

Ns300 provider

YASKAWA Fieldbus I/F Unit

Version 1.0.1

User's guide

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【Revision history】

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【Hardware】

Model	Version	Notes

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1. Introduction

This book is an user's guide of the Ns300 provider that is the provider that communicates DeviceNet with the series made of YASKAWA Ns300.

Please refer to the manual of Ns300 for details of the communication protocol.

2. Outline of provider

2.1. Outline

The Ns300 provider is mounting the DeviceNet communication command of the Ns300 series in the command, the robot, and the variable class.

It communicates by using the DeviceNet provider for the communication. Therefore, it is necessary to register the DeviceNet provider in the registry to use this provider.

The outline of the provider is described.

Table1Ns300 provider

File name	CaoProvNs300.dll
ProgID	CaoProv.YASKAWA.Ns300
Registry registration	regsvr32 CaoProvNs300.dll
Blotting out of registry registration	regsvr32 /u CaoProvNs300.dll

2.2. Method property

2.2.1. CaoWorkspace::AddController method

When the Controller object is generated, connected processing by the DeviceNet communication is done in the Ns300 provider. At this time, DeviceNet board ID necessary for the connection, the baud rate, the mastering node, and the slave node are specified by using the option character string. Moreover, when connecting it, both sizes of IN/.OUT are set by eight bytes.

```
AddController
(
  "< controller name >"           // Controller name.
  " CaoProv.YASKAWA.Ns300",       // Provider name. Fixation.
  "< machine name >"             // Execution machine name of provider.
  "< option >"                   // Option character string.
)
```

The list specified for the option character string is shown as follows.

Table2Option character string of CaoWorkspace::AddController

Option	Meaning
BoardId=<BoardId>	Specification of connection destination DeviceNet board number (indispensability)
BaudRate=<BaudRate>	Specification of transmission rate (indispensability) 0:125kbps 1:250kbps 2:500kbps
MasterNo =<MacId>	Mastering node address (indispensability)
SlaveNo =<MacId>	Slave node address (indispensability)

2.2.2. CaoController::AddCommand method

The command object that executes the command of Ns300 is generated.

The list of the command name that can be used is shown as follows.

```
AddCommand
(
  "< command name >"           // Command name.
  "< option >"                   // Option character string. (unused)
)
```

Table3Command name list

Command name	Instruction in Ns300	Parameter	Result
ResetAlarm	Alarm reset instruction	-	-
ResetModule	Module reset instruction	-	-
SetCurrentPos	Present location setting instruction	VT_I4: Present location data	-
SetOriginalPos	Starting point position and setting instructions	-	-
GetAlarmHistory	Alarm reading instruction	-	VT_ARRAY VT_UI1 :Alarm code

Please refer to the manual of Ns300 for details concerning the operation of each command.

2.2.3. CaoController::AddRobot method

The robot object that can do the operation instruction command of Ns300 is generated. An arbitrary name can be specified for a robot name.

```

AddRobot
(
  "< robot name >"           // Robot name.
  "< option >"               // Option character string. (unused)
)

```

2.2.4. CaoController::AddVariable method

The variable object corresponding to status information and each parameter is generated. Please refer to 2.3.1 about the variable identifier that can be specified.

```

AddVariable
(
  "< variable identifier >" , // Variable identifier.
  "< option >"               // Option character string. (unused)
)

```

2.2.5. CaoController::get_CommandNames property

The list of the command name is displayed. Please refer to Table3 about the acquired list.

2.2.6. CaoController::get_VariableNames property

The list of the variable identifier is specified. Please refer to Table5 about the acquired list.

2.2.7. CaoController::Execute method

It reads and writes it directly IN and OUT of DeviceNet. The following can be specified for a command name.

Command name	Explanation	Parameter	Result
GetIN	The data of IN is read.	-	VT_ARRAY VTUI1
GetOUT	The data of OUT is read.	-	VT_ARRAY VTUI1
SetOUT	Data is set to OUT.	VT_ARRAY VTUI1	-

At this time, the parameter and the result are acquired in the array of eight bytes, and set.

2.2.8. CaoCommand::Execute method

The instruction in Ns300 corresponding to the command name is executed. At the command for which the parameter is necessary. The parameter 2.2.11 that sets are used. When this method is executed, the parameter causes the error when it is illegal. Generated error information 2.2.9 is acquired.

2.2.9. CaoCommand::put_Parameters property

The parameter necessary for the command is set. The error doesn't occur even when the parameter is illegal.

2.2.10. CaoCommand::get_Parameters property

The parameter 2.2.8 that sets are acquired. When nothing is set, VT_EMPTY is acquired.

2.2.11. CaoCommand::get_Result property

It drinks and the execution result is acquired.

2.2.12. CaoRobot::Move method

The PTP operation or the position No. specification execution is done.

```

Move
(
  "< interpolation specification >" // The content of the input is disregarded.
  "< posed row >" // Operation is changed by the specification method.
  "< option >" // The content of the input is disregarded.
)

```

All content of the first argument is disregarded.

Operation is changed as follows by the method of specifying posed row of the second argument.

All content of the third argument is disregarded.

Table4 Correspondence table of specification and operation of posed row

Posed row	Operation
P < numerical value >	Position No. specification execution (Q3 command)
< numerical value >	Absolute positional instruction PTP operation (c command)
* + (< numerical value >)	Relative, positional instruction PTP operation (e command)

- I. For position No.10: "P10"
- II. For absolute position 100 : "100"
- III. For relative position 200 : "* + (200)"

The target position and the passing speed of the position data can be accessed through the "Pn" variable of the controller class. Please set this variable and set the value if necessary.

2.2.13. CaoRobot::Halt method

The cancellation instruction of Ns300 is executed.

Please refer to the manual of Ns300 for details.

2.2.14. CaoRobot::Hold method

The temporary stop instruction of Ns300 is executed.

Please refer to the manual of Ns300 for details.

2.2.15. CaoRobot::Unhold method

The flag of the cancellation instruction of Ns300 is released.

Please refer to the manual of Ns300 for details.

2.2.16. CaoRobot::GoHome method

The starting point return instruction of Ns300 is executed.

Please refer to the manual of Ns300 for details.

2.2.17. CaoVariable::put_Value method

Information corresponding to the variable identifier is written. Please refer to 2.3.1 about the operation of each variable.

2.2.18. CaoVariable::get_Value method

It is acquisition [masu] as for information corresponding to the variable identifier. Please refer to 2.3.1 about the operation of each variable.

2.3. Variable list

2.3.1. Controller class

Table5Controller class user variable list

Variable identifier	Data type	Explanation	Attribute	
			get	put
Pn < user constant number >	VT_I4	<p>The user constant value is acquired, and set.</p> <p>The value is specified by the hexadecimal number for a user constant number.</p> <p>Ex.</p> <p>Point No.1 "Pn900" = target position and "Pn940" = speed</p> <p>Point No.2 "Pn901" = target position and "Pn941" = speed</p> <p>:</p> <p>Point No.50 "Pn931" = target position and "Pn971" = speed</p> <p>Please execute the ResetModule command to set these data persistent.</p>	√	√
Servo	VT_BOOL	<p>The state of the servo is acquired, and set.</p> <p>True: Servo ON</p> <p>False: Servo OFF</p>	√	√
Alarm	VT_BOOL	<p>The state of the alarm is acquired.</p> <p>True: The alarm is being generated.</p> <p>False: Alarm none</p>	√	-
Warning	VT_BOOL	<p>The state of the warning is acquired.</p> <p>True: The warning is being generated.</p> <p>False: Warning none</p>	√	-
Ready	VT_BOOL	<p>Command lady's state is acquired.</p> <p>True: Command lady</p> <p>False: Command busy</p>	√	-
Power	VT_BOOL	<p>The state of the main power supply is acquired.</p> <p>True: Main power supply ON</p> <p>False: Main power supply OFF</p>	√	-

Running	VT_BOOL	The running state of the command is acquired. Only when the CaoRobot::Move method is executed immediately before, it is possible to acquire it. Besides, the error is returned. True: The command is being executed. False: Command execution completion	√	-
Hold	VT_BOOL	Holding is acquired. Only when the CaoRobot::Move method is executed immediately before, it is possible to acquire it. Besides, the error is returned. True: Holding False: Holding release	√	-
OperationPosition	VT_I4	The instruction position is acquired. (unit of instruction)	√	-
CurrentPosition	VT_I4	Present location is acquired. (unit of instruction)	√	-
Deviation	VT_I4	Positional deflection is acquired. (unit of instruction)	√	-
OperationSpeed	VT_I4	The instruction speed is acquired. (unit/1000 instruction minute)	√	-
CurrentSpeed	VT_I4	The speed is acquired now. (unit/1000 instruction minute)	√	-
Torque	VT_I4	The torque is acquired. (%)	√	-
StationNo	VT_I4	The station number is acquired.	√	-
PositionNo	VT_I4	The point table number is acquired.	√	-

2.4. Error code

In the Ns300 provider, there is no peculiar error code. Please refer to the chapter of the error code of "[ORiN2 Programming guide](#)" for the ORiN2 commonness error.

3. Sample program

The sample that moves to the position of Text1 is shown as follows.

List 3-1
Sample.frm

```

Private eng As CaoEngine
Private ctrl As CaoController
Private rob As CaoRobot

Private Sub Form_Load()
    Dim ws As CaoWorkspace

    Set eng = New CaoEngine
    Set ws = eng.Workspaces(0)

    Set ctrl = ws.AddController("Sample", _
                                "CaoProv.YASKAWA.Ns300", _
                                "", _
                                "BoardId=0,BaudRate=2,MasterNo=63,SlaveNo=32")

    Set rob = ctrl.AddRobot("0")

    Dim var As CaoVariable
    With rob
        .AddRobot ("0") "The YAS running axis object is prepared.
        Set var = .AddVariable("Servo")
        var.Value = True 'Servo ON
    End With

End Sub

Private Sub Command1_Click()
    rob.Move 1, Text1.Text
    'Ex.
    ' Move 1, "150000"           'Absolute movement
    ' Move 1, "P1"             'It moves to P1.
    ' Move 1, "*+(10000)"      'move relative 10000
End Sub

```