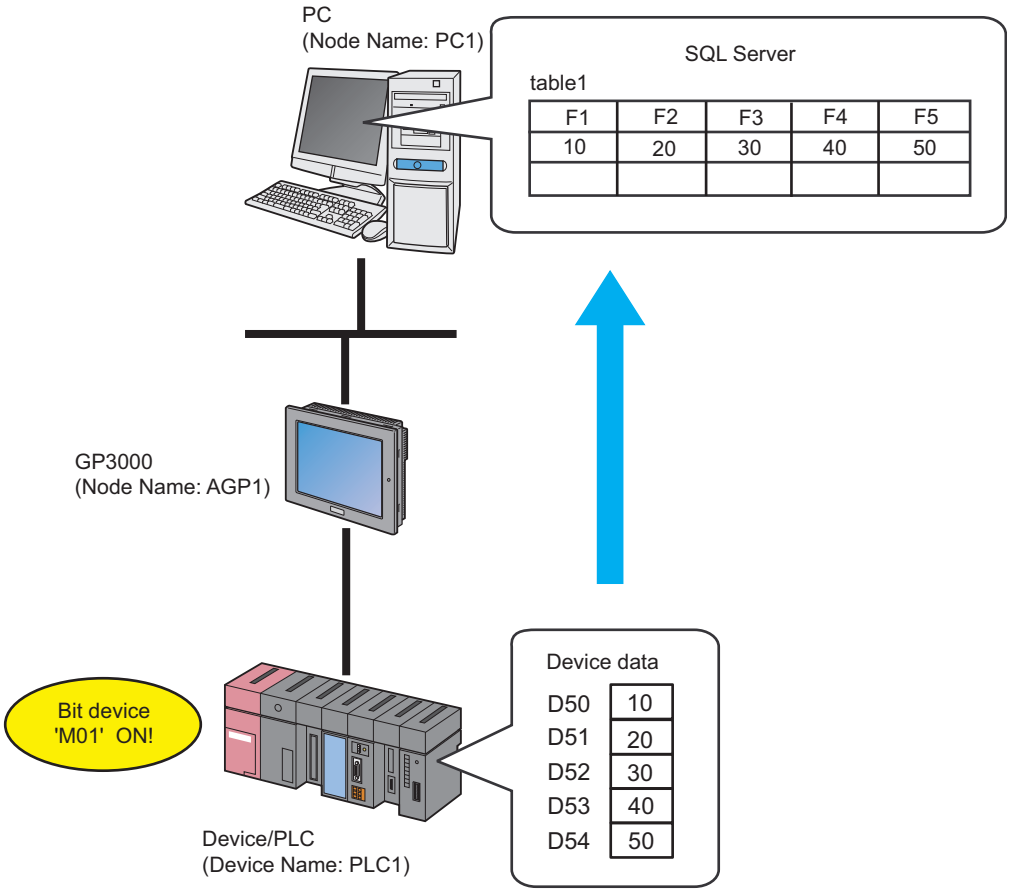
8 Writing Device/PLC Data in Database

8.1 Try to Write Device/PLC Data in Database

[Action Example]

Detect the rising of the trigger device (bit device: "M01") of Device/PLC, read device address (word device: address "D50" to "D54") values specified in an Excel file table, and write the values into the specified relational database field.



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

[Setting Procedure]

1	Creating a Table (page8-4)	This step creates a table to specify the device to read data from or the database to read data in.
2	Starting 'Pro-Studio EX' (page8-6)	This step starts 'Pro-Studio EX'.
3	Registering Entry Nodes (page8-6)	This step registers the PC and the display units as
4	Registering Symbols (page8-7)	This step registers as a symbol the device of Device/PLC which serves as a trigger condition (trigger) and also a data read destination.
5	Parameter Setting for Feature (ACTION) (page8-8)	This step sets the following items: • Database information • Database access method • File specification
6	Setting Trigger Conditions (page8-13)	This step sets data read conditions (trigger).
7	Setting Data Received by ACTION (page8-16)	This step sets a constant value to transfer.
8	Setting ACTION Node/Process Completion Notification (page8-17)	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.
9	Verifying Setting Result (page8-19)	This step verifies setting results on the setting content list screen.
10	Saving a Network Project File (page8-21)	This step saves the current settings as a network project file and reloads.
11	Transferring a Network Project File (page8-21)	This step transfers a saved network project file to the display unit.
12	Executing ACTION (page8-22)	This step verifies that device data is written in database when the preset trigger condition has become effective.

8.1.1 Creating a Table

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

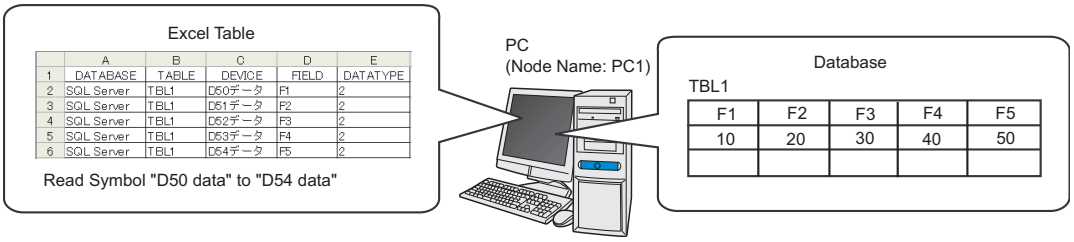


Table type	Description
'Microsoft Excel'	Writes data directly in database. A B C D E 1 DATABASE TABLE DEVICE FIELD DATATYPE 2 DBA table1 D100 field1 2 3 DBA table1 D101 field2 2 4 DBB table2 D102 field3 2
'Microsoft Access'	Writes data in database after once writing in 'Microsoft Access'. **NOTE** • You can write saved data into database when the next ACTION triggers even if you cannot connect with database. DATABASE TABLE DEVICE FIELD DATATYPE DBA table1 D100 field1 2 DBA 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 in which data is written.

[TABLE]

Set the table name of the database in which data is written.

[DEVICE]

Set the device or symbol name of the device from which data is read.

[FIELD]

Set the field of the database table in which data is written.

[DATATYPE]

Set the type of data to write.

Specify a 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 "12" (character string) is set to [TYPE], read 255 characters from the device address specified in [DEVICE] and write the data until NULL of the character string in the database.
- 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. (When installed as standard, the directory is C:\Program Files\Pro-face\Pro-Server EX\PRO-SDK.)
  The "PRO-SDK" folder is located on the following path when installed as standard.
  - Windows Vista or later: C:\Pro-face\Pro-Server EX\PRO-SDK
  - Windows XP / Server 2003: C:\Program Files\Pro-face\Pro-Server EX\PRO-SDK

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

8.1.2 Starting 'Pro-Studio EX'

This step starts 'Pro-Studio EX'.

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

8.1.3 Registering Entry Nodes

This step registers as entry nodes the PC and the display units which serve as trigger conditions (trigger).

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

Subnet Mask :255.255.255.0

Device/PLC Information

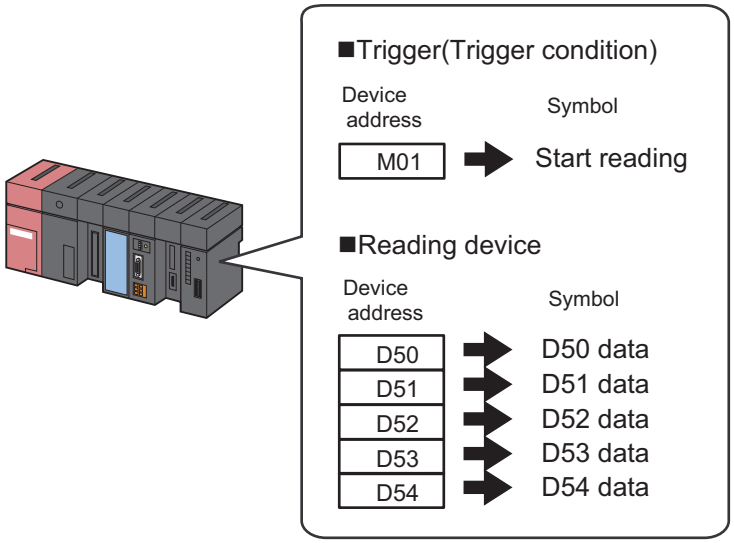
Ex.

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

8.1.4 Registering Symbols

This step registers as a symbol the device address of Device/PLC which serves as a trigger condition and from which data is read.

Refer to "32 Symbol Registration" for details about symbols.



Ex.

- Trigger (Trigger Condition)

Setting item	Setting content
Symbol Name	Start reading
Data Type	Bit
Device address for symbol registration	"M01" of Device/PLC (PLC1)
No. of Devices	1

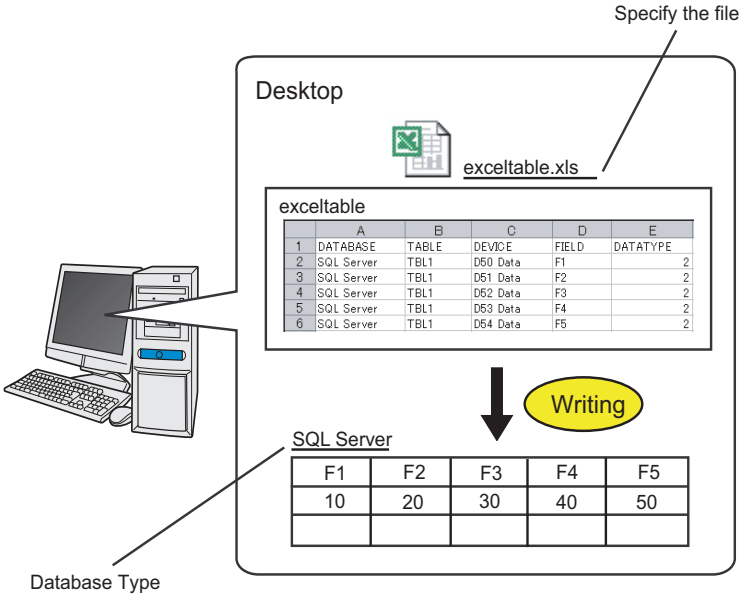
- Reading Device

Setting item	Setting content				
Symbol Name	D50 data	D51 data	D52 data	D53 data	D54 data
Data Type	16Bit (Signed)				
Device address for symbol registration	"D50" of Device/PLC (PLC1)	"D51" of Device/PLC (PLC1)	"D52" of Device/PLC (PLC1)	"D53" of Device/PLC (PLC1)	"D54" of Device/PLC (PLC1)
No. of Devices	1	1	1	1	1

8.1.5 Parameter Setting for Feature (ACTION)

This step makes settings to write device data in database. (parameter settings)

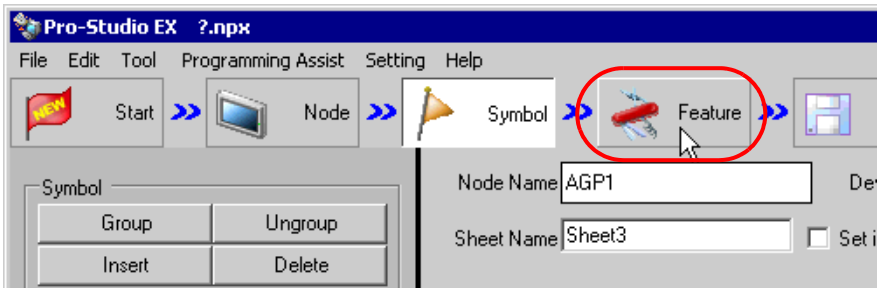
Refer to "8.2 Setting Guide" for more details about ACTION parameters.



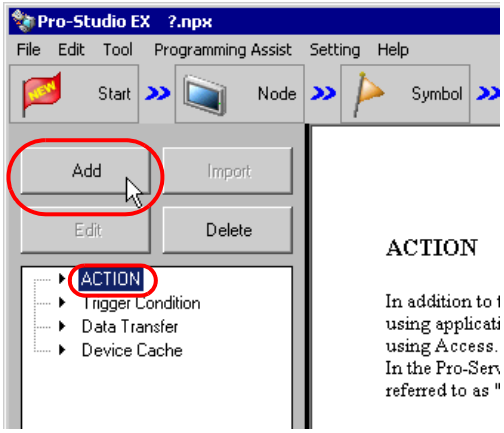
Ex.

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

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

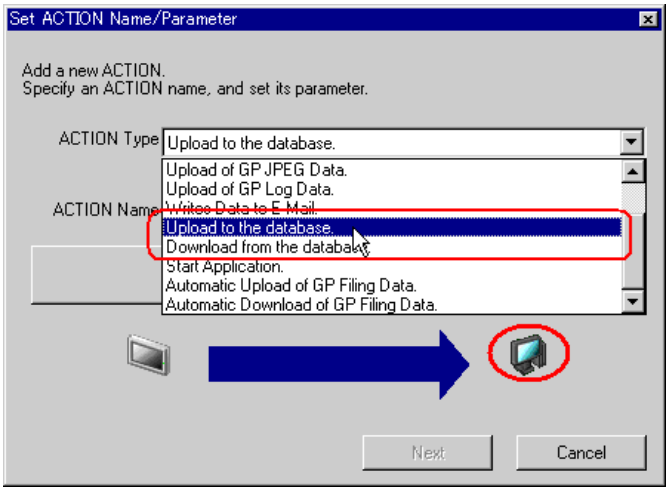


2 Select [ACTION] from the tree display on the left of the screen, then click the [Add] button.

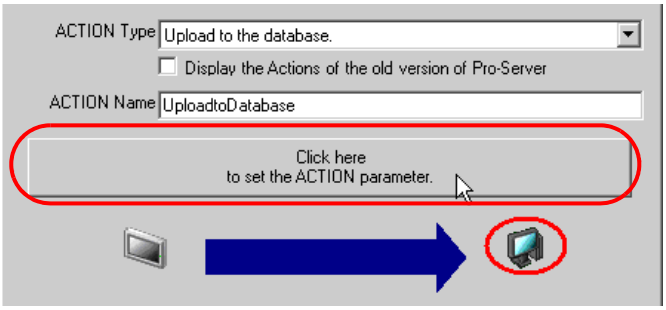


3 Click the [ACTION Type] list button, and select "Upload to the database".

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

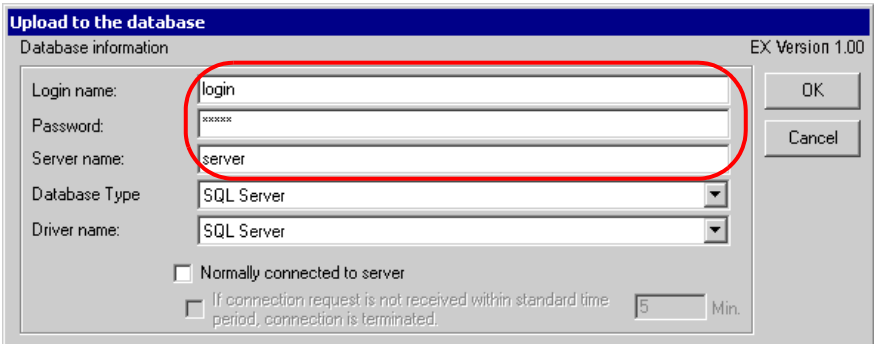


4 Click the [Click here to set the ACTION parameter] button.



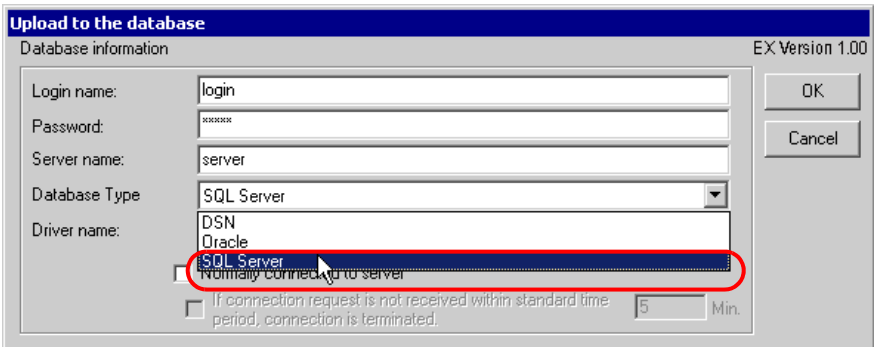
5 Make settings regarding a database.

1) 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.



NOTE • Enter "PC Name" or "IP Address" of the database server in [Server name].

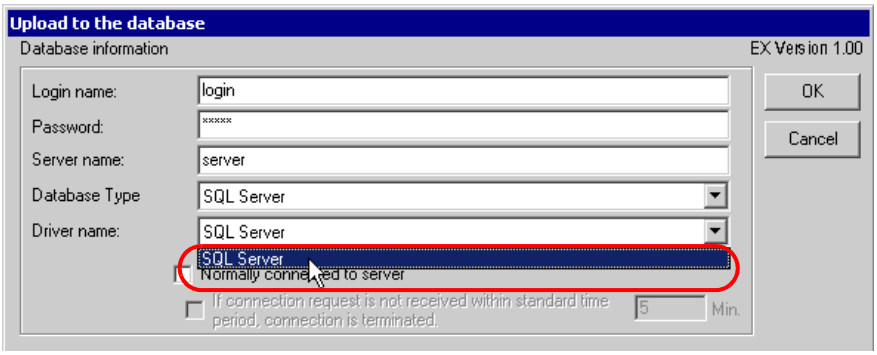
2) Set "SQL Server" in [Database Type].



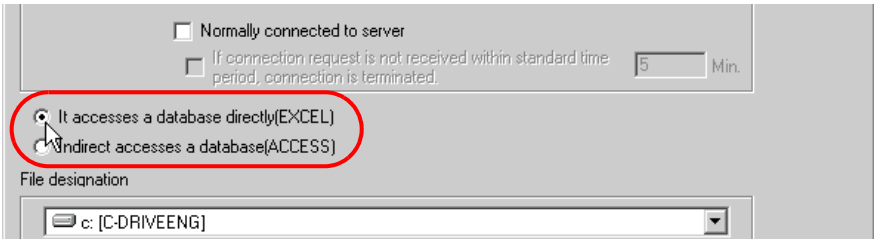
NOTE

- When selecting [Oracle ODBC Driver], you cannot specify [Server name].
- Supports Oracle8, 10g, and 11g. However, cannot run on 64-bit operating systems.
- Use [Oracle ODBC Driver] with version 8.0.5.5.0 or later. If it is earlier than the specified version, the "Reverse set does not support the scroll in the reversed direction" message is displayed and the Action ends.
- [DSN] supports Microsoft Access only.
- When selecting [DSN], enter nothing in [Server name].
- Do not search when opening with the Microsoft Access design view.
- SQL Server 2000 and 2012 are supported.
- For [SQL Server], use SQL Server authentication. Windows authentication is not supported.

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

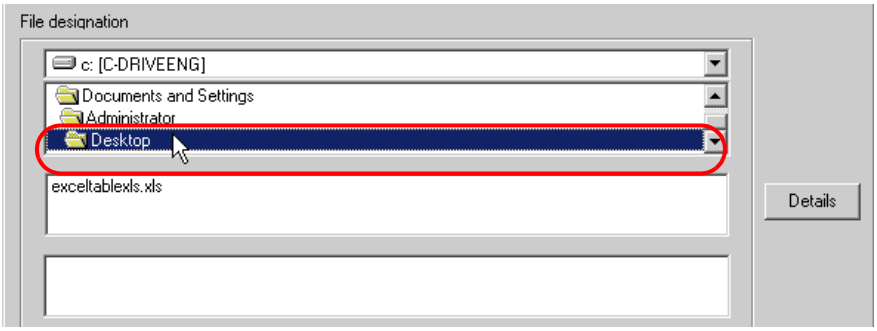


6 Select "It accesses a database directly (EXCEL)" as an access method.

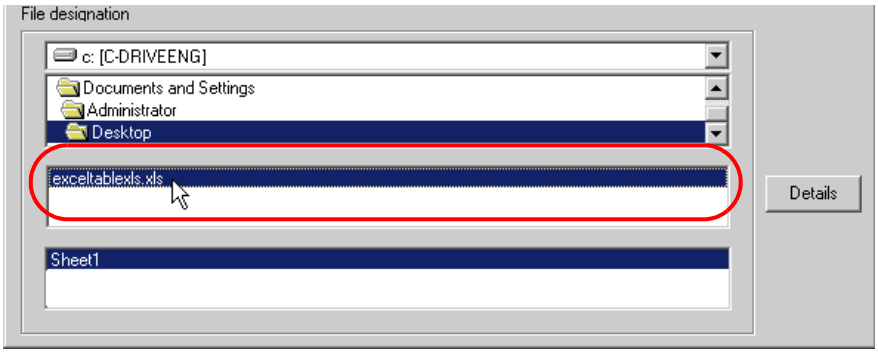


7 Make settings regarding a file (a table).

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



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



8 Click the [OK] button.

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

8.1.6 Setting Trigger Conditions

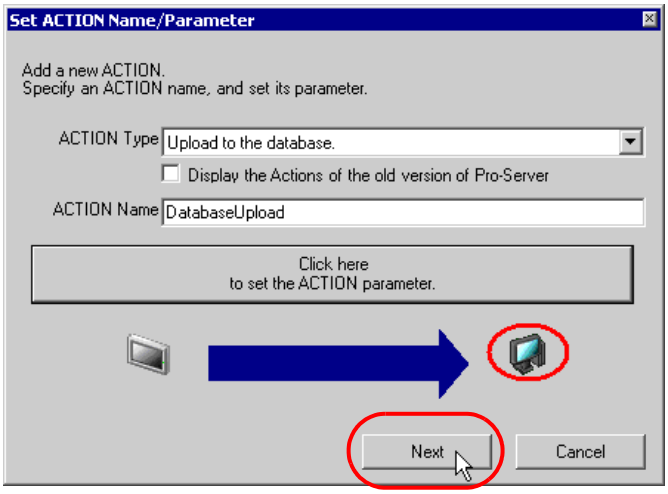
This step sets a trigger condition (trigger bit ON) to read out device data.

Refer to "33 Trigger Conditions" for details about trigger conditions.

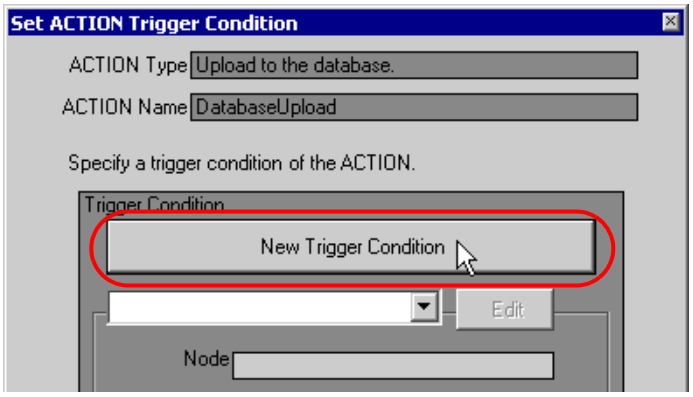
Ex.

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

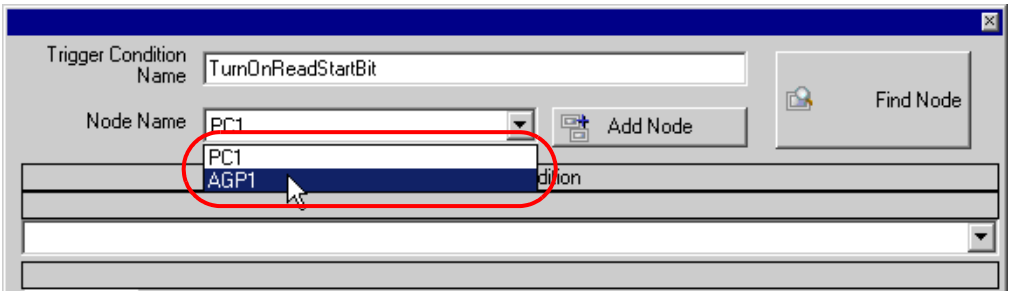
1 On the "Set ACTION Name/Parameter" screen, click the [Next] button.



2 Click the [New Trigger Condition] button.



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

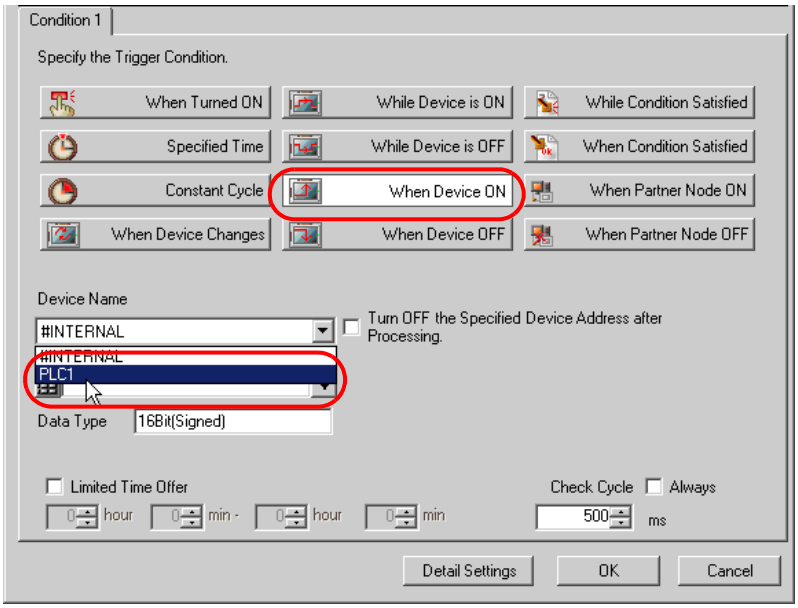


NOTE

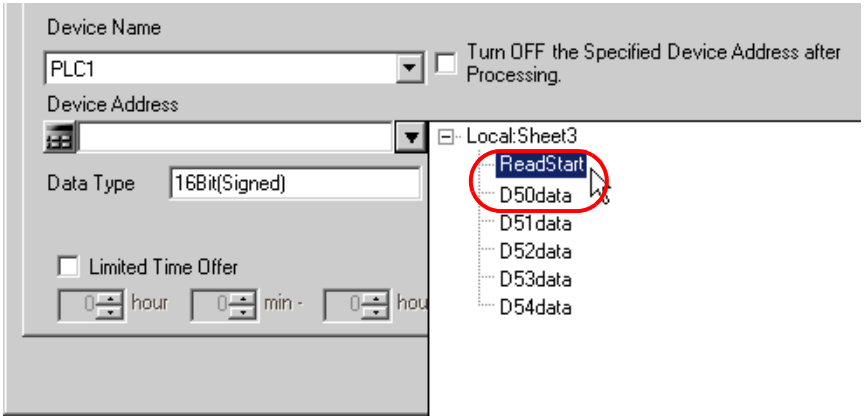
- Here, you are to specify the node having the device to be the trigger condition or having data to transfer.

  ☞ "33 Trigger Conditions"

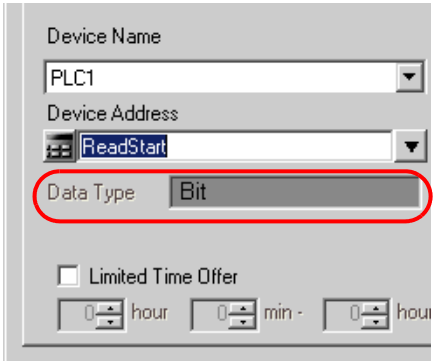
4 Click the [When Device ON] button in the [Condition 1] tab and select "PLC1" for the device name.



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



[Data Type] automatically appears after selection, too.



NOTE

- You can also set trigger conditions by combining 2 different types of conditions ("And" condition or "Or" condition).

  ☞ "33 Trigger Conditions"

6 Click the [OK] button.

This is the end of trigger condition settings.

8.1.7 Setting Data Received by ACTION

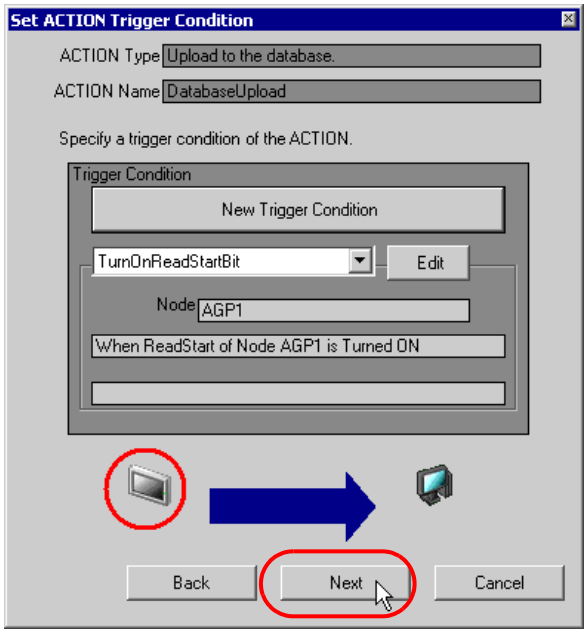
This step sets data to transfer in ACTION.

Any constant value is acceptable as data to transfer.

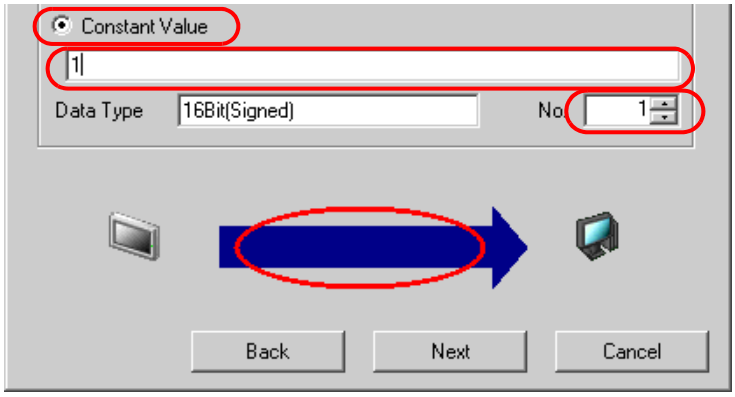
[Setting Example]

- Constant value to transfer: 1

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



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



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

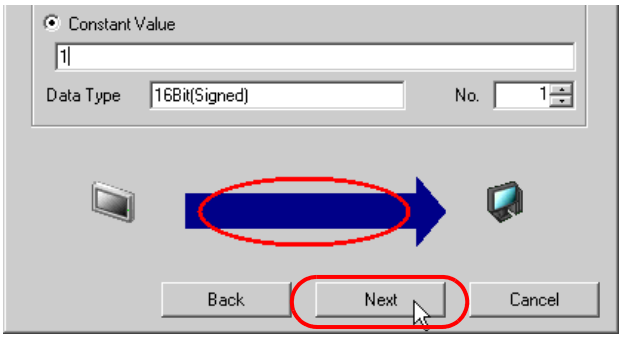
8.1.8 Setting ACTION Node/Process Completion Notification

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.

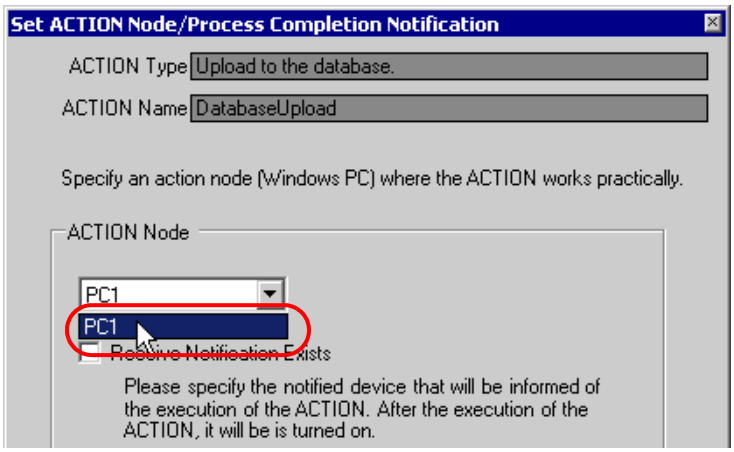
[Setting Example]

- ACTION Node: PC1
- Receive Notification: OFF

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



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.



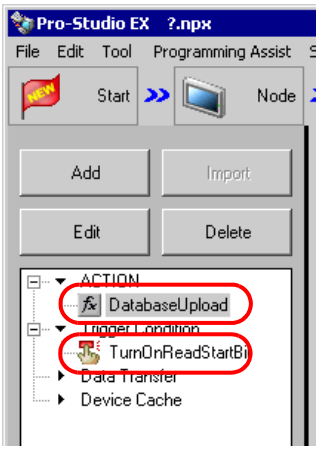
NOTE

- 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 a trigger condition (trigger) of the subsequent ACTION when you want to execute two or more ACTIONs sequentially.

☞ "33 Trigger Conditions"

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.

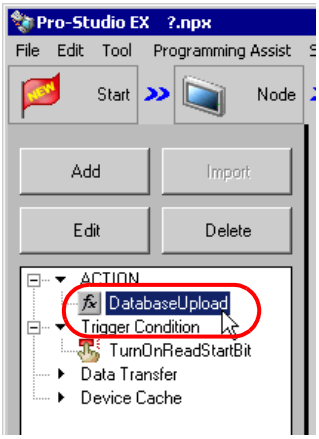


This is the end of the settings of the ACTION node and process completion notification.

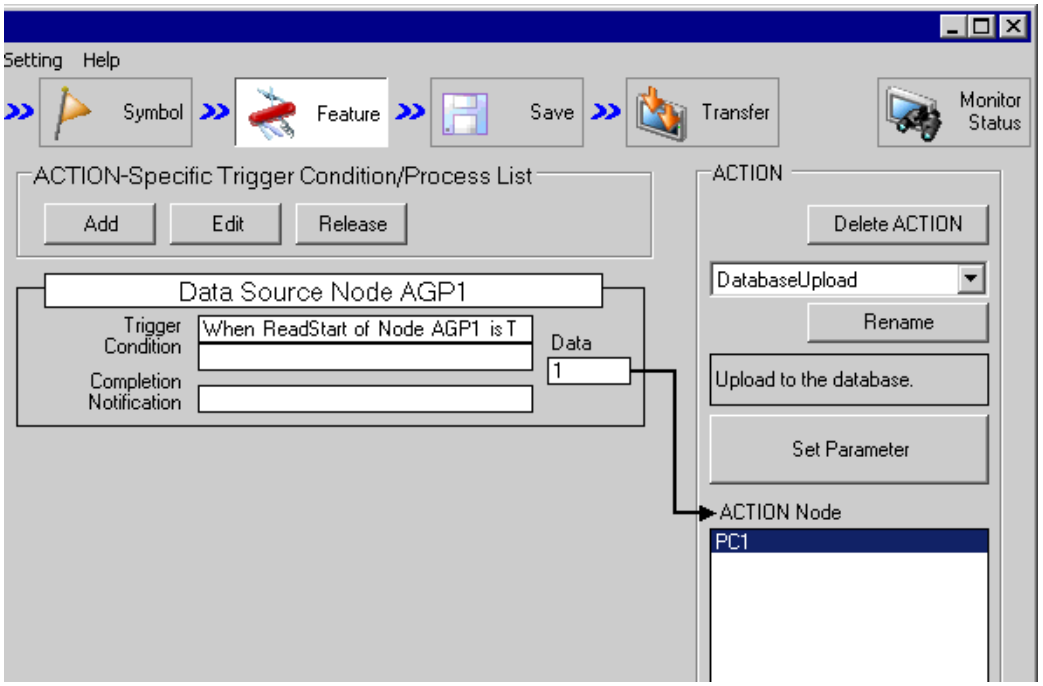
8.1.9 Verifying Setting Result

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

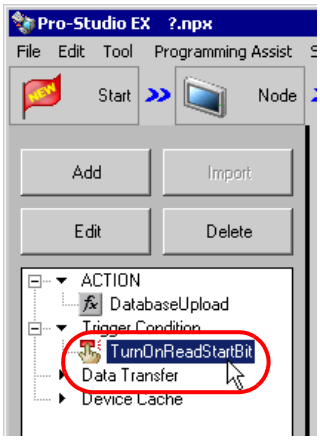
1 Select the ACTION name "Database Upload" from the tree display on the left of the screen.



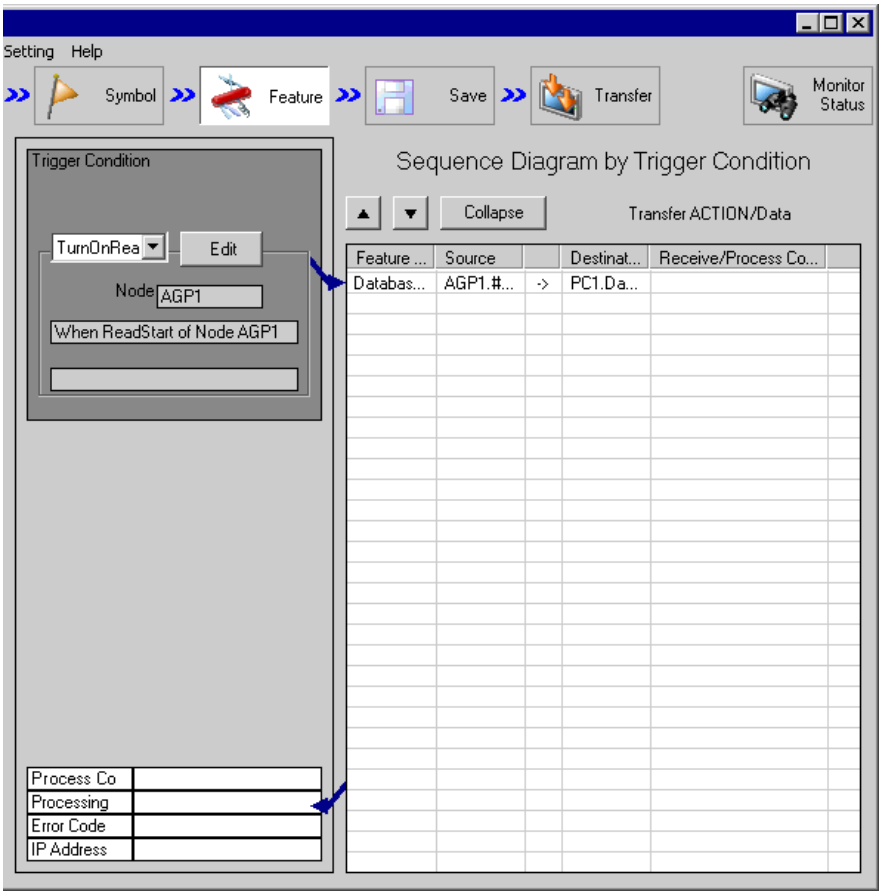
Confirm that the setting content appears on the right of the screen.



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



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



This is the end of the verification of the settings.

8.1.10 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.

IMPORTANT
- '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.

Ex.

- Path of network project file : Desktop\Database_upload.npx
- Title : Database upload action

8.1.11 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.

8.1.12 Executing ACTION

This step verifies that 5 device data are written in the field of database when the preset trigger condition has become effective.

SQL Server

F1	F2	F3	F4	F5
10	20	30	40	50

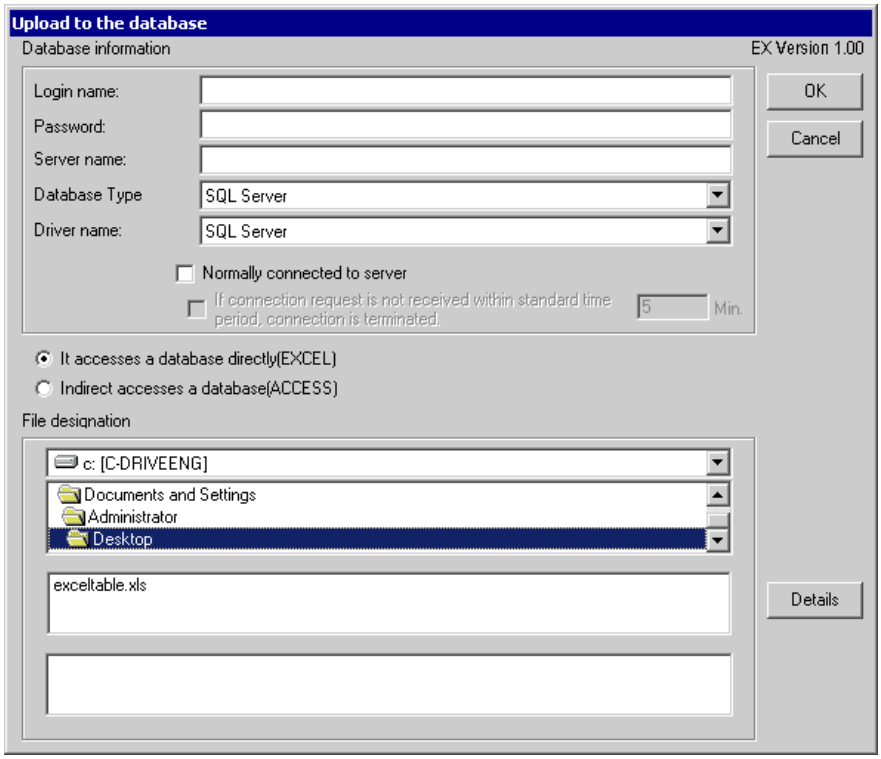
This is the end of the explanation of this ACTION.

NOTE

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

8.2 Setting Guide

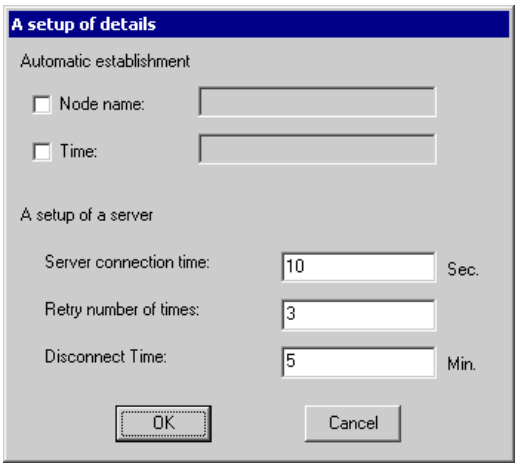
This section explains how to set the parameters of ACTION.



Setting 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.
	Server name	Enters "PC Name" or "IP Address" of the database server.-{}- **NOTE** • If you select "DSN" in [Database Type], you do not have to enter this.
	Database Type	Selects database type between [SQL Server], [Oracle], and [DSN]. **NOTE** • If you select [DSN] with 'Pro-Server EX' used as a service, register the DSN as a system 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.

Setting item		Setting content
Database Information	Nomally connected to server	Check if you want to connect with the server all the time. **NOTE** • If you connect with the server frequently, an always-on connection is useful to reduce the time to open database.
	If connection request is not received within standard time period, connection is terminated.	Check if you want to disconnect when no connection requested in a certain period in case of regular connection to the server.
Access Method		Selects how to access database. • It accesses a database directly (EXCEL) Data is directly written into the database. • Indirect accesses a database (ACCESS) After first writing to the Access file, data is then written to the database. When using a file with the extension ".accdb", you need Microsoft(R) Access(R) 2007 or later. **NOTE** • You can write saved data in database when the next ACTION triggers even if you cannot connect with database.
File designation		Specify the save folder of the file including a table. After you specify the folder, select the file name from the list and the sheet name including a table.
Details		On the "Detailed Settings" screen, sets to change retry related items in database connection. Refer to "■ "A setup of details" Screen" for more details.

■ "A setup of details" Screen



Setting item		Setting content
Automatic establishment	Node name	If you want to write a node name, check here and enter a field name to write in.
	Time	If you want to write time, check here and enter a field name to write in.
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.