FZ provider
OMRON

Version 1.0.6

User's guide

May 1, 2020

【Remarks】

【 Revision history 】

Version	Date	Content
1.0.0.0	2011-12-06	First edition.
1.0.0.1	2012-01-26	SCRSWITCH was added SCNGROUP was added
1.0.0	2012-07-17	Document versioning rules was changed
1.0.1	2012-09-11	Measure command was changed, add set up rules.
1.0.2	2013-01-11	UNITDATA was added. RAW was added.
1.0.3	2014-01-21	Added commands, - TRIGGER - GETRESULT - CLEARPACKET - GETTIMEOUT - SETTIMEOUT - LAYOUTNO FH, FZ5 is supported. Corrected misprints.
1.0.4	2014-05-27	Added commands, - SETSCENEASYNC - SETSCNGROUPASYNC - RECIEVEPACKET
1.0.5	2017-05-18	Added error numbers. ・E_EXEC_COMMAND ・E_BADPACKET ・E_NOPACKET ・E_NORECEIVED ・E_COMMAND_EXECUTING
1.0.6	2020-05-01	Added commands, - SETSCENE - GETSCENE - SETSCNGROUP - GETSCNGROUP

Contents

1. Introduction

This document is a user's guide of the FZ provider that is the CAO provider the FZ series, which is the vision system manufactured by OMRON.

The FZ provider sends and receives "Non-procedure commands" from/to the Ethernet connected-FZ series.

This document describes functions of this FZ provider and implemented methods.

The following models are supported by the FZ provider. For details of commands, refer to Section 3.

- FZ3, FZ4, FZM1
- FZ5, FH
- FQ-M, FQ2

Table1-1 FZ provider supported commands

		FZ series		
Non-procedure commands	Provider commands	FZ3/4/FZM1	FZ5/FH	FQ-M/FQ2
SCENE	SCENE	A	A	A
SCNGROUP	SCNGROUP	A	A	NA
MEASURE	MEASURE	A	A	A
	TRIGGER	A	A	A
	GETRESULT	A	A	A
SCRSWITCH	SCRSWITCH	A	NA	NA
LAYOUTNO	LAYOUTNO	NA	A	NA
UNITDATA	UNITDATA	A	A	NA
CLRMEAS	CLRMEAS	A	A	A
―	RAW	A	A	A
―	CLEARPACKET	A	A	A
―	SETTIMEOUT	A	A	A
―	GETTIMEOUT	A	A	A
SCENE	SETSCENEASYNC	A	A	A
SCNGROUP	SETSCNGROUPASYNC	A	A	A
	RECIEVEPACKET	A	A	A

A: Available

NA: Not available

2. Outline of provider

2.1. Outline

The FZ provider offers the CaoController::Execute-method as a command execution method.

CaoController::Execute executes the sending and receiving of the non-procedure command.

Table 2-1 FZ provider

File name	CaoProvFZ.dll
ProgID	CaoProv.OMRON.FZ
Registry registration[1]	regsvr32 CaoProvFZ.dll
Remove registry registration	regsvr32 /u CaoProvFZ.dll

2.2. Setup

The FZ series need be set up the communication specification and the output setting beforehand as follows when connecting it from the FZ provider to the FZ series.

When an appropriate setting is not done, data input-output is not operated properly.

The following example shows how to set the FZ3 series manufactured by OMRON.

2.2.1. Communication module setup

Select “Non-procedure” for the communication module of FZ3 series as follows.

- Operation route
  [Mode]-[System]-[Controller]-[Start up setting]-[Communication module]
- Configuration parameter
  Serial (Ethernet) :Non-procedure

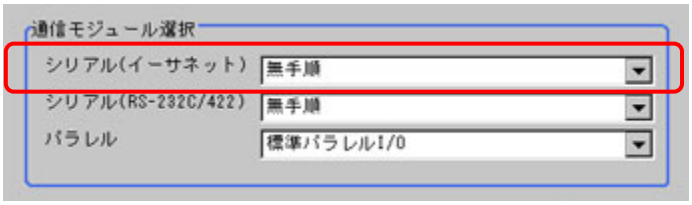

Figure 2-1 Setting of communication module

[1] If the registry is installed by ORiN SDK, you do not need to register/delete it manually

2.2.2. Communication routing

Set the communication specification as follows when connecting the provider to the FZ3 series via Ethernet.

- Operation route

  [Communication]-[Serial]-[Ethernet]

- Configuration parameter

  Output IP address : Input the destination IP address

  I/O port number : Set the port number used for the communication.

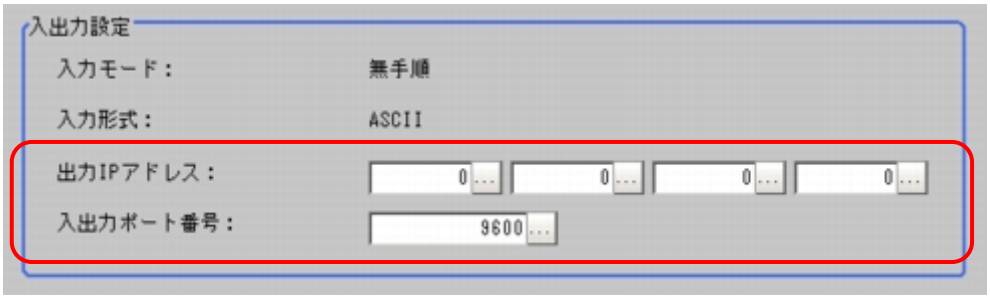

Figure 2-2 Communication routing

2.2.3. Output setup

To receive the image processing result, set the serial data output as follows.

To send 9 or more results, select “Comma” from the Record separator character, and then set “Delimiter” to the record separator for the last data.

- Operating procedure

  [Serial data] - [Output the result] - [Serial data output] - [Output format]

- Configuration parameter

  Communication method : Ethernet

  Output format : ASCII

  Expression of negative number : -

  Zero suppression functions : Yes

  Field separator character : Comma

  Record separator character : Delimiter

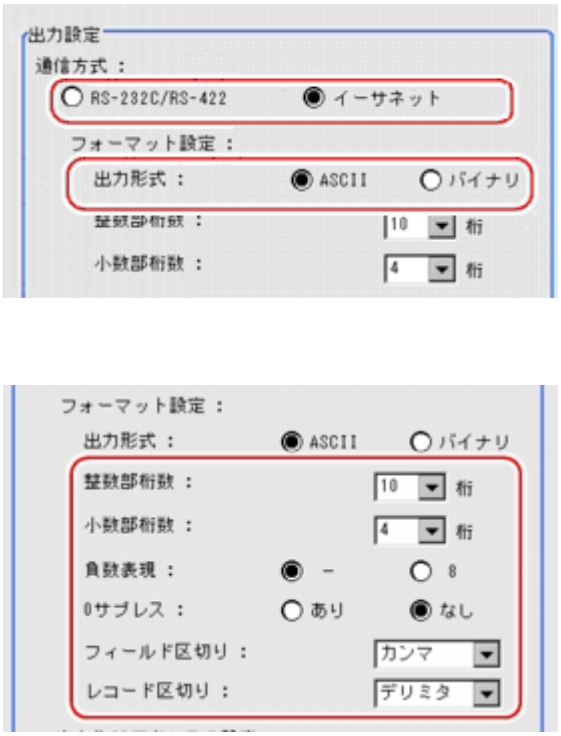

Figure 2-3 Output setting

2.2.4. RS-232C/422 non-procedure setup

- Operating procedure

  [System] - [Communication] - [RS-2323C/422 non-procedure]

- Configuration parameter

  Delimiter : CR

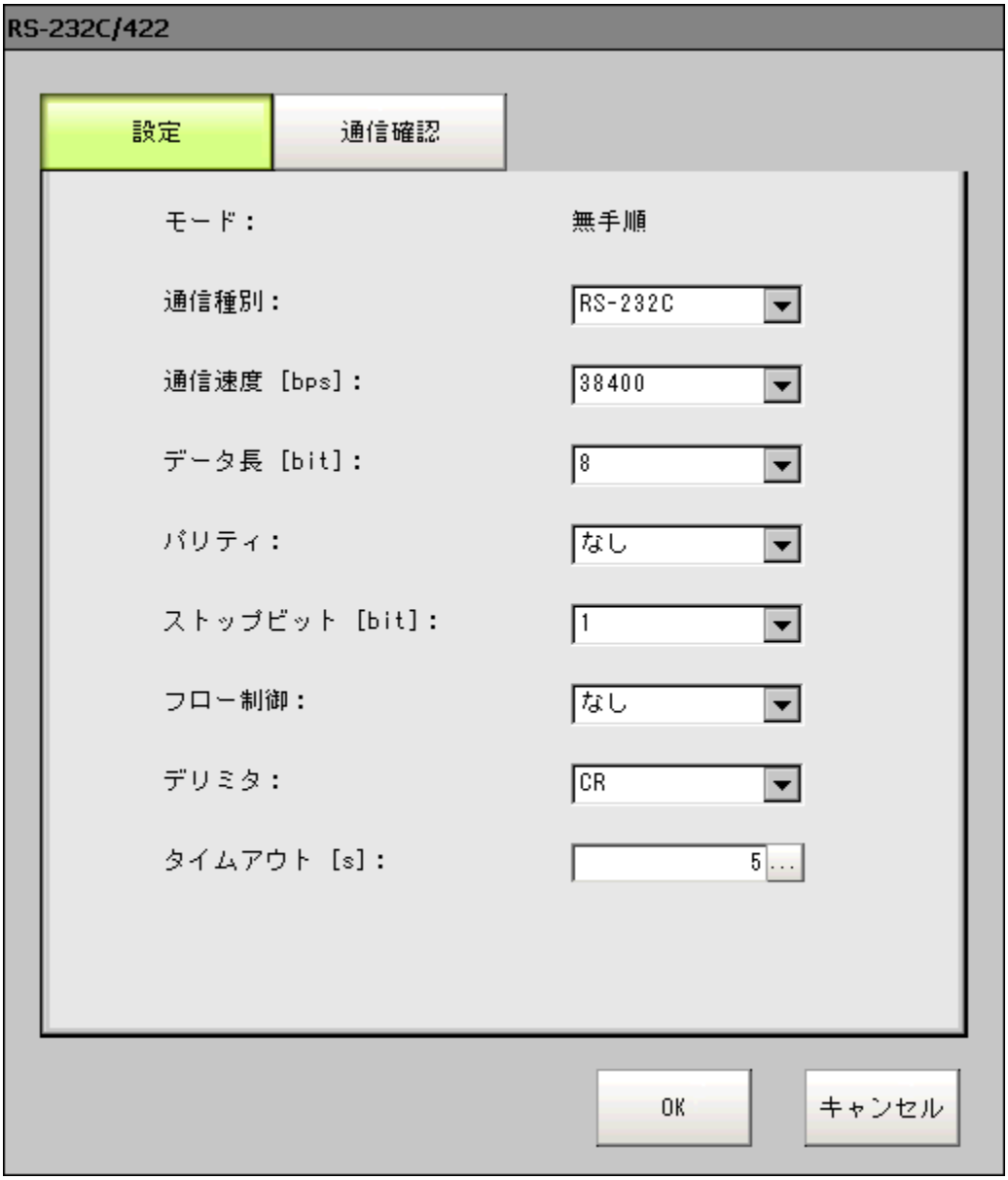

Figure 2-4 RS-232C/422 setting

2.3. Method and Property

2.3.1. CaoWorkspace::AddController method

At AddController, FZ3 provider refers communication connection parameters and connects communication. Option specifies communication method, destination IP address and time-out time.

Syntax AddController (< bstrCtrlName:VT_BSTR > and < bstrProvName:VT_BSTR >
<bstrPcName:VT_BSTR > [,<bstrOption:VT_BSTR>])

bstrCtrlName : [in] Controller name arbitrary.

bstrProvName : [in] Provider name (Fixed to " CaoProv.OMRON.FZ")
bstrPcName : [in] Provider execution machine name
bstrOption : [in] Option character string

Following is a list of option string items.

Table 2-2 Option string of CaoWorkspace::AddController

Option	Explanation
Conn =< connected parameter >	Mandatory. Set the Communication form and connected parameters Refer 2.3.1.1 for details.
MyIP=[<Local IP address>[:local port number]]	NIC can be selected by specifying IP address by this option when two or more NICs are used. An appropriate address is automatically selected when omitting input. When IP address which is not allocated in a local machine is specified, the error is returned.
timeout =< Time-out time >	Specify the communication time-out time (default: 500) msec.

2.3.1.1. Conn option

Following is communication parameter string for Conn option. Parameters surrounded by the square blankets ("[]") can be omitted. Underlined part shows the default value when the option is not specified.

- Ethernet device
  "eth:<IP Address> [:<Port No>]"
  <IP Address> : IP address of connected FZ series.
  Example:"127.0.0.1", "10.5.5.100"
  <Port No> : Connection port number. 9876, 9877. . . any port number can be assigned

2.3.2. CaoController::Execute method

It sends and receives commands in a non-procedural manner via Ethernet. Specify the command name as the first argument and the command parameter as the second argument. See Chapter 3 for details of each command.

Syntax Execute (<bstrCommandName:VT_BSTR>,[<vntParam : VT_VARIANT>])
bstrCommandName: [in] Command name
vntParam : [in] Parameter

The processing result from FZ at the time of Execute method execution is returned as HRESULT.

When normally processed (OK): S_OK (0)

When not normally processed (ER): 0x80100010

2.4. Error code of FZ provider

In the FZ provider, specific error codes shown below are designated. About the ORiN2 commonness error, please refer to the chapter of the error code of "ORiN2 Programming guide".

Table 2-3 Costom Error

Error name	Error code	Explanation
E_EXEC_COMMAND	0x80100010	The enhancing command was not correctly executed.
E_BADPACKET	0x80100011	Receive data was missed, and it was not possible to analyze it.
E_NOPACKET	0x80100012	Receive data did not exist.
E_NOTRECIEVED	0x80100013	The command of the asynchronization system is executed, and the result is not received.
E_COMMAND_EXECUTING	0x80100014	Another command was executed while executing the command.

3. Command reference

This chapter explains each command of the CaoController::Execute method. The command list that corresponds in the FZ series provider is shown as follows.

Please refer to the user's manual of the OMRON Co. for detailed operation of each command.

Table3-1 CaoController::Execute List of Command

FZ series Command	Command	Function	
Scene control command			
SCENE	SCENE	Get current scene number.	P.13
		Switch currently used scene number.	P.13
	GETSCENE	Get current scene number.	P.13
	SETSCENE	Set current scene number.	P.14
SCNGROUP	SCNGROUP	Get currently used scene group number.	P.14
		Switch scene group number.	P.14
	GETSCNGROUP	Get currently used scene group number.	P.15
	SETSCNGROUP	Set currently used scene group number	P.15
Measurement control/ Measurement value acquisition command			
MEASURE	MEASURE	Execute measurement one time.	P.15
SCRSWITCH	SCRSWITCH	Switch the adjustment screen/driving screen.	P.17
LAYOUTNO	LAYOUTNO	Get current layout number.	P.17
		Switch currently used layout number.	P.18
UNITDATA	UNITDATA	Get the parameter and the measurement value of the specified processing unit (unimplemented).	P.18
		Set the parameter of the specified processing unit (unimplemented)	P.19
Utility command			
CLRMEAS	CLRMEAS	Clear all the measurement values of a present scene	P.19
Original command			
-	RAW	Send command packet and get received packet.	P.20
-	CLEARPACKET	Clear the received packet	P.20
-	SETTIMEOUT	Set the communication timeout value	P.20
-	GETTIMEOUT	Get the timeout value	P.21
SCENE	SETSCENEASYNC	The scene number is switched by the asynchronization.	P21
SCNGROUP	SETSCNGROUPASYNC	The response to which the scene group number is switched by the asynchronization is received.	P22
-	RECIEVEPACKET	The response is received.	P22

3.1. Scene control command

3.1.1. CaoController::Execute(“SCENE") command

3.1.1.1. Get the scene number

Get the currently used scene number.

Syntax SCENE ()

Argument : None

Return value : [out] Currently used scene number (0-31) (VT_I4)

Following example shows when scene 0 is used

Example

```
Dim lSceneNo as long
lSceneNo = caoCtrl.Execute("SCENE")

lSceneNo : 0
```

3.1.1.2. Switch the scene number

Switch the currently used scene number.

Syntax SCENE(<lSceneNo>)

<lSceneNo> : [in] Scene number (0-31) (VT_I4) after switch

Return value : None

Following example shows how to switch to scene 2.

Example

```
caoCtrl.Execute "SCENE", 2
```

3.1.2. CaoController::Execute(“GETSCENE") command

Get the currently used scene number.

Syntax SCENE ()

Argument : None

Return value : [out] Currently used scene number (0-31) (VT_I4)

Following example shows when scene 0 is used

Example

```
Dim lSceneNo as long
lSceneNo = caoCtrl.Execute("GETSCENE")

lSceneNo : 0
```

3.1.3. CaoController::Execute(“SETSCENE") command

Switch the currently used scene number.

Syntax SetSCENE(<lSceneNo>)

<lSceneNo> : [in] Scene number (0-31) (VT_I4) after switch

Return value : None

Following example shows how to switch to scene 2.

Example

```
caoCtrl.Execute "SETSCENE", 2
```

3.1.4. CaoController::Execute(“SCNGROUP") command

3.1.4.1. Get the currently used scene group number

Get the currently used scene group number.

Syntax SCNGROUP ()

Argument : None

< lScnGrpNo > : [out] Currently used scene group number (0-31) (VT_I4)

Following example shows when the scene group 0 is used.

Example

```
Dim lScnGrpNo as long
lScnGrpNo = caoCtrl.Execute("SCNGROUP")

lScnGrpNo : 0
```

3.1.4.2. Switch the scene group number

Switch the currently used scene group number.

Syntax SCNGROUP (<lScnGrpNo>)

<lScnGrpNo> : Scene group number (0-31) (VT_I4) of in

Return value : None

Following example shows when the scene group is switched to the scene group 2.

Example

```
Dim lScnGrpNo as long
lScnGrpNo = 2
caoCtrl.Execute "SCNGROUP", lScnGrpNo
```

3.1.5. CaoController::Execute(“GETSCNGROUP") command

Get the currently used scene group number.

Syntax GetSCNGROUP ()

Argument	:	None
< lScnGrpNo >	:	[out] Currently used scene group number (0-31) (VT_I4)

Following example shows when the scene group 0 is used.

Example

```
Dim lScnGrpNo as long
lScnGrpNo = caoCtrl.Execute("GETSCNGROUP")

lScnGrpNo : 0
```

3.1.6. CaoController::Execute(“SETSCNGROUP") command

Switch the currently used scene group number.

Syntax SetSCNGROUP (<lScnGrpNo>)

<lScnGrpNo>	:	Scene group number (0-31) (VT_I4) of in
Return value	:	None

Following example shows when the scene group is switched to the scene group 2.

Example

```
Dim lScnGrpNo as long
lScnGrpNo = 2
caoCtrl.Execute "SETSCNGROUP", lScnGrpNo
```

3.2. Measurement control/Measurement value acquisition command

3.2.1. CaoController::Execute ("MEASURE") command

The measurement is executed one time

When the serial data output is set, the measurement result is output to the return value.

When the serial data output is not set, the measurement result is not output.

Syntax MEASURE ()

Argument	:	None
dblResult	:	Measurement result (serial data output) (VT_R8 | VT_ARRAY)

Following example shows when “MEASURE" command is executed.

Example

```
Dim vntResult as Variant
vntResult = caoCtrl.Execute("MEASURE")

VntResult: Value set by serial data output
```

3.2.2. CaoController::Execute ("TRIGGER") command

Execute the measurement one time

Use this command when the serial data output is not set.

Syntax Trigger ()

Argument	:	None
Return value	:	None

Following example shows when “TRIGGER" command is executed.

Example

```
Dim vntResult as Variant

caoCtrl.Execute "TRIGGER"
vntResult = caoCtrl.Execute("GETRESULT")

VntResult: Value set by serial data output
```

3.2.3. CaoController::Execute ("GETRESULT") command

Get the result of the serial data output.

Syntax GETRESULT ()

Argument	:	None
dblResult	:	Measurement result (serial data output) (VT_R8 | VT_ARRAY)

Following example shows when “GETRESULT" command is executed.

Example

```
Dim vntResult as Variant

caoCtrl.Execute "TRIGGER"
vntResult = caoCtrl.Execute("GETRESULT")

VntResult: Value set by serial data output
```

3.2.4. CaoController::Execute ("SCRSWITCH") command

Switch the adjustment screen and the driving screen.

Syntax SCRSWITCH ()

Argument	:	None
Return value	:	None

Following example shows when “SCRSWITCH" command is executed.

Example

```
caoCtrl.Execute "SCRSWITCH"
```

3.2.5. CaoController::Execute ("LAYAOUTNO") command

3.2.5.1. For the layout number acquiring

Get the currently used layout number.

Syntax LAYOUTNO (<lTargetNumber>)

<lTargetNumber>	:	[in] target Number(VT_I4)
		0 : Local
		1 : Remote
Return value	:	[out] Layout Number (VT_I4)
		FH : 0 – 7
		FZ5 : 0 or 1

Following example shows when “LAYOUTNO" command is executed.

Example

```
Dim lNo as Long
lNo = caoCtrl.Execute("LAYOUTNO", 0)
```

3.2.5.2. For the layout number setting

Switch the currently used layout number.

Syntax LAYOUTNO (<lTargetNumber>, <lLayoutNo>)

<lTargetNumber>	:	[in] TargetNumber (VT_I4)
		0 : Local
		1 : Remote
<lLayoutNo>	:	[in] Layout Number (VT_I4)
		FH : 0 – 7
		FZ5 : 0 or 1
Return value	:	None

Following example shows when “LayoutNo" command is executed.

Example

```
caoCtrl.Execute "LAYOUTNO", Array(0, 1)
```

3.2.6. CaoController::Execute ("UNITDATA") command

3.2.6.1. Get the parameter and the measurement value of the specified processing unit (unimplemented)

Syntax UNIDATA (<lUnitNo>, <lTableNo>)

<lUnitNo>	:	[in] Unit Number. (0 – 9999) (VT_I4)
<lTableNo>	:	[in] Table Number. (VT_I4)
<bstrMeasuer>		[out] Parameter or Measurement. (VT_BSTR)

Following example shows when “UNITDATA" command is executed.

Example

```
Dim lUnitNo as long
Dim lTableNo as long
Dim bstrMeasure as string

lUnitNo = 5
lTableNo = 0
bstrMeasure = caoCtrl.Execute("UNITDATA", Array(lUnitNo, lTableNo))

bstrMeasure : “Result of search”
```

3.2.6.2. Set the parameter of the specified processing unit (unimplemented)

Syntax UNIDATA <lUnitNo>, <lTableNo>, <vntData>

<lUnitNo>	:	[in] Unit Number. (0 – 9999) (VT_I4)
<lTableNo>	:	[in] Table Number. (VT_I4)
< vntData>		[in] Parameter (VT_VARIANT)
Return value	:	None

Following example shows when “UNITDATA" command is executed.

Example

```
Dim lUnitNo as long
Dim lTableNo as long
Dim vntData as Variant

lUnitNo = 5
lTableNo = 124
vntData = 10
caoCtrl.Execute "UNITDATA", Array(lUnitNo, lTableNo, vntData)
```

3.3. Utility command

3.3.1. CaoController::Execute ("CLRMEAS") command

Clear all the measurement values of a current scene.

Syntax CLRMEAS ()

Argument	:	None
Return value	:	None

Following table shows the display status after command execution.

Judgment result	Has not measured yet (0)
Numerical value	0
Character string	Null character

Following example shows when the “CLRMEAS" command is executed .

Example

```
caoCtrl.Execute "CLRMEAS"
```

3.4. Original command

3.4.1. CaoController::Execute ("RAW") command

Send command packet and get recieved packet.

Syntax RAW(<bstrCommand> [,<lRecvCnt>])

<bstrCommand> : [in] Command String(VT_BSTR)

<lRecvCnt> : [in] Number of Reply. (delault 1) (VT_I4)

<bstrResult> : [out] Recieved data. (VT_BSTR)

Following example shows when the “RAW" command is executed .

Example

```
Dim bstrCommand as string
Dim lRecvCnt as long
Dim vntResult as Variant

bstrCommand = “SCENE”
lRecvCnt = 2

vntResult = caoCtrl.Execute("RAW", Array(bstrCommand, lRecvCnt))

vntResult : “OK”, “0”
```

3.4.2. CaoController::Execute ("CLEARPACKET") command

Clear currently receiving all packets.

Syntax CLEARPACKET( )

Argument : None

Return value : None

Following example shows when the “CLEARPACKET " command is executed .

Example

```
caoCtrl.Execute "CLEARPACKET"
```

3.4.3. CaoController::Execute ("SETTIMEOUT") command

Set the communication timeout value.

In the default setting, the value set by AddController is used.

Syntax SETTIMEOUT (<lTimeout>)

<lTimeout> : [in] time-out time (msec) (VT_I4)

Return value : None

Following example shows when the “SETTIMEOUT " command is executed .

Example

```
caoCtrl.Execute "SETTIMEOUT", 1000
```

3.4.4. CaoController::Execute ("GETTIMEOUT") command

Get the communication timeout value.

In the default setting, the value set by AddController is used

Syntax GETTIMEOUT ( )

Argument : None

<lTimeout> : [out] time-out time (msec) (VT_I4)

Following example shows when the “GETTIMEOUT " command is executed .

Example

```
Dim lTimeout as Long
lTimeout = caoCtrl.Execute("GETTIMEOUT")
```

3.4.5. CaoController::Execute ("SETSCENEASYNC") command

The data of the switch response is not received though the scene is switched. Please receive by the RECIEVEPACKET command, and confirm the data of the response. Other commands cannot be used before the response is received by the RECIEVEPACKET command. The error of 0x80100013 occurs when using it.

Syntax SETSCENEASYNC (<lSceneNo>)

<lSceneNo> : [in] Scene number (0-31) (VT_I4) after switch

Return value : None

Following example shows when the “SETSCENEASYNC" command is executed .

Example

```
Dim strRet As String
caoCtrl.Execute "SETSCENEASYNC", 1

strRet = caoCtrl.Execute("RECIEVEPACKET")
If (strRet = "OK") Then
```

```
    Debug.Print "OK"
Else
    Debug.Print "NG"
End If
```

3.4.6. CaoController::Execute ("SETSCNGROUPASYNC") command

The data of the switch response is not received though the scene group is switched. Please receive by the RECIEVEPACKET command, and confirm the data of the response. Other commands cannot be used before the response is received by the RECIEVEPACKET command. The error of 0x80100013 occurs when using it.

Syntax SETSCNGROUPASYNC (<lScnGrpNo>)

<lScnGrpNo> : Scene group number (0-31) (VT_I4) of in

Return value : None

Following example shows when the “SETSCNGROUPASYNC" command is executed .

Example

```
Dim strRet As String
caoCtrl.Execute "SETSCNGROUPASYNC", 1

strRet = caoCtrl.Execute("RECIEVEPACKET")
If (strRet = "OK") Then
    Debug.Print "OK"
Else
    Debug.Print "NG"
End If
```

3.4.7. CaoController::Execute ("RECIEVEPACKET") command

The response data is received.

Time-out error (0x80000900) occurs when the response data cannot be received in the set time-out time.. Please extend the timeout period of the SETTIMEOUT command or AddController in the option when the time-out error occurs.

Syntax RECIEVEPACKET ()

Argument : None

Return value : [out] Recieved data. (VT_BSTR)

Following example shows when the “RECIEVEPACKET" command is executed .

Example

```
Dim strRet As String
caoCtrl.Execute "SETSCENEASYNC", 1

strRet = caoCtrl.Execute("RECIEVEPACKET")
If (strRet = "OK") Then
    Debug.Print "OK"
Else
```

```
        Debug.Print "NG"
    End If
```