

# **Mitsubishi FR-A5NM**

## **Instruction Manual**

### **Modbus Plus Communications Option Unit**



Mitsubishi VFD Instruction Manual  
FR-A5NM Modbus Plus Communications Option  
Unit

© 1999 Mitsubishi Electric Automation, Inc.

Manual No. VC7BNA00008 Revision C

Microsoft Windows, DOS, and other brands and their products are trademarks or registered trademarks of their respective companies.

## Introduction

Thank you for choosing this option unit for the Mitsubishi FR-A500(L) series transistorized frequency VFDs.

Please read this manual carefully before using this option unit. This instruction manual gives handling information and precautions for use of this product as well as the information required for the transmission of data to and from the VFD via a Modbus Plus network.

It is assumed that the reader of this manual possesses an understanding of the configuration, implementation, and operation of Modbus Plus networks. For details on the Modbus Plus network protocol and/or Modbus Plus network configuration and installation, please refer to the applicable specifications as published by Schneider Automation.

Please forward this manual to the end user.

### Modbus Plus Communications Option Unit (FR-A5NM)

This option unit lets you connect a FR-A500(L) series VFD to a network adhering to the Modbus Plus communications protocol.

Some important features of this option unit include:

- Data rate of 1 Modbus Plus
- Support for up to 32 nodes without a repeater (64 nodes with a repeater) on a single network
- Network access to all VFD parameters
- Passed Modicon Conformance Test in March, 1999
- Designed and assembled in the U.S.A.

This page is intentionally left blank.

## Table of Contents

Introduction .....	i
Table of Contents .....	iii
List of Figures .....	iv
Safety Instructions .....	1
Warning Information .....	1
Caution Information .....	1
Electric Shock Prevention.....	2
Injury Prevention.....	3
Additional Instructions .....	4
Transportation and Installation .....	4
Usage .....	4
Maintenance, Inspection, and Parts	
Replacement .....	5
Disposal.....	5
General Information.....	5
Structure .....	6
Installation.....	7
Pre-Installation Checks .....	7
Mounting Procedure .....	7
Connecting to the Network .....	10
Diagnostic LED Status Indicator.....	13
Operation.....	15
Operating Modes .....	15
Selecting the Operating Mode.....	15
Functions Available in the Operating Modes	
.....	17
Input From Modbus Plus to VFD .....	17
Accessing A500(L) Drive Data .....	18

Parameter Definitions .....	19
Output From VFD to Modbus Plus .....	20
System Environment Variable (SEV) Interface .....	20
Using the Modsoft MSTR Block .....	21
Real-Time Monitor .....	22
Input/Output Terminal Assignment .....	23
Operation When an Alarm Occurs .....	24
Alarm History .....	24
Alarm Numbers vs. Alarm Codes .....	25
Normal Parameter Area.....	26
900f Parameter Area .....	37
900 Percent Parameter Area.....	37
Prog Op Time (t) Components .....	38
Prog Op Dir. (D) Components .....	39
Prog Op Freq. (f) Components .....	40
References .....	41
Mitsubishi Electric.....	41
Schneider Automation .....	41
Technical Support Number.....	41
Specifications .....	42
Revisions .....	42
Index .....	43

You will find a documentation evaluation form at the end of the Index, following page 46.

## List of Figures

Figure 1: Top view .....	6
Figure 2: 3-D view .....	6
Figure 3: Installation view .....	9
Figure 4: Mitsubishi VFD view .....	9

This page is intentionally left blank.

## Safety Instructions

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 manual, the safety instruction levels are classified into **WARNING** and **CAUTION** instructions (as described below).

### Warning Information

---



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

---

### Caution Information

---



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

---

Note that even the **CAUTION** level may lead to a serious consequence under some circumstances. Please follow the instructions of both levels as they are important to personal safety.



## Electric Shock Prevention

---



- Do not open the front cover while power is on or when the VFD is running.
  - When installed in a VFD, the option module is in close proximity to dangerously high voltages. All precautions should be taken to avoid contact with such voltages. Only trained, authorized personnel should conduct installation, wiring, and inspection. Failure to follow the following guidelines may result in injury or death.
  - Before starting wiring or inspection, switch VFD power off, wait for at least 10 minutes and until the bus charge light is off, and check for any residual voltage with appropriate test equipment. See the *FR-A500(L) VFD Instruction Manual* for further information.
  - Do not subject the cables to scratches, excessive stress, heavy loads, or pinching.
-

## Injury Prevention

---



- Apply only the voltage specified in the instruction manual to each terminal to prevent damage, etc.
  - Ensure that the cables are connected to the correct terminals. Otherwise damage, etc. may occur.
  - Always make sure that polarity is correct to prevent damage, etc.
  - While power is on or for some time after power-off, do not touch the VFD as it is hot and you may get burnt.
-

## Additional Instructions

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

### Transportation and Installation

---



- 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, conductive bodies, oil, or other flammable substances from entering the VFD.

### Usage

---



Do not modify the equipment.



The option module is sensitive to electro-static discharge. Proper ESD measures required.

## Maintenance, Inspection, and Parts Replacement

---



Do not test the equipment with a megohm meter.

---

## Disposal

---



Dispose of this product as general industrial waste.

---

## General Information

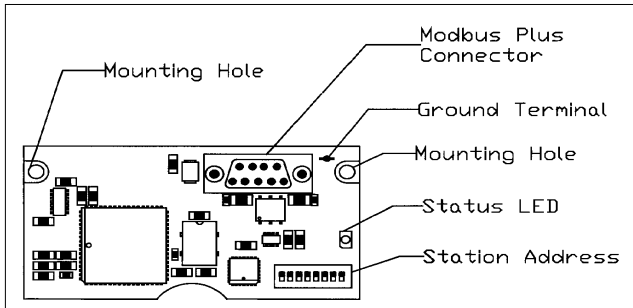
All illustrations given in this manual may have been drawn with covers or safety guards removed to provide in-depth descriptions.



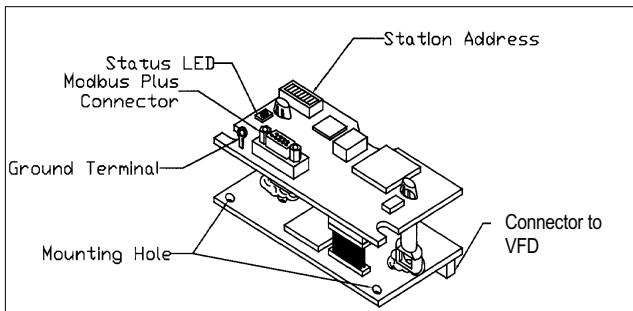
Before starting operation of the product, always return the covers and guards into original positions as specified and operate the equipment in accordance with the manual.

---

## Structure



**Figure 1: Top view**



**Figure 2: 3-D view**

## Installation

Remove the drive cover following the VFD instruction manual and install the option unit using the following procedure:

### Pre-Installation Checks

1. Check the VFD type.  
You may use the option unit only with a FR-A500(L) series VFD. You must not use it with any other series (e.g. A200E, A200, A100, Z and F series). These other series VFDs have a different option connector to prevent installation; if you force the connector, you may damage the VFD as well as the option unit.
2. Make sure the VFD line power is off.  
You may damage the option unit if you install it with the line power connected.

### Mounting Procedure

---

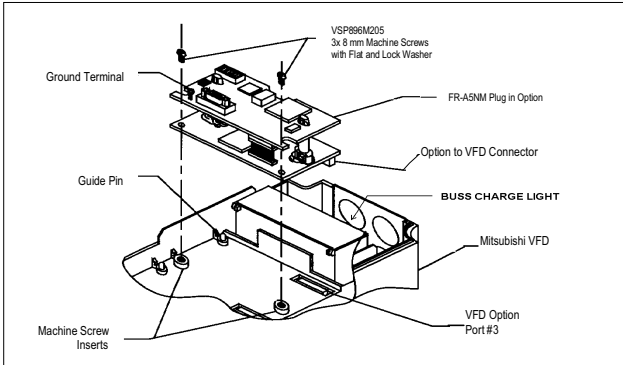


**HAZARDOUS VOLTAGE PRESE**  
Always isolate power from the VFD and wait 10 minutes until the bus charge light is off to ensure the charge lamp has gone out before inserting or removing this option unit or touching the terminals.

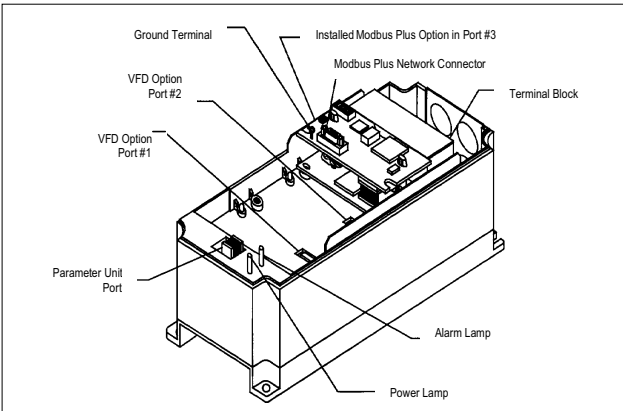
- 
3. Insert this option unit into the VFD's **OPTION PORT# 3** only.
  4. Carefully insert the connector of the option unit into the connector of the VFD. Use the

two mounting holes and the guide hole to align the bottom board with the matching machine screw inserts and the plastic guide pin on the VFD. Make sure that the VFD option is firmly seated in the VFD and the connector is fully plugged in.

5. Secure the option unit to the VFD with two mounting screws. If the screw holes in the option unit do not line up with the VFD mounting holes, check that the connectors have been fitted correctly.



**Figure 3: Installation view**



**Figure 4: Mitsubishi VFD view**



6. When making a cable for the Modbus Plus protocol, make sure that each end of the cable is terminated with the A5MBKT185 terminator connectors. For nodes between the termination points, use the in-line connectors (A5MBKT085). The cable should be a Modbus Plus standard cable (490NAA271xxF).

Connect a wire from the ground terminal on the FR-A5NM to the VFD Chassis to ensure proper grounding of the option board.

Makers of DB9 connectors, Schneider Automation:

- End Connector Part#: AS-MBKT-185 (light gray)
  - Inline Connector Part#: AS-MBKT-085 (dark gray)
7. Please consult and adhere to standard Modbus Plus documentation and specifications on the wiring and installation of Modbus Plus network hardware, as provided by Schneider Automation.
  8. Set the address before placing the cover back onto the option card.
  9. Next remove the option data port insert from the VFD cover. Then replace the VFD cover, while making sure that the Modbus Plus connector is aligned with the option data port window. Connect the Modbus Plus cable to the VFD by plugging DB9-style male connector into DB9-style female connector of the option unit, which should be visible in the option port window.

### **Connecting to the Network**

1. Make sure that the VFD power is off and the option unit is mounted in the VFD. Connect the Modbus Plus cable you created to the network.

2. When setting the Modbus Plus address on the option board, use the following table. Refer to Figure 1 for the address switch location.

**NOTE:** A switch setting of 1 indicates the On position, and a switch setting of 0 indicates the Off position.

Decimal Address	Switch Positions							
	1	2	3	4	5	6	7	8
3	1	0	1	1	1	1	1	1
4	0	0	1	1	1	1	1	1
5	1	1	0	1	1	1	1	1
6	0	1	0	1	1	1	1	1
7	1	0	0	1	1	1	1	1
8	0	0	0	1	1	1	1	1
9	1	1	1	0	1	1	1	1
10	0	1	1	0	1	1	1	1
11	1	0	1	0	1	1	1	1
12	0	0	1	0	1	1	1	1
13	1	1	0	0	1	1	1	1
14	0	1	0	0	1	1	1	1
15	1	0	0	0	1	1	1	1
16	0	0	0	0	1	1	1	1
17	1	1	1	1	0	1	1	1
18	0	1	1	1	0	1	1	1
19	1	0	1	1	0	1	1	1
20	0	0	1	1	0	1	1	1
21	1	1	0	1	0	1	1	1
22	0	1	0	1	0	1	1	1
23	1	0	0	1	0	1	1	1
24	0	0	0	1	0	1	1	1
25	1	1	1	0	0	1	1	1
26	0	1	1	0	0	1	1	1
27	1	0	1	0	0	1	1	1
28	0	0	1	0	0	1	1	1
29	1	1	0	0	0	1	1	1
30	0	1	0	0	0	1	1	1
31	1	0	0	0	0	1	1	1

Decimal Address	Switch Positions							
	1	2	3	4	5	6	7	8
32	0	0	0	0	0	1	1	1
33	1	1	1	1	1	0	1	1
34	0	1	1	1	1	0	1	1
35	1	0	1	1	1	0	1	1
36	0	0	1	1	1	0	1	1
37	1	1	0	1	1	0	1	1
38	0	1	0	1	1	0	1	1
39	1	0	0	1	1	0	1	1
40	0	0	0	1	1	0	1	1
41	1	1	1	0	1	0	1	1
42	0	1	1	0	1	0	1	1
43	1	0	1	0	1	0	1	1
44	0	0	1	0	1	0	1	1
45	1	1	0	0	1	0	1	1
46	0	1	0	0	1	0	1	1
47	1	0	0	0	1	0	1	1
48	0	0	0	0	1	0	1	1
49	1	1	1	1	0	0	1	1
50	0	1	1	1	0	0	1	1
51	1	0	1	1	0	0	1	1
52	0	0	1	1	0	0	1	1
53	1	1	0	1	0	0	1	1
54	0	1	0	1	0	0	1	1
55	1	0	0	1	0	0	1	1
56	0	0	0	1	0	0	1	1
57	1	1	1	0	0	0	1	1
58	0	1	1	0	0	0	1	1
59	1	0	1	0	0	0	1	1
60	0	0	1	0	0	0	1	1
61	1	1	0	0	0	0	1	1
62	0	1	0	0	0	0	1	1
63	1	0	0	0	0	0	1	1

**Alternate method for setting the switch:**

- To set the node address to be nn, first subtract 1 from it.
- Convert the result (nn-1) into hexadecimal XXh.
- Then span it into binary format, padding with 0's in the front 00fedcba.
- Finally, take the complement 11nmlkji, if a bit is 0, set the switch to Off position; if a bit is 1, set the switch to On position.  
**NOTE:** the first two leading position switches are not used.

For example, to set the node address to 30, do the following:

- Convert the result  $29=30-1$  into 1Dh
  - Span into 8-bit format 00011101
  - Take the complement 11100010
  - Set 8 positions according to c
3. It is now safe to apply power to the VFD and run it in PU, external, or net mode, provided that any external VFD control cables in addition to the Modbus Plus network cable are installed correctly.

### Diagnostic LED Status Indicator

The green LED located next to the address DIP switch on the Modbus Plus option top board provides indication of communication status. The LED on the bottom board will be solid green if the option CPU acts correctly.

The following describes the LED on the top board definitions.

Green	State of system
Flash every 160 mSec	Node is working normally.

	It is successfully receiving and passing the network token.
Flash every 1 Sec	Node is in the MONITOR_OFFLINE state. It monitors the network link every 5 seconds but is not transmitting.
2 flashes, off 2 Secs	Node is in MAC_IDLE state. This node may have a bad transmitter.
3 flashes, off 1.7 Secs	Node is not receiving tokens. This indicates that this node is the only active node on the network or the receiver is bad.
4 flashes, off 1.4 Secs	Duplicate node address seen.

## Operation

The operation of the A500(L) VFD changes slightly when you install this option unit, as described below.

### Operating Modes

In the PU operating mode, a Parameter Unit (PU) controls the VFD. In the External-operating mode, the VFD is controlled by external signals connected to the VFD's terminal block. In the Network (computer link) operating mode, the VFD is controlled by commands from a Modbus Plus master.

### Selecting the Operating Mode

The following conditions must also be met before you can change the operating mode:

- The VFD is stopped.
- The forward and reverse commands are off.

The following table describes the actions required to change the operating mode.

Mode Change	Action Required
Ext Operation => PU Operation	User presses PU key on Parameter Unit.
PU Operation => Ext Operation	User presses EXT key on Parameter Unit.
Ext Operation => Net Operation	Modbus Plus master writes a 1400h to Register 40010.
Net Operation => Ext Operation	Modbus Plus master writes a 1000h to Register 40010.

For all other mode changes, please refer to the *FR-A500(L) VFD Instruction Manual*.

Pr 340 allows you to select the Network operating mode on power-up and after a drive reset. Once the Network operating mode is initiated, there must be Modbus Plus activity at least once every 3 seconds. If the option unit does not sense valid Modbus Plus activity for 3 seconds or more, the VFD performs an option module alarm stop (E.OP3), and **you must reset the VFD to clear this fault.**

## Functions Available in the Operating Modes

The functions available to the drive depend on the operating mode.

The following table indicates the command types available according to the operating mode.

Control Type	Command Type	Net	Ext	PU
Modbus Plus	Operating Command	Yes <sup>(1)</sup>	No	No
	Output Frequency Setting	Yes <sup>(1)</sup>	No	No
	Monitor	Yes	Yes	Yes
	Parameter Write	Yes <sup>(2)</sup>	No <sup>(2)</sup>	No <sup>(2)</sup>
	Parameter Read	Yes	Yes	Yes
	VFD Reset	Yes <sup>(3)</sup>	No	No
External Terminals	Operating Command	Yes <sup>(1)</sup>	Yes	No
	Output Frequency Setting	Yes <sup>(1)</sup>	Yes	No
	VFD Reset	Yes	Yes	Yes

(1) Depends on the value of Prs 338 and 339.

(2) Depends on the value set in Pr 77.  
Refer to the *FR-A500(L) VFD Instruction Manual* for further information.

(3) If a network communication error has occurred, a manual reset will be required.

## Input From Modbus Plus to VFD

This option unit supports all VFD Control Input Commands.



## Accessing A500(L) Drive Data

1. This option unit acts as a Modbus Plus slave to a PLC or equivalent controller acting as a Modbus Plus master.

This means that the option unit:

- Acknowledges messages received
  - Transmits messages at the request of a network master.
2. The option unit can also act as a Modbus Plus slave to a Modbus Plus master that can read the drive's I/O values, as well as configure the drive itself.
  3. The option unit cannot send messages on its own, and it has no bus access rights. It also cannot simultaneously act as a slave to network master and as a lead drive (master) to follower drives (slaves).
  4. This option unit does not support any other manufacturer-specific messages or parameters.

## Parameter Definitions

The Modbus Plus option card has error codes which serve the purpose of letting the user indicate when an inappropriate operation occurs. Register 40020 contains the value of the error codes. If a write occurs to the VFD while the VFD is in EXT mode, a 0x14 will exist in register 40020. If a write occurs to the Real Time Monitor or the Alarm History, 0x42 will exist in register 40020. 0x43 will exist in register 40020 if an out of range value is written to any parameter.

Any register that does not appear in any entry of the following tables is considered Reserved.

Examples for reading from and writing to parameters:

Operation	Communication Function
Read Parameter 0	Read from Register 41000
Start running forward	Write a 2 Decimal to Register 40009
Stop the drive from running	Write a 0 to Register 40009
Enable Net Mode	Write a 0x14 to Register 40010
Enable EXT Mode	Write a 0x10 to Register 40010

## Output From VFD to Modbus Plus

To check the VFD status, read the word out from Register 40009.

The following table describes the bit-map for the VFD status word.

Bit	Definition	Abbreviation
0	1 = running	(RUN)
1	1 = forward running	(FWD)
2	1 = reverse running	(REV)
3	1 = up to frequency	(SU)
4	1 = overload	(OL)
5	1 = instantaneous power failure	(IPF)
6	1 = frequency detection	(FU)
7	1 = alarm	(ABC)
8-14	Special	

## System Environment Variable (SEV) Interface

VFD Reg	Definition	Access	WriteVal
40001	UsrClrValSett	WO	0000h
40002	VFDReset	WO	0000h
40003	PrClr	WO	5A96h
40004	PrAllClr	WO	AA99h
40005	PrUsrClr	WO	555Ah
40006	PrClr(ECP)	WO	965Ah
40007	PrAllClr(ECP)	WO	99Aah
40008	PrUsrClr(ECP)	WO	5A55h
40009	VFDStatus/CtrlInpCmd	R/W	XX00h
40010	OpMode/VFDConfig	R/W	Ext=1000h Net=1400h
40013	f Sett Val	R/W	ggffh
40014	Runng f (RAM) #	R/W	ggffh
40015	Runng f (EEPROM) #	WO	ggffh

WO: Write only, no read.

- (1) Writing to Register 40014 or 40015 can be read out from Register 40014.

## Using the Modsoft MSTR Block

Items in the above table are byte-swapped. This means, for example, that to place the VFD in “net mode” a value of 0014H should be written to register 40010 in the VFD instead of the 1400H value shown.

The MSTR control register usage is as follows:

PLC Register	Register Value	Value Base	Description
n	1,2	decimal	Commands MSTR function: 1 = write; 2 = read
n+1	xxxx	hexadecimal	MSTR function error code
n+2	1	decimal	Number of registers to be written/read to /from the VFD
n+3	rrrr	decimal	Specifies the VFD register to write/read to/from. Value represents an offset starting w/register 40000 (i.e. 1 = 40001; 49 = 40049).
n+4, 5, 6, 7	node number	decimal	Routing registers contain Modbus Plus nodes for communication routing. The first register following the register containing the VFD node number must contain a 1 value. Remaining routing registers must contain a 0 value.

**Real-Time Monitor**

Reg	Definition	Prec.
40201	RTM01 Outp f	0.01Hz
40202	RTM02 Outp I	0.01A
40203	RTM03 Outp V	0.1V
40205	RTM05 f Sett Val	0.01Hz
40206	RTM06 Runng Spd	1r/m
40207	RTM07 Motor Torq	0.1%
40208	RTM08 Convtrr Outp V	0.1V
40209	RTM09 Regen Brake Duty	0.1%
40210	RTM10 Electr Overcur Protectn Load Factr	0.1%
40211	RTM11 Outp I Peak	0.01A
40212	RTM12 VFD Peak Outp V	0.1V
40213	RTM13 VFD Input Powr	0.01kW
40214	RTM14 VFD Output Powr	0.01kW
40215	RTM15 Inp Termnl Status	
40216	RTM16 Outp Termnl Status	
40217	RTM17 Load Meter	
40218	RTM18 Motor Excitatn I	0.01A
40219	RTM19 Positive Pulse	
40220	RTM20 Cumulative Energ t	1h
40222	RTM22 Orientatn Status	
40223	RTM23 Actl Op t	1h
40224	RTM24 Motor Load Factr	0.1%
40225	RTM25 Cumulative Powr	1kWh

**Bit-Map for Register 40215**

Input Terminal Monitor:

15..12	11	10	9	8	7	6
0	CS	RES	STOP	MRS	JOG	RH

5	4	3	2	1	0
RM	RL	RT	AU	STR	STF

Bit-Map for Register 40216  
Outp Terminal Monitor:

15..6	5	4	3	2	1	0
0	Relay	FU	OL	IPF	SU	RUN

**NOTE:** The bit-wise data here reflect Prs 190-196; if assignments for terminals are changed, the bit-map may not be the same.

## Input/Output Terminal Assignment



Input/output terminal assignment functions depend upon programmed functions such as brake sequences

---

## Operation When an Alarm Occurs

The following table shows the behavior of the VFD and network when an alarm occurs:

Fault Type	Item	Net	Ext	PU
VFD	VFD Operation	Stop	Stop Continue	Stop Continue
	Network Comm.	Continue		
Modbus Plus Comm.	VFD Operation	Stop	Continue Continue (1)	Continue Continue (1)
	Network Comm	Continue (1)		

(1) Depends on the type of communication fault.

## Alarm History

Reg	Definition
40501	Alarm 1 <sub>(1)</sub>
40502	Alarm 2
40503	Alarm 3
40504	Alarm 4
40505	Alarm 5
40506	Alarm 6
40507	Alarm 7
40508	Alarm 8

(1) Writing a value of 0000h to this parameter resets the alarm history buffer for all alarms. All other entries in this table are read only.

**Alarm Numbers vs. Alarm Codes**

#	Code	#	Code	#	Code	#	Code
10	OC1	80	GF	D1	Osd	F3	E3
11	OC2	81	LF	D2	ECT	F4	E4
12	OC3	90	OHT	D3	Od	F5	E5
20	OV1	A0	OPT	D4	ECA	F6	E6
21	OV2	A1	OP1	D5	Mb1	F7	E7
22	OV3	A2	OP2	D6	Mb2	F8	E8
30	THT	A3	OP3	D7	Mb3	F9	E9
31	THM	B0	PE	D8	Mb4	FA	E10
40	FIN	B1	PUE	D9	Mb5	FB	E11
41	FAN	B2	RET	DA	Mb6	FC	E12
50	IPF	C0	CPU	DB	Mb7	FD	E13
51	UVT	C1	CTE	F0	E0	FE	E14
60	OLT	C2	P24	F1	E1	FF	E15
70	BE	D0	OS	F2	E2		

Please refer to the *FR-A500(L) VFD Instruction Manual* for an explanation of Alarm Codes.



**Normal Parameter Area**

Pr	Reg	Definition	Range	Hex	A500 Prec	A500L Prec
Pr0	41000	Torq Boost (Manual)	0-30	0-12C	0.1%	
Pr1	41001	Max f Limit	0-120	0-2EE0	0.01Hz	
Pr2	41002	Min f Limit	0-120	0-2EE0	0.01Hz	
Pr3	41003	Base f Limit	0-400	0-9C40	0.01Hz	
Pr4	41004	MultiSpd Set (HiSpd)	0-400	0-9C40	0.01Hz	
Pr5	41005	MultiSpd Set (MiSpd)	0-400	0-9C40	0.01Hz	
Pr6	41006	MultiSpd Set (LoSpd)	0-400	0-9C40	0.01Hz	
Pr7	41007	Acc t	0-3600	0-8CA0	0.1s	
Pr8	41008	Dec t	0-3600/ 0-360	0-8CA0	0.1s/ 0.01s	
Pr9	41009	Electr Therml O/L Relay	0-500	0-C350	0.01A	
Pr10	41010	DC Inj Brake Op f	0-120	0-2EE0	0.01Hz	
Pr11	41011	DC Inj Brake Op t	0-10	0-64	0.1s	
Pr12	41012	DC Inj Brake V	0-30	0-12C	0.1%	
Pr13	41013	Startg f	0-60	0-1770	0.01Hz	
Pr14	41014	Applied Load Pattern	0-5	0-5	1	
Pr15	41015	Jog f	0-400	0-9C40	0.01Hz	
Pr16	41016	Jog Acc/Dec t	0-3600/ 0-360	0-8CA0	0.1s/ 0.01s	
Pr17	41017	MRS Inp Selectn	0-3	0-3	1	
Pr18	41018	HiSpd Max f Limit	120-400	2EE0- 9C40	0.01Hz	
Pr19	41019	Base f V	0-1000	0-2710	0.1V	
Pr20	41020	Acc/Dec Ref f	0-400	0-9C40	0.01Hz	
Pr21	41021	Acc/Dec t Increments	0-1	0-1	1	
Pr22	41022	Stall Preventn Op Level	0-200	0-7D0	0.1%	
Pr23	41023	Stall Preventn Op Level At DoubleSpd	0-200	0-7D0	0.1%	
Pr24	41024	MultiSpd Set (Spd4)	0-400	0-9C40	0.01Hz	
Pr25	41025	MultiSpd Set (Spd5)	0-400	0-9C40	0.01Hz	

Mitsubishi FR-A5NM Instruction Manual

Pr	Reg	Definition	Range	Hex	A500 Prec	A500L Prec
Pr26	41026	MultiSpd Set (Spd6)	0-400	0-9C40	0.01Hz	
Pr27	41027	MultiSpd Set (Spd7)	0-400	0-9C40	0.01Hz	
Pr28	41028	MultiSpd Inp Compensatn	0-1	0-1	1	
Pr29	41029	Acc/Dec Pattern	0-3	0-3	1	
Pr30	41030	Regen Func Selectn	0-2	0-2	0	
Pr31	41031	f Jump 1A	0-400	0-9C40	0.01Hz	
Pr32	41032	f Jump 1B	0-400	0-9C40	0.01Hz	
Pr33	41033	f Jump 2A	0-400	0-9C40	0.01Hz	
Pr34	41034	f Jump 2B	0-400	0-9C40	0.01Hz	
Pr35	41035	f Jump 3A	0-400	0-9C40	0.01Hz	
Pr36	41036	f Jump 3B	0-400	0-9C40	0.01Hz	
Pr37	41037	Spd Display	2-9998	2-270E	1	
	41038	Special				
	41039	Special				
	41040	Special				
Pr41	41041	Up-To-f Sensitivity	0-1000	0-3E8	0.1%	
Pr42	41042	Outp f Detectn	0-400	0-9C40	0.01Hz	
Pr43	41043	Outp f Detectn At REV Rotatn	0-400	0-9C40	0.01Hz	
Pr44	41044	2nd Acc/Dec t	0-3600/ 0-360	0-8CA0	0.1s/ 0.01s	
Pr45	41045	2nd Dec t	0-3600/ 0-360	0-8CA0	0.1s/ 0.01s	
Pr46	41046	2nd Torq Boost	0-30	0-12C	0.1%	
Pr47	41047	2nd V/F (Base f)	0-400	0-9C40	0.01Hz	
Pr48	41048	2nd Stall Preventn Op l	0-200	0-7D0	0.1%	
Pr49	41049	2nd Stall Preventn Op f	0-400	0-9C40	0.01Hz	
Pr50	41050	2nd Outp f Detectn	0-400	0-9C40	0.01Hz	
	41051	Special				
Pr52	41052	PU Main Display Data Selectn	0-20	0-18	1	
Pr53	41053	PU Level Display Data Selectn	0-18	0-12	1	

Pr	Reg	Definition	Range	Hex	A500 Prec	A500L Prec
Pr54	41054	FM Termnl Func Selectn	1-121	1-79	1	
Pr55	41055	f Monitorg Ref	0-400	0-9C40	0.01Hz	
Pr56	41056	l Monitorg Ref	0-500	0-C350	0.01Hz	
Pr57	41057	Restart Coastg t	0-5	0-32	0.1s	
Pr58	41058	Restart Cushion t	0-5	0-32	0.1s	
Pr59	41059	Remote Sett Func Selectn	0-2	0-2	1	
Pr60	41060	Intellgnt Mode Selectn	0-6	0-6	1	
Pr61	41061	Ref l For Intellgnt Mode	0-500	0-C350	0.01A	
Pr62	41062	Ref l For Intellgnt Mode Acc	0-200	0-7D0	0.1%	
Pr63	41063	Ref l For Intellgnt Mode Dec	0-200	0-7D0	0.1%	
Pr64	41064	Startg f For Elevator Mode	0-10	0-3E8	0.01Hz	
Pr65	41065	Retry Selectn	0-5	0-5	1	
Pr66	41066	Stall Preventn Op Reductn Startg f	0-400	0-9C40	0.01Hz	
Pr67	41067	No. Of Retries At Alarm Occur	0-10	0-A	1	
Pr68	41068	Retry Waitg t	0-10	0-64	0.1s	
Pr69	41069	Retry Count Display Erasure	0	0	1	
Pr70	41070	Special Regen Brake Duty	0-30	0-12C	0.1%	
Pr71	41071	Applied Motor	0-20	0-14	1	
Pr72	41072	PWM f Selectn	0.7-14.5	7-91	0.1kHz	
Pr73	41073	0 to 5V, 0 to 10V Selectn	0-15	0-F	1	
Pr74	41074	Response t For Analog Signl	0-8	0-8	1	

Pr	Reg	Definition	Range	Hex	A500 Prec	A500L Prec
Pr75	41075	Reset/ Disconnect PU Detectn/ PU Stop Selectn	0-17	0-11	1	
Pr76	41076	Alarm Code Outp Selectn	0-3	0-3	1	
Pr77	41077	Pr Write Disable Selectn	0-2	0-2	1	
Pr78	41078	REV Rotatn Preventn Selectn	0-2	0-2	1	
Pr79	41079	Op Mode Selectn	0-8	0-8	1	
Pr80	41080	Motor Capacity	.4-55	28-157C	0.01k W	
Pr81	41081	No. Of Motor Poles	2-16	2-10	1	
Pr82	41082	Excitatn I	0-9999	0-270F	0.01A	
Pr83	41083	Rated Motor V	0-1000	0-2710	0.1V	
Pr84	41084	Rated Motor f	50-120	1388- 2EE0	0.01Hz	
	41085	Special				
	41086	Special				
	41087	Special				
	41088	Special				
	41089	Special				
Pr90	41090	Motor Constant R1	0-9999	0-270F	0.01	
Pr91	41091	Motor Constant R2	0-9999	0-270F	0.01	
Pr92	41092	Motor Constant L1	0-9999	0-270F	0.01	
Pr93	41093	Motor Constant L2	0-9999	0-270F	0.01	
Pr94	41094	Motor Constant X	0-9999	0-270F	0.01	
Pr95	41095	Online Auto Tung	0-1	0-1	1	
Pr96	41096	Autotung Set/State	0-101	0-65	1	
	41097	Special				
	41098	Special				
	41099	Special				
Pr100	41100	V/F 1 (1st f)	0-400	0-9C40	0.01Hz	
Pr101	41101	V/F 1 (1st f V)	0-1000	0-2710	0.1V	

Pr	Reg	Definition	Range	Hex	A500 Prec	A500L Prec
Pr102	41102	V/F 2 (2nd f)	0-400	0-9C40	0.01Hz	
Pr103	41103	V/F 2 (2nd f V)	0-1000	0-2710	0.1V	
Pr104	41104	V/F 3 (3rd f)	0-400	0-9C40	0.01Hz	
Pr105	41105	V/F 3 (3rd f V)	0-1000	0-2710	0.1V	
Pr106	41106	V/F 4 (4th f)	0-400	0-9C40	0.01Hz	
Pr107	41107	V/F 4 (4th f V)	0-1000	0-2710	0.1V	
Pr108	41108	V/F 5 (5th f)	0-400	0-9C40	0.01Hz	
Pr109	41109	V/F 5 (5th f V)	0-1000	0-2710	0.1V	
Pr110	41110	3rd Acc/Dec t	0-3600	0-8CA0	0.1s	
Pr111	41111	3rd Dec t	0-3600	0-8CA0	0.1s	
Pr112	41112	3rd Torq Boost	0-30	0-12C	0.1%	
Pr113	41113	3rd V/F (Base f)	0-400	0-9C40	0.01Hz	
Pr114	41114	3rd Stall Preventn Op l	0-200	0-7D0	0.1%	
Pr115	41115	3rd Stall Preventn Op f	0-400	0-9C40	0.01Hz	
Pr116	41116	3rd Outp f Detectn	0-400	0-9C40	0.01Hz	
Pr117	41117	Statn No.	0-31	0-1F	1	
Pr118	41118	Comms Spd	48-192	30-C0	1	
Pr119	41119	Stop Bit Length	0-11	0-B	1	
Pr120	41120	Parity Chk Presence /Absence	0-2	0-2	1	
Pr121	41121	No. Of Comms Retries	0-10	0-A	1	
Pr122	41122	Comms Chk t Interval	0-999.8	0-270E	0.1s	
Pr123	41123	Waitg t Sett	0-150	0-96	1ms	
Pr124	41124	CR,LF Presence /Absence Selectn	0-2	0-2	1	
	41125	Special				
	41126	Special				
	41127	Special				
Pr128	41128	PID Actn Selectn	10-21	A-15	1	

Pr	Reg	Definition	Range	Hex	A500 Prec	A500L Prec
Pr129	41129	PID Proportionl Band	0-1000	0-2710	0.1%	
Pr130	41130	PID Integr t	0.1-3600	1-8CA0	0.1s	
Pr131	41131	PID Uppr Limit	0-100	0-3E8	0.1%	
Pr132	41132	PID Lowr Limit	0-100	0-3E8	0.1%	
Pr133	41133	PID Actn Set Pnt For PU Op	0-100	0-3E8	0.1%	
Pr134	41134	PID Differentl t	0.01-10	1-3E8	0.01s	
Pr135	41135	CPS-VFD Swc-Over Seq Outp Termnl Selectn	0-2	0-2	1	
Pr136	41136	MC Swc-Over Interlock t	0-100	0-3E8	0.1s	
Pr137	41137	Startg Waitg t	0-100	0-3E8	0.1s	
Pr138	41138	CPS-VFD Swc-Over Selectn At Alarm Occur	0-1	0-1	1	
Pr139	41139	Auto VFD-CPS Swc-Over f	0-60	0-1770	0.01Hz	
Pr140	41140	Backlash Acc Stopg f	0-400	0-9C40	0.01Hz	
Pr141	41141	Backlash Acc Stopg t	0-360	0-E10	0.1s	
Pr142	41142	Backlash Dec Stopg f	0-400	0-9C40	0.01Hz	
Pr143	41143	Backlash Dec Stopg t	0-360	0-E10	0.1s	
Pr144	41144	Spd Sett Swc-Over	0-110	0-6E	1	
Pr145	41145	PU Lang Swc	0-7	0-7	1	
	41146	Special				
	41147	Special				
Pr148	41148	Stall Preventn Level At 0V Inp	0-200	0-7D0	0.1%	
Pr149	41149	Stall Preventn Level At 10V Inp	0-200	0-7D0	0.1%	

Mitsubishi FR-A5NM Instruction Manual

Pr	Reg	Definition	Range	Hex	A500 Prec	A500L Prec
Pr150	41150	Outp I Detectn Level	0-200	0-7D0	0.1%	
Pr151	41151	Outp I Detectn Period	0-10	0-64	0.1s	
Pr152	41152	0-I Detectn Level	0-200	0-7D0	0.1%	
Pr153	41153	0-I Detectn Period	0-1	0-64	0.01s	
Pr154	41154	V Reductn Selectn During Stall Preventn Op	0-1	0-1	1	
Pr155	41155	RT Activatd Cond	0-10	0-A	1	
Pr156	41156	Stall Preventn Op Selectn	0-100	0-64	1	
Pr157	41157	OL Sgnl Waitg t	0-25	0-FA	0.1s	
Pr158	41158	AM Termnl Func Selectn	1-21	1-15	1	
	41159	Special				
Pr160	41160	Usr Group Read Selectn	0-11	0-B	1	
	41161	Special				
Pr162	41162	Auto Restart After IPF Selectn	0-1	0-1	1	
Pr163	41163	1st Cushn t For Restart	0-20	0-C8	0.1s	
Pr164	41164	1st Cushn V For Restart	0-100	0-3E8	0.1s	
Pr165	41165	Restart Stall Preventn Op Level	0-200	0-7D0	0.1s	
	41166	Special				
	41167	Special				
	41168	Special				
	41169	Special				
Pr170	41170	Watt-Hr Meter Clr	0	0	1	
Pr171	41171	Actl Op Hr Meter Clr	0	0	1	
	41172	Special				
Pr173	41173	Usr Group 1 Registratn	0-999	0-3E7	1	
Pr174	41174	Usr Group 1 Deletn	0-999	0-3E7	1	
Pr175	41175	Usr Group 2 Registratn	0-999	0-3E7	1	

Pr	Reg	Definition	Range	Hex	A500 Prec	A500L Prec
Pr176	41176	Usr Group 2 Deletn	0-999	0-3E7	1	
	41177	Special				
	41178	Special				
	41179	Special				
Pr180	41180	RL Termnl Func Selectn	0-99	0-63	1	
Pr181	41181	RM Termnl Func Selectn	0-99	0-63	1	
Pr182	41182	RH Termnl Func Selectn	0-99	0-63	1	
Pr183	41183	RT Termnl Func Selectn	0-99	0-63	1	
Pr184	41184	AU Termnl Func Selectn	0-99	0-63	1	
Pr185	41185	JOG Termnl Func Selectn	0-99	0-63	1	
Pr186	41186	CS Termnl Func Selectn	0-99	0-63	1	
	41187	Special				
	41188	Special				
	41189	Special				
Pr190	41190	RUN Termnl Func Selectn	0-199	0-C7	1	
Pr191	41191	SU Termnl Func Selectn	0-199	0-C7	1	
Pr192	41192	IPF Termnl Func Selectn	0-199	0-C7	1	
Pr193	41193	OL Termnl Func Selectn	0-199	0-C7	1	
Pr194	41194	FU Termnl Func Selectn	0-199	0-C7	1	
Pr195	41195	ABC Termnl Func Selectn	0-199	0-C7	1	
	41196	Special				
	41197	Special				
	41198	Special				
Pr199	41199	Usr's Initl Val Sett	0-999	0-3E7	1	
Pr232	41232	MultiSpd Sett (Spd8)	0-400	0-9C40	0.01Hz	



Pr	Reg	Definition	Range	Hex	A500 Prec	A500L Prec
Pr233	41233	MultiSpd Sett (Spd9)	0-400	0-9C40	0.01Hz	
Pr234	41234	MultiSpd Sett (Spd10)	0-400	0-9C40	0.01Hz	
Pr235	41235	MultiSpd Sett (Spd11)	0-400	0-9C40	0.01Hz	
Pr236	41236	MultiSpd Sett (Spd12)	0-400	0-9C40	0.01Hz	
Pr237	41237	MultiSpd Sett (Spd13)	0-400	0-9C40	0.01Hz	
Pr238	41238	MultiSpd Sett (Spd14)	0-400	0-9C40	0.01Hz	
Pr239	41239	MultiSpd Sett (Spd15)	0-400	0-9C40	0.01Hz	
	41240	Special				
	41241	Special				
	41242	Special				
	41243	Special				
	41244	Special				
	41245	Special				
	41246	Special				
	41247	Special				
	41248	Special				
	41249	Special				
	41250	Special				
	41251	Special				
	41252	Special				
	41253	Special				
	41254	Special				
	41255	Special				
	41256	Special				
	41257	Special				
	41258	Special				
	41259	Special				
	41260	Special				
Pr261	41261	Power Failure Stop Func	0-1	0-1	1	
Pr262	41262	Subtractd f At Dec Start	0-20	0-7D0	0.01Hz	
Pr263	41263	Subtractn Startg f	0-120	0-2EE0	0.01Hz	
Pr264	41264	Power- Failure Dec t 1	0-3600	0-8CA0	0.1s	
Pr265	41265	Power Failure Dec t 2	0-3600	0-8CA0	0.1s	

Pr	Reg	Definition	Range	Hex	A500 Prec	A500L Prec
Pr266	41266	Power Failure Dec t Swc-Over f	0-400	0-9C40	0.01Hz	
	41267	Special				
	41268	Special				
	41269	Special				
Pr270	41270	Stop-On-Contact/ Load Torq HiSpd Ctrl Selectn	0-3	0-3	1	
Pr271	41271	HiSpd Sett Max l	0-200	0-7D0	0.1%	
Pr272	41272	HiSpd Sett Min l	0-200	0-7D0	0.1%	
Pr273	41273	l Avg Range	0-400	0-9C40	0.01Hz	
Pr274	41274	l Avg Filter Constant	1-4000	1-FA0	1	
Pr275	41275	Stop-On-Contact Excitg l LoSpd Multipl Factr	0-1000	0-3E8	1%	
Pr276	41276	Stop-On-Contact PWM Carrier f	0-15	0-F	1	
	41277	Special				
Pr278	41278	Brake Openg f	0-30	0-BB8	0.01Hz	
Pr279	41279	Brake Openg l	0-200	0-7D0	0.1%	
Pr280	41280	Brake Openg l Detectn t	0-2	0-14	0.1s	
Pr281	41281	Brake Op t At Start	0-5	0-32	0.1s	
Pr282	41282	Brake Clog f	0-30	0-BB8	0.01Hz	
Pr283	41283	Brake Op t At Stop	0-5	0-32	0.1s	
Pr284	41284	Dec Detectn Func Selectn	0-1	0-1	1	
Pr285	41285	Overspd Detectn f	0-30	0-BB8	0.01Hz	
	41286	Special				
	41287	Special				
	41288	Special				
	41289	Special				
	41290	Special				
	41291	Special				
	41292	Special				
	41293	Special				

Pr	Reg	Definition	Range	Hex	A500 Prec	A500L Prec
Pr338	41338	Op Cmd Source	0-1	0-1	1	
Pr339	41339	Spd Cmd Source	0-1	0-1	1	
Pr340	41340	Link Startup Mode Selectn	0-2	0-2	1	
	41341	Special				
	41342	Special				
	41360	Special				
	41361	Special				
	41362	Special				
	41363	Special				
	41364	Special				
	41365	Special				
	41366	Special				
Pr367	41367	Spd Feedbk Range	0-400	0-9C40	0.01Hz	
Pr368	41368	Feedbk Gain	0-100	0-64	1	

**Notes:**

1. Some default values depend on the rating of the VFD.
2. Values of 65535 Unit, 6553.5 Unit, 655.35 Unit indicate the function is NOT active; its meaning is the same as 9999 on PU, as specified in the *FR-A500(L) VFD Instruction Manual*.
3. Please refer to the *FR-A500(L) VFD Instruction Manual* for more details.
4. Access to Special Parameters from Modbus Plus depends on the actual functions and option units installed.

**900f Parameter Area**

Reg	Definition	
41900	Pr900 FM	Terminal Calibration
41901	Pr901 AM	Terminal Calibration
41902	Pr902f	Pr902f Frequency Setting Voltage Bias, Frequency Component (f)
41903	Pr903f	Frequency Setting Voltage Gain, Frequency Component (f)
41904	Pr904f	Frequency Setting Current Bias, Frequency Component (f)
41905	Pr905f	Frequency Setting Current Gain, Frequency Component (f)

**900 Percent Parameter Area**

Reg	Definition	
42092	Pr902%	Frequency Setting Voltage Bias Percent Of Full Scale (%)
42093	Pr903%	Frequency Setting Voltage Gain, Percent Of Full Scale (%)
42094	Pr904%	Frequency Setting Current Bias, Percent Of Full Scale (%)
42095	Pr905%	Frequency Setting Current Gain, Percent Of Full Scale (%)

**Prog Op Time (t) Components**

<b>Reg</b>	<b>Definition</b>
41200	Pr200 Program time unit (Min/Sec) Select
41201	Pr201t Program Setting 1 (t)
41202	Pr202t Program Setting 2 (t)
41203	Pr203t Program Setting 3 (t)
41204	Pr204t Program Setting 4 (t)
41205	Pr205t Program Setting 5 (t)
41206	Pr206t Program Setting 6 (t)
41207	Pr207t Program Setting 7 (t)
41208	Pr208t Program Setting 8 (t)
41209	Pr209t Program Setting 9 (t)
41210	Pr210t Program Setting 10 (t)
41211	Pr211t Program Setting 11 (t)
41212	Pr212t Program Setting 12 (t)
41213	Pr213t Program Setting 13 (t)
41214	Pr214t Program Setting 14 (t)
41215	Pr215t Program Setting 15 (t)
41216	Pr216t Program Setting 16 (t)
41217	Pr217t Program Setting 17 (t)
41218	Pr218t Program Setting 18 (t)
41219	Pr219t Program Setting 19 (t)
41220	Pr220t Program Setting 20 (t)
41221	Pr221t Program Setting 21 (t)
41222	Pr222t Program Setting 22 (t)
41223	Pr223t Program Setting 23 (t)
41224	Pr224t Program Setting 24 (t)
41225	Pr225t Program Setting 25 (t)
41226	Pr226t Program Setting 26 (t)
41227	Pr227t Program Setting 27 (t)
41228	Pr228t Program Setting 28 (t)
41229	Pr229t Program Setting 29 (t)
41230	Pr230t Program Setting 30 (t)
41231	Pr231 Time Of Day

**Prog Op Dir. (D) Components**

<b>Reg</b>	<b>Definition</b>
42001	Pr201D Program Setting 1 (D)
42002	Pr202D Program Setting 2 (D)
42003	Pr203D Program Setting 3 (D)
42004	Pr204D Program Setting 4 (D)
42005	Pr205D Program Setting 5 (D)
42006	Pr206D Program Setting 6 (D)
42007	Pr207D Program Setting 7 (D)
42008	Pr208D Program Setting 8 (D)
42009	Pr209D Program Setting 9 (D)
42010	Pr210D Program Setting 10 (D)
42011	Pr211D Program Setting 11 (D)
42012	Pr212D Program Setting 12 (D)
42013	Pr213D Program Setting 13 (D)
42014	Pr214D Program Setting 14 (D)
42015	Pr215D Program Setting 15 (D)
42016	Pr216D Program Setting 16 (D)
42017	Pr217D Program Setting 17 (D)
42018	Pr218D Program Setting 18 (D)
42019	Pr219D Program Setting 19 (D)
42020	Pr220D Program Setting 20 (D)
42021	Pr221D Program Setting 21 (D)
42022	Pr222D Program Setting 22 (D)
42023	Pr223D Program Setting 23 (D)
42024	Pr224D Program Setting 24 (D)
42025	Pr225D Program Setting 25 (D)
42026	Pr226D Program Setting 26 (D)
42027	Pr227D Program Setting 27 (D)
42028	Pr228D Program Setting 28 (D)
42029	Pr229D Program Setting 29 (D)
42030	Pr230D Program Setting 30 (D)

**Prog Op Freq. (f) Components**

<b>Reg</b>	<b>Definition</b>
42031	Pr201f Program Setting 1 (f)
42032	Pr202f Program Setting 2 (f)
42033	Pr203f Program Setting 3 (f)
42034	Pr204f Program Setting 4 (f)
42035	Pr205f Program Setting 5 (f)
42036	Pr206f Program Setting 6 (f)
42037	Pr207f Program Setting 7 (f)
42038	Pr208f Program Setting 8 (f)
42039	Pr209f Program Setting 9 (f)
42040	Pr210f Program Setting 10 (f)
42041	Pr211f Program Setting 11 (f)
42042	Pr212f Program Setting 12 (f)
42043	Pr213f Program Setting 13 (f)
42044	Pr214f Program Setting 14 (f)
42045	Pr215f Program Setting 15 (f)
42046	Pr216f Program Setting 16 (f)
42047	Pr217f Program Setting 17 (f)
42048	Pr218f Program Setting 18 (f)
42049	Pr219f Program Setting 19 (f)
42050	Pr220f Program Setting 20 (f)
42051	Pr221f Program Setting 21 (f)
42052	Pr222f Program Setting 22 (f)
42053	Pr223f Program Setting 23 (f)
42054	Pr224f Program Setting 24 (f)
42055	Pr225f Program Setting 25 (f)
42056	Pr226f Program Setting 26 (f)
42057	Pr227f Program Setting 27 (f)
42058	Pr228f Program Setting 28 (f)
42059	Pr229f Program Setting 29 (f)
42060	Pr230f Program Setting 30 (f)

## References

### **Mitsubishi Electric**

*FR-A500(L) VFD Instruction Manual*

### **Schneider Automation**

*Modicon Modbus Plus Network Planning  
and Installation Guide, 890 USE 100 00  
Version 3.0, April 1996*

*Modicon Modbus Protocol Reference Guide,  
PI-MBUS-300 Rev. J, June 1996*

### **Technical Support Number**

800-950-7781



## Specifications

Current Consumption	From A500(L) drive: 300 mA typ. @5 Vdc Provided to Modbus Plus network: 100 mA @5 Vdc
Backplane Isolation	500 Vdc min.
Supported Data Rates	<= 450 m: 1 Mps, no repeater; <= 1800 m: 1 Mps, repeaters  Maximum distance between nodes is 450 meters.
Operating Temperature	-10 to 50 °C
Storage Temperature <sup>(1)</sup>	-20 to 65 °C
Relative Humidity	<= 90% @50 °C, non-condensing
Dimensions	96 x 49 x 33 mm

- (1) This refers to a short period of time such as during transportation.

## Revisions

Print Date	Manual Number <sup>(1)</sup>	Revision
June 1998	VC7BNA00008A	Obsolete version
August 1998	VC7BNA00008 Rev. B	First revision
March 1999	VC7BNA00008 Rev. C	Second revision

- (1) The manual number is on the bottom left of the back cover.

## Index

### 9

- 900
  - 900 percent parameter area, 37
  - 900f parameter area, 37

### A

- A500(L) drive data, 18
- accessing
  - A500(L) drive data, 18
- alarm
  - history, 24
  - operating when occurs, 24

### B

- backplane isolation, 42
- bit-map
  - inverter status word, 20
  - register 40215 input terminal monitor, 22
  - register 40216 output terminal monitor, 23

### C

- cables, making, 10
- cautions
  - disposal, 5
  - injury prevention, 3
  - input/output terminal assignment, 23
  - maintenance, inspection, parts replacement, 5
  - usage, 4
- checks
  - pre-installation, 7
- components
  - prog op dir (d), 39
  - prog op freq (f), 40
  - prog op time (t), 38
- current consumption, 42

### D

- diagnostic LED status indicator, 14
- dimensions, 42
- disposing, 5
- drive data
  - A500(L), 18

## **E**

- error codes, 19
- ESD measures, 4

## **G**

- grounding
  - option board, 10

## **I**

- installing, 7
  - connecting to network, 11
  - pre-installation checks, 7

## **M**

- making
  - cables, 10
- manual reset, 17
- megaohm meter
  - testing with, 5
- modifying equipment, 4
- Modsoft MSTR block, 21
- monitor
  - bit-map for register 40215 input terminal, 22
  - bit-map for register 40216 outp terminal, 23
  - real-time, 22

## **N**

- network
  - active node, 14
  - alarm, 24
  - communication error, 17
  - connecting Modbus Plus cable, 11, 13
  - connecting to, 11
  - hardware, 10
  - link, 14
  - master, 18
  - operating mode, 15, 16
  - token, 14

## O

- operating
  - input from Modbus Plus to inverter, 17
  - modes, 15
  - selecting the operating mode, 15
  - when alarm occurs, 24
- operating mode
  - functions available, 17
  - overview, 15
  - selecting, 15
- operating temperature, 42
- option board
  - grounding, 10
  - setting Modbus Plus address, 11
- output
  - from inverter, 20

## P

- parameter
  - 900 percent parameter area, 37
  - 900f parameter area, 37
  - alarm history, 24
  - definitions, 19
  - error codes, 19
  - normal area, 26
  - operating when alarm occurs, 24
  - output from inverter to Modbus Plus, 20
  - prog op dir (d) components, 39
  - prog op freq (f) components, 40
  - prog op time (t) components, 38
  - real-time monitor, 22
  - SEV interface, 20
  - terminal assignment, 23
  - using the modsoft MSTR block, 21
- preventing
  - injury, 3
- prog-op dir components, 39
- prog-op freq components, 40
- prog-op time components, 38

## R

- real-time monitor, 22
- relative humidity, 42
- reset
  - manual, 17

## S

- Schneider Automation, i, 10, 41
- setting
  - switch, 11
  - switch, alternate method, 13
- SEV. *See* System Environment Variable
- specifications
  - backplane isolation, 42
  - current consumption, 42
  - dimensions, 42
  - operating temperature, 42
  - relative humidity, 42
  - storage temperature, 42
  - supported data rates, 42
- status indicator, 14
- storage temperature, 42
- supported data rates, 42
- switch
  - DIP switch, 14
  - positions, 11
  - setting, 11
  - setting, alternate method, 13
- System Environment Variable, 20

## T

- temperature
  - operating, 42
  - storage, 42
- terminal assignment, 23

## V

- voltage, 2, 3, 7

## W

- warnings
  - usage, 4
- wiring, 2, 10



**FR-A5NM Instruction Manual Evaluation**

Please help us evaluate our Modbus Plus Communications Option Unit documentation.

Complete and mail this form to:

FR-A500 Option Marketing Group  
Mitsubishi Electric Automation, Inc.  
500 Corporate Woods Parkway  
Vernon Hills, IL 60061

or fax this form to: (847) 478-2253

<b>Ease of use</b>	The documentation is clear, easy to understand, and helpful. <input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree Specific comments:
<b>Topic Sequence</b>	Topics are presented in a logical and orderly sequence. <input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree Specific comments:
<b>Technical Accuracy</b>	Technical diagrams, charts, and instructions provide accurate information. <input type="checkbox"/> Strongly agree <input type="checkbox"/> Agree <input type="checkbox"/> Disagree <input type="checkbox"/> Strongly disagree Specific comments:

**Please fill out both sides of this page.**



**FR-A5NM Instruction Manual Evaluation**

Please help us evaluate our Modbus Plus Communications Option Unit documentation.

Complete and mail this form to:

FR-A500 Option Marketing Group  
 Mitsubishi Electric Automation, Inc.  
 500 Corporate Woods Parkway  
 Vernon Hills, IL 60061

or fax this form to: (847) 478-2253

**Please fill out both sides of this page.**

<b>Product Packaging</b>	Technical diagrams, charts, and instructions provide accurate information.  <input type="checkbox"/> Strongly agree  <input type="checkbox"/> Agree  <input type="checkbox"/> Disagree  <input type="checkbox"/> Strongly disagree  Specific comments:
<b>Installation &amp; Configuration</b>	I was able to install and configure the FR-A5NM using the documentation.  <input type="checkbox"/> Strongly agree  <input type="checkbox"/> Agree  <input type="checkbox"/> Disagree  <input type="checkbox"/> Strongly disagree  Specific comments:
<b>Other Comments</b>	
<p><b>To Be Completed by Mitsubishi</b></p> <p>Received by: _____ Date: _____</p> <p>Reviewed by: _____ Date: _____</p> <p>Corrective Action: _____</p> <p>_____</p> <p>Forward to: _____ Date: _____</p>	

Please fill out and return the documentation survey.



This page is intentionally left blank.

**Modbus Plus Communications Option Unit  
(FR-A5NM)**

This option unit lets you connect a FR-A500(L) series VFD to a network adhering to the Modbus Plus communications protocol.

Some important features of this option unit include:

- Data rate of 1 Modbus Plus
- Support for up to 32 nodes without a repeater (64 nodes with a repeater) on a single network
- Network access to all VFD parameters
- Passed Modicon Conformance Test in March, 1999
- Designed and assembled in the U.S.A.

Mitsubishi VFD Instruction Manual  
FR-A5NM

© 1999 Mitsubishi Electric Automation, Inc.

