

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

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This product omits individual descriptions of each of these rights.

Trademark / Tradename	Right Holder
Microsoft, MS, MS-DOS, Windows, Windows 95, Windows NT, Windows 98, Windows Me, 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, fix	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 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.

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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 serious injury.
 Caution	Incorrect operation resulting from negligence of this instruction may cause injury or damage to equipment.
 Important	Failure to observe this instruction may cause abnormal operation of equipment or data loss.
 Careful!	Indicates Instructions/Procedures that must be performed to ensure correct product use.
 STOP	Indicates Actions/Procedures that should <u>not</u> be performed.

■ General Information Symbols and Terms


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


Symbol	Description
 Note:	Provides hints on correct use, or supplementary information.
 Reference	Indicates an item's (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 malfunction 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.*

 · *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**

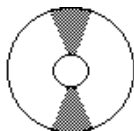
To prevent CD-ROM damage or malfunctions, please observe the following instructions:

 · *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.*

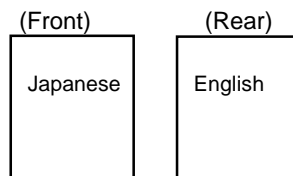
PACKAGE CONTENTS

The *Pro-Server with Pro-Studio for Windows 2.0* package includes the following items. Check that there are no missing items before using the software.

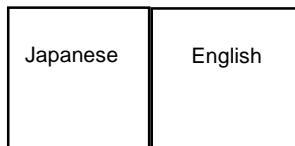
■ **Pro-Server with Pro-Studio for Windows 3.0**
 Installation CD-ROM



■ **Packing List (Japanese/English)**



■ **Installation Guide (Japanese/English)**



■ **User Registration (Japanese/English)**



OPERATING ENVIRONMENT

■ Pro-Server with Pro-Studio for Windows

◆ Hardware

Personal Computer	IBM Compatible	Pentium 133MHz or faster processor
Display	VGA (640 x 480) or higher	16 bit color (65536 colors) or higher
Hard Disk Space	10 MB or more	Required for installation
CD-ROM Drive	Windows compatible	
Memory	32MB or more	64MB or more is recommended
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)	
Other software	Microsoft Access 97 or higher Microsoft Excel 97 or higher	When using action contents
Mouse	Windows compatible	Mouse is required for operation
Ethernet Board	10Base-2/5/T, 100BASE-T	
Network Configuration	TCP/IP Protocol ^{*1}	Set up from Control Panel
Additional Items	Ethernet Hub, Ethernet cables, etc.	User supplied



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's data transfer.

^{*1} Until the TCP/IP protocol is set, the Pro-Server with Pro-Studio cannot be used.

■ **2-Way Driver**

◆ **Hardware**

GP		Ethernet I/F Unit	Bus Conversion Unit
GP77R series *1	GP-377R series	GP377R-MLTE11 GP377R-MLTE41	/
	GP-477R series	GP070-ET11 GP070-ET41	
	GP-577R series	GP077-MLTE41	
GP2000 series	GP-2400 series	Built-in Ethernet I/F Unit*1	PSL-CONV00
	GP-2500 series		
	GP-2501 series	GP070-ET11 GP070-ET41 GP077-MLTE41	
	GP-2600 series	Built-in Ethernet I/F Unit*1	
GLC2000 series	GLC2400 series		

◆ **Software**

*GP-PRO/PB III for Windows (GP screen creation software)*2*

	GP-477R series GP-577R series	GP-377R series	GP2000 series GLC2400 series
GP screen creation software	Ver3.0 or higher	Ver4.0 or higher	Ver5.0 or higher



- Even though protocol versions 1.2 or earlier can be used, the read error detection feature will not available., read error detection may not function.

■ **OPC Server**

Compatible OS (Japanese or English)	Windows NT Windows 2000
Hard disk capacity	100MB or more
Required memory	64MB or more

*1 When the optional Expansion Ethernet I/F unit is attached, the 2-Way Driver uses the built-in Ethernet I/F Unit, The optional Expansion Ethernet unit can perform communication with a host(PLC).

■ Pro-Server compatible PLC Vendors and Models

Vendor Name	PLC Type (in GP-PRO/PBIII for Windows)	GP77R GP-2501	GP2000	Comment
Mitsubishi Electric	mitsubishi MELSEC-AnN(LINK)	OK	OK	
	mitsubishi MELSEC-AnN(CPU)	OK	OK	
	mitsubishi MELSEC-AnA(LINK)	OK	OK	
	mitsubishi MELSEC-AnA(CPU)	OK	OK	
	mitsubishi MELSEC-A(JPCN1)	NG	OK	*1
	mitsubishi MELSEC-A(ETHER)	NG	OK	*2
	mitsubishi MELSEC-FX (CPU)	OK	OK	
	mitsubishi MELSEC-FX2 (LINK)	OK	OK	
	mitsubishi MELSEC-QnA(LINK)	OK	OK	
	mitsubishi MELSEC-QnA(CPU)	OK	OK	
	mitsubishi MELSEC-Q(CPU)	OK	OK	
	mitsubishi MELSEC-Q(ETHER)	NG	OK	*4
	mitsubishi MELSECNET/10	OK	OK	
	mitsubishi FREQROL SERIES	NG	OK	*2
Omron	OMRON SYSMAC-C SERIES	OK	OK	
	OMRON SYSMAC-CV SERIES	OK	OK	
	OMRON SYSMAC-CS1 SERIES	OK	OK	
	OMRON SYSMAC-CS1(ETHER)	NG	NG	*2*3
	OMRON THERMAC NEO SERIES	OK	OK	*2*3
Sharp	SHARP NewSatellite JW Series	OK	OK	
Yokogawa Electric	YOKOGAWA FACTORY ACE 1:1 Comm.	OK	OK	
	YOKOGAWA FACTORY ACE 1:n Comm.	OK	OK	
	YOKOGAWA FA-M3(ETHER)	NG	OK	
Fuji Electric	FUJI MICREX-F SERIES	OK	OK	
	FUJI MICREX-F SERIES (FLT)	NG	OK	*1
	FUJI AMICREX-F SERIES (T-LINK)	OK	OK	
	FUJI FLEX-PC(LINK)	OK	OK	
	FUJI FLEX-PC(CPU)	OK	OK	
	FUJI INVERTER	OK	OK	
	FUJI TEMPERATURE PXR	OK	OK	
Toyota Machine Works	TOYOTA TOYOPUC-PC2 SERIES	OK	OK	
	TOYOTA TOYOPUC-PC2 1:n Comm.	OK	OK	
	TOYOTA TOYOPUC-PC3 SERIES	OK	OK	
	TOYOTA TOYOPUC-PC3J 1:n Comm.	OK	OK	
Yaskawa Electric	YASKAWA Memocon-SC SERIES	OK	OK	
	YASKAWA GL120/130 SERIES	OK	OK	
	YASKAWA PROGIC8 SERIES	OK	OK	
	YASKAWA CP9200SH SERIES	OK	OK	
Hitachi	HITACHI HIDIC-S10 SERIES	OK	OK	
	HITACHI HIDIC-S10(JPCN1)	NG	OK	*1
	HITACHI HIDIC H SERIES	OK	OK	
	HITACHI HIDIC H2 SERIES	OK	OK	
	HITACHI HIZAC-EC SERIES	OK	OK	
Toshiba	TOSHIBA PROSEC-EX2000 SERIES	OK	OK	
	TOSHIBA PROSEC-T SERIES	OK	OK	
	TOSHIBA PROSEC-T (ETHER)	NG	OK	*2
Matsushita Electric Works	MATSUSHITA MEWNET-FP SERIES	OK	OK	
Koyo Electronics Industries	KOYO KOSTAC-SG8 SERIES	OK	OK	
	KOYO KOSTAC SR21/22 SERIES	OK	OK	
	KOYO DL-305 SERIES	OK	OK	
	KOYO DL-205/405 SERIES	OK	OK	

Preface

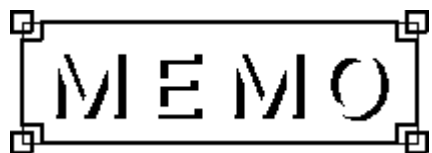
Vendor Name	PLC Type (in GP-PRO/PBIII for Windows)	GP77R GP-2501	GP2000	Comment
Toshiba Machine	TOSHIBA TC200 SERIES	OK	OK	
GE FANUC Automation	GE FANUC SERIES 90 SNP-X	OK	OK	
	GE FANUC SERIES 90-30/70 SNP	OK	OK	
Fanuc	FANUC POWER MATE SERIES	OK	OK	
IDEC Izumi	IZUMI IDEC_1	OK	OK	
	IZUMI IDEC_2	OK	OK	
	IZUMI IDEC_3	OK	OK	
	IZUMI MICRO3	OK	OK	
	IDEC FC3/FC4A Series	OK	OK	
SIEMENS	SIEMENS S5 90-115 SERIES	OK	OK	
	SIEMENS S5 135-155 SERIES	OK	OK	
	SIEMENS S5 3964(R) Protocol	OK	OK	
	PROFIBUS-DP	NG	OK	*1
	Siemens S7-200 PPI	OK	OK	
	SIMATIC S7-300/400 via MPI	OK	OK	
	SIMATIC S7 via 3964/RK512	OK	OK	
	INTERBUS SLAVE	NG	NG	*1
Rockwell (Allen Bradley)	Allen Bradley PLC-5 SERIES	OK	OK	
	Allen Bradley SLC500 SERIES	OK	OK	
	AB Data Highway Plus	NG	NG	*1*3
	AB Slc500 DH485	NG	NG	*3
	AB Remote IO	NG	NG	*1*3
Keyence	KEYENCE KZ300 SERIES	OK	OK	
	KEYENCE KZ-A500(CPU)	OK	OK	
	KEYENCE KZ-A500(LINK)	OK	OK	
Shinko Electric	SHINKO DENKI SELMART	OK	OK	
Matsushita Electric Industrial	Panadac 7000 SERIES	OK	OK	
Modicon	Modicon Modbus (MASTER)	OK	OK	
	Modicon Modbus (SLAVE)	OK	OK	
	Modicon Modbus Plus	NG	NG	*1*3
FACON	FATEK FACON FB	OK	OK	
ORIM VEXTA	ORIM VEXTA E1 SERIES	OK	OK	
Yamatake	YAMATAKE SDC SERIES	OK	OK	
RKC INSTRUMENT	RKC CB/SR-Mini SERIES	OK	OK	
Shinko Technos	SHINKO TECHNOS INDICATING	OK	OK	
Toho Electronics	TOHO ELECTRONICS TTM SERIES	OK	OK	
Other Units	JPCN-1(Standard)	NG	OK	*1
	CC-Link Type	NG	OK	*1
	CC-Link Intelligent Device	NG	NG	*1*3
	DeviceNet Slave I/O	NG	OK	*1
	MEMORY LINK SIO Type	OK	OK	
	MEMORY LINK Ethernet Type	NG	OK	*2

*1 Usage of a GP77R Series or a GP2501 Series unit with the 2-Way Driver requires the attachment of Pro-face's optional Expansion Ethernet I/F Unit. The attachment of this unit prevents the attachment of any other Communication Unit, which in turn prevents the use of any other protocol.

*2 The GP77R Series and GP2501 Series units cannot use both the 2-Way Driver and Ethernet protocols at the same time.

*3 This protocol and the 2-Way Driver protocol cannot be used at the same time.

*4 The Mitsubishi Melsec Net/10 can only use link devices.



Chapter 1

Introduction

- 1.1 Outline
- 1.2 What is the 2-Way Driver?
- 1.3 System Configuration
- 1.4 Application Interface
- 1.5 Provider Information Outline
- 1.6 Configuring the System

This chapter describes how to use this software to configure a system in which you can gather data from the equipment connected to the GPs.

1.1 Outline

Downloading the 2-Way driver to your GPs allows you to configure a network using the Pro-Server software. After the 2-Way driver is installed in your GP, you can then read data from and write data to other PLCs on an Ethernet network via the host personal computer (hereafter called the “PC”). Moreover, installing Pro-Server on your PC lets you use commercially available application software or programs you have created to read/write data on the GPs and PLCs connected to the network.



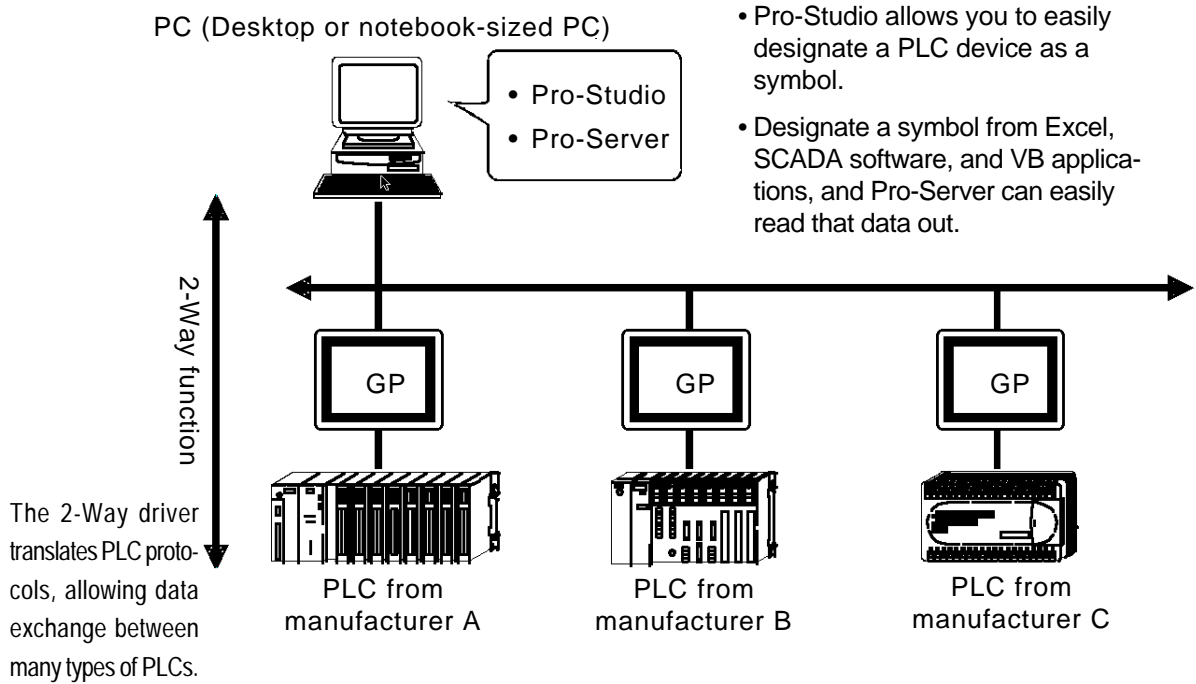
A GP reads and writes data via the 2-Way driver only when it is not serving as a display and operation panel, since this work is its first priority. Also, reading or writing a large volume of data may cause the GP to temporarily stop refreshing its display.

1.2 What is the 2-Way Driver?

The 2-Way driver is software that allows the host PC to access data on the GPs or PLCs connected to a network (Ethernet). One advantage of this software is that you can transfer data on the host PC without worrying about the fact that different PLCs are being used. To use the 2-Way function, the Pro-Server software and the Ethernet compatible GP unit are needed.

1.3 System Configuration

1.3.1 External Configuration

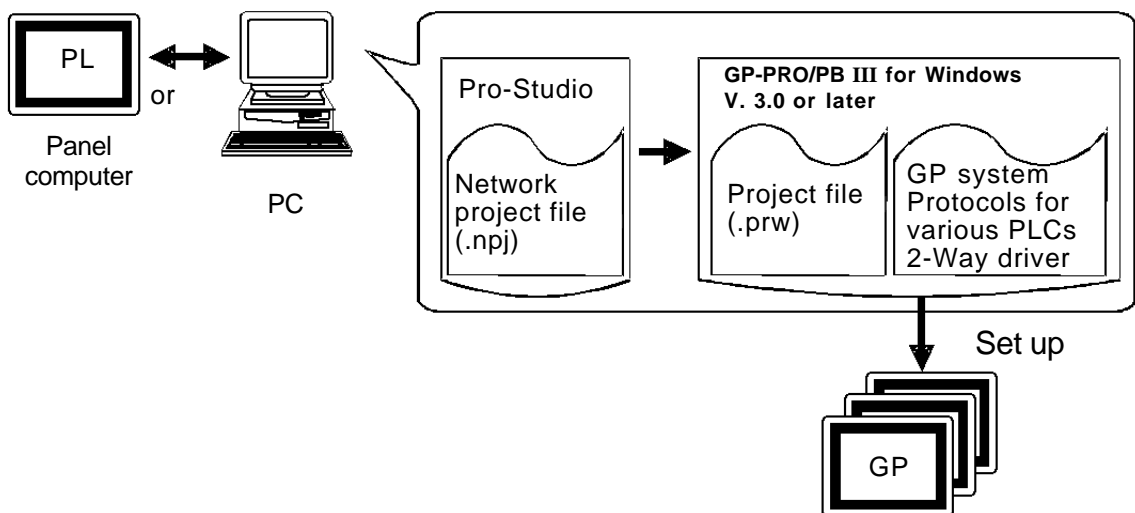


1.3.2 Internal Configuration

■ Off-line

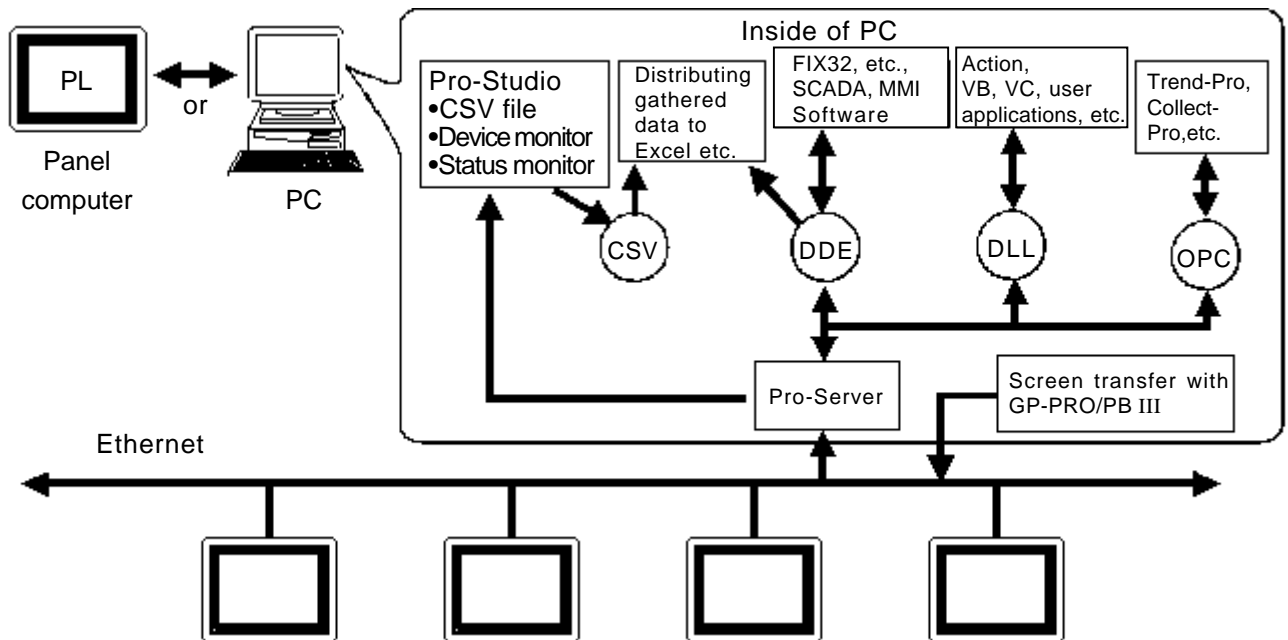
Inside your PC, information such as the node names of the connected GPs, the symbol names for accessing the PLC devices, and the information the GPs provide is all set up via this software. Also, the file in which this information is stored is called a network project file (*.npj).

To allow this, each GP must have the 2-Way driver and the network project information downloaded to it, along with the screen information, via GP-PRO/PB III.



■ 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.



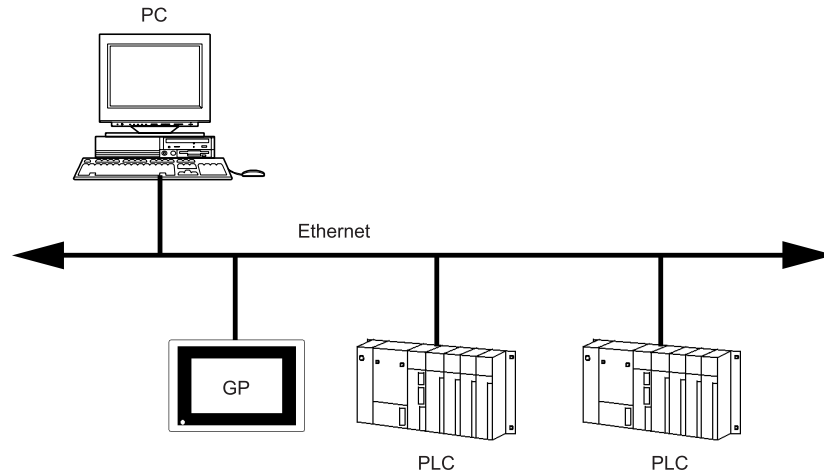
- **Transferring your screen data in the on-line mode temporarily causes the GP to display the transfer screen and stop other transmissions.**
- **After screen transfer is completed, the screen will re-activate and regular operation can resume.**

- ◆ **Pro-Studio (Network project file editing/setting software)**
Software to set and register symbols for the GPs and PLCs that provide data. Physical IP addresses, PLC's device addresses, etc. can be converted into symbols.
- ◆ **Pro-Server (Data exchange software between applications and GPs)**
Software that communicates with the GPs according to the requests made by Excel, VB, SCADA or other application software.
- ◆ **2-Way driver (Protocol conversion driver built into GPs)**
This driver selects the applicable PLC protocol, based on the Pro-Server read/write command. Though GP77R series requires setup via the screen editor software, and then transfer to the GP unit, GP2000 and GLC2000 series are installed at factory.

■ 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 your unit will differ depending on whether you use the unit's internal Ethernet I/F, or attach an Expansion Ethernet I/F to the rear of the unit.

◆ 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 INFORMATION] 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 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.

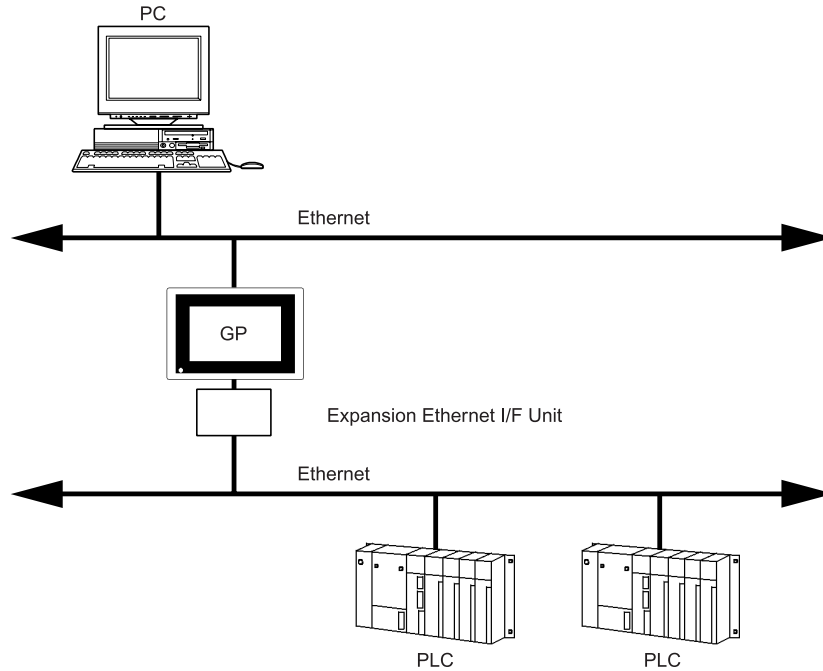
The following table describes what each setting is used for.

Setting	PLC Transfer Settings	2-Way Driver Settings	Remarks
IP Address	O	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

Chapter 1 - Introduction

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



After attaching the Expansion Ethernet I/F Unit, your GP/GLC unit is now equipped with two Ethernet I/F units. (The Ethernet Expansion Unit cannot be used with the GP-2400 Series 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.

In this case, using 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 INFORMATION] 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 GP/GLC's internal Ethernet I/F is done using the 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/GLC'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

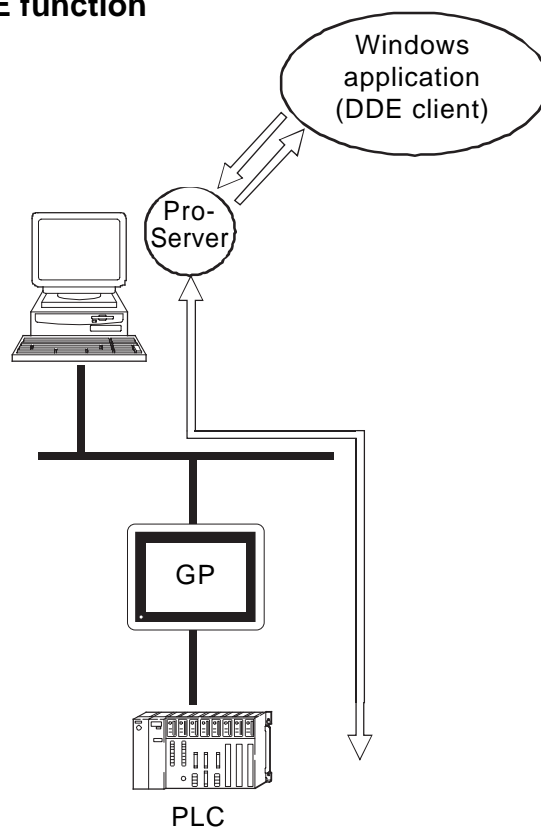
1.4 Application Interface

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 support 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 fact. Pro-Server provides the client with the data being monitored when a read-out request is made and writes the data when a writing request is made.

■ DDE function

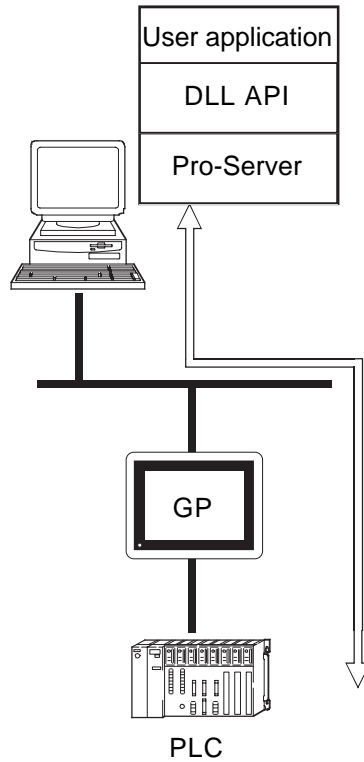


Excel's client feature does not support data write, so the DDE's write feature cannot be used. When writing data using Excel, please use the VBA feature.

1.4.2 Simple DLL Function Outline

The applications you create with Visual Basic or Visual C will request Pro-Server to read/write the PLC data by way of the GPs. 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.

■ Connection by Simple DLL



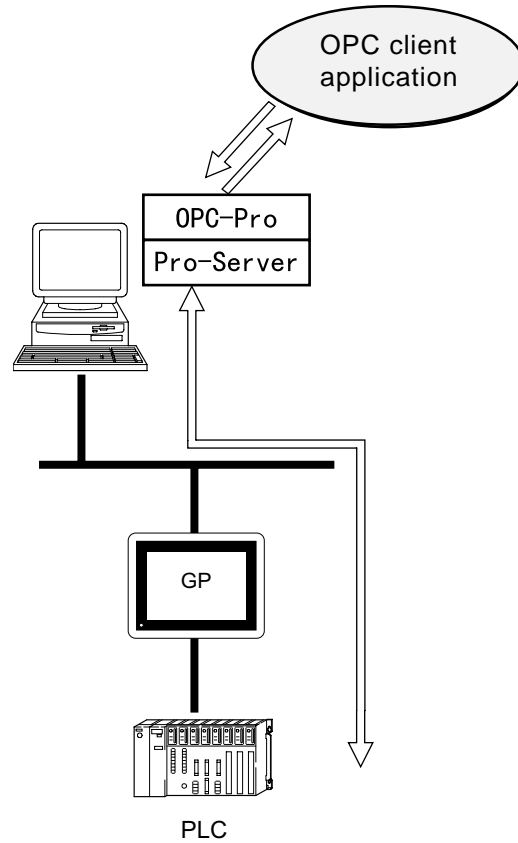
In environments where data transfer errors can frequently occur, be sure your applications are designed to use the data transfer retry feature.

1.4.3 Overview of 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.

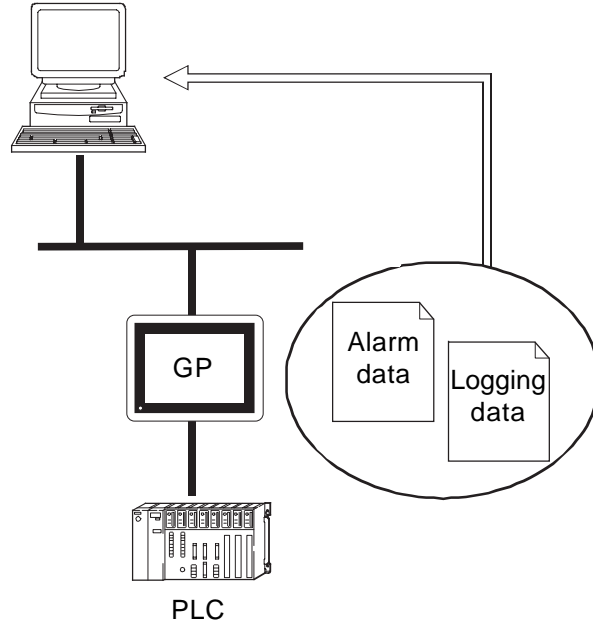
■ Overview of OPC Interface Function



1.4.4 Overview of 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 the logging data, trend data, sampling data, alarm data (log/history), etc.

■ Outline of the SRAM Backup Function



▼ Reference ▼

For details of the data you can transfer to the host PC, refer to **GP-PRO/PB III Ver.3.0 Tag Reference Manual**.

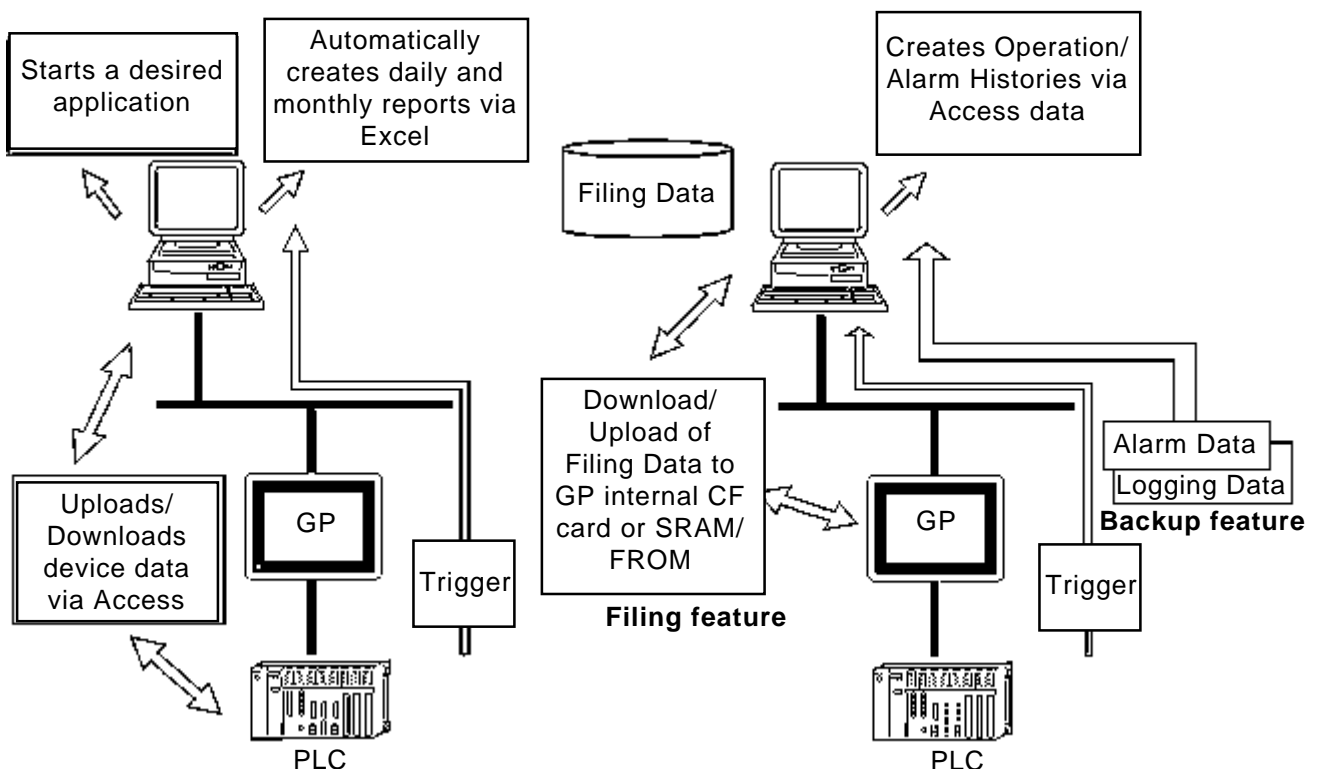
1.4.5 Action Feature Overview

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

■ Action Feature Summary

- 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

■ Action Feature Overview

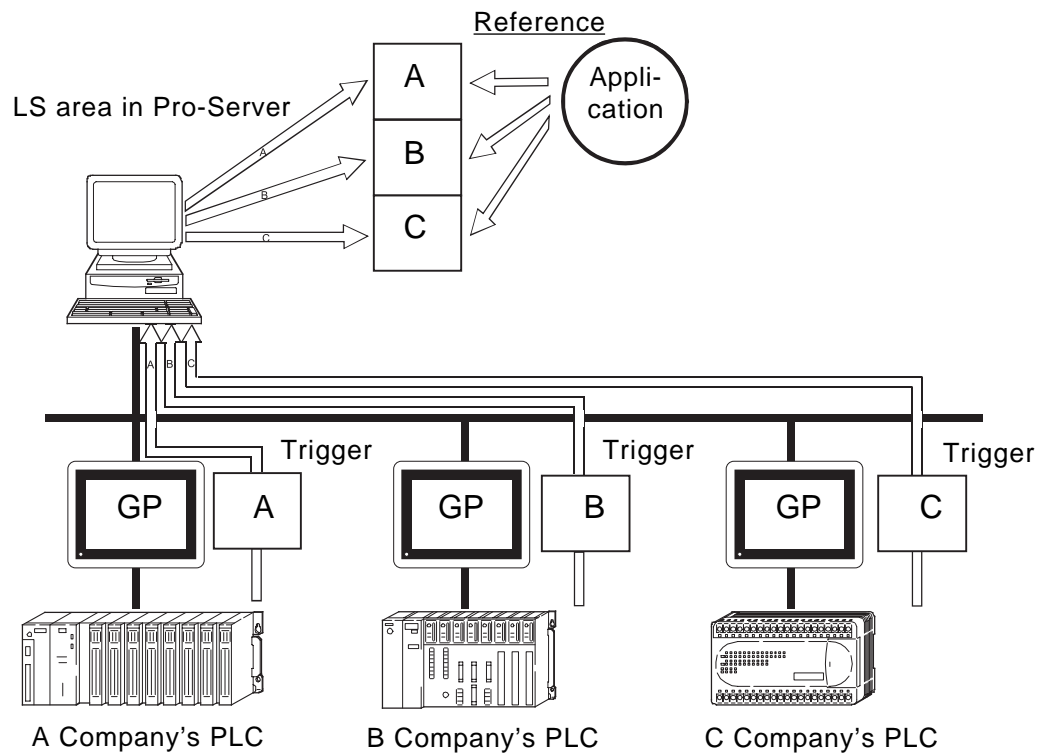


1.5 Provider Information Outline

1.5.1 Providing Information to the Host

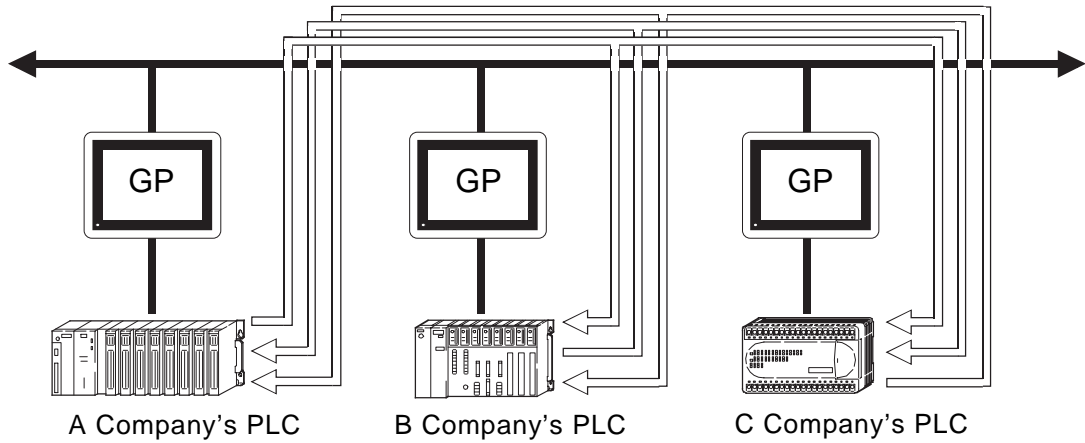
When a designated trigger's condition(s) is/are satisfied, PLC data is translated by the GP's resident 2-Way driver using the appropriate PLC manufacturer's protocol, and then collected by Pro-Studio and provided to the host PC. Also, since Pro-Server can temporarily store this data in the PC's memory,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

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



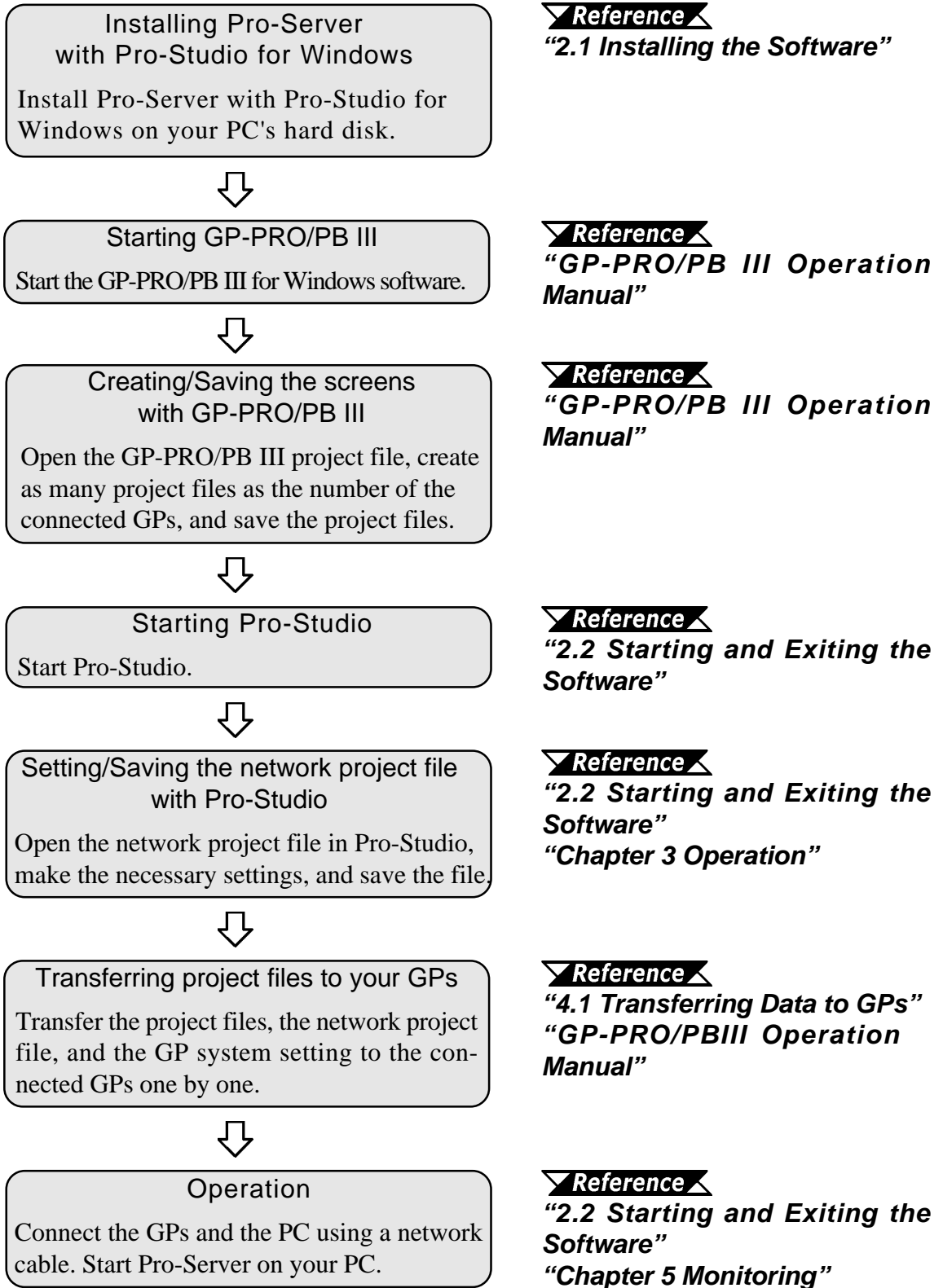
1.5.2 *Providing Information between GPs*


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 information to be exchanged, via the GP, between PLCs on the network, at a predetermined times or event, regardless of the brand of PLC used.



1.6 **Configuring the System**

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





MEMO

Chapter 2

Basic Operations

2.1 Installing the Software

2.2 Starting and Exiting the Software

2.3 Screen Item Names and Functions

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

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.



Careful! Before starting the installation procedure, exit all programs except the Pro Server with Pro-Studio for Windows Setup program. You also need to terminate memory-resident programs (such as Virus detection software) as well as other application programs.



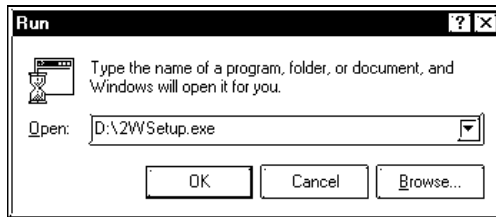
Important When an older version of this software is currently installed on your PC, be sure to uninstall it prior to installing this software.

PROCEDURE	REMARKS
<ol style="list-style-type: none">1) Insert the CD-ROM into your PC's CD-ROM drive.2) Click on the [Start] button and, when the Start menu appears, click on [Run].	 <p>important Copying the files on the master CD-ROM and pasting them onto your hard disk does not install this software. To be able to start this software, you must use the Setup program (follow step 2).</p>
	<p>The master CD-ROM supports the AutoPlay feature, which means inserting it into your CD-ROM drive will automatically start the Setup program.</p>

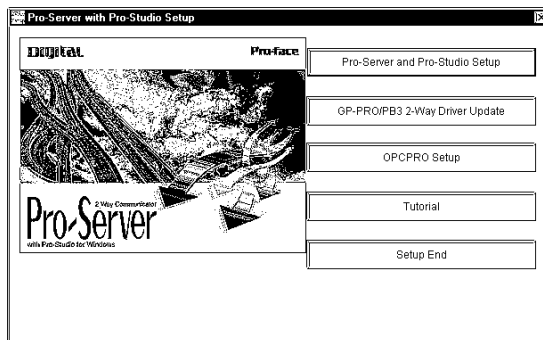
PROCEDURE

REMARKS

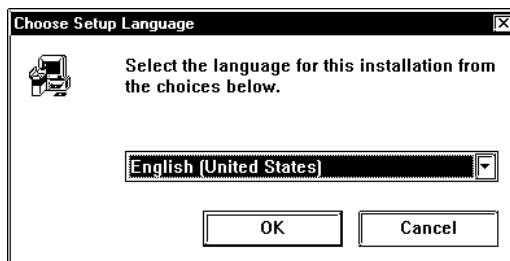
- 3) Type “X:/2WSetup.exe” and then click on [OK]. (“x” is the drive letter assigned to your CD-ROM drive.)



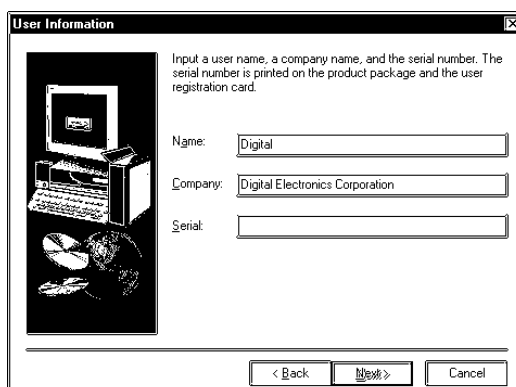
- 4) The following setup program will start. Click on the “Pro-Server and Pro-Studio Setup” bar.

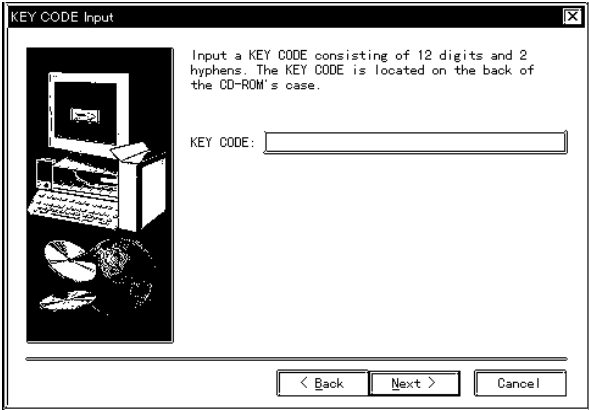


- 5) Select which language you wish to use in the Setup program (English or Japanese) and click on “OK”.



- 6) The User Information screen will appear. Enter all the information correctly and click on the [Next] button.



PROCEDURE	REMARKS
<p>7) The key code entry screen then appears. Enter the code printed on the rear of your CD-ROM case and click on [Next].</p>	<p>The data entered must also include the “-” character.</p>
	
<p>After this, follow the instructions displayed on the screen.</p>	

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/PB III 2-Way Driver Update**

As GP-PRO/PB III for Windows Ver. 5.05 software includes 2-Way driver for Pro-Server with Pro-Studio for Windows Ver.3.1, the driver requires no update. If you use the lower version of GP-PRO/PB III for Windows, update to the 2-Way driver compatible with the Pro-Server with Pro-Studio for Windows Ver.3.1.

◆ **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**

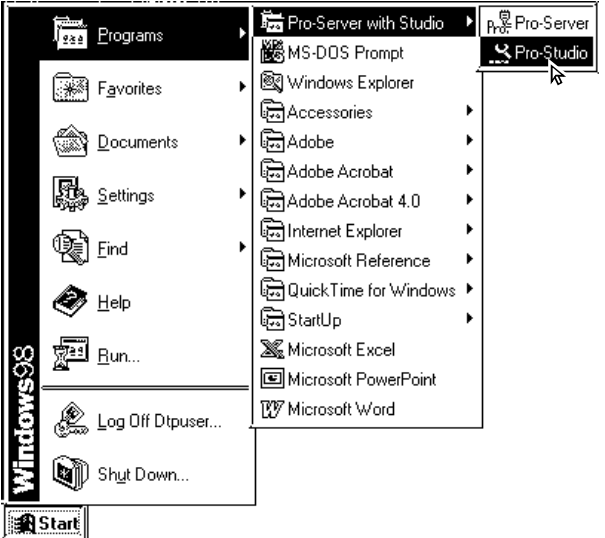
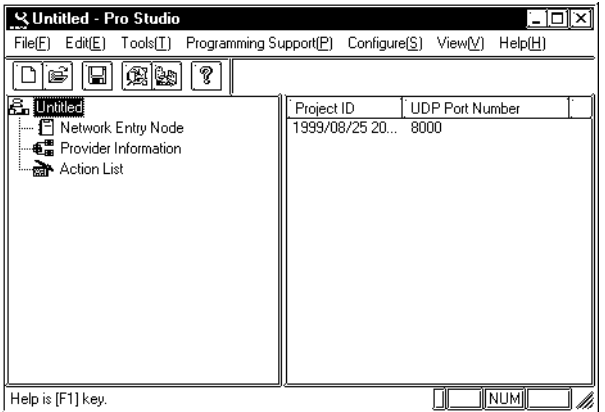
This item uses HTML files to explain the installation, setup and usage of the Pro-Studio software.

2.2 Starting and Exiting the Software

This section describes how to start and exit this software.

2.2.1 Basic Operations of Pro-Studio

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

PROCEDURE	REMARKS
<p>1) Click on the [Start] button and when the Start menu appears, point to [Programs] and [Pro-Server with Studio] and then select [Pro-Studio].</p>	<p>Double-clicking on the desired network project file (*.npj) in Windows Explorer automatically starts Pro-Studio.</p>
	<p>Important Starting Pro-Studio automatically starts Pro-Server. While Pro-Server resides in the memory, its indicator appears on the right side of the taskbar.</p>
<p>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.</p>	<p>Important Quitting Pro-Server automatically exits Pro-Studio as well.</p> <p>To start Pro-Server only, click the [Start] button and, when the Start menu appears, point to [Programs] and [Pro-Studio and Pro-Server], and then click on [Pro-Server].</p>
	

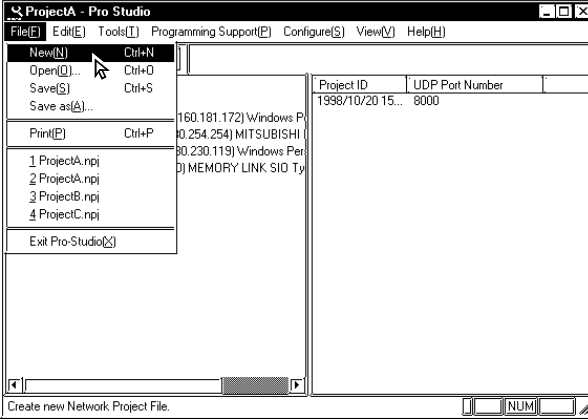
Chapter 2 - Basic Operations

■ 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

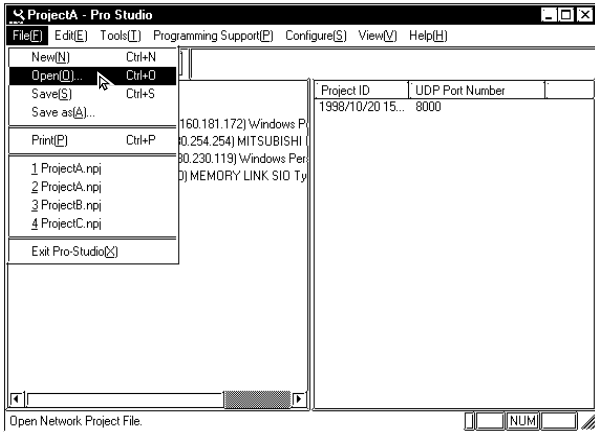
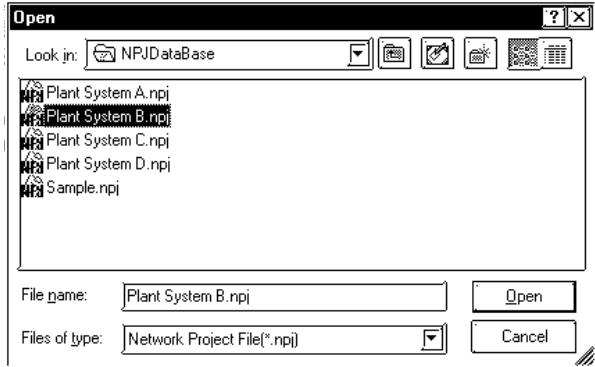
The following explains how to open a window and create new network projects.

PROCEDURE	REMARKS
1) Click on [New (N)] in the [File (F)] menu.	
	

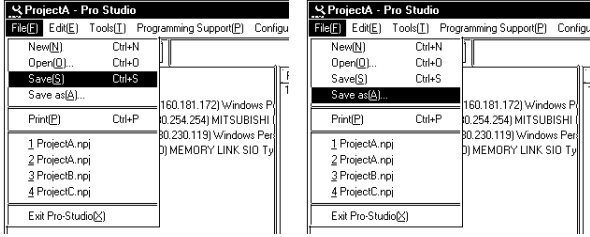
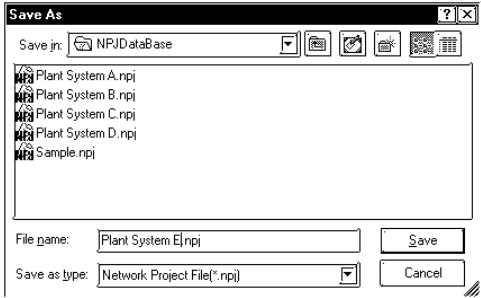
■ Opening/Saving a Network Project File

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

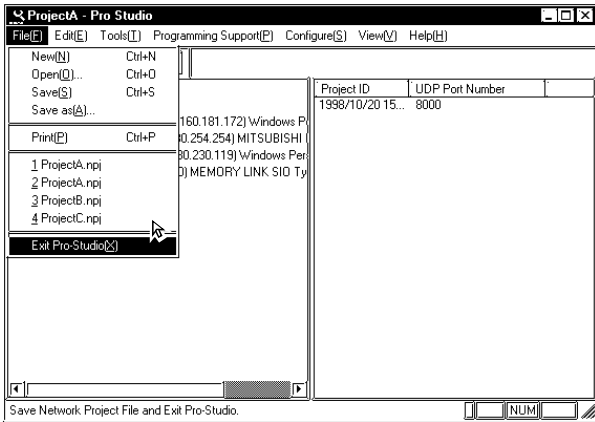

PROCEDURE	REMARKS
<p>1) In the program's main window, click on [Open (O)] in the [File (F)] menu.</p>  <p>The screenshot shows the 'ProjectA - Pro Studio' application window. The 'File' menu is open, and the 'Open(O)...' option is highlighted. The menu also includes 'New(N)...', 'Save(S)', 'Save as(A)...', 'Print(P)', and 'Exit Pro-Studio(X)'. The background shows a project configuration table with columns for 'Project ID' and 'UDP Port Number'.</p>	
<p>2) Select the file you wish to open, and click on [Open (O)].</p>  <p>The screenshot shows an 'Open' dialog box. The 'Look in:' field is set to 'NFJDataBase'. The file list contains: 'Plant System A.npj', 'Plant System B.npj', 'Plant System C.npj', 'Plant System D.npj', and 'Sample.npj'. 'Plant System B.npj' is selected. The 'File name:' field contains 'Plant System B.npj' and the 'Files of type:' dropdown is set to 'Network Project File (*.npj)'. 'Open' and 'Cancel' buttons are visible.</p>	
<p>3) The file opens.</p>	

◆ Saving a Network Project File

PROCEDURE	REMARKS
<p>1) In the program's main window, click on [Save (S)] or [Save as (A)] in the [File (F)] menu.</p> 	
<p>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.</p> 	

2.2.2 *Exiting Pro-Studio*

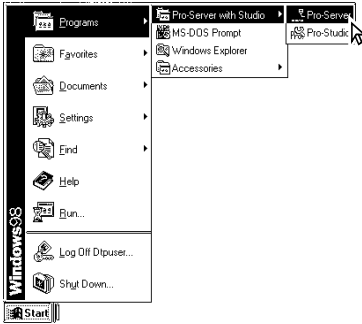

The following describes the procedure for exiting Pro-Studio.

PROCEDURE	REMARKS
<p>1) Click on [Exit Pro-Studio (X)] in the [File (F)] menu.</p> 	<p>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.</p> <p> Important <i>Exiting Pro-Server automatically closes Pro-Studio. To be sure to terminate all communication, exit Pro-Server.</i></p>

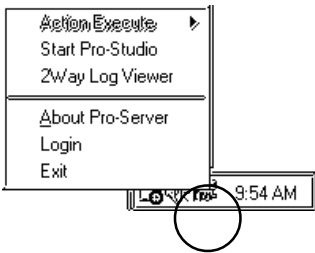
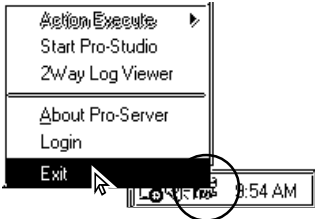
2.2.3 Starting and Exiting Pro-Server

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

■ Starting Pro-Server

PROCEDURE	REMARKS
<p>1) Click on the [Start] button and, when the Start menu appears, point to [Programs] and [Pro-Server with Pro-Studio], and then click on [Pro-Server].</p>  <p>2) While Pro-Server is running, the Pro-Server indicator appears on the right side of the Windows main menu taskbar.</p> 	<p>Important Starting Pro-Studio automatically starts Pro Server.</p>

■ Exiting Pro-Server

PROCEDURE	REMARKS
<p>1) To manually exit Pro-Server, right-click the Pro-Server indicator in the taskbar.</p>  <p>2) When the shortcut menu appears, click on [Exit].</p> 	<p>Important Exiting Pro-Server automatically exits Pro-Studio.</p> <p>If an application uses Pro-Server as a DDE client, an alarm message will appear before you exit this software.</p>

2.3 Screen Item Names and Functions

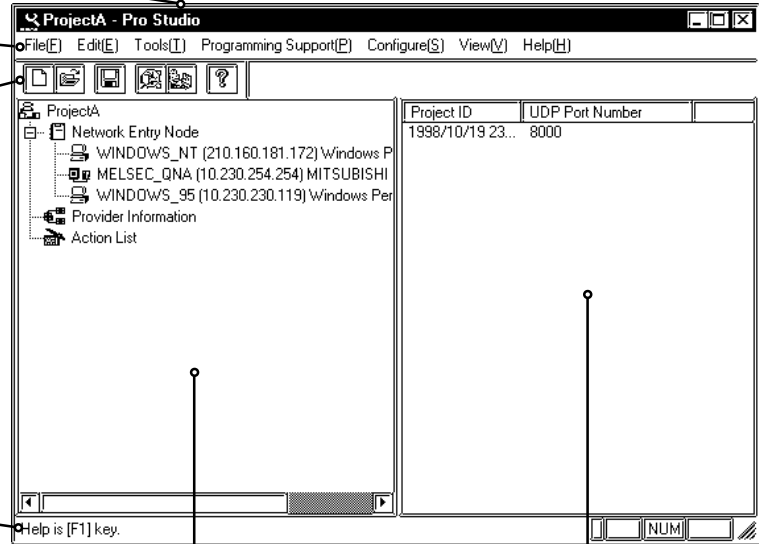
The names and functions of Pro-Studio's main screen items are as follows:

a. Title Bar

b. Menu Bar

c. Tool Bar

d. Status Bar



e. Network Project Information List

f. Detailed Information

a. Title Bar

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

b. 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.

c. Tool Bar

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

d. Status Bar

Displays operation-related messages and other information.

e. Network Project Information List

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

f. Detailed Information

Displays the detailed information such as a network project information list, nodes, symbols, and actions.

MEMO

Chapter 3

Operation

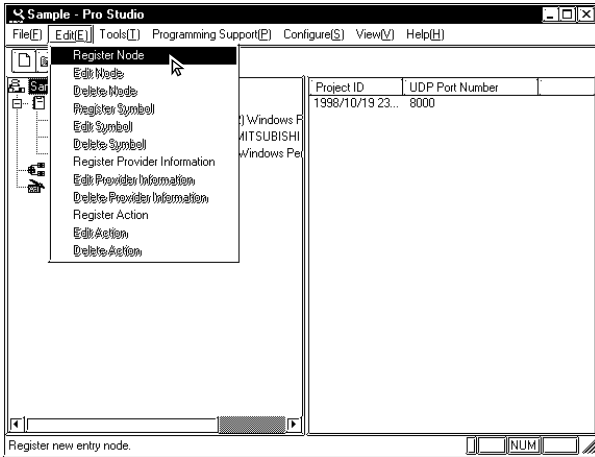
- 3.1 Registering Network Entry Nodes
- 3.2 Registering Symbols
- 3.3 Registering Provider Data
- 3.4 Action Item Functions
- 3.5 Using the DDE Function
- 3.6 Using the VBA/VC Function
- 3.7 Saving SRAM Backup Data in SRAM
- 3.8 Security Function
- 3.9 Configuring the System
- 3.10 Configuring the Network
- 3.11 Printing the Settings

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

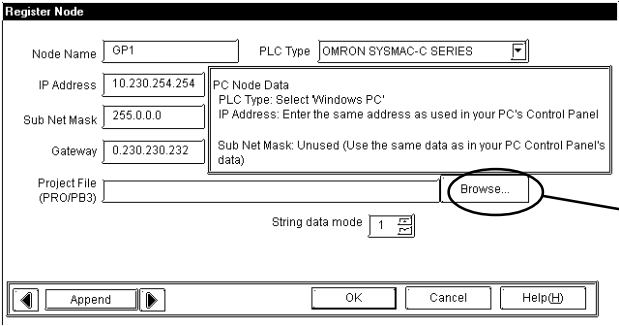
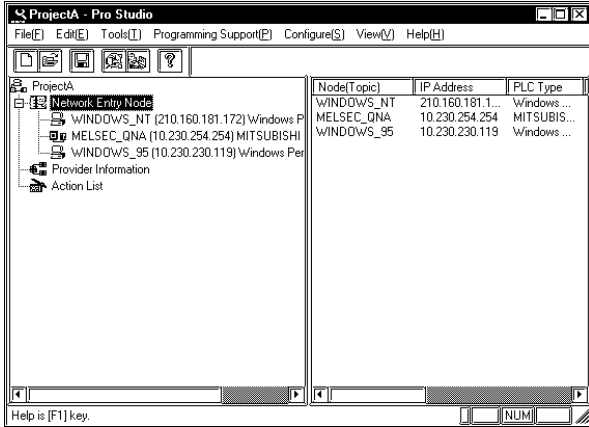
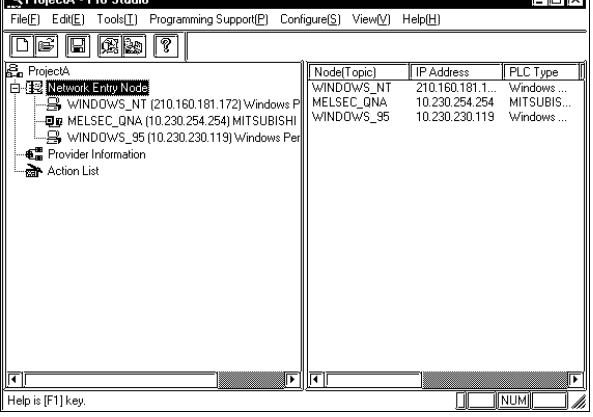
3.1 Registering Network Entry Nodes

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)

PROCEDURE	REMARKS
<p>1) Click on [Register Node] in the [Edit(E)] menu.</p> 	<p>You can right-click on the network entry node and select [Register Node] from the shortcut menu that appears.</p>

(Continued from the previous page.)

PROCEDURE	REMARKS
<p>2) The [Register Node] window will appear. Enter the necessary data for all the items and click on [OK].</p> <p>Designate [Gateway] only when required.</p> <p>Designate [IP Address] so that it does not overlap with any other addresses.</p>	<p>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:</p> <ul style="list-style-type: none"> • Consist of 31 characters or less. • Begin with an alphabetic letter. • Use alphanumeric characters (no differentiation between upper and lowercase letters), _ (underscore), ~ (tilde), and 80h or higher ASCII characters.
	<p>Select the GP-PRO/PB III for Windows project file (.prw) you wish to use.</p> <p>You may also drag the file from Windows Explorer and drop it in the Pro-Studio's main window.</p>
<p>3) After registration is completed, the registered node name will be added to the network node list.</p>	
	<p>The detailed settings of the selected network entry node are shown in the right-side window.</p>

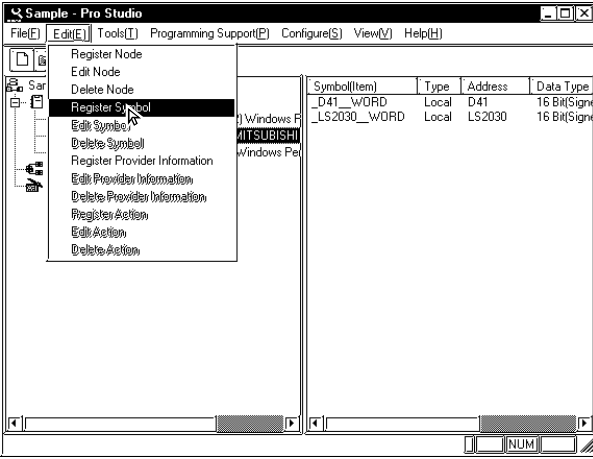
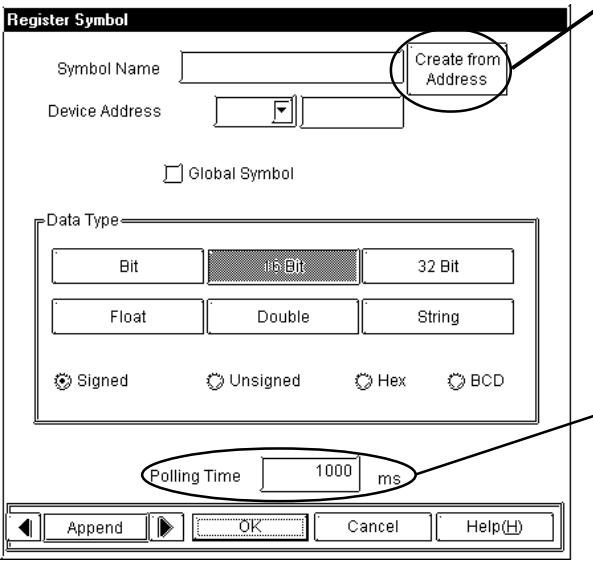
If you wish to change a node (topic)'s data after it has been registered, simply right-click on the topic to bring up a list of selections. From these, click on either the [Edit Node] or [Delete Node] selections, or, from the menu bar, click on the [Edit] menu's [Edit Node] or [Delete Node] items.

Note: 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/PB III. Symbols can be registered for each network entry node.

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

PROCEDURE	REMARKS
<p>1) Click on the right section of the window. Or, click on the right-side window and then click on [Register Symbol] in the [Edit (E)] menu.</p>	<p>A symbol must:</p> <ul style="list-style-type: none"> • 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.
	<p>After selecting a Device Address, click on this button to automatically register the Device Address as a symbol.</p>
<p>2) The [Register Symbol] window then appears. Enter all items and click on [OK].</p>	<p><Global Symbol></p> <p>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.</p>
	<p><Polling Time></p> <p>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 and monitoring devices may not be performed. (See next page)</p>
<p>3) When all settings are selected, the detailed settings appear in the right-side window.</p>	

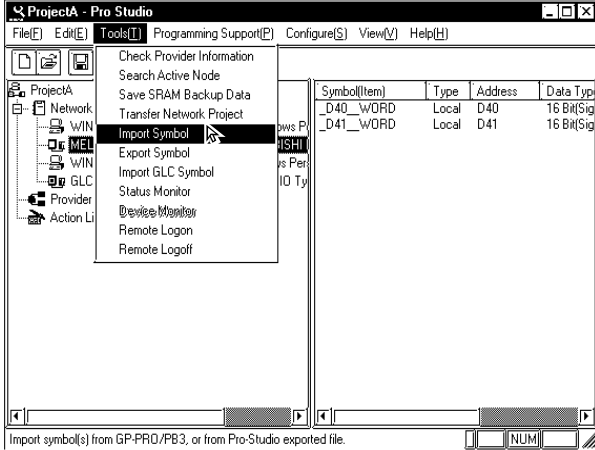
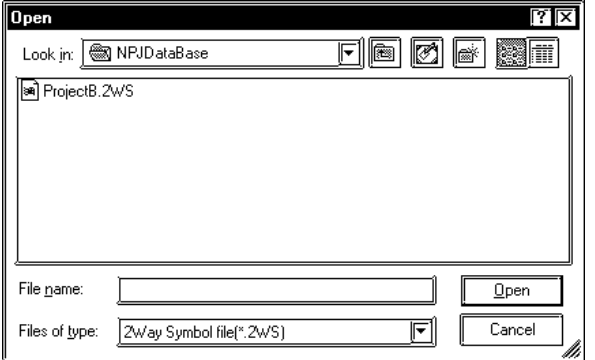
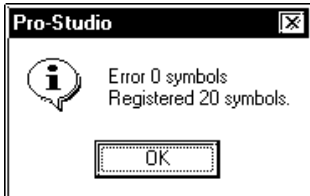
(Continued from the previous page.)

PROCEDURE	REMARKS
	<p>(continued)</p> <p>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.</p> <p>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.</p>

If you wish to change a symbol’s data after it has been registered, simply right-click on 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/PB III (*.lbe), symbols exported from other network project file (*.2ws), and comment data (*.csv) from GPP function software for Windows (Mitsubishi Electric).

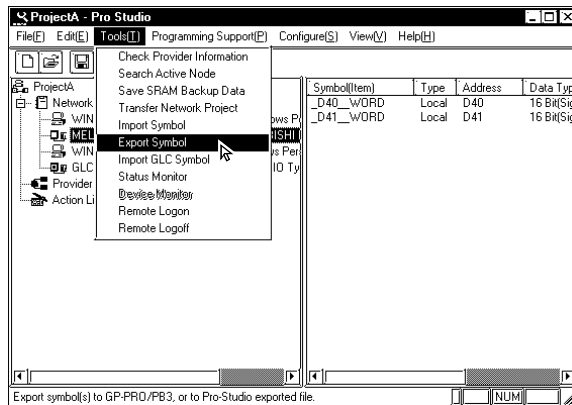
PROCEDURE	REMARKS												
<p>1) Click on [Import Symbol] in the [Tools (T)] menu.</p>	<p>You can also right-click the registered network node and click [Import Symbol] on the shortcut menu.</p>												
 <table border="1" data-bbox="496 696 938 752"> <thead> <tr> <th>Symbol(Item)</th> <th>Type</th> <th>Address</th> <th>Data Type</th> </tr> </thead> <tbody> <tr> <td>_D40_WORD</td> <td>Local</td> <td>D40</td> <td>16 Bit(Sig)</td> </tr> <tr> <td>_D41_WORD</td> <td>Local</td> <td>D41</td> <td>16 Bit(Sig)</td> </tr> </tbody> </table>	Symbol(Item)	Type	Address	Data Type	_D40_WORD	Local	D40	16 Bit(Sig)	_D41_WORD	Local	D41	16 Bit(Sig)	
Symbol(Item)	Type	Address	Data Type										
_D40_WORD	Local	D40	16 Bit(Sig)										
_D41_WORD	Local	D41	16 Bit(Sig)										
<p>2) The following dialog box will appear. Select the file type to be imported. Then, click on a desired file and then the [Open] button.</p>													
													
<p>3) The following dialog box will appear, and the designated symbol will be imported.</p>													
													

3.2.2 Symbol Export

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

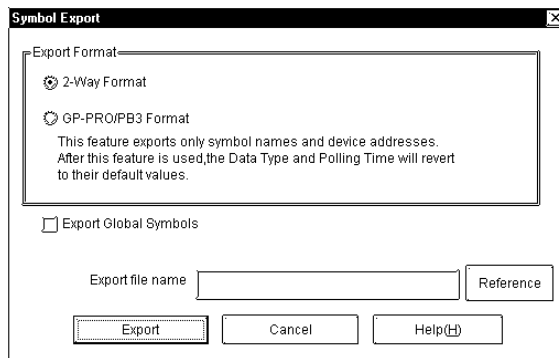
PROCEDURE

- 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 on [Export Execute].

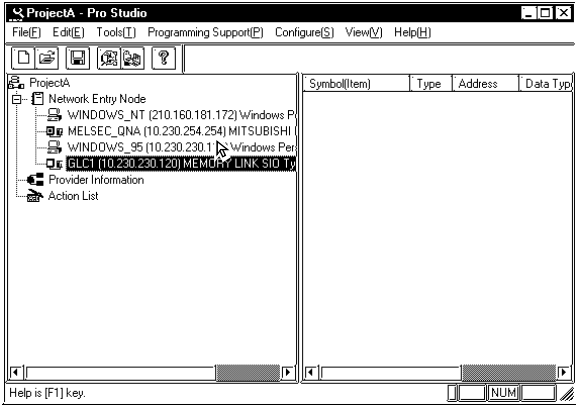
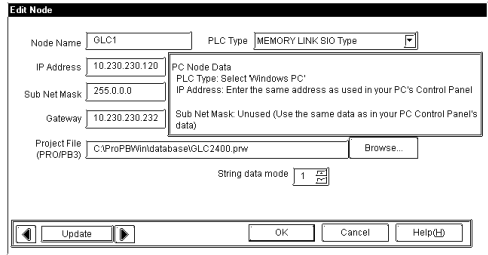
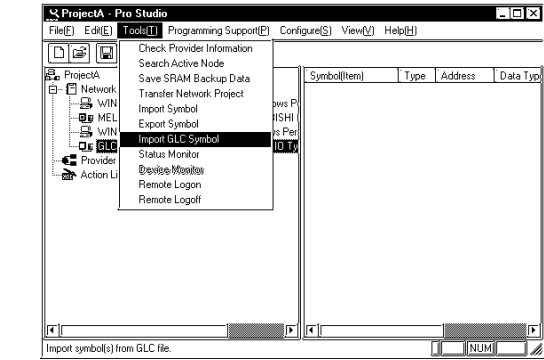
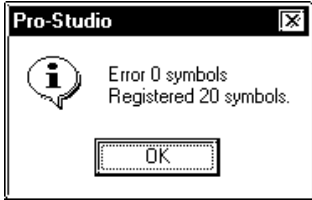


- 3) The following dialog box will appear and the symbol will be exported.



3.2.3 Importing the GLC Symbols

GLC symbols registered in a GP-PRO/PB III for Windows project file (*.prw) can be imported to Pro-Server and used as symbols.

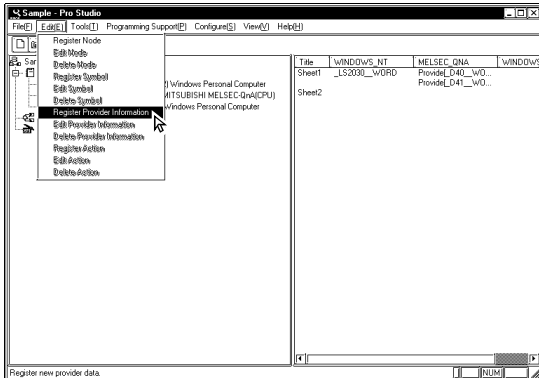
PROCEDURE	REMARKS
<p>1) Select the target node from the Network Entry Node list</p>	<p>To import a GLC symbol, the related project file must be designated correctly.</p>
 <p>The screenshot shows the 'ProjectA - Pro Studio' interface. On the left, the 'Network Entry Node' list is expanded, showing several nodes including 'GLC1 (10.230.230.120) MEMORY LINK SIO Ty'. The 'GLC1' node is selected. The main window displays a table with columns for 'Symbol(Item)', 'Type', 'Address', and 'Data Typ', which is currently empty.</p>	 <p>The 'Edit Node' dialog box is shown. It contains fields for 'Node Name' (GLC1), 'PLC Type' (MEMORY LINK SIO Type), 'IP Address' (10.230.230.120), 'Sub Net Mask' (255.0.0.0), and 'Gateway' (10.230.230.232). There are also sections for 'PC Node Data' and 'Project File (PRO/PB3)'. The 'Project File' field contains 'C:\ProPBWin\databas\GLC2400.prw'. Buttons for 'Update', 'OK', 'Cancel', and 'Help(F1)' are at the bottom.</p>
<p>2) Select the [Tools (T)] menu [Import GLC Symbol] command.</p>	<p>Prior to importing a project file, the transfer preparation must be completed in GP-PRO/PBIII for Windows.</p>
 <p>The screenshot shows the 'Tools' menu in 'ProjectA - Pro Studio'. The 'Import GLC Symbol' option is highlighted. Other menu items include 'Check Provider Information', 'Search Active Node', 'Save SRAM Backup Data', 'Transfer Network Project', 'Import Symbol', 'Export Symbol', 'Status Monitor', 'Remote Monitor', 'Remote Logon', and 'Remote Logoff'.</p>	<p>You can not edit or delete the imported GLC symbols.</p>
<p>3) The following dialog box will appear and the GLC symbols will be imported.</p>	
 <p>The dialog box has a title bar 'Pro-Studio' and an information icon. The text inside reads 'Error 0 symbols Registered 20 symbols.' and there is an 'OK' button at the bottom.</p>	

3.3 Registering Provider Data

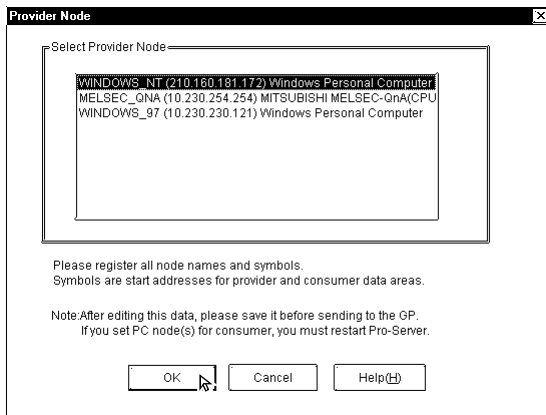
Here you can designate the data each network node GP provides periodically or when the trigger condition is satisfied, as well as the data storage location for the GP or PC that receives the data. (The following description assumes that the Pro-Studio main window is open).

PROCEDURE

- 1) Click **[Register Provider Information]** on the **[Edit (E)]** menu.



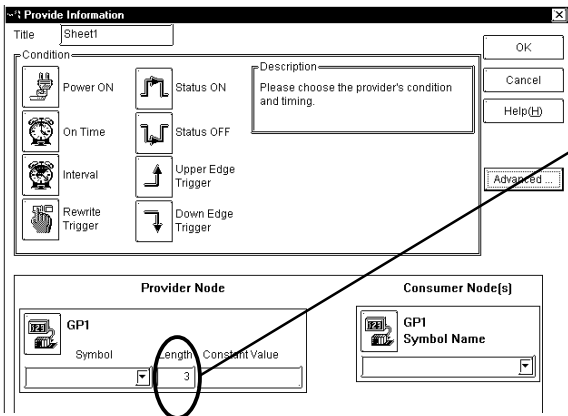
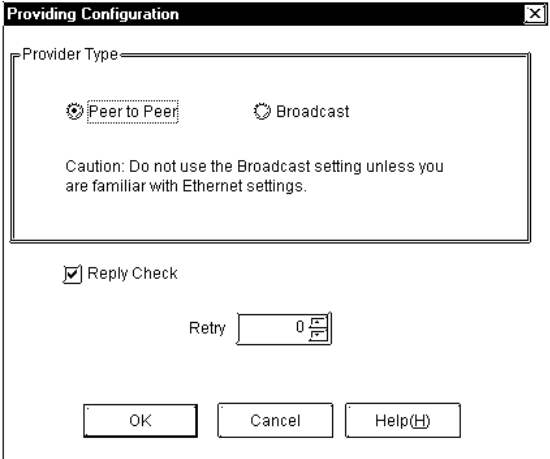
- 2) The **[Provider Node]** window appears. Select the node that provides data and then click **[OK]**.



REMARKS

Right-clicking on the provider information list can also be used to select **[Register Provide Information]**.

(Continued from previous page.)

PROCEDURE	REMARKS									
<p>3) The [Provide Information] dialog box will appear. Perform all the settings and click on the [OK] button. For Advanced settings, click on [Advanced...].</p> 	<p>Reference For details of each item, refer to On-line Help.</p> <p>If the Provider and Consumer's symbols are not the same data type, they cannot be selected.</p> <p>When a large volume of data is sent, the GP will not refresh its display while data is being provided.</p> <p>In addition, the volume of data that can be sent at one time will vary depending on each PLC type. Please refer to each PLC's manual and check the volume of data that can be sent at one time.</p> <p><Range of Provider Data Length></p> <p>Bit data: 1 to 16 Others: 1 to 255</p>									
<p>4) The [Providing Configuration] window appears. Enter the necessary items and then click [OK].</p> 	<table border="1" data-bbox="970 1151 1436 1370"> <thead> <tr> <th>Transmission Type</th> <th colspan="2">Response Check</th> </tr> </thead> <tbody> <tr> <td>Peer to Peer</td> <td>Performed (Default)</td> <td>None</td> </tr> <tr> <td>Broadcast</td> <td>Performed (Default)</td> <td>None</td> </tr> </tbody> </table> <p>The Broadcast feature places a burden even on devices that are not related to the transmission, and an alarm message will appear to inform you of this.</p>	Transmission Type	Response Check		Peer to Peer	Performed (Default)	None	Broadcast	Performed (Default)	None
Transmission Type	Response Check									
Peer to Peer	Performed (Default)	None								
Broadcast	Performed (Default)	None								

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

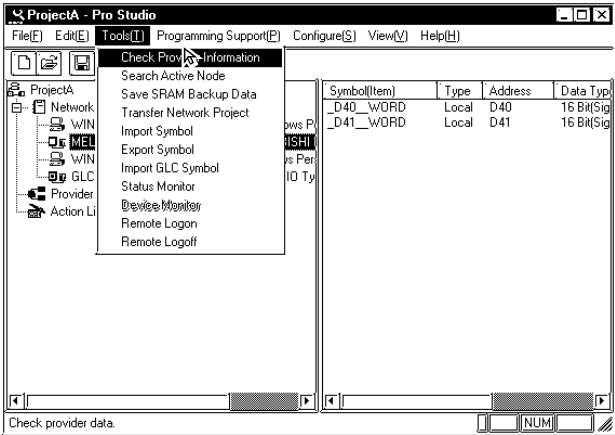
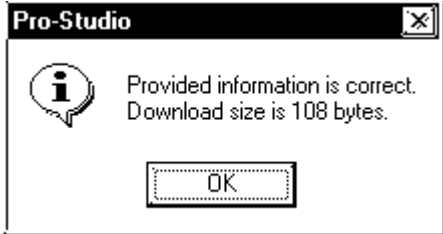
When two GP units are started simultaneously and one is set to provide data to the other ("Consumer"), if the sending unit sends the data before the Consumer finishes its start-up process, an error will be displayed on the Consumer GP. Since this error can usually be fixed by simply sending the data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

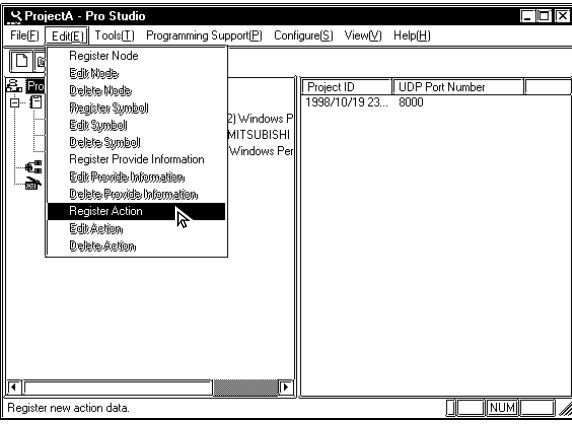
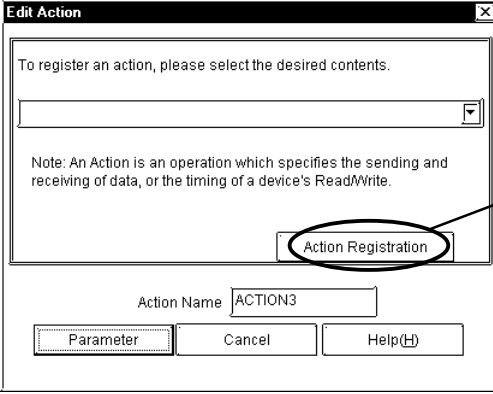
PROCEDURE	REMARKS
<p>1) Click on the [Check Provider Information] item in the [Tools (T)] menu.</p>  <p>2) The following dialog box appears.</p> 	<p>Although the program checks provider data automatically during saving, it will not display the file size. In the following cases an error will occur: <u>After entering provider information,</u></p> <ul style="list-style-type: none"> • 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. <p>If an error occurs, you will not be able to transfer the network project file (*.npj) to the GP.</p> <p>DO NOT edit or delete a symbol, or that symbol's designated provider node.</p> <p>Maximum size of provider information data is 64 kbytes.</p> <p>rule of thumb</p> <p>Base 36bytes</p> <p>Register Node 72bytes</p> <p>Register Provide Information . 120bytes</p>

3.4 Action Items

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.

3.4.1 Action Item Registration

The following procedure explains how to register an action item.

PROCEDURE	REMARKS
<p>1) Select the [Edit(E)] menu's [Register Action] selection.</p>	<p><Action Item Description> An "Action Item" is simply a program that is activated (i.e. performs a desired action) for a Consumer which is receiving information from a provider.</p>
 <p>The screenshot shows the 'ProjectA - Pro Studio' application window. The 'Edit(E)' menu is open, and the 'Register Action' option is highlighted with a mouse cursor. Other menu options include 'Register Node', 'Edit Node', 'Delete Node', 'Register Symbol', 'Edit Symbol', 'Delete Symbol', 'Register Provide Information', 'Edit Provide Information', 'Delete Provide Information', 'Edit Action', and 'Delete Action'. The background shows a project tree with nodes like '2) Windows P', 'MITSUBISHI', and 'Windows Per'.</p>	<p>To use action items, the action must be installed (registered) beforehand.</p> <p>Reference Refer to 2.1 <i>Installing the Software</i>.</p>
<p>2) The [Register Action] dialog box will appear. Select the desired action item from the pull-down menu and designate the action name.</p>	<p>To use user action item contents, first, register the action item in the registry. To register new action items, click on the [Action Registration] button.</p>
 <p>The 'Edit Action' dialog box is shown. It contains a text area with the instruction: 'To register an action, please select the desired contents.' Below this is a pull-down menu. A note states: 'Note: An Action is an operation which specifies the sending and receiving of data, or the timing of a device's Read/Write.' At the bottom, there is an 'Action Name' field containing 'ACTIONS3', and three buttons: 'Parameter', 'Cancel', and 'Help(H)'. The 'Action Registration' button is circled in red.</p>	
<p>3) Clicking on the [Parameter] button will call up detailed settings for each selected action item.</p>	

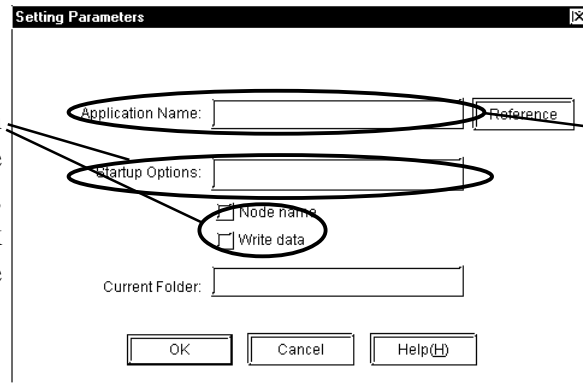
3.4.2 Action Item “Contents”

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.

■ Selecting “Start Application” calls up the following setting screen

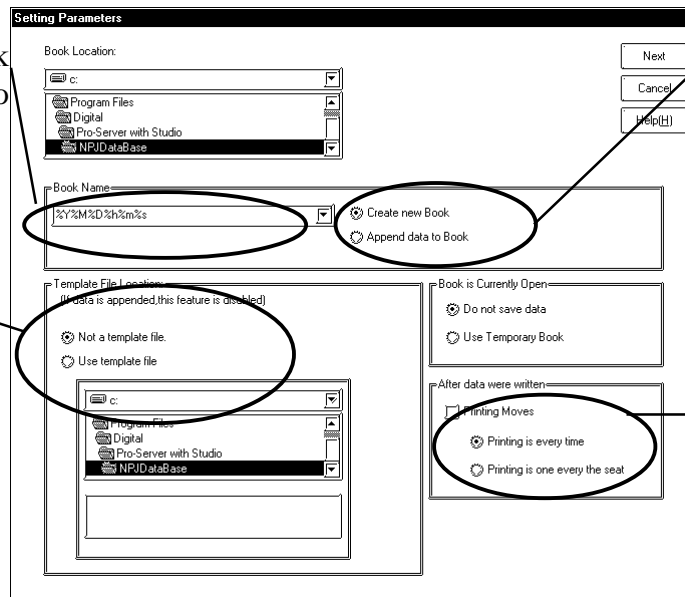
When a start up option or Provider data are used as a parameter, enter the data and click on the appropriate check box.



Enter the name of the application to be started here. This includes any user-created applications as well.

■ Selecting “Write Data to Excel Book” calls up the following setting screen.

Enter the Book Name and Save To location.



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

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.

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

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

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.

Designate the sheet's data write pattern, and the write data's cell range.

Selecting [Time Stamp is Used] will write the Provider's time data.

- The “Alarm Log (with Sound Alert features)” selection operates as follows:

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.

(See next page for explanation of the Alarm Log feature's setting screen)

(Continued from previous page)

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

Table:
Ex. "Temp Alarm_TBL"

WAV Data field:
Ex. "Wav"

mdb File name:
Ex. "Alarm.mdb"

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.

KEY Field: Ex. "Key_Code"

Message Display Field:
Ex. "DISP1, DISP2"

■ Selecting "Upload of GP Log Data" calls up the following setting screen.

Back-up data can be read online from the distribution station SRAM and CF card by designating the read source.

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

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

Save To Folder:
Select the drive and folder used.

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

Save Method:
Select either [Create New Book] or [Append data to Book]
(Clicking on the [Next] button will call up the following page's setting screen.)

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

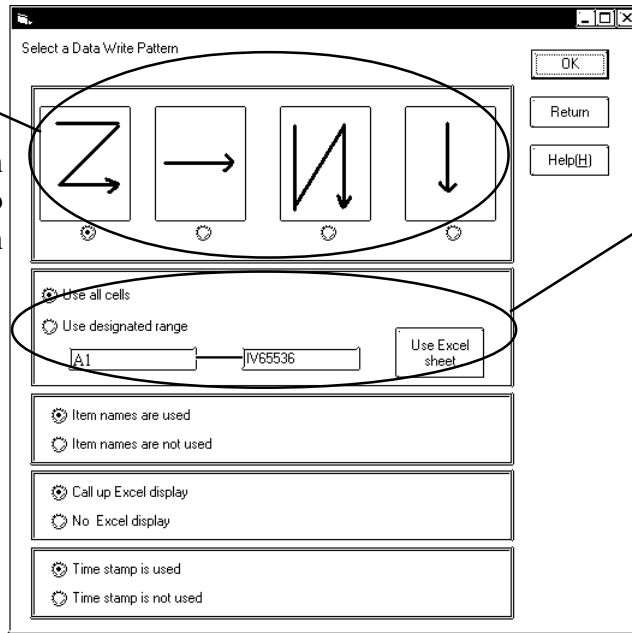
Data type:
Select one of the following items from the pull-down box

- Logging Data
- Trend Graph Data
- Sampling Data
- Alarm History Data
- Alarm Log Data
- Block 1
- Block 2
- Block 3

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

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



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].

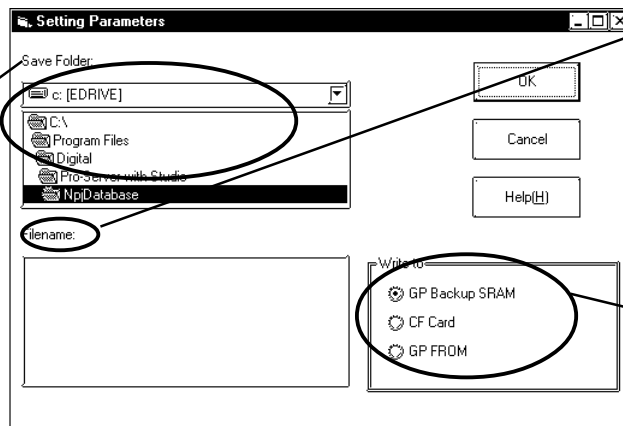
- When “Automatic Download of Filing Data” has been chosen, the following detailed settings are available.

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.

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.

Save Folder:
Designates the write data source file. (drive and folder)



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

Write to:
Designates the write data’s destination.

■ Selecting “Automatic Upload of GP Filing Data” calls up the following setting screen.

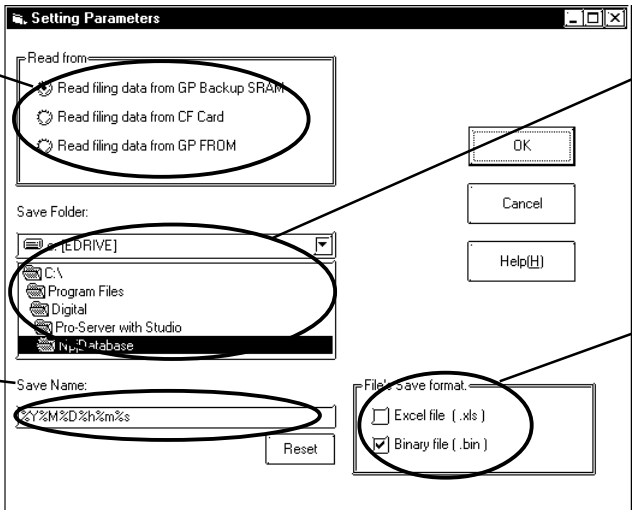
This action item will automatically upload filing data from a Provider’s SRAM area, CF-Card, or internal FROM memory area.



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.

Read from:

Designates the read data source file. (SRAM, CF Card or internal FROM)



Save Name:

(In GP-PRO/PBIII for Windows folder) Designate the filename used.

Default value is % Y % M % D % h % m % s.

Save Folder:

Designates where the write data source file will be saved. (drive and folder)

File Save format:

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



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.

- The “Automatic Upload of Access Data” selection operates as follows:

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)	TBL (database table name)
1		Table 1
2		Table 2
3		Table 3

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

(Database Table Name Ex. “Table 1”)

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

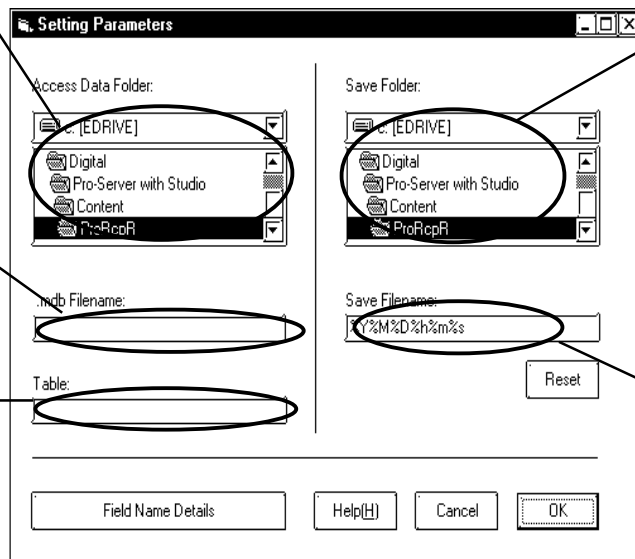
PLC device data is read out according to the data in the table.
Data Structure: Multiple data items are delineated by commas within a single field.

- 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:
Designate the Access file’s save destination.

Save Filename:
Designate the save filename.
Default value is %Y%M%D%h%m%s

- The “Automatic Download of Access Data” selection operates as follows:

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.

(Example of KEY Master Table Type)

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

Node	Symbol	Type	Data	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

Delimited by commas

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

Access Data Folder:
Designate the Access filename (drive and folder)

mdb File name:
Select the desired mdb file.

Table:
Select the desired Table file.

Note:
Be sure to select the mdb file with the KEY Master Table Type data.

- The “Download Recipe Data for Excel” selection operates as follows:

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.

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

- ◆ 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	2	2
Data Type	2	2	2	3
	1	2	3	4
	2	4	4	4
	2	5		
	3	6		
	4	7		
	5			
	7			

 **Note:** Make sure to set provider’s data to 16 bits.

- The “Download Recipe Data for Excel” selection (continued)
After selection, the following setting window will appear.

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].

Book location:
Designate the Excel filename

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

Column change:
Designate the data sheet type to be written.

- The “Writes Data to E-Mail” selection operates as follows:
Mail can be sent without programming. The provider’s data or the message sheet created by Excel can be used as mail contents.

Message Sheet Example of Microsoft Excel

Key_Code	Title	Message
1	Oil pressure down	Oil pressure of device A decreases.
2	Stop operation	Device A stops operation.
3	Temperature rise	The temperature of device A rises.

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.

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.

Title name:
Set when sending a fixed message attached.

■ The “Upload from Database” selection operates as follows:

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

Using Excel, the data will directly be written into the relational database, while, using Access, data will once be saved in file and then be written into the relational database. If Microsoft Access is used, 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.

Sheet/table example of Microsoft Excel/Access (respectively)

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

After selection, the following setting window will appear.

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

- The “Download from Database” selection operates as follows:

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 as Access file and then be written into the specified device address(es).

Sheet/table example of Microsoft Excel/Access (respectively)

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

After selection, the following setting window will appear.

Database Information: Designate required informations to access database server.

File Settings: Designate a file location and a sheet/table name.

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

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

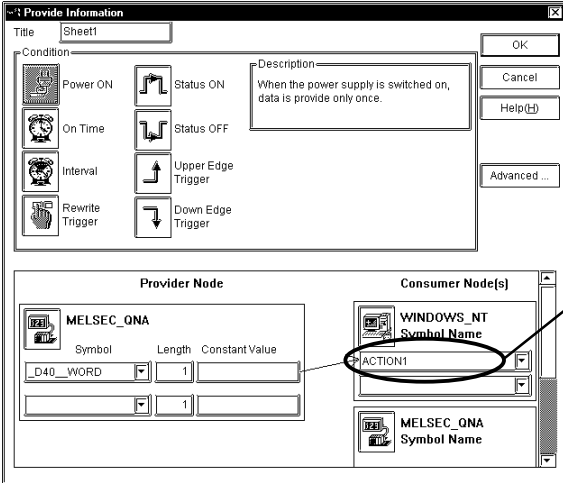
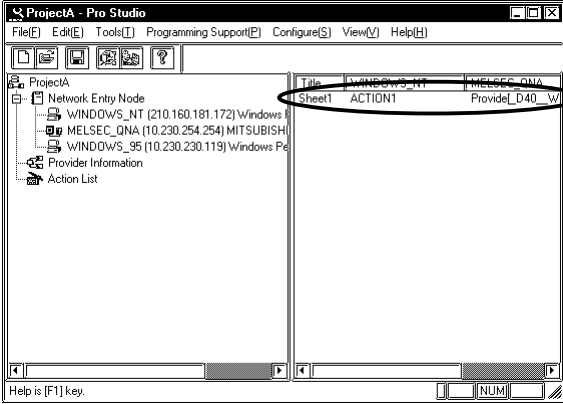
Server setting: Enter the sequential communication time to database server and the number to retry.

Not use in “Data Download from Database”

3.4.3 Action Item Designation

The following description explains how to designate an action item.

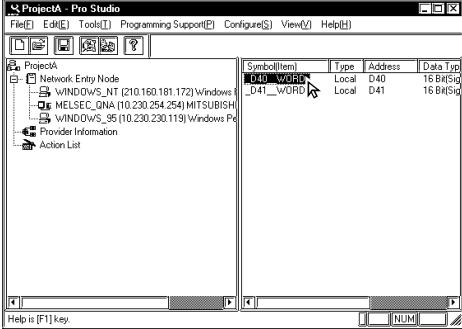
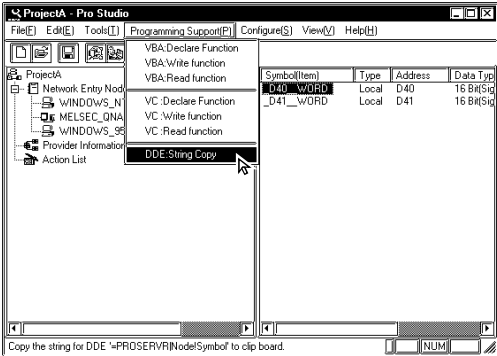
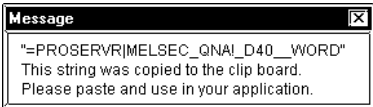
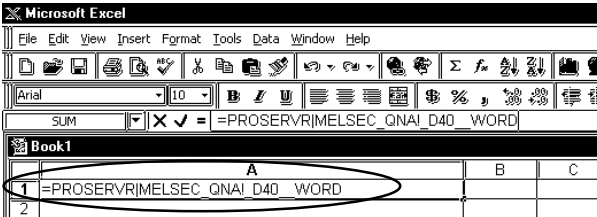
Transfer the Network Project file to the GP unit to make the specific Action effective. Action items can be designated via the [Provide Information] dialog box.

PROCEDURE	REMARKS
<p>1) Designate the Condition and Provider Node Symbol Names. Then, select an action item for the Consumer's symbol name.</p>	<p>An action item can be selected only via the Consumer's Windows computer.</p>
	<p>Reference For the detailed information about entering configuration data, refer to 3.3 Registering Provider Data.</p>
<p>2) Click on the [OK] button, and the action will be added to the Provider information list.</p>	<p>Action items must be registered before they can be used. To register new action items, click on the [Action Registration] button.</p>
	

3.5 Using the DDE Function

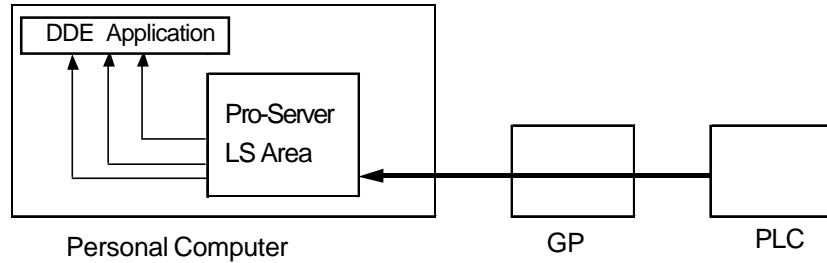
Pro-Server incorporates the DDE server function and therefore can exchange data with applications that support the DDE client function. The following description assumes that the program's main window is open.

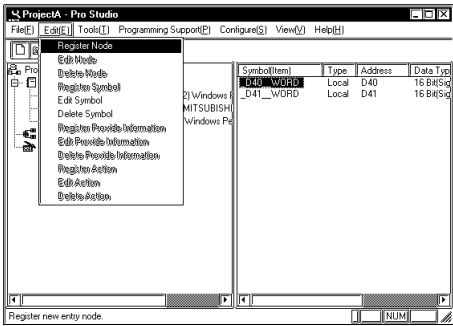
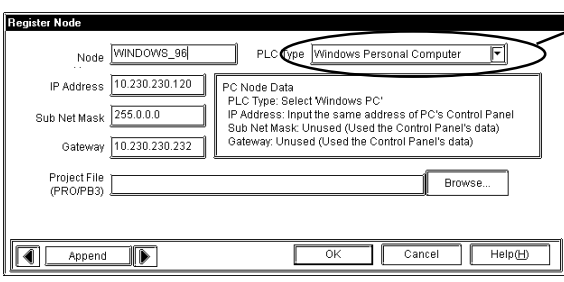
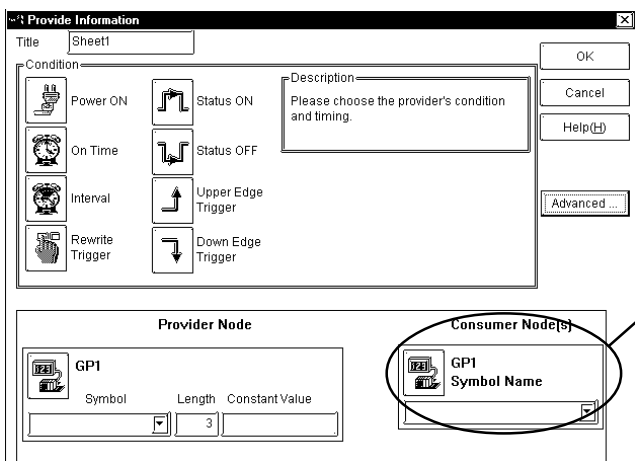
■ DDE: String Copy

PROCEDURE	REMARKS
<p>1) Click on the desired symbol name.</p> 	<p>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.</p> <p>Important 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.</p> <p>Ex.</p> <pre>=PROSERVER GP1!' SYMBOL . *20'</pre> <p>Be sure to put " ' " after "!'".</p> <p>Reference A.1 DDE Function Details.</p> <p>All text copied to the clipboard can be pasted via the [Edit] menu's [Paste] feature, or by pressing [Ctrl] and [V].</p>
<p>2) Click [DDE: String Copy] on the [Programming Support (P)] menu. Or, you can right-click on the symbol name, then select [DDE: String Copy].</p> 	
<p>3) When the following dialog appears you can paste the copied string into any DDE-compatible software.</p> 	
<p>4) Here, the copied string is pasted into an Excel worksheet to create a DDE link.</p> 	

■ When Creating an LS Area inside your PC:

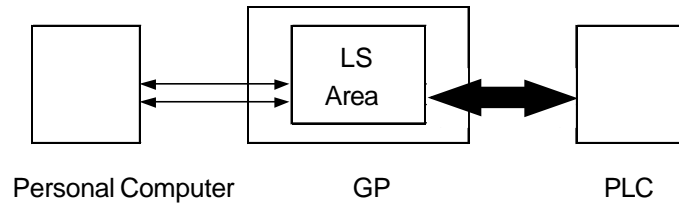
When using the (data) distribution feature, the creation of an internal LS (Pro Server) area inside your PC will allow you to easily read out data periodically from one or more PLCs. The setting of the DDE feature to read out collected data from the LS area will allow the data in the LS area to be refreshed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



PROCEDURE	REMARKS
<p>1) Call up the Register Node feature to register the Host PC.</p>	<p>Reference To Register a Node, refer to 3.1 Registering Network Entry Nodes.</p>
	<p>Designate the Host PC</p>
<p>2) Designate the Host PC.</p>	<p>Reference For detailed Provider information, refer to 3.3 Registering Provider Data.</p>
	<p>Designate the Host PC</p>
<p>3) Enter the settings for the PC's internal LS area.</p>	<p>Designate the PC's internal LS area.</p>
	<p>Designate the PC's internal LS area.</p>

- When Creating an LS Area inside your GP:

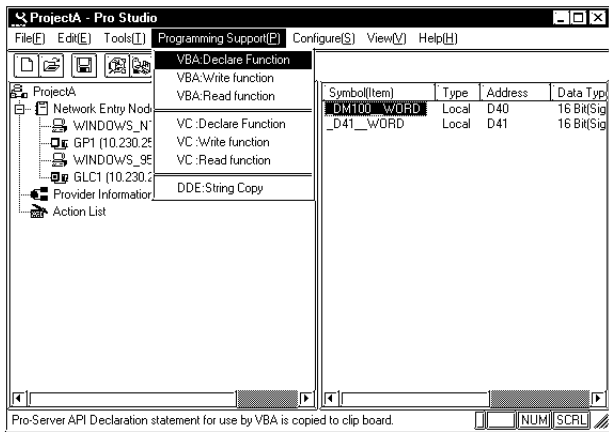
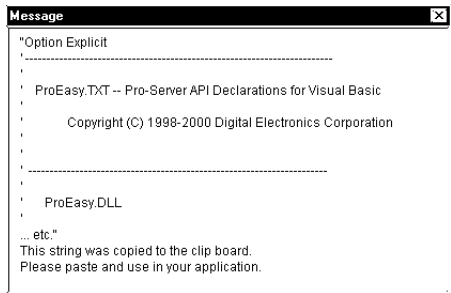
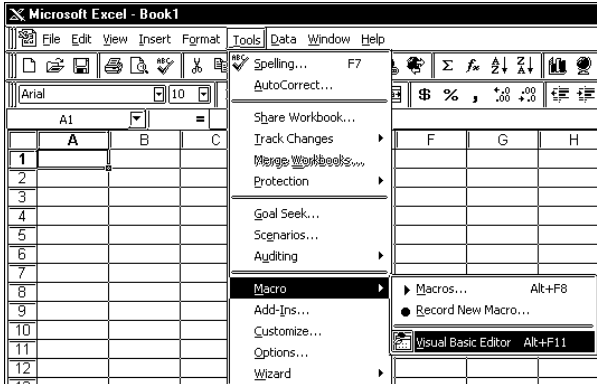
Creating an LS area inside your GP will allow your PC to easily read out data periodically from the GP. The setting of this feature allows data to be read out comparatively faster. This feature also makes data writing comparatively faster.



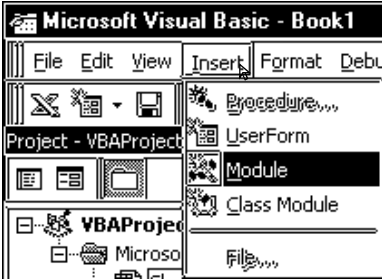
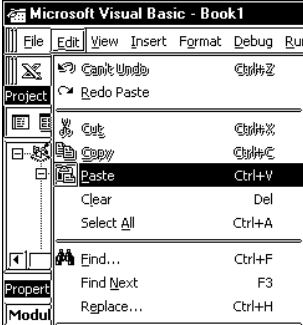
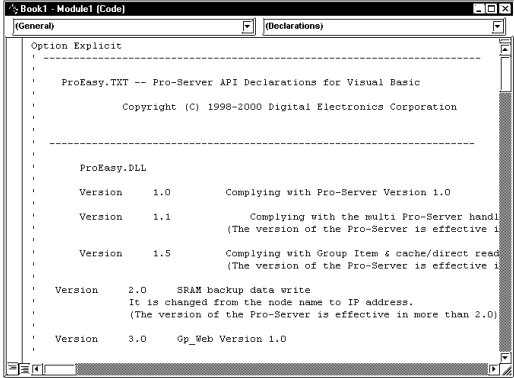
3.6 Using the VBA/VC Support Function

Pro-Server can read and write data both to and from applications supporting VBA and VC using read and write functions. The following procedures explain how to write data from Excel to a designated symbol via a programming support function.

■ VBA: Declare statement

PROCEDURE	REMARKS
<p>1) Selecting [VBA: Declaration statement] from [Programming help].</p> 	<p>Reference</p> <p>When developing applications with VB or VC, refer to A.2: Simple DLL (ProEasy.DLL) function.</p>
<p>2) The declaration is copied to the Clip board.</p> 	
<p>3) Start-up Microsoft Excel. Select [Visual Basic Editor] from the [Tools] menu's [Macro] feature..</p> 	

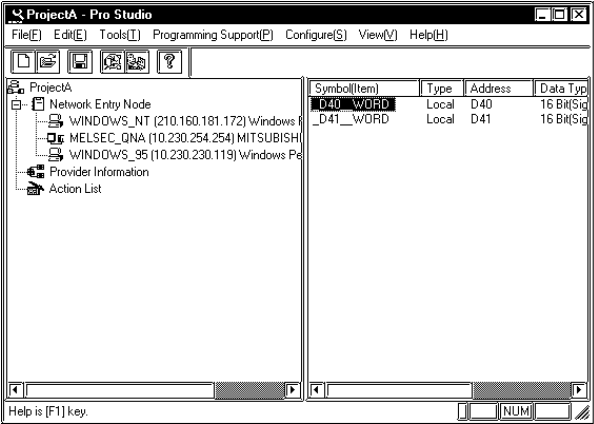
(Continued from the previous page.)

PROCEDURE	REMARKS
<p>4) Select [Standard module] from [Insert] in the Visual Basic Editor.</p>	
 <p>The screenshot shows the Microsoft Visual Basic - Book1 window. The 'Insert' menu is open, and the 'Module' option is highlighted. Other options visible include Procedure..., UserForm, and Class Module.</p>	
<p>5) Paste the declare statement in the inserted standard module.</p>	
 <p>The screenshot shows the Microsoft Visual Basic - Book1 window. The 'Edit' menu is open, and the 'Paste' option is highlighted. Other options visible include Undo, Redo, Cut, Copy, Clear, Select All, Find..., Find Next, and Replace...</p>	
<p>6) This completes function declaration.</p>	
 <p>The screenshot shows the Visual Basic Code Editor window titled 'Book1 - Module1 (Code)'. The 'Declarations' tab is active, displaying the following text:</p> <pre> Option Explicit ----- ProEasy.TXT -- Pro-Server API Declarations for Visual Basic Copyright (C) 1998-2000 Digital Electronics Corporation ----- ProEasy.DLL Version 1.0 Complying with Pro-Server Version 1.0 Version 1.1 Complying with the multi Pro-Server handl (The version of the Pro-Server is effective 1 Version 1.5 Complying with Group Item < cache/direct read (The version of the Pro-Server is effective 1 Version 2.0 SRAM backup data write It is changed from the node name to IP address. (The version of the Pro-Server is effective in more than 2.0) Version 3.0 Gp_Web Version 1.0 </pre>	

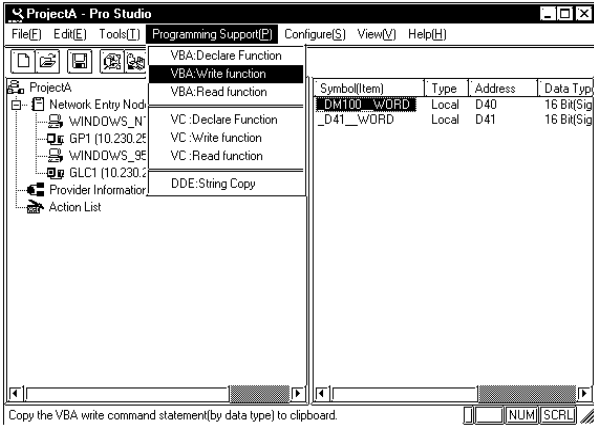
■ VBA: Write Function

PROCEDURE	REMARKS
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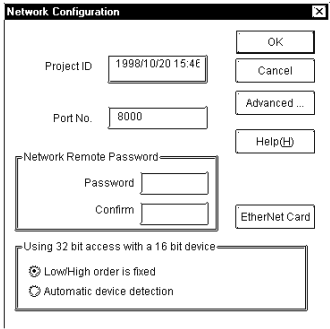
7) Click on the desired symbol name.



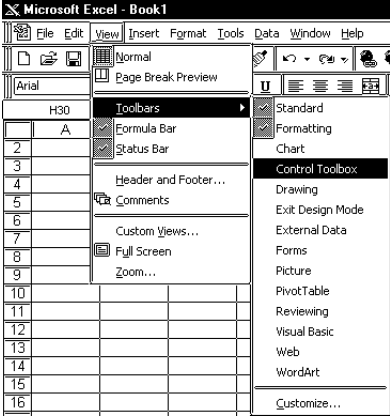
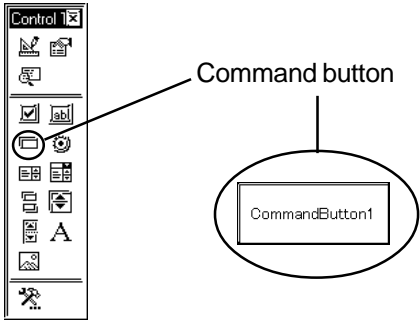
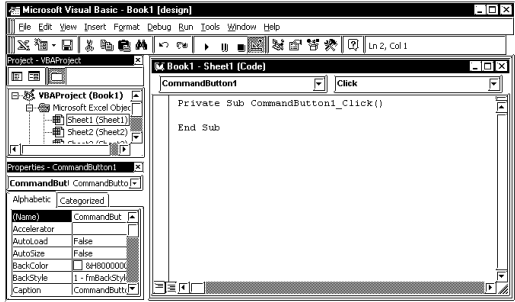
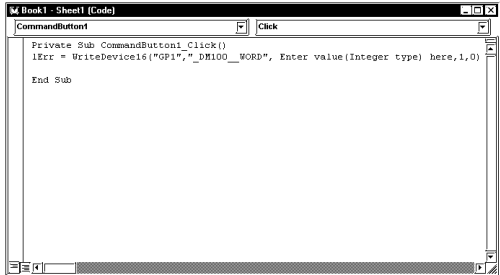
8) Select [Programming Support(P)]'s [VBA: Write function] from the Menu Bar.



9) Write Command is now copied to the Clipboard.



(continued from previous page)

PROCEDURE	REMARKS
<p>10) In Microsoft Excel, select the [Control Toolbox] from the [Views] menu's [Tool bars] feature..</p>	<p>Set the cursor between “Private Sub CommandButton1_Click” and “End Sub”, paste the Command copied at procedure (10).</p>
	
<p>11) Paste the command button onto the sheet.</p>	
	
<p>12) Double click on the button. The following VBA creation screen is displayed.</p>	
	
<p>13) Paste the instruction statement in the program position of the VBA creation screen.</p>	
	

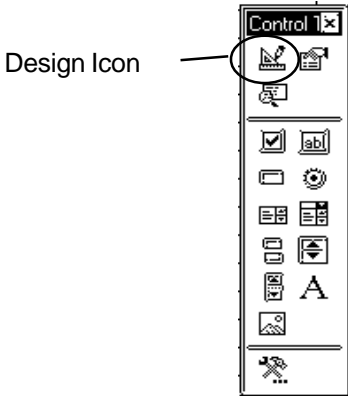
(continued from previous page)

PROCEDURE	REMARKS
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14) Input the value it is wish 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.

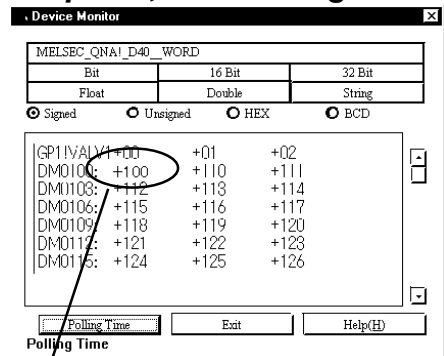


16) Thus, when you click on Excel's Command Button, "100" is written to the PLC symbol's device.



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

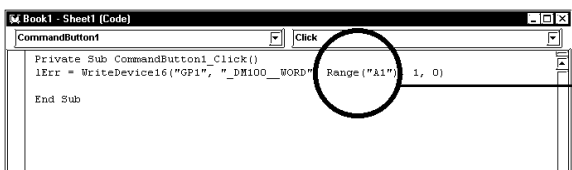
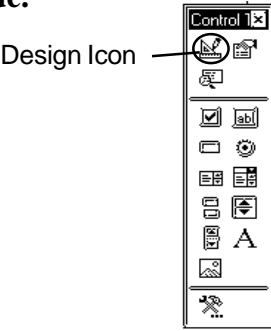
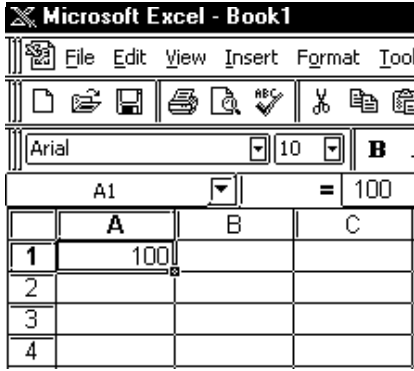
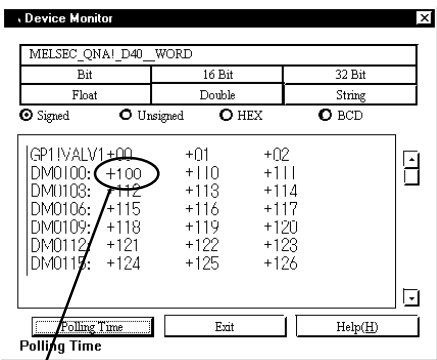
Reference
Chapter 5, "Monitoring".



"100" has been written to the device.

(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 Refer to page 3-25, step 11.

PROCEDURE	REMARKS																																												
<p>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".</p> 	<p>"lErr = WriteDevice16 ("GP1", "_DM100_WORD", Range("A1"), 1, 0)"</p>																																												
<p>2) Click on the [Design] icon to quit the Design Mode.</p> 	<p>The Device Monitor feature allows you to easily check that the data has been written successfully.</p>																																												
<p>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.</p> 	<p>Reference Chapter 5, "Monitoring".</p>  <table border="1" data-bbox="981 1624 1396 1881"> <thead> <tr> <th colspan="4">MELSEC_QNA1_D40_WORD</th> </tr> <tr> <th>Bit</th> <th>16 Bit</th> <th colspan="2">32 Bit</th> </tr> <tr> <th>Float</th> <th>Double</th> <th colspan="2">String</th> </tr> </thead> <tbody> <tr> <td><input checked="" type="radio"/> Signed</td> <td><input type="radio"/> Unsigned</td> <td><input type="radio"/> HEX</td> <td><input checked="" type="radio"/> BCD</td> </tr> <tr> <td>GP1 I/VALV1+00</td> <td>+01</td> <td>+02</td> <td></td> </tr> <tr> <td>DM0100:</td> <td>+100</td> <td>+110</td> <td>+111</td> </tr> <tr> <td>DM0103:</td> <td>+112</td> <td>+113</td> <td>+114</td> </tr> <tr> <td>DM0106:</td> <td>+115</td> <td>+116</td> <td>+117</td> </tr> <tr> <td>DM0109:</td> <td>+118</td> <td>+119</td> <td>+120</td> </tr> <tr> <td>DM0112:</td> <td>+121</td> <td>+122</td> <td>+123</td> </tr> <tr> <td>DM0115:</td> <td>+124</td> <td>+125</td> <td>+126</td> </tr> </tbody> </table>	MELSEC_QNA1_D40_WORD				Bit	16 Bit	32 Bit		Float	Double	String		<input checked="" type="radio"/> Signed	<input type="radio"/> Unsigned	<input type="radio"/> HEX	<input checked="" type="radio"/> BCD	GP1 I/VALV1+00	+01	+02		DM0100:	+100	+110	+111	DM0103:	+112	+113	+114	DM0106:	+115	+116	+117	DM0109:	+118	+119	+120	DM0112:	+121	+122	+123	DM0115:	+124	+125	+126
MELSEC_QNA1_D40_WORD																																													
Bit	16 Bit	32 Bit																																											
Float	Double	String																																											
<input checked="" type="radio"/> Signed	<input type="radio"/> Unsigned	<input type="radio"/> HEX	<input checked="" type="radio"/> BCD																																										
GP1 I/VALV1+00	+01	+02																																											
DM0100:	+100	+110	+111																																										
DM0103:	+112	+113	+114																																										
DM0106:	+115	+116	+117																																										
DM0109:	+118	+119	+120																																										
DM0112:	+121	+122	+123																																										
DM0115:	+124	+125	+126																																										

"100" has been written to the device.

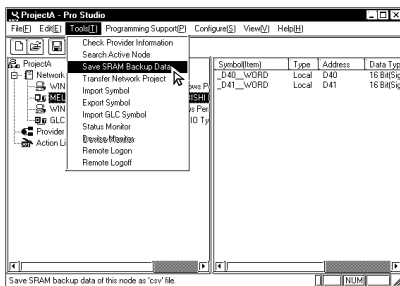
3.7 Saving Backup Data in SRAM

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).

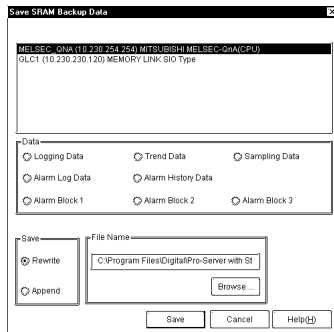
PROCEDURE

REMARKS

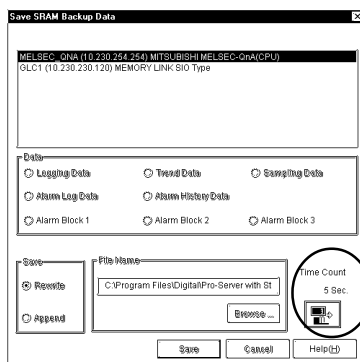
- 1) Click [Save SRAM Backup Data] on the [Tools (T)] menu.



- 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].



- 3) The time elapsed for saving is shown.



Saving time is shown.

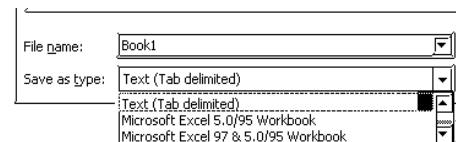
- 4) When the saving process has been completed successfully, the following window appears.



Reference

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

Note: 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 [File type].



3.8 Security Function

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

The following items are included in this function:

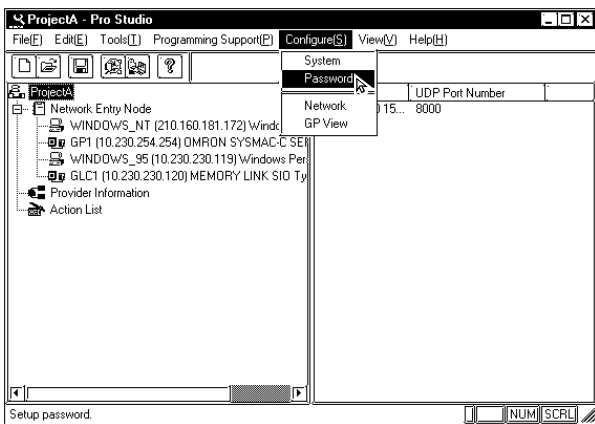
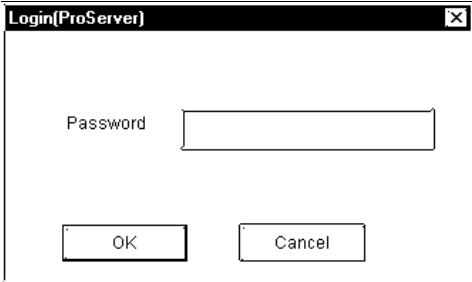
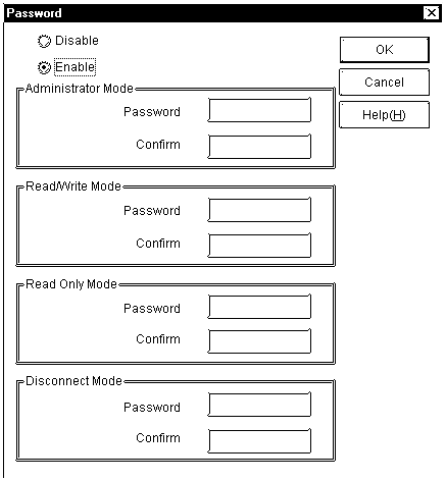
- Passwords to set up user levels (User level password)
- Password to protect accesses from unregistered personal computers (Remote password)

3.8.1 User Level Password Setup

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



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.

PROCEDURE	REMARKS																				
<p>1) Click on [Password] in the [Configure(S)] menu.</p> 	<p>If you enter a password, the following Login window will appear at the start of Pro-Server/Pro-Studio.</p> 																				
<p>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].</p> 	<p>Reference For a detailed explanation of each item, refer to On-line Help.</p> <p>Operations available for each level are as follows:</p> <table border="1"> <thead> <tr> <th>Level</th> <th>Setting change</th> <th>Writing data</th> <th>Reading data</th> </tr> </thead> <tbody> <tr> <td>Administrator</td> <td style="text-align: center;">○</td> <td style="text-align: center;">○</td> <td style="text-align: center;">○</td> </tr> <tr> <td>Read / Write</td> <td style="text-align: center;">x</td> <td style="text-align: center;">○</td> <td style="text-align: center;">○</td> </tr> <tr> <td>Read only</td> <td style="text-align: center;">x</td> <td style="text-align: center;">x</td> <td style="text-align: center;">○</td> </tr> <tr> <td>Disconnect</td> <td style="text-align: center;">x</td> <td style="text-align: center;">x</td> <td style="text-align: center;">x</td> </tr> </tbody> </table> <p>Setting Change: Provider information setting changes, etc.</p> <p>Writing data: Data write via device monitor</p> <p>Reading data: Data read via device monitor</p>	Level	Setting change	Writing data	Reading data	Administrator	○	○	○	Read / Write	x	○	○	Read only	x	x	○	Disconnect	x	x	x
Level	Setting change	Writing data	Reading data																		
Administrator	○	○	○																		
Read / Write	x	○	○																		
Read only	x	x	○																		
Disconnect	x	x	x																		

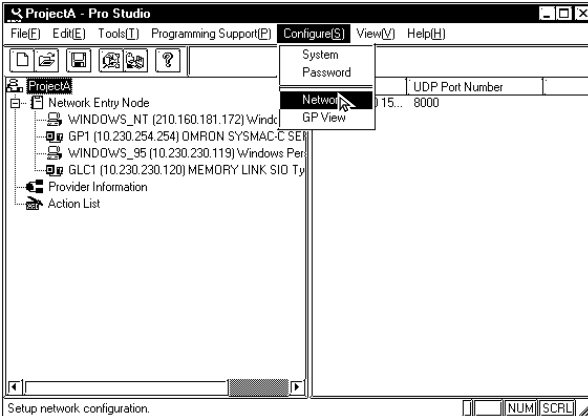
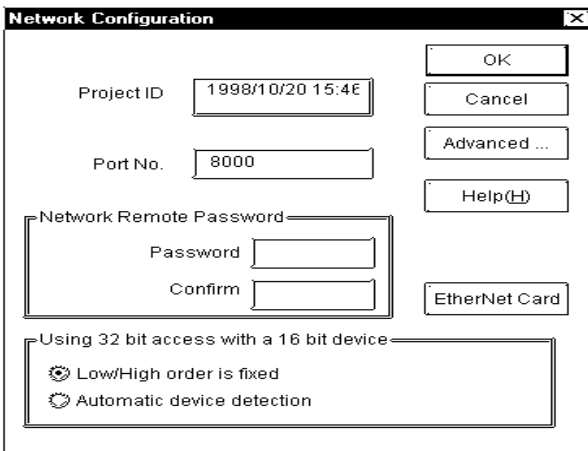

3.8.2 Remote Password Setup

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.

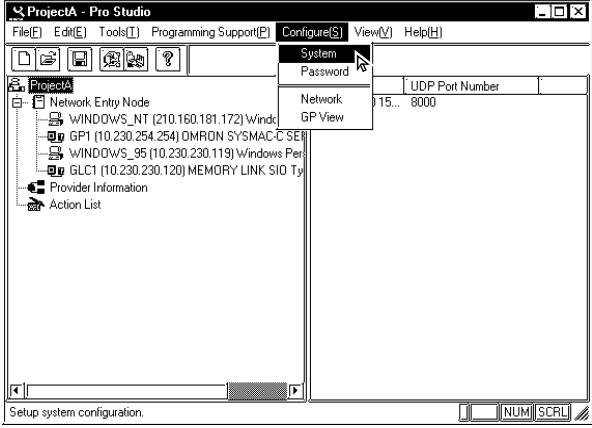
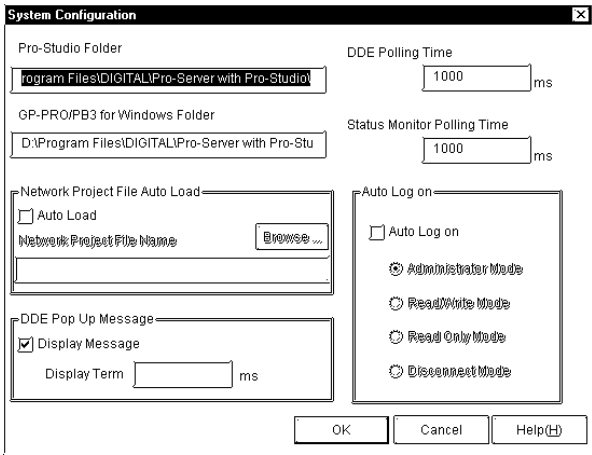


Be sure to write down each registered password. If a password is forgotten, remote access cannot be performed.

PROCEDURE	REMARKS
<p>1) Select [Configure(S)]'s [Network] from the Menu Bar.</p>	
	
<p>2) The [Network Configuration] dialog box will appear. Enter a password in [Network Remote Password] and click on the [OK] button.</p>	<p>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.</p>
	

3.9 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)

PROCEDURE	REMARKS
<p>1) Click on [System] in the [Configure(S)] menu.</p>	<p>[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.</p>
	<p>[GP-PRO/PB 3 for Windows Folder] Designate the folder where GP-PRO/PB III for Windows is installed. The default is "C:/ProPBWin/".</p>
<p>2) The [System Configuration] window will appear. Enter all necessary data and click on [OK].</p>	<p>[Network Project File Auto Load] The designated network project file is loaded automatically when Pro-Server starts.</p>
	<p>Reference For access rights by modes, refer to 3.8.1 Setting the User Level Password.</p> <p>Reference For the detailed information for other items, refer to On-line Help.</p>



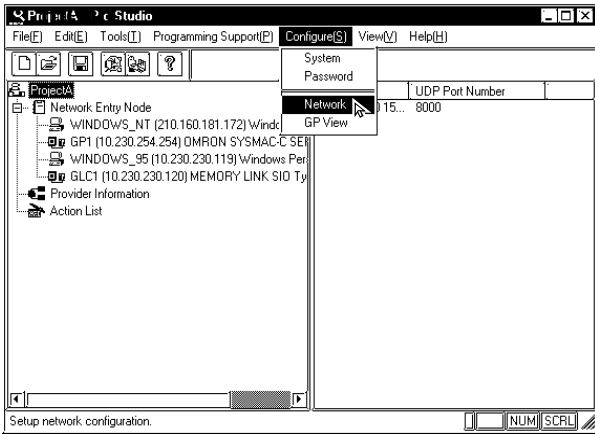
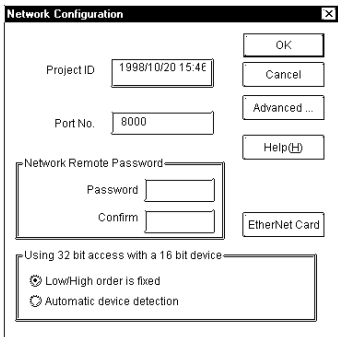
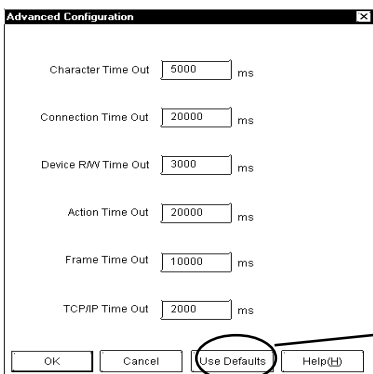
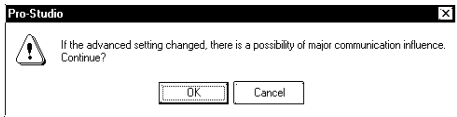
• **<Polling Time>**

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].

3.10 Configuring the Network

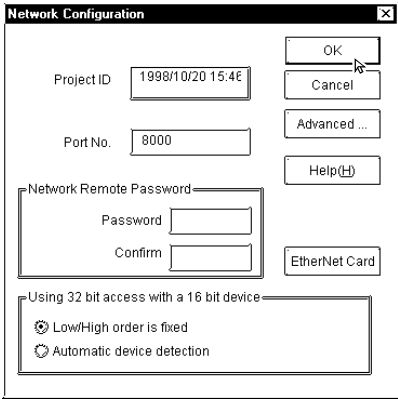
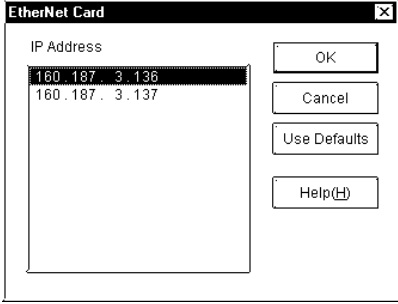
Follow the procedure below to change the Network Port Number setting. The ports to be used should be consecutive ports, beginning with the first port number entered. The default port number setting is “8000”, which uses ports 8000 and 8001. The following description assumes the Pro-Studio main window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

PROCEDURE	REMARKS
<p>1) Click on [Network] in the [Configure(S)]</p> 	
<p>2) The [Network Configuration] window will appear. Enter all necessary data and click on [OK]. To enter advanced settings, click on [Advanced].</p> 	<p>For port numbers, ten numbers in series are used, starting from the designated number.</p> <p>Reference For a remote password through network, refer to 3.8.2. Setting the Remote Password</p> <p>[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.</p>
<p>3) The [Advanced Configuration] window will appear. Enter all necessary data and click on [OK].</p> 	<p>After you have selected an advanced setting, the following message appears.</p>  <p>Reference For a detailed explanation of each item, refer to On-line Help.</p> <p>Clicking [Use Defaults] resets all values to the default values.</p>

3.11 Configuring the 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.

This settings will not function at Windows 95.

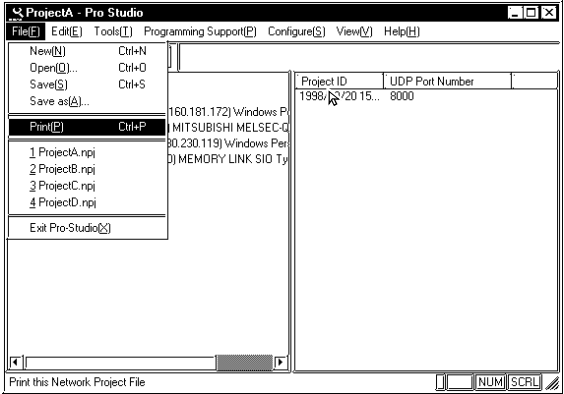
PROCEDURE	REMARKS
<p>1) Select [Configure(s)] menu's [Network Configuration] item.</p>	
	
<p>2) Click on the [Ethernet Card] button. Ethernet Card window will appear.</p>	
	
<p>3) Select the IP address of the card to be used by Pro-Server and then click OK.</p>	<div data-bbox="970 1429 1066 1518" data-label="Image"> </div> <p>important</p> <p><i>After changing the Ethernet card, make sure to restart both Pro-Server and Pro-Studio.</i></p>

3.12 Printing the Setting Data

You can Print some setting data set by Pro-Studio.

The contents to 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)

PROCEDURE	REMARKS
<p>1) Select the [File] menu's [Print] command.</p> 	<p>When no Network Project file (*.npj) is open, a dialog box will appear to ask a target file to print.</p>
<p>2) The default printer will print the data.</p>	<p>Printable paper size is A4 only.</p>

Chapter 4

GP Setup

4.1 Transferring Data to GPs

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.

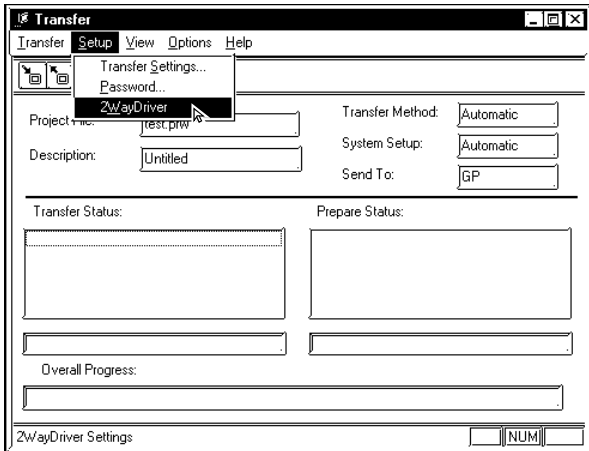
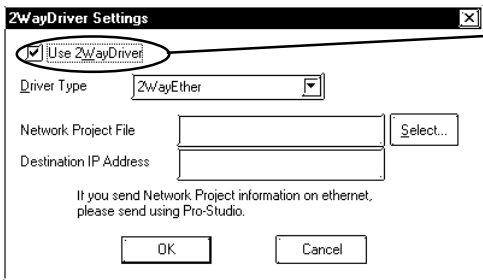
4.1 Transferring Data to GPs

In the GP-PRO/PB III 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/PB III Ver. 3.0 Transfer feature's window is open.

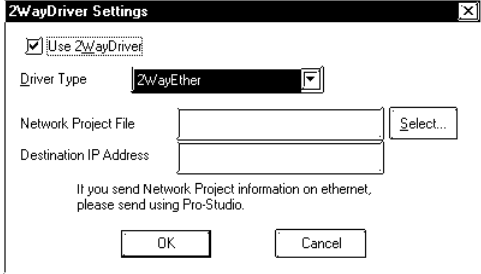
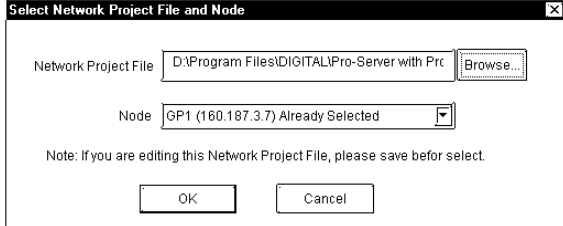
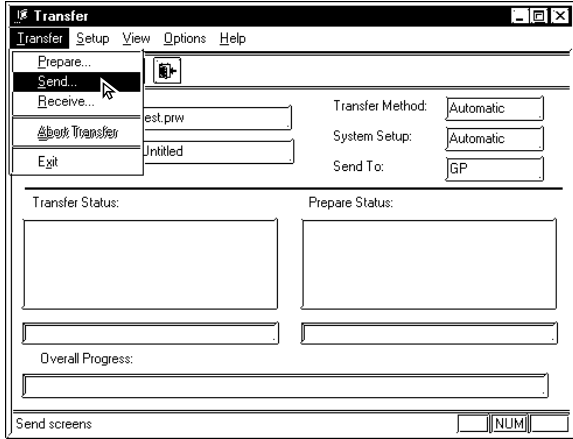
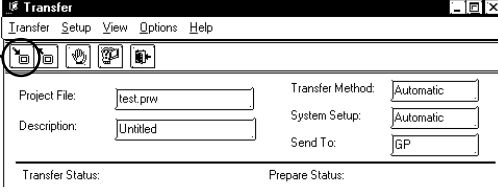


Be sure to first install the 2-Way driver in order to transfer a network project file (*.npj) from the GP-PRO/PB III for Windows to a GP unit.

Reference Refer to 2.1 Installing the Software.

PROCEDURE	REMARKS
<p>1) Click on [2WayDriver] in the [Setup] menu.</p>	<p>Important When transferring the network project file with GP-Pro/PB III for Windows, use the data transfer cable.</p>
	<p>Important 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.</p>
<p>2) Select "TwoWayEther" from the [Driver Type] pull-down list.</p>	<p>Important 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.</p>
	

(Continued from the previous page.)

PROCEDURE	REMARKS
<p>3) Select “TwoWayEther” from the [Driver Type] pull-down list.</p>	
	
<p>4) Select the network project file and the network node to which you wish to transfer the information and then click [OK].</p>	
	
<p>5) Click [Send] on the Transfer menu or the Send Screen button to transfer the information to the GP.</p>	
	
<p>Send Screen button</p>	
<p>6) The transfer is completed if no error message is displayed.</p>	

Chapter 5

Monitoring

5.1 Device Monitoring

5.2 GP Status Monitoring

This chapter explains how to monitor device and status information.

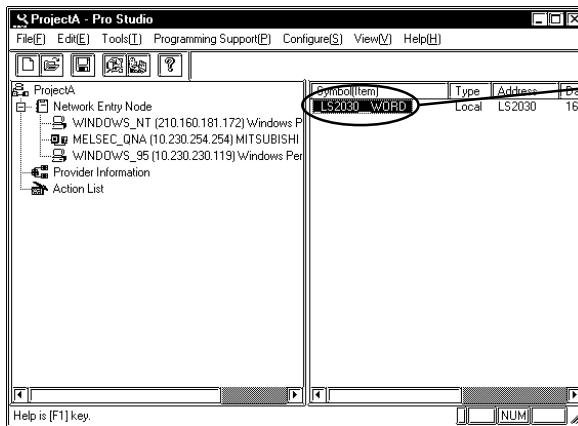
5.1 Device Monitoring

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.

PROCEDURE

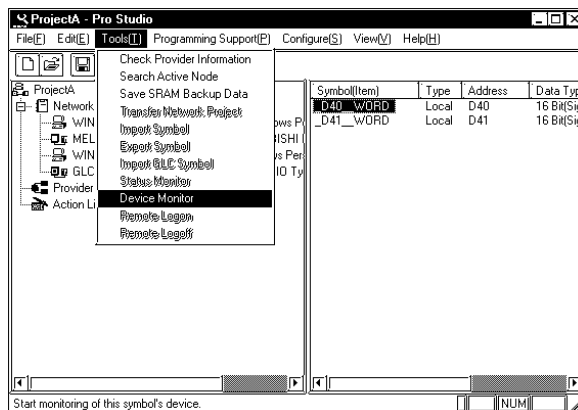
REMARKS

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



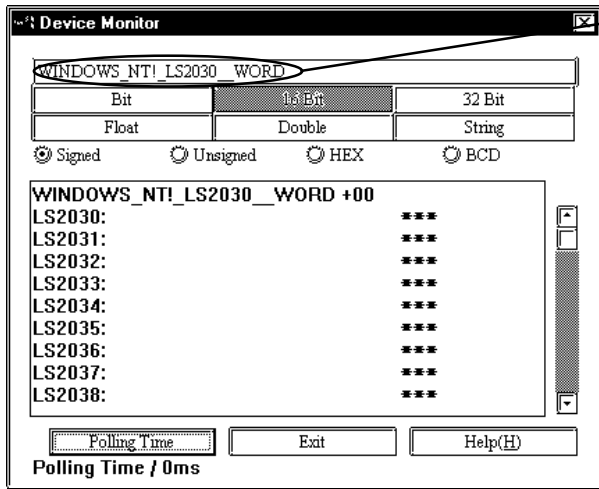
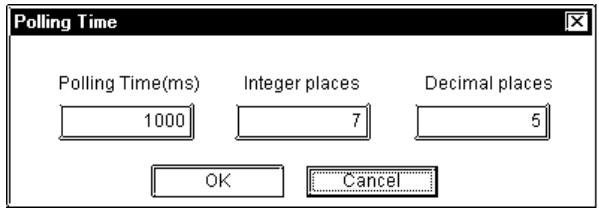
The registered symbol names are listed here.

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



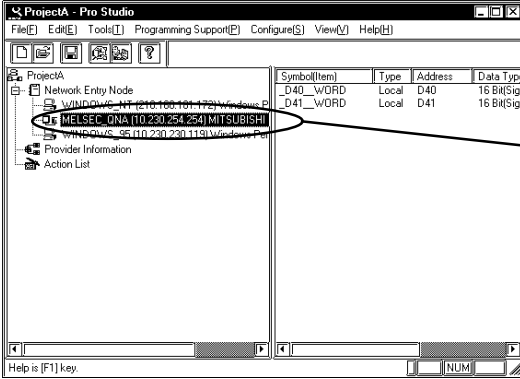
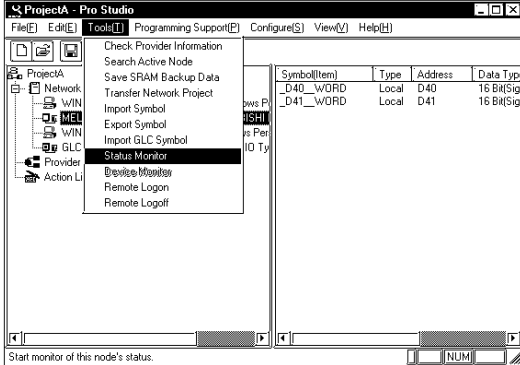
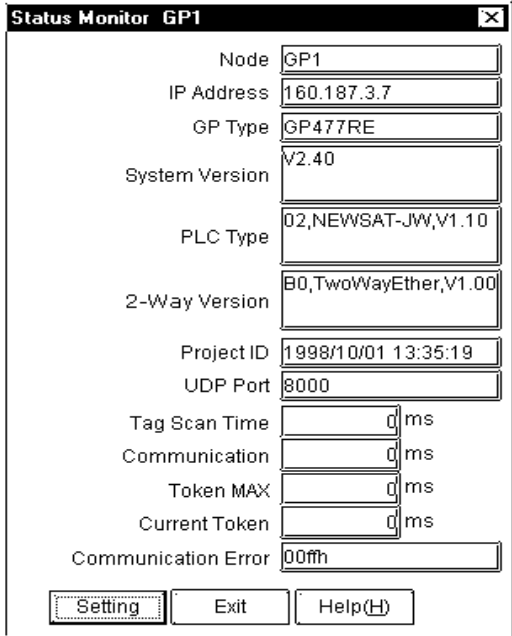
You can right-click the symbol to select [Device Monitor] from the shortcut menu.

(Continued from the previous page.)

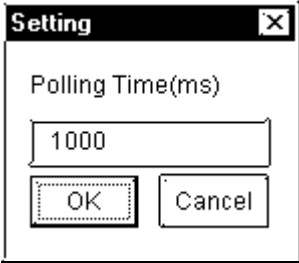
PROCEDURE	REMARKS
<p>3) To change the polling time and the number of displayed decimal places, click on [Polling Time].</p>	<p>You can type in the IP address or device address directly.</p>
	<p>Reference refer to On-line Help.</p>
<p>4) Enter the desired polling time, number of decimal places displayed and then click on [OK].</p>	<p>Note: Up to 15 values can be entered (total of both integer and decimal place values)</p>
	<p>Reference For details of each item, refer to On-line Help.</p>
	<p><PollingTime></p> <p>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.</p> <p>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.</p>

5.2 GP Status Monitoring

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

PROCEDURE	REMARKS
<p>1) Click on the node you wish to monitor.</p>  <p>The network entry nodes are listed.</p>	<p>You can right-click the symbol to select [Status Monitor] from the shortcut menu.</p>
<p>2) Click on [Status Monitor] in the [Tools (T)] menu.</p> 	
<p>3) Monitor the status of the GP. To change the polling time, click [Setting].</p> 	<p>Reference refer to On-line Help.</p>

(Continued from the previous page.)

PROCEDURE	REMARKS
<p>4) Set the polling time and then click [OK].</p>	<p><PollingTime></p> <p>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.</p> <p>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.</p>
	

Chapter 6

Maintenance via Ethernet

6.1 Transferring Network Project Files

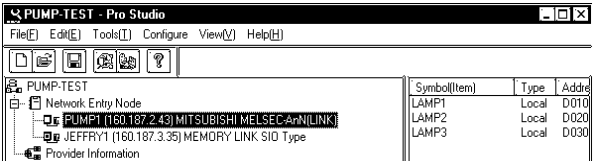
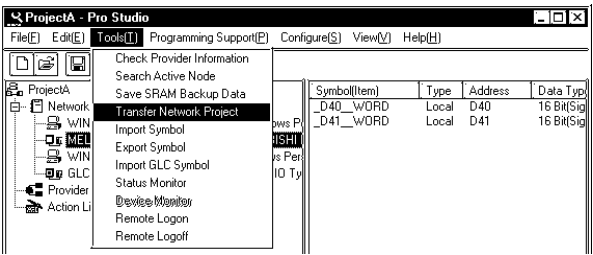
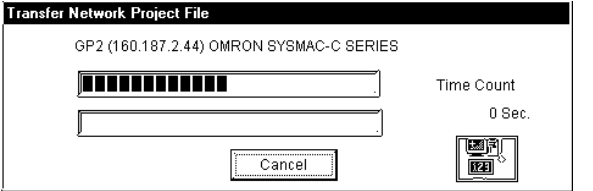
6.2 Transferring Only Updated Screen Data to GPs

6.3 Searching for a Network Node

This chapter explains the maintenance procedures you can perform via the Ethernet network.

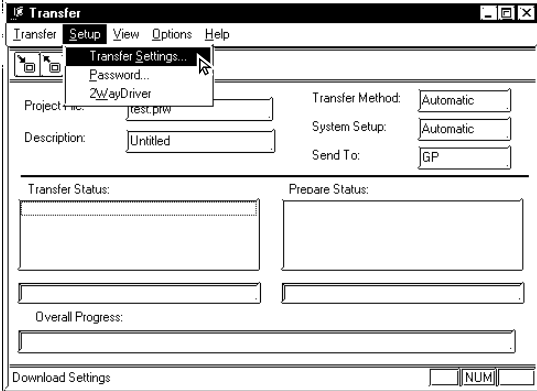
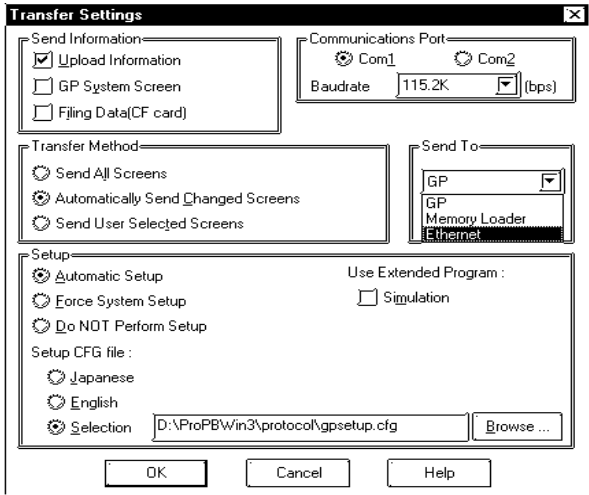

6.1 Transferring Network Project Files

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).

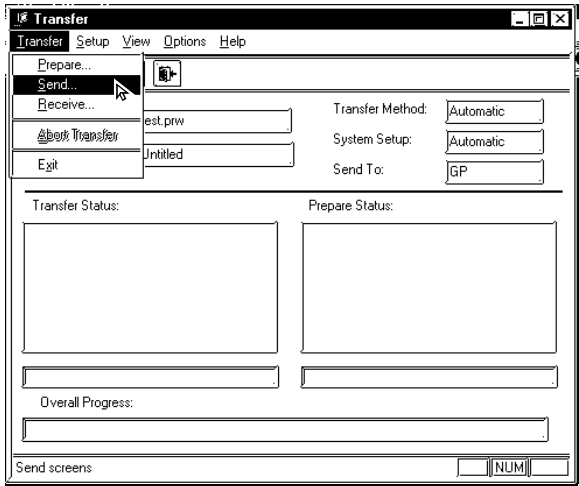
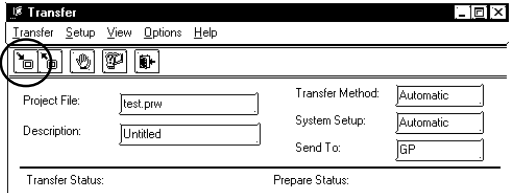
PROCEDURE	REMARKS
<p>1) On the Network Entry Node list, click on the destination GP.</p>	<p>If you are currently editing a network project file, the file must be saved before it can be sent to a GP.</p>
	
<p>2) Click on [Transfer Network Project] in the [Tools (T)] menu.</p>	
	
<p>3) The [Transfer Network Project File] window appears and then the transfer of the network project file begins.</p>	
	

6.2 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.

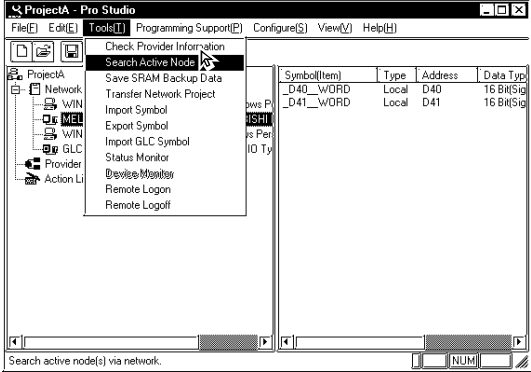
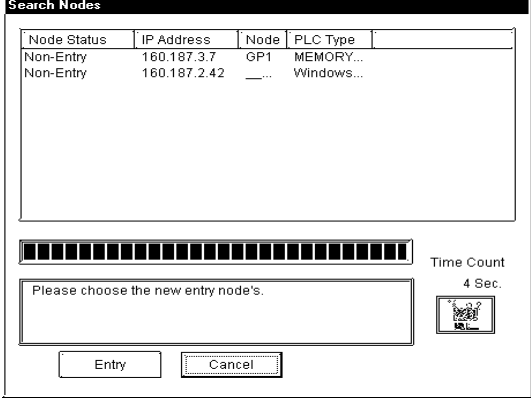
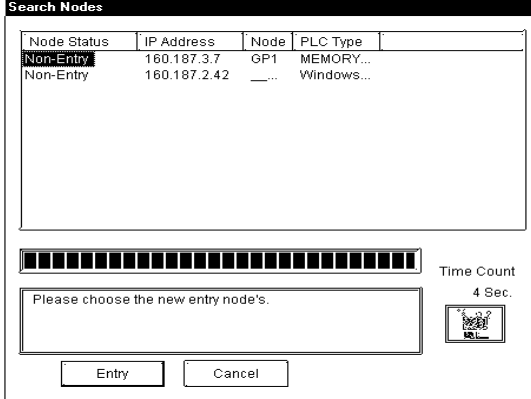
PROCEDURE	REMARKS
<p>1) Click on [Transfer Settings] in the [Setup] menu.</p>	
	
<p>2) When the [Transfer Settings] window appears, click on [Ethernet] in the [Send To] pull-down list and click on [OK].</p>	<p>Ethernet can be used to transfer only the updated screen data to the GPs whose setup has been completed.</p>
	<p>However, set-up via Ethernet is also possible with the GP2000 Series.</p>
	<p>Reference Refer to <i>GP-PRO/PBIII for Windows Help Files</i>.</p>
 <p>Important 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.</p>	

(Continued from the previous page.)

PROCEDURE	REMARKS
<p>3) Click on [Send] in the Transfer menu or on the Send Screen button to transfer the information to the GP.</p>	<p>The GP displays the following information when the screen data is being transferred.</p>
	<p>Receive the application data</p> <p>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.</p>
<p>Send Screen button</p> 	<p>Reference</p> <p>For how to setup a GP for Ethernet, refer to A.5 Setting Up a GP for Ethernet.</p>
	<p>Important From GP-PRO/PBIII for Windows Ver. 4.0, only screen data transfer is required. The Network Project file's data is not sent.</p> <p>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.</p>
	<p>Reference</p> <p>Ch.6.1 Transferring a Network Project</p>

6.3 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)

PROCEDURE	REMARKS											
<p>1) Click on [Search Active Node] in the [Tools (T)] menu.</p>	<p>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.</p>											
												
<p>2) The following dialog box will appear. To register any of the detected nodes, click first on the [Node Status] “Non-Entry” text, then on the [Entry] button.</p>												
 <table border="1" data-bbox="357 1196 858 1384"> <thead> <tr> <th>Node Status</th> <th>IP Address</th> <th>Node</th> <th>PLC Type</th> </tr> </thead> <tbody> <tr> <td>Non-Entry</td> <td>160.187.3.7</td> <td>GP1</td> <td>MEMORY...</td> </tr> <tr> <td>Non-Entry</td> <td>160.187.2.42</td> <td>---</td> <td>Windows...</td> </tr> </tbody> </table>	Node Status	IP Address	Node	PLC Type	Non-Entry	160.187.3.7	GP1	MEMORY...	Non-Entry	160.187.2.42	---	Windows...
Node Status	IP Address	Node	PLC Type									
Non-Entry	160.187.3.7	GP1	MEMORY...									
Non-Entry	160.187.2.42	---	Windows...									
<p>3) The following dialog box will appear to show that the node has been registered.</p>												
 <table border="1" data-bbox="357 1711 858 1899"> <thead> <tr> <th>Node Status</th> <th>IP Address</th> <th>Node</th> <th>PLC Type</th> </tr> </thead> <tbody> <tr> <td>Non-Entry</td> <td>160.187.3.7</td> <td>GP1</td> <td>MEMORY...</td> </tr> <tr> <td>Non-Entry</td> <td>160.187.2.42</td> <td>---</td> <td>Windows...</td> </tr> </tbody> </table>	Node Status	IP Address	Node	PLC Type	Non-Entry	160.187.3.7	GP1	MEMORY...	Non-Entry	160.187.2.42	---	Windows...
Node Status	IP Address	Node	PLC Type									
Non-Entry	160.187.3.7	GP1	MEMORY...									
Non-Entry	160.187.2.42	---	Windows...									

Appendices

- A.1 DDE Function Details**
- A.2 Simple DLL (ProEasy.DLL) Function**
- A.3 OPC Server**
- A.4 Error Messages**
- A.5 GP Ethernet Settings**

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**

ApplicationName 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.

Ex.)

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'

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(.).



<Polling Time>

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" 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.

◆ 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 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.



A sample Pro-Easy.DLL program is included in the Pro-Server with Pro-Studio for Windows CD-ROM.

A.2.1 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.

■ Precautions When Using Threads Other than the Main Thread in Multi-Thread Function

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.
- Before 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.

■ When LPVARIANT Returns an Undefined Error After ProEasy.h Compiles Using Visual C++

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 correct this error, please include `#include<afxdisp.h>` in the `stdafx.h`.

■ 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`.

A.2.2 Read/Write Functions

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 Functions

◆ 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 WriteDeviceDoubleD(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 WriteDeviceStrD(LPCTSTR bsNodeName, LPCTSTR bsDeviceName, LPCTSTR psData, WORD wCount);
- ◆ General-use data
 - INT WINAPI ReadDeviceD(LPCTSTR bsNodeName, LPCTSTR bsDeviceName, LPVOID pData, WORD wCount, WORD wAppKind);
 - INT WINAPI WriteDevice(LPCTSTR bsNodeName, LPCTSTR bsDeviceName, LPVOID pData, WORD wCount, WORD wAppKind);
 - INT WINAPI WriteDeviceD(LPCTSTR bsNodeName, LPCTSTR bsDeviceName, LPVOID pData, WORD wCount, WORD wAppKind);
- ◆ General-use data (for VB)
 - INT WINAPI ReadDeviceVariantD(LPCTSTR bsNodeName, LPCTSTR bsDeviceName, LPVARIANT pData, WORD wCount, WORD wAppKind);
 - INT WINAPI WriteDeviceVariant(LPCTSTR bsNodeName, LPCTSTR bsDeviceName, LPVARIANT pData, WORD wCount, WORD wAppKind);
 - INT WINAPI WriteDeviceVariantD(LPCTSTR bsNodeName, LPCTSTR bsDeviceName, LPVARIANT pData, WORD wCount, WORD wAppKind);

■ Multi-Direct Read/Write Functions

◆ Bit data

```
INT WINAPI ReadDeviceBitDM(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,WORD* pwData,WORD wCount);
```

```
INT WINAPI WriteDeviceBitM(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,WORD* pwData,WORD wCount);
```

```
INT WINAPI WriteDeviceBitDM(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,WORD* pwData,WORD wCount);
```

◆ 16 bit data

```
INT WINAPI ReadDevice16DM(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,WORD* pwData,WORD wCount);
```

```
INT WINAPI WriteDevice16M(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,WORD* pwData,WORD wCount);
```

```
INT WINAPI WriteDevice16DM(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,WORD* pwData,WORD wCount);
```

◆ 32 bit data

```
INT WINAPI ReadDevice32DM(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,DWORD* pdwData,WORD wCount);
```

```
INT WINAPI WriteDevice32M(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,DWORD* pdwData,WORD wCount);
```

```
INT WINAPI WriteDevice32DM(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,DWORD* pdwData,WORD wCount);
```

◆ 16 bit BCD data

```
INT WINAPI ReadDeviceBCD16DM(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,WORD* pwData,WORD wCount);
```

```
INT WINAPI WriteDeviceBCD16M(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,WORD* pwData,WORD wCount);
```

```
INT WINAPI WriteDeviceBCD16DM(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,WORD* pwData,WORD wCount);
```

◆ 32 bit BCD data

```
INT WINAPI ReadDeviceBCD32DM(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,DWORD* pdwData,WORD wCount);
```

```
INT WINAPI WriteDeviceBCD32M(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,DWORD* pdwData,WORD wCount);
```

```
INT WINAPI WriteDeviceBCD32DM(HANDLE hProServer,LPCTSTR bsNode  
Name,LPCTSTR bsDeviceName,DWORD* pdwData,WORD wCount);
```

- ◆ Single precision floating-point data
 - INT WINAPI ReadDeviceFloatDM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,FLOAT* pflData,WORD wCount);
 - INT WINAPI WriteDeviceFloatM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,FLOAT* pflData,WORD wCount);
 - INT WINAPI WriteDeviceFloatDM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,FLOAT* pflData,WORD wCount);
- ◆ Double precision floating-point data
 - INT WINAPI ReadDeviceDoubleDM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,DOUBLE* pdbData,WORD wCount);
 - INT WINAPI WriteDeviceDoubleM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,DOUBLE* pdbData,WORD wCount);
 - INT WINAPI WriteDeviceDoubleDM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,DOUBLE* pdbData,WORD wCount);
- ◆ String data
 - INT WINAPI ReadDeviceStrDM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,LPTSTR psData,WORD wCount);
 - INT WINAPI WriteDeviceStrM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,LPCTSTR psData,WORD wCount);
 - INT WINAPI WriteDeviceStrDM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,LPCTSTR psData,WORD wCount);
- ◆ General-use data
 - INT WINAPI ReadDeviceDM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,LPVOID pData,WORD wCount,WORD wAppKind);
 - INT WINAPI WriteDeviceM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,LPVOID pData,WORD wCount,WORD wAppKind);
 - INT WINAPI WriteDeviceDM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,LPVOID pData,WORD wCount,WORD wAppKind);
- ◆ General-use data (for VB)
 - INT WINAPI ReadDeviceVariantDM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind);
 - INT WINAPI WriteDeviceVariantM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind);
 - INT WINAPI WriteDeviceVariantDM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind);

If a device has been read from once using the cache read function, the Pro-Server will subsequently perform automatic polling, and the second and subsequent read-outs will return at high speed. The polling cycle is the cycle at symbol storage, and is one second if the device address is directly designated.

■ Cache Read Functions

◆ Bit data

```
INT WINAPI ReadDeviceBit(LPCTSTR bsNodeName,LPCTSTR  
bsDevice Name,WORD* pwData,WORD wCount);
```

◆ 16 bit data

```
INT WINAPI ReadDevice16(LPCTSTR bsNodeName,LPCTSTR  
bsDevice Name,WORD* pwData,WORD wCount);
```

◆ 32 bit data

```
INT WINAPI ReadDevice32(LPCTSTR bsNodeName,LPCTSTR  
bsDevice Name,DWORD* pdwData,WORD wCount);
```

◆ 16 bit BCD data

```
INT WINAPI ReadDeviceBCD16(LPCTSTR  
bsNodeName,LPCTSTR bsDevice Name,WORD* pwData,WORD  
wCount);
```

◆ 32 bit BCD data

```
INT WINAPI ReadDeviceBCD32(LPCTSTR  
bsNodeName,LPCTSTR bsDevice Name,DWORD*  
pdwData,WORD wCount);
```

◆ Single precision floating-point data

```
INT WINAPI ReadDeviceFloat(LPCTSTR bsNodeName,LPCTSTR  
bsDevice Name,FLOAT* pflData,WORD wCount);
```

◆ Double precision floating-point data

```
INT WINAPI ReadDeviceDouble(LPCTSTR  
bsNodeName,LPCTSTR bsDevice Name,DOUBLE*  
pdbData,WORD wCount);
```

◆ String data

```
INT WINAPI ReadDeviceStr(LPCTSTR bsNodeName,LPCTSTR  
bsDevice Name,LPTSTR psData,WORD wCount);
```

◆ General-use data

```
INT WINAPI ReadDevice(LPCTSTR bsNodeName,LPCTSTR  
bsDevice Name,LPVOID pData,WORD wCount,WORD
```

■ Multi-Cache Read Functions

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 bsNode Name,LPCTSTR bsDeviceName,WORD* pwData,WORD wCount);

◆ 16 bit data

INT WINAPI ReadDevice16M(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,WORD* pwData,WORD wCount);

◆ 32 bit data

INT WINAPI ReadDevice32M(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,DWORD* pdwData,WORD wCount);

◆ 16 bit BCD data

INT WINAPI ReadDeviceBCD16M(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,WORD* pwData,WORD wCount);

◆ 32 bit BCD data

INT WINAPI ReadDeviceBCD32M(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,DWORD* pdwData,WORD wCount);

◆ Single precision floating-point data

INT WINAPI ReadDeviceFloatM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,FLOAT* pflData,WORD wCount);

◆ Double precision floating-point data

INT WINAPI ReadDeviceDoubleM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,DOUBLE* pdbData,WORD wCount);

◆ String data

INT WINAPI ReadDeviceStrM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,LPTSTR psData,WORD wCount);

◆ General-use data

INT WINAPI ReadDeviceM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,LPVOID pData,WORD wCount,WORD wAppKind);

◆ General-use data (for VB)

INT WINAPI ReadDeviceVariantM(HANDLE hProServer,LPCTSTR bsNode Name,LPCTSTR bsDeviceName,LPVARIANT pData,WORD wCount,WORD wAppKind);

Appendices

<Return value>

Normal termination: 0

Abnormal termination: Error code (Refer to the attached table.)

<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: "GP"

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	16 Bit		32 Bit		Float	Double	String
		S/U/HEX	BCD	S/U/HEX	BCD			
XXXDeviceBit	0	-	-	-	-	-	-	-
XXXDevice16	-	0	-	-	-	-	-	-
XXXDevice32	-	-	-	0	-	-	-	-
XXXDeviceBCD16	-	-	0	-	-	-	-	-
XXXDeviceBCD32	-	-	-	-	0	-	-	-
XXXDeviceFloat	-	-	-	-	-	0	-	-
XXXDeviceDouble	-	-	-	-	-	-	0	-
XXXDeviceStr	-	-	-	-	-	-	-	0
XXXDevice	0	0	0	0	0	0	0	0

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.

A.2.3 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);

<Return value>

Normal termination: 0

Illegal termination: Error code

<Arguments>

<u>sDBName</u>	<u>Pointer to the path name and file name (string) of the network project file</u>
<u>dwSetOrAdd</u>	<u>Reserved (Fixed to 1)</u>

■ 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>

<u>iErrorCode</u>	<u>Simple DLL error code</u>
<u>osErrorMessage</u>	<u>Pointer to the storage area for the converted string (Secure storage area of 512 bytes or more)</u>

Reference A. 4.1 Pro-Server with Pro-Studio for Windows Error Messages

Appendices

■ 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 (Refer to the attached table.)

<Arguments>

sSaveFileName Pointer to the path name and file name (string) of the destination 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 EasyBackupDataWrite(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: Any other value (refer to the separate Error Code listing)

■ 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 A.2.1 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 A.2.1 Precautions When Using Functions

Appendices

Example of using the EasyDLL's VB to create data:

<Declaration>

```
Private Declare Function ReadDevice16 Lib "ProEasy.DLL"  
(ByVal bsNodeName As String, ByVal bsDeviceName As String,  
ByRef pwData As Integer, ByVal wcount As Integer) As Long
```

<Variable string>

```
Dim Data1 As Integer  
Dim Node As String  
Dim Device As String
```

```
Private Sub Read_click()
```

```
Node=ReadNode.Text  
Device=ReadDevice.Text
```

The data input into the text box created with VB is used for the Node and Device Address.

```
IErr=ReadDevice16(Node,Device,Data1,1) ————— Read Variable  
| |  
Node Device Address  
End Sub  
(a symbol can be used to reference this data directly)
```

Example of using the EasyDLL's VB to create data:

```
Private Sub CommandButton1_Click()  
Dim data As String * 256 ————— designates size  
data = "String_data"  
IErr = WriteDeviceVariant("PC", "_LS0010_STRING", data, 11, 0)  
End Sub
```

A.3 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 synchronously 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 acknowledge 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



OPC cannot be used on the Windows 95/98 system.

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,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

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")



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.OPCIODRV. 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)

■ 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.

VT_I4 4-byte real number type

VT_I2 2-byte real number type

VT_UI2 2-byte no-code integer type

VT_UI4 4-byte no-code integer type

VT_R4 4-byte real number type

VT_R8 8-byte real number type

VT_BSTR String type

VT_BOOL BOOL type

■ Interface

Interfaces that this software's OPC server supports are as follows:

○: Supported ✕: Not supported

Object	Interface	Method	Status	Remark
OPCServer	IOPCServer	AddGroup	○	
		GetErrorString	○	
		GetGroupByName	○	
		GetStatus	○	
		RemoveGroup	○	
	IOPCServerPublicGroups (Optional)	CreateGroupEnumerator	○	
		GetPublicGroupByName	✕	
		RemovePublicGroup	✕	
	IOPCBrowseServerAddressSpace (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	✕	
		SaveCompleted	✕	
	IOPCItemProperties	GetCurFile	✕	
		QueryAvailableItemProperties	○	
		GetItemProperties	○	
LookupItemID		○		
OPCGroup	IOPCGroupStateMgt	GetState	○	
		SetState	○	
		SetName	○	
		CloneGroup	○	
	IOPCPublicGroupsStateMgt (Optional)	GetState	✕	
		MoveToPublic	✕	
	IOPCSyncIO	Read	○	
		Write	○	
	IOPCAsyncIO (Optional)	Read	○	
		Write	○	
		Refresh	○	
	IOPCAsyncIO2	Cancel	○	
		Read	○	
		Write	○	
		Refresh	○	
		Cancel2	○	
		SetEnable	○	
	IOPCItemMgt	GetEnable	○	
		AddItems	○	
		ValidateItems	○	
		RemoveItems	○	
		SetActiveState	○	
		SetClientHandles	○	
		SetDatatypes	○	
	IDataObject (Optional)	CreateEnumerator	○	
		Dadvise	○	
	IConnectionPointContainer	Dunadvise	○	
		EnumConnectionPoints	○	
	IConnectionPoint	FindConnectionPoints	○	
		GetConnectionInterface	○	
		GetConnectionPointContainer	○	
		Advise	○	
		Unadvise	○	
IEnumOPCItemAttributes	EnumConnections	○		
	Next	○		
	Skip	○		
	Reset	○		
	Clone	○		
IEnumString	Next	○		
	Skip	○		
	Reset	○		
	Clone	○		
IEnumUnknown	Next	○		
	Skip	○		
	Reset	○		
	Clone	○		

A.4 Error Messages

A.4.1 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	Message	Meaning
	Hex.	
9300	2454h	Cannot find network project file.
9301	2455h	Reserved
:	:	
9329	2471h	
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	Reserved
:	:	
9339	247Bh	
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.

Error Code	Message	Meaning
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.
9371 : 9399	249Bh : 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 : 9419	24BFh : 24CBh	Reserved
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 : 9449	24D2h : 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.
9462	24F6h	The specified lifetime is invalid.
9463 : 9499	24F7h : 251Bh	Reserved

Error Code	Message	Meaning
Decimal	Hex.	
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	Reserved
:	:	
9599	257Eh	
9660	25BCh	Data Read failed.
9661	25BDh	Reserved
:	:	
9699	25E3h	
9700	25E4h	Received the first trigger establish command for non-existing provider information.
9701	25E5h	Reserved
:	:	
9709	25EDh	
9710	25EEh	Received the second trigger establish command for non-existing provider information.
9711	25EFh	Reserved
:	:	
9729	2601h	
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.)
9735	2607h	Reserved
:	:	
9739	260Bh	
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.)

Reference For information about 2580h, 25A8h, 25A9h, refer to **A.4.2 2-Way Driver Error Messages and Syslog Features**

(Continued from previous page)

Error Code	Message	Meaning
9744	2610h	SRAM backup data read error. (The requested data amount is 0 or differs from the previous amount.)
9745 : 9779	2611h : 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)

A.4.2 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.

Syntax: 2Way ERROR(<Cause No.>:<Error No. 1>:<Error No. 2>:<Error No. 3>)

Reason Code	Error Type	Error No.			Reason
		1	2	3	
30	Fatal	Unused	Unused	Unused	Insufficient GP resources.
31	Fatal	Unused	Unused	Unused	Cannot release GP resources
32	Fatal	Unused	Unused	Unused	Cannot release GP resources
40	Fatal	Unused	Unused	Unused	IP address & Port number are not registered.
41	Fatal	Unused	Unused	Unused	The symbol state is different than GLC control.
51	Fatal	Unused	Unused	Refer to protocol stack error codes	Protocol Stack Call up error.
F0	Warning	0	Unused	2580	After transmit command was sent, Device Read was ignored due to insufficient Receiver memory.
		0	Unused	25A8	After transmit command was sent, Receiver unable to find data.
		0	Unused	25A9	After transmit command (with reply) was sent, no reply was received from Receiver.
		1	Refer to each PLC's error code list		After transmit command was sent, Receiver was unable to write to device.

◆ 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.
32	No response from the Receiver.



- *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> <Argument 1>
DEBUG	Device Read	gp[17]: rdev: <Argument 2>
DEBUG	Device Write	gp[17]: wdev: <Argument 2>
DEBUG	Command Received	gp[17]: bel: <Command Text1>, recv from <IP address>(<port>)<Argument 3>
DEBUG	Command Sent	gp[17]: bel: <Command Text2>, send to <IP address>(<port>)<Argument 3>
DEBUG	s201 File Read	gp[17]: bel: <Command Text3> <Argument 4> 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.

Argument 1 (<String> = <Value>)

String	Value	Value display format
err	Error No.	Hex.
pr	ProjectID	Hex.
ow	OwnerApp	Hex.
ma	MajorNo	Hex.
mi	MinorNo	Hex.

Argument 2 (<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.

Argument 3 (<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.

Argument 4 (<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.5 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.



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.

SUBNETMASK

If unused, enter all zeroes here.

MYPORTNO.

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	[]		

HOST IP ADDRESS

IP Address for the SYSLOG destination output. (Where GP SYSLOG.EXE is running.)

FACILITY

Designate the facility.

(Setting range: 0 to 23, Default value: 1)

OUTPUTLEVEL

Designate the output level.

(Setting range: 0 to 4, Default value: 0)

[3] OTHERS SETUP

OTHERS SETUP			PREVIOUS	NEXT
BUZZER ON ERROR	ON	OFF		
DISPLAY WARNING	ON	OFF		

BUZZERONERROR

Buzzer sounds when a 2-Way Driver error occurs.

(Default value: ON)

DISPLAYWARNING

This screen designates if warning messages are displayed on the GP's screen.