

FR-A5NPA

Frequency Inverter

Instruction Manual

Profibus/DP Communication Option

Thank you for choosing the Mitsubishi transistorized inverter option unit. This instruction manual gives handling information and precautions for use of this equipment. Incorrect handling might cause an unexpected fault. Before using the equipment, please read this manual carefully to use the equipment to its optimum.

This section is specifically about safety matters

Do not attempt to install, operate, maintain or inspect this product until you have read through this instruction manual and appended documents carefully and can use the equipment correctly. Do not use this product until you have a full knowledge of the equipment, safety information and instructions.

In this instruction manual, the safety instruction levels are classified into "WARNING" and "CAUTION".



WARNING

Assumes that incorrect handling may cause hazardous conditions, resulting in death or severe injury.



CAUTION

Assumes that incorrect handling may cause hazardous conditions, resulting in medium or slight injury, or may cause physical damage only.

Note that the CAUTION level may lead to a serious consequence according to conditions. Please follow the instructions of both levels because they are important to personnel safety.

SAFETY INSTRUCTIONS

1. Electric Shock Prevention



WARNING


- While power is on or when the inverter is running, do not open the front cover. You may get an electric shock.
- Do not run the inverter with the front cover removed. Otherwise, you may access the exposed high-voltage terminals and charging part and get an electric shock.
- If power is off, do not remove the front cover except for wiring or periodic inspection. You may access the charged inverter circuits and get an electric shock.
- Before starting wiring or inspection, switch power off, wait for more than 10 minutes, and check for no residual voltage with a tester or the like.



WARNING

- Any person who is involved in the wiring or inspection of this equipment should be fully competent to do the work.
- Always install the option unit before wiring. Otherwise, you may get an electric shock or be injured.
- Handle this option unit with dry hands to prevent an electric shock.
- Do not subject the cables to scratches, excessive stress, heavy loads or pinching. Otherwise, you may get an electric shock.
- While power is on, do not move the station number and baud rate setting switches. Doing so can cause an electric shock.


2. Injury Prevention

 CAUTION
<ul style="list-style-type: none">• Apply only the voltage specified in the instruction manual to each terminal to prevent burst, damage, etc.• Ensure that the cables are connected to the correct terminals. Otherwise, burst, damage, etc. may occur.• Always make sure that polarity is correct to prevent burst, damage, etc.• While power is on or for some time after power-off, do not touch the inverter as it is hot and you may get burnt.

3. Additional instructions

Also note the following points to prevent an accidental failure, injury, electric shock, etc.:

(1) Transportation and mounting


 CAUTION
<ul style="list-style-type: none">• Do not install or operate the option unit if it is damaged or has parts missing.• Do not stand or rest heavy objects on the product.• Check that the mounting orientation is correct.• Prevent screws, metal fragments or other conductive bodies or oil or other flammable substance from entering the inverter.

(2) Test operation and adjustment

 CAUTION
<ul style="list-style-type: none">• Before starting operation, confirm and adjust the parameters. A failure to do so may cause some machines to make unexpected motions.

(3) Usage

 WARNING
<ul style="list-style-type: none">• Do not modify the equipment.

 CAUTION
<ul style="list-style-type: none">• When parameter clear or all parameter clear is performed, each parameter returns to the factory setting. Re-set the required parameters before starting operation.• For prevention of damage due to static electricity, touch nearby metal before touching this product to eliminate static electricity from your body.

(4) Maintenance, inspection and parts replacement

 CAUTION
<ul style="list-style-type: none">• Do not test the equipment with a megger (measure insulation resistance).

(5) Disposal

 CAUTION
<ul style="list-style-type: none">• Treat as industrial waste.

(6) General instruction

<p>All illustrations given in this manual may have been drawn with covers or safety guards removed to provide in-depth description. Before starting operation of the product, always return the covers and guards into original positions as specified and operate the equipment in accordance with the manual.</p>

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1. PRE-OPERATION INSTRUCTIONS

1.1 Unpacking and Product Confirmation

Take the option unit out of the package, check the unit name, and confirm that the product is as you ordered and intact.

Note that the FR-A500/F500 series inverter and FR-V500 series inverter have different functions when the option is fitted.

Please check the SERIAL number of the inverter when using the FR-V500 series.

- SERIAL number check
 - This product may be used with the FR-V500 series manufactured in and after May 2002. Any of the models may be used with this unit if its SERIAL number indicated on the rating plate and package has "O25OOOOOO" or later version. For details on the SERIAL number, please contact your sales representative.
SERIAL is made up of 1 version symbol, 1 alphabet letter or numeric character indicating month, and 7 numeric characters indicating year and control number as shown below. (Only the first three digits of the control number are printed on the package.)

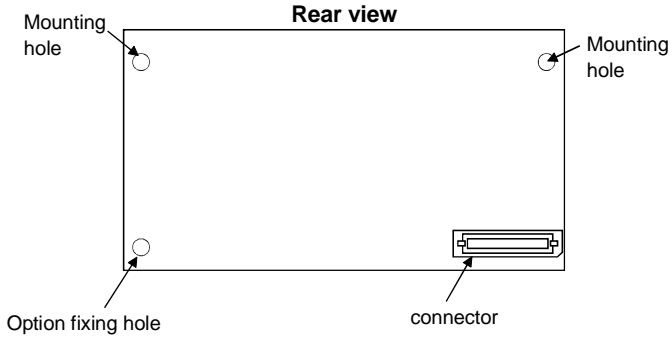
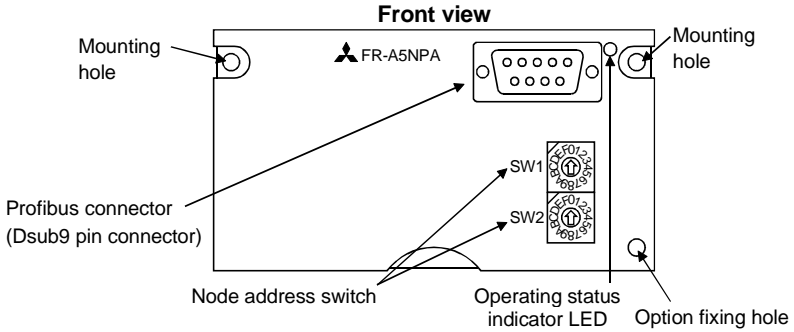
 O 2 5 OOOOOO
Symbol Year Month Control number
SERIAL number

1.2 Packing Confirmation

Make sure that the package includes the following

- Instruction manual.....1
- Mounting screws M3 × 62

1.3 Structure



Name	Function	
Node address setting switches	Used to set the inverter station number between 0H and 7DH. For details, refer to page 4.	
Operating status indicator LEDs (green)	off	Communication stops
	on	During communication
Profibus connector (Dsub9 pin connector)	Used to connect a Profibus cable for Profibus communication (Refer to page 7.)	

1.4 Inverter Specifications

Type	Inverter inboard option, to be connected with a connector (can be mounted/dismounted to/from the inverter front face)
Number of node occupied	One inverter occupies one node.
Cable	For 12Mbps communication (compliant with EEIA-RS-485 standard)

* When the option unit (FR-A5NPA) is plugged in, the protective structure (JEM1030) is open type (IP00).

1.5 Communication Specification


Communication speed	Wiring length 1200m maximum	9600bps, 19.2Kbps, 93.75Kbps
	Wiring length 600m maximum	187.5Kbps
	Wiring length 200m maximum	500Kbps, 1.5Mbps
	Wiring length 100m maximum	3Mbps, 6Mbps, 12Mbps

2. INSTALLATION

2.1 Pre-Installation Instructions

Make sure that the input power of the inverter is off.

CAUTION

 **With input power on, do not install or remove the option unit. Otherwise, the inverter and option unit may be damaged.**

2.2 Inverter Node Address Setting

Set the node address of the inverter on the Profibus network.

Set the inverter node address before switching on the inverter and do not change the setting while power is on.

The node address may be set between 0H and 7DH.

CAUTION

1. Do not set the node address to 7EH through FFH.
2. Depending on the master module, 0H, 1H, 2H, 7CH, 7DH may not be used.
3. The node address changed while powering on the inverter is not made valid. The node address setting is made valid either after power is reapplied or when the RES signal turns on.
4. You cannot set the same node address to other devices on the network. (Such setting disables normal communication.)

- Set the arrow ($\hat{\uparrow}$) of the corresponding switch to the required numeral.

Example:

- For node address 1H:

Set ($\hat{\uparrow}$) of SW1 to "0" and ($\hat{\uparrow}$) of SW2 to "1".



- For node address 7DH:

Set ($\hat{\uparrow}$) SW1 to "7" and the ($\hat{\uparrow}$) SW2 to "D".



REMARKS

Set each node address switch to the position of its numeral without error. If it is set to any position between numerals, normal data communication cannot be made.

Good example



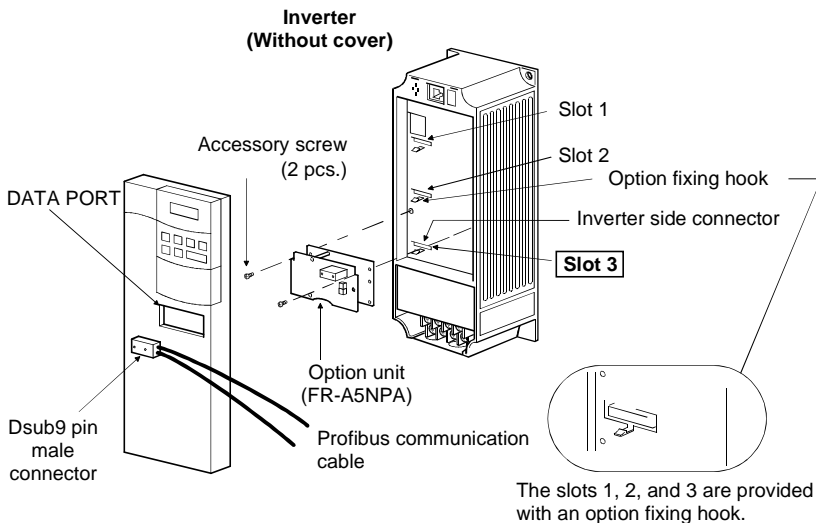
Bad example



2.3 Installation and Removal Procedure

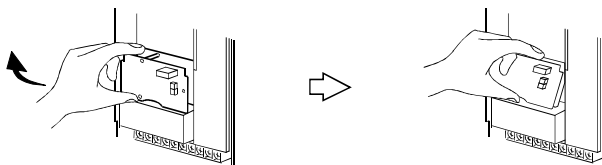
Mount the option unit to slot 3.

- (1) Remove the front cover from the inverter and remove the DATA PORT cover by pushing it from the back of the front cover.
- (2) Securely insert the connector of the option unit far into the connector of slot 3 in the inverter. At this time, fit the option fixing holes snugly. For the position of slot 3, refer to the illustration below.
Also be sure to fit the unit into the option fixing hook (For the FR-A500/FR-F500 series, it is available in Aug., 2000).
- (3) Securely fix the option unit to the inverter on both sides with the accessory mounting screws. If the screw holes do not line up, the connector may not have been plugged snugly. Check for loose plugging.
- (4) Reinstall the front cover of the inverter. (Refer to the inverter manual.)
- (5) Connect a Profibus communication cable to the Profibus connector (Dsub9 pin connector) of the option. (Refer to page 7 for a communication cable.)



INSTALLATION

- (6) To remove the option unit, remove the two left and right screws, and then hold the option unit and pull its bottom toward you as shown in the figure. (The option unit is fixed by the hook of the inverter.)



REMARKS

Perform wiring after the option unit (FR-A5NPA) was fitted and the inverter front cover was mounted.

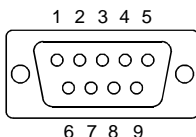
The option unit (FR-A5NPA) is valid only if it is fitted in slot 3.

When two or more communication option units are mounted, "E.OPT" error is displayed. Note that when the relay output/computer link unit (FR-A5NR) is mounted, only relay output is activated.

2.3.1 Profibus Communication Cable

Make a network communication cable using a Dsub9 pin male connector and a cable supporting 12Mbps communication.

(1) Pin arrangement of a connector



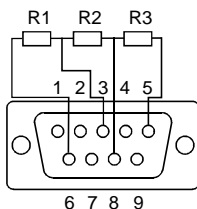
Dsub9 pin type male connector pin number	Signal	Application
1	SHIELD	Shield
2	N/C	Unconnected
3	RxD/TxD+	Receive/transmit + data
4	RTS *1	Control signal (transmission request from the inverter)
5	DGND *2	Data earth
6	+5VDC *2	Voltage output
7	N/C	Unconnected
8	RxD/TxD-	Receive/transmit - data
9	N/C	Unconnected

*1 It may not be necessary depending on the master module used.

*2 This signal is used to make the terminating resistor present.

(2) Terminating resistor

If the nodes at both ends of the network are the FR-A5NPA and inverter, connect a connector with a built-in terminating resistor.



R1=390Ω±2% 1/4W
 R2=220Ω±2% 1/4W
 R3=390Ω±2% 1/4W

3. INVERTER SETTING

3.1 List of Dedicated Communication Parameters

When this option unit is mounted, extended functions of the following parameters become available.

Perform setting as required.

FR-A500/F500 series parameter

Parameter Number	Name	Setting Range	Minimum Setting Increments	Factory Setting	Refer to page
338	Operation control command source	0, 1	1	0	15
339	Speed command source	0, 1	1	0	15
340	Link startup mode selection	0 to 2	1	0	12
500(*1)	Communication error recognition waiting time	0 to 999.8s	0.1s	0	19
501(*1)	Communication error occurrence count display	0	1	0	20
502(*1)	Communication error-time stop mode selection	0 to 2	1	0	21

*1 Pr. 500 to Pr. 502 are available only with the FR-A500 series.

Refer to the inverter manual for the availability of the parameters.

FR-V500 series parameter

Parameter Number	Name	Setting Range	Minimum Setting Increments	Factory Setting	Refer to page
338	Operation control command source	0, 1	1	0	17
339	Speed command source	0, 1	1	0	17
340	Link startup mode selection	0 to 2	1	0	12
400	DI11 terminal function selection	0 to 3, 5, 8 to 12, 14 to 16, 20, 22 to 27, 42 to 44, 9999	1	9999	—
401	DI12 terminal function selection				
402	DI13 terminal function selection				
500	Communication error recognition waiting time	0 to 999.8s	0.1s	0	19
501	Communication error occurrence count display	0	1	0	20
502	Communication error-time stop mode selection	0 to 2	1	0	21

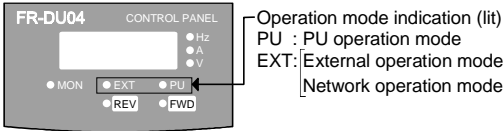
3.2 Operation Mode

The inverter mounted with the option unit (FR-A5NPA) has the following operation modes:

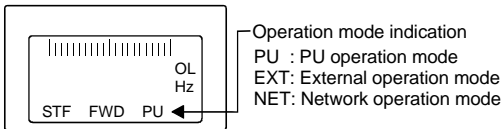
- (1) PU operation [PU] Controls the inverter from the keyboard of the operation panel (FR-DU04(-1)) or parameter unit (FR-PU04(V)) (referred to as the "PU") installed to the inverter.
- (2) External operation [EXT] Controls the inverter by switching on/off external signals connected to the control circuit terminals of the inverter.
- (3) Network operation [NET] Controls the inverter with instructions from the Profibus master module via the option unit (FR-A5NPA).
(The operation signal and running frequency can be entered from the control circuit terminals depending on the Pr. 338 "operation control command source" and Pr. 339 "speed command source" setting.)

3.2.1 Operation mode indication

FR-DU04(-1)



FR-PU04(V)



3.2.2 Operation mode switching

(1) Operation mode switching conditions

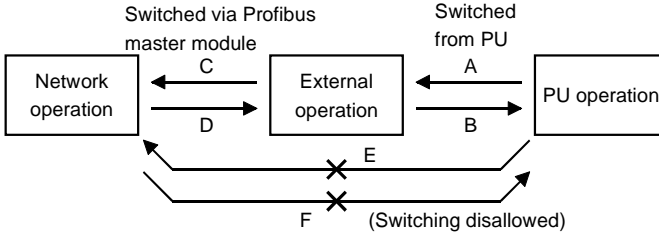
Before switching the operation mode, check that:

- 1) The inverter is at a stop;
- 2) Both the STF and STR signals are off; and
- 3) The Pr. 79 "operation mode selection" setting is correct.
(For setting, use the inverter's operation panel or optional parameter unit.)

Pr. 79 Setting	Operation Mode Selection	Switching to Network Operation Mode
0	PU or external operation	Disallowed when the PU mode is selected. Allowed when the external mode is selected.
1	PU operation	Disallowed
2	External operation	Allowed
3, 4	External/PU combined operation	Disallowed
5 ^{*1}	Programmed operation	Disallowed
6	Switch-over	Allowed
7	External operation (PU operation interlock)	Allowed only in the external operation mode when the PU interlock signal (X12) is on.
8	PU or external (signal switching)	Allowed only in the external operation mode (X16 on).

*1 Programmed operation is available only with the FR-A500 series.

(2) Operation mode switching method



Symbol	Switching Type	Switching Method
A	PU operation → External operation	Operate the external operation key on the PU.
B	External operation → PU operation	Operate the PU operation key on the PU.
C	External operation → Network operation	Switch to the network operation mode via Profibus master module.
D	Network operation → External operation	Switch to the external operation mode via Profibus master module.
E	PU operation → Network operation	Switching disallowed. Allowed if external operation is selected in A and network operation is then selected in C. *1
F	Network operation → PU operation	Switching disallowed. Allowed if external operation is selected in D and PU operation is then selected in B. *1

*1 In the switch-over mode (Pr. 79 = 6), switching in E and F is allowed.

CAUTION

1. When "1" or "2" is set in Pr. 340 "link startup mode selection", the operation mode is network operation at power on or inverter reset.
2. When setting "1" or "2" in Pr. 340, the initial settings of the inverter must be made without fail.

INVERTER SETTING

(3) Link startup mode selection (Pr. 340)

The operation mode at power on and at restoration from instantaneous power failure can be selected.

To choose the network operation mode, set "1" or "2" in Pr. 340.

After the link has started, parameter write is enabled by the Profibus master module.

Pr. 340 Setting	Pr. 79	Operation Mode	Mode at Power On or at Restoration from Instantaneous Power Failure
0 (Factory Setting)	0	PU or external operation	Inverter operates in the external operation mode.
	1	PU operation	Inverter operates in the PU operation mode.
	2	External operation	Inverter operates in the external operation mode.
	3	External/PU combined operation	Inverter operates in the external/PU combined operation mode. Input running frequency/running speed from the PU and the start signal from outside.
	4	External/PU combined operation	Inverter operates in the external/PU combined operation mode. Input running frequency/running speed from outside and the start signal from the PU.
	5*1	Programmed operation	Inverter operates in the programmed operation mode.
	6	Switch-over	Inverter operates in the external operation mode. Operation mode is switched while running.
	7	PU operation interlock	X12 signal ON Inverter operates in the external operation mode. (Operation mode can be switched to the PU operation mode from the parameter unit.) X12 signal OFF.... Inverter operates in the external operation mode.
	8	Operation mode switch-over by the external signal	X16 signal ON Inverter operates in the external operation mode. X16 signal OFF.... Inverter operates in the PU operation mode.

*1 Programmed operation is available only with the FR-A500 series.

Pr. 340 Setting	Operation Mode		Mode at Power On or at Restoration from Instantaneous Power Failure
	Pr. 79		
1, (2*2)	0	PU or network operation	Inverter operates in the network operation mode. (Profibus master module need not be used for switching)
	1	PU operation	Inverter operates in the PU operation mode.
	2	Network operation	Inverter operates in the network operation mode. (Profibus master module need not be used for switching.)
	3	External/PU combined operation	Inverter operates in the external/PU combined operation mode. Input running frequency/running speed from the PU and the start signal from outside.
	4	External/PU combined operation	Inverter operates in the external/PU combined operation mode. Input running frequency/running speed from outside and the start signal from the PU.
	5*1	Programmed operation	Inverter operates in the programmed operation mode.
	6	Switch-over	Inverter operates in the network operation mode. Operation mode is switched while running. Refer to the inverter manual for details.
	7	PU operation interlock	X12 signal ON Inverter operates in the network operation mode. (Operation mode can be switched to the external operation mode by the Profibus master module.) X12 signal OFF Inverter operates in the external operation mode.
	8	Operation mode switch-over by the external signal	X16 signal ON Inverter operates in the network operation mode. (Operation mode can be switched to the external operation mode by the Profibus master module.) X16 signal OFF Inverter operates in the PU operation mode.

*1 Programmed operation is available only with the FR-A500 series.

*2 When Pr. 340 = "2"

The inverter will resume the same operation state which was in before the instantaneous power failure occurrence when values other than "9999" are set in Pr. 57 (with restart).

(This setting is mainly used for computer link option (FR-A5NR).)

REMARKS

1. The Pr. 340 value may be changed from the PU in any operation mode.
2. Computer programming, which has stopped due to an instantaneous power failure or like during network operation, remains stopped even if power is recovered.
3. When Pr. 340 = "2":
When a start command is given from the network with restart enabled (Pr. 57 \neq 9999), a start command during power off (including instantaneous power failure and power failure) is stored. Therefore, the inverter resumes operation in the state before powering off at powering on again (power restoration).

3.3 Operation and Speed Command Source

In the network operation mode, commands from the external terminals and Profibus master module are as listed below.

(For Pr. 180 and higher (input terminal function selection), assigned signals differ depending on inverters. For details, refer to the inverter manual.)

3.3.1 FR-A500/F500 series

Control location selection	Pr. 338 "operation control command source"		0: NET	0: NET	1: External	1: External	REMARKS
	Pr. 339 "speed command source"		0: NET	1: External	0: NET	1: External	
Fixed functions (Functions equivalent to terminals)	Forward rotation command (STF)		NET	NET	External	External	
	Reverse rotation command (STR)		NET	NET	External	External	
	Start self-holding selection (STOP)		—	—	External	External	
	Output stop (MRS)		Combined	Combined	External	External	(*1, 2)
	Reset (RES)		Combined	Combined	Combined	Combined	
	Network operation frequency		NET	—	NET	—	
	2		—	External	—	External	
	4		—	External	—	External	
1		Compensation	External	Compensation	External		
Selective functions Pr. 180 to Pr. 186 settings	0	Low-speed operation command (RL)	NET	External	NET	External	Pr. 59 = 0
	1	Middle-speed operation command (RM)	NET	External	NET	External	Pr. 59 = 0
	2	High-speed operation command (RH)	NET	External	NET	External	Pr. 59 = 0
	3	Second function selection (RT)	NET	NET	External	External	
	4	Current input selection (AU)	—	Combined	—	Combined	
	5	Jog operation selection (JOG)	—	—	External	External	
	6	Automatic restart after instantaneous power failure selection (CS)	External	External	External	External	
	7	External thermal relay input (OH)	External	External	External	External	
	8	15-speed selection (REX)	NET	External	NET	External	Pr. 59 = 0
	9	Third function (X9)	NET	NET	External	External	
	10	FR-HC connection, FR-CV connection (inverter operation enable) (X10)	External	External	External	External	
	11	FR-HC connection, instantaneous power failure detection (X11)	External	External	External	External	
	12	PU operation external interlock (X12)	External	External	External	External	
	13	External DC injection braking start (X13)	NET	NET	External	External	
	14	PID control valid terminal (X14)	NET	External	NET	External	
	15	Brake opening completion signal (BRI)	NET	NET	External	External	
16	PU operation-external operation switching (X16)	External	External	External	External		

INVERTER SETTING

Control location selection	Pr. 338 "operation control command source"		0: NET	0: NET	1: External	1: External	REMARKS
	Pr. 339 "speed command source"		0: NET	1: External	0: NET	1: External	
Selective functions Pr. 180 to Pr. 186 settings	17	Load pattern selection-forward/reverse rotation boost switching (X17)	NET	NET	External	External	
	18	Magnetic flux-V/F switching (X18)	NET	NET	External	External	
	19	Load torque high-speed frequency (X19)	NET	NET	External	External	
	20	S-pattern acceleration/deceleration C selection terminal (X20) *3	NET	NET	External	External	
	22	Orientation command (X22) *3	NET	NET	External	External	
	23	Pre-excitation (LX) *3	NET	NET	External	External	
RH, RM, RL, RT selective functions	Remote setting (RH, RM, RL)		NET	External	NET	External	Pr. 59 = 1, 2
	Programmed operation group selection (RH, RM, RL) *4		—	—	—	—	Pr. 79 = 5 Network operation is disabled
	Stop-on-contact selection 0 (RL) *4		NET	External	NET	External	Pr. 270 = 1, 3
	Stop-on-contact selection 1 (RT) *4		NET	NET	External	External	

- External : Control by signal from external terminal is only valid.
NET : Control from Profibus master module is only valid.
Combined : Control from both external terminal and Profibus master module is valid.
— : Control from both external terminal and Profibus master module is invalid.
Compensation : Control by signal from external terminal is only valid if Pr. 28 "multi-speed input compensation" setting is "1".

- *1 If the FR-HC connection, FR-CV connection (inverter operation enable signal) (X10) is not assigned when "2" is set in Pr. 30 "regenerative function selection" (when the FR-HC or FR-CV is used) or if the PU operation interlock signal (X12) is not assigned when "7" (when the PU operation interlock function is set) is set in Pr.79 "operation mode selection" , this function is also used by the MRS terminal and therefore operation is only valid for the external terminal, independently of Pr. 338 and Pr. 339 settings.
*2 When the MRS signal is assigned to both network and external control, the output stop command is as listed below:

Network	External	Output Stop Command	
		Pr. 17 = 0	Pr. 17 = 2
ON	ON	Output stopped	Output not stopped
ON	OFF	Output stopped	Output stopped
OFF	ON	Output stopped	Output stopped
OFF	OFF	Output not stopped	Output stopped

- *3 This setting is valid only when the FR-A5AP option is mounted. (The FR-A5AP cannot be used with the FR-F500 series.)
*4 Programmed operation is available only with the FR-A500 series.

3.3.2 FR-V500 series

Control location selection	Pr. 338 "operation control command source"		0: NET	0: NET	1: External	1: External	REMARKS	
	Pr. 339 "speed command source"		0: NET	1: External	0: NET	1: External		
Fixed functions (Functions equivalent to terminals)	Forward rotation command (STF)		NET	NET	External	External		
	Reverse rotation command (STR)		NET	NET	External	External		
	Reset (RES)		Combined	Combined	Combined	Combined		
	External thermal relay (OH)		External	External	External	External		
	Computer link operation speed		NET	—	NET	—		
	2		—	External	—	External		
	1	Speed setting auxiliary		Compensation	External	Compensation	External	
		Magnetic flux command/regeneration torque restriction		External	External	External	External	
	3		—	External	—	External		
	Selective functions Pr. 180 to Pr. 183, Pr. 187 settings *1	0	Low-speed operation command, Remote setting (setting clear) (RL)	NET	External	NET	External	Pr. 59 ≠ 0: Remote setting
1		Middle-speed operation command, Remote setting (deceleration) (RM)	NET	External	NET	External		
2		High-speed operation command, Remote setting (acceleration) (RH)	NET	External	NET	External		
3		Second function selection (RT)	NET	NET	External	External		
5		Jog operation selection (JOG)	—	—	External	External		
8		15-speed selection (REX)	NET	External	NET	External		
9		Third function (X9)	NET	NET	External	External		
10		FR-HC connection, FR-CV connection (inverter operation enable) (X10)	External	External	External	External		
11		FR-HC connection (instantaneous power failure detection) (X11)	External	External	External	External		
12		PU operation external interlock (X12)	External	External	External	External		
14		PID control enable terminal (X14)	NET	External	NET	External		
15		Brake sequence opening completion signal (BR1)	NET	NET	External	External		
16		PU-external operation switchover (X16)	External	External	External	External		
20		S-pattern acceleration/deceleration C switchover (X20)	NET	NET	External	External		
22		Orientation command(X22)	NET	NET	External	External		
23		Pre-excitation/servo ON (LX)	NET	NET	External	External		
24		Output stop (MRS)	Combined	Combined	External	External	*2	
25		Start self-holding selection (STOP)	—	—	External	External		
26		Control mode changing (MC)	NET	NET	External	External		
27		Torque restriction selection (TL)	NET	NET	External	External		
42	Torque bias selection 1 (X42)	NET	NET	External	External			
43	Torque bias selection 2 (X43)	NET	NET	External	External			
44	P control selection (P/PI control switchover) (X44)	NET	NET	External	External			

External : Control by signal from external terminal is only valid.

NET : Control from Profibus master module is only valid.

Combined : Control from both external terminal and Profibus master module is valid.

— : Control from both external terminal and Profibus master module is invalid.

Compensation : Control by signal from external terminal is only valid if Pr. 28 "multi-speed input compensation" setting is 1.

INVERTER SETTING

- *1 For details of Pr. 180 to Pr. 183, Pr. 187 (input terminal function selection), refer to the inverter manual.
- *2 When the MRS signal is assigned for both network and external control, the output stop command is as indicated in the following table.

Network	External	Output Stop Command	
		Pr.17="0"	Pr.17="2"
ON	ON	Output stopped	Output not stopped
ON	OFF	Output stopped	Output stopped
OFF	ON	Output stopped	Output stopped
OFF	OFF	Output not stopped	Output stopped

3.4 Operation at Communication Error Occurrence

3.4.1 Operation selection at communication error occurrence (For the FR-A500/V500 series only)

You can select operations at error occurrences by setting Pr. 500 to Pr. 502 under network operation.

REMARKS

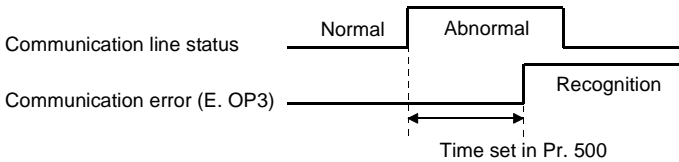
For the FR-A500, Pr. 500 to Pr. 502 are available with an upgraded inverter. Refer to the inverter manual for the availability of the parameters.

• Parameter setting

1) **Pr. 500 "communication error recognition waiting time"**

You can set the waiting time from when a communication line fault occurs until it is recognized as a communication error.

Parameter Number	Setting Range	Minimum Setting Increments	Factory Setting
500	0 to 999.8s	0.1s	0



If the communication line fault still persists after the time set in Pr. 500 has elapsed, it is recognized as a communication error.

When the fault is restored to normal communication within the set time, it is not regarded as a communication error and operation continues.

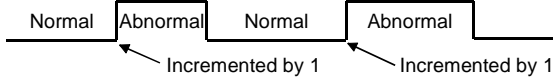
INVERTER SETTING

2) Pr. 501 "communication error occurrence count display"

The cumulative number of communication error occurrences can be indicated. Write 0 to erase this cumulative count.

Parameter Number	Setting Range	Minimum Setting Increments	Factory Setting
501	0	1	0

Count timing depending on communication line status



At the point of communication line fault occurrence, Pr. 501 "communication error occurrence count display" is incremented by 1.

CAUTION

The communication error occurrence count is stored into RAM temporarily. Since this data is stored in E²PROM at one-hour intervals, performing power-on reset or inverter reset may cause the Pr. 501 data to be the value stored in E²PROM the last time depending on the reset timing.

3) Pr. 502 "communication error-time stop mode selection"

You can select the inverter operation if a communication line fault or a fault of the option unit itself occurs.

Parameter Number	Setting Range	Minimum Setting Increments	Factory Setting
502	0, 1, 2	1	0

About setting

• At Fault Occurrence

Fault	Pr. 502 Setting	Operation	Indication	Alarm output
Communication line	0	Continued*	Normal indication*	Not provided*
	1			
	2			
Option itself	0	Coast to stop	E. 3 lit	Provided
	1, 2	Decelerated to stop	E. 3 lit after stop	Provided after stop

* If the fault status returns to the normal communication status within the time set in Pr. 500 , communication line fault (E.OP3) does not occur.

• At Fault Recognition after Elapse of Pr. 500 Time

Fault	Pr. 502 Setting	Operation	Indication	Alarm output
Communication line	0	Coast to stop	E.OP3 lit	Provided
	1	Decelerated to stop	E.OP3 lit after stop	Provided after stop
	2	Decelerated to stop	E.OP3 lit after stop	Not provided
Option itself	0	Coast to stop	E. 3 lit	Provided
	1, 2	Decelerated to stop	E. 3 lit after stop	Provided after stop

• At Fault Removal

Fault	Pr. 502 Setting	Operation	Indication	Alarm output
Communication line	0	Kept stopped	E.OP3 kept lit	Kept provided
	1			
	2	Restart	Normal indication	Not provided
Option itself	0	Kept stopped	E. 3 kept lit	Kept provided
	1, 2			

CAUTION

1. A communication line fault [E.OP3 (alarm data: HA3)] is a fault that occurs on the communication line, and a fault of the option unit itself [E. 3 (alarm data: HF3)] is a communication circuit fault in the option.
2. The alarm output is the ABC contact output or alarm bit output.
3. When the Pr. 502 setting is "1" or "2", the deceleration time is the ordinary deceleration time setting (e.g. Pr. 8, Pr. 44, Pr. 45).
4. The acceleration time at a restart is the ordinary acceleration time setting (e.g. Pr. 7, Pr. 44).
5. When the Pr. 502 setting is "2", the operation/speed command at a restart is the one given before the fault occurrence.
6. When the setting was made to provide an alarm output, the fault definition is stored into the alarm history.
(The fault definition is written to the alarm history when an alarm output is provided.)
When no alarm output is provided, the fault definition overwrites the alarm indication of the alarm history temporarily, but is not stored.
After the fault is removed, the alarm indication is reset and returns to the ordinary monitor, and the alarm history returns to the preceding alarm indication.
7. When a communication line fault occurs at the Pr. 502 setting of "2", removing the fault during deceleration causes acceleration to restart at that point.
(Acceleration is not restarted if the fault is that of the option unit itself.)

3.4.2 Alarm and measures

(1) The inverter operates as follows at alarm occurrences

Fault Location	Status		Operation Mode		
			PU operation	External operation	Network operation
Inverter alarm	Inverter operation		Inverter trip	Inverter trip	Inverter trip
	Data communication		Continued	Continued	Continued
Communication line alarm	Inverter operation		Continued	Continued	Inverter trip (Depends on the Pr. 502 setting)
	Data communication		Stop	Stop	Stop
Option itself	Communication option connection fault	Inverter operation	Inverter trip (Depends on the Pr. 502 setting)	Inverter trip (Depends on the Pr. 502 setting)	Inverter trip (Depends on the Pr. 502 setting)
		Data communication	Continued	Continued	Continued
	FR-A5NPA alarm	Inverter operation	Continued	Continued	Inverter trip (Depends on the Pr. 502 setting)
		Data communication	Stop	Stop	Stop

(2) Measures at alarm occurrences

Alarm Indication	Alarm Definition	Measures
E. OP3	Communication line alarm	Check the LED states of the option unit (FR-A5NPA) and remove the cause of the alarm. (Refer to page 2 for the LED indication status.) Check the Profibus master module.
E. 3	Option alarm	Check the connection between the inverter and option unit (FR-A5NPA) for poor contact, etc. and remove the cause of the alarm.

When alarms other than the above are displayed, refer to the inverter manual and remove the cause of the alarm.

3.4.3 Inverter reset

Which resetting method is allowed or not allowed in each operation mode is described below.

Resetting Method		Operation Mode		
		Network operation	External operation	PU operation
Profibus master module	Inverter reset • Inverter reset can be made any time.	Allowed	Disallowed	Disallowed
	Error reset at inverter fault • Reset can be made only when the protective function of the inverter is activated.	Allowed	Allowed	Allowed
Connect terminals RES-SD		Allowed	Allowed	Allowed
Switch off inverter power		Allowed	Allowed	Allowed

CAUTION

- 1. When a communication line fault has occurred, reset cannot be made from the Profibus master module.**
- 2. The inverter is set to the external operation mode if it has been reset in the network operation mode.**
To resume the network operation, the inverter must be switched to the network operation again.
(When "1" or "2" is set in Pr. 340 "link startup mode selection", switching is not needed. Refer to page 12.)
- 3. Communication stops for about 1 s during inverter reset.**

3.5 Instructions

For the FR-A500/F500 series, use the factory-set values when using Pr. 37 "speed display" and Pr. 144 "speed setting switchover". The inverter may not function correctly if the setting was changed.

4. FUNCTION OVERVIEW

4.1 Function Overview

The following table lists the functions that can be controlled from the Profibus master module.

Control Location	Item	Operation Mode		
		PU operation	External operation	Network operation
Profibus	Operation command/Output frequency setting	Disallowed	Disallowed	Allowed
	Monitor	Allowed	Allowed	Allowed
	Parameter write	Disallowed *3	Disallowed *3	Allowed *3
	Parameter read	Allowed	Allowed	Allowed
	Inverter reset	Disallowed	Disallowed	Allowed *1
	Error reset at inverter fault	Allowed *1	Allowed *1	Allowed *1
	Stop command (*2)	Disallowed	Disallowed	Allowed
Control circuit terminal	Inverter reset terminal	Allowed	Allowed	Allowed
	Operation command/Output frequency setting	Disallowed	Allowed	Allowed *4

*1 At a communication error, reset cannot be made from the master module.
(For inverter reset, refer to the inverter manual.)

*2 As set in Pr. 75 "PU stop selection".

*3 As set in Pr. 77 "parameter write disable selection".

For parameters write-enabled during operation, refer to the inverter manual.

*4 As set in Pr. 338 and Pr. 339. (Refer to pages 15, 17.)

CAUTION

The external operation mode is selected when the inverter is reset from the master module in the network operation mode.

Setting "1" or "2" in Pr. 340 selects the network operation mode.

4.1.1 Input from master module to inverter

(1) Operation command

The following items can be output any time from the master module to the inverter as operation commands. (Refer to pages 39, 46)

FR-A500/F500 series		FR-V500 series	
Terminal	Operation Command (Signal)	Terminal	Operation Command (Signal)
STF	Forward rotation command (STF)	STF	Forward rotation command (STF)
STR	Reverse rotation command (STR)	STR	Reverse rotation command (STR)
RH	High speed operation command (RH) *1	DI1	Low speed operation command (RL) *1
RM	Middle speed operation command (RM) *1	DI2	Middle speed operation command (RM) *1
RL	Low speed operation command (RL) *1	DI3	High speed operation command (RH) *1
JOG	Jog operation selection (JOG) *1	DI4	Second function selection (RT) *1
RT	Second function selection (RT) *1	DI11	— *2
AU	Current input selection (AU) *1	DI12	— *2
CS	Instantaneous power failure restart selection (CS) *1	DI13	— *2
MRS	Output stop (MRS)	MRS	Output stop (MRS)

*1 These are factory-set signals. Input signals can be changed by input terminal function selection (Pr. 180 and higher). Note that some signals do not accept a command from the master module according to the settings. Refer to page 15 for details. Signals to be assigned to input terminal function selection (Pr. 180 and higher) differ according to the inverters. For details, refer to the inverter manual.

*2 Signals can be assigned using input terminal function selection (Pr. 400 to Pr. 402). Refer to page 8. (when the FR-A5NPA is connected)

(2) Set frequency/set speed

Write a setting change from the master module to the inverter. (Refer to pages 38, 45.)

(3) Parameter write

You can write a function from the master module. Note that writing a function during inverter operation will result in a write mode error. (Refer to pages 35, 42.) Refer to the inverter manual for parameter details.

(4) Inverter reset

You can reset the inverter or reset an inverter error. (Refer to pages 37, 44, 50, 60.)

4.1.2 Output from inverter to master module

(1) Monitor function

You can monitor the following items from the master module.

- 1) Running frequency :0.01Hz increments (FR-A500/F500 series)
(Refer to page 38.)

Running speed : 1r/min increments (FR-V500 series) (Refer to page 45.)

- 2) Alarm definition : Refer to page 51 for the FR-A500/F500 series and page 61 for the FR-V500 series.

- 3) Special monitoring: Monitor data set by the real time monitor (P1.1 to P1.37). Refer to page 48 for the FR-A500/F500 series and page 57 for the FR-V500 series.

4) Inverter status

Inverter output signal can be monitored by the PNU. (Refer to pages 38, 45.)

FR-A500/F500 series	FR-V500 series
Output Definition (Signal)	Output Definition (Signal)
Inverter running (RUN)	Inverter running (RUN)
Forward running	Forward running
Reverse running	Reverse running
Up to frequency (SU)	Up to speed (SU)
Overload alarm (OL)	Overload alarm (OL)
Instantaneous power failure or under voltage (IPF)	Instantaneous power failure or under voltage (IPF)
Frequency detection (FU)	Speed detection (FB)
Alarm output (ABC)	Alarm output (ABC)

(2) Parameter read

You can read a function to the master module. (Refer to pages 35, 42.)
Refer to the inverter manual for parameter details.

5. Profibus PROFILES

5.1 Profibus Device Data

MEAU0865A. GSD is a GSD file designed to recognize the features and functions of the Profibus DP devices of the FR-A5NPA.

You can obtain it from us. Please contact your sales representative.

When editing this file, use a text editor.

For installation instruction, refer to the instruction manual of the Profibus-DP Configuration Software.

<MEAU0865A.GSD>

Parameter	Value	Description*1
#Profibus_DP		File header
GSD_Revision	1	ID version of GSD file
Vendor_Name	"Mitsubishi Electric"	Manufacturer's name*2
Model_Name	"FR-A5NPA"	Product name
Revision	"Revision 2.00"	Product version
Ident_Number	0865AH	Device number obtained from Profibus Nutzer Organization
Protocol_Ident	0	Profibus-DP is 0.
Station_Type	0	DP slave is 0.
FMS_Supp	0	FMS (Field-Bus Message Specifications) not supported.
Hardware_Release	"Series A"	Hardware version
Software_Release	"Revision 2.00"	Software version
9.6_supp	1	Communication speed 9600bps support
19.2_supp	1	Communication speed 19.2Kbps support
93.75_supp	1	Communication speed 93.75Kbps support
187.5_supp	1	Communication speed 187.5Kbps support
500_supp	1	Communication speed 500Kbps support
1.5M_supp	1	Communication speed 1.5Mbps support
3.0M_supp	1	Communication speed 3.0Mbps support
6.0M_supp	1	Communication speed 6.0Mbps support
12.0M_supp	1	Communication speed 12.0Mbps support
MaxTsstr_9.6	60	Longest time 60 bit times at 9600bps communication speed
MaxTsstr_19.2	60	Longest time 60 bit times at 19.2Kbps communication speed
MaxTsstr_93.75	60	Longest time 60 bit times at 93.75Kbps communication speed
MaxTsstr_187.5	60	Longest time 60 bit times at 187.5Kbps communication speed
MaxTsstr_500	100	Longest time 100 bit times at 500Kbps communication speed

Parameter	Value	Description*1
MaxTsd_r_1.5M	150	Longest time 150 bit times at 1.5MKbps communication speed
MaxTsd_r_3.0M	250	Longest time 250 bit times at 3.0Mbps communication speed
MaxTsd_r_6.0M	450	Longest time 450 bit times at 6.0Mbps communication speed
MaxTsd_r_12.0M	800	Longest time 800 bit times at 12.0Mbps communication speed
Redundancy	0	Redundancy not supported.
Repeater_Ctrl_Sig	2	Installed as TTL level via RTS signal from module.
24V_Pins	0	24V power supply for maintenance device connection is not used.
Freeze_Mode_supp	1	Freeze mode supported.
Sync_Mode_supp	1	Synchronous mode supported.
Auto_Baud_supp	1	Automatic baud rate detection support
Set_Slave_Add_supp	0	Slave address is not set.
Min_Slave_Intervall	1	100µs interval between 2 polling cycles
Modular_Station	1	Modular device specified.
Max_Module	1	Maximum number of modules: 1
Max_Input_Len	28	Input data: Maximum 28 bytes
Max_output_Len	28	Output data: Maximum 28 bytes
Max_Data_Len	56	Input and output data: Maximum 28 + 28 = 56 bytes
Fail_Safe	0	Failsafe not supported
Max_Diag_Data_Len	6	Diagnostic data of 6 bytes secured (no external diagnosis)
Slave_Family	1	Drives defined as function class (Main Family)
PrmText	1	Text selection 1 registration
Text(0)	"No byte swapping"	If Bit 0 = 0, "No byte swapping"
Text(1)	"Byte swapping"	If Bit 0 = 1, "Byte swapping"
EndPrmText		
ExtUserPrmData	1 "Byte swapping"	Byte swapping selection 1 registration on text base
Bit(0) 0 0-1		Bit 0 = default 0, range 0 to 1
Prm_Text_Ref	1	Text selection 1 is used.
EndExtUserPrmData		
Max_User_Prm_Data_Len	2	User parameter of 2 bytes secured
Ext_User_Prm_Data_Const(0)	01H	Initial value of user parameter's first byte

Parameter	Value	Description*1
Ext_User_Prm_Data_Const(1)	00H	Initial value of user parameter's second byte
Ext_User_Prm_Data_Ref(1)	1	Byte swapping selection 1 is used on text base in user parameter's second byte.
Module	"PPO type 1" F3H, F1H	PPO type 1 selection
EndModule		
Module	"PPO type 2" F3H, F5H	PPO type 2 selection
EndModule		
Module	"PPO type 3" F1H	PPO type 3 selection
EndModule		
Module	"PPO type 4" F5H	PPO type 4 selection
EndModule		
Module	"PPO type 5" F3H, F9H	PPO type 5 selection
EndModule		

*1 Description is not included in the ASCII file itself.

*2 Use "Mitsubishi" if the maximum number of characters of the vendor-name of the master used is 10.

5.2 Slave User Parameter

By changing the slave user parameter value, you can use the byte swapping function (byte inversion function).

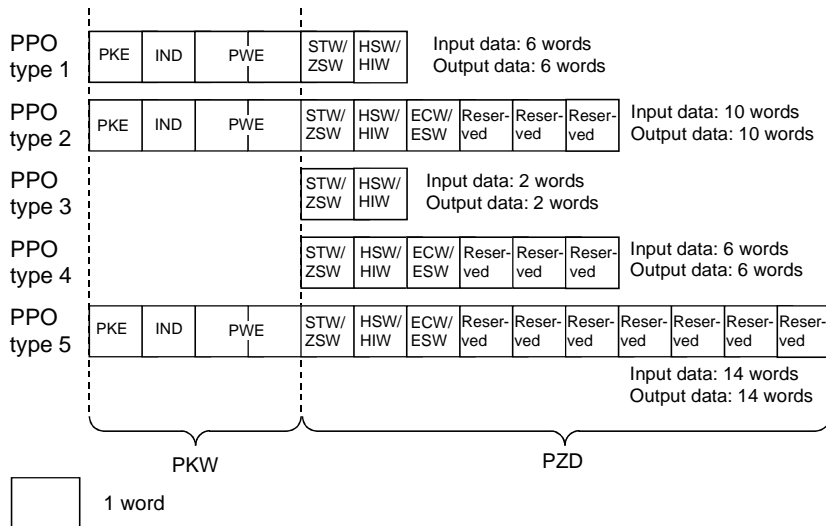
Setting "1" at Address 1H (Bit 0) makes the byte swapping function valid. Since "-" is an unused bit, set "0".

Address	Function							
0H	For manufacturer's setting (Value should be "1".)							
1H	15 Bit	14 Bit	13 Bit	12 Bit	11 Bit	10 Bit	9 Bit	8 Bit
	-	-	-	-	-	-	-	-
	7 Bit	6 Bit	5 Bit	4 Bit	3 Bit	2 Bit	1 Bit	0 Bit
	-	-	-	-	-	-	-	0:Byte swapping invalid 1:Byte swapping valid

5.3 Profibus Profiles

The option unit operates as a "slave of the Profibus DP master" or a "controller equivalent to Profibus DP master class 1 on an RS-485 network".

The Profibus profile (data buffer) can be selected from among five different types, "PPO type 1" to "PPO type 5". Change the Module type in the slave module setting. For details, refer to the instruction manual of the Network Master Configuration Software.



5.3.1 ID definitions

ID	Description	
PKW	PKE	PNU number (PNU) and task or response Id (AK)
	IND	Sub-Index number and reserved area for extension
	PWE	Set 0 since high bits (Bits 16 to 31) are not used. Low bits (Bits 0 to 15): Parameter value
PZD	STW/ ZSW	STW :Control word (command request) ZSW :Status word (command response)
	HSW/ HIW	HSW :Set frequency/set speed (command request) HIW :Running frequency/running speed (command response)
	ECW/ ESW	ECW :Extended control word (command request) ESW :Extended status word (command response)
	Reserved	Reserved area for extension

* Command request :Message from master to slave
 Command response :Message from slave to master

5.3.2 Buffer memory map

The following shows the buffer memory map of the PPO type 1 to PPO type 5 Profibus profiles.

1Word	2Word	3Word	4Word	5Word	6Word	7Word	8Word	9Word	10Word	11Word	12Word	13Word	14Word
PKE	IND	PWE	STW/ ZSW	HSW/ HIW									
PPO type 1													
PKE	IND	PWE	STW/ ZSW	HSW/ HIW	ECW/ ESW	Reser- ved	Reser- ved	Reser- ved					
PPO type 2													
STW/ ZSW	HSW/ HIW												
PPO type 3													
STW/ ZSW	HSW/ HIW	ECW/ ESW	Reser- ved	Reser- ved	Reser- ved								
PPO type 4													
PKE	IND	PWE	STW/ ZSW	HSW/ HIW	ECW/ ESW	Reser- ved	Reser- ved	Reser- ved	Reser- ved	Reser- ved	Reser- ved	Reser- ved	Reser- ved
PPO type 5													

5.3.3 Points to note

Only when the contents of the command request (request for changing the inverter setting: PKW, HSW, STW/ECW) from the master changed, the inverter processes the request. If the contents of the command request are identical with those of the last request, the inverter does not process the request. (The received request is cleared.)

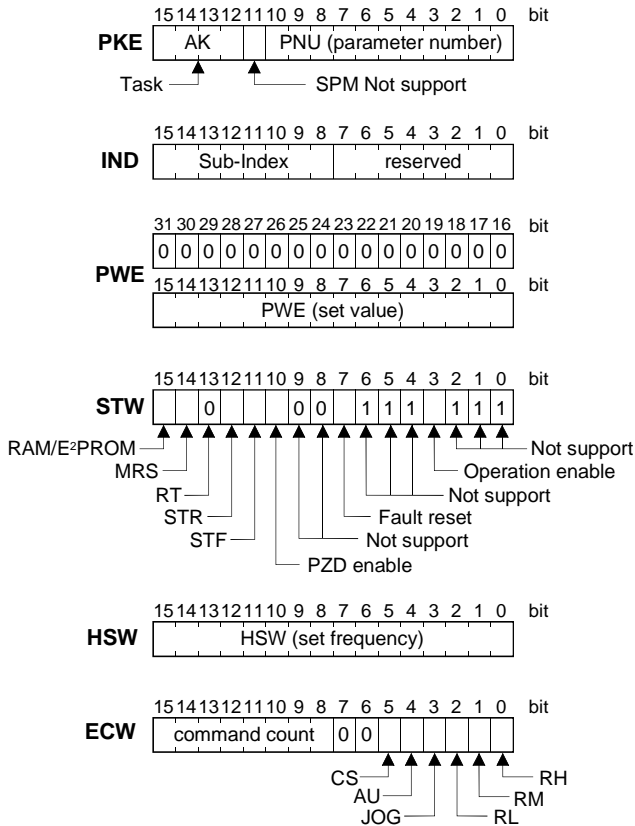
For instance, while the master keeps sending the "network operation mode enabled" command, changing the mode to the PU operation mode with switchover function does not allow the "network operation mode enabled" command to be executed due to the same contents as that sent last time. Therefore, the operation mode remains the PU operation mode without changing to the network operation mode. In this case, send another command as "PU operation mode enabled" from the master once, then send the "network operation mode enabled" command again.

6. BUFFER MEMORY DETAILS

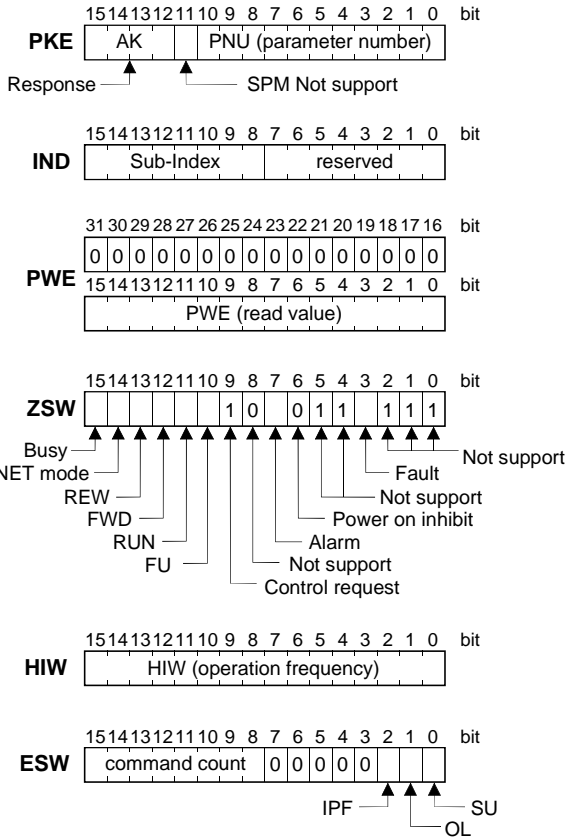
6.1 FR-A500/F500 Series

The following indicates the buffer memory details of the FR-A500/F500 series Profibus profiles.

Master→Slave (command request)



Slave → Master (command response)



FR-A500/F500 series

Name		Bit	Description
PKW	PKE	PNU	0 to 10 PNU number
		SPM	11 Not used (0 is set)
		AK	12 to 15 [Command request] 0:No task 1:Parameter value is requested (read request) 2:Parameter value (word) is changed (write request) 3 to 5:Not supported 6:Parameter value (array) is requested (read request) 7:Parameter value (array word) is changed (write request) 8 to 15:Not supported [Command response] 0:No response 1:Parameter value (word) is transferred. 2 to 3:Not supported 4:Parameter value (array word) is transferred. 5 to 6:Not supported 7:Command execution error (error number is stored into PWE) 8 to 15:Not supported
	IND	0 to 7	Reserved area for extension (0 is set)
		8 to 15	Sub-Index number At command request, set this number when AK = 6 or 7.

BUFFER MEMORY DETAILS

FR-A500/F500 series

Name		Bit	Description	
PKW	PWE	0 to 15	PNU read value/write value When command response AK = 7 (command execution error), PWE definition is as follows.	
			Error Definition	
			0	Invalid PNU
			1	Parameter value unchangeable (This error also occurs when Pr. 77 = 1)
			2	Outside setting range
			3	Invalid Sub-Index number
			4	No array
			11	No parameter change right
			18	Other error (*1)
			*1 Error Definition	
<ul style="list-style-type: none"> • Outside AK number range • Write data error • External operation error • Without option error • Instruction code error • With STF error • With STR error • With operation mode specification error • Calibration error (Pr. 900 and later) • Reset disabled error (per Pr. 75 reset input specification) 				
16 to 31	Not used (0 is set)			

FR-A500/F500 series

Name		Bit	Description
PZD	STW	-	0 to 2 Not used (1 is set)
		Control enable	3 0:Inverter output shutoff 1:Inverter output shutoff is cancelled
		-	4 to 6 Not used (1 is set)
		Fault reset	7 [At inverter error] 0:No action 1:Inverter reset [When inverter is normal] No action
		-	8 to 9 Not used (0 is set)
		PZD enable	10 0:Command request of PZD is not processed. (*1) 1:Command request of PZD is processed. • At power-on or inverter reset, set 1 once.
		STF signal	11 0:OFF 1:ON (Forward rotation command)
		STR signal	12 0:OFF 1:ON (Reverse rotation command)
		RT terminal	13 0:RT-OFF 1:RT-ON Factory-set to the second function selection Pr. 183 can be used to change the signal. (*2)
		MRS signal	14 0:OFF 1:ON (Output shutoff)
RAM/ E ² PROM	15 0:Set frequency (HSW) is written to RAM (Power-on reset returns the changed set frequency to the setting before it was written to RAM.). 1:Set frequency (HSW) is written to E ² PROM.		

*1 PZD enable and command count request can be executed.

*2 Refer to the inverter manual for details of the input terminal function selection (Pr. 180 to Pr. 186).

BUFFER MEMORY DETAILS

FR-A500/F500 series

Name		Bit	Description
PZD	ZSW	-	0 to 2 Not used (1 is returned)
		Fault (Alarm signal)	3 0:Inverter normal 1:Inverter alarm occurrence
		-	4 to 5 Not used (1 is returned)
		Power-on inhibit	6 0 is returned
		Alarm	7 0:Command execution normal 1:Command execution error
		-	8 Not used (0 is returned)
		Control request	9 1 is returned
		FU signal	10 0:OFF 1:ON (Output frequency being detected) Refer to Pr. 42 and Pr. 43 in the inverter manual.
		RUN signal	11 0:OFF 1:ON (Inverter running)
		FWD	12 0:Other than forward operation being performed (at a stop, reverse rotation operation being performed) 1:Forward rotation operation being performed
		REW	13 0:Other than reverse operation being performed (at a stop, forward rotation operation being performed) 1:Reverse rotation operation being performed
		Operation mode	14 0:Other than network operation mode 1:Network operation mode
	BUSY	15 0:Ready status 1:Busy status If it takes time to perform slave side processing, slave side busy status is announced since reply to master will be delayed. In busy status, other response data are unfixed values. When slave side is busy, request from master is invalid. Therefore, the same request must be sent again. During busy status, 0 is returned for all Bits except for Bit 15.	
	HSW	0 to 15 Set frequency (0.01 Hz increments)	
HIW	0 to 15 Running frequency (0.01 Hz increments)		

FR-A500/F500 series

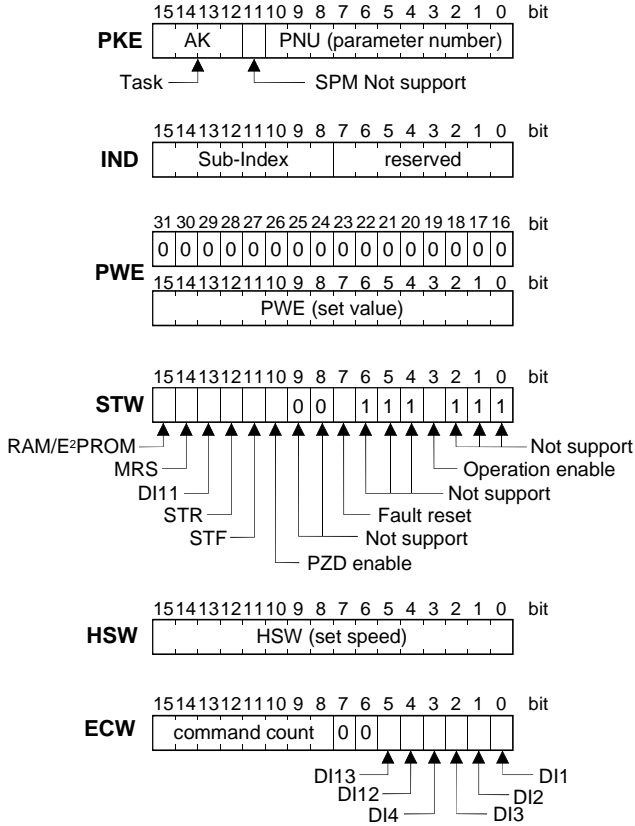
Name		Bit	Description	
PZD	ECW	RH terminal	0 0:RH-OFF 1:RH-ON Factory-set to high-speed operation command Pr. 182 can be used to change the signal. (*1)	
		RM terminal	1 0:RM-OFF 1:RM-ON Factory-set to middle-speed operation command Pr. 181 can be used to change the signal. (*1)	
		RL terminal	2 0:RL-OFF 1:RL-ON Factory-set to low-speed operation command Pr. 180 can be used to change the signal. (*1)	
		JOG terminal	3 0:JOG-OFF 1:JOG-ON Factory-set to jog operation selection Pr. 185 can be used to change the signal. (*1)	
		AU terminal	4 0:AU-OFF 1:AU-ON Factory-set to current input selection Pr. 184 can be used to change the signal. (*1)	
		CS terminal	5 0:CS-OFF 1:CS-ON Factory-set to automatic restart after instantaneous power failure selection Pr. 186 can be used to change the signal. (*1)	
		-	6, 7	Not used (0 is set)
		Command count	8 to 15	Used by the master to recognize the command response
	ESW	SU signal	0	0:OFF 1:ON (Up to frequency)
		OL signal	1	0:OFF 1:ON (Overload alarm)
		IPF signal	2	0:OFF 1:ON (Instantaneous power failure or undervoltage)
		-	3 to 7	Not used (0 is set)
		Command count	8 to 15	Echo back of the command request
	Reserved		0 to 15	Not used (0 is set, 0 is returned)

*1 Refer to the inverter manual for details of the input terminal function selection (Pr. 180 to Pr. 186).

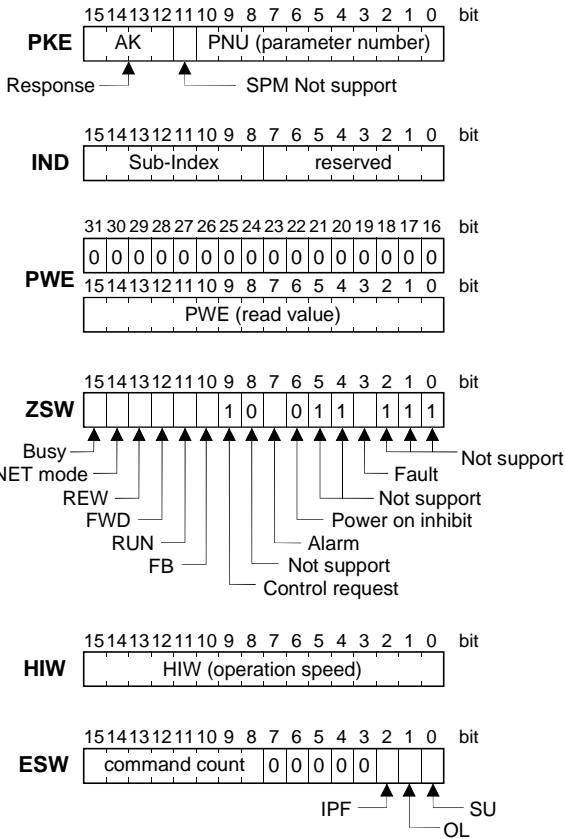
6.2 FR-V500 Series

The following indicates the buffer memory details of the FR-V500 series Profibus profiles.

Master→Slave (command request)



Slave → Master (command response)



BUFFER MEMORY DETAILS

FR-V500 series

Name		Bit	Description	
PKW	PKE	PNU	0 to 10 PNU number	
		SPM	11 Not used (0 is set)	
	AK	12 to 15	[Command request]	
			0:No task	
			1:Parameter value is requested (read request)	
			2:Parameter value (word) is changed (write request)	
3 to 5:Not supported		6:Parameter value (array) is requested (read request)		
7:Parameter value (array word) is changed (write request)		8 to 15:Not supported		
[Command response]		0:No response		
1:Parameter value (word) is transferred.		2 to 3:Not supported		
4:Parameter value (array word) is transferred.		5 to 6:Not supported		
7:Command execution error (error number is stored into PWE)		8 to 15:Not supported		
IND	0 to 7		Reserved area for extension (0 is set)	
	8 to 15		Sub-Index number At command request, set this number when AK = 6 or 7.	

FR-V500 series

Name		Bit	Description	
PKW	PWE	0 to 15	PNU read value/write value When command response AK = 7 (command execution error), PWE definition is as follows.	
			Error Definition	
			0	Invalid PNU
			1	Parameter value unchangeable (This error also occurs when Pr. 77 = 1)
			2	Outside setting range
			3	Invalid Sub-Index number
			4	No array
			11	No parameter change right
			18	Other error (*1)
			*1 Error Definition	
<ul style="list-style-type: none"> • Outside AK number range • Write data error • External operation error • Without option error • Instruction code error • With STF error • With STR error • With operation mode specification error • Calibration error (Pr. 900 and later) • Reset disabled error (per Pr. 75 reset input specification) 				
16 to 31	Not used (0 is set)			

BUFFER MEMORY DETAILS

FR-V500 series

Name		Bit	Description
PZD	STW	-	0 to 2 Not used (1 is set)
		Control enable	3 0:Inverter output shutoff 1:Inverter output shutoff is cancelled
		-	4 to 6 Not used (1 is set)
		Fault reset	7 [At inverter error] 0:No action 1:Inverter reset [When inverter is normal] No action
		-	8 to 9 Not used (0 is set)
		PZD enable	10 0:Command request of PZD is not processed. (*1) 1:Command request of PZD is processed. • At power-on or inverter reset, set 1 once.
		STF signal	11 0:OFF 1:ON (Forward rotation command)
		STR signal	12 0:STR-OFF 1:STR-ON Factory-set to reverse rotation command Pr. 187 can be used to change the signal. (*2)
		DI11 terminal	13 0:DI11 terminal function-OFF 1:DI11 terminal function-ON Pr. 400 can be used to select the signal. (*3)
		MRS signal	14 0:OFF 1:ON (Output shutoff)
RAM/ E ² PROM	15 0:Set speed (HSW) is written to RAM (Power-on reset returns the set speed to the setting before it was written to RAM.). 1:Set speed (HSW) is written to E ² PROM.		

*1 PZD enable and command count request can be executed.

*2 Refer to the inverter manual for details of the input terminal function selection (Pr. 180 to Pr. 183, Pr. 187).

*3 Refer to the inverter manual for the signal types.

FR-V500 series

Name		Bit	Description
PZD	ZSW	-	0 to 2 Not used (1 is returned)
		Fault (Alarm signal)	3 0:Inverter normal 1:Inverter alarm occurrence
		-	4 to 5 Not used (1 is returned)
		Power-on inhibit	6 0 is returned
		Alarm	7 0:Command execution normal 1:Command execution error
		-	8 Not used (0 is returned)
		Control request	9 1 is returned
		FB signal	10 0:OFF 1:ON (Output speed being detected) (Refer to Pr. 42, 43 in the invert manual)
		RUN signal	11 0:OFF 1:ON (Inverter running)
		FWD	12 0:Other than forward rotation operation being performed (at a stop, reverse rotation operation being performed) 1:Forward rotation operation being performed
		REW	13 0:Other than reverse rotation operation being performed (at a stop, forward rotation operation being performed) 1:Reverse rotation operation being performed
		Operation mode	14 0:Other than network operation mode 1:Network operation mode
		BUSY	15 0:Ready status 1:Busy status If it takes time to perform slave side processing, slave side busy status is announced since reply to master will be delayed. In busy status, other response data are unfixed values. When slave side is busy, request from master is invalid. Therefore, the same request must be sent again. During busy status, 0 is returned for all Bits except for Bit 15.
		HSW	0 to 15 Set speed (1 r/min increments)
HIW	0 to 15 Running speed (1 r/min increments)		

BUFFER MEMORY DETAILS

FR-V500 series

Name		Bit	Description	
PZD	ECW	DI1 terminal	0 0:RL-OFF 1:RL-ON Factory-set to low-speed operation command Pr. 180 can be used to change the signal. (*1)	
		DI2 terminal	1 0:RM-OFF 1:RM-ON Factory-set to middle-speed operation command Pr. 181 can be used to change the signal. (*1)	
		DI3 terminal	2 0:RH-OFF 1:RH-ON Factory-set to high-speed operation command Pr. 182 can be used to change the signal. (*1)	
		DI4 terminal	3 0:RT-OFF 1:RT-ON Factory-set to second function selection Pr. 183 can be used to change the signal. (*1)	
		DI12 terminal	4 0:DI12 terminal function-OFF 1:DI12 terminal function-ON Pr. 401 can be used to change the signal. (*1)	
		DI13 terminal	5 0:DI13 terminal function-OFF 1:DI13 terminal function-ON Pr. 402 can be used to change the signal. (*2)	
		-	6, 7	Not used (0 is set)
		Command count	8 to 15	Used by the master to recognize the command response
	ESW	SU signal	0 0:OFF 1:ON (Up to speed)	
		OL signal	1 0:OFF 1:ON (Overload alarm)	
		IPF signal	2 0:OFF 1:ON (Instantaneous power failure/undervoltage)	
		-	3 to 7	Not used (0 is set)
		Command count	8 to 15	Echo back of the command request
	Reserved		0 to 15	Not used (0 is set, 0 is returned)

*1 Refer to the inverter manual for details of the input terminal function selection (Pr. 180 to Pr. 183, Pr. 187).

*2 Refer to the inverter manual for the signal types.

7. PARAMETER DEFINITIONS - A500/F500 SERIES

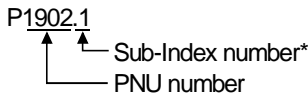
7.1 Outline of PNU

You can use the PNU to make inverter settings from the network.
The data used with the network is denoted P for PNU to differentiate it from Pr. for parameter.

CAUTION

The parameter definitions differ between the FR-A500/F500 and FR-V500 series. When using the FR-V500 series, refer to page 56.

(1) PNU data definition



* When the data type is "with array", the Sub-Index number is included in the PNU.

(2) PNU data type

The PNU has the data types of "Array Unsigned 16" and "Unsigned 16".

Array Unsigned 16 Abbreviation:AUs16	
P1902.1 ↑ Sub-Index number	With array
Unsigned 16 Abbreviation:Us16	
P1200	Without array

CAUTION

When the data type is "with array", include the Sub-Index number in the PNU.

7.2 Profibus PNU

7.2.1 Real-time monitor

The following items can be monitored from the master.

PNU	Item	Unit	Data Type
P1.1	Output frequency	0.01Hz	AUs16
P1.2	Output current	0.01A	AUs16
P1.3	Output voltage	0.1V	AUs16
P1.5	Frequency setting	0.01Hz	AUs16
P1.6	Running speed	1r/min	AUs16
P1.7	Motor torque	0.1%	AUs16
P1.8	Converter output voltage	0.1V	AUs16
P1.9	Regenerative brake duty	0.1%	AUs16
P1.10	Electronic overcurrent protection load factor	0.1%	AUs16
P1.11	Output current peak value	0.01A	AUs16
P1.12	Converter output voltage peak value	0.1V	AUs16
P1.13	Input power	0.01kW	AUs16
P1.14	Output power	0.01kW	AUs16
P1.15	Input terminal status (refer to page 49 (1))	-	AUs16
P1.16	Output terminal status (refer to page 49 (2))	-	AUs16
P1.17	Load meter	0.1%	AUs16
P1.18	Motor excitation current	0.01A	AUs16
P1.19	Position pulse*	-	AUs16
P1.20	Cumulative energization time	1h	AUs16
P1.22	Orientation status*	-	AUs16
P1.23	Actual operation time	1h	AUs16
P1.24	Motor load factor	0.1%	AUs16
P1.25	Cumulative power	1kWh	AUs16

* Can be monitored only when the FR-A5AP is fitted.

(1) External input terminal status PWE bitmap

	Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Terminal name		0	0	0	0	CS*	RES	STOP	MRS	JOG*	RH*	RM*	RL*	RT*	AU*	STR	STF

Not used (system reserved)

* Pr. 180 to 186 can be used to assign the terminal functions. Refer to the inverter manual for details of the terminal functions.

(2) External output terminal status PWE bitmap

	Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Terminal name		0	0	0	0	0	0	0	0	0	0	ABC*	FU*	OL*	IPF*	SU*	RUN*

Not used (system reserved)

* Pr. 190 to 195 can be used to assign the terminal functions. Refer to the inverter manual for details of the terminal functions.

7.2.2 Parameter clear

Parameter clear can be performed from the master.

PNU	Item	Data Definition	Data Type
P2.1	User clear value setting	Set parameter number	AUs16
P2.2	Parameter clear	965AH	AUs16
P2.3	Parameter all clear	99AAH	AUs16
P2.4	Parameter user clear	5A55H	AUs16
P2.5	Parameter clear (*1)	5A96H	AUs16
P2.6	Parameter all clear (*1)	AA99H	AUs16
P2.7	Parameter user clear (*1)	555AH	AUs16
P2.8	Error history clear	0000H	AUs16

*1 Communication parameters (Pr. 117 to Pr. 124, Pr. 331 to Pr. 342) are not cleared.

7.2.3 Operation mode read/write

Read/write of the operation mode can be performed from the master.

PNU	Item	Data Definition	Data Type
P3	Operation mode read/write	NET :14H External :10H	Us16

7.2.4 Set frequency read

The frequency set to the inverter can be read from the master.

PNU	Item	Data Definition	Data Type
P4.1	Set frequency (RAM) read	Set frequency (RAM) is read.	AUs16
P4.2	Set frequency (E ² PROM) read	Set frequency (E ² PROM) is read.	AUs16

7.2.5 Terminal input read

The setting of the No. 2 terminal can be read.

PNU	Item	Data Definition	Data Type
P5	No. 2 terminal input value read	No. 2 terminal input value (%) is read.	Us16

7.2.6 Inverter reset

The inverter can be reset from the master.

PNU	Item	Data Definition	Data Type
P6	Inverter reset	The inverter is reset after the data was written to the master.	Us16

- The inverter maintains the resetting status while reset is requested.
- When Pr. 75 ≠ "0, 2, 14, 16", reset is enabled only during an inverter error.

7.2.7 Node address read

The node address of the inverter can be read.

PNU	Item	Data Definition	Data Type
P918	Node address read	Set node address is read.	Us16

7.2.8 Alarm history

The eight past error definitions of the inverter can be read.

PNU	Item	Data Definition	Data Type
P947.1 to P947.8	Error history No. 1 read	P947.1 :Error number P947.2 to P947.8 :All 0	AUs16
P947.9 to P947.16	Error history No. 2 read	P947.9 :Error number P947.10 to P947.16:All 0	AUs16
P947.17 to P947.24	Error history No. 3 read	P947.17 :Error number P947.18 to P947.24:All 0	AUs16
P947.25 to P947.32	Error history No. 4 read	P947.25 :Error number P947.26 to P947.32:All 0	AUs16
P947.33 to P947.40	Error history No. 5 read	P947.33 :Error number P947.34 to P947.40:All 0	AUs16
P947.41 to P947.48	Error history No. 6 read	P947.41 :Error number P947.42 to P947.48:All 0	AUs16
P947.49 to P947.56	Error history No. 7 read	P947.49 :Error number P947.50 to P947.56:All 0	AUs16
P947.57 to P947.64	Error history No. 8 read	P947.57 :Error number P947.58 to P947.64:All 0	AUs16

<Error numbers>

Error Number	Definition	Error Number	Definition	Error Number	Definition
00H	No alarm	70H	E.BE	C2H	E.P24
10H	E.OC1	80H	E.GF	D5H	E.MB1
11H	E.OC2	81H	E.LF	D6H	E.MB2
12H	E.OC3	90H	E.OHT	D7H	E.MB3
20H	E.OV1	A0H	E.OPT	D8H	E.MB4
21H	E.OV2	A1H	E.OP1	D9H	E.MB5
22H	E.OV3	A2H	E.OP2	DAH	E.MB6
30H	E.THT	A3H	E.OP3	DBH	E.MB7
31H	E.THM	B0H	E.PE	F1H	E. 1
40H	E.FIN	B1H	E.PUE	F2H	E. 2
50H	E.IPF	B2H	E.RET	F3H	E. 3
51H	E.UVT	C0H	E.CPU	F6H	E. 6
60H	E.OLT	C1H	E.CTE	F7H	E. 7

* Refer to the inverter manual for details of the error definitions.

7.2.9 PNU list read

The usable PNU numbers can be read.

PNU	Item	Data Definition	Data Type
P980.1 to 116 P981.1 to 116 P982.1 to 116 P983.1 to 116 P984.1 to 116 P985.1 to 116 P986.1 to 116 P987.1 to 116 P988.1 to 116 P989.1 to 116	PNU list read	Usable PNU numbers are read in sorted status.	AUs16

<PNU list read example>

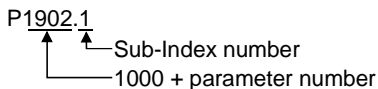
PNU	Number
P980.1	1
P980.2	2
P980.3	3
:	:
P980.116	1000
P981.1	1001
P981.2	1002
:	:
P982.111	0 (*1)

*1 When 0 is stored, read is terminated.

7.3 Standard Parameters

You can use the PNU to make parameter settings from the network. Standard parameter examples are introduced below. Refer to the examples and make parameter settings. For the parameter data and details, refer to the inverter and option manuals.

Representation of the PNU for standard parameters (Example: Pr. 902)



Pr. Number	PNU	Name	Minimum Setting Increments	Setting Range		Data Type	Remarks
				Decimal	Hexadecimal		
0	P1000	Torque boost	0.1%	0 to 30	0 to 12C	Us16	
1	P1001	Maximum frequency	0.01Hz	0 to 120	0 to 2EE0	Us16	
2	P1002	Minimum frequency	0.01Hz	0 to 120	0 to 2EE0	Us16	
3	P1003	Base frequency	0.01Hz	(A500) 0 to 400 (F500) 0 to 120	(A500) 0 to 9C40 (F500) 0 to 2EE0	Us16	
4	P1004	Multi-speed setting (High speed)	0.01Hz	(A500) 0 to 400 (F500) 0 to 120	(A500) 0 to 9C40 (F500) 0 to 2EE0	Us16	
5	P1005	Multi-speed setting (Middle speed)	0.01Hz	(A500) 0 to 400 (F500) 0 to 120	(A500) 0 to 9C40 (F500) 0 to 2EE0	Us16	
6	P1006	Multi-speed setting (Low speed)	0.01Hz	(A500) 0 to 400 (F500) 0 to 120	(A500) 0 to 9C40 (F500) 0 to 2EE0	Us16	
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮

CAUTION

Write to Pr. 77 and Pr. 79 is not allowed from the network with the FR-A5NPA. (Read is allowed.)

PARAMETER DEFINITIONS - A500/F500 SERIES

The following parameters require the Sub-Index number for the PNU.

Pr. Number	PNU	Name	Minimum Setting Increments	Setting Range		Data Type	Remarks
				Decimal	Hexadecimal		
201 to 210	P1201.1 to P1210.1	Program setting 1 (Time)	0.01	0 to 99.59	0 to 26E7	AUs16	A500 series parameters
	P1201.2 to P1210.2	Program setting 1 (Rotation direction)	1	0 to 2	0 to 2	AUs16	
	P1201.3 to P1210.3	Program setting 1 (Frequency)	0.1Hz	0 to 400, 9999	0 to 9C40, FFFF	AUs16	
211 to 220	P1211.1 to P1220.1	Program setting 2 (Time)	0.01	0 to 99.59	0 to 26E7	AUs16	
	P1211.2 to P1220.2	Program setting 2 (Rotation direction)	1	0 to 2	0 to 2	AUs16	
	P1211.3 to P1220.3	Program setting 2 (Frequency)	0.1Hz	0 to 400, 9999	0 to 9C40, FFFF	AUs16	
221 to 230	P1221.1 to P1230.1	Program setting 3 (Time)	0.01	0 to 99.59	0 to 26E7	AUs16	
	P1221.2 to P1230.2	Program setting 3 (Rotation direction)	1	0 to 2	0 to 2	AUs16	
	P1221.3 to P1230.3	Program setting 3 (Frequency)	0.1Hz	0 to 400, 9999	0 to 9C40, FFFF	AUs16	
900	P1900.1	FM terminal calibration	-	-	-	AUs16	
901	P1901.1	AM terminal calibration	-	-	-	AUs16	
902	P1902.1	Frequency setting voltage bias (frequency)	0.01Hz	0 to 60	0 to 1770	AUs16	
	P1902.2	Frequency setting voltage bias (%)	0.1%	-	-	AUs16	

PARAMETER DEFINITIONS - A500/F500 SERIES

Pr. Number	PNU	Name	Minimum Setting Increments	Setting Range		Data Type	Remarks
				Decimal	Hexadecimal		
903	P1903.1	Frequency setting voltage gain (frequency)	0.01Hz	(A500) 1 to 400 (F500) 1 to 120	(A500) 64 to 9C40 (F500) 64 to 2EE0	AUs16	
	P1903.2	Frequency setting voltage gain (%)	0.1%	-	-	AUs16	
904	P1904.1	Frequency setting current bias (frequency)	0.01Hz	0 to 60	0 to 1770	AUs16	
	P1904.2	Frequency setting current bias (%)	0.1%	-	-	AUs16	
905	P1905.1	Frequency setting current gain (frequency)	0.01Hz	(A500) 1 to 400 (F500) 1 to 120	(A500) 64 to 9C40 (F500) 64 to 2EE0	AUs16	
	P1905.2	Frequency setting current gain (%)	0.1%	-	-	AUs16	

8. PARAMETER DEFINITIONS - V500 SERIES

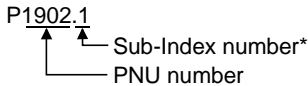
8.1 Outline of PNU

You can use the PNU to make inverter settings from the network.
The data used with the network is denoted PNU(P) to differentiate it from the parameter (Pr.).

CAUTION

The parameter definitions differ between the FR-V500 and A500/F500 series. When using the A500/F500 series, refer to page 47.

(1) PNU data definition



* When the data type is "with array", the Sub-Index number is included in the PNU.

(2) PNU data type

The PNU has the data types of "Array Unsigned 16" and "Unsigned 16".

Array Unsigned 16 Abbreviation:AUs16	
P1902.1 ↑ Sub-Index number	With array
Unsigned 16 Abbreviation:Us16	
P1200	Without array

CAUTION

When the data type is "with array", include the Sub-Index number in the PNU.

8.2 Profibus PNU

8.2.1 Real-time monitor

The following items can be monitored from the master.

PNU	Item	Unit	Data Type
P1.1	Output frequency	0.01Hz	AUs16
P1.2	Output current	0.01A	AUs16
P1.3	Output voltage	0.1V	AUs16
P1.5	Speed setting	1r/min	AUs16
P1.6	Running speed	1r/min	AUs16
P1.7	Motor torque	0.1%	AUs16
P1.8	Converter output voltage	0.1V	AUs16
P1.9	Regenerative brake duty	0.1%	AUs16
P1.10	Electronic thermal overload protection load factor	0.1%	AUs16
P1.11	Output current peak value	0.01A	AUs16
P1.12	Converter output voltage peak value	0.1V	AUs16
P1.15	Input terminal status (refer to page 58 (1))	-	AUs16
P1.16	Output terminal status (refer to page 58 (2))	-	AUs16
P1.17	Load meter	0.1%	AUs16
P1.18	Motor excitation current	0.01A	AUs16
P1.19	Position pulse	-	AUs16
P1.20	Cumulative energization time	1h	AUs16
P1.23	Actual operation time	1h	AUs16
P1.24	Motor load factor	0.1%	AUs16
P1.32	Trace status	0.1%	AUs16
P1.33	Torque current command	0.1%	AUs16
P1.34	Motor output	0.01kW	AUs16
P1.35	Feedback pulse	-	AUs16
P1.38	Trace status	-	AUs16

PARAMETER DEFINITIONS - V500 SERIES

(1) External input terminal status PWE bitmap

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Terminal name	0	0	0	0	0	0	0	0	RES*	OH*	DI4*	DI3*	DI2*	DI1*	STR*	STF

Not used (system reserved)

* Pr. 180 to Pr. 183 and Pr. 187 can be used to assign the terminal functions. Refer to the inverter manual for details of the terminal functions.

(2) External output terminal status PWE bitmap

Bit	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
Terminal name	0	0	0	0	0	0	0	0	0	0	0	0	ABC*	DO3*	DO2*	DO1*

Not used (system reserved)

* Pr. 190 to Pr. 192 and Pr. 195 can be used to assign the terminal functions. Refer to the inverter manual for details of the terminal functions.

8.2.2 Parameter clear

Parameter clear can be performed from the master.

PNU	Item	Data Definition	Data Type
P2.2	Parameter clear	965AH	AUs16
P2.3	Parameter all clear	99AAH	AUs16
P2.5	Parameter clear (*1)	5A96H	AUs16
P2.6	Parameter all clear (*1)	AA99H	AUs16
P2.8	Error history clear	0000H	AUs16

*1 Communication parameters (Pr. 117 to Pr. 124, Pr. 331 to Pr. 342) are not cleared.

8.2.3 Operation mode read/write

Read/write of the operation mode can be performed from the master.

PNU	Item	Data Definition	Data Type
P3	Operation mode read/write	NET :14H External :10H	Us16

8.2.4 Set frequency read

The frequency set to the inverter can be read from the master.

PNU	Item	Data Definition	Data Type
P4.1	Set speed (RAM) read	Set speed (RAM) is read.	AUs16
P4.2	Set speed (E ² PROM) read	Set speed (E ² PROM) is read.	AUs16

8.2.5 Terminal input read

The setting of the No. 2 terminal can be read.

PNU	Item	Data Definition	Data Type
P5	No. 2 terminal input value read	No. 2 terminal input value (%) is read.	Us16

8.2.6 Inverter reset

The inverter can be reset from the master.

PNU	Item	Data Definition	Data Type
P6	Inverter reset	The inverter is reset after the data was written to the master.	Us16

- The inverter maintains the resetting status while reset is requested.
- When Pr. 75 ≠ "0, 2, 14, 16", reset is enabled only during an inverter error.

8.2.7 Node address read

The node address of the inverter can be read.

PNU	Item	Data Definition	Data Type
P918	Node address read	Set node address is read.	Us16

8.2.8 Alarm history

The eight past error definitions of the inverter can be read.

PNU	Item	Data Definition	Data Type
P947.1 to P947.8	Error history No. 1 read	P947.1 :Error number P947.2 to P947.8 :All 0	AUs16
P947.9 to P947.16	Error history No. 2 read	P947.9 :Error number P947.10 to P947.16:All 0	AUs16
P947.17 to P947.24	Error history No. 3 read	P947.17 :Error number P947.18 to P947.24:All 0	AUs16
P947.25 to P947.32	Error history No. 4 read	P947.25 :Error number P947.26 to P947.32:All 0	AUs16
P947.33 to P947.40	Error history No. 5 read	P947.33 :Error number P947.34 to P947.40:All 0	AUs16
P947.41 to P947.48	Error history No. 6 read	P947.41 :Error number P947.42 to P947.48:All 0	AUs16
P947.49 to P947.56	Error history No. 7 read	P947.49 :Error number P947.50 to P947.56:All 0	AUs16
P947.57 to P947.64	Error history No. 8 read	P947.57 :Error number P947.58 to P947.64:All 0	AUs16

<Error numbers>

Error Number	Definition	Error Number	Definition	Error Number	Definition
00H	No alarm	90H	E.OHT	D3H	E.OD
10H	E.OC1	A0H	E.OPT	D4H	E.ECA
11H	E.OC2	A1H	E.OP1	D5H	E.MB1
12H	E.OC3	A2H	E.OP2	D6H	E.MB2
20H	E.OV1	A3H	E.OP3	D7H	E.MB3
21H	E.OV2	B0H	E.PE	D8H	E.MB4
22H	E.OV3	B1H	E.PUE	D9H	E.MB5
30H	E.THT	B2H	E.RET	DAH	E.MB6
31H	E.THM	C0H	E.CPU	DBH	E.MB7
40H	E.FIN	C1H	E.CTE	DCH	E.EP
50H	E.IPF	C2H	E.P24	F1H	E. 1
51H	E.UVT	C3H	E.P12	F2H	E. 2
60H	E.OLT	D0H	E.OS	F3H	E. 3
70H	E.BE	D1H	E.OSD	F6H	E. 6
80H	E.GF	D2H	E.ECT	F7H	E. 7
81H	E.LF				

* Refer to the inverter manual for details of the error definitions.

8.2.9 PNU list read

The usable PNU numbers can be read.

PNU	Item	Data Definition	Data Type
P980.1 to 116	PNU list read	Usable PNU numbers are read in sorted status.	AUs16
P981.1 to 116			
P982.1 to 116			
P983.1 to 116			
P984.1 to 116			
P985.1 to 116			
P986.1 to 116			
P987.1 to 116			
P988.1 to 116			
P989.1 to 116			

<PNU list read example>

PNU	Number
P980.1	1
P980.2	2
P980.3	3
:	:
P980.116	1000
P981.1	1001
P981.2	1002
:	:
P982.111	0 (*1)

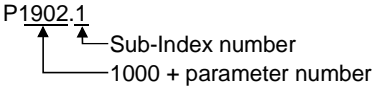
*1 When 0 is stored, read is terminated.

8.3 Standard Parameters

You can use the PNU to make parameter settings from the network. Standard parameter examples will be introduced. Refer to the examples and make parameter settings.

For the parameter data and details, refer to the inverter and option manuals.

Representation of the PNU for standard parameters (Example: Pr. 902)



Pr. Number	PNU	Name	Minimum Setting Increments	Setting Range		Data Type	Remarks
				Decimal	Hexadecimal		
0	P1000	Torque boost	0.1%	0 to 30	0 to 12C	Us16	
1	P1001	Maximum setting	1r/mim	0 to 3600	0 to E10	Us16	
2	P1002	Minimum setting	1r/min	0 to 3600	0 to E10	Us16	
3	P1003	Base frequency	0.01Hz	20 to 200	14 to 4E20	Us16	
4	P1004	Multi-speed setting (High speed)	1r/min	0 to 3600	0 to E10	Us16	
5	P1005	Multi-speed setting (Middle speed)	1r/min	0 to 3600	0 to E10	Us16	
6	P1006	Multi-speed setting (Low speed)	1r/min	0 to 3600	0 to E10	Us16	
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮

CAUTION

Write to Pr. 77 and Pr. 79 is not allowed from the network with the FR-A5NPA. (Read is allowed.)

PARAMETER DEFINITIONS - V500 SERIES

The following parameters require the Sub-Index number for the PNU.

Pr. Number	PNU	Name	Minimum Setting Increments	Setting Range		Data Type	Remarks
				Decimal	Hexadecimal		
900	P1900.1	DA1 terminal calibration	-	-	-	AUs16	
901	P1901.1	DA2 terminal calibration	-	-	-	AUs16	
902	P1902.1	Speed setting No. 2 bias (speed)	0.1r/min	0 to 3600	0 to 8CA0	AUs16	
	P1902.2	Speed setting No. 2 bias (%)	0.1%	-	-	AUs16	
903	P1903.1	Speed setting No. 2 gain (speed)	1r/min	0 to 3600	0 to E10	AUs16	
	P1903.2	Speed setting No. 2 gain (%)	0.1%	-	-	AUs16	
904	P1904.1	Torque command No. 3 bias (torque)	0.1%	0 to 400	0 to FA0	AUs16	
	P1904.2	Torque command No. 3 bias (%)	0.1%	-	-	AUs16	
905	P1905.1	Torque command No. 3 gain (torque)	0.1%	0 to 400	0 to FA0	AUs16	
	P1905.2	Torque command No. 3 gain (%)	0.1%	-	-	AUs16	
917	P1917.1	No. 1 terminal bias (speed)	0.1r/min	0 to 3600	0 to 8CA0	AUs16	Speed
	P1917.2	No. 1 terminal bias (%)	0.1%	-	-	AUs16	Speed

PARAMETER DEFINITIONS - V500 SERIES

Pr. Number	PNU	Name	Minimum Setting Increments	Setting Range		Data Type	Remarks
				Decimal	Hexadecimal		
918	P1918.1	No. 1 terminal gain (speed)	1r/min	0 to 3600	0 to E10	AUs16	Speed
	P1918.2	No. 1 terminal gain (%)	0.1%	-	-	AUs16	Speed
919	P1919.1	No. 1 terminal bias (torque)	0.1%	0 to 400	0 to FA0	AUs16	Torque/magnetic flux
	P1919.2	No. 1 terminal bias (%)	0.1%	-	-	AUs16	Torque/magnetic flux
920	P1920.1	No. 1 terminal gain (torque)	0.1%	0 to 400	0 to FA0	AUs16	Torque/magnetic flux
	P1920.2	No. 1 terminal gain (%)	0.1%	-	-	AUs16	Torque/magnetic flux

9. TROUBLESHOOTING

If an alarm occurred in the inverter and the inverter and option unit do not function, refer to the following check points, find the cause from the operation panel indication of the inverter and the LED status of the option unit, and take an appropriate action. If any of the causes does not apply to the alarm, a failure may have occurred. In that case, contact your sales representative.

Operation Panel Indication	Option Unit LED Status	Assumed Cause	Check Point
0.00	Off	Option unit does not function.	Make sure that the option is fitted properly.
			Reset the inverter.
			Perform parameter all clear to return the parameters to the factory settings, and switch power off once, then on again.
		Network is instable.	Make sure that the network cables between the nodes are connected properly.
			Make sure that the network cables are terminated.
			Check the network setting from the Profibus-DP Network Configuration Software.
			Check the other nodes for a network error.
Network master does not exist or does not function properly.	Check the connection and operation of the Profibus-DP master.		
E.***	Off/on	Inverter in error	Refer to the inverter manual.

* The error code of the inverter enters.

REVISIONS

*The manual number is given on the bottom left of the back cover.

Print Date	*Manual Number	Revision		
May, 2002	IB(NA)-0600095-A	First edition		
Feb., 2003	IB(NA)-0600095-B	<table border="1"><tr><td data-bbox="543 268 658 300">Additions</td></tr><tr><td data-bbox="543 300 967 347"><ul style="list-style-type: none">• Command count• Inverter reset command</td></tr></table>	Additions	<ul style="list-style-type: none">• Command count• Inverter reset command
Additions				
<ul style="list-style-type: none">• Command count• Inverter reset command				

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