Ezi-SERVO®Ⅱ Plus-E

Closed Loop Stepping System

User Manual

Communication Function

(**Rev.05**)

FASTECH

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1. Communication Protocols

1-1. Communication Functions

Ezi-SERVOⅡ Plus-E can control up to 254(1~254) axes by multidrop link at Ethernet.

1-1-1. Communication Specifications

Item	Specification
Communication Speed	10/100base-T/TX
Communication Type(Protocol)	TCP/ (Port No. : **2001,2002**)
	UDP (Port No. : **3001,3002**)
Max Cabling Length	Within 100m
Min Cable length between drive	More than 20cm
Number of Connected Axes	254 axes (No. 01~FE)

- Port No. 2001, 3001 : For GUI
- Port No. 2002, 3002 : For User Library
- Port No. 2001, 3001 can not use when using User Library file which is provided.

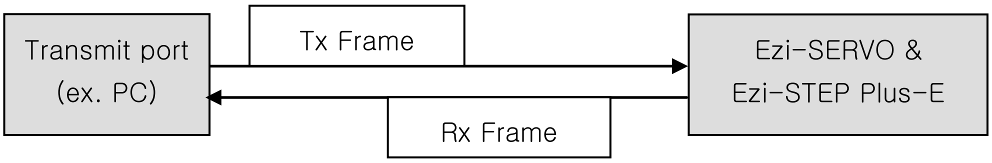
1-1-2. Ethernet IP Address

1) Subnet Mask : 255.255.255.0
2) Gateway : 192.168.0.1
3) IP address : 192.168.0.x (x is set by an external switch.)

- When connectiong to Ezi-SERVOⅡ Plus-E directly from a PC or Ethernet device, be sure to set the network setting according to the above IP address.
  If it is not set or is different, it cannot be connected.
- If the switch set to 255(FF), IP address is automatically set.
  Because it uses DHCP, IP address set automatically only when using router.
- When connecting directly from the controller(PC, PLC, etc.), be sure to set the IP address with the switch.
- Set the IP address automatically only when the default IP address is not used.
  If the IP set automatically, connect the user program(GUI), save the IP address, turn off the power, and set the last number of the IP with the switch.
- When the IP setting switch set to 0, the IP setting is reset to the above value.

1 - 1 - 3 . Ethernet Protocol

1) Overview of communication FRAME



2) Basic structure of FRAME

UDP Header	***Frame Data***
8bytes	4~254 bytes

The UDP Header contains the following information:

① Transmit port number : 2bytes
② Receiving port number : 2bytes
③ Data length : 2bytes, Total length of UDP Header and Frame Data
④ Checksum : 2bytes

1 - 1 - 4 . Receive Frame Data Structure

The detailed configuration of the receiving ***Frame Data*** is as follows.

Header	Length	Sync No.	Reserved	Frame type	Data
1 byte	1 byte	1 byte	1 byte (0x00)	1 byte	0 ~ 253 bytes.

① Header : 0xAA, Displays that the beginning of Frame.
② Length : Length of Data after Length
(Sync No. + Reserved + Frame type + Data)
③ Reserved : 1 byte (Input as "0x00")
④ Sync No. : The Sync number of the packet is used to check whether the command is executed in the drive module.
The value should change every time when you send a new command.
⑤ Frame type : Specify the command type of the Frame. The types are listed below.
Refer to 「Frametypeand Data configuration」.
⑥ Data : The data structure and length of this clause are determined by the Frame type.
The detailed structure refers to 「Frametypeand Data configuration」 section below.

1 - 1 - 5 . Response Frame Structure and Communication Error

When any commnad is sent, the basic structure of Frame at the response side is same. However, there is a difference in case of ***Frame Data***, which "communication status" is added as shown below.

Header	Length	Sync No.	Reserved	Frame type	Data	
1 byte	1 byte	1 byte	1 byte (0x00)	1 byte	1byte	0 ~ 252 bytes
					Communication Status	Response Data

① Header : 0xAA, Displays that the beginning of Frame.

② Length : Length of Data after Length
(Sync No. + Reserved + Frame type + Data)

③ Sync No. : Same as Response Frame
(If it does not match the data at the same time of reception, recognize it as an error.)

④ Reserved : 1 byte(0x00)

⑤ Frame type : Same as Receive Frame
(If it does not match the data at the time of transmission, recognize it as an error.)

⑥ Data : In reply, 1 byte of data indicating communication status(error/normal) is included.
The simple Execution command has only the communication status data.

The contents of byte indicating communication status are as follows.

Hexa Code	Decimal Code	Description
0x00	0	Communication is normal.
0x80	128	Frame type Error : Receive Frame type command cannot be recognized.
0x81	129	Data error, ROM data read/write error : The received data is out of the specified range.
0x82	130	Response Frame Error : Received Frame is out of this specification.
0x85	133	Running command failure : The user tried to execute new running command in wrong condition as follows. 1) Currently motor is running 2) Currently motor is stopping 3) Servo(Step) is OFF status 4) Try to Z-pulse Origin without external encoder 5) Other wrong motion command
0x86	134	RESET Failure : The user has tried to execute new running in condition as follow. 1) Already RESET status by external input signal
0x87	135	Servo ON fail ① : Try to execute Servo ON during alarm occurring.
0x88	136	Servo ON fail ② : Try to execute Servo ON during emergency stop.
0x89	137	Servo ON fail ③ : 'Servo ON' is set on an external input signal. It is only available to execute Servo ON/OFF by this input signal.

⚠ Caution	**1) If 'Header' and 'Length' value of response Frame is abnormal, there is no response from the drive.** **2) If the communication status is displayed to '130', the size of response data is '0' byte.**

1 - 2 . Structure of Frame

1 - 2 - 1 . Frame type Data Configuration

(1) The following table displays the content and configuration of data by Frame type.

- 0xXX of Frame type is value of Hex, the value in () is Dec.

<table>
<tr><th>Frame type</th><th>Library Name</th><th>Description</th></tr>
<tr><td>0x01
(1)</td><td>FAS_
GetboardInfo</td><td>Connected slave type and program version information are required.

Sending : 0 byte
Response : 1~248 bytes
<table><tr><td>1 byte</td><td>1 byte</td><td>0~253 bytes</td></tr><tr><td>Communication status</td><td>board type</td><td>ACII string with NULL byte
(strlen() + 1 byes)</td></tr></table>
◆ board type : 130 : Ezi-SERVOⅡ Plus-E ST</td></tr>
<tr><td>0x05
(5)</td><td>FAS_
GetMotorInfo</td><td>Information of motor type connected to board is required.

Sending : 0 byte
Response : 1~246 bytes
<table><tr><td>1 byte</td><td>1 byte</td><td>0~246 bytes</td></tr><tr><td>Communication status</td><td>Motor No.
(1~255)</td><td>ACII string with NULL byte
(strlen() + 1 byes)</td></tr></table></td></tr>
<tr><td>0x10
(16)</td><td>FAS_
SaveAllParameters</td><td>Current setting parameters & assign of IO signals are saved in the ROM of the drive. Even though the drive is powered off, saving these must be possible. Values set at 'FAS_SetParameter' & 'FAS_SetIOAssignMap' are saved together.

Sending : 0 byte
Response : 1 byte
<table><tr><td>1 byte</td></tr><tr><td>Communication status</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x11
(17)</td>
<td>FAS_
GetRomParameter</td>
<td>Specific parameter values in the ROM are read.
Sending : 1 byte
<table><tr><td>1 byte</td></tr><tr><td>Parameter number (0~32)</td></tr></table>
Response : 5 bytes
<table><tr><td>1 byte</td><td>4 bytes</td></tr><tr><td>Communication Status</td><td>Parameter value</td></tr></table>
Refer to 「1-2-2. Parameter List」.</td>
</tr>
<tr>
<td>0x12
(18)</td>
<td>FAS_
SetParameter</td>
<td>Specific parameter values are saved to the RAM parameter.
Sending : 5 bytes
<table><tr><td>1 byte</td><td>4 bytes</td></tr><tr><td>Parameter number (0~32)</td><td>Parameter value</td></tr></table>
Response : 1 byte
<table><tr><td>1 byte</td></tr><tr><td>Communication Status</td></tr></table>
Refer to 「1-2-2. Parameter List」.</td>
</tr>
<tr>
<td>0x13
(19)</td>
<td>FAS_
GetParameter</td>
<td>Specific parameter values in the RAM are read.
Sending : 1 byte
<table><tr><td>1 byte</td></tr><tr><td>Parameter number (0~32)</td></tr></table>
Response : 5 bytes
<table><tr><td>1 byte</td><td>4 bytes</td></tr><tr><td>Communication Status</td><td>Parameter value</td></tr></table>
Refer to 「1-2-2. Parameter List」.</td>
</tr>
<tr>
<td>0x20
(32)</td>
<td>FAS_
SetIOOutput</td>
<td>Output signal level of the control output port is set.
Sending : 8 bytes
<table><tr><td>4 bytes</td><td>4 bytes</td></tr><tr><td>I/O set mask value</td><td>I/O clear mask value</td></tr></table>
When specific bit of the set mask is ‘1’, the relevant output port signal is set to [ON].
When specific bit of the clear mask is ‘1’, the relevant output port signal is set to [OFF].
For more information, refer to 「1-2-3. Bit setup of Output pin」.

Response : 1 byte
<table><tr><td>1 byte</td></tr><tr><td>Communication Status</td></tr></table></td>
</tr>
</table>

<table>
<tr>
<td>0x21
(33)</td>
<td>FAS_
SetIOInput</td>
<td>
Input signal level of the control input port is set.

Sending : 8 bytes
<table>
<tr><td>4 bytes</td><td>4 bytes</td></tr>
<tr><td>I/O set mask value</td><td>I/O clear mask value</td></tr>
</table>
When specific bit of the set mask is ‘1’, the relevant input port signal is set to [ON].
When specific bit of the clear mask is ‘1’., the relevant input port signal is set to [OFF].
For more information, refer to 「1-2-4. Bit setup of Input Pin」.

Response : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>Communication status</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x22
(34)</td>
<td>FAS_
GetIOInput</td>
<td>
Current input signal status of the control input port is read.

Sending : 0 byte
Response : 5 bytes
<table>
<tr><td>1 byte</td><td>4 bytes</td></tr>
<tr><td>Communication Status</td><td>Input status value</td></tr>
</table>
Relevant bit by each input signal, refer to 「「1-2-4. Bit setup of Input Pin」.
</td>
</tr>
<tr>
<td>0x23
(35)</td>
<td>FAS_
GetIOOutput</td>
<td>
Current output signal status of the control output port is read.

Sending : 0 byte
Response : 5 bytes
<table>
<tr><td>1 byte</td><td>4 bytes</td></tr>
<tr><td>Communication Status</td><td>Output status value</td></tr>
</table>
Relevant bit by each ouput signal, refer to 「1-2-3. Bit setup of Output Pin」.
</td>
</tr>
</table>

<table>
<tr>
<td>0x24
(36)</td>
<td>FAS_
SetIOAssignMap</td>
<td>
Allocate control I/O signal to pin of CN1 and set signal level at the same time. To save this setting in ROM memory, execute 'FAS_SaveAllParameters'.

Sending : 6 bytes
<table>
<tr><td>1 byte</td><td>4 bytes</td><td>1 byte</td></tr>
<tr><td>I/O number</td><td>I/O pin masking data</td><td>Setting level</td></tr>
</table>
◆I/O number : '0~11' corresponds to 'Limit+,Limit-,Org,IN1,...,IN9' respectively, and '12~22' corresponds to 'COMP, OUT1,...,OUT9' respectively.
◆I/O pin masking data : Refer to 「1-2-4. Bit setup of Intput Pin」.
◆Setting level : 0:Active Low, 1:Active High

Response : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>Communication Status</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x25
(37)</td>
<td>FAS_
GetIOAssignMap</td>
<td>
Pin setting status of CN1 port is read.

Sending : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>I/O number</td></tr>
</table>
◆I/O number : '0~11' corresponds to 'Limit+,Limit-,Org,IN1,...,IN9' respectively, and '12~22' corresponds to 'COMP, OUT1,...,OUT9' respectively.

Response : 6 bytes
<table>
<tr><td>1 byte</td><td>4 bytes</td><td>1 byte</td></tr>
<tr><td>Communication Status</td><td>IO pin masking status</td><td>Level status</td></tr>
</table>
For more information, refer to '0x24'Frame type.
</td>
</tr>
<tr>
<td>0x26
(38)</td>
<td>FAS_
IOAssignMapReadROM</td>
<td>
Setting status of control I/O signal and level setting value of signal is read from ROM memory area.

Sending : 0 byte
Response : 2 bytes
<table>
<tr><td>1 byte</td><td>1 byte</td></tr>
<tr><td>Communication Status</td><td>Command performing status
(0: complete, values except 0 : error)</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x27
(39)</td>
<td>FAS_
TriggerOutput_RunA</td>
<td>
Command for generating control output signal(Compare Out).

Sending : 18 bytes
<table>
<tr><td>1 byte</td><td>4 bytes</td><td>4 bytes</td></tr>
<tr><td>Output start/stop command
(1 : start 0 : stop)</td><td>Output start position
[pulse]</td><td>Pulse period
[pulse]</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td>
<table>
<tr><td>4 bytes</td><td>1 byte</td><td>4 bytes</td></tr>
<tr><td>Pulse width
[msec]</td><td>Output pin No.
(fix to 0)</td><td>spare</td></tr>
</table>
◆Output start position : First start position value for signal output
(-134,217,728 ~134,217,727)
◆Pulse period : Setting period of output signal
(0 : pulse output only 1 time in pusle start position
1~134,217,727 : pulse output repeatedly depends on setting)
◆Pulse width : Setting width of output signal (1 ~1000)

● The parameter range differs from the product version, listed as below.
V06.01.2x.xx : -134,217,728 ~134,217,727(Start Position), 0 ~ 134,217,727(Pulse Period)
V06.01.3x.xx : - 2,147,483,648 ~ 2,147,483,647(Start Position), 0 ~ 2,147,483,647(Pulse Period)
Response : 2 bytes
<table>
<tr><td>1 byte</td><td>1 byte</td></tr>
<tr><td>Communication Status</td><td>Command performing status
(0: complete, values except 0: error)</td></tr>
</table>
● Enter the value in which the pulse period is calculated by time and the sum of the pulse width is more than 2 [ms]. If it is less than that, it will not work properly.
</td>
</tr>
<tr>
<td>0x28
(40)</td>
<td>FAS_
TriggerOutput_
Status</td>
<td>
Command to check whether the current signal(Compare Out) output function is working.

Sending : 0 byte
Response : 2 bytes
<table>
<tr><td>1 byte</td><td>1 byte</td></tr>
<tr><td>Communication Status</td><td>Current status (1: output ON, 0 : output OFF)</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr>
<td>0x7E
(126)</td>
<td>FAS_SetTriggerOutputEx</td>
<td>
Setting for generating output at a specific position on the set output.
(Available after setting the output signal to User Out)
Sending : 245 bytes
<table>
<tr><td>1 byte</td><td>1 byte</td><td>2 bytes</td><td>1byte</td></tr>
<tr><td>User Out No.
(0~8)</td><td>Output Start/End command
(1: Start 0: End)</td><td>Output On time
(In ms, 1~65,535)</td><td>Output position count</td></tr>
</table>
<table>
<tr><td>240 bytes</td></tr>
<tr><td>Output position Array(4bytes * 60)
Location: -134,217,728~134,217,727</td></tr>
</table>
◆ Number of output position : 1~60
◆ Output position Array : Based on 4bytes, 60 arrays. Even if the number of positions is not 60, the output position array has 60 information inputs.
● The range of output position differs from the product version, lised as below.
V06.01.2x.xx : -134,217,728 ~134,217,727
V06.01.3x.xx : - 2,147,483,648 ~ 2,147,483,647

◆ Output is automatically close when the number of outputs is reached.

◆ To output, execute the move command after setting.
The position of the move command should be greater than the last position if the last position of the output position is positive and less than the last position if the position is negative.
Normal output may not be generated depending on the starting position (current position), so it is necessary to set to an appropriate value.
Normal output may not be generated depending on drive speed and output On time setting, so it is necessary to set to an appropriate value.

Response : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>Communication Status</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x7F
(127)</td>
<td>FAS_GetTriggerOutputEx</td>
<td>
Command checked from which information and output status set as FAS_SetTriggerOutputEx.

Sending : 1byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>User Out No.</td></tr>
</table>
◆ User Out No. : User Out number from which information can be verified(0~8).

Response : 245bytes
<table>
<tr><td>1 byte</td><td>1 byte</td><td>2 bytes</td><td>1byte</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td>
<table>
<tr><td>Communication Status</td><td>Output status</td><td>Output On time
(In ms, 1~65535)</td><td>Number of output locations
(1~60)</td></tr>
</table>
<table>
<tr><td>240 bytes</td></tr>
<tr><td>Ouput location Array(4bytes * 60)
Location: -134,217,728~134,217,727</td></tr>
</table>
◆ Ouput status : Run/Stop status of corresponding User out number
0 : Stop
2 : Run

● The range of output position differs from the product version, lised as below.
V06.01.2x.xx : -134,217,728 ~134,217,727
V06.01.3x.xx : - 2,147,483,648 ~ 2,147,483,647
</td>
</tr>
<tr>
<td>0x2A
(42)</td>
<td>FAS_
ServoEnable</td>
<td>
Step ON/OFF(Enable/Disable) status is set.
Sending : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>0:OFF, 1:ON</td></tr>
</table>
Response : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>Communication Status</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x2B
(43)</td>
<td>FAS_
ServoAlarmReset</td>
<td>
To reset Alarm status.
Sending : 0 byte
Response : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>Communication Status</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr>
<td>0x2E
(46)</td>
<td>FAS_
GetAlarmType</td>
<td>
To request current Alarm status and information.

Sending : 0 byte

Response : 2 bytes
<table>
<tr><td>1 byte</td><td>1 byte</td></tr>
<tr><td>Communication Status</td><td>Alarm status (0: No alarm, values except 0: Alarm No.)</td></tr>
</table>
◆ Alarm type: No alarm (0) OverCurrent(1) OverSpeed(2)
StepOut(3) OverLoad(4) OverTemperature(5)
BackEMF(6) MotorConnect(7) EncoderConnect(8)
MotorPower(9) Inposition(10) SystemHalt(11)
ROMdevice(12) Position Overflow(15)
</td>
</tr>
<tr>
<td>0x31
(49)</td>
<td>FAS_
MoveStop</td>
<td>
To request to stop running the motor.

Sending : 0 byte
Response : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>Communication Status</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x32
(50)</td>
<td>FAS_
EmergencyStop</td>
<td>
To request the running motor to stop emergently.

Sending : 0 byte
Response : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>Communication Status</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x33
(51)</td>
<td>FAS_
MoveOriginSingleAxis</td>
<td>
To request the motor to return to the origin at the current setting parameter condition.

Sending : 0 byte
Response : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>Communication Status</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x34
(52)</td>
<td>FAS_
MoveSingleAxisAbsPos</td>
<td>
To request the motor to move its position as much as the absolute value[pulse].

Sending : 8 bytes
<table>
<tr><td>4 bytes</td><td>4 bytes</td></tr>
<tr><td>Absolute position value</td><td>Running speed[pps]</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td>Response : 1 byte
<table><tr><th>1 byte</th></tr><tr><td>Communication Status</td></tr></table></td></tr>
<tr><td>0x35
(53)</td><td>FAS_
MoveSingle
AxisIncPos</td><td>To request the motor to move its position as much as the incremental value[pulse].

Sending : 8 bytes
<table><tr><th>4 bytes</th><th>4 bytes</th></tr><tr><td>Incremental position value</td><td>Running speed[pps]</td></tr></table>
Response : 1 byte
<table><tr><th>1 byte</th></tr><tr><td>Communication Status</td></tr></table></td></tr>
<tr><td>0x36
(54)</td><td>FAS_
MoveToLimit</td><td>To request the motor to start Limit motion at the current setting parameter condition.

Sending : 5 bytes
<table><tr><th>4 bytes</th><th>1 byte</th></tr><tr><td>Running speed[pps]</td><td>Running direction (0:-Limit 1:+Limit)</td></tr></table>Response : 1 byte
<table><tr><th>1 byte</th></tr><tr><td>Communication Status</td></tr></table></td></tr>
<tr><td>0x37
(55)</td><td>FAS_
MoveVelocity</td><td>To request the motor to start Jog motion at the current setting parameter condition.

Sending : 5 bytes
<table><tr><th>4 bytes</th><th>1 byte</th></tr><tr><td>Running speed[pps]</td><td>Running direction (0:-Jog 1:+Jog)</td></tr></table>
Response : 1 byte
<table><tr><th>1 byte</th></tr><tr><td>Communication Status</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x38
(56)</td>
<td>FAS_
PositionAbsOverride</td>
<td>To request the motor to change the target absolute position value[pulse] while it is in running.
Sending : 4 bytes
<table><tr><th>4 bytes</th></tr><tr><td>Changed command position value[pulse]</td></tr></table>
Response : 1 byte
<table><tr><th>1 byte</th></tr><tr><td>Communication Status</td></tr></table>
◆ Only at constant speed</td>
</tr>
<tr>
<td>0x39
(57)</td>
<td>FAS_
PositionIncOverride</td>
<td>To request the motor to change the target incremental position value[pulse] while it is in running.
Sending : 4 bytes
<table><tr><th>4 bytes</th></tr><tr><td>Changed command position value [pulse]</td></tr></table>
Response : 1 byte
<table><tr><th>1 byte</th></tr><tr><td>Communication Status</td></tr></table>
◆ Only at constant speed</td>
</tr>
<tr>
<td>0x3A
(58)</td>
<td>FAS_
VelocityOverride</td>
<td>To request the motor to change the running speed value[pps] while it is in running.
Sending : 4 bytes
<table><tr><th>4 bytes</th></tr><tr><td>Changed running speed[pps]</td></tr></table>
The accel/decel time is assigned to 'Axis Acc Time' and 'Axis Dec Time' value in parameter lists.
Response : 1 byte
<table><tr><th>1 byte</th></tr><tr><td>Communication Status</td></tr></table>
◆ Only at constant speed.
◆ Check the speed range that can be changed according to the Command speed(Move command speed at standstill) and use the function.
Please refer to the table below.
<table>
<tr><th rowspan="2">Command Speed [pps]</th><th colspan="2">Speed range [pps]</th></tr>
<tr><th>Min</th><th>Max</th></tr>
<tr><td>1~983</td><td>1</td><td>4914</td></tr>
</table></td>
</tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td>
<table>
<tr><td>984~1638</td><td>1</td><td>8191</td></tr>
<tr><td>1639~3276</td><td>1</td><td>16383</td></tr>
<tr><td>3277~6553</td><td>2</td><td>32766</td></tr>
<tr><td>6554~16384</td><td>5</td><td>81915</td></tr>
<tr><td>16385~32768</td><td>10</td><td>163830</td></tr>
<tr><td>32769~65536</td><td>20</td><td>327660</td></tr>
<tr><td>65537~163840</td><td>50</td><td>819150</td></tr>
<tr><td>163841~327680</td><td>100</td><td>1638300</td></tr>
<tr><td>327681~655360</td><td>200</td><td>3276600</td></tr>
</table>
If you set the parameter to a value outside the speed change range, it will be changed to the minimum or maximum speed within the range.
</td>
</tr>
<tr>
<td>0x80
(128)</td>
<td>FAS_
MoveSingleAxisAbsPosEx</td>
<td>
To request the motor to move its position as much as the absolute value[pulse] with Custom Accel. / Decel. Time[msec].

Sending : 40 bytes
<table>
<tr><td>4 bytes</td><td>4 bytes</td><td>4 bytes</td><td>2 bytes</td></tr>
<tr><td>Absolute position value</td><td>Running speed[pps]</td><td>Flag option</td><td>Custom Accel. Time (1~9999)</td></tr>
</table>

<table>
<tr><td>2 bytes</td><td>24 bytes</td></tr>
<tr><td>Custom Decel. Time (1~9999)</td><td>Reserved</td></tr>
</table>
Flag option : 0x0001 : reserved
0x0002 : Custom Accel. Time is used.
0x0004 : Custom Decel. Time is used.

If the bit value is OFF status(0), Accel. / Decel. Time value is used that saved in controller.

Response : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>Communication Status</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr>
<td>0x81
(129)</td>
<td>FAS_
MoveSingle
AxisIncPosEx</td>
<td>
To request the motor to move its position as much as the incremental value[pulse] with Custom Accel. / Decel. Time[msec].

Sending : 40 bytes
<table>
<tr><th>4 bytes</th><th>4 bytes</th><th>4 bytes</th><th>2 bytes</th></tr>
<tr><td>Incremental position value</td><td>Running speed[pps]</td><td>Flag option</td><td>Custom Accel. Time (1~9999)</td></tr>
</table>
<table>
<tr><th>2 bytes</th><th>24 bytes</th></tr>
<tr><td>Custom Decel. Time (1~9999)</td><td>Reserved</td></tr>
</table>
Flag option : 0x0001 : reserved
0x0002 : Custom Accel. Time is used.
0x0004 : Custom Decel. Time is used.
If the bit value is OFF status(0), Accel. / Decel. Time value is used that saved in controller.

Response : 1 byte
<table>
<tr><th>1 byte</th></tr>
<tr><td>Communication Status</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x82
(130)</td>
<td>FAS_
MoveVelocityEx</td>
<td>
To request the motor to start Jog motion with Accel. / Decel. Time value[msec].

Sending : 37 bytes
<table>
<tr><th>4 bytes</th><th>1 byte</th><th>4 bytes</th></tr>
<tr><td>Running speed[pps]</td><td>Running direction (0:-Jog 1:+Jog)</td><td>Flag option</td></tr>
</table>
<table>
<tr><th>2 bytes</th><th>26 bytes</th></tr>
<tr><td>Custom Accel./Decel. Time (1~9999)</td><td>Reserved</td></tr>
</table>
Flag option : 0x0001 : reserved
0x0002 : Custom Accel./Decel. Time is used.

If the bit value is OFF status(0), Accel. / Decel. Time value is used that saved in controller.
Response : 1 byte
</td>
</tr>
<tr>
<td>0x40
(64)</td>
<td>FAS_
GetAxisStatus</td>
<td>
To request the Flag value of displaying the running status.

Sending : 0 byte
Response : 5 bytes
<table>
<tr><th>1 byte</th><th>4 bytes</th></tr>
<tr><td>Communication Status</td><td>Status Flag value</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td>For bit related to each Flag, refer to 「1-2-5. Bit setup of Status Flag」.</td></tr>
<tr><td>0x41
(65)</td><td>FAS_
GetIOAxisStatus</td><td>To request the I/O status and the running Flag status.
(Frame type 0x22, 0x23, 0x40 are packed.)

Sending : 0 byte
Response : 13 bytes
<table>
<tr><td>1 byte</td><td>4 bytes</td><td>4 bytes</td><td>4 bytes</td></tr>
<tr><td>Communication Status</td><td>Input status value</td><td>Output status value</td><td>Status Flag value</td></tr>
</table></td></tr>
<tr><td>0x42
(66)</td><td>FAS_
GetMotionStatus</td><td>To request the current running progress status and its PT number.
(Frame type 0x51, 0x53, 0x54, 0x55 are packed.)

Sending : 0 byte
Response : 21 bytes
<table>
<tr><td>1 byte</td><td>4 bytes</td><td>4 bytes</td><td>4 bytes</td><td>4 bytes</td><td>4 bytes</td></tr>
<tr><td>Communication Status</td><td>Command Position value</td><td>Actual Position value</td><td>Position Difference value</td><td>Running speed value</td><td>Current running PT number</td></tr>
</table></td></tr>
<tr><td>0x43
(67)</td><td>FAS_
GetAllStatus</td><td>To request all data including the current running stauts.
(Frame type 0x41, 0x42 are packed.)

Sending : 0 byte
Response : 33 bytes
<table>
<tr><td>1 byte</td><td>4 bytes</td><td>4 bytes</td><td>4 bytes</td></tr>
<tr><td>Communication Status</td><td>Input status value</td><td>Ouput status value</td><td>Status Flag value</td></tr>
</table>
<table>
<tr><td>4 bytes</td><td>4 bytes</td><td>4 bytes</td><td>4 bytes</td><td>4 bytes</td></tr>
<tr><td>Command Position value</td><td>Actual Position value</td><td>Position Difference value</td><td>Running speed value</td><td>Current running PT number</td></tr>
</table></td></tr>
<tr><td>0x50
(80)</td><td>FAS_
SetCommandPos</td><td>The user sets it to the command position value before it starts to operate and then can check how the command position value is changed.

Sending : 4 bytes
<table>
<tr><td>4 bytes</td></tr>
<tr><td>Command position setting count value</td></tr>
</table>
Response : 1 byte</td></tr>
</table>

<table>
<tr><td></td><td></td><td><table><tr><td>1 byte</td></tr><tr><td>Communication Status</td></tr></table></td></tr>
<tr><td>0x51
(81)</td><td>FAS_
GetCommandPos</td><td>To request the commnad position value[pulse] being tracked.

Sending : 0 byte
Response : 5 bytes<table><tr><td>1 byte</td><td>4 bytes</td></tr><tr><td>Communication Status</td><td>Command position value</td></tr></table></td></tr>
<tr><td>0x52
(82)</td><td>FAS_
SetActualPos</td><td>Ezi-SERVOⅡ Plus-E is the closed loop control drive and so the actual position value is continuously controlled while the motor is in running.
The user sets it to the actual position value before it strats to operate and then can check how the actual position value is changed.

Sending : 4 bytes<table><tr><td>4 bytes</td></tr><tr><td>Actual position count valule</td></tr></table>Response : 1 byte<table><tr><td>1 byte</td></tr><tr><td>Communication Status</td></tr></table></td></tr>
<tr><td>0x53
(83)</td><td>FAS_
GetActualPos</td><td>To request the current actual position value[pulse].
Sending : 0 byte

Response : 5 bytes<table><tr><td>1 byte</td><td>4 bytes</td></tr><tr><td>Communication Status</td><td>Actual position value</td></tr></table></td></tr>
<tr><td>0x54
(84)</td><td>FAS_
GetPosError</td><td>To request the difference[pulse] between the command position value and the actual position value.

Sending : 0 byte

Response : 5 byte<table><tr><td>1 byte</td><td>4 bytes</td></tr><tr><td>Communication Status</td><td>Position difference value</td></tr></table>By this value, the user can check the current running status (how much inposition is tracked.)</td></tr>
</table>

<table>
<tr>
<td>0x55
(85)</td>
<td>FAS_
GetActualVel</td>
<td>To request the current running speed value[pps].

Sending : 0 byte
Response : 5 bytes
<table>
<tr><td>1 byte</td><td>4 bytes</td></tr>
<tr><td>Communication Status</td><td>Speed value</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x56
(86)</td>
<td>FAS_
ClearPosition</td>
<td>Set both the command position value and actual position value to '0'.
Sending : 0 byte
Response : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>Communication Status</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x58
(88)</td>
<td>FAS_
MovePause</td>
<td>To request the pause start and pause end of motor motioning.

Sending : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>0: pause release, 1: pause start</td></tr>
</table>
Response : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>Communication Status</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x60
(96)</td>
<td>FAS_
PosTableReadItem</td>
<td>To read PT values in the RAM of the drive.

Sending : 2 bytes
<table>
<tr><td>2 bytes</td></tr>
<tr><td>Readable PT No. (0~255)</td></tr>
</table>
Response : 65 bytes
<table>
<tr><td>1 byte</td><td>64 bytes</td></tr>
<tr><td>Communication Status</td><td>Relevant PT value</td></tr>
</table>
For items by each PT, refer to 「1-2-6. Position Table Item」.
</td>
</tr>
<tr>
<td>0x61
(97)</td>
<td>FAS_
PosTableWriteItem</td>
<td>To save PT values to the RAM of the drive.

Sending : 66 bytes
<table>
<tr><td>2 bytes</td><td>64 bytes</td></tr>
<tr><td>PT No. (0~255)</td><td>Relevant PT value</td></tr>
</table>
For items by each PT, refer to 「1-2-6. Position Table Item」.

Response : 2 bytes
<table>
<tr><td>1 byte</td><td>1 byte</td></tr>
<tr><td>Communication Status</td><td>Command performing status</td></tr>
</table>
</td>
</tr>
</table>

<table>
<tr><td></td><td></td><td><table><tr><td></td><td>(values except 0 : complete, 0: error)</td></tr></table></td></tr>
<tr><td>0x62
(98)</td><td>FAS_
PosTableReadROM</td><td>To read all PT values (256) in the ROM of the drive.
Sending : 0 byte
Response : 2 bytes<table><tr><td>1 byte</td><td>1 byte</td></tr><tr><td>Communication Status</td><td>Command performing status
(0: complete, values except 0: error)</td></tr></table></td></tr>
<tr><td>0x63
(99)</td><td>FAS_
PosTableWriteROM</td><td>To save all PT value(256) to the ROM of the drive.
Sending : 0 byte
Response : 2 bytes<table><tr><td>1 byte</td><td>1 byte</td></tr><tr><td>Communication Status</td><td>Command performing status
(0: complete, values except 0: error)</td></tr></table></td></tr>
<tr><td>0x64
(100)</td><td>FAS_
PosTableRunItem</td><td>To start the position table operation from the designated PT number.
Sending : 2 bytes<table><tr><td>2 bytes</td></tr><tr><td>PT No. (0~255)</td></tr></table>Response : 1 byte<table><tr><td>1 byte</td></tr><tr><td>Communication Status</td></tr></table></td></tr>
</table>

<table>
<tr>
<td>0x6A
(106)</td>
<td>FAS_
PosTableReadOneItem</td>
<td>
To read specific values of PT items in the RAM of the drive.

Sending : 4 bytes
<table>
<tr><td>2 bytes</td><td>2 bytes</td></tr>
<tr><td>PT No. to read (0~255)</td><td>Offset value of the specific item to read (0~40)</td></tr>
</table>
Refer to 「1-2-6. Position Table Item」 for Offset value.

Response : 5 bytes
<table>
<tr><td>1 byte</td><td>4 bytes</td></tr>
<tr><td>Communication Status</td><td>Relevant one of PT value</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x6B
(107)</td>
<td>FAS_
PosTableWriteOneItem</td>
<td>
To save specific values of PT items in the RAM of the drive.

Sending : 8 bytes
<table>
<tr><td>2 bytes</td><td>2bytes</td><td>4 bytes</td></tr>
<tr><td>PT No. To save(0~255)</td><td>Offset value of the specific item to save (0~40)</td><td>Stored value</td></tr>
</table>
Refer to 「1-2-6. Position Table Item」 for Offset value.

Response : 2 bytes
<table>
<tr><td>1 byte</td><td>1 byte</td></tr>
<tr><td>Communication Status</td><td>Command performing status
(values except 0: complete, 0: error)</td></tr>
</table>
</td>
</tr>
<tr>
<td>0x78
(120)</td>
<td>FAS_
MovePush</td>
<td>
To request push motion.(To maintain specified motor torque.)

Sending : 28 bytes
<table>
<tr><td>4 bytes</td><td>4 bytes</td><td>4 bytes</td><td>2 bytes</td><td>2 bytes</td></tr>
<tr><td>Normal Start speed</td><td>Normal Move speed</td><td>Normal Position</td><td>Accel time</td><td>Decel time</td></tr>
</table>
<table>
<tr><td>2 bytes</td><td>4 bytes</td><td>4 bytes</td><td>2 bytes</td></tr>
<tr><td>Push torque ratio</td><td>Push Move speed</td><td>Push Position</td><td>Push mode</td></tr>
</table>
Position move start speed : 1~35,000[pps]
Position move move speed : 1~500,000[pps]
Position move absolute position value : -134,217,728 ~134,217,727
Position move Acc/Dec time : 1~9,999[ms]
Push torque ratio : 20~90[%]
Push move speed : 1~33,333[pps] (Max 200[rpm]) (Resolution : 10,000)
Push absolute position value : -134,217,728 ~134,217,727
Push mode : 0(stop mode), 1~10,000(non-stop mode)
</td>
</tr>
</table>

<table>
<tr>
<td></td>
<td></td>
<td>For more information, refer to 「User Manual_Text 8-6. Push Motion」.

Response : 1 byte
<table>
<tr><td>1 byte</td></tr>
<tr><td>Communication status</td></tr>
</table>
♦ Be sure to execute Stop(E-Stop) command before the next motion command.
</td>
</tr>
<tr>
<td>0x79
(121)</td>
<td>FAS_
GetPushStatus</td>
<td>To request the current push motion status.

Sending : 0 byte
Response : 1 bytes
<table>
<tr><td>1 byte</td><td>1 byte</td></tr>
<tr><td>Communication status</td><td>Push motion status
(0: normal Servo ON
1: push motioning but the work is not detected
2: work detected and torque is maintained
3: work is not detected within push motion area.
In this case, the Stop (E-Stop) command must be executed before the next motion command.</td></tr>
</table>
</td>
</tr>
</table>

* Frame Type ‘0x65’~ ‘0x69’, ‘0x90’~ ‘0x92’ are allotted for internal use.

1 - 2 - 2 . Parameter Lists

No.	Name	Unit	Lower	Upper	Default
0	Pulse Per Revolution		0	8	8
1	Axis Max Speed	[pps]	1	2,500,000	500,000
2	Axis Start Speed	[pps]	1	35,000	1
3	Axis Acc Time	[msec]	1	9,999	100
4	Axis Dec Time	[msec]	1	9,999	100
5	Speed Override	[%]	1	500	100
6	Jog Speed	[pps]	1	2,500,000	5,000
7	Jog Start Speed	[pps]	1	35,000	1
8	Jog Acc Dec Time	[msec]	1	9,999	100
9*2	S/W Limit Plus Value	[pulse]	-134,217,728	134,217,727	134,217,727
10*2	S/W Limit Minus Value	[pulse]	-134,217,728	134,217,727	-134,217,728
11	S/W Limit Stop Method		0	2	2
12	H/W Limit Stop Method		0	1	0
13	Limit Sensor Logic		0	1	0
14	Org Speed	[pps]	1	500,000	5,000
15	Org Search Speed	[pps]	1	50,000	1,000
16	Org Acc Dec Time	[msec]	1	9,999	50
17	Org Method		0	7	0
18	Org Dir		0	1	1
19*2	Org OffSet	[pulse]	-134,217,728	134,217,727	0
20*2	Org Position Set	[pulse]	-134,217,728	134,217,727	0
21	Org Sensor Logic		0	1	0
22	Position Loop Gain		0	63	4
23	Inpos Value		0	63	0
24	Pos Tracking Limit	[pulse]	1	134,217,727	2,500
25	Motion Dir		0	1	0
26	Limit Sensor Dir		0	1	0
27	Org Torque Ratio	[%]	20	90	50
28	Pos. Error Overflow Limit	[pulse]	1	134,217,727	2,500
29*1	Brake Delay Time	[msec]	10	5,000	200
30	Run Current	*10[%]	5	15	10
31	Boost Current	*50[%]	0	7	0
32	Stop Current	*10[%]	2	10	5
33	Jog EXT FUNC Use		0	1	0
34	Jog Speed1	[pps]	1	500,000	5,000
35	Jog Speed2	[pps]	1	500,000	5,000
36	Jog Speed3	[pps]	1	500,000	5,000
37	Jog Speed4	[pps]	1	500,000	5,000
38	Jog Speed5	[pps]	1	500,000	5,000

39	Jog Speed6	[pps]	1	500,000	5,000
40	Jog Speed7	[pps]	1	500,000	5,000
41	Use Motion Queue		0	1	0
42	Disconnection Option		0	4	0
43	Communication Timeout	msec	100	60,000	100
44	Motion Profile		0	1	0
45	ORG RET OK OFF OPTION		0	3	0

*1 In the case of drive for 86[mm] motor, this parameter not be used.

*2 The range of parameter 9, 10, 19, 20 differs from the product version, listed as below.
V06.01.**2**x.xx : -134,217,728 ~134,217,727
V06.01.**3**x.xx : - 2,147,483,648 ~ 2,147,483,647

- Parameter No.33~40 are used from Firmware [ver.6.1.20.11].
- Parameter No.41~43 are used from Firmware [ver.6.1.20.16].
- Parameter No.44 and 45 are used from Firmware [ver.6.1.xx.19].

1 - 2 - 3 . Bit setup of control Output pin

This displays the detailed description for '0x20' Frame type.

This command is applicable only to 9 signals of 'User Output 0' ~ 'User Output 8' out of 24 signal types in the control output port. The rest (15 output signals) of them cannot be operated by the user's disposal. When any relevant situation occurs while the drive operates, they are displayed.

The following table shows bit mask values by each signal.

Signal Name	**Corresponding bit Position**	**Signal Name**	**Corresponding bit Position**	**Signal Name**	**Corresponding bit Position**
Compare Out	0x00000001	Origin Search OK	0x00000100	User OUT 1	0x00010000
Inposition	0x00000002	ServoReady	0x00000200	User OUT 2	0x00020000
Alarm	0x00000004	reserved	0x00000400	User OUT 3	0x00040000
Moving	0x00000008	reserved	0x00000800	User OUT 4	0x00080000
Acc/Dec	0x00000010	PT Output0	0x00001000	User OUT 5	0x00100000
ACK	0x00000020	PT Output1	0x00002000	User OUT 6	0x00200000
END	0x00000040	PT Output2	0x00004000	User OUT 7	0x00400000
AlarmBlink	0x00000080	User OUT 0	0x00008000	User OUT 8	0x00800000

【Example 1】 Sending data to turn ON the User Output 5 port.

4 bytes (I/O set mask value)	4 bytes (I/O clear mask value)
0x00100000	0x00000000

【Example 2】 Sending data to turn OFF the User Output 5 port

4 bytes (I/O set mask value)	4 bytes (I/O clear mask value)
0x00000000	0x00100000

1 - 2 - 4 . Bit setup of control Input pin

This displays the detailed description for ‘0x21’ Frame type.

This command is applicable to 32 signals in the control input port. The user can use signals for test as if they are inputted without actual input signal.

The following table shows bit mask values by each signal.

Signal Name	**Corresponding bit Position**	**Signal Name**	**Corresponding bit Position**	**Signal Name**	**Corresponding bit Position**	**Signal Name**	**Corresponding bit Position**
Limit+	0x00000001	PT A4	0x00000100	Alarm Reset	0x00010000	JPT input2	0x01000000
Limit-	0x00000002	PT A5/ User IN 6/ Jog0	0x00000200	ServoON	0x00020000	JPT Start	0x02000000
Origin	0x00000004	PT A6/ User IN 7/ Jog1	0x00000400	Pause	0x00040000	User IN 0	0x04000000
Clear Position	0x00000008	PT A7/ User IN 8/ Jog2	0x00000800	Org Search	0x00080000	User IN 1	0x08000000
PT A0	0x00000010	PT Start	0x00001000	Teaching	0x00100000	User IN 2	0x10000000
PT A1	0x00000020	Stop	0x00002000	E-stop	0x00200000	User IN 3	0x20000000
PT A2	0x00000040	Jog+	0x00004000	JPT input0	0x00400000	User IN 4	0x40000000
PT A3	0x00000080	Jog-	0x00008000	JPT input1	0x00800000	User IN 5	0x80000000

【Example 1】 Sending data to turn ON the Pause port.

4 bytes (I/O set mask value)	4 bytes (I/O clear mask value)
0x00040000	0x00000000

【Example 2】 Sending data to turn OFF the Pause port.

4 bytes (I/O set mask value)	4 bytes (I/O clear mask value)
0x00000000	0x00040000

⚠ Caution	**Do not mix the bit setup of ‘PT A5 ~ PT A7’ and ‘User IN6 ~ IN8’, ‘Jog0 ~ Jog2’ together on your program.**

1 - 2 - 5 . Bit setup of Status Flag

Refer to 'MOTION_EziSERVO2_DEFINE.h' among the include files.

Name of Flag define	Description	Corresponding bit Position
FFLAG_ERRORALL	One or more error occurs.	0X00000001
FFLAG_HWPOSILMT	+ direction Limit sensor turns ON.	0X00000002
FFLAG_HWNEGALMT	- direction Limit sensor turns ON.	0X00000004
FFLAG_SWPOGILMT	+ direction program Limit is exceeded.	0X00000008
FFLAG_SWNEGALMT	- direction program Limit is exceeded.	0X00000010
Reserved1		0X00000020
Reserved2		0X00000040
FFLAG_ERRPOSOVERFLOW	Position error is higher than 'Pos Error Overflow Limit' parameter after position command.	0X00000080
FFLAG_ERROVERCURRENT	Alarm occurs when an overcurrent occurs in the motor drive element.	0X00000100
FFLAG_ERROVERSPEED	Alarm occurs when the motor speed exceeds 3000 [rpm].	0X00000200
FFLAG_ERRPOSTRACKING	Position error is higher than 'Pos Tracking Limit'parameter during position command run.	0X00000400
FFLAG_ERROVERLOAD	Alarm occurs when a load exceeding the maximum torque of the motor is applied for a distance of more than 5 seconds or more than 10 turns.	0X00000800
FFLAG_ERROVERHEAT	The internal temperature of the drive exceeds 85°C.	0X00001000
FFLAG_ERRBACKEMF	A counter electromotive force of the motor exceeds 70V.	0X00002000
FFLAG_ERRMOTORPOWER	Alarm occurs when it is the motor voltage error.	0X00004000
FFLAG_ERRINPOSITION	Alarm occurs when it is In-position error.	0X00008000
FFLAG_EMGSTOP	If the motor is in an emergency stop.	0X00010000
FFLAG_SLOWSTOP	If the motor is in an emergency stop.	0X00020000
FFLAG_ORIGINRETURNING	During homing operation.	0X00040000
FFLAG_INPOSITION	In-position is complete.	0X00080000
FFLAG_SERVOON	The motor is under Servo On.	0X00100000
FFLAG_ALARMRESET	Alarm Reset has run.	0X00200000
FFLAG_PTSTOPED	Position Table operation has been finished.	0X00400000
FFLAG_ORIGINSENSOR	The origin sensor is ON.	0X00800000
FFLAG_ZPULSE	In case of z-pulse type operation during homing operaiton.	0X01000000
FFLAG_ORIGINRETOK	Origin return operation has been finished.	0X02000000
FFLAG_MOTIONDIR	Motor operating direction (+ :OFF, - :ON)	0X04000000
FFLAG_MOTIONING	The motor is running.	0X08000000
FFLAG_MOTIONPAUSE	The motor in running is stopped by Pause command.	0X10000000

FFLAG_MOTIONACCEL	The motor is operating to the acceleration section.	0X20000000
FFLAG_MOTIONDECEL	The motor is operating to the deceleration section.	0X40000000
FFLAG_MOTIONCONST	The motor is operating to the normal speed, not acceleration / deceleration sections.	0X80000000

1 - 2 - 6 . Position table Item

Refer to ‘motion_define.h’ among the include file.

Name	Name of structure paramater	Number of Byte	Offset value	Unit	Low Limit	Upper Limit
Position*1	lPosition	4 (signed)	0	[pulse]	-134,217,728	+134,217,727
Low Speed	dwStartSpd	4 (unsigned)	4	[pps]	0	500,000
High Speed	dwMoveSpd	4 (unsigned)	8	[pps]	0	500,000
Accel. Time	wAccelRate	2 (unsigned)	12	[msec]	1	9,999
Decel. Time	wDecelRate	2 (unsigned)	14	[msec]	1	9,999
Command	wCommand	2 (unsigned)	16		0	10
Wait time	wWaitTime	2 (unsigned)	18	[msec]	0	600,000
Continuous Action	wContinuous	2 (unsigned)	20		0	1
Jump Table No.	wBranch	2 (unsigned)	22		0 10,000	255 10,255
Jump PT 0	wCond_branch0	2 (unsigned)	24		0 10,000	255 10,255
Jump PT 1	wCond_branch1	2 (unsigned)	26		0 10,000	255 10,255
Jump PT 2	wCond_branch2	2 (unsigned)	28		0 10,000	255 10,255
Loop Count	wLoopCount	2 (unsigned)	30		0	100
Loop Jump Table No.	wBranchAfterLoop	2 (unsigned)	32		0 10,000	255 10,255
PT set	wPTSet	2 (unsigned)	34		0	15
Loop Counter Clear	wLoopCountCLR	2 (unsigned)	36		0	255
Check Inposition	bCheckInpos	2 (unsigned)	38		0	1
Compare *1 Position	lTriggerPos	4 (signed)	40	[pulse]	-134,217,728	+134,217,727
Compare Width	wTriggerOnTime	2 (unsigned)	44	[msec]	1	9,999
Push Ratio	wPushRatio	2 (unsigned)	46	[%]	20	90
Push Speed	dwPushSpeed	4 (unsigned)	48	[pps]	0	33,333

Push Position	lPushPosition	4 (signed)	52	[pulse]	-134,217,728	+134,217,727
Push Mode	wPushMode	2 (unsigned)	56		0	10,000
Blank		6 (unsigned)	58	0x00		

*[1] The parameter range differs from the product version, listed as below.

V06.01.**2**x.xx : -134,217,728 ~134,217,727
V06.01.**3**x.xx : - 2,147,483,648 ~ 2,147,483,647

For the setting method by each item, refer to 「User Manual-Position Table」.

1 - 3 . Program Method

There are 2 method of programming for Ezi-SERVOⅡ Plus-E.

The first is normally used method that using Visual C++ language under window system of PC.
This time, Library that serviced together (Refer to 「2. Library for PC Program」) is used.

The second method is to send the command character directly without using the library function. Protocol it is necessary to create a low-level protocol program like a test program and it is mainly used when a PLC is used as a host controller.

2. Library for PC Program

2 - 1 . Library Configuration

(1) For C++

To use this library, C++ header file(*.h) and library file(*.lib or *.dll)are required. These files are included in “₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩₩include₩₩ and the following contents should be included in a source file for development.

#include “₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩₩include₩₩FAS_EziMotionPlusE.h”
#include “₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩₩include₩₩ReturnCodes_Define.h”
#include “₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩₩include₩₩MOTION_DEFINE.h”
#include “₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩₩include₩₩COMM_Define.h”

Also, library files are as follows:
1) For 32bit
“₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩₩include₩₩EziMotionPlusE.lib”
“₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩₩include₩₩EziMotionPlusE.dll“

2) For 64bit
“₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩₩include₩₩x64₩₩EziMotionPlusE.lib”
“₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩₩include₩₩x64₩₩EziMotionPlusE.dll“

A sample program source of using library is included in a “₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩₩Examples₩₩C++₩₩” folder.

(2) For C#

To use this library, C# header file and library file are required. These files are included in “₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩” and the following contents should be included in a source file for development.

#include “₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩₩include₩₩MOTION_DEFINE_PlusE.cs”

Also, library files are as follows:
1) For 32bit
“₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩₩include₩₩LIB_EziMOTIONPlusE.cs”
2) For 64bit
“₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩₩include_x64₩₩LIB_EziMOTIONPlusE.cs”

A sample program source of using library is included in a

"₩₩FASTECH₩₩Ezi-MOTION Plus-E V6₩₩Examples₩₩C#₩₩" folder.

(3) The following table describes values returned when each library(DLL) function is used. The user can check the values returned at the library(DLL) function. In case of program using protocol, this service is not provided.

Sort	Name	Return Value	Description
Normal	FMM_OK	0(0x00)	The function has normally performed the command.
Input Error	FMM_NOT_OPEN	1(0x01)	Wrong port number is inputted.
	FMM_INVALID_PORT_NUM	2(0x02)	The port is not connected.
	FMM_INVALID_SLAVE_NUM	3(0x03)	Wrong board number is inputted.
Operation Error	FMM_POSTABLE_ERROR	9(0x09)	An error occurs while read/write to the positon table.
Connection Error	FMC_DISCONNECTED	5(0x05)	The relevant board is disconnected.
	FMC_TIMEOUT_ERROR	6(0x06)	Response delay occurs. (100[msec])
	FMC_RECVPACKET_ERROR	8(0x08)	Protocol level error occurs in packet that comes from Drive.

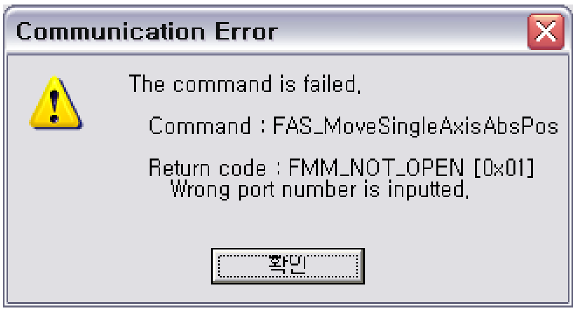
(4) The following table shows return values included commonly in all libraries. The user can check the result (communication status, running status) judged by the drive. Supported for both case of using library(DLL) and programming using protocol.

Sort	Name	Return Value	Description
Normal	FMP_OK	0(0x00)	Communication has been normally performed.
Input Error	FMP_FRAMETYPEERROR	128(0x80)	The command that the drive cannot recognize.
	FMP_DATAERROR	129(0x81)	Inputted data is out of the range.
Operation Error	FMP_RUNFAIL	133(0x85)	The motor is already running or not prepared for running. Other wrong motion command.
	FMP_RESETFAIL	134(0x86)	The user cannot execute Alarm Reset command while the servo is ON.
	FMP_SERVOONFAIL1	135(0x87)	An alarm has occurred.
	FMP_SERVOONFAIL2	136(0x88)	The motor is under Emergency Stop.
	FMP_SERVOONFAIL3	137(0x89)	'Servo ON' signal is already assigned to input pin.
Connection Error	FMP_PACKETERROR	130(0x82)	Protocol level error occurs in packed that Drive's received.

2 - 2 . Communication Status Window

Above communication status is divide by 3 groups.

(1) Communication Error



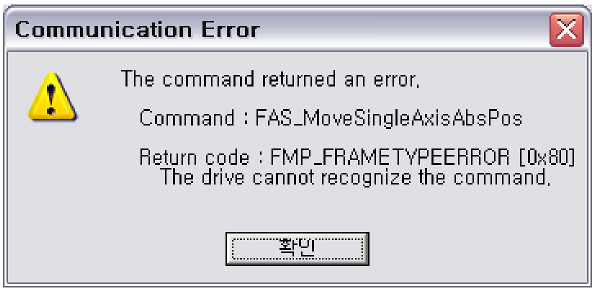
The command is failed.

Command : FAS_MoveSingleAxisAbsPos

Return code : FMM_NOT_OPEN [0x01]
Wrong port number is inputted.

FMM_NOT_OPEN,

COM Port is not connected. (This error cannot occut on GUI.)



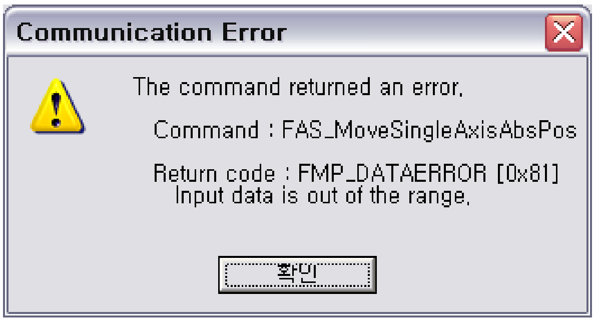
The command returned an error.

Command : FAS_MoveSingleAxisAbsPos

Return code : FMP_FRAMETYPEERROR [0x80]
The drive cannot recognize the command.

FMP_FRAMETYPEERROR = 0x80,

Drive cannot recognize the Command or do not support the Command.



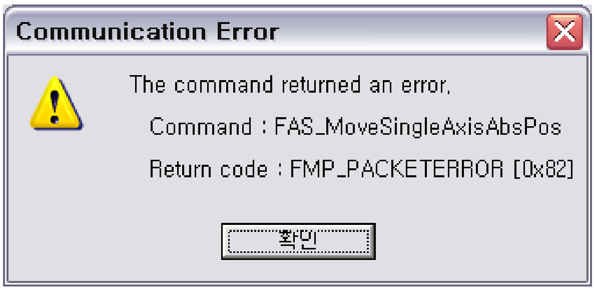
The command returned an error.

Command : FAS_MoveSingleAxisAbsPos

Return code : FMP_DATAERROR [0x81]
Input data is out of the range.

FMP_DATAERROR,

Range of inputted data is out of the proper range for drive.



The command returned an error.

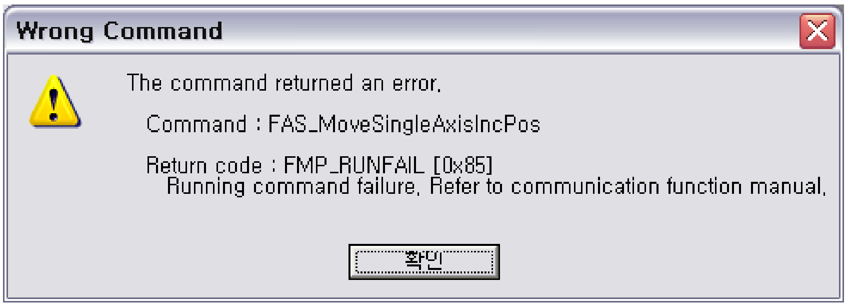
Command : FAS_MoveSingleAxisAbsPos

Return code : FMP_PACKETERROR [0x82]

FMP_PACKETERROR,

The received frame is data that does not meet the standard. (The length of Packet sent to Drive does not match.)

(2) Wrong Command



The command returned an error.

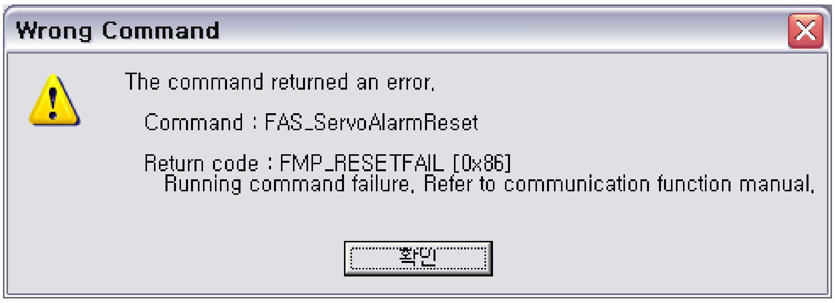
Command : FAS_MoveSingleAxisIncPos

Return code : FMP_RUNFAIL [0x85]
Running command failure. Refer to communication function manual.

FMP_RUNFAIL

Running command failure: When trying to execute new running under as below status.

- The motor is already running.
- The motor is under stop command.
- Servo OFF Status.
- Try to Z-pulse Origin without external encoder.
- Other wrong motion command.



The command returned an error.

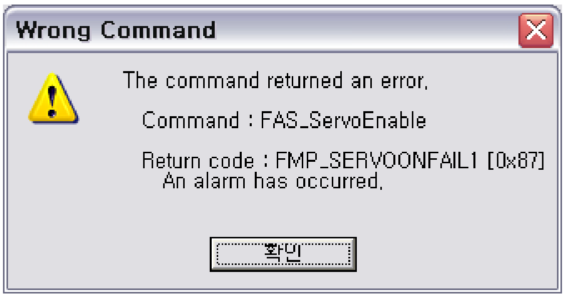
Command : FAS_ServoAlarmReset

Return code : FMP_RESETFAIL [0x86]
Running command failure. Refer to communication function manual.

FMP_RESETFAIL,

Trying to the motor reset on next status.

- Servo ON status.
- Already ‘Reset’ status by external input signal.



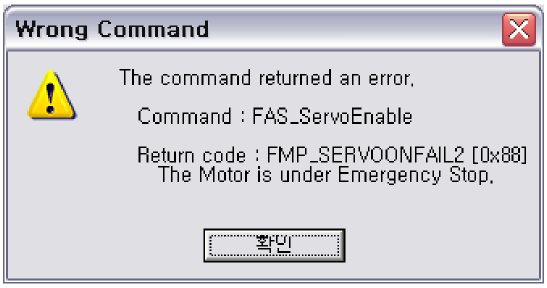
The command returned an error.

Command : FAS_ServoEnable

Return code : FMP_SERVOONFAIL1 [0x87]
An alarm has occurred.

FMP_SERVOONFAIL1,

Trying to run Servo ON command during alarm occurred.


Wrong Command

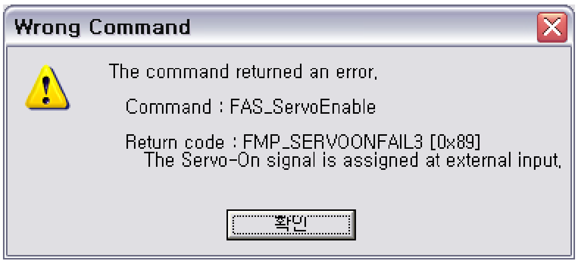
The command returned an error.

Command : FAS_ServoEnable

Return code : FMP_SERVOONFAIL2 [0x88]
The Motor is under Emergency Stop.

FMP_SERVOONFAIL2,

Trying to run Servo OFF command during an emergency stop.


Wrong Command

The command returned an error.

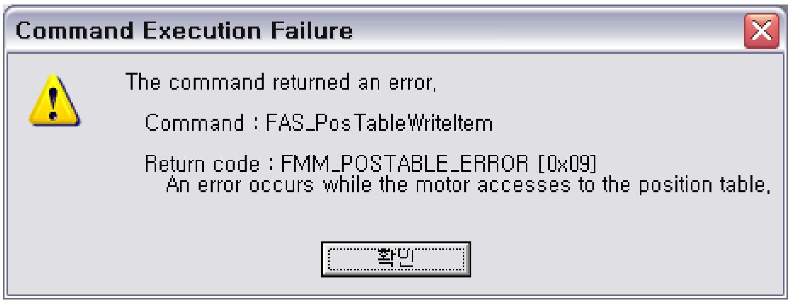
Command : FAS_ServoEnable

Return code : FMP_SERVOONFAIL3 [0x89]
The Servo-On signal is assigned at external input.

FMP_SERVOONFAIL3,

Servo ON signal is assigned to external input and cannot be executed.

(3) Command Execution Error


Command Execution Failure

The command returned an error.

Command : FAS_PosTableWriteItem

Return code : FMM_POSTABLE_ERROR [0x09]
An error occurs while the motor accesses to the position table.

FMM_POSTABLE_ERROR,

Run failure of function about Position Table.

2 - 3 . Drive Link Function

Function Name	Description
FAS_Connect	The drive tries to connect with UDP Protocol. : When it it successfully connected, TRUE will return. Otherwise, FALSE will return.
FAS_ConnectTCP	The drive module tries to connect with TCP Protocol. : When it it successfully connected, TRUE will return. Otherwise, FALSE will return.
FAS_Reconnect	Reconnect with existing IP, Protocol, iBdID.
FAS_AutoReconnect	In case of using TCP, if the response is not within 100[ms] or unintentionally disconnected from TCP, it automatically connects to another port and executes the unsuccessful function again. When connecting to the GUI using the above functions, make sure to connect the GUI by UDP.
FAS_Close	The drive tries to disconnect communication with the drive.
FAS_GetSlaveInfo	The drive reads drive type and program version. : Drive type and version information will be returned.
FAS_GetMotorInfo	Reads information about the type and manufacturer of the motor connected to the drive.
FAS_IsSlaveExist	The drive checks whether there is the relevant drive. : When it exists, TRUE will return. Otherwise, FALSE will return.
FAS_IsBdIDExist	Check whether BdID is used for the IP Address. : When it exists, TRUE will return. Otherwise, FALSE will return.
FAS_IsIPAddressExist	Check whether the IP Address is assigned to the BdID. : When it exists, TRUE will return. Otherwise, FALSE will return.
FAS_EnableLog	Controls output of the Log related to communication error. : When it exists, TRUE will return. Otherwise, FALSE will return.
FAS_SetLogPath	Set the path to save the output Log. : When it exists, TRUE will return. Otherwise, FALSE will return.
FAS_SetLogLevel	Output Log according to the set level. : By default, only Log related to internal communication errors are displayed. (LOG_LEVEL_COMM)
FAS_PrintCustomLog	Output arbitrary Log.

● 1. **The following functions are supported by F/W Ver V06.01.020.04 Library Ver 2.0.0.10 or later.**

1) **FAS_ConnectTCP**
2) **FAS_Reconnect**
3) **FAS_SetLogLevel**
4) **FAS_PrintCustomLog**

2. The following function is supported by F/W Ver V06.01.020.05 Library Ver 2.3.0.15 or later.

1) FAS_SetAutoReconnect

FAS_Connect

FAS_Connect is a function that connects Ezi-SERVOⅡ Plus-E with UDP Protocol.

Syntax

```
BOOL FAS_Connect(
      BYTE sb1, BYTE sb2, BYTE sb3, BYTE sb4
      int iBdID
);
```

Parameters

sb1~4

Enter the IP address of the drive you want to connect to.

ex) 192.168.0.2

sb1 = 192, sb2 = 168, sb3=0, sb4=2

iBdID

Unique ID of board to connect. The ID(value) is set by the user.

You can not use the same ID as an IP address.

Return Value

When it is successfully connected, TRUE will returns. Otherwise, FALSE will return.

Remarks

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcInit()
{
        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0 // A unique board number of 192.168.0.2
        char lpBuff[256];
        int nBuffSize = 256;
        BYTE nType;
        int nRtn;

        // Try to connect.
        if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
        {
                // Connection failed.
                MessageBox(_T("connect fail!"));
                return;
        }

        if (FAS_IsSlaveExist(iBdID) == FALSE)
        {
                // There is no relevant board number.
                // Check the board number of Ezi-SERVOⅡ Plus-E.
                return;
        }

        nRtn = FAS_GetSlaveInfo(iBdID, &nType, lpBuff, nBuffSize);
        if (nRtn != FMM_OK)
        {
                // Command has not been performed properly.
                // Refer to ReturnCodes_Define.h
        }

        printf("Port : %d (board %d) ₩n", iBdID);
        printf("₩tType : %d ₩n", nType);
        printf("₩tVersion : %d ₩n", lpBuff);

        // Terminate the connection.
        FAS_Close(iBdID);
}
```

See Also

FAS_Close

FAS_ConnectTCP

FAS_Connect is a function to connect Ezi-SERVOⅡ Plus-to TCP Protocol.

Syntax

```
BOOL FAS_ConnectTCP(
      BYTE sb1, BYTE sb2, BYTE sb3, BYTE sb4
      int iBdID
);
```

Parameters

sb1~4

Enter the IP address of the drive you want to connect to.

ex) 192.168.0.2

sb1 = 192, sb2 = 168, sb3=0, sb4=2

iBdID

It is unique ID of board to connect. The ID(value) is set by the user.

You can not use the same ID as an IP address.

Return Value

When it is successfully connected, TRUE will returns. Otherwise, FALSE will return.

Remarks

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcInit()
{
        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0 // A unique board number of 192.168.0.2
        char lpBuff[256];
        int nBuffSize = 256;
        BYTE nType;
        int nRtn;

        // Try to connect.
        if (FAS_ConnectTCP(sb1, sb2, sb3, sb4, iBdID) == FALSE)
        {
                // Connection failed.
                MessageBox(_T("connect fail!"));
                return;
```

```
		}

		if (FAS_IsSlaveExist(iBdID) == FALSE)
		{
			// There is no relevant board number.
			// Check the board number of Ezi-SERVOⅡ.
			return;
		}

		nRtn = FAS_GetSlaveInfo(iBdID, &nType, lpBuff, nBuffSize);
		if (nRtn != FMM_OK)
		{
			// Command has not been performed properly.
			// Refer to ReturnCodes_Define.h.
		}

		printf("Port : %d (board %d) ₩n", iBdID);
		printf("₩tType : %d ₩n", nType);
		printf("₩tVersion : %d ₩n", lpBuff);

		// Disconnect.
		FAS_Close(iBdID);
	}
```

See Also

FAS_Close

FAS_Reconnect

Disconnect to the protocol which was used.

Syntax

```
void FAS_Reconnect(int iBdID);
```

Parameters

iBdID

Drive ID number to reconnect.

Remarks

After connecting with FAS_Connect() function, the connection is terminated or connected again without using FAS_Connect().

Example

Refer to FAS_Connect library.

See Also

FAS_Connect

FAS_SetAutoReconnect

To connect TCP communication automatically.

Syntax

```
void FAS_SetAutoReconnect(BOOL bSET);
```

Parameters

bSET

Set whether to use the Auto Reconnect function.

Remarks

If the function used after setting FAS_SetAutoReconnect to Set is not within 100[ms], or if TCP is unintentionally disconnected, connect using a different port and execute the function that was not answered again.

(Only executed when connected using FAS_ConnecTCP.)

- When connecting to the GUI while using the above functions, be sure to connect the FUI by UDP.

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcInit()
{
        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0 // A unique board number of 192.168.0.2
        char lpBuff[256];
        int nBuffSize = 256;
        BYTE nType;
        int nRtn;

        // Try to connect.
        if (FAS_ConnectTCP(sb1, sb2, sb3, sb4, iBdID) == FALSE)
        {
                // Connection failed.
                MessageBox(_T("connect fail!"));
                return;
        }
        // Enable Auto Reconnect
        FAS_SetAutoReconnect(SET);
}
```

See Also

FAS_Close

To disconnect the serial port being used.

Syntax

```
void FAS_Close(int iBdID);
```

Parameters

iBdID

// ID number to disconnect.

Remarks

Example

// Refer to FAS_Connect library.

See Also

FAS_Connect

FAS_GetSlaveInfo

To get the version information string of the relevant drive

Syntax

```
int FAS_GetboardInfo(
      int iBdID,
      BYTE pType,
      LPSTR lpBuff,
      int nBuffSize
);
```

Parameters

iBdID

The ID number of the board iBdID set by FAS_Connect function.

pType

Type number of relevant board.

lpBuff

Buffer Pointer to get version information string.

nBuffSize

lpBuff memory allocation size.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of iBdID does not exist.

Remarks

Example

Refer to FAS_Connect library.

See Also

FAS_GetMotorInfo

To get the motor information string of the relevant drive.

Syntax

```
int FAS_GetMotorInfo(
      int iBdID,
      BYTE pType,
      LPSTR lpBuff,
      int nBuffSize
);
```

Parameters

iBdID

The ID number of the board. The iBdID set by the FAS_Connect function.

pType

Type number of the motor.

lpBuff

Buffer Pointer to receive motor information string.

nBuffSize

The memory allocation size value of lpBuff.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of iBdID does not exist.

Remarks

Example

Refer to FAS_Connect library.

See Also

FAS_IsSlaveExist

To check that the drive is connected.

Syntax

```
BOOL FAS_IsSlaveExist(int iBdID);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

Return Value

TRUE : Connection status.

FALSE : Disconnection status.

Remarks

This function is provided only in the library and is not supported for protocol programming.

Example

Refer to FAS_Connect library.

See Also

FAS_Connect

FAS_IsBdIDExist

To check that the drive is connected.

Syntax

```
BOOL FAS_IsBdIDExist(int iBdID, BYTE* sb1, BYTE* sb2, BYTE* sb3, BYTE* sb4 );
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

sb1, sb2, sb3, sb4

IP Address. (Ex,192.168.0.10 → sb1:192, sb2:168, sb3:0, sb4:10)

Return Value

TRUE : Use relevant BdID

FALSE : Not use relevant BdID

Remarks

This function is provided only in the library and is not supported for protocol programming.

Example

Refer to FAS_Connect library.

See Also

FAS_Connect

FAS_IsIPAddressExist

To check that the drive is connected.

Syntax

```
BOOL FAS_IsIPAddressExist(BYTE sb1, BYTE sb2, BYTE sb3, BYTE sb4, int iBdID );
```

Parameters

sb1, sb2, sb3, sb4

IP Address. (Ex,192.168.0.10 → sb1:192, sb2:168, sb3:0, sb4:10)

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

Return Value

TRUE : Use IP Address

FALSE : Not use IP Address

Remarks

This function is provided only in the library and is not supported for protocol programming.

Example

Refer to FAS_Connect library.

See Also

FAS_Connect

FAS_EnableLog

To control Log output about communication error.

Syntax

```
void FAS_EnableLog(BOOL bEnable);
```

Parameters

bEnable

Log output setting.

Remarks

Controls the Log output which occurs while using Ezi-MOTION Plus-E function in the current process. This setting does not affect the Log output of other processes or programs.

Log starts from FAS_Connect. When FAS_Close is used to disconnect the currently connected drive, Log output is terminated. The default setting for the Log output is TRUE.

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcDisableLog()
{

        FAS_EnableLog(FALSE);

        // After this, the Log of the functions are not printed.

        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0 // A unique board number of 192.168.0.2

        // Try to connect.
        if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
        {
                // Connection failed.
                return;
        }

        // Terminate the connection.
        FAS_Close(iBdID);
}
```

See Also

FAS_SetLogPath

FAS_SetLogPath

Setup the folder path of Log output files.

Syntax

```
BOOL FAS_SetLogPath(LPCTSTR lpPath);
```

Parameters

lpPath

Folder path character string of Log output file.

Return Value

If the folder name does not exist or can not access, return FALSE.

Remarks

This function has to be called before FAS_Connect library.
If the lpPath value is NULL or the length is 0, the Log path is selected to Ezi-MOTION Plus-E Library folder. The default value for Log path is NULL that the current library and the program exist.

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcEnableLog()
{
		BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
		int iBdID = 0 // A unique board number of 192.168.0.2

		// Log output
		FAS_EnableLog(TRUE);   // Do not need to use it.

		if (!FAS_SetLogPath(_T(“C:₩₩Logs₩₩”))) // C:₩Logs folder must exist.
		{
				// Log path does not exist.
				Return;
		}

		// Logs of all functions are displayed in C:₩Logs folder.

		// Try to connect.
		if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
		{
				// Connection fail.

				return;
		}

		// Connection close.
		FAS_Close(iBdID);
}
```

See Also

FAS_EnableLog

FAS_SetLogLevel

Set the path to save the output Log.

Syntax

BOOL FAS_SetLogLevel(enum LOG_LEVEL level);

Parameters

level

Log output range setting

Return Value

If a value other than the step setting value is entered, FALSE is returned.

Remarks

LOG_LEVEL_COMM : Only Logs related to communication errors are displayed.

LOG_LEVEL_PARAM : The parameter setting function Log is additionally output to the above Log output.

LOG_LEVEL_MOTION : The motion command function Log is additionally output to the above Log output.

LOG_LEVEL_ALL : All Logs that can be outputted are displayed.

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcEnableLog()
{
		BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
		int iBdID = 0 // A unique board number of 192.168.0.2

		// Log output
		FAS_EnableLog(TRUE);   // Do not need to use it.

		FAS_SetLogLevel(LOG_LEVEL_ALL); // Log output range setting

		// Try to connect.
		if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
		{
				// Connection fail

				return;
		}

		// Connection close
		FAS_Close(iBdID);
}
```

See Also

FAS_EnableLog

FAS_PrintCustomLog

Set the path to save the output Log.

Syntax

```
BOOL FAS_PrintCustomLog(
        int iBdID,
        enum LOG_LEVEL level,
        LPCTSTR lpszMsg
        );
```

Parameters

iBdID

ID number of the board. iBdID set in FAS_Connect function

level

Log output range setting

lpszMsg

String of Log to be output

Return Value

If a value other than the step setting value is entered, FALSE is returned.

Remarks

The Level is equal to the set value(range) of FAS_SetLogLevel().
Used to output the log at a specific location (function) in the program.
Or, output the log differently from the setting value of FAS_SetLogLevel () in the program.

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcCustomLog()
{
        int iBdID = 0 // A unique board number of 192.168.0.2
        int level = LOG_LEVEL_PARAM;


        //Communication error and parameter setting function Log output setting
        FAS_PrintCustomLog (iBdID, level, lpszMsg );


}
```

See Also

FAS_ SetLogLevel

2 - 4 . Parameter Control Function

Function Name	Description
FAS_SaveAllParameters	Current parameters are saved to the ROM : Even after the drive is powered OFF, parameters related to operating speed, acceleration/deceleration time, and origin return need to be preserved.
FAS_SetParameter	The designated parameter is saved to the RAM : Specific parameter is saved.
FAS_GetParameter	The designated parameter is read from the RAM : Specific parameter is read.
FAS_GetROMParameter	The designated parameter is read from the ROM : Specific parameter is read from the ROM.

FAS_SaveAllParameters

All parameters edited up to now and assign status of In/Out signals are saved in the ROM area.

Syntax

```
Int FAS_SaveAllParameters(
    int iBdID
);
```

Parameters

iBdID

The ID number of the boad. iBdID set by FAS_Connect function.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Parameter values set to ‘FAS_SetIOAssignMap’ library as well as current parameter values are saved to the ROM.

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcModifyParameter()
{
        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0;          //   A unique board number

        long lParamVal;
        int nRtn;

        // Try to connect
        if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
        {
                // Connection fail

                return;
        }

        // Check Axis Start Speed Parameter value
        nRtn = FAS_GetParameter(iBdID, SERVO_AXISSTARTSPEED, &lParamVal);
        if (nRtn != FMM_OK)
        {
                // The command was not executed normally.
                // Refer to ReturnCodes_Define.h.
                _ASSERT(FALSE);
        }
        else
        {
            // Parameter value stored in Ezi-SERVOⅡ
            printf("Parameter [before] : Start Speed = %d ₩n", lParamVal);
        }


        // Change the Start Speed Parameter value to 200 and read the value again.
        nRtn = FAS_SetParameter(iBdID, SERVO_AXISSTARTSPEED, 200);
        _ASSERT(nRtn == FMM_OK);   // If the command was not executed normally, it stops.

        nRtn = FAS_GetParameter(iBdID, SERVO_AXISSTARTSPEED, &lParamVal);
        _ASSERT(nRtn == FMM_OK);
        printf("Parameter [after] : Start Speed = %d ₩n", lParamVal);


        // Check the value stored in ROM.
        nRtn = FAS_GetROMParameter(iBdID, SERVO_AXISSTARTSPEED, &lParamVal);
        _ASSERT(nRtn == FMM_OK);   // If the command was not executed normally, it stops.
        printf("Parameter [ROM] : Start Speed = %d ₩n", lParamVal);


        // Modify the parameter value and save it to ROM.
        nRtn = FAS_SetParameter(iBdID, SERVO_AXISSTARTSPEED, 100);
        _ASSERT(nRtn == FMM_OK);   // If the command was not executed normally, it stops.

        nRtn = FAS_SaveAllParameters(iBdID);
        _ASSERT(nRtn == FMM_OK);

        // Connection close.
        FAS_Close(iBdID);
    }
```

See Also

FAS_GetRomParameter

FAS_SetParameter

Edit the relevant parameter value. (Save it to the RAM)

Syntax

```
int FAS_SetParameter(
      int iBdID,
      BYTE iParamNo,
      long lParamValue
);
```

Parameters

iBdID

The ID number of the board. The iBdID set by the FAS_Connect function.

iParamNo

Parameter number to be edited.

lParamValue

Parameter value to be edited.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

FMM_INVALID_PARAMETER_NUM : The parameter of specified iParamNo does not exist.

Remarks

The function operates only for one parameter designated.

Parameters in the drive are saved to 2 memory areas. That is, when power is off, the ROM saves parameters permanently. When power is on, parameters in the ROM are copied to the DSP RAM and used. When the user changes parameters, it changes not parameters in the ROM but parameter in the RAM. This function set the parameter of designated number from the RAM as the relevant value.

Example

Refer to FAS_SaveAllParameter library.

See Also

FAS_GetParameter

FAS_GetParamater

To call specific parameter values of the board.

Syntax

```
int FAS_GetParameter(
      int iBdID,
      BYTE iParamNo,
      long* lParamValue
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

iParamNo

The number of the parameter to import.

lParamValue

Parameter value.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

FMM_INVALID_PARAMETER_NUM : The specified parameter of iParamNo does not exist.

Remarks

The function operates only for one parameter designated.
Parameters in the drive are saved to 2 memory areas. That is, when power is off, the ROM saves parameters permanently. When power is on, parameters in the ROM are copied to the DSP RAM and used. When the user changes parameters, it changes not parameters in the ROM but parameter in the RAM. This function reads the parameter of designated number in the RAM area.

Example

Refer to FAS_SaveAllParameter library.

See Also

FAS_SetParameter

FAS_GetROMParameter

To call up the parameter saved in the ROM area.

Syntax

```
int FAS_GetROMParameter(
      int iBdID,
      BYTE iParamNo,
      long* lRomParam
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function

iParamNo

The number of the parameter to import.

lRomParam

Parameter value stored in ROM.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

FMM_INVALID_PARAMETER_NUM : The specified parameter of iParamNo does not exist.

Remarks

To call parametervalues saved in the ROM

Even though this function runs, the value in the RAM is not changed. For this, run FAS_SetParameter.

Example

Refer to FAS_SaveAllParameter library.

See Also

FAS_SaveAllParameters

2 - 5 . Servo Control Function

Function Name	Description
FAS_ServoEnable	The designated drive turns ON/OFF.
FAS_ServoAlarmReset	Release the drive in which an alarm occurs. : Remove the cause of the alarm before doing it.
FAS_GetAlarmType	Check the current alarm occurrence and the type of alarm.

FAS_ServoEnable

To turn the drive Servo ON/OFF.

Syntax

```
int FAS_ServoEnable(
      int iBdID,
      BOOL bOnOff
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function

bOnOff

Enable or Disable.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

The given time is required until Servo ON flag in the axis status turns on after enable.

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcAxisStatus()
{
        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0;          // A unique board number
        EZISERVO_AXISSTATUS AxisStatus;
        int nRtn;

        // Try to connect.
        if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
        {
                // Connection fail.
                return;
        }

        nRtn = FAS_GetAxisStatus(iBdID, &(AxisStatus.dwValue));
```

```
		_ASSERT(nRtn == FMM_OK);

		// Servo On when SERVO_ON flag is OFF.
		if (AxisStatus.FFLAG_SERVOON == 0)
		{
			nRtn = FAS_ServoEnable(iBdID, TRUE);
			_ASSERT(nRtn == FMM_OK);
		}

		// If there is an Alarm, AlarmReset runs.
		if (AxisStatus.FFLAG_ERRORALL || AxisStatus.FFLAG_ERROVERCURRENT || AxisStatus.FFLAG_ERROVERLOAD)
		{
			nRtn = FAS_ServoAlarmReset(iBdID);
			_ASSERT(nRtn == FMM_OK);
		}

		// Connection close.
		FAS_Close(iBdID);
	}
```

See Also

FAS_ServoAlarmReset

FAS_ServoAlarmReset

To send AlarmReset command

Syntax

```
int FAS_ServoAlarmReset(
    int iBdID
);
```

Parameters

iBdID

The ID number of the board. IBdID set by FAS_Connect function

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Before sending this command, remove the cause of the alarm first.

For alarm cause, refer to ‘User Manual_Text’.

Example

Refer to FAS_ServoEnable library.

See Also

FAS_ServoEnable

2 - 6 . Control I/O Function

Function Name	Description
FAS_SetIOInput	To set the input signal level of the control input port : Input signal is set to [ON] or [OFF].
FAS_GetIOInput	To read the current input signal status of the control input port : The signal status returns by bit for each input signal.
FAS_SetIOOutput	To set the output signal level of the control input port : Output signal is set to [ON] or [OFF].
FAS_GetIOOutput	To read the current input signal status of the control output port : The signal status returns by bit for each output signal.
FAS_GetIOAssignMap	To read the pin setting status of the CN1 port : The setting status for each 9 variable signals returns by bit to the Input and Output port.
FAS_SetIOAssignMap	To assignthe control I/O signal to CN1 port pin and also set the signal level : Setting for each 9 variable signals is assigned to the Input and Output port.
FAS_IOAssignMapReadROM	To load the pin setting status of CN1 port from ROM area to RAM area.

FAS_SetIOInput

To set I/O input. For more information, refer to ‘1-2. Structure of Frame Type’.

Syntax

```
int FAS_SetIOInput(
      int iBdID,
      DWORD dwIOSetMask,
      DWORD dwIOCLRMask
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

dwIOSetMask

Bitmask value of the input to be Set(ON status).

dwIOCLRMask

Bitmask value of the input to be Clear(OFF status).

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Be careful that dwIOSetMask bit and dwIOCLRMask bit are not duplicated.

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcIO()
{
        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0;          //   A unique board number
        DWORD dwInput, dwOutput;
        int nRtn;

        // Try to connect.
        if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
        {
                // Connection fail.

                return;
```

```
		}

		// Check I/O Input
		nRtn = FAS_GetIOInput(iBdID, &dwInput);
		_ASSERT(nRtn == FMM_OK);
		if (dwInput & SERVO_IN_BITMASK_LIMITP)
		{
			// Limit+ input is ON.
		}

		if (dwInput & SERVO_IN_BITMASK_USERIN0)
		{
			// User Input 0 is ON.
		}

		// Turning ON Clear Position and User Input 1 and turning OFF Jog+ input.
		nRtn	=	FAS_SetIOInput(iBdID,	SERVO_IN_BITMASK_CLEARPOSITION	|
	SERVO_IN_BITMASK_USERIN1, SERVO_IN_BITMASK_PJOG);
		_ASSERT(nRtn == FMM_OK);

		// Check I/O Output
		nRtn = FAS_GetIOOutput(iBdID, &dwOutput);
		_ASSERT(nRtn == FMM_OK);
		if (dwOutput & SERVO_OUT_BITMASK_USEROUT0)
		{
			// User Output 0 signal is ON.
		}

		// Turn OFF User Output 1 and 2 signals.
		nRtn	=	FAS_SetIOOutput(iBdID,	0,	SERVO_OUT_BITMASK_USEROUT1	|
	SERVO_OUT_BITMASK_USEROUT2);
		_ASSERT(nRtn == FMM_OK);

		// Connection close.
		FAS_Close(iBdID);
	}
```

See Also

FAS_GetIOInput

FAS_GetIOInput

To read I/O input values. For more information, refer to '1-2. Structure of Frame Type'.

Syntax

```
int FAS_GetIOInput(
      int iBdID,
      DWORD* dwIOInput
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

dwIOInput

Parameter pointer which input values will be saved.

Return Value

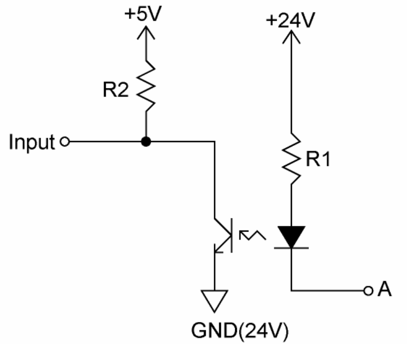
FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

There are 12 input pins in Ezi-SERVOⅡ Plus-E. The user can select and use 9 input pins of them. This function can read the input port status by 32bit unit. All of them are insulated by a photocoupler. (Refer to the figure.)



When Port A is supplied 24V from an external input port, the input is recognized to 5V(High).

Example

Refer to FAS_SetIOInput library.

See Also

FAS_SetIOInput

FAS_SetIOOutput

To set I/O output values. For more information, refer to '1-2. Structure of Frame Type'.

Syntax

```
int FAS_SetIOOutput(
      int iBdID,
      DWORD dwIOSetMask,
      DWORD dwIOCLRMask
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

dwIOSetMask

Bitmask value of the output to be Set(ON status).

dwIOCLRMask

Bitmask value of the output to be Clear(OFF status).

Return Value

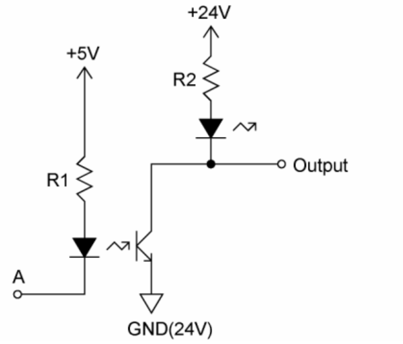
FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

There are 10 input pins in Ezi-SERVOⅡ Plus-E. The user can select and use 9 output pins of them.



When output data is '1', Port A becomes 0V. When it is '0', Port A becomes +5V.

Be careful that dwIOSetMask bit and dwIOCLRMask bit are not duplicated.

Example

Refer to FAS_SetIOInput library.

See Also

FAS_GetIOOutput

FAS_GetIOOutput

To read I/O output values. For more information, refer to '1-2. Structure of Frame Type'.

Syntax

```
int FAS_GetIOOutput(
    int iBdID,
    DWORD* dwIOOutput
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function

dwIOInput

Parameter pointer which the output value will be saved.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

Refer to FAS_SetIOInput library.

See Also

FAS_SetIOOutput

FAS_GetIOAssignMap

To read I/O Assign Map. For more information, refer to '1-2. Structure of Frame Type'.

Syntax

```
int FAS_GetIOAssignMap(
      int iBdID,
      BYTE iIOPinNo,
      BYTE* nIOLogic,
      BYTE* bLevel
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

iIOPinNo

I/O pin number to be read.

nIOLogic

Parameter pointer which the logic value assigned to a relevant pin will be saved.

bLevel

Parameter pointer which the active level of relevant logic will be saved.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

For nIOLogic, refer to 'Motion_define.h'.

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcIOAssign()
{

        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0;          // A unique board number.
        BYTE iPinNo;
        DWORD dwLogicMask;
        BYTE bLevel;
        BYTE i;
```

```
    int nRtn;

    // Try to connect.
    if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
    {
        // Connection fail.
        return;
    }

    // Check assigned information of Input pin.
    for (i=0; i</*Input Pin Count*/12; i++)
    {
        nRtn = FAS_GetIOAssignMap(iBdID, i, &dwLogicMask, &bLevel);
        _ASSERT(nRtn == FMM_OK);

        if (dwLogicMask != IN_LOGIC_NONE)
            printf("Input Pin %d : Logic Mask 0x%08X (%s)₩n", i,
dwLogicMask, ((bLevel == LEVEL_LOW_ACTIVE) ? "Low Active" : "High Active"));
        else
            printf("Input Pin %d : Not assigned₩n", i);
    }

    // Assign SERVOON Logic (Low Active) to Input pin 3.
    iPinNo = 3;         // Values 0 ~ 11 are possible (Note : 0 ~ 2 are fixed).
    nRtn = FAS_SetIOAssignMap(iBdID, iPinNo, SERVO_IN_BITMASK_SERVOON,
LEVEL_LOW_ACTIVE);
    _ASSERT(nRtn == FMM_OK);

    // Check assigned information of Output pin.
    for (i=0; i<10/*Output Pin Count*/; i++)
    {
        nRtn = FAS_GetIOAssignMap(iBdID, 12/*Input Pin Count*/ + i,
&dwLogicMask, &bLevel);
        _ASSERT(nRtn == FMM_OK);

        if (dwLogicMask != OUT_LOGIC_NONE)
            printf("Output Pin %d : Logic Mask 0x%08X (%s)₩n", i,
dwLogicMask, ((bLevel == LEVEL_LOW_ACTIVE) ? "Low Active" : "High Active"));
        else
            printf("Output Pin %d : Not assigned₩n", i);
    }

    // Assign ALARM Logic (High Active) to Output pin 9.
    iPinNo = 9;         // Values 0 ~ 9 are possible (Note : 0 is fixed to COMPOUT).
    nRtn = FAS_SetIOAssignMap(iBdID, 12/*Input Pin Count*/ + iPinNo,
SERVO_OUT_BITMASK_ALARM, LEVEL_HIGH_ACTIVE);
		_ASSERT(nRtn == FMM_OK);

		// Connection close.
		FAS_Close(iBdID);
}
```

See Also

FAS_SetIOAssignMap

FAS_SetIOAssignMap

To set I/O Assign Map. For more information, refer to '1-2. Structure of Frame Type'.

Syntax

```
int FAS_SetIOAssignMap(
      int iBdID,
      BYTE iIOPinNo,
      BYTE nLogicNo,
      BYTE bLevel
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function

iIOPinNo

I/O Pin number to be read

nIOLogic

Logic value to be assigned to the relevant pin

bLevel

Active Level value of the relevant logic

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

FMM_INVALID_PARAMETER_NUM : Designated iIOPinNo ornIOLogicvalue is out of range.

Remarks

To save current setting values to the ROM memory, 'FAS_SaveAllParameters'library should be run.

Example

Refer to FAS_GSetIOAssignMap library.

See Also

FAS_GetIOAssignMap

FAS_IOAssignMapReadROM

The I/O setting status and signal level values saved in the current ROM area are read.

Syntax

```
int FAS_PosTableReadROM(

    int iBdID
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

FMC_POSTABLE_ERROR : An error occurs while position table is being read.

Remarks

Example

See Also

FAS_ GetIOAssignMap

2 - 7 . Position Control Function

Function Name	Description
FAS_SetCommandPos	To set the command position value to any value
FAS_SetActualPos	To set the actual position value to any value
FAS_GetCommandPos	To read the current command position value
FAS_GetActualPos	To read the actual position value
FAS_GetPosError	To read the difference between the current actual position value and the command position value
FAS_GetActualVel	To read the actual running speed value while the motor is moving
FAS_ClearPosition	To set the command position and actual position value to ‘0’

FAS_SetCommandPos

Motor 의 Command Position 값을 설정합니다.

Syntax

```
int FAS_SetCommandPos(
      int iBdID,
      long lCmdPos
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lCmdPos

Command Position value to be set.

Return Value

FMM_OK : Command has been normally performed.
FMM_NOT_OPEN : The board has not been connected yet.
FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

The user sets the position command (pulse output counter) value.
This function is generally used when the user sets the current position to coordinates that user wants.

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcClearPosition()
{

        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0;          //   A unique board number
        int nRtn;

        // Try to connect.
        if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
        {
                // Connection fail.
                return;
        }
```

```
		// Initialize Command Position and Actual Position value.
		nRtn = FAS_SetCommandPos(iBdID, 0);
		_ASSERT(nRtn == FMM_OK);
		nRtn = FAS_SetActualPos(iBdID, 0);
		_ASSERT(nRtn == FMM_OK);

		// Connection fail.
		FAS_Close(iBdID);
	}
```

See Also

FAS_SetActualPos

FAS_SetActualPos

To set the Actual Position value of the motor

Syntax

```
int FAS_SetActualPos(
    int iBdID,
    long lActPos
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lActPos

Actual Position value to be set.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

The user sets the encoder feedback counter value to the value that user wants.

Example

Refer to FAS_GetActualPos library.

See Also

FAS_SetCommandPos

FAS_GetCommandPos

To read the command position of the current motor

Syntax

```
int FAS_GetCommandPos(
      int iBdID,
      long* lCmdPos
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lCmdPos

Parameter pointer that Command Position value will be saved.

Return Value

FMM_OK : Command has been normally performed.
FMM_NOT_OPEN : The board has not been connected yet.
FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

To read the position command (pulse output counter) value.

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcDisplayStatus()
{

        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0;          // A unique board number
        long lValue;
        int nRtn;

        // Try to connect
        if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
        {
                // Connection fail
                return;
        }

        // Check the information on the position of Ezi-SERVOⅡ
        nRtn = FAS_GetCommandPos(iBdID, &lValue);
```

```
		_ASSERT(nRtn == FMM_OK);
		printf("CMDPOS : %d ₩n", lValue);
		nRtn = FAS_GetActualPos(iBdID, &lValue);
		_ASSERT(nRtn == FMM_OK);
		printf("ACTPOS : %d ₩n", lValue);
		nRtn = FAS_GetPosError(iBdID, &lValue);
		_ASSERT(nRtn == FMM_OK);
		printf("POSERR : %d ₩n", lValue);
		nRtn = FAS_GetActualVel(iBdID, &lValue);
		_ASSERT(nRtn == FMM_OK);
		printf("ACTVEL : %d ₩n", lValue);

		// Connection close
		FAS_Close(iBdID);
	}
```

See Also

FAS_GetActualPos

FAS_GetActualPos

To read the actual position value of the current motor

Syntax

```
int FAS_GetActualPos(
      int iBdID,
      long* lActPos
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lActPos

Parameter pointer which the actual position value will be saved.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

When the user decides the motor position and checks its actual position, this function is generally used.

Example

Refer to FAS_GetCommandPosition library.

See Also

FAS_GetCommandPos

FAS_GetPosError

To read Position Error value of the motor

Syntax

```
int FAS_GetPosError(
      int iBdID,
      long* lPosErr
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lPosErr

Parameter pointer which the Position Error value will be saved.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

Refer to FAS_GetCOmmandPosition library.

See Also

FAS_GetCommandPos,

FAS_GetActualPos

FAS_GetActualVel

To read Actual Velocity value of the motor

Syntax

```
int FAS_GetActualVel(
    int iBdID,
    long* lActVel
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lActVel

Parameter pointer which the Actual Velocity value will be saved.

Return Value

FMM_OK : Command has been normally performed.
FMM_NOT_OPEN : The board has not been connected yet.
FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

Refer to FAS_GetCOmmandPosition library.

See Also

FAS_ClearPosition

To set Command Position value and Actual Position value of the motor to '0'

Syntax

```
int FAS_ClearPosition(
    int iBdID
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

Return Value

FMM_OK : Command has been normally performed.
FMM_NOT_OPEN : The board has not been connected yet.
FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

The position value is set by the user.
It is mainly used at system initialization.

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcClearPosition()
{

        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0;          //   A unique board number
        int nRtn;

        // Try to connect
        if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
        {
                // Connection fail
                return;
        }

        // Initialize Command Position value and Actual Position value to 0.
        nRtn = FAS_ClearPosition(iBdID);
        _ASSERT(nRtn == FMM_OK);

        // Connection close
```

```
                FAS_Close(iBdID);
    }
```

See Also

FAS_SetActualPos, FAS_SetCommandPos

2 - 8 . Drive Status Control Function

Function Name	Description
FAS_GetIOAxisStatus	To read control I/O status, running status Flag value : The current input status value, the output setting status value, and the running status Flag value will return.
FAS_GetMotionStatus	To read the current running progress status and its PT number : The command position value, the actual position value, the speed value will return.
FAS_GetAllStatus	To read all status including the current status at one time : This function is to combine ‘FAS_GetIOAxisStatus’ function and ‘FAS_GetMotionStatus’ function.
FAS_GetAxisStatus	To read the running status Flag value of the relevant drive

FAS_GetIOAxisStatus

To read I/O Input, Output values of the relevant board, and the motor Axis Status

Syntax

```
int FAS_GetIOAxisStatus(
      int iBdID,
      DWORD* dwInStatus,
      DWORD* dwOutStatus,
      DWORD* dwAxisStatus
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

dwInStatus

Parameter pointer which I/O Input values will be saved.

dwOutStatus

Parameter pointer which I/O Output values will be saved.

dwAxisStatus

Parameter pointer which the Axis Status value of the relevant motor will be saved.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

Refer to FAS_MoveSingleAxisAbsPos library.

See Also

FAS_GetMotionStatus

To read the Motion Status of current motor at one time

Syntax

```
int FAS_GetMotionStatus(
        int iBdID,
        long* lCmdPos,
        long* lActPos,
        long* lPosErr,
        long* lActVel,
        WORD* wPosItemNo
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lCmdPos

Parameter pointer which the Command Position value will be saved.

lActPos

Parameter pointer which the Actual Position value will be saved.

lPosErr

Parameter pointer which the Position Error value will be saved.

lActVel

Parameter pointer which the Actual Velocity value will be saved.

wPosItemNo

Parameter pointer which current running item number in the position table will be saved.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

Refer to FAS_MoveSingleAxisAbsPos library.

See Also

FAS_GetAllStatus

To read I/O Input and Output values of the relevant board, the motor Axis Status, the motor motion status

Syntax

```
int FAS_GetAllStatus(
        int iBdID,
        DWORD* dwInStatus,
        DWORD* dwOutStatus,
        DWORD* dwAxisStatus,
        long* lCmdPos,
        long* lActPos,
        long* lPosErr,
        long* lActVel,
        WORD* wPosItemNo
);
```

Parameters

iBdID

The ID number of the board. IBdID set by FAS_Connect function.

dwInStatus

Parameter pointer which I/O input values will be saved.

dwOutStatus

Parameter pointer which the I/O output value will be saved.

dwAxisStatus

Parameter pointer which the axix status value of the relevant motor will be saved.

lCmdPos

Parameter pointer which the command position value will be saved.

lActPos

Parameter pointer which the actual position value will be saved.

lPosErr

Parameter pointer which the position error value will be saved.

lActVel

Parameter pointer which the actual velocity value will be saved.

wPosItemNo

Parameter pointer which current running item number in the Position Table will be saved.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

Refer to FAS_MoveSingleAxisAbsPos library.

See Also

FAS_GetAxisStatus
FAS_GetMotionStatus

FAS_GetAxisStatus

To read the Axis Status value of the motor. For Status Flag value, refer to '1-2. Structure of Frame Type'.

Syntax

```
int FAS_GetAxisStatus(
      int iBdID,
      DWORD* dwAxisStatus
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

dwAxisStatus

Parameter pointer which the Axis Status value of the relevant motor will be saved.

Return Value

FMM_OK : Command has been normally performed.
FMM_NOT_OPEN : The board has not been connected yet.
FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

Refer to FAS_MoveSingleAxisAbsPos library.

See Also

2 - 9 . Operation Control Function

Function Name	Description
FAS_MoveStop	The motor in running is decelerate and stopped.
FAS_EmergencyStop	The motor in running stops directly without deceleration.
FAS_MoveOriginSingleAxis	The motor starts the origin return.
FAS_MoveSingleAxisAbsPos	The motor moves as much as the given absolute position value.
FAS_MoveSingleAxisIncPos	The motor moves as much as the given incremental position value.
FAS_MoveToLimit	The motor moves up to the position that the Limit sensor is detected.
FAS_MoveVelocity	The motor moves to the given velocity and direction. : This function is available to Jog motion and more.
FAS_PositionAbsOverride	While the motor is running, the targe absolute position value[pause] is changed.
FAS_PositionIncOverride	While th motor is running, the targe incremental position value[pause] is changed.
FAS_VelocityOverride	While the motor is running, the running velocity value[pps] is changed.
FAS_MoveLinearAbsPos	Linear Interpolation operation is executed as much as absolute value given to two or more drives.
FAS_MoveLinearIncPos	Linear Interpolation operation is executed as much as incremental value given to two or more drives.
FAS_MoveLinearAbsPos2[*1]	Improved version of **FAS_MoveLinearAbsPos.** Acceleration and Deceleration were improved.
FAS_ MoveLinearIncPos2[*1]	Improved version of **FAS_MoveLinearIncPos.** Acceleration and Deceleration were improved.
FAS_MoveSingleAxisAbsPosEx	The motor moves as much as the given absolute position value. It is possible to set the acceleration and deceleration times.
FAS_MoveSingleAxisIncPosEx	The motor moves as much as the given incremental position value. It is possible to set the acceleration and deceleration times.
FAS_MoveVelocityEx	The motor moves to the given velocity and directions. : This function is available to Jog motion and more. It is possible to set the acceleration and deceleration times.
FAS_MovePause	In the running state, the operation is paused and the operation resumed in the paused state.

[*1] These functions are available from Firmware [ver.6.1.xx.18] or higher version.

FAS_MoveStop

To stop the motor

Syntax

```
int FAS_MoveStop(
      int iBdID,
      );
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

Refer to FAS_MoveSingleAxisAbsPos library.

See Also

FAS_EmergencyStop

To stop the motor without deceleration

Syntax

```
int FAS_EmergencyStop(
      int iBdID,
      );
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

This function does not include deceleration phase. So, the user must be careful so that the machine cannot be impacted.

Example

Refer to FAS_MoveSingleAxisAbsPos library.

See Also

FAS_MoveOriginSingleAxis

To search the origin of system

For more information, refer to 'User Manual-Text 9-3 Origin Return'.

Syntax

```
int FAS_MoveOriginSingleAxis(
      int iBdID,
      );
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

Refer to FAS_MoveSingleAxisAbsPos library.

See Also

FAS_MoveSingleAxisAbsPos

To move the motor to the absolute coordinate

Syntax

```
int FAS_MoveSingleAxisAbsPos(
      int iBdID,
      long lAbsPos,
      DWORD lVelocity,
      );
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lAbsPos

Absolute coordinate of position to move.

lVelocity

Velocity when the motor moves.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcMove()
{

        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0;       //   A unique board number
        DWORD dwAxisStatus, dwInput;
        EZISERVO_AXISSTATUS stAxisStatus;
        long lAbsPos, lIncPos, lVelocity;
        int nRtn;

        // Try to connect
        if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
```

```
    {
        // Connection fail

        return;
    }

    // Check Error and Servo On status.
    nRtn = FAS_GetAxisStatus(iBdID, &dwAxisStatus);
    _ASSERT(nRtn == FMM_OK);
    stAxisStatus.dwValue = dwAxisStatus;

    //if (dwAxisStatus & 0x00000001)
    if (stAxisStatus.FFLAG_ERRORALL)
        FAS_ServoAlarmReset(iBdID);
    //if ((dwAxisStatus & 0x00100000) == 0x00)
    if (stAxisStatus.FFLAG_SERVOON == 0)
        FAS_ServoEnable(iBdID, TRUE);

    // Check Input status.
    nRtn = FAS_GetIOInput(iBdID, &dwInput);
    _ASSERT(nRtn == FMM_OK);

    if (dwInput & (SERVO_IN_LOGIC_STOP | SERVO_IN_LOGIC_PAUSE |
SERVO_IN_LOGIC_ESTOP))
        FAS_SetIOInput(iBdID, 0, SERVO_IN_LOGIC_STOP | SERVO_IN_LOGIC_PAUSE |
SERVO_IN_LOGIC_ESTOP);

    // Increase 15000 pulse to the motor.
    lIncPos = 15000;
    lVelocity = 30000;
    nRtn = FAS_MoveSingleAxisIncPos(iBdID, lIncPos, lVelocity);
    _ASSERT(nRtn == FMM_OK);

    // Stand by until motion command is completely finished.
    do
    {
        Sleep(1);

        nRtn = FAS_GetAxisStatus(iBdID, &dwAxisStatus);
        _ASSERT(nRtn == FMM_OK);
        stAxisStatus.dwValue = dwAxisStatus;
    }
    while (stAxisStatus.FFLAG_MOTIONING);

    // Move the motor to '0'.
```

```
		lAbsPos = 0;
		lVelocity = 20000;
		nRtn = FAS_MoveSingleAxisAbsPos(iBdID, lAbsPos, lVelocity);
		_ASSERT(nRtn == FMM_OK);

		// Stand by until motion commnad is completely finished.
		do
		{
			Sleep(1);
			nRtn = FAS_GetAxisStatus(iBdID, &dwAxisStatus);
			_ASSERT(nRtn == FMM_OK);
			stAxisStatus.dwValue = dwAxisStatus;
		}
		while (stAxisStatus.FFLAG_MOTIONING);

		// Connection close
		FAS_Close(iBdID);
	}
```

See Also

FAS_MoveSingleAxisIncPos

To move the motor to the incremental coordinate value

Syntax

```
int FAS_MoveSingleAxisIncPos(
      int iBdID,
      long lIncPos,
      DWORD lVelocity
      );
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lIncPos

Incremental coordinate of position to move.

lVelocity

Velocity when the motor moves.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

Refer to FAS_MoveSingleAxisAbsPos library.

See Also

FAS_MoveToLimit

To give a command to motor to search the Limit sensor

Syntax

```
int FAS_MoveToLimit(
    int iBdID,
    DWORD lVelocity,
    int iLimitDir,
    );
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lVelocity

Velocity when the motor moves.

iLimitDir

Limit direction which the motor moves.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

Refer to FAS_MoveSingleAxisAbsPos library.

See Also

FAS_MoveVelocity

To move the motor to the relevant direction and velocity.

This function is also available for Jog motion.

Syntax

```
int FAS_MoveVelocity(
      int iBdID,
      DWORD lVelocity,
      int iVelDir
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lVelocity

Velocity when the motor moves.

iVelDir

Direction which the motor moves.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

Refer to FAS_MoveSingleAxisAbsPos library.

See Also

FAS_PositionAbsOverride

To change the absolute position value set while the absolute position move

Syntax

```
int FAS_PositionAbsOverride(
    int iBdID,
    long lOverridePos
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lOverridePos

Absolute coordinate position value to be changed.

Return Value

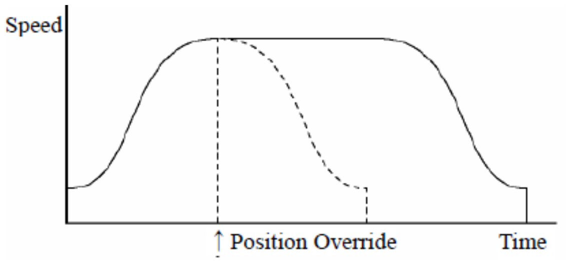
FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

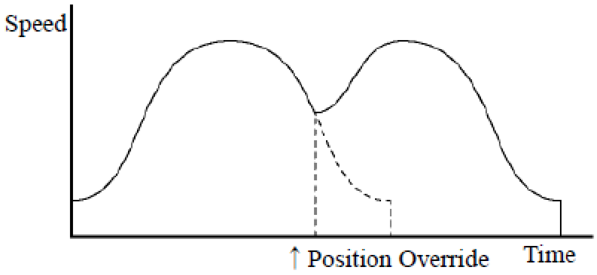
FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

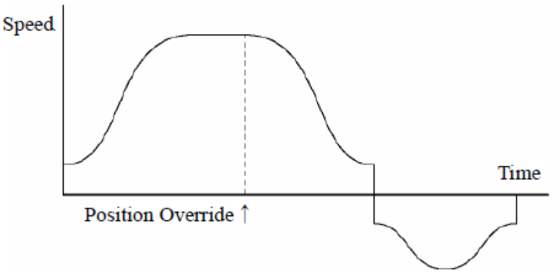
1) If the target position is set to the farther coordinate than the original target position while the motor moves to the accelerated or uniform velocity, the motor moves as the velocity pattern and stops at the target position.



2) If the target position is changed while the motor is decelerated, it is again accelerated up to the uniform velocity and then stops at the target position.



3) If the changed target position is set to the closer coordinate than the original target position, the motor moves to the changed target position and then stops.



4) Can not be used concurrently with the FAS_PositionAbsOverride library.
It can not be used concurrently with the FAS_VelocityOverride library.

Example

Refer to FAS_MoveSingleAxisAbsPos library.

See Also

FAS_PositionIncOverride

FAS_PositionIncOverride

To change the incremental position value set while the incremental position move

Syntax

```
int FAS_PositionIncOverride(
      int iBdID,
      long lOverridePos
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lOverridePos

Incremental coordinate position value to be changed.

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

1) Refer to FAS_PositionAbsOverride library.
2) Can not be used simultaneously with the FAS_PositionIncOverride library.
   It can not be used concurrently with the FAS_VelocityOverride library.

Example

Refer to FAS_MoveSingleAxisAbsPos library.

See Also

FAS_PositionAbsOverride

FAS_VelocityOverride

To change the velocity set while the motor moves

Syntax

```
int FAS_VelocityOverride(
    int iBdID,
    DWORD lVelocity
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lVelocity

Velocity to be changed

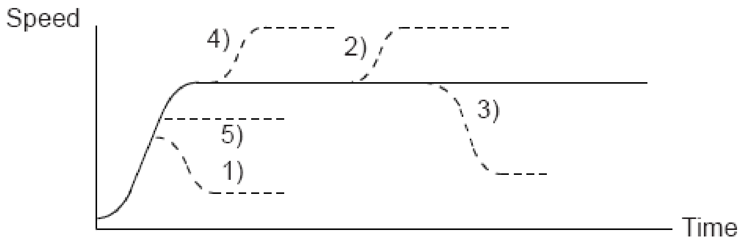
Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks



1) In case of ((change speed) < (speed before change)), the motor reaches the change speed through acceleration/deceleration using a new velocity pattern.
5) In case of ((change speed) ≥ (speed before change)), the motor reaches the change speed through acceleration/deceleration without any velocity pattern.
4) The motor reaches the 'speed before change' without a change of the velocity pattern and then it reaches the 'change speed' by a new velocity pattern.
2), 3) After acceleration/deceleration is finished, the motor reaches the change speed corresponding to the velocity pattern of the 'change speed'.

- Check the speed range that can be changed according to the Command speed(Move command speed at standstill) and use the function.
  Please refer to the table below.

Command Speed [pps]	Speed range [pps]	
	Min	Max
1~983	1	4914
984~1638	1	8191
1639~3276	1	16383
3277~6553	2	32766
6554~16384	5	81915
16385~32768	10	163830
32769~65536	20	327660
65537~163840	50	819150
163841~327680	100	1638300
327681~655360	200	3276600

If you set the parameter to a value outside the speed change range, it will be changed to the minimum or maximum speed within the range.

- Can not be used concurrently with the FAS_PositionIncOverride library.
- Can not be used concurrently with the FAS_PositionAbsOverride library.

Example

Refer to FAS_MoveSingleAxisAbsPos library.

See Also

FAS_MoveLinearAbsPos

To move the motor to the absolute coordinate

(It is possible to set the acceleration and deceleration times.)

Syntax

```
int FAS_MoveLinearAbsPos(
      BYTE nNoOfBds,
      int* iBdID,
      long* lplAbsPos,
      DWORD lFeedreat,
      DWORD wAcceltime
);
```

Parameters

nNoOfBds

Number of drives to execute Linear Motion

iBdID

ID array of the drives

lplAbsPos

Arrangement of Move Location of the drives

lFeedrate

Linear velocity value when moving

wAcceltime

Time value of acceleration / deceleration section during movement

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

FAS_ MoveLinearIncPos

To move the motor to the incremental coordinate

(It is possible to set the acceleration and deceleration times.)

Syntax

```
int FAS_MoveLinearIncPos(
      BYTE nNoOfBds,
      int* iBdID,
      long* lplIncPos,
      DWORD lFeedreat,
      DWORD wAcceltime
);
```

Parameters

nNoOfBds

Number of drives to execute Linear Motion

iBdID

ID array of the drives

lplIncPos

Arrangement of Move Location of the drives

lFeedrate

Linear velocity value when moving

wAcceltime

Time value of acceleration / deceleration section during movement

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

FAS_MoveLinearAbsPos2

Improved version of FAS_MoveLinearAbsPos.

Acceleration and Deceleration were improved.

Syntax

```
int FAS_MoveLinearAbsPos2(
      BYTE nNoOfBds,
      int* iBdID,
      long* lplAbsPos,
      DWORD lFeedreat,
      DWORD wAcceltime
);
```

Parameters

nNoOfBds

Number of drives to execute linear motion

iBdID

ID array of Drives

lplAbsPos

Movement position's arrangement of Drives

lFeedrate

Linear velocity value during movement

wAcceltime

Time value of acceleration / deceleration section during movement

Return Value

FMM_OK : The command ran successfully.

FMM_NOT_OPEN : The drive it not connected yet.

FMM_INVALID_SLAVE_NUM : The drive of corresponding iBdID does not exist.

Remarks

FAS_ MoveLinearIncPos2

Improved version of FAS_MoveLinearIncPos.

Acceleration and Deceleration were improved.

Syntax

```
int FAS_MoveLinearIncPos2(
      BYTE nNoOfBds,
      int* iBdID,
      long* lplIncPos,
      DWORD lFeedreat,
      DWORD wAcceltime
);
```

Parameters

nNoOfBds

Number of drives to execute linear motion

iBdID

ID array of Drives

lplAbsPos

Movement position’s arrangement of Drives

lFeedrate

Linear velocity value during movement

wAcceltime

Time value of acceleration / deceleration section during movement

Return Value

FMM_OK : The command ran successfully.

FMM_NOT_OPEN : The drive it not connected yet.

FMM_INVALID_SLAVE_NUM : The drive of corresponding iBdID does not exist.

Remarks

FAS_MoveSingleAxisAbsPosEx

To move the motor to the absolute coordinate

(It is possible to set the acceleration and deceleration times.)

Syntax

```
int FAS_MoveSingleAxisAbsPosEx(
      int iBdID,
      long lAbsPos,
      DWORD lVelocity,
      MOTION_OPTION_EX* lpExOption
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lAbsPos

Absolute coordinate of position to move

lVelocity

Velocity when the motor moves

lpExOption

Custom option

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Refer to MOTION_OPTION_EX struct.

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcMoveEx()
{

        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0;          // A unique board number
        DWORD dwAxisStatus, dwInput;
        EZISERVO_AXISSTATUS stAxisStatus;
        long lAbsPos, lIncPos, lVelocity;
        MOTION_OPTION_EX opt = {0};
```

```
int nRtn;

// Try to connect
if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
{
        // Connection fail

        return;
}

// Move the motor with a certain acceleration and deceleration time.
  : FAS_MoveSingleAxisIncPosEx
lIncPos = 15000;
lVelocity = 30000;

opt.flagOption.BIT_USE_CUSTOMACCEL = 1;
opt.flagOption.BIT_USE_CUSTOMDECEL = 1;

opt.wCustomAccelTime = 50;
opt.wCustomDecelTime = 200;

nRtn = FAS_MoveSingleAxisIncPosEx(iBdID, lIncPos, lVelocity, &opt);
_ASSERT(nRtn == FMM_OK);

// Waiting until motion command is done.
do
{
        Sleep(1);

        nRtn = FAS_GetAxisStatus(iBdID, &dwAxisStatus);
        _ASSERT(nRtn == FMM_OK);
        stAxisStatus.dwValue = dwAxisStatus;
}
while (stAxisStatus.FFLAG_MOTIONING);

// Move the motor to position 0.
lAbsPos = 0;
lVelocity = 20000;
nRtn = FAS_MoveSingleAxisAbsPos(iBdID, lAbsPos, lVelocity);
_ASSERT(nRtn == FMM_OK);

// Waiting until motion command is done.
do
{
        Sleep(1);
```

```
				nRtn = FAS_GetAxisStatus(iBdID, &dwAxisStatus);
				_ASSERT(nRtn == FMM_OK);
				stAxisStatus.dwValue = dwAxisStatus;
			}
			while (stAxisStatus.FFLAG_MOTIONING);

			// Connection close
			FAS_Close(iBdID);
	}
```

See Also

FAS_MoveSingleAxisIncPosEx

To move the motor to the incremental coordinate

(It is possible to set the acceleration and deceleration times.)

Syntax

```
int FAS_MoveSingleAxisIncPosEx(
      int iBdID,
      long lIncPos,
      DWORD lVelocity,
      MOTION_OPTION_EX* lpExOption
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lIncPos

Incremental coordinatae of position to move

lVelocity

Velocity when the motor moves

lpExOption

Custom option

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

See Also

FAS_MoveVelocityEx

To move the motor to the relevant direction and velocity.

This function is also available for Jog motion.

Syntax

```
int FAS_ MoveVelocityEx (
      int iBdID,
      DWORD lVelocity,
      int iVelDir,
      VELOCITY_OPTION_EX* lpExOption
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

lVelocity

Velocity when the motor moves

iVelDir

Direction which the motor moves (0: -Jog, 1: +Jog)

lpExOption

Custom option

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Refer to VELOCITY_OPTION_EX struct.

Example

```
#include "FAS_ EziMOTIONPlusE.h"

void funcMoveVelocityEx()
{

        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0;          // A unique board number
        long lVelocity;
        VELOCITY_OPTION_EX opt = {0};
        int nRtn;

        // Try to connect
```

```
    if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
    {
        // Connection fail

        return;
    }

    // Move the motor with a certain acceleration and deceleration time.
          : FAS_MoveSingleAxisIncPosEx
    lVelocity = 30000;

    opt.flagOption.BIT_USE_CUSTOMACCDEC = 1;
    opt.wCustomAccDecTime = 300;

    nRtn = FAS_MoveVelocityEx(iBdID, lVelocity, DIR_INC, &opt);
    _ASSERT(nRtn == FMM_OK);

    Sleep(5000);
    FAS_MoveStop(iBdID);
}
```

See Also

2-10. Position Table Control Function

Function Name	Description
FAS_PosTableReadItem	To read item values of RAM area of the specific position table
FAS_PosTableWriteItem	To save item values of the specific position table to RAM area
FAS_PosTableWriteROM	To save all of position table values to ROM area : Total 256 PT values are saved.
FAS_PosTableReadROM	To read all of position table values of ROM area : Total 256 PT values are read.
FAS_PosTableRunItem	The motor starts to run from the designated position table in sequence.
FAS_PosTableReadOneItem	Reads the RAM area value of a specific item in a specific position table.
FAS_PosTableWriteOneItem	Saves the RAM area value of a specific item in a specific position table.

FAS_PosTableReadItem

To read a specific item in the position table

Syntax

```
int FAS_PosTableReadItem(
      int iBdID,
      WORD wItemNo,
      LPITEM_NODE lpItem
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function

wItemNo

Item number to be read

lpItem

Item structure pointer which item value is saved

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

FMM_INVALID_PARAMETER_NUM : wItemNo is out of range.

Remarks

Example

```
#include "FAS_EziMOTIONPlusE.h"

void funcPosTable()
{

        BYTE sb1 = 192, sb2 = 168, sb3=0, sb4=2 // IP :192.168.0.2
        int iBdID = 0;          //   A unique board number
        WORD wItemNo;
        ITEM_NODE nodeItem;
        int nRtn;

        // Try to connect
        if (FAS_Connect(sb1, sb2, sb3, sb4, iBdID) == FALSE)
        {
                // Connection fail

                return;
        }

        // Read No.20 position table value and edit the position value.
        wItemNo = 20;
        nRtn = FAS_PosTableReadItem(iBdID, wItemNo, &nodeItem);
        _ASSERT(nRtn == FMM_OK);

        nodeItem.lPosition = 260000;  // Change the position value to 260000.
        nodeItem.wBranch = 23;                 // Set next command to No.23.
        nodeItem.wContinuous = 1;              // Next command should be connected
                                                // without deceleration.

        nRtn = FAS_PosTableWriteItem(iBdID, wItemNo, &nodeItem);
        _ASSERT(nRtn == FMM_OK);

        // Call the value to the ROM regardless of edited position table data.
        nRtn = FAS_PosTableReadROM(iBdID);
        _ASSERT(nRtn == FMM_OK);

        // Save edited position table data in the ROM.
        nRtn = FAS_PosTableWriteROM(iBdID);
        _ASSERT(nRtn == FMM_OK);

        // Disconnect
        FAS_Close(iBdID);
}
```

See Also

FAS_PosTableWriteItem

FAS_PosTableWriteItem

To edit specific items in the position table

Syntax

```
int FAS_PoslableWriteItem(
      int iBdID,
      WORD wItemNo,
      LPITEM_NODE lpItem
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function

wItemNo

Item number to be edited

lpItem

Item structure pointer to be edited

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

FMM_INVALID_PARAMETER_NUM : wItemNo is out of range.

FMC_POSTABLE_ERROR : An error occurs while position table is being written.

Remarks

Position table data is saved to RAM / ROM area.

This function acts to save data to RAM area. When power is OFF, data is deleted.

Example

See Also

FAS_PosTableWriteROM

To save all current position table items in ROM area

Syntax

```
int FAS_PosTableWriteROM(
    int iBdID
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

FMC_POSTABLE_ERROR : An error occurs while position table is being written.

Remarks

Position table data is saved to RAM / ROM area.

This function acts to save data to ROM area. Even though power is OFF, data is preserved.

Example

See Also

FAS_PosTableReadROM

FAS_PosTableReadROM

To read position table items being saved in ROM area

Syntax

```
int FAS_PosTableReadROM(
      int iBdID
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

FMC_POSTABLE_ERROR : An error occurs while position table is being read.

Remarks

Example

See Also

FAS_PosTableWriteROM

FAS_PosTableRunItem

To perform command from a specific item in the position table

Syntax

```
int FAS_PosTableRunItem(
      int iBdID,
      WORD wItemNo
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function

wItemNo

Item number to start motion

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

FMM_INVALID_PARAMETER_NUM : wItemNo is out of range.

Remarks

Example

See Also

FAS_GetAllStatus

FAS_MoveStop

FAS_EmergencyStop

FAS_PosTableReadOneItem

To read the value of a specific item in the Position Table

Syntax

```
int FAS_PosTableReadOneItem(
      int iBdID,
      WORD wItemNo,
      WORD wOffset,
      long* lPosItemVal
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function

wItemNo

Item number to be read

wOffset

OFFSET value which will be read in PT items. (Refer to '1-2-6. Position Table Item')

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

FMM_INVALID_PARAMETER_NUM : wItemNo is out of range.

Remarks

Example

See Also

FAS_PosTableReadItem

FAS_PosTableWriteOneItem

FAS_PosTableWriteOneItem

To edit the value of a specific item in the Position Table

Syntax

```
    int FAS_PoslableWriteOneItem(
    int iBdID,
    WORD wItemNo,
    WORD wOffset,
    long lPosItemVal
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function

wItemNo

Item number to be edited

wOffset

OFFSET value which will be read in PT items (Refer to '1-2-6. Position Table Item')

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

FMC_POSTABLE_ERROR : An error occurs while position table is being written.

FMM_INVALID_PARAMETER_NUM : wItemNo is out of range.

Remarks

Example

See Also

FAS_PosTableWriteItem

FAS_PosTableReadOneItem

2-11. Other Control Function

Function Name	Description
FAS_TriggerOutput_RunA	Function to generate an output signal at a specific location
FAS_TriggerOutput_Status	Function to check whether output signal(COMP) is generated
FAS_MovePush	Function to move from a specific position holding the power
FAS_GetPushStatus	Function to check the current push motion status

FAS_TriggerOutput_RunA

To start/stop the digital output signal (COMP pin) at a specific position during operation by position command.

Syntax

```
        int FAS_TriggerOutput_RunA(
        int iBdID,
        BOOL bStartTrigger,
        long lStartPos,
        DWORD dwPeriod,
        DWORD dwPulseTime,
    );
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

bStartTrigger

Output start/stop command (1:start, 0:stop)

long lStartPos

Output start position [pulse]

DWORD dwPeriod

Period of output signal [pulse]

DWORD dwPulseTime

Width of output signal [msec]

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

See Also

FAS_TriggerOutput_Status

FAS_ TriggerOutput_Status

To check if the signal output function is working or not

Syntax

```
      int FAS_TrggerOutput_Status(
      int iBdID,
      BYTE* bTriggerStatus
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

bTriggerStatus

Current status of signal output

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

See Also

FAS_ TriggerOutput_RunA

FAS_MovePush

It moves while maintaining a fixed force from a specific position during movement by position command, and stops moving when it touches work during movement, but keeps the force.

Syntax

```
int FAS_MovePush(
int iBdID,
DWORD dwStartSpd,
DWORD dwMoveSpd,
long lPosition,
WORD wAccel,   WORD wDecel,
WORD wPushRate,
DWORD dwPushSpd,
long lEndPosition,
WORD wPushMode
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

DWORD dwStartSpd

Start speed of position command

DWORD dwMoveSpd

Operation speed of position command

long lPosition

Target absolute position value of position command

WORD wAccel

Acceleration time of position command

WORD wDecel

Decelereation time of position command

WORD wPushRate

Push rate during Push operaiton

DWORD dwPushSpd

Operation speed during Push operation

long lEndPosition

Target absolute position value during Push operation

WORD wPushMode

Set the mode during Push operation

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

See Also

FAS_GetPushStatus

FAS_GetPushStatus

To check the progress of the curren push motion

Syntax

```
int FAS_MovePush(
int iBdID,
BYTE* nPushStatus
);
```

Parameters

iBdID

The ID number of the board. iBdID set by FAS_Connect function.

BYTE nPushStatus*

Push motion status value to be read.

(Refer to '1-2-1. Frame Type Data Configuration'.)

Return Value

FMM_OK : Command has been normally performed.

FMM_NOT_OPEN : The board has not been connected yet.

FMM_INVALID_SLAVE_NUM : The board of the corresponding iBdID does not exist.

Remarks

Example

See Also

FAS_Move Push

3. Appendix

– Network information setting using DHCP

3 - 1 . DHCP Function

1) DHCP(Dynamic Host Configuration Protocol) ?

→ Standard network protocol used to dynamically configure network information for performing TCP / IP communication, such as IP address.
(Network information : Gateway, Subnet, IP address)

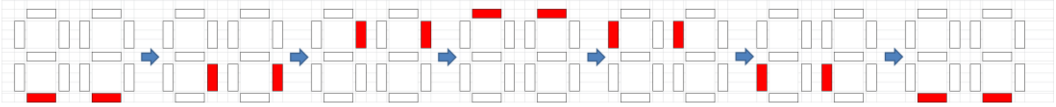
2) When not using DHCP

→ If do not use a Gateway, Subnet, IP address set as drive standard, change and save setting using GUI and need to know current network information.

→ When using DHCP, Gateway, Subnet, IP address are automatically set in product. It is necessary to save network information which is automatically set using GUI.

3 - 2 . Network setting using DHCP (Plus-E series)

1) Set IP setting switch (SW1, SW2) as F,F.
2) Connect Ehternet at Ethernet IN Connector
3) Power ON
4) 7-segment flashes as below



5) When the network information is set, the IP address is displayed on the 7-segment
(After displaying aaa.bbb.ccc.ddd, displaying Hex.value corresponding to ddd)
6) Power OFF after accessing GUI and saving network information
(Using Config Slave ID / IP Address)
7) Do not overlap the value of IP setting switch(SW1, SW2) with Gateway at 1~254
8) Power ON(Setting finished)

● DHCP automatically configures network information, so every time applying power, IP address – ddd in aaa.bbb.ccc.ddd can be changed. Therefore, after setting Network information by DHCP method, 6) must be performed.

● **Network information can be set using DHCP only when using a PC or a router with a DHCP server function.**

Fast, Accurate, Smooth Motion

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