

**TOSVERT VF-S15**

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**PROFINET Option Function Manual**

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**PNE001Z**

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**NOTICE**

1. Read this manual before installing or operating. Keep this manual on hand of the end user, and make use of this manual in maintenance and inspection.
2. All information contained in this manual will be changed without notice. Please contact your Toshiba distributor to confirm the latest information.

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## Introduction

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Thank you for purchasing the PROFINET option “PNE001Z” for the VF-S15 (CPU1 version 112 or later). Before using the PROFINET option, please familiarize yourself with the product and be sure to thoroughly read the instructions and precautions contained in this manual.

In addition, please make sure that this manual and “Precautions Manual” (E6582052) is delivered to the customer, and keep this function manual in a safe place for future reference or drive/interface inspection.

This manual describes the supported functions for the “PNE001Z”.

In conjunction with this manual, the following manuals are supplied by Toshiba, and they are essential both for ensuring a safe, reliable system installation as well as for realizing the full potential of the “PNE001Z”:

- TOSVERT VF-S15 Instruction Manual ..... E6581611
- TOSVERT VF-S15 communication option Precautions Manual ..... E6582052

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Modbus is a registered trademark of Schneider Automation.

Other product names may be trademarks or registered trademarks of their respective owners.

## Safety precautions

On the drive and in its instruction manual, important information is contained for preventing injuries to users and damages to assets and for proper use of the device. Read the instruction manual attached to VF-S15 along with this instruction manual for completely understanding the safety precautions and adhere to the contents of these manuals.




### Explanation of markings

Marking	Meaning of marking
 Warning	Indicates that errors in operation may lead to death or serious injury.
 Caution	Indicates that errors in operation may lead to injury (*1) to people or that these errors may cause damage to physical property. (*2)





(\*1) Such things as injury, burns or shock that will not require hospitalization or long periods of outpatient treatment.

(\*2) Physical property damage refers to wide-ranging damage to assets and materials.




### Meanings of symbols

Marking	Meaning of marking
	Indicates prohibition (Don't do it). What is prohibited will be described in or near the symbol in either text or picture form.
	Indicates something mandatory (must be done). What is mandatory will be described in or near the symbol in either text or picture form.
	Indicates warning. What is warned will be described in or near the symbol in either text or picture form. Indicates caution. What the caution should be applied to will be described in or near the symbol in either text or picture form.



■ General Operation

 <b>Warning</b>	
 Disassembly prohibited	<ul style="list-style-type: none"> <li>▼ Never disassemble, modify or repair. Doing so could result in electric shock, fire and injury. For repairs, call your sales agency.</li> </ul>
 Prohibited	<ul style="list-style-type: none"> <li>▼ Do not attach this option to any drive other than the VF- S15. Doing so could result in electric shock or fire.</li> <li>▼ When the drive is energized, never detach the this option from the VF- S15. Doing so could result in electric shock.</li> <li>▼ Don't place or insert any kind of object into the PNE001Z (electrical wire cuttings, rods, wires). Doing so could result in electric shock or fire.</li> <li>▼ Do not allow water or any other fluid to come in contact with the PNE001Z. Doing so could result in electric shock or fire.</li> </ul>
 Mandatory	<ul style="list-style-type: none"> <li>▼ Turn off the VF- S15 when installing and wiring this option.</li> <li>▼ If the drive begins to emit smoke or an unusual odor, or unusual sounds, immediately turn power off. If the equipment is continued in operation in such a state, the result may be fire. Call your local sales agency for repairs.</li> </ul>



■ Transportation & installation

 <b>Warning</b>	
 Prohibited	<ul style="list-style-type: none"> <li>▼ Do not operate the drive if it is damaged or any component is missing. Doing so could result in electric shock or fire. Call your local sales agency for repairs.</li> <li>▼ Do not place any inflammable substances near the VF- S15 drive. If an accident occurs in which flame is emitted, this could lead to fire.</li> <li>▼ Do not install in any location where the drive could come into contact with water or other fluids. Doing so could result in electric shock or fire.</li> <li>▼ When installing this option, be careful not to touch the leads from parts on the reverse side of its circuit board. Doing so could result in injury.</li> </ul>
 Mandatory	<ul style="list-style-type: none"> <li>▼ Operate under the environmental conditions prescribed in the instruction manual. Operations under any other conditions may result in malfunction.</li> </ul>




■ Wiring

 <b>Warning</b>	
 Mandatory	<ul style="list-style-type: none"> <li>▼ Shut off power when installing and wiring this option. Wait at least 15 minutes and check to make sure that the charge lamp (VF-S15) is no longer lit.</li> <li>▼ Electrical construction work must be done by a qualified expert. Installation or connection of input power by someone who does not have that expert knowledge may result in fire or electric shock.</li> </ul>



■ Operations

 <b>Warning</b>	
 Prohibited	<ul style="list-style-type: none"> <li>▼ Do not touch switches when the hands are wet and do not try to clean the drive with a damp cloth. Doing so could result in electric shock.</li> <li>▼ Do not pull on any cable itself. Doing so could result in damage or malfunction.</li> </ul>

■ Cautions for the communication

 <b>Warning</b>	
 Prohibited	<ul style="list-style-type: none"> <li>▼ Do not set the value that exceeds an effective range as data. The motor may suddenly restart or stop and that could result in injury.</li> </ul>
 Mandatory	<ul style="list-style-type: none"> <li>▼ Check PROFINET state (using below status word bit) when the option unit is deactivated by an unusual event such as an operating error, power outage, failure, etc. - ZSW Status Word Bit 3 (Fault), Bit 7 (Warning) (The communication error occurs when "1" as value or this value cannot be read.) Deactivated option unit may cause an accident, if the PROFINET state is not checked.</li> <li>▼ Make sure that the operation signals are STOP before clearing the drive's fault. The motor may suddenly start and that may result in injuries.</li> </ul>

■ Disposal

 <b>Caution</b>	
 Mandatory	<ul style="list-style-type: none"> <li>▼ For safety's sake, do not dispose of the disused drive yourself but ask an industrial waste disposal agent (*). If the collection, transport and disposal of industrial waste are done by someone who is not licensed for that job, it is a punishable violation of the law. (Laws in regard to cleaning and processing of waste materials) (* ) Persons who specialize in the processing of waste and known as "industrial waste product collectors and transporters" or "industrial waste disposal persons."</li> </ul>

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## Notes on use

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### Notes

- ▼ Do not install the drive where the temperature or the humidity will change rapidly.
- ▼ Keep a distance of 20cm or more between the drive 's power cable and the data transmission cable.  
Or the drive might malfunction because of noise.
- ▼ Insert a magnetic contactor or similar device between the drive and the power supply to ensure that power is turned off if an emergency stop command is entered through the network.



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## 1. Overview

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The PNE001Z is a dual port PROFINET fieldbus module that can be used in a PROFINET industrial fieldbus. The PNE001Z also offers an embedded Web server which offers comfortable monitoring and setup directly from a standard web browser.

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### 1.1. PROFINET

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The PNE001Z supports the cyclic command transmission and monitoring by the “PROFIdrive” profile and 3 vendor profile.

- Telegram1: PROFIdrive
- Telegram100: 4 PKW and 2 PDZ format.
- Telegram101: 4 PKW and 6 PDZ format.
- Telegram102: 6 PDZ format.

PNE001Z also supports The PROFIdrive parameters channel.

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### 1.2. Modbus TCP

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The PNE001Z supports the following Modbus services.

- 03 (0x03): Read Holding Registers
- 06 (0x06): Write Single Register
- 16 (0x10): Write Multiple Registers
- 43 (0x2B): Read Device Identification

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### 1.3. PROFINET and Ethernet Features

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The PNE001Z supports the following functions.

- Automatic IP address assignment via DHCP and DCP
- Support of MRP (Media Redundancy Protocol)
- Support of LLDP (Link Layer Discovery Protocol)
- Diagnostics and configuration via integrated Web server

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### 1.4. Web server

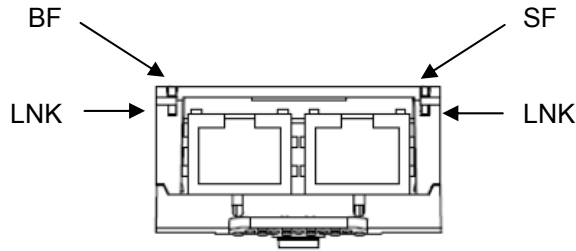
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The PNE001Z supports the following functions on Web server

- Drive monitor
- Drive parameters
- Network parameters
- Administration
- TCP/IP statistics
- Modbus statistics

**1.5. LED indicator**

The LED shows the present status of the network and module.



■The behavior of LNK LED

Link Activity	
Color and behavior	Meaning
OFF	No link
Green Blink	Network Activity at 100 Mbps
Green ON	Link established at 100 Mbps

■The behavior of BF LED

Module Status	
Color and behavior	Meaning
OFF	The device is powered off
Green/Red blinking	Power up testing
Green flashing	In combination with other LEDs : DCP manual identification phase / DCP flash mode
Green ON	The device is ready and operational
Red Single flash	No connection to the PROFINET Controller
Red flickering	The option has detected a communication error (E r r B)
Red ON	The option has detected a option module error (E - 2 3)

■The behavior of SF LED

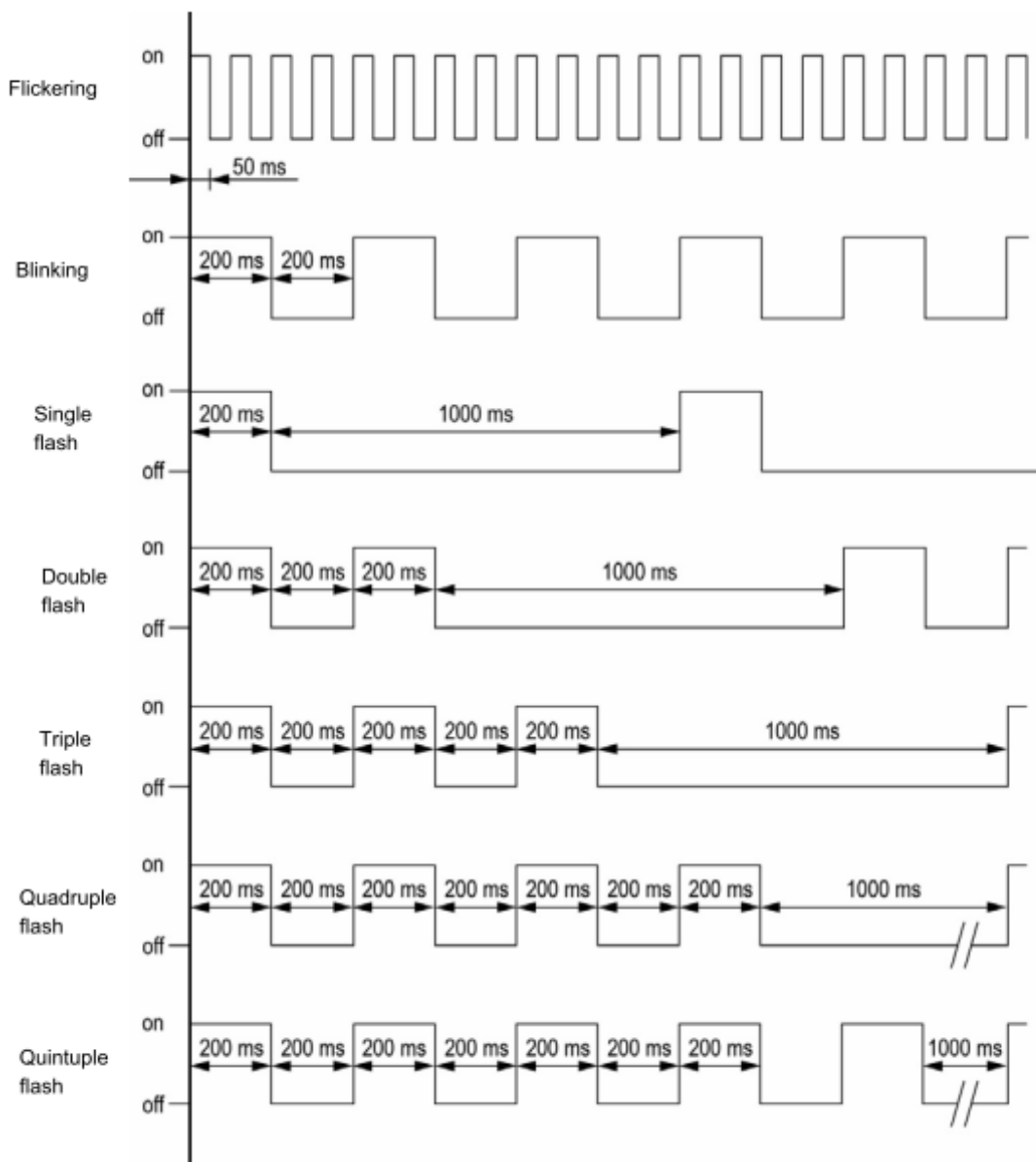
Network Status	
Color and behavior	Meaning
OFF	The option does not have IP address or powered off
Green/Red blinking	Power up testing
Green flickering	In combination with other LEDs: DCP manual identification phase / DCP flash mode
Green flashing 3 times	All ports are unplugged, but the card has an IP address
Green flashing 4 times	Error: duplicate IP address
Green flashing 5 times	The card is performing a DHCP sequence
Green ON	At least a port is connected and has a valid IP address.
Red ON	General error on the module

If the communication card operates as a Modbus TCP server only, LNK LEDs work as follows.

■The behavior of LNK LED for ModbusTCP

Link Activity	
Color and behavior	Meaning
OFF	No link
Green Blink	Network Activity at 100 Mbps
Green ON	Link established at 100 Mbps
Yellow Blink	Network Activity at 10 Mbps
Yellow ON	Link established at 10 Mbps

**LED Behavior Detail**



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## 1.6. Diagnostic (PROFINET Service)

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PROFINET Diagnostic alarms have to be used when the error occurs within the Device.

Diagnostic table

Byte	Name	Size	Value
1	User specific status information	1 byte	Length of the block
2		1 byte	Trip code
3		1 byte	Profile
4		1 byte	Drive version, LSB
5		1 byte	Drive version, MSB
6		1 byte	Software version
7		1 byte	Communication network fault
8		1 byte	Internal link fault

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## 1.7. GSDML file

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As for acquisition of a GSDML file for VF-S15, please contact your Toshiba distributor.

## 2. Hardware Setup

When using the PNE001Z with VF-S15, sold separately VF-S15 option adapter (SBP009Z) is required.

### 2.1. Mounting and removing

#### ⚠ Warning

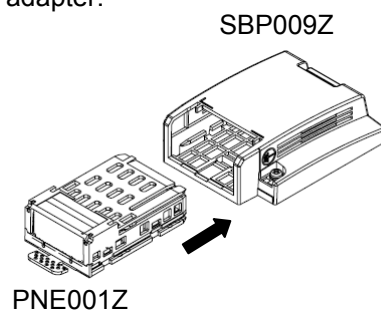


Mandatory  
action

- ▼ The mounting/removing of option must be performed without supplying power (Turn off all input power, wait at least 15 minutes, confirm that the charge lamp of inverter is no longer lit). The inverter and option can become damaged.
- ▼ Do not use tool for the mounting/removing of option. The inverter and option can become damaged.

#### 2.1.1. Mounting of option

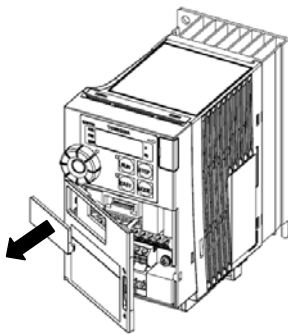
- ① Insert option into option adapter.



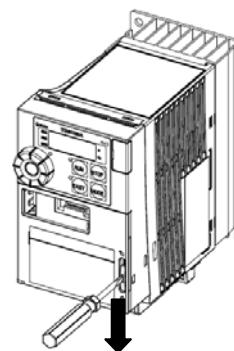
\*Note: Mount option adapter to inverter after option insertion.

Insert the option straightly and slowly along the guide inside option adapter. Follow this instruction, the connector can become damaged.

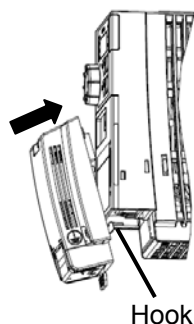
- ② Remove the option connector cover on control terminal cover.



- ③ Lock the control terminal cover.

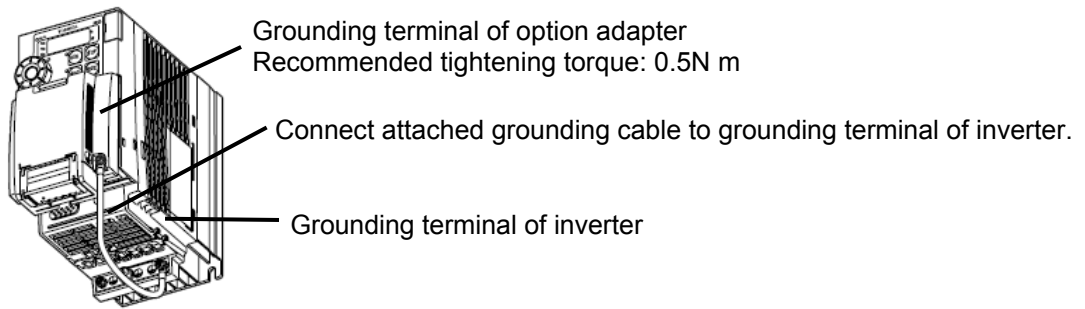


- ④ Hang the hook of option adapter on the control terminal cover. Insert the connector in the direction of arrow



2.1.2. Earth wire wiring

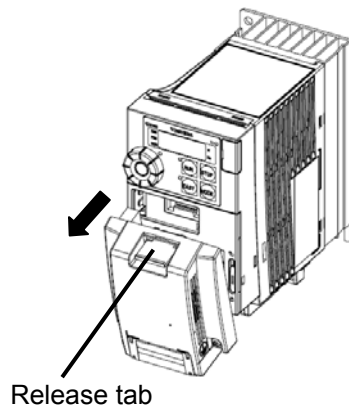
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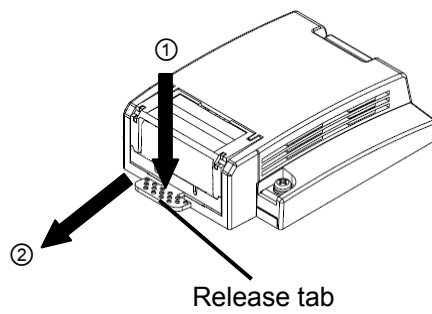
2.1.3. Removing of option

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- ① Remove the connector in the direction of arrow while pushing the release tab.



- ② Remove an option in the direction of arrow while pushing the release tab in the lower direction.



## 2.2. Wiring

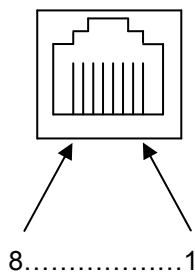
PNE001Z is equipped with dual shielded RJ45 connectors. When you use PNE001Z with VF-S15, the shielding of RJ45 connectors are connected to the grounding terminal of option adapter.

Cable specifications

- Minimum Cat 5e,
- Use equipotential bonding conductors,
- Connector RJ45, no crossover cable
- Shield: both ends grounded
- Twisted pair cable
- Maximum cable length = 100 m (328 ft)

The following table describes the pin layout of RJ45 connector.

Port L and Port R



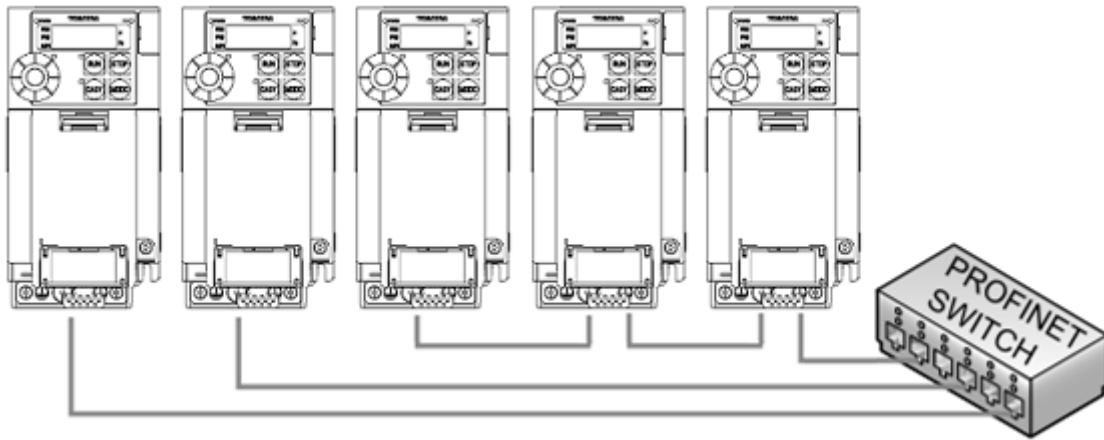
Pin	Signal
1	TD+
2	TD-
3	RD+
4	-
5	-
6	RD-
7	-
8	-

\* Fix a cable so that a communication connector may be not taken the weight of wire.

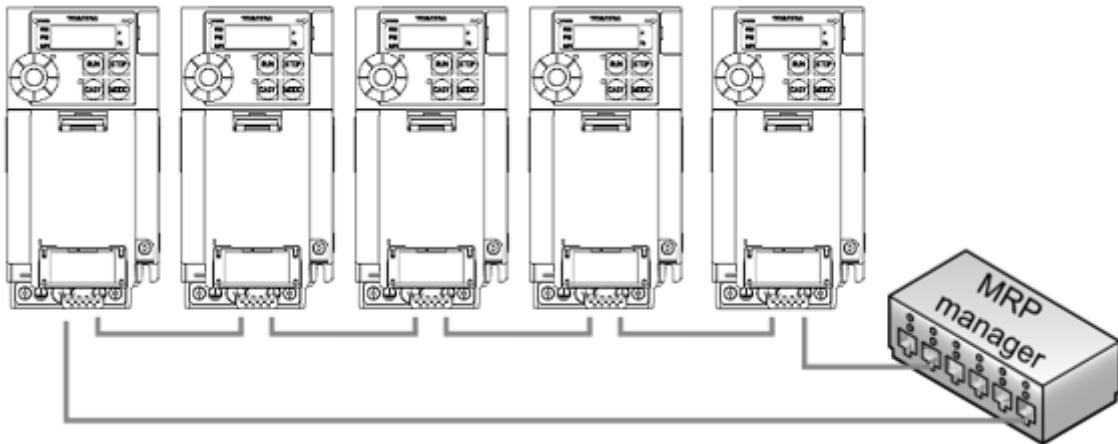
## 2.3. Installation Topology

The PNE001Z support several wiring solutions:

### Daisy Chain and/or Star topology



### Ring topology



Note: The ring topology can only be used with a Media Redundancy Protocol (MRP) capable managed switch.



## 3. Parameters

### 3.1. Communication parameters

This option doesn't operate if these parameters are not correctly set.

Title	Communication No.	Function	Description	Default setting
<i>C70d</i>	0003	Command mode selection	0: Terminal board 1: Panel keypad (including remote keypad) 2: RS485 communication 3: CANopen communication 4: Communication option	1
<i>F70d</i>	0004	Frequency setting mode selection 1	0: Setting dial 1 (save even if power is off) 1: Terminal board VIA 2: Terminal board VIB 3: Setting dial 2 (press in center to save) 4: RS485 communication 5: UP/DOWN from external logic input 6: CANopen communication 7: Communication option 8: Terminal board VIC 9, 10: - 11: Pulse train input 12, 13: - 14: <i>Sr0</i>	0
<i>F519</i>	0519	Setting of acceleration / deceleration time unit	0: - 1: 0.01s unit (after execution: 0) 2: 0.1s unit (after execution: 0)	0 (*3)
<i>F749</i>	0749	Integrating wattmeter display unit selection	0: 1=1kWh 1: 1=10kWh 2: 1=100kWh 3: 1=1000kWh 4: 1=10000kWh	(*1)
<i>F856</i>	0856	Number of motor pole pair for communication	1: 2 poles 2: 4 poles 3: 6 poles 4: 8 poles 5: 10 poles 6: 12 poles 7: 14 poles 8: 16 poles	2
<i>F899</i>	0899	Communication function reset	0: - 1: Reset (after execution: 0)	-
<i>C081-C096</i>	C081-C096	Device Name 1-16 (*2)	16 characters The device name is required if the card uses DHCP to obtain its IP Address.	0

(\*1): Default setting values vary depending on the capacity.

(\*2): (*LYP*) does not work for this parameter.

(\*3): 0.1s unit is selected as default setting.

Title	Communication No.	Function	Description	Default setting
<i>C100</i>	C100	Communication error detection delay time	0.0 - 100.0 sec. The waiting time of network error detection can be adjusted. If a network error continues past the time set in <i>C100</i> , it is recognized as a communication error, and inverter will operate according the setting of <i>C101</i> . If network error was removed during <i>C100</i> , inverter will continue normal operation.	0.0
<i>C101</i>	C101	Inverter operation at the communication loss action	0: Stop and controlled by <i>Cn0d, Fn0d</i> 1: Operation continue 2: Deceleration stop 3: Coast stop 4: Network error stop ( <i>Err-B</i> trip) 5: Preset speed operation (by <i>C102</i> setting)	4
<i>C102</i>	C102	Preset speed operation selection	0: None 1 to 15: Preset speed The operation frequency when the communication fault is occurred can be selected from preset speed. (Only when <i>C101</i> is set to 5)	0
<i>C103</i>	C103	Communication time-out condition selection	0: Disconnection detection 1: When communication mode enable (Both <i>Cn0d</i> and <i>Fn0d</i> are set CANopen or communication option) only 2: 1 + Driving operation	1
<i>C154</i>	C154	PROFIdrive JOG1 frequency	0.0 to 20.0Hz	5.0Hz
<i>C155</i>	C155	PROFIdrive JOG2 frequency	0.0 to 20.0Hz	5.0Hz
<i>C156</i>	C156	PROFIdrive Tmax	0.1 to 60.0s	10.0s
<i>C157</i>	C157	PROFIdrive Tolerance	0.1 to 99.0%	50.0%
<i>C504</i>	C504	IP mode (*1)	Use this parameter to select the IP address assignment method. 0: Manual 1:Invalid setting 2: DHCP 3: DCP	0
<i>C505 - C508</i>	C505- C508	IP address (*1)	The IP address of the option module. These fields are effective settings at <i>C504</i> = 0.	0.0.0.0
<i>C509 - C512</i>	C509- C512	Subnet Mask (*1)	The subnet mask of the option module. These fields are effective settings at <i>C504</i> = 0.	0.0.0.0
<i>C513 - C516</i>	C513- C516	Gateway address (*1)	The gateway IP address of the option module. These fields are effective settings at <i>C504</i> = 0.	0.0.0.0
<i>C554</i>	C554	Web service (*1)	Enables web server. 0: Disable 1: Enable	1

(\*1): These parameters are affected after reset.

3.2. Monitor parameters

The following parameters can be used for network status confirmation of the PNE001Z.

Title	Communication No.	Function	Description
C001	C001	Scanner input 1 address	0: - 1: F A 0 6 (Communication command 1) 2: F A 2 3 (Communication command 2) 3: F A 0 7 (Frequency command, 0.01Hz) 5: F A 5 0 (Terminal output data) 6: F A 5 1 (FM analog output) 8: F 6 0 1 (Stall prevention level, %) 13: A C C (Acceleration time 1, 0.1s) (*1) 14: d E C (Deceleration time 1, 0.1s) (*1) 15: U L (Upper limit, 0.01Hz) 16: u b (Torque boost value 1, 0.1%) 17: u L v (Base frequency voltage 1, 0.1V)
C002	C002	Scanner input 2 address	0-17 (Same as C001)
C003	C003	Scanner input 3 address	0-17 (Same as C001)
C004	C004	Scanner input 4 address	0-17 (Same as C001)
C005	C005	Scanner input 5 address	0-17 (Same as C001)
C006	C006	Scanner input 6 address	0-17 (Same as C001)
C021	C021	Scanner output 1 address	0: - 1: F d 0 1 (Status information 1) 2: F d 0 0 (Output frequency, 0.01Hz) 3: F d 0 3 (Output current, 0.01%) 4: F d 0 5 (Output voltage, 0.01%) 5: F C 9 1 (Alarm information) 6: F d 2 2 (PID feedback value, 0.01Hz) 7: F d 0 6 (Input terminal board status) 8: F d 0 7 (Output terminal status) 9: F E 3 6 (VIB input, 0.01%) 10: F E 3 5 (VIA input, 0.01%) 11: F E 3 7 (VIC input, 0.01%) 12: F d 0 4 (Input voltage (DC detection), 0.01%) 13: F d 1 6 (Estimated speed 0.01Hz) 14: F d 1 8 (Torque, 0.01%) 15: - 16: - 17: - 18: - 19: F 8 8 0 (Free notes) 20: F d 2 9 (Input power, 0.01kW) 21: F d 3 0 (Output power, 0.01kW) 22: F E 1 4 (Cumulative operation time, hour) 23: F E 4 0 (FM terminal output monitor, 0.01%) 24: - 25: F d 2 0 (Torque current, 0.01%) 26: F d 2 3 (Motor overload factor, 0.01%) 27: F d 2 4 (Drive overload factor, 0.01%) 28: F d 2 5 (PBR overload factor, %) 29: F d 2 6 (Motor load factor, %) 30: F d 2 7 (Drive load factor, %) 31: F E 5 6 (Pulse train input, pps) 32: F E 7 0 (Drive rated current, 0.1A) 33: F E 7 6 (Input Watt-hour, 0.1kWh × 10 <sup>F 7 4 9</sup> ) 34: F E 7 7 (Output Watt-hour, 0.1kWh × 10 <sup>F 7 4 9</sup> ) 35: F d 8 3 (IGBT temperature, degree C)
C022	C022	Scanner output 2 address	0-35 (Same as C021)
C023	C023	Scanner output 3 address	0-35 (Same as C021)
C024	C024	Scanner output 4 address	0-35 (Same as C021)
C025	C025	Scanner output 5 address	0-35 (Same as C021)
C026	C026	Scanner output 6 address	0-35 (Same as C021)

(\*1): The unit is depended by the F 5 1 9 setting.

Title	Communication No.	Function	Description
[ 152	C152	Profile monitor	0 : Telegram 1 (PROFIdrive) 1 : Telegram 100 (Vender Spec. 1) 2 : Telegram 101 (Vender Spec. 2) 3 : Telegram 102 (Vender Spec. 3)
[517- [522	C517- C522	MAC address (*1)	The MAC address of the option module. [C517 - C518 - C519 - C520 - C521 - C522]
[524- [527	C524- C527	IP address actual	The current IP address of the option module.
[528- [531	C528- C531	Subnet Mask actual	The subnet mask actual of the option module. Refer to "3.3.2 Assigning IP addresses" for the details.
[532- [535	C532- C535	Gateway address actual	The gateway IP address actual of the option module. Refer to "3.3.2 Assigning IP addresses" for the details.
[ 536	C536	Ethernet Error	Monitor of the Ethernet error. 0: No error 1: PROFINET I/O timeout 2: Network overload 3: Loss of Ethernet carrier 9: duplicated IP address. 10: No valid IP. 17: Application I/O configuration error

(\*1): These values are displayed by decimal number format on panel of VFS15.

### 3.3. The details of the parameter setting

#### 3.3.1. Device name (c081-c096)

This option module can set the "Device name" of 16 characters.

(Device name (C081-C096) is 1 character within one parameter.)

The device name is required if the option module uses DHCP to obtain its IP Address.

Please set the setting of the device name according to the following rules.

1. The parameter is displayed by the hexadecimal number.
2. One parameter shows an ASCII character.
3. The relation between the device name and the parameter is as follows.

Example for Device Name ='VFS15-2004PM'

Chars No.	Parameter	Character (Ex.)	ASCII (Ex.)	Set point(Ex.)
1	C081	'V'	56H	86
2	C082	'F'	46H	70
3	C083	'S'	53H	83
4	C084	'1'	31H	49
5	C085	'5'	35H	53
6	C086	'.'	2DH	45
7	C087	'2'	32H	50
8	C088	'0'	30H	48
9	C089	'0'	30H	48
10	C090	'4'	34H	52
11	C091	'P'	50H	80
12	C092	'M'	4DH	77
13	C093	-	-	-
14	C094	-	-	-
15	C095	-	-	-
16	C096	-	-	-

3.3.2. Assigning IP addresses (*Ⓒ 504, Ⓒ 505 - Ⓒ 516*)

---

The drive needs 3 addresses.

- \*The drive IP address.
- \*The subnet mask.
- \*The gateway address.

These parameters are effective settings at *Ⓒ 504 = 0* (IP mode: Manual).

If the address has been given by a DHCP server, these parameters are invalidity.

- After dynamic addressing by DHCP server, the new address value is displayed in the parameters.

(*Ⓒ 524 - Ⓒ 535*)

They can be provided by:

- \*DHCP server (correspondence between Device Name and the IP addresses).
- \* DCP (Discovery Control Protocol) protocol to discover PROFINET devices.

The address is assigned according to the IP mode parameter.

<i>Ⓒ 504: IP mode</i>	Comments
0	The option uses the address defined in <i>Ⓒ 505-Ⓒ 516</i> .
1	Don't use on PNE001Z.
2	The option receives its address from a DHCP server. *Device name contains ( <i>Ⓒ 081-Ⓒ 096</i> ) a valid name.
3	The option receives its address from PROFINET controller.

**Case of automatic switching of *Ⓒ 504* (IP mode) to 3 (DCP)**

Needed conditions:

- The device has a Station Name configuration and validation
- The device is connected to a PROFINET controller
- The PROFINET controller has the Station Name in its own configuration
- The settings are in local configuration of the PROFINET controller

If all of these conditions are fulfilled:

- *Ⓒ 504* (IP mode) is automatically set to 3 (DCP), and *Ⓒ 505 - Ⓒ 516* are set to 0.
- IP settings are replaced by the one set in local PROFINET controller
- The new configuration is applied immediately

## 4. PROFIdrive Profile

### 4.1. Telegram 1: PROFIdrive

PROFIdrive standard (PPO Type 3)

This telegram complies with PROFIdrive standard

Corresponding PPO Type: 3

Word	PLC → INV	INV → PLC	PP0
1	STW	ZSW	PZD1
2	HSW	HIW	PZD2

PKW1	PKW2	PKW3	PKW4	PZD1	PZD2	PZD3	PZD4	PZD5	PZD6
------	------	------	------	------	------	------	------	------	------

INV: Inverter

PKW: Parameter ID/value

PZD: Process Data, cyclically transferred

STW: Control word

HSW: Main setpoint

ZSW: Status word

HIW: Main actual value

## 4.2. STW Control Word Data

PNE001Z supports only speed control mode.

Bit	Value	Name	Note
0	1	ON	"Switched on" condition
	0	OFF	Normal stop.
1	1	No Coast Stop	All "Coast Stop (OFF2)" commands are withdrawn
	0	Coast Stop (OFF 2)	Coast stop.
2	1	No Quick Stop	All "Quick Stop (OFF3)" commands are withdrawn.
	0	Quick Stop (OFF 3)	Quick Stop
3	1	Enable Operation	The drive then runs-up to the set point.
	0	Disable Operation	Normal stop.
4	1	Enable Ramp Generator	-
	0	Reset Ramp Generator	Output of the RFG is set to 0.
5	1	Unfreeze Ramp Generator	-
	0	Freeze Ramp Generator	Freeze the actual setpoint entered by the RFG *.
6	1	Enable Setpoint	The value selected at the input of the RFG is switched-in.
	0	Disable Setpoint	The value selected at the input of the RFG is set to 0.
7	1	Fault Acknowledge	Fault reset (0 -> 1)
	0	No meaning	-
8	1	JOG 1 ON **	Inverter drives with JOG 1 speed 1 (ζ 154).
	0	JOG 1 OFF	Jogging stop, if "JOG 1" was previously ON. Stop drive according to setting parameter of inverter.
9	1	JOG 2 ON **	Inverter drives with JOG 2 speed 2 (ζ 155).
	0	JOG 2 OFF	Jogging stop, if "JOG 2" was previously ON. Stop drive according to setting parameter of inverter.
10	1	Control By PLC	The control word and main setpoint are activated.
	0	No Control By PLC	The control word and main setpoint are inactivated.
11	---	Device-specification	(Reserved.)
12	1	Net Control	PNE001Z control is enabled.
	0	Local Control	PNE001Z control is disabled.
13	1	Net Reference	PNE001Z reference is enabled.
	0	Local Reference	PNE001Z reference is disabled.
14	---	Device-specification	(Reserved.)
15	---	Device-specification	(Reserved.)

\* RFG: Ramp Function Generator

\*\* Operation is enabled, drive is in standstill and STW1 bit 4, 5, 6 = 0.



**4.3. ZSW Status Word Data**

Bit	Value	Name	Note
0	1	Ready To Switch-on	Power supply is switched on
	0	Not Ready To Switch-on	-
1	1	Ready To Operate	Refer to control word, bit 1.
	0	Not Ready To Operate	-
2	1	Operation Enabled	Drive follows set point. (Refer to control word 1, bit 3)
	0	Operation Disabled	-
3	1	Fault Present	Inverter tripped.
	0	No Fault	Inverter is not tripped.
4	1	Coast Stop Not Activated	-
	0	Coast Stop Activated (OFF 2)	"Coast Stop (OFF 2)" command is present.
5	1	Quick Stop Not Activated	-
	0	Quick Stop Activated (OFF 3)	"Quick Stop (OFF 3)" command is present
6	1	Switching On Inhibited	Control word bit1 or 2 is set to 0 or fault trip has been acknowledged.
	0	Switching On Not Inhibited	-
7	1	Warning Present	Drive still operational: Alarm in service parameter: No acknowledgement.
	0	No Warning	Alarm not present or alarm has disappeared again
8	1	Speed Error Within Tolerance Range	Refer to section 4.3.1.
	0	Speed Error Out Of Tolerance Range	
9	1	Control Requested	Inverter is controlled by PROFINET master.
	0	No Control Requested	Inverter is controlled by another interface.
10	1	f Or n Reached Or Exceeded	Actual value $\geq$ Comparison value (setpoint)
	0	f Or n Not Reached	-
11	----	Device-specification	(Reserved.)
12	----	Device-specification	(Reserved.)
13	----	Device-specification	(Reserved.)
14	----	Device-specification	(Reserved.)
15	----	Device-specification	(Reserved.)

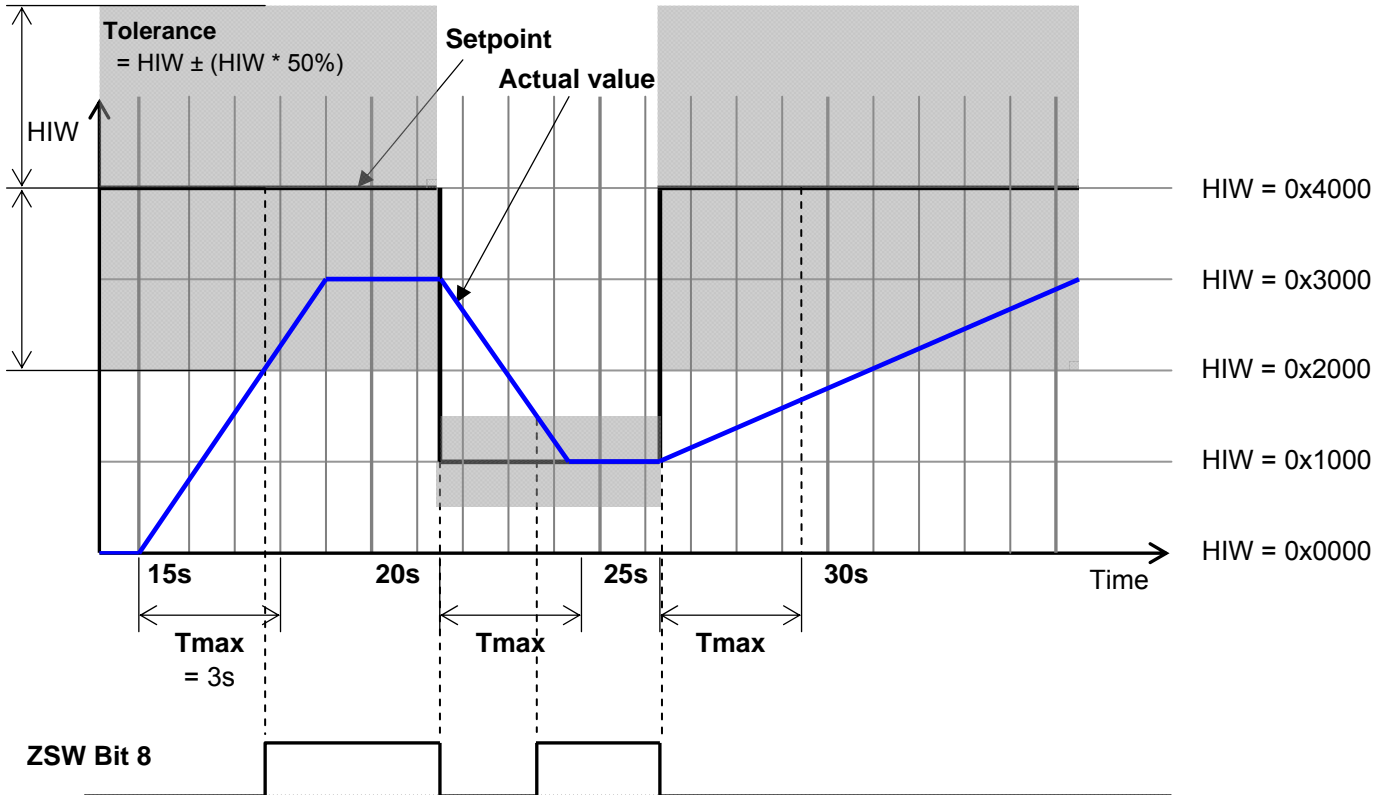
4.3.1. Tolerance Range (ZSW Bit 8)

If the setpoint is changed:

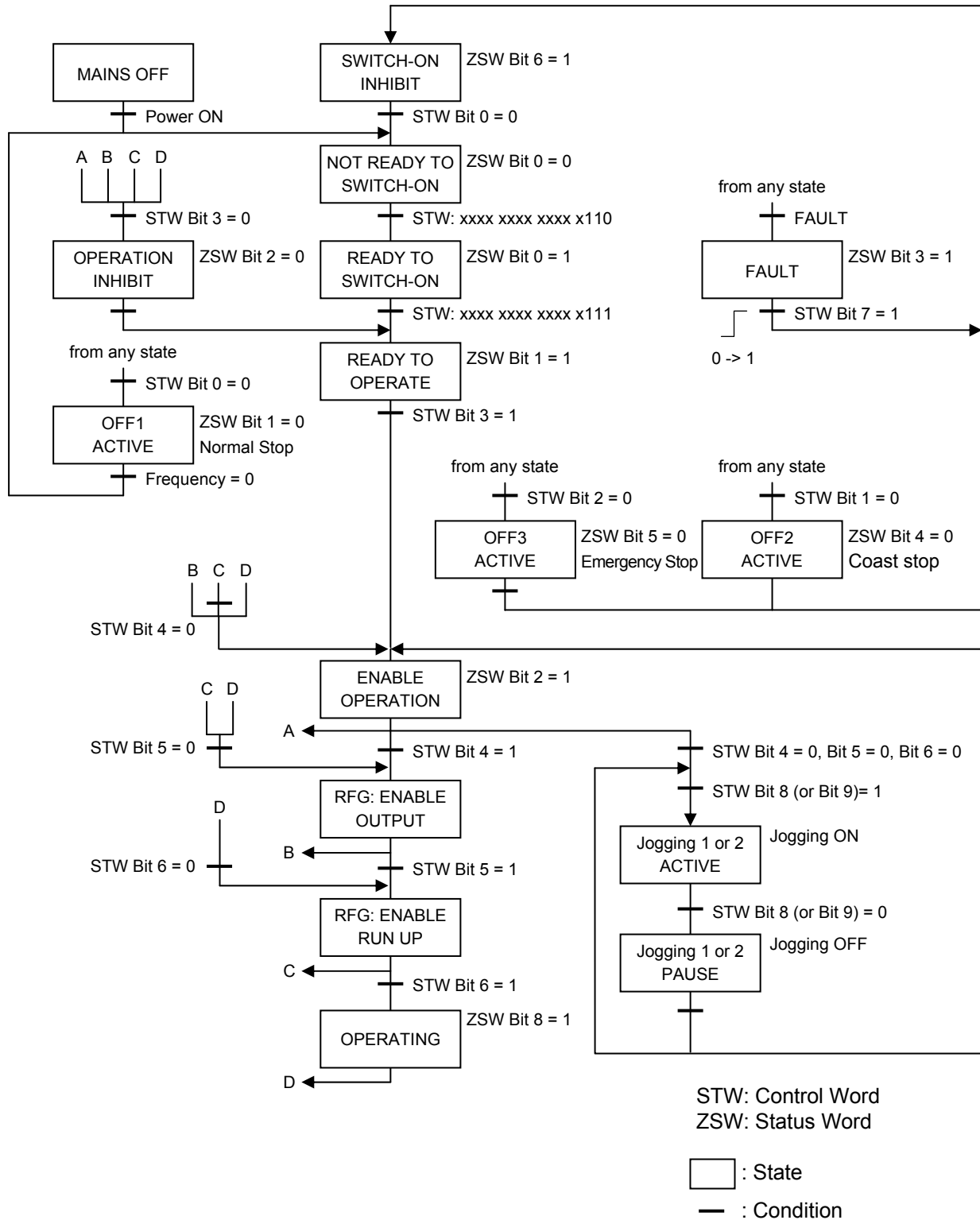
1. ZSW Bit 8 is set 0
2. Calculate the tolerance.
3. Start the timer which will time-out based on parameter Tmax.

PNE001Z checks that the timer (Tmax) has not timed-out and if the actual value is within the tolerance. If both conditions are fulfilled ZSW Bit 8 is set 1 and the timer is stopped.

The figure shows ZSW 8 when Tolerance (E 15 7) is 50% and Tmax (E 15 1) is 3s.



4.4. State Machine



Notes	
	<ul style="list-style-type: none"> <li>▼ STW Bit 10, 12 = 1 or <math>\overline{ENDD} = 4</math> is needed for above control.</li> <li>▼ If <math>\overline{ENDD}</math> is set to Local (0, 1, 2 or 3), set 1 to STW Bit10 and 12 first after turning on the power supply of VF-S15.</li> <li>▼ Check ZSW always and take care to give the command to STW.</li> </ul>

#### 4.4.1. Examples of driving by the State Machine

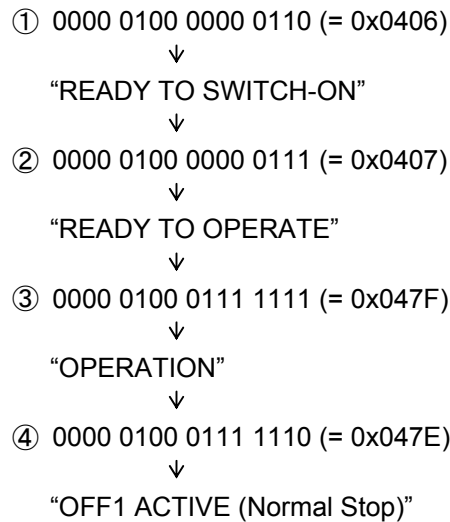
When using the PROFIdrive profile, the frequency reference is set to HSW. The setting value "0x0000" - "0x4000" is equivalent to "0" - "Base frequency (parameter  $FH$ )".

When the reverse operation, the frequency reference is set with two's complement of the forward frequency reference. During running, HIW shows a output frequency.

\*  $F\overline{H}$  and  $\overline{C}\overline{H}$  should be set to "Communication option" on these examples.

##### 4.4.1.1. Example 1. 60Hz Forward running and Deceleration stop

Set "0x4000" to HSW and the following is set to STW in order.



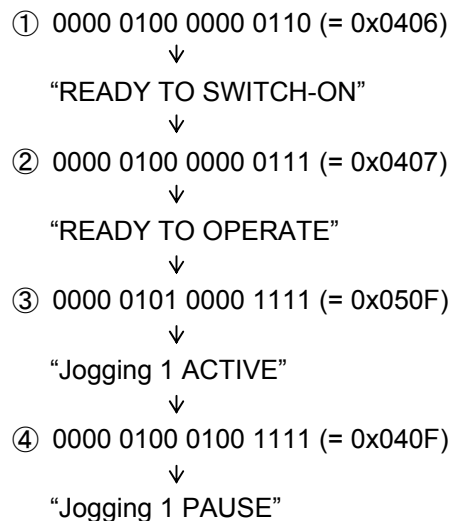
##### 4.4.1.2. Example 2. 30Hz Reverse running

When the reverse operation, "0xE000" is set to HSW. "0xE000" is two's complement of the "0x2000" as the forward frequency reference 30Hz.

The Setup to STW is same as the Example 1.

##### 4.4.1.3. Example 3. Inching and pause

the following is set to STW in order.



\* The inching frequency is according to the parameter  $\overline{C}154$ ,  $\overline{C}155$  of inverter.

## 5. Vendor Specification Profile

Cyclic command transmission is possible for PNE001Z by the original profile

Select the "Telegram 100", "Telegram 101" or "Telegram 102" as the profile on the configuration. Refer to the PLC configuration tool documents.

You will be able to select the command and monitor items from the following table.  
Please execute these settings by the configuration tool of controller.

Scanner input <i>C001-C006</i>	Scanner output <i>C021-C026</i>
0: No action	0: No action
1: <i>F R 0 5</i> (Communication command 1)	1: <i>F d 0 1</i> (Status information 1)
2: <i>F R 2 3</i> (Communication command 2)	2: <i>F d 0 0</i> (Output frequency, 0.01Hz)
3: <i>F R 0 7</i> (Frequency command, 0.01Hz)	3: <i>F d 0 3</i> (Output current, 0.01%)
5: <i>F R 5 0</i> (Terminal output data)	4: <i>F d 0 5</i> (Output voltage, 0.01%)
6: <i>F R 5 1</i> (FM analog output)	5: <i>F C 9 1</i> (Alarm information)
8: <i>F 5 0 1</i> (Stall prevention level, %)	6: <i>F d 2 2</i> (PID feedback value, 0.01Hz)
13: <i>A C C</i> (Acceleration time 1, 0.1s)*	7: <i>F d 0 6</i> (Input terminal board status)
14: <i>d E C</i> (Deceleration time 1, 0.1s) *	8: <i>F d 0 7</i> (Output terminal status)
15: <i>U L</i> (Upper limit,0.01Hz)	9: <i>F E 3 6</i> (VIB input, 0.01%)
16: <i>u b</i> (Torque boost value 1,0.1%)	10: <i>F E 3 5</i> (VIA input, 0.01%)
17: <i>u L u</i> (Base frequency voltage 1, 0.1V)	11: <i>F E 3 7</i> (VIC input, 0.01%)
	12: <i>F d 0 4</i> (Input voltage (DC detection), 0.01%)
	13: <i>F d 1 6</i> (Estimated speed (real-time value), 0.01Hz)
	14: <i>F d 1 8</i> (Torque, 0.01%)
	19: <i>F 8 8 0</i> (Free notes)
	20: <i>F d 2 9</i> (Input power, 0.01kW)
	21: <i>F d 3 0</i> (Output power, 0.01kW)
	22: <i>F E 1 4</i> (Cumulative operation time, hour)
	23: <i>F E 4 0</i> (FM terminal output monitor, 0.01%)
	25: <i>F d 2 0</i> (Torque current, 0.01%)
	26: <i>F d 2 3</i> (Motor overload factor, 0.01%)
	27: <i>F d 2 4</i> (Drive overload factor, 0.01%)
	28: <i>F d 2 5</i> (PBR overload factor, %)
	29: <i>F d 2 6</i> (Motor load factor, %)
	30: <i>F d 2 7</i> (Drive load factor, %)
	31: <i>F E 5 6</i> (Pulse train input, pps)
	32: <i>F E 7 0</i> (Drive rated current, 0.1A)
	33: <i>F E 7 6</i> (Input Watt-hour, $0.1\text{kWh} \times 10^{F 749}$ ) **
	34: <i>F E 7 7</i> (Output Watt-hour, $0.1\text{kWh} \times 10^{F 749}$ ) **
	35: <i>F d 8 3</i> (IGBT temperature, degree C)

\* The unit of *A C C*, *d E C* is according to the parameter *F 5 1 9*.

\*\* The unit of *F E 7 6*, *F E 7 7* is according to the parameter *F 7 4 9*.

### 5.1. Telegram 100: Vendor specific

Corresponding PPO Type: 1

Word	PLC → INV	INV → PLC	PP0
1	Detailed behavior described in 5.6 to 5.8.		PKW1(PKE)
2			PKW2(IND)
3			PKW3(PWE1)
4			PKW4(PWE2)
5	<i>C001</i>	<i>C021</i>	PZD1
6	<i>C002</i>	<i>C022</i>	PZD2

PKW1	PKW2	PKW3	PKW4	PZD1	PZD2	PZD3	PZD4	PZD5	PZD6
------	------	------	------	------	------	------	------	------	------

INV: Inverter

PKW: Parameter ID/value

PZD: Process Data, cyclically transferred

PKE: Parameter ID (1st and 2nd octet)

IND: Sub-index (3rd octet), 4th octet is reserved

PWE: Parameter value (5th until 8th octet)

### 5.2. Telegram 101: Vendor specific

Corresponding PPO Type: 2

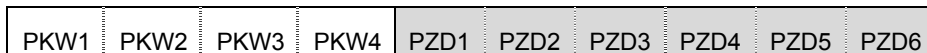
Word	PLC → INV	INV → PLC	PP0
1	Detailed behavior described in 5.6 to 5.8.		PKW1(PKE)
2			PKW2(IND)
3			PKW3(PWE1)
4			PKW4(PWE2)
5	<i>C001</i>	<i>C021</i>	PZD1
6	<i>C002</i>	<i>C022</i>	PZD2
7	<i>C003</i>	<i>C023</i>	PZD3
8	<i>C004</i>	<i>C024</i>	PZD4
9	<i>C005</i>	<i>C025</i>	PZD5
10	<i>C006</i>	<i>C026</i>	PZD6

PKW1	PKW2	PKW3	PKW4	PZD1	PZD2	PZD3	PZD4	PZD5	PZD6
------	------	------	------	------	------	------	------	------	------

### 5.3. Telegram 102: Vendor specific

Corresponding PPO Type: 4

Word	PLC → VSD	VSD → PLC	PP0
1	<i>C001</i>	<i>C021</i>	PZD1
2	<i>C002</i>	<i>C022</i>	PZD2
3	<i>C003</i>	<i>C023</i>	PZD3
4	<i>C004</i>	<i>C024</i>	PZD4
5	<i>C005</i>	<i>C025</i>	PZD5
6	<i>C006</i>	<i>C026</i>	PZD6

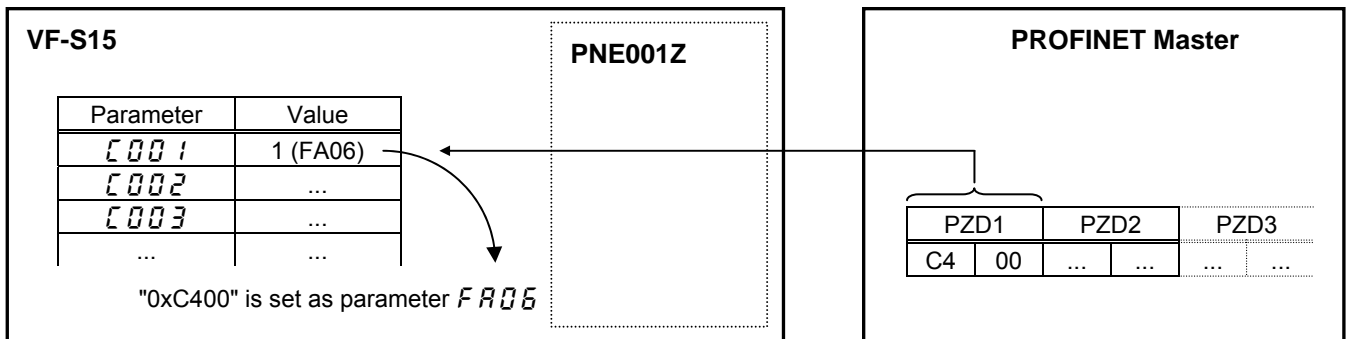


### 5.4. How to use

The purposes are adjustment by real time command transmission, and the monitor of an operation state by using cyclic communication of PROFINET.

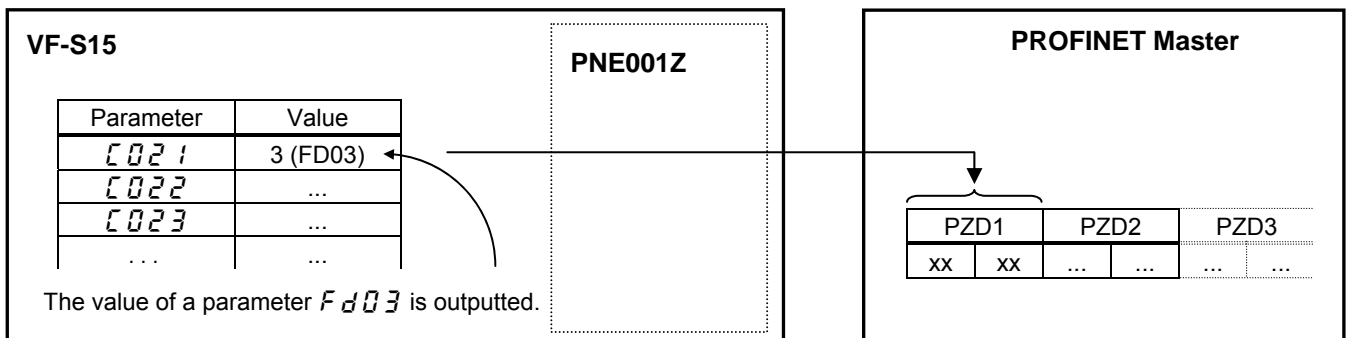
**Example 1: Command transmitting**

When you want to set "0xC400" to parameter *FA06*, set "1 (*FA06*)" to parameter *C001*. And Since 0 and 1 byte of the PZD1 supports the parameter *C001*, if "0xC400" is set up here, "0xC400" will be set as *FA06*.



**Example 2: State monitoring**

When you want to monitor the output current, set "3 (FD03)" to parameter *C021*. The value of the parameter *FD03* specified as 0 and 1 byte of the PZD1 with the parameter *C021* is inputted.



**5.5. The overview of the VF-S15 parameter**

Refer to a communication functional description (E6581913) for details.

5.5.1. *FREQ* (Communication command1)

bit	Function	0	1	Note
0	Preset speed operation frequencies 1	Preset speed operation is disabled or preset speed operation frequencies (1-15) are set by specifying bits for preset speed operation frequencies 1-4. (0000: Preset speed operation OFF, 001-1111: Setting of preset speed operation frequencies (1-15))		
1	Preset speed operation frequencies 2			
2	Preset speed operation frequencies 3			
3	Preset speed operation frequencies 4			
4	Motor selection (1 or 2) (THR 2 selection)	Motor 1 (THR 1)	Motor 2 (THR 2)	THR 1: $P_t = \text{setting value}, t_{Hr}$ THR 2: $P_t = 0, F_{170}, F_{171}, F_{172}, F_{173}$
5	PI D control	Normal operation	PI D off	-
6	Acceleration/deceleration pattern selection (1 or 2) (AD2 selection)	Acceleration/deceleration pattern 1 (AD1)	Acceleration/deceleration pattern 2 (AD2)	AD1: <i>ACC, dec</i> AD2: <i>F500, F501</i>
7	DC braking	OFF	Forced DC braking	-
8	Jog run	OFF	Jog run	-
9	Forward/reverse run selection	Forward run	Reverse run	-
10	Run/stop	Stop	Run	-
11	Coast stop command	Standby	Coast stop	-
12	Emergency stop	OFF	Emergency stop	Always enable, "E" trip
13	Fault reset	OFF	Reset	No data is returned from the drive
14	Frequency priority selection	OFF	Enabled	Enabled regardless of the setting of <i>FPOd</i>
15	Command priority selection	OFF	Enabled	Enabled regardless of the setting of <i>CPOd</i>

\* VF-S15: When 14(*Sr0*) is set to *FPOd*, preset speed operation frequency 0 is selected.



5.5.2. *FR23* (Communication command 2)

bit	Function	0	1	Note
0	(Reserved)	-	-	-
1	Electric power quantity reset	OFF	Reset	Electric power quantity ( <i>FE76</i> , <i>FE77</i> ) reset
2	(Reserved)	-	-	-
3	(Reserved)	-	-	-
4	(Reserved)	-	-	-
5	(Reserved)	-	-	-
6	(Reserved)	-	-	-
7	Maximum deceleration forced stop	Normal	Enabled	-
8	Acceleration/deceleration selection 1	00: Acceleration/deceleration 1 01: Acceleration/deceleration 2 10: Acceleration/deceleration 3		Select acceleration/deceleration 1-4 by combination of two bits.. AD1: <i>ACC, dec</i> AD2: <i>F500, F501</i> AD3: <i>F510, F511</i>
9	Acceleration/deceleration selection 2			
10	(Reserved)	-	-	-
11	(Reserved)	-	-	-
12	OC stall level switch	OC stall 1	OC stall 2	OC stall 1: <i>F601</i> OC stall 2: <i>F185</i>
13	(Reserved)	-	-	-
14	(Reserved)	-	-	-
15	(Reserved)	-	-	-

Note: Set 0 to reserved bit.

5.5.3. *FR07* (frequency reference from internal option)

Frequency reference is set up by 0.01Hz unit and the hexadecimal number.

For example, when "Frequency reference" is set up to 80Hz, since the minimum unit is 0.01Hz,  
 $80 / 0.01 = 8000 = 0x1F40$  (Hex.)

5.5.4. *FR50* (Terminal output data from communication)

By setting up the data of the bit 0 - 1 of terminal output data (*FR50*) from communication, setting data (OFF or ON) can be outputted to the output terminal.

Please select the functional number 92 - 95 as the selection (*F130 - F138*) of the output terminal function before using it.

bit	Output TB function name	0	1
0	Specified data output 1 (Output terminal No.: 92, 93)	OFF	ON
1	Specified data output 2 (Output terminal No.: 94, 95)	OFF	ON
2-15	(Reserved)	-	-

Note: Set 0 to reserved bit

5.5.5. *FR51* (Analog output (FM) data from communication)

Use this function, set the FM terminal meter selection parameter (*FR5L*) to 18 (communication data output).

This makes it possible to send out the data specified as FM analog output data (*FR51*) though the FM analog output terminal. Data can be adjusted in a range of 0 to 1000 (resolution of 10 bit).

Please refer to "Meter setting and adjustment" Section of the VF-S15 instruction manual for details.

5.5.6. *Fd01* (Inverter operating status 1 (real time))

bit	Function	0	1	Note
0	Failure FL	No output	Under in progress	-
1	Failure	Not tripped	Tripped	Trip status includes <i>rtr</i> and the trip retention status are also regarded as tripped statuses.
2	Alarm	No alarm	Alarm issued	-
3	Under voltage ( <i>NOFF</i> )	Normal	Under voltage	-
4	Motor selection (1 or 2) (THR 2 selection)	Motor 1 (THR1)	Motor 2 (THR2)	THR1: <i>Pt</i> = setting value, <i>uL</i> , <i>uLu</i> , <i>ub</i> , <i>tHr</i> THR2: <i>Pt</i> = 0, <i>F170</i> , <i>F171</i> , <i>F172</i> , <i>F173</i>
5	PID control off	PID control permitted	PID control prohibits	-
6	Acceleration/deceleration pattern selection (1 or 2)	Acceleration/deceleration pattern 1 (AD1)	Acceleration/deceleration pattern 2 (AD2)	AD1: <i>ACC</i> , <i>DEC</i> AD2: <i>F500</i> , <i>F501</i>
7	DC braking	OFF	Forced DC braking	-
8	Jog run	OFF	Jog run	-
9	Forward / reverse run	Forward run	Reverse run	-
10	Run/stop	Stop	Run	-
11	Coast stop (ST = OFF)	ST=ON	ST=OFF	-
12	Emergency stop	No emergency stop status	Emergency stop status	-
13	Standby ST=ON	Start-up process	Standby	Standby: Initialization completed, not failure stop status, not alarm stop status ( <i>NOFF</i> , <i>LL</i> forced stop), ST=ON, and RUN=ON
14	Standby	Start-up process	Standby	Standby: Initialization completed, not failure stop status and not alarm stop status ( <i>NOFF</i> , <i>LL</i> forced stop)
15	(Undefined)	-	-	-

Note: The bit described "Undefined" is unstable. Don't use the bit for the judgment.

5.5.7. *Fd00* (Output frequency (real time))

The current output frequency is read into 0.01Hz of units and by the hexadecimal number. For example, when the output frequency is 80Hz, 0x1F40 (hexadecimal number) are read.

Since the minimum unit is 0.01%,  
 $0x1F40 \text{ (Hex.)} = 8000 \text{ (Dec.)} * 0.01 = 80 \text{ (Hz)}$

Also about the following parameters, these are the same as this.

- *Fd22* (Feedback value of PID (real time)) ..... Unit: 0.01Hz
- *Fd16* (Estimated speed (real time)) ..... Unit: 0.01Hz
- *Fd29* (Input power (real time)) ..... Unit: 0.01kW
- *Fd30* (Output power (real time)) ..... Unit: 0.01kW

### 5.5.8. *Fd03* (Output current (real time))

---

The output current is read into 0.01% of units and by the hexadecimal number.

For example, when the output current of the rated current 4.8A drive is 50% (2.4A), 0x1388 (hexadecimal number) is read out.

Since the minimum unit is 0.01%,

$$0x1388 \text{ (Hex.)} = 5000 \text{ (Dec.)} * 0.01 = 50 \text{ (\%)}$$

Also about the following parameters, these are the same as this.

- *Fd05* (Output voltage (real time)) ..... Unit: 0.01% (V)
- *Fd04* (Voltage at DC bus (real time)) ..... Unit: 0.01% (V)
- *Fd18* (Torque) ..... Unit: 0.01% (Nm)\*

\* When the motor information connected to the drive set to the parameter (*F405* - *F415*), torque monitor value "100%" is same as the rated torque of a motor in general.

### 5.5.9. *FE35, FE36, FE37* (Monitoring of the analog input VIA, VIB, VIC)

---

VIA terminal board monitor: "Communication Number *FE35*"

VIB terminal board monitor: "Communication Number *FE36*"

VIC terminal board monitor: "Communication Number *FE37*"

These monitors can also be used as A/D converters irrespective of the drive's control.

VIA / VIC terminal board monitor is capable of reading the data from external devices in a range of 0.01 to 100.00% (unsigned data: 0x0000 to 0x2710).

VIB terminal board monitor is capable of reading the data from external devices in a range of -100.00 to 100.00% (signed data: 0xD8F0 to 0x2710).

If analog input mode is selected with the frequency setting mode selection parameter, however, keep in mind that any data entered via an analog terminal is regarded as a frequency command.

### 5.5.10. *FE14* (Cumulative run time)

---

The operated cumulative time is read by the hexadecimal number.

For example, when cumulative operation time is 18 hours, 0x12 (18 hours) is read.

$$0x12 \text{ (Hex.)} = 18 \text{ (Dec., hour)}$$

### 5.5.11. *FE40* (Analog output (FM))

---

The output value of FM terminal is read.

The value range is set to 0 to 10000 (0x2710).

5.5.12. *F<sub>09</sub>* (Alarm code)

bit	Function	0	1	Remarks (Code displayed on the panel)
0	Over-current alarm	Normal	Alarming	<i>L</i> flicking
1	Inverter over load alarm	Normal	Alarming	<i>L</i> flicking
2	Motor over load alarm	Normal	Alarming	<i>L</i> flicking
3	Over heat alarm	Normal	Alarming	<i>H</i> flicking
4	Over voltage alarm	Normal	Alarming	<i>P</i> flicking
5	Main circuit under voltage alarm	Normal	Alarming	-
6	main device overheat alarm	Normal	Alarming	<i>L</i> flicking
7	Under current alarm	Normal	Alarming	-
8	Over-torque alarm	Normal	Alarming	-
9	Braking resistor overload alarm	Normal	Alarming	-
10	Cumulative operation hours alarm	Normal	Alarming	-
11	Option communication alarm	Normal	Alarming	-
12	Serial communication alarm	Normal	Alarming	-
13	MOFFMS (MS relay off or MOFF)	Normal	Alarming	-
14	Stop after instantaneous power off	-	Dec., Under stop	Refer to <i>F<sub>302</sub></i> value
15	Stop after LL continuance time	-	Dec., Under stop	Refer to <i>F<sub>256</sub></i> value

5.5.13. *F<sub>06</sub>* (Input TB Status)

bit	TB Name	Function (Parameter)	0	1
0	F	Input terminal function selection 1 ( <i>F<sub>111</sub></i> )	OFF	ON
1	R	Input terminal function selection 2 ( <i>F<sub>112</sub></i> )		
2	RES	Input terminal function selection 3 ( <i>F<sub>113</sub></i> )		
3	S1	Input terminal function selection 4 ( <i>F<sub>114</sub></i> )		
4	S2	Input terminal function selection 5 ( <i>F<sub>115</sub></i> )		
5	S3	Input terminal function selection 6 ( <i>F<sub>116</sub></i> )		
6	VIB*1	Input terminal function selection 7 ( <i>F<sub>117</sub></i> )		
7	VIA*1	Input terminal function selection 8 ( <i>F<sub>118</sub></i> )		
5 to 15	(Undefined)	-	-	-

Note: The bit described "Undefined" is unstable. Do not use the bit for the judgment.

\*1: VIA/ VIB are input terminal function when *F<sub>109</sub>* is logic input.

\*The input terminal function is selected by each parameter.

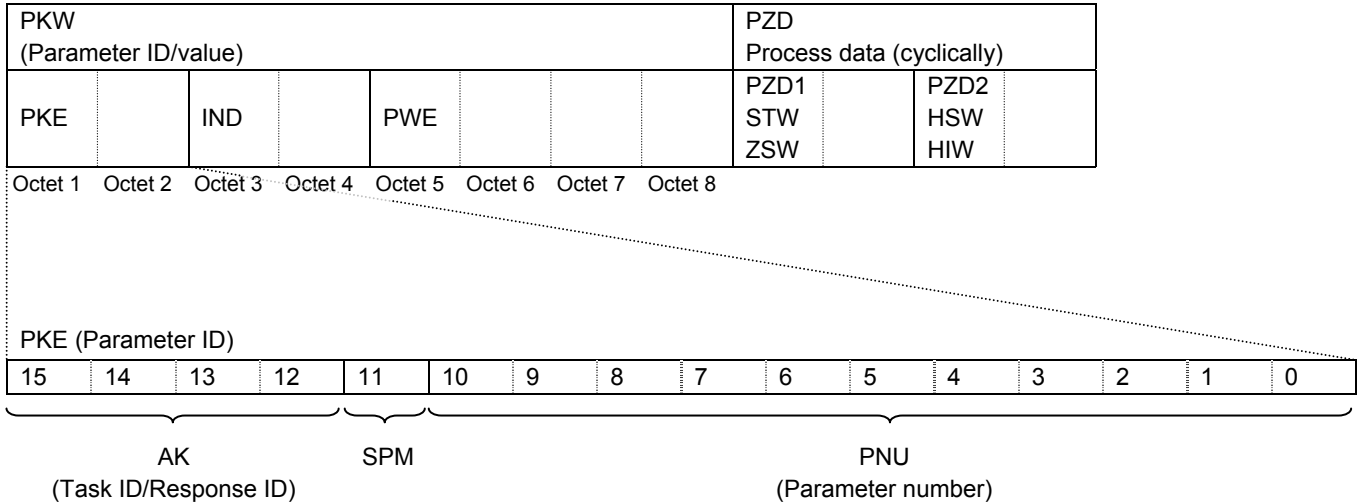
5.5.14. *F<sub>07</sub>* (Output TB Status)

bit	TB Name	Function (Parameter)	0	1
0	RY-RC	Output terminal function selection 1A ( <i>F<sub>130</sub></i> )	OFF	ON
1	OUT	Output TB Function select 2A ( <i>F<sub>131</sub></i> )	OFF	ON
2	FL	Output TB Function select 3 ( <i>F<sub>132</sub></i> )	OFF	ON
3 - 15	(Undefined)	-	-	-

Note: The bit described "Undefined" is unstable. Do not use the bit for the judgment.

## 5.6. Access to the PROFIdrive parameter

In the cyclic PROFINET communication, the parameter data is transferred via Telegram 100 or 101. If the requirement is not executed, the cause is distinguished by octet 7 and 8.



### AK (Request from Master to PNE001Z)

Request ID	Function	Note
0	No task	
1	Request parameter value	for PNU access
2	Change parameter value (word)	for PNU access
6	Request parameter value (array)	for PNU access or inverter parameter access
7	Change parameter value (array)	for PNU access or inverter parameter access

### AK (Response from PNE001Z to Master)

Response ID	Function
0	No response
1	Transfer parameter value (word)
4	Transfer parameter value (array)
7	Task can not be executed, followed by error number 0 = Illegal parameter number 1 = Parameter value cannot be changed 2 = Lower or upper limit violated 3 = Erroneous sub index 11 = No parameter change rights 17 = Task cannot be executed due to operating status (e.g. parameter is currently read-only) 18 = Other error 102 = Request not supported

SPM: always 0.

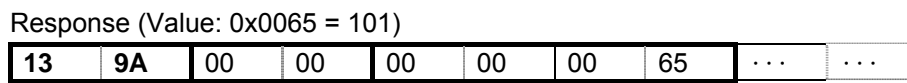
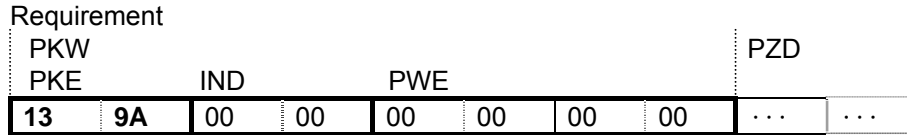
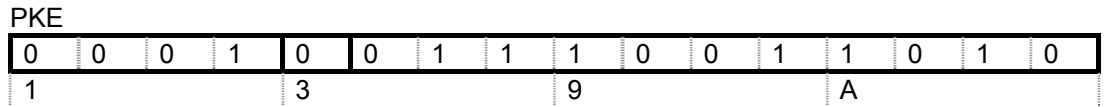
## 5.7. PROFIdrive parameter (PNU)

PNU	R/W	data type	Note
915	R	Array [6] Unsigned16	PNU 915, IND 0 = the drive parameter $\text{C}001$ PNU 915, IND 1 = the drive parameter $\text{C}002$ PNU 915, IND 2 = the drive parameter $\text{C}003$ PNU 915, IND 3 = the drive parameter $\text{C}004$ PNU 915, IND 4 = the drive parameter $\text{C}005$ PNU 915, IND 5 = the drive parameter $\text{C}006$
916	R	Array [6] Unsigned16	PNU 916, IND 0 = the drive parameter $\text{C}021$ PNU 916, IND 1 = the drive parameter $\text{C}022$ PNU 916, IND 2 = the drive parameter $\text{C}023$ PNU 916, IND 3 = the drive parameter $\text{C}024$ PNU 916, IND 4 = the drive parameter $\text{C}025$ PNU 916, IND 5 = the drive parameter $\text{C}026$
922	R	Unsigned16	Telegram selection ( same as the drive parameter $\text{C}152$ ) 1, 100, 101, 102
923	R	Unsigned16	List of all the parameters for signals
930	R	Unsigned16	Operating mode 1: supports the speed control mode and the speed setpoint channel comprises RFG functionality.
944	R	Unsigned16	Fault message counter
947	R	Array [1] Unsigned16	Fault number
964	R	Array [5] Unsigned16	Drive Unit identification IND 0 = Manufacturer-ID (0x0190) IND 1 = Model number IND 2 = VF-S15 CPU1 version IND 3 = VF-S15 firmware release year (yyyy) IND 4 = VF-S15 firmware release date (ddmm)
965	R	Octet String2	Profile number (PROFIdrive, V4.1)

5.7.1. Examples of reading the PROFIdrive parameter

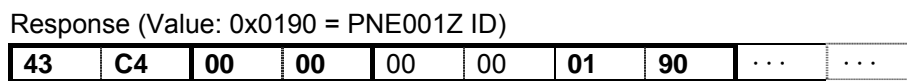
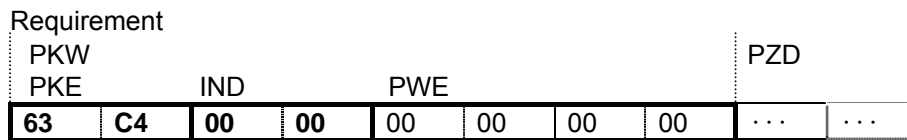
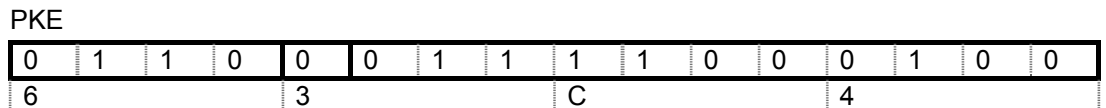
5.7.1.1. Example 1. Reading the PNU 922 (Telegram)

AK = 1 (Request parameter value)  
 SPM = 0  
 PNU = 922 (0x039A)



5.7.1.2. Example 2. Reading the PNU 964, IND 0

AK = 6 (Request parameter value (array))  
 SPM = 0  
 PNU = 964 (0x03C4)  
 IND = 0 (PNE001Z ID)



## 5.8. Access to drive parameter

When access to drive parameter, set "1" to the PNU. The communication number of the drive parameter is set to the sub index IND.

Refer to the drive instruction manual about the communication number and unit.

\* This procedure changes the value of drive EEPROM.

### 5.8.1. Examples of reading or changing drive parameter

#### 5.8.1.1. Example 1. Reading the basic parameter ( $\mathcal{L} \mathcal{N} \mathcal{D}$ (command mode selection))

AK = 6 (Request parameter value (array))

SPM = 0

PNU = 1

IND = 0x0003 ( $\mathcal{L} \mathcal{N} \mathcal{D}$  communication number)

PKE

0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6				0				0								1	

Requirement

PKW													PZD
PKE		IND		PWE								...	...
60	01	00	03	00	00	00	00	...	...				

Response (Value: 0x0001 = Operation panel)

40	01	00	03	00	00	00	01	...	...
----	----	----	----	----	----	----	----	-----	-----

#### 5.8.1.2. Example 2. Reading the extended parameter ( $F \mathcal{Z} \mathcal{I} \mathcal{S}$ (VIC input point 2 frequency))

AK = 6 (Request parameter value (array))

SPM = 0

PNU = 1

IND = 0x0219 ( $F \mathcal{Z} \mathcal{I} \mathcal{S}$  communication number)

PKE

0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6				0				0								1

Requirement

PKW													PZD
PKE		IND		PWE								...	...
60	01	02	19	00	00	00	00	...	...				

Response (Value: 0x1770 (= 6000 -> 60.00Hz \*))

40	01	02	19	00	00	17	70	...	...
----	----	----	----	----	----	----	----	-----	-----

\* "0x1770" as reading value of "VIC input point 2 frequency" is 0x1770 = 6000 (decimal number)

Since the unit of "VIC input point 2 frequency" is 0.01Hz, set the following value.

$6000 \times 0.01 = 60.00\text{Hz}$



5.8.1.3. Example 3. Reading the status monitor parameter (*F E 0 2* (The operation frequency))

AK = 6 (Request parameter value (array))  
 SPM = 0  
 PNU = 1  
 IND = 0xFE02(*F E 0 2* communication number)

PKE

0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
6				0				0				1				

Requirement

PKW								PZD								
PKE				IND				PWE								
<b>60</b>	<b>01</b>	<b>FE</b>	<b>02</b>	00	00	00	00	...	...	...	...	...	...	...	...	...

Response (Value: 0x03E8 (= 1000 -> 10.00Hz))

<b>40</b>	<b>01</b>	<b>FE</b>	<b>02</b>	00	00	<b>03</b>	<b>E8</b>	...	...	...	...	...	...	...	...	...
-----------	-----------	-----------	-----------	----	----	-----------	-----------	-----	-----	-----	-----	-----	-----	-----	-----	-----

\* The status monitor parameter can not be changed.

5.8.1.4. Example 4. Changing the basic parameter (*A 0 0 9* (acceleration time))

AK = 7 (Change parameter value (array))  
 SPM = 0  
 PNU = 1  
 IND = 0x0009 (*A 0 0 9* communication number)

PKE

0	1	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1
7				0				0				1				

Requirement (*A 0 0 9* = 7.0 sec. -> 70 (= 0x0046) \*)

PKW								PZD								
PKE				IND				PWE								
<b>70</b>	<b>01</b>	<b>00</b>	<b>09</b>	00	00	<b>00</b>	<b>46</b>	...	...	...	...	...	...	...	...	...

Response

<b>40</b>	<b>01</b>	<b>00</b>	<b>09</b>	00	00	<b>00</b>	<b>46</b>	...	...	...	...	...	...	...	...	...
-----------	-----------	-----------	-----------	----	----	-----------	-----------	-----	-----	-----	-----	-----	-----	-----	-----	-----

\* When the "Acceleration time" is set to 7.0 sec., set the following value.  
 (The unit of the "Acceleration time" is according to the parameter *F 5 1 9*.)  
 7.0 / 0.1 = 70 = 0x0046 (hexadecimal number)

<p><b>Notes</b></p> <ul style="list-style-type: none"> <li>▼ When the control power is shut off by the instantaneous power failure, communication will be unavailable for a while.</li> <li>▼ The Life of EEPROM is approximately 100,000 times. Avoid writing a command more than 100,000 times to the same parameter of the drive and the communication board.</li> </ul>
---

## 6. PROFIdrive acyclic parameter access

In PNE001Z, inverter parameters and PROFIdrive parameters are accessible by acyclic communications in addition to the cyclic communication via Telegram 100 or 101.

### 6.1. Example1. Read the PROFIdrive parameter

#### 6.1.1. Request data table (Read PNU 964 (0x03C4) IND 0)

Field	Description	Value
Request Header (Byte 1)	Request Reference	0x01
Request Header (Byte 2)	Request ID (0x01: Request)	<b>0x01</b>
Request Header (Byte 3)	Axis	0x01
Request Header (Byte 4)	Number of Parameters	0x01
Parameter Address (Byte 1)	Attribute (0x10: Value)	0x10
Parameter Address (Byte 2)	Number of Elements	0x01
Parameter Address (Byte 3)	Parameter number (PNU), High byte	<b>0x03</b>
Parameter Address (Byte 4)	Parameter number (PNU), Low byte	<b>0xC4</b>
Parameter Address (Byte 5)	Sub index (IND), High byte	<b>0x00</b>
Parameter Address (Byte 6)	Sub index (IND), Low byte	<b>0x00</b>

#### 6.1.2. Response data table (positive)

Field	Description	Value
Request Header (Byte 1)	Request Reference (mirrored)	0x01
Request Header (Byte 2)	Response ID	<b>0x01</b>
Request Header (Byte 3)	Axis (mirrored)	0x01
Request Header (Byte 4)	Number of Parameters	0x01
Parameter Value (Byte 1)	Format	0x06
Parameter Value (Byte 2)	Number of Values	0x01
Parameter Value (Byte 3)	Values, High byte	<b>0x01</b>
Parameter Value (Byte 4)	Values, Low byte	<b>0x90</b>

## 6.2. Example 2. Change the PROFdrive parameter

### 6.2.1. Request data table (Change, set 0 to PNU 927 (0x039F))

Field	Description	Value
Request Header (Byte 1)	Request Reference	0x01
Request Header (Byte 2)	Request ID (0x02: Change) *	<b>0x02</b>
Request Header (Byte 3)	Axis	0x01
Request Header (Byte 4)	Number of Parameters	0x01
Parameter Address (Byte 1)	Attribute	0x10
Parameter Address (Byte 2)	Number of Elements	0x01
Parameter Address (Byte 3)	Parameter number (PNU), High byte	<b>0x03</b>
Parameter Address (Byte 4)	Parameter number (PNU), Low byte	<b>0x9F</b>
Parameter Address (Byte 5)	Sub index (IND), High byte	0x00
Parameter Address (Byte 6)	Sub index (IND), Low byte	0x00
Parameter Value (Byte 1)	Format *	0x06
Parameter Value (Byte 2)	Number of Value	0x01
Parameter Value (Byte 3)	Values, High byte	<b>0x00</b>
Parameter Value (Byte 4)	Values, Low byte	<b>0x00</b>

\* Refer to section 6.5.

### 6.2.2. Response data table (positive)

Field	Description	Value
Request Header (Byte 1)	Request Reference (mirrored)	0x01
Request Header (Byte 2)	Response ID (0x02: Positive)	<b>0x02</b>
Request Header (Byte 3)	Axis (mirrored)	0x01
Request Header (Byte 4)	Number of Parameters	0x01

### 6.2.3. Response data table (negative, set 2 to PNU 927)

Field	Description	Value
Request Header (Byte 1)	Request Reference (mirrored)	0x01
Request Header (Byte 2)	Response ID (0x82: Negative) *	<b>0x82</b>
Request Header (Byte 3)	Axis (mirrored)	0x01
Request Header (Byte 4)	Number of Parameters	0x01
Parameter Value (Byte 1)	Format (0x44: Error) *	<b>0x44</b>
Parameter Value (Byte 2)	Number of Values	0x01
Parameter Value (Byte 3)	Error number, High byte	<b>0x00</b>
Parameter Value (Byte 4)	Error number, Low byte	<b>0x01</b>

\* Refer to section 6.5.

### 6.3. Example 3. Read the VF-S15 parameter

When access to VF-S15 parameter, set "1000" to the PNU.

#### 6.3.1. Request data table (Read $F_{d04}$ (Input voltage))

Field	Description	Value
Request Header (Byte 1)	Request Reference	0x01
Request Header (Byte 2)	Request ID (0x01: Request) *	<b>0x01</b>
Request Header (Byte 3)	Axis	0x01
Request Header (Byte 4)	Number of Parameters	0x01
Parameter Address (Byte 1)	Attribute	0x10
Parameter Address (Byte 2)	Number of Elements	0x01
Parameter Address (Byte 3)	Parameter number, High byte **	<b>0x03</b>
Parameter Address (Byte 4)	Parameter number, Low byte **	<b>0xE8</b>
Parameter Address (Byte 5)	VF-S15 Parameter number, High byte	<b>0xFD</b>
Parameter Address (Byte 6)	VF-S15 Parameter number, Low byte	<b>0x04</b>

\* Refer to section 6.5.

\*\* Parameter number is fixed to 0x03E8 (1000) for accessing to VF-S15 parameter.

#### 6.3.2. Response data table (positive)

Field	Description	Value
Request Header (Byte 1)	Request Reference (mirrored)	0x01
Request Header (Byte 2)	Response ID *	<b>0x01</b>
Request Header (Byte 3)	Axis (mirrored)	0x01
Request Header (Byte 4)	Number of Parameters	0x01
Parameter Value (Byte 1)	Format *	0x06
Parameter Value (Byte 2)	Number of Values	0x01
Parameter Value (Byte 3)	Values, High byte	<b>0x31 **</b>
Parameter Value (Byte 4)	Values, High byte	<b>0xEC **</b>

\* Refer to section 6.5.

\*\* Value 0x31EC is "12780" in decimal. This means "127.80 (%)".

## 6.4. Example 4. Change the VF-S15 parameter

When access to VF-S15 parameter, set "1000" to the PNU.

\* This procedure changes the value of VF-S15 EEPROM.

### 6.4.1. Request data table (Change, set 7 to VF-S15 parameter $F 130$ )

Field	Description	Value
Request Header (Byte 1)	Request Reference	0x01
Request Header (Byte 2)	Request ID (0x02: Change) *	<b>0x02</b>
Request Header (Byte 3)	Axis	0x01
Request Header (Byte 4)	Number of Parameters	0x01
Parameter Address (Byte 1)	Attribute	0x10
Parameter Address (Byte 2)	Number of Elements	0x01
Parameter Address (Byte 3)	Parameter number, High byte **	<b>0x03</b>
Parameter Address (Byte 4)	Parameter number, Low byte **	<b>0xE8</b>
Parameter Address (Byte 5)	VF-S15 Parameter number, High byte	<b>0x01</b>
Parameter Address (Byte 6)	VF-S15 Parameter number, Low byte	<b>0x30</b>
Parameter Value (Byte 1)	Format *	0x06
Parameter Value (Byte 2)	Number of Value	0x01
Parameter Value (Byte 3)	Value, High byte	<b>0x00</b>
Parameter Value (Byte 4)	Value, Low byte	<b>0x07</b>

\* Refer to section 6.5.

\*\* Parameter number is fixed to 0x03E8 (1000) for accessing to VF-S15 parameter.

### 6.4.2. Response data table (positive)

Field	Description	Value
Request Header (Byte 1)	Request Reference (mirrored)	0x01
Request Header (Byte 2)	Response ID *	<b>0x02</b>
Request Header (Byte 3)	Axis (mirrored)	0x01
Request Header (Byte 4)	Number of Parameters	0x01

\* Refer to section 6.5.

### 6.4.3. Response data table (negative, at set 256 to $F 130$ )

Field	Description	Value
Request Header (Byte 1)	Request Reference (mirrored)	0x01
Request Header (Byte 2)	Response ID *	<b>0x82</b>
Request Header (Byte 3)	Axis (mirrored)	0x01
Request Header (Byte 4)	Number of Parameters	0x01
Parameter Value (Byte 1)	Format * (= Error)	<b>0x44</b>
Parameter Value (Byte 2)	Number of Values	0x01
Parameter Value (Byte 3)	Error number, High byte *	<b>0x00</b>
Parameter Value (Byte 4)	Error number, Low byte *	<b>0x02</b>

\* Refer to section 6.5.

---

## 6.5. Code Table for PROFdrive parameter channel

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### Request ID

0x01: Request the value

0x02: Change the value

### Response ID

0x01: Positive response for Request the value

0x02: Positive response for Change the value

0x81: Negative response for Request the value

0x82: Negative response for Change the value

### Axis

0x01: (Fixed for PNE001Z)

### Error number

0x00: Impermissible parameter number

0x01: Impermissible parameter number

0x02: Low or High limit exceeded

0x03: Faulty sub index

0x04: No array

0x05: Incorrect data type

0x06: Setting not permitted (may only be reset)

0x07: Description element cannot be changed

0x09: No description data available

0x0B: No operation priority

0x0F: No text array available

0x11: Request cannot be executed because of operating state

0x14: Value impermissible

0x15: Response too long

0x17: Write Req., Illegal format/format of the parameter data is not supported

0x18: Number of values are not consistent

0x19: Axis/DO non existent

0x20: Parameter text element cannot be changed

### Format

0x01: Boolean

0x02: Integer 8

0x03: Integer 16

0x04: Integer 32

0x05: Unsigned 8

0x06: Unsigned 16

0x07: Unsigned 32

0x08: FloatingPoint

0x09: VisibleString

0x10: OctetString

0x12 TimeOfDay (with date indication)

0x13: TimeDifference

0x40: Zero

0x41: Byte

0x42: Word

0x43: Double word

0x44: Error

## 7. Modbus TCP

### 7.1. Modbus TCP frames

Modbus TCP frames consist of a header and a Modbus request.

**Header format:**

Byte	Description		Comments
0	Transaction identifier	high order	
1		low order	
2	Protocol identifier	high order	This identifier always equals 0.
3		low order	
4	Length of data	high order	Number of bytes in the Modbus request +1. The frame length is always less than 256 bytes, the value of the significant byte therefore equals 0.
5		low order	
6	Destination identifier (Unit ID)		
7	Modbus request function code		

The frame header returned by the VF- S15 server is identical to that of the frame sent by the client.

### 7.2. Drive Modbus servers

The destination identifier (Unit ID) is used to access drive Modbus TCP servers:

Unit ID	Modbus TCP server	Accessible data
0-248	Inverter (VF-S15)	Inverter parameter Device identification of inverter
251	Communication module (PNE001Z)	Device identifications of module

### 7.3. List of Modbus functions supported

Function code	Function name	Description	Size of data
03	Read Holding Registers	Read N output words	63 words max.
06	Write Single Register	Write one output word	-
16 (0x10)	Write Multiple Registers	Write N output words	63 words max.
43 (0x2B)	Read Device Identification	Identification	-

**7.4. "03 (0x03) Read Holding Registers" function**

This Modbus request is used to read the values of a number (Number of Points) of adjacent words starting at the address indicated (Starting Address). The values read are restored one after another, at the end of the response (First Point Data -> Last Point Data).

Request Format:

Byte	Meaning
0	Function Code = <b>03h</b>
1	Starting Address Hi
2	Starting Address Lo
3	Number of Points Hi (0)
4	Number of Points Lo (1 - 125)

Response format:

Byte	Meaning
0	Function Code = <b>03h</b>
1	Byte Count (B = 2 × Number of Points)
2	First Point Data Hi
3	First Point Data Lo
...	.....
B	Last Point Data Hi
B+1	Last Point Data Lo

Exception response format:

Byte	Meaning
0	Function Code = <b>83h</b>
1	Exception Code = <b>01 (Illegal Function)</b> <b>02 (Illegal Data Address)</b> <b>03 (Illegal Data Value)</b>

**Notes**

▼ If the communication number that doesn't exist is read, PNE001Z returns 0x8000.



## 7.5. "06 (0x06) Write Single Register" function

This Modbus request is used to write a given value (Present Data) to the address supplied (Register Address).

Request format:

Byte	Meaning
0	Function Code = <b>06h</b>
1	Register Address Hi
2	Register Address Lo
3	Preset Data Hi
4	Preset Data Lo

Response format:

Byte	Meaning
0	Function Code = <b>06h</b>
1	Register Address Hi
2	Register Address Lo
3	Preset Data Hi
4	Preset Data Lo

Exception response format:

Byte	Meaning
0	Function Code = <b>86h</b>
1	Exception Code = <b>01 (Illegal Function)</b> <b>02 (Illegal Data Address)</b> <b>03 (Illegal Data Value)</b> <b>04 (Slave Device Failure)</b>

### Notes

- ▼ As for the EEPROM parameter, first the data is written to RAM, after that the data is written to EEPROM. Some EEPROM parameters cannot be changed during the inverter is running.  
 When write to EEPROM parameter that will change inverter status from stop to run, the inverter must be in the state that it cannot run.  
 For example: To write to EEPROM, the inverter must open ST-CC. (display shows "OFF")  
 If not, the data is only written to RAM.
- ▼ The Life of EEPROM is approximately 100,000 times. Avoid writing a command more than 100,000 times to the same parameter of the Inverter.
- ▼ Please access only parameters in document.

**7.6. "16 (0x10) Write Multiple Registers" function**

This Modbus request is used to write a number (Number of Registers) of adjacent words starting at a given address (Starting Address). The values to be written are supplied one after another (First Register Data -> Last Register Data).

Request format:

Byte	Meaning
0	Function Code = <b>10h</b>
1	Starting Address Hi
2	Starting Address Lo
3	Number of Registers Hi (0)
4	Number of Registers Lo (1 - 100)
5	Byte Count (B = 2 × Number of Registers)
6	First Register Data (Hi)
7	First Register Data (Lo)
...	.....
B+4	Last Register Data (Hi)
B+5	Last Register Data (Lo)

Response format:

Byte	Meaning
0	Function Code = <b>10h</b>
1	Starting Address Hi
2	Starting Address Lo
3	Number of Registers Hi (0)
4	Number of Registers Lo (1 - 100)

Exception response format:

Byte	Meaning
0	Function Code = <b>90h</b>
1	Exception Code = <b>01 (Illegal Function)</b> <b>02 (Illegal Data Address)</b> <b>03 (Illegal Data Value)</b> <b>04 (Slave Device Failure)</b>

**Notes**

- ▼ As for the EEPROM parameter, first the data is written to RAM, after that the data is written to EEPROM. Some EEPROM parameters cannot be changed during the inverter is running.  
 When write to EEPROM parameter that will change inverter status from stop to run, the inverter must be in the state that it cannot run.  
 For example: To write to EEPROM, the inverter must open ST-CC. (display shows "OFF")  
 If not, the data is only written to RAM.
- ▼ The Life of EEPROM is approximately 100,000 times. Avoid writing a command more than 100,000 times to the same parameter of the Inverter.
- ▼ Please access only parameters in document.

**7.7. "43 (0x2B) Read Device identification" function**

The Modbus request is used to read the device identification.

Example in VF-S15 is shown below.

Request format:

Byte	Meaning	
0	Function Code = <b>2Bh</b>	<b>2Bh</b>
1	Type of MEI	0Eh
2	Read Device ID code	01: Basic 02: Regular 03: Extended
3	Object ID	0

Response format: (ID = 0 - 248)

Byte	Meaning	With the PNE001Z	
0	Function Code = <b>2Bh</b>	<b>2Bh</b>	
1	Type of MEI	0Eh	
2	Read Device ID code	01: Basic 02: Regular 03: Extended	
3	Conformity Level	2	
4	More Follows	0	
5	Next Object Id	0	
6	Number Of Objects	3 for Basic. 6 for Regular or Extended	
7	Obj 0 Id → <b>Vendor Name</b>	0	
8	Obj 0 length	7	
9-15	Obj 0 value	"TOSHIBA"	
16	Obj 1 Id → <b>ProductCode</b>	1	
17	Obj 1 length	13	
18-30	Obj 1 value	"VFS15-2004PM"	
31	Obj 2 Id → <b>Version</b>	2	
32	Obj 2 length	5	
33-37	Obj 2 value	"11200"	
38	Obj 4 Id → <b>Product Name</b>	4	<b>Only for Regular and Extended</b>
39	Obj 4 length	6	
40-45	Obj 4 value	"VF-S15"	
46	Obj 5 Id → <b>Model Name</b>	5	
47	Obj 5 length	3	
44-58	Obj 5 value	"TSB"	
59	Obj 6 Id → <b>UserApplicationName</b>	6	
60	Obj 6 length	16 maximum	
61-80	Obj 6 value	"PROFINET"	

Response format: (ID = 251)

Byte	Meaning	With the PNE001Z
0	Function Code = <b>2Bh</b>	<b>2Bh</b>
1	Type of MEI	0Eh
2	Read Device ID code	01: Basic 02: Regular 03: Extended
3	Conformity Level	2
4	More Follows	0
5	Next Object Id	0
6	Number Of Objects	3 for Basic. 6 for Regular or Extended
7	Obj 0 Id → <b>Vendor Name</b>	0
8	Obj 0 length	7
9-15	Obj 0 value	"TOSHIBA"
16	Obj 1 Id → <b>ProductCode</b>	1
17	Obj 1 length	7
18-24	Obj 1 value	"PNE001Z"
25	Obj 2 Id → <b>Version</b>	2
26	Obj 2 length	4
27-30	Obj 2 value	"0201"

Exception response format:

Byte	Meaning
0	Function Code = <b>ABh</b>
1	Exception Code = <b>01 (Illegal Function)</b> <b>02 (Illegal Data Address)</b> <b>03 (Illegal Data Value)</b>

---

## 8. WebServer

---

The option has webserver function. Writing and reading the drive's parameter and the communication can be monitored by using this function through web network.

The chapter describes the function of the integrated webserver of PNE001Z.

---

### 8.1. Access to the webserver

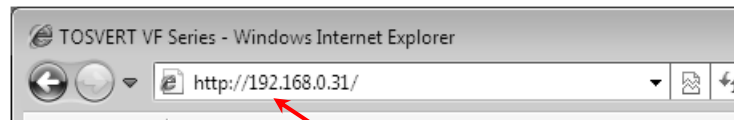
---

This web server can be accessed by the navigators listed below:

Microsoft® Internet Explorer – Version 7.0 or greater

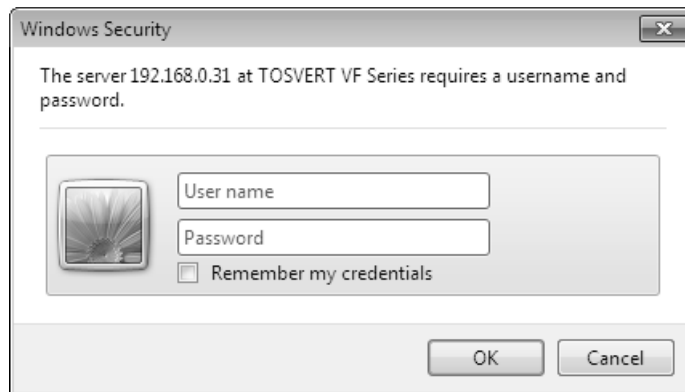
The navigator must support Java™ Virtual Machine because the factory loaded web server uses applets.

Startup the web browser and input IP address of the drive as the homepage address.



The drive IP address

From your web browser, default http password and login are "USER".



From the Home page, you can access to 3 main menus:

Home	Monitoring	Drive Monitor Drive parameters
	Network Setup	Network Parameters Administration
	Diagnostics	TCP/IP Statistics Modbus Statistics

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Home Documentation...

Monitoring Network Setup Diagnostics

Home

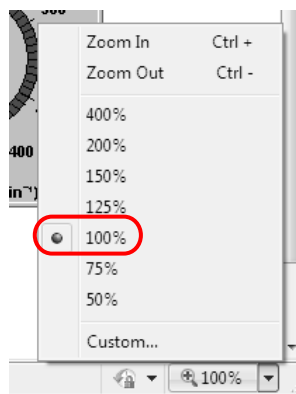
Language  
English



VF-S15  
3PH-230/240V-48V/50Hz  
DANGER

Web site version : 1.0.0.0  
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- If the screen does not appear well, please try to return the magnification of IE7 to 100%



## 8.2. Web pages structure

Each web page uses the same structure. Each main menu, "Monitoring", "Network Setup" and "Diagnostics" contains each own sub menu. Sub menus are displayed on the left side of web page.

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Home Documentation...

**Monitoring**

Monitoring

Drive Monitor

Drive parameters

**TOSVERT VF Series**

Network Setup Diagnostics



Web site version : 1.0.0.0  
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## 8.3. Drive Monitor (Main menu: Monitoring)

The state of the drive can be confirmed on this page.

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Home Documentation...

**Monitoring**

Monitoring

Drive Monitor

Drive parameters

**TOSVERT VF Series**

Network Setup Diagnostics

**Drive Monitor**

Station name

Device name

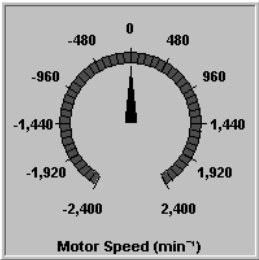
VF Status

Type-form

Output frequency	Hz	0.0
Output current	%	0.0
Frequency reference	Hz	22.0
Input voltage	%	128.0
Output voltage	%	0.0
Input power	kW	0.0
Output power	kW	0.0
Torque	%	0.0
Torque current	%	0.0
Motor cumulative load factor	%	0.0
Drive cumulative load factor	%	0.0
Braking res. cumulative load factor	%	0
Frequency ref. after comp.	Hz	0.0
VIA input value	%	0.0
VIB input value	%	0.0
VIC input value	%	0.0
Pulse train input (S2) value	koos	0

F	RY-RC	VIA	<input type="text" value="0.0"/>
R	OUT	VIB	<input type="text" value="0.0"/>
RES	FL	VIC	<input type="text" value="0.0"/>
S1	(S2)	FM	<input type="text" value="0.0"/>
S2	(VIB)	(OUT)	<input type="text" value="0.0"/>
S3	(VIA)		

( ): Selectable by parameter



**Motor Speed (min<sup>-1</sup>)**

## 8.4. Drive parameters (Main menu: Monitoring)

The parameters of the drive can be set on this page.

The left column is used to select a modify group (or list) of parameters. The right column displays the parameters, its Modbus address and its current value.

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Home Documentation...

Monitoring

Drive Monitor

Drive parameters

**TOSVERT VF Series**

Monitoring | Network Setup | Diagnostics

Rate 1000 IP address 192.168.0.31

Parameter	Address	UnitId	Description
AU1	0	0	Automatic acceleration/deceleration
AU2	1	0	Torque boost setting macro function
CMOd	3	0	Command mode selection
FMOd	4	0	Frequency setting mode selection 1
FMSL	5	0	Meter selection
FM	6	0	Meter adjustment gain
Fr	8	0	Forward/reverse run selection (Panel key)
ACC	9	0	Acceleration time 1
dEC	16	0	Deceleration time 1
FH	17	0	Maximum frequency
UL	18	0	Upper limit frequency
LL	19	0	Lower limit frequency
vL	20	0	Base frequency 1
vLv	1033	0	Base frequency voltage 1
Pt	21	0	V/F control mode selection

### ■Set the parameters

When you modify the drive parameter from the webserver, please press the set button, and input the PASSWORD. (The default password is "USER.")

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Home Documentation...

Monitoring

Drive Monitor

Drive parameters

**TOSVERT VF Series**

Monitoring | Network Setup | Diagnostics

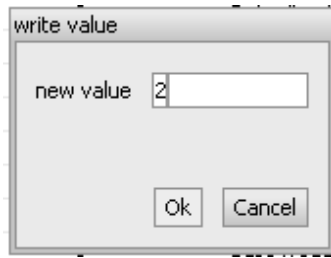
Rate 1000 IP address 192.168.0.31

Parameter	Address	UnitId	Description
AU1	0	0	Automatic acceleration/deceleration
AU2	1	0	Torque boost setting macro function
CMOd	3	0	Command mode selection
FMOd	4	0	Frequency setting mode selection 1
FMSL	5	0	Meter selection
FM	6	0	Meter adjustment gain
Fr	8	0	Forward/reverse run selection (Panel key)
ACC	9	0	Acceleration time 1
dEC	16	0	Deceleration time 1
FH	17	0	Maximum frequency
UL	18	0	Upper limit frequency
LL	19	0	Lower limit frequency
vL	20	0	Base frequency 1
vLv	1033	0	Base frequency voltage 1
Pt	21	0	V/F control mode selection



■Set the parameters value

Input the write value to popup window.



---

## 8.5. Network parameters (Main menu: Network Setup)

---

The network parameters of the drive can be confirmed on this page.

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Home Documentation...

Monitoring Network Setup Diagnostics

Network Setup

Network Parameters

Administration

### Network Parameters

<b>Profile</b>	Telegram 1
<b>IP Mode</b>	Manual
<b>IP address</b>	192.168.0.31
<b>Subnet mask</b>	255.255.255.0
<b>Gateway address</b>	0.0.0.0
<b>Device Name</b>	
<b>Station Name</b>	VFS15DEVICE

Save Abort Password

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## 8.6. Administration (Main menu: Network Setup)

The "web read password" and "web write password" of the webserver can be modify on this page.

Press the "Password" button, and enter the "web write password".

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Home Documentation...

Monitoring Network Setup Diagnostics

Administration

Web read password  Save

Web write password  Save

Abort Password

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After that, press the Enter key.

Administration

Web read password  Save

Web write password  Save

Abort Enter your password:

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Enter the new password, and press the "Save" button.

Administration

Web read password  Save

Web write password  Save

Abort Password

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## 8.7. TCP/IP statistics (Main menu: Diagnostics)

You can check TCP/IP status on this page.

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Home Documentation...

Diagnostics

TCP/IP Statistics

Modbus Statistics

**TOSVERT VF Series**

Monitoring Network Setup Diagnostics

**TCP/IP Statistics**

TCP/IP parameters		Receive statistics	
IP address	192.168.0.31	Frames received OK	27134
Subnet mask	255.255.255.0	CRC errors	0
Default gateway	0.0.0.0	Transmit statistics	
IP Mode	Manual	Frames transmitted OK	29632
Ethernet parameters		Collisions	0
MAC address	00-80-F4-D9-1B-	Carrier sense errors	0
Ethernet frame format	Ethernet II, IEEE 802.3 sender, IEEE 80	Excessive collisions	0
		Late collisions	0

## 8.8. Mod statistics (Main menu: Diagnostics)

You can check Modbus status on this page.

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Home Documentation...

Diagnostics

TCP/IP Statistics

Modbus Statistics

**TOSVERT VF Series**

Monitoring Network Setup Diagnostics

**Modbus Statistics**

Inbound/Outbound Statistics	
Opened TCP Connections	1
Send Modbus msg	14639
Received Modbus msg	14639
Modbus error message	0

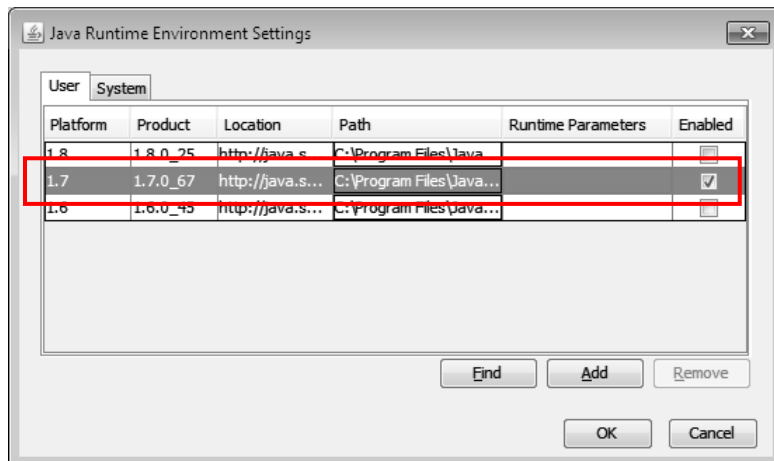
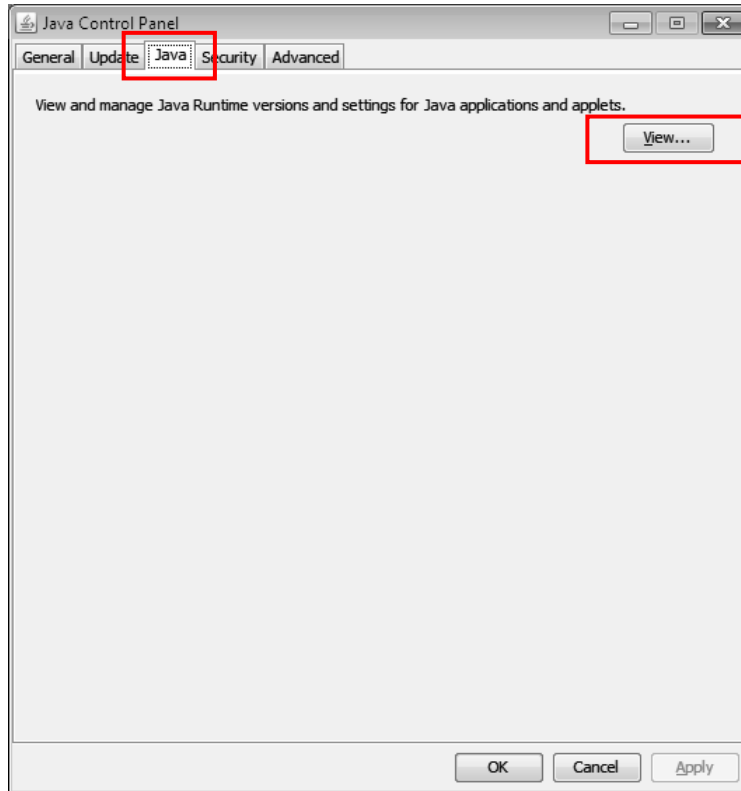
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## 8.9. Activation of JAVA7

To observe the webserver, the version of Java must be at least 1.7.67 in the bits version of your internet browser. We recommend using Internet Explorer. If the version 1.8.25 or other 1.8 version are already installed on your computer, you can install the 1.7.67 too.

### 8.9.1. Activate JAVA1.7 version

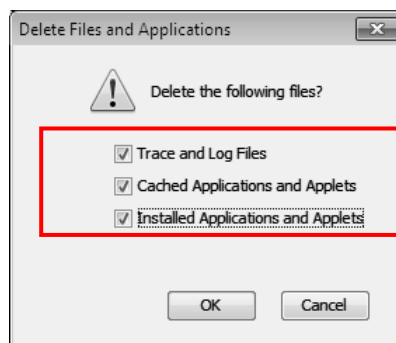
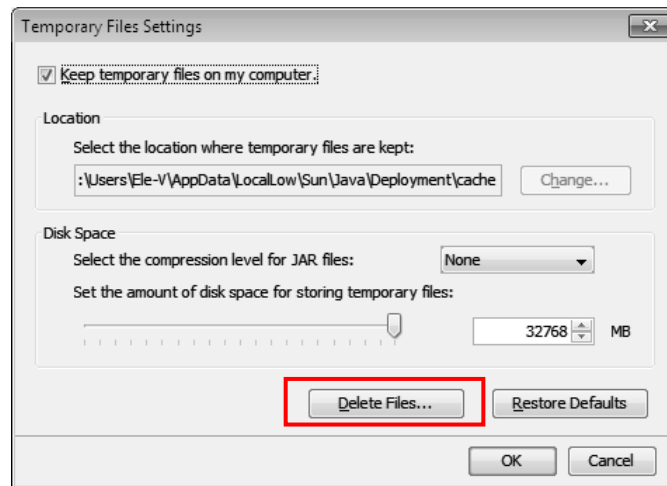
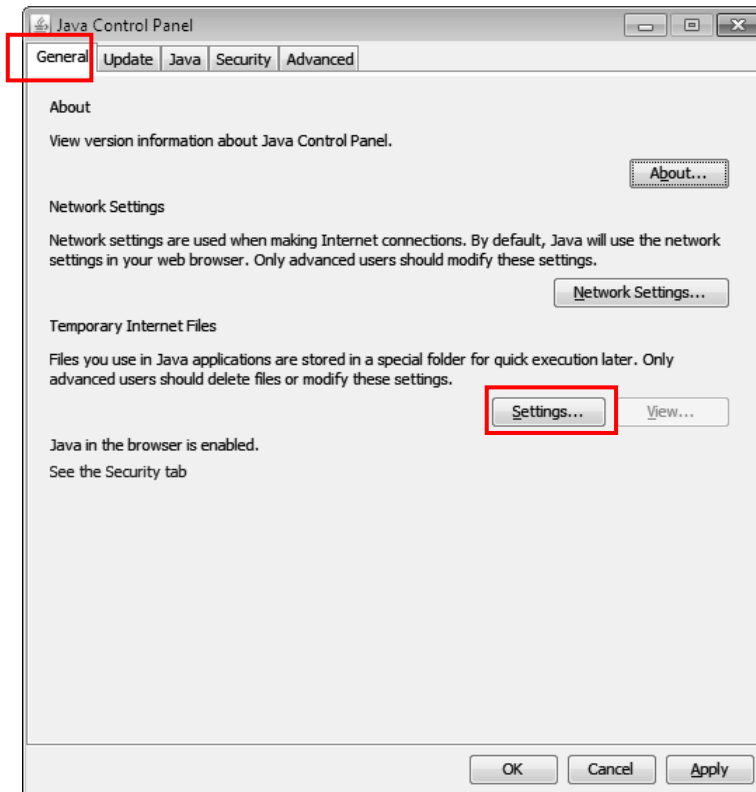
To configure your Java, please do following instructions:



After activation of 1.7.67 you can close this window with "OK".

8.9.2. Delete temporary files

If you had started a web server in the JAVA8, you will need to delete the temporary file with the following procedure.

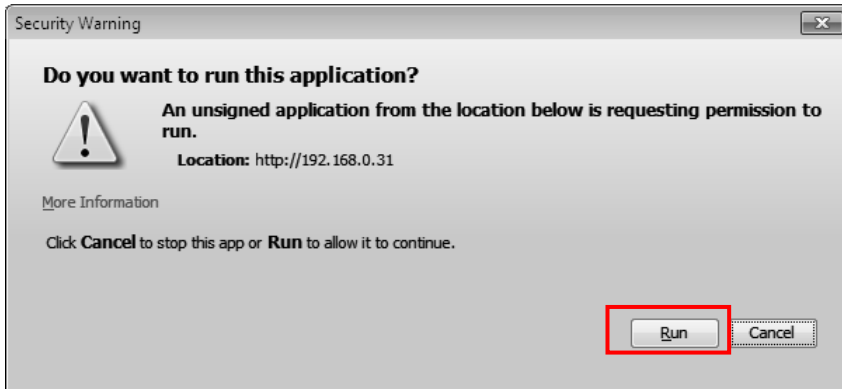


“OK” to validate and close this window.

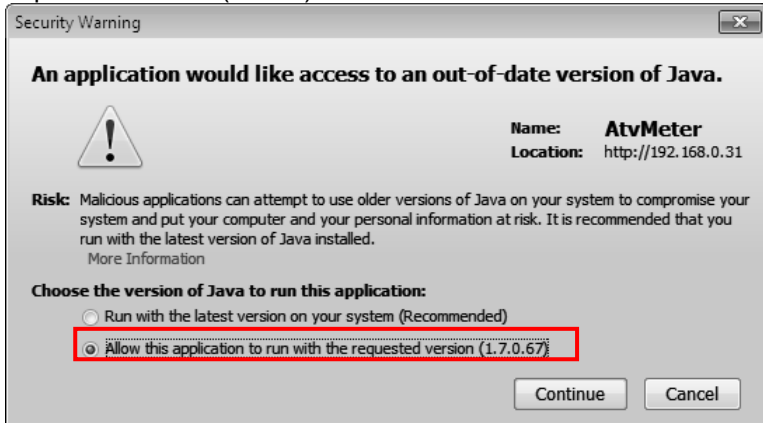
8.9.3. Launch webserver after activation

Launch the webserver and enter your username and password. After the loading of Java application, you will see bellow window.

Please select “Execute”.



After that, you will see a new window, please select “Authorize the execution of the application with the requested version (1.7.67)” and select “Continue”.



You will see the webserver correctly.

The screenshot shows the Toshiba webserver monitoring interface. At the top left is the Toshiba logo and "Leading Innovation >>>". Below it are navigation tabs: "Monitoring" (selected), "Network Setup", and "Diagnostics". The "Monitoring" tab is active, showing a "Drive Monitor" section. This section includes fields for "Station name" (VFS15DEVICE), "Device name", "VF Status" (STOP), and "Type-form" (VFS15-2007PM). Below these fields is a table of drive parameters:

Output frequency	Hz	0.0
Output current	%	0.0
Frequency reference	Hz	22.0
Input voltage	%	128.0
Output voltage	%	0.0
Input power	kW	0.0
Output power	kW	0.0
Torque	%	0.0
Torque current	%	0.0
Motor cumulative load factor	%	0.0
Drive cumulative load factor	%	0.0
Braking res. cumulative load factor	%	0
Frequency ref. after comp.	Hz	0.0
VIA input value	%	0.0
VIB input value	%	0.0
VIC input value	%	0.0
Pulse train input (S2) value	kpps	0

To the right of the table is a "Diagnostics" section with several input fields: F, R, RES, S1, S2, S3, (VIB), (VIA), RY-RC, OUT, FL, VIA, VIB, VIC, (S2), FM, (OUT). Below these fields is a gauge for "Motor Speed (min<sup>2</sup>)" with a scale from -2,400 to 2,400. At the bottom right, there is a note: "( ): Selectable by parameter".

TOSVERT VF Series

## 9. Specifications

### Module specifications

Item	Specification
Type-form	PNE001Z
Applicable inverter	VF-S15 CPU1 Ver.112 or later (With SBP009Z)
Connector	Dual RJ45 shielded connector
Supported network	PROFINET, Modbus TCP
Indicator	4 LEDs indicating the communication status and error status.
Protection degree	IP20
Environments	Correspond to inverter.

### Network specifications

Item		Specification
PROFINET	Baud rate	100Mbps (Full duplex)
	Cyclic communication	PROFIdrive V.4.1 (Telegram1)
		4PKW and 2 PZD vendor format (Telegram100)
		4PKW and 6 PZD vendor format (Telegram101)
		6 PZD vendor format (Telegram102)
	Acyclic communication	Reading the PROFIdrive parameter
		Reading/writing the inverter parameters
	Configuration	Configure by PROFINET master
IP configuration mode	Manual setup, DCP, DHCP, Embedded Web server	
PROFINET IO classes	Conformance Class-B	
I&M	I&M function 0	
Modbus TCP	Baud rate	10/100Mbps (Full/Half duplex)
	Supported function	Read Holding Registers (03H)
		Write Single Register (06H)
		Write Multiple Registers (10H)
		Read Device Identification (2BH)
IP configuration mode	Manual setup, DHCP, Embedded Web server	
Ethernet	MRP	Supported
	LLDP	Supported
	Web server	Inverter status monitor, inverter parameter monitor/configuration, Network status monitor, password lock