29 Tips for Faster Communication

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This chapter describes how to shorten the communication time and achieve efficient communication.

1 First, get to know the present performance!

"29.1 Getting to Know the Performance of the Configured System"

2 Improve communication efficiency by controlling symbols proficiently!

"29.3 Grouping Symbols"
 "29.4 Array of Symbols"

 $\mathbf{3}$ Improve communication efficiency by stocking the data of Device/PLC to the PC!

^(C) "29.5 Cache Registration of Frequently Used Devices"

4 Which device do you often use?

"29.6 Device Access Log"

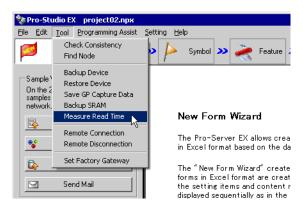
29.1 Getting to Know the Performance of the Configured System

This feature allows you to measure the reading time of device data from the specified node.

A result of measu	urement		
	Time	208 msec	
	Begin	Close	

29.1.1 Measuring Reading Time

1 Click [Measure Read Time] from [Tools] on the menu bar.



2 Set each item on the "Data Read Performance Measurement" screen.

Data Read Performar	
Head out	the specified device and measure the required time.
Node Name	_
Device/PLC	
Device Address	▼
Number	255 *
A result o	Access Type C Bit C 98it C 16Bit C 32Bit C Double C 64Bit C String f measurement
	Time msec Begin Cancel

• For details about the setting items, please refer to "29.1.2 Setting Guide".

The "now" screen is displayed, indicating the measurement progress of reading performance.

now	
Now reading device data.	
0/10000: 0%	Cancel

After reading, the following dialog box will appear.

Pro-Server EX Tools								
i	Processing is completed normally							
	ОК							

The measurement result (ms) is displayed in [Time] after processing.

- A r	esult of measurement	
	Time 208 msec	
	BeginClose	

• Measurement results may vary according to the environmental conditions (number of tags on the screen, PLC connection style, application programs running on Windows at the same time and so on).

• If the set contents are incorrect, the following screen will appear.

Message	Required action				
You cannot specify a BIT symbol for measurement other than in BIT format	If you have specified a BIT symbol in the [Device Address] field, you cannot set an access type other than BIT to measure reading time. Reset the access type to [Bit], and then execute measurement.				
You cannot specify a symbol other than BIT for measurement in BIT format	If you have specified a symbol in formats other than BIT in the [Device Address] field, you cannot set [Bit] as an access type to measure reading time. Reset the access type to other than [Bit], and then execute measurement.				

29.1.2 Setting Guide

Data Read Performa	nce Measurement
Read ou	t the specified device and measure the required time.
Node Name	_
Device/PLC	v
Device Address	a
Number	
A result	Access Type Bit Bit Bit 16Bit 32Bit Double 64Bit String of measurement Time msec Begin Cancel

Setting item Setting content						
Node Name	Select the node name that you wish to measure.					
Device/PLC Select the Device/PLC having the device you wish to measure.						
Device Address Enter the device address directly or select the symbol by clicking the list button.						
Number	Enter the number of devices. The maximum number is 65535 although it changes depending on the device type and the access type. NOTE • This is automatically set up when a symbol is selected as the [Access Type].					

Setting item		Setting content									
	Select an access type. Accessible tag data formats are as follows:										
	Device Size or Tag data format										
			1 8 16 32				64				
			BOOL	BYTE SINT USINT	WORD INT UINT	DWORD DINT UDINT REAL	DATE	TIME	TIME_OF _DAY	DATE_AND_ TIME	STRING
		Bit	0	х	0 ^{*1}	O ^{*1}	х	х	x	х	х
	define	8 bits	х	0	х	х	х	х	x	x	x
Access Type	Access Type you can define for data read	16 bits	х	х	0	0	х	х	х	х	x
		32 bits	х	х	0	0	ο	0	ο	х	x
	s Typ for c	64 bits	х	х	х	х	х	х	x	0	x
	Acces	Real	х	х	0	0	ο	ο	о	х	x
		Text	х	х	0	0	х	х	x	х	0
	*1 Avai	* ¹ Availability depends on the driver in use.									
	• This is automatically set up when a symbol is selected as the [Access Type].										
Read Type	Select a read type. [Direct] Read device values directly. [Cache] Read cached device data. 										

29.2 References on System Configuration

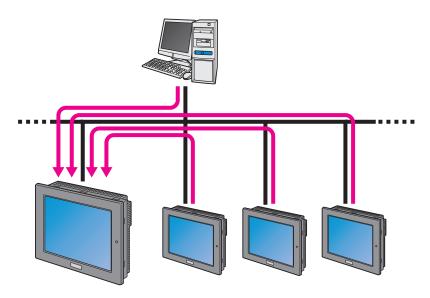
'Pro-Server EX' can access PCs, Displays, and/or Device/PLCs through Displays, via a network. This section describes the following references for dealing with connections.

- · Reference when a specified node is accessed many times from multiple nodes
- · Reference when a specified node is accessed continuously by other nodes
- · Nodes that can be monitored / controlled from 'Pro-Server EX' nodes simultaneously

Reference when a Specified Node is Accessed Many Times from Multiple Nodes

When multiple nodes simultaneously access the internal device in a specified node, the number of nodes to access simultaneously should be eight nodes (communications from eight locations) at maximum (access more than once from the same node should be regarded as separate communication).

If nine or more nodes simultaneously access a device, a retry or timeout error may occur.



NOTE

Examples of the internal device in the node are as follows:
When a node is 'Pro-Server EX': LS area

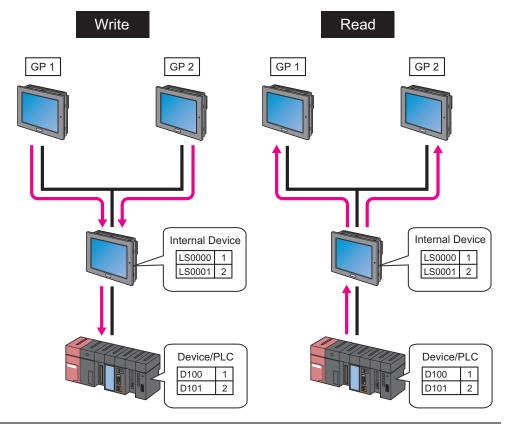
•When a node is a Display: LS area, USR area, Memory link device, System device

• When multiple nodes simultaneously access a Device/PLC, timeout may occur depending on the type or number of devices, even if the number of access source nodes is eight or less.Timeout occurs when communication speed between a device and a node is slower than that between a node and other node.

When timeout occurs, try to access the Device/PLC via the internal device in the node connected to the Device/PLC.

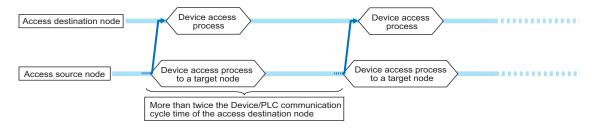
If you execute write access, first execute write from each node to the internal device in the node connected to the Device/PLC. Following this, sum up the written contents and write them from the internal device in the node to the Device/PLC in one shot.

If you execute read access, first read data from the Device/PLC to the internal device in the node connected to the device in one shot, then arrange it so that each node reads the data that has been read in the internal device.



Reference when a Specified Node is Accessed Continuously by Other Nodes

When you continuously access a specified node from other nodes at high speed, the screen updating on the Display may slow down. In this case, the access source node should be set to attempt access at intervals. The interval will be approximately more than twice the Device/PLC communication cycle time of the access destination node. If the access destination is an internal device, set the interval to 100 ms or longer.



- The Device/PLC communication cycle time varies depending on the configuration of the currentlydisplayed screens on the Display (e.g. types and numbers of the devices on the screen). Set the continuous access interval to approximately more than twice the slowest cycle time.
 - You can check the Device/PLC communication cycle time using the status monitor function.

■ Nodes that can be Monitored / Controlled from 'Pro-Server EX' Nodes Simultaneously

The maximum number of nodes that operate, from which the 'Pro-Server EX' node can read 1000 words in the sequential internal device per second approx., is around 20.

NOTE • If the number of nodes is over 20, consider the following methods: the Multi-Handle function in a multi-thread application, the device cache function, symbol grouping, and/or symbol alignment.

- "29.3 Grouping Symbols"
- "29.4 Array of Symbols"
- "29.5 Cache Registration of Frequently Used Devices"
- Generally the ARP packet is sent regularly to update the ARP table in the TCP/IP network.On Windows PCs, packets may be lost when transmission is performed via ARP protocol and communication protocol simultaneously. If this is the case, take the following countermeasures.
 1 Start the command prompt on a PC in a 'Pro-Server EX' node.
 - 2 Execute the following command.
 - arp -s (IP address of a send destination) (MAC address of a send destination)

When Replacing GP Series Nodes with GP4000/LT4000 Series, GP3000 Series or LT3000 Nodes

When a display unit in the GP series node is replaced with that of the GP4000/LT40000 series node, GP3000 series node, or LT3000 node, communication speed for high-speed continuous access may become slower than that before replacement.

If communication speed slows down, do not continuously access at high speed, but consider a method of combining the number of necessary access events into a single one.

The methods for combining a number of times for necessary access into accessing only once include the device cache function, symbol grouping, and symbol alignment.

- ^(C) "29.3 Grouping Symbols"
- "29.4 Array of Symbols"
- "29.5 Cache Registration of Frequently Used Devices"

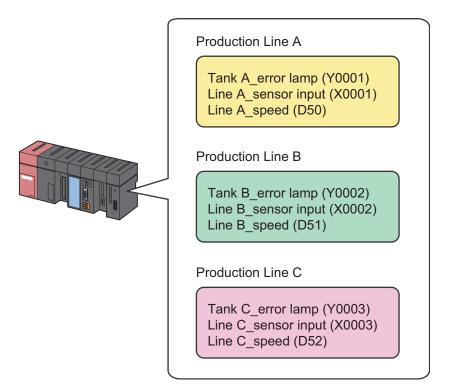
29.3 Grouping Symbols

29.3.1 Grouping Symbols

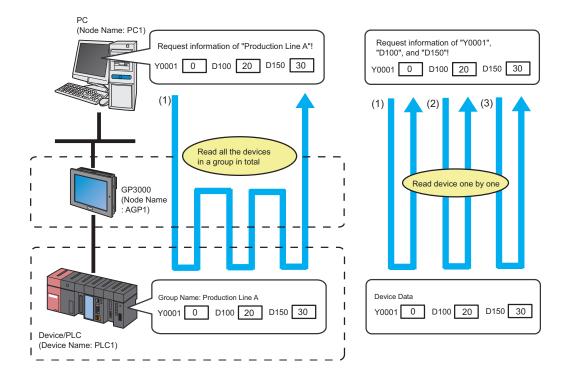
This feature allows you to collect and group multiple symbols.

Within the same Device/PLC, symbol grouping is available regardless of sequential/non-sequential addresses or data type to establish efficient communication at data transfer and access from API.

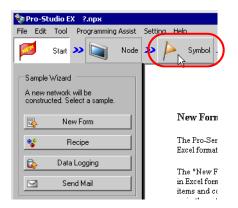
In addition, grouping makes symbol control easier.



Communication Example Using Grouping



1 Click the [Symbol] icon on the status bar.



2 Select the symbol sheet where the symbols you wish to group are registered.

🏷 Pro-Studio EX 🛛 1.npx						_ 🗆 ×
File Edit Tool Programming Assist Sett	ing Help					
Start 🔉 🔪 Node 🔉	🌔 Symbol ≫ 🍦	Feature ≫ 🗜	- Sa	ve 渊 🆄 T	ransfer	Monito Status
Symbol	Node Name AGP1		Device	Name PLC1		
Group Ungroup	Sheet Name Sheet3		Set it as a	a global symbol shee	et.	
Copy Cut Paste	Symbol	Data Type	Consec utive	Device Address	No. of Data	Comment
Symbol Sheet	TankA_error_lamp	Bit		Y0001	1	
Add Delete	LineA_sensor_input	Bit		X0001	1	
	LineA_speed	16Bit(Signed)		D0050	1	
Check Duplication/List Used Addresses					1	
Check Duplication/List Osed Addresses	TankB_error_lamp	Bit		Y0002	1	
Global Constant Setting Screen	LineB_sensor_input	Bit		X0002	1	
	LineB_speed	16Bit(Signed)		D0051	1	
□ ▼ Pro-Server EX					1	
⊡	TankC_error_lamp	Bit		Y0003	1	
	LineC_sensor_input	Bit		X0003	1	
	LineC_speed	16Bit(Signed)		D0052	1	
HINTERNAL-Check2					1	
PLC1:Sheet3 A Series CPU I					1	
					1	
► GP Series					1	
 Global Symbol 					1	

 $\mathbf{3}$ Click the symbols you wish to group on the symbol sheet.

🂱 Pro-Studio EX 1.npx						_ 🗆 ×
File Edit Tool Programming Assist Settin	g Help					
Start 🔉 🟹 Node >	≽ Symbol ⋗ 葇	Feature ≫ [Sa	ive ᠉ 🆄 Ti	ransfer	Monitor Status
Symbol	Node Name AGP1		Device	Name PLC1		
Group Ungroup	Sheet Name Sheet3		Set it as .	a global symbol shee	+	
Insert Delete	onocentanoj		00.1.00	a global cymbol chioc	~	
Copy Cut Paste	Symbol	Data Type	Consec utive	Device Address	No. of Data	Comment
Symbol Sheet	TankA_error_lamp	Bit		Y0001	1	
Add Delete	LineA_sensor_input	Bit		×0001	1	
	LineA_speed	16Bit(Signed)		D0050	1	
Check Duplication/List Used Addresses					1	
	TankB_error_lamp	TankB_error_lamp Bit		Y0002	1	
Global Constant Setting Screen	LineB_sensor_input	Bit		×0002	1	
	LineB_speed	16Bit(Signed)		D0051	1	
Pro-Server EX					1	

The selected symbol row turns gray.

NOTE • To select sequential multiple symbols at a time, click the first symbol row to be selected and drag the mouse over the last symbol row.

4 Click the [Group] button.

🂱 Pro-Studio EX 1.npx						_ 🗆 🗙	
File Edit Tool Programming Assist Settin	g Help						
Start 🔉 🟹 Node >	🍐 Symbol ᆇ 🄾	Feature ➤ 📑	Sa	ave > 🆄 T	ransfer	Monitor Status	
Psymbol Node Name AGP1 Device Name PLC1							
Group Ungroup Insert Delete	Sheet Name Sheet3						
Copy Cut Paste	Symbol	Data Type	Consec utive	Device Address	No. of Data	Comment	
Symbol Sheet	TankA_error_lamp	Bit		Y0001	1	<u> </u>	
Add Delete	LineA_sensor_input	Bit		X0001	1		
	LineA_speed	16Bit(Signed)		D0050	1		
Check Duplication/List Used Addresses					1		
Check Duplication List Code Addresses	TankB_error_lamp	Bit		Y0002	1		
Global Constant Setting Screen	LineB_sensor_input	Bit		×0002	1		
	LineB_speed	16Bit(Signed)		D0051	1		

The "Group" screen appears.

Group		×
Group Symbol Name Group1		
Identification Color		
	Form Array	
Other Colors		
	<u>ок</u>	Cancel

5 Enter a group symbol name in [Group Symbol Name] and click a color that you wish to use from the color palette for distinguishing the group symbol.

Group	×
Group Symbol Name Production_	LineA
Identification Color	
	Form Array
Other Colors	OK Cancel

NOTE

• If you do not find one you wish to use on the palette, click the [Other Colors] button. This displays the "Color Setup" screen, where you can set the color.

"32.2 Registering Symbols on a Symbol Sheet"

6 Click the [OK] button.

A group display column (indicated as "G") is created on the left of the symbol display window. The set group name is displayed in the top row of the symbols.

Additionally, the group display column of the grouped symbols shows the identifying color set above.

Shap on the state					
Pro-Studio EX 1.npx					_ 🗆 ×
File Edit Tool Programming Assist Settin	ng Help				
Start ン 🟹 Node ン	🕨 Symbol 🛰 ≷	Feature 💙 📑	Save ≫ 🆄 Trans	sfer	Monitor Status
Symbol	Node Name AGP1	Der	vice Name PLC1		
Group Ungroup	Sheet Name Sheet3	Set i	t as a global symbol sheet.		
Insert Delete					
Copy Cut Paste	G Symbol	Data Type	Consec Device Address	No. of Data	Comme
Symbol Sheet	Production_LineA				
Add Delete	TankA_error_iamp	Bit	110001	1	_
	LineA_sensor_input	Bit	×0001	1	
Check Duplication/List Used Addresses	LineA_speed	16Bit(Signed)	D 0050	1	
Check Duplication/List Osed Addresses				1	
Global Constant Setting Screen	TankB_error_lamp	Bit	Y0002	1	
	LineB_sensor_input	Bit	×0002	1	
Erro-Server EX	LineB_speed	16Bit(Signed)	D0051	1	
				1	
#INTERNAL:Sheet1		ins i	Lucopo	i. I	

With the group configuration symbols displayed, the [-] button is placed in the column displaying the group name. Clicking the [-] button hides the configuration symbols and displays only the group name. (The [-] button changes to the [+] button.)

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File Edit Tool Pro	gramming Assist Setti	ng Help						
💋 Start >	Node >	A Symt	ool 🔉 ≷	Feature ン 📑	Save	🔉 🆄 Trans	fer 🧕	Monitor Status
Symbol		Node Na	ame AGP1	D	evice Nar	me PLC1		
Group	Ungroup	Sheet Na	ame Sheet3		titas a di	obal symbol sheet.		
Insert	Delete	01100(11)		,	uo u gr	obal oynibol onlook		
Сору С	Cut Paste	<u> </u>	Symbol	Data Type	Consec utive	Device Address	No. of Data	Comme
Symbol Sheet		Pipdue	tion_LineA					<u> </u>
Add	Delete	5					1	
		TankB	_error_lamp	Bit		Y0002	1	
Check Duplication/	List Used Addresses	LineB_	sensor_input	Bit		×0002	1	
	List Osed Addresses	LineB	speed	16Bit(Signed)		D0051	1	
Global Constan	t Setting Screen						1	
		Taulo	Leave	los.		Looon	4	

• When clicking the [OK] button, the group names are checked whether they are duplicated or not. Reset the same names to be different ones.

Ungrouping

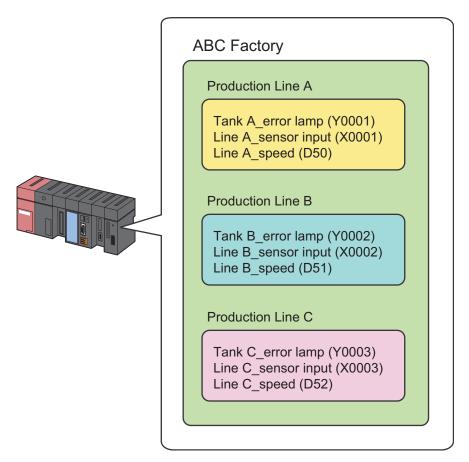
Click the column displaying the group name, and then click the [Ungroup] button.

🂱 Pro-Studio EX 1.npx							
File Edit Tool Programming Assist Settin	ng Help						
Start 🔉 🟹 Node 🔉	녿 Symbol ⋗ ≷	Feature 🔉 📑	Save > 🆄 Trar		Monitor Status		
Symbol	Node Name AGP1	D	evice Name PLC1				
Group Ungroup	Sheet Name Joneed Street Stree						
Copy Cut Paste	G Symbol	Data Type	Consec utive Device Address	No. of Data 0	Comme		
Symbol Sheet	Production_LineA						
Add Delete	TankA_error_lamp	Bit	Y0001	1			
	LineA_sensor_input	Bit	×0001	1			
Check Duplication/List Used Addresses	LineA_speed	16Bit(Signed)	D0050	1			
				1			
Global Constant Setting Screen	TankB_error_lamp	Bit	Y0002	1			
	LineB_sensor_input	Bit	×0002	1			
	LineB_speed	16Bit(Signed)	D0051	1			
FCT (152.166.0.1)				1			
	TankC array Jame	10a	COULS COULS	1	_		

Symbols are ungrouped.

29.3.2 Grouping Groups/Symbols Together

Grouping is available up to 2 hierarchies. You can create a new group by gathering two different groups, or a group and symbols.



1 Select the groups or symbols you wish to group from the symbol sheet, and then click the [Group] button.

🂱 Pro-Studio EX 1.npx							_ 🗆 ×
File Edit Tool Programming Assist Settin	ng He	lp					
Start 🔉 🔪 Node >	1	Symbol ⋗ ≷	Feature ン 📑	Save	ン 🔖 Trans	fer	Monitor Status
Symbol	N	lode Name AGP1	D	evice Nar	ne PLC1		
Group	S	heet Name Sheet3	□ Set	it as a glo	bal symbol sheet.		
inseit Delete							
Copy Cut Paste	G	Symbol	Data Type	Consec utive	Device Address	No. of Data	Comme
Symbol Sheet	+	Production_LineA					
Add Delete						1	
	+	Production_LineB					
Check Duplication/List Used Addresses						1	
	<u>+</u>	Production_LineC					J
Global Constant Setting Screen						1	
Er ▼ Pro-Server EX						1	
E PC1 (192.168.0.1)						1	

The "Group Symbols" screen appears.



• When you click the [Yes] button:

The "Group" screen appears.

Set [Group Symbol Name] and [Identification Color] for the group in the second hierarchy, and then click the [OK] button.

The second hierarchy group is now created, and the groups or the group and symbols selected above are registered as a new group.

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File Edit Tool Programming Assist Settin	g Help				
💋 Start ン 🟹 Node ン	🍐 Symbol 🔉 襓 Fe	ature ン 📄 Save 🗴	• 🄖 Transfer		Monitor Status
Symbol	Node Name AGP1	Device Name	PLC1		
Group Ungroup	Sheet Name Sheet3	 Set it as a global	symbol sheet.		
Insert Delete	,	,	-,		
Copy Cut Paste	G G Symbol	Data Type Consec	Device Address	No. of Data	Сог
Symbol Sheet	ABC_Factory				<u> </u>
Add Delete	+ Production_LineA				
· · · · · · · · · · · · · · · · · · ·				1	_ 1
Check Duplication/List Used Addresses	+ Production_LineB			1	- 1
Global Constant Setting Screen	+ Production LineC			· · · · · · · · · · · · · · · · · · ·	
				1	
				1	
#INTERNAL:Sheet1				1	

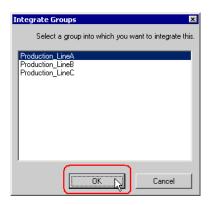
• When you click the [No] button:

According to the combination of the groups or symbols selected, either (1) or (2) given below will be performed.

(1) Combination of a group and symbols: The selected symbols are integrated (added) into the existing group to be selected.

(2) Combination of two different groups: The selected group is added into the other group.

Select the group name to be integrated on the "Integrate Groups" screen, and then click the [OK] button. The other group will be added into the group selected here.

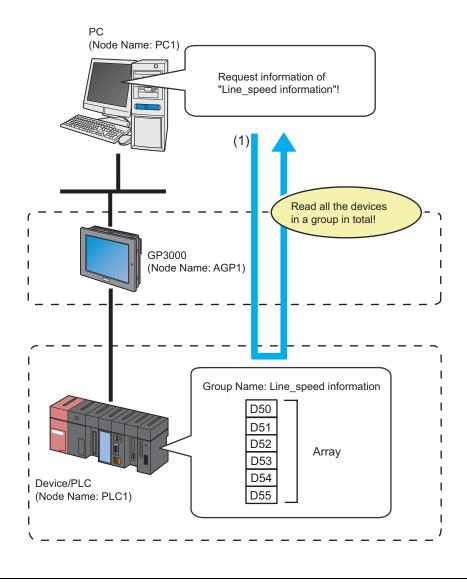


29.4 Array of Symbols

29.4.1 Advantages of Symbol Array

'Pro-Server EX' offers efficient communication by storing data to be read or written in sequential devices. Moreover, array symbols allows you to save the effort of registering sequential devices as symbols respectively, making symbol control easier.

You can register sequential devices on a symbol sheet as "Array".



NOTE

Data types should be integrated into Word or Bit type.

• As for the Word type, you can add Bit offset symbols into an array. However, it is impossible to place these symbols at the first address of the array.

1 Click the [Symbol] icon on the status bar, and select the symbol sheet where the symbol you wish to array are registered.

🎭 Pro-Studio EX 1.np	×						
File Edit Tool Program	mming Assist Settin	ng Help					
Start > โ	🗻 Node ン	녿 Symbol 🍛 🄾	Feature ン 📑	Save	>> 🖄 T r	ansfer	Monitor Status
Symbol		Node Name AGP1		Device Nam	ne PLC1		
Group	Ungroup Delete	Sheet Name Sheet3		Set it as a glo	ibal symbol shee	t.	
Copy Cut	Paste	Symbol	Data Type	Consec De	evice Address	No. of Data	Comment
Symbol Sheet		Line_speed	16Bit(Signed)	DOC	050	6	
Add	Delete					1	
						1	
Check Duplication/List	Used Addresses					1	
				<u> </u>		1	
Global Constant Se	tting Screen					1	
Pro-Server EX				<u> </u>		1	
🗍 🗄 🛒 PC1 (192.168	.0.1)					1	
🖾 #INTERN	IAL:Sheet1			<u> </u>		1	
E → GP3000 Series		II				1	
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· · · · · · · · · · · · · · · · · · ·	eet3 A Series CPU [<u> </u>			III
→ WinGF	5	/				1	
• LT3000		II				-	
► GP Series						 -	
Global Symbol				<u> </u>		1	

2 Click the symbol you wish to align, and click the [Group] button of [Symbol] on the symbol sheet.

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Start 😕 🟹 Node ン	🍐 Symbol 😕	Feature ン 📔	Sa	ive ᠉ 🄖 Ti	ransfer	Monitor Status
Symbol	Node Name AGP1		Device	Name PLC1		
Group	Sheet Name Sheet3	F	Set it as	a global symbol shee	ł	
Incert Delete	,			- 3	-	
Copy Cut Paste	Symbol	Data Type	Consec utive	Device Address	No. of Data	Comment
Symbol Sheet	Line_speed	16Bit(Signed)		D0050	6	<u> </u>
Add Delete					1	
					1	
Check Duplication/List Used Addresses					1	
Check Dupication/List Osed Addresses					1	
Global Constant Setting Screen					1	
					1	

3 Set the group symbol name and identification color.

Group		×
Group Symbol Name Line_speedi	nformation	
Identification Color		
Other Colors	Form Array	1
	ОК	Cancel

4 Check the [Form Array] check box, and enter the number of array (elements).

Group	×
Group Symbol Name Line_speed	information
Identification Color	
	Form Array
Other Colors	OK Cancel

NOTE • You can select the number of alignments with global constants.

"32.6.3 Global Constant Setting"

• When multiple values are set for the element number, sequential groups from the original device address are created by the number of elements.

5 Click the [OK] button.

A group display column (indicated as "G") is created on the left of the symbol display window. The top row of the symbols shows the group name, array type (Word type or Bit type) and the number of array (elements).

Studio EX 1.npx	ng He	la la					_ _ ×
Start >> Node >>		·	Feature »	Save	» 🄖 Trans	fer 😡	Monitor Status
Symbol Node Name AGP1 Device Name PLC1 Group Ungroup Sheet Name Sheet3 Steet it as a global symbol sheet.							
Copy Cut Paste	G	Symbol	Data Type	Consec utive	Device Address	No. of Data	Comme
Symbol Sheet Add Delete		ine_speedinformation _ine_speed	16Bit(Signed)		00050	6 1	
Check Duplication/List Used Addresses						1	

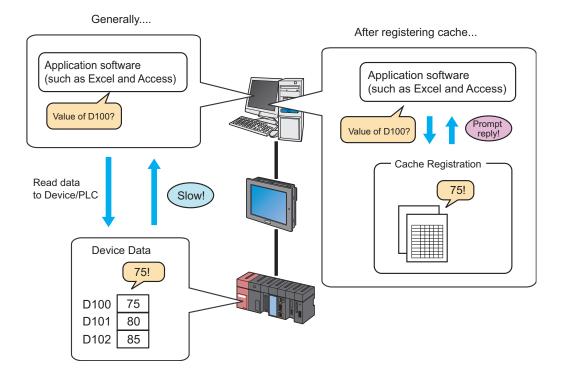
29.5 Cache Registration of Frequently Used Devices

Device cache makes 'Pro-Server EX' automatically access a device and temporarily save the values into the memory in a PC.

When a device receives the access request from the application, 'Pro-Server EX' replies promptly by returning cached data temporarily stored in the memory of a PC if the device has been already cached. If there is no cached data, 'Pro-Server EX' is to read to the Device/PLC via a display unit.

Using device cache minimizes delay of data transfer or disruption on the line due to access concentration.

To utilize the device cache function, the specified device should be registered on the network project in advance.



There are two methods to register device cache as follows:

- Register manually."29.5.1 Manual Registration"
- Register by importing from device access log. "29.5.2 Import Registration from Device Access Log"

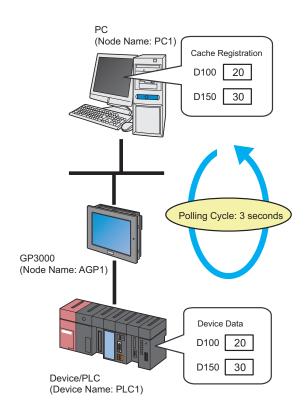
NOTE • To utilize the device cache function, the specified device should be registered on the network project in advance.

29.5.1 Manual Registration

The following describes how to cache-register the device manually.

• You can register devices of multiple nodes in one device cache, but cannot start polling to the other nodes if any of the nodes cannot establish communication. Therefore, it is recommended to register a device for each node as a separate device cache as much as possible.

Manual Cache Registration of Devices



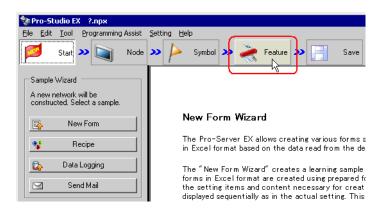
NOTE

• A polling cycle means a time cycle to update the device value that is cache-registered.

Ex. /

Setting item	Setting content
Device Cache Name	Cache Registration
Polling Cycle	3 seconds
Polling Start Timing	At Pro-Server EX Startup
Cache Subject Device	"D100" to "D150" of Device/PLC (PLC1)

1 Click the [Feature] icon on the status bar.



2 Select [Device Cache] from the tree display on the left of the screen, then click the [Add] button.

💱 Pro-Studio EX	?.npx			
<u>File Edit Tool</u>	Programming Assist			
Start 🔉	Node			
Add	Import			
Edit	Delete			
ACTION Trigger Condition Date Transfer Device Cache				

3 Enter "Cache 1" in [Device Cache Name] as a device cache name to be registered.

Device Cache Setting 🛛 💌
Device Cache Name Cache1
Polling Cycle
C Always
Polling Cycle
Polling Start Timing
At Pro-Server EX Startup
C Automatically start when a registered device is read.
□ 30 → sec of lapse from the last access stops Poling.
O Disable Auto Start
Cache Subject Device
Add Edit Delete
Node.DeviceName Device Address Data Type No. of Data
OK Cancel

4 Check [Polling Cycle] and set "3.0 seconds".

Device Cache Setting
Device Cache Name Cache1
Polling Cycle
C Always
Polling Cycle 30 sec
Polling Start Timing
At Pro-Server EX Startup
C Automatically start when a registered device is read.
□ 30 ★ sec of lapse from the last access stops Poling.
C Disable Auto Start

5 Check [At Pro-Server EX Startup] of [Polling Start Timing].

Device Cache Setting
Device Cache Name Cache1
Polling Cycle
O Always
Polling Cycle 3.0 + sec
Polling Start Timing
At Pro-Server EX Startup
C Automatically start when a registered device is read.
□ 30 → sec of lapse from the last access stops Poling.
C Disable Auto Start

6 Register a device to be cached.

1) Click the [Add] button.

	ache Subject Delete	Device		
Node.DeviceName	Device Address	Data Type	No. of Data	
	_	OK	Cancel	

2) Select the node name "AGP1" in [Node Name] which has a device to be cached.

Add Cache Subje	ect Device	×
Specify a cache	e subject symbol/group.	
Node Name		
PC1	•	
PC1		ר
	-	JI
Device Addr	ess	
.	v	
Data Type	16Bit(Signed) No. of Data 1	
	OK Cancel	

3) Select "PLC1" in [Device Name].

Add Cache Subject Device	×
Specify a cache subject symbol/group.	
Node Name	
AGP1	•
Device Name	
#INTERNAL	-
#INTERNAL	
PLC1	
Data Type 16Bit(Signed) No.	of Data 1
OK	Cancel

4) Set "D100" in [Device Address] as a device to be cached.

Add	l Cache Subje	ct Device		×
Sp	pecify a cache Node Name	subject symbol/group) .	
	AGP1			*
	Device Name	:		
	PLC1			-
0	Device Addre	-55		
L	ee D0100			
	Data Type	16Bit(Signed)	No. of Data	1
			ОК	Cancel

5) Set "16Bit(Signed)" in [Data Type] as a device data type and "1" in [No. of Data] as the number of devices, then click the [OK] button.

Add Cache Subject Device	×
Specify a cache subject symbol/group. Node Name	
AGP1	•
Device Name	
PLC1	•
Device Address	
D0100	T
Data Type 16Bit(Signed) No. of Data	13
<u> </u>	Cancel

"D100" has now been registered as a device to be cached.

Register the device "D150" in the same manner as "D100".

7 Click the [OK] button.

	Ca	ache Subject Delete	Device		
Г	Node.DeviceName	Device Address	Data Type	No. of Data	
	AGP1.PLC1	D0100	16Bit(Signed)	1	
	AGP1.PLC1	D0150	16Bit(Signed)	1	
ш					
			OK	Cance	

Now you can see the device cache name specified above in the tree display on the left of the screen and "Device Cache Subject List" on the right.

Pro-Studio EX <u>Fi</u> le <u>E</u> dit <u>T</u> ool	project02.npx Programming As	sist <u>S</u> etting <u>H</u> elp					
Start 🔊	Node	>> 🏳 Symbol >>	Feature »	📑 Save 🔪	• 🔌 T	ransfer	Monitor Status
Edit Delete Device Cache Subject List			t				
Add	Import	Device Cache Name	Node.DeviceName	Device Address	Data Ty	No. of D	Start Timing
Edit	Delete	Cache1	AGP1.PLC1 AGP1.PLC1	D0100 D0150	16Bit(Si 16Bit(Si	1	At Pro-Server EX
→ ACTION → Trigger Cor → Data Trans → Device Cac	fer be						

Setting Guide

Device Cache Setting 🔀
Device Cache Name Cache1
Polling Cycle
C Always
C Polling Cycle 1.0 + sec
Polling Start Timing
At Pro-Server EX Startup
C Automatically start when a registered device is read.
□ ³⁰ sec of lapse from the last access stops Poling.
C Disable Auto Start
Cache Subject Device Add Edit Delete Node.DeviceName Device Address Data Type No. of Data
0K Cancel

Setting item	Setting content		
Device Cache Name	 Enter a device cache name. NOTE Device cache names will be used in the case of control from API. 		
Polling Cycle	 Sets the polling time (data update cycle) of the device to be registered. [Always] Check this when updating device data regularly. [Polling Cycle] Check this when updating device data at a particular interval, which can be set in increments of 100ms (0.1sec). NOTE If a Pro-Server EX node or a GP Series node is included in a cached record, you cannot specify [Always]. 		

Setting item		Setting content		
Polling Start Timing		 Selects the timing to start polling. [At Pro-Server EX Startup] When 'Pro-Server EX' starts, polling is executed. And when 'Pro-Server EX' exits, polling is stopped. [Automatically start when a registered device is read.] Polling starts when any registered device is accessed. If checked, the item [* sec of lapse from the last access stops polling] becomes active, and polling stops if no read access is given for the period specified here. If not checked, polling does not stop until 'Pro-Server EX' exits. [Disable Auto Start] Polling starts according to the request not from 'Pro-Server EX' but from API. 		
	Add	Set [Node Name], [Device Name], [Device Address] (or symbol), [Data Type] and [No. of Data] on the "Add Cache Subject Device" screen. Then, click the [OK] button to register.		
Cache Subject Device	Edit	Specify the device you wish to edit, and edit the contents on the "Edit Cache Subject Device" screen. Then, click the [OK] button.		
	Delete	Specify the device you wish to delete, and click the [Yes] button on the "Delete Device Cache" screen.		

29.5.2 Import Registration from Device Access Log

Cache registration is available from the output results of "Device Access Log".

On [Device Access Log], you can output device access logs into a CSV-format file, and then import that file for cache registration.

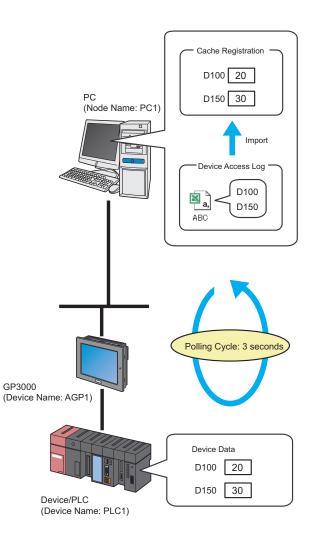
NOTE • Refer to "29.6 Device Access Log" about creating device access logs.

• For better performance, it is recommended to open the device access log file before importing it, by means of an application like Excel or Notepad, and to follow the actions below:

(1) Delete the devices that do not require device cache.

(2) Register the devices that can be arranged in sequence as one sequential device as much as possible.

Import Registration



NOTE

• A polling cycle means a time cycle to update the device value that is cache-registered.

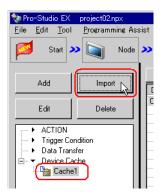


Setting item	Setting content	
Polling Cycle	3 seconds	
Polling Start Timing	At Pro-Server EX Startup	
Output file of device access logs to be cached	C:\Desktop\ABC.csv	

1 Click the [Feature] icon on the status bar.

💱 Pro-Studio EX 🛛 ?.npx	
	Setting Help
Stat >> 🔪 Node	🍑 🕨 Symbol 💙 ≷ Feature 🕨 📄 Save
Sample Wizard On the 2nd time or later, samples will be added to the network.	2-Way Network
New Form	2 110, 110, 100, 001
📽 Recipe	2-Way network is a network connecting FA units and in Excel format by acquiring data of the GPs and the v
🔯 Data Logging	connected to the GPs, and transmit the information of connection units.
Send Mail	Pro-Studio EX

 $2 \hspace{0.1 cm} \text{Select} \hspace{0.1 cm} [\text{Cache1}] \hspace{0.1 cm} \text{from the tree display on the left of the screen, then click the [Import] button.}$



3 Check [Polling Cycle] and set "3.0 seconds".

Import Device Cache Buffer 🛛 🔀				
Device Cache Buffer is automatically generated to cache data of devices written in the output result of the device access log.				
Set Cache Buffer to Generate				
Polling Cycle				
O Always				
C Polling Cycle				
Polling Start Timing				
At Pro-Server EX Startup				
C Automatically start when a registered device is read.				
□ 30 → sec of lapse from the last access stops Poling.				
C Disable Auto Start				

4 Check [At Pro-Server EX Startup] of [Polling Start Timing].

Import Device Cache Buffer	×
Device Cache Buffer is automatically generated to cache data of devices written in the output result of the device access log.	
Set Cache Buffer to Generate	
Polling Cycle	1
C Always	
Polling Cycle 30 sec	
Polling Start Timing	
The server EX Startup	
C Automatically start when a registered device is read.	
sec of lapse from the last access stops Poling.	
C Disable Auto Start	

5 Set the file name "aaa.csv" in [Output File of Device Access Logs to Cache], and then click the [Create] button.

Output File of Device Access Log to Cache	
C:\Documents and Settings\Administrator\Desktop\aaa.csv	Browse
	1
Create	Cancel

Setting Guide

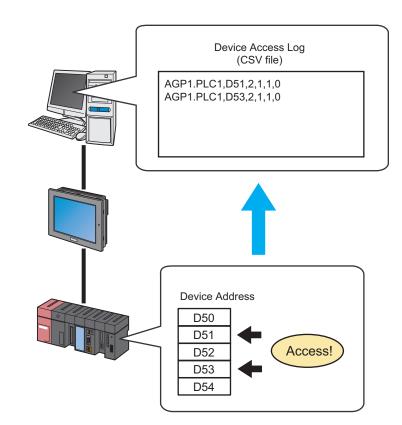
Import Device Cache Buffer 🛛 💌
Device Cache Buffer is automatically generated to cache data of devices written in the output result of the device access log.
Set Cache Buffer to Generate
Polling Cycle
C Always
Polling Cycle
Polling Start Timing
At Pro-Server EX Startup
 Automatically start when a registered device is read. Image: 30
Output File of Device Access Log to Cache
Browse
Create

Setting item	Setting content		
Polling Cycle	 Sets the polling time (data update cycle) of the device to be registered. [Always] Check this when updating device data regularly. [Polling Cycle] Check this when updating device data at a particular interval, which can be set in increments of 100ms (0.1sec). NOTE When you import the output file including a WindowsPC node or a GP Series node with [Always] selected, the setting will be automatically changed to [Polling Cycle 1.0 second]. After importing, check it again. 		
Polling Start Timing	 Selects the timing to start polling. [At Pro-Server EX Startup] When 'Pro-Server EX' starts, polling is executed. And when 'Pro-Server EX' exits, polling is stopped. [Automatically start when a registered device is read.] Polling starts when any registered device is accessed. If checked, the item [* sec of lapse from the last access stops polling] becomes active, and polling stops if no read access is given for the period specified here. If not checked, polling does not stop until 'Pro-Server EX' exits. [Disable Auto Start] Polling starts according to the request not from 'Pro-Server EX' but from API. 		
Output File of Device Access Logs to Cache	Click the [Browse] button, and select a device access log file (CSV file) on the "Save As" screen.		

29.6 Device Access Log

'Pro-Server EX' records accessed devices as needed basis, and allows you to output this record (Device access log) to a CSV file.

NOTE • You can cache-register a device more easily by importing a CSV file.



This section describes a series of actions to collect, save and clear device access logs.

1 Click the [Status Monitoring] icon on the status bar.

The status monitor screen appears to indicate the ongoing status of 'Pro-Server EX'.



For details about the screen, see "28 Simply Confirming On-site Status".

2 Click the [Device Access Log] button.

📚 Pro-Studio EX 🛛 project02.npx					
<u>F</u> ile <u>E</u>	<u>E</u> dit <u>T</u> ool <u>P</u> rogramming Ass				
	Start 🔉		Node		
P	Status N	fonitor			
<u>_</u>	💻 Device Monitor				
<u></u>	Symbol I	Monitor			
	Log Vi	iewer			
Device Access Log					

The "Device Access Log" screen appears.



29.6.1 Collecting Device Access Log

1 Click the [Start] button.



Collection of device access logs starts with the [Now collecting device access log] message displayed.

🕎 Device Access Log			<
Stop	Save	Clear	
Now collecting	device acces	ss log.	
]		

When the collection finishes, csv file appears to indicate the collected log number.

Click the [Stop] button when you want to stop the collection.

Device Access Log		
		×
Stop	Save	Clear
Now collecting	device acces	s log.
	_	

29.6.2 Saving Device Access Log After Collecting

1 Click the [Save] button.



2 Enter a file name and click the [Save] button.

My Network	File name: Save as type:	DeviceAccessLog.CSV CSV File(*.csv)	· (Save Cancel
Places				

The Save Completed message now appears, and the collected device access logs are saved.

NOTE	•	You can collect at maximum 1000 logs.
	•	If 'Pro-Server EX' is closed with Device Access Log running, Device Access Log is also closed and
		the collected logs are to be broken.
	•	If 'Pro-Server EX' reloads a network project file during the Device Access Log operation, the
		collected logs are to be broken and the "Now collecting" message will turn to "Under suspension".

■ Formats of Device Access Log to Be Saved

Formats of device access logs (CSV file) to be saved are as follows:

"Node Name. Device Name", "Group Name/Device Address", "Access Mode*", "Access Point", "Access Count" and "0"

(Example) AGP1.PLC1,D100,2,5,2,0 AGP2,LS200,6,10,1,0

* "Access Mode" is indicated as the numbers in the table below.

Mode	Value
Bit Access	1
16-bit Access (excluding BCD)	2
16-bit BCD Access	5
32-bit Access (excluding BCD)	6
32-bit BCD Access	9
64-bit Access Float Access	10
Double Access	11
Character String Access	12
8-bit Access	13
8-bit BCD Access	16
TIME Access	17
TIME_OF_DAY Access	18
DATE Access	19
DATE_AND_TIME Access	20
Group	32768 (0x8000)

Order of Display

Device access logs are output to a CSV file and sorted in the following sequence:

- (1) Node Name. Device Name
- (2) Group Name/Device Address
- (3) Access Mode*
- (4) Access Point

(Example)

AGP1.PLC1,D100,2,5,2,0 AGP1.PLC2,D100,2,5,2,0 AGP2.PLC1,D100,2,5,2,0 AGP2.PLC1,D101,2,5,2,0 AGP2.PLC1,D101,5,5,2,0 AGP2.PLC1,D101,5,10,2,0

29.6.3 Clearing Device Access Log After Collecting

1 Click the [Clear] button.



The "Are you sure you want to clear logs?" message appears.

Device Access Log for Pro-Server EX 🛛 🛛 🔀			
?	Are you sure you want to to clear the log?		
	<u>Y</u> es	No	

2 Select the [Yes] button.

Device Access Log for Pro-Server EX 🛛 🛛 🕅		
?	Are you sure you want to to clear the log?	
(

The collected device access logs are cleared.

29.6.4 Restrictions

Conditions for collecting device access logs

Whether collecting device access logs or not is determined by the following conditions:

- If a device gives a read-request to the device of another node, device data are collected as logs. When a read-request is received from another node, these data are not collected as logs.
- Access frequency is counted despite whether a request is via a network or not (whether cache read or not).
- Data is collected as logs despite whether actually accessed to devices or not (whether connected on the network or not).
- In the case of data transfer, data is not collected. (excluding a transfer source device when the transfer type is "Collection-type data transfer")

Conditions for access to the same device

Whether accessing the same device or not (whether access frequency is counted or not) is determined by the following conditions:

- The first address of the device is the same.
- The access mode is the same.
- The access point is the same.

If any of the above conditions are not satisfied, the access is judged as an access to another device.

(Example) These examples are the cases judged as different:
16-bit access x 1 point to LS100 and 32-bit access x 1 point to LS100
16-bit access x 2 points to LS100 and 32-bit access x 1 point to LS100
Bit access x 16 points to LS100:00 and 16-bit access x 1 point to LS100

When the same device is specified, moreover, the case specifying the device directly and that accessing the group where just one device is registered are judged as different. However, the case accessing by specifying the symbol or device inside of the group (excluding the nest group) is judged as an access by specifying the device directly.

Allowance of log collection

You can collect at maximum 1000 logs, and the logs exceeding this limit are not collected. In this case, it is not required to make the [Start] button on the "Device Access Log" screen invalid.

When the access frequency exceeds the maximum number (4294967295), the exceeding access is not counted.

Other restrictions

- If 'Pro-Server EX' is closed with Device Access Log running, Device Access Log is also closed (and the collected logs are to be broken).
- If 'Pro-Server EX' reloads a network project file during the Device Access Log operation, the collected logs are to be broken and the [Now collecting] message will turn to [Under suspension].