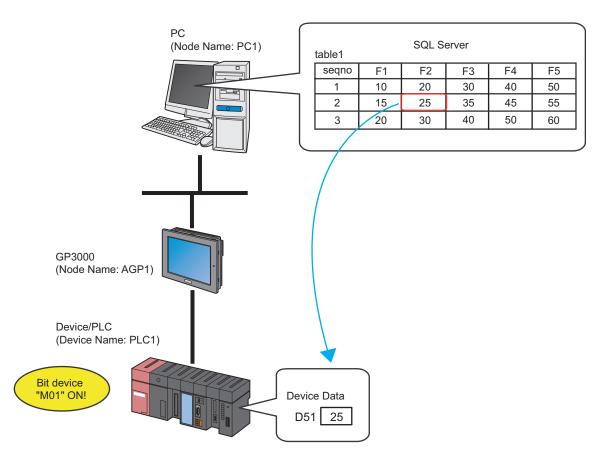
# 13 Reading Device/PLC from Database

13.1	Try to Read Device/PLC Data from Database	13-2
13.2	Setting Guide	13-26

# 13.1 Try to Read Device/PLC Data from Database

### [Action Example]

Detect the rising of the trigger device (bit device: "M01") of Device/PLC, read data from the field (F2) set for the trigger device in a relational database, and write the data into a specified device address.



This section describes the setting procedures for executing the above action (ACTION) as an example.

[Setting P	rocedure]	
1	Creating a Table	This step creates a table to specify the database to read data from or the device to write data in.
2	Creating a Database	This step creates a database table containing data to write in the device of Device/PLC.
3	Starting 'Pro-Studio EX'	This step starts 'Pro-Studio EX'.
4	Registering Entry Nodes	This step registers the PC and the GPs as entry nodes.
5	Registering Symbols	This step registers as a symbol the device of Device/ PLC which serves as a trigger condition (trigger) and a data write destination.
	<b>—</b>	
6	Parameter Setting for Feature (ACTION)	<ul><li>This step sets the following items:</li><li>Database informaiton</li><li>Database access method</li><li>File specification</li></ul>
	•	
7	Setting Trigger Conditions	This step sets conditions (trigger) for executing data write.
	•	
8	Setting Data Received by ACTION	This step sets a constant value to be the sequence No. (seqno) of a database.
	•	
9	Setting ACTION Node/Process Completion Notification	This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed.
	+	
10	Verifying Setting Result	This step verifies setting results on the setting content list screen.
11	Saving a Network Project File	This step saves the current settings as a network project file and reloads.
		1
12	Transferring a Network Project File	This step transfers a saved network project file to the GP.
·		
13	Executing ACTION	This step verifies that database data is written in the device of Device/PLC when the preset trigger condition has become effective.

### 13.1.1 Creating a Table

This step creates a table to specify the database to read data from or the device to write data in.

'Pro-Server EX' obtains database information, referring to data to transfer (which is "Fixed vale" of the transfer source set in "13.1.8 Setting Data Received by ACTION") and Excel table rows.

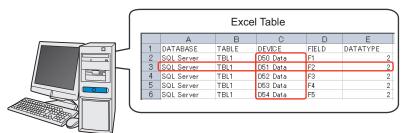


Table type	Description					
	Read d	ata directly from o	latabase.			
		A	В	C	D	E
'Microsoft Excel'	1	DATABASE	TABLE	DEVICE	FIELD	DATATYPE
	2	DBA	table1	D1 00	field1	2
	3	DBA	table1	D1 01	field2	2
	4	DBB	table2	D1 02	field3	2
Data is first written from database to Access, and then read from Access.						
'Microsoft Access'		DATABASE	TABLE	DEVICE	FIELD	DATATYPE
				D100	field1	2
				D101	field2	2
		DBB	table2	D102	field3	2

DATABASE	TABLE	DEVICE	FIELD	DATATYPE
SQL Server	TBL1	D50 data	F1	2
SQL Server	TBL1	D51 data	F2	2
SQL Server	TBL1	D52 data	F3	2
SQL Server	TBL1	D53 data	F4	2
SQL Server	TBL1	D54 data	F5	2

1 Start 'Microsoft Excel' and create the table below.

Below are the contents of each item of this table.

### [DATABASE]

Set the name of the database from which data is read.

### [TABLE]

Set the name of the database table from which data is read.

### [DEVICE]

Set the device or symbol name of the device to which data is written.

### [FIELD]

Set the field of the database table from which data is read.

### [DATATYPE]

Set the type of data to write.

Specify the data type as the following table shows.

Value	Data Type	Value	Data Type
1	Bit	7	32 bits without decimal code
2	16 bits with decimal code	8	Hexadecimal 32 bits
3	16 bits without decimal code	9	BCD 32 bits
4	Hexadecimal 16 bits	10	Single precision floating point
5	BCD 16 bits	11	Double-precision floating point
6	32 bits with decimal code	12	Character string

NOTE

• Do not fail to enter table item names like [DATABASE] or [TABLE] in the first row of Excel sheets.

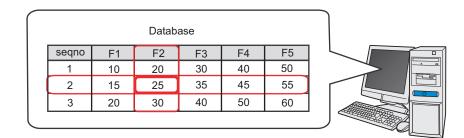
• There is a sample file (ProDB.xls) of an Excel table in the "PRO-SDK" folder where Pro-Server EX has been installed. Use this as a template when creating a table.

**2** Save it on PC desktop with the file name "exceltable.xls" after creating.

# 13.1.2 Creating a Data Table

This step creates a database table to store data to read out (recipe data).

'Pro-Server EX' obtains data in the [FIELD] row specified on an Excel table, referring to data to transfer (which is "Fixed vale" of the transfer source set in "13.1.8 Setting Data Received by ACTION") and "seqno" data on a database table.



Create the table below on a database.

seqno	F1	F2	F3	F4	F5
1	10	20	30	40	50
2	15	25	35	45	55
3	20	30	40	50	60



• Do not use "0" for "seqno" value. If data to transfer is not a character string, the lowest row of the table is searched when the data is "0".

- Do not use any character string containing " ' " (apostrophe) for "seqno" value.
- If you use "DSN", there is a sample file (DataBase.mdb) of a data table available in the "PRO-SDK" folder where Pro-Server EX has been installed. Use this as a template when creating a table.

# 13.1.3 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

Refer to "3 Trial of Pro-Server EX" for details about starting method.

# 13.1.4 Registering Entry Nodes

This step registers the PC and the GP connected with network as nodes. Refer to "30 Node Registration" for details about entry nodes.



Node Name	:PC1
IP Address	:192.168.0.1



Node Name	:AGP1		
IP Address	:192.168.0.100		
Device/PLC Information			

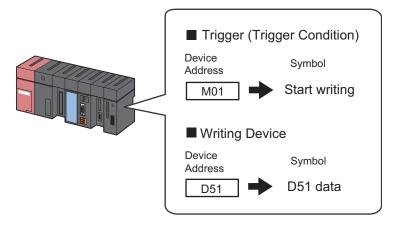


Entry node	Setting item	Setting example
PC	Node Name	PC1
	IP Address	192.168.0.1
	Туре	GP3000 series
GP	Node Name	AGP1
	IP Address	192.168.0.100

## 13.1.5 Registering Symbols

This step registers as a symbol the device address of Device/PLC which serves as a trigger condition (trigger) and the device of Device/PLC to write data in.

Refer to "31 Symbol Registration" for details about entry nodes.

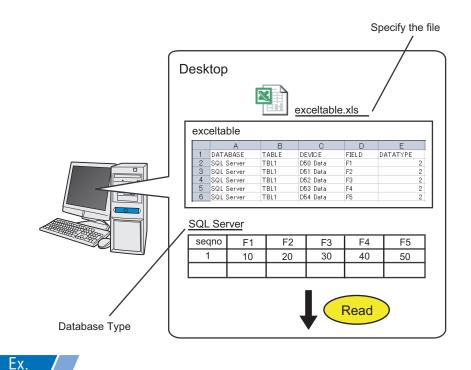




Setting item	Trigger (trigger condition)	Writing device
Symbol Name	Start writing	D51 data
Data Type	Bit	16Bit (Signed)
Device address for symbol registration	"M01" of Device/PLC (PLC1)	"D51" of Device/PLC (PLC1)
No. of Devices	1	1

# 13.1.6 Parameter Setting for Feature (ACTION)

This step makes settings to write database data in a device. (parameter settings) Refer to "13.2 Setting Guide" for more details about ACTION parameter.



Setting item	Setting content	
Login Name	login	
Password	abcde	
Server Name	server	
Database Type SQL Server		
Database Access Method	Access directly to database (EXCEL)	
File Specification	C:\Documents and Settings\Administrator\Desktop\exceltable.xls	

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

饕 Pro-Studio EX 🛛 ?	.npx	
File Edit Tool Pro	gramming Assist – Setti	ing Help
Start 🔉	Node >	Symbol Symbol Save .
Symbol		Node Name AGP1 Device Name
Group	Ungroup	Sheet Name Sheet3 📃 Set it as a glob
Insert	Delete	

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

饕 Pro-St	udio EX	t	est.npx					
File Edit	Tool	Pro	gramming	g Assist	Setti	ing He	lp	
<b>1</b>	Start 2	<b>&gt;&gt;</b>		Node	<b>&gt;&gt;</b>	$\triangleright$	Symbol	
Ad	ld L	)_	Impo	rt				
Ec			Delel			A	CTIO	N
	CTION rigger Co )ata Trar )evice Co	nsfer				u u	n additior Ising appl Ising Acc n the Pro-	lic es

 ${\bf 3}$  Click the [ACTION Type] list button, and select "Download from the database".

Then, enter the name of ACTION to set in the [ACTION Name] field. In this example, enter "Database Download".

<b>NOTE</b> • [ACTION Name] can be an arbitrary name.
---

Set ACTION Name	/Parameter		×
Add a new ACTION Specify an ACTION	l. I name, and set its parameter.		
ACTION Type	Create form using Excel.		•
ACTION Name	Create form using Excel. Writes Data to CSV file. Writes Data from CSV file. Upload of GP JPEG Data. Upload of GP Log Data. Writes Data to E-Mail. Upload to the database.		
· · · · · · · · · · · · · · · · · · ·	Download from the database.	<u> </u>	
	)	42	
		Next	Cancel

4 Click the [Click here to set the ACTION parameter] button.

Set ACTION Name/Parameter	×
Add a new ACTION. Specify an ACTION name, and set its parameter.	
ACTION Type Download from the database.	•
Display the Actions of the old version of Pro-Server	
ACTION Name DatabaseDownload	
Click here to set the ACTION parameter.	

- 5 Make settings regarding a database.
  - Set "login" in [Login name] and "abcde" in [Password] to access the database server with, and "server" in [Server name] for the database server PC name.

Download from the database	
Database information	EX Version 1.21
Login name: login Password: server Server name: server Database Type SQL Server Driver name: SQL Server	OK Cancel
Normally connected to server     If connection request is not received within standard time     period, connection is terminated.     It accesses a database directly(EXCEL)     Indirect accesses a database(ACCESS) File designation	

2) Set "SQL Server" in [Database Type].

Download from the Database information	database		EX Version 1.21
Login name: Password: Server name: Database Type Driver name:	login xxxxx server SQL Server DSN Dracle SUL Server Toonnected to server	▼ 5 M	OK Cancel
	period, connection is terminated. tabase directly(EXCEL) is a database(ACCESS)		

|--|

• If you select "DSN" in [Database Type], you do not have to set [Server name].

3) Set "SQL Server" in [Driver name].

Download from the	database			
Database information				EX Version 1.21
Login name:	login			ок
Password:	XXXXX			Cancel
Server name:	server			
Database Type	SQL Server		•	
Driver name:	SQL Server		•	
	SQL Server Normally connected server			
	□ If connection request is not received within standard time period, connection is terminated.	5	Min.	
<ul> <li>It accesses a data</li> </ul>	tabase directly(EXCEL)			
C Indirect accesse	s a database(ACCESS)			
File designation				

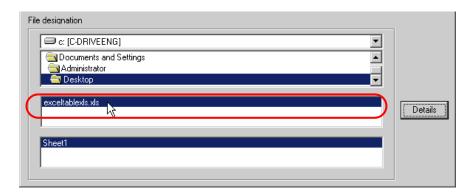
6 Select "It accesses a database directly (EXCEL)" as an access method.

Normally connected to server	
☐ If connection request is not received within standard time 5 № №	Min.
accesses a database directly(EXCEL) direct accesses a database(ACCESS)	

- 7 Make settings regarding a file (a table).
  - 1) Set "Desktop" as the destination to save in the upper list box.

File designation	
🖃 c: [C-DRIVEENG]	
Coursents and Settings	
	Details

2) Select the Excel table file name "exceltable.xls".



8 Click the [OK] button.

This is the end of the feature (ACTION) settings.

### 13.1.7 Setting Trigger Conditions

This step sets a trigger condition (trigger bit ON) to read out device data. Refer to "32 Trigger Conditions" for details about trigger conditions.

# Ex.

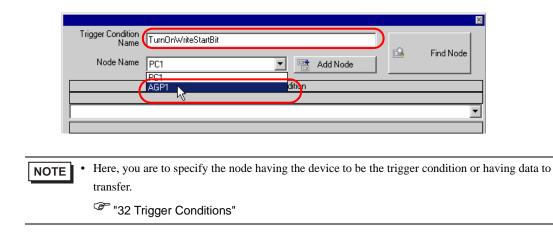
- Trigger Condition Name: Turn on write start bit
- Trigger Condition : When "Start writing" (M01) is ON
- $1 \ \ \, \text{On the "Set ACTION Name/Parameter" screen, click the [Next] button.}$

Set ACTION Name/Parameter	×
Add a new ACTION. Specify an ACTION name, and set its parameter.	
ACTION Type Download from the database.	•
Display the Actions of the old version of Pro-Server	
ACTION Name DatabaseDownload	
,	_
Click here to set the ACTION parameter.	
Next Cancel	

2 Click the [New Trigger Condition] button.

Set ACTION Trigger Condition	×
ACTION Type Download from the database.	
ACTION Name DatabaseDownload	
Specify a trigger condition of the ACTION.	
Trigger Condition	
New Trigger Condition	
Edit	
Node	

**3** Enter the trigger condition name "TurnOnWriteStartBit" in [Trigger Condition Name], and select "AGP1" in [Node Name] which has the device to serve as the trigger condition (trigger).



4 Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.

Condition <sup>-</sup>	1					
Specify th	he Trigger Condition.					
R	When Turned ON	While Device is ON 🛛 🙀 While Condition Satisfied				
Ġ	Specified Time	While Device is OFF 🛛 🙀 When Condition Satisfied				
٢	Constant Cycle	When Device ON 🐘 When Partner Node ON				
	When Device Changes	When Device OFF 🕺 When Partner Node OFF				
Device Name       #INTERNAL     Turn OFF the Specified Device Address after       Processing.       PLC1						
Data Typ	,					

5 Click the [Device Address] list button and select "WriteStart" for the symbol name of the device which serves as the trigger.

	n OFF the Specified Device Address after cessing.
Device Address	-
Data Tupe (198) (Signed)	writeStart
Limited Time Offer	
	þe

[Data Type] automatically appears after selection, too.

	Device Name
	PLC1
	Device Address
	writeStart
	Data Type Bit
	Limited Time Offer
	hour in hour
<b>NOTE</b> • You can also set the	igger conditions by combining 2 different types of conditions ("And" condition
or "Or" condition)	
🖙 "32 Trigger (	Conditions"

6 Click the [OK] button.

This is the end of trigger condition settings.

# 13.1.8 Setting Data Received by ACTION

This step sets a constant value (seqno) to be the sequence No. of a data table in ACTION .



• Constant value to transfer : 2

1 On the "Set ACTION Trigger Condition" screen, click the [Next] button.

Set ACTION Trigger Condition 🛛 🛛 🛛
ACTION Type Download from the database.
ACTION Name DatabaseDownload
Specify a trigger condition of the ACTION.
Trigger Condition
New Trigger Condition
TumOnWriteStartBit Edit
Node AGP1
When WriteStart of Node AGP1 is Turned ON
Back Next Cancel

2 After clicking [Constant Value], enter "2" in the text box for the constant value to transfer and "1" in [No.].

Transfer Source
Node
AGP1
Device Name
#INTERNAL 💌
C Device Address
Constant Value
2
Data Type 16Bit(Signed) No. 1

This is the end of the setting of data received by ACTION.

### 13.1.9 Setting ACTION Node/Process Completion Notification

This step sets the name of an ACTION node and the alert setting whether it should be tuned on or off when the ACTION is completed.



- ACTION Node : PC1
- Receive Notification: OFF

1 On the "Data settings to be received by ACTION" screen, click the [Next] button.

O Device Address
Constant Value
2
Data Type 16Bit(Signed) No. 1
Back Cancel

2 Click the list button of [ACTION Node] and select "PC1" as a node where ACTION operates. Also, clear the check if [Receive Notification Exists] has been checked.

Set ACTION Node/Process Completion Notification	×
ACTION Type Download from the database.	
ACTION Name DatabaseDownload	
Specify an action node (Windows PC) where the ACTION works practic ACTION Node PCT PCT PCT Reveive Notification Exists Please specify the notified device that will be informed of the execution of the ACTION. After the execution of the ACTION, it will be is turned on.	ally.

• When "Receive Notification Exists" is turned on, the specified bit device will be turned on when the ACTION is completed. This can be used as the trigger condition (trigger) of the subsequent ACTION when you want to execute two or more ACTIONs sequentially.

"32 Trigger Conditions"

### $\mathbf{3}$ Click the [Complete] button.

The "Set ACTION Node/Process Completion Notification" screen will disappear. On the left of the screen, the ACTION and trigger condition names you set will appear.

物 Pro-Studio EX 🛛 test.npx							
File	Edit	Tool	ol Programming Assist				
P	1	Start	<b>&gt;&gt;</b>		Node	2	
Add				Impo	rt	l	
Edit				Delete			
<ul> <li>ACTION</li> <li>ACTION</li> <li>Action</li> <li>Trigger Condition</li> <li>TurnOnWriteStartBit</li> <li>Data Transfer</li> <li>Device Cache</li> </ul>							

This is the end of the settings of the ACTION node and process completion notification.

### 13.1.10 Verifying Setting Result

This step verifies setting results on the setting content list screen.

1 Select the ACTION name "Database Download" from the tree display on the left of the screen.

💱 Pro-Studio EX 🛛 test.npx							
File	Edit	Tool	Pro	ogramming	g Assist	S	
	1	Start	<b>&gt;&gt;</b>		Node	<b>,</b>	
	Ad	d		Impo	rt		
Edit				Delete			
ACTION DatabaseDownload Trigger Condition TurnOnWriteStartBit Data Transfer Device Cache							

Confirm that the setting content appears on the right of the screen.

Setting Help	
» ≽ Symbol » ≷ Feature » 📄 Save » 🆄	Transfer Monitor Status
ACTION-Specific Trigger Condition/Process List	ACTION
Add Edit Release	Delete ACTION
Data Source Node AGP1	DatabaseDownload
Trigger When WriteStart of Node AGP1 is Tu Condition Data	Rename
Condition Data Completion 2	Download from the database.
	Set Parameter
L	ACTION Node
	PC1

2 Select the trigger condition name "TurnOnWriteStartBit" from the tree display on the left of the screen.

物 Pro-Studio EX	test.npx			
File Edit Tool P	Programming Assist 9			
对 Start 🔉	Node			
Add	Import			
Edit	Delete			
ACTION     Actio				

Confirm that the setting content appears on the right of the screen.

etting Help						_ 🗆 ×
	» 🗄	Save >		🔰 Transfei		Monitor Status
Trigger Condition	Sec	quence D	)iag	ram by Ti	rigger Conditioi	า
	• •	Collapse		Tra	nsfer ACTION/Data	
TurnOnWrit 💌 Edit	Feature	Source		Destinat	Receive/Process Co	)
Node AGP1	Databas	AGP1.#	->	PC1.Da		
When WriteStart of Node AGP1						

This is the end of the verification of the settings.

### 13.1.11 Saving a Network Project File

This step saves the current settings as a network project file and reloads to 'Pro-Server EX'.

Refer to "24 Saving" for details about saving a network project file.

- Pro-Server EX' reads a created network project file, and then executes ACTION according to the settings in the file. The settings therefore need be saved in the network project file.
  - Be sure to reload the network project file to 'Pro-Server EX'. If not, ACTION will not work.



• Path of network project file

 $: Desktop \Database\_download.npx$ 

Title

: Database download action

### 13.1.12 Transferring a Network Project File

This step transfers a saved network project file to entry nodes.

Refer to "25 Transferring" for details about transferring a network project file.

**NOTE** • Be sure to transfer a network project file. If not, ACTION will not work.

### 13.1.13 Executing ACTION

This step verifies that database data is written in the device of Device/PLC when the preset trigger condition has become effective.

🜉 Symbol - Moni	tor of Pro-Server EX				
Node AGP1	<ul> <li>Device/PLC</li> </ul>	PLC1	▼ Device Add	dress Sheet3	
Set	Polling time 1000ms	Time expended for re	ead 3031ms	Time expended for write	Start
G G Symbol	Data type	+ Address	Count	+00 +01	+02
D51Data	te Bit 16Bit(Signed)	M0001 D0050	<u>1</u>	25	
ADDIDUUU	robiotorgnous	20000			

**NOTE** • Check the actually written values with such function as monitor of rudder creation software.

This is the end of the explanation of this ACTION.

# 13.2 Setting Guide

This section explains how to set the parameters of ACTION.

Download from the database	
Database information	EX Version 1.21
Login name:	ОК
Password:	Cancel
Server name:	
Database Type SQL Server	
Driver name: SQL Server	
Normally connected to server	
If connection request is not received within standard time 5 Mi	n.
It accesses a database directly(EXCEL)	
C Indirect accesses a database(ACCESS)	
File designation	
= e:	
Pro-face	
The server EX S	
	Details

Setting item		Setting content	
	Login name	Sets a login name to access the database server with.	
	Password	Sets a password to access the database server with.	
		Enters "PC Name" or "IP Address" of the database server.	
Database Information	Server name	<ul> <li>NOTE</li> <li>If you select "DSN" in [Database Type], you do not have to enter this.</li> </ul>	
	Database Type	Selects a database type between [SQL Server], [Oracle], and [DSN].	
	Driver name	<ul> <li>Selects a driver depending on the selected database type.</li> <li><b>NOTE</b></li> <li>If you select "DSN" in [Database Type], you do not have to enter this.</li> </ul>	

Setting item		Setting content
Database Information	Normally connected to server	<ul> <li>Connects with the server at all times.</li> <li><b>NOTE</b></li> <li>If you connect with the server frequently, an always-on connection is useful to reduce the time to open your database.</li> </ul>
	If connection request is not received within standard time period, connection is terminated.	Disconnects when no connection is requested in a certain period in case of always-on connection to the server.
Database Access Method		<ul> <li>Selects how to access databases.</li> <li>It accesses a database directly (EXCEL) If you use Excel, database data is directly written into a device.</li> <li>Indirect accesses a database (ACCESS) If you use Access, database data is once written into an Access file and then into a device.</li> </ul>
File designation		Specify the save folder of the file including a table. C drive (C:) folder is to appear for initial setting. To change the drive to display, click the list button to select new one. After you specify the folder, select the file name from the list and the sheet name including a table.
[Details] Button		Clicking this button displays the "A setup of details" screen. Refer to "■ "A setup of details" Screen" Screen" for more details.

# "A setup of details" Screen

A setup of details	
A setup of a server	
Server connection time:	10 Sec.
Retry number of times:	3
Disconnect Time:	5 Min.
OK	Cancel

Setting item		Setting content	
A setup of a server	Server connection time	Sets communication time-out with the database server.	
	Retry number of times	Sets the number of communication retries with the database server.	
	Disconnect Time	Sets the time allowed until connection is cut if it has been set to disconnect when no connection is requested in a certain period.	