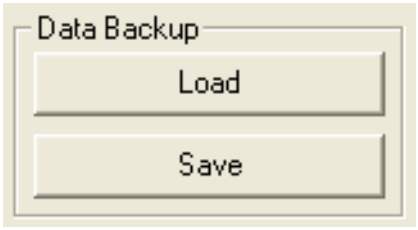


Figure 9-6 "Manufacturer" window

- **Manufacturer**
  This field shows the information on manufacturer registered in the positioner.
  Normally, "Yamatake" is displayed.
- **Model**
  This field shows the information on the device model registered in the positioner. "AVP303" or "AVP304" is displayed.
- **ITK Version**
  This field shows the version of the Interoperable Test Kit.
- **Device Rev**
  This field shows the revision number of the software inside the positioner.
- **DD Rev**
  This field shows the revision number of the DD (Device Description).
- **S/W Version**
  This field shows the version of the positioner internal software based on the control method used inside Yamatake.

No.	Description
③	**"Config" window** In this window, you can change the operation mode of the positioner or set various setup items.  *Figure 9-7 "Config" window* • **Mode** The mode is changed to [In Service] or [Out of Service]. • **Travel Cut-Off** You must set current input values (%) for the valve forced fully closed and fully opened. If the input signal, which is the travel cut-off Hi value or less, is applied, the valve is closed fully. If the input signal, which is the travel cut-off Lo value or more, is applied, the valve is opened fully. • **Input Signal Range (to use hybrid positioner model AVP304/204)** A range of the input signal applied to the positioner is specified by inputting the values in the "LRV" and "URV" fields. • **Valve System Config.** The operation of the positioner is set by considering the specifications of the control valve and necessary fail safe operation. The items, such as the actuator action (direct/reverse), valve action (direct/reverse), and positioner action (direct/reverse) are set. • **Dynamic Characteristic** You can set the dynamic characteristic (gap operation type PID parameter setup) of the positioner by setting the parameters suitable for the actuator size and gland packing type used for the control valve. The gap operation type PID parameter can also be set individually. • **Valve Characterization** The input/output characteristics of the positioner are set. In addition to basic three characteristics, "Linear", "Equal %", and "Quick Opening", the user can also select the user defined valve characterization that the user freely sets the input/output characteristics. • **Valve Control Mode (to use hybrid positioner model AVP304/204)** You can set the control mode of the control valve to the analog signal (4 to 20 mA) or FOUNDATION Fieldbus.

No.	Description
④	**"Device Condition" window** In this window, various variable conditions of the positioner are displayed. The data when the "Parameter Management" widow is opened are shown. Or, when checking on the [Auto Update] check box, the variables are displayed dynamically.  *Figure 9-8 "Device Condition" window*
⑤	**"Calibrate" window** In this window, the 4-20 mA signal recognized by the positioner is calibrated, and the zero and span are adjusted.  *Figure 9-9 "Calibrate" window*

No.	Description
⑥	**"Maintenance" window** In this window, the operation is performed by the dummy signal sent to the positioner and the adjustment data saved into the memory inside the positioner is written or saved.  *Figure 9-10 "Maintenance" window*
⑦	**"Data Backup" window** In this window, the adjustment results of the positioner can be saved into the file of the Valstaff application or the adjustment result file saved in the Valstaff application is loaded into the "Parameter Management" window.  *Figure 9-11 "Data Backup" window*
⑧	**"Read"/ "Write" window** When clicking the [Read] button, the communication with the field positioner is performed to display various setup items of the current positioner are displayed in the "Parameter Management" window. When clicking the [Write] button, various setup items you have changed in the "Parameter Management" window are made influenced on the connected field positioner.
⑨	**"Log" window** In this window, various operation logs you have made through the "Parameter Management" window are displayed.

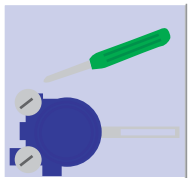
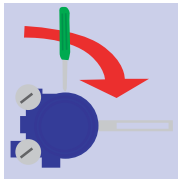
9-3-3: Functions in the "Diagnostic Parameter Management" window

You can perform the following operations through each window of the "Diagnostic Parameter Management" window shown in Figure 9-4.

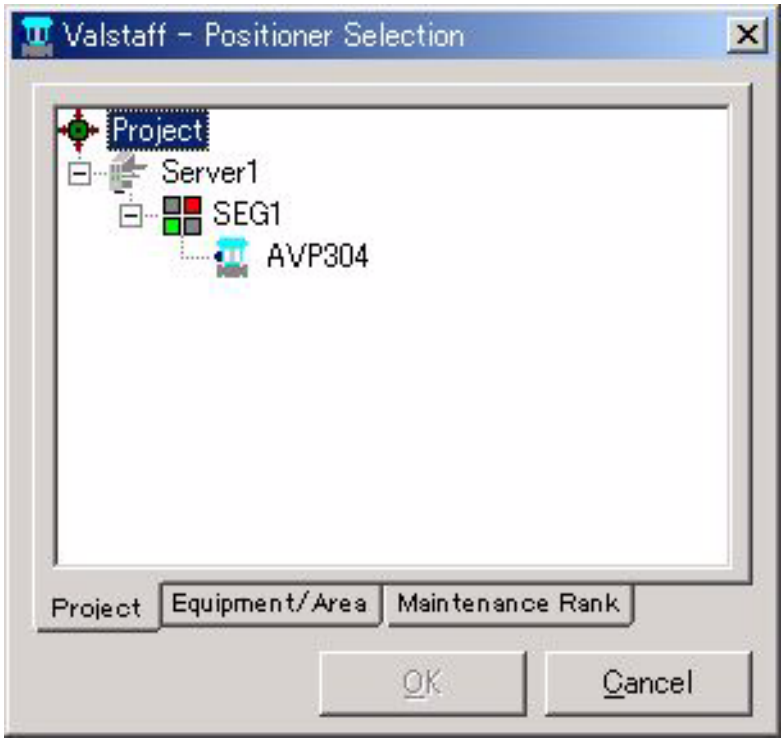
No.	Description
①	**Setting threshold values for each diagnostic parameter** You can set a threshold value to give an alarm for changes in each diagnostic parameter.
②	**Setting related configuration items of each diagnostic parameter** You can set related configuration items used to determine operation conditions for diagnostic parameters.
③	**Reading the latest diagnostic data** The communication with the selected positioner is performed to read the latest values of the diagnostic parameters and they are displayed in the "Diagnostic Parameter Management" window.
④	**Positioner self-diagnosis** The self-diagnosis command is sent to the positioner to display the self-diagnosis results.
⑤	**Data Backup** You can save the threshold values of the diagnostic parameters and the set results of the related configuration items into the Valstaff application file or load the diagnostic parameter file saved in the Valstaff application into the "Diagnostic Parameter Management" window.
⑥	**Read Diag. Data/Write Diag. Data** When clicking the [Read Diag. Data] button, the communication with the field positioner is performed to display the current diagnostic parameters in the "Diagnostic Parameter Management" window. When clicking the [Write Diag. Data] button, the various setup items you have changed in the "Diagnostic Parameters Management" window are made influenced on the connected field positioner.
⑦	**Log** Various operation logs you have made in the "Diagnostic Parameter Management" window are displayed.

9-4: Running the auto setup

9-4-1: Selecting a positioner to be adjusted

Step	Description
1	 Click the configuration/calibration mode start button in the "Valstaff Start" window.
2	 Click the [Auto Setup] button in the "Positioner Configuration/Calibration" mode start window.

9-4-1-1: Selecting a positioner from the "Positioner Selection" window

Step	Description
1	Click the device select button on the right of the "Selected Positioner" field to display the "Positioner Selection" window.  *Figure 9-12 "Positioner Selection"window*
2	Click a desired positioner in the "Positioner Selection" window to select it and click the [OK] button.

9-4-2: Starting the auto setup

Click the [Execute Auto Setup] button to start the auto setup.

⚠ CAUTION

When the auto setup is executed, the control valve is operated from its fully closed position to its fully opened position.This operation may hinder the plant operation or give hazard to operators around the control valve. Therefore, take appropriate measures so that the safety of the plant operation or operators can be kept even though the control valve is operated.

In the auto setup, the specifications of the control valve are specified through the processes shown in Figure 9-13 and the internal parameters of the positioner are set automatically so that they meet the specifications.

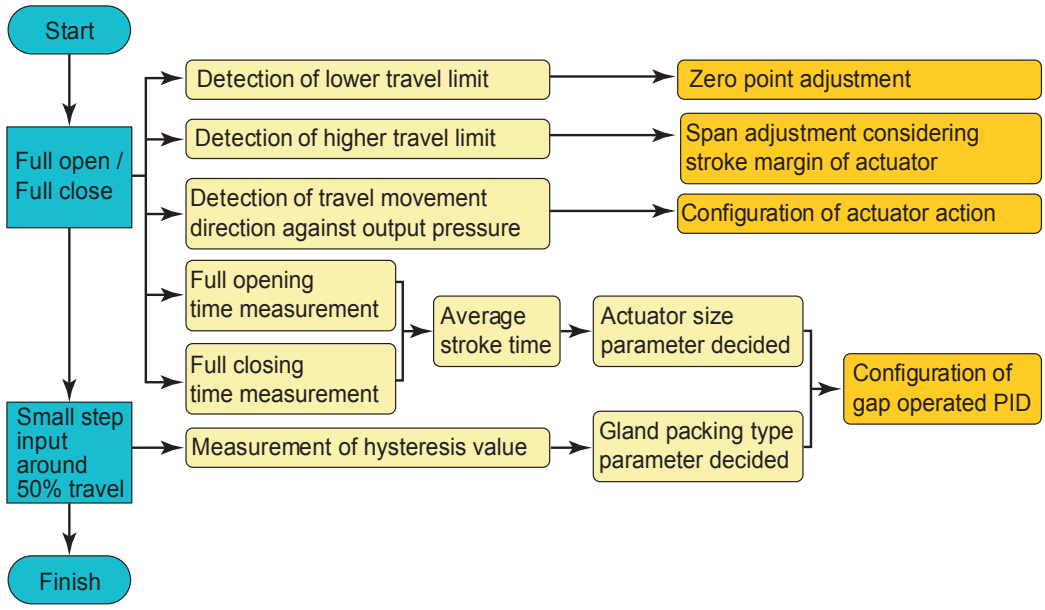


Figure 9-13 Auto setup processes

When the auto setup has been completed, the message showing that the auto setup is completed is shown in the message window.

After this message has been checked, change the input signal to the positioner to check that the adjustment has been performed correctly.

Note

- *Never set the input signal to 4 mA or less during auto setup. When the input signal is within a rage of 4 to 20 mA, no problem occurs.*
- *If the span position deviates after auto setup, make the span adjustment while referring to "9-5-2-5: Calibrating the positioner" on page 9-30, or the instruction manual for positioner.*
- *The dynamic characteristics cannot be set correctly depending on the actuator size (smaller than that of Yamatake's actuator model HA1 (capacity of diaphragm chamber: 850 cm³). If this occurs, set the dynamic characteristics manually while referring to "9-5-2-4-5: Setting up the dynamic characteristics" on page 9-23, or the instruction manual for positioner.*
- *The forced fully opened value may be changed after the auto setup has been performed. When necessary, set the forced fully opened value again.*

- *If the booster relay is assembled, hunching may occur during auto setup.*
- *If this occurs, set the booster and positioner appropriately while referring to the instruction manual for positioner.*
- *When the actuator size parameter is set at "Param 0", the auto setup operation is completed after the operation has been performed between the full open and full close operations once.*
- *Additionally, note that the actuator size is not set automatically.*
- *When performing the auto setup of the control valve model VFR, make any of "Param 7" to "Param 9" applied to the positioner once and start the auto setup again.*

9-4-3: Displaying the auto setup results

9-4-3-1: Displaying the parameters for the auto setup

The execution results of the auto setup are shown in the "After Auto Setup" fields of the positioner data display window.

Make sure that the configuration/calibration is performed correctly while referring to the specifications of the control valve.

Additionally, make also sure that the zero-point and span are adjusted correctly while checking the field control valve.

9-4-3-2: Displaying the auto setup execution graph

In the "Monitoring" window, the auto setup execution processes described in Figure 9-13 are displayed as trend graph. Make sure that the processes shown in Figure 9-13 are performed correctly.

9-4-3-3: Displaying the parameters for the auto setup in the chronological order

In the positioner data window, the parameters after the auto setup shown in “9-4-3-1: Displaying the parameters for the auto setup” on page 9-16, as well as various parameters after the previous auto setup has been performed are displayed in the "Before Auto Setup" fields.

If the operation speed or hysteresis difference index value is changed largely, it is predicted that the deterioration is progressed, such as air leak from the actuator or running out of the gland packing grease.

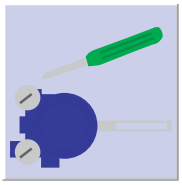
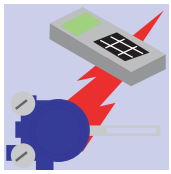
Check the deterioration status of the actual control valve, and then repair defective parts properly or replace the defective part.

9-4-4: Exiting the auto setup

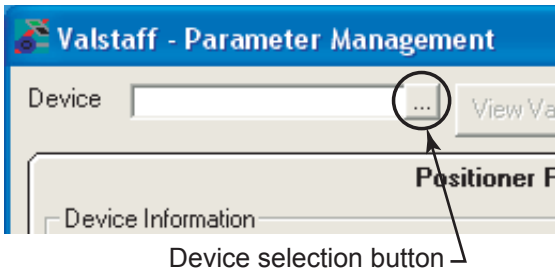
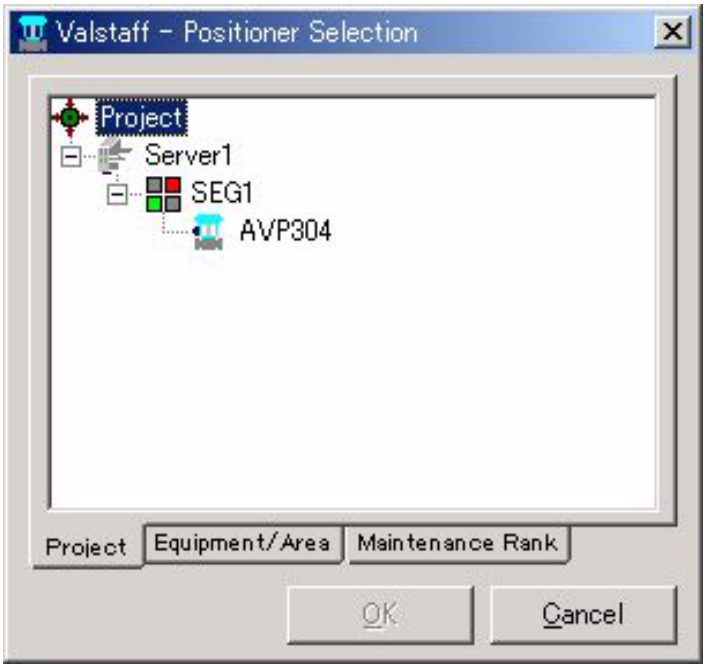
After the positioner configuration/calibration with the auto setup has been completed, clicking the [Close] button will exit the auto setup.

9-5: Running the parameter management

9-5-1: Selecting a positioner for the parameter management

Step	Description
1	 Click the configuration/calibration mode start button in the "Valstaff Start" window.
2	 Click the [Parameter Management] button in the "Positioner Configuration/Calibration" mode start window.

9-5-1-1: Selecting a device from the "Positioner Selection" window

Step	Description
1	Click the device select button on the right of the "Device" field to display the "Positioner Selection" window. *Figure 9-14 Device selection button*   *Figure 9-15 "Positioner Selection" window*
2	Click a desired positioner in the "Positioner Selection" window to select it and click the [OK] button.

9-5-2: Running the parameter management

Click the [Positioner Parameters] tab to display the "Parameter Management" window.

9-5-2-1: Displaying and registering the device information

In the "Device Information" window, you can display or register various kinds of information shown in ① of "9-3-2: Functions in the "Positioner Parameter Management" window". For details, refer to ① of "9-3-2: Functions in the "Positioner Parameter Management" window".

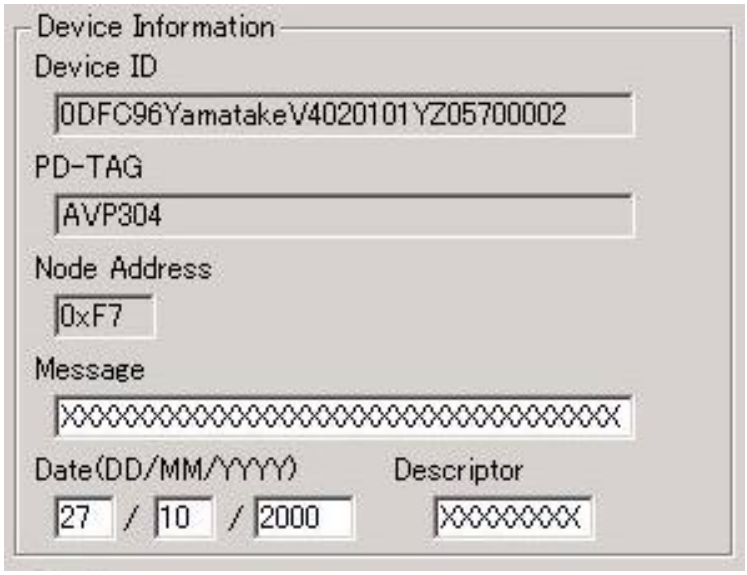


Figure 9-16 "Device Information" window

9-5-2-2: Displaying the manufacturer information

Various kinds of information shown in ② of "9-3-2: Functions in the "Positioner Parameter Management" window" are displayed. For details, refer to ② of "9-3-2: Functions in the "Positioner Parameter Management" window".

9-5-2-3: Displaying the device conditions

Various kinds of device conditions shown in ④ of "9-3-2: Functions in the "Positioner Parameter Management" window" are displayed. For details, refer to ④ of "9-3-2: Functions in the "Positioner Parameter Management" window".

9-5-2-4: Setting up the positioner parameters

9-5-2-4-1: Changing the mode

The positioner provides two kinds of modes. One is [Auto] and the other is [Out of Service].

To start the calibration, configuration, or setting change of the positioner, click the [Out of Service] button after checking that such work does not hinder the plant operation.

Click the [Out of Service] button to put the operation in the "Out of Service" mode.

After the calibration, configuration, or setting change of the positioner has been completed, click the [Auto] button to put the operation in the "Auto" mode.

In the "Auto" mode, such work cannot be performed.

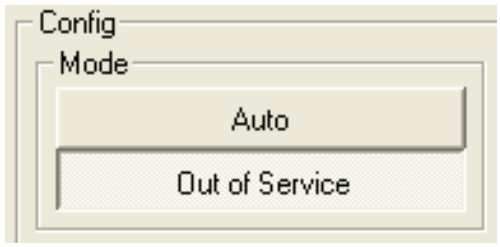


Figure 9-17 "Mode" change window

9-5-2-4-2: Setting up the input signal range

You can set a current input value (LRV) when the control valve is closed fully and a current input value (URV) when the control valve is opened fully.

You can input a current value ranging from "4 mA" to "20 mA".

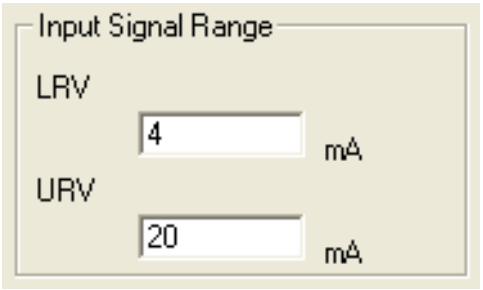


Figure 9-18 "Input Signal Range" setup window

Note
- *Make the setting properly so that the current input span (|LRV-URV|) becomes 4 to 16 mA.*
- *If the span is 8 mA or less, the accuracy becomes 1.5%F.S.*

Setting up the input signal at full-close

Step	Description
1	Using the ten-key pad, input an input signal value when the control valve is closed fully in the "LRV" field.
2	Click the [Write] button. The input signal setting of the field positioner when the control valve is closed fully is then changed.

Setting up the input signal at full-open

Step	Description
1	Using the ten-key pad, input an input signal value when the control valve is opened fully in the "URV" field.
2	Click the [Write] button. The input signal setting of the field positioner when the control valve is opened fully is then changed.

9-5-2-4-3: Setting up the Travel Cut-Off Lo and Travel Cut-Off Hi values

You can set current input values (%) to forced fully close and open the control valve. If a value, which is the value set in the "Travel Cut-Off Lo" field or less, is input, the control valve is closed fully. On the contrary, if a value, which is the value set in the "Travel Cut-Off Hi" field or more, is input, the control valve is opened fully. You can set an individual current input value (%) in the "Travel Cut-Off Hi" or "Travel Cut-Off Lo" field.

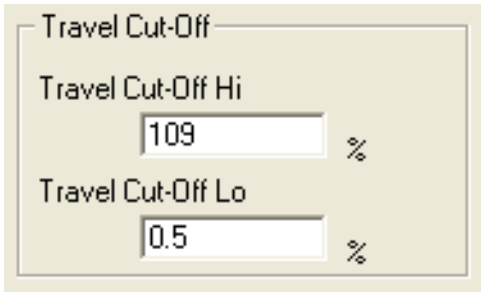


Figure 9-19 "Travel Cut-Off" setup window

Note

- *The default value of the "Travel Cut-Off Lo" field has been set at "0.5%". Unless otherwise specified particularly, it is not necessary to change this setting.*
- *Always make the setting so that forced fully closed value (Travel cut off low) < forced fully opened value (Travel cut off high).*
- *The allowable setting range is "-19999" to "+19999".*
- *If the span is adjusted after the auto setup has been completed, the forced fully opened value (Travel cut off high) is changed to a value ("over stroke (%)" - "1%").*

Setting up the Travel Cut-Off Lo value

Step	Description
1	Using the ten-key pad, input an input signal value (%) to forced fully close the valve in the "LRV" field.
2	Click the [Write] button. The input signal setting for the travel cut-off Lo value of the field positioner is then changed.

Setting up the Travel Cut-Off Hi value

Step	Description
1	Using the ten-key pad, input an input signal value (%) to forced fully open the valve in the "URV" field.
2	Click the [Write] button. The input signal setting for the travel cut-off Hi value of the field positioner is then changed.

9-5-2-4-4: Setting up the valve system configuration data

Make the system operation ("Air-to-open" or "Air-to-close") of the entire control valve influenced on the positioner setting with a combination of the actuator action (direct or reverse action) and valve action (direct or reverse action).

Additionally, you can set the positioner output status (maximum or zero) when the input signal is not applied by selecting a positioner action (direct or reverse action).

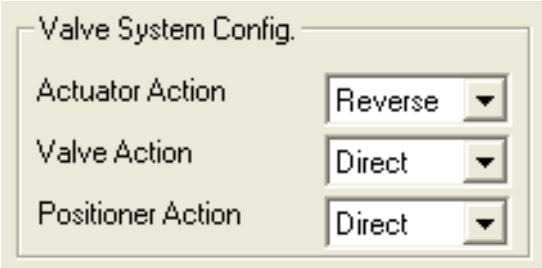


Figure 9-20 "Valve System Config." setup window

Setting up the actuator action

Step	Description
1	From the pull-down menu, select "Direct" or "Reverse" action of the actuator. When the feedback lever of the single-acting linear actuator (Yamatake's actuator model PSA, HA, or VA) is moved from the top to the bottom as the air pressure is increased, set the "Direct" action. When this lever is moved from the bottom to the top as the air pressure is increased, set "Reverse" action. When the feedback lever of the double-acting linear actuator (Yamatake's actuator model VP or SLOP) is moved from the top to the bottom as the air pressure of the reversing relay output 1 (OUT1) of the positioner is increased, set the "Direct" action. When this lever is moved from the bottom to the top, set "Reverse" action. When using the VR/RSA actuator of the control valve model VFR, you must set the system operation of the entire control valve in this setting. Set the "Direct" action for "Air-to-close" and the "Reverse" action for "Air-to-open".
2	Click the [Write] button. The valve action setting of the field positioner is then changed.

Setting up the valve action

Step	Description
1	From the pull-down menu, select "Direct" or "Reverse". For the structure of the globe type control valve, in which the valve is opened as the plug stem is moved up (the stem is projected from the valve main body), set "Direct". For the structure, in which the valve is closed, set "Reverse". For the control valve model VFR, always set "Direct". In other type control valve, when the feedback lever is moved from the top to the bottom as the control valve is moved from "open" to "close", set "Direct". When the feedback lever is moved from the bottom to the top, set "Reverse".
2	Click the [Write] button. The valve action setting of the field positioner is then changed.

Setting up the positioner action

Step	Description
1	From the pull-down menu, select "Direct" or "Reverse" action of the positioner. When the positioner output becomes zero if the input signal is shut down, set "Direct". When the positioner output becomes the maximum level, set "Reverse".
2	Click the [Write] button. The positioner action setting of the field positioner is then changed.

Note • *The positioner operations are determined depending on the main body hardware. The settings made here for the positioner operations are subordinate, based on the determinations. If a positioner with the specifications for the "Reverse" operations is*

to be used, be sure to change the hardware specifications to those for the "Reverse" operations and then to make the software settings for the positioner operations that are described here.

9-5-2-4-5: Setting up the dynamic characteristics

The gap operation type PID parameters inside the positioner are set by selecting an actuator size parameter suitable for the actuator size and by combining gland packing types used for the control valve.

The gap operation type PID operation means a control system that deviation values (gap values) to the target values are put at the upper and lower positions, and then the PID parameters are changed inside and outside the gap.

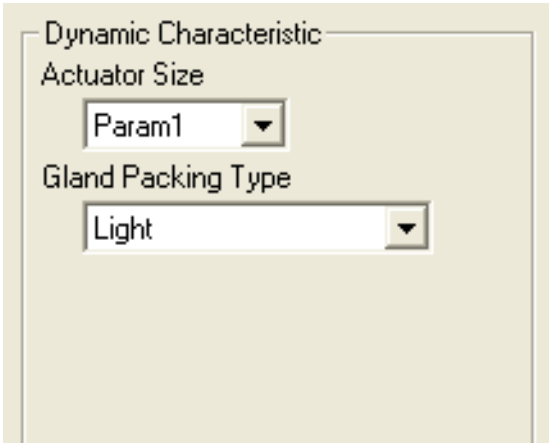


Figure 9-21 "Dynamic Characteristic" window (Actuator size is other than "Param 0".)

If excellent dynamic characteristics cannot be obtained due to selection and combination of actuator size and gland packing type, the dynamic characteristics are set by individually inputting a numeric value of the gap operation type PID parameter.

When inputting a numeric value of the gap operation type PID parameter individually, the actuator size parameter is set at [Param 0].

As the actuator size parameter is set at [Param 0], the "GAP PID Parameters" fields are displayed in the window, allowing you to make the setting.

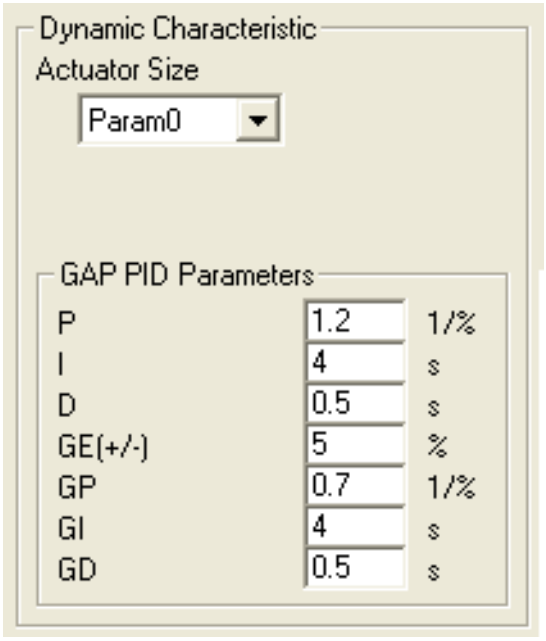


Figure 9-22 "Dynamic Characteristic" window (Actuator size is "Param 0".)

Setting up the actuator size

Step	Description
1	From the pull-down menu, select an actuator parameter suitable for the actuator size while referring to Table 9-1.
2	Click the [Write] button. The actuator size setting of the field positioner is then changed.

Table 9-1 Actuator size parameters

Actuator size parameter	Actuator diaphragm/ Cylinder capacity (cm^3)	Applicable Yamatake's model
Param 1	1000	PSA1, PSK1, HA1, VA1
Param 2	3500	PSA2, HA2, VA2
Param 3	7600	PSA3, HA3, VA3
Param 4	14000	PSA4, HA4, VA4
Param 5	25300	VA5
Param 6	8400	PSA6, VA6
Param 7	760	RSA1, VR1
Param 8	2200	RSA2, VR2
Param 9	5800	VR3
Param 0	For manual setup of gap operation type PID parameters	

Note

- *Param 7, 8, and 9 are special parameters for Yamatake's control valve model VFR. Do not apply these parameters to control valves other than the model VFR.*

Setting up the gland packing type

Step	Description
1	From the pull-down menu, select a parameter suitable for the gland packing type while referring to Table 9-2.

Table 9-2 Gland packing type parameters

Gland packing type parameter	Example of gland packing material	Hysteresis level
Heavy (Graphite system packing)	Graphite packing or graphite molding packing, etc.	Heavy
Medium (Yarn packing)	PTFE yarn packing	Medium
Light (PTFE molding packing)	PTFE yarn packing or PTFE molding packing	Light
Heavy (Graphite system packing)-1 *1	Graphite packing or graphite molding packing, etc.	Heavy
Heavy (Graphite system packing)-2 *1	Graphite packing or graphite molding packing, etc.	Heavy
Heavy (Graphite system packing)-3 *1	Graphite packing or graphite molding packing, etc.	Heavy

*1 You can select these parameters only when the actuator size parameter is "Param 1".
These parameters are prepared assuming that the actuator is smaller than the reference actuator diaphragm/cylinder capacity for "Param 1" stated in Table 9-1. If the actuator is small and the dynamic characteristics become improper due to standard parameter comparisons, use of these parameters needs to be taken into consideration.

2	Click the [Write] button. The gland packing type setting of the field positioner is then changed.

Setting up the gap operation type PID parameters

Step	Description
1	From the pull-down menu, select "Param 0" in the "Actuator Size" field.
2	Using the ten-key pad, input a gap operation type PID parameter while referring to Table 9-3.

Table 9-3 Gap operation type PID parameters

Parameter *3	Meaning of parameter	Unit	
P	Inverse number of proportional band inside gap	1/%	*2
I	Integration time inside gap	s	
D	Derivative time inside gap	s	
GE	Gap width	%F.S.	
GP *1	Inverse number of proportional band outside gap	1/%	*2
GI *1	Integration time outside gap	s	
GD *1	Derivative time outside gap	s	

*1 You can set GP, GI, and GD only when GE is not "0".
*2 An inverse number of the general proportional band (for example, 50%) is input. When inputting "P=2.00" ("1/2(%)"), the proportional band becomes 50%.
*3 The allowable setting range is "-19999" to "+19999".

Step	Description
3	Click the [Write] button. The gap operation type PID parameter setting of the field positioner is then changed.

9-5-2-4-6: Setting up the valve characterization

Output characteristics to the input signal of the positioner are set.

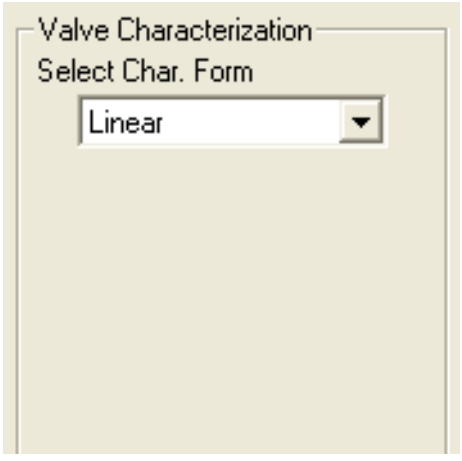


Figure 9-23 "Select Char. Form" setup window (Other than "User Defined")

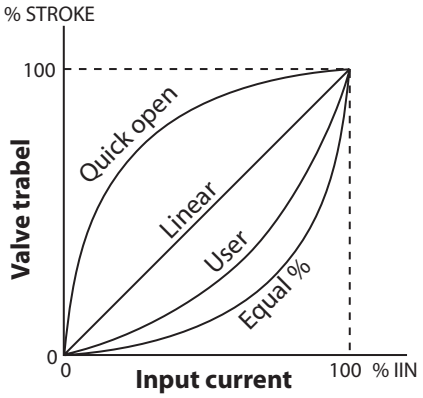
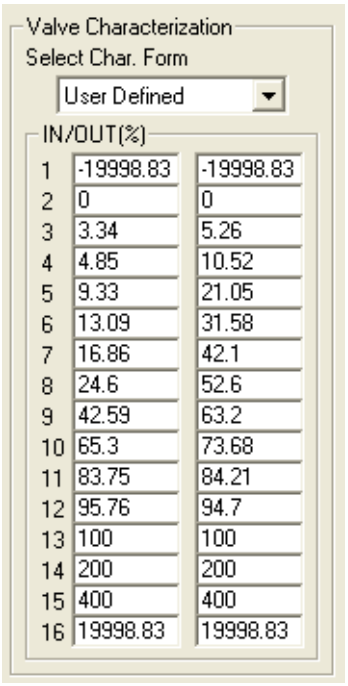


Figure 9-24 Concept of input/output characteristics

In addition to the general items, "Linear", "Equal %", and "Quick Open", you can select "User Defined", allowing you to originally define the input/output characteristics.



1	-19998.83	-19998.83
2	0	0
3	3.34	5.26
4	4.85	10.52
5	9.33	21.05
6	13.09	31.58
7	16.86	42.1
8	24.6	52.6
9	42.59	63.2
10	65.3	73.68
11	83.75	84.21
12	95.76	94.7
13	100	100
14	200	200
15	400	400
16	19998.83	19998.83

Figure 9-25 "Select Char. Form" setup window (For "User Defined")

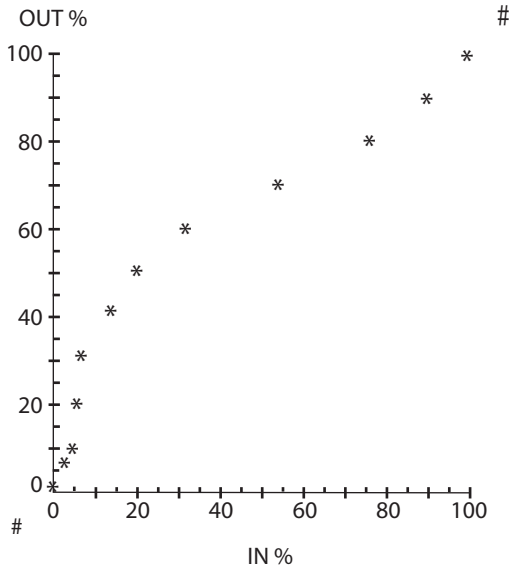


Figure 9-26 Example of user defined characteristics

Setting up the "Select Char. Form"

Step	Description
1	From the pull-down menu, select "Linear", "Equal %", or "Quick Opening" in the "Select Char. Form" field.
2	Click the [Write] button. The "Select Char. Form" setting of the field positioner is then changed.

Setting up the user defined "Select Char. Form"

Step	Description
1	From the pull-down menu, select "User Defined" in the "Select Char. Form" field.
2	The IN/OUT(%) fields are shown. 16 valve travel (OUT%) points to the input signals (IN%) are set in total. Input an appropriate value (%) in each field.
3	Click the [Write] button. The "Select Char. Form" setting of the field positioner is then changed.

Note

- *Always set all 16 points.*
- *Always sequentially set input values in fields P1 to 16 from the smallest value.*
- *Always set the values so that the characteristic does not have any inflection point (increased monotonically).*
- *The allowable setting range is "-19999" to "+19999".*

9-5-2-5: Calibrating the positioner

The calibration of the input signal is a work to make the current signal generated by the controller combined with the standard instrument or positioner matched with the current signal recognized by the positioner.

The zero point and span adjustment is a work to set the fully closed point/fully opened point of the control valve using an angle recognized by the valve travel sensor of the positioner.

Two kinds of setting methods are provided, one is that the angle is increased or decreased and the other is that the control valve is fully closed or fully opened from the outside to recognize each angle.

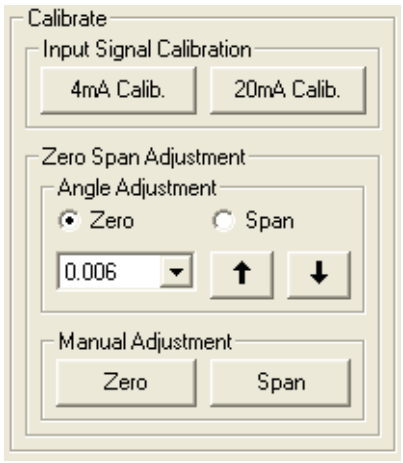


Figure 9-27 "Calibrate" window

9-5-2-5-1: Calibrating the 4mA-signal

Step	Description
1	Click the [4mA Calib.] button.
2	The guidance window will appear. Set the output of the standard instrument or controller to "4mA". When the output is set at "4mA", click the [OK] button in the guidance window.
3	The "Conformation" window will appear. Check again that the output of the standard instrument or controller is set at "4mA", and then click the [OK] button.
4	The "Exit" window will appear. Click the [OK] button to exit the calibration work. After that, check the calibration results by changing the input signal to make sure that the valve travel following the input signal is obtained.

9-5-2-5-2: Calibrating the 20mA-signal

Step	Description
1	Click the [20mA Calib.] button.
2	The guidance window will appear. Set the output of the standard instrument or controller to "20mA". When the output is set at "20mA", click the [OK] button in the guidance window.
3	The "Conformation" window will appear. Check again that the output of the standard instrument or controller is set at "20mA", and then click the [OK] button.
4	The "Exit" window will appear. Click the [OK] button to exit the calibration work. After that, check the calibration results by changing the input signal to make sure that the valve travel following the input signal is obtained.

9-5-2-5-3: Adjusting the zero-point with the angle adjustment

Step	Description
1	Input an input signal value (LRV) to fully close the control valve from the controller to the positioner.
2	Set a value less than "0%" in the "Travel Cut-Off Lo" field.
3	Check on the [Zero] option button in the "Zero Span Adjustment" window.
4	From the pull-down menu, select an operation angle.
5	Adjust the valve travel with the [↑] or [↓] button so that the control valve is located at the fully closed position while referring to the valve travel indication of the field control valve actuator. Clicking the [↑] button will operate the control valve in the opening direction. On the contrary, clicking the [↓] button will operate the control valve in the closing direction.
6	When it is checked visually with the valve travel indication that the control valve is closed fully, the zero-point adjustment is then completed.
7	Return the value in the "Travel Cut-Off Lo" field to its previous value.

9-5-2-5-4: Adjusting the span with the angle adjustment

Step	Description
1	Input an input signal value (URV) to fully open the control valve from the controller to the positioner.
2	Set a value more than "100%" in the "Travel Cut-Off Hi" field.
3	Check on the [Span] option button in the "Zero Span Adjustment" window.
4	From the pull-down menu, select an operation angle.
5	Adjust the valve travel with the [↑] or [↓] button so that the control valve is located at the fully opened position while referring to the valve travel indication of the field control valve actuator. Clicking the [↑] button will operate the control valve in the opening direction. On the contrary, clicking the [↓] button will operate the control valve in the closing direction.
6	When it is checked visually with the valve travel indication that the control valve is opened fully, the span adjustment is then completed.
7	Return the value in the "Travel Cut-Off Hi" field to its previous value.

9-5-2-5-5: Adjusting the zero-point with the manual operation

Step	Description
1	Click the [Zero] button in the "Manual Adjustment" window.
2	The guidance window will appear. By performing the bypass operation of the pressure reducing valve of the field positioner or by operating the manual handle, fully close the control valve while checking the valve travel indication of the actuator. After checking that the control valve is closed fully, click the [OK] button in the guidance window.
3	The "Confirmation" window will appear. After checking that the control valve is closed fully, click the [OK] button.
4	The "Exit" message will appear. Clicking the [OK] button will exit the operation.

9-5-2-5-6: Adjusting the span with the manual operation

Step	Description
1	Click the [Span] button in the "Manual Adjustment" window.
2	The guidance window will appear. By performing the bypass operation of the pressure reducing valve of the field positioner or by operating the manual handle, fully open the control valve while checking the valve travel indication of the actuator. After checking that the control valve is opened fully, click the [OK] button in the guidance window.
3	The "Confirmation" window will appear. After checking that the control valve is opened fully, click the [OK] button.
4	The "Exit" message will appear. Clicking the [OK] button will exit the operation.

9-5-2-6: Running the maintenance mode

In the dummy input signal operation or dummy drive value (EPM drive signal) operation, the signal status inside the positioner is changed to drive the control valve regardless of the input signal actually applied to the positioner.

This operation is effective to locate the problem points if a trouble occurs.

For example, if the positioner and control valve are driven by operating the dummy input signal even though the control valve is not operated corresponding to the input signal, it is judged that the host system from the wiring is faulty.

The user data save and correct reset are operated by the memory for setup data backup inside the positioner.

The user data save is used to write the setting of the current positioner into the backup memory inside the positioner.

With the default setting, the data, which has been set before shipment from the factory, is saved into the backup memory.

The correct reset is used to load the positioner setting data saved in the backup memory to replace the current setting data.

If the user data save was not run in the past, the default value data, which has been set before shipment from the factory, can be loaded.

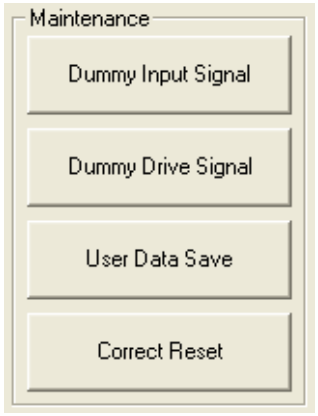
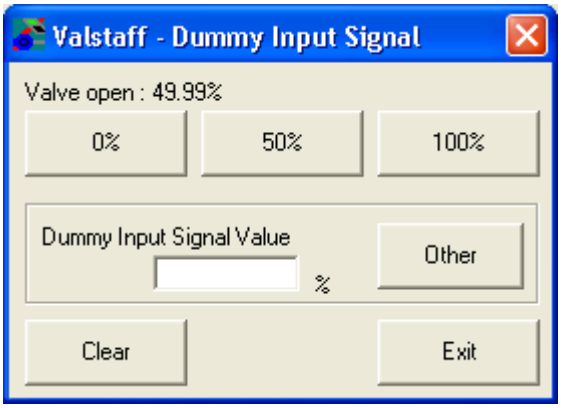
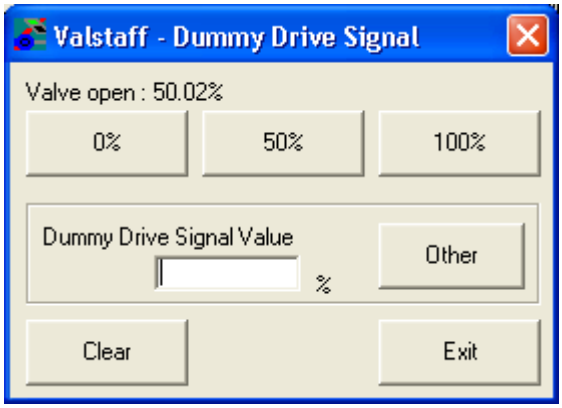


Figure 9-28 "Maintenance" window

9-5-2-6-1: Operating the maintenance mode with the dummy input signal

Step	Description
1	Click the [Dummy Input Signal] button.
2	The "Dummy Input Signal" window shown in Figure 9-29 will appear.  *Figure 9-29 "Dummy Input Signal" window*
3	The dummy input signal is applied. To apply dummy input signals of 0%, 50%, and 100%, click the [0%], [50%], and [100%] buttons, respectively, which are prepared as default switches. To apply other dummy input signal value, input a dummy input signal value (%) in the "Dummy Input Signal Value" field with the ten-key pad, and then click the [Other] button.
4	When the control valve and positioner are in the normal operation status, the valve travel of the control valve is set for the valve travel corresponding to the dummy input signal. Visually check the field control valve and the display value of the valve travel of the field control valve shown at the upper portion of the window.
5	Click the [Clear] button to return the operation status with the dummy input signal to a normal operation status, in which the operation follows the input signal.
6	Clicking the [Exit] button will exit the operation with the dummy input signal.

9-5-2-6-2: Operating the maintenance mode with the dummy drive signal (EPM drive signal)

Step	Description
1	Click the [Dummy Drive Signal] button.
2	The "Dummy Drive Signal" window shown in Figure 9-30 will appear.  *Figure 9-30 "Dummy Drive Signal" window*
3	The dummy drive signal is applied. To apply dummy drive signals of 0%, 50%, and 100%, click the [0%], [50%], and [100%] buttons, respectively, which are prepared as default switches. To apply other dummy drive signal value, input a dummy drive signal value (%) in the "Dummy Drive Signal Value" field with the ten-key pad, and then click the [Other] button.
4	When the control valve and positioner are in the normal operation status, the valve travel of the control valve is set for the valve travel corresponding to the dummy drive signal. Visually check the field control valve and the display value of the valve travel of the field control valve shown at the upper portion of the window. **Note** • *Note that the drive value does not meet the valve travel.*
5	Click the [Clear] button to return the operation status with the dummy drive signal to a normal operation status, in which the operation follows the input signal.
6	Clicking the [Exit] button will exit the operation with the dummy drive signal.

9-5-2-6-3: Operating the user data save

Step	Description
1	Click the [User Data Save] button.
2	The "Conformation" window appears twice. Make sure that the operation does not have any problem, and then click the [OK] button.
3	The "Exit" message window appears. Clicking the [OK] button will save the user data and exit the user data save.

Note • *As the user data save operation is performed, all of data, which has been stored inside the positioner before shipment from the factory, will be lost.*

Before starting the user data save operation, make sure that the user data save operation does not adversely affect the operation.

9-5-2-6-4: Operating the correct reset

Step	Description
1	Click the [Correct Reset] button.
2	The "Conformation" window appears twice. Make sure that the operation does not have any problem, and then click the [OK] button.
3	The "Exit" message window appears. Clicking the [OK] button will save the user data and exit the correct reset.

Note • *As the correct reset operation is performed, the fully closed and fully opened positions of the control valve (zero and span settings) are also changed to the values saved in the backup memory.*

In this case, perform the auto setup or parameter management to set the positioner appropriately.

9-5-3: Operating the parameter management data

The operation of the parameter management data is a utility function that starts the communication with the positioner to display the latest setup information in the "Parameter Management" window or to save the setting information shown in the window into the Valstaff application.

9-5-3-1: Reading the positioner parameters

The communication with the selected field positioner is performed to display the current positioner parameters in the window.

9-5-3-2: Writing the positioner parameters

The setting of the selected field positioner is changed to that shown in the "Parameter Management" window.

9-5-3-3: Loading the backup data

The positioner parameter information, which has been saved into the project, is loaded into the "Parameter Management" window.

9-5-3-4: Saving the backup data

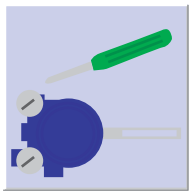
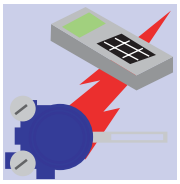
The positioner configuration/calibration information currently being shown in the "Parameter Management" window is saved into the project.

9-5-4: Exiting the parameter management

Clicking the [Close] button in the "Parameter Management" window will exit the parameter management.

9-6: Running the diagnostic parameter management

9-6-1: Selecting a positioner for the diagnostic parameter management

Step	Description
1	 Click the configuration/calibration mode start button in the "Valstaff Start" window.
2	 Click the [Parameter Management] button in the "Positioner Configuration/Calibration" mode start window.

9-6-1-1: Selecting a device from the "Positioner Selection" window

Step	Description
1	Click the device select button on the right of the "Device" field to display the "Positioner Selection" window.
2	Click a desired positioner in the "Positioner Selection" window to select it and click the [OK] button.

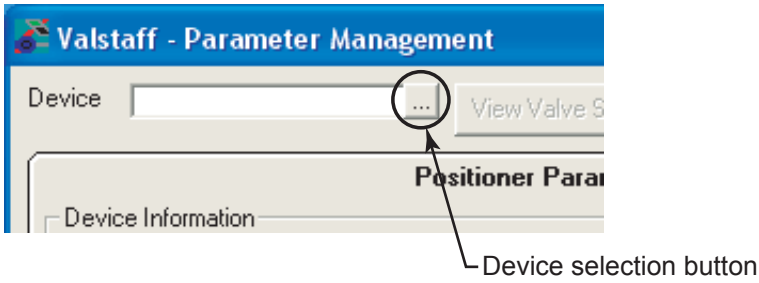


Figure 9-31 Device selection button

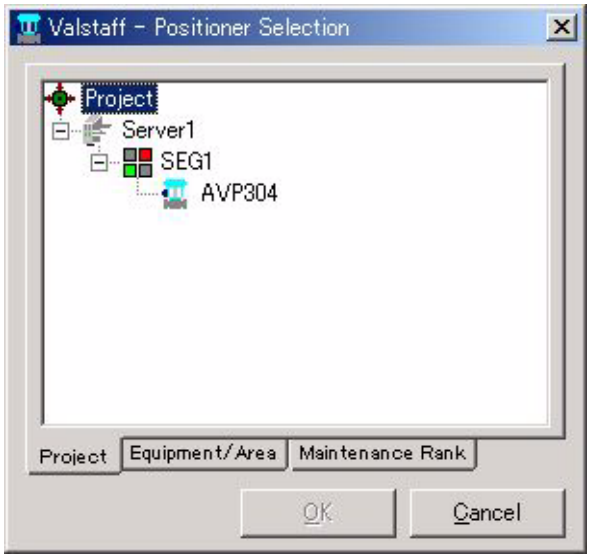


Figure 9-32 "Positioner Selection" window

9-6-2: Running the diagnostic parameter management

Click the [Diagnostic Parameters] tab to display the "Diagnostic Parameter Management" window.

9-6-2-1: Setting up the diagnostic parameter threshold values

Step	Description
1	Input an appropriate value in the "Threshold Value" field of each diagnostic parameter. For details about allowable setting range, refer to Table 9-4.
2	Click the [Write Diag. Data] button to set the threshold values into the field positioner.

9-6-2-2: Setting up the related configuration items of the diagnostic parameters

Step	Description
1	Input an appropriate value in the related configuration item field of each diagnostic parameter. For details about allowable setting range, refer to Table 9-4.
2	Click the [Write Diag Data] button to set the values in the related configuration items into the field positioner.

Note • *Whether or not the alarm of each diagnostic parameter is needed is set in the operation setup mode.*

For details, refer to "6-6-3: Setting up alarms of diagnostic parameters" on page 6-11.

Table 9-4 List of diagnostic parameter threshold values and related configuration items

Diagnostic parameter			Default value	Allowable setting range	Remarks
Total stroke	Threshold		20,000,000%	0 to 1,000,000,000%	
	Related configuration item	Dead band	0.5%	0 to 100%	
Shut-off count	Threshold		100.000 counts	0 to 100,000 counts	
Cycle count	Threshold		100.000 counts	0 to 100,000 counts	
	Related configuration item	Position Hi	95%	$-10 < PositionHi \leq 100, Hi = \infty$	Position Hi > Position Lo
		Position Lo	5%	$-10 \leq PositionLo < 100, Lo = -\infty$	
Max. travel speed	Threshold (+)		1,000%/s	0 to 1,000%/s	
	Threshold (-)		-1,000%/s	-1,000 to 0%/s	
Stick-slip	Threshold (+)		10	1 to 100,000,000	
	Related configuration item	Stick-slip count	3 counts	0 to 100,000 counts	
Internal Temp. alarm	Threshold (Hi)		80°C	$-100 < Hi \leq 200°C$	Hi > Lo
	Threshold (Lo)		40°C	$-100 < Lo \leq 200°C$	
	Related configuration item	Wait time	1 min.	0 to 10,000 min.	
Deviation alarm	Threshold (Hi)		5%	$-100 < Hi \leq 200$ %	Hi > Lo
	Threshold (Lo)		-5%	$-100 < Lo \leq 200$ %	
	Related configuration item	Wait time	10 sec.	0 to 19,800 sec.	
0% travel angle comparison	Threshold (+)		1%	0 to 100%, ∞	Digits after the decimal point are not provided.
	Threshold (-)		-3%	-100 to 0%, -∞	
	Related configuration item	Wait time	40 sec.	0 to 3,600 sec., ∞	
Travel histogram	Segmentation	1	-100%	-100 to 300%	
		2	-5%		
		3	0%		
		4	5%		
		5	10%		
		6	20%		
		7	30%		
		8	40%		
		9	50%		
		10	60%		
		11	70%		
		12	80%		
		13	90%		
		14	95%		
		15	100%		
		16	120%		

9-6-3: Operating the diagnostic parameter management data

The operation of the diagnostic parameter management data is a utility function that starts the communication with the positioner to display the latest setting information or latest values of the diagnostic parameters in the "Diagnostic Parameter Management" window or to save the setting information displayed in the window into the Valstaff application.

9-6-3-1: Reading the latest values of the diagnostic parameters

The communication with the field positioner is performed to read the latest values of the diagnostic parameters. When replacing the positioner, this operation is used to save the diagnostic parameters of the positioner before replacement and to use these parameters for a new positioner.

9-6-3-2: Reading the diagnostic parameters

The communication with the selected positioner is performed to display the threshold values and related configuration items of the current diagnostic parameters in the window.

9-6-3-3: Writing the diagnostic parameters

The threshold values and related configuration items displayed in the "Diagnostic Parameter Management" window are written into the selected positioner.

9-6-3-4: Loading the backup data

The diagnostic parameter information saved in the project is loaded into the "Diagnostic Parameter Management" window.

9-6-3-5: Saving the backup data

The diagnostic parameter information currently displayed in the "Parameter Management" window is saved into the project.

9-6-3-6: Exiting the diagnostic parameter management

Clicking the [Close] button in the "Diagnostic Parameter Management" window will exit the diagnostic parameter management.

9-7: Exiting the positioner configuration/calibration mode

Clicking the [Close] button in the "Positioner Configuration/Calibration" start window will exit the configuration/calibration mode.

Chapter 10: Data Backup & Data Load

10-1: What are data backup & data load?

With these functions, you can back up various kinds of data, which has been collected or saved by the Valstaff application, into external media, or you can load various kinds of data, which was backed up in the past, into the Valstaff application again.

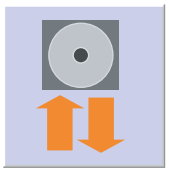
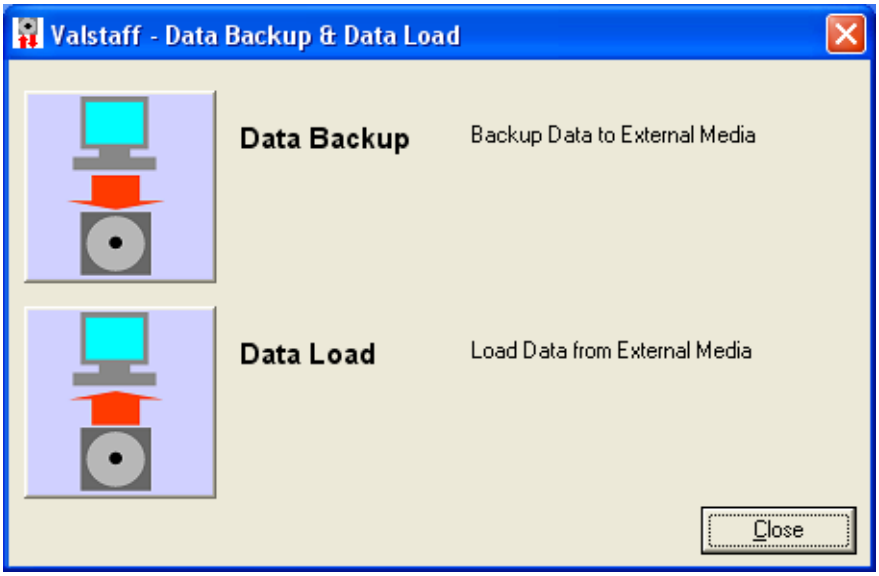
For details about data for the data backup & data load, refer to Table 10-1.

Table 10-1 Data for data backup & data load

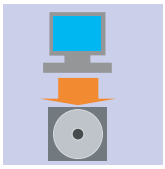
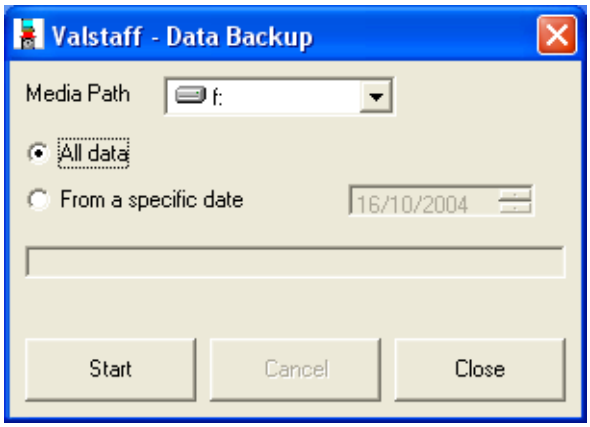
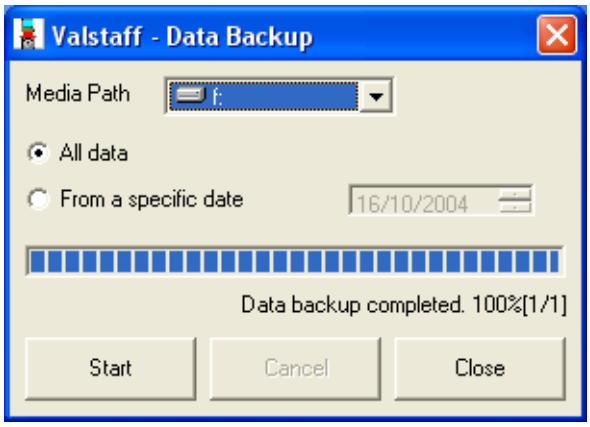
Data backup & data load item		Frequency and object device, etc.
Monitoring mode Diagnostic parameters	Total stroke	Yearly
	Total shut-off count	Yearly
	Cycle count	Yearly
	Travel histogram	Yearly
	Max. travel speed	Yearly
	Stick-slip	Daily
	Trend	Hourly
Positioner configuration/ calibration mode Configuration/calibration data	Auto setup data	By positioner
	Configuration/calibration data	By positioner
Test mode Test data	Test result file	By test
	Test pattern file	
Control valve specification data	Control valve specification information data	By control valve
	Control valve specification information data link file	
Others	Log	Daily
	Project file	By project
	Status summary file	By project
	Commissioning file	

Note *Use a USB type portable HDD for the data backup/data load.*

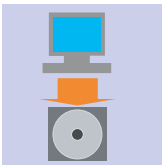
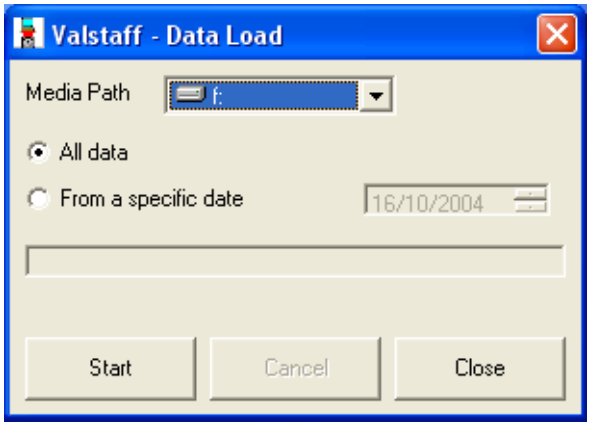
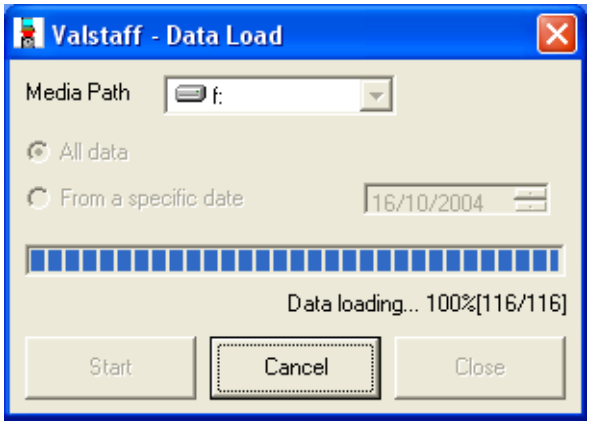
10-2: Starting up the data backup & data load

Step	Description
1	 Click the [Data Backup & Data Load] button in the Valstaff-starting-up window. When the operation to back up/load data is started up, the operation to collect data is stopped.
2	The "Data Backup & Data Load" window will appear.  *Figure 10-1 "Data Backup & Data Load" window*

10-3: Running the data backup

Step	Description
1	 Click the [Data Backup] button in the "Data Backup & Data Load" window.
2	The "Data Backup" window shown in Figure 10-2 will appear.  *Figure 10-2 "Data Backup" window*
3	Select a media drive, into which the data is backed up. From the pull-down menu of the "Media Path" field, select a backup destination media.
4	To back up all of data, check on the [All data] option button. To back up only the data, which has been updated since the specific date, check on the [From a specific date] option button and specify a start date.
5	When clicking the [Start] button, the confirmation message will appear. After checking the drive and backup method, click the [OK] button to start the data backup.  *Figure 10-3 "Data Backup" in progress window*
6	After the backup has been completed, the window is returned to the "Data Backup & Data Load" window, and then the backup process is exited.

10-4: Running the data load

Step	Description
1	 Click the [Data Load] button in the "Data Backup & Data Load" window.
2	The "Data Load" window shown in Figure 10-4 will appear.  *Figure 10-4 "Data Load" window*
3	Select a media drive, from which the data is loaded. From the pull-down menu of the "Media Path" field, select a load destination media.
4	To load all of data, check on the [All data] option button. To load only the data, which has been updated since the specific date, check on the [From a specific date] option button and specify a start date.
5	When clicking the [Start] button, the confirmation message will appear. After checking the drive and load method, click the [OK] button to start the data load.  *Figure 10-5 "Data Load" in progress window*
6	After the load has been completed, the window is returned to the "Data Backup & Data Load" window, and then the load process is exited.

Note *When loading the data, the existing data stored in the Valstaff application is deleted and the data backed up in the media is loaded into the Valstaff application.*

Therefore, you must consider the data load operation as an emergency process to restore as much data as possible if the hard disk drive becomes defective.

10-5: Exiting the data backup & data load

Clicking the [Close] button in the "Data Backup" and "Data Load" windows will exit the data backup and data load, respectively.

Chapter 11: Appendix

11-1: Message lists

Table 11-1 Messages in the monitoring mode

Message No.	English message	Message classification	Meaning
2001	Total Stroke Notice	Messages related to diagnostic parameters	
2002	Cut-Off Lo Count Notice		
2003	Limit Cycle Count Notice		
2004	Max. Speed Notice (+)		
2005	Max. Speed Notice (-)		
2006	Stick-Slip Notice		
2007	Deviation Alarm (Hi)		
2008	Deviation Alarm (Lo)		
2009	Temperature Alarm (Hi)		
2010	Temperature Alarm (Lo)		
2011	Shut Error (+)		
2012	Shut Error (-)		
2013	Stick-Slip (Pre Alarm)		
1001	Valve Travel Detector Error	Positioner self-diagnosis alarms	VTD (valve travel sensor) error
1002	Input signal too low		Input signal is the specified value or less.
1003	Non-Volatile Memory Error		Non-volatile memory error
1004	RAM Error		RAM error
1005	ROM Error		ROM error
1006	A/D Conversion Module Error		A/D conversion module error
1010	External zero/span adjustment is being made.		External zero span is running.
1011	Electro-pneumatic module is outside normal range.		EPM drive signal is beyond the normal range.
1012	positioner is forced fully shut-off.		Forced fully close or forced fully open is running.
1014	Abnormal Environmental Temperature.		Ambient temperature is the specified value or more.
1015	Dummy Input Signal Operation		Dummy input signal is being operated.
1016	Dummy Drive Signal Operation		Dummy drive signal is being operated.
1018	Configuration data is reset at the time of shipment.		Correct reset is implemented.

Table 11-2 Messages in the test mode

Message No.	English message	Event	Meaning
4000	Start tests.	Messages related to the test	Start tests.
4001	Tests finished.		Tests finished.
4002	Tests failed.		
4003	Test currently running has been terminated.		
4004	Start tests.		
4005	Tests finished.		
4006	Test currently running has been terminated.		
4007	Error has occurred.		
4008	Data overflow.		Data overflows from the test result data buffer inside the positioner.
4009	Wrong test pattern inputted.		Illegal test pattern is made.
4010	Unable to obtain end flag.		End flag is not received at the completion of the test.
4011	Communication error occurred during test.		Error occurs when the test data is received from the positioner.
4012	Failed to load pattern file.		
4013	Time-out has occurred.		Valve setting is not completed within the end time of the specified step.
4014	File not exist.		Test pattern file does not exist.
4015	Valve not exist.		Control valve to be tested does not exist in the project.
4016	HDD does not have enough free space.		
4020	Successfully changed device mode.		
4021	Failed to change device mode.		
4022	Successfully read Device Information.		
4023	Failed to read Auto Device Information.		
4030	Pattern file saved.		
4031	Failed to save pattern file.		
4032	Pattern file deleted.		
4033	Schedule file save.		
4034	Failed to save schedule file.		
4035	Schedule file deleted.		

Table 11-3 Messages in the positioner configuration/calibration mode

Message No.	English message	Event	Meaning
4100	Start Auto Setup.	Messages related to the auto setup	
4101	Auto Setup completed.		
4102	Successfully read Auto Setup parameter.		
4103	Failed to read Auto Setup parameter.		
4104	Successfully read Device Information.		
4105	Failed to read Auto Device Information.		
4106	Auto Setup canceled.		
4110	Successfully enabled Diagnosis.		
4111	Failed to enable Diagnosis.		
4120	Auto Setup mode started.		
4121	Auto Setup mode finished.		
4122	Successfully changed to MONITORING MODE.		
4123	Failed to change to MONITORING MODE.		
4124	Successfully changed to USER MODE.		
4125	Failed to change to USER MODE.		
4200	Parameter management mode started.	Messages related to the parameter management	
4201	Parameter management mode finished.		
4202	Successfully changed modes.		
4203	Failed to change modes.		
4204	Positioner parameter reading started.		
4205	Successfully read positioner parameters.		
4206	Failed to read positioner parameters.		
4207	Writing positioner parameters.		
4208	Successfully wrote positioner parameters.		
4209	Failed to write positioner parameters.		
4210	Reading Diagnostic parameters.		
4211	Successfully read Diagnostic parameters.		
4212	Failed to read Diagnostic parameters.		
4213	Writing Diagnostic parameters.		
4214	Successfully wrote Diagnostic parameters.		
4215	Failed to write Diagnostic parameters.		
4216	Adjustment successful.		
4217	Adjustment failed.		
4218	Maintenance started.		
4219	Maintenance finished.		
4220	Maintenance successful.		
4221	Maintenance failed.		
4222	File load completed.		
4223	Failed to load files.		
4224	File save completed.		
4225	Failed to save files.		
4226	An error occurred while reading.		

Table 11-4 Messages in the operation setup/PD tag commissioning

Message No.	English message	Event	Meaning
4300	Commissioning result is no good.	Messages related to the PD tag commissioning	PD tag commissioning results are determined as NG.
4301	Unexpected valve may run with this command.		As a result of the HART tag commissioning, the tag registered in the Valstaff is different from the tag registered in the positioner.Therefore, the valve to be operated becomes different.
4302	Proceed?		
4303	PD Tag Commissioning has not been executed.		PD Tag Commissioning has not been executed.
4304	Device ID differs from that of the PD TAG Commission executed.		Tag registered in the positioner may be changed after completion of the PD tag commissioning.
4305	Results from the safety check are no good.		Results of the PD tag commissioning are determined as NG.
4306	Results from the safety check are no good, but user has chosen to continue.		Results of the PD tag commissioning are determined as NG. Even though the results are not good, the operation is continued based on the user's judgment.
4307	PD Tag Commissioning has not been executed.		
4308	PD Tag Commissioning result is no good.		
4309	Device ID		
4310	Manufacturer ID		
4311	Device Type		
4312	PD Tag		
4313	Software Version		
4314	Successfully edited tag name.		
4315	Failed to edit tag name.		

Table 11-5 Messages in the data backup & data load

Message No.	English message	Event	Meaning
4400	File save completed.	Messages related to the data backup & data load	
4401	Failed to save files.		
4402	Download started.		
4403	Download complete.		
4404	Download failed.		
4405	Download canceled.		
4406	Apply to project		
4407	Clear from project.		
4500	Data backup started.		
4501	Data backup completed.		
4502	Data backup canceled.		
4503	Data back failed.		
4504	All data has been backed up.		
4505	Data load started.		
4506	Data load completed.		
4507	Data load canceled.		
4508	Data load failed.		
4509	All data has been loaded.		

Table 11-6 Other messages

Message No.	English message	Event	Meaning
3001	Successfully wrote Total Stroke parameter	Others	
3002	Failed to write Total Stroke parameter		
3003	Failed to read Total Stroke parameter		
3011	Successfully wrote Cut-Off Lo Count		
3012	Failed to write Cut-Off Lo Count		
3013	Failed to read Cut-Off Lo Count		
3021	Successfully wrote Limit Cycle Count		
3022	Failed to write Limit Cycle Count		
3023	Failed to read Limit Cycle Count		
3031	Successfully wrote Travel Rate value		
3032	Failed to write Travel Rate value		
3033	Failed to read Travel Rate value		
3034	Failed to clear Travel Rate value		
3041	Successfully wrote Max. Speed		
3042	Failed to write Max. Speed		
3043	Failed to read Max. Speed		
3044	Failed to clear Max. Speed		
3051	Successfully wrote Stick-Slip parameters		
3052	Failed to write Stick-Slip parameters		
3053	Failed to read Stick-Slip parameters		
3054	Stick-Slip Count Reset		
3061	Successfully wrote Trend parameters		
3062	Failed to write Trend parameters		
3063	Failed to read Trend parameters		
3071	Successfully wrote Diagnostic parameters		
3072	Failed to write Diagnostic parameters		
3073	Failed to read Diagnostic parameters		
3074	Failed to read device information		
3075	Failed to read S/W version of device		
3076	Failed to read tag name		
3077	Failed to write tag name		
3100	Communication Error		
3111	Successfully wrote positioner mode		
3112	Failed to write positioner mode		
3113	Failed to read positioner mode		
3114	In Service		
3115	Out of Service		

(Continued)

Table 11-6 Other messages

Message No.	English message	Event	Meaning
3120	Successfully wrote Non-Volatile Memory	Others	
3121	Failed to write Non-Volatile Memory		
3130	Failed to read positioner status		
3131	Positioner is in normal condition.		
3140	Failed to save Cut-Off Lo Count data		
3141	Failed to save Limit Cycle Count data		
3142	Failed to save Max. Speed data		
3143	Failed to save Stick-Slip data		
3144	Failed to save Total Stroke data		
3145	Failed to save Travel Rate data		
3146	Failed to save Trend data		
3147	Failed to save Stick-Slip Pre Alarm data		
3148	Failed to save Stick-Slip reset log		
3200	Alarm acknowledged.		
3210			(User message display)
3300	Error reset.		
3400	HMI configuration changed.		
3401	Successfully save Diagnostic parameter history.		
3402	Failed to save Diagnostic parameter history.		
3500	Failed to load project file.		
3501	Project file parse error.		
3502	Project file unexpected error.		
3503	Cannot read positioner default configuration file.		
3504	Loading log files...		
3505	Stop monitoring...		
3506	Loading project...		
3507	Reading...		
3508	Writing...		
3510	Start monitoring		
3511	End monitoring		
3512	Unsupported project.		Project having unsupported version
3520	OPC Server is not active.		OPC server is not started up.
3521	FF OPC Server setting is incorrect.		Network setting of the FF OPC Server is different from the project.
3522	Cannot communicate with FF OPC Server .		Network setting of the FF OPC Server is different from the project.

(Continued)

Table 11-6 Other messages

Message No.	English message	Event	Meaning
3530	Monitoring window opened.	Others	
3531	Monitoring window closed.		
3536	Test Mode started.		
3537	Test Mode closed.		
3538	Operation Setup mode started.		
3539	Operation Setup mode closed.		
3550	Language Changed.		
3551	Project file has been changed.		
3552	Failed to save project file.		
3553	Message Settings have been changed.		
3554	Failed to save log file of message settings.		
3600	*** System start up ***		
3601	*** System shut down ***		
3602	Open object		
3603	Close object		
3604	*** System fatal error ***		Error occurs when the data is received. (The number of data is insufficient.)
3605	Project includes duplicated tag names.		Project cannot be opened if the tag name is duplicated.
3606	HDD does not have enough free space.		
3610	Password changed.		
3623	Connecting...		
3700	OS Time has changed.		
3800	Diagnostic Data Error: Total Stroke		
3801	Diagnostic Data Error: Cut Off Lo Count		
3802	Diagnostic Data Error: Limit Cycle Count		
3803	Diagnostic Data Error: Travel Rate		
3804	Diagnostic Data Error: Max. Speed		
3805	Diagnostic Data Error: Stick-Slip		
3806	Diagnostic Data Error: Trend		

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