Remote RAS Feature
Installation Guide

This feature is used together with the Pro-Server (separately sold) software on a Server PC. It allows remote monitoring/control of Pro-face's panel-type industrial computers (hereafter referred to as the "PL".) via the System Monitor/RAS feature.

! Important *This software has versions for each series PL unit. Be sure to check that the version you have selected is correct before installing this software.*

For how to install the software ▼Reference◢ *3. Installation*

Corresponding PL units : PL-5900 Series, PL-X920 Series

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Pro-face : Digital Electronics Corporation
(in Japan and other counties)
MS-DOS®, Visual Basic®, Visual C++® : Microsoft Corporation (USA)

The Remote RAS feature requires both the System Monitor/RAS feature and the Pro-Server with Pro-Studio for Windows. Please be sure you understand both applications prior to using the Remote RAS feature.

For System Monitor/RAS Feature details, ▼Reference◢ *PL Series User Manual.*

For Pro-Server details, ▼Reference◢ *Pro-Server with Pro-Studio for Windows Operation Manual.*

1 **Operating Environment**

The Server PC and Client PL operating environments are as follows:

	Server PC	Client PL
Operator Interface	Windows® compatible PC, or PL Series unit	PL-5900/PL-6920/ PL-7920/PL-B920 Series units
OS Requirements	Windows® 95 OSR2 Windows® 98 Second Edition Windows NT®4.0 (Service Pack3 or higher) Windows® 2000 Complies with Pro-Server specifications	Windows® 95 OSR2 Windows® 98 Second Edition Windows NT®4.0 (Service Pack3 or higher) Windows® 2000 Complies with PL Series unit specifications[*1]
Other Software	Pro-Server with Pro-Studio for Windows Ver.3.12 or higher (Sold separately)	System Monitor/RAS feature (included in the PL unit's CD-ROM)
Compatible Languages	Japanese, English	
Network Configuration	TCP/IP Protocol	

2 **System Configuration**

The Remote RAS feature system configuration is as shown below.

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*1 Remote RAS cannot be used in an MS-DOS® environment.

3 Installation

■ Installing the Remote RAS Feature

! *Important*

- *Prior to installation, check that Pro-Server with Pro-Studio Ver.3.12 or higher is installed on the Server PC.*

- *Be sure to install the correct PL series version software in each Client PL unit. (See below)*

Client PL Units	Applicable Software
PL-5900 Series	RAS_5900.exe
PL-X920 Series	RAS_X920.exe

- *Prior to installing this software, be sure to close all applications.*

1) Create a folder named [RAS] on the Server PC.
   When installing both software for PL-5900 Series and PL-X920 Series, create two folders named [RAS1] and [RAS2].

2) Download the applicable software from the Pro-face home page.

3) Copy the file that appears after Procedure 2 to the folder created after Procedure1, and double-click on the file to open it. (file is self-extracting) The following two folders will be extracted.

   - **[server] folder (required when installing on the Server PC)**
   - **[client] folder (required when installing on the Client PL)**

When installing both software for PL-5900 Series and PL-X920 Series, copy the file that appears after Procedure 2 to each folder separately, named [RAS1] and [RAS2] created after Procedure 1, and double-click on the files to open them. (files are self-extracting)

◆ When installing one software only

```
[RAS]
  ├── RAS_5900.exe
  │    (or RAS_X920.exe)
  │
  ├── [server]
  │        └──── setup.exe
  │              :
  │              :
  │              :
  │
  └── [client]
           └──── setup.exe
                 :
                 :
                 :
```

◆ When installing both two software

```
[RAS1]                                      [RAS2]
  ├── RAS_5900.exe                            ├── RAS_X920.exe
  │    (or RAS_X920.exe)                      │    (or RAS_5900.exe)
  │                                           │
  ├── [server]                                ├── [server]
  │        └──── setup.exe                    │        └──── setup.exe
  │              :                            │              :
  │              :                            │              :
  │              :                            │              :
  │                                           │
  └── [client]                                └── [client]
           └──── setup.exe                             └──── setup.exe
                 :                                            :
                 :                                            :
                 :                                            :
```

4) Double-click on the [server] folder's [setup.exe] file to start the Server installation.

Please do this Procedure 4 once for 1 (one) Server PC, no matter how many Client PLs you have or no matter what software you install.

5) Copy the [client] folder to the Client PL's hard disk, and double-click on the [setup.exe] file in there to start the Client installation.

All of the Client PL need to be done Procedure 5.

Note: **[setup.exe] files to start the Client installation have different versions, one for PL-5900 Series and the other for PL-X920 Series. In Procedure 5, when starting up the [setup.exe] file to start the Client installation, be sure to confirm that the [setup.exe] file is downloaded from the correct software compatible with your PL and start to install it.**

When starting up the wrong [setup.exe] file to your PL, uninstall the file, at first. Then, start up the correct [setup.exe] file again which is compatible with your PL Series.

To uninstall the file, select [Start] menu, [Settings], [Control Panel], and [Add/Remove Programs] command. In the list in the [Install/Uninstall] tab, select the wrongly installed software, [PL-5900 Remote RAS], or [PL-X920 Remote RAS], then delete it.

■4 Remote RAS Settings/Preparation

To use the Server PC to monitoring the System Monitor/RAS feature, you must first set up the Remote RAS feature and start up the System Monitor (PL_Smon.exe).

■ Client PL Settings

◆ Remote RAS Settings

Double-click on PL_Wps.exe to open the Client PL's [System Monitor Property] dialog box. Then, click on the [Net Ras] tab's [Enable] check box.

When communicating only with a Server PC at the designated IP address

Input the IP address of the Server PC used when communicating with the Client PL.

◆ Starting up the System Monitor (PL_Smon.exe)

For System Monitor (PL_Smon.exe) details, ▽Reference△ *each PL Series User Manual.*

■ Server PC Settings

First, register the Client PL as a node using the Server PC's Pro-Studio software. This can be done using any of the following three (3) ways.

- Edit a sample's network project file
- Manually register the Client PL as a node
- Search for and register the Client PL as a node

Note: **Be sure to save the network project file after creating or editing it.**

◆ How to Edit a Sample's Network Project File

Edit a sample's network project file that is installed on the Server PC and easily register a node and a symbol.

1) Start the Server PC's Pro-Studio software.

2) Select the [File (F)] menu's [Open (O)] command.

3) Select the [PL_Ras.npj] file, and click on [Open].

4) In the "Network Entry Node" list, select the node named [PL_1].

5) Select the [Edit(E)] menu's [Edit Node] command.

6) In [Edit Node], enter any desired name in "Node Name", and then input the Client PL's "IP Address", "Subnet Mask", and "Gateway".

7) Click on   OK   .

8) Edit a second node [PL_2] , by repeating steps 4 to 7. When using only one (1) node, delete node [PL_2].

When using three (3) or more nodes, add the third and all following nodes using the procedure described in "◆Manually Registering a Client PL as a Node" .

◆ **Manually Registering a Client PL as a Node**

When manually registering a node, the device address must be registered manually as a symbol. When registering three (3) or more nodes, using the procedure explained previously in "◆How to Edit a Sample's Network Project File", please use the following steps.

1) Start the Server PC's Pro-Studio software.

2) Select the [Edit (E)] menu's [Register Node] command.

3) In [Register Node], enter any desired node name in "Node Name", and select "PL Series Computer" for "PLC Type". Also, enter the Client PL's "IP Address", "Subnet Mask", and "Gateway". "Project File (PRO/PB3)" is not used in this example. "String data mode" always uses the default value of "2".

4) Click on OK .

5) Select the node registered in steps 2 to 4. Then, select the [Edit (E)] menu's [Register Symbols] command.

6) In the [Register Symbol] dialog box, select/enter the desired device address in "Device Address".
In "Data Type", select the desired data type for the device address.
When entering device address and data type information, see ▼Reference◣
5.Reading/Writing via System Monitor/RAS Feature <Device Address List>
When checking "Global Symbol" data, the same device address will be registered as a common symbol in all network entry nodes.
Click on Create from Address , and the "Symbol Name" will be set automatically.
(Manual selection/entry of "Symbol Name" is possible.)

7) Register all remaining device addresses as symbols, repeating steps 5 and 6.

8) When adding more nodes, repeat steps 2 to 7.

◆ Client PL Search and Node Registration

Pro-Studio (Server PC) can be used to search for the Client PL on a network. Once the Client PL is found, you can register it as a network entry node.

Note: Prior to searching for and registering the Client PL, please do the following.

- **Enter the Remote RAS settings**
- **Start up the System Monitor (PL_Smon.exe) application**
- **Enter the network settings, such as the IP address, etc.**

1) Once the above is completed, start Pro-Studio.

2) Select the [Tool (T)] menu's [Search Active Nodes] command.

3) The Client PL (nonregistered node) will appear as "Windows Personal Computer" in the "PLC type" column. To allow the Client PL (non-registered node) to participate in a network project, select that node and click on [Entry].

4) In the "Network Entry Node" list, select the network entry node registered in the previous steps 2 and 3. Then, select the [Edit(E)] menu's [Edit Node] command.

5) In [Edit Node], select "PL Series Computer" for the "PLC Type" and click on [OK].
   In the "Network Entry Node" list, the entry "Windows Personal Computer" in the "PLC Type" column will change to "PL Series Computer".

6) Set each network entry node's "PLC Type" data in the same way as Step 5.

For details about Device Address symbol registration, refer to steps 5 to 7 in "◆ Manually Registering a Client PL as a Node".

Note:
- **PL units on other networks connected via a router cannot be searched. Please register each of those nodes manually.**
- **Network project files created in Pro-Studio (Server PC) do not need to be transferred to the Client PL.**

5　Reading/Writing via System Monitor/RAS Feature

Pro-Server provides the Server PC with read and write data that indicates both the status of each Client PL, and the status of the System Monitor/RAS features. Also, the Server PC can access Client PL user application data located within the Client PL's Common Memory area. Moreover, the Server PC can read/write that data via Pro-Server.

*a　Device memory is used to store System Monitor/RAS feature data, and to also assign each device address.

> ▽Reference△ *\<Device Address List\>,\<Bit Assign List for DIN, Error Event, and Error Mask\>*

*b　The Server PC's user application accesses *a (Device) using ProEasy.dll.

> *For further information about ProEasy.dll* ▽Reference△ *Pro-Server with Pro-Studio for Windows Operation Manual.*

*c　The Client PL's user application accesses the Common Memory area inside *a (Device) using PL_Ras.dll.

> *For further information about Common Memory* ▽Reference△ *7. Data Sharing Between User Applications.*

Note:
For details of Pro-Server error messages that can occur when reading and writing device data, ▽Reference△ **Error Messages**

<Device Address List>

Device	Corresponding Units PL-5900 Series	Corresponding Units PL-X920 Series	Device Type	Device Symbol	Read/ Write	Bit Access	16 Bit Access	32 Bit Access
CPU Voltage[*1]	O	O	WORD				VLT0	
+3.3V Voltage[*1]	O	O	WORD				VLT1	
+5V Voltage[*1]	O	O	WORD				VLT2	
+12V Voltage[*1]	O	O	WORD	VLT			VLT3	
-5V Voltage[*1]	O	O	WORD				VLT4	
-12V Voltage[*1]	O	O	WORD		Read	X	VLT5	
VIT Voltage[*1]	X	O	WORD				VLT6	
CPU Fan Rotation Speed[*2]	O	O	WORD	FAN			FAN0	X
Power Fan Rotation Speed[*2]	O	O	WORD				FAN1	
CPU Temperature[*3]	O	O	WORD	TMP			TMP0	
System Temperature[*3]	O	O	WORD				TMP1	
DIN	O	O	WORD	DIN		DIN00-DIN01	DIN0	
DOUT	O	O	WORD	DOUT	Read/ Write	DOUT00	DOUT0	
Alarm	O	O	WORD	ALM		ALM00	ALM0	
Lamp	O	O	WORD	LAMP		LAMP00	LAMP0	
Error Event	O	O	WORD	ERR	Read	ERR00-ERR0E	ERR0	
Internal Memory Area[*4]	O	O	WORD	LS	Read/ Write	LS00000-LS0000F to LS02550-LS0255F	LS0000 to LS0255	LS0000 to LS0254
Common Memory	O	O	WORD	PL	Read/ Write	PL00000-PL0000F to PL02550-PL0255F	PL0000 to PL0255	PL0000 to PL0254
Software Reset Port[*5]	O	O	WORD	RST	Read/ Write	X	RST0	X
Error Mask[*6]	O	O	WORD	ERRM	Read	ERRM00-ERRM0E	ERRM0	X

*1 When monitoring using Device Monitor, Voltage displays as 'mV'.

*2 When monitoring using Device Monitor, Fan Rotation Speed displays as 'rpm'.

*3 When monitoring using Device Monitor, Temperature displays as 'ºC'.

*4 Only system uses this area for reading/writing and monitoring.

*5 Will shut down or reboot the Client PL's OS. When writing the value in the device address, [Request.log] file will be created at C:\Proface\Sysmon, where "Shut-Down" or "Reboot" request information is logged.

Important

When "Forced Shut down" or "Forced Reboot" values are written to the device address, the OS will be forced to be shut down or rebooted without any warning message, and without saving current application data. To stop to disappear the data due to easy writing, please be careful when using this function.

Setting Value Decimal	Setting Value Hex.	Action
1	0001	Shut-Down
2	0002	Reboot
257	0101	Forced Shut-Down
258	0102	Forced Reboot

*6 Shows which "Error Event" is being monitored by the PL Seies unit.

<Bit Assign List for DIN, Error Event and Error Mask>

The bit allocations of DIN, Error Event and Error Mask are shown below.

To start the monitoring of an Error Event, check the System Monitor/RAS feature [System Monitor Property] dialog box's [Enable] check box for each desired feature. Once this is done, the Error Mask's corresponding bits will turn ON. Then, if an error occurs, that Error Event's bit will turn ON.

Device Name	Items	Corresponding Units		Bit
		PL-5900 Series	PL-X920 Series	
DIN	DIN0	O	O	DIN00
	DIN1	O	O	DIN01
Error Event	CPU Voltage Error	O	O	ERR00
	+3.3V Voltage Error	O	O	ERR01
	+5V Voltage Error	O	O	ERR02
	+12V Voltage Error	O	O	ERR03
	-5V Voltage Error	O	O	ERR04
	-12V Voltage Error	O	O	ERR05
	VIT Voltage Error	X	O	ERR06
	CPU Fan Error	O	O	ERR07
	Power Fan Error	O	O	ERR08
	CPU Temperature Error	O	O	ERR09
	System Temperature Error	O	O	ERR0A
	Watch Dog Timer Error	O	O	ERR0B
	Software Mirroring Error	O[*1]	O[*1]	ERR0C
	Hardware Mirroring Error	X	O[*2]	ERR0D
	Backlight Error	O	O[*3]	ERR0E
Error Mask	CPU Voltage Error	O	O	ERRM00
	+3.3V Voltage Error	O	O	ERRM01
	+5V Voltage Error	O	O	ERRM02
	+12V Voltage Error	O	O	ERRM03
	-5V Voltage Error	O	O	ERRM04
	-12V Voltage Error	O	O	ERRM05
	VIT Voltage Error	X	O	ERRM06
	CPU Fan Error	O	O	ERRM07
	Power Fan Error	O	O	ERRM08
	CPU Temperature Error	O	O	ERRM09
	System Temperature Error	O	O	ERRM0A
	Watch Dog Timer Error	O	O	ERRM0B
	Software Mirroring Error	O[*1]	O[*1]	ERRM0C
	Hardware Mirroring Error	X	O[*2]	ERRM0D
	Backlight Error	O	O[*3]	ERRM0E

*1 PL-SM900 (Separately sold "Soft Mirror Utility") is required. Please install PL-SM900 software first, then the Remote RAS Feature software. When the PL-SM900 software is installed, the Remote RAS Feature software must also be installed.

*2 PL-MD*00 (Separately sold "Mirror Disk Unit") is required.

*3 "Backlight" is available only with PL-6920 Series units.

■ Error Messages

The Pro-Server with Pro-Studio error messages can occur during reading/writing of data to a device.

Error Codes related to the Remote RAS features are as follows.

Error Code		Error Messages
Decimal	Hex.	
9530	253Ah	PL RAS initialization error
9531	253Bh	Unsupported Command
9532	253Ch	Unsupported Access Type
9533	253Dh	Unsupported Read/Write Type
9534	253Eh	Device access is not allowed
9535	253Fh	Failed to set/get the value from the device
65535 (Unsigned)	ffffh	Error occurred during read/write of an invalid Voltage, Temperature and Fan Rotation Speed value, or to a non-supporting device. Ex.) When PL-5900 Series unit writing the value to "VIT Voltage" device

For other Pro-Server with Pro-Studio for Windows error messages information ▼Reference▲ *Pro-Server with Pro-Studio for Windows Operation Manual*

■6 DDE Functions

The Pro-Server software is equipped with the DDE Server function and can exchange data with applications that support the DDE Client function.
The following explanation describes how to use Microsoft® Excel to read out device data and view real-time changes in that data.

1) Click on the "Symbol [Item]" bar, shown below.

2) Select the [Programming Support (P)] menu's [DDE:String Copy].

3) Here, the copied string is pasted into an Excel worksheet, which creates a
   DDE link.

4) If desired, create surrounding text and graphs for that data. Excel's graph
   feature allows you to view device value changes in real time.

7 **Data Sharing Between User Applications**

A "Common Memory" area is allocated for Client PL devices to store data. This area allows user applications ("A" in the Server PC and "B" in the Client PL) to share data.

*a   User Application A accesses Common Memory using ProEasy.dll.

For further information about ProEasy.dll ▼**Reference**▲ *Pro-Server with Pro-Studio for Windows Operation Manual.*

*b   User Application B accesses Common Memory using PL_Ras.dll.

The following page explains the Visual Basic and Visual C++ Read/Write arguments used when User Application B uses PL_Ras.dll and accesses the Common Memory area.

Note: **Beforehand, be sure to include PL_Ras.h and Link PL_Ras.lib.**

■ Application Development Language Microsoft® Visual Basic® 6.0 Service Pack 3 or higher

[Call Format]   Declare Function PLDevWordWrite Lib "PL_Ras.dll"
(ByVal Addr As Long, ByVal wData As Long) As Long

[Return Value] 0 : Normal

Except 0 : Error

[Arguments]   Addr As Long   Write memory word address　from 0 to 255 (Pass by value)

wData As Long   Write data

[Processing]   Write data to common memory

[Call Format]   Declare Function PLDevWordRead Lib "PL_Ras.dll"
(ByVal Addr As Long, ByRef wData As Long) As Long

[Return Value] 0 : Normal

Except 0 : Error

[Arguments]   Addr As Long   Read memory word address　from 0 to 255 (Pass by value)

wData As Long   Pointer to read data storage variable (Pass by reference)

[Processing]   Read out common memory data.

■ Application Development Language Microsoft® Visual C++® 6.0 Service Pack 3 or higher

[Call Format]   long WINAPI PLDevWordWrite (long Addr, long wData)

[Return Value] 0 : Normal

Except 0 : Error

[Arguments]   Addr   Write memory word address (from 0 to 255)

wData   Write data

[Processing]   Write data to common memory

[Call Format]   long WINAPI PLDevWordRead (long Addr, long *wData)

[Return Value] 0 : Normal

Except 0 : Error

[Arguments]   Addr   Read memory word address (from 0 to 255)

*wData   Pointer to read data storage variable

[Processing]   Read out common memory data.

■ Creating and Deleting Common Memory

Starting PL_Smon.exe will automatically create the Common Memory area, and quitting PL_Smon.exe will delete the Common Memory area. Since Common Memory is located in RAM, the PC/PL is unable to save this data. Starting PL_Smon.exe will automatically initialize this area's data.

8 Restrictions

• Pro-Server can use the following features to access device addresses.
For details about each feature ▽Reference△ *Pro-Server with Pro-Studio for Windows Operation Manual.*

Pro-Server Features	O:Support X:Not Support
DDE	O
Simple DLL (ProEasy.dll)	described the details on next page
OPC Interface	O[1]
SRAM Backup Data	X
Actions	X
Provider Information	X
Data View	O[2][3]
VBA Support Function	O
Device Data Backup and Restoration	O[4]
Capture Data Saving Function	X
Security Function	O
Device Monitoring	O
Status Monitoring	X
Read Performance Measuring Tool	O

*1 The compatible OS is Windows NT® 4.0 and Windows® 2000 only.

*2 The "Data View" feature requires Pro-Server with Pro-Studio for Windows Ver.4.0 or higher.

*3 Remote RAS Feature cannot use GP-Viewer in Data View Function.

*4 Only devices that enable to be written to can be restored.

✎ **Note:** **The following Remote RAS Simple DLL (ProEasy.dll) features are available.**

- **Direct Read** [1]
- **Direct Write** [1]
- **Cache Read** [1]
- **Multi-Thread Handle Acquisition**
- **Multi-Thread Handle Release**
- **Loading the Network Project File**
- **Convert Error Codes to Strings**
- **Entry Node Status Read**
- **Simple DLL Initialization**
- **Simple DLL Termination**

• In a PL unit, simultaneous use of both the Remote RAS feature and Pro-Server is not possible.

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1 Depending on the device's Read/Write characteristics or the types of data that can be accessed, certain Remote RAS Write/Read features may not be available. For Read/Write characteristics and available device data types, ▼Reference◢ 5 - Reading/Writing via System Monitor/RAS Feature.

Note

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

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