# Pro-face

**2 Way Communicator**

# Pro-Server

with Pro-Studio for Windows

# Operation Manual

# PREFACE

Thank you for purchasing Digital's "Pro-Server with Pro-Studio for Windows" for use with Digital's GP series touch panels.

To ensure correct use of this product, be sure to carefully read the manuals included and keep them nearby so that you can refer to them whenever required.

## NOTE

(1) The copyrights to all programs and manuals included in the "Pro-Server with Pro-Studio for Windows" (hereinafter referred to as "this product") are reserved by the Digital Electronics Corporation. Digital  grants the use of this product to its users as described in the "Software Operating and License Conditions" section. Any actions violating the above-mentioned conditions are prohibited by both Japanese and foreign regulations.

(2) The contents of this manual have been thoroughly checked. However, if you should find any errors or omissions in this manual, please contact your local representative and inform them of your findings.

(3) Please be aware that Digital Electronics Corporation shall not be held liable by the user for any damages, losses, or third party claims arising from the uses of this product.

(4) Differences may occur between the descriptions found in this manual and the actual functioning of this product. The latest information about this product is provided in the accompanying data files (i.e. Readme.txt files, etc.) and/or separate documents. Please consult these sources as well as this manual prior to use.

(5) Even though the information contained in and displayed by this product may be related to intangible or intellectual properties of the Digital Electronics Corporation or third parties, the Digital Electronics Corporation shall not warrant or grant the use of said properties to any users and/or other third parties.

For the rights to trademarks and trade names, see "TRADEMARK RIGHTS"

# TRADEMARK RIGHTS

The company names and product names used in this manual are the trade names, trademarks (including registered trademarks), and service marks of their respective companies.

This product omits individual descriptions of each of these rights.

| Trademark/Tradename | Right Holder |
|---|---|
| Microsoft, MS-DOS, Windows, Windows 95, Windows 98, Windows 98 SE, Windows Me, Windows NT, Windows 2000, Windows Explorer, ActiveX | Microsoft, U.S. |
| Intel, Pentium, MMX | Intel, U.S |
| Ethernet | Xerox, U.S. |
| IBM, VGA, PC/AT, OS/2 | IBM, U.S. |
| FIX32, FIX-MMI, FIX-FA, ifix | Intellution, U.S. |

The following terms used in this manual differ from the above mentioned formal trade names and trademarks.

| Term used in this manual | Formal Trade Name or Trademark |
|---|---|
| Windows 95 | Microsoft® Windows® 95 Operating System |
| Windows 98 | Microsoft® Windows® 98 Operating System |
| Windows 98 SE | Microsoft® Windows® 98 SE Operating System |
| Winoows Me | Microsoft® Windows® Me Operating System |
| Windows NT | Microsoft® Windows® NT Operating System |
| Windows 2000 | Microsoft® Windows® 2000 Operating System |

# HOW TO USE THIS MANUAL

## Structure of This Manual

This manual, titled "Pro-Server with Pro-Studio for Windows Operation Manual" describes how to use the "Pro-Server with Pro-Studio for Windows" software, hereinafter referred to as "this software"

The following table describes the GP-PRO/PBIII for Windows software's manuals, which are often referred to in this manual.

| Vol. 1 | Operation Manual | Describes the procedures for the installation and operation of GP-PRO/PBIII for Windows. |
| Vol. 2 | Tag Reference Manual | Includes detailed descriptions on the "tags" used to specify the functions used on the GP's screen. |
| Vol. 3 | Parts List | Describes the library of pre-made Parts included with this product as well as a variety of diagram symbols. |
| Vol. 4 | PLC Connection Manual | Describes the procedures to create connections between GP series units and other manufacture PLCs. |

In addition to this manual, information on additional/modified functions may be provided as data files.

# TABLE OF CONTENTS

# Chapter 3  Operation

# Chapter 4  Action Items

# Chapter 10 OPC Server

# Appendices

# MANUAL SYMBOLS AND TERMINOLOGY

This manual uses the following symbols and terminology.

If you have any questions about the contents of this manual, please contact your local GP distributor.

Also, If you have any question about your personal computer or Windows, please contact your local distributor or manufacturer.

## Safety Symbols and Terms

This manual uses the following symbols and terms for important information related to the correct and safe operation of this product.

| Symbol | Description |
|---|---|
| ⚠ Warning | Incorrect operation resulting from negligence of this instruction may cause death or serous injury. |
| ⚠ Caution | Incorrect operation resulting from negligence of this instruction may cause injury or damage to equipment. |
| ❗ | Indicates Instructions/Procedures that must be performed to ensure correct product use. |
| 🚫 | Indicates Actions/Procedures that should not be performed. |

## General Information Symbols and Terms

This manual uses the following symbols and term for general information.

| Symbol | Description |
|---|---|
| MEMO | Provides hints on correct use, or supplementary information. |
| Reference → | Indicates (manual name, page number) related information. |
| Pro-Server with Pro-Studio for Windows | Downloading Ethernet (2-Way Driver) information to the GP allows the Host PC to use the network to send and receive data from a PLC, via the GP. |
| Screen editor software | Indicates "GP-PRO/PBIII for Windows". |
| PLC | Acronym for Programmable Logic Controller. |

# PRECAUTIONS

## Product Usage Precautions

To prevent program malfunctions or accidents, be sure to observe the following instructions:

## ⚠ Warning

🛑 Touch panel switches should NOT be used for a device's Emergency Stop switch. Generally speaking, all industrial machinery/systems must be equipped with a mechanical emergency stop switch that can only be operated by people. Also, for other kinds of systems, similar mechanical switches must be provided to ensure safe operation of that system.

## ⚠ Cautions

🚫 • Do not turn off your personal computer's power switch during the execution of a program.

• Do not change the contents of this product's project files using the Text Editor software.

## ■ CD-ROM Usage Precautions

To prevent CD-ROM damage or malfunctions, please observe the following instructions:

• Do not remove a CD-ROM disk from the CD-ROM drive while the operation lamp is lit.

• Do not touch the CD-ROM recording surface.

• Do not store the CD-ROM disk in a place where it may be exposed to extremely high or low temperatures, high humidity, or dust.

# PACKAGE CONTENTS

The Pro-Server with Pro-Studio for Windows 4.0 package includes the following items. Check that there are no missing items before using the software.

■ Pro-Server with Pro-Studio for Windows 4.0

Application CD-ROM



■ Packing List (Japanese/English)

| (Front) | (Rear) |
|---------|--------|
| Japanese | English |
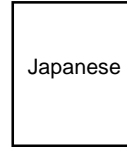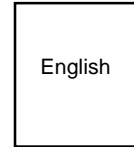
■ Installation Guide (Japanese/English)

| Japanese | English | Pro-face |
|----------|---------|----------|
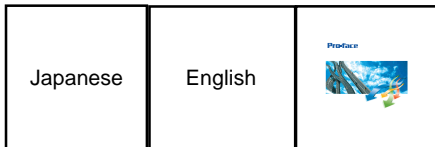
■ User Registration (Japanese/English)

| Japanese | English |
|----------|---------|
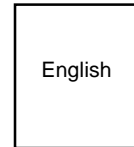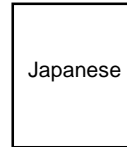
# OPERATING ENVIRONMENT

■ Pro-Server with Pro-Studio for Windows

| Item | Specification | Remark |
|---|---|---|
| Personal Computer | IBM Compatible | Pentium 133MHz or faster processor |
| Display | VGA (640 x 480) or higher | 64 bit color or higher |
| Hard Disk Space Requirements | 20 MB or more | 30 MB or more is recommended |
| Memory Requirements | 32 MB or more | 128 MB or more is recommended |
| CD-ROM Drive | Windows compatible | |
| OS Requirements | Windows 95 (English or Japanese) | OSR2 or higher |
| | Windows 98 (English or Japanese) | |
| | Windows Me (English or Japanese) | |
| | Windows NT 4.0 (English or Japanese) | Service Pack 3.0 or higher |
| | Windows 2000 (English or Japanese) | |
| Related software | Microsoft Access 97 or later | When using action contents |
| | Microsoft Excel 97 or later | |
| | Browser (IE V4.0 or later) | |
| Supported languages | Japanese, English | |
| Printer | Any printers that your OS supports | |
| Mouse | Windows compatible | Mouse is required for operation. |
| Ethernet Board | 10BASE-2/5/T, 100BASE-T | |
| Network Configuration | TCP/IP Protocol∗2 | Set up from Control Panel. |
| Additional Items | Ethernet Hub, Ethernet cables, etc. | User supplied |

The following operating environment is required when you use the OPC Server.

| Item | Specification | Remark |
|---|---|---|
| OS Requirements | Windows NT 4.0 | Service Pack 3.0 or higher |
| | Windows 2000 | |
| Hard Disk Space | 100 MB or more | |
| Memory | 64 MB or more | |

**MEMO**
- Depending on the type of Ethernet hub used, Pro-Server may be unable to transmit data. Be sure to test and confirm the compatibility of Pro-Server with your Ethernet network prior to installing a complete Pro-Server with Pro-Studio for Windows system.
- When using a Switching Hub, if the GP and the Switch Hub are started at the same time, a communication error can occur. If the Switching Hub cannot be started first, Set the GP's [START TIME] to slow the start of the GP.

∗1 You can not use this feature with the OPC Server.

∗2 Until the TCP/IP protocol is set, Pro-Server with Pro-Studio cannot be used.

When installing and using the GP-Viewer, the following system environment is required.

| Related Software | Microsoft Internet Explorer Ver. 5.0 or higher | Includes JavaVM (Ver.5.0.3176 or higher) |
|---|---|---|

**MEMO**

- When using Microsoft Internet Explorer Ver. 5.0, some of the features may not display as desired. To solve this problem, please use Microsoft Internet Explorer Ver. 5.01 or later, in combination with the latest version of Microsoft Java VM. The latest versions of Microsoft Internet Explorer and Microsoft Java VM can be downloaded from Microsoft's homepage.

- When using GP-Viewer on a PC with GP-Web installed, please be sure the version of GP-Web is 1.5 or later.

## ■ 2-Way Driver

Hardware

| Series Name | | | Product Name | Model | Built-in Ethernet Unit | External Ethernet Unit | Com-ment |
|---|---|---|---|---|---|---|---|
| GP77R series | GP-377R series | GP-377RT | GP377R-TC11-24V | | X | ○ | *1 |
| | | | GP377R-TC41-24V | | | | |
| | GP-477R series | GP-477RE | GP477R-EG11 | | | | |
| | | | GP477R-EG41-24VP | | | | |
| | GP-577R series | GP-577RS | GP577R-SC11 | | | | |
| | | | GP577R-SC41-24VP | | | | |
| | | GP-577RT | GP577R-TC11 | | | | |
| | | | GP577R-TC41-24VP | | | | |
| GP2000 series | GP-2300 series | GP-2300L | GP2300-LG41-24V | | ○ | X | − |
| | | GP-2300T | GP2300-TC41-24V | | | | |
| | GP-2400 series | GP-2400T | GP2400-TC41-24V | | | | |
| | GP-2500 series*1 | GP-2500L | GP2500-LG41-24V | | ○ | ○ | *2 |
| | | GP-2500S | GP2500-SC41-24V | | | | |
| | | GP-2500T | GP2500-TC11 | | | | |
| | | | GP2500-TC41-24V | | | | |
| | GP-2501 series | GP-2501S | GP2501-SC11 | | X | | |
| | | GP-2501T | GP2501-TC11 | | | | |
| | GP-2600 series*1 | GP-2600T | GP2600-TC11 | | ○ | | |
| | | | GP2600-TC41-24V | | | | |
| GLC2000 series | GLC2300 series | GLC2300L | GLC2300-LG41-24V | | ○ | X | − |
| | | GLC2300T | GLC2300-TC41-24V | | | | |
| | GLC2400 series | GLC2400T | GLC2400-TC41-24V | | | | |
| | GLC2600 series*1 | GLC2600T | GLC2600-TC41-24V | | ○ | ○ | *2 |
| IT series | IT2400 series | IT2400 TypeA | IT2400-TC41-GP | | ○ | X | − |
| | | | IT2400-TC41-GP200V | | | | |
| | | IT2400 TypeB | IT2400-TC41-GLC | | | | |
| | | | IT2400-TC41-GLC200V | | | | |

> **MEMO**
>
> The Expansion Ethernet unit is required to use the 2-Way Driver with a GP77R series or a GP2501 series unit. Therefore, you cannot use the expansion units required protocol.
> You cannot use both the 2-Way Driver and the Ethernet protocol together with a GP77R series on a GP2501 series unit.
> Reference → "Pro-Server compatible PLC Vendors and Models"
> Settings used will differ (IP Addreess Port No., etc.), depending on the type of Ethernet unit used, i.e. built-in type or expantion unit type.
> Reference → "Using an Ethernet protocol with the 2-Way Driver"

*1 An expansion Ethernet unit (sold separately) is required.

*2 An expansion Ether net (sold separately) unit and a bus conversion unit (sold separately) are required to use a external Ethernet unit.

■ Software

GP-PRO/PB III for Windows (Screen creation software)

| Screen Creation Software | Language | Software Version | System Version | | | |
|---|---|---|---|---|---|---|
| | | | GP70 | GP77R | GP377R | GP2000 |
| GP-PRO/PB III for Windows | Japanese | Ver. 3.0 | Ver. 1.51 | Ver. 2.40 | - | - |
| | ML | Ver. 3.0 | Ver. 1.51 | Ver. 2.40a | - | - |
| | Japanese | Ver. 4.0 | Ver. 1.54 | Ver. 2.60 | Ver. 2.60 | - |
| | Japanese/ML | Ver. 5.0 | Ver. 1.55 | Ver. 2.64 | Ver. 2.64 | Ver. 3.10 |
| | Japanese/ML | Ver. 6.0 | Ver. 1.55 | Ver. 2.68 | Ver. 2.68 | Ver. 3.30 |

The following restrictions apply to Pro-Server and any related software.

Pro-Server and GP-PRO/PB III for Windows

| Feature | Compatibility Requirement |
|---|---|
| GP screen capture (capturing JPEG files) | GP-PRO/PB III for Windows V6.0 or later |
| LS area extension | GP-PRO/PB III for Windows V6.0 or later |
| Online screen upload | GP-PRO/PB III for Windows V6.0 or later |

■ Pro-Server compatible PLC Vendors and Models

| Vendor Name | Device/PLC Type (in GP-PRO/PBIII for Windows) | GP/GLC Series | | | Comment |
|---|---|---|---|---|---|
| | | GP77R GP-2501 | GP-2000 GLC-2000 | GP-2300 GLC-2300 | |
| Mitsubishi Electric | MITSUBISHI MELSEC-AnN(LINK) | O | O | O | |
| | MITSUBISHI MELSEC-AnN(CPU) | O | O | O | |
| | MITSUBISHI MELSEC-AnA(LINK) | O | O | O | |
| | MITSUBISHI MELSEC-AnA(CPU) | O | O | O | |
| | MITSUBISHI MELSEC-A(JPCN1) | X | X | O | *1 |
| | MITSUBISHI MELSEC-A(ETHER) | X | O | O | *2 |
| | MITSUBISHI MELSEC-FX(CPU) | O | O | O | |
| | MITSUBISHI MELSEC-FX2(LINK) | O | O | O | |
| | MITSUBISHI MELSEC-QnA(LINK) | O | O | O | |
| | MITSUBISHI MELSEC-QnA(CPU) | O | O | O | |
| | MITSUBISHI MELSEC-Q(CPU) | O | O | O | |
| | MITSUBISHI MELSEC-Q(ETHER) | X | O | O | *2 |
| | MITSUBISHI MELSEC NET/10 | X | X | ◆ | *1 *3 |
| | MITSUBISHI FREQROL SERIES | O | O | O | |
| Omron | OMRON SYSMAC-C SERIES | O | O | O | |
| | OMRON SYSMAC-CV SERIES | O | O | O | |
| | OMRON SYSMAC-CS1 SERIES | O | O | O | |
| | OMRON SYSMAC-CS1(ETHER) | X | X | X | *1 *3 |
| | OMRON THERMAC NEO SERIES | O | O | O | |
| Sharp | SHARP NewSatellite JW Series | O | O | O | |
| Yokogawa Electric | YOKOGAWA FACTORY ACE 1:1 Comm. | O | O | O | |
| | YOKOGAWA FACTORY ACE 1:n Comm. | O | O | O | |
| | YOKOGAWA FA-M3 (ETHER) | X | O | O | *2 |
| Fuji Electric | FUJI MICRES-F SERIES | O | O | O | |
| | FUJI MICREX-F SERIES (FLT) | O | O | O | |
| | FUJI MICREX-F SERIES (T LINK) | X | X | O | *1 |
| | FLEX-PC SERIES (LINK) | O | O | O | |
| | FLEX-PC SERIES (CPU) | O | O | O | |
| | FUJI INVETER | O | O | O | |
| | FUJI TEMPERATURE PXR | O | O | O | |
| Toyoa Machine Works | TOYOTA TOYOPUC-PC2 SERIES | O | O | O | |
| | TOYOTA TOYOPUC-PC2 1:n Comm. | O | O | O | |
| | TOYOTA TOYOPUC-PC3J SERIES | O | O | O | |
| | TOYOTA TOYOPUC-PC3J 1:n Comm. | O | O | O | |
| Yasukawa Electric | YASKAWA Memocon-SC SERIES | O | O | O | |
| | YASKAWA GL120/130 SERIES | O | O | O | |
| | YASKAWA PROGIC8 SERIES | O | O | O | |
| | YASKAWA GP9200SH SERIES | O | O | O | |
| Hitachi | HITACHI HIDIC-S10$f¿$SERIES | O | O | O | |
| | HITACHI HIDIC-S10$f¿$(JPCN1) | X | X | O | *1 |
| | HITACHI HIDIC-H SERIES | O | O | O | |
| | HITACHI HIDIC-H2 SERIES | O | O | O | |
| | HITACHI HIZAC-EC SERIES | O | O | O | |
| Toshiba | TOSHIBA PROSEC-EX2000 SERIES | O | O | O | |
| | TOSHIBA PROSEC-T SERIES | O | O | O | |
| | TOSHIBA PROSEC-T(ETHER) | X | O | O | *2 |
| Matsushita Electric Works | MATSUSHITA MEWNET-FP SERIES | O | O | O | |
| Koyo Electronics Industries | KOYO KOSTAC-SG8 SERIES | O | O | O | |
| | KOYO KOSTAC-SR21/22 SERIES | O | O | O | |
| | KOYO DL-305 SERIES | O | O | O | |
| | KOYO DL-205/405 SERIES | O | O | O | |

| Vendor Name | Device/PLC Type (in GP-PRO/PBIII for Windows) | GP/GLC Series | | | Comment |
|---|---|---|---|---|---|
| | | GP77R GP-2501 | GP-2000 GLC-2000 | GP-2300 GLC-2300 | |
| Toshiba Machine | TOSHIBA TC200 SERIES | O | O | O | |
| | TOSHIBA TC200-S SERIES | O | O | O | |
| GE FANUC Automation | GE FANUC SERIES 90SNP-X | O | O | O | |
| | GE FANUC SERIES 90-30/70SNP | O | O | O | |
| FANUC | FANUC Power Mate SERIES | O | O | O | |
| IDEC Izumi | IZUMI IDEC 1 | O | O | O | |
| | IZUMI IDEC 2 | O | O | O | |
| | IZUMI IDEC 3 | O | O | O | |
| | IZUMI MICRO3 | O | O | O | |
| | IZUMI FC3/FC4A SERIES | O | O | O | |
| Siemens AG | SIEMENS S5 90-115 SERIES | O | O | O | |
| | SIEMENS S5 135-155 SERIES | O | O | O | |
| | SIEMENS S5 3964R Protocol | O | O | O | |
| | PROFIBUS-DP | X | X | O | *1 |
| | SIEMENS S7-200PPI | O | O | O | |
| | SIMATIC S7-300/400 via MPI | O | O | O | |
| | SIMATIC S7 via 3964/RK512 | O | O | O | |
| Rockwell (Allen Bradley) | Interbus-SLAVE | X | X | O | *1 |
| | SIMATIC 545/555 CPU | O | O | O | |
| | Allen Bradley PLC-5 SERIES | O | O | O | |
| | Allen Bradley SLC500 SERIES | O | O | O | |
| | AB Data Highway Plus | X | X | ◆ | *1 *3 |
| | AB Slc500 DH485 | ◆ | ◆ | ◆ | *3 |
| | AB Remote IO | X | X | ◆ | *1 *3 |
| Keyence | KEYENCE KV-10/16/24/40 SERIES | O | O | O | |
| | KEYENCE KZ300 SERIES | O | O | O | |
| | KEYENCE KZ-A500 SERIES(CPU) | O | O | O | |
| | KEYENCE KZ-A500 SERIES(LINK) | O | O | O | |
| Shinko Electric | SHINKO SELMART SERIES | O | O | O | |
| Matsushita Electirc Industrial | Panadac 7000 SERIES | O | O | O | |
| | MINAS-A/S SERIES | O | O | O | |
| Modicon Corp. | Modicon Modbus(MASTER) | O | O | O | |
| | Modicon Modbus(SLAVE) | O | O | O | |
| | Modicon Modbus Plus | X | X | ◆ | *1 *3 |
| FATEK | FATEK FACON FB | O | O | O | |
| ORIM VEXTA | ORIM VEXTA E1 SERIES | O | O | O | |
| Yamatake | YAMATAKE SCD SERIES | O | O | O | |
| Toho Electronics | TOHO TTM SERIES | O | O | O | |
| RKC INSTRUMENT | RKC CB/SR-Mini SERIES | O | O | O | |
| Shinko Technos | SHINKO TECHNOS INDICATING | O | O | O | |
| Other Device | DeviceNet Slave I/O | X | X | O | *1 |
| | JPCN-1(Standard) | X | X | O | *1 |
| | CC-Link Type | X | X | O | *1 |
| | CC-Link Intelligent Device | X | X | X | *4 |
| | Memory Link SIO Type | O | O | O | |
| | Memory Link Ethernet Type | X | O | O | *2 |

**MEMO** Protocols before V1.2 can be used, however it cannot detect write errors.

*1 An expansion Ethernet unit is required to use the 2-Way Driver with GP77R/GP-2501 series units. The attachment of this unit prevents the attachment of any other expansion units, which in turn prevents the use of any other protocols.

Expansion units cannot be attached to GP-2300/GP-2400/GLC2300/GLC2400 series units. Therefore, you will not be able to use protocols that require expansion units.

*2 You cannot use both the 2-Way Driver and Ethernet protocols at the same time on GP77R/GP-2501 series units.

*3 You can use the 2-Way Driver together with listed protocols, however, there are device restrictions for Pro-Server access. Screens only need to be created for the devices that can be accessed.

| | | |
|---|---|---|
| Mitsubishi Electric | MELSEC NET/10 | Supports only link devices and the LS area. |
| Omron | SYSMAC-CS1(ETHER) | Supports only the LS area. |
| Rockwell | AB Data Highway Plus | Supports only the LS area. |
| Rockwell | AB S1c500 DH485 | Supports only the LS area. |
| Rockwell | AB Remote IO | Supports only the LS area. |
| Modicon Corp. | Modicon Modbus Plus | Supports only the LS area. |

*4 This protocol cannot be used with the 2-Way Driver.

# 1 Introduction

This chapter describes how to use this software to configure a system in which you can gather data from devices/PLCs connected to networked GPs.

## 1.1 Outline

The Pro-Server software reads/writes/collects data to and from PLC, and GP's data via a network (Ethernet).

Pro-Server on your PC lets you use commercially available application software or programs you have

created to read/write/collect data on the GPs and PLCs connected to the network.

It can also save and playback (Playback Feature) the saved data.

> **MEMO**   The GP reads and writes data via the 2-Way driver only when it is not
> serving as a display and operation panel, which is its first priority. Also,
> reading or writing a large volume of data may cause the GP to temporarily
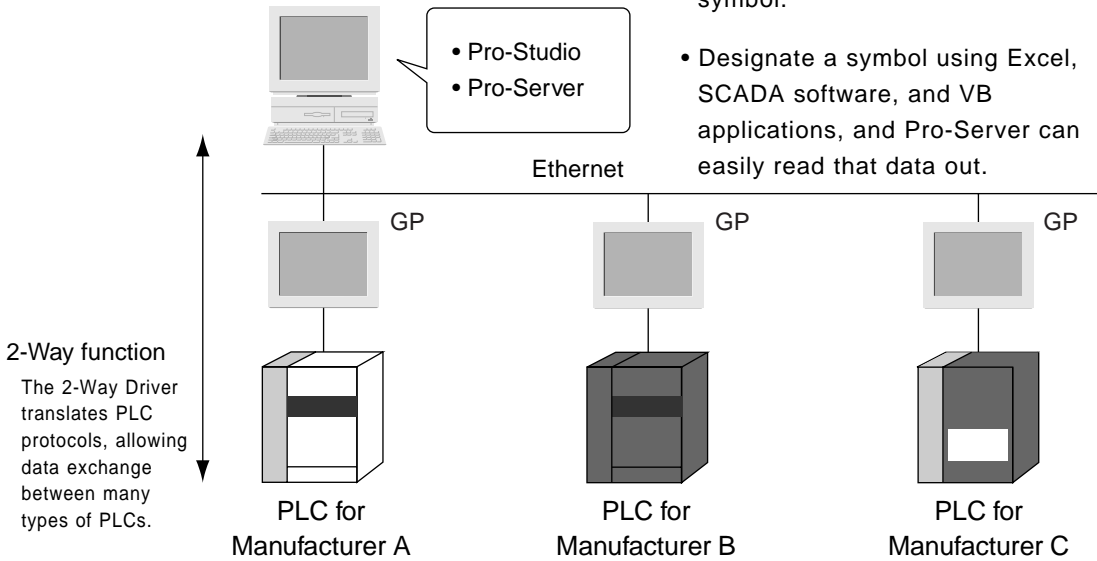> stop refreshing its display.

## 1.2   What is the 2-Way Driver?

The 2-Way Driver is software that allows the host PC to access data on GPs or PLCs connected to a network (Ethernet). One advantage of this software is that you can transfer data to the host PC, regardless of type of PLC being used.

To use the 2-Way function, Pro-Server software and an Ethernet compatible GP unit are required.

## 1.3 **System Configuration**

### 1.3.1 External Configuration

• Pro-Studio allows you to easily designate a PLC device as a symbol.

• Designate a symbol using Excel, SCADA software, and VB applications, and Pro-Server can easily read that data out.



• Pro-Studio
• Pro-Server

Ethernet

GP       GP       GP

2-Way function

The 2-Way Driver translates PLC protocols, allowing data exchange between many types of PLCs.

PLC for Manufacturer A      PLC for Manufacturer B      PLC for Manufacturer C

## 1.3.2 Internal Configuration

### Off-line

Inside your PC, information such as node names of the connected GPs, symbol names for accessing the PLC devices, and information read from the GPs is all set up and controlled via this software. The file in which this information is stored is called a network project file (*.npj) and is used by Pro-Server for its data exchange with application programs.

To exchange data with the host PC, each GP must have the 2-Way Driver and the network project information downloaded to it, along with the GP's screen information, via GP-PRO/PBIII for Windows Ver. 3.0 or later. The 2-Way Driver is factory installed in the GP2000 and GLC2000 Series units.
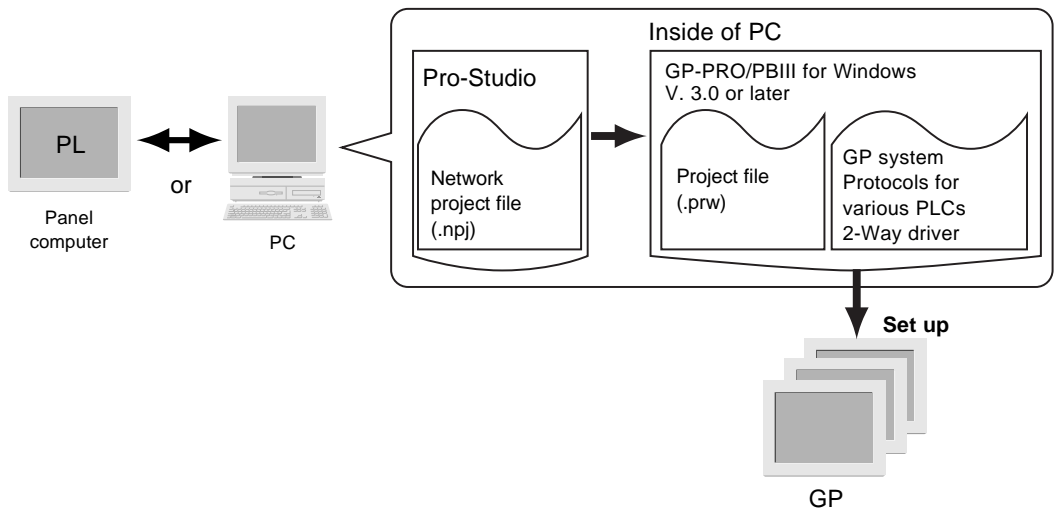
## On-line

In response to an application's request, this software accesses PLC data, by way of the GP, using the network project file. Each GP must have the 2-Way driver downloaded to it, together with the protocol that corresponds to the connected PLC.
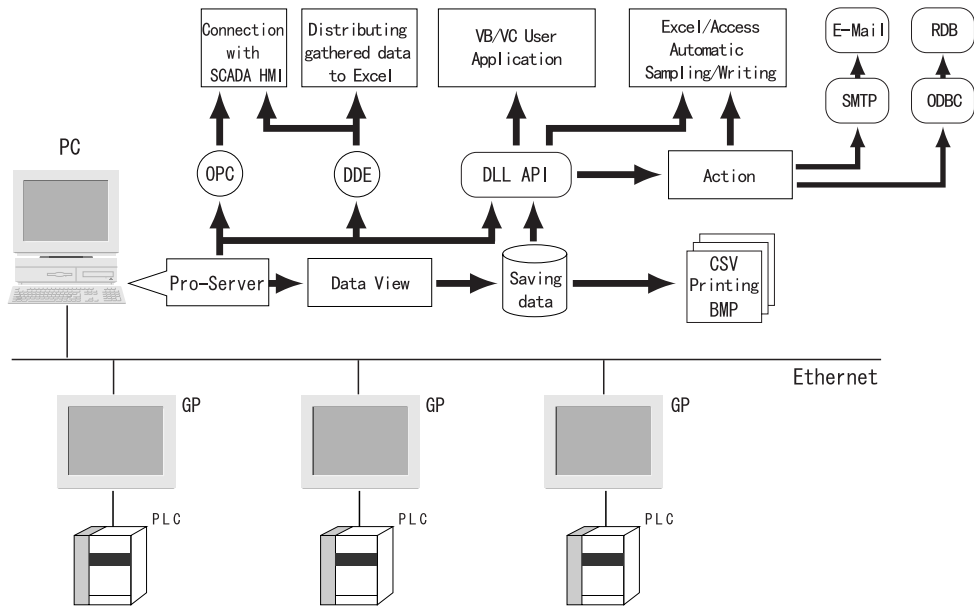


**MEMO**
- Transferring screen data in on-line mode or downloading a network project file, will temporarily cause the Transfer screen to appear and all other data transfer operations to stop.
- After screen transfer is completed, the screen will re-activate and regular operation will resume.

### Pro-Studio (Performs Network project file editing/setting)

This software is used to set and register symbols for the GPs and PLCs designated as data providers. Physical IP addresses, PLC device addresses, etc. can all be converted into symbols.

### Pro-Server (Performs Data exchange between applications and GPs)

This software that communicates with GPs according to the requests made by Excel, VB, SCADA or other applications.

### 2-Way Driver (Protocol conversion driver built into GPs)

This driver selects the applicable PLC protocol, based on the Pro-Server read/write command. GP77R series units requires setup and then transfer to the GP unit via the screen editor software GP2000 and GLC2000 series unit 2-Way Driver software is factory installed.

## Using an Ethernet protocol with the 2-Way Driver

Pro-face's GP2000 (GP-2501 does not support this function) and GLC2000 Series units can simultaneously use an Ethernet communication protocol and the 2-Way Driver feature to communicate with a PLC. However, the IP address and the Port No. used for differ depending on whether the internal Ethernet I/F or the Expansion Ethernet I/F is used.

### When using the GP/GLC Unit's Internal I/F
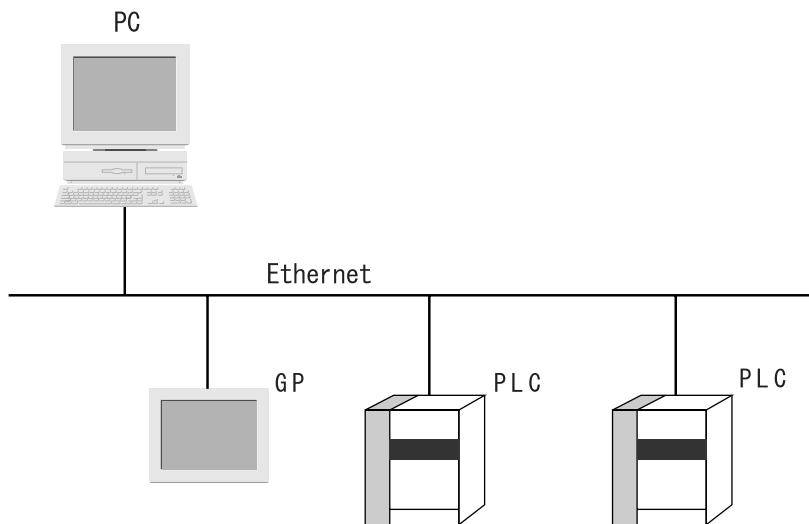


Using the GP/GLC's internal Ethernet I/F to communicate with a PLC allows you to also use the 2-Way Driver feature. However, while you will need only one IP Address, you will need to designate two Port No.s. One will be for when you transfer data to a PLC, and the other will be when using the 2-Way feature.
In order to transfer data to a PLC, you will need to enter your GP/GLC unit's Ethernet settings via the OFFLINE mode's [INITIALIZE] -> [PLC SETUP] -> [PLC SETUP] -> [SETUP ETHERNET INFORMA-TION] screen. However, the Subnet Mask and IP Address must be entered in the [PLC SETUP] -> [SETUP ETHERNET EXT. INFORMATION] screen. This data must also be entered in the GP-PRO/PBIII for Windows software's Project Manager screen [GP Setup] menu's [Communication Settings] tab.
The entering of Ethernet settings for communication using the 2-Way Driver feature is done via the previously mentioned OFFLINE mode. Select the [INITIALIZE] -> [PLC SETUP] -> [EXPANSION SET-TINGS] -> [ETHERNET SETUP] area, and enter the required setting data there. You need to also enter the required settings in the Pro-Studio program's [Register/Edit Node] area, and the [Port No.] in the [Configure] -> [Network] area.

The following table describes what each setting is used for.

| Setting | PLC Transfer Settings | 2-Way Driver Settings | Remarks |
|---|---|---|---|
| IP Address | O | X | These settings apply to a single Ethernet I/F and only one setting value can be entered. When the PLC Transfer Settings are not entered, the 2-Way Driver Settings will be enabled. |
| Subnet Mask | O | X | |
| Gateway (IP Route Address) | O | X | |
| Port No. | O | O | Be sure the Port No.s used are not the same. Port numbers are allocated continuously for a total of 10 No.s, starting from the 2-Way Driver Port No. entered. |

O: Setting enabled     X: Setting disabled

When using the GP/GLC Unit's Rear Face Expansion Ethernet I/F
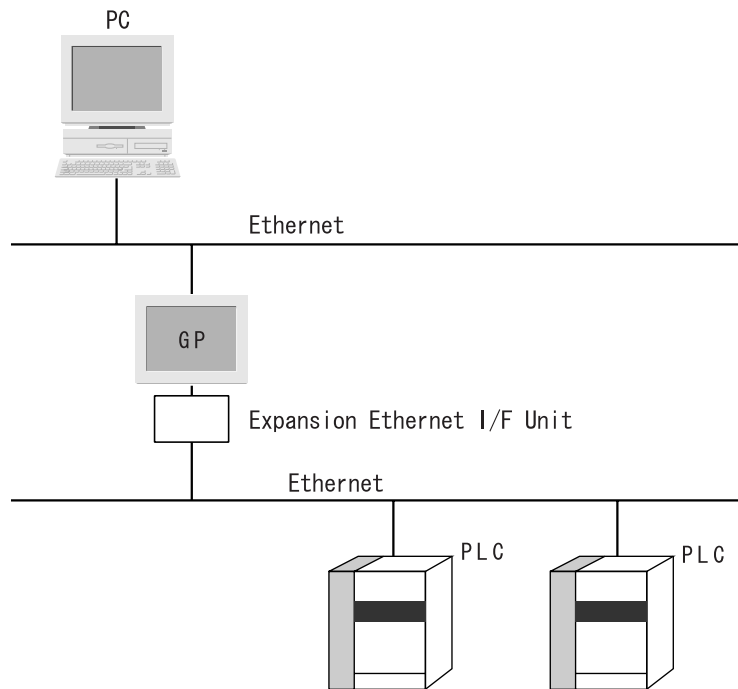


After attaching the Expansion Ethernet I/F Unit, your GP unit is now equipped with two Ethernet I/F units.
(The Ethernet Expansion Unit cannot be used with the GP-2300, GP-2400, GLC2300 or GLC2400 series
units.)

The Expansion Ethernet I/F Unit is used for PLC data transfer and the internal Ethernet I/F is used for data
transfer via the 2-Way Driver.

Use of the Expansion Ethernet I/F Unit will require the setting of a separate IP Address.

In order to transfer data to a PLC, you will need to enter your GP/GLC unit's Ethernet settings via the
OFFLINE mode's [INITIALIZE] -> [PLC SETUP] -> [PLC SETUP] -> [SETUP ETHERNET INFORMA-
TION] screen. However, the Subnet Mask and IP Address must be entered in the [PLC SETUP] -> [SETUP
ETHERNET EXT. INFORMATION] screen. This data must also be entered in the GP-PRO/PBIII for
Windows software's Project Manager screen [GP Setup] menu's [Communication Settings] tab.

The entering of Ethernet settings for communication using the 2-Way Driver feature via the internal Ethernet
I/F is done using the GP unit's previously mentioned OFFLINE mode. Select the [INITIALIZE] -> [PLC
SETUP] -> [EXPANSION SETTINGS] -> [ETHERNET SETUP] area, and enter the required setting data
there. Also, enter the required settings in the Pro-Studio program's [Register/Edit Node] area. Also, enter the
[Port No.] in the [Configure] -> [Network] area.

The following table describes what each setting is used for.

| Setting | PLC Transfer Settings | 2-Way Driver Settings | Remarks |
|---|---|---|---|
| IP Address | O | O | The PLC communication settings used are allocated to the Expansion Ethernet I/F Unit, and the 2-Way Driver settings are allocated to the GP's internal Ethernet I/F. |
| Subnet Mask | O | O | |
| Gateway (IP Route Address) | O | O | |
| Port No. | O | O | |

O: Setting enabled    X: Setting disabled

## 1.4   **Application Interfaces**

### 1.4.1   DDE function Outline

The DDE (Dynamic Data Exchange) function can be used with your PC's commercial applications (SCADA or MMI software) and Excel, which supports the DDE client function that provides for program-less data exchange.

Once a DDE link is established, Pro-Server monitors the internal data and, if a stored value changes, notifies the client of the change. Pro-Server provides the client with the data being monitored when a read-out request is received and writes the data when a write request is received.

DDE function
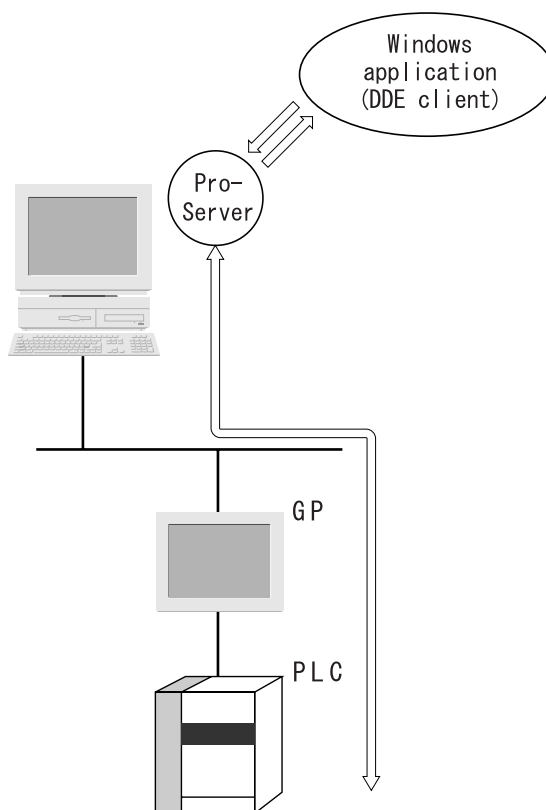


**MEMO**   Excel's client feature does not support data write, so the DDE's write feature cannot be used. When writing data using Excel, please use the VBA feature.

## 1.4.2   Simple DLL Function

The applications you create with Visual Basic or Visual C will request Pro-Server to read/write PLC data via a GP. The function (API) for this is provided in the form of a DLL. In both read and write operations, the function will not be completed until communication between the two units is finished.

### Simple DLL Connection
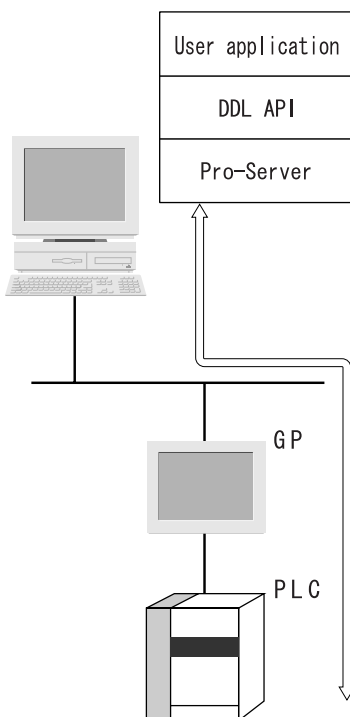


| MEMO | In environments where data transfer errors can frequently occur, be sure your applications include a data transfer retry feature. |

### 1.4.3  OPC Interface Function

Installing a Pro-Server OPC server allows you to use applications that have an OPC client function, such as Intellution's iFIX, as well as others.

The OPC interface function can only be used on a Windows NT or Windows 2000 system.

## OPC Interface Design
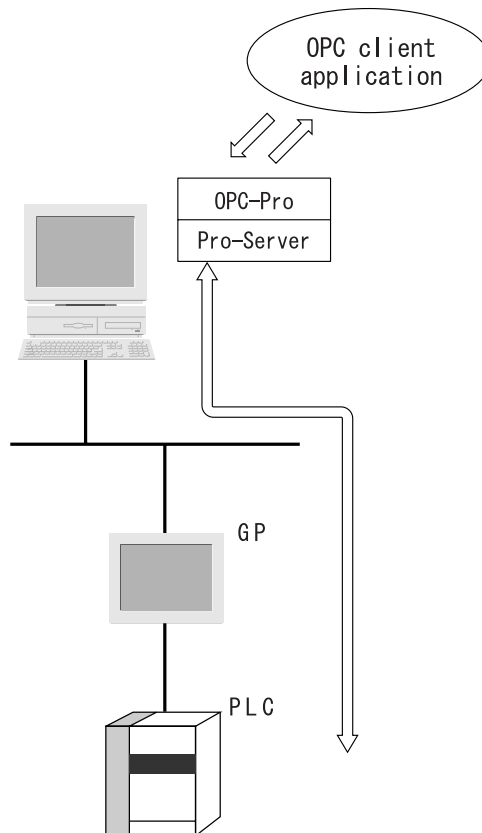
### 1.4.4 SRAM Backup Data Storage Function

The backup data in the SRAM of each GP can be easily transferred to the host PC. This SRAM backup

function is available for logging data, trend data, sampling data, alarm data (log/history), and others.

## SRAM Backup Function
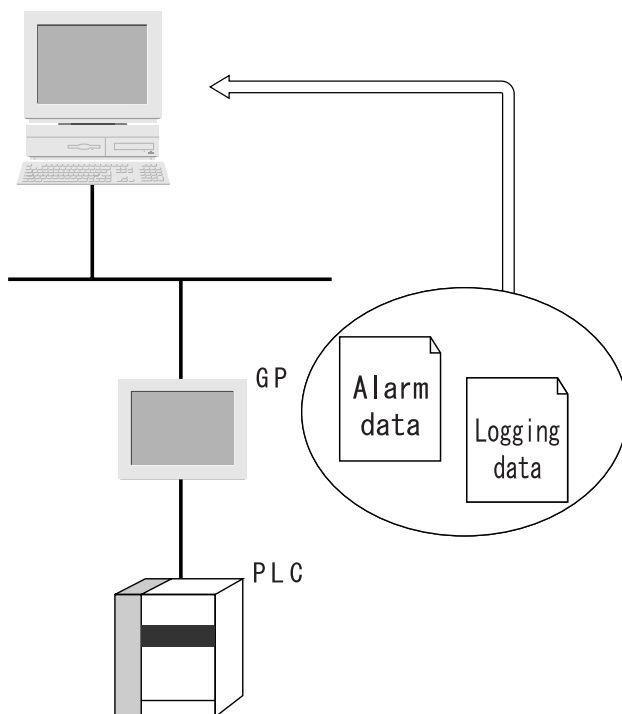


For details about the types of data you can transfer to the host PC, refer to the GP-PRO/PBIII for Windows

Tag Reference Manual.

Reference → "GP-PRO/PBIII for Windows Tag Reference Manual"

**MEMO**    Alarm data (active) can be captured on Pro-Server using an alarm block.

## 1.5   Provider Information Outline

### 1.5.1   Providing Information to the Host

When a designated trigger's condition(s) is/are satisfied, PLC data is first translated by the GP's resident 2-Way driver using the appropriate PLC manufacture's protocol, then collected by Pro-Studio and provided to the host PC. Therefore, since Pro-Server can temporarily store this data in the PC's memory, overall network traffic can be reduced.

For the procedure to register symbols in Pro-Server's PC memory area, refer to 3.2 Registering Symbols.

Reference ⟶ "3.2 Registering Symbols"
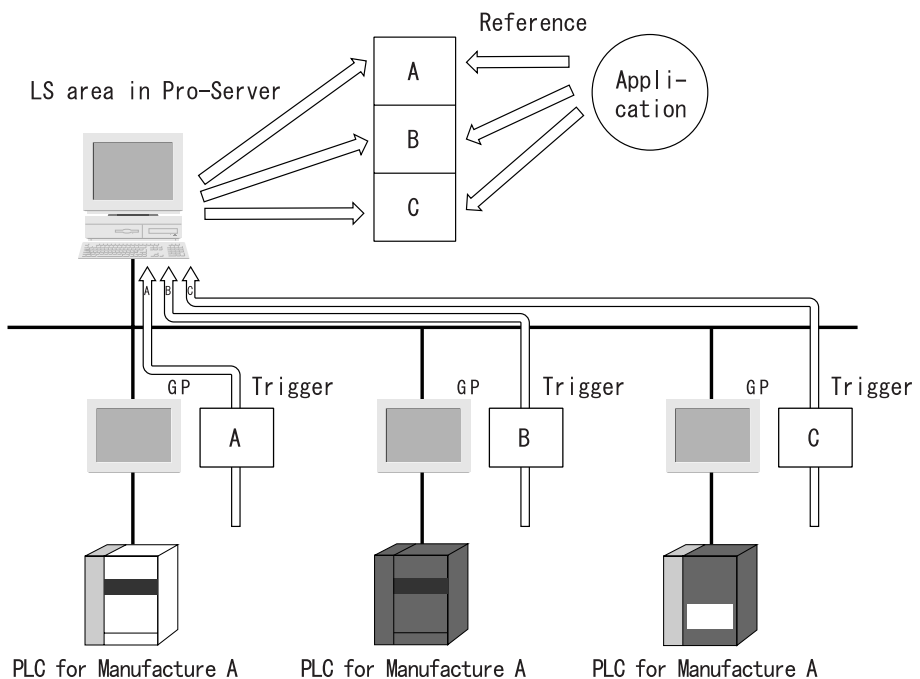
## 1.5.2   Providing Information between GPs

Even if your system lacks a host PC or Pro-Server, you can transfer the provider information setting file setup in Pro-Studio to each GP. This then allows device data to be exchanged, via the GP, between PLCs on the network, at a predetermined times or event, regardless of the brand of PLC used.



PLC for Manufacturer A     PLC for Manufacturer B     PLC for Manufacturer C
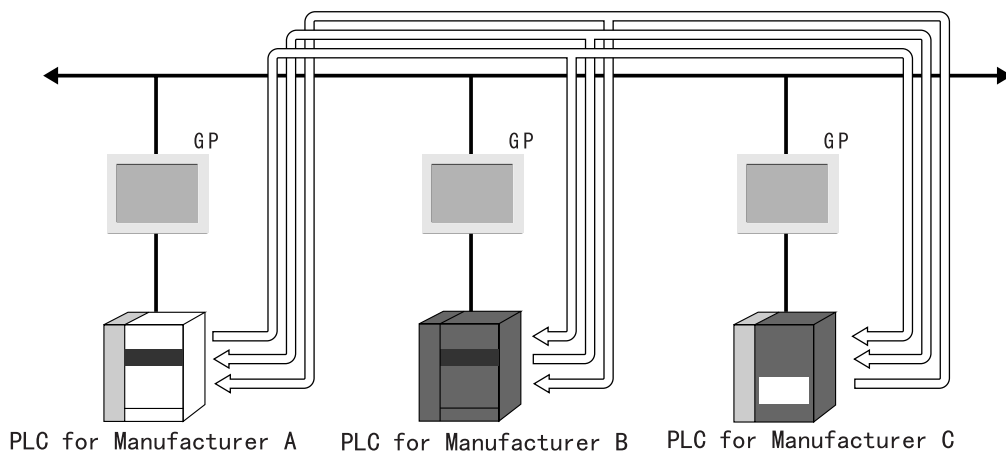
### 1.5.3　Action Feature Overview

When the designated trigger conditions are fulfilled, an "Action" feature allows an application in a remote PC on the network to be activated.  Also, the program triggered by the Action feature is called the "Action Contents" .

## Action Features

Automatic Upload of Access Data (requires Microsoft Access)

Automatic Download of Access Data (requires Microsoft Access)

Write Data to Excel Book (requires Microsoft Excel)

Download of Excel Recipe (requires Microsoft Excel)

Upload of GP Log Data

Automatic Download of GP Filing Data

Automatic Upload of GP Filing Data

Data Transfer via Mail

Alarm Log (with Sound Alert Feature) (requires Microsoft Access)

Data Upload to Database (requires Microsoft Access/Excel)

Data Download from Database (requires Microsoft Access/Excel)

Start Application

Upload of GP JPEG Data

## Action Feature Overview
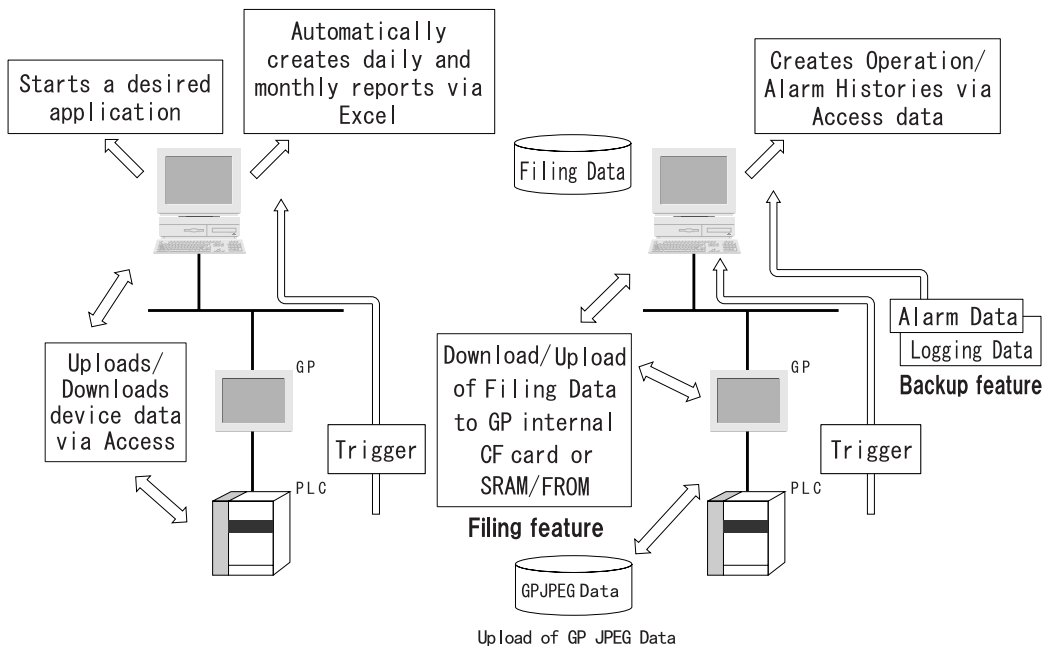
## 1.6 Overview of Data View

When a designated trigger's condition(s) is/are satisfied, PLC data is first translated by the GP's resident 2-Way Driver using that PLC's protocol, and then is collected by Pro-Studio and saved on the server PC. Data View allows you to display the collected data on Pro-face's exclusive browser (GP-Viewer, Device View) in real-time. You can also change the data collection condition or set the synchronization style with GPs (GP-Viewer only) using Data View. Device data of multiple PLCs can be collected at the same time (Device View only).

In addition to the above, you can playback device data already collected on Data View (Playback Feature) or on user-created applications (System Time Bar).
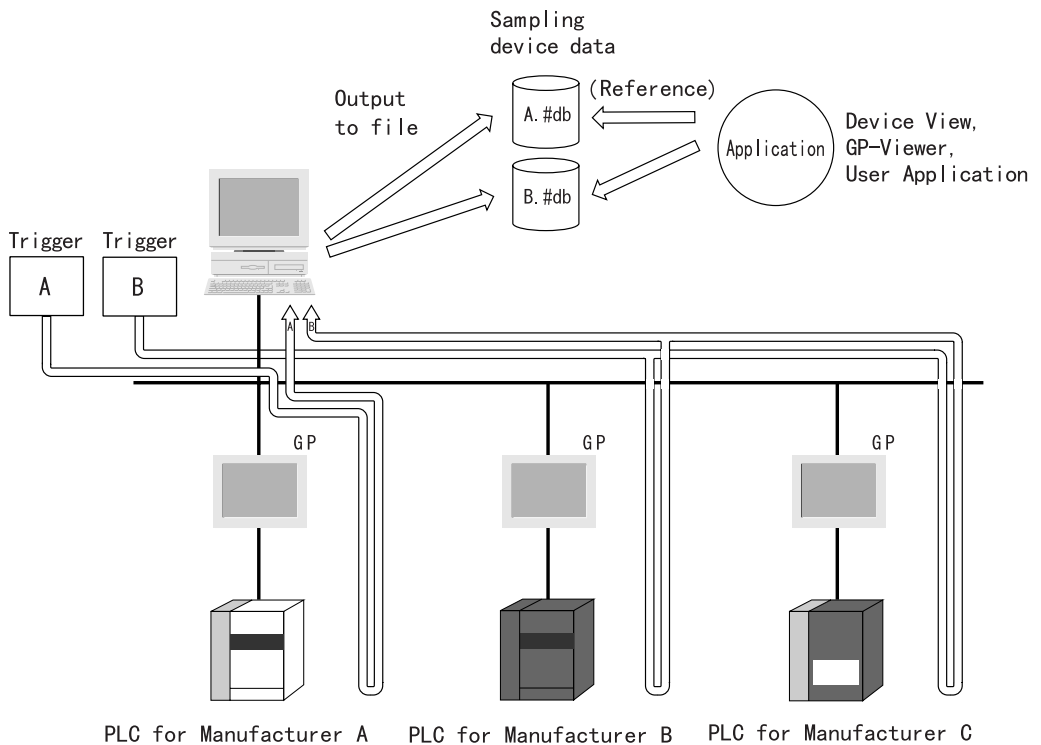


**MEMO**  Collected device data can be viewed using a variety of tools, such as Device View and GP-Viewer.

## 1.7 Configuring the System

The following explanation describes the steps you must follow to start Pro-Server, and assumes that GP-PRO/PBIII is already installed on your PC.

> Installing Pro-Server with Pro-Studio for Windows
> Install Pro-Server with Pro-Studio for Windows on your PC's hard disk.

Reference→ "2.1 Installing the Software"

⬇

> Starting GP-PRO/PBIII
> Start the GP-PRO/PBIII for Windows software.

Reference→ "GP-PRO/PBIII Operation Manual"

⬇

> Creating/Saving the screens with GP-PRO/PBIII
> Open the GP-PRO/PBIII project file, create as many project files as the number of the connected GPs, and save the project files.

Reference→ "GP-PRO/PBIII Operation Manual"

⬇

> Starting Pro-Studio
> Start Pro-Studio.

Reference→ "2.2 Starting and Exiting the Software"

⬇

> Setting/Saving the network project file with Pro-Studio
> Open the network project file in Pro-Studio, make the necessary settings, and save the file.

Reference→ "2.2 Starting and Exiting the Software" "Chapter 3 Operation"

⬇

> Transferring project files to your GPs
> Transfer the project files, the network project file, and the GP system setting to each connected GPs, one by one.

Reference→ "5.1 Transferring Data to GPs" "GP-PRO/PBIII Operation Manual"

⬇

> Performance Measurement
> Measure the performance with the read performance measuring tool.

Reference→ "6.3 Read Performance Measuring Tool"

⬇

> Operation
> Connect the GPs and the PC using a network cable. Start Pro-Server on your PC.

Reference→ "2.2 Starting and Exiting the Software" "Chapter 6 Tools" "Chapter 7 Database"

# 2 Pro-Server Fundamentals

This chapter describes how to install this software. It also explains the procedures for starting and exiting the software.

2.1 Installing the Software
2.2 Starting and Exiting the Software
2.3 Screen Item Names and Functions

## 2.1 Installing the Software

Install this software from the CD-ROM to your hard disk. The following explanation assumes that Windows is already installed on your hard disk.

> **MEMO**
> • Prior to installing the software, exit all programs except the Pro-Server with Pro-Studio for Windows Setup program. Be sure to quit all memory-resident programs (such as Virus detection software).
> • If an older version of this software is currently installed on your PC, be sure to uninstall it prior to installing this software.
> • Copying the master CD-ROM files to your hard disk does not install this software. To be able to start this software, you must use the Setup program (step 2 below).

1. Insert the CD-ROM into your PC's CD-ROM drive.
2. Click the [Start] button and, when the Start menu appears, select [Run].



3. Type "X:/2WSetup.exe" and then click [OK]. ("x" represents the drive letter assigned to your CD-ROM drive.)
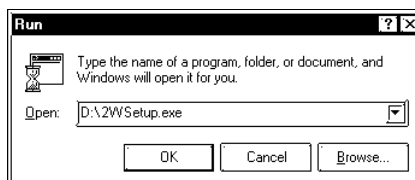


The master CD-ROM supports the AutoPlay feature, which means inserting it into your CD-ROM drive will automatically start the Setup program.

4. The installation menu appears. Click the "Pro-Server with Pro-Studio Setup" bar.
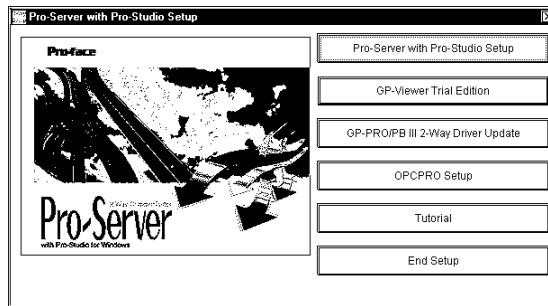


5. Select which language you wish to use in the Setup program (English or Japanese) and click "OK".



6. The User Information screen will appear. Enter all the information and click the [Next] button.
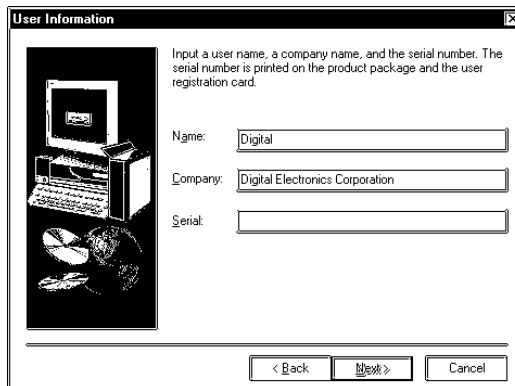
7.  The key code entry screen then appears. Enter the code printed on the rear of your CD-ROM
    case and click [Next].

    The data entered must also include the "–" character.
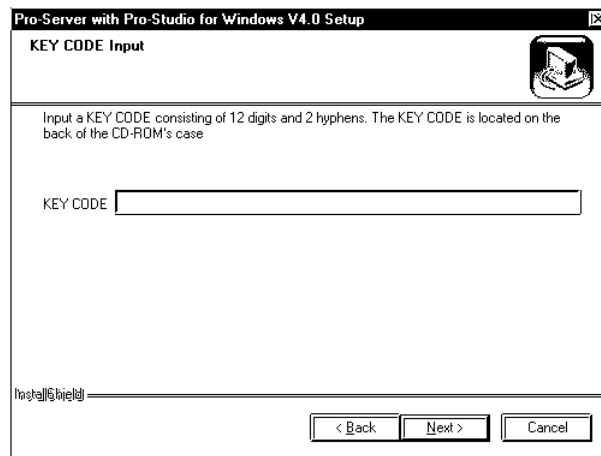


    After this, follow the instructions displayed on the screen.

    In addition to the Pro-Server with Pro-Studio for Windows program, the "2Wsetup.exe" command can
    be used to start the following items.

    • GP-PRO/PBIII 2-Way Driver Update

      As GP-PRO/PBIII for Windows Ver. 6.0 software includes the 2-Way Driver for Pro-Server with Pro-
      Studio for Windows Ver. 4.0, the driver requires no update.

      If you use an earilier version of GP-PRO/PBIII for Windows, update your software to a 2-Way
      Driver compatible with the Pro-Server with Pro-Studio for Windows Ver. 4.0.

    • OPCPRO Setup

      Two types of OPCs, for the server and for the client, can be installed via this item.

      Be sure to install the OPC server in a personal computer running this software.

    • Tutorial

      The tutorial uses HTML files to explain the installation, setup and usage of the Pro-Studio software.

    • GP-Viewer Trial Version Setup

      Install the GP-Viewer after Pro-Server installation is completed.

## 2.2  Starting and Exiting the Software

This section describes how to start and exit this software.

### 2.2.1  Starting and Using Pro-Studio

The following explanation assumes that the Windows desktop is already displayed.

1.  Click [Start] button and when the Start menu appears, point to [Programs], [Pro-face] and [Pro-Server with Studio], and select [Pro-Studio].
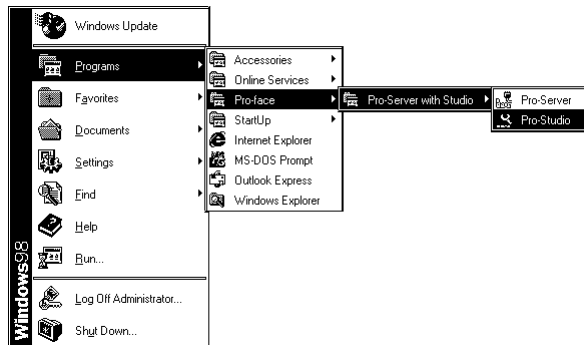
Double-clicking on the desired network project file (*.npj) in Windows Explorer automatically starts Pro-Studio.

2.  The program's main window will appear. The left-side window shows a list of network entry node GPs; the right-side window shows the symbols registered for each GP. Use this screen to enter a variety of settings to configure your system.
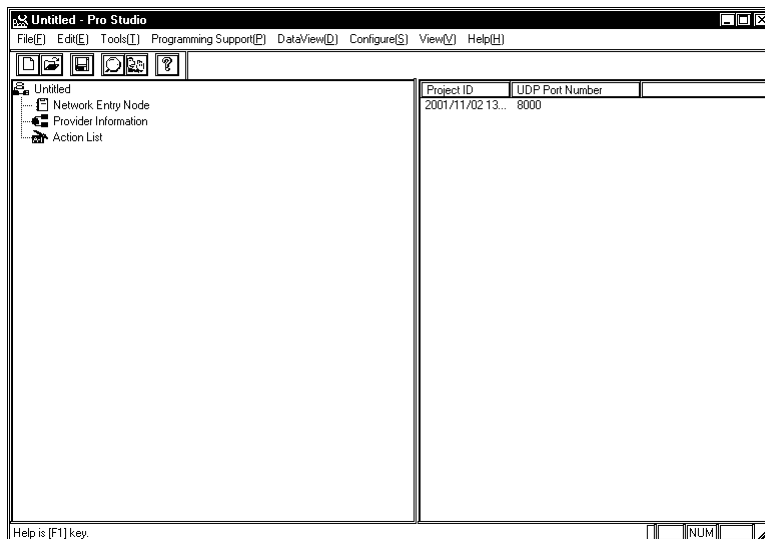
**MEMO**
- Starting Pro-Studio automatically starts Pro-Server. Pro-Server resides in memory and its indicator appears on the right side of the taskbar.
- Quitting Pro-Server automatically exits Pro-Studio as well.
  To start Pro-Server only, click the [Start] button and, when the Start menu appears, point to [Programs], [Pro-face] and [Pro-Server with Studio] and then click on [Pro-Server].

## Creating a Network Project File

A network project file (*.npj file) stores information such as the network entry nodes, symbols, and provider information settings.

### Creating a New Network Project

The following explains how to open a window and create new network projects.

1. Select [New(N)] in the [File(F)] menu.
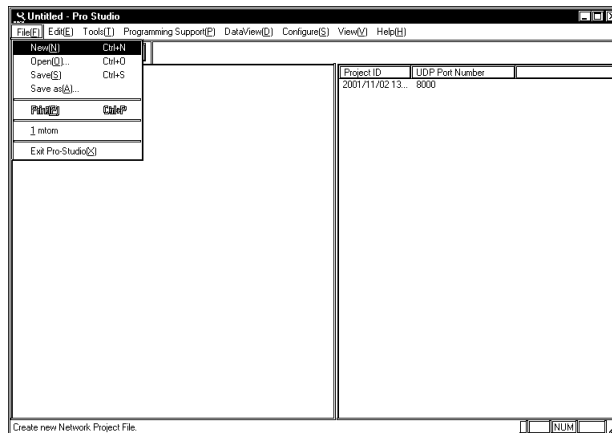
## Opening/Saving a Network Project File

The following procedures  explain how to open, close, and save a network project file. Before you proceed, open the Pro-Studio main window.

Opening a Network Project File

1.  In the program's main window, click [Open(O)] in the [File(F)] menu.
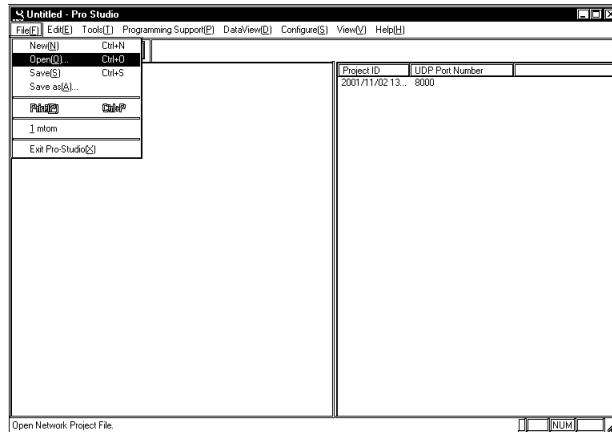


2.  Select the file you wish to open, and click [Open(O)].
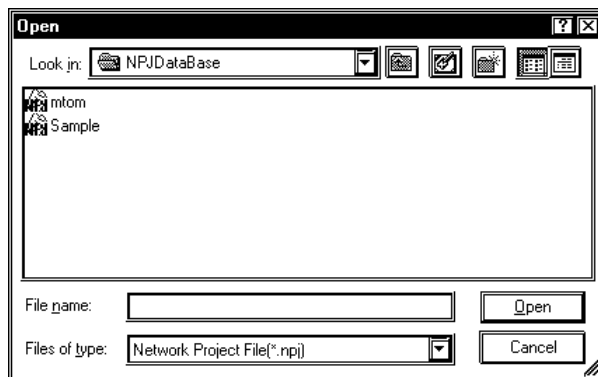


3.  The file opens.

Saving a Network Project File

1.   In the program's main window, click [Save(S)] or [Save as(A)] in the [File(F)] menu.
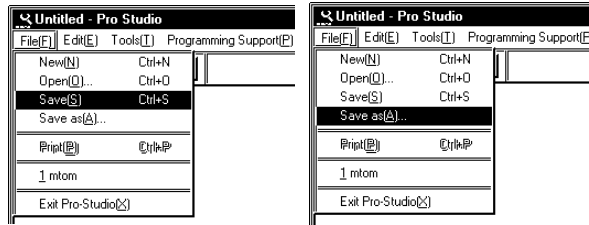


2.   If you have selected [Save(S)], the file is saved by overwriting the existing contents. If you have

     selected [Save as(A)], in the following dialog box, save the file with a new file name.
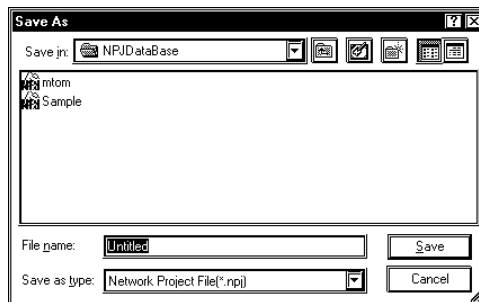
## 2.2.2 Exiting Pro-Studio

The following describes the procedure for exiting Pro-Studio.

1. Click [Exit Pro-Studio(X)] in the [File(F)] menu.
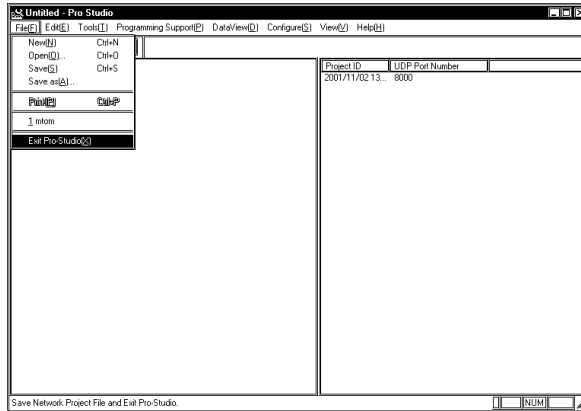


| MEMO | • If you change the settings of a currently open project and then attempt to close it, you will be asked whether or not to save the new settings. Clicking [Yes] saves the settings by overwriting the existing contents, and then exits Pro-Studio. Clicking [No] exits Pro-Studio without saving the changes. |

• Exiting Pro-Server automatically closes Pro-Studio. To be sure to terminate all communication, be sure to exit Pro-Server.

## 2.2.3   Starting and Exiting Pro-Server

The following explanation assumes that the Windows desktop is already displayed.

### Starting Pro-Server

1.   Click the [Start] button and, when the Start menu appears, point to [Programs] [Pro-face] and
[Pro-Server with Studio], and then click [Pro-Server].
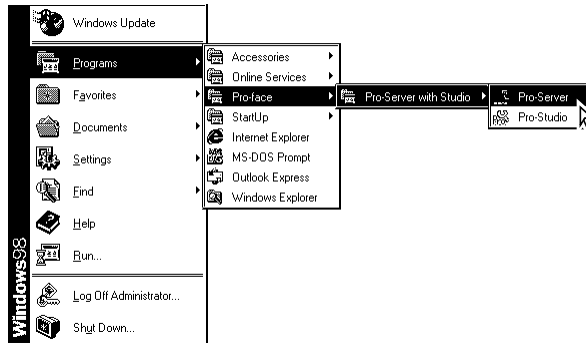


2.   While Pro-Server is running, the Pro- Server icon appears on the right side of the task tray.



| MEMO | Starting Pro-Studio automatically starts Pro Server. |

## Exiting Pro-Server

1. To exit Pro-Server, right-click on the Pro-Server icon on the right side of the task tray.
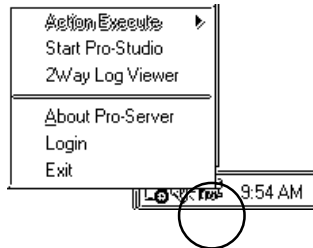


2. When the shortcut menu appears, click [Exit].



**MEMO**
- Exiting Pro-Server automatically exits Pro-Studio.
- If an application uses Pro-Server as a DDE client, an alarm message will appear before you exit this software.
- An alarm message dialog will appear when you try to exit Pro-Server while it is collecting data.
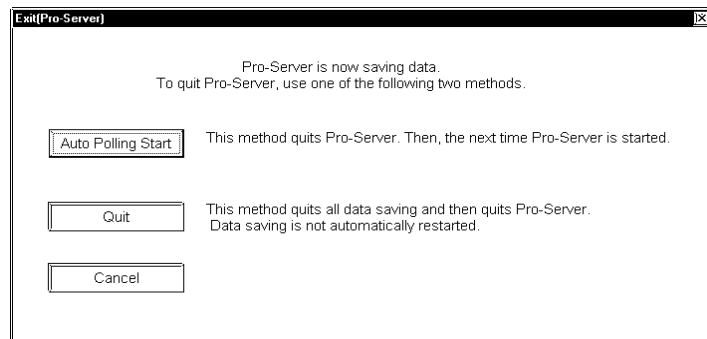
## 2.3  Screen Item Names and Functions

The names and functions of Pro-Studio's main screen items are as follows:

Title Bar

Menu Bar

Tool Bar

Status Bar

Network Project
Information List

Detailed Information
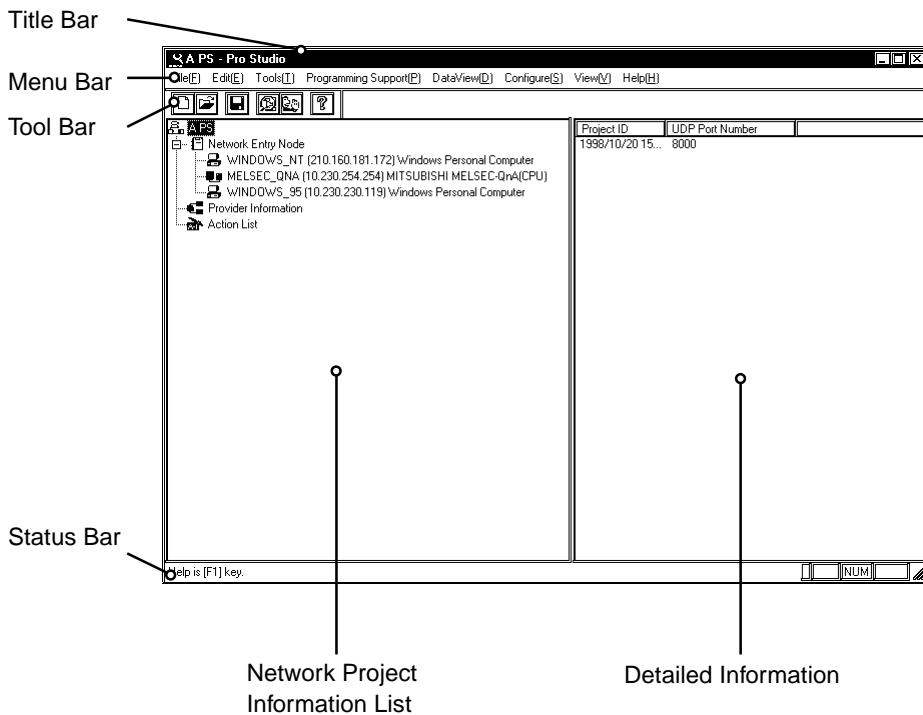
Title Bar

Displays the currently open network project file (*. npj)'s name.

Menu Bar

Displays the menu to be used to operate Pro-Studio. Use the mouse or keypad to select a desired menu, and

the pull-down menu appears.

Tool Bar

Displays icons that represent frequently used commands. Click on an icon to execute that command.

Status Bar

Displays operation-related messages and other information.

Network Project Information List

Displays the currently open network project file's contents in a tree structure.

Detailed Information

Displays network project information list, nodes, symbols, and actions.

# 3  Operation

This chapter describes how to register various types of system information.

## 3.1    Registering Network Entry Nodes

The procedure for entering the node name, IP address, sub net mask, gateway, and PLC type information is described below. The node name can be the same as the project file name with the PLC type automatically determined by selecting GP-PRO-PB III's project file (*.prw). To transfer provider data from a GP to the PC, you must first register the PC as a network entry node.

(The following description assumes that Pro-Studio's main window is open)

1.    Select [Register Node] in the [Edit(E)] menu.
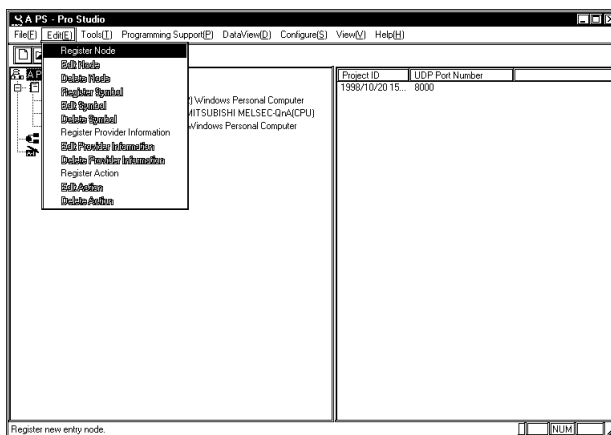


You can right-click on the network entry node and select [Register Node] from the shortcut menu that appears.

2.   The [Register Node] window will appear. Enter the necessary data for all the items and click [OK].

Designate [Gateway] only when required.

Designate [IP Address] so that it does not overlap with any other addresses.



A "Node" indicates a name of a communicator that performs communication activities on the network, which is usually a GP unit or personal computer. This node name must:

• Consist of 31 characters or less.

• Begin with an alphabetic letter.

• Use alphanumeric characters  (no differentiation between upper and lowercase letters), _ (under-score), ˜ (tilde), and 80h or higher ASCII characters.

**MEMO**   • Select the GP-PRO/PBIII for Windows project file (.prw) you wish to use.

• You may also drag the file from Windows Explorer and drop it in the Pro-Studio's main window.
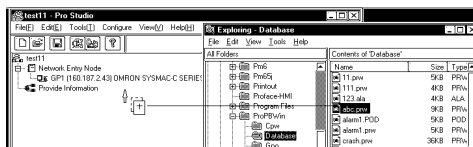
**MEMO** The character string data mode is set according to the data storage order of the used PLC. Normally, it is automatically set to the mode according to the data storage order of the used PLC, therefore, you do not have to change it.

| (I) Device Storage Order of Data | (II) Byte LH/HL Storage Order in Word | (III) Word LH/HL Storage Order in Double-Word | Character String Data Mode |
|---|---|---|---|
| Store from the front data | LH | LH | 4 |
| | | HL | 2 |
| | HL | LH | 5 |
| | | HL | 1 |
| Store from the end data | LH | LH | 6 |
| | | HL | 7 |
| | HL | LH | 8 |
| | | HL | 3 |

The detailed settings of the selected network entry node are shown in the right-side window.

3. After registration is completed, the registered node name will be added to the network node list.

If you wish to change a node (topic)'s data after it has been registered, simply right-click on the topic to bring up a list of selections. From these, click either the [Edit Node] or [Delete Node] selections, or, from the menu bar, click the [Edit] menu's [Edit Node] or [Delete Node] items.
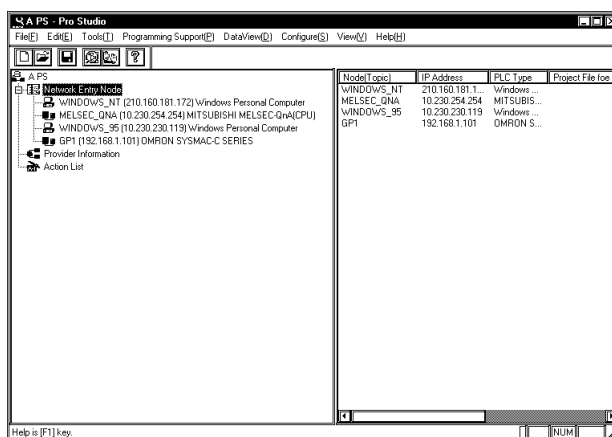


**MEMO** Clicking either ◀ or ▶ allows you to edit the registered nodes, in the order of registration. When ▶ is clicked on while the last registered node is highlighted, the "edit" mode will change to the "add" mode and a new node will be added.

## 3.2  Registering Symbols

The following describes how to enter symbol name, device address, data type, and polling time data. The device address you enter will be converted internally into a device code that can be used inside the GPs. Polling time refers to how often Pro-Server polls the GP when data is read out through a DDE. You may also import symbols that have been exported from GP-PRO/PBIII. Symbols can be registered for each network entry node.

(The following description assumes that the program's main window is open)

1.   Click on the right section of the window. Or, click on the right-side window and then click [Register Symbol] in the [Edit(E)] menu.
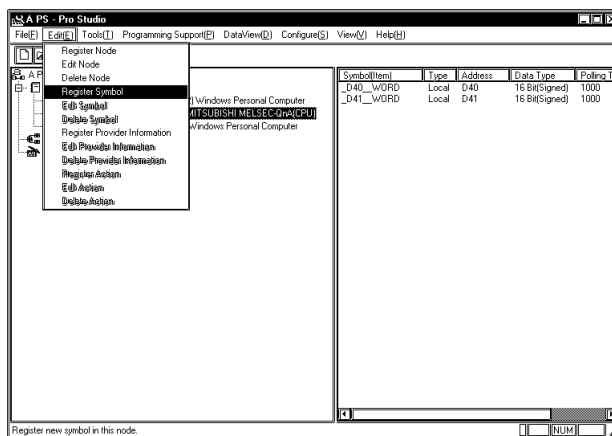
2. The [Register Symbol] window then appears. Enter all items and click [OK].



A symbol must

· Consist of 31 characters or fewer.

· Begin with an alphabetic letter.

· Use alphanumeric characters  (no differentiation between upper and lowercase letters), _ (underscore), ˜ (tilde), and 80h or higher ASCII characters.

[Create from Address]

After selecting a Device Address, click on this button to automatically register the Device Address as a symbol.

You can use up to 27 names as PC exclusive device names, that is, LS, LSA, LSB, LSC, LSD ... LSY and LSZ.  The device address ranges from 0000 to 9999 in Word Address, using in Decimal. The bit values range from 00000 to 9999F, which designates the first four (4) digits in Decimal,then the last digit in HEX.

**MEMO**    The PC exclusive LS area can also be used for the setup area of the simple DLL function, the provider function or the action item function.

[Global Symbol]

Clicking on the Global Symbol check box automatically designates the same symbol for all of the registered network nodes. This setting will be ignored if the device specified by the symbol does not

exist in the registered network nodes.

[Polling Time]

The data here shows an example of  data being read out via the DDE feature. Under certain conditions the polling time used for collecting or writing data for each symbol, distributing data and monitoring devices may not be performed.

These conditions include the number of currently registered GPs, number of Tags used on each screen sent, type of PLC connection, and number of other currently open Windows applications.

Entering "0" will allow the system to operate at maximum speed. Use this value as a benchmark when entering other values to "fine-tune" your system.

3.   When all settings are selected, the detailed settings appear in the right-side window.

If you wish to change a symbol's data after it has been registered, simply right-click  the symbol name (right-window)  to bring up a list of selections. From these, click on either the [Edit Symbol] or [Delete

Symbol] selections, or, from the menu bar, click on the [Edit (E)] menu's [Edit Symbol] or [Delete Symbol] items.

### 3.2.1 Importing Symbols

This section describes how to import symbols. The usable symbol data include symbols imported from GP-PRO/PBIII (*.lbe), symbols exported from other network project file (*. 2ws), and comment data (*.csv) from GPP function software for Windows (Mitsubish Electric).

1.  Click [Import Symbol] in the [Tools(T)] menu.
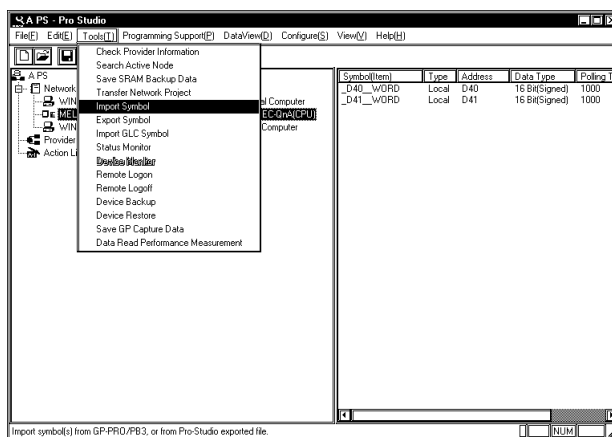


You can also right-click the registered network node and click [Import Symbol] on the shortcut menu.

2.  The following dialog box will appear. Select the file type to be imported. Then, click a desired file and then the [Open] button.
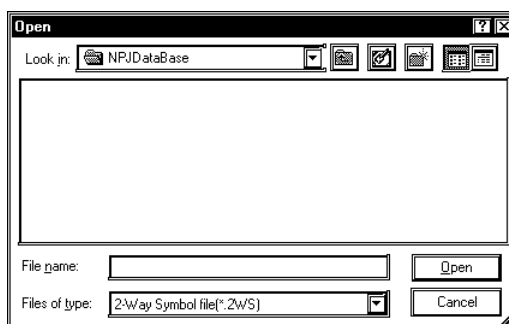


3.  The following dialog box will appear, and the designated symbol will be imported.

### 3.2.2 Symbol Export

The created symbols can be exported in a file format (*. lbe) that can be used on GP-PRO/PBIII for Windows. Also, these symbols can be exported in a file format (*. 2ws) that can be imported to another network project.

1. Select the [Tool(T)]'s [Export Symbol] from the Menu Bar.
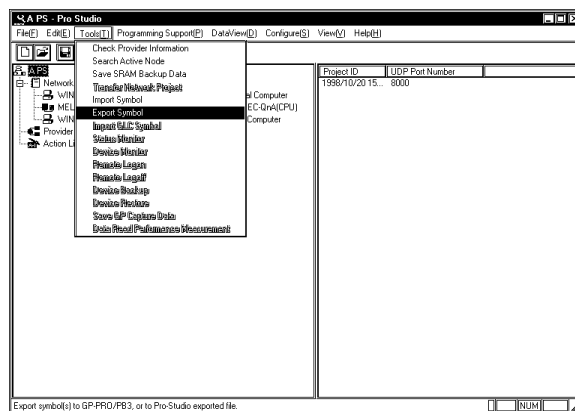


Right-clicking on a desired node can also be used to select [Export Symbol].

2. The following dialog box will appear. Designate the format and name of the file to be exported and click [Export].
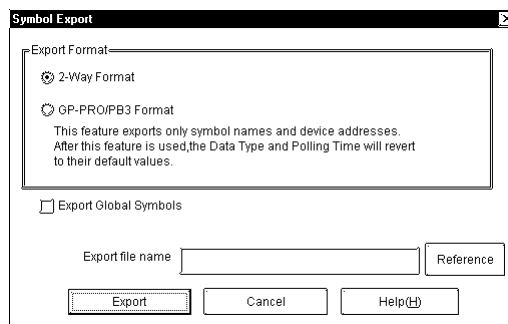
3. The following dialog box will appear and the symbol will be exported.



### 3.2.3 Importing the GLC Symbols

In order for Pro-Server to access GP symbols (variables), the GLC symbols registered in the GP-PRO/PBIII for Windows project file (*.prw) must be imported to a Network Project using Pro-Studio.

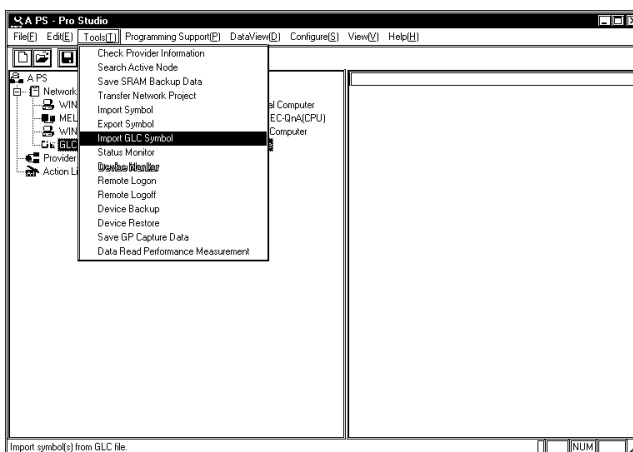1. Select the target node from the Network Entry Node list
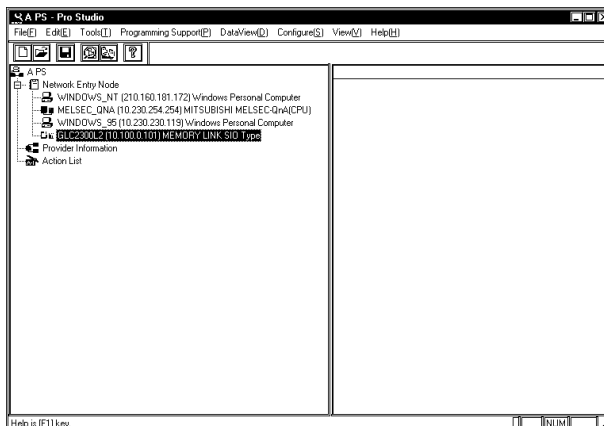
2.  Designate the project file to import in the [Edit Node] screen's [Project File (PRO/PB3)] window.
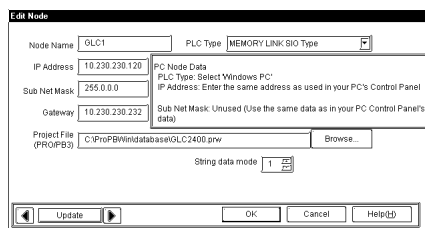


**MEMO**   If the designated project file name is incorrect, an alarm message dialog box will appear.

3.  Select the [Tools(T)] menu [Import GLC Symbol] command.



4.  The following dialog box will appear and the GLC symbols will be imported.

## 3.3  Registering Provider Data

Here you can designate the data each network node GP provides periodically or when the trigger condition is satisfied, as well as the data storage location for the GP or PC that receives the data. (The following description assumes that the Pro-Studio main window is open.)

1.  Click [Register Provider Information] in the [Edit(E)] menu.
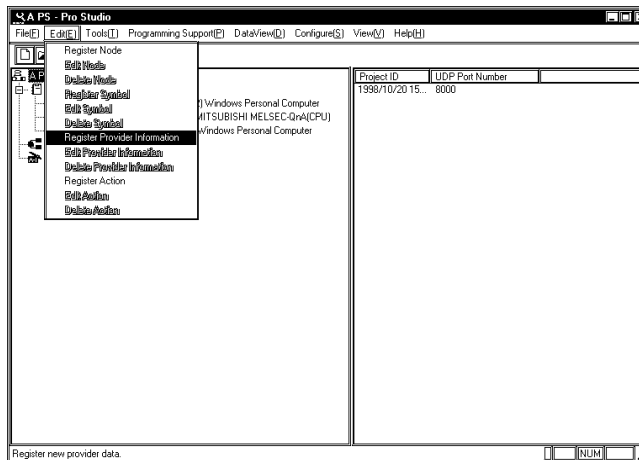
Right-clicking on the provider information list can also be used to select [Register Provide Information].

2.  The [Provider Node] window appears. Select the desired node and click [OK].
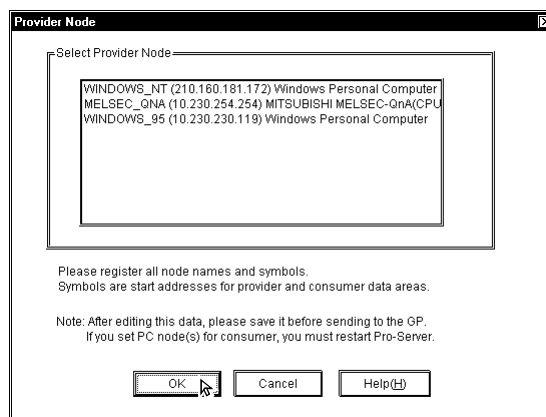
3.  The [Provide Information] dialog box will appear. Perform all the settings and click the [OK] button. For
    Advanced settings, click on [Advanced...].
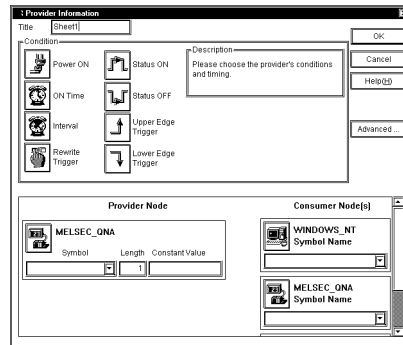


For details of each item, refer to On-line Help.

Reference → "On-line Help"

If the Provider and Consumer's symbols are not the same data type, they cannot be selected.

When a large volume of data is sent, the GP will not refresh its display while data is being provided.

In addition, the volume of data that can be sent at one time will vary depending on each PLC type.

Please refer to your PLC's manual to confirm the volume of data that can be sent at one time.

(Range of Provider Data Length)

  Bit data:1 to 16

  Others:1 to 255

You can register up to three "symbol names" for one "Provider information".

The following items are displayed by selecting the provider's condition.

| Condition | Setup Items | | | | Remarks |
|---|---|---|---|---|---|
| | Symbol Name | Time/Interval Setup | Designated Interval | Processing after Providing | |
| Power ON | X | X | X | X | |
| On Time | X | O | X | X | |
| Interval | X | O | ◆ | X | |
| Rewrite Trigger | O | O | ◆ | X | |
| Status ON | O | O | ◆ | X | |
| Status OFF | O | O | ◆ | X | |
| Upper Edge Trigger | O | O | ◆ | ◆ | *1 |
| Lower Edge Trigger | O | O | ◆ | ◆ | *2 |

X : Setting enabled      O : Setting disabled      ◆ : Option (need to be set when checkboxes are checked)

*1   If you designate "Upper Edge Trigger" and check "OFF Time After Providing", the device desig
     nated by the symbol name is set to OFF (0) when the providing process is completed.

*2   If you designate "Lower Edge Trigger" and check "ON Time After Providing", the device desig-
     nated by the symbol name is set to ON (1) when the providing process is completed.

> **MEMO**
> • The check interval is defaulted to "0 (zero)" ms. "0" ms will run as fast as possible. You should adjust the check interval if your system requires it.
> • The process after providing should be set to "Complete Process". The process is completed even when a providing error occurred.

4. The [Providing Configuration] window appears. Enter the necessary items and then click [OK].
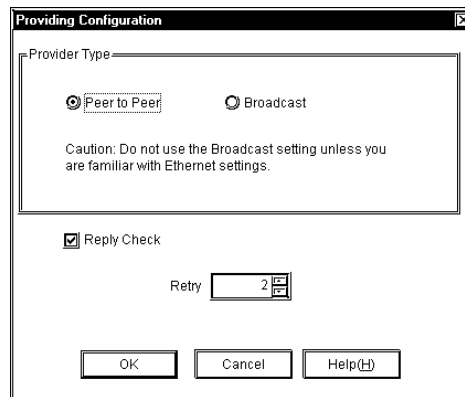


| Transmission Type | Response Check | |
|---|---|---|
| Peer to Peer | Performe(Default) | None |
| Broadcast | Performe(Default) | None |

The Broadcast feature places a load even on devices that are not related to data transfer, and an alarm message will appear to inform you of this.

If you wish to change a node (topic)'s data after it has been registered, simply right-click on the topic to bring up a list of selections. From these, click either the [Edit Node] or [Delete Node] selections, or, from the menu bar, click the [Edit(E)] menu's [Edit Node] or [Delete Node] items.

When two GP units are started simultaneously and one is set to provide data to the other ("Consumer"), if the sending unit sends the data before the Consumer finishes its start-up process, an error will be displayed on the Consumer GP. Since this error can usually be fixed by simply sending the data again, set "Retry" to one (1) to prevent the error message display.

In environments where data transfer errors can frequently occur, setting the number of data transfer retries can prevent unnecessary communication errors.

### 3.3.1    Checking for Provider Data Errors

The following procedure explains how to check provider data. If, after registering provider data, you delete

the relevant symbol name or network node, or alter any symbol's data type, an error message will appear. If

no errors are found in the provider data, the data's file size when it is downloaded to the GP will be dis-

played. The file size shown in this dialog box reflects the amount of GP screen area used.

(The following description assumes that the program's main window is open)

1.    Click the [Check Provider Information] item in the [Tools(T)] menu.
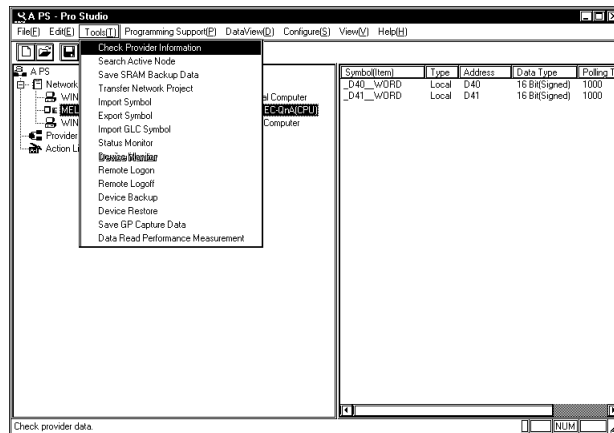
2. The following dialog box appears.



Although the program checks provider data automatically during saving, it will not display the file size.

In the following cases an error will occur:

After entering provider information,

· the data type of a symbol has been changed,

· a symbol name has been changed or deleted, or

· a node name has been changed or deleted.

If an error occurs, you will not be able to transfer the network project file (*.npj) to the GP.

DO NOT edit or delete a symbol, or that symbol's designated provider node.

Maximum size of provider information data is 64 kbytes.


Rule of thumb

Base.........................................36bytes

Register Node..........................72bytes

Register Provide Information.....120bytes

## 3.3.2    Action Items

Using the action item function, you can designate the desired action item(s) (called action item "contents")

so that a Consumer (only a Windows OS personal computer) which has received provider information will

perform them.

You can start action items by setting the symbol name of the Provider node to the action name.

Action items must be set up, however, it is possible that they are not used during normal operation.

For a detailed explanation of action item functions, refer to "Chapter 4 Action Items".

## 3.4   Using the DDE Function

Pro-Server incorporates the DDE server function and therefore can exchange data with applications that

support the DDE client function. The following description assumes that the program's main window is

open.

### DDE: String Copy

1.   Click the desired symbol name.
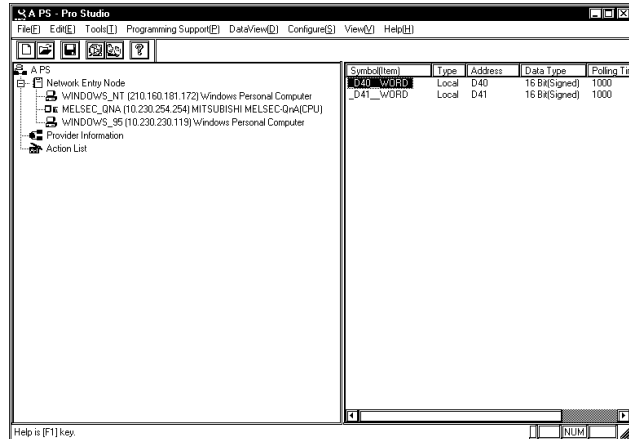


```
MEMO
```
   With Excel, you cannot use DDE to write data because Excel does not

support data writing as a DDE client. To write data to Excel, use the VBA

function.

2.   Click [DDE: String Copy] on the [Programming Support(P)] menu. Or, right-click the symbol

name, and then select [DDE: String Copy].
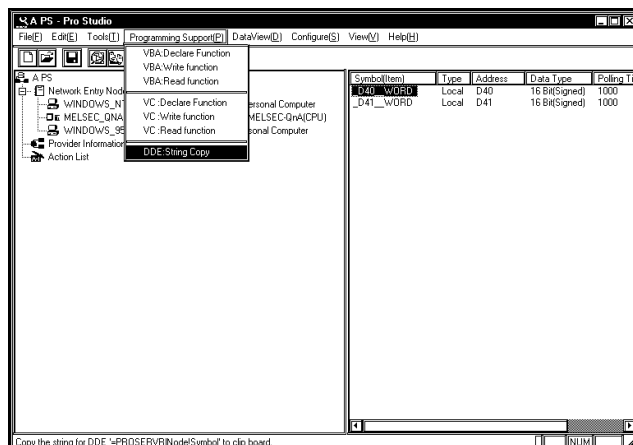
3.  When the following dialog appears you can paste the copied string into any DDE-compatible software.
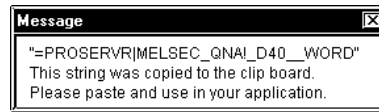


4.  Here, the copied string is pasted into an Excel worksheet to create a DDE link.
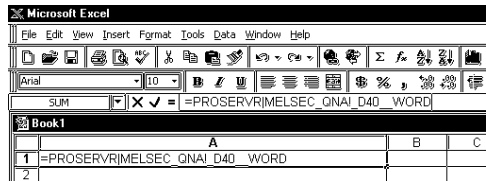


**MEMO**  When a symbol's data is text and is copied to an Excel cell, only the first character of the text will be displayed. In this case, edit that Excel cell and add the required characters.

Ex.

=PROSERVER|GP1!' SYMBOL.*20'

Be sure to put ""around "!".

Reference → "A.1 DDE Function Details"

When Creating an LS Area inside your PC:

When using the (data) distribution feature, the creation of an internal LS (Pro Server) area inside your PC will allow you to easily read out data periodically from one or more PLCs. The setting of the DDE feature to read out collected data from the LS area will allow the data in the LS area to be refreshed faster.
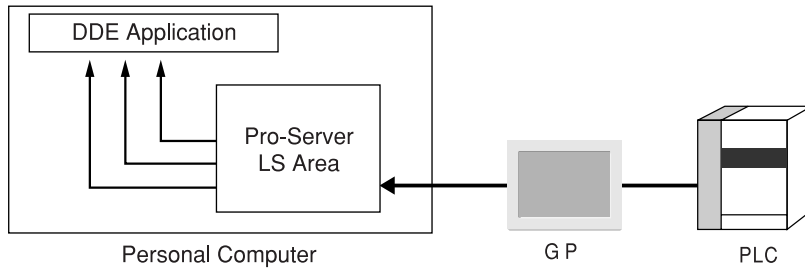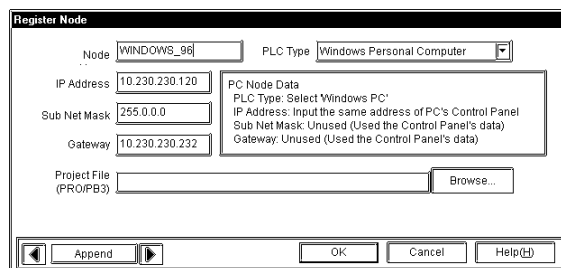


1. Call up the Register Node feature to register the Host PC.
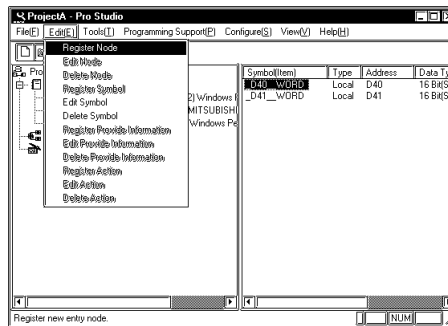


To Register a Node, refer to "3.1 Registering Network Entry Nodes"
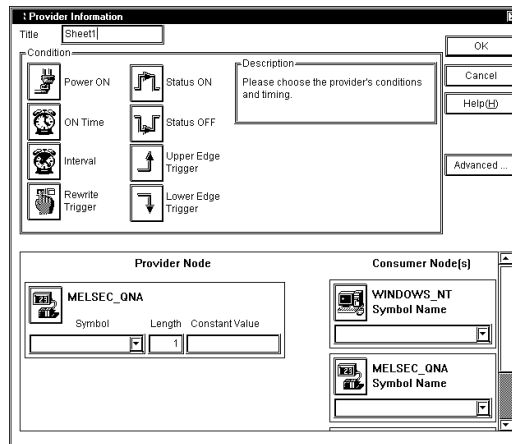
2. Designate the Host PC.



[PLC Type]

Designate the Host PC.

3.   Enter the settings for the PC's internal LS area.



[Consumer Node(s)]

Designate the LS area name that the host PC will use.  You should designate the LS area name that you wish to use among LS, LSA, LSB ... LSY and LSZ.

For detailed Provider information, refer to "3.3 Registering Provider Data".

When Creating an LS Area inside your GP

Creating an LS area inside your GP will allow your PC to easily read out data periodically from the GP. The setting of this feature allows data to be read out faster. This feature also speeds up data writing.



Personal Computer          G P          PLC
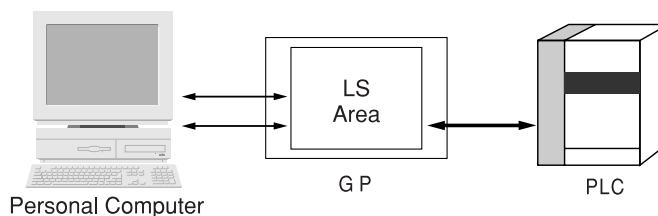
**MEMO**   The GP's LS area will vary depending on the GP system used.  The following table shows LS area sizes according to GP system versions.

| LS Area Size | GP |
|---|---|
| 4096 | GP77R SERIES |
| 8192 | GP-2000 SERIES/GLC2000 SERIES/IT SERIES |

For the GP's LS area size, the 2-Way Driver will automatically decide its accessible range.

GP-PRO/PBIII for Windows Ver. 6.0 or later should be installed on the GP system to use the LS area up to 8192.

## 3.5 Using the VBA Support Function

Pro-Server can read and write data both to and from applications supporting Visual Basic and Visual C++ using read and write functions. The following procedures explain how to write data from Excel to a designated symbol via a programming support function.
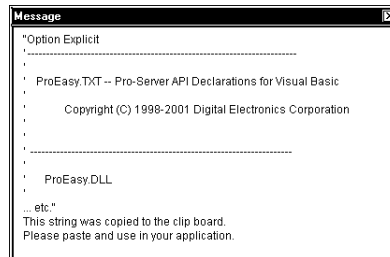
When developing applications with VB or VC, refer to "Chapter 9 Simple DLL Function".
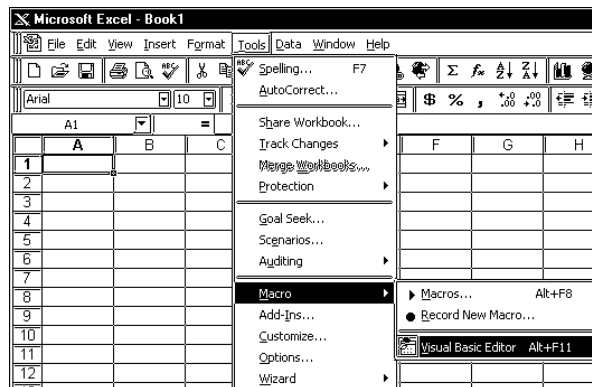
### VBA: Declare statement

1. Selecting [VBA: Declaration statement] from [Programming Support].
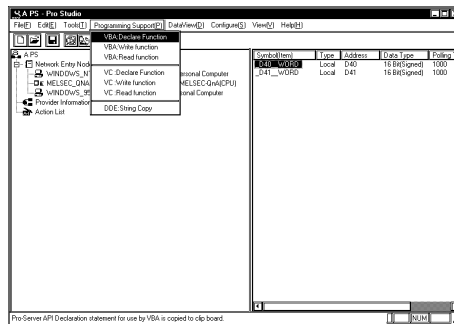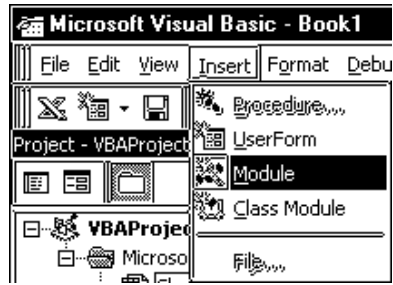


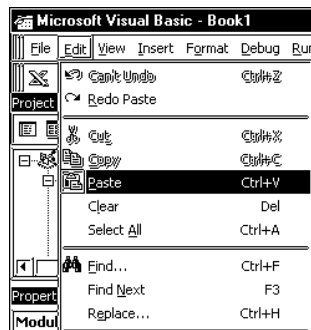2. The declaration is copied to the Clip board.



3. Start-up Microsoft Excel. Select [Visual Basic Editor] from the [Tools] menu's [Macro] feature.
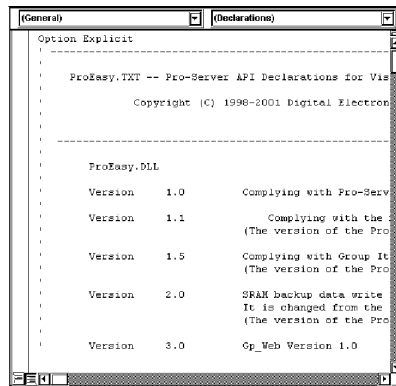
4.   Select [Module] from [Insert] in the Visual Basic Editor.



5.   Paste the declare statement in the inserted standard module.



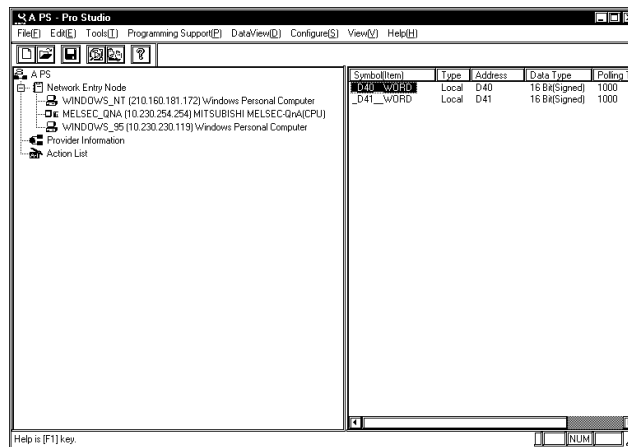6.   This completes function declaration.

## VBA: Write Function

7.  Click the desired symbol name.

8.  Select [Programming Support(P)]'s [VBA: Write function] from the Menu Bar.
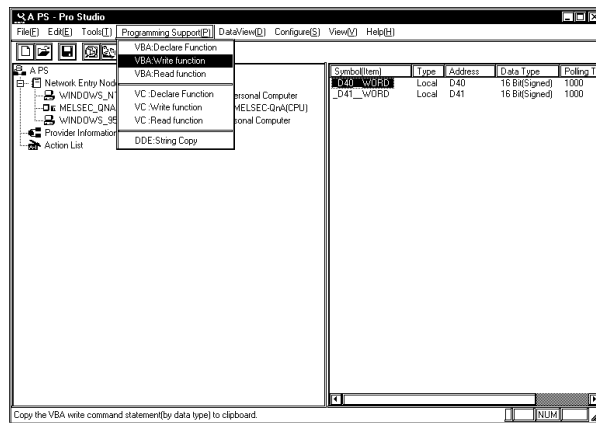
9.  Write Command is now copied to the Clipboard.

Message

"lErr = WriteDevice16("MELSEC_QNA","_D40__WORD", Enter value(Integer type) here,1)
"
This string was copied to the clip board.
Please paste and use in your application.

3.5 Using the VBA/VC Support Function
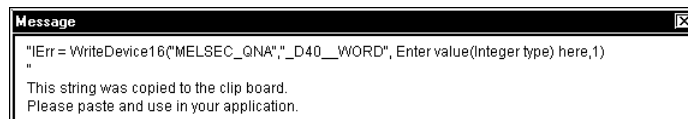
10. In Microsoft Excel, select the [Control Toolbox] from the [Views] menu's [Tool bars] feature.
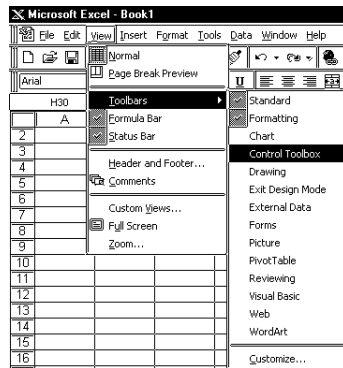
11. Paste the command button onto the sheet.

Command Button
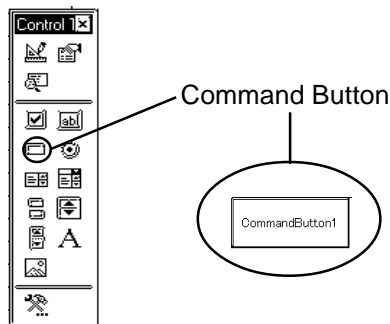
12. Double click the button. The following VBA creation screen is displayed.
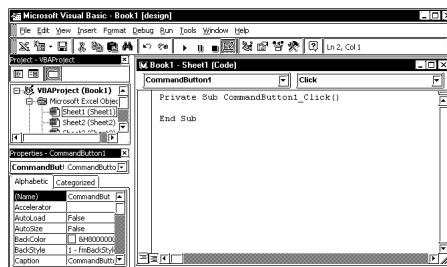
13. Paste the instruction statement in the program position of the VBA creation screen.

3-25
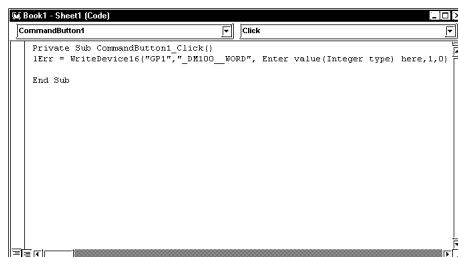
14. Input the value to be written into the PLC device whose symbol is indicated. Replace the words 'Input value here' with the numeric value.

Example) When set to 100,
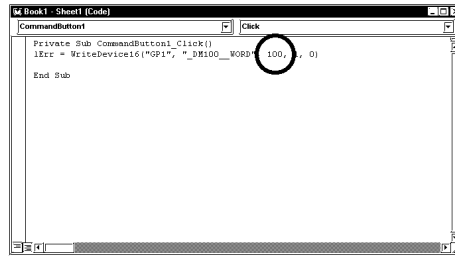


15. Click on the [Design] icon to quit the Design Mode.



Design Icon
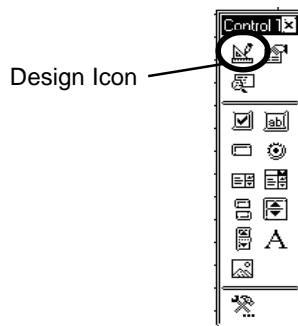
16. Thus, when you click Excel's Command Button, "100" is written to the PLC symbol's device.
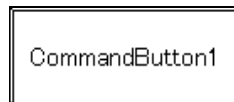


CommandButton1

The Device Monitor feature allows you to easily check that the data has been written successfully.

Reference → "Chapter 6  Tools"
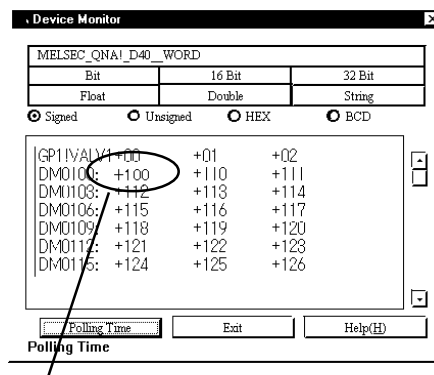


"100" has been written to the device.

(Reference)

Cells that have been designated as using Excel's Range Function can write data to a GP or PLC device. If you then change the value entered in this cell and push the Command Button, the device's data will be immediately refreshed.

Reference → 3-25, step 11.

1.  Input the value to be written to the  symbol's PLC device.

    Here, enter "Range("A1")" in the space shown by "Enter value here"

    "IErr = WriteDevice16("GP1","_DM100_WORD", Range("A1"),1,0)"
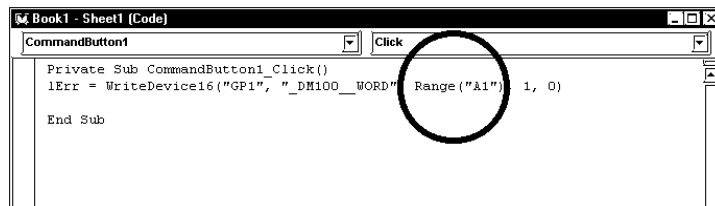


2.  Click the [Design] icon to quit the Design Mode.



Design Icon
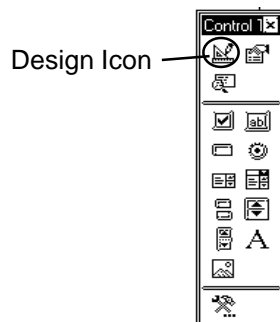
3.  Thus, when you enter 100 in Excel's worksheet cell A1, and press the Command Button, "100" is written to the GP or PLC symbol's device.
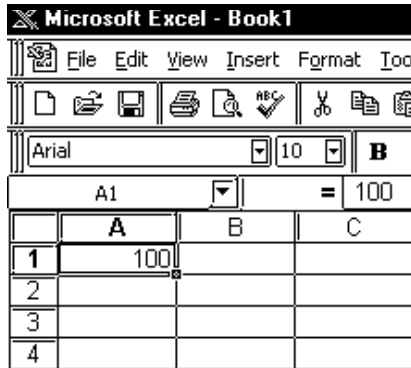


The Device Monitor feature allows you to easily check that the data has been written successfully.

Reference → Chapter 5, "Monitoring"
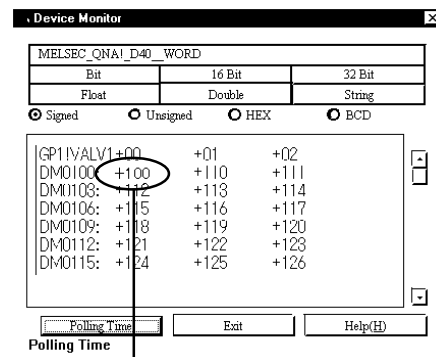


"100" has been written to the device.

## 3.6   Saving Backup Data in SRAM

Pro-Studio allows you to upload backup data stored in a GP's SRAM to the host PC as a comma-delimited

CSV (Comma Separated Value) file. You can open CSV files using Excel, Access, or any application that

supports the CSV file editing format. There are eight types of backup data you can upload (or save).

1.   Click [Save SRAM Backup Data] on the [Tools(T)] menu.
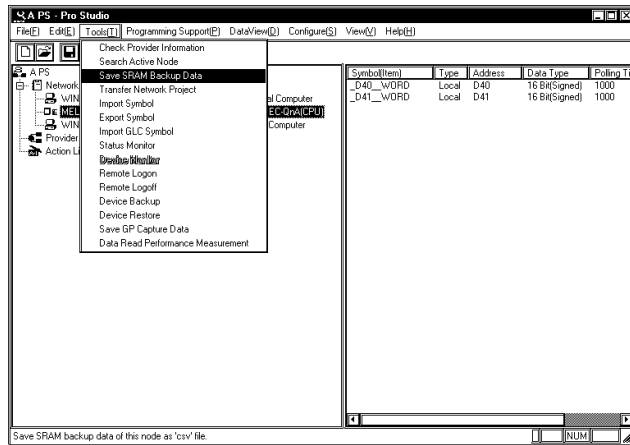


2.   The [Save SRAM Backup Data] window appears. After selecting the network entry node, the
data you wish to save, and the file in which the data is saved, click [Save].
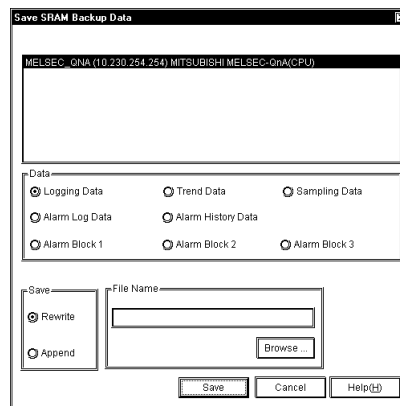


For detailed information about each data, refer to GP-PRO/PBIII for Windows Tag Reference Manual.

Reference → "GP-PRO/PBIII for Windows Tag Reference Manual"

3. The time elapsed for saving is shown.
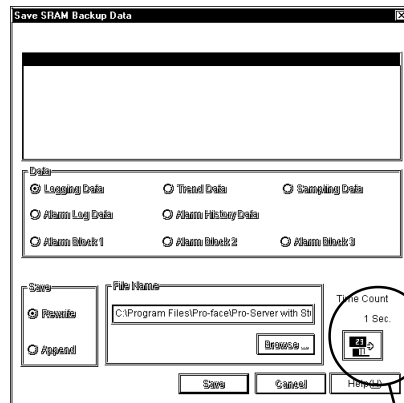


Saving time is shown.

4. When the saving process has been completed successfully, the following window appears.



**MEMO**   To open an SRAM backup data file you saved using Excel, start Excel,

click [Open] on the [File] menu, and then select [Text file (*.prn; *.txt;

*.csv)] as [Save as type].
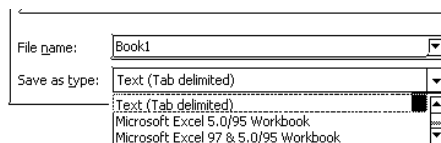
## 3.7  **Device Data Backup and Restoration**

The device data backup function allows you to collect a series of device data via the Internet and to save it as data files.

The device data restoration function allows you to restore collected data from a series of devices.

The data saving format can be either BIN (binary) or CSV.

### 3.7.1  Device Data Backup

1.  Click the [Tools (T)] menu in the [Device Backup] window.
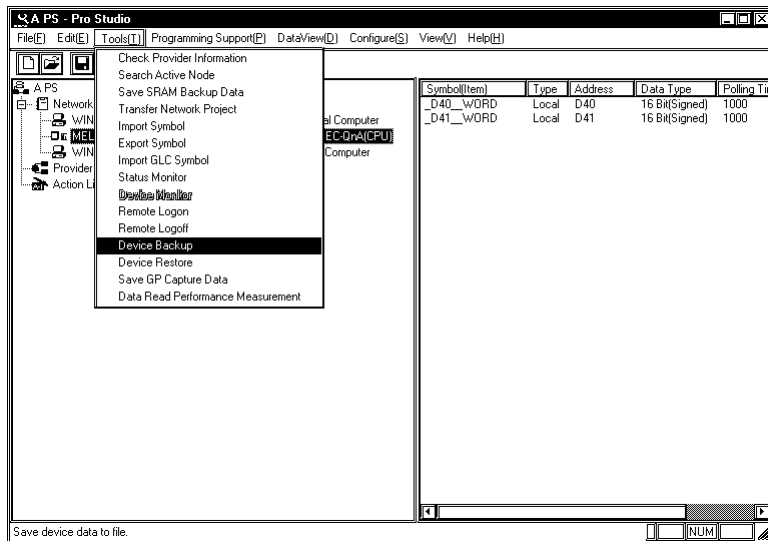


2.  The [Device Backup] window appears.  After selecting all items, click [Backup].
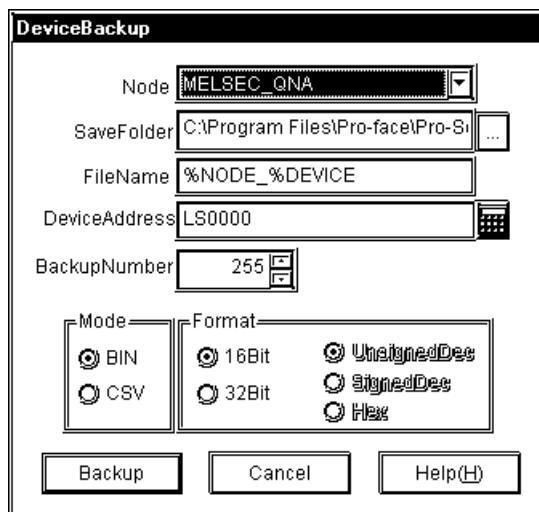
[Node Name]

Select the node name.  If unselected, the error dialog will appear.

[Save Folder]

Enter the path to the folder that you wish to save data.  This is defaulted to the "NPJDataBase" folder in the current directory of Pro-Server.  If not entered, the error dialog will appear.

[File Name]

Enter the file name.  By default, the file name will vary depending on the node name, the device address, the saved type and the data type.  If not entered, the error dialog will appear.

[Device Address]

Enter the device address that you wish to start saving.  This is defaulted to "LS0000".  If not entered or entered incorrectly, the error dialog will appear.

[Backup Number]

Enter the number of backup data.  The minimum value is 1, and this is defaulted to 255.

[Mode]

Select the saved type.  This is defaulted to "BIN" (binary).

[Format]

Select the data type.  This is defaulted to "16 bits unsigned decimal".  Select the number system only when the saved type is CSV.

3.  The backup processing status is displayed in the [now] dialog.
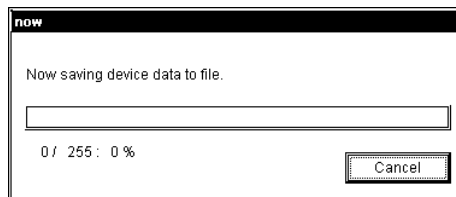
4.  When the backup process has been completed successfully, the following window appears.

    Click [OK] to exit the process.

```
Pro Studio       ⊠
   ⓘ   Save Complete

       ┌─────────┐
       │   OK    │
       └─────────┘
```

**MEMO**

• The following shows the data contents for CSV device data.

Node name, (Node name for backup) (CR)

Device name, (Device address to start backup) (CR)

Number, (Number of backup data) (CR)

Device length, (Bit length of the backup device) (CR)

Data type, unsigned decimal (CR)

Date, (Backup date) (CR)

(CR)

Data, comment (CR)

(Value of the first device address), (Name of the first device address) (CR)

(Value of the second device address), (Name of the second device address)

(CR)

• The backup date should be written in a format of (year)/(month)/(day) (space)

(hour):(minute).  If (minute), if it is one digit, use 0 (zero) in the second digit.

## 3.7.2    Restoring Device Data

1.    Click [Device Restore] on the [Tools (I)] menu of the Menu Bar.

[File Name]

Enter the file name.  All buttons except for the cancel button will stay dimmed until you designate the correct file.
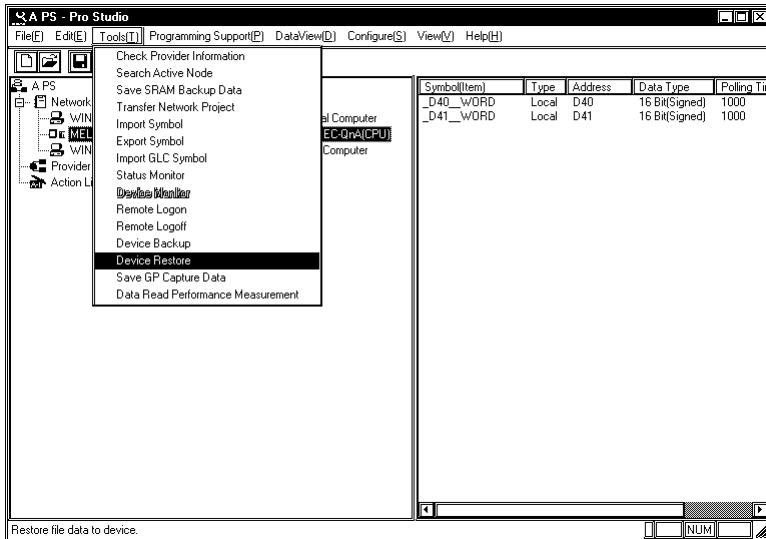
2.    The [Device Restore] window appears.  After selecting all items, click [Restore].
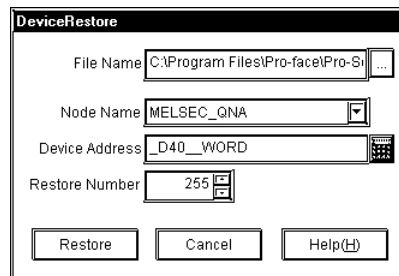
[File Name]

Enter the file name.  All buttons except for the cancel button will stay dimmed until you designate the correct file.

[Node Name]

Select the node name from the selection box.  If unselected, the error dialog will appear.

[Device Address]

Enter the device address to start the restoration.  When you enter the file name, the header address saved in the file is entered.  If not entered or entered incorrectly, the error dialog will appear.

[Restore Number]

Enter the number of restoration data.  The minimum value is 1, and the maximum value depends on collected data files.  When you enter the file name, the number of data saved in the file is displayed.

3.  The restoration processing status is displayed in the [now] dialog.

```
now
File data is now being restored to the device.

[                                    ]
0 /  255 :  0 %              [ Cancel ]
```
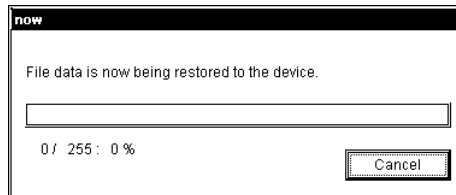
4.  When the restoration process has been completed successfully, the following window appears.  Click [OK] to exit the process.

```
Pro Studio                    [X]
 (i)   Save Complete
         [ OK ]
```

## 3.8 GP Capture Data Saving Function

Pro-Server allows you to read the on-line GP capturing data on your network. This screen capturing is realized by two different ways, the way to execute it using the action item function or the interactive way. This section describes the interactive capturing procedure.

For the procedure using the action item function, refer to "Chapter 4 Action Items".

Reference → "Chapter 4 Action Items"

**MEMO**
- You can use this function only on GP-2000 series/GLC2000 series/IT series.
- Prior to performing this function with the CF Card inserted into the GP because the read data is temporarily saved in the CF Card.

1. Click [Save GP Capture Data] on the [Tools (T)] menu of the Menu Bar.
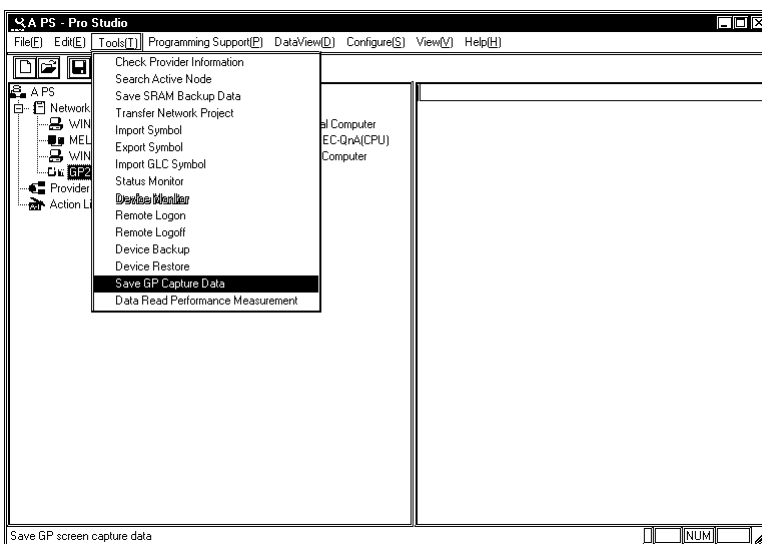
2. The [Screen Capture & Save] window appears. After selecting all items, click [Save].



[Node Name]

Select the node name. If unselected, the error dialog will appear.

[Folder Name]

Enter the folder name to save data. This defaults to the "NPJDataBase" folder in the current directory of Pro-Server. If not entered, the error dialog will appear.

[File Name]

Enter the file name. This defaults to %NODE%Y%M%D%h%m%s (node name, year, month, day, hour, minute).

[Show Browser]

Select if you wish to display it on your browser after uploading the GP screen. If you check (ON) the box, it will be displayed on your browser. This defaults to unchecked (OFF).

**MEMO**  When you execute [Save GP Capture Data], drawings and operations on the GP screen will stop for a few seconds. Therefore, you cannot normally execute the GP screen capturing operation from upper-level PCs. You should set the bit "0" of GP's LS2076 to "ON (1)" to capture GP screens from upper-level PCs. The bit "0" of LS2076 will be set to "ON (1)" while capturing.

## 3.9　Security Function

Pro-Server has a security function to protect PLC and GP data.

The following items are included in this function:

- Passwords to set up user levels (User level password)
- Password to protect accesses from unregistered personal computers

  (Remote password)

### 3.9.1　User Level Password Settings

Pro-Server can restrict the range of functions available to a user via three different password levels.

**MEMO**　　Be sure to write down every password registered so as not to forget it. You cannot log on to the system without the correct password.

1.　Select [Password] in the [Configure(S)] menu.
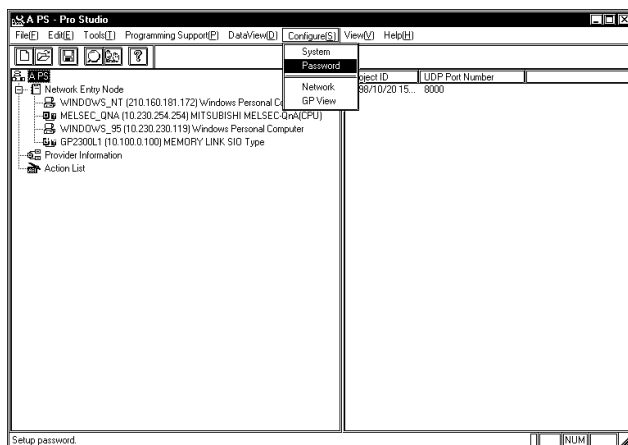
2. The Password window appears. Specify whether you enable or disable the password check by turning on the corresponding option. If you select [Enable], enter all the items and then click [OK].



Operations available for each level are as follows:

| Level | Change settings | Writing data | Reading data |
|---|---|---|---|
| Administrator | ○ | ○ | ○ |
| Read / Write | ✕ | ○ | ○ |
| Read only | ✕ | ✕ | ○ |
| Disconnect | ✕ | ✕ | ✕ |

Change Settings...Provider information setting changes, etc.

Writing data.........Data write via device monitor

Reading data........Data read via device monitor

If you enter a password, the following Login window will appear at the start of Pro-Server/Pro-Studio.

## 3.9.2 Remote Password Setup

In order to prevent illegal accesses by a personal computer that has not been registered on the network, a password can be registered for the entire network.

When remote access is attempted from a personal computer that has not been registered as a network node, a dialog box will appear asking for the password. After the registered password is correctly entered, remote access can be performed.

**MEMO**     Be sure to write down each registered password. If a password is forgotten, remote access cannot be performed.

1.  Select [Network] in the [Configure(S)] menu.
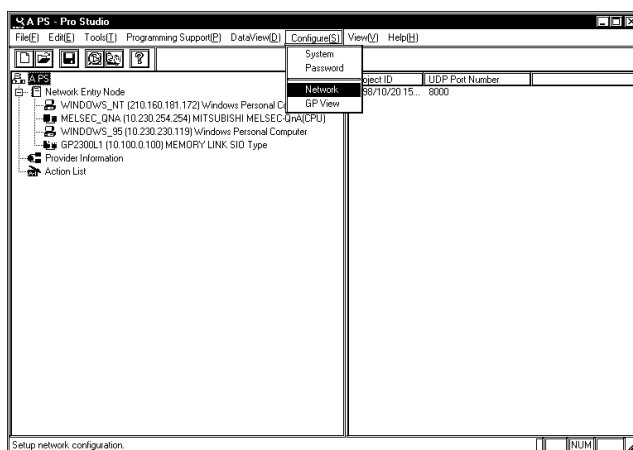
2.  The [Network Configuration] dialog box will appear. Enter a password in [Network Remote
    Password] and click the [OK] button.
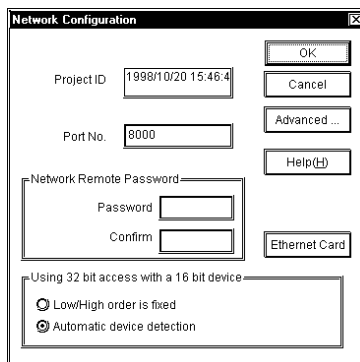


When selecting a node via a personal computer that has not been registered as a network node and
selecting [Tool]'s [Remote Logon] from the Menu Bar, a dialog box will appear, asking for the
password.
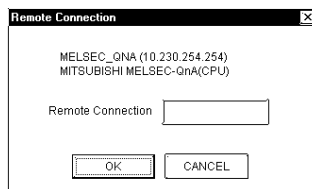
## 3.10 Configuring the System

The following describes how to enter Pro-Server and Pro-Studio system information. (The following description assumes the program's main window is open).

1.　Select [System] in the [Configure(S)] menu.
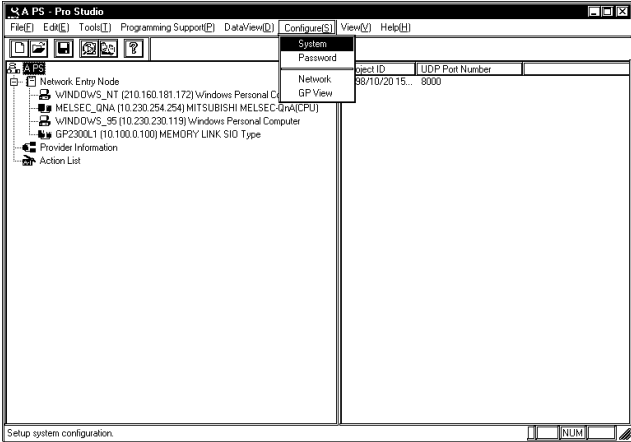
2. The [System Configuration] window will appear. Enter all necessary data and click [OK].
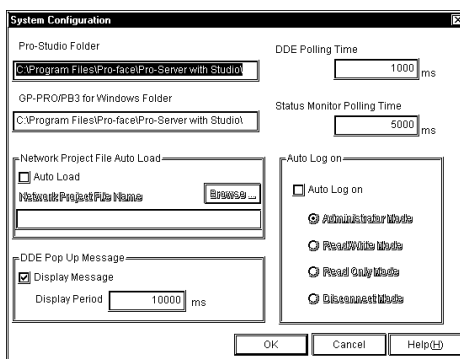


[DDE Polling Time]

The DDE polling time designated here will be used as an initial value of the polling time when a symbol is registered.

[GP-PRO/PBIII for Windows Folder]

Designate the folder where GP-PRO/PBIII for Windows is installed. The default is "C:\ProPBWin\".

[Network Project File Auto Load]

The designated network project file is loaded automatically when Pro-Server starts.

For access rights by modes:

Reference → "3.9.1 User Level Password Settings".

For the detailed information for other items:

Reference → On-line Help.

**MEMO**

- The polling time used set for collecting or writing data for each symbol, providing data and monitoring devices may not be able to be performed under certain conditions. These conditions include the currently registered number of GPs, number of Tags used on each screen sent, type of PLC connection, and number of other currently open Windows applications. Entering "0" will allow the system to operate at its maximum speed. Use this value as a benchmark when entering other values to "fine-tune" your system.
- If you create and add Pro-Server's short-cut to the Windows Start Up menu, Pro-Server will start automatically with a network project that has been designated via [Network Project File Auto Load].

# 3.11 Configuring the Network

Follow the procedure below to change the Network Port Number setting. The ports to be used should be consecutive ports, beginning with the first port number entered. The default port number setting is "8000" which uses ports 8000 and 8001. The following description assumes the Pro-Studio main window is open.

1.  Click [Network] in the [Configure(S)].
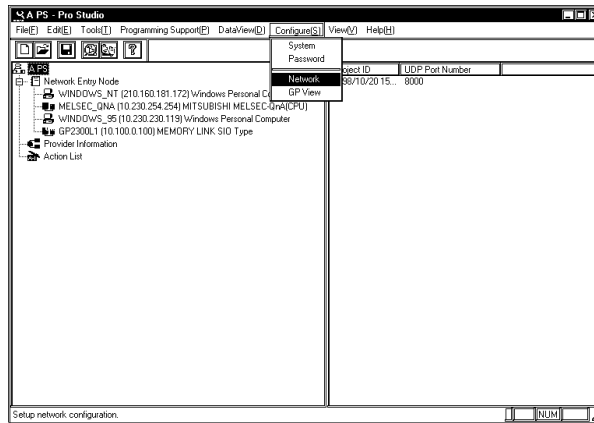


2.  The [Network Configuration] window will appear. Enter all necessary data and click [OK]. To enter advanced settings, click on [Advanced].
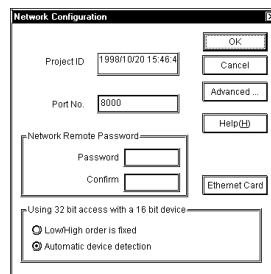


[Port No.]

For port numbers, ten numbers in series are used, starting from the designated number.
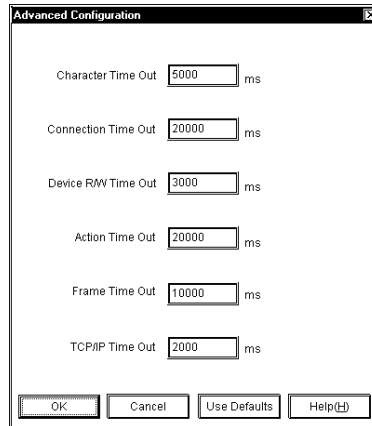
[Network Remote Password]

For a remote password through network, refer to "3.10.2 Setting the Remote Password".

[Using 32 bit Access with a 16 bit device]

Selects the access order of sequential two 16-bit devices which are regarded as a single 32-bit device.

3. The [Advanced Configuration] window will appear. Enter all necessary data and click [OK].

| Advanced Configuration | |
|---|---|
| Character Time Out | 5000 ms |
| Connection Time Out | 20000 ms |
| Device R/W Time Out | 3000 ms |
| Action Time Out | 20000 ms |
| Frame Time Out | 10000 ms |
| TCP/IP Time Out | 2000 ms |
| OK | Cancel | Use Defaults | Help(H) |

After you have selected an advanced setting, the following message appears.

Pro-Studio

⚠ If the advanced settings are changed, data transfer may be effected. Do you wish to continue?

OK    Cancel
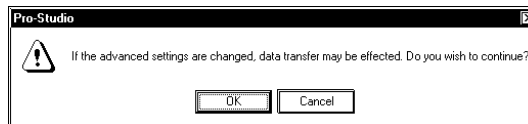
Clicking [Use Defaults] resets all values to the default values.

## 3.11.1   Configuring Ethernet Cards

If the PC for Pro-Server has equipped with two or more Ethernet cards, it is required to designate the specific card for Pro-Server to use. If the PC has only one Ethernet card, there is no need to change the settings.

These settings are not available on a PC running Windows 95.

1.   Select [Configure(s)] menu's [Network Configuration] item.
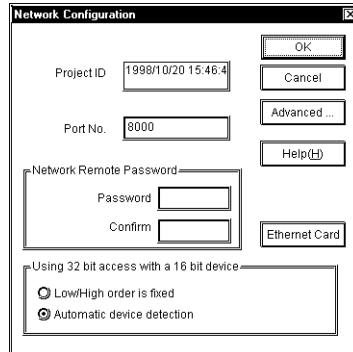


2.   Click the [Ethernet Card] button. The Ethernet Card window will appear.
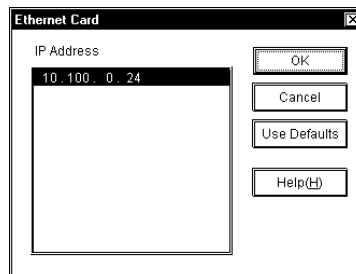


3.   Select the IP address of the card to be used by Pro-Server and click OK.

**MEMO**   After changing the Ethernet card, make sure to restart both Pro-Server and Pro-Studio.

## 3.12 Printing the Setting Data

You can Print Pro-Studio Setting data.

The items that can be printed are as follows:

· Provider's list

 IP address, sub net mask, PLC type

· Registered symbol information by provider

 Symbol name, symbol type, device address, data type, polling time

· Registered provider information data by provider

 Provider title, provider contents (conditions, symbol name, check interval,

 provider, receiver)

1. Select the [File(F)] menu's [Print(P)] command.
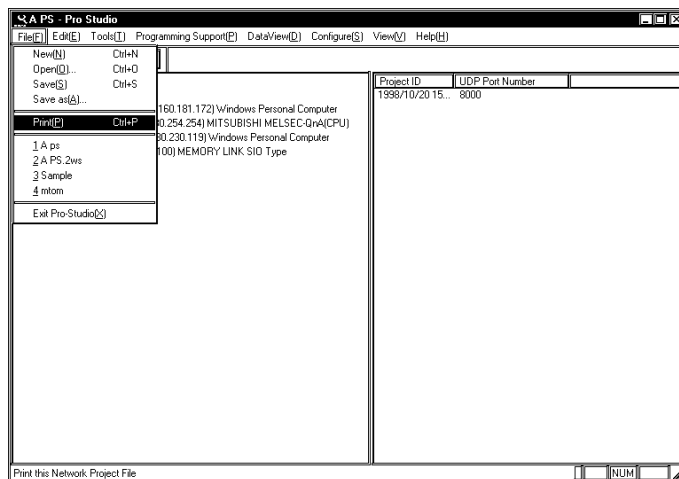


When no Network Project file (*.npj) is open, a dialog box will appear to ask a target file to print.

2. The default printer will print the data.

Printable paper size is A4 only.

# 4 | Action Items

This chapter describes the detail about Action Items.

## 4.1   Overview

Using the action item function, you can designate the desired action item(s) so that a Consumer (only a Windows computer) that has received provider information will perform them.

To use an action item, first, use the Setup Menu to register it. A registered action item can then be used by designating the action's name instead of a symbol name in the [Provider Information] dialog box.

## 4.2 Action Item Registration

The following procedure explains how to register an action item.

1.  Select the [Edit(E)] menu's [Register Action] selection.
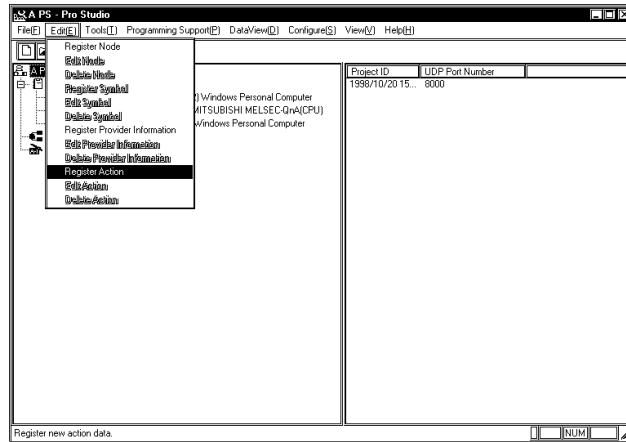


2.  The [Edit Action] dialog box will appear. Select the desired action item from the pull-down menu and designate the action name.
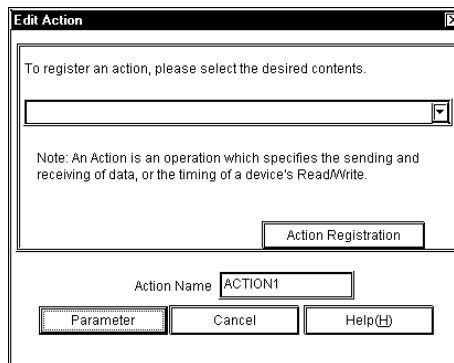


[Action Registration]

It is necessary to register the action item contents to the registry when you created it by yourself. To register new action items, click the [Action Registration] button.

**MEMO**　　Action item contents prepared by Pro-Server with Pro-Studio are automatically registered at the installation time so that you do not need to perform this operation for those.

3.  Clicking the [Parameter] button will call up detailed settings for each selected action item.

## 4.3   Action Item "Contents"

The following description explains how to enter settings for individual  action items.

The following explanations assume that the [Register Action] dialog box has been opened, an action selected from the pull-down menu, and the [Parameter] button has been pressed to bring up that action item's [Setting Parameters] dialog box.

### 4.3.1    Start Application

1.   The following screen will appear.



[Application Name]

Enter the name of the application to be started here. This includes any user-created applications as well. (e.g. *.exe, *.com)

[Startup Options]

When a start up option or Provider data are used as a parameter, enter the data and click the appropriate check box.

[Node name]

The Provider node name is automatically added as startup options.

[Write data]

Provider data (write data) is automatically added as startup options.  If there are multiple Provider data, "<single-byte space>, <Provider data>" is added in turn.

(Example) :    <starting options><single-byte space><Provider data><single-byte space><Provider data> ...

[Current Folder]

Designate the current folder of [Application Name].

## 4.3.2    Write Data to Excel Book

1.   The following screen will appear.
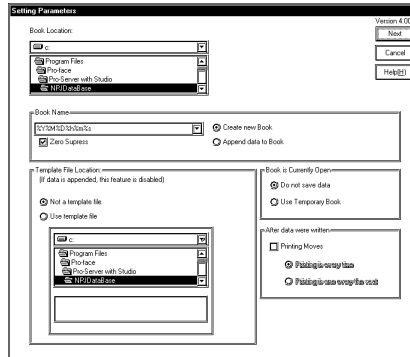


[Book Location]

If you check the Save To Folder location in the action parameter display, and if the folder exists, the

contents exactly as you designated is displayed.

If the folder does not exist, the following window appears.
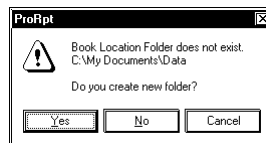


Click [Yes] to create the folder.  The folder creation window will appear.  If you click [No], the folder

designation window will appear to designate the Save To Folder location.

If you click [Cancel], the process is canceled.

[Book Name]

Enter the book name.

[Zero Suppress]

If you check this option, no zeros are supplied to the file name even though the file name includes any

of "%M%D%h%m%s" (month, day, hour, minute, second).

If you do not check this option, 0 (zero) is supplied to the file name if the file name includes any of

"%M%D%h%m%s" (month, day, hour, minute, second) and that number is one digit.

The default is "checked".

**MEMO** Writing in the Excel sheet is performed while searching blank cells. A large amount of data in a sheet will slow down a writing process.

A sheet is divided by setting a book name as "%Y%M%D%h%m%s" so that a writing process will be speeded up.

[File Save Method]

When you normally wish to make a new book, check the upper button. If you wish to add historical data, etc., click on the lower button.

[Template File Location]

If you wish to use a previously made template file, click the [Use Template file] button, and then select the desired template file (*.xlt).

**MEMO** Only the sheet1 should exist within the designated template file.

[Book is Currently Open]

Select the action from [Do not save data] or [Use Temporary Book] when books with the same filename are open on writing.

If you selected [Do not save data], written data are not saved when book files with the same filename are open in advance.

If you selected [Use Temporary Book], written data are saved as a separate filename temporarily. The temporary filename will be "%Y%M%D%h%m%s.xls".

[After data were written]

Select when printing is required after data write. Timing can be set to [every time] or [every sheet].

If you selected [every time], printing is executed every time data are written.

If you selected [every sheet], printing is executed after data are written to all the designated cell range.

2. Clicking the previous Excel Setting screen's upper right corner  [Next] button calls up the following screen.
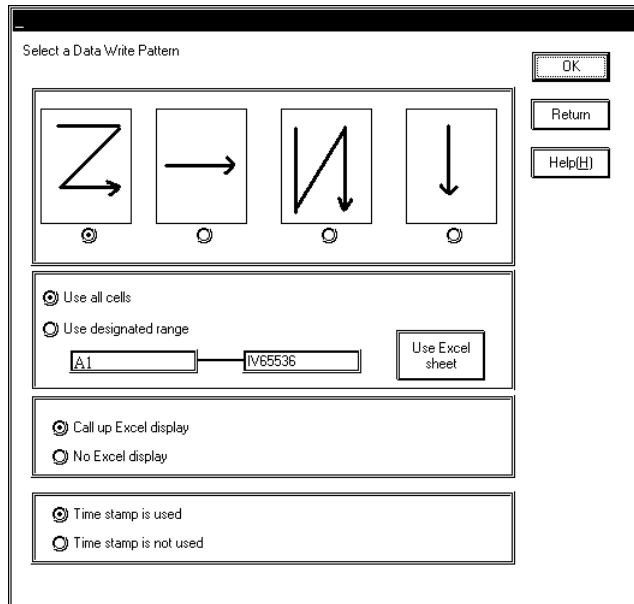


[Select a Data Write Pattern] [Write Data Range]

Designate the sheet's data write pattern, and the write data's cell range. If you click [Use Excel sheet], you can designate the rage in the Excel environment.  When the designated write data cell range is filled with write data, the new sheet is automatically created and the write data process is continuously executed on the newly created sheet.

[Call up Excel display]

When [Call up Excel display]  is checked, as soon as the designated trigger conditions are met, Excel will automatically start and the data will be written to the Book.

Once the data write is finished, however, Excel will quit after a preset interval.

[Time Stamp]

Selecting [Time stamp is used] will write the Provider's time data.

### 4.3.3 Alarm Log (with Sound Alert Features)

This feature allows the simultaneous output of sound data and display of alarm data, while automatically saving a Provider's Alarm history data.

Also, after creating the following table data with Microsoft Access, an Action Item's table designation settings can be used to compare the Provider data and a Key Code, and then perform the actions designated in the table.

mdb file name:     Alarm.mdb

Table name:     TemperatureAlarm_TBL

Designate the WAV files.

| Key_Code | WAV | DISP1 | DISP2 |
|----------|-----|-------|-------|
| 1 | Machine1.wav | Machine1 | High Temp. |
| 2 | Machine2.wav | Machine2 | Low Temp. |
| 3 | Machine3.wav | Machine3 | High Temp. |

Enter the message you wish to have appear when the Action Item is started.

**MEMO**     The sample of Alarm.mdb is available in "\Pro-Server with Pro-Studio\Pro-SDK".

1. When the Setting Parameters screen appears, enter the following data.

[mdb Filename]

Ex."Alarm.mdb"

[Table]

Ex."Temp Alarm_TBL"

[Key Field]

Ex."Key_Code"

[WAV Data Field]

Ex."Wav"

[Message Display Field]

Ex."DISP1, DISP2"

[Log Data Save Table]

If you check the Save To Folder location in the action parameter display, and if the folder exists, the contents will display exactly as you designated.
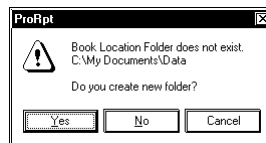
If the folder does not exist, the following window appears.



Click [Yes] to create the folder. The folder creation window will appear. If you click [No], the folder designation window will appear to designate the Save To Folder location.

If you click [Cancel], the process is canceled.

[Number of Log Data Items]

Enter the number of items to be logged. When the number of items exceeds this value, the oldest item is deleted.

## 4.3.4    Upload of GP Log Data

Back-up data can be read online from the provider's SRAM or CF Card by designating the read source.

If XLS format is selected for the save format, Microsoft Excel must be installed.

1. The following screen will appear.
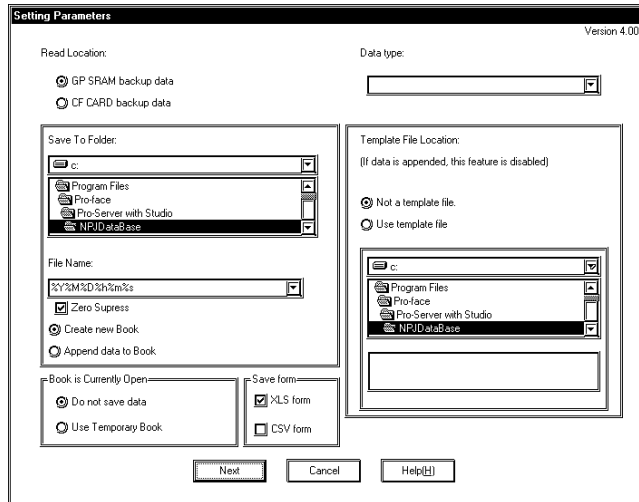


[Read Location]

Select a location to read data from, i.e. either SRAM or the CF Card.


[Data type]

Select one of the following items from the  pull-down box

    Logging Data

    Trend Graph Data

    Sampling Data

    Alarm History Data

    Alarm Log Data

    Block 1 (When designating an alarm block in GP-PRO/PBIII for Windows)

    Block 2  (When designating an alarm block in GP-PRO/PBIII for Windows)

    Block 3  (When designating an alarm block in GP-PRO/PBIII for Windows)

[Save To Folder]

If you check the Save To Folder location in the action parameter display, and if the folder exists, the contents will appear exactly as you designated.

If the folder does not exist, the following window appears.

Click [Yes] to create the folder. The folder creation window will appear. If you click [No], the folder designation window will appear to designate the Save To Folder location.

If you click [Cancel], the process is canceled.
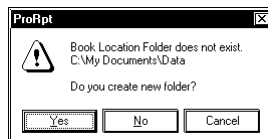


[File Name]

Default setting is a full date stamp,%Y%M%D%h%m%s

[Zero Suppress]

If you check this option, no zeros are supplied to the file name even though the file name includes any of "%M%D%h%m%s" (month, day, hour, minute, second).

If you do not check this option, 0 (zero) is supplied to the file name if the file name includes any of "%M%D%h%m%s" (month, day, hour, minute, second) and that number is one digit.

The default is "checked".

[File Save Method]

Select either [Create new Book] or [Append data to Book].

If you designate the fixed file name, it will be written in the sheet1.

[Book is Currently Open]

Select the action from [Do not save data] or [Use Temporary Book] when books with the same filename are open on writing.

If you selected [Do not save data], written data are not saved when book files with the same filename are open in advance.

If you selected [Use Temporary Book], written data are saved as a separate filename temporarily. The temporary filename will be "%Y%M%D%h%m%s.xls".

[Save form]

Selects from Excel (.xls) or text (.csv) file formats.

[Template File Location]

If [Use template file] is selected, be sure to enter the Drive, Folder and Template File name.

2. Clicking the previous Setting screen's [Next] button calls up the following screen.



[Select a Data Write Pattern]

Select the radio button that corresponds to the data write direction desired.

[Write Data Range]

Select the data range used for the data written to the file.

Clicking [Use Excel Sheet] will call up an Excel sheet and allow you to designate the range directly.

**MEMO**  When CSV is selected as a saving format, Template and Data write pattern can not be selected. Data write is fixed to [Z] type, [Use all cells], [Item names are not used], and [Time stamp is not used].

## 4.3.5    Automatic Download of GP Filing Data

This action item will automatically download filing data to a Provider's SRAM area, CF-Card, or internal FROM memory area.

Only data that has been previously uploaded from a GP can be downloaded. Also, uploaded data can only be modified, not added to or deleted.

**MEMO**        When data is being written to a GP's internal memory (FROM) or to its CF Card, the GP will switch to OFFLINE mode until the data transfer is completed. After the transfer is completed, the GP will be reset.

1.    The following screen will appear.



[Save Folder]

If you check the Save To Folder location in the action parameter display, and if the folder exists, the contents exactly as you designated is displayed.

If the folder does not exist, the following window appears.



Click [Yes] to create the folder.  The folder creation window will appear.  If you click [No], the folder designation window will appear to designate the Save To Folder location.

If you click [Cancel], the process is canceled.

[Filename]

Designates where the  write data source file will be saved. (either .bin or .xls)

[Write to]

Designates the write data's destination.

## 4.3.6    Automatic Upload of GP Filing Data

This action item will automatically upload filing data from a Provider's SRAM area, CF-Card, or internal FROM memory area.

**MEMO**    When data is being read from a GP's internal memory (FROM), the GP will switch to OFFLINE mode until the data transfer is completed. After the transfer is completed, the GP will be reset.

1.    The following screen will appear.
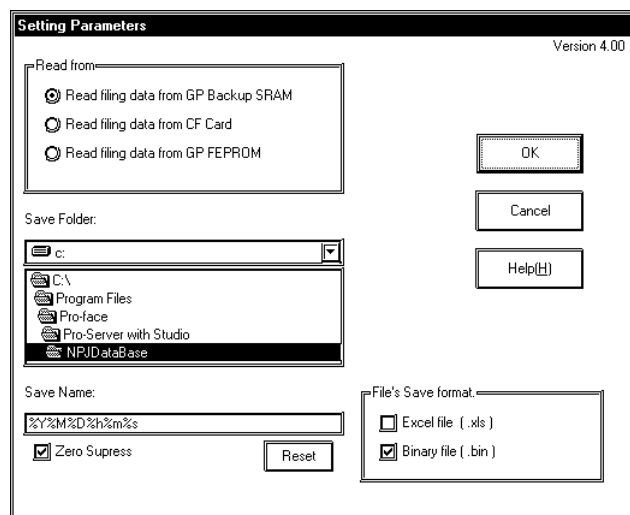


[Read from]

Designates the read data source file.

(SRAM, CF Card or internal FROM)

[Save Folder]

If you check the Save To Folder location in the action parameter display, and if the folder exists, the contents will appear exactly as you designated.

If the folder does not exist, the following window appears.
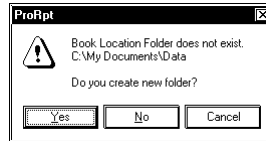


Click [Yes] to create the folder.  The folder creation window will appear.  If you click [No], the folder designation window will appear to designate the Save To Folder location.

If you click [Cancel], the process is canceled.

[Save Name]

Designate the file name used.

Default value is %Y%M%D%h%m%s. The [Reset] button will make your entry back to the default value.

[Zero Suppress]

If you check this option, no zeros are supplied to the file name even though the file name includes any of "%M%D%h%m%s" (month, day, hour, minute, second).

If you do not check this option, 0 (zero) is supplied to the file name if the file name includes any of "%M%D%h%m%s" (month, day, hour, minute, second) and that number is one digit.

The default is "checked".

[File's Save format]

Designates the format used when the file is saved. Either Excel (*.xls) or Binary (*.bin - for GP-PRO/ PBIII for Windows) formats.

**MEMO**    When using a CF Card, the file No. is based on the Provider's data, to allow the saving of multiple files.

Ex. A file named ZF00002.BIN would be used for Provider 2.

### 4.3.7 Automatic Upload of Access Data

After the following table data has been created with Microsoft Access, the table data designated by an Action Item's settings is used to compare the Provider data and a Key_Code, and then read the device designated in the table.

Ex.This file will be named BIBLIO.mdb

**Microsoft Access Table Structure Ex. "MAIN_TABLE"**

| Key_Code | .mdb (filename) *1 | TBL (database table name) |
|----------|--------------------|---------------------------|
| 1 | | Table 1 |
| 2 | | Table 2 |
| 3 | | Table 3 |

*1  If a duplicate file name exists, leave this cell blank.

**Database Table Name Ex. "Table 1"**

| Node | Symbol | Type | Data *2 | Number |
|------|--------|------|---------|--------|
| _GP1 | D1000_WORD | 2 | 1,2,3,4,5 | 5 |
| _GP1 | D1010_WORD | 2 | | 7 |
| _GP2 | DM1000_WORD | 2 | | 5 |

Table 2
Table 3

*2  PLC device data is read out according to the data in the table.

Data Structure: Multiple data items are delineated by commas within a single field.

1.  When the Setting Screen Appears, enter the following data, based on the above example.

[Access Data Folder]

Enter the save destination (drive and folder).

[mdb Filename]

Designate the mdb filename.

[Table]

Select the reference table.

When an mdb file is selected, all the mdb tables are automatically displayed.
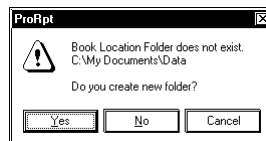
[Save Folder]

If you check the Save To Folder location in the action parameter display, and if the folder exists, the contents you designated are displayed.

If the folder does not exist, the following window appears.
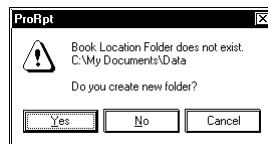


Click [Yes] to create the folder. The folder creation window will appear. If you click [No], the folder designation window will appear to designate the Save To Folder location.

If you click [Cancel], the process is canceled.

[Save Filename]

Designate the save filename.

Default value is %Y%M%D%h%m%s. The [Reset] button will make your entry back to the default value.

[Zero Suppress]

If you check this option, no zeros are supplied to the file name even though the file name includes any of "%M%D%h%m%s" (month, day, hour, minute, second).

If you do not check this option, 0 (zero) is supplied to the file name if the file name includes any of "%M%D%h%m%s" (month, day, hour, minute, second) and that number is one digit.

The default is "checked".

## 4.3.8    Automatic Download of Access Data

After the following table data has been created with Microsoft Access, the table data designated by the Action Item settings is used to compare the Provider data and a Key_Code, and then write the designated device data into the table.

**KEY Master Table**

| Key_Code | .mdb (filename) | TBL (database table name) |
|----------|------------------|---------------------------|
| 1 | c:\ACCESSDEMO.mdb | Table 1 |
| 2 | c:\ACCESSDEMO.mdb | Table 2 |
| 3 | c:\ACCESSDEMO.mdb | Table 3 |
| 4 | c:\ACCESSDEMO.mdb | Table 4 |
| 5 | c:\ACCESSDEMO.mdb | Table 5 |

**Database Table Name Ex. "Table 1"**

| Node | Symbol | Type | Data[*1] | Number |
|------|--------|------|----------|--------|
| _GP1 | D1000_WORD | 2 | 10,20,30 | 3 |
| _GP1 | D1010_WORD | 2 | 15,25,35 | 3 |
| _GP2 | DM1000_WORD | 2 | 30,40,50 | 3 |

Table 2

Table 3

*1  Delimited by commas

1. When the Setting Screen Appears, enter the following data, based on the above example.
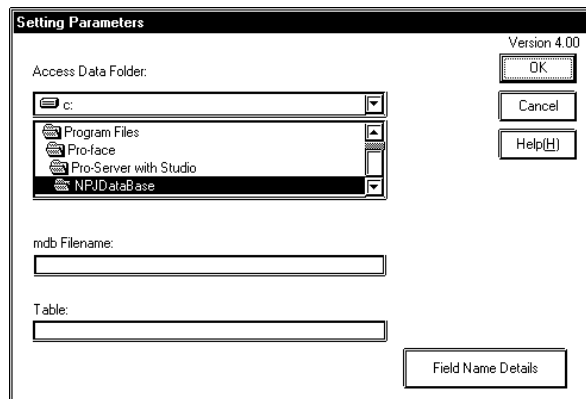


[Access Data Folder]

Designate the Access file name (drive and folder)
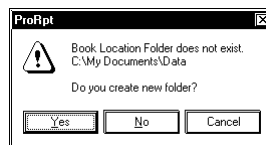


Click [Yes] to create the folder. The folder creation window will appear. If you click [No], the folder

designation window will appear to designate the Save To Folder location.

If you click [Cancel], the process is canceled.

[mdb Filename]

Select the desired mdb file.

[Table]

Select the desired Table file.

**MEMO**   Be sure to select the mdb file with the KEY Master Table Type data.

## 4.3.9 Download Recipe Data for Excel

This feature writes Microsoft Excel sheet data to the specified device address. The following two types of Excel sheet data can be used for designating write data.

**MEMO**
- A device access is executed in 255 per scan.  If you designated more than 255, a time lag will occur.
- If you designate a device address that do not exit, a device access error will occur.

### Column Change [One Sheet Mode] Type

If the provider's data and a Block No. matches, the data in that column will be written into the device address specified in [Address]. Only one device address can be specified. [Item] specifies the number of sequential words (up to 10,000 words) to write from the first address specified in [Address].

| Block | 3 | |
|---|---|---|
| Item | 5 | |
| Address | D108 | |
| Data Type | 2 | |
| Block1 | Block2 | Block3 |
| 1 | 12 | 21 |
| 13 | 2 | 6 |
| 18 | 7 | 3 |
| 8 | 17 | 10 |
| 22 | 9 | 14 |

**MEMO**
The sample table file is available in "\Pro-Server with Pro-Studio\Pro-SDK".

Column Change [Any Sheet Mode] Type

If the provider's data and a Sheet No. matches, the data in that sheet will be written into the device address(es) specified in [Address]. Multiple device addresses can be specified at a time. [Item] specifies the number of sequential words to write from the first address specified in [Address].

| Block | 4 | | | |
|---|---|---|---|---|
| | | | | |
| Block Name | 1 | 2 | 3 | 4 |
| Address | D100 | D200 | D300 | D400 |
| Item | 7 | 5 | 7 | 2 |
| Data Type | 2 | 2 | 2 | 3 |
| | 1 | 2 | 1 | 4 |
| | 2 | 4 | 2 | 4 |
| | 2 | 5 | 2 | |
| | 3 | 6 | 3 | |
| | 4 | 7 | 4 | |
| | 5 | | 5 | |
| | 7 | | 7 | |

1. After selection, the following setting window will appear.
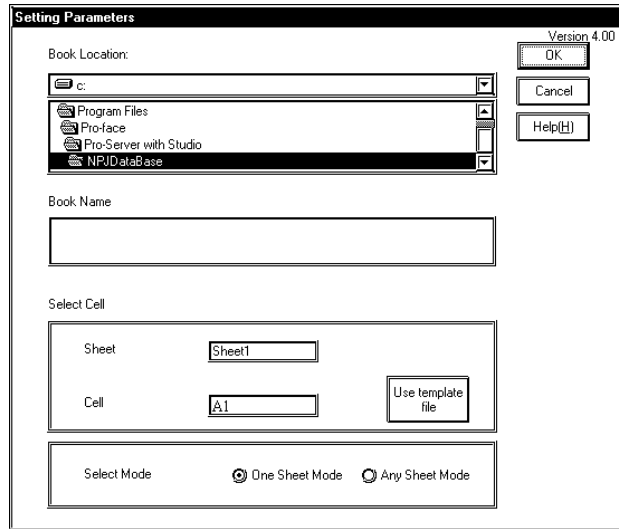


[Book Location]

Designate the Excel file name.

If you check the Save To Folder location in the action parameter display, and if the folder exists, the contents you designated are displayed.

If the folder does not exist, the following window appears.
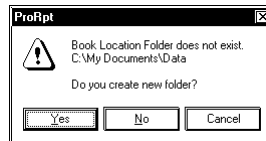


Click [Yes] to create the folder. The folder creation window will appear. If you click [No], the folder designation window will appear to designate the Save To Folder location.

If you click [Cancel], the process is canceled.

[Select Cell:Sheet]

Select the desired Excel sheet name to read. When [Any Sheet Mode] is selected in [Column change], sheet name will change to [Sheet%n].

[Select Cell:Cell]

Designate the first cell to be read. Click [Reference] to allow you to designate the cell at Excel.

[Select Mode]

Designate the data sheet type to be written.

## 4.3.10   Writing Data to E-Mail

E-Mail can be sent without programming. The provider's data or the message sheet created by Excel can be used as mail contents. Multiple error information can also be sent to E-Mail and this feature allows you to urgently contact employees or managers about site problems without a human intervention.

There are three mailing methods available.

• Send Provider data as Title

• Send fixed Title

• Send Title and message using Provider data

The following describes the setup contents of each method.

"Send Provider Data as Title"

Uncheck [Title name] and [Table] and designate the symbol type to the Provider information setup.

"Send Fixed Title"

Check [Title name] field and designate a Title.

"Send Title and Message Using Provider Data"

Check [Table name] and designate the template file created by Microsoft Excel.

If Provider data matches to the value in the Key_Code field, data in that line will be sent.

**Example of Microsoft Excel Message Sheet**

| Key_Code | Title | Message | Address |
|----------|-------|---------|---------|
| 1 | Device A Failure | Valve 1 failed. | a@zzzzz.com, ab@zzzzz.com |
| 1 | Device A Failure | Device A stopped due to a failure. | kanri@zzzzz.com |
| 1 | Device A Failure | Valve 1 failed. The repair part is at F1. | c@zzzzz.com |
| 2 | Device C Failure | Valve 2 failed. | a@zzzzz.com |
| 2 | Device C Failure | Device C stopped due to a failure. | kanri@zzzzz.com |
| 2 | Device C Failure | Valve 2 failed. The repair part is at F1. | b@zzzzz.com |
| 3 | Device B Failure | Oil pressure of device B is abnormal. | a@zzzzz.com |
| 3 | Device B Failure | Oil pressure of device B is abnormal. | b@zzzzz.com |
| 3 | Device B Failure | Device B stopped due to a failure. | kanri@zzzzz.com |

**MEMO**

• You can register, at maximum, 5 messages with the same Key_Code.

• If it fails in sending, an error message will appear in the log viewer.

1. After selection, the following setting window will appear.
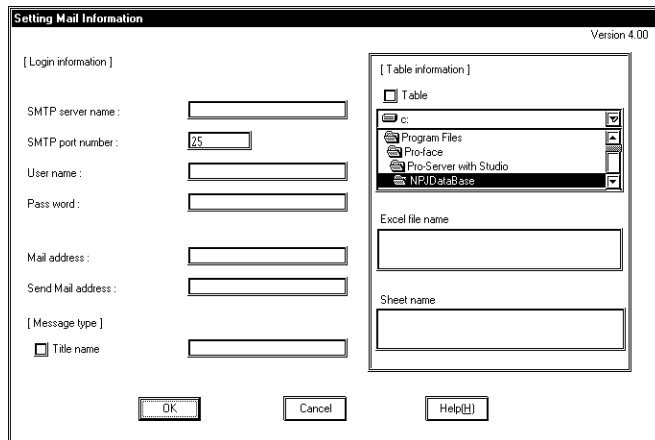


[Mail server settings]

Specify the mail server to send.


[Mail address]

Enter the sender's mail address


[Send Mail address]

Enter a receiver's mail address.


[Message type]

Set when sending a fixed message attached.


[Table information]

Designate when Microsoft Excel message sheet is used to send.

If provider's data matches Key_code, title and message in the specific line will be sent.

If you check the Save To Folder location in the action parameter display, and if the folder exists, the contents you designated are displayed.

If the folder does not exist, the following window appears.
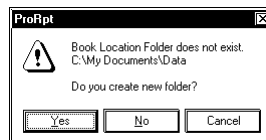


Click [Yes] to create the folder. The folder creation window will appear. If you click [No], the folder designation window will appear to designate the Save To Folder location.

If you click [Cancel], the process is canceled.

## 4.3.11    Upload to Database

Reads data from device address(es) specified by Microsoft Excel or Access and write into designated relational database.

Using Excel, the data will directly be written into the relational database. Using Access, data will once be saved in file and then be written into the relational database. Even if it is presently not possible to connect to the relational database, the saved data can be written to the relational database at the next action start-up.

The table field of the designated contents should exist in the relational database.

**Relational Database**

| table1 | | |
|--------|--------|--------|
| field1 | field2 | .... |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

Uploaded data is written here. ➡

**Example of Microsoft Excel/Access Sheet/Table (respectively)**

| Data Base | Table | Device | Field | Type |
|-----------|-------|--------|-------|------|
| DBA | table1 | D100 | field1 | 2 |
| DBA | table1 | D101 | field2 | 2 |
| DBB | table2 | D102 | field1 | 2 |

**MEMO**    The sample table file (ProDB.xls) is available in "\Pro-Server with Pro-Studio\Pro-SDK".

When using ProDB.xls, DataBase.mdb is in the same folder as the sample in the relational database.

1.   After selection, the following setting window will appear.
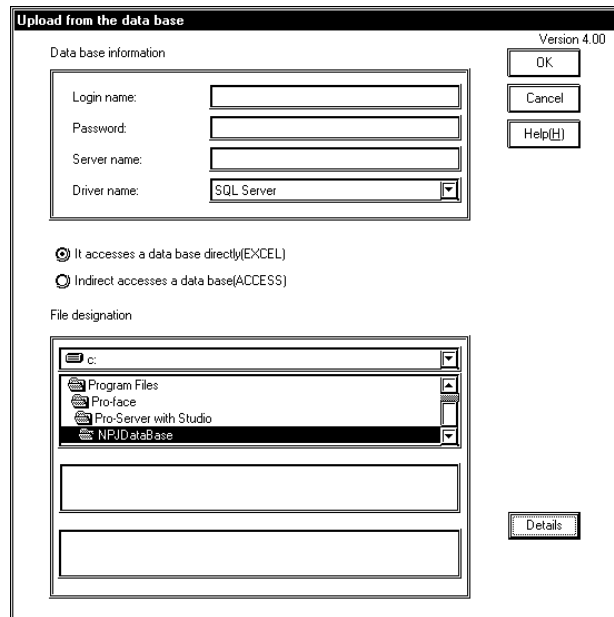


[Database Information]

Designate required informations to access database server.

[Database Access Method]

Select whether  write to the database at once (Excel) or write to  the database after save (Access).

[File designation]

Designate a file location and a sheet/table name.

If you check the Save To Folder location in the action parameter display, and if the folder exists, the contents exactly as you designated is displayed.

If the folder does not exist, the following window appears.
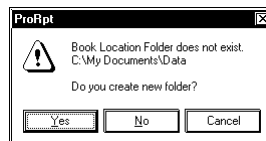


Click [Yes] to create the folder.  The folder creation window will appear.  If you click [No], the folder designation window will appear to designate the Save To Folder location.
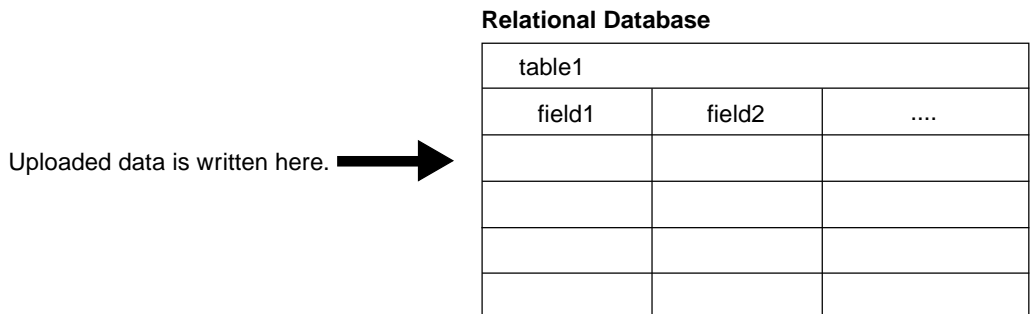
If you click [Cancel], the process is canceled.

2. When clicking [Details], the following setting window will appear.

```
A setup of details
Automatic establishment
   ☐ Node name:        [_____]
   ☐ Time:             [_____]

A setup of a server
   Server connection time:  [10        ]
   Retry number of times:   [3         ]

   [    OK    ]              [  Cancel  ]
```

[Automatic establishment]

Select when provider's name and/or data time are required to be written and enter the target field name(s).

[A setup of a server]

Enter the sequential communication time to database server and the number to retry.

## 4.3.12 Download from Database

Reads data from the relational database specified by Microsoft Excel or Access and write into the specific device address(es).

Using Excel, the data will directly be written into the specified device address(es), while, using Access, data will once be written once as Access file and then be written into the specified device address(es).

**Example of Microsoft Excel/Access Sheet/Table (respectively)**

| Data Base | Table | Device | Field | Type |
|-----------|-------|--------|-------|------|
| DBA | table1 | D100 | field1 | 2 |
| DBA | table1 | D101 | field2 | 2 |
| DBB | table2 | D102 | field1 | 2 |

| seq No. | F1 | F2 | F3 |
|---------|-----|-----|-----|
| 1 | 100 | 110 | 130 |
| 2 | 101 | 111 | 131 |
| 3 | 102 | 112 | 132 |
| 4 | 103 | 113 | 133 |

1.  After selection, the following setting window will appear.
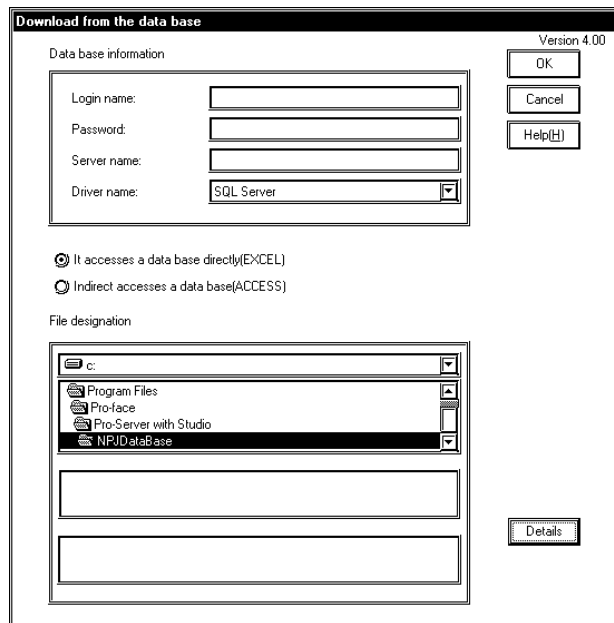


[Database Information]

Designate the required information to access the database server.

[Database Access Method]

Select data is written from the database at once (Excel) or written after being saved (Access).

[File designation]

Designate a file location and a sheet/table name.

If you check the Save To Folder location in the action parameter display, and if the folder exists, the contents exactly as you designated is displayed.

If the folder does not exist, the following window appears.



Click [Yes] to create the folder.  The folder creation window will appear.  If you click [No], the folder designation window will appear to designate the Save To Folder location.

If you click [Cancel], the process is canceled.

2.   When clicking [Details], the following setting window will appear.
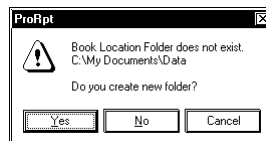
```
┌──────────────────────────────────────────┐
│ A setup of details                       │
├──────────────────────────────────────────┤
│ A setup of a server                       │
│                                           │
│   Server connection time:  │10        │   │
│                                           │
│   Retry number of times:   │3         │   │
│                                           │
│      ┌──────────┐        ┌──────────┐     │
│      │    OK    │        │  Cancel  │     │
│      └──────────┘        └──────────┘     │
└──────────────────────────────────────────┘
```

[A setup of a server]

Enter the communication time to the database server and the number of retries performed.

## 4.3.13   Upload of GP JPEG Data

Pro-Server allows you to read the on-line GP screen data in your PC.  If the VM unit is attached to the GP, video capture data can also be read.

Prior to performing this action with the CF Card inserted into the GP because the read data is temporarily saved in the CF Card.

You can use this action on GP-2000 series, GLC2000 series and IT series.

1.   The following window appears.  After designating all items, click [OK].
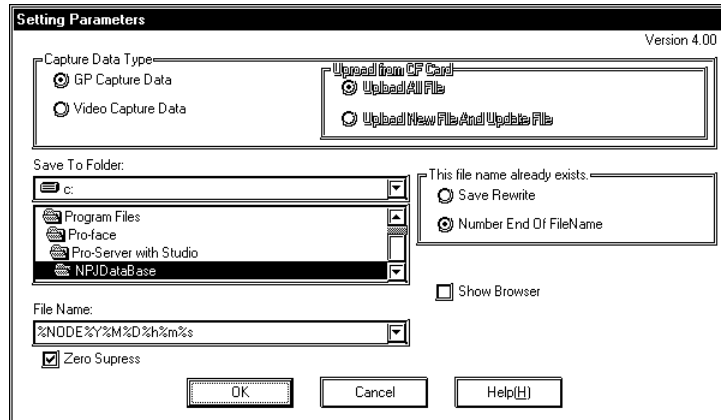


[Capture Data Type]

Select data to read.

If you selected "GP Capture Data", the displayed GP screen is captured and uploaded.

If you selected "Video Capture Data", the video screen data saved in the CF Card is uploaded.  If you select [Video Capture Data], you can not designate [File Name], [Zero Suppress] or [Show Browser].

The default is "GP Capture Data".

[Upload from CF Card]

You should select either to upload all the video screen data in the CF Card, or to upload only files that do not exist in the directory designated by [Save To] or that have been updated.

This defaults to "Upload All Files".

This item can be designated only when [Video Screen Saving Data] has been selected at [Select Data to Read].

For how to capture video screens:

Reference → "GP-PRO/PBIII for Windows Tag Reference"

[Save To Folder]

If you check the Save To Folder location in the action parameter display, and if the folder exists, the contents exactly as you designated is displayed.
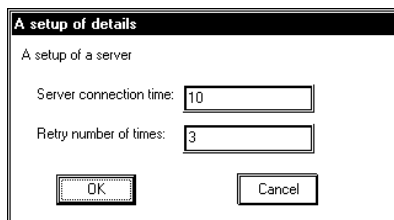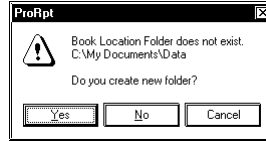
If the folder does not exist, the following window appears.



Click [Yes] to create the folder.  The folder creation window will appear.  If you click [No], the folder designation window will appear to designate the Save To Folder location.

If you click [Cancel], the process is canceled.

[File Name]

Designate the file name to save JPEG files read.  The extension is "*.jpg".  This is defaulted to "%NODE%Y%M%D%h%m%s" (node name, year, month, day, hour, minute, second).  The exact file name in the CF Card is used if [Video Screen Saving Data] has been selected at [Select Data to Read].

[Zero Suppress]

If you check this option, no zeros are supplied to the file name even though the file name includes any of "%M%D%h%m%s" (month, day, hour, minute, second).

If you do not check this option, 0 (zero) is supplied to the file name if the file name includes any of "%M%D%h%m%s" (month, day, hour, minute, second) and that number is one digit.

The default is "checked".

[This file name already exists.]

If you wish to overwrite existing files, check [Save Rewrite].  If you do not want to overwrite existing files, check [Number End of File Name].

This is defaulted to [Number End of File Name].

[Show Browser]

When this item is checked, the data uploaded is displayed using a special JPEG file browser.

This browser can be used to print, copy or call (start up) other Windows JPEG "viewer" applications (Internet Explorer, Paint, etc.).

**MEMO** When you execute [Save GP Capture Data], drawings and operations on the GP screen will stop for a few seconds. Therefore, you cannot normally execute the GP screen capturing operation from upper-level PCs. You should set the bit "0" of GP's LS2076 to "ON (1)" to capture GP screens from upper-level PCs. The bit "0" of LS2077 will be set to "ON (1)" while capturing.

## 4.4   Action Item Designation

The following description explains how to designate an action item.

Transfer the Network Project file to the GP unit to make the specific Action effective. Action items can be designated via the [Provide Information] dialog box.

1.   Designate the Condition and Provider Node Symbol Names. Then, select an action item for the Consumer's symbol name.
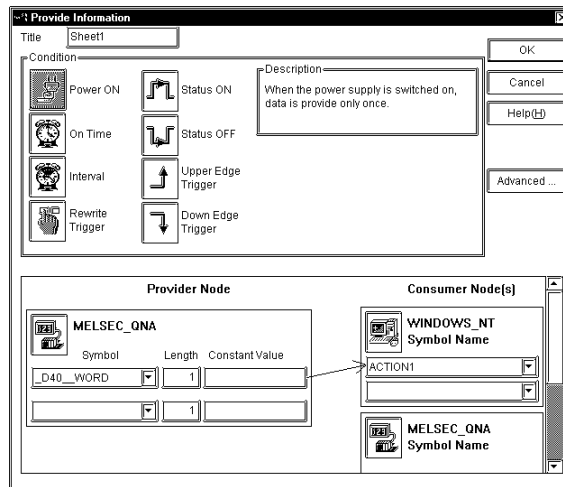


An action item can be selected only via the Consumer's Windows computer.

For the detailed information about entering configuration data, refer to "3.3 Registering Provider Data"

Action items must be registered before they can be used. To register new action items, click the [Action Registration] button.

Reference → "4.2 Action Item Registration"

2. Click the [OK] button, and the action will be added to the Provider information list.
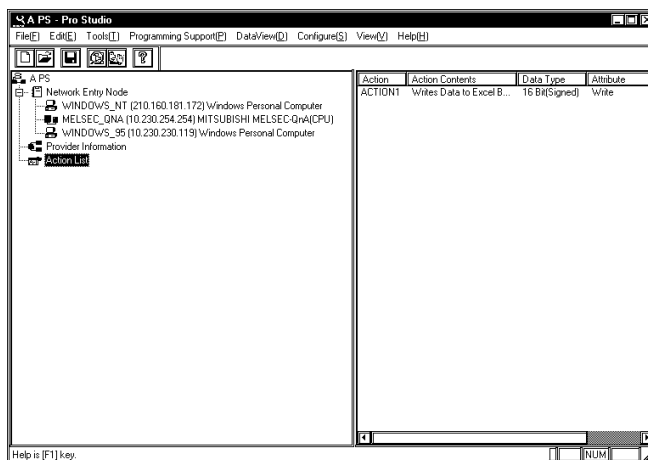


The following table shows the data types that you can designate to the Provider node's symbol name for each action item.

| Action Items | Bit | 16 Bits | | | | 32 Bits | | | | Single Precision | Double Precision | Character |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Signed | Unsigned | HEX | BCD | Signed | Unsigned | HEX | BCD | | | |
| Start an Application | O | O | O | O | O | O | O | O | O | O | O | O |
| Write Data to Excel Book | O | O | O | O | O | O | O | O | O | O | O | O |
| Alarm Log (with voice notification feature) | O | O | O | O | O | O | O | O | O | O | O | X |
| Upload of GP Log Data | O | O | O | O | O | O | O | O | O | O | O | X |
| Automatic Download of GP Filing Data | O | O | O | O | O | O | O | O | O | O | O | X |
| Automatic Upload of GP Filing Data | O | O | O | O | O | O | O | O | O | O | O | X |
| Automatic Upload of Access Data | O | O | O | O | O | O | O | O | O | O | O | X |
| Automatic Download of Access Data | O | O | O | O | O | O | O | O | O | O | O | X |
| Download of Excel Receipt | O | O | O | O | O | O | O | O | O | O | O | X |
| Data Sending by Mail (Specifying an Subject) | O | O | O | O | O | O | O | O | O | O | O | O |
| Data Sending by Mail (Specifying a Table) | X | O | O | O | X | X | X | X | X | X | X | X |
| Data Sending by Mail (no specifications) | X | X | X | X | X | X | X | X | X | X | X | O |
| Download to Database | O | O | O | O | O | O | O | O | O | O | O | O |
| Upload from Database | X | O | O | O | X | X | X | X | X | X | X | O |
| Upload of GP JPEG Data | O | O | O | O | O | O | O | O | O | O | O | O |

When an Action designates a Data Type using a value (1 to 12), be sure to use the following table values.

| Value | Data Type | Value | Data Type |
|-------|-----------|-------|-----------|
| 1 | Bit | 7 | Unsigned 32 Bit |
| 2 | Signed 16 Bit | 8 | HEX 32 Bit |
| 3 | Unsigned 16 Bit | 9 | BCD 32 Bit |
| 4 | HEX 16 Bit | 10 | Float |
| 5 | BCD 16 Bit | 11 | Double |
| 6 | Signed 32 Bit | 12 | String |

# **5** GP Setup

This chapter explains how to transfer a Pro-Studio network project file (*.npj) and a GP-PRO/PB III project file (*.PRW) to a connected GP.

5.1 Transferring Data to GPs

## 5.1 Transferring Data to GPs

In the GP-PRO/PBIII screen editor software, select the network project file and node name and transfer the desired data to the connected GPs. The following description assumes that the GP-PRO/PBIII Ver. 3.0 Transfer feature's window is open.

**MEMO**  Be sure to first install the 2-Way driver in order to transfer a network project file (\*. npj) from the GP-PRO/PB III for Windows to a GP unit.

Reference → "2.1 Installing the Software"

1. Click on [2WayDriver] in the [Setup] menu.
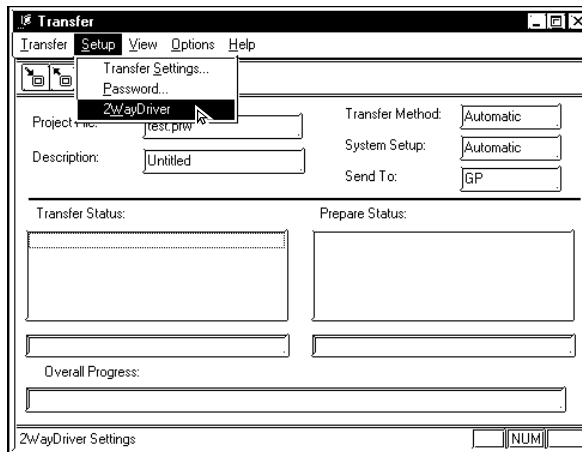


**MEMO**  • When transferring the network project file with GP-PRO/PBIII for Windows, use the data transfer cable.

• Transferring your screen data in the on-line mode temporarily causes the GP to display the transfer screen. The initial screen will be restored as soon as the data transfer is completed.

2. Select [TwoWayEther] from the [Driver Type] pull-down list.
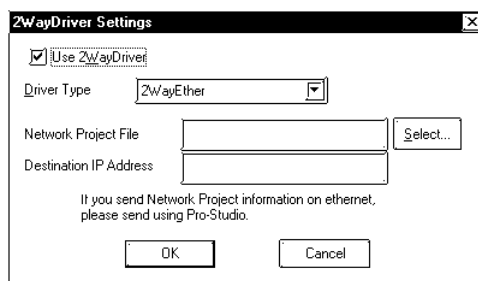


**MEMO**    To send to GP77R series, be sure to click on the [Use 2Way Driver] checkbox. Otherwise, the 2-Way Driver will not function. [Use 2Way Driver] checkbox is initially checked for GP2000, GLC2000 series.

3. Select [2WayEther] from the [Driver Type] pull-down list.
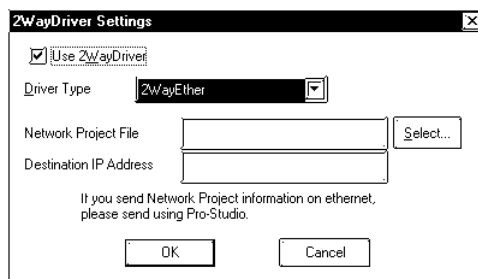


4. Select the network project file and the network node to which you wish to transfer the information and then click [OK].
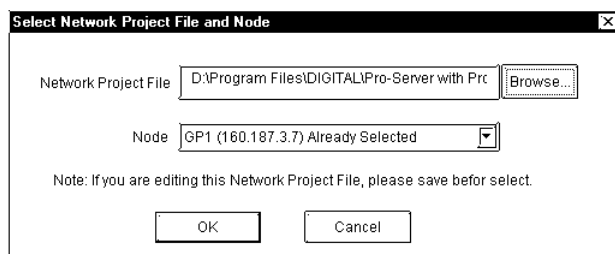
5.  Click [Send] on the Transfer menu or the Send Screen button to transfer the information to the
    GP.
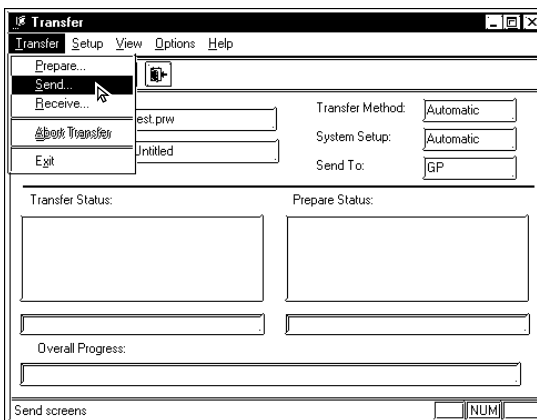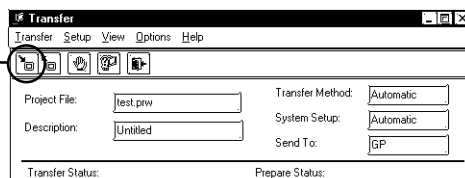


6.  The transfer is completed if no error message is displayed.

# 6 Tools

This chapter describes monitoring tools.

## 6.1   Device Monitoring

Any selected device can be monitored via this feature, which allows you to check the status of data communication. Also, in the [Device Monitor] window, you can specify the IP and device addresses.

1.   Click on the symbol name you want to monitor.
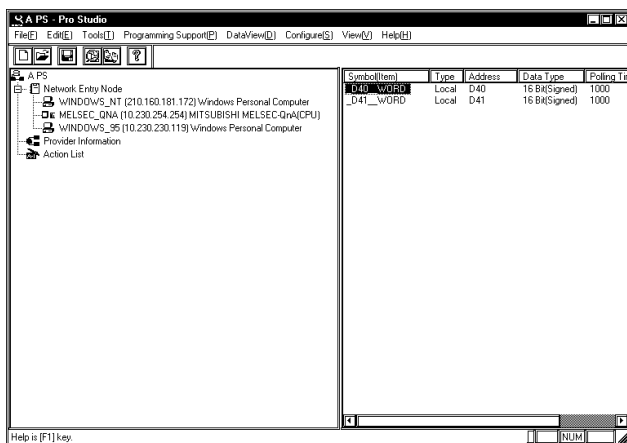


[Symbol (Item)]

The registered symbol names are listed here.

2.   Click [Device Monitor] in the [Tools(T)] menu.
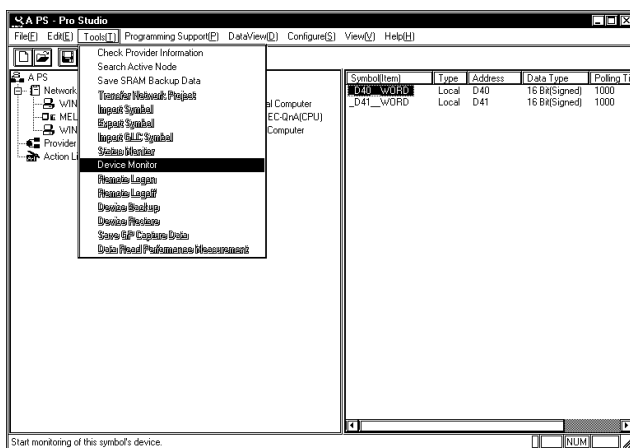


You can right-click the symbol to select [Device Monitor] from the shortcut menu.

3. To change the polling time and the number of displayed decimal places, click [Polling Time].
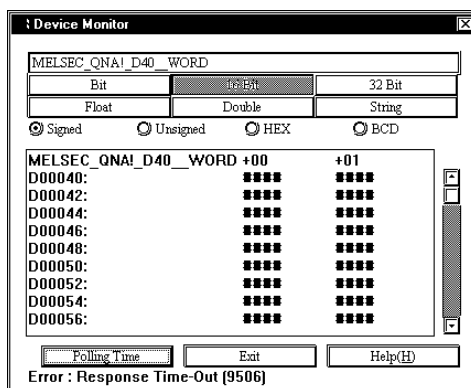


You can type in the IP address or device address directly.

Reference → On-line Help.

4. Enter the desired polling time, number of decimal places displayed and then click [OK].
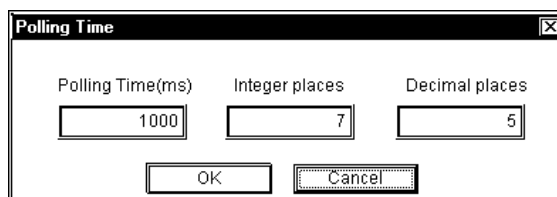


Up to 15 values can be entered (total of both integer and decimal place values)

For details of each item, refer to On-line Help.

Reference → "On-line Help"

**MEMO**  The polling time set for collecting or writing data for each symbol, distributing data and monitoring devices may not be able to be performed under certain conditions. These conditions include the currently registered number of GPs, number of Tags used on each screen sent, type of PLC connection, and number of other currently open Windows applications. Entering "0" will allow the system to operate at its maximum speed. Please use this value as a benchmark when entering other values to "fine-tune" your system.

If you try to monitor an inexistent device, the communication error message will appear on the GP screen.

## 6.2   GP Status Monitoring

Here, you can monitor the status of any GP connected to the network.

1.   Click the node you wish to monitor.
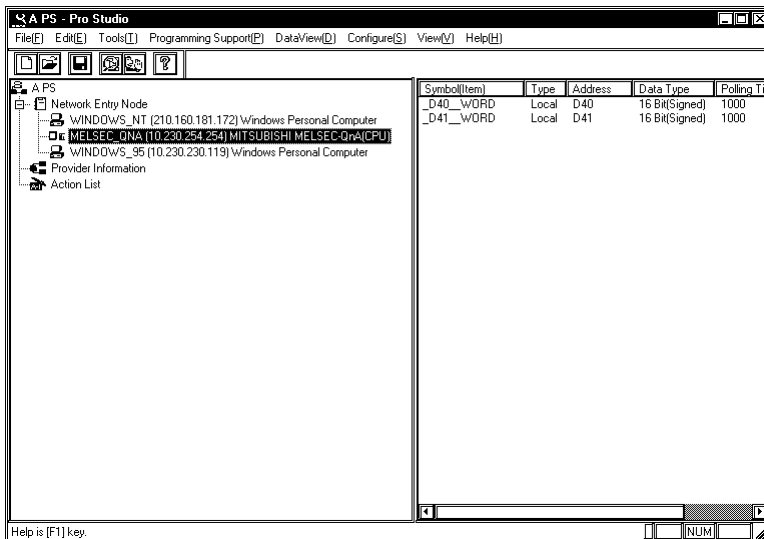


You can right-click the symbol to select [Status Monitor] from the shortcut menu.

2.   Click [Status Monitor] in the [Tools(T)] menu.
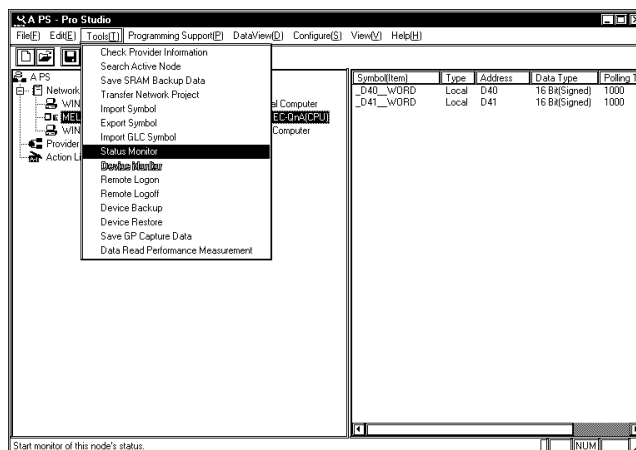
3.   Monitor the status of the GP. To change the polling time, click [Setting].

Click [Clear] to clear communication error codes of the selected node.



If you click [Clear], the following communication error codes will be cleared.

• PLC communication error code

• PLC communication error code (for an extension)

• 2-Way communication error code

Reference →"A.2.2 2-Way Driver Error Messages and Syslog Features"

4.   Set the polling time and then click [OK].



**MEMO**   The polling time set for collecting or writing data for each symbol, distributing data and monitoring devices may not be able to be performed under certain conditions. These conditions include the number of currently registered GPs, number of Tags used on each screen sent, type of PLC connection, and number of other currently open Windows software. Entering "0" will allow the system to operate at its maximum speed. Please use this value as a benchmark when entering other values to "fine-tune" your system.

## 6.3 Read Performance Measuring Tool

This tool allows you to measure the data read performance from the designated node.

1. Click [Data Read Performance Measurement] on the [Tools (I)] bar of the Menu Bar.
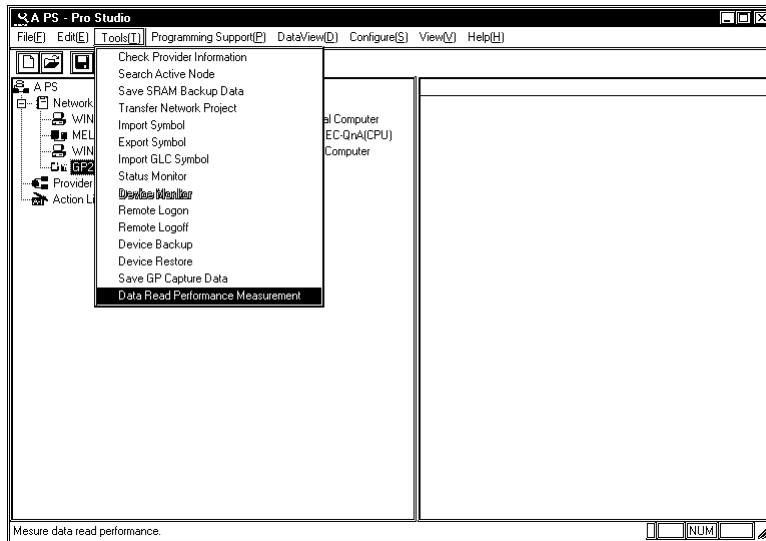


2. The [Data Read Performance Measurement] window appears. After designating all items, click [Begin].
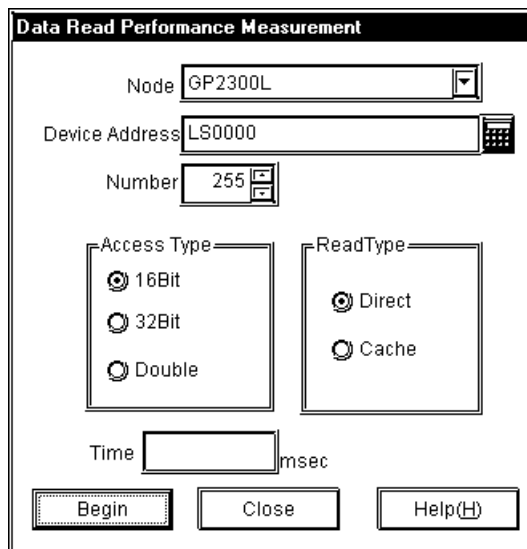


[Node]

Select the node name. All entry node names have been registered. If unselected, the error dialog will appear.

[Device Address]

Enter the device address or the symbol name to start measuring.  This is defaulted to "LS0000" (This will vary depending on the PLC model).  If not entered or entered an incorrect address, the error dialog will appear.

If you click the right-side icon, the [Device Address Entry] window appears and you can designate the device address from this window.

[Number]

Enter the number of device addresses to measure.  This is defaulted to 255.  The minimum value is 1 and the maximum value depends on the device address or the address type.  You can enter the value up to 65535.

[Access Type]

Select the access type.  This is defaulted to "16 Bit".

[Read Type]

Designate the read type.  This is defaulted to "Direct".

[Time]

The measured read performance value after the execution is displayed.

3.  The processing status of the read performance measuring is displayed in the [now] dialog.

| now |
| --- |
| Now reading device data. |
| |
| 0 / 255 : 0 %    Cancel |
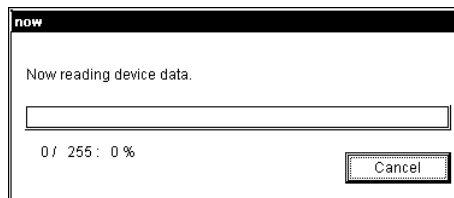
4.  The measured result is displayed in the [Time] field of the [Data Read Performance Measurement] window.

| Data Read Performance Measurement |
| --- |
| Node GP2300L |
| Device Address LS0000 |
| Number 255 |
| Access Type: 16Bit / 32Bit / Double    ReadType: Direct / Cache |
| Time 129 msec |
| Begin    Close    Help(H) |
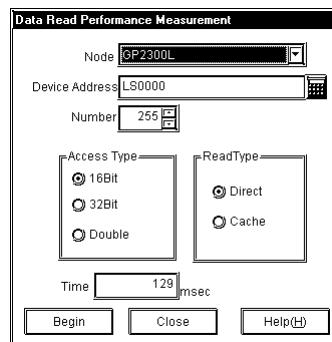
**MEMO**　[Time] may vary depending on the environmental condition (number of tags on a screen, PLC connection style, application software running on Windows at the same time and so on).

# 7 Data View

This chapter describes data sampling/viewing tools, "GP-Viewer" and "Device View".

## 7.1　Data View Overview

The [Data View(<u>D</u>)] menu of the menu bar allows you to start the tool to display data saved on Pro-Server in various formats.

The following shows the overview of the display tool.

Device View

Device View allows you to sample data from devices connected to Ethernet to monitor the status or to playback saved device data on Device View.

GP-Viewer

GP-Viewer allows you to sample screen data from the GP system connected to Ethernet to display screen data or to playback saved GP data on GP-Viewer.

In addition to the above, you can also use the [Data Sampling Status] dialog showing the data sampling status on Pro-Server or the tool such as System Time Bar applicable to user created application software.

The frame structures of Device View, GP_ Viewer and the [Data Sampling Status] dialog differ from other windows.  The following shows the general view.

Operation Window

Show/Hide Switching Bar

Operation Description Window
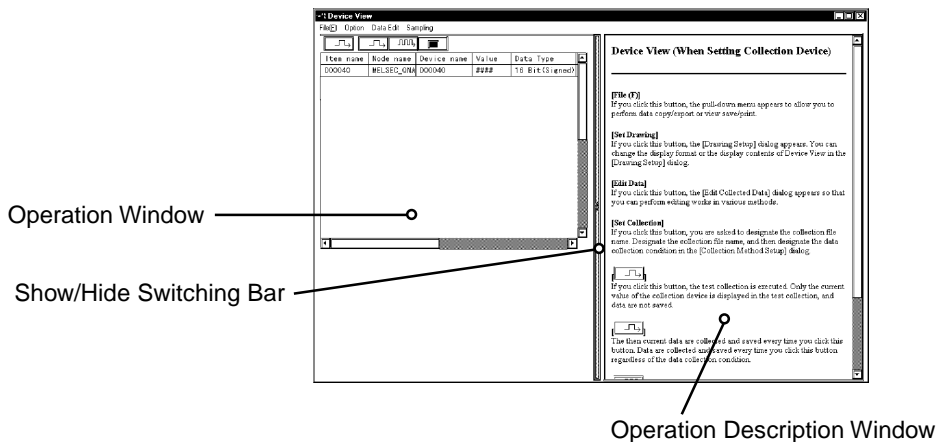
**MEMO**　You can only install the trial version of "GP Viewer" from the "Pro-Server with Pro-Studio for Windows Ver.4.0" CD-ROM. When a trial version of the GP-Viewer software is used, the words "Trial Edition" will appear on the splash screen. All the program's features, however, are the same as the official version.

You need to purchase it separately to use the official version of "GP _Viewer".

In this chapter, the whole usage procedure of "GP_Viewer" is described.

Following four files are created by Device View.

\*\*\*.#DV .............. Sampled device information (text format)

\*\*\*.#DB .............. Sampling method information (text format)

\*\*\*.#SR ............... Sampled device optimal information (text format)

\*\*\*.#DR .............. Saved data (binary format)

**MEMO**　　When using Data View, the database accessed, even if it is only temporarily, will be registered as a network project. If, during data polling the system should go down, once the system is restored, simply restarting Pro-Server will automatically restarts the data polling. (Polling data is saved in a file using the same file extension as a Network Project file - NPJ_DBs.) When Pro-Server is started, the Network Project's registered databases are read. As a result, if a large number of databases are registered, Pro-Server's startup will be slowed, and can result in the use of a large amount of system resources. As a result, please be sure to delete any temporary databases that are no longer used from the Network Project's registry. To do this, open Pro-Studio's [DataView (D)] menu's [Data Sampling Status] dialog box. Click on the unneeded database names and press your PC keyboard's [Delete] key. Even though this deletes the database from the Network Project, the database itself is not deleted. If needed, the database file can reopened by simply re-registering it in the Network Project.

## 7.2 Device View

Device View allows you to sample data from devices connected to Ethernet to monitor the status or to playback saved device data on Device View.

You can also view non-sequential devices or devices of multiple entry nodes at one time.

### 7.2.1 Setting Sampling Target Device

This section describes how to designate the device that you wish to sample data. After you completed the setup, you can monitor data of the target device.

1. After selecting the entry node that you wish to sample data, click [Device View] on the [Data View (D)] menu of the Menu Bar.
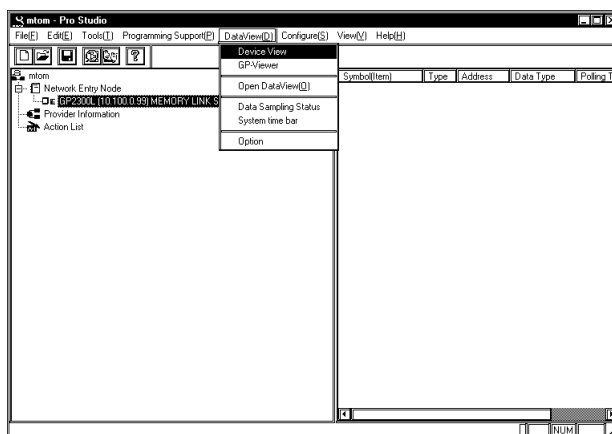


You can also right-click the entry node to select "GP-Viewer".

2.　The [Data sampling source] window appears.  After designating each item for the device that you wish to sample data, click [Next].
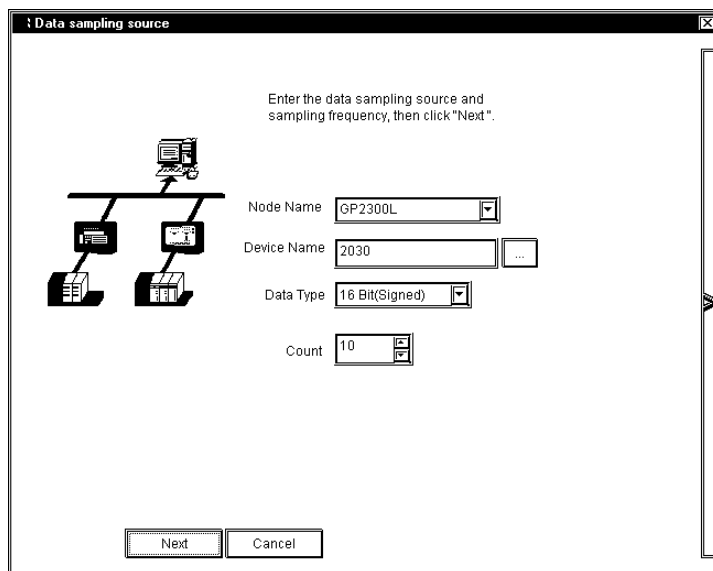


[Node Name]

Enter the node name to sample data.  Node names registered in the network project file are displayed.

[Device Name]

Enter the device name to sample data.  If you click [Browse], the symbol entry window appears.

[Device Type]

Designate the device model to sample data.

[Count]

Designate the number of sequential devices from the device to sample data.  You can designate up to 255.

3.  The [Data Input] window appears.  Conditions that you have designated so far are displayed in the window. You can also click and edit each item.  If you have made a mistake, click [Back].  If you do not have other devices to sample data, click [OK].

```
┌─ Data Input ──────────────────────────────────────────────────────── ⊠ ┐
│                                                                         │
│   Sampling device data is shown in a list                               │
│                                                                         │
│   When adding additional data sampling devices, click the ""Add"" button│
│                                                                         │
│   ┌────┬───────────┬───────────┬─────────────┬──────────┐              │
│   │ ?? │ Item name │ Node name │ Device name │   Value  │   ┌──────────┐│
│   │ 1  │ 2030      │ GP2300L   │ 2030        │    0     │   │  Append  ││
│   │ 2  │ 2031      │ GP2300L   │ 2031        │    0     │   └──────────┘│
│   │ 3  │ 2032      │ GP2300L   │ 2032        │    0     │   ┌──────────┐│
│   │ 4  │ 2033      │ GP2300L   │ 2033        │    0     │   │  Delete  ││
│   │ 5  │ 2034      │ GP2300L   │ 2034        │    0     │   └──────────┘│
│   │ 6  │ 2035      │ GP2300L   │ 2035        │    0     │              │
│   │ 7  │ 2036      │ GP2300L   │ 2036        │    0     │              │
│   │ 8  │ 2037      │ GP2300L   │ 2037        │    0     │              │
│   │ 9  │ 2038      │ GP2300L   │ 2038        │    0     │              │
│   │ 10 │ 2039      │ GP2300L   │ 2039        │    0     │              │
│   │    │           │           │             │          │   ┌──────────┐│
│   │    │           │           │             │          │   │  Upper   ││
│   │    │           │           │             │          │   └──────────┘│
│   │    │           │           │             │          │   ┌──────────┐│
│   │    │           │           │             │          │   │  Lower   ││
│   │    │           │           │             │          │   └──────────┘│
│   └────┴───────────┴───────────┴─────────────┴──────────┘              │
│                                                                         │
│   ┌────────┐    ┌────────┐    ┌────────┐                                │
│   │  Back  │    │   OK   │    │ Cancel │                                │
│   └────────┘    └────────┘    └────────┘                                │
└─────────────────────────────────────────────────────────────────────────┘
```

**MEMO**    Be sure to connect to the GP system since the communication process will start with the designated GP system when you click [OK].

[Append]

Use this button to append the device to sample data.

The [Data sampling source] window appears so that you can designate the device to append.

[Delete]

Use this button to delete lines.
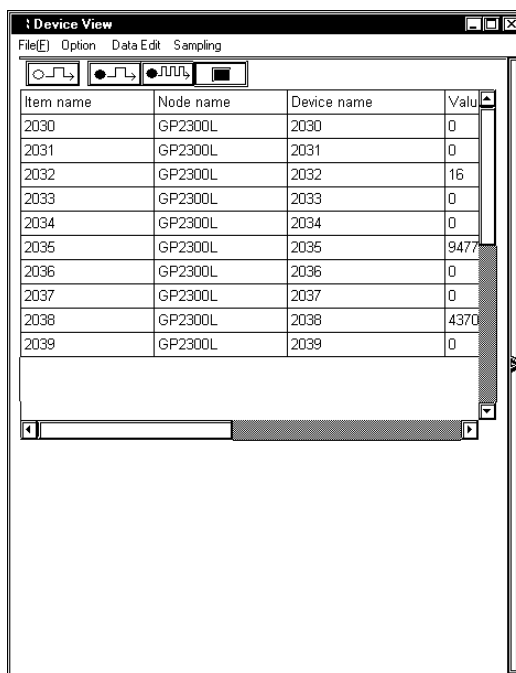
Select lines to delete and then click [Delete].

[Upper], [Lower]

Use these buttons to change the order of lines.

Select the line that you wish to change the order, and then click either [Upper] or [Lower].

4. The selected device data is displayed on Device View.

| Item name | Node name | Device name | Valu |
|---|---|---|---|
| 2030 | GP2300L | 2030 | 0 |
| 2031 | GP2300L | 2031 | 0 |
| 2032 | GP2300L | 2032 | 16 |
| 2033 | GP2300L | 2033 | 0 |
| 2034 | GP2300L | 2034 | 0 |
| 2035 | GP2300L | 2035 | 9477 |
| 2036 | GP2300L | 2036 | 0 |
| 2037 | GP2300L | 2037 | 0 |
| 2038 | GP2300L | 2038 | 4370 |
| 2039 | GP2300L | 2039 | 0 |

**MEMO** The contents here displayed on Device View are device data at the moment when you click [OK] in the step 3. This data is not updated.

## 7.2.2    Setting the Data Sampling Condition

This feature allows you to setup the data sampling condition from the sampling target device.

This section describes operations after you selected the sampling target device.

1.    Click [Sampling] of Device View.
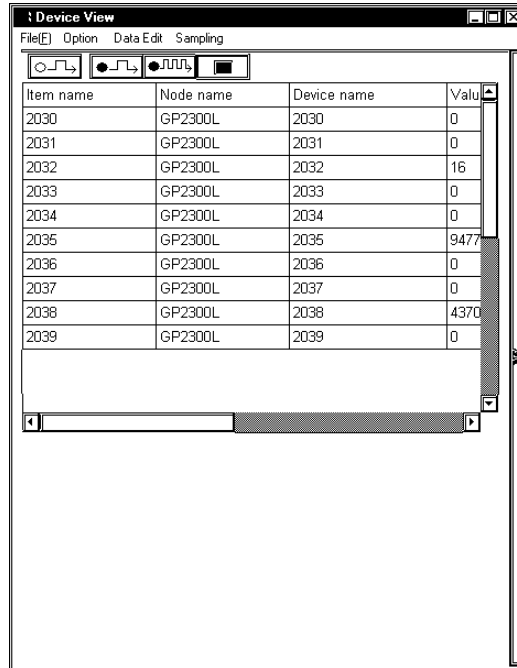
2.    The following dialog appears. Click [Yes].
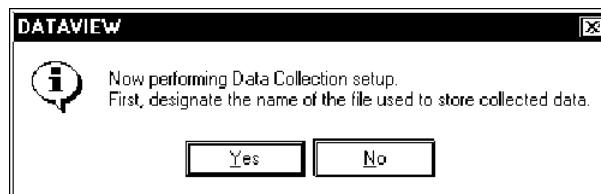
3.    The [Save As] dialog appears, and you can create the file to save the sampled data.  The file

extension is (.DB).  After you designated the file name, click [Save].
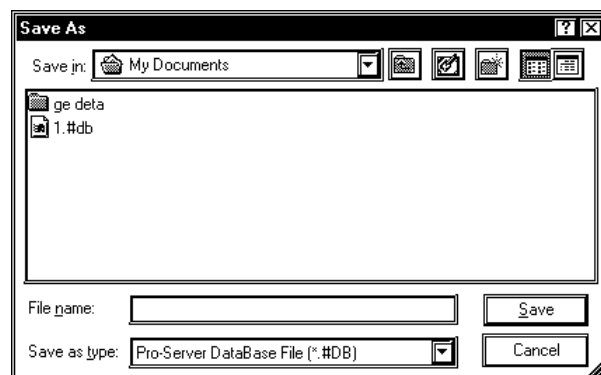
4.  The [Sampling method] dialog appears.

Check the "Sampling method" that you wish to execute.

The contents of the "Condition" field differ depending on the "Sampling method" selected.  You should

perform the setting according to the contents displayed.

When You Selected "Regular Sampling" in "Sampling method" :

The setup contents are as the following.  You should designate [Data sampling in specified seconds]

and [Sampling using cache] in the "Condition" field.
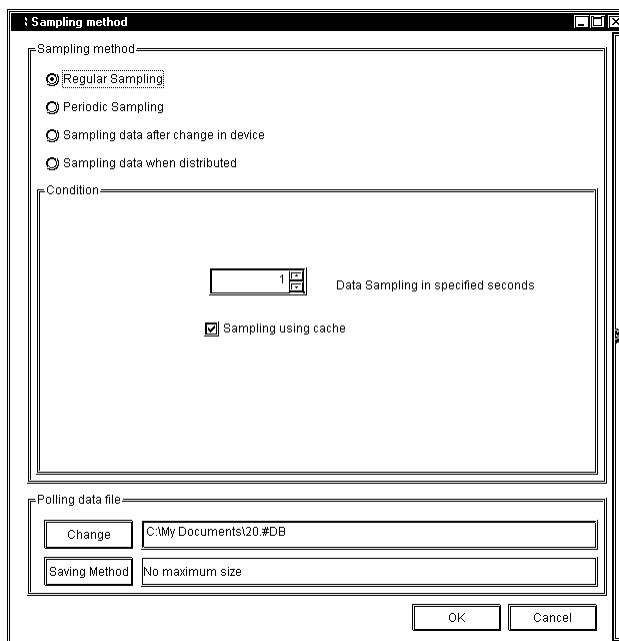


[Data sampling in specified seconds]

Designate the device data capturing interval in second.  This is defaulted to "1 second".

[Sampling using cache]

Check this box to use the cache to sample device data.

When You Selected "Periodic Sampling" in "Sampling method" :

The following settings are available.  You should create the periodical sampling schedule using the

[Append], the [Delete], and the [Edit] buttons in the "Condition" field.
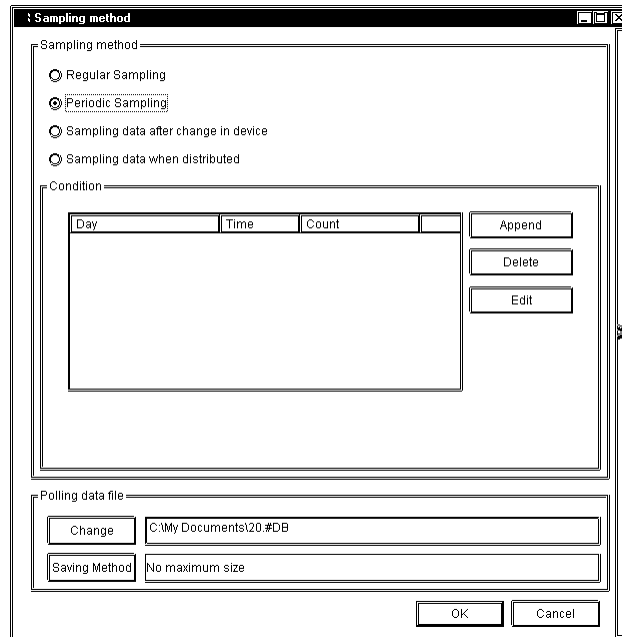


[Delete]

After selecting unnecessary schedules, click [Delete] to delete selected schedules.

[Append]

Click this button to create the new sampling schedule.

If you click the [Append] button, the [Designate the data sampling date] dialog appears.  Designate

each item in the [Designate the data sampling date] dialog, and then click [Next].
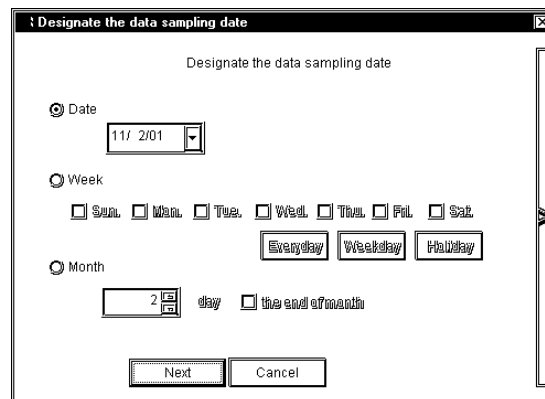


[Date]

Designate the date to sample device data.  Device data are sampled on the day designated here.

[Week]

Designate a day of a week to sample device data.  Check the day that you wish to sample device data. You can also click [Everyday] (Fri), [Weekday] (Mon, Tue, Wed, Thu, Fri) or [Holiday] (Sat, Sun) under the day check boxes.

[Month]

Designate a day of a month to sample device data.  You can designate either a particular day (one day) or the last day every month.  Device data are sampled on the day designated here every month.

If you click [Next], the [Designate the sampling time] dialog appears.  Designate each item in the [Designate the sampling time] dialog, and then click [OK].

[Append] allows you to create the new sampling schedule and it will be displayed in the schedule field.



[Start Time]

Designate the time to start capturing device data.  The sampling will start at the time designated here.

[Sampling count]

If you wish to sample device data once, check [One time only].

If you wish to repeat device data sampling, designate the sampling condition.  You should designate the sampling interval and the number of sampling.

[Edit]

Click this button to change the contents of the selected schedule.

When You Selected "Sampling data after change in device" in "Sampling method":

The contents of the "Condition" field are as the following. You should designate [Sampling Condition], [Interval Condition], and [Data sampling - from start to finish of data reception] in the "Condition" field.



[Sampling Condition]

Designate the timing to sample device data. You should designate the node name that you wish to perform a sampling, the target device name, the device model, and the device change condition.

[Interval Condition]

Designate intervals to check the device change and to sample data when the status changed.

[Data sampling - from start to finish of data reception]

Designate the intervals to save data "before and after" the device change occurred and the sampling condition was satisfied. Intervals designated here should be longer than the sampling interval.

When You Selected "Sampling data when distributed" in "Sampling method":

The contents of the "Condition" field are as the following.



[Provide Sheet]

If pre-defined Provider information setups exist, select it from the pull-down list.

Be sure to set the [Provide Information] interval to 1000ms or longer.

[Sampling using cache]

Check this box to use the cache to sample device data.

[Data Sampling – from start to finish of data reception]

Designate the sampling method "before and after" receiving the Provider information. You should designate sampling times "before" and "after" receiving (in second), and the sampling interval (in second).

5. Designate each item in the "Polling data file" field of the [Sampling method] dialog, and then click [OK].



[Change]

Use this button to change the folder to save sampled data.

[Saving Method]

If you click this button, the [Saving Method] dialog appears. Designate each item in the [Saving Method] dialog, and then click [OK].



[Saving Method]

Designate the folder to save sampled data. You should designate the total volume (size) of data to save among "No maximum size is designated (as much as storage media allows)", "Designate maximum size" and "Periodic saving".

If you selected "Designate maximum size", you should also designate the maximum data size (in MByte) and the sampling method.

  - Selecting "Continuous numbering for new files"

  When the maximum allowed size is exceeded, the following new file is created:

  ****.[Sequence number]. #DT  ABCD.0.#DT  ->  ABCD.1.#DT

  - Selecting "Save over oldest data"

  The oldest Polling data is overwritten when the maximum allowed size is exceeded.

  - Selecting "Do not save files after size limit reached"

  When the maximum allowed size is exceeded, Polling is stopped and an error message appears.

If you selected "Periodic saving", you should also designate the interval to upload the files.

6.  Execute the device data sampling.

If you wish to test the sampling, click ⊙⎍⌐ button.  The sampling process starts and the contents are displayed on Device View.  The sampled data are not saved at this time.

If you wish to sample data once, click ⬤⎍⌐ button.  Data are sampled and saved every time you click the ⬤⎍⌐ button regardless of the designated data sampling condition.  If you wish to sample data according to the designated data sampling condition, click the ⬤⊓⊓⊓⌐ button.  The data "Sample & Save" is executed according to the data sampling condition, and the contents are displayed on Device View.  The display contents are updated according to the data change.

When you start the device data sampling, various buttons for viewing sampled data are appended on Device View.

Refer to "7.2.5 Playback Feature" for the viewing method of sampled device data.

Reference → "7.2.5 Playback Feature"

| Item name | Node name | Device name | Valu |
|-----------|-----------|-------------|------|
| 2030 | GP2300L | 2030 | 0 |
| 2031 | GP2300L | 2031 | 0 |
| 2032 | GP2300L | 2032 | 16 |
| 2033 | GP2300L | 2033 | 0 |
| 2034 | GP2300L | 2034 | 0 |
| 2035 | GP2300L | 2035 | 1058 |
| 2036 | GP2300L | 2036 | 10 |
| 2037 | GP2300L | 2037 | 0 |
| 2038 | GP2300L | 2038 | 7277 |
| 2039 | GP2300L | 2039 | 0 |
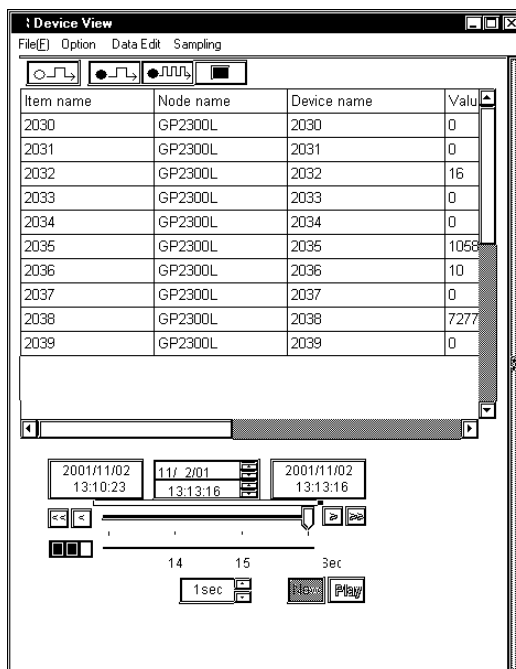
## 7.2.3    Editing Sampled Data

This feature allows you to edit saved device data.

1.    Click [Data Edit] of Device View.
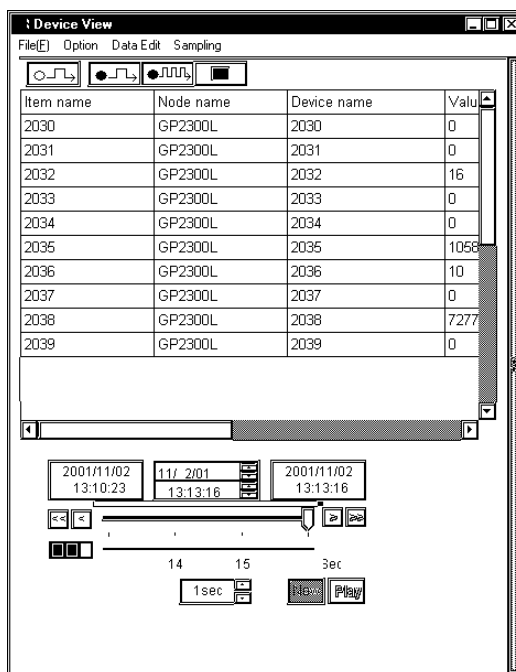


2.    The [Data Edit] dialog appears.  You can edit data in various methods.  The following part
      describes the major operation method after the [Data Edit] dialog appeared.
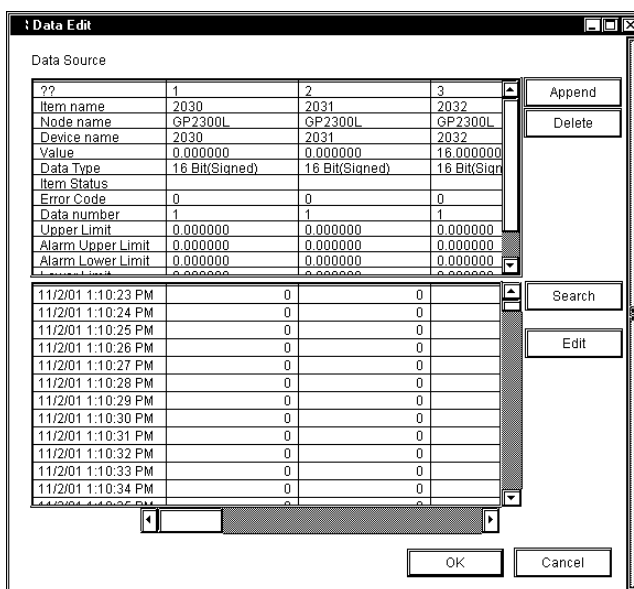


**MEMO**    Although you can start multiple Device View windows, you cannot edit
            data simultaneously.

Appending Sampled Data

1.   Click [Append] of the [Data Edit] dialog.

2.   The next dialog appears.  Designate each item about the device that you wish to append, and

     then click [OK].  Items are equal to those in the [Data sampling source] dialog.

       Reference → "7.2.1 Setting the Sampling Target Device"



3.   The device data that you wish to append are displayed in the [Data Edit] dialog.

Deleting Sampled Data

1.   Select the data that you wish to delete in the [Data Edit] dialog.

2.   Click [Delete]. The selected data will be deleted.

Searching Sampled Data

1.   Click [Search] in the [Data Edit] dialog.

2.   The [Search] dialog appears.  Enter the date that you wish to search, and then click [OK].



3.   The display contents are updated and data are displayed showing one closest to the date

     entered in the middle.

Editing Data Source

1.  Click the data source field that you wish to edit. The column including the selected field is
    highlighted so that you can enter data from the keyboard in the selected field. The pull-down
    list may appear depending on the selected item.



2.  Enter the new contents from the keyboard. The contents of the selected field are updated.

    **MEMO**    Data cannot be edited during Polling.

Editing Saved Data

1.  Click [Edit] of the [Data Edit] dialog.

2.  The [Edit] button in the [Data Edit] dialog is dimmed, and the [Delete Record] button appears.
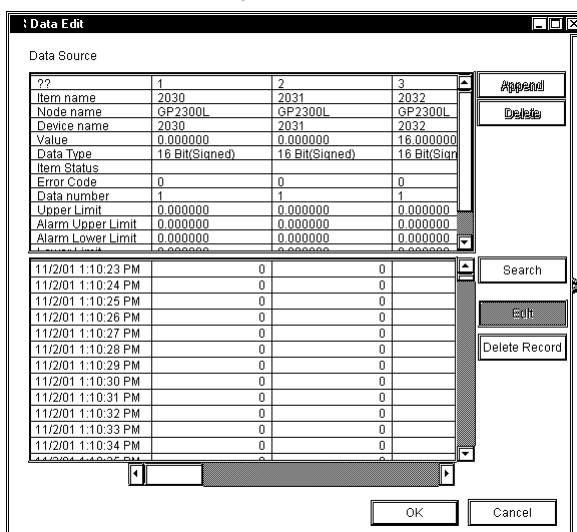


3.  Select the data that you wish to delete, and then click [Delete Record]. The selected data will
    be deleted.

    **MEMO**    Click on [OK] to set the selections made in [Edit] and/or [Delete Record].

    Click on [Cancel] to delete all current selections.

## 7.2.4    Option

This feature allows you to change the display format of the data display area in Device View.

1.    Click [Option] of Device View.
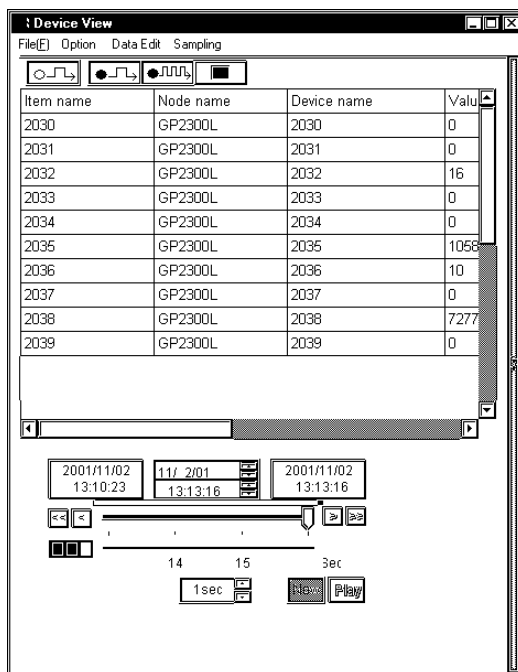


2.    The [Option] dialog appears.  You can change the display contents or format of the data
      display area in various methods.  The following part describes the major operation method
      after the [Option] dialog appeared.
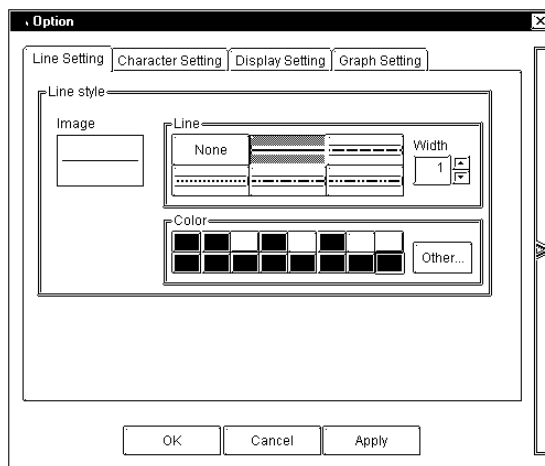
Setting a Line

1.  Click the [Line setting] tab in the [Option] dialog.

2.  Items on the [Line setting] tab appear.  Designate each item in the [Line Style] field, and then click [OK].
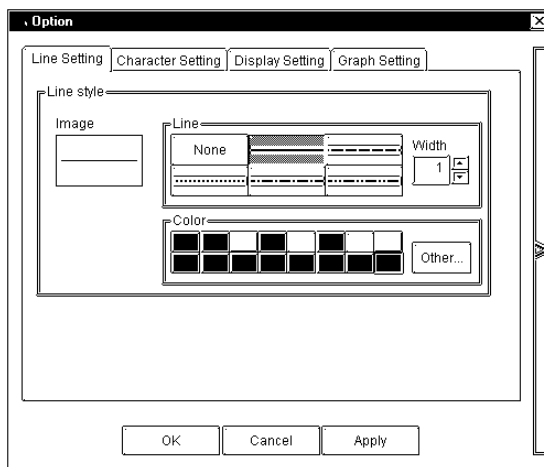


[Line]

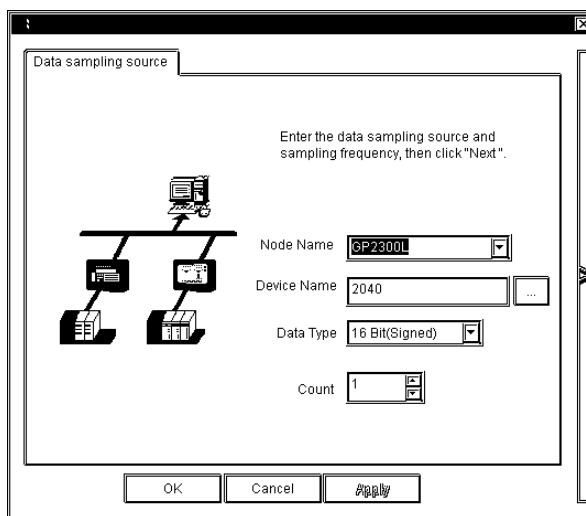Select the ruled line that you wish to use among 6 styles.  Also designate the thickness of the ruled line. The unit is point and it is defaulted to 1 point.

[Color]

Select the ruled line color among 16 colors.  If you do not find one that you wish to use among those, click [Other].  The [Color Setup] dialog appears so that you can select or create the color that you wish to use.

Character Setting

1.  Click the [Character Setting] tab in the [Option] dialog.

2.  Items on the [Character Setting] tab appear.  Designate each item, and then click [OK].
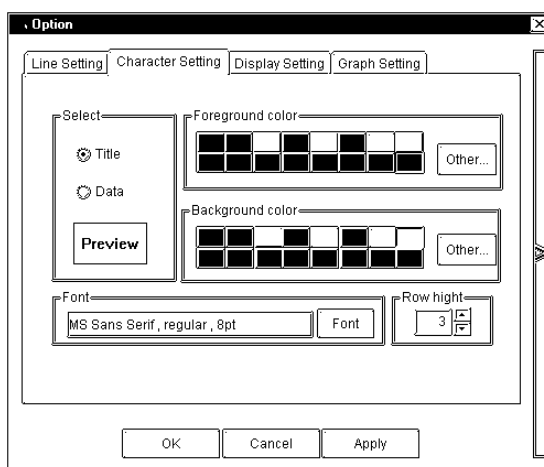
[Select]

Select which texts you wish to change, "Title" texts on the top or "Data" texts.

[Foreground color]

Select the text color among 16 colors.  If you do not find the color that you wish to use among those, click the [Other] button.  The [Color Setup] dialog appears so that you can select or create the color that you wish to use.

[Background color]

Select the background color among 16 colors.  If you do not find the color that you wish to use among those, click the [Other] button.  The [Edit Color] dialog appears so that you can select or create the color that you wish to use.

[Font]

Select the font that you wish to use.  Click [Font].  The [Font] dialog appears.  Designate each item such as the "font to use", the "font style", the "font size" and the "type", and then click [OK].

[Row height]

Designate the row height of the data display area.  The unit is "point" and it is defaulted to 3 points.

Setting the Display Contents

1.  Click the [Display Setting] tab in the [Option] dialog.

2.  Items on the [Display Setting] tab appear.  Designate each item, and then click [OK].
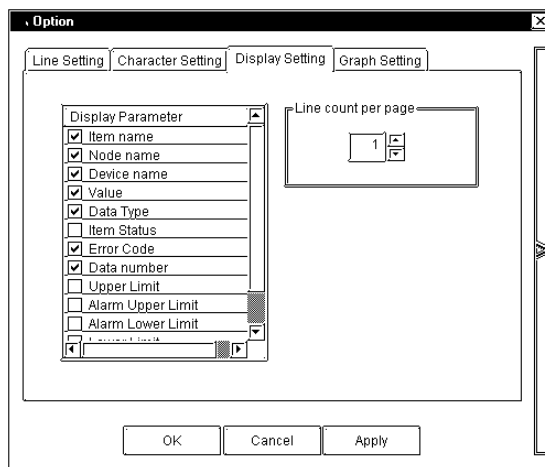


[Parameters]

Select parameters that you wish to display in the data display area.  Check each item that you wish to display.  The following describes the overview of each item.

Item name: Designated symbol name.

Node name: Designated node name.

Device name: Designated device name.

Value: The latest data.

Data Type: Designated device data type.

Item Status: (reserved)

Error Code: Error code when an error occurred in sampling. (normaly 0)

Data number: (reserved)

Upper Limit: The upper limit value to display the graph. (Even if you designate a greater value than this, the graph remains in the 100% status.)

Alarm Upper Limit: The alarm upper limit value to display the graph. (including this value)

Alarm Lower Limit: The alarm lower limit value to display the graph. (including this value)

Lower Limit: The lower limit value to display the graph. (If you designate a less value than this, the graph will not be displayed.)

Graph: The horizontal bar graph is displayed according to values of "Upper Limit", "Alarm Upper Limit", "Alarm Lower Limit" and "Lower Limit".

[Line count per page]

Designate the number of data lines per page that you wish to display in the data display area.  If the actual number of data exceeds the number of data per page, the [Previous] and the [Next] buttons are displayed in the left and the right sides under the data display area respectively.  You can switch pages using these buttons.

Setting the Graph Color

1.  Click [Graph Setting] tab in the [Option] dialog.

2.  Items in the [Graph Setting] tab appear.  Designate each item, and then click [OK].
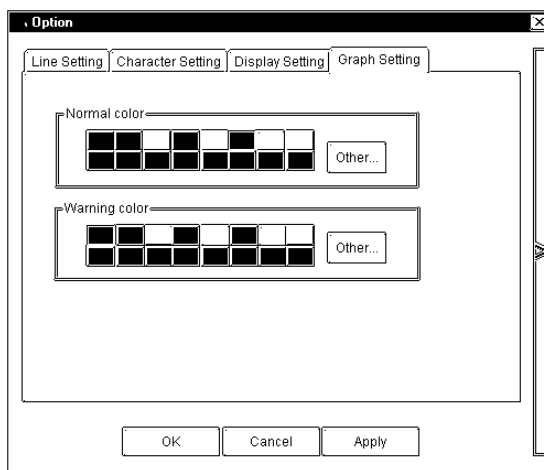


[Normal color]

Select the normal graph color among 16 colors.  If you do not find the color that you wish to use among those, click the [Other] button.  The [Color Setup] dialog appears so that you can select or create the color that you wish to use.

[Warning color]

Select the warning graph color among 16 colors.  If you do not find the color that you wish to use among those, click the [Other] button.  The [Edit Color] dialog appears so that you can select or create the color that you wish to use.

## 7.2.5    Playback Feature

This feature allows you to playback sampled device data on Device View.

1.    Select [Open Data View (O)] on [Data View (D)] of the menu bar.
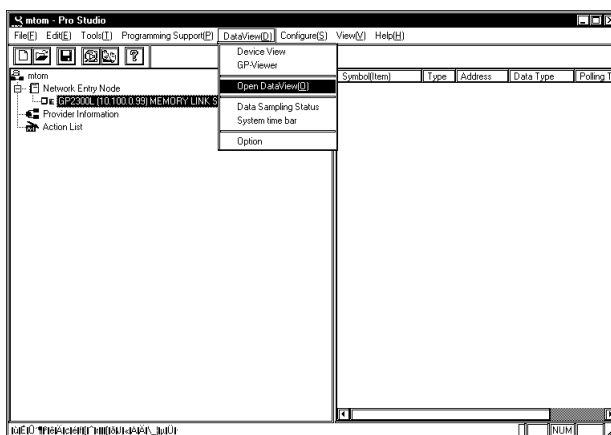


2.    The [Open] dialog appears.  Select the device data (.#DV) that you wish to playback, and then click [Open].
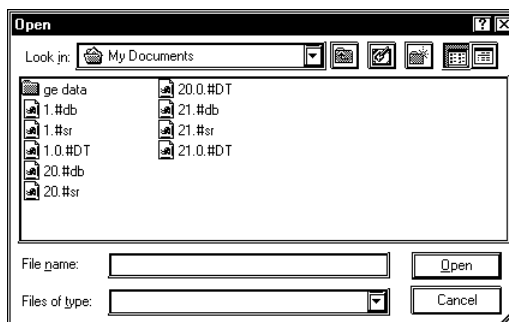


**MEMO**    You can also playback data in the saving process.

3.  The contents of device data that you wish to playback are displayed on Device View. You can playback device data using various buttons on Device View.



[Saved Time]

This field shows the saved time of the saved device data.

The field shows, from the left, the saving start time, the time for currently displayed data and the last saved time. When the current status is displayed, the time for currently displayed data is identical to the last saved time.

[Time Bar]

Saved data can be displayed by sliding the time bar control to either side. The data saving process continues even while you operate the control.

[Time Setup]

You can designate the time unit for one graduation of the time bar.

[Now/Play Display Switch]

[Now] and [Play] buttons are available. You can playback the saved data from the designated time either by sliding the time bar control to the time that you wish to start the playback or by clicking the [Play] button after clicking the time for currently displayed data (the center field of [Saved Time]) and then entering the time to start the playback.

## 7.2.6    Other Features

This section describes the File menu and options of Device View.

1.    If you click [File (F)] of Device View, 8 options are available.  The following describes the overview of each option.
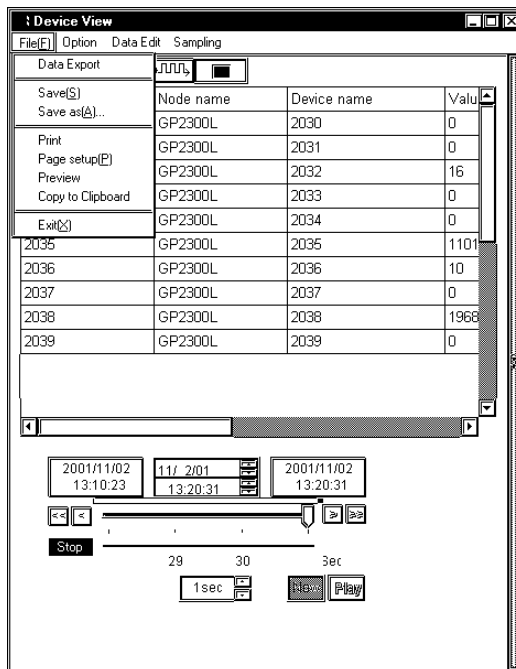


Exporting Data

1.    Select [Data Export] on the [File(F)] menu.

2.    The [Export] dialog appears.  Designate each item, and then click [Export].
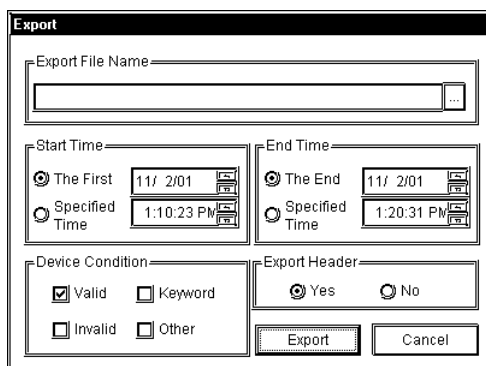


[Export File Name]

Designate the location and the file name to save exported data.  The file extension is (.CSV).

[Start Time]

Designate the time to start exporting data. To export Polling data immediately, click on the [The First] checkbox. To export Polling data after a specific period of time elapses, click on the [Specified Time] checkbox. If you checked "Specified Time", you should also designate the start time to export.

[End Time]

Designate the time to end exporting data. To wait until all data is polled before exporting, click on the [The End] checkbox. To export Polling data after a specific period of time elapses, click on the [Specified Time] checkbox. If you checked "Specified Time", you should also designate the end time to export.

[Device Condition]

This is the reserved data. You should not change the designated value.

[Export Header]

If you wish to include the header information in exported data, check "Yes". If not, check "No".

[Export]

Executes the data export.

[Cancel]

The process is stopped and goes back to Device View.

---

**MEMO**

- Although you can start multiple Device View programs, you cannot export data simultaneously.
- Data can be exported during Polling. However, if the [Designate maximum size/Save over oldest data] selection is used, data export cannot be performed.

---

Saving Data

1.  If you wish to save displayed data on Device View, click [Save (S)] on the [File (F)] menu. Data are overwritten.

    If you wish to save displayed data on Device View as a separate file name, click [Save As (A)] on the [File (F)] menu. The [Save As] dialog appears. Enter the file name, and then click [Save].

Print

1.  Click [Print] on the [File (F)] menu.  The printing process is executed.

Page Setup

1.  Click [Page setup(P)] on the [File (F)] menu.

2.  The [Page setup] dialog appears.  Designate each item, and then click [OK].
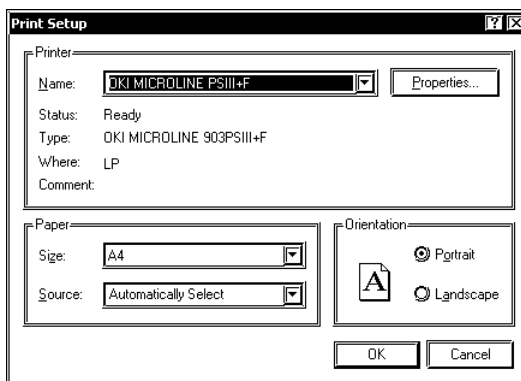


**MEMO**  The contents of the [Page setup] dialog differ depending on your printer.

Refer to the user manual of your printer for details.

Preview

1.  Click [Preview] on the [File (F)] menu.

2.  The print preview appears.

Copy to Clipboard

1.  Click [Copy to Clipboard] on the [File (F)] menu.

2.  The data value displayed on Device View is copied into the clipboard.

3.  Paste the data value onto the application used.

**MEMO**  You can only copy data in the data display area of Device View into the

clipboard.  You cannot copy data such as a title.

Exit

1.  Click [Exit(X)] on the [File (F)] menu. Exits  Device View.

Option

This is selected on [Data View (<u>D</u>)] of the menu bar.

1.    Select [Option] on [Data View (<u>D</u>)] of the menu bar.
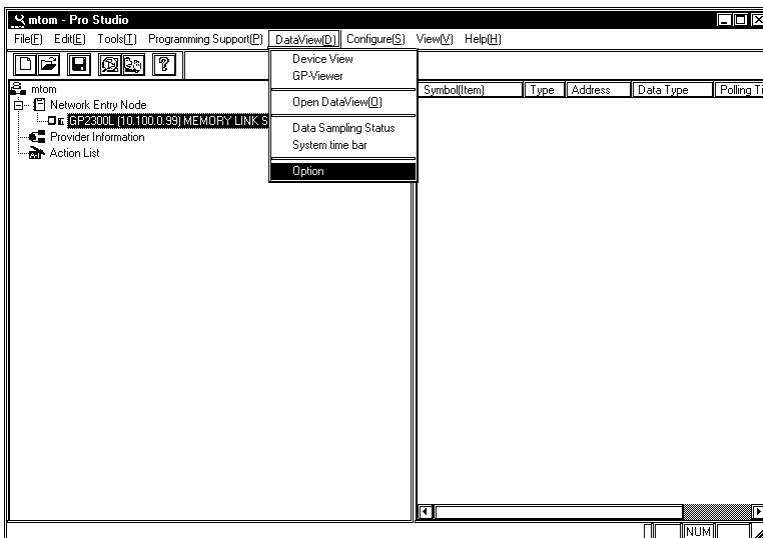


2.    The [Data View Options] dialog appears.

You can select "Show/Hide" of the setup menu and the save button.

If you uncheck "Display menu", the [Option], the [Data Edit], and the [Sampling] menus are hidden on Device View.

If you uncheck "Display button" , ,  buttons are hidden on Device View.
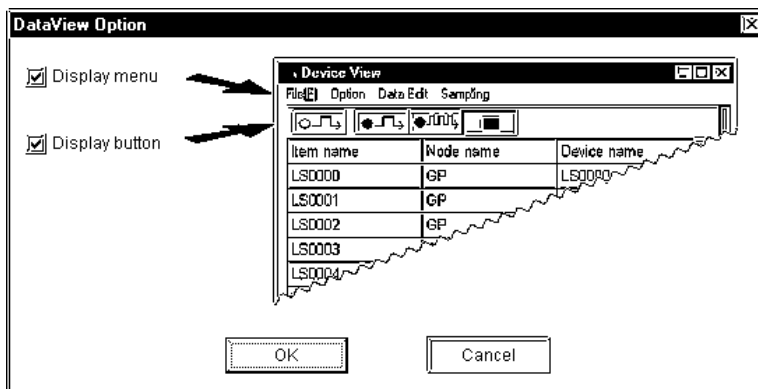
## 7.3   GP-Viewer

GP-Viewer allows you to sample screen data from the GP system connected to Ethernet to display screen data or to playback saved GP data on GP-Viewer.

### 7.3.1   Starting GP-Viewer

When you start GP-Viewer, screens on the GP system are displayed on the GP-Viewer browser in real time.

1.   After selecting the entry node to use GP-Viewer, select [GP-Viewer] on [Data View (<u>D</u>)] of the menu bar.
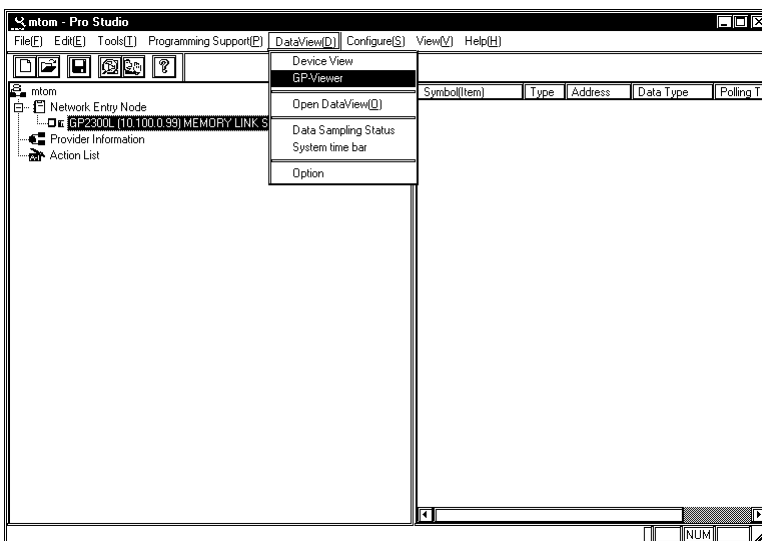


**MEMO**

- You should make sure to connect to the GP system because the communication process will start when you click [GP-Viewer].

- You can upload the connected GP screen on GP77R SERIES, however, the GP system is reset once.  If your model does not support the online uploading function, the warning window appears.

- If the password protection has been set to the GP screen, the password entry dialog appears.

- The GP-Viewer screen refresh period is set via Pro-Studio's -> [Configure] -> [System] -> [DDE Polling Time] dialog box (Default: 1000ms). If the GP-Viewer's screen refresh time becomes too slow, increasing the [DDE Polling Time] value will speed it up.

2.  While the upload process from the GP system is running, the following dialog appears.  The
    dialog will disappear when the upload process is completed.
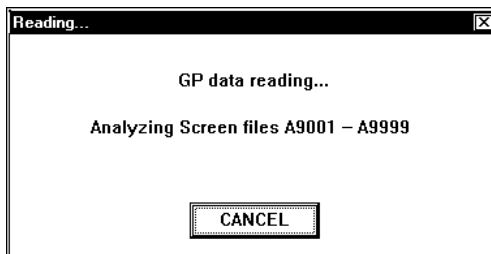


3.  The selected GP screen data are displayed on GP-Viewer.
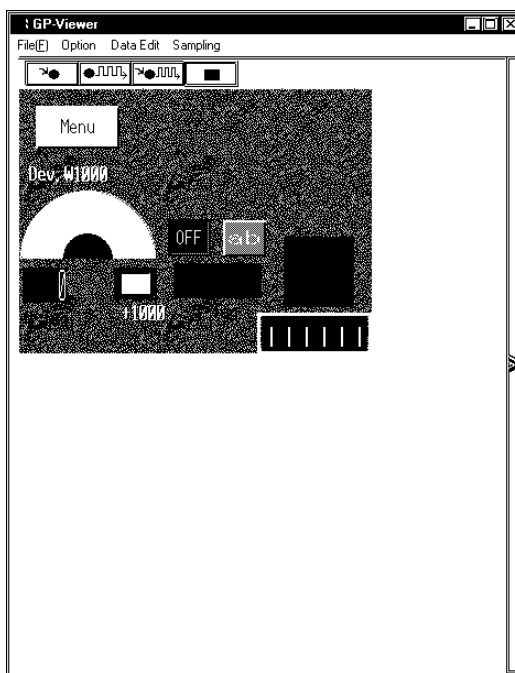


**MEMO**    Data have been monitored but not been saved at this stage.

### 7.3.2    Setting the Data Sampling Condition

This feature allows you to set the data sampling condition from the target device.

The following part describes the procedure after GP-Viewer is started.

1. Click [Sampling] of GP-Viewer.
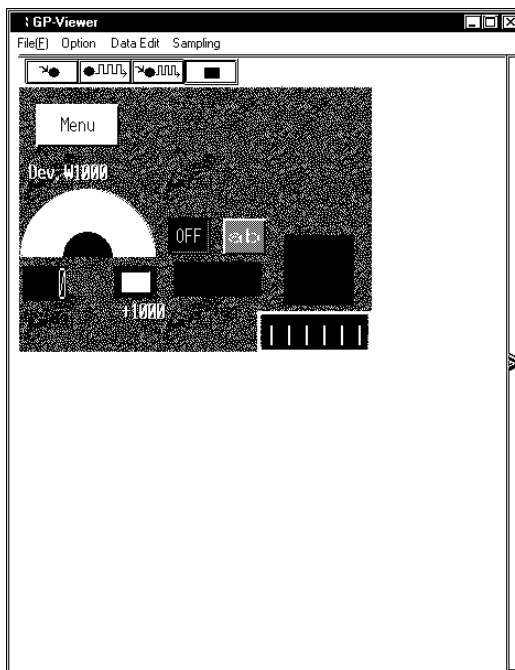


2. The next dialog appears.  Click [Yes].
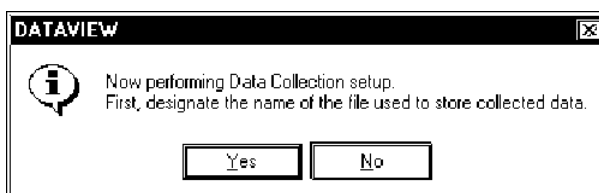


3. The [Save As] dialog appears so that you can create the file to save sampled data.  The file extension is (.DB).  Designate the file name, and then click [Save].
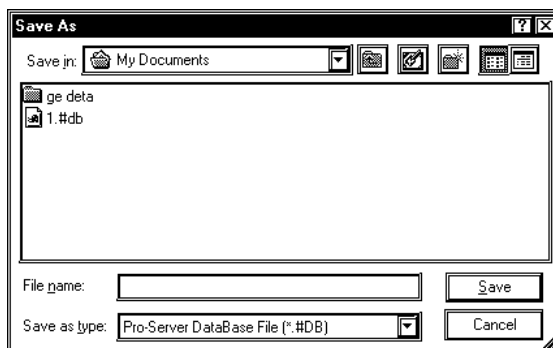
4. The [Sampling method] dialog appears.

   Check the desired "Sampling Method".

   The contents of the "Condition" field differ depending on the "Sampling method" selected.  You should perform the setting according to the contents displayed.


When You Selected "Regular Sampling" on "Sampling method":

The setup contents are as the following.  You should designate [Data Sampling in specified seconds] and [Sampling using cache] in the "Condition" field.
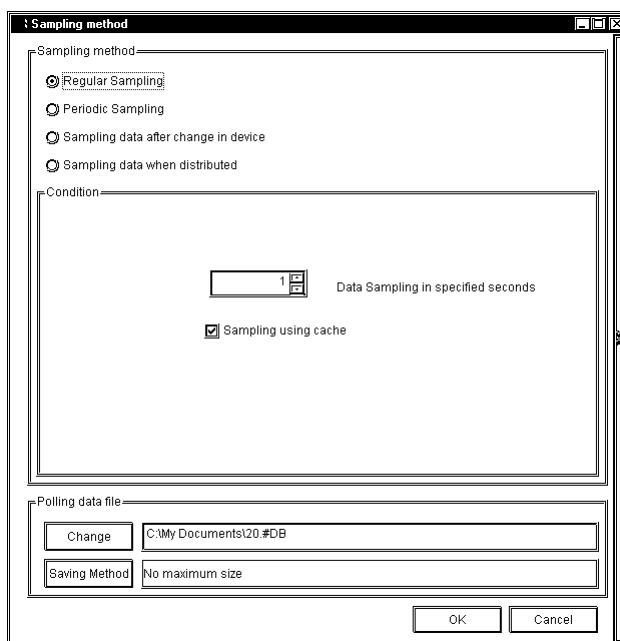


[Data Sampling in specified seconds]

Designate the device data capturing interval in second.  This is defaulted to "1 second".


[Sampling using cache]

Check this box to use the cache to sample device data.

When You Selected "Periodic Sampling" in "Sampling method" :

The setup contents are as the following.  You should create the periodical sampling schedule using the [Append], the [Delete], and the [Edit] buttons in the "Condition" field.
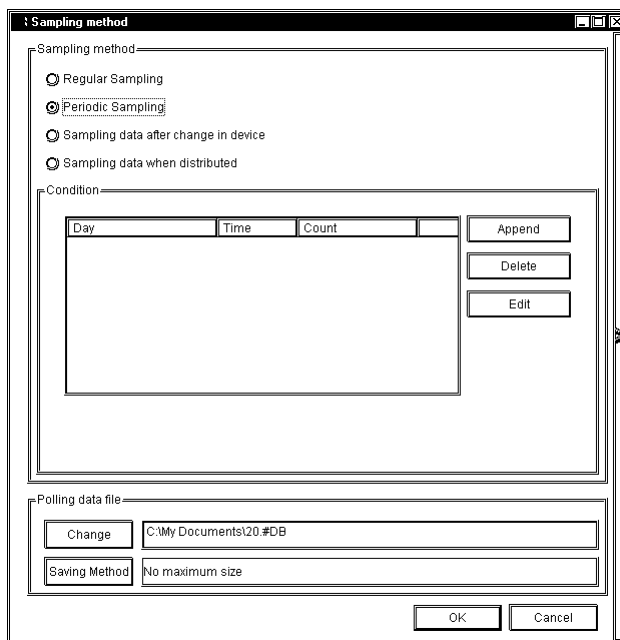


[Delete]

After selecting unnecessary schedules, click [Delete] to delete selected schedules.

[Append], [Edit]

Click these buttons to append or to edit the sampling schedule.

If you click either the [Append] button, or the [Edit] button after you selected the schedule that you wish to edit, the [Designate the data sampling date] dialog appears.  Designate each item in the [Designate the data sampling date] dialog, and then click [Next].
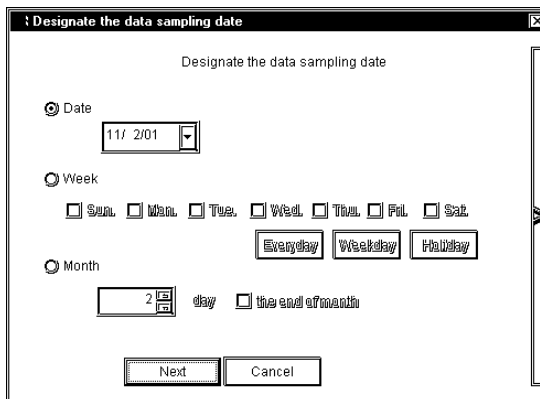


[Date]

Designate the date to sample device data.  Device data are sampled on the day designated here.

[Week]

Designate a day of a week to sample device data.  Check the day that you wish to sample device data.
You can also click [Everyday] (Fri), [Weekday] (Mon, Tue, Wed, Thu, Fri) or [Weekend] (Sat, Sun)
under the day check boxes.

[Month]

Designate a day of a month to sample device data.  You can designate either a particular day (one day)
or the last day every month.  Device data are sampled on the day designated here every month.

If you click [Next], the [Designate the sampling time] dialog appears.  Designate each item in
the [Designate the sampling time] dialog, and then click [OK].

[Append] allows you to create the new sampling schedule and it will be displayed in the schedule field.
[Edit] allows you to change the contents of the selected schedule.



[Start Time]

Designate the time to start capturing device data.  The sampling will start at the time designated here.

[Sampling count]

If you wish to sample device data once, check [One time only].
If you wish to repeat device data sampling, designate the sampling condition.  You should designate the
sampling interval and the number of sampling.

When You Selected "Sampling data after change in device" in "Sampling method" :

The contents of the "Condition" field are as the following. You should designate [Sampling Condition],

[Interval Condition], and [Data sampling - from start to finish of data reception] in the "Condition" field.



[Sampling Condition]

Designate the timing to sample device data. You should designate the node name that you wish to

perform a sampling, the target device name, the device model, and the device change condition.

[Interval Condition]

Designate intervals to check the device change and to sample data when the status changed.

[Data sampling - from start to finish of data reception]

Designate the intervals to save data "before and after" the device change occurred and the sampling

condition was satisfied. Intervals designated here should be longer than the sampling interval.

When You Selected "Sampling data when distributed" in "Sampling method" :

The contents of the "Condition" field are as the following. You should enter the Provider information setup name in [Provider Sheet] of the "Condition" field, and then click [Provider Data Registration] to designate the new Provider information setup. If you have already designated Provider information setups, you can select it from the pull-down list.
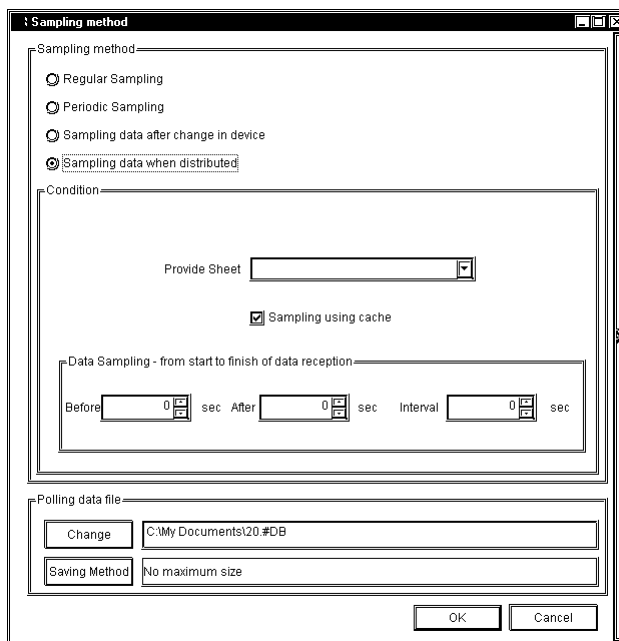


[Provide Sheet]

If pre-defined Provider information setups exist, select it from the pull-down list. If it does not exist, you should enter the name.

Be sure to set the [Provide Information] interval to 1000ms or longer.

[Sampling using cache]

Check this box to use the cache to sample device data.

[Data sampling - from start to finish of data reception]

Designate the sampling method "before and after" receiving the Provider information. You should designate sampling times "before" and "after" receiving (in second), and the sampling interval (in second).

5.  Designate each item in the "Polling data file" field of the [Sampling method] dialog, and then click [OK].

[Change]

Use this button to change the folder to save sampled data.

[Saving Method]

If you click this button, the [Saving Method] dialog appears.  Designate each item in the [Saving Method] dialog, and then click [OK].

[Saving Method]

Designate the folder to save sampled data. You should designate the total volume (size) of data to save among "No maximum size is designated (as much as storage media allows)", "Designate maximum size" and "Periodic saving".

If you selected "Designate maximum size", you should also designate the maximum data size (in MByte) and the sampling method.

- Selecting "Continuous numbering for new files"

  When the maximum allowed size is exceeded, the following new file is created:

  ****.[Sequence number]. #DT  ABCD.0.#DT  ->  ABCD.1.#DT

- Selecting "Save over oldest data"

  The oldest Polling data is overwritten when the maximum allowed size is exceeded.

- Selecting "Do not save files after size limit reached"

  When the maximum allowed size is exceeded, Polling is stopped and an error message appears.

If you selected "Periodic saving", you should also designate the interval to upload the files.

6. Execute the device data sampling.

To perform sampling registration for GP display screens, click the [ 🛠 ] button.

To poll sample registered device data, click the [●JUUₗ] button.

If you wish to sample data according to the designated data sampling condition, click the [🛠●JUUₗ] button. The data "Sample & Save" is executed according to the data sampling condition, and the contents are displayed on GP-Viewer. The display contents are updated according to the data change. When you start the device data sampling, various buttons for viewing sampled data are appended on GP-Viewer.

Refer to "7.3.5 Playback Feature" for the viewing method of sampled device data.

Reference → "7.3.5 Playback Feature"
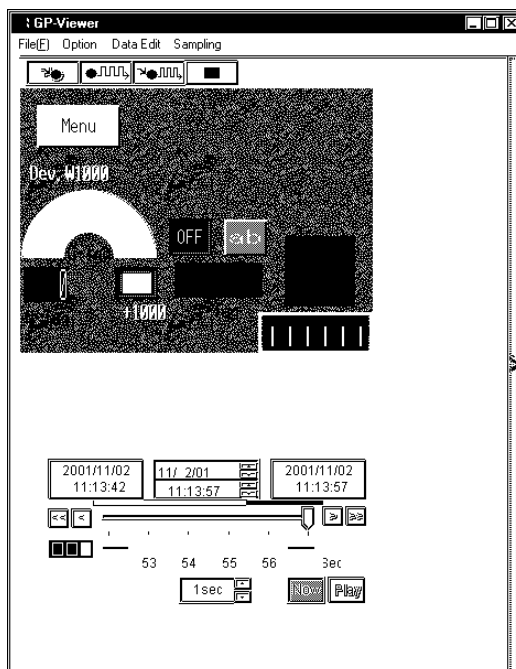
## 7.3.3    Editing Sampled Data

This feature allows you to edit sampled device data.

1.  Click [Data Edit] of GP-Viewer.
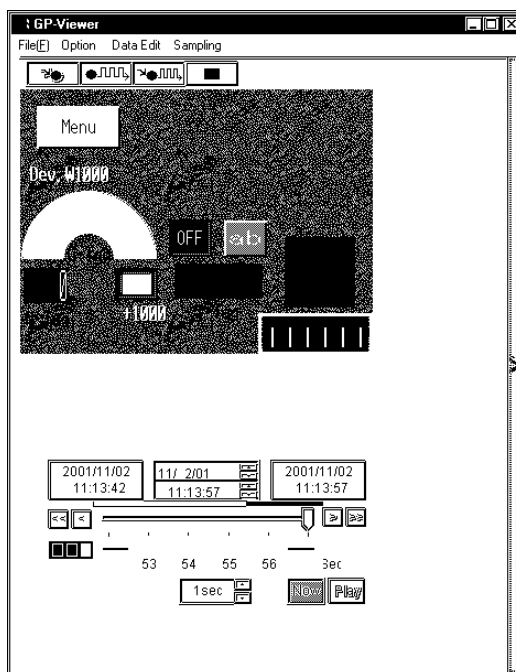


2.  The [Data Edit] dialog appears. You can edit data in various methods. The following part
    describes the major operation method after the [Data Edit] dialog appeared.
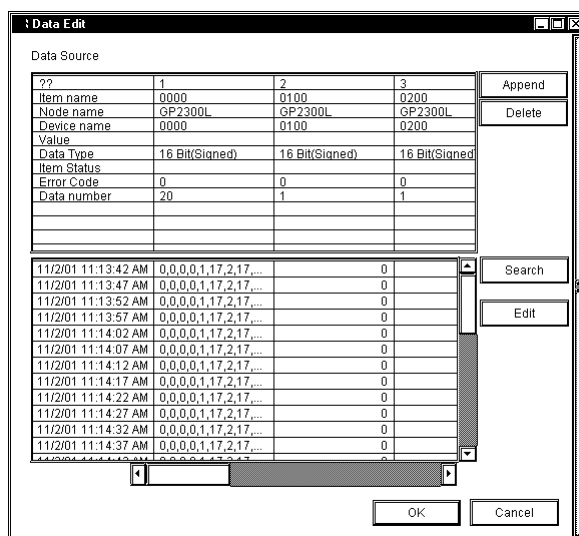
Appending Sampled Data

1.  Click [Append] of the [Data Edit] dialog.

2.  The next dialog appears.  Designate each item about the device that you wish to append, and then click [OK].  Items are equal to those in the [Data sampling source] dialog.

    Reference → "7.3.1 Setting the Sampling Target Device"



3.  The device data that you wish to append are displayed in the [Data Edit] dialog.

Deleting Sampled Data

1.  Select the data that you wish to delete in the [Data Edit] dialog.

2.  Click [Delete]. The selected data will be deleted.

Searching Sampled Data

1.  Click [Search] in the [Data Edit] dialog.

2.  The [Search] dialog appears.  Enter the date that you wish to search, and then click [OK].



3.  The display contents are updated and data are displayed showing one closest to the date entered in the middle.

Editing Data Source

1. Click the data source field that you wish to edit. The column including the selected field is highlighted so that you can enter data from the keyboard in the selected field. The pull-down list may appear depending on the selected item.



2. Enter the new contents from the keyboard. The contents of the selected field are updated.

**MEMO**    Data cannot be edited during Polling.

Editing Saved Data

1. Click [Edit] of the [Data Edit] dialog.
2. The [Edit] button in the [Data Edit] dialog is highlighted, and the [Delete Record] button appears.
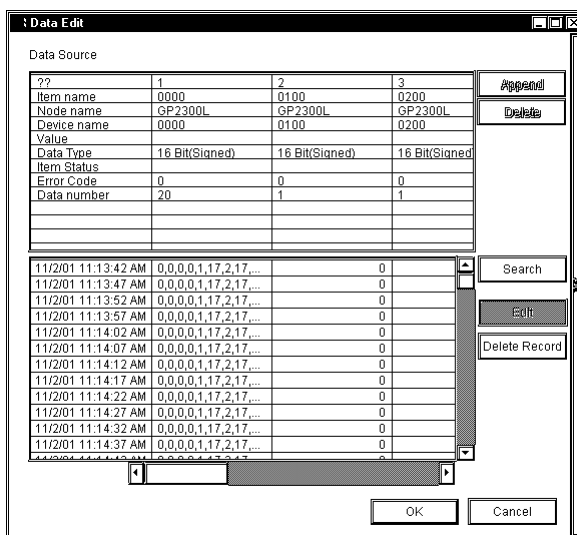


3. Select the data that you wish to delete, and then click [Delete Record]. The selected data will be deleted.

**MEMO**    Click on [OK] to set the selections made in [Edit] and/or [Delete Record].

Click on [Cancel] to delete all current selections.

### 7.3.4    Setting Drawing

This feature allows you to change the display format of the data display area in GP-Viewer.

1.    Click [Option] of GP-Viewer.
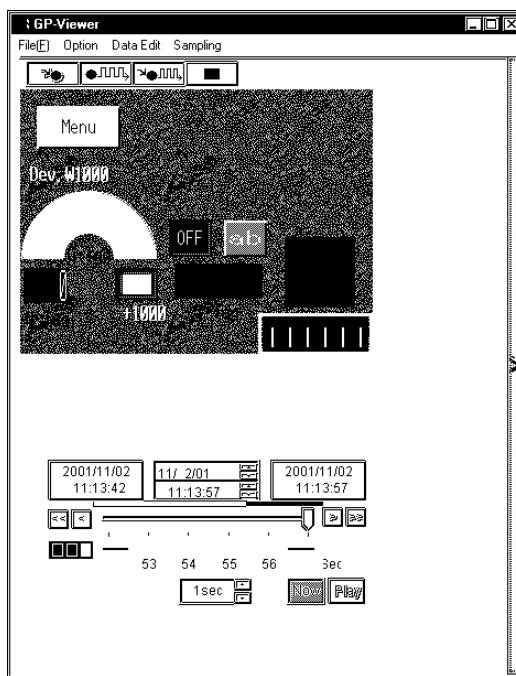
2.    The [Wizard] dialog appears.  Perform required settings, and then click [Option] of GP-Viewer to close the dialog.
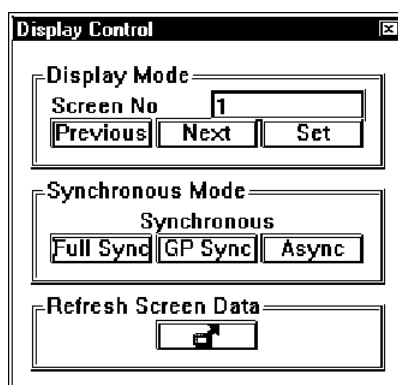
[Display Control]

You can designate the synchronization style between GP screens and GP-Viewer.  There are 3 synchronous modes available, Full Synchronous, GP Synchronous and Asynchronous.  The following describes the detail of each style.

| | |
|---|---|
| Asynchronous | Screens can be switched on GP-Viewer.  Switching a screen on GP-Viewer does not synchronize with a screen on the GP system. |
| GP Synchronous | Screens cannot be switched on GP-Viewer.  Switching a screen on the GP system synchronizes with a screen on GP-Viewer.  (This is the default setting.) |
| Full Synchronous | Screens can be switched on GP-Viewer.  Switching a screen on GP-Viewer synchronizes with a screen on the GP system and vice versa. |

[Screen No]

This feature allows you to change the displayed screen of GP-Viewer according to screen numbers predefined on the GP system.

If you click [Previous], the previous screen from the currently displayed screen is displayed and the value in the "Screen No" field is deceased by one.

If you click [Next], the next screen from the currently displayed screen is displayed and the value in the "Screen No" field is increased by one.

If you enter the screen number that you wish to display in the "Screen No" field and click [Set], the corresponding screen to the number entered is displayed.

**MEMO**

• The screen switching feature of GP-Viewer is effective only when the synchronous mode is either "Asynchronous" or "Full Synchronous".

• You cannot normally switch screens by GP-Viewer from upper-level PCs.
  You should set the bit "4" of GP's LS2076 to "ON (1)" to switch screens in the [Full Synchronous] mode from upper-level PCs.

[Refresh Screen Data]

If you changed the GP screen contents, click [Refresh Screen Data].  GP-Viewer re-captures the setup contents of the GP system.

## 7.3.5    Playback Feature

This feature allows you to playback sampled device data on GP-Viewer.

1.    Select [Open Data View (O)] on [Data View (D)] of the menu bar.
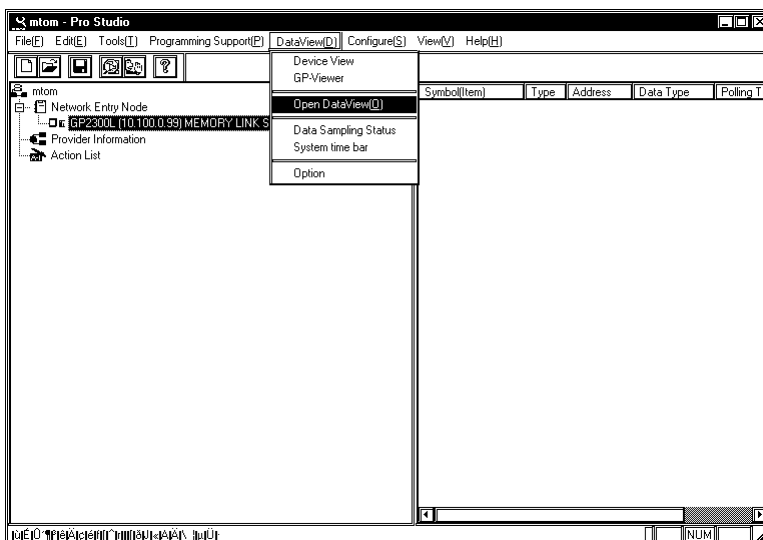


2.    The [Open] dialog appears.  Select the device data (.#DV) that you wish to playback, and then click [Open].
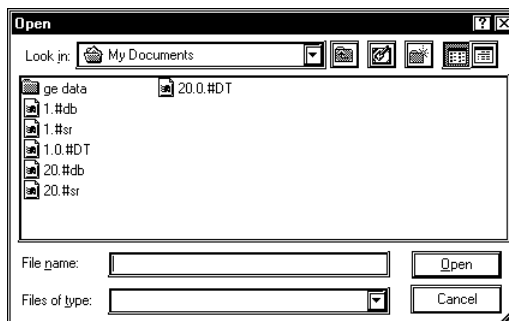


**MEMO**    You can also playback data in the saving process.

3.   The contents of sampled data are displayed on GP-Viewer. You can playback saved data using various buttons on GP-Viewer.



[Saved Time]

This field shows the saved time of the saved device data.

The field shows, from the left, the saving start time, the time for currently displayed data and the last saved time.  When the current status is displayed, the time for currently displayed data is identical to the last saved time.

[Time Bar]

Saved data can be displayed by sliding the time bar control to either side.  The data saving process continues even while you operate the control.

[Time Setup]

You can designate the time unit for one graduation of the time bar.

[Now/Play Display Switch]

[Now] and [Play] buttons are available.  You can playback the saved data from the designated time either by sliding the time bar control to the time that you wish to start the playback or by clicking the [Play] button after clicking the time for currently displayed data (the center field of [Saved Time]) and then entering the time to start the playback.

## 7.3.6    Other Features

This section describes the File menu and options of GP-Viewer.

1.    If you click [File (F)] of GP-Viewer, 8 options are available.  The following describes the overview of each option.
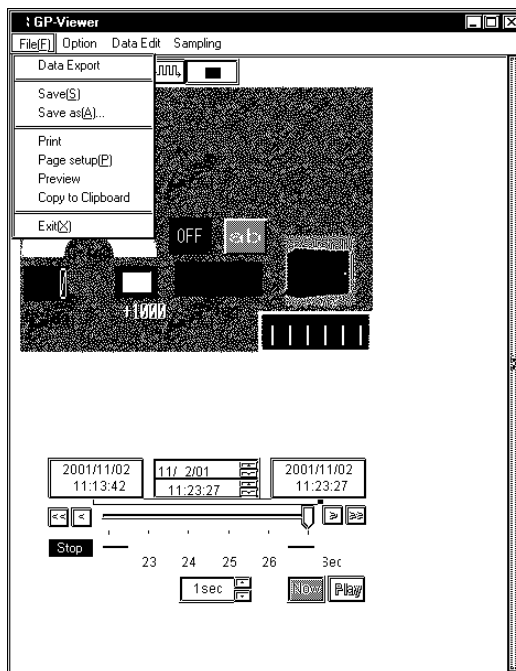


Exporting Data

1.    Select [Data Export] on the [File (F)] menu.

2.    The [Export] dialog appears.  Designate each item, and then click [Export].
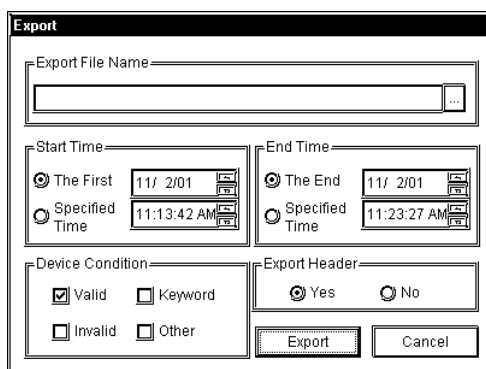


[Export File Name]

Designate the location and the file name to save exported data.  The file extension is (.CSV).

[Start Time]

Designate the time to start exporting data. If you wish to start exporting immediately after you clicked [Export], check "The First". If you wish to start exporting at the designated time, check "Specified Time". If you checked "Specified Time", you should also designate the start time to export.

[End Time]

Designate the time to end exporting data. If you wish to export the entire sampled data, check "The End". If you wish to export until the designated time, check "Specified Time". If you checked "Specified Time", you should also designate the end time to export.

[Device Condition]

This is the reserved data. You should not change the designated value.

[Export Header]

If you wish to include the header information in exported data, check "Yes". If not, check "No".

[Export]

Executes the data export.

[Cancel]

The process is stopped and goes back to GP-Viewer.

**MEMO** Although you can start multiple GP-Viewer programs, you cannot export data simultaneously.

Saving Data

1. If you wish to save displayed data to GP-Viewer, click [Save (S)] on the [File (F)] menu. Data are overwritten.

   If you wish to save displayed data to GP-Viewer as a separate file name, click [Save As (A)] on the [File (F)] menu. The [Save As] dialog appears. Enter the file name, and then click [Save].

Print

1. Click [Print] on the [File (F)] menu. The printing process is executed.

Page Setup

1.    Click [Page Setup(P)] on the [File (F)] menu.

2.    The [Page Setup] dialog appears.  Designate each item, and then click [OK].
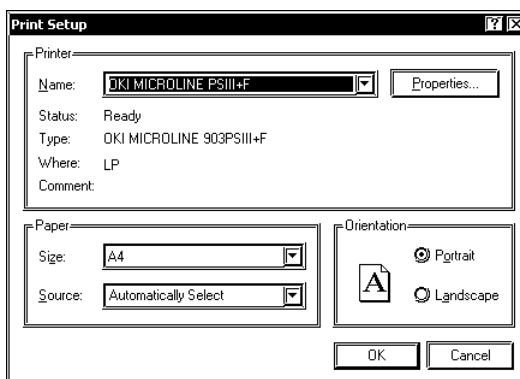


**MEMO**    The contents of the [Page Setup] dialog differ depending on your printer.

Refer to the user manual of your printer for details.

Preview

1.    Click [Preview] on the [File (F)] menu.

2.    The print preview appears.

Copy to Clipboard

1.    Click [Copy to Clipboard] on the [File (F)] menu.

2.    The data value displayed on GP-Viewer is copied into the clipboard.

3.    Paste the data value onto the application used.

**MEMO**    You can only copy data in the data display area of GP-Viewer into the

clipboard.  You cannot copy data such as a title.

Exit

1.    Click [Exit(X)] on the [File (F)] menu.  Exits GP-Viewer.

Options

This is selected on [Data View (D)] of the menu bar.

1.   Select [Option] on [Data View (D)] of the menu bar.
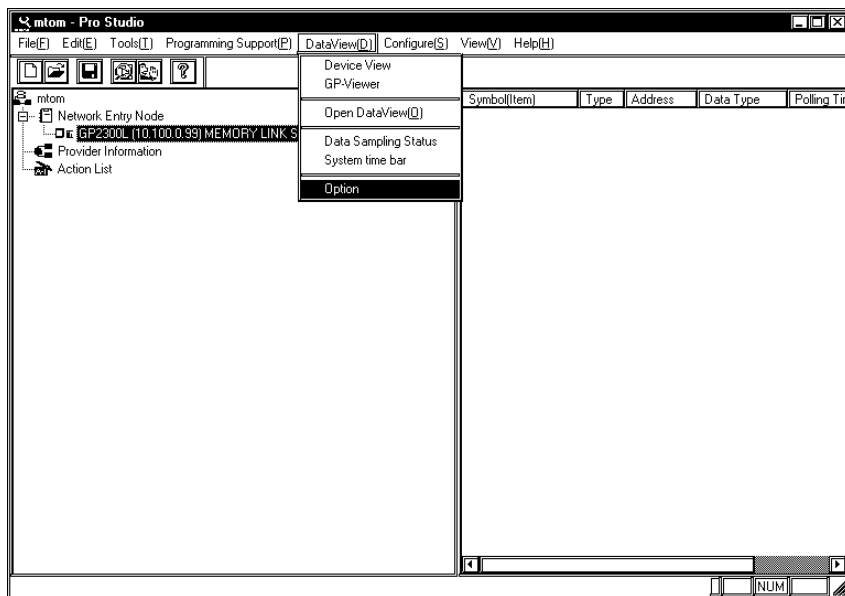


2.   The [DataView Option] dialog appears.

You can select "Show/Hide" of the setup menu and the save button.

If you uncheck "Display menu", the [Option], the [Data Edit], and the [Sampling] menus are hidden on GP-Viewer.

If you uncheck "Display button", ⬛JULY, ↗⬛JULY, ⬛ buttons are hidden on GP-Viewer.
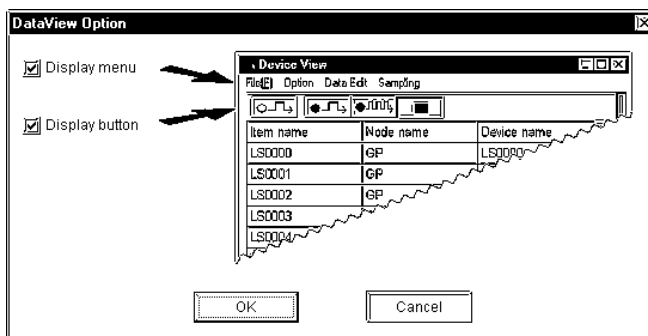
## Supported Drawing Commands

Among GP-PRO/PBIII drawing commands, the following commands are supported by GP-Viewer.

Only the following drawing features are function properly.

- line/poly-line command
- rectangle command
- circle/ellipse command
- arc/sector command
- polygon fill command
- ruler command
- text string command
- mark call-up command

Among these drawing commands, there are some functions not available with GP-Viewer. Functions available and not available with GP-Viewer are listed below for each drawing command.

The display may differ between GP and GP-Viewer even if drawing commands are supported.

| Line/Poly-line Command | |
|---|---|
| specifying a display color | Yes |
| blinking a display color | Yes |
| specifying a background color | No |
| blinking a background color | No |
| drawing an arrow | Yes |
| drawing a solid line | Yes |
| drawing a dotted line | No |
| **Rectangle Command** | |
| specifying a display color | Yes |
| blinking a display color | Yes |
| specifying a background color | No |
| blinking a background color | No |
| drawing a solid line | Yes |
| drawing a dotted line | No |
| chamfering | Yes |
| specifying the number of dots in chamfering | Yes |
| solid fill pattern | Yes |
| fill patterns except for a solid fill | No |

| Circle/Ellipse Command | | |
|---|---|---|
| | specifying a display color | Yes |
| | blinking a display color | Yes |
| | specifying a background color | No |
| | blinking a background color | No |
| | drawing a solid line | Yes |
| | drawing a dotted line | No |
| | solid fill pattern | Yes |
| | fill patterns except for a solid fill | No |
| **Arc/Sector Command** | | |
| | specifying a display color | Yes |
| | blinking a display color | Yes |
| | specifying a background color | No |
| | blinking a background color | No |
| | drawing a solid line | Yes |
| | drawing a dotted line | No |
| **Polygon Fill Command** | | |
| | specifying a display color | Yes |
| | blinking a display color | Yes |
| | specifying a background color | No |
| | blinking a background color | No |
| | drawing a solid line | Yes |
| | drawing a dotted line | No |
| | solid fill pattern | Yes |
| | fill patterns except for a solid fill | No |
| **Ruler Command** | | |
| | specifying a display color | Yes |
| | blinking a display color | Yes |
| | specifying a background color | No |
| | blinking a background color | No |
| | drawing a solid line | Yes |
| | drawing a dotted line | No |
| | ruler type | Yes |
| | number of graduations to be divided | Yes |

| Text String Command | |
|---|---|
| specifying a display color | Yes |
| blinking a display color | Yes |
| specifying a background color | Yes |
| blinking a background color | Yes |
| specifying a shade color of a carving style | Yes |
| blinking a shade color of a carving style | Yes |
| text direction | Yes |
| text style | Yes |
| text size | Yes |
| text rotation angle | Yes |
| text font | No |
| Mark Call-up Command | |
| specifying a display color | Yes |
| blinking a display color | Yes |
| specifying a background color | Yes |
| blinking a background color | Yes |
| specifying a mark size | Yes |

## Supported Tag Commands

The following GP-PRO/PBIII tag commands are supported by GP-Web.

Only the following tags are supported.

- C tag
- E tag
- F tag
- G tag
- K tag
- L tag
- N tag
- S tag
- T tag
- U tag

Among these tag commands, there are some features not available with GP-Web. Refer to the following list for each tag command.

The display may differ for GP and for your Web browser even if drawing commands are supported.

| C Tag | | | | |
|---|---|---|---|---|
| | character size | – | Yes | Yes |
| | specifying a display color | – | Yes | Yes |
| | blinking a display color | – | Yes | Yes |
| | specifying display rotation | – | Yes | Yes |
| | specifying a tiling pattern | – | Yes | Yes |
| | specifying a background color | – | Yes | Yes |
| | character size (full/half) | – | Yes | Yes |
| | specifying a background color at tiling | – | Yes | Yes |
| **E Tag** | | | | |
| | specifying data (absolute/relative) | – | Yes | Yes |
| | specifying a sign | – | Yes | Yes |
| | rounding off numbers | – | Yes | Yes |
| | specifying a display data form | – | Yes | Yes |
| | specifying display address (indirect) | – | No | No |
| | bit length when [relative] is selected | – | Yes | Yes |
| | input sign when [relative] is selected | – | Yes | Yes |
| | input display when [relative] is selected | – | Yes | Yes |
| | input range when [relative] is selected | – | Yes | Yes |
| | display range when [relative] is selected | – | Yes | Yes |
| | character size | – | Yes | Yes |
| | the number of digits to be displayed | – | Yes | Yes |
| | the number of decimals | – | Yes | Yes |
| | display style | | Yes | Yes |

| E Tag | | | |
|---|:---:|:---:|:---:|
| specifying a range | – | Yes | Yes |
| the number of ranges | – | Yes | Yes |
| setting a range | – | Yes | Yes |
| specifying a number color | – | Yes | Yes |
| blinking a number color | – | Yes | Yes |
| specifying a background pattern | – | Yes | Yes |
| specifying a background color | – | Yes | Yes |
| blinking a background color | – | Yes | Yes |
| operation | – | Yes | Yes |
| specifying display rotation | – | Yes | Yes |
| **F Tag** | | | |
| specifying a display (direct/indirect) | – | Yes | Yes |
| type of screen (base screen/image screen) | – | Yes | Yes |
| type of screen (CF card image screen) | – | No | No |
| screen number | – | Yes | Yes |
| specifying a word address | – | Yes | Yes |
| specifying a display data form when [relative] is selected | – | Yes | Yes |
| operation mode (area move/move between 2 points) | – | Yes | Yes |
| displaying a display data form | – | Yes | Yes |
| **G Tag** | | | |
| specifying data (absolute/relative) | Yes | Yes | Yes |
| display mode | Yes | Yes | Yes |
| display a data form when [absolute] is selected (BIN/BCD) | Yes | Yes | Yes |
| input range when [relative] is selected | Yes | Yes | Yes |
| chart type (bar chart/pie chart/half-pie chart) | Yes | Yes | Yes |
| fill patterns for a bar chart | Yes | Yes | Yes |
| chart fill patterns except for a bar chart | No | No | No |
| indicating a starting point of a meter-type pie or half-pie chart | Yes | Yes | Yes |
| specifying a display color | Yes | Yes | Yes |
| specifying a background color | No | No | No |
| blinking a background color | No | No | No |
| displaying alarm | Yes | Yes | Yes |
| specifying alarm background color | No | No | No |
| blinking alarm background color | No | No | No |
| specifying display rotation | No | Yes | Yes |

| K Tag | | | | |
|---|---|---|---|---|
| specifying a data (absolute/relative/character string) | – | Yes | Yes |
| specifying a word address | – | Yes | Yes |
| specifying a starting bit address | – | No | No |
| specifying a display address (indirect) | – | No | No |
| specifying a sign | – | Yes | Yes |
| rounding off numbers | – | Yes | Yes |
| specifying display/write data form | – | Yes | Yes |
| bit length when [relative] is selected | – | Yes | Yes |
| input sign when [relative] is selected | – | Yes | Yes |
| input range when [relative] is selected | – | Yes | Yes |
| display range when [relative] is selected | – | Yes | Yes |
| the number of characters to be displayed when [character string] is selected | – | Yes | Yes |
| character size | – | Yes | Yes |
| the number of digits to be displayed | – | Yes | Yes |
| the number of decimals (direct/indirect) | – | Yes | Yes |
| specifying display style | – | Yes | Yes |
| automatic clear | – | No | No |
| checking the number of digits to be input | – | No | No |
| bar code input | – | No | No |
| alarm (direct/indirect/color change) | – | Yes | Yes |
| specifying an alarm display color | – | Yes | Yes |
| blinking an alarm display color | – | Yes | Yes |
| specifying an alarm background color | – | Yes | Yes |
| blinking an alarm background color | – | Yes | Yes |
| operation | – | Yes | Yes |
| specifying display rotation | – | Yes | Yes |

| L Tag | | | | |
|---|---|---|---|---|
| screen number (direct/indirect/state) | Yes | Yes | Yes |
| starting method | Yes | Yes | Yes |
| calling the base screen and the image screen | Yes | Yes | Yes |
| delete action (enable/unable) | Yes | Yes | Yes |
| display a data form when [indirect] is selected (BIN/BCD) | Yes | Yes | Yes |
| calling image screens in the CF Card | No | No | No |

| N Tag | | | | |
|---|---|---|---|---|
| | specifying data (absolute/relative) | Yes | Yes | Yes |
| | specifying if to show a negative number | Yes | Yes | Yes |
| | specifying a display data form | Yes | Yes | Yes |
| | access a data length | Yes | Yes | Yes |
| | input range when [relative] is selected | Yes | Yes | Yes |
| | text size | Yes | Yes | Yes |
| | text font | No | No | No |
| | number of digits to be displayed | Yes | Yes | Yes |
| | specifying a display color | Yes | Yes | Yes |
| | blinking a display color | Yes | Yes | Yes |
| | specifying a background color | Yes | Yes | Yes |
| | blinking a background color | No | No | No |
| | alarm process | Yes | Yes | Yes |
| | specifying an alarm color | Yes | Yes | Yes |
| | blinking an alarm color | Yes | Yes | Yes |
| | specifying an alarm background color | Yes | Yes | Yes |
| | blinking an alarm background color | No | No | No |
| | operator process | Yes | Yes | Yes |
| | specifying display rotation | No | Yes | Yes |
| S Tag | | | | |
| | starting method | Yes | Yes | Yes |
| | post-start read | Yes | Yes | Yes |
| | text size | Yes | Yes | Yes |
| | text font | No | No | No |
| | number of texts to be displayed | Yes | Yes | Yes |
| | specifying a text color | Yes | Yes | Yes |
| | blinking a text color | Yes | Yes | Yes |
| | specifying a background color | Yes | Yes | Yes |
| | blinking a background color | Yes | Yes | Yes |
| | display location | Yes | Yes | Yes |
| | clearing display | Yes | Yes | Yes |
| | specifying display angle | Yes | Yes | Yes |

| T Tag | | | |
|---|---|---|---|
| write action mode (bit/word/special) | Yes | Yes | Yes |
| specifying an operator | Yes | Yes | Yes |
| hierarchical screen switching | Yes | Yes | Yes |
| special actions except for T tag extension | No | No | No |
| Q tag extended action | No | No | No |
| function key process | No | No | No |
| interlock capability | Yes | Yes | Yes |
| grouping with the automatic disable capability | Yes | Yes | Yes |
| addition/subtraction on/from a specified digit | Yes | Yes | Yes |
| GP reset | Yes | Yes | Yes |
| AUX output | No | No | No |
| buzzer sound | Yes | Yes | Yes |
| reverse display | Yes | Yes | Yes |
| **U Tag** | | | |
| specifying method of the window registration screen (direct/ indirect) | Yes | Yes | Yes |
| display a data form when [indirect] is selected (BIN/BCD) | Yes | Yes | Yes |
| action mode | Yes | Yes | Yes |
| reshuffling of overlapped screens | Yes | Yes | Yes |

## 7.4 Checking the Data Sampling Status

This section describes the procedure to check the sampling status of device data.

1. Select [Data Sampling Status] on [Data View (D)] of the menu bar.
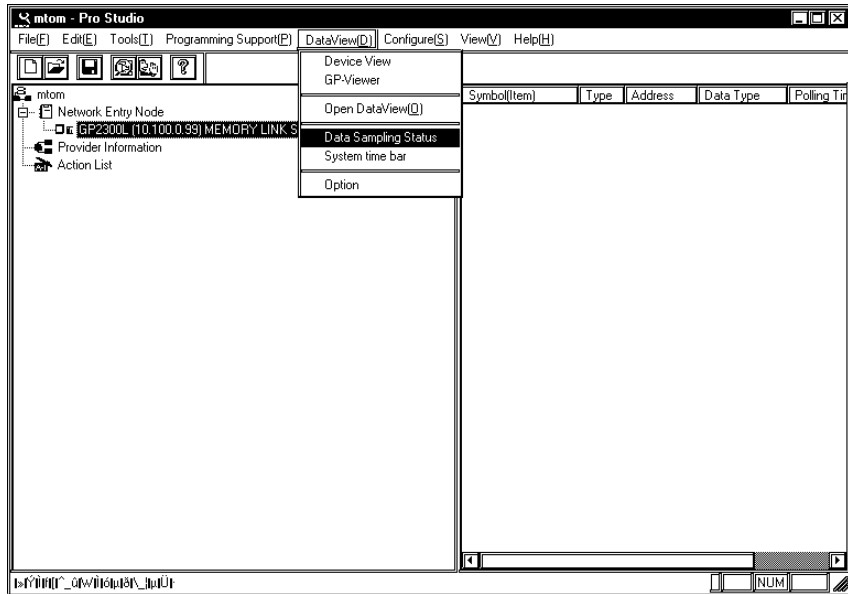


2. The [Data Sampling Status] dialog appears. The sampling status of each registered database is displayed so that you can check the contents.
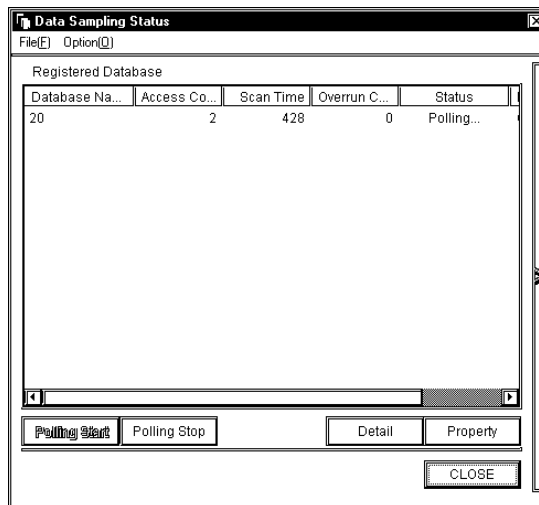


[File (F)]

You can open a database not displayed here, or close the [Data Sampling Status] dialog.

[Option (O)]

You can set the [Data Sampling Status] dialog to be "displayed on the front always".

[Polling Start]

If you select a database that a sampling is not currently executed, this button becomes active.

If you click this button, the data save is started.

[Polling Stop]

If you select the database that a sampling is currently executed, this button becomes active.

If you click this button, the data save is stopped.

[Detail]

After selecting the database that you wish to check the detail, click the [Detail] button.

If you click it, the [Detail] dialog appears.  The detailed contents of the selected database are displayed.

[Set]

After selecting the database that you wish to change the data sampling condition, click the [Set] button.

If you click it, the [Sampling method] dialog appears so that you can change the data sampling condition of the selected database.  The operation procedure is equal to the procedure after Step 4 in "7.2.2 Setting the Data Sampling Condition"" or in "7.3.2 Setting the Data Sampling Condition" Reference → "7.2.2 Setting the Data Sampling Condition", "7.3.2 Setting the Data Sampling Condition"

## 7.5 System Time Bar

This section describes the operation procedure of System Time Bar.

1. Select [System time bar] on [Data View (D)] of the menu bar.
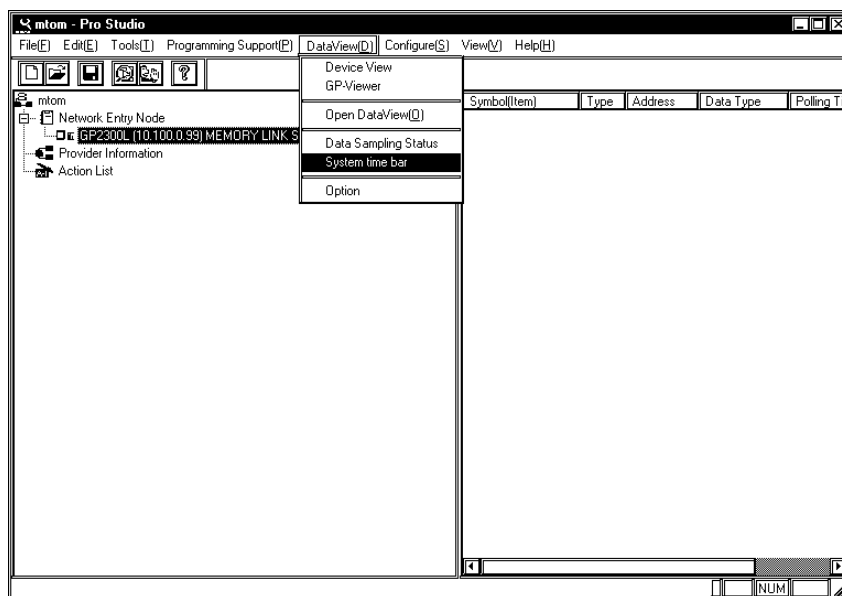


2. System Time Bar appears.

   Click [Change Database] to open the database (file) that you wish to display.
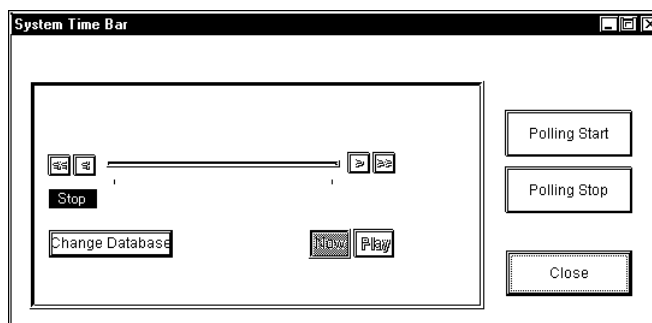
3.  The contents of the selected database is displayed in System Time Bar.



[Saved Time]

This field shows the saved time of the saved device data.

The field shows, from the left, the saving start time, the time for currently displayed data and the last saved time.  When the current status is displayed, the time for currently displayed data is identical to the last saved time.

[Time Bar]

Saved data can be displayed by sliding the time bar control to either side.  The data saving process continues even while you operate the control.

[Time Setup]

You can designate the time unit for one graduation of the time bar.

[Now/Play Display Switch]

[Now] and [Play] buttons are available.  You can playback the saved data from the designated time either by sliding the time bar control to the time that you wish to start the playback or by clicking the [Play] button after clicking the time for currently displayed data (the center field of [Saved Time]) and then entering the time to start the playback.

[Polling Start]

If you click this button, the data save is started.

[Polling Stop]

If you click this button, the data save is stopped.

[Close]

If you click this button, you can exit the System Time Bar.

[Change Database]

If you click this button, the [Open] dialog appears.  If you select the database that you wish to display and click [Open], it is displayed in System Time Bar.

Purpose of System Time Bar

System Time Bar has been developed for the purpose of using the Time Bar (data playback) feature on your own applications.

If you read the file used on your own application (e.g. application to display the database value in a bar graph format) that is equal to the Pro-Server Database File (*.#DB) into System Time Bar, you can synchronize the action of System Time Bar with the display contents of your application (e.g. length change of a bar graph) so that you can playback the database contents on various applications.

# 8 | Maintenanc via Ethernet

This chapter explains the maintenance procedures you can perform via the Ethernet network.

8.1 Transferring Network Project Files
8.2 Transferring Only Updated Screen Data to GPs
8.3 Searching for a Network Node

## 8.1 Transferring Network Project Files

The following procedures explain how to transfer a modified network project file (*.npj) via the Ethernet
network to a previously set up GP (i.e. that has had its system data file sent to it).

1. On the Network Entry Node list, click the destination GP.
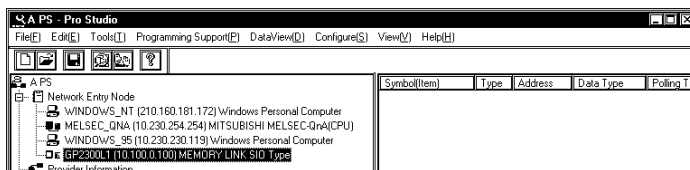


If you are currently editing a network project file, the file must be saved before it can be sent to a GP.

2. Click [Transfer Network Project] in the [Tools(T)] menu.
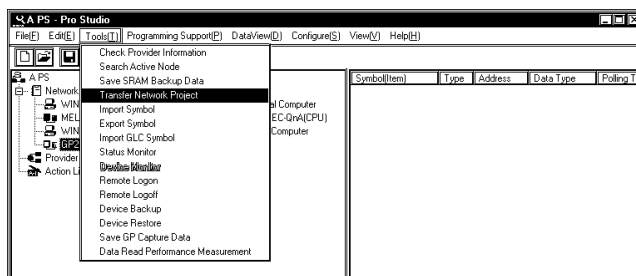


3. The [Transfer Network Project File] window appears and then the transfer of the network
   project file begins.
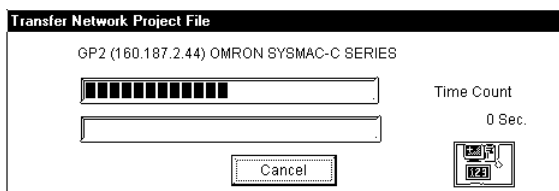


**MEMO**    You can transfer the file to multiple GPs at the same time by selecting [Network
Entry Node List] and then entry nodes that you wish to transfer the file from the
listed entry nodes on the right side.

## 8.2 Transferring Only Updated Screen Data to GPs

If you have modified screen data via the GP-PRO/PB III screen editor software, follow the procedure below to transfer only screen data to the GP. The following description assumes that GP-PRO/PB III's data transfer window is open.

1. Click [Transfer Settings] in the [Setup] menu.
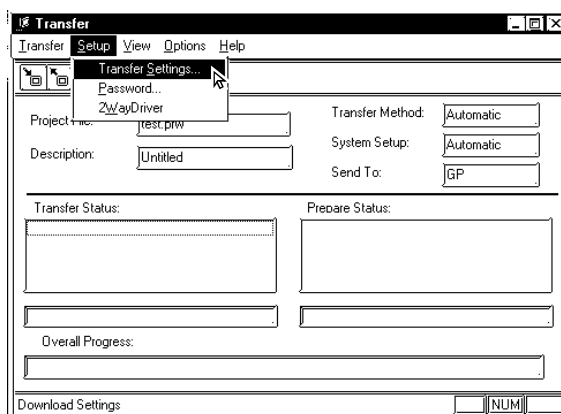


2. When the [Transfer Settings] window appears, click [Ethernet] in the [Send To] pull-down list and click [OK].
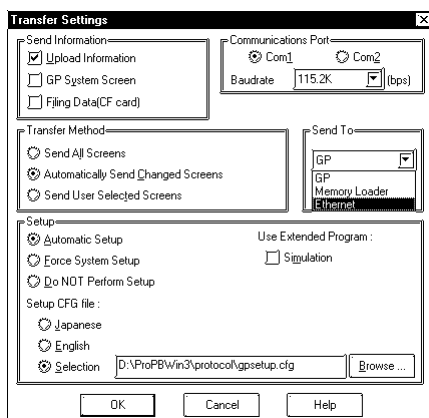


Ethernet can be used to transfer only the updated screen data to the GPs whose setup has been completed.

However, set-up via Ethernet is also possible with the GP2000 Series.

Reference → "GP-PRO/PBIII for Windows Help Files"

**MEMO**  Transferring your screen data in on-line mode temporarily causes the GP to display the transfer screen. The initial screen will be restored as soon as data transfer is completed.

3.  Click [Send] in the Transfer menu or on the Send Screen button to transfer the information to the GP.



Send
Screen
button
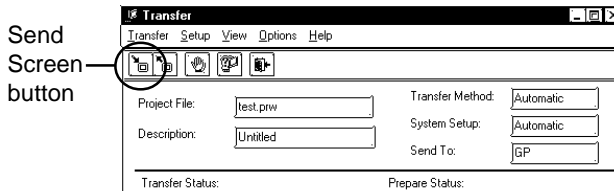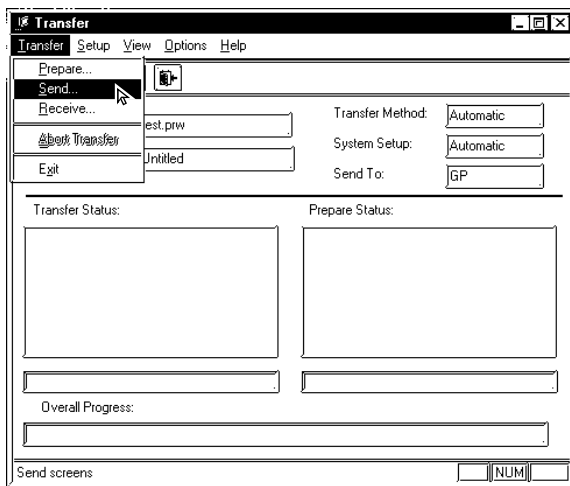
The GP displays the following information when the screen data is being transferred.

Receive the application data

Downloading the screen data from the
upper screen for maintenance. Don't turn
the GP power off. To turn the GP power off
while downloading might destroy the data
inside the GP.
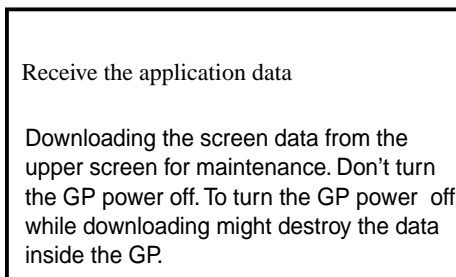
For how to setup a GP for Ethernet,  refer to A.5 Setting Up a GP for Ethernet.

**MEMO**
From GP-PRO/PBIII for Windows Ver. 4.0, only screen data transfer is
required. The Network Project file's data  is not sent.
As a result, the sending of the same screen data to multiple GPs at the
same time is possible. When the Network Project file is modified, use the
Pro-Studio [Tool] menu's [Transfer Network Project] selection to send this
updated data.
Reference → "8.1 Transferring a Network Project"

## 8.3   Searching for a Network Node

You can create a list of the GPs and PCs that are active in the network and immediately register any node that is not in the network project file (*.npj).  (The following description assumes that Pro-Studio's main window is open)

1.   Click [Search Active Node] in the [Tools(T)] menu.
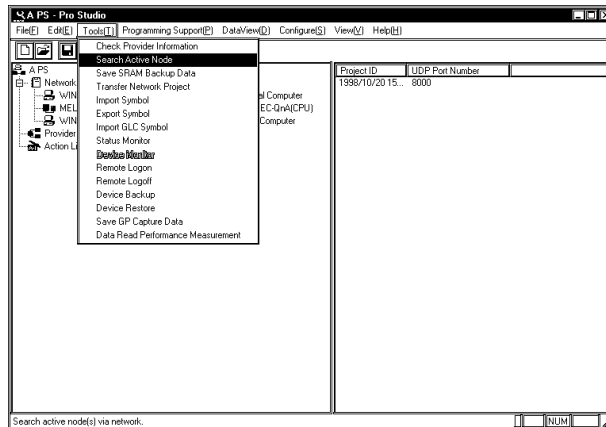


Use this function to automatically search for the nodes connected to the network. It allows you to register network nodes easily, since information such as the PLC type is retrieved and entered automatically by Pro-Studio.

2.   The following dialog box will appear. To register any of the detected nodes, click first the [Node Status] "Non-Entry" text, then the [Entry] button.
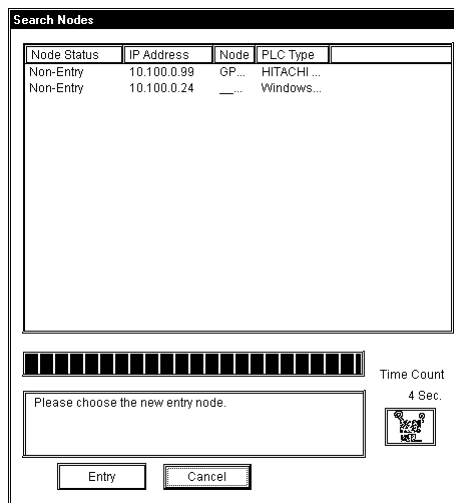
3.   The following dialog box will appear to show that the node has been registered.
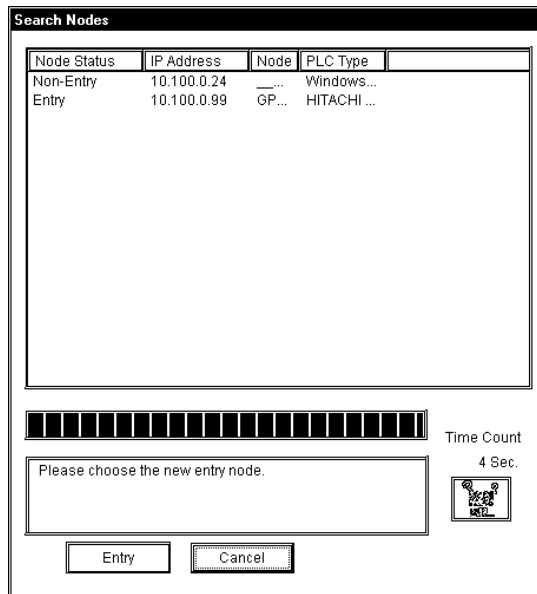
# 9 Simple DLL Function

This chapter describes the Simple DLL function.

# 9.1 Simple DLL (ProEasy.DLL) Function

This section explains functions used to read and write PLC data from applications created via Visual Basic and Visual C. These functions will be provided via the simple DLL

(ProEasy. DLL) and will be contained in "C:\Windows\System" at program installation.

Since GetMessage and DispatchMessage will be repeatedly sent until Pro-Server returns an acknowledge for the SendMessage, messages to the thread will be processed.

**MEMO**　　A sample Pro-Easy. DLL program is included in the Pro-Server with Pro-Studio for Windows CD-ROM.

## 9.1.1 Precautions When Using Functions

### Precautions When Using the Read/WriteDeviceBIT Function

pwData stores the quantity of data specified by wCount in series, starting from D0 bit.

(Ex. When wCount is 20)

|          | F  | E  | D  | C  | B  | A  | 9  | 8 | 7 | 6 | 5 | 4 | 3  | 2  | 1  | 0  |
|----------|----|----|----|----|----|----|----|---|---|---|---|---|----|----|----|----|
| PwData   | 16 | 15 | 14 | 13 | 12 | 11 | 10 | 9 | 8 | 7 | 6 | 5 | 4  | 3  | 2  | 1  |
| PwData+1 | *  | *  | *  | *  | *  | *  | *  | * | * | * | * | * | 20 | 19 | 18 | 17 |

For data consisting of two or more bits that continue in series, using Read/WriteDevice16 or Read/WriteDevice32 to read/write 16 or 32 bits at a time is more effective than using Read/WriteDevice.

Since the "*" character denotes data that is not fixed or defined, use the application program to mask it.

### Precautions When Using the Read/WriteDeviceBCD16/32 Functions

These functions are used to treat data as BCD inside the PLC. However, the data (contents of pxxData) transferred to and from these functions is binary not BCD. (Pro-Server internally converts this data.)

Negative values cannot be used.

| Function Name        | Decimal       | Hex.                 |
|----------------------|---------------|----------------------|
| Read/WriteDeviceBCD16 | 0 to 9999     | 0000 to 270F         |
| Read/WriteDeviceBCD32 | 0 to 99999999 | 00000000 to 05F5E0FF |

### Precautions When Using String Data Functions

For variables to receive string data, be sure to keep data space large enough to receive the data.

## Single-Thread Function and Multi-Thread Function

A single-thread function accesses to multiple GPs from a single application sequentially.

Application

(1) Read request
(3) Reply

Pro-Server

(2) Read execution
GP

(4) Read request
(6) Reply

(5) Read execution
GP

(7) Read request
(9) Reply

(8) Read execution
GP
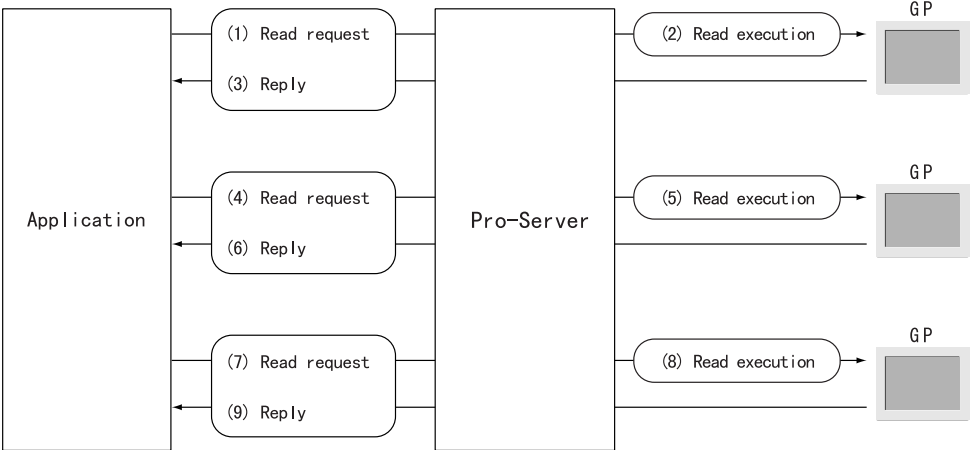
A multi-thread function accesses to multiple GPs from multiple applications.  Multiple read requests can be realized simultaneously and an access speed to multiple GPs increases.

Application

(1) Read request
(7) Reply

Pro-Server

(4) Read execution
GP

(2) Read request
(8) Reply

(5) Read execution
GP

(3) Read request
(9) Reply

(6) Read execution
GP
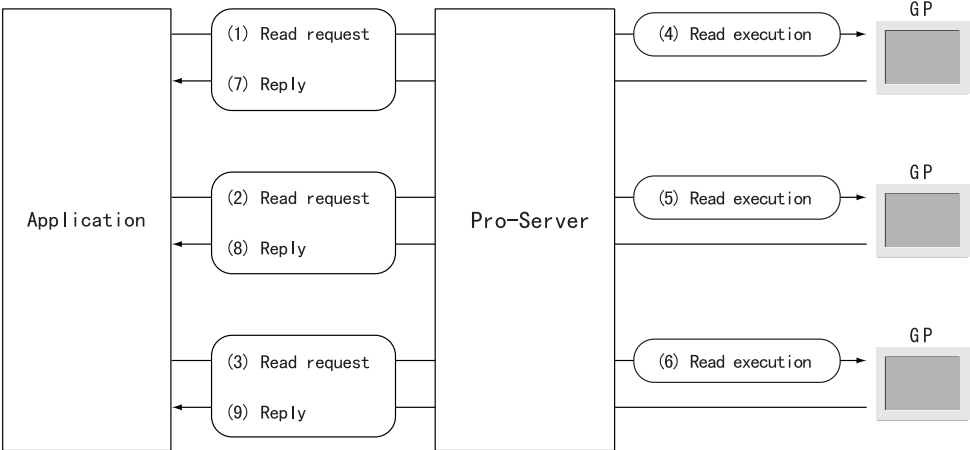
## Precautions When Using Simple DLL from Multiple Threads in Function for Multi-Thread

Acquire the handle per thread (CreatProServerHandle), and then designate arguments.

## Precautions When Threads Other Than the Main Thread Use Simple DLL in Function for Multi-Thread

If the thread that uses the simple DLL is not the application's main thread (which starts when the application is started and terminates when the application is terminated) but a thread generated in the main thread, the following procedures are needed:· Before using the simple DLL, initialize it by executing EasyInit in the thread that uses the simple DLL.

· efore the thread that uses the simple DLL terminates, terminate the simple DLL by executing EasyTerm. Unless the above procedures are followed, the resources used by the simple DLL may not be released for use by other programs.

Perform initialization and shutdown processing once for each application. If these are used multiple times, the system may not return from simple DLL.

## Precautions When LPVARIANT Returns an Undefined Error at ProEasy.h Compilation by VC

When Visual C++ ver. 6 is used to compile Pro-SDK\VC\Public\ProEasy.h, or the header data copied to the clipboard via Pro-Studio's (Programming extension], [VC Text], the LPVARIANT may return an undefined error. Since the LPVARIANT is defined within afxdisp.h, if the data is not included, an error will occur. To avoid this error to occur, you should define "#include<afxdisp.h>" in stdafx.h in a normal case.

## GLC 32 Bit Device Bit Access Method

The GLC unit's 32-bit addressing (integer variables, integer array variables) can access data in individual bit units. Adding a suffix (descriptor). Xm to a variable name allows this type of bit unit access. Also, adding the suffix<n>to a variable name allows you to designate individual array elements. Therefore, if you wish to access the Integer_Array's N+1 element's m+1 position bit, you would write Integer_Array<n>.Xm.

Ex. To access the Integer_Variable's 7th position bit, you would write Integer.X6.

Ex. To access the Integer_Array's 2nd element's 30th position bit, you would write Integer_Array<1>.X29.

## 9.1.2  Direct Read/Write Function

This is a Pro-Server synchronous function that, when a Read/Write request is issued by an application, accesses the designated PLC device via the GP unit, and then waits until the PLC returns the result to Pro-Server, via the GP.
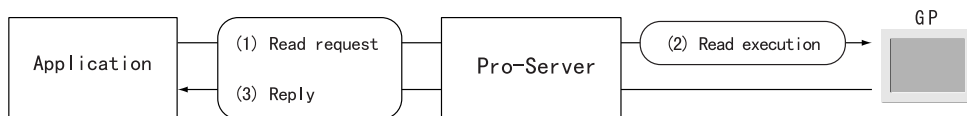


There are three types of functions and they are stored in the following order.

Read****D............ Read (in) function.

Write****...............Write (in) function. To check if the Write was performed correctly, a successive Read is
performed.

Write****D............Write (in) function. Read check is not performed. Used for Write Only devices.


### Direct Read/Write Function for Single-Thread

#### Bit data

INT WINAPI ReadDeviceBitD(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,WORD* pwData,

WORD wCount);

INT WINAPI WriteDeviceBit(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,WORD* pwData,
WORD wCount);

INT WINAPI WriteDeviceBitD(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,WORD* pwData,
WORD wCount);

#### 16-bit data

INT WINAPI ReadDevice16D(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,WORD* pwData,

WORD wCount);

INT WINAPI WriteDevice16(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,WORD* pwData,
WORD wCount);

INT WINAPI WriteDevice16D(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,WORD* pwData,
WORD wCount);

#### 32-bit data

INT WINAPI ReadDevice32D(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,DWORD* pdwData,

WORD wCount);

INT WINAPI WriteDevice32(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,DWORD* pdwData,
WORD wCount);

INT WINAPI WriteDevice32D(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,DWORD* pdwData,
WORD wCount);

16-bit BCD data

INT WINAPI ReadDeviceBCD16D(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,WORD* pwData,

WORD wCount);

INT WINAPI WriteDeviceBCD16(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,WORD* pwData,
WORD wCount);

INT WINAPI WriteDeviceBCD16D(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,WORD* pwData,
WORD wCount);

32-bit BCD data

INT WINAPI ReadDeviceBCD32D(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,DWORD* pdwData,

WORD wCount);

INT WINAPI WriteDeviceBCD32(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,DWORD* pdwData,
WORD wCount);

INT WINAPI WriteDeviceBCD32D(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,DWORD* pdwData,
WORD wCount);

Single-precision floating-point data

INT WINAPI ReadDeviceFloatD(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,FLOAT* pflData,

WORD wCount);

INT WINAPI WriteDeviceFloat(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,FLOAT* pflData,WORD wCount);

INT WINAPI WriteDeviceFloatD(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,FLOAT* pflData,

WORD wCount);

Double-precision floating-point data

INT WINAPI ReadDeviceDoubleD(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,DOUBLE* pdbData,

WORD wCount);

INT WINAPI WriteDeviceDouble(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,DOUBLE* pdbData,
WORD wCount);

INT WINAPI WriteDeviceDouble(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,DOUBLE* pdbData,

WORD wCount);

String data

INT WINAPI ReadDeviceStrD(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,LPTSTR psData,
WORD wCount);

INT WINAPI WriteDeviceStr(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,LPCTSTR psData,
WORD wCount);

INT WINAPI WriteDeviceStr(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,LPCTSTR psData,WORD wCount);

General-use data

INT WINAPI ReadDeviceD(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,LPVOID pData,WORD wCount,
WORDwAppKind);

INT WINAPI WriteDevice(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,LPVOID pData,WORD wCount,

WORDwAppKind);

INT WINAPI WriteDeviceD(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,LPVOID pData,WORD wCount,

WORDwAppKind);

General-use data(for VB)

INT WINAPI ReadDeviceVariantD(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,LPVARIANT pData,

WORDwCount,WORD wAppKind);

INT WINAPI WriteDeviceVariant(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,LPVARIANT pData,

WORDwCount,WORD wAppKind);

INT WINAPI WriteDeviceVariantD(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,LPVARIANT pData,

WORDwCount,WORD wAppKind);

## Direct Read/Write Function for Multi-Thread

### Bit data

INT WINAPI ReadDeviceBitDM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,WORD* pwData,WORD wCount);

INT WINAPI WriteDeviceBitM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,WORD* pwData,WORD wCount);

INT WINAPI WriteDeviceBitDM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,WORD* pwData,WORD wCount);

### 16 bit data

INT WINAPI ReadDevice16DM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,WORD* pwData,WORD wCount);

INT WINAPI WriteDevice16M(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,WORD* pwData,WORD wCount);

INT WINAPI WriteDevice16DM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,WORD* pwData,WORD wCount);

### 32 bit data

INT WINAPI ReadDevice32DM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,DWORD* pdwData,WORD wCount);

INT WINAPI WriteDevice32M(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,DWORD* pdwData,WORD wCount);

INT WINAPI WriteDevice32DM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,DWORD* pdwData,WORD wCount);

### 16 bit BCD data

INT WINAPI ReadDeviceBCD16DM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,WORD* pwData,WORD wCount);

INT WINAPI WriteDeviceBCD16M(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,WORD* pwData,WORD wCount);

INT WINAPI WriteDeviceBCD16DM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,WORD* pwData,WORD wCount);

32 bit BCD data

INT WINAPI ReadDeviceBCD32DM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,DWORD* pdwData,WORD wCount);

INT WINAPI WriteDeviceBCD32M(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,DWORD* pdwData,WORD wCount);

INT WINAPI WriteDeviceBCD32DM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,DWORD* pdwData,WORD wCount);

Single precision floating-point data

INT WINAPI ReadDeviceFloatDM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,FLOAT* pflData,WORD wCount);

INT WINAPI WriteDeviceFloatM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,FLOAT* pflData,WORD wCount);

INT WINAPI WriteDeviceFloatDM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,FLOAT* pflData,WORD wCount);

Double precision floating-point data

INT WINAPI ReadDeviceDoubleDM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,DOUBLE* pdbData,WORD wCount);

INT WINAPI WriteDeviceDoubleM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,DOUBLE* pdbData,WORD wCount);

INT WINAPI WriteDeviceDoubleDM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,DOUBLE* pdbData,WORD wCount);

String data

INT WINAPI ReadDeviceStrDM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,LPTSTR psData,WORD wCount);

INT WINAPI WriteDeviceStrM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,LPCTSTR psData,WORD wCount);

INT WINAPI WriteDeviceStrDM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,LPCTSTR psData,WORD wCount);

General-use data

INT WINAPI ReadDeviceDM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTR bsDeviceName,LPVOIDpData,WORD wCount,WORD wAppKind);

INT WINAPI WriteDeviceM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTR bsDeviceName,LPVOID pData,WORD wCount,WORD wAppKind);

INT WINAPI WriteDeviceDM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,LPVOID pData,WORD wCount,WORD wAppKind);

General-use data(for VB)

INT WINAPI ReadDeviceVariantDM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind);

INT WINAPI WriteDeviceVariantM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind);

INT WINAPI WriteDeviceVariantDM(HANDLE hProServer,LPCTSTR bsNodeName,

LPCTSTRbsDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind);

## 9.1.3   Cache Read Function

If a device has been once read using the cache read function, Pro-Server will subsequently perform automatic polling and save device data in the cache memory within Pro-Server, and the second and subsequent read-outs will be executed more rapidly form the cache memory.  The polling interval is equal to the interval at the symbol registration.  When designating the Device Address directly, the value set in the [Configure (S)] -> [System] -> [DDE Polling Time] dialog box is used. (Default: 1000ms)
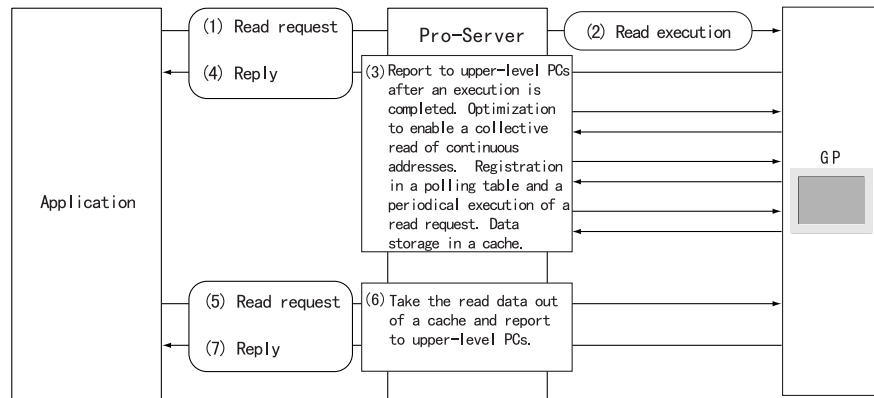


> **MEMO**
> • Because the second and subsequent read-outs are performed from the cache memory, the address value may be different from the real device address value.
>
> • When the cache read function is used, once a device is read, an automatic polling is executed on Pro-Server.  If you execute a wrong device address read, a communication error may occur repeatedly because of this automatic polling.

### Cache Read Function for Single-Thread

Bit data

INT WINAPI ReadDeviceBit(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,WORD* pwData, WORDwCount);

16 bit data

INT WINAPI ReadDevice16(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,WORD* pwData, WORD wCount);

32 bit data

INT WINAPI ReadDevice32(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,DWORD* pdwData, WORDwCount);

16 bit BCD data

INT WINAPI ReadDeviceBCD16(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,WORD* pwData, WORD wCount);

32 bit BCD data

INT WINAPI ReadDeviceBCD32(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,DWORD* pdwData,
WORD wCount);

Single precision floating-point data

INT WINAPI ReadDeviceFloat(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,FLOAT* pflData,
WORD wCount);

Double precision floating-point data

INT WINAPI ReadDeviceDouble(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,DOUBLE*pdbData,
WORD wCount);

String data

INT WINAPI ReadDeviceStr(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,LPTSTR psData,
WORD wCount);

General-use data

INT WINAPI ReadDevice(LPCTSTR bsNodeName,LPCTSTR bsDeviceName,LPVOID pData,
WORD wCount,WORD wAppKind);

## Cache Read Function for Multi-Thread

A device whose data has once been read via the Cache Read function will then be polled by Pro-Server
automatically. Therefore, data read from the second time will be performed at high speeds. The polling time
to be used will be the one that has been used when the symbol is registered. The polling time to be used
when a device address is directly designated will be one second. Polling for a device whose data has not
been read for a certain period of time will automatically end.

Bit data

INT WINAPI ReadDeviceBitM(HANDLE hProServer,LPCTSTR bsNodeName,LPCTSTR
bsDeviceName,WORD* pwData,WORD wCount);

16 bit data

INT WINAPI ReadDevice16M(HANDLE hProServer,LPCTSTR bsNodeName,LPCTSTR
bsDeviceName,WORD* pwData,WORD wCount);

32 bit data

INT WINAPI ReadDevice32M(HANDLE hProServer,LPCTSTR bsNodeName,LPCTSTR
bsDeviceName,DWORD* pdwData,WORD wCount);

16 bit BCD data

INT WINAPI ReadDeviceBCD16M(HANDLE hProServer,LPCTSTR bsNodeName,LPCTSTR
bsDeviceName,WORD* pwData,WORD wCount);

32 bit BCD data

INT WINAPI ReadDeviceBCD32M(HANDLE hProServer,LPCTSTR bsNodeName,LPCTSTR
bsDeviceName,DWORD* pdwData,WORD wCount);

Single precision floating-point data

INT WINAPI ReadDeviceFloatM(HANDLE hProServer,LPCTSTR bsNodeName,LPCTSTR bsDeviceName,FLOAT* pflData,WORD wCount);

Double precision floating-point data

INT WINAPI ReadDeviceDoubleM(HANDLE hProServer,LPCTSTR bsNodeName,LPCTSTR bsDeviceName,DOUBLE* pdbData,WORD wCount);

String data

INT WINAPI ReadDeviceStrM(HANDLE hProServer,LPCTSTR bsNodeName,LPCTSTR bsDeviceName,LPTSTR psData,WORD wCount);

General-use data

INT WINAPI ReadDeviceM(HANDLE hProServer,LPCTSTR bsNodeName,LPCTSTR bsDeviceName,LPVOID pData,WORD wCount,WORD wAppKind);

General-use data (for VB)

INT WINAPI ReadDeviceVariantM(HANDLE hProServer,LPCTSTR bsNodeName,LPCTSTR bsDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind);

<Return value>

Normal termination:        0

Abnormal termination:      Error code

<Arguments>

bsNodeName......Pointer to the node name (char.string)

Specify directly the network node name registered with Pro-Studio or the IP address.

Ex.1)      To specify the node name:              "GP2

Ex.2)      To specify directly the IP address:    "92.9.201.1"

bsDeviceName....Pointer to the symbol (char. string) to perform Read/Write

Specify directly the symbol name or the device address.

Ex.1)        To specify the symbol:                    "SWITCH1"

Ex.2)        To specify directly the device:          "M100"

| Function | Symbol Data Type | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| | Bit | 16Bit | | 32Bit | | Float | Double | String |
| | | S/U/HEX | BCD | S/U/HEX | BCD | | | |
| XXXDeviceBit | O | - | - | - | - | - | - | - |
| XXXDevice16 | - | O | - | - | - | - | - | - |
| XXXDevice32 | - | - | - | O | - | - | - | - |
| XXXDeviceBCD16 | - | - | O | - | - | - | - | - |
| XXXDeviceBCD32 | - | - | - | - | O | - | - | - |
| XXXDeviceFloat | - | - | - | - | - | O | - | - |
| XXXDeviceDouble | - | - | - | - | - | - | O | - |
| XXXDeviceStr | - | - | - | - | - | - | - | O |
| XXXDevice | O | O | O | O | O | O | O | O |

pxxData......Pointer to the Read/Write Data

wCount.......Read/Write data quantity (1 to 255)

With the Read/WriteDeviceStr function, the quantity of string data is counted as the number of bytes. Always specify

the data quantity as a multiple of 2 for devices with 16-bit data, and a multiple of 4 for devices with 32-bit data.

wAppKind ....Data type specification

| Value | Data Type | Value | Data Type |
|---|---|---|---|
| 1 | Bit | 7 | Unsigned 32 Bit |
| 2 | Signed 16 Bit | 8 | HEX 32 Bit |
| 3 | Unsigned 16 Bit | 9 | BCD 32 Bit |
| 4 | HEX 16 Bit | 10 | Float |
| 5 | BCD 16 Bit | 11 | Double |
| 6 | Signed 32 Bit | 12 | String |

The Read/WriteDevice function allows the data type to be changed dynamically because it is specified as a

parameter.

## 9.1.4  Additional Functions

### Multi-Thread Handle Acquisition

HANDLE WINAPI CreateProServerHandle ();

<Return value>

Normal termination:      Other than 0 (handle code)

Illegal termination:      0

### Multi-Thread Handle Release

INT WINAPI DeleteProServerHandle (HANDLE hProServer);

<Return value>

Normal termination:      0

Illegal termination:      Error code

### Loading the Network Project File

Single

INT WINAPI EasyLoadNetworkProject(LPCTSTR sDBName,DWORD dwSetOrAdd = TRUE);

Multi

INT WINAPI EasyLoadNetworkProjectM(HANDLE hProServer,LPCTSTR sDBName,DWORD

dwSetOrAdd = TRUE);

<Function>

Pro-Server is started under the network project designated by the argument.

<Return value>

Normal termination:      0

Illegal termination:      Error code

<Arguments>

sDBName............Pointer to the path name and file name (string) of the network project file

dwSetOrAdd.......Reserved (Fixed to 1)

## Conversion of Error Codes to Strings

BOOL WINAPI EasyLoadErrorMessage(INT iErrorCode, LPTSTR osErrorMessage);

<Return value>

Other than 0:     Normal termination

0:    Failed in string conversion(Unused error codes, etc.)

<Arguments>

iErrorCode...........Simple DLL error code

osErrorMessage..Pointer to the storage area for the converted string

(Secure storage area of 512 bytes or more)

Reference → "A.2.1 Pro-Server with Pro-Studio for Windows Error Messages"

## Reading SRAM Backup Data

Single

INT WINAPI EasyBackupDataRead(LPCTSTR sSaveFileName,LPCTSTR sNodeName,

INT BackupDataType,INT SaveMode);

Multi

INT WINAPI EasyBackupDataReadM(HANDLE hProServer,LPCTSTR sSaveFileName,

LPCTSTR sNodeName,INT BackupDataType,INT SaveMode);


<Return value>

Normal termination:        0

Illegal termination:        Error code

<Arguments>

sSaveFileName.........Pointer to the path name and file name(string)of the estination storage file

sNodeName............Pointer to the node name(string)

BackupDataType..…Types of Readout Data

| No. | Type |
|---|---|
| 0 | Reserved |
| 1 | Filing Data |
| 2 | Logging data |
| 3 | Line data |
| 4 | Sampling data |
| 5 | Alarm block 1 |
| 6 | Alarm history data, Alarm block 2 |
| 7 | Alarm log data, Alarm block 3 |
| 8 or above | Reserved |

SaveMode.............Saving Method

| No. | Mode | Note |
|---|---|---|
| 0 | Stores data as a new file. | If the file exists, deletes the existing contents and overwrites data. |
| 1 | Appends data to an existing file. | If the file does not exist, creates a new file. |

## Backup Data's Write Function

### Single

INT WINAPI EasyBackupDataWrite(LPCTSTR sSourceFileName,LPCTSTR sNodeName,

INT BackupDataType);

### Multi

INT WINAPI EasyBackupDataWriteM(HANDLE hProServer,LPCTSTR sSourceFileName,

LPCTSTR sNodeName,INT BackupDataType);

<Function>

Writes the designated Binary file to the GP's internal SRAM.

<Argument>

HProServer............Pro-Server handle

sSourceFileName...File path for the value to be written to the GP's SRAM

sNodeName...........Node name of GP to be written to.(Node must be previously registered as a Pro-Server

Network Project.)

BackupDataType....Designates the type of write file.(Must be the EasyBackupDataType_FILING type[filing

data]supported by Ver. 2.0)

<Return value>

Normal Completion:   0

Write Error: Error Code

## Entry Node Status Read Function

### Single

INT WINAPI GetNodeProperty (LPCTSTR sNodeName, DWORD dwTimeLimit, LPCTSTR GPType,

LPCTSTR SystemVersion, LPCTSTR ComVersion, LPCTSTR ECOMVersion)

### Multi

INT WINAPI GetNodePropertyM (HANDLE hProServer, LPCTSTR sNodeName, DWORD dwTimeLimit,

LPCTSTR GPType, LPCTSTR SystemVersion, LPCTSTR ComVersion, LPCTSTR ECOMVersion)

<Function>

The connected GP status can be acquired.  This can also be used to check a connection since the response

timeout value can be a variable.

<Argument>

hProServer .......... Pro-Server handle

sNodeName ........ Node name of GP to be read from. (Node name must be previously registered as a Pro-Server network project.)

dwTimeLimit ...... Response timeout setup value (If you designate 0, this will be defaulted to 3000 msec.) The setup range is from 1 through 2,147,483,647. (unit:msec)

Secure the area more than 32 bytes for each of followings.

GpType:           GP model code

SystemVersion:    GP system version

ComVersion:       PLC protocol driver version

ECOMVersion:      2-Way Driver version

<Return value>

Normal Completion:       0

Error:           Error codes (refer to the separate table)

GpType:          Character string data of the GP device code

SystemVersion:   Character string data of the GP system version

ComVersion:      Character string data of the PLC protocol driver version

ECOMVersion:     Character string data of the 2-Way Driver version

## CF Card Status Read Function

Single

INT WINAPI EasyIsCFCard (LPCTSTR sNodeName)

Multi

INT WINAPI EasyIsCFCardM (HANDLE hProServer, LPCTSTR sNodeName)


<Function>

The CF Card connection status of the connect GP can be acquired.

<Argument>

hProServer ........... Pro-Server handle

sNodeName ......... Node name of GP to be read from. (Node name must be previously registered as a Pro-Server network project.)

<Return value>

0:      CF Card is not inserted.

1:      CF Card is inserted.

2:      reserved

3:      CF Card is write-protected.

other   Error codes (refer to the separate table)

## Simple DLL Initialization

INT WINAPI EasyInit();


<Return value>

Normal termination:    0

Illegal termination: Error code(Refer to the attached table.)

When using multi-thread type applications, always call the simple DLL from the thread

in which it is used.

Reference → "9.1.1 Precautions When Using Functions"


## Simple DLL Termination

INT WINAPI EasyTerm();

<Return value>

Normal termination:    0

Illegal termination:    Error code(Refer to the attached table.)

For multi-thread type applications, call ProEasy.DLL from the thread where it is used.

Reference → "9.1.1  Precautions When Using Functions"

## 9.2 Examples of Simple DLL Function

Using read/write functions provided by Pro-Server allows you to read/write data from VB or VC applications.

This section describes the procedure to read/write designated symbols using the programming help feature.

Procedures are different between VP and VC applications.  They're described separately.

### 9.2.1 VG Feature Help

#### VBA: Declaration

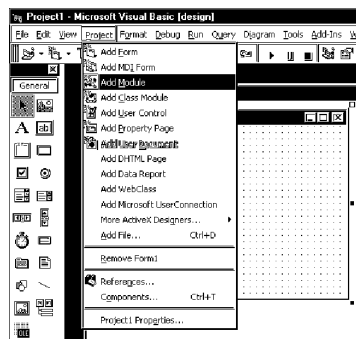1. Click [VBA: Declare Function] on [Programming Support].
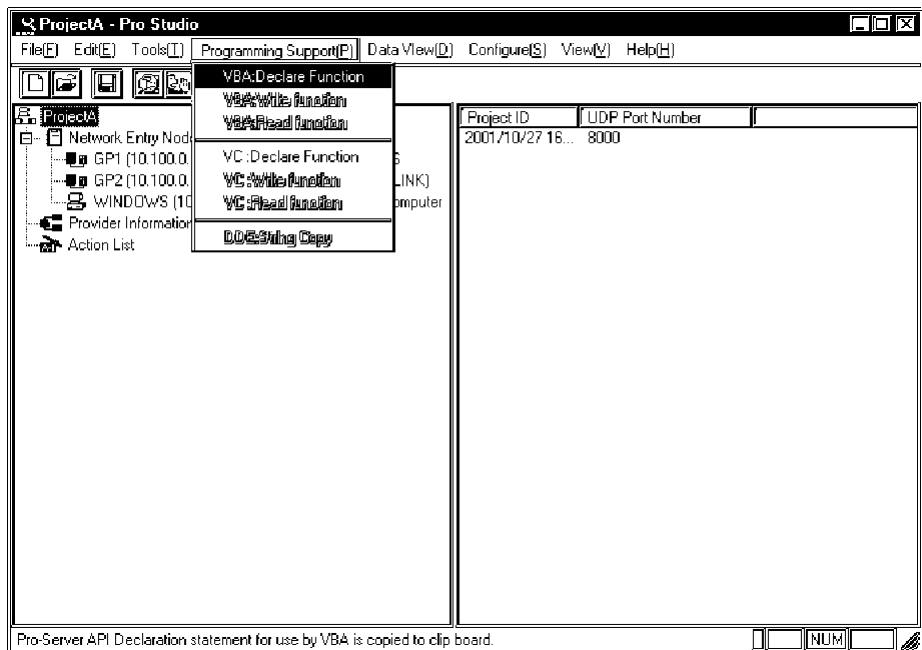


2. The declaration is copied to the Clipboard.
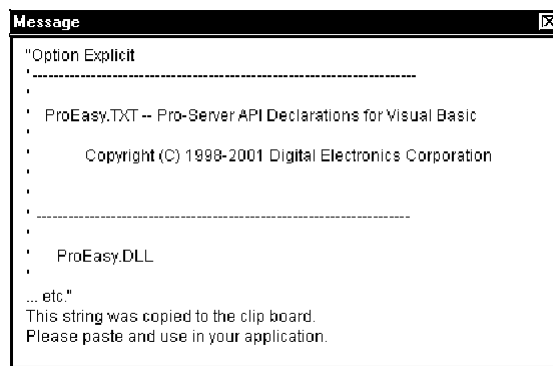
3. Start-up Microsoft Visual Basic, and then click [New Project] on [File] from the menu.
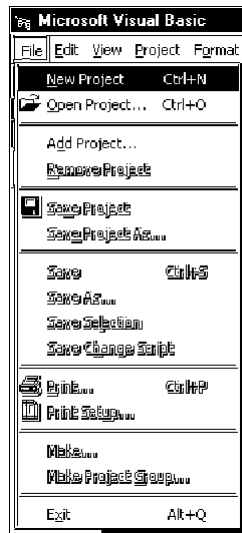


4. Select [Standard EXE], and then click [OK].
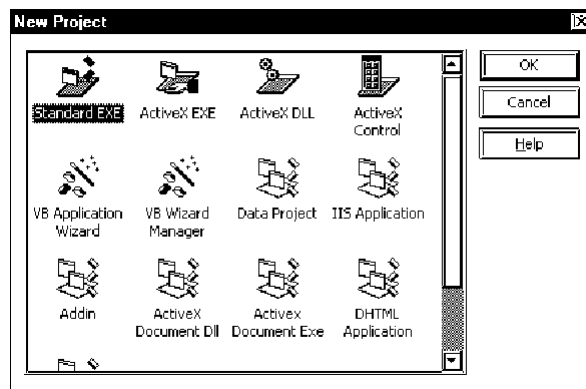


5. Click [Add Module] on [Project] of the Microsoft Visual Basic menu.

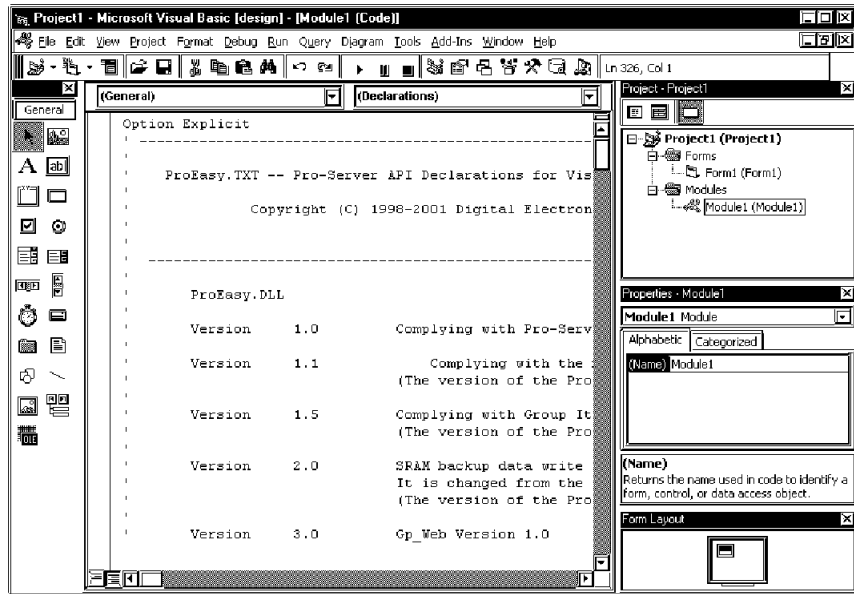6.   Select [Standard Module] on the [New] tab, and then click [Open].
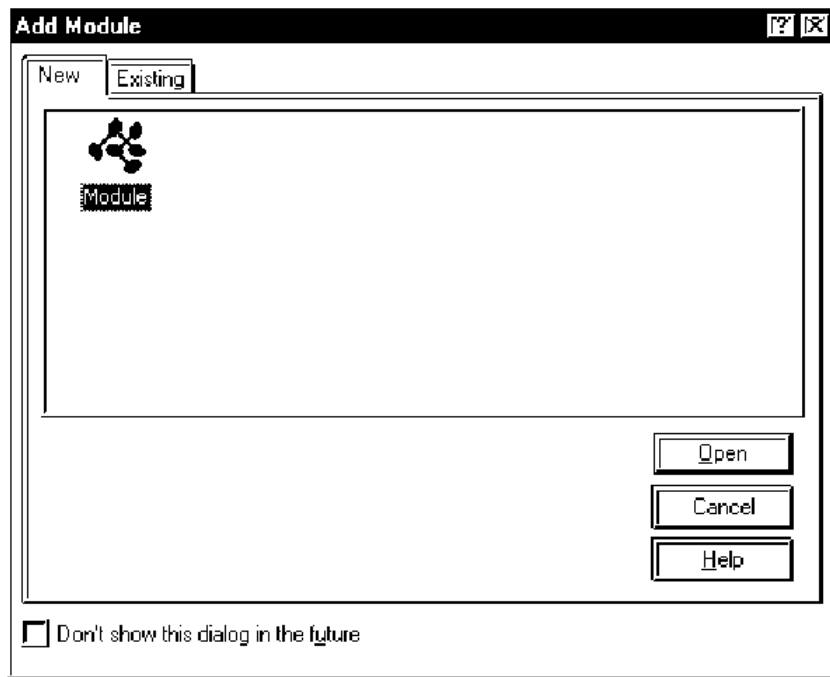


7.   Click [Paste] on [Edit] of the Microsoft Visual Basic menu to paste the declaration (the contents in the Clipboard) to the added standard module.
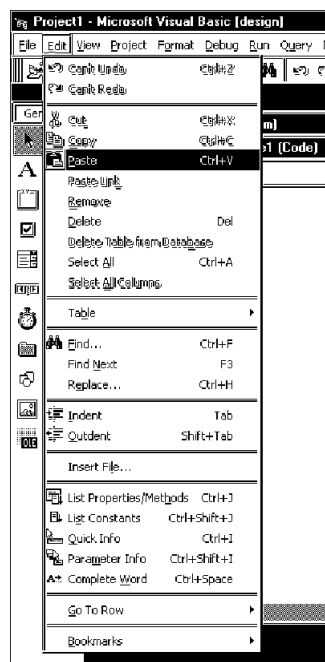
8.   The declaration will be pasted.

This completes function (read/write functions) declaration.



Operations from Step 1 through 8 mentioned above are common to both read and write.

For the subsequent part, each procedure is described separately because procedures are different

between read and write.

Refer to Step 9 through 21 to create the [Read] application.

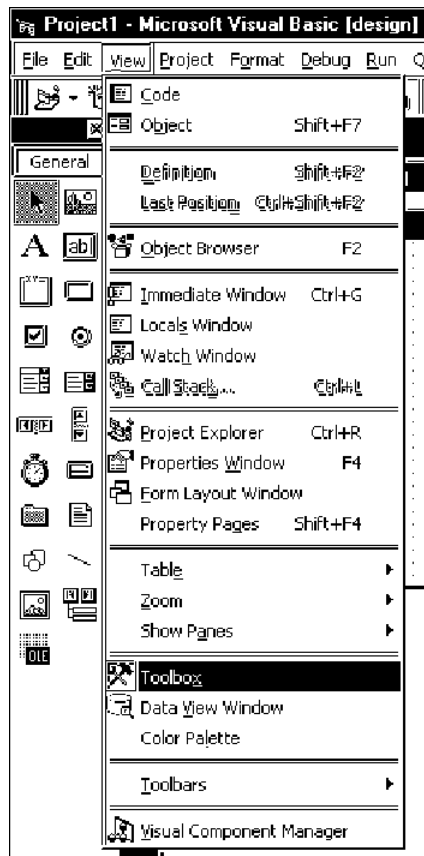Refer to Step 22 through 33 to create the [Write] application.

## Creating [Read] Application

9. This section describes the application to read and display three data (16 bits signed) when clicking [Command1].
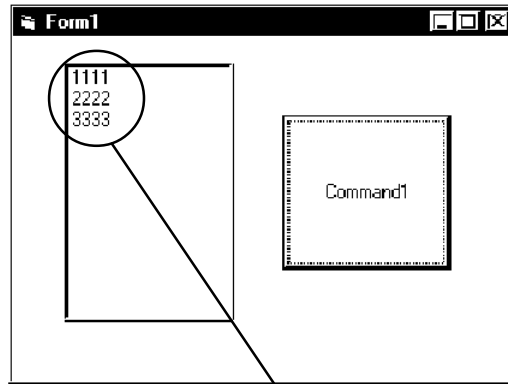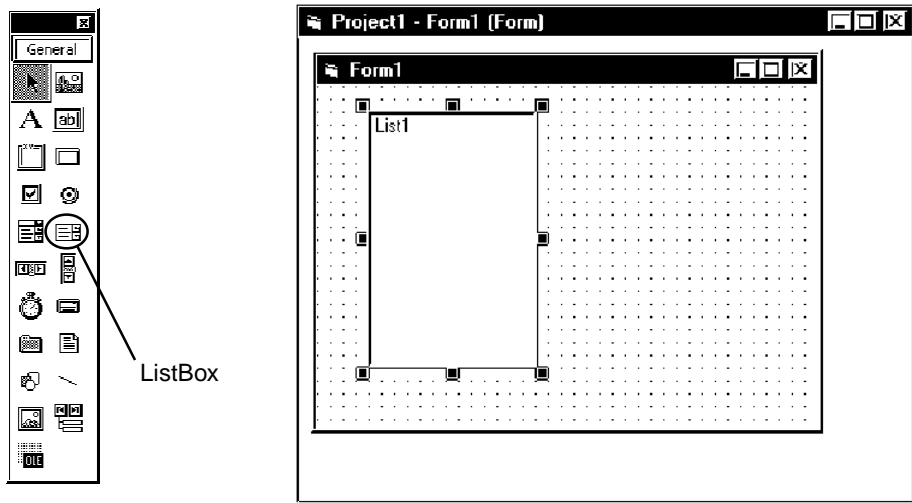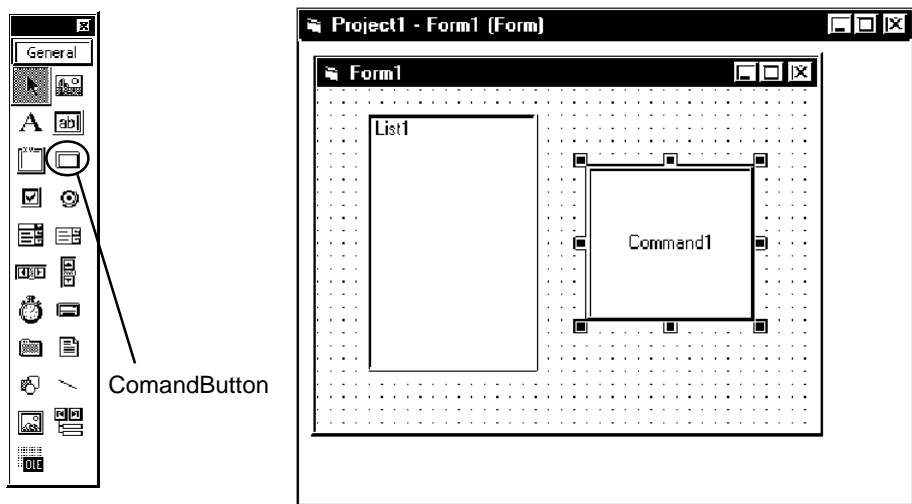


Displays three read data.

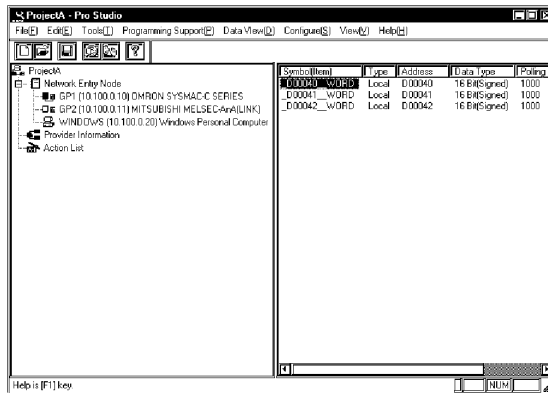10. Click [Toolbox] on [View] of the Microsoft Visual Basic menu.
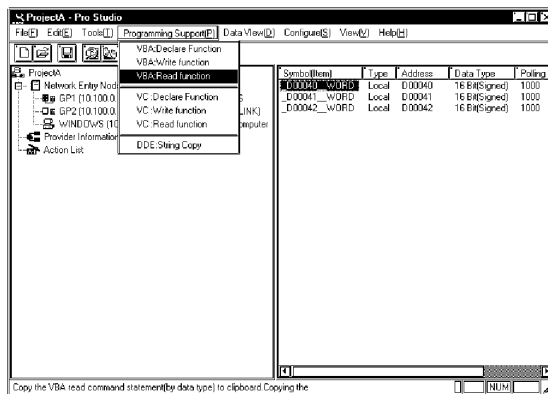
11. Select [ListBox], and then paste to [Form1].



ListBox

12. Select [CommandButton], and then paste to [Form1].
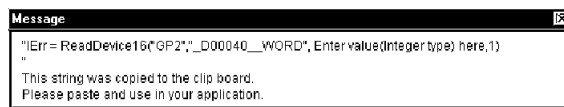


ComandButton

13. Select the symbol name that you wish to read among symbols registered on Pro-Studio (Select the heading symbol to read from.).
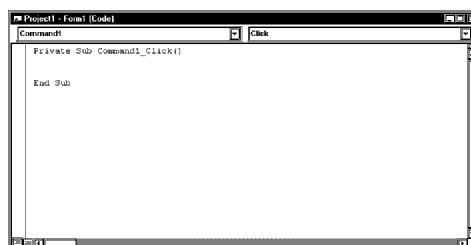


14. Click [VBA: Read function] on [Programming Support] of the menu.



15. The read function will be copied into the Clipboard.



16. Double click [Command1] on [Form1] to paste the contents (read function) in the Clipboard between the Sub and the EndSub statements.

17. Declare the area to store read data. You should designate three or more area elements if the number of read data is three (The number of area elements is from 0 to 2 in this example). However, the area type (Integer in this example) needs to be matched to the symbol data type to use.



18. Designate the header area to store read data (wData (0)), and also designate 3 as the number of read data.



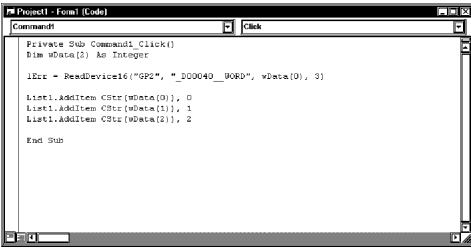19. Set three data read (wData(0), wData(1), wData(2)) in the ListBox one after another.



20. Click [Start] on [Run] of the Microsoft Visual Basic menu.

21. Click [Command1] to display three data form the symbol "_D40_WORD" in the ListBox.
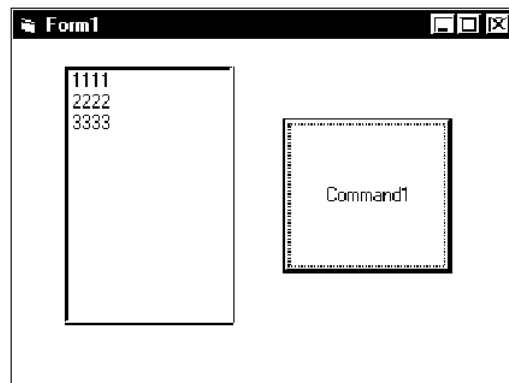
### Creating [Write] Application

22.  This section describes the application to write three data (16 bits signed) read when clicking [Command1].
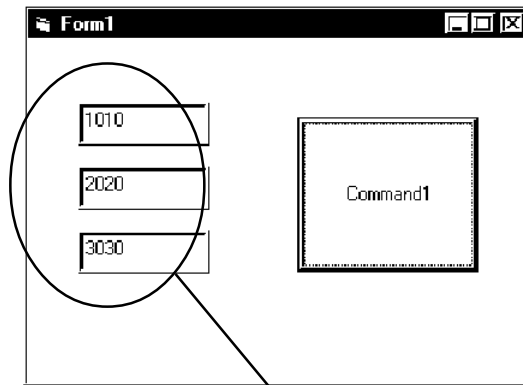


Writes three data.

23.  Select [TextBox], and then paste in [Form1]. Paste three [TextBox]s.



TextBox
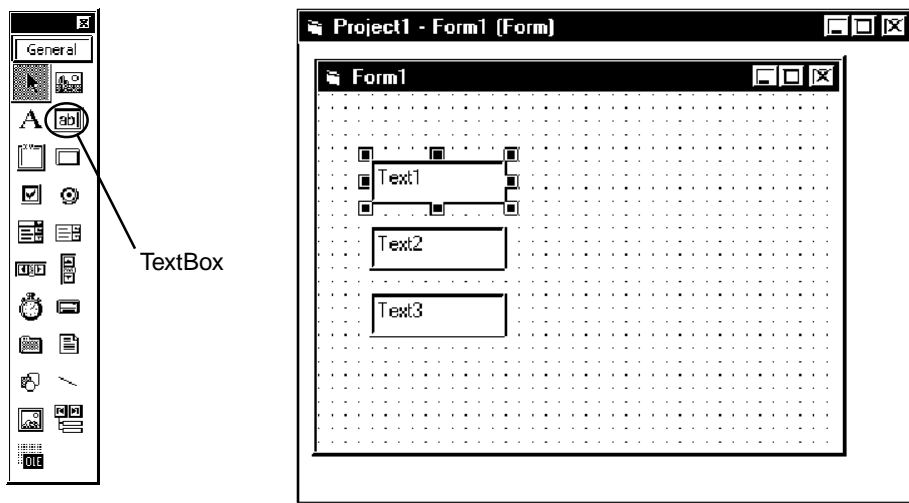
24. Select [CommandButton], and then paste to [Form1].
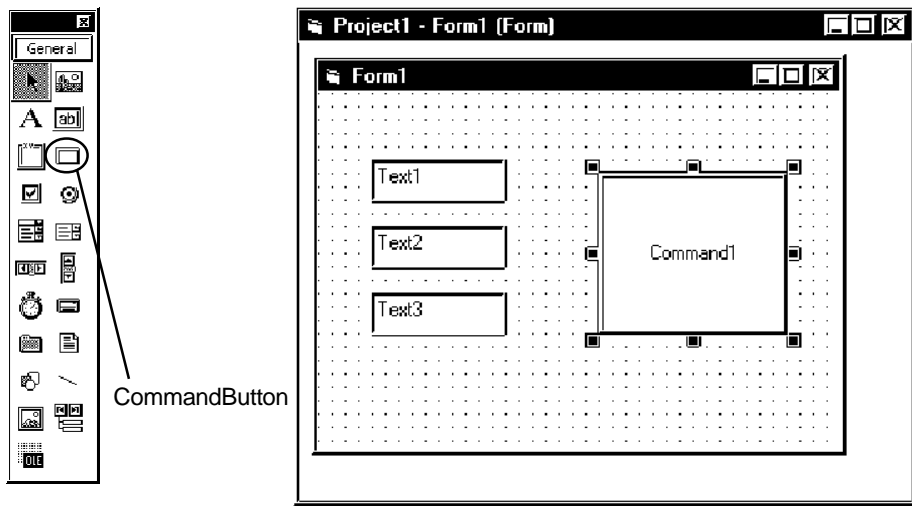


25. Select the symbol name that you wish to write to among symbols registered on Pro-Studio (Select the heading symbol to write to).
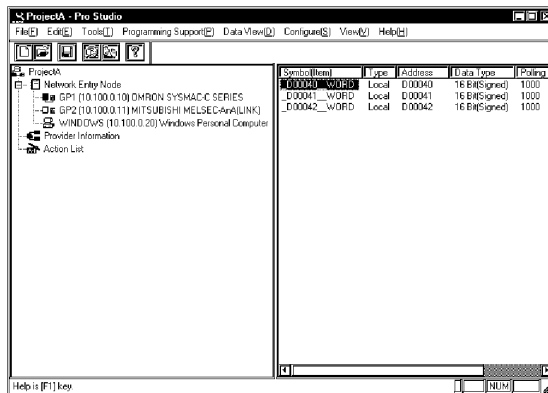


26. Click [VBA: Write function] on [Programming Support] of the menu.

27. The write function will be copied into the Clipboard.

```
Message                                                          [X]
"IErr = WriteDevice16("GP2","_D00040__WORD", Enter value(Integer type) here,1)
"
This string was copied to the clip board.
Please paste and use in your application.
```
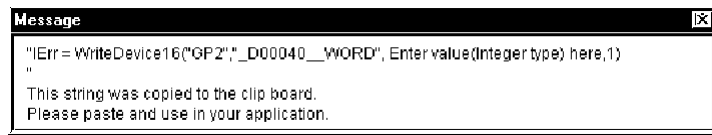
28. Double click [Command1] on [Form1] to paste the contents (write function) in the Clipboard
    between the Sub and the EndSub statements.

```
Project1 - Form1 (Code)                                    [_][□][X]
Command1                           [▼]  Click                  [▼]
    Private Sub Command1_Click()

    End Sub
```
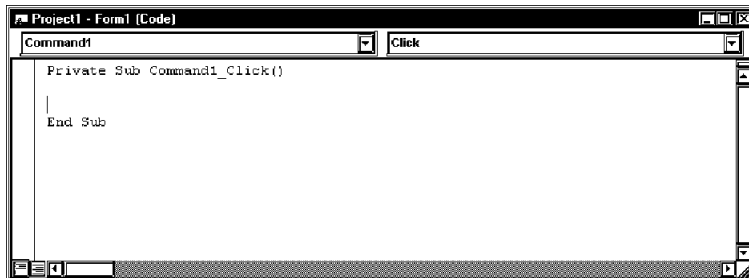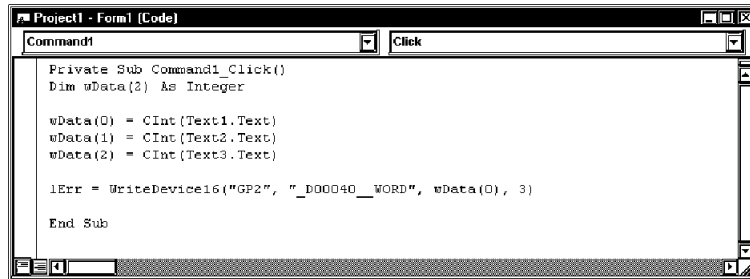
29. Declare the area to store data to write. You should designate three or more area elements if
    the number of write data is three (The number of area elements is from 0 to 2 in this example).
    However, the area type (Integer in this example) needs to be matched to the symbol data type
    to use.

```
Project1 - Form1 (Code)                                    [_][□][X]
Command1                           [▼]  Click                  [▼]
    Private Sub Command1_Click()
    Dim wData(2)  As Integer


    End Sub
```
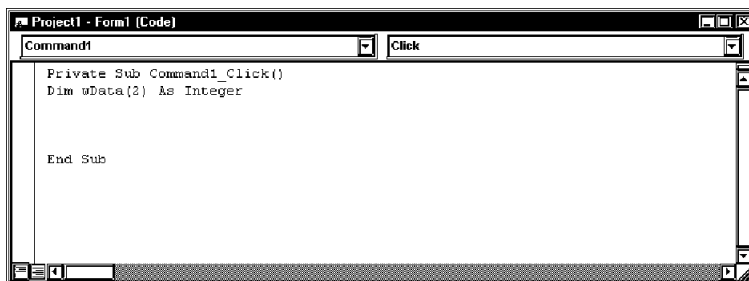
30. Set entered data in [TextBox] to the area.

```
Project1 - Form1 (Code)                                    [_][□][X]
Command1                           [▼]  Click                  [▼]
    Private Sub Command1_Click()
    Dim wData(2)  As Integer

    wData(0)  = CInt(Text1.Text)
    wData(1)  = CInt(Text2.Text)
    wData(2)  = CInt(Text3.Text)


    End Sub
```
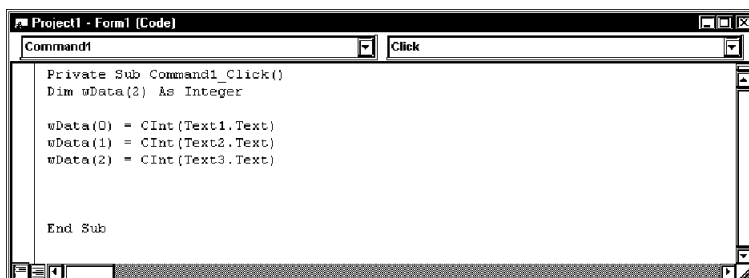
31.  Designate the header area (wData (0)) where written data have been set.  Also designate three as the number of write data.



32.  Click [Start] on [Run] of the Microsoft Visual Basic menu.
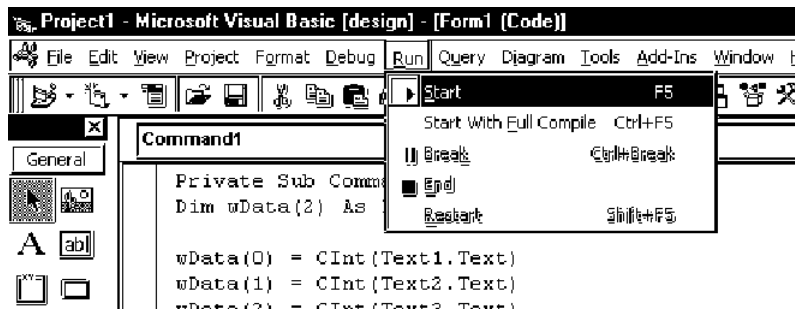


33.  After entering three data to write in [TextBox], click [Command1] to write three data form the symbol, "_D40_WORD".
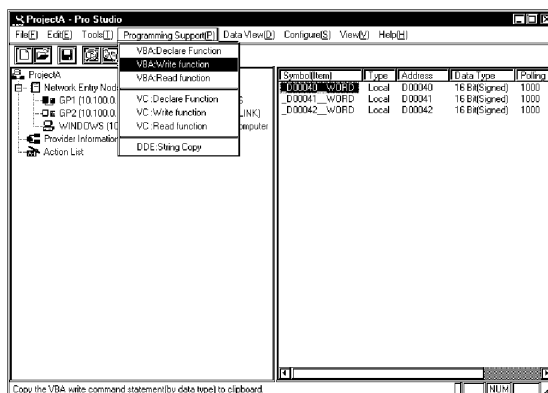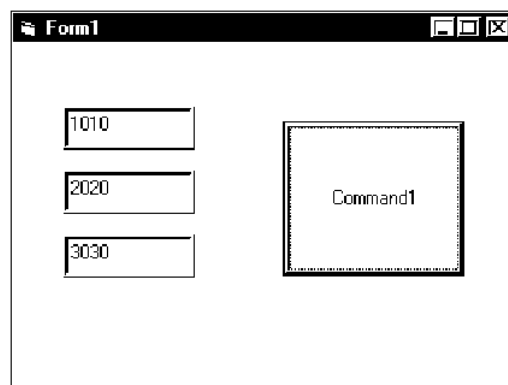
## 9.2.2   VC Function Help

This section describes how to create the dialog-based application example using MFC (Microsoft Foundation Class).

### VC: Declaration

1.   Start Microsoft Visual C++, and then click [New] on [File].
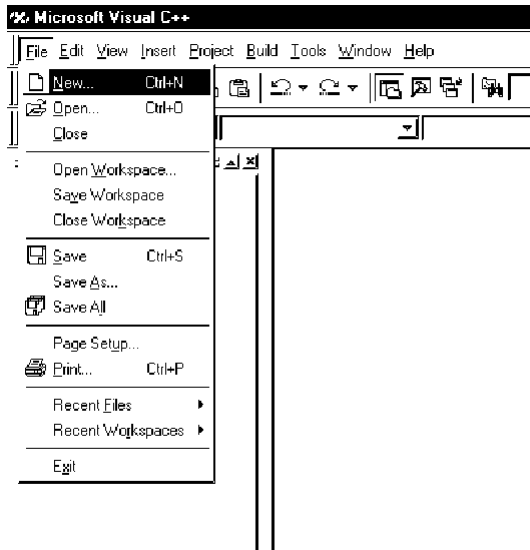


2.   Select [MFCAppWizard (exe)] in the [Projects] tab, enter [Project name] and [Location], and then click [OK].

    This example uses "Sample" for [Project name] and "C:\Program Files\Pro-Server with Studio\Pro-SDK\VC" for [Location].
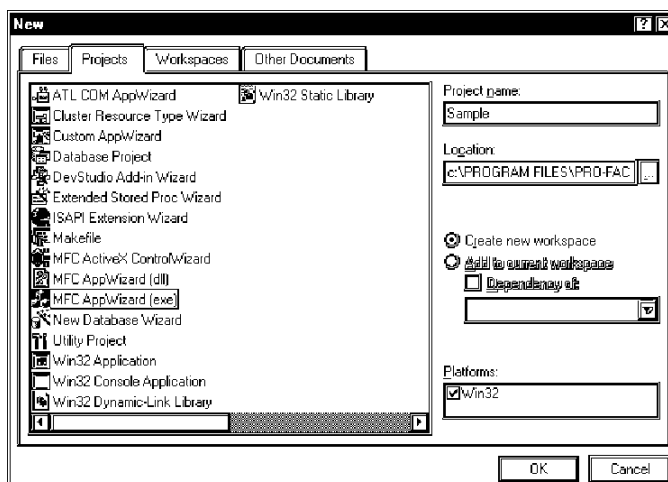
3. Select [Dialog based] in the "What type of application would you like to create?" field, and then click [Finish].
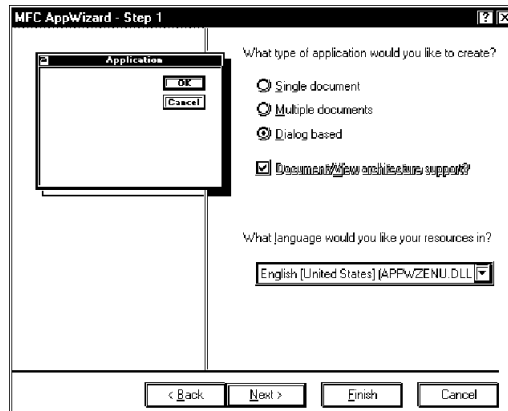


4. Click [OK] to complete the project.
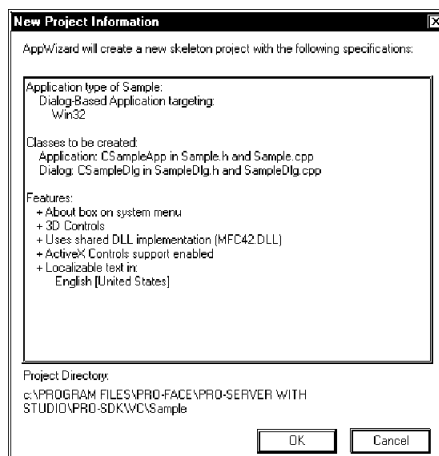


5. Pro-Serer provides read/write functions as DLLs. You should designate the LIB file to use those DLLs.

Click [Setting] on [Project] of the Microsoft Visual C++ menu.
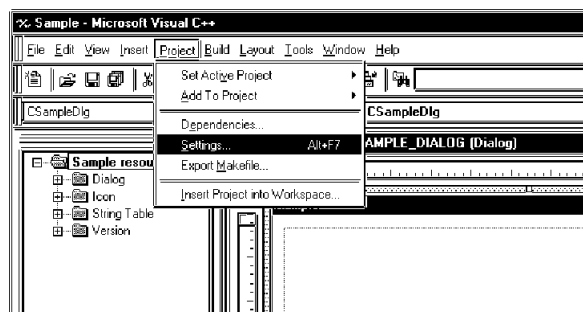
6.  Designate the LIB file using [Object/library modules] in the [Link] tab, and then click [OK].

    "Pro-SDK\Public\ProEasy.lib" is designated in this example because the LIB file (ProEasy.lib) exists in

    "Pro-SDK\Public" under the folder where Pro-Server has been installed.
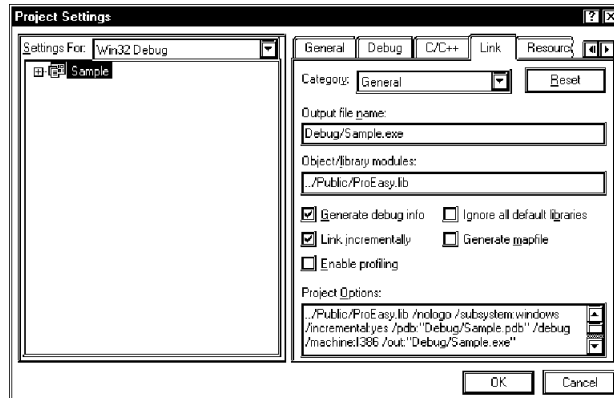


7.  You should install the header file (ProEasy.h) to use read/write functions provided by Pro-

    Server.  Click the [FileView] tab in the Microsoft Visual C++ [Workspace] window, and then

    double click the SampleDig.cpp file.

    In this example, read/write functions are used in the SampleDig.cpp file.
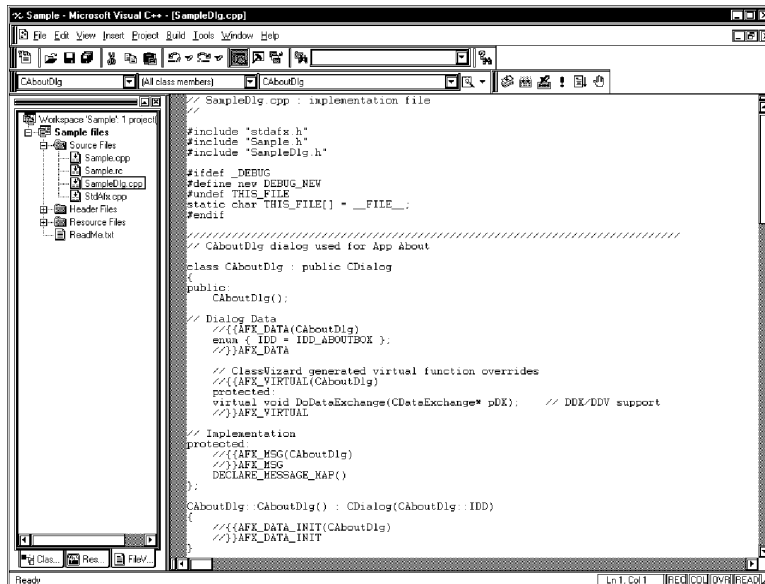
8. Add #include "Pro-SDK\Public\ProEasy.h" in the SampleDig.cpp file to complete the read/write function declaration.
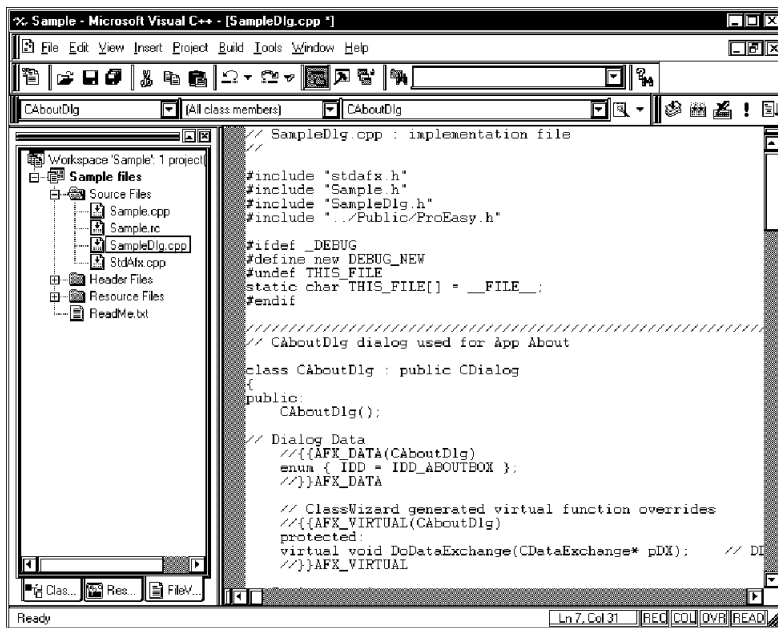


Operations from step 1 through 8 mentioned above are common to both read and write.

For the subsequent part, each procedure is described separately because procedures are different between read and write.

Refer to step 9 through 32 to create the [Read] application.

Refer to step 33 through 51 to create the [Write] application.

## Creating [Read] Application

9. This section describes the application to read and display three data (16 bits signed) when clicking [Button1].
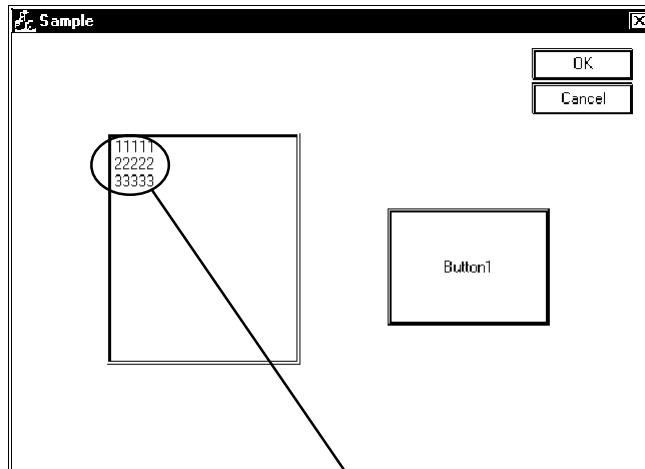


Displays three read data.

10. Click the [ResourceView] tab in the Microsoft Visual C++ [Workspace] window, and then double click [IDD_SAMPLE_DIALOG].
    Select and delete [Static Text] in the center of the dialog.
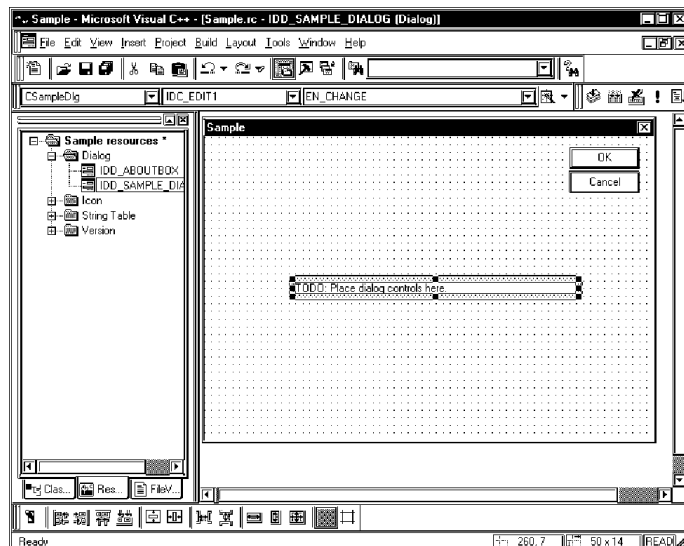
11.  Click [Customize] on [Tools] of the Microsoft Visual C++ menu.
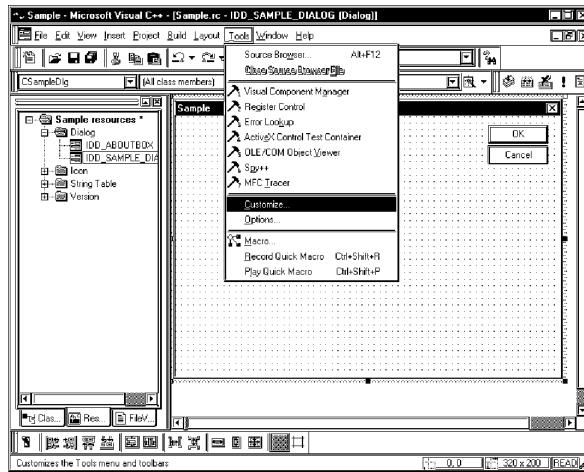


12.  Check [Controls] in the [Toolbars] tab, and then click [Close].
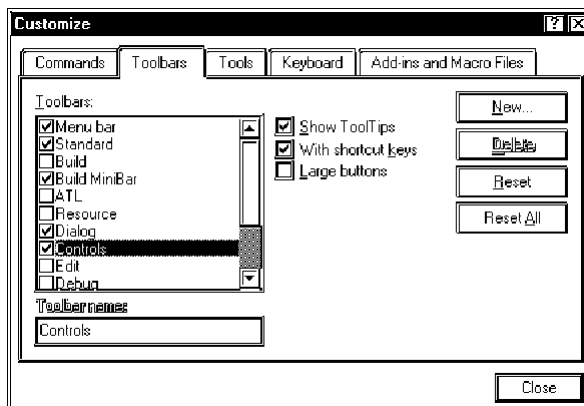


13.  Select [ListBox], and then paste it in the dialog.
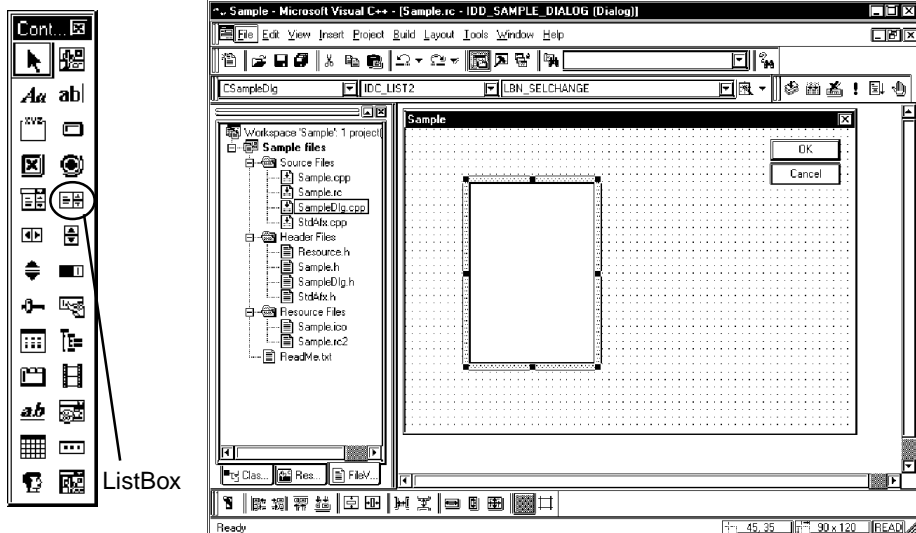


ListBox

14. Right-click the pasted [ListBox], and then select [Property]. After the [ListBox Properties] window appears, uncheck [Sort].
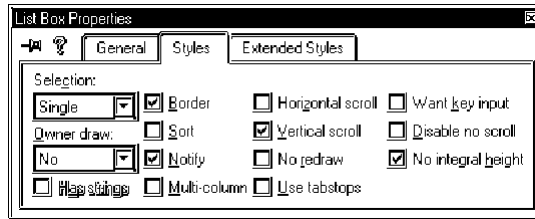


15. Click [ClassWizard] on [View] of the Microsoft Visual C++ menu.
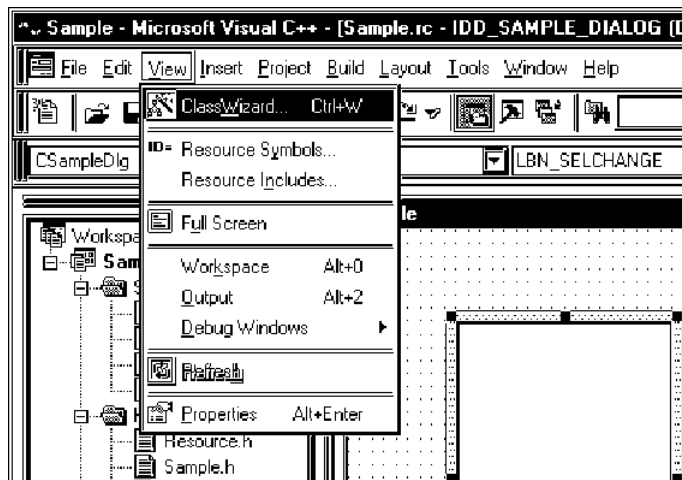


16. Select the [Member Variables] tab, and then select "IDC_LIST1" in [Control ID].
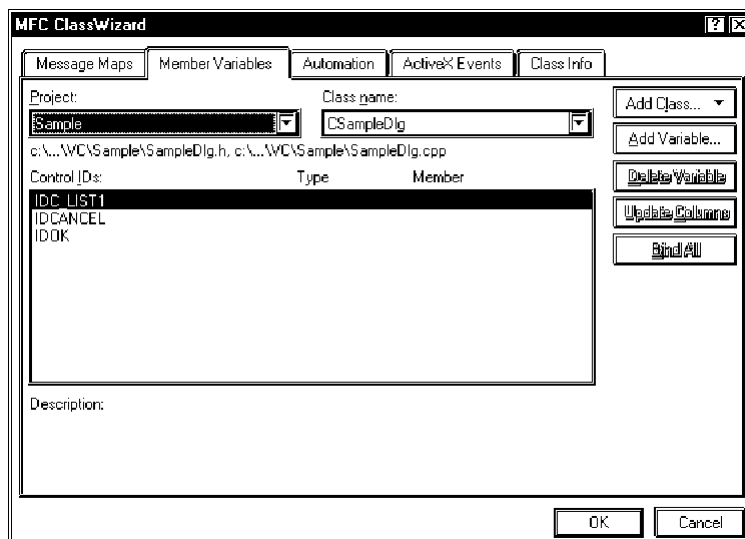
17. Click [Add Variable...], and then enter "m_List" in [Member Variable name]. Select "Control" in [Category], and then click [OK].
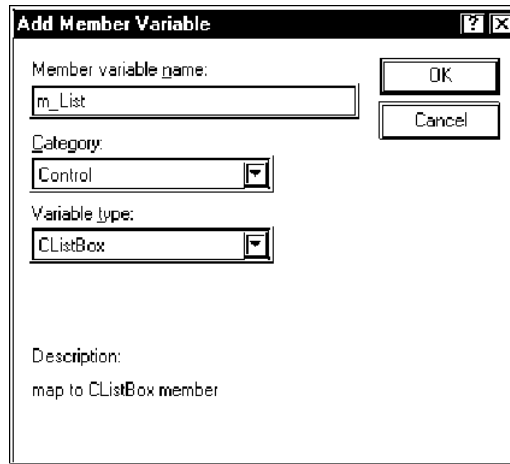


18. Make sure if the member variable has been added, and then click [OK].
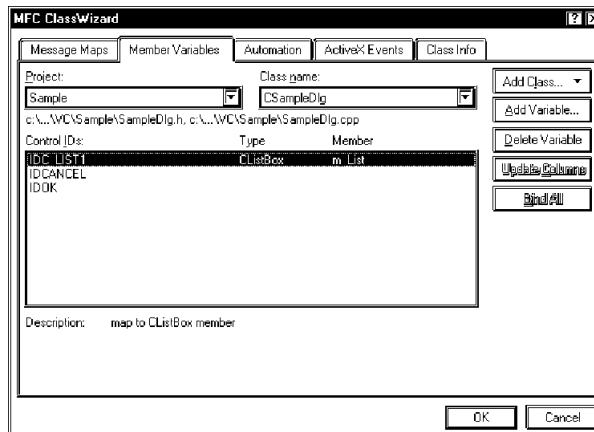


19. Select [Button], and then paste it in the dialog.
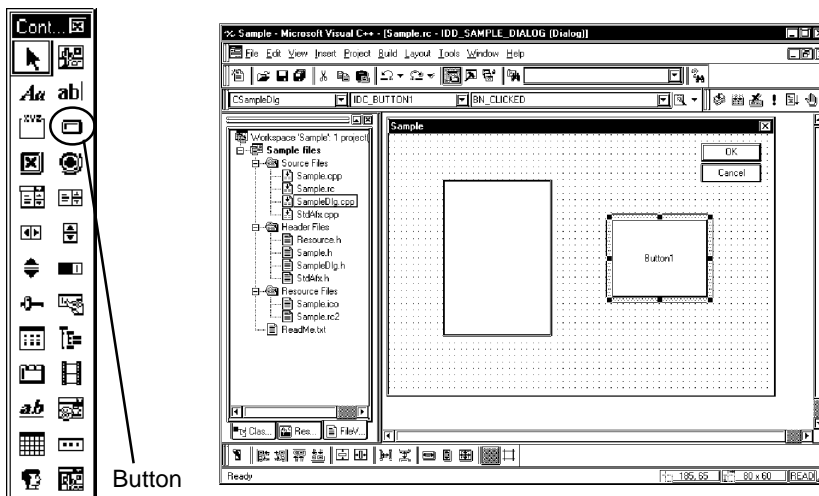
20. Select the symbol name that you wish to read among symbols registered on Pro-Server (Select the heading symbol to read from.).
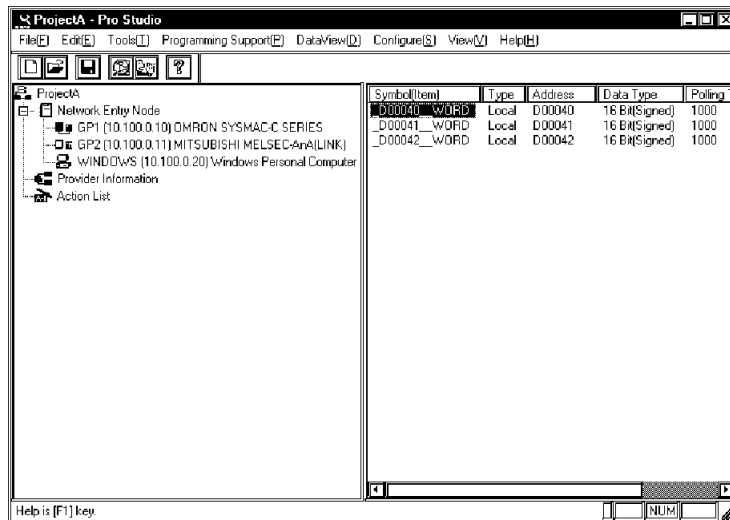


21. Click [VC: Read Function] on [Programming Support] of the menu.
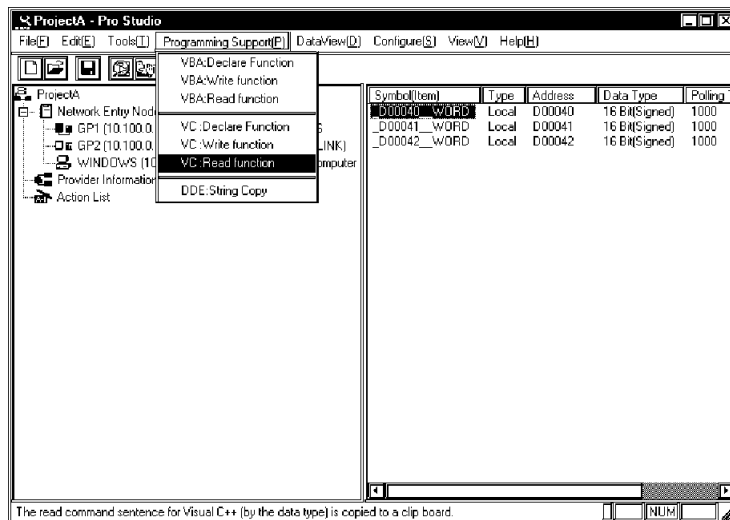


22. The read function will be copied into the Clipboard.
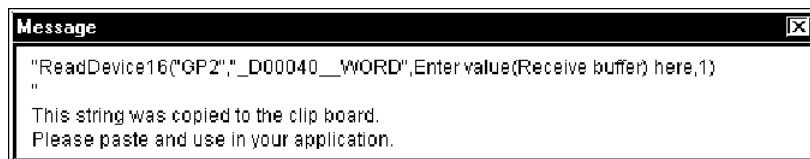
23. Double click [Button1] pasted to [Dialog] of the Microsoft Visual C++ menu.
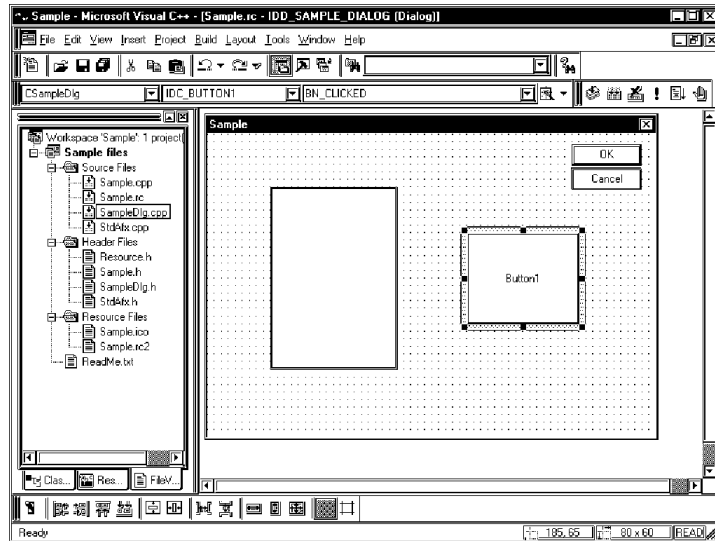


24. Click [OK].
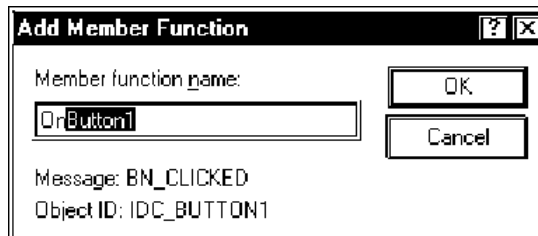


25. Paste the contents of the Clipboard (read function) into the OnButton1 member function.
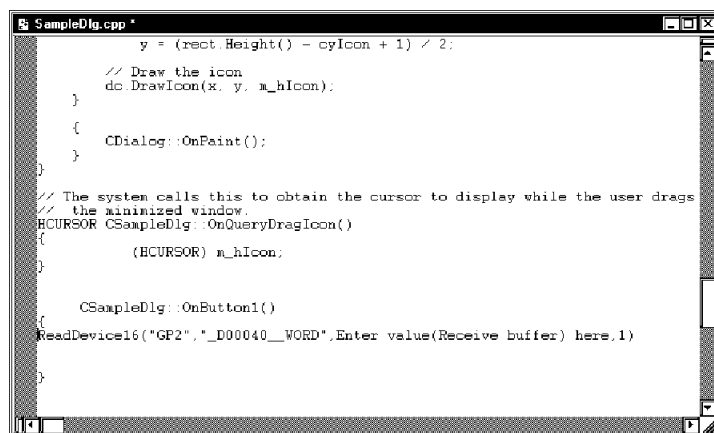
26. Declare the area to store read data. You should designate three or more area elements if the number of read data is three.

```
SampleDlg.cpp *
            y = (rect.Height() - cyIcon + 1) / 2;

        // Draw the icon
        dc.DrawIcon(x, y, m_hIcon);
    }

    {
        CDialog::OnPaint();
    }
}

// The system calls this to obtain the cursor to display while the user drags
//  the minimized window.
HCURSOR CSampleDlg::OnQueryDragIcon()
{
        (HCURSOR) m_hIcon;
}


    CSampleDlg::OnButton1()

WORD wData[3];

ReadDevice16("GP2","_D00040__WORD",Enter value(Receive buffer) here,1)
```

27. Designate the header area to store read data (wData(0)), and 3 as the number of read data. You should also add a semicolon ( ; ) at the end of the read function.

```
SampleDlg.cpp *
            y = (rect.Height() - cyIcon + 1) / 2;

        // Draw the icon
        dc.DrawIcon(x, y, m_hIcon);
    }

    {
        CDialog::OnPaint();
    }
}

// The system calls this to obtain the cursor to display while the user drags
//  the minimized window.
HCURSOR CSampleDlg::OnQueryDragIcon()
{
        (HCURSOR) m_hIcon;
}


    CSampleDlg::OnButton1()
{
WORD wData[3];

ReadDevice16("GP2","_D00040__WORD", wData, 3);
```

28. Convert read data to CString type characters once to display three read data (wData(0), wData(1), wData(2)) in the ListBox.

```
SampleDlg.cpp *
    {
        CDialog::OnPaint();
    }
}

// The system calls this to obtain the cursor to display while the user drags
//  the minimized window.
HCURSOR CSampleDlg::OnQueryDragIcon()
{
        (HCURSOR) m_hIcon;
}


    CSampleDlg::OnButton1()
{
WORD wData[3];

ReadDevice16("GP2","_D00040__WORD", wData, 3);

CString str[3];
str[0].Format("%d", wData[0]);
str[1].Format("%d", wData[1]);
str[2].Format("%d", wData[2]);
}
```

29. Set three data read (wData(0), wData(1), wData(2)) in the ListBox one after another.



30. Click [Execute Smaple.exe] on [Build] of the Microsoft Visual C++ menu.
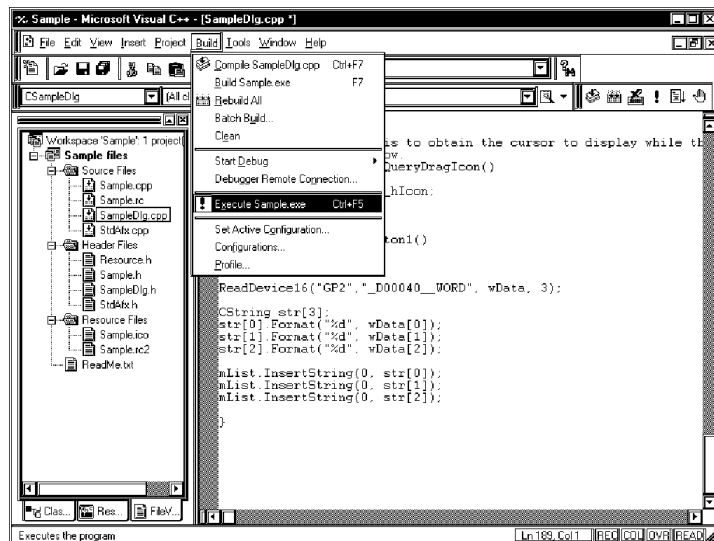


31. Click [Yes].
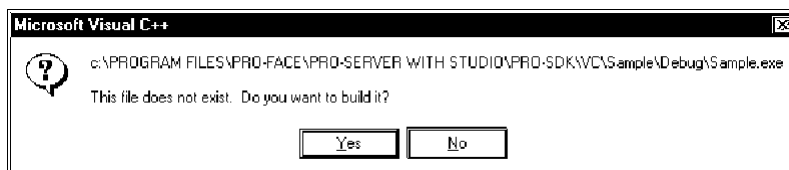
32. Click [Button1] to display three data from the symbol "_D40_WORD" in the ListBox.
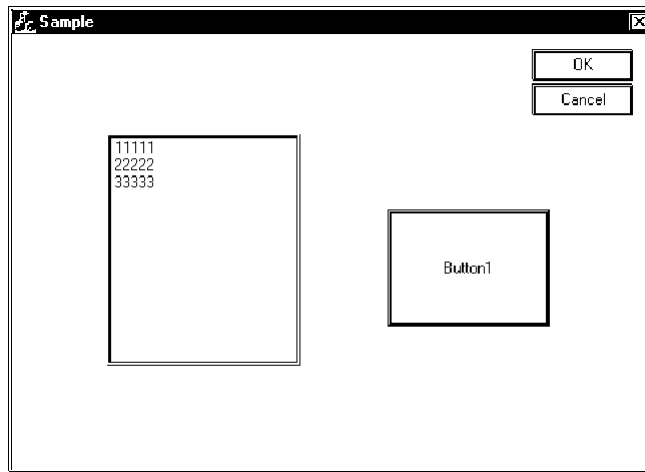
### Creating Write Application

33. This section describes the application to write three read data when clicking [Button1].

    Execute the same operations, step 10 through 12, as in "Creating Read Application".
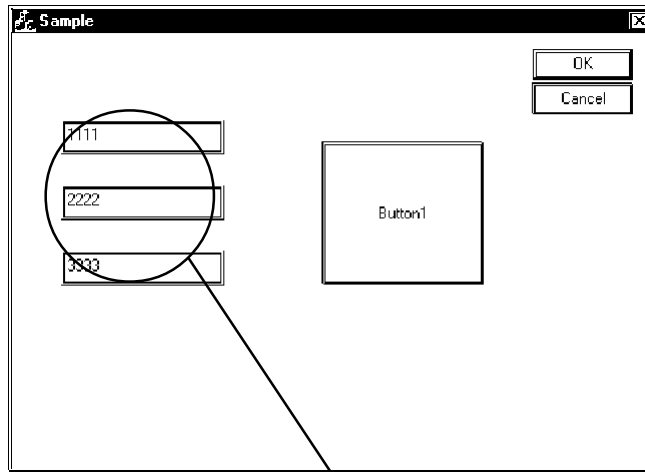


Write three read data.

34. Select [EditBox], and then paste it in [Dialog]. You should paste three [EditBox]s.
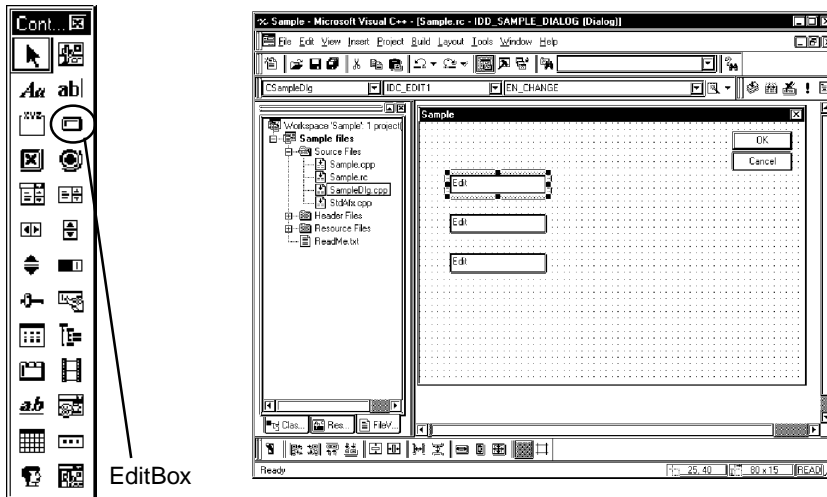


EditBox

35. Click [Class Wizard] on [View] of the Microsoft Visual C++ menu.
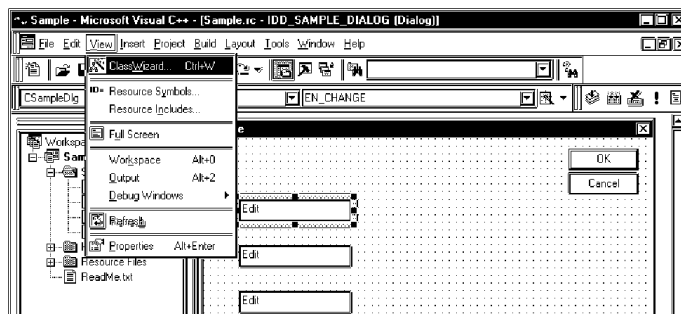
36.  Select "IDC_EDIT1" in [Control IDs] of the [Member Variables] tab, and then click [Add Variable...].
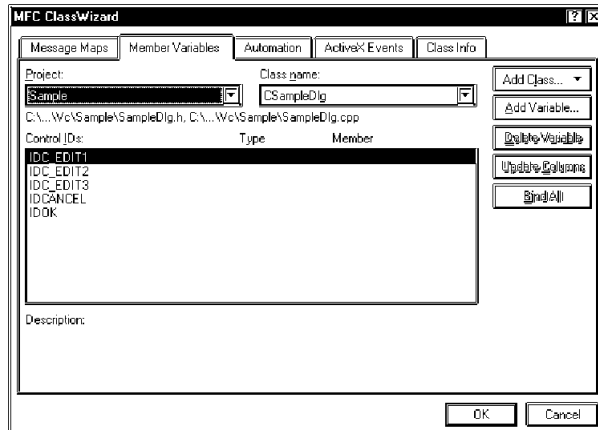


37.  Enter "m_Edit1" in [Member variable name], select "short" in [Variable type], and then click [OK].
Repeat step 36 and 37 for other two [EditBox]s.  However, you should designate their member
variables as "m_Edit2" and "m_Edit3" respectively.
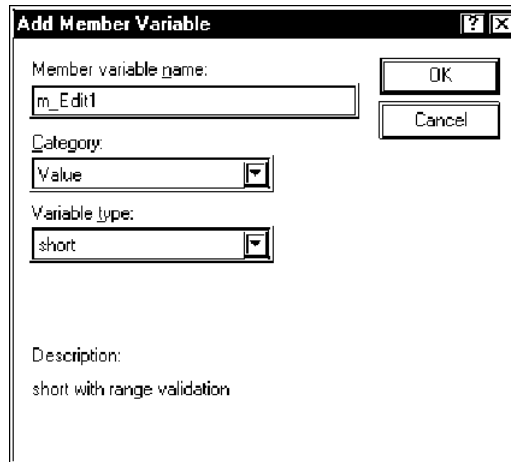


38.  Click [OK].
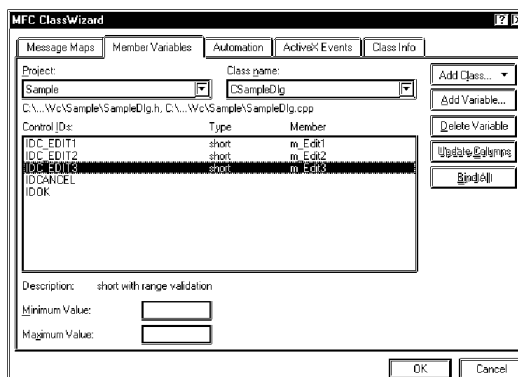
39. Select [Button] and paste it to [Dialog].
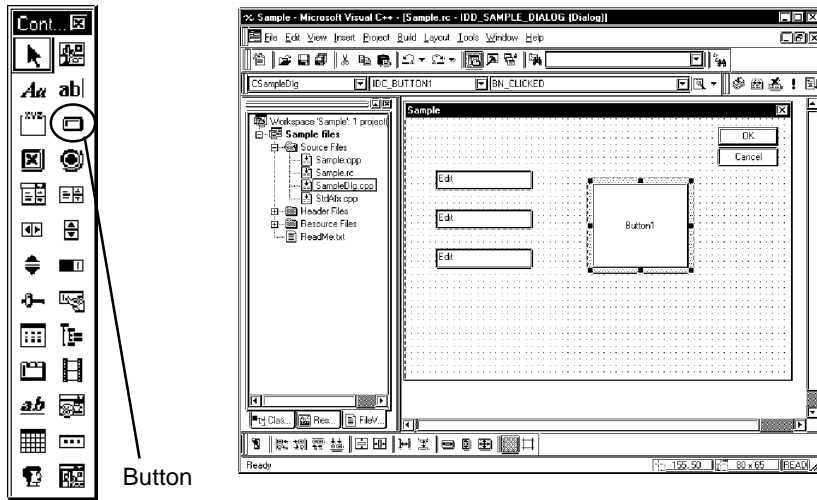


Button

40. Select the symbol name to write to among symbols registered on Pro-Server (Select the heading symbol).
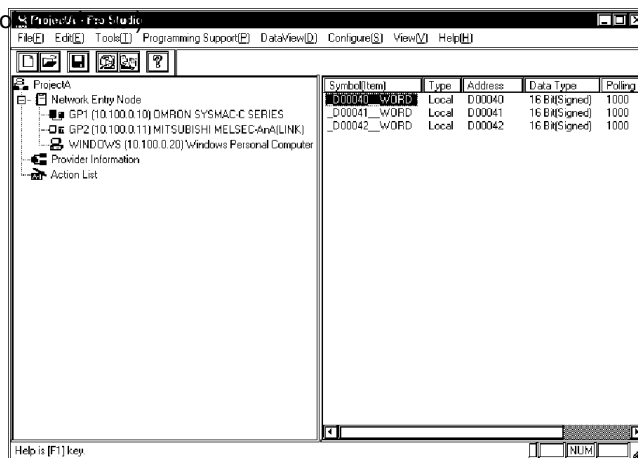


41. Click [VC: Write Function] on [Programming Support] of the menu.
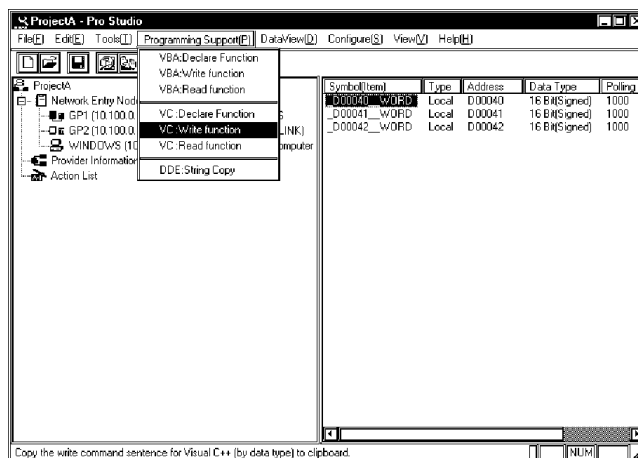
42. The write function will be copied into the Clipboard.

```
Message                                                        ☒

"WriteDevice16("GP2","_D00040__WORD", Enter value(Transmitting buffer) here,1)
"
This string was copied to the clip board.
Please paste and use in your application.
```
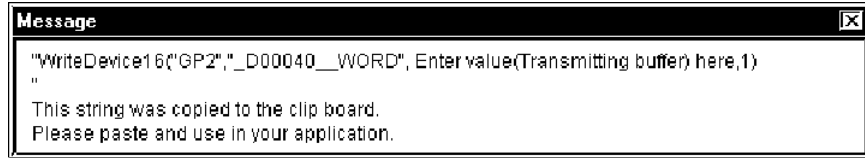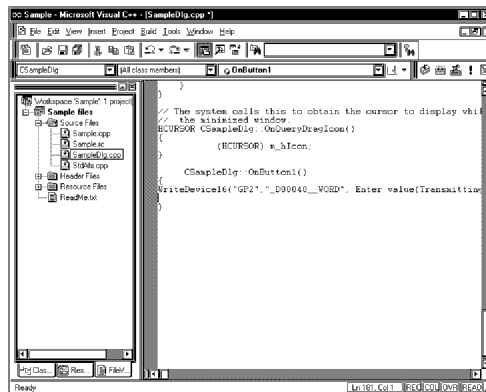
43. Double click [Button1] pasted on [Dialog] of the Microsoft Visual C++ menu.

44. Click [OK].

```
Add Member Function                              ⧉ ☒

    Member function name:                           OK

    On Button1                                     Cancel

    Message: BN_CLICKED
    Object ID: IDC_BUTTON1
```
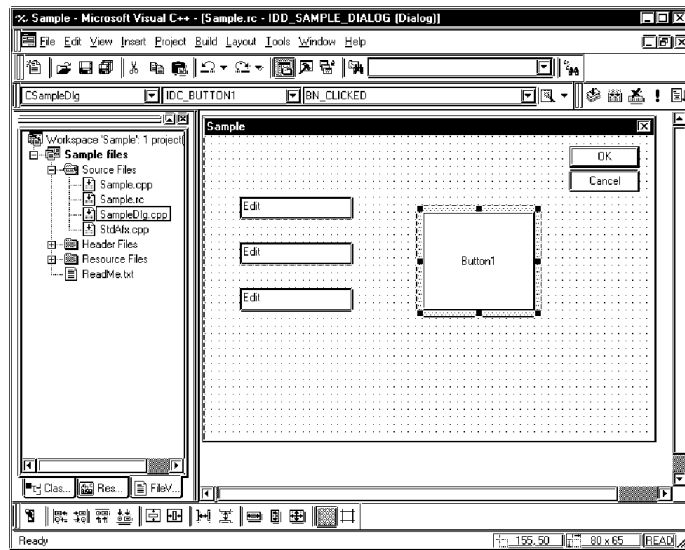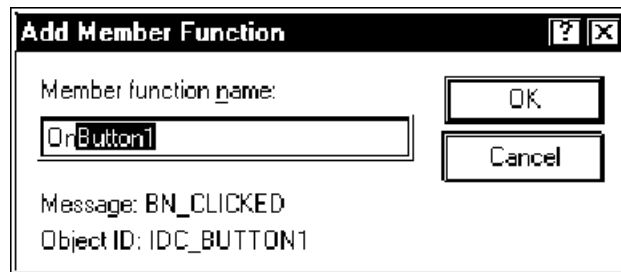
45. Paste the contents of the Clipboard (write function) into the OnButton1 member function.



46. Declare the area to store write data. You should designate three or more area elements if the number of write data is three.



47. Set three write data entered into the EditBox to the area.

48. Designate the header area where write data have been set (wData(0)), and 3 as the number of read data. You should also add a semicolon ( ; ) at the end of the write function.
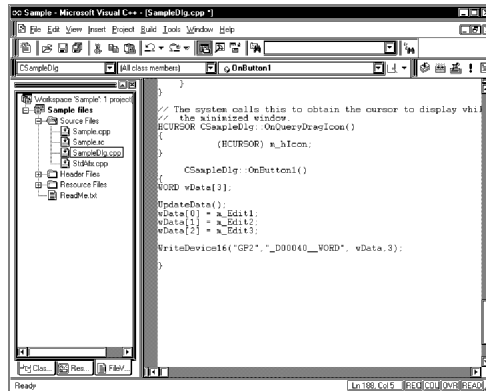


49. Click [Execute Smaple.exe] on [Build] of the Microsoft Visual C++ menu.
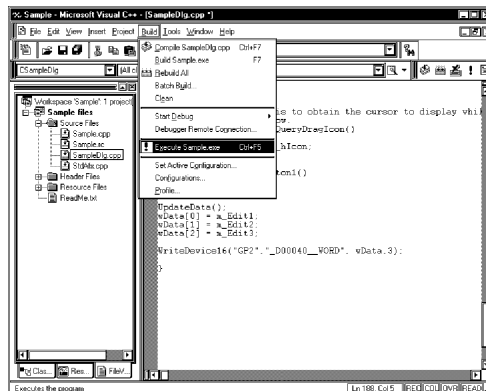


50. Click [Yes].
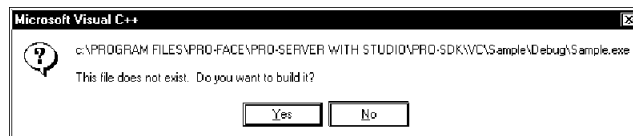
51. After entering three write data to [EditBox]s, click [Button1] to execute writing three data from the symbol "_D40_WORD".
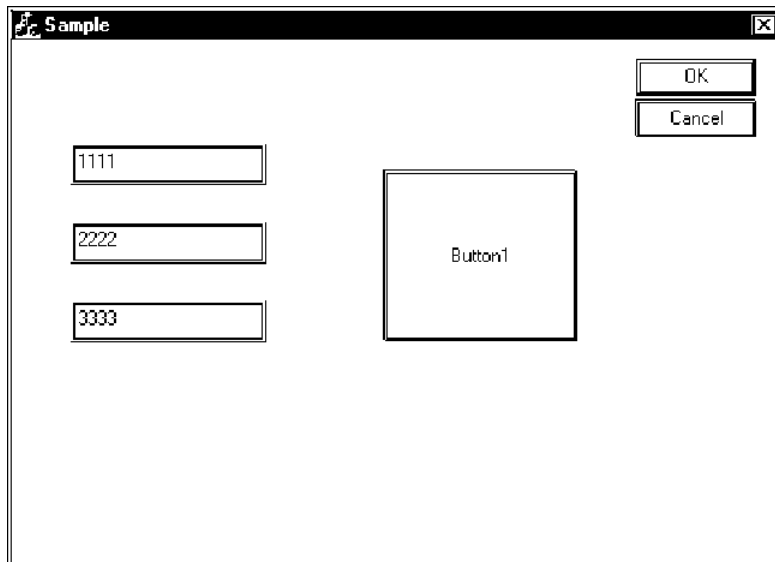
# 10 OPC Server

This chapter describes OPC server for Pro-Server.

## 10.1 OPC Server

Installing the Pro-Server OPC Server allows you to use applications which contain the OPC Client feature(ex. Intellution's iFIX, etc.).

· The OPC I/F functions like a DLL to the OPC Client(In-Process Server)

· EXE format is used for OPC I/F for an OPC Client existing in the same PC(Local Server)

· EXE format is used for the OPC I/F for an OPC Client existing in a remote PC(Remote Server)

### Read/Write Functions

The Read/Write functions can be used either sychronously or asynchronously. The Read function can use either CACHE or DEVICE, and the Write function can use only DEVICE.

Synchronous

This method will require other processing to wait while the OPC Client is either reading or writing data to/from the OPC Server.

Asynchronous

This method utilizes a CALLBACK to ackowlege to the Client the reception and completion of a Client's read/write requests. This allows the OPC Client to perform other processing while waiting for the CALLBACK notice.

CACHE

CACHE means the storage and handling method used for processing requests (collected periodically from the Clients) in the OPC Server. With Pro-Server, this means the polling tool's internal data. This method, while it allows the returning of data at high speed to a Client, does not allow Real-Time processing.

DEVICE

Device data refers to handling of data from the final target (PLC). Current target data can be provided in real time, however, the response to that data is usually slower than the CACHE method.

### OPC Server's Operating Environment

| OS Requirement (Japanese or English) | Windows NT |
|---|---|
| Hard disk capacity | 100MB or more |
| Required memory | 64MB or more |

**MEMO** OPC cannot be used on the Windows 95, Windows 98, Windows 98 SE or Windows Me.

The following data explains the settings required when using the OPC Server. These settings should be entered in each of the OPC Clients used.

## ItemID

The ItemID format is as follows:

ItemID = "XXX:DDDDD,SIG(NUMCHAR),SCL,SCH,EGUL,EGUH"

- XXX      Node name to be accessed
- DDDDD      Symbol name to be accessed or applicable PLC's device address
- SIG      Signal condition (Can be omitted. When omitted, this becomes "NONE") Corresponding signal

  condition type: LIN, BCD, and SQRT
- NUMCHAR      When the Item's data type is set to VT_BSTR, the NUMCHAR value is used to place a character string in the position designated by the SCL value. Using VT_BSTR will automatically disable all options after SCL. Designate the character string using byte values. The default value is 40 bytes.
- SCL      Lower limit value before scale conversion(Can be omitted. When omitted, this becomes "0")
- SCH      Upper limit value before scale conversion(Can be omitted. When omitted, this becomes "65535")
- EGUL      EGU's lower limit value(Can be omitted. When omitted, this becomes "0")
- EGUH      EGU's upper limit value(Can be omitted. When omitted, this becomes "65535")

> **MEMO**      When the data type is set to VT_BSTR, designate the number of characters(NUMCHAR)for SIG as the value of bytes. In that case, optional items(values)after SIG will become ineffective. The default value is 20 bytes.

Ex.)

When converting D100(from 0 to 4096)of PLC connected to GP1(node name)to LIN(0 to 100)and accessing:

ItemID = "GP1:D100,LIN,0,4096,0,100"

## Program ID

The accompanying OPC server's Program ID is as follows:

"DIGITAL.OPCPRO.1"

Since CLSID is automatically registered to the registry at program installation, use this Program ID to perform the connection.

## Initialization File

Editing the OPCIODRV. INI file allows you to change each initial value.

The items included in this file are as follows. The numbers shown are the initial (default)values.

[Server]

| | |
|---|---|
| Server_MAX=10 | (Number of servers) |
| Group_MAX=10 | (Number of groups) |
| Item_MAX=100 | (Number of items) |
| InproSvr_ScanRate=250 | (In-Proc server's scanning cycle, Unit: ms) |
| LocalSvr_ScanRate=500 | (Local server's scanning cycle, Unit: ms) |

[Client]

| | |
|---|---|
| CharacterStringCode=0 | (Character string format  0: UNICODE, 1:Multibyte) |
| ItemID_Separator=.:! | (Designates the ItemID separator) |

## Data Type

VARIANT data types that the accompanying OPC server has supported are as follows:

The I/O driver converts all analog data to 4-byte actual values and process them internally. Therefore, VT_I2, VT_I4, VT_UI2, VT_UI4, and VT_R8 will be all converted to VT_R4.

- EVT_I4        4-byte real number type
- EVT_I2        2-byte real number type
- EVT_UI2       2-byte no-code integer type
- EVT_UI4       4-byte no-code integer type
- EVT_R4        4-byte real number type
- EVT_R8        8-byte real number type
- EVT_BSTR     String type
- EVT_BOOL     BOOL type

## Interface

Interfaces that this software's OPC server supports are as follows:

| Object | Interface | Method | Status | Remaek |
|---|---|---|---|---|
| OPCServer | IOPCServer | AddGroup | ○ | |
| | | GetErrorString | ○ | |
| | | GetGroupByName | ○ | |
| | | GetStatus | ○ | |
| | | RemoveGroup | ○ | |
| | | CreateGroupEnumerator | ○ | |
| | IOPCServerPublicGroups (Optional) | GetPublicGroupByName | ✕ | |
| | | RemovePublicGroup | ✕ | |
| | IOPCBrowsServerAddressSpace (Optional) | QueryOrganization | ○ | Supports only Flat |
| | | ChangeBrowsePosition | ○ | Always returns an error due to supporting only Flat |
| | | BrowseOPCItemIDs | ○ | Supports only Flat |
| | | GetItemID | ✕ | |
| | | BrowseAccessPaths | ✕ | |
| | IPersistFile (Optional) | IsDirty | ✕ | |
| | | Load | ✕ | |
| | | Save | ✕ | |
| | | SaveComplated | ✕ | |
| | | GetCurFile | ✕ | |
| | IOPCItemProperties | QueryAvailableItemProperties | ○ | |
| | | GetItemProperties | ○ | |
| | | LookupItemID | ○ | |
| OPCGroup | IOPCGroupStateMgt | GetState | ○ | |
| | | SetState | ○ | |
| | | SetName | ○ | |
| | | CloneGroup | ○ | |
| | IOPCPublicGroupsStateMgt (Optional) | GetState | ✕ | |
| | | MoveToPublic | ✕ | |
| | IOPCSyncIO | Read | ○ | |
| | | Write | ○ | |
| | IOPCAsyncIO (Optional) | Read | ○ | |
| | | Write | ○ | |
| | | Refresh | ○ | |
| | | Cancel | ○ | |
| | IOPCAsyncIO2 | Read | ○ | |
| | | Write | ○ | |
| | | Refresh | ○ | |
| | | Cancel2 | ○ | |
| | | SetEnable | ○ | |
| | | GetEnable | ○ | |
| | IOPCItemMgt | AddItems | ○ | |
| | | ValidateItems | ○ | |
| | | RemoveItems | ○ | |
| | | SetActiveState | ○ | |
| | | SetClientHandles | ○ | |
| | | SetDatatypes | ○ | |
| | | CreateEnumerator | ○ | |
| | IDataObject (Optional) | Dadvise | ○ | |
| | | Dunadvise | ○ | |
| | IConnectionPointContainer | EnumConnectionPoints | ○ | |
| | | FindConnectionPoints | ○ | |
| | IConnectionPoint | GetConnectionInterface | ○ | |
| | | GetConnectionPointContainer | ○ | |
| | | Advise | ○ | |
| | | Unadvise | ○ | |
| | | EnumConnections | ○ | |
| IEnumOPCItemAttributes | IEnumOPCItemAttributes | Next | ○ | |
| | | Skip | ○ | |
| | | Reset | ○ | |
| | | Clone | ○ | |
| IEnumString | IEnumString | Next | ○ | |
| | | Skip | ○ | |
| | | Reset | ○ | |
| | | Clone | ○ | |
| IEnumUnknown | IEnumUnknown | Next | ○ | |
| | | Skip | ○ | |
| | | Reset | ○ | |
| | | Clone | ○ | |

○:Supported    ✕:Not supported

# Appendices

## A.1  DDE Function Details

The Pro-Server software contains the DDE server function and can therefore exchange data with applications that support the DDE client function.

### A.1.1  DDE Address

Sending/receiving data to/from the DDE server is accomplished by specifying an  address that consists of three components; the application name, the topic name, and the item name.

### Address components required for connecting to a DDE server

Application Name...........The name of the DDE server application. To have access to Pro-Server data, use the name "PROSERVR".

Topic Name...................The name of the data group in the DDE server. In Pro-Server, specify the node name of the GP on the network.

Item Name....................The actual data name used in the data group on the DDE server. In Pro-Server, specify the device address of the PLC connected to the GP. You can use the symbol name defined in Pro-Studio for this name.

### Address example

=PROSERVR|GP's Node Name!Symbol Name

The actual address of the PLC can be used.

The IP address itself can be used.

Example:

To read the data stored in address D100 of a Mitsubishi PLC, which is connected to a GP running the Mitsubishi protocol and with an IP address of 160.187.2.101, enter the following data:

=PROSERVR|' 160.187.2.101'!' D100'

---

**MEMO**    You may not use 2-bytes characters or single-byte "KATAKANA" characters to node names or symbol names because Microsoft Excel does not support those for topic or item names.

## A.1.2   Device Address Options

If you use symbol names defined in Pro-Studio, the data type and the sampling frequency for the symbols will be set automatically. However, when the device address is specified directly, you can specify the data type and the sampling frequency as options.

### Available Data Types

The available data types are as follows.

| Data Type | Contents | |
|---|---|---|
| | Data Format | Value |
| Bit Data | .BIT | 0 or 1 |
| Unsigned Word(Default) | .WORD | 0 to 65,535 |
| Signed Word | .+WORD | -32,768 to 32,767 |
| HEX Word | .HEX | 0000 to FFFF |
| BCD Word | .BCD | 0 to 9,999 |
| Unsigned Long Word | .DWORD | 0 to 4,294,967,295 |
| Signed Long Word | .+DWORD | -2,147,483,648 to 2,147,483,647 |
| HEX Long Word | .HEXDWORD | 00000000 to FFFFFFFF |
| BCD Long Word | .BCDDWORD | 0 to 99,999,999 |
| Float | .FLOAT | -9.9E+16 to 9.9E+16 |
| String | .STRING.*length*1 | String(default length = 1) |

*1  If the data type is "String", the data length is the maximum number of characters. If Null Data is included, the characters up to that point will be sent/received as data.

## Concerning Data Types

.****:Polling Time is designated in ms units.

The default Polling Time is 1 second (1000ms)

### Data Type/Polling Time

When designating the data type or polling time, be sure to put a comma (,) or a space ( ) in front of the period (.).

**MEMO** The polling time set for collecting or writing data for each symbol, distributing data and monitoring devices may not be able to be performed under certain conditions. These conditions include the currently registered number of GPs, number of Tags used on each screen sent, type of PLC connection, and number of other currently open Windows software. Entering "0" hwill allow the system to operate at its maximum speed. Please use this value as a benchmark when entering other values to "fine-tune" your system.

### Device Designation Example

Here, the Device Address D100 is BCD data and the sampling frequency is 500 ms.

=PROSERVR|GP Node Name!' D100 BCD .500'

**D100_.BCD_.500**

## A.2  Error Messages

### A.2.1  Pro-Server with Pro-Studio for Windows Error Messages

This section describes Pro-Server with Pro-Studio's error messages.

The error codes and error messages will be displayed on the personal computer where Pro-Server is

currently operating. In addition, these error codes will be used when the simple DLL completes abnormally.

"%s" indicates character strings, and "%??x" indicates hexadecimal values.

| Error Code | | Meaning |
|---|---|---|
| Decimal | Hex. | |
| 9300 | 2454h | Cannot find network project file. |
| 9301 : 9329 | 2455h : 2471h | Reserved |
| 9330 | 2472h | Cannot execute the command because resources are insufficient. Terminated program. |
| 9331 | 2473h | The system resource was dead-locked. Terminated program. |
| 9332 | 2474h | System error |
| 9333 | 2475h | Cannot execute the command because program versions do not match. |
| 9334 : 9339 | 2476h : 247Bh | Reserved |
| 9340 | 247Ch | An error occurred when accessing the <%s> file. |
| 9341 | 247Dh | Pro-Server is being used by too many applications. |
| 9342 | 247Eh | OS resources are insufficient (insufficient memory). |
| 9343 | 247Fh | The set connector is used by another application. |
| 9344 | 2480h | Pro-Server has not been started. Could not reference data. |
| 9345 | 2481h | Pro-Server has been terminated. Could not reference data. |
| 9346 | 2482h | Cannot continue - Pro-Server has been terminated. |
| 9347 | 2483h | Cannot continue - Pro-Server has been terminated. |
| 9348 | 2484h | Could not start Pro-Server. |
| 9349 | 2485h | Could not start Pro-Studio. |
| 9350 | 2486h | Unsupported command. Cannot continue. |
| 9351 | 2487h | Failed in loading the network project file. |
| 9352 | 2488h | The entered node name has already been registered. |
| 9353 | 2489h | The entered node name has not been registered. |
| 9354 | 248Ah | Backup data type specified is not supported. |
| 9355 | 248Bh | Failed to writing to the file. |
| 9356 | 248Ch | Could not create a file to store the SRAM backup data. |
| 9357 | 248Dh | The node name entered has not been registered. |
| 9358 | 248Eh | Pro-Server is already operating. Cannot start two copies. |
| 9359 | 248Fh | Reserved |
| 9360 | 2490h | '%s' has not been entered. |
| 9361 | 2491h | 0 cannot be entered in '%s'. |
| 9362 | 2492h | '%s' should be: "xxx.xxx.xxx.xxx" format; where xxx is a value between 0 and 255. |
| 9363 | 2493h | An invalid value has been entered in '%s'. |
| 9364 | 2494h | A character unavailable for '%s' is involved. |
| 9365 | 2495h | '%s' has not been entered yet. |
| 9366 | 2496h | Cannot start a new process until the process result is returned from the server. |
| 9367 | 2497h | Cannot terminate the application while waiting for the process result. |
| 9368 | 2498h | Read permission required to execute this command. Log on to the network again. |
| 9369 | 2499h | Write permission required to execute this command. Log on to the network again. |
| 9370 | 249Ah | Administrator permission required to execute this command. Log on to the network again. |

| Reserved | | Meaning |
|---|---|---|
| Decimal | Hex. | |
| 9371 | 249Bh | The specified number is not registered. |
| 9372 | 249Ch | Reserved |
| 9373 | 249Dh | |
| 9374 | 249Eh | Cannot find the file (Core.ID). |
| 9375 | 249Fh | Does not support the designated GP. |
| 9376 | 24A0h | Cannot read the file (Core.ID) |
| 9377 : 9399 | 24A1h : 24D7h | Reserved |
| 9400 | 24B8h | The function of Pro-Easy.DLL was doubly called up. |
| 9401 | 24B9h | The specified access handle for Pro-Server is not effective. |
| 9402 | 24BAh | Pro-Server has stopped and can not perform processing. |
| 9403 | 24BBh | The error occurred in the function of OLE. Data cannot be converted. |
| 9404 | 24BCh | The effective data for the specified data-type variant does not exist in the original data, or is not enough. |
| 9405 | 24BDh | Original data and destination data types cannot be converted by data-type variant. |
| 9406 | 24BEh | The specified argument is not enabled. |
| 9407 | 24BFh | Can not create the time bar. |
| 9408 | 24C0h | Public memory of provide sheet could not open. |
| 9409 | 24C1h | The symbol name is not registered. |
| 9410 | 24C2h | The specified time bar has already been locked. |
| 9411 | 24C3h | The specified handle has already been linked. |
| 9412 | 24C4h | The specified handle is not linked. |
| 9413 | 24C5h | The specified handle is not linked to the database |
| 9414 | 24C6h | Specified handle is locked or played, Please excute after clearing to its status. |
| 9415 | 24C7h | Designate the internal format of the argument's Variant as either "date" type, or comatible with "date". |
| 9416 | 24C8h | The specified time is out of the valid range. |
| 9417 | 24C9h | The invalid argument has been set. |
| 9418 | 24CAh | Database of appinted handle is closed. |
| 9419 | 24CBh | Database access error. |
| 9420 | 24CCh | INI file ('%s') in the action contents cannot be opened. |
| 9421 | 24CDh | '%s' of INI file ('%s') in the action contents cannot be analyzed. |
| 9422 | 24CEh | Action '%s' uses action contents not yet installed in the network project. |
| 9423 | 24CFh | There are too many actions to register. |
| 9424 | 24D0h | The specified action has already been registered. |
| 9425 | 24D1h | The action contents which action '%s' uses cannot be started. |
| 9426 | 24D2h | The designated action is not registered. |
| 9427 | 24D3h | An error occurred on the Active-X IF. |
| 9428 | 24D4h | The designated action has been registered in the registry. |
| 9429 : 9449 | 24D5h : 24E9h | Reserved |
| 9450 | 24EAh | The node name or symbol name is not specified. |
| 9451 | 24EBh | The node name is not specified. |
| 9452 | 24ECh | The data type setting is not valid. |
| 9453 | 24EDh | The node name and symbol is not delimited with '!'. |
| 9454 | 24EEh | The symbol name has not been registered or it is not a valid device address. |
| 9455 | 24EFh | Cannot continue the process - no valid device is specified. |
| 9456 | 24F0h | Cannot make word-access to 32-bit devices. |
| 9457 | 24F1h | The address is out of the valid range. |
| 9458 | 24F2h | The No. of points setting is invalid. |
| 9459 | 24F3h | The No. of points setting is 0 or exceeds the setting range. |
| 9460 | 24F4h | Cannot convert the set symbol into a device address. |
| 9461 | 24F5h | A value input error occurred. Enter a correct value. |

| Error Code | | Meaning |
| Decimal | Hex. | |
|---|---|---|
| 9462 | 24F6h | The specified lifetime is invalid. |
| 9463 | 24F7h | The designated bit location is incorrect. |
| 9464 : 9499 | 24F8h : 251Bh | Reserved |
| 9500 | 251Ch | Pro-Server schedule management thread initialization error |
| 9501 | 251Dh | Pro-Server LAN management thread initialization error |
| 9502 | 251Eh | Pro-Server timer management thread initialization error |
| 9503 | 251Fh | Pro-Server DDE control thread initialization error |
| 9504 | 2520h | Pro-Server API control thread initialization error |
| 9505 | 2521h | Pro-Server API parameter error |
| 9506 | 2522h | Response time out |
| 9507 | 2523h | Pro-Server failed in initializing the LAN. |
| 9508 | 2524h | No data |
| 9509 | 2525h | Invalid device |
| 9510 | 2526h | Invalid address |
| 9511 | 2527h | The address is out of the valid range. |
| 9512 | 2528h | Data type error |
| 9513 | 2529h | Transmission message error |
| 9514 | 252Ah | Cannot initialize Pro-Server cache function. |
| 9515 | 252Bh | Cannot load the network project because the database is used. |
| 9516 : 9519 | 252Ch : 252Fh | Reserved |
| 9520 | 2530h | PS item handle is incorrect. |
| 9521 | 2531h | PS item read/write were not executed. (The process was stopped on the way.) |
| 9522 | 2532h | Polling View output failed. |
| 9523 : 9529 | 2533h : 2539h | Reserved |
| 9530 | 253Ah | PL RAS initialization error. |
| 9531 | 253Bh | Unsupported Command. |
| 9532 | 253Ch | Unsupoorted Access Type. |
| 9533 | 253Dh | Unsupoorted Read/Write Type. |
| 9534 | 253Eh | Rejected to access to the device. |
| 9535 | 253Fh | Failed to set/get the value to the device. |
| 9536 : 9559 | 2540h : 2557h | Reserved |
| 9560 | 2558h | DLL load error. |
| 9561 | 2559h | Cannot find a function in DLL. |
| 9562 | 255Ah | System error can be considered if this occurs. |
| 9563 | 255Bh | The designated property ID is not defined. |
| 9564 | 255Ch | Value conversion error. Incorrect characters as numbers are designated. |
| 9565 | 255Dh | Too many characters. |
| 9566 | 255Eh | The number is too large. |
| 9567 | 255Fh | Cannot start COMM. |
| 9568 | 2560h | Cannot start GJ. |
| 9569 | 2561h | Cannot open the %s file. |
| 9570 | 2562h | File read error. |
| 9571 | 2563h | File write error. |
| 9572 | 2564h | No tags exist. (No parameter class declarations exist.) |
| 9573 | 2565h | No end tags exist. (No parameter class declarations exist.) |
| 9574 | 2566h | Found the unexpected end tag. |

| Error Code | | Meaning |
|---|---|---|
| Decimali | Hex. | |
| 9575 | 2567h | Signatures do not match. |
| 9576 | 2568h | Unsupported parameter. |
| 9577 | 2569h | Reached the file end. |
| 9578 | 256Ah | The incorrect structure. |
| 9579 | 256Bh | Cannot continue the process due to a memory lack. |
| 9580 | 256Ch | Cannot analyze the device name. |
| 9581 | 256Dh | DB name is not designated. |
| 9582 | 256Eh | Cannot access to DB. |
| 9583 | 256Fh | Cannot edit DB because it is locked (edited) by another program (e.g. Data View). |
| 9584 | 2570h | Either the node name or the device name is not designated. |
| 9585 | 2571h | Cannot use DB because it has been closed. (DB in use is automatically closed once when NPJ is saved/loaded.) |
| 9586 | 2572h | The database may be broken. |
| 9587 | 2573h | Data not saved. |
| 9588 | 2574h | Cannot find data at the designated time. |
| 9589 | 2575h | No polling setups exist. |
| 9590 | 2576h | The database has not been opened. (Or it has already been closed.) |
| 9591 | 2577h | Already polling start. |
| 9592 | 2578h | Old data will be overwritten, isteadd of newest data. |
| 9593 | 2579h | Delete recode. |
| 9594 : 9599 | 258Ah : 257Fh | Reserved |
| 9600 | 2580h | Cannot continue the process due to a resource lack in GP. |
| 9601 : 9619 | 2581h : 2593h | Reserved |
| 9620 | 2594h | The network project item has been registered redundantly. (The network project file has been broken.) |
| 9621 : 9639 | 2595h : 25A7h | Reserved |
| 9640 | 25A8h | The Provider information data that is not registered in the network project file were sent from other node. (Network projects differ between the Provider and the Receiver nodes.) |
| 9641 | 25A9h | Either that the device write failed at the Receiver node or that no partner nodes exist while providing data. |
| 9642 : 9659 | 25AAh : 25BBh | Reserved |
| 9660 | 25BCh | Data Read failed. |
| 9661 | 25BDh | Invalid access range of the read device. |
| 9662 : 9699 | 25BEh : 25E3h | Reserved |
| 9700 | 25E4h | Received the first trigger establish command for non-existing provider information. |
| 9701 : 9709 | 25E5h : 25EDh | Reserved |
| 9710 | 25EEh | Received the second trigger establish command for non-existing provider information. |
| 9711 : 9729 | 25EFh : 2601h | Reserved |
| 9730 | 2602h | The GP is busy sending screen data or saving SRAM backup data to another PC. |
| 9731 | 2603h | An error occurred in reading the SRAM backup data. (The item ID differs from the previous ID.) |
| 9732 | 2604h | An error occurred in reading the SRAM backup data. (The data type differs from the previous type.) |
| 9733 | 2605h | An error occurred in reading the SRAM backup data. (The block No. differs from the previous No.) |
| 9734 | 2606h | SRAM backup data read error. (The requested data amount is 0 or differs from the previous amount.) |

| Error Code | | Meaning |
|---|---|---|
| Decimal | Hex. | |
| 9735 : 9739 | 2607h : 260Bh | Reserved |
| 9740 | 260Ch | The GP is busy sending screen data or saving SRAM backup data to another PC. |
| 9741 | 260Dh | An error occurred in reading the SRAM backup data. (The item ID differs from the previous ID.) |
| 9742 | 260Eh | An error occurred in reading the SRAM backup data. (The data type differs from the previous type.) |
| 9743 | 260Fh | An error occurred in reading the SRAM backup data. (The block No. differs from the previous No.) |
| 9744 | 2610h | SRAM backup data read error. (The requested data amount is 0 or differs from the previous amount.) |
| 9745 : 9749 | 2611h : 2615h | Reserved |
| 9750 | 2616h | CF command error. |
| 9751 | 2617h | CF Access error |
| 9752 | 2618h | No CF card unit. |
| 9753 : 9779 | 2619h : 2633h | Reserved |
| 9780 | 2634h | Transmission error occurred with PLC during data write. (Code:%02x:%04x) |
| 9781 | 2635h | The designated SRAM backup data is not in the GP. |
| 9782 | 2636h | The GP's SRAM backup data is incorrect. (Code:%04x) |
| 9783 : 9789 | 2637h : 263Dh | Reserved |
| 9790 | 263Eh | No remote access right (not connected remotely) |

For information about 2580h, 25A8h, 25A9h, refer to "2-Way Driver Error Messages and Syslog Features".

## A.2.2 2-Way Driver Error Messages and Syslog Features

### Error Display

The ECOM task displays the following error information on the lower left of the screen.

| Screen Display | Meaning |
|---|---|
| SYSTEM ERROR | System call error |
| 2Way ERROR | 2-Way Driver error |

System Errors

A system error is a fatal error.

2-Way Errors

A 2-Way error is an error that has occurred due to the 2-Way Driver.

When a 2-Way error occurs, the [2-Way Transfer Error Code] is saved to the GP unit's LS2075 address.

Syntax: 2Way ERROR(<Cause No.>:<Error No. 1>:<Error No. 2>:<Error No. 3>)

| Reason Code | Error Type | Error No. | | | Reason | 2Way Error Code |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | | |
| 30 | Fatal | Unused | Unused | Unused | Insufficient GP resources. | FF30 |
| 31 | Fatal | Unused | Unused | Unused | Cannot release GP resources | FF31 |
| 32 | Fatal | Unused | Unused | Unused | Cannot release GP resources | FF32 |
| 40 | Fatal | Unused | Unused | Unused | IP address & Port number are not registered. | FF40 |
| 41 | Fatal | Unused | Unused | Unused | The symbol state is different than GLC control. | FF41 |
| 51 | Fatal | Unused | Unused | Refer to protocol stack error codes | Protocol Stack Call up error. | FF51 |
| F0 | Warn-ing | 0 | Unused | 2580 | After transmit command was sent, Device Read was ignored due to insufficient Receiver memory. | 2580 |
| | | 0 | Unused | 25A8 | After transmit command was sent, Receiver unable to find data. | 25A8 |
| | | 0 | Unused | 25A9 | After transmit command (with reply) was sent, no reply was received from Receiver. | 25A9 |
| | | 0 | Refer to each PLC's error code list | | After transmit command was sent, Receiver was unable to write to device. (Refer to each PLC's Manual) | FFF0 |

Protocol Stack Error Codes

The following protocol stack error codes are displayed on the GP screen.

| Error Code | Meaning |
|---|---|
| 1000 | Current node IP Address entry failed during initialization |
| 1005 | Initialization failed |
| 1006 | Transmit Halt processing failed |
| 1007 | Initialization is performed again, without previous initialization being completely terminated |
| 1008 | Provider Node Port number error. |
| 1009 | Receiver Node port number error. |
| 100A | Receiver Node IP Address error. |
| 100B | UDP was used to register this port number. |
| 100C | TCP was used to connect an adjacent port with a port having the same number. |
| 100D | Protocol Stack establishment refused |
| 100E | Protocol Stack Open Failure(value)was returned |
| 100F | The(communication)connection has been cut. |
| 1010 | All connections are currently in use. |
| 1013 | Receiver has aborted(communication). |
| 1030 | No response from the protocol stack. |
| 1032 | No response from the Receiver. |

**MEMO**

- When the error type is fatal, the 2-Way Driver cannot be restored.
- When the error type is Warning, the 2-Way Driver continues to operate.Once the cause of the error is removed, the error display will disappear when the GP's screen changes.
- When the Reason Code is "F0" the "Alarm Issued Time" and "Receiver IP Address" will also be displayed.

## SYSLOG

If the SYSLOG file(SYSLOG.EXE), located inside the Pro-Server's system folder, is started, the following data can be checked. The 2-Way Driver downloaded to the GP can perform a variety of tasks, among them being the output of SYSLOG data.

You can select the type of SYSLOG data output via the GP OFFLINE mode's[SYSLOG Information Settings]. The correspondence of the Output Level and the output producing SYSLOG Priority level is shown below.

| Output Level | SYSLOG Output Priority Level |
|:---:|:---|
| 0 | No correspondence |
| 1 | INFO, |
| 2 | INFO,NOTICE |
| 3 | INFO,NOTICE,WARNING |
| 4 | INFO,NOTICE,WARNING,DEBUG |

SYSLOG Output Information

| SYSLOG Level | ECOM Response | SYSLOG Text |
|:---:|:---:|:---|
| INFO | Starts ONLINE | gp[17]: start online |
| INFO | Starts OFFLINE | gp[17]: start offline |
| WARNING | Processing Failed | gp[17]: bel: fail, <Processing Failed Text> <Argument1> |
| DEBUG | Device Read | gp[17]: rdev: <Argument2> |
| DEBUG | Device Write | gp[17]: wdev: <Argument2> |
| DEBUG | Command Received | gp[17]: bel: <Command Text1>, recv from <IP address>(<port>)<Argument3> |
| DEBUG | Command Sent | gp[17]: bel: <Command Text2>, send to <IP address>(<port>)<Argument3> |
| DEBUG | s201 File Read | gp[17]: bel: <Command Text3> <Argument4> send to <IP address> |

| Failed Processing String | Meaning |
|:---|:---|
| read device | Failed in reading from the device |
| write device | Failed in writing to the device. |
| sync provide, response timeout | No return data received from the receiver node after providing data. |
| sync provide, fail to read device | Failed in reading from the device when providing data. |
| lack memory | Command ignored due to insufficient 2-Way driver memory. |
| first trigger on | The command to enable the first trigger failed. |
| second trigger on | The command to enable the second trigger failed. |
| backup data read | Failed in reading the backup data. |

| Command String 1 | Contents |
|:---|:---|
| response | Receives the response. |
| sync provide | Provides the data. |
| read device | Reads from the device. |
| write device | Writes to the device. |
| get node property | Reads the node property. |
| first trigger on | Enables the first trigger. |
| second trigger on | Enables the second trigger. |
| backup data read | Reads the backup data. |

| Command String 2 | Contents |
|---|---|
| sync provide, broadcast | Provides the data(Broadcast, no response). |
| sync provide, send each | Provides the data(Peer to Peer, no response). |
| sync provide, broadcast and wait for response | Provides the data(Broadcast, with response). |
| sync provide, send each and wait for response | Provides the data(Peer to Peer, with response). |
| sync provide, response | Provide data response. |
| read device, response | Device read response. |
| write device, response | Device write response. |
| write device, response(retry) | Write to device(Retry)response. |
| get node property, response | Read node property response. |
| first trigger on, response | First trigger enable response. |
| second trigger on, response | Second trigger enable response. |
| backup data read, response | Read backup data response. |

| Command String 3 | Contents |
|---|---|
| register as sender | Registers provide data command as sender(provider). |
| register as receiver | Registers provide data command as receiver. |

Argument1(<String>=<Value>)

| String | Value | Value display format |
|---|---|---|
| err | Error No. | Hex. |
| pr | ProjectID | Hex. |
| ow | OwnerApp | Hex. |
| ma | MajorNo | Hex. |
| mi | MinorNo | Hex. |

Argument2(<String>=<Value>)

| String | Value | Value display format |
|---|---|---|
| code | Device code | Hex. |
| addr | Device address | Hex. |
| pack | DataPack | Hex. |
| kind | DataKind | Hex. |
| count | Data count by word | Hex. |
| d0 | First data (1WORD) | Hex. |

Argument3(<String>=<Value>)

| String | Value | Value display format |
|---|---|---|
| pr | ProjectID | Hex. |
| ow | OwnerApp | Hex. |
| ma | MajorNo | Hex. |
| mi | MinorNo | Hex. |
| dl | DataLen | Hex. |
| va | Validity | Hex. |

Argument4(<String>=<Value>)

| String | Value | Value display format |
|---|---|---|
| rn | ResourceNo | Hex. |
| pack | DataPack | Hex. |
| kind | DataKind | Hex. |
| count | ProvidCount | Hex. |
| howto | HowTo | Hex. |
| ext | ExtDevType | Hex. |
| code | Device code | Hex. |
| addr | Device address | Hex. |
| retry | RetryCount | Hex. |
| wait | RetryWaitTime | Hex. |

## A.3  Scale Conversion using Excel

This section explains the use of Microsoft Excel's scale conversion feature for input data.

The following example converts a range of 1 to 1000 to a range of 1 to 100.



C2:  Minimum input value

D2:  Maximum input value

E2:  Minimum conversion value

F2:  Maximum conversion value

D4:  Input value

H4:  Conversion value

The formula for H4 is as follows:

=IF(((D4/(D2/F2))<1),1,QUOTIENT(D4/(D2/F2),1))

**MEMO**   To use the abovementioned formula, you must first install Excel's [Analysis ToolPack]. To do this, us Excel's [Tools] -> [Add-Ins] dialog to add the [Analysis ToolPack].

## A.4  GP Ethernet Settings

Prior to sending data to the GP, the proper settings must be entered. After data transfer or setup are finished, the GP's OFFLINE menu will appear. Select[INITIALIZE], [SETUP OPERATION SURROUNDINGS], and then[EXTENDED SETTINGS]and the following screen will appear.

**MEMO**   When using the 2-Way driver, perform self-diagnosis of the Ethernet unit from the following Expanded Settings screen, not from the OFFLINE mode's Main Menu screen.

### Expanded Settings

The screens shown here are setup examples.

| 1 | ETHERNET SETUP |
|---|---|
| 2 | SYSLOG SETUP |
| 3 | OTHERS SETUP |
| 4 | SELF-DIAGNOSIS |

### [1]ETHERNET SETUP

```
ETHERNET SETUP                    PREVIOUS   NEXT
     MY IP ADDRESS     [    ] . [    ] . [    ] . [    ]
     SUBNET MASK       [    ] . [    ] . [    ] . [    ]
     MY PORT NO.       [    ]
     GATEWAY           [    ] . [    ] . [    ] . [    ]
```

• MY IP ADDRESS

The IP addresses 32 bits used are divided into 4 groups of 8. Use Base 10 numbers only.

• SUBNET MASK

If unused, enter all zeroes here.

• MY PORT NO.

Port number range is from 1024 to 65535. Sequential ten ports from MY PORT NO. are used.

• GATEWAY

If unused, enter all zeroes here. There is only one GATEWAY setting.

## [2]SYSLOG SETUP

```
SYSLOG SETUP                          PREVIOUS  NEXT

  HOST IP ADDRESS      [   ] . [   ] . [   ] . [   ]
  FACILITY             [   ]
  OUTPUT LEVEL         [   ]
```

## [3]OTHERS SETUP

```
OTHERS SETUP                          PREVIOUS  NEXT

  BUZZER ON ERROR        ON        OFF
  DISPLAY WARNING        ON        OFF
```

• HOST IP ADDRESS

IP Address for the SYSLOG destination output. (Where

GPSYSLOG.EXE is running.)

• FACILITY

(Default value:1) reserved

You may not change the default value.

• OUTPUT LEVEL

Designate the output level.

(Setting range: 0 to 4, Default value: 0)

• BUZZER ON ERROR

Buzzer sounds when a 2-Way Driver error occurs.

(Default value: ON)

• DISPLAY WARNING

This screen designates if warning messages are displayed

on the GP's screen.