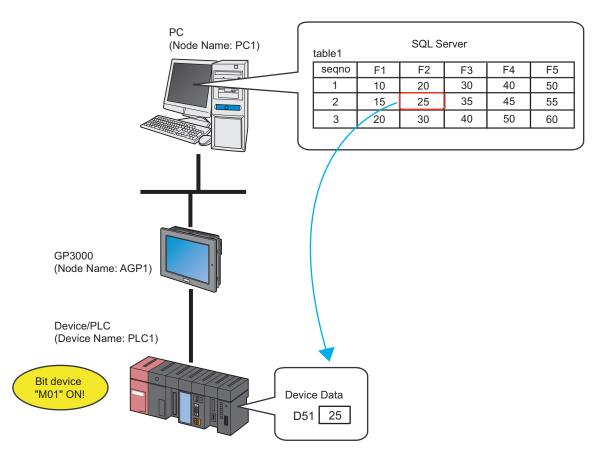
14 Reading Device/PLC from Database

14.1	Try to Read Device/PLC Data from Database	14-2
14.2	Setting Guide	14-27

14.1 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 Procedure]

	-	
1	Creating a Table (page14-4)	This step creates a table to specify the database to read data from or the device to write data in.
2	Creating a Data Table (page14-7)	This step creates a database table containing data to write in the device of Device/PLC.
3	Starting 'Pro-Studio EX' (page14-8)	This step starts 'Pro-Studio EX'.
4	Registering Entry Nodes (page14-8)	This step registers the PC and the display units as entry nodes.
5	Registering Symbols (page14-9)	This step registers as a symbol the device of Device/ PLC which serves as a trigger condition (trigger) and a data write destination.
6	Parameter Setting for Feature (ACTION) (page14-10)	This step sets the following items:Database informaitonDatabase access methodFile specification
7	Setting Trigger Conditions (page14-16)	This step sets conditions (trigger) for executing data write.
8	Setting Data Received by ACTION (page14- 19)	This step sets a constant value to be the sequence No. (seqno) of a database.
9	Setting ACTION Node/Process Completion Notification (page14-21)	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 (page14-23)t	This step verifies setting results on the setting content list screen.
11	Saving a Network Project File (page14-25)	This step saves the current settings as a network project file and reloads.
12	Transferring a Network Project File (page14- 25)	This step transfers a saved network project file to the display unit.
13	Executing ACTION (page14-26)	This step verifies that database data is written in the device of Device/PLC when the preset trigger condition has become effective.

14.1.1 Creating a Table

This step creates a table that specifies the database(s) from which data is read and the device(s) to which data is written.

'Pro-Server EX' retrieves database information by referencing transfer data ("Constant Value" of the transfer source specified in "14.1.8 Setting Data Received by ACTION") and rows in the Excel table.



	Excel Table						
		A	В	C	D	E	
	1	DATABASE	TABLE	DEVICE	FIELD	DATATYPE	
	2	SQL Server	TBL1	D50 Data	F1		2
_	3 (SQL Server	TBL1	D51 Data	F2		2
	4	SQL Server	TBL1	D52 Data	F3		2
	5	SQL Server	TBL1	D53 Data	F4		2
	6	SQL Server	TBL1	D54 Data	F5		2
U							

Table type	Description					
	Read da	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
			table1	D100	field1	2
			table1	D101	field2	2
		DBB	table2	D102	field3	2

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

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

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	11	Double-precision floating point
2	Decimal 16 bit signed	12	Character string
3	Decimal 16 bit unsigned	13	Decimal 8 bit signed
4	Hexadecimal 16 bits	14	Decimal 8 bit unsigned
5	BCD 16 bits	15	Hexadecimal 8 bit
6	Decimal 32 bit signed	16	BCD 8 bit
7	Decimal 32 bit unsigned	17	TIME data
8	Hexadecimal 32 bits	18	TIME_OF_DAY Data
9	BCD 32 bits	19	DATE Data
10	Single precision floating point		-

NOTE

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

• When you want to specify two or more Device/PLC devices, set a device name and a device address to [DEVICE].

Example: [PLC1]D100

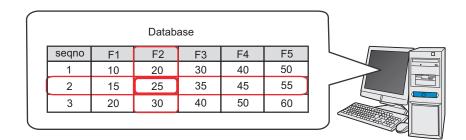
• There is a sample file (ProDB.xls) of an Excel table in the "PRO-SDK" folder where Pro-Server EX has been installed. Use this as a template when creating a table.

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

14.1.2 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 "14.1.8 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.

14.1.3 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

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

14.1.4 Registering Entry Nodes

This step registers the PC and the display unit connected with network as nodes. Refer to "31 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			

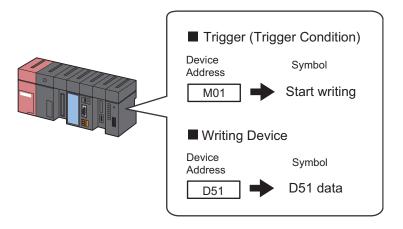


Entry node	Setting item	Setting example
PC	Node Name	PC1
	IP Address	192.168.0.1
	Туре	GP3000 series
Display Unit	Node Name	AGP1
	IP Address	192.168.0.100

14.1.5 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 "32 Symbol Registration" for details about entry nodes.

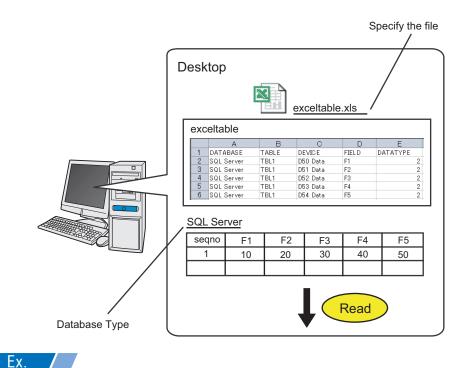




Setting item	Trigger (trigger condition)	Writing device
Symbol Name	Start writing	D51 data
Data Type	Bit	16Bit (Signed)
Device address for symbol registration	"M01" of Device/PLC (PLC1)	"D51" of Device/PLC (PLC1)
No. of Devices	1	1

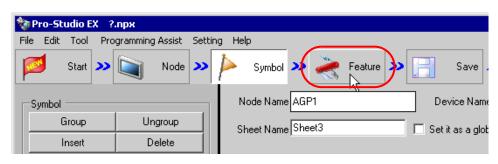
14.1.6 Parameter Setting for Feature (ACTION)

This step makes settings to write database data in a device. (parameter settings) Refer to "14.2 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.



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

饕 Pro-S	tudio EX	t	est.npx					
File Edit	: Tool	Pro	grammin	g Assist	Setti	ing He	elp	
1	Start	»>		Node	>>	\triangleright	Symbol	2
	dd)[Impo	nt				
E	dit		Dele	te		Į	ACTION	ł
	ACTION Trigger Co Data Trar Device C	ondi nsfei	T			ບ ບ	n addition Ising appli Ising Acco n the Pro-1	ic es

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".

|--|

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.
	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	
Children	× .
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	E	X Version 1.21
Login name: login Password: ***** 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.	Min.	
 It accesses a database directly(EXCEL) 		
C Indirect accesses a database(ACCESS)		
File designation		

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

Download from the Database information				EX Version 1.21
Login name:	login			ок
Password:	XXXXX			Cancel
Server name:	server			
Database Type	SQL Server		•	
Driver name:	DSN Oracle			
	SUL Server			
	If connection request is not received within standard time period, connection is terminated.	5	Min.	
 It accesses a data 	atabase directly(EXCEL)			
C Indirect accesse	es a database(ACCESS)			
File designation				

- NOTE
- If you select "DSN" in [Database Type], you do not have to set [Server name].
- [SQL Server] supports SQL Server 2000 only.
- Supports Oracle8, 10g, and 11g. However, cannot run on 64-bit operating systems.

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

Download from the	database			
Database information				EX Version 1.21
Login name:	login			ок
Password:	*****			Cancel
Server name:	server			
Database Type	SQL Server		•	
Driver name:	SQL Server		•	
	SQL Server Normally connected reserver			
	□ If connection request is not received within standard time period, connection is terminated.	5	Min.	
 It accesses a data 	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	o server	
If connection reque period, connection i	st is not received within standard time s terminated.	5 Min.
It accesses a database directly(EXCEL)		

7 Make settings regarding a file (a table).

1) Set "Desktop" as the destination to save in the upper list box.

File designation	7
🖃 c: [C-DRIVEENG]	
Administrator	
	Details
·	

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

File designation	
🖃 c: [C-DRIVEENG]	
Administrator	
	Details
Sheet1	

8 Click the [OK] button.

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

14.1.7 Setting Trigger Conditions

This step sets a trigger condition (trigger bit ON) to read out device data. Refer to "33 Trigger Conditions" for details about trigger conditions.

Ex.

- Trigger Condition Name: Turn on write start bit
- Trigger Condition : When "Start writing" (M01) is ON

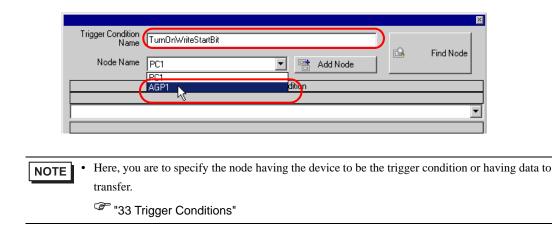
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.

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	

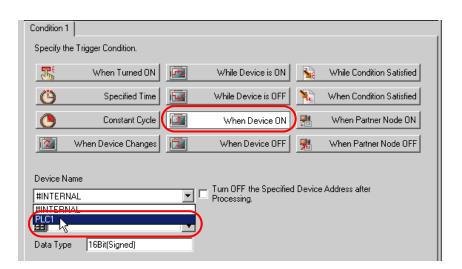
2 Click the [New Trigger Condition] button.

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.



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

Device Name	
PLC1 Turn OFF the Specified Device Address after Processing.	
Device Address	
▼ ⊡- Local Sheet3	
Data Type 16Bit(Signed)	
Limited Time Offer	
0 → hour 0 → min - 0 → hou	
	cel

[Data Type] automatically appears after selection, too.

	Device Name	
	PLC1	
	Device Address	
	📰 WriteStart 💽 💌	
	Data Type Bit	
	Limited Time Offer	
	0 🔹 hour 🛛 🛫 min - 🛛 😴 hour	
NOTE • You can also set tri	gger conditions by combining 2 differen	t types of conditions ("And" condition
or "Or" condition).		
😨 "33 Trigger C	onditions"	

6 Click the [OK] button.

This is the end of trigger condition settings.

14.1.8 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
TurnOnWriteStartBit 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
T
Constant Value
2
Data Type 16Bit(Signed) No. 1

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

14.1.9 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.	1
ACTION Name DatabaseDownload	
Specify an action node (Windows PC) where the ACTION works practically. ACTION Node PC1 PC1 PC1 PC1 PC1 PC1 PC1 PC1 PC1 PC	
Receive 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.	

• 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.

"33 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.

🏷 P	ro-St	udio E	X t	est.npx		
File	Edit	Tool	Pro	ogrammine	g Assist	S
P	1	Start	>>		Node	2
	Ad	ld		Impo	nt	
Edit				Dele	te	l
		rigger I	abase Condi hOnW ansfe	/riteStartB r		

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

14.1.10 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.

牧 P	ro-St	udio E	X t	est.npx		
File	Edit	Tool	Pro	gramming	g Assist	S
	1	Start	>>		Node	2
	Ad	d		Impo	nt	l
Edit				Dele	te	l
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
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 Data	Rename
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	Programming Assist 9				
对 Start 🕽	Node				
Add	Import				
Edit	Delete				
ACTION ACTION ACTION Action Trigger Condition TurnOnWriteStartBit Data Transfor Device Cache					

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

etting Help						-	
	» 📑	Save ン		Transfe	r [,	Monitor Status
Trigger Condition	Sec	luence Di Collapse	iagran	,	rigger Cor ansfer ACTION		
TurnOnWrite Edit Node AGP1 When WriteStart of Node AGP1	Feature Databas	Source AGP1.#		stinat 1.Da	Receive/Pro	ocess Co.	

This is the end of the verification of the settings.

14.1.11 Saving a Network Project File

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

Refer to "25 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

14.1.12 Transferring a Network Project File

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

Refer to "26 Transferring" for details about transferring a network project file.

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

14.1.13 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	Device/PLC	PLC1	 Device Ad 	dress Sheet3	-		
Set	Polling time 1000ms	Time expended for rea	ad 3031ms	Time expended for write		Start .	
G G Symbol	Data type te Bit	+ Address	Count	+00	+01	+02	
D51Data	16Bit(Signed)	D0050	5	25			
NOTE • C	Theck the actually wr	itten values wit	h such funct	tion as monitor of	f rudder crea	ation soft	ware.

• If you want to achieve faster communication during ACTION, refer to "29 Tips for Faster Communication".

This is the end of the explanation of this ACTION.

14.2 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	- I
Driver name: SQL Server	- I
Normally connected to server	
	Min.
 It accesses a database directly(EXCEL) Indirect accesses a database(ACCESS) 	
File designation	
	-
Pro-face	-
	-
	-
	Details

Setti	ng item	Setting content
Database Information	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.
	Server name	 NOTE If you select "DSN" in [Database Type], you do not have to enter this.
	Database Type	Selects a database type between [SQL Server], [Oracle], and [DSN].
	Driver name	 Selects a driver depending on the selected database type. NOTE If you select "DSN" in [Database Type], you do not have to enter this.

Setti	ng item	Setting content
Database Information	Normally connected to server	Connects with the server at all times. NOTE • If you connect with the server frequently, an always-on connection is useful to reduce the time to open your database.
	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		 Selects how to access databases. It accesses a database directly (EXCEL) If you use Excel, database data is directly written into a device. Indirect accesses a database (ACCESS) If you use Access, database data is once written into an Access file and then into a device.
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.
	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.