# 8 Writing Device/PLC Data in Database

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# 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]

	Creating a Table	This stan anastas a table to anasify the device to need
1	Creating a Table	data from or the database to read data in.
2	Starting 'Pro-Studio EX'	This step starts 'Pro-Studio EX'.
3	Registering Entry Nodes	This step registers the PC and the GPs as entry
4	Registering Symbols	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)	This step sets the following items:
		<ul> <li>Database information</li> <li>Database access method</li> </ul>
		<ul><li>File specification</li></ul>
6	Setting Trigger Conditions	This step sets data read conditions (trigger).
		······································
7	Setting Data Received by ACTION	This step sets a constant value to transfer.
	•	
8	Setting ACTION Node/Process Completion	This step sets the name of an ACTION node and the
	Notification	alert setting whether it should be tuned on or off
		when the ACTION is completed.
9	Verifying Setting Result	This step verifies setting results on the setting
		content list screen.
10	Saving a Network Project File	This step saves the current settings as a network
		project file and reloads.
11	Transferring a Network Project File	This step transfers a saved network project file to the
'		GP.
10	Executing ACTION	This step verifies that device data is written in
12	Executing ACTION	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				
	Writes data directly in d	atabase.			
	A	В	С	D	E
'Microsoft Excel'	1 DATABASE	TABLE	DEVICE	FIELD	DATATYPE
	2 DBA	table1	D100	field1	2
	3 DBA	table1	D1 01	field2	2
	4 DBB	table2	D1 02	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         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	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.

- 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.
- 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.)
- **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 GPs which serve as trigger conditions (trigger). Refer to "30 Node Registration" for details about entry nodes.





Node Name :AGP1

IP Address :192.168.0.100

Subnet Mask:255.255.255.0

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	

# 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 "31 Symbol Registration" for details about symbols.





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.





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".

Set ACTION Name/Parameter	×
Add a new ACTION. Specify an ACTION name, and set its parameter.	
ACTION Type Upload to the database.	1
Upload of GP JPEG Data. Upload of GP Log Data. ACTION Name Writee Data to E Mail. Upload to the database. Download from the databask. Start Application. Automatic Upload of GP Filing Data.	
Next Cancel	

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

	ACTION Type Upload to the database.	•
	ACTION Name UploadtoDatabase	
(	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.

Upload to the data	abase		
Database informatio	n	E	EX Version 1.00
Login name: Password:	login xxxxxx		OK Cancel
Server name:	server		
Database Type	SQL Server	-	
Driver name:	SQL Server	-	
	Normally connected to server		
	If connection request is not received within standard time period, connection is terminated.         5	Min.	



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

Upload to the databa	56	
Database information		EX Version 1.00
Login name:	login	ОК
Password:	*****	Cancel
Server name:	server	
Database Type	SQL Server	
Driver name:	DSN Dracle	
	SQL Server Nomeny connector server	)
I	If connection request is not received within standard time 5 Min period, connection is terminated.	

NOTE

• When selecting [Oracle], you cannot specify [Server name].

- Supports Oracle8 only.
- Use [Oracle] 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.

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

Upload to the data	base	
Database information	1	EX Version 1.00
Login name:	login	ок
Password:	жжик	Cancel
Server name:	server	]
Database Type	SQL Server	]
Driver name:	SQL Server	]
	SQL Server Normally conner, ed to server	)
	F onnection request is not received within standard time 5 M	in.

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.

File designation	
🖃 c: [C-DRIVEENG]	
Coursents and Settings	
Desktop	
exceltablexIs.xIs	Details

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 "32 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.

Se	t ACTION Name/Parameter	×
4.05	Add a new ACTION. Specify an ACTION name, and set its parameter.	
	ACTION Type Upload to the database.	•
	Display the Actions of the old version of Pro-Server	
	ACTION Name DatabaseUpload	
		_
	Click here to set the ACTION parameter.	
		_

2 Click the [New Trigger Condition] button.

Set ACTION Trigger Condition	×
ACTION Type Upload to the database.	
ACTION Name DatabaseUpload	
Specify a trigger condition of the ACTION.	
Trigger Condition	
New Trigger Condition	
Edit	
Node	

**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).

		×
Trigger Condition Name TurnOnReadStartBit	-0	
Node Name PC1 Add Node		Find Node
AGP1 diftion		
		•

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

"32 Trigger Conditions"

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

Condition 1	
Specify the Trigger Condition.	
🛒 When Turned ON	While Device is ON While Condition Satisfied
G Specified Time	While Device is OFF When Condition Satisfied
Onstant Cycle	When Device ON 🐘 When Partner Node ON
When Device Changes	When Device OFF 🕺 When Partner Node OFF
Device Name #INTERNAL PLC1 Data Type 16Bit(Signed)	Turn OFF the Specified Device Address after Processing.
Limited Time Offer	Check Cycle C Always
	Detail Settings OK Cancel

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

Device Name	Turn OFF the Specified Device Address after
PLC1	Processing.
Device Address	
<b>Ξ</b>	⊡- Local:Sheet3
Data Type 16Bit(Signed)	PeadStart D50data D51data D52data D53data D54data

[Data Type] automatically appears after selection, too.

	Device Name PLC1  Device Address  ReadStart  Data Type Bit  Limited Time Offer  hour  hour hour	
• You can also set tri or "Or" condition).	gger conditions by combining 2 different t	ypes of conditions ("And" condition
🐨 "32 Trigger Co	onditions"	

6 Click the [OK] button.

ſ

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.

Set ACTION Trigger Condition
ACTION Type Upload to the database.
ACTION Name DatabaseUpload
Specify a trigger condition of the ACTION.
Trigger Condition
New Trigger Condition
TumOnReadStartBit Edit
Node AGP1
When ReadStart of Node AGP1 is Turned ON
Back Next Cancel

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

Constant V	alue		
Data Type	16Bit(Signed)		No 1÷
		$\rightarrow$	
	Back	Next	Cancel

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.

Constant \	/alue
1	
Data Type	16Bit(Signed) No. 1

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 Upload to the database.	
ACTION Name DatabaseUpload	
Specify an action node (Windows PC) where the ACTION works pract ACTION Node PC1 PC1 RetUre 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	cally.

• 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.

"32 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.

Setting Help	
» 卢 Symbol » ≷ Feature » 📄 Save » 🖄	Transfer Monitor Status
ACTION-Specific Trigger Condition/Process List	ACTION
Add Edit Release	Delete ACTION
Data Source Node AGP1	DatabaseUpload
Trigger When ReadStart of Node AGP1 is T Data	Rename
Completion 1	Upload to the database.
	Set Parameter
-	PC1

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.

					_ (	Ι×
Setting Help						
>> ≽ Symbol >> 촩 Feature .	» 🔒	Save >		🤰 Transfe	r M	onitor Status
Trigger Condition	Sec	juence D	)iag	ram by T	rigger Condition	
		Lollapse		1 ra	ansfer AUTIUN/Data	
TurnOnRea 💌 🗕 Edit	Feature	Source		Destinat	Receive/Process Co	
	Databas	AGP1.#	->	PC1.Da		
	L					_
When ReadStart of Node AGPT						
						_
	L					
	L					
	<u> </u>					
Process Co						
Processing						
Error Code						
LIP Address						

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 "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
- Title

 $: Desktop \verb| Database\_upload.npx|$ 

: Database upload action

# 8.1.11 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.

# 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.

# 8.2 Setting Guide

This section explains how to set the parameters of ACTION.

Upload to the datab	ase	
Database information		EX Version 1.00
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 da	tabase directly(EXCEL)	
<ul> <li>Indirect accesse</li> </ul>	s a database(ACCESS)	
File designation		
C: [C-DRIVEE	NG]	
Documents a	and Settings	
Administrato		
, overlisble vie		
exceitable.xis		Details
I		

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.
Server r Database	Server name	Enters "PC Name" or "IP Address" of the database server{}- <b>NOTE</b> • 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].
	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
Nomally connected to server		<ul> <li>Check if you want to connect with the server all the time.</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 database.</li> </ul>
Database Information Information If connection request is not received with standard time period, connection is terminated.	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		<ul> <li>Selects how to access database.</li> <li>It accesses a database directly (EXCEL) If you use Excel, data is directly written into database .</li> <li>Indirect accesses a database (ACCESS) If you use Access, data is once written into an Access file and then into database.</li> <li>NOTE</li> <li>You can write saved data in database when the next ACTION triggers even if you cannot connect with database.</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		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

A setup of details			
Automatic establishment			
Node name:			
🔲 Time:			
A setup of a server			
Server connection tim	ne:	10	Sec.
Retry number of times	¢	3	
Disconnect Time:		5	Min.
OK		Cancel	

Setting item		Setting content
Automatic Node name		If you want to write a node name, check here and enter a field name to write in.
establishment	Time	If you want to write time, check here and enter a field name to write in.
	Server connection time	Sets communication time-out with the database server.
A setup of a 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.