MITSUBISHI ELECTRIC

TRANSISTORIZED INVERTER

INSTRUCTION MANUAL

VFD SETUP SOFTWARE

FR-SW1-SETUP-WE

-Windows® (English) Version-

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INTRODUCTION

Thank you for choosing the Mitsubishi Transistorized VFD Setup Software.
This instruction manual gives handling information and precautions for use of this software.
Incorrect handling might cause an unexpected fault. Before using this product, please read this manual carefully to use it to the optimum.
Please forward this manual to the end user.

When reading this manual, note the following:

- This manual is written on the basis that Windows® 95 (English version) is the operating system.
  - The [return] and [enter] keys are represented by the ↵ key.
  - Drive D is described as the CD-ROM drive and Drive C as the hard disk drive.
  - In keyboard operation, simultaneous pressing of keys is indicated by "+".
    Example: Pressing the [Alt] and [G] keys simultaneously is indicated by (Alt+G).
- The screens, parameter names, set values and so on given in this manual are written on the basis of the FR-A500 series. When using the inverter of any other series, refer to the instruction manual of the used inverter.

Trademarks

- Microsoft and Windows are registered trademark or trademark of Microsoft Corporation in the United States and/or other countries.
  1) The formal name of Windows 95 is Microsoft® Windows® 95 operating system.
  2) The formal name of Windows 98 is Microsoft® Windows® 98 operating system.
  3) The formal name of Windows NT® is Microsoft® Windows NT® operating system.
  4) The formal name of Windows® 2000 is Microsoft® Windows® 2000 operating system.
  5) The formal name of Windows® Me is Microsoft® Windows® Me operating system.
  6) The formal name of Windows® XP is Microsoft® Windows® XP operating system.
  7) The formal name of Excel is Microsoft® Excel for Windows®.
- The DOS/V personal computer is a registered trademark of IBM Corporation.
- The "Mitsubishi Transistorized VFD Setup Software" is a registered trademark of Mitsubishi Electric Corporation. The copyright and other rights of this software all belong to Mitsubishi Electric Corporation.
- No part of this manual may be copied or reproduced without the permission of Mitsubishi Electric Corporation.
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⚠ For Maximum Safety

- Mitsubishi vector inverters are not designed or manufactured to be used in equipment or systems in situations that can affect or endanger human life.
- When considering this product for operation in special applications such as machinery or systems used in passenger transportation, medical, aerospace, atomic power, electric power, or submarine repeating applications, please contact your nearest Mitsubishi sales representative.
- Although this product was manufactured under conditions of strict quality control, you are strongly advised to install safety devices to prevent serious accidents when it is used in facilities where breakdowns of the product are likely to cause a serious accident.

<Abbreviations>

PU	Operation panel and parameter unit
Inverter	Mitsubishi inverter (VFD)
Pr.	Parameter Number
PU operation	Operation using the PU
External operation	Operation using the control circuit signals

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1 OVERVIEW

This chapter provides the fundamental "overview" for use of this product.
Always read the instructions before using this software.

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When using this software to make communication with the inverters, set a value other than 0 in Pr. 122 "communication check time interval" on the inverter's operation panel. When using the FR-A5NR, set any value other than 0 in Pr. 336 "communication check time interval", and when using the FR-S500 series, set any value other than 0 in the communication parameter n6 (336) "communication check time interval".
(Refer to the inverter instruction manual for the setting method.)

1.1 Before Using This Software

- This software can be used effectively as a support tool for operations from startup to maintenance of the Mitsubishi transistorized inverter. The following functions can be performed efficiently on the Windows screen of a personal computer.
  · System setting function
  · Parameter editing function
  · Monitoring function
  · Diagnosis function
  · Test running function
  · File management function
  · Advanced function
  · Help function

1.1.1 Packing list

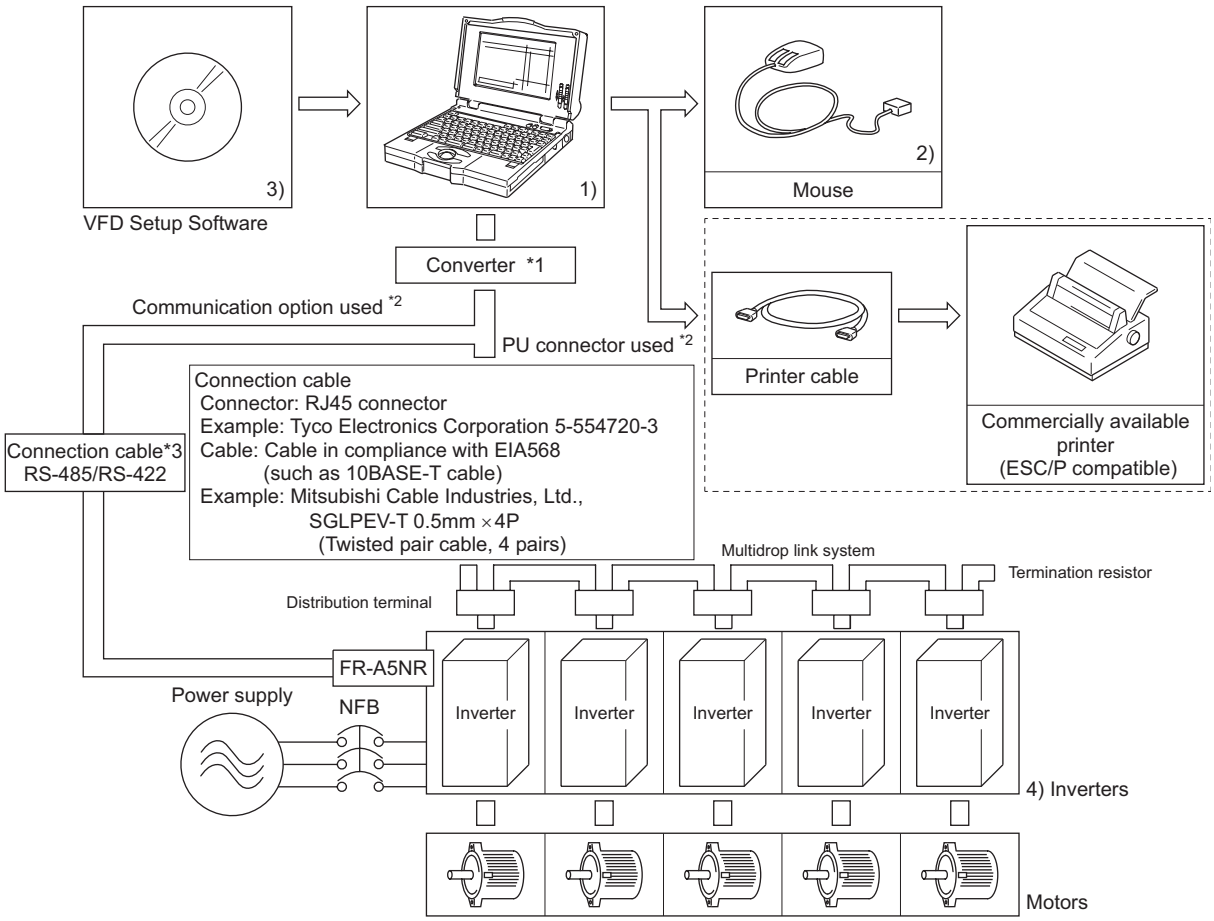
After unpacking, check that the following items are contained in the package:

Item	Quantity
CD-ROM	1 disk
Instruction manual	1 book

1.2 Preparations for Startup

1.2.1 System configuration

The following devices are required to use the VFD Setup Software. Configure the system in accordance with the instruction manuals of the corresponding devices.



*1: A converter commercially available is required when the personal computer uses the RS-232C port.
<Example of a commercially available product>
Model: FA-T-RS40☐ Converter (Model with connectors and cable is also available)
Mitsubishi Electric Engineering Co., Ltd.
- The converter cable cannot connect two or more inverters (the computer and inverter are connected on a 1:1 basis). Since the product is packed with the RS-232C cable and RS-485 cable (10BASE-T + RJ-45 connector), the cable and connector need not be prepared separately.

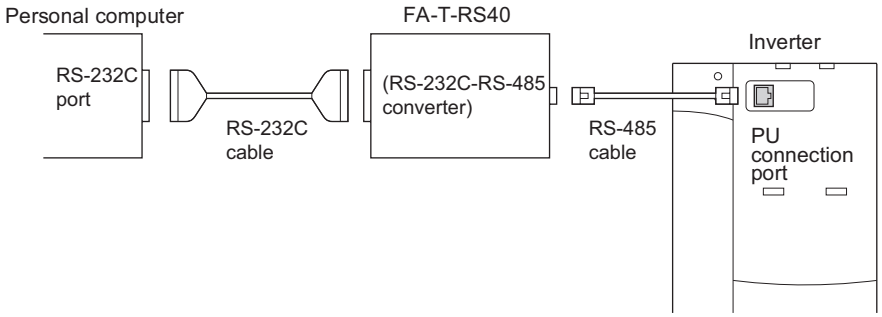
*2: The PU connector or FR-A5NR (FR-A500 (L) / F500 (L) / V500 (L) series) can be used to make communication.
(Refer to the corresponding instruction manual for details.)

*3: Overall length of connection cable: 500m

	Model, Specifications, Etc.
1) Personal computer	One on which Windows 95, Windows 98, Windows NT 4.0, Windows 2000, Windows Me or Windows XP (English version) operates
2) Mouse	Mouse which can be connected to the personal computer
3) Setup software	VFD Setup Software (FR-SW1-SETUP-WE)
4) Inverter	FR-A520 (-NA), FR-A540 (-NA) (-EC) (-CH), FR-A560-NA, FR-A520L-75K, 90K, FR-A540L-65K*, 75K to 450K (-NA) (-G-NA) (-EC) (-G-EC), FR-A540L-S-60K to 375K (-EC) (-CH), FR-A560L-NA-75K to 450K, FR-E520-0.1K to 7.5K (-NA), FR-E540-0.4K to 7.5K (-NA) (-EC) (-CH), FR-E520S-0.1K to 0.75K, FR-E520S-0.4K to 2.2K-EC (-CH), FR-E510W-0.1K to 0.75K (-NA), FR-F520-0.75K to 55K (-NA), FR-F540-0.75K to 55K (-NA) (-EC) (-CH), FR-F520L-75K to 110K, FR-F540L-75K to 530K (-NA) (-EC) (-CH) (-G-CH), FR-F540L-S-75K to 400K (-CH), FR-F720-0.75K to 55K, FR-F720-00046 to 02330 (-NA) FR-F740-0.75K to 160K, FR-F740-00023 to 03610 (-NA) (-EC) FR-F740-0.75K to 55K, S75K to S185K (-CH) FR-S520-0.1K to 3.7K-R, FR-S540-0.4K to 3.7K-R (-NAR) (-ECR) (-CHR), FR-S520S-0.1K to 1.5K-R, FR-S520S-0.2K to 1.5K-ECR (-CHR), FR-S510W-0.1K to 0.75K-R FR-S520E-0.1K to 3.7K (-NA), FR-S540E-0.4K to 3.7K (-NA) (-EC) (-CHT) FR-S520SE-0.1K to 1.5K, (FR-S520SE-0.2K to 1.5K (-EC) (-CHT)), FR-S510WE-0.1K to 0.75K (-NA) FR-V520, FR-V540, FR-V520L-75K, FR-V540L-75K to 250K (-NA)

* For the 65K, only (-NA), (-G-NA), (-EC), and (-G-EC) are supported.

[Connection example between converter and inverter (PU connection port)]



1.2.2 Installing the Setup Software

To use the VFD Setup Software (FR-SW1-SETUP-WE), the files included in the setup disks must be installed onto the personal computer.
When using an old version inverter setup software, move the setting file you have created from the default folder where the file is placed to another folder. Also, be sure to uninstall *4 the old version software before installing a new setup software.

To install the VFD Setup Software, use the setup program (SETUP.EXE) on the Setup Disk (CD-ROM). The setup program creates a directory on the specified hard disk and copies the required files.

CAUTION

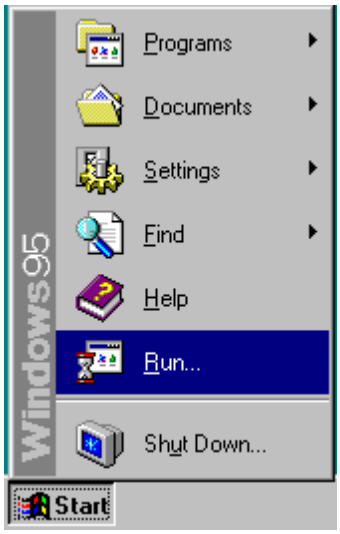
1. **Since the files in the Setup Disk are compressed, the VFD Setup Software will not operate by merely copying the files. Always use the setup program to install the software.**
2. **Install the software in accordance with the Windows installation procedure.**
3. **When installing on Windows 95, be sure to install Microsoft DCOM95 for Windows 95, Version 1.3 before installing setup software. You can download DCOM95 for Windows 95, Version 1.3 from the following website of Microsoft Corporation. Note that URL is subject to variation.**
   http://www.microsoft.com/com/
4. **For uninstallation, use [Uninstall] of the inverter setup software or [Setting] of the [Start] menu-[Add/Remove Programs Properties] of [Control panel].**

• Installation procedure

Use the following procedure to register (install) the VFD Setup Software onto the hard disk drive of the personal computer:

(1) Insert the CD-ROM into the CD-ROM drive.

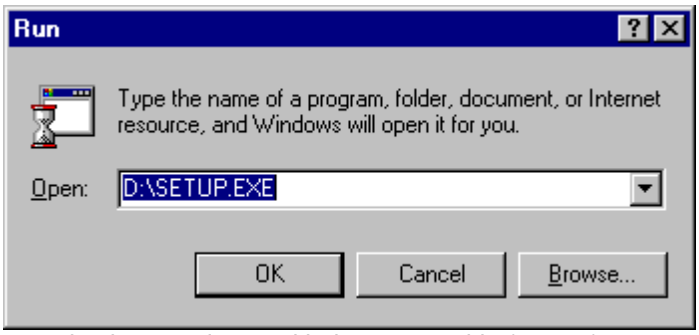
(2) Press the [Start] button and choose the [Run] command.



CAUTION

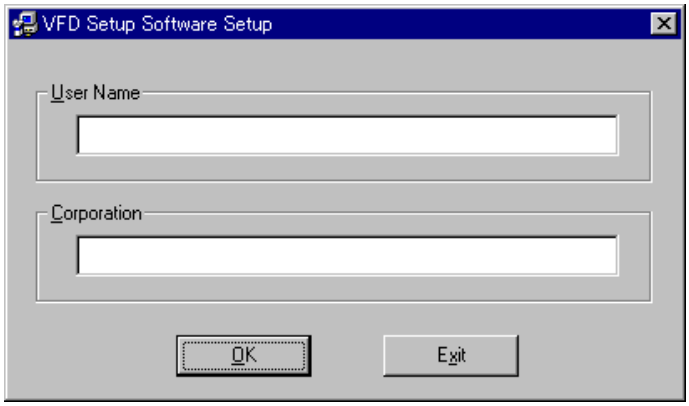
Close any other applications that have already been started.

(3) Running the installation program
1) The [Run] dialog box appears.
2) Type "D:\SETUP" (use half-size letters) in [Open] and click the [OK] button or press the ↵ key. (When the CD-ROM drive is drive D)

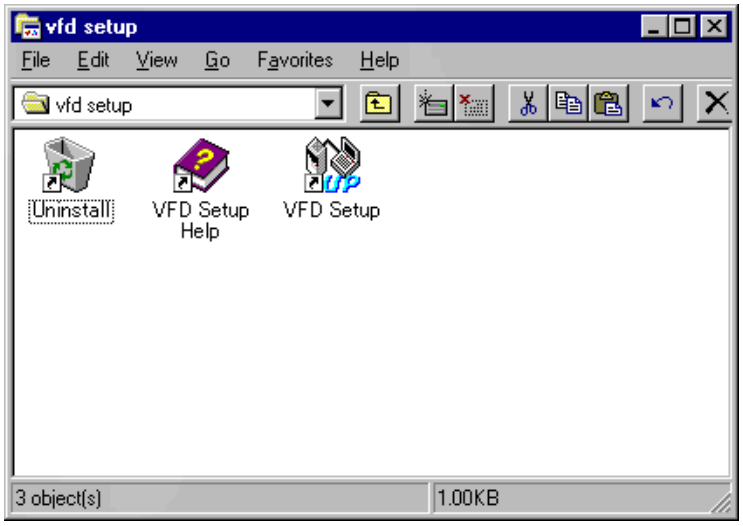


3) After that, perform operation in accordance with the setup guide (screen).

(4) When file copying is over, the following screen appears. Always enter the user and company names and click the [OK] button.
Installation is not completed unless the user and company names are entered.



(5) When installation is finished, the "Uninstall", "VFD Setup S/W" and "VFD Setup S/W Help" icons are registered and the following screen appears.



MEMO

2 FUNCTIONS

This chapter describes the "functions" for use of this product.
Always read the instructions before using this software.

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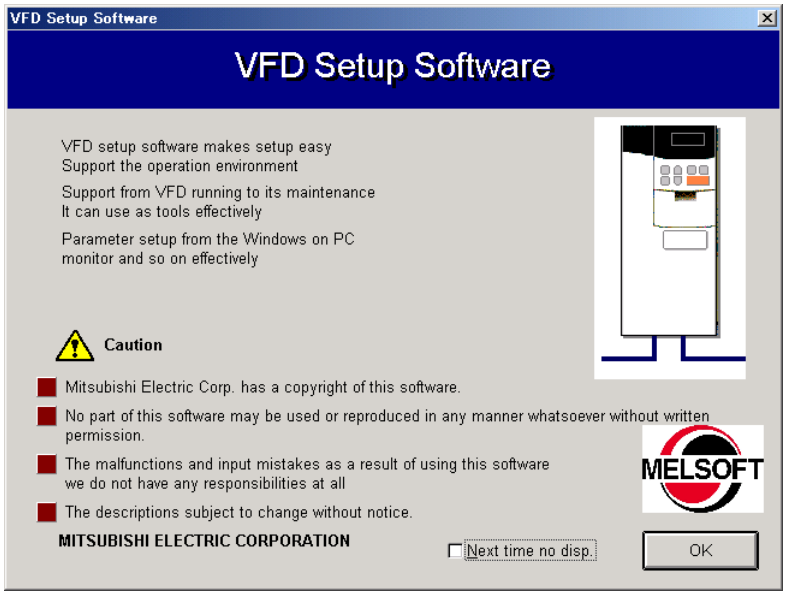
2.1 Starting the VFD Setup Software

Start the VFD Setup Software with "INVSUPE.EXE".

CAUTION

Start only one VFD setup software program.

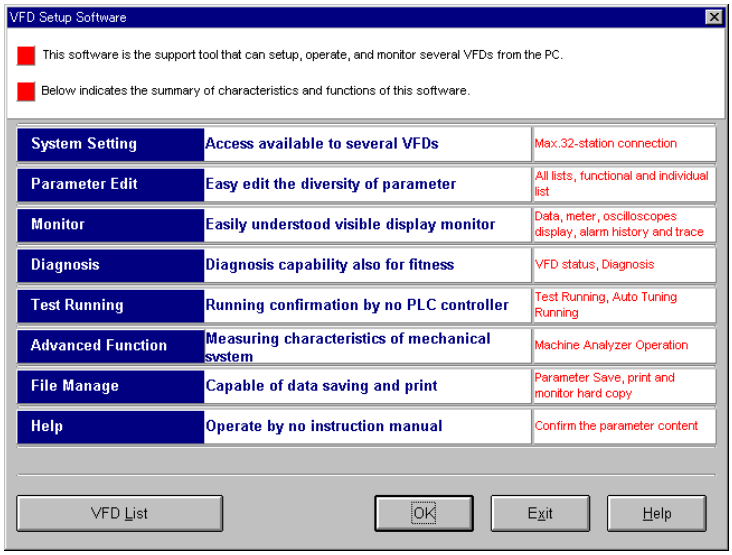
<Primary screen>



REMARKS

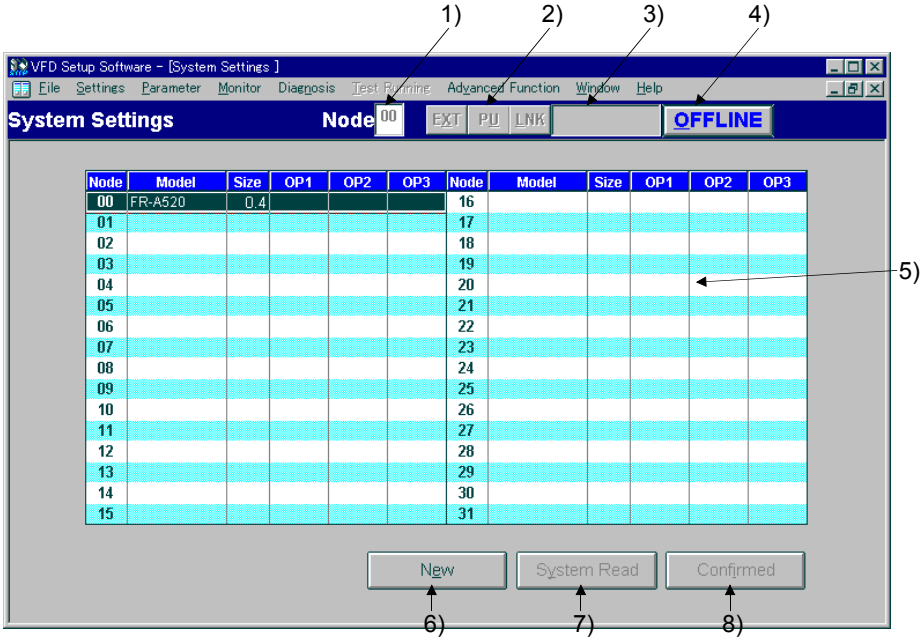
If check box "next time no disp." is checked, the above screen will not be displayed from the next time.
To display it again, check the check box "Display the initial screen", see section "2.2.3 Environmental Setting" (refer to page 14).

<Initial screen>



2.2 Settings

When you press the [OK] button on the initial screen, the following screen appears:



(1) Menu list

This software has the following functions:

Menu	Pull-Down Menu	Function/Operation
File (Alt+F)	Open Ctrl+O	Opens a file.
	Close	Closes the screen.
	Save Ctrl+S	Saves data.
	Save As Ctrl+A	Save data with a new name.
	Print Ctrl+P	Selects printing.
	Exit	Performs exiting procedure.
Settings (Alt+S)	System Settings	Sets the model, capacity (size) and option type. (Stations 00 to 31)
	Communication Settings	Sets serial communication information.
	Environmental Settings	Sets the directory where data will be stored and sets re-display of the initial screen.
Parameter (Alt+P)	All list Format	Shows and sets the parameter list.
	Functional List Format	Shows and sets the related parameters function-by-function.
	Individual list Format	You can register or delete a total of 32 parameters out of all parameters to or from two different user groups.
	Basic Settings	You can set the parameters required for starting up the inverter without being aware of parameter numbers.
Monitor (Alt+M)	Data Display	Shows four pieces of data (up to four stations) in terms of values.
	Meter Display	Shows four pieces of data (up to four stations) in terms of meter deflections.
	Oscilloscopes	Shows four pieces of data (up to four stations) in terms of waveforms.
	Alarm History	Shows the alarm history of all inverter stations connected.
	Trace Oscilloscopes	Analyzes various types of data.
Diagnosis (Alt+N)	VFD Status	Shows various data of all stations connected in real time in terms of values.
	Diagnosis	Examine the estimated cause of the alarm in accordance with the alarm display.
Test Running (Alt+T)	Test Running	Gives the operation command from the personal computer to actually test run the inverter.
	Auto Tuning	Performs auto tuning in accordance with the motor connected to the inverter.
Advanced function (Alt+V)	Machine Analyzer	Measures the response frequency characteristic of speed relative to the motor torque of the machine.
Window (Alt+W)	Cascade Display	Overlapping Windows.
	Tile Display	Windows are side-by-side.
Help (Alt+H)	Contents	Various help functions (parameter explanations, function explanations, etc.)
	About VFD Setup S/W	Version information (copyright, version information, user and company names, etc.)

(2) Description of various buttons and indications

1) Node
   The station number selected is displayed.

2) [EXT] (Alt+X), [PU] (Alt+U) and [LNK] (Alt+L) buttons
   You can choose the inverter operation mode for online operation.
   · [EXT] button: External operation mode
   · [PU] button: PU operation mode
   · [LNK] button: Computer link operation mode

3) The operation mode and error codes appear. (Refer to page 47 for the error codes.)
   Operation mode indications
   · EXT..... External operation mode
   · PU..... PU operation mode
   · EXT JOG ..... External jog mode
   · PU JOG ..... PU jog mode
   · LNK..... Computer link mode
   · PU EXT..... PU-external combined mode
   · TIME ..... Time scheduled operation
   · SP ..... Special mode
   · No Node..... Time-out occurred in the online mode
   In any other case, the error number at NAK error occurrence appears.
   · When an alarm occurs, the operation mode and error codes are displayed in red.
   · To display a warning, the operation mode and warning appear.

4) [ONLINE/OFFLINE] (Alt+O) button
   · [ONLINE] (online) button: Online operation mode
   · [OFFLINE] (offline) button: Offline operation mode
   Click the corresponding button to select the online or offline mode.

5) System settings
   You can set the environment of the inverters of stations 00 to 31.
   Set the model, capacity and options for these inverters.

6) [New] button (Alt+E)
   Used to make new system settings.

7) [System Read] button (Alt+Y)
   Used to batch-read all inverters in the system with which the personal computer communicates.

8) [Confirmed] button (Alt+I)
   You can register the data specified in the system settings. Always confirm the entry with the [Confirmed] button when you have changed the setting of the system configuration manually.

2.2.1 System Settings

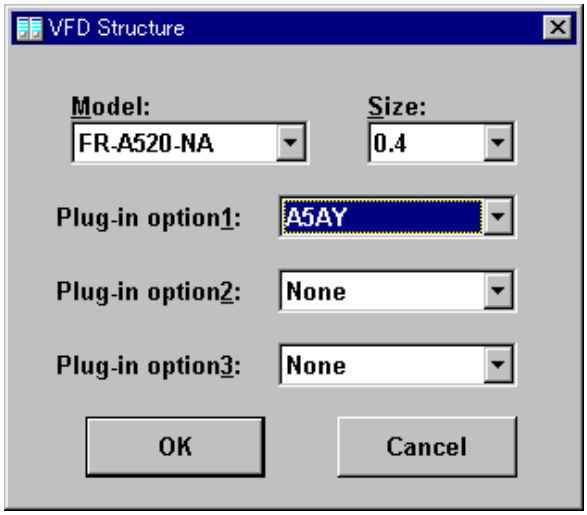
This screen appears when you start this software and press the [OK] button on the initial screen.
On this screen, set the station numbers, models, capacities and plug-in options of the inverters connected. Inverters can be set to stations 0 to 31.

(1) Station selection (Ctrl+N)

Click the required station number. That line is then chosen.

(2) Selection of model, capacity and options

When you double-click the selected line, the "VFD Structure" panel (as shown on the right) appears. Set the model, capacity and options and press the [OK] button to complete the settings. Using the same procedure, set all inverter stations which connected.



(3) [Confirmed] button (Alt+I)

After setting all stations, pressing the Confirmed button completes the system settings.

(4) [New] button (Alt+E)

Press the New button to initialize (clear) the system settings/communication settings being edited.

(5) [System Read] button (Alt+Y)

Before pressing the [System Read] button, press the [ONLINE/OFFLINE] button to change the mode indication to [ONLINE] and select the online operation mode. In the online operation mode, the personal computer is switched to the inverter communication status and clicking the [System Read] button reads the models, capacities and options of all stations (stations 0 to 31) and displays the stations connected (with which the personal computer can communicate).
After reading, the settings are registered automatically.
When the system settings have not yet been made, the read stations are displayed. When the system settings have already been registered, check is performed. If the check result is different from the read data, select whether different points are displayed and changed or not.

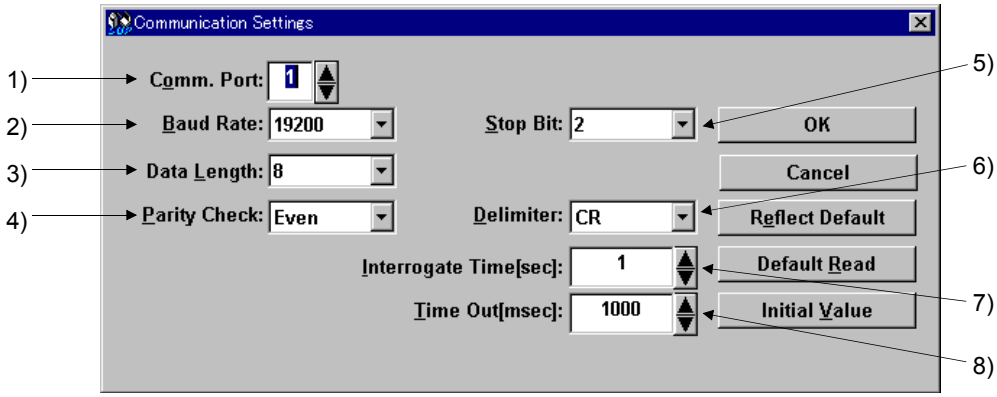
CAUTION

1. **When the [Cancel] button is clicked during [System Read], the system setting made until then is verified.**
2. **• When the [System Read] button is pressed, the 100V or 200V class of the FR-E500 series is displayed as the FR-E520-NA, the 400V class as the FR-E540-NA.**
   • When the [System Read] button is pressed, the 100V class of the FR-S500 series as the 200V class.
   • When the [System Read] button is pressed, CH model of the FR-S540E, or FR-S520SE is displayed as CHT.
   • During [System Read] of the FR-F520 and the FR-F540(L), the models are displayed as the FR-F520-NA and the FR-F540(L)-NA.
   • During [System Read] of the FR-F540L-G-CH, the model is displayed as the FR-F540L-S-CH and the capacity is the value one rank lower.

When the model and the capacity differ, change them manually.

2.2.2 Communication Settings

The VFD Setup Software uses the serial port of the personal computer to control the inverters through serial communication. Its communication settings must be the same as those of the inverter. (The initial values of the setup software have been matched with the factory settings of the inverter.)
When you start this software, the initial screen appears. Pressing the [OK] button displays the system setting screen. Choosing the [Settings] → [Communication settings] command on the menu bar. The screen then shows the following dialog box, where various communication settings can be made.
Communication settings will be described below:



(1) Screen explanations

The values in parentheses are initial values.

1) Communication Port (1)
   Choose the communication port of the personal computer.
2) Baud Rate (19200)
   Set the communication speed.
3) Data Length (8)
   Set the data bit length.
4) Parity Check (Even)
   Specify the parity bit.
5) Stop Bit (2)
   Set the stop bit length.
6) Delimiter (CR)
   Specify the delimiter at the data trailer.
7) Interrogate Time [sec] (1)
   Set the interval at which data transmission (operation mode indication and error check) is always made to the inverter.
8) Time Out [msec] (1000)
   Set the time from when data is transferred from the personal computer to the inverter until when the personal computer receives a reply from the inverter. If a reply is not given after the preset time has passed, the "time-out" error is displayed.

The above set values depend on the inverter connected. Set them after confirming the set values of the communication function parameters of the inverter.

(2) Button settings

1) [OK] button
   Recognizes the settings on the communication screen and returns to the system setting screen.
2) [Cancel] button
   Cancels the communication settings and returns to the system setting screen.
3) [Reflect Default] button
   Used to omit the setting of the values specified in communication settings from the next time onward.
4) [Default Read] button
   Used to read the default values. The value is as set with the [Reflect Default] button.
5) [Initial Value] button
   This button is used to return the communication setting to the initial value (factory setting of the inverter).

(3) Inverter communication settings

The values set for communication depend on the inverter and connection method.

Inverter		Connection Method	Operation mode	Setting Range	
FR-A520(-NA) FR-A520L FR-A540(-NA) (-EC) (-CH) FR-A540L (-NA) (-G-NA) (-EC) (-G-EC) (-S-EC) (-S-CH) FR-A560-NA FR-A560L-NA FR-F520 (-NA) FR-F520L	FR-F540 (-NA) (-EC) (-CH) FR-F540L (-NA) (-EC) (-CH) (-G-CH) (-S-CH) FR-F720 (-NA) FR-F740 (-NA) (-EC) (-CH) FR-V520 FR-V520L FR-V540 FR-V540L (-NA)	PU connector (RS-485 connector) or FR-A5NR	· When PU connector (RS-485 connector) is connected PU mode · When FR-A5NR is connected LINK mode	[Node] [Baud rate] [Stop bit] [Data length] [Parity bit] [Delimiter]	Station 0 to 31 4800, 9600, 19200 bps 1 bit, 2 bits 7 bits, 8 bits None, odd, even None, CR, CR+LF
FR-E520 (-NA) FR-E520S (-EC) (-CH)	FR-E510W (-NA) FR-E540 (-NA) (-EC) (-CH)	PU connector (RS-485 connector)	PU mode		
FR-S520-R FR-S520E (-NA) FR-S520S-R FR-S520S-ECR (-CHR) FR-S520SE (-EC) (-CHT)	FR-S510W-R FR-S510WE (-NA) FR-S540-R (-NAR) (-ECR) (-CHR) FR-S540E (-NA) (-EC) (-CHT)	RS-485 connector	LINK mode		

CAUTION

When making communication with the inverters, set a value other than 0 in Pr. 122 "communication check time interval" on the inverter's operation panel. For the FR-A5NR, set any value other than 0 in Pr. 336 "communication check time interval", and for the FR-S500 series, set any value other than 0 in the communication parameter n6 (336) "communication check time interval".
(Refer to the inverter instruction manual for the setting method.)

(4) Interrogate time

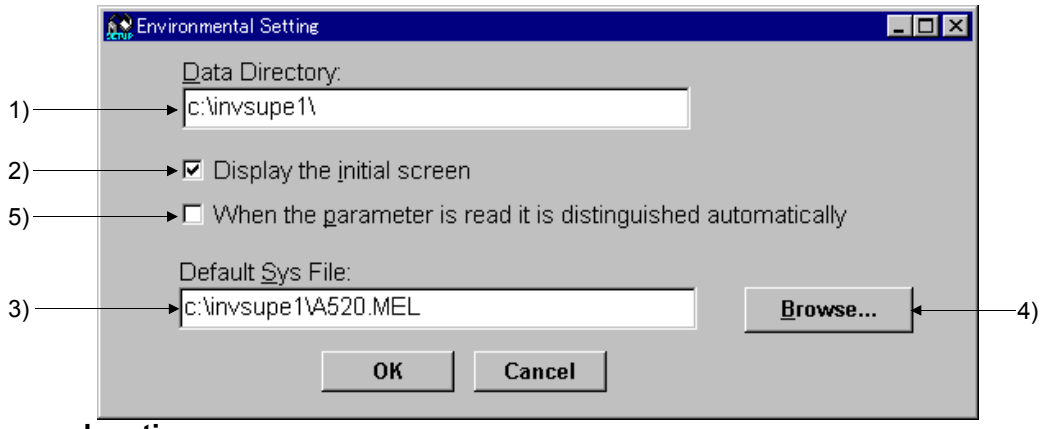
Set the interval at which data is always sent or received to or from the inverter.
It must be set to at least 2 seconds shorter than the communication check time interval setting of the inverter. If its setting is longer than the communication check time interval setting, the inverter will come to an alarm stop.

CAUTION

The setting of short interrogate time may slow down the response of the menus and buttons on each window depending on the operating model and communication speed.

2.2.3 Environmental Setting

You can specify the data directory (place where data is saved) and default system file.



(1) Screen explanations

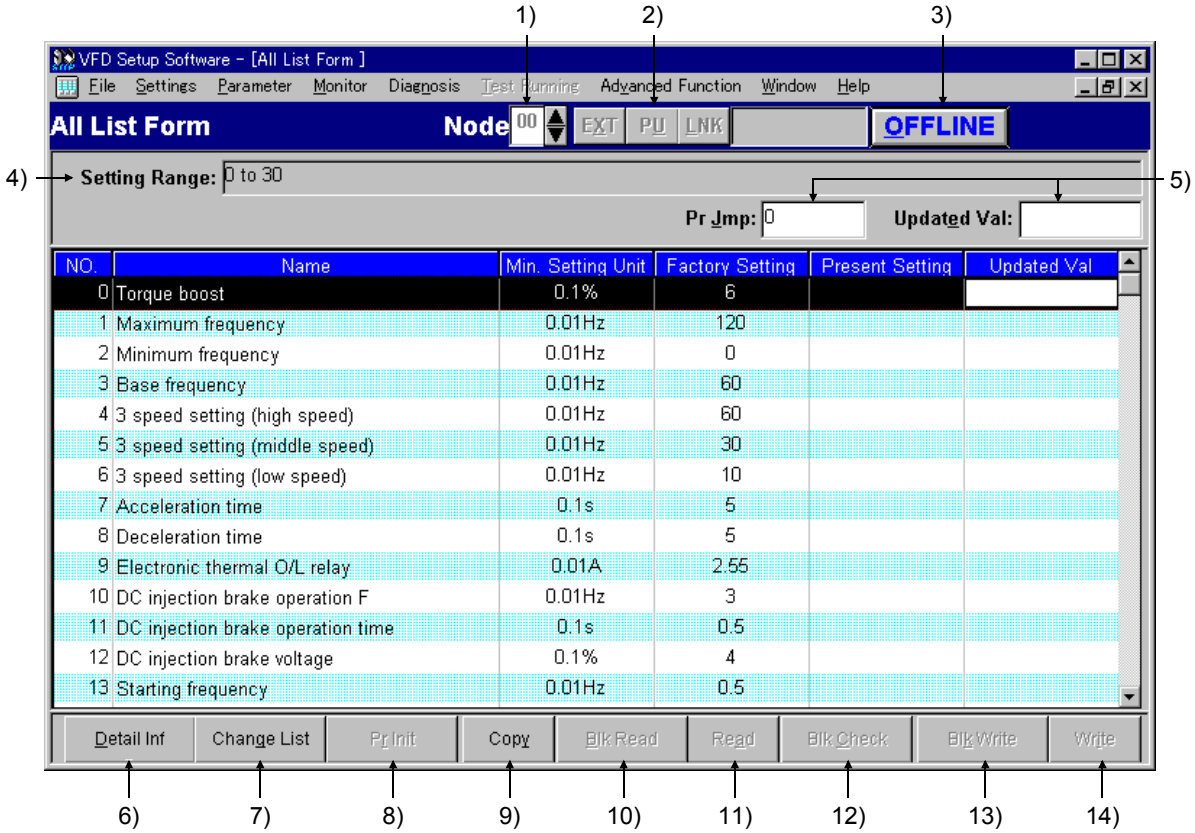
1) Data Directory..... You can change the directory where data will be saved.
2) Display the initial screen..... Checking the check box displays the initial screen.
3) Default Sys File ..... Shows the system file (*.MEL) which is automatically set when starting of the software.
   There is no default registered.
4) Browse..... Default system file browsing button.
   Shows the file selection common dialog and displays the chosen file name in the default system file text box.
5) When the parameter is read it is distinguished automatical..... Turn on the check box to hide the parameters read-disabled for parameter batch-read or batch-verify from the error panel. (Refer to page 17)

2.3 Parameter

When system settings are complete, you can choose menu parameters.
Choose the [Parameter] → [All List Format], [Functional List Format], [Individual List Format] or [Basic Settings] command in the menu to select the corresponding format, and set parameters. Any parameter setting is changed by first entering new data in the Updated column and then pressing the [Write] or [Blk Write] button. The new data is then displayed in the Current setting column, which shows the current settings of the inverter.

2.3.1 All List Format

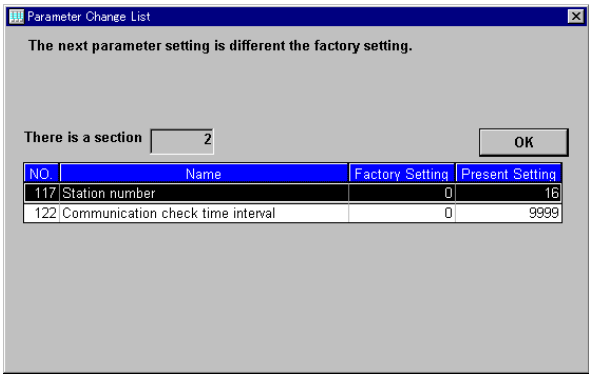
By choosing the [Parameter] → [All List Format] command in the menu, all parameters of the inverter are displayed as a list. When changing any parameter setting, enter a new value in the required parameter column and press the ↵ key to register it.



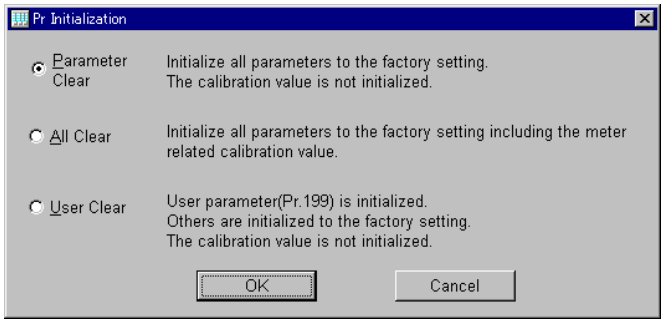
(1) Buttons and indications common to various parameter setting screens

1) Node (Ctrl+N) ..... Indicates the inverter station number to be set (only the station numbers registered in the system settings may be selected.)
2) Inverter operation mode ..... Used to choose/display the operation mode of the selected inverter station number.
3) Online/offline (Alt+O) ..... To read/write the parameter values of the inverter, select the online operation mode.
4) Setting Range..... Indicates the setting range of the selected parameter.
5) Pr Jmp (Alt+J), updated Val (Alt+E)..... Shows the number and new value of the selected parameter. Values may be entered directly into these columns.
6) Detail Information (Alt+D,F1) ..... Shows the function explanation of the selected parameter.

7) Change List (Alt+G) ..... Lists the parameters with the present set values which have been changed from the initial values.



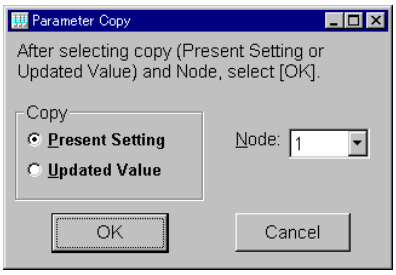
8) Parameter initialization (Alt+R) ... Initializes the parameters of the inverter. (The communication parameters are not initialized.)
Choose the clearing method from among "Parameter Clear", "All Clear" and "User Clear" on the following panel and click the [OK] button to execute clear.



CAUTION

Changing the Pr. 21 setting automatically switches the minimum setting increments of the acceleration/deceleration time-related parameters (Pr. 7, Pr. 8, Pr. 16, Pr. 45, Pr. 46, Pr. 110, Pr. 111, Pr. 264, Pr.265). (Increments are 0.1s when Pr. 21=0, 0.01s when Pr. 21=1)
The acceleration deceleration time-related parameters differ according to the inverter. Refer to the inverter manual for details.

9) Copy (Alt+Y) ..... · System setting file (*.MEL)
Used to copy the parameter list as a file to the inverter. Choose the system setting file (*.MEL) and click the [OK] button to display the panel shown on the right. Making selections at "Copy" and "Node" and clicking the [OK] button reads the parameter settings and sets them to the Updated column. Therefore, by performing block write after that, they are copied to the inverter. (Parameter copy cannot be made between different models.)

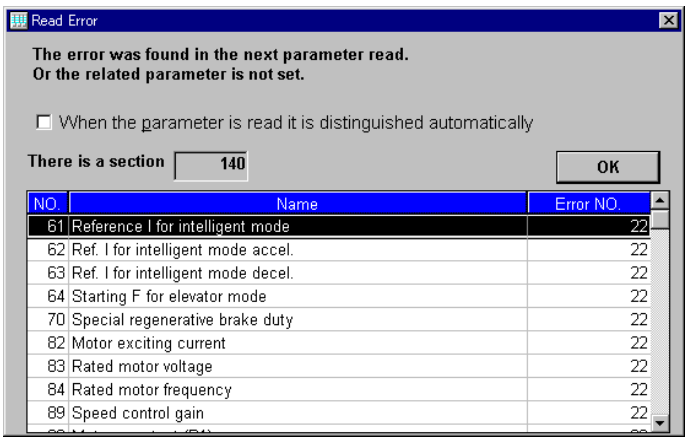


·Parameter setting file (*.PRM)
Choosing the parameter setting file (*.PRM) displays the present settings in the Updated value field of the screen. (When only the present settings are saved)
When there are both the present settings and updated values, display the parameter copy panel (shown above) and select the values to be copied.

10) Blk Read (Alt+B) ..... Reads all parameters of the selected inverter station number.
11) Read (Alt+A) ..... Reads the data of the parameter numbers selected on the screen.
12) Blk Check (Alt+C) ..... Batch-checks the parameters of the inverter against those of the personal computer.
13) Blk write (Alt+K) ..... Writes new parameter values to the inverter.
(When there are no values in the Updated value field, the screen for selecting whether the present settings will be written or not appears. Perform operation following the screen prompts.)
14) Write (Alt+I) ..... Writes the data of the parameter numbers selected on the screen.

CAUTION

If an error occurred during "block read", "block check" or "block write", the parameter list appears on the panel. Double-clicking the error number in the displayed list shows the details of the error definition on the panel.

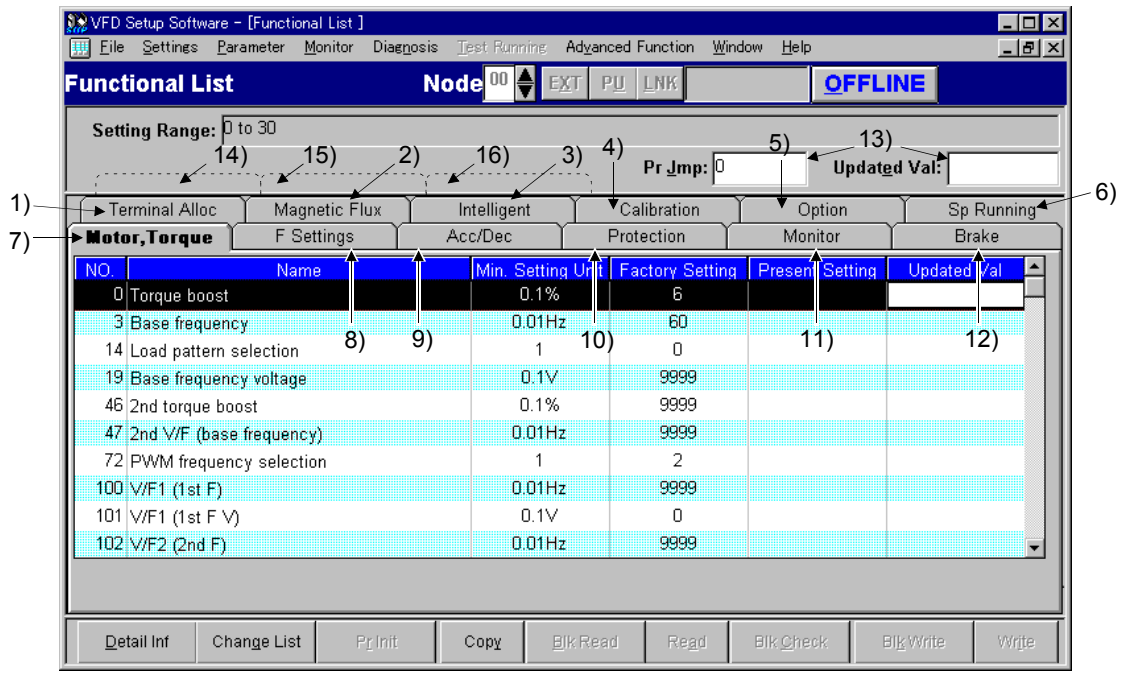


[When the parameter is read it is distinguished automatically]
Turning on this check box automatically judges the read-disabled parameters and hide them from the read error panel.

2.3.2 Functional List Format

By choosing the [Parameter] → [Functional List Format] command in the menu, the parameters are displayed as a function list. For parameter setting and changing, values may only be written in the online operation mode.

When changing any parameter setting, enter a new value in the required parameter column and press the ↵ key to register it.



(1) Various panel indications

- FR-A500(L)/F500(L)/E500/S500 series

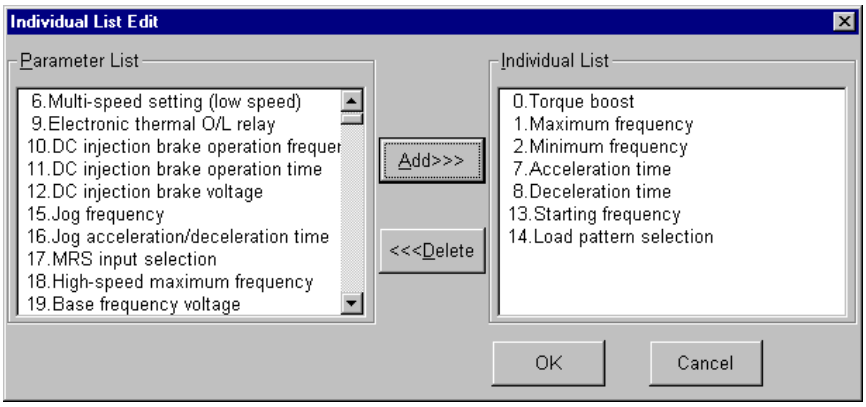
1) Terminal allocation ..... Lists the parameters concerned with the control circuit terminals.
2) Magnetic flux vector..... Lists only the parameters for magnetic flux vector control.
3) Intelligent ..... Shows the parameters related to the intelligent mode in which the inverter performs operation after setting appropriate parameters automatically.
4) Calibration ..... Lists the parameters related to the calibration of the FM and AM terminals and the bias/gain adjustments of the frequency setting voltage (frequency setting current).
5) Option ..... Lists the parameters of the values related to the options.
6) Special running ..... Lists the parameters such as the functions used by making pre-selection.
7) Motor torque ..... Lists the parameters related to motor torque.
8) Frequency settings ..... Lists the parameters related to frequency.
9) Acceleration/deceleration ..... Lists the parameters related to acceleration/deceleration.
10) Protection..... Lists the parameters related to the protective functions.
11) Monitor ..... Lists the parameters related to the monitoring function.
12) Brake..... Lists the parameters related to braking.
13) Pr Jmp (Alt+J), Updated Val (Alt+E) ..... Show the selected parameter number and its new value. Values may be entered directly into these columns.

- FR-V500 series

1) Terminal allocation..... Lists the parameters concerned with the control circuit terminals.
2) V/F control ..... Lists only the parameters used to exercise V/F control.
4) Calibration ..... Lists the parameters related to the calibration of the DA1 and DA2 terminals and the bias/gain adjustment of the speed setting voltage (speed setting current).
5) Option ..... Lists the parameters of the values related to the options.
6) Special running ..... Lists the parameters such as the functions used by making pre-selection.
7) Motor ..... Lists the parameters related to the motor.
8) Speed setting..... Lists the parameters related to the speed.
9) Acceleration/deceleration ..... Lists the parameters related to acceleration/deceleration.
10) Protection..... Lists the parameters related to the protective functions.
11) Monitor ..... Lists the parameters related to the monitoring function.
12) Brake..... Lists the parameters related to braking.
13) Pr Jmp (Alt+J), Updated Val (Alt+E) ..... Show the selected parameter number and its new value. Values may be entered directly into these columns.
14) Speed control..... Lists the parameters related to speed control.
15) Torque control ..... Lists the parameters related to torque control.
16) Position control ..... Lists the parameters related to position control.

2.3.3 Individual List Format

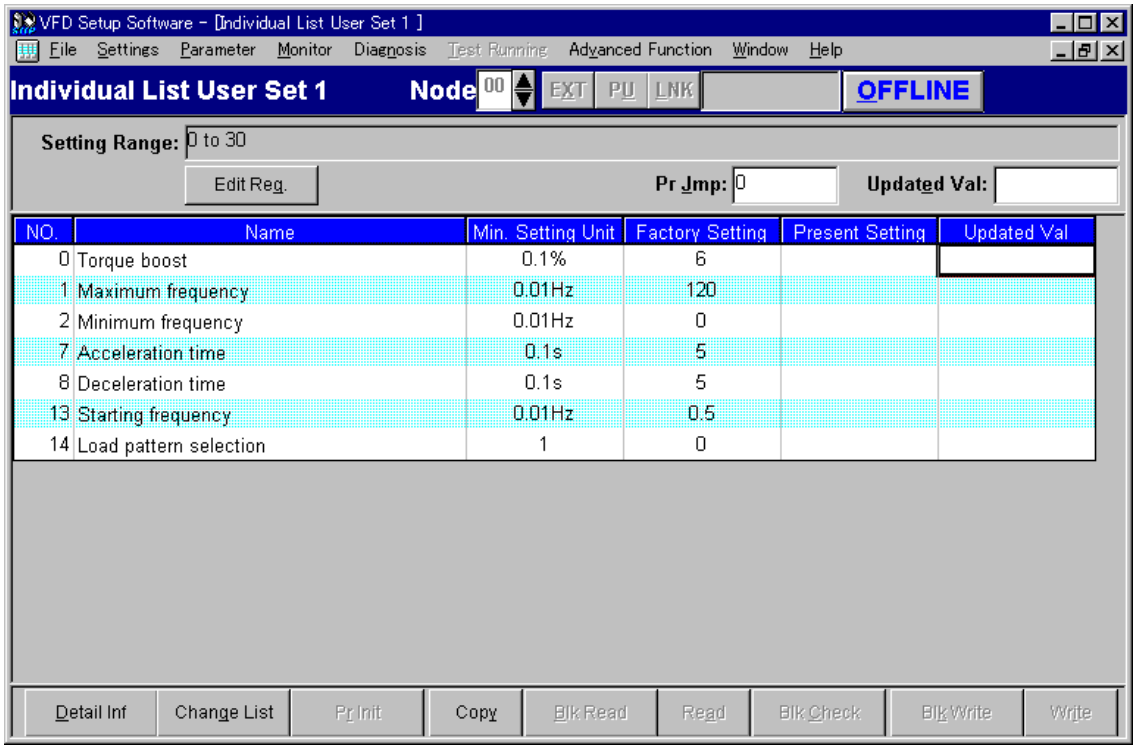
By choosing the [Parameter] → [Individual List Format] command in the menu, you can select two different user groups ("User Group 1", "User Group 2").
To these user groups, you can register a total of 32 parameters from among all parameters. Click the [Edit Reg.] button. The following panel appears.



(1) Description of individual list editing operation

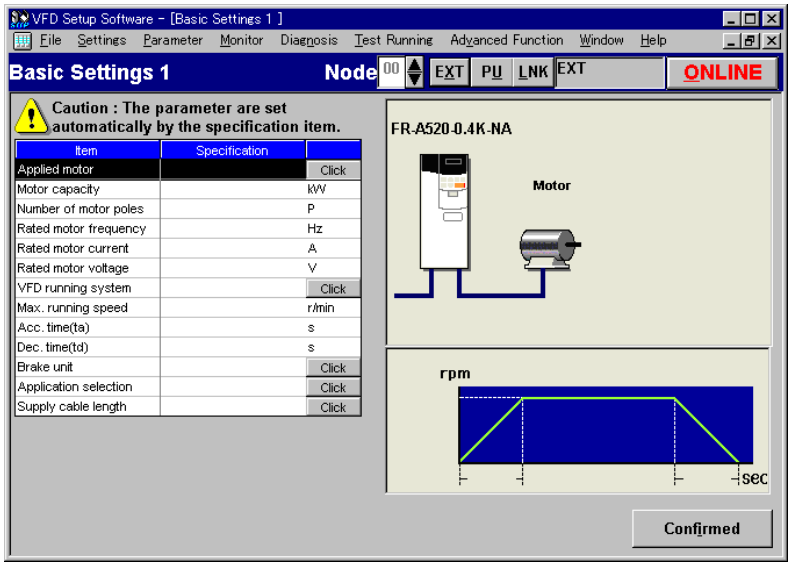
1) Registration ..... Choose the items to be registered in the "Parameter List" and press the [Add>>>] button to register them to the "Individual List".
2) Deletion ..... Choose the items to be deleted in the "Individual List" and press the [<<<Delete] button to delete them.

After choosing the parameters, pressing the [OK] button completes the user setting and displays the individually selected list in the following panel. To save the individual list, choose the [File] → [Save] command from the menu to save it.



2.3.4 Basic Settings

Choosing the [Parameter] → [Basic Settings] command in the menu displays the following screen.
By entering data into the items shown on the screen, you can set the parameters without being aware of the parameter numbers.

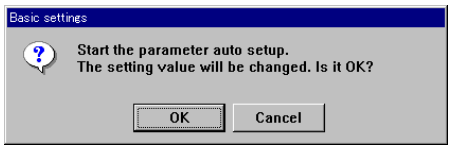


(1) Setting of each specification

Set the specification of each item in the Specification column. When the [Click] button is provided, clicking it displays choices. Make selection and click the [OK] button.
60Hz is the maximum setting for operation speed.

(2) Registration of the specifications

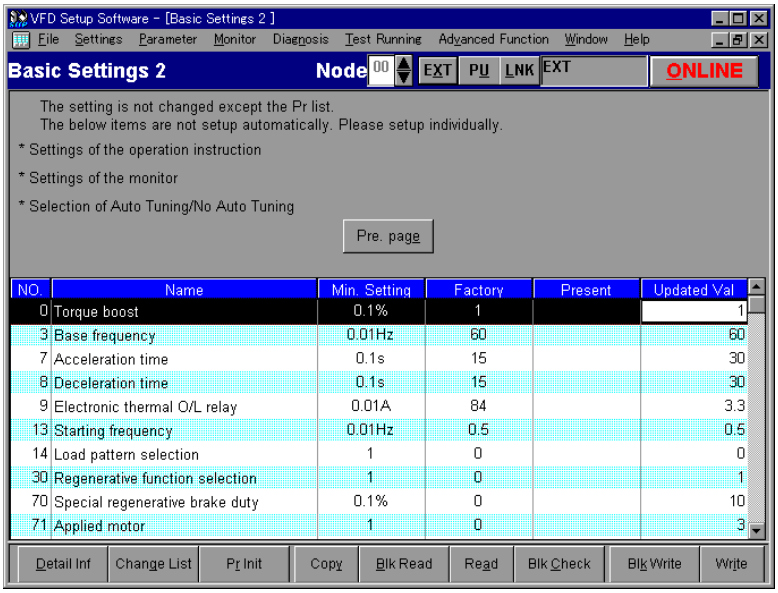
After entering the specifications of all items, press the [Confirmed] button to register them. Pressing the [Confirmed] button displays the following panel.



By pressing the [OK] button, the parameters are set automatically and the new values of the parameters that may be set automatically are displayed.

(3) Parameter setting

When the automatic settings of the parameters are registered, the following panel appears.
To write the new parameter values to the inverter, press the [Blk Write] button.

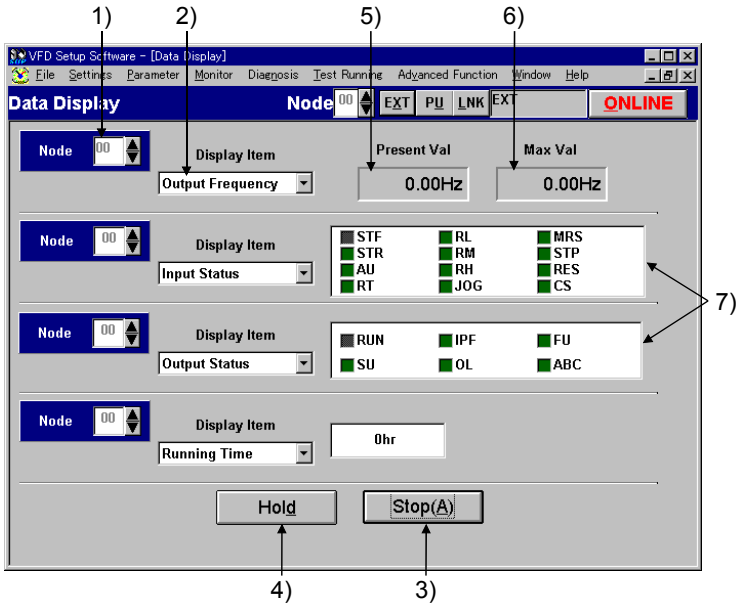


2.4 Monitor

Choosing the [Monitor] - [Data Display], [Meter Display], [Oscilloscopes], [Alarm History] or [Trace Oscilloscopes] command in the menu allows you to select the corresponding monitor item.

2.4.1 Data Display

Data Display shows four different signals (those of up to four stations) as numerical values in real time. The input and output statuses of the control terminals can also be monitored.
Choosing the [Monitor] → [Data Display] command from the menu displays the following screen:

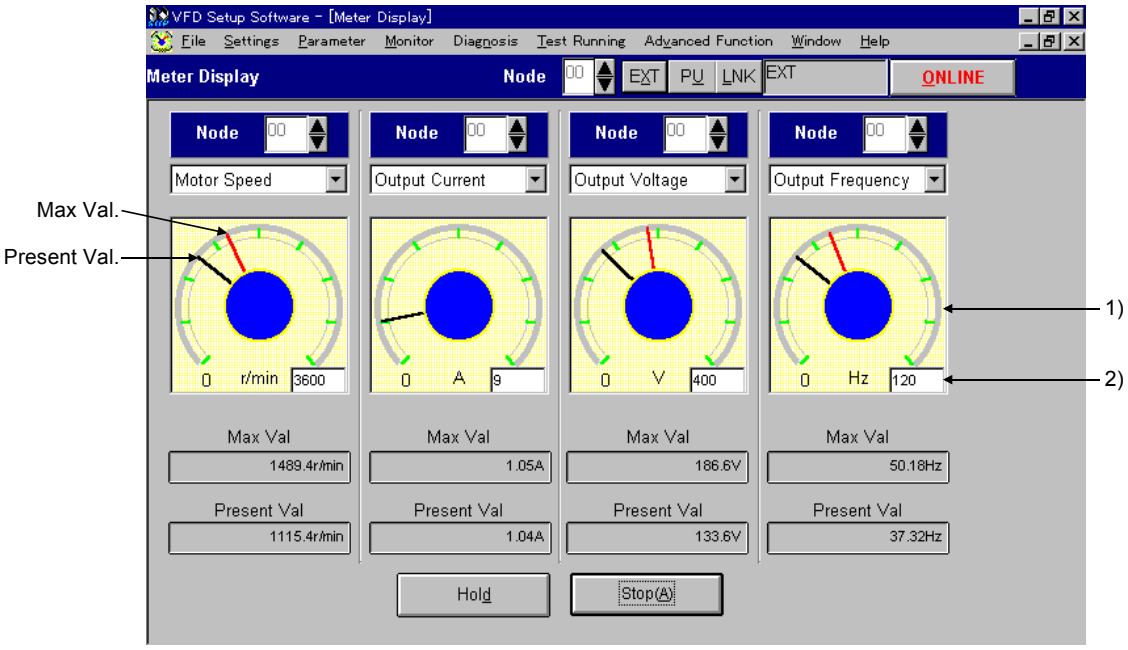


Explanation of the buttons and indications

1) Node setting
   You can enter the station number specified in "System Settings" or use the [▲/▼] button to choose the station number.
2) Display items
   Choose the items to be displayed in the menu.
3) Start/Stop (Alt+A)
   After pressing the [ONLINE/OFFLINE] button to display [ONLINE], click the [Start] button to start monitoring. (The function of this button toggles depending upon the mode.)
   Click this button during monitoring to stop monitoring.
4) Hold (Alt+D)
   Clicking the [Hold] button holds the data being monitored. In this state, the data can also be saved.
   Click this button during holding to cancel hold.
5) Present value
   Shows the real-time monitor value.
6) Maximum value
   Shows the maximum value of the monitor value. Once monitoring is stopped, the maximum value is cleared.
7) I/O status
   When you have chosen "Input Status" or "Output Status" in "Display Item", the I/O status (ON or OFF) is displayed. (ON: red, OFF: gray)

2.4.2 Meter Display

Meter Display shows four different signals (those of up to four stations) as meters in real time. Meter Display handles show only data which can be indicated by meter deflections.
Choosing the [Monitor] → [Meter Display] command shows the following screen:



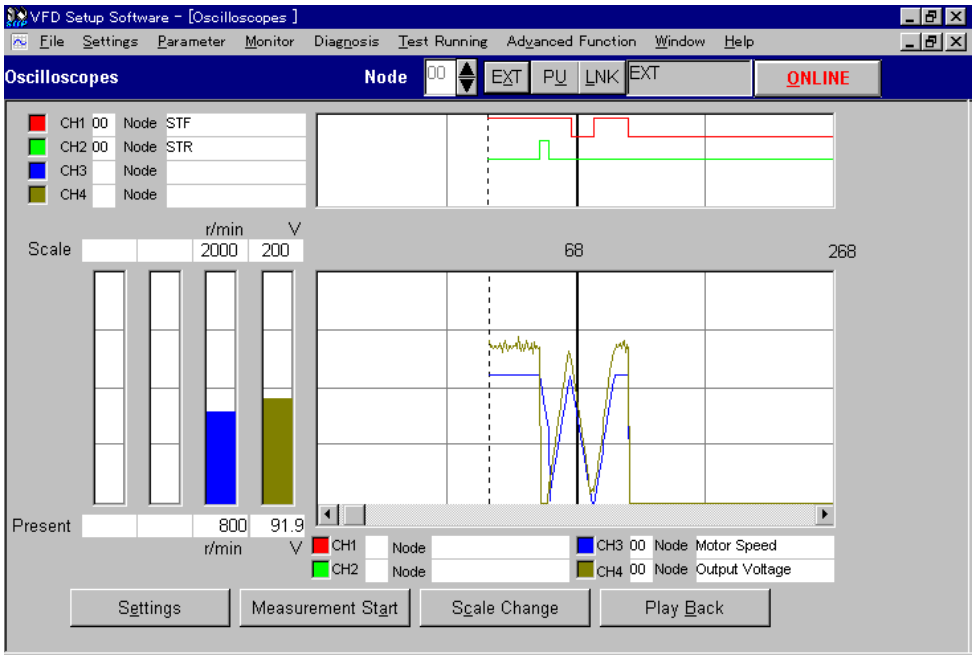
Perform operation as with Data Display.
The meter scales are automatically adjusted. After the parameters are batch-read, they are set to the optimum values.

Panel display

1) Meter display
   Shows monitor values on the meters.
   The present value is indicated by the black pointer and the maximum value by the red pointer.
2) Meter full-scale
   Shows the full-scale value of the meter display. It can be changed by entering a new value.

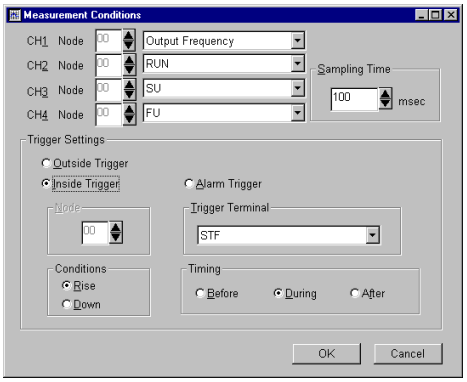
2.4.3 Oscilloscopes

Oscilloscopes show four different signals, which had been received from the inverter beforehand, as waveforms on the personal computer screen.
Choosing the [Monitor] → [Oscilloscopes] command from the menu displays the following screen:



[Operating procedure]

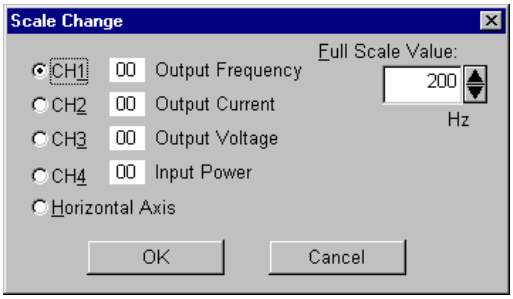
1) Setting (Alt+E)
Pressing the [Settings] button shows the "Measurement Conditions" panel.



   a. Choose the station number and measurement item.
   b. Trigger signal setting
      Choose the outside, inside or alarm trigger. For "Outside Trigger", pressing the [Measurement Start] button starts measurement. For "Inside Trigger", since the signal from the inverter is used as a trigger signal, set the station number measurement signal, timing, trigger terminal and conditions.
      For "Alarm Trigger", the alarm occurrence signal of the inverter is used as a trigger signal. In this case, the trigger settings valid are the station number and timing only.
      [Timing] ..... Choose the displayed data from among "Before", "During" and "After" the trigger signal.
      [Sampling Time] ..... Set the interval of importing data. (100 to 60000msec)
      [Conditions] ..... Choose the "Rise" or "Down" timing when the trigger is activated.
   c. After setting the measurement conditions, press the [OK] button. The screen returns to Oscilloscopes and the station numbers and measurement items set appear.

2) Measurement start (Alt+A)
Press the [ONLINE] button. For "Inside Trigger", press the [Measurement Start] button to start the importing of data. On a trigger condition match, waveforms are displayed on the screen. For "Outside Trigger", pressing the [Measurement Start] button starts the importing of data endlessly. After completion or (suspension), press the [Play Back] button to display the data.

3) Scale Change (Alt+C)
To change the vertical and horizontal axis scales of the displayed waveforms, press the [Scale Change] button to display the "Scale Change" panel, on which the scales are to be changed.

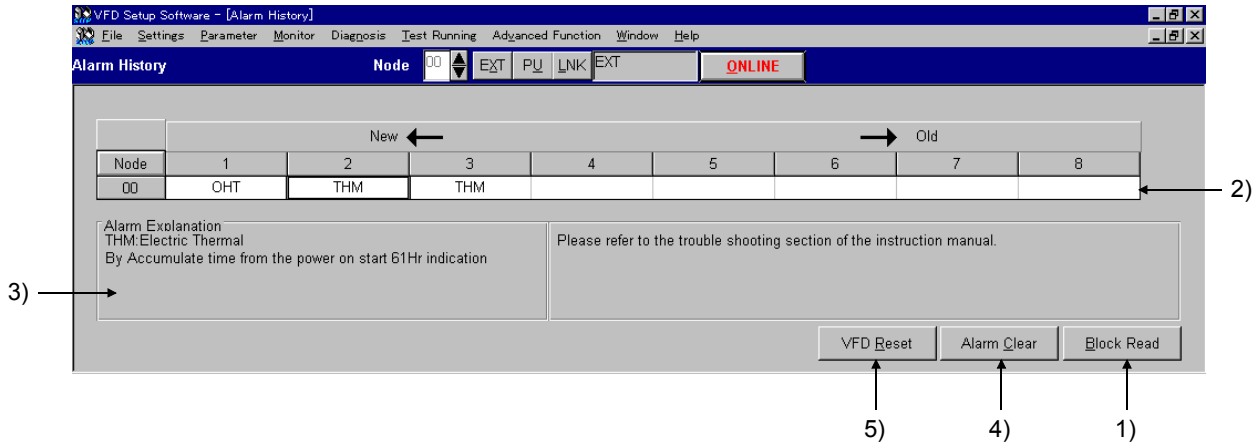


The full-scale values on the vertical axes and time axes (horizontal axes) of the displayed waveforms of the four channels (four stations) can be changed.
Specify the sampling count as the unit for the time axis (horizontal axis).
(Reference) Time converting method
: [sampling count] × [sampling interval]
+ [personal computer processing time] + [data importing time]

4) Play Back (Alt+B)
You can play back the measured oscilloscope data.
   a. By pressing the [Play Back] button after the end of measurement, the oscilloscope data can be played back. When the waveforms are being displayed, the screen is blanked once and the waveforms are then played back.
   b. You can play back saved oscilloscope data. By choosing [File] → [Open] to read the data, the waveforms appear (are loaded).

2.4.4 Alarm History

Alarm History displays the history of eight past alarms of all inverter stations connected.
Choosing the [Monitor] → [Alarm History] command from the menu displays the following screen.



Explanation of the buttons and indications

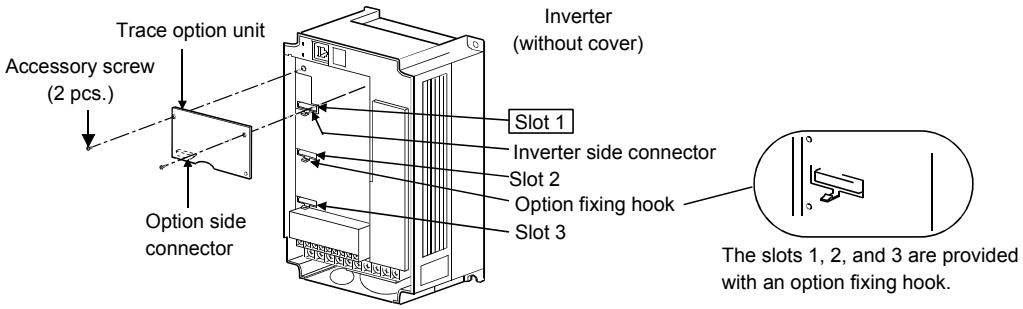
1) Block Read (Alt+B)
   Press the [ONLINE/OFFLINE] button to show [ONLINE] and then click the [Block Read] button to display the alarm history of all stations specified in the system settings.
2) Alarm History
   Lists the station numbers specified in the system settings and their history of eight past alarms.
3) Alarm Explanation
   Clicking the alarm display column in the alarm history list shows the explanation of that alarm.
4) Alarm Clear (Alt+C)
   Clicking the [Alarm Clear] button clears the alarm history of the chosen station inverter.
5) VFD Reset (Alt+R)
   Clicking the [VFD Reset] button resets the chosen station inverter.

2.4.5 Trace Oscilloscopes (for FR-V500 (L) series only)

The FR-V500 (L) series allows you to trace various data by setting Pr. 520 to Pr. 536 and Pr. 538.
Using the trace function of the setup software, you can set the parameters on the trace function setting screen and analyze the traced data. The trace function is available for the FR-V500 (L) series only.
When using the trace function, the trace option unit T-TRC50 need to be fitted to the inverter. Install the trace option unit T-TRC50 in Slot 1 of the inverter. If you install it in Slot 2 or 3, operation is not performed. The traced data are stored in the memory of the trace option unit T-TRC50.

<Installation>

(1) Make sure that the input power of the inverter is OFF.
(2) Insert the option unit connector into the connector of the inverter securely. At this time, also insert the option fixing holes securely.
Refer to the following diagram for the position of Slot 1. Push the option unit securely into the option fixing hook.
(3) Fix the two left and right places of the option unit to the inverter securely with the accessory mounting screws. If the screw holes do not line-up, the connector may not have been inserted securely. Check for insecure insertion.

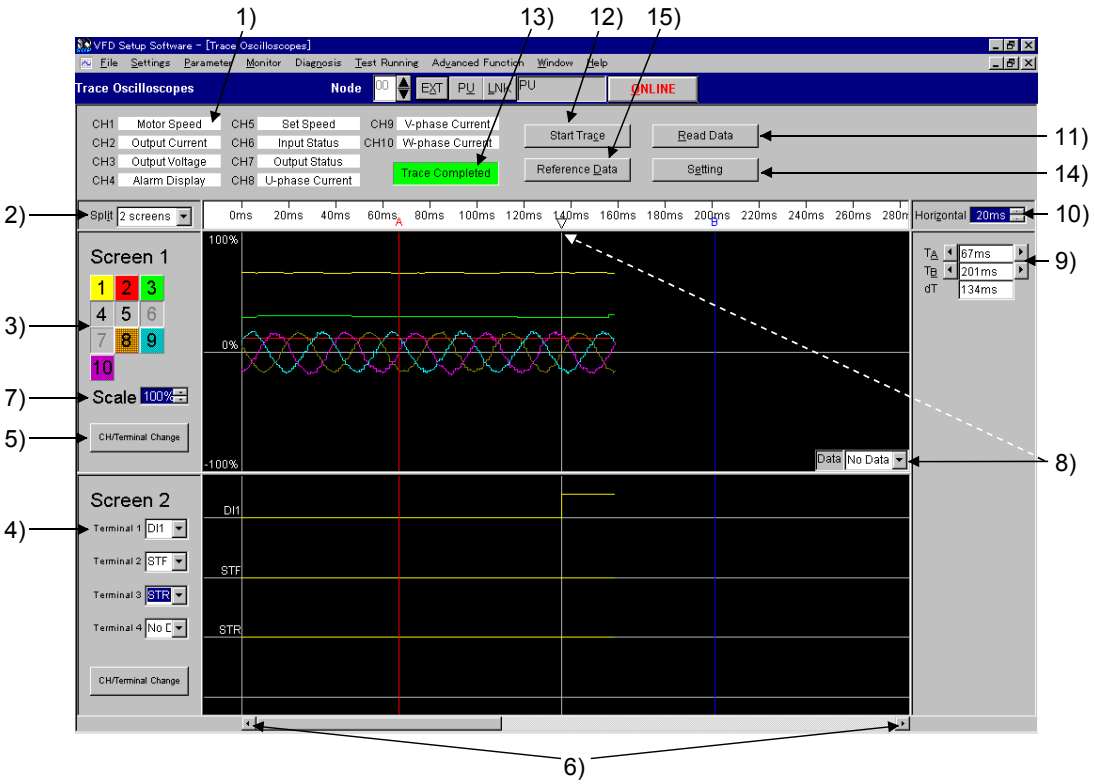


CAUTION

1. **You cannot use more than one same option units.**
2. **Option error (E.OP1) is displayed if the inverter does not recognize the mounted option.**

(1) Trace function oscilloscope screen

Choosing the [Monitor] → [Trace Oscilloscopes] command in the menu displays the following screen.
To use the trace function, you need to make trace function setting. Click the [Settings] button 14 to make trace function setting. (Refer to page 28 for details of the trace function setting screen.)



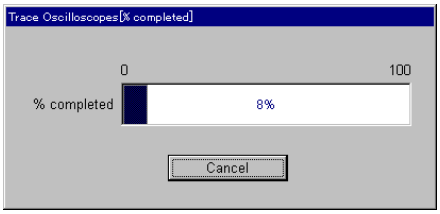
Trace function oscilloscope screen

•Explanation of the buttons and indications

1) Channel setting indication
   Shows a data name according of the setting of each channel. The indication is blanked when no data is set.
2) Screen split selection
   You can choose any of one to four way splits. (Initial setting: One way split)
3) Channel indication
   Clicking the channel of the data you want to display shows the data assigned to the clicked channel.
4) Terminal signal indication
   Clicking [▼] displays a list of terminal signals to enable setting. Unset signal names are blanked.
   Up to four terminal signals can be displayed simultaneously.
   The input/output terminal signals can be displayed only when the input/output terminal signal data are included in the CH1 to CH10 data.

Input terminal signals	Output terminal signals
STF, STR, DI1, DI2, DI3, DI4, OH, RES	DO1, DO2, DO3, ABC

5) CH signal screen/Terminal signal screen switchover
   Clicking here alternates between the channel (CH) indication (3) and terminal signal indication (4).
6) Scroll
   Clicking here shifts the whole screen left to right.
7) Scale adjustment
   Click [▼]/[▲] to adjust the scale. The adjustable range is 50% to 400%. (Initial setting: 100%)
8) Data indication
   Clicking [▼] and choosing the channel from the list displays on the screen the data value of the selected channel at the point of the cursor A.
9) T_A/T_B
   Clicking [◄]/[►] moves the cursor to the left/right. The time indication of the cursor A on the right hand side of [T_A] also varies with the movement of the cursor A. This also applies to the operation of the cursor B.
10) Horizontal axis time unit
    Clicking [▼]/[▲] changes the time unit of the horizontal axis. The changing range is 10ms to 500s. (Initial setting: 20ms)
11) Read Data
    Clicking [Read Data] starts data read. At the same time, the following screen also appears. Clicking "Cancel" stops data read and returns to the trace function oscilloscope screen.

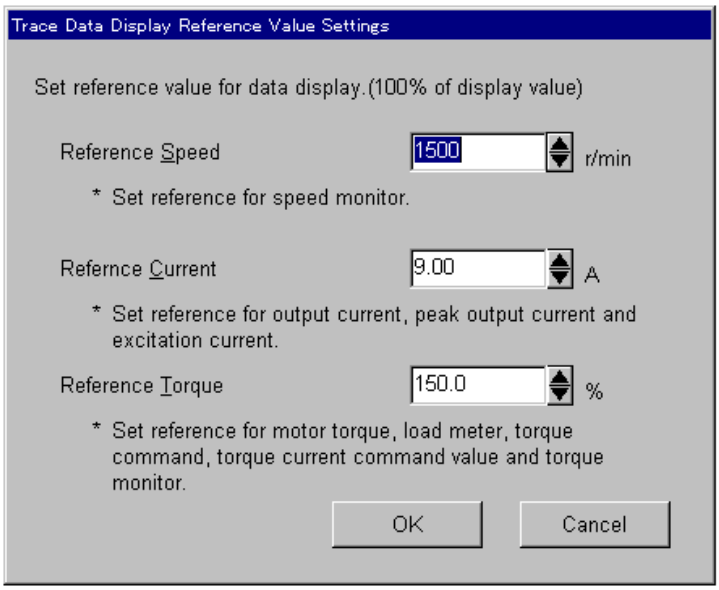


12) Start Trace/Stop Trace
    Clicking [Start Trace]/[Stop Trace] starts/stops a trace. (At this time, write "1" in Pr. 538 "trace start/stop selection" for a start or "0" for a stop.)
13) Trace status indication
    Shows the trace status. The trace status is monitored at intervals of 500ms.

Indication	Stop, waiting for pre-trigger, waiting for trigger, during trace, trace completed

14) Setting
    Clicking [Setting] displays the trace function setting screen.

15) Reference Data
Clicking [Reference Data] shows the data display reference value setting screen.



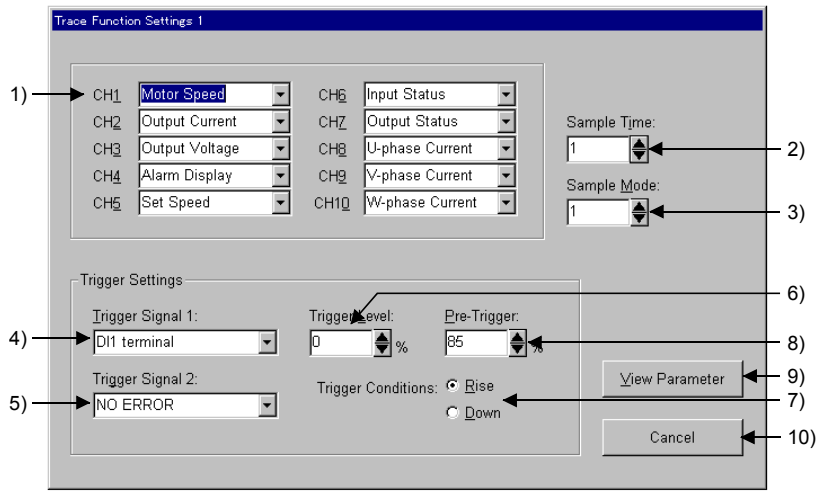
Clicking [▼]/[▲] varies the reference value setting. Clicking [OK] changes the data reference value. Clicking "Cancel" stops the setting and returns to the trace function oscilloscope screen.

(2) Trace function setting screen

By changing the set values on the trace function setting screen and writing them to the parameters, you can change the parameter settings of the inverter. (Refer to page 29 for details of the parameters.)

CAUTION

The trace function setting screen is used to only set the parameter values and not to write them. Use the parameter check screen to write them. Click [Parameter check]. (Refer to page 33 for details of the parameter check screen.)



Trace function setting screen

1) Function setting [Pr. 520 to Pr. 529]
   Select the data of CH1 to CH10. The selected data are displayed.
   You can assign one piece of data to two or more channels.
   Selecting the data changes the Pr. 520 to Pr. 529 values.
2) Sample Time [Pr. 530]
   Vary the sampling period. (1 = 444s)
   Varying the sampling period changes the Pr. 530 value.
3) Sample Mode [Pr. 531]
   Set the number of samplings made at one time. Increasing the sampling count limits the number of data that can be traced.
   Changing the sampling mode changes the Pr. 531 value.
4) Trigger Signal 1 [Pr. 532]
   A specific signal times the start and end of a trace.
   Changing the trigger signal choice 1 changes the Pr. 532 value.
5) Trigger Signal 2 [Pr. 533]
   When you have selected "Error (trigger signal choice 2)" in the trigger signal choice 1, select the error that will output a trigger signal.
   Changing the trigger signal choice 2 changes the Pr. 533 value.
6) Trigger Level [Pr. 534]
   A trigger is enabled when the value of the data set in the trigger signal choice 1 reaches the set trigger level on the trigger condition.
   Changing the trigger level changes the Pr. 534 value.
7) Trigger conditions [Pr. 535]
   Select whether a trigger will be enabled on the "leading edge" or on the "trailing edge".
   Changing the trigger condition changes the Pr. 535 value.
8) Pre-trigger [Pr. 536]
   Used to trace the data before trigger.
   Specify the percentage of the trigger point on the assumption that the recording starting point is 0% and the recording end point is 100%.
   Changing the pre-trigger changes the Pr. 536 value.
9) View Parameter
   Clicking [View Parameter] shifts to the parameter check screen.
10) Cancel
    Clicking [Cancel] cancels function changing and returns to the trace function oscilloscope screen.

(3) Parameter list

Parameter	Name	Setting Range	Factory Setting
52	PU/DU main display data selection	0, 5 to 12, 17 to 20, 23, 24, 32 to 35, 38, 100 (5 to 12 are invalid for FR-PU04V)	0
190	DO1 terminal function selection	0 to 8, 10 to 16, 20, 25 to 27, 30 to 37, 39 to 44, 96 to 99, 100 to 108, 110 to 116, 120, 125 to 127, 130 to 137, 139 to 144, 196 to 199, 9999	0
191	DO2 terminal function selection		1
192	DO3 terminal function selection		2
195	ABC terminal function selection		99
520	Trace data CH1	1 to 12, 15 to 20, 23, 24, 32 to 36, 50 to 56, 9999	1 (speed)
521	Trace data CH2		2 (output current)
522	Trace data CH3		3 (output voltage)
523	Trace data CH4		4 (alarm display)
524	Trace data CH5		5 (set speed)
525	Trace data CH6		15 (input status (DI))
526	Trace data CH7		16 (output status (DO))
527	Trace data CH8		50 (U phase output current)
528	Trace data CH9		51 (V phase output current)
529	Trace data CH10		52 (W phase output current)
530	Sampling period	1 to 9998	1
531	Sampling count selection	1, 2, 3, 4	1
532	Trigger source selection 1	0 to 17, 22, 31 to 34, 9999	9999
533	Trigger source selection 2	0 to 23, 25, 26, 29 to 40, 46 to 48, 51, 52, 9999	9999
534	Trigger level	600% to 1400% (*)	1000%
535	Trigger slope selection	0, 1	0
536	Pre-trigger	0 to 100%	85%
538	Trace start/stop selection	0, 1	0

REMARKS

1. *: In Pr. 534, set the trigger level value (-400% to 400%) plus 1000.
2. When Pr. 538 = "1", you cannot write any parameter values to Pr. 520 to Pr. 536.
3. You can write parameter values to Pr. 520 to Pr. 536 and Pr. 538 if Pr. 77 = "0".

(4) Parameter details

1. Trace status (Pr. 52, Pr. 190 to Pr. 192, Pr. 195)

The trace progress status, data output status and so on can be displayed on the DU/PU monitor and output to the external output terminals.

· Pr. 52 "PU/DU main display data selection"

When "38 (trace status)" is set in Pr. 52, the trace status is displayed on the FR-DU04-1/FR-PU04V.

Monitor Display	Trace Status
0	Stop
1	During pre-trigger
2	Waiting for trigger
3	During trace
4	Trace completed

REMARKS

• The trace status is displayed instead of the output voltage monitor of the DU/PU main monitor.

· Pr. 190 to Pr. 192, Pr. 195 "output terminal function selection"

When you set "40 (positive logic) and 140 (negative logic)" (Y40 signal: trace status) in Pr. 190 to Pr. 192 and Pr. 195, the trace status is output from the output terminals.

Y40 Signal		Trace Status
40 (positive logic)	140 (negative logic)	
OFF	ON	Stop, trace completed, during data output, data output completed
ON	OFF	During pre-trigger, waiting for trigger, during trace

2. Function setting (Pr. 520 to Pr. 529)

· Pr. 520 to Pr. 529 "trace data CH1 to CH10" (1 to 12, 15 to 20, 23, 24, 32 to 36, 50 to 56, 9999)
Set the data to be traced. You can set the data of CH1 to CH10.

Setting	Name	Setting	Name	Setting	Name
9999	No trace data CH setting	11	Output current peak value	33*	Torque current command
1	Speed	12	Converter voltage peak value	34*	Motor output
2	Output current value	15	Input status (DI)	35*	Feedback pulse
3	Output voltage value	16	Output status (DO)	36*	Torque monitor
4	Alarm display	17*	Load meter	50	U phase output current
5	Set speed	18*	Motor exciting current	51	V phase output current
6	Output frequency	19	Position pulse	52	W phase output current
7*	Motor torque	20	Energization time	53*	Torque current
8	DC bus voltage	23	Operation time	54	U phase voltage command value
9	Regenerative brake duty	24	Motor load factor	55	V phase voltage command value
10	Thermal load factor	32*	Torque command	56	W phase voltage command value

CAUTION

***: Data that are made invalid under V/F control. If they are traced, correct values will not be displayed.**

REMARKS

The data to be traced can be assigned to two or more channels.

3. Sampling setting (Pr.530, Pr.531)

· Pr.530 "Sampling period" (1 to 9998)
Change the sampling period.

Sampling period = T × Pr.530

T=444 μs

· Pr.531 "Sampling count selection" (1 to 4)
Set the number of samplings made at one time. Increasing the sampling count limits the number of data that can be traced.

Pr. 531 Setting	Sampling Count	Number of Usable Channels
1	360	10
2	720	4
3	1080	2
4	1440	1

CAUTION

1. **Set "9999" (no trace data CH setting) in Pr. 520 to Pr. 529 of any unused channel.**
2. **When Pr. 531 = "2 to 4", the operating channels have the priorities of CH1, CH2 ... and the channel that has exceeded the number of usable channels does not operate.**

4. Trigger source setting (Pr.532, Pr.533)

· Pr.532 "Trigger source selection 1" (0 to 17, 22, 31 to 34, 9999)
A specific signal can be used to time the start and end of a trace.
When Pr. 532 = "1 to 10", set the trigger level in Pr. 534 and Pr. 535.

Setting	Trigger Source	Setting	Trigger Source
9999	Error (all errors)	11	STF
0	Error (any error can be selected using Pr. 533)	12	STR
1	Trace data CH1 setting data	13	RES
2	Trace data CH2 setting data	14	DI1
3	Trace data CH3 setting data	15	DI2
4	Trace data CH4 setting data	16	DI3
5	Trace data CH5 setting data	17	DI4
6	Trace data CH6 setting data	22	OH
7	Trace data CH7 setting data	31	ABC
8	Trace data CH8 setting data	32	DO1
9	Trace data CH9 setting data	33	DO2
10	Trace data CH10 setting data	34	DO3

CAUTION

1. **A trace start trigger is made valid when Pr. 538 = "1". To trace data again after a trace start trigger, set "1" in Pr. 538.**
2. **When using the input/output terminal signal as a trigger source, set any of "11 to 17, 22, 31 to 34" in Pr. 532. Do not set the trace data CH1 to 10 (Pr. 520 to Pr. 529 = "15, 16"), to which the input status/output status has been set, as a trigger source.**

· Pr.533 "Trigger source selection 2" (0 to 23, 25, 26, 29 to 40, 46 to 48, 51, 52, 9999)
Pr.532 "Trigger source selection 1" = When you selected "0 (error)", choose the error that will output the trigger signal.

Setting	Indication	Code	Setting	Indication	Code
9999	No error	E.0	21	CPU error	E.CPU
0	Overcurrent shutoff during acceleration	E.OC1	22	Fan fault	FN
1	Overcurrent shutoff during constant speed	E.OC2	23	Fin overheat	E.FIN
2	Overcurrent shutoff during deceleration	E.OC3	25	Excessive acceleration deviation detection	E.OSD
3	Regenerative overvoltage shutoff during acceleration	E.OV1	26	Open cable detection	E.ECR
4	Regenerative overvoltage shutoff during constant speed	E.OV2	29	Brake sequence error 1	E.MB1
5	Regenerative overvoltage shutoff during deceleration	E.OV3	30	Brake sequence error 2	E.MB2
6	Motor overload shutoff	E.THM	31	Brake sequence error 3	E.MB3
7	Inverter overload shutoff	E.THT	32	Brake sequence error 4	E.MB4
8	Momentary voltage interruption protection	E.IPF	33	Brake sequence error 5	E.MB5
9	Undervoltage protection	E.UVT	34	Brake sequence error 6	E.MB6
10	Brake transistor alarm detection	E.BE	35	Brake sequence error 7	E.MB7
11	Output side ground fault overcurrent protection	E.GF	36	24VDC power output short circuit	E.P24
12	External thermal operation	E.OHT	37	Operation panel power supply short circuit	E.CTE
13	Stall prevention	E.OLT	38	Lost output phase failure protection	E.LF
14	Option alarm	E.OPT	39	P12 alarm	E.P12
15	Option slot 1 alarm	E.OP1	40	Encoder phase error	E.EP
16	Option slot 2 alarm	E.OP2	46	Error 1	E.E1
17	Option slot 3 alarm	E.OP3	47	Error 2	E.E2
18	Parameter storage device alarm	E.PE	48	Error 3	E.E3
19	Parameter unit disconnection	E.PUE	51	Error 6	E.E6
20	Retry count excess	E.RET	52	Error 7	E.E7

5. Trigger level setting (Pr.534, Pr.535)
A trigger is enabled when the value of the data set in Pr. 532 "Trigger source selection 1" reaches the trigger level set in Pr. 534 on the trigger condition set in Pr. 535.
This setting is made valid when Pr. 532 = "1 to 10".

REMARKS

Set the trigger level (Pr. 534, Pr. 535) when Pr. 532 = "1 to 10". However, the trigger level is made invalid when the channel where "4: alarm display" is set to the trace data CH setting (Pr. 520 to Pr. 529) is used as a trigger source.

· Pr.534 "Trigger level" (-400% to 400%)
Refer to the following table for calculation of the trigger level.

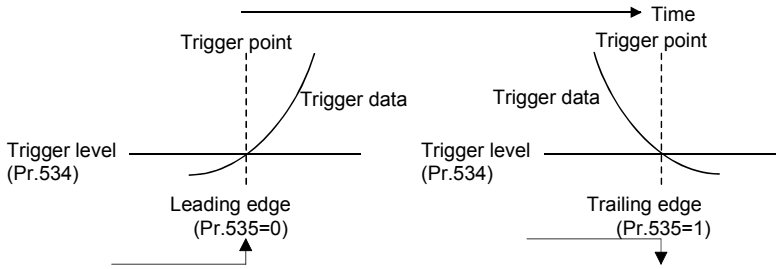
Trigger Data	Reference Value	Trigger Data	Reference Value	Trigger Data	Reference Value
Speed	Pr.55	Converter voltage peak value	400V/800V	Motor output	Inverter capacity
Output current value	Pr.56	Input status (DI)	---	Feedback pulse	0×ffff/4
Output voltage value	400V/800V	Output status (DO)	---	Torque monitor	Pr.866
Alarm display	1	Load meter	Pr.866	U phase output current	Rated current
Set speed	Pr.55	Motor exciting current	4096/rating	V phase output current	Rated current
Output frequency	120	Position pulse	0×ffff/4	W phase output current	Rated current
Motor torque	Pr.866	Energization time	0×ffff/4	Torque current	Rated current
DC bus voltage	500V/1000V	Operation time	0×ffff/4	U phase voltage command value	400V/800V
Regenerative brake duty	100%	Motor load factor	100%	V phase voltage command value	400V/800V
Thermal load factor	100%	Torque command	Rated current	W phase voltage command value	400V/800V
Output current peak value	Pr.56	Torque current command	Rated current		

CAUTION

When setting the trigger level on the setup software, set it within the range -400% to 400%. When directly setting the parameter (Pr. 534) of the inverter, set the calculated trigger level plus 1000 (600% to 1400%).

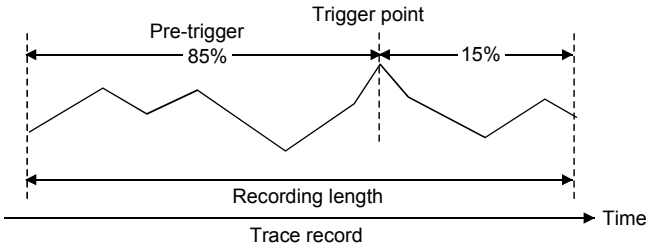
· Pr.535 "Trigger condition"
Select whether a trigger will be enabled on the "leading edge" or on the "trailing edge".

Pr. 535 Setting	Function
0	Trigger is enabled on the leading edge.
1	Trigger is enabled on the trailing edge.



6. Pre-trigger (Pr.536)

· Pr.536 "Pre-trigger" (0 to 100%)
Used to trace the data before a trigger.
Specify the percentage of the trigger point on the assumption that the recording starting point is 0% and the recording end point is 100%.
<Example>
Pr.536 = "85%"



CAUTION

If a trigger occurs during a pre-trigger, the trigger signal is not made valid. The trigger signal is made valid after the pre-trigger time zone has ended.

7. Trace start, stop (Pr.538)

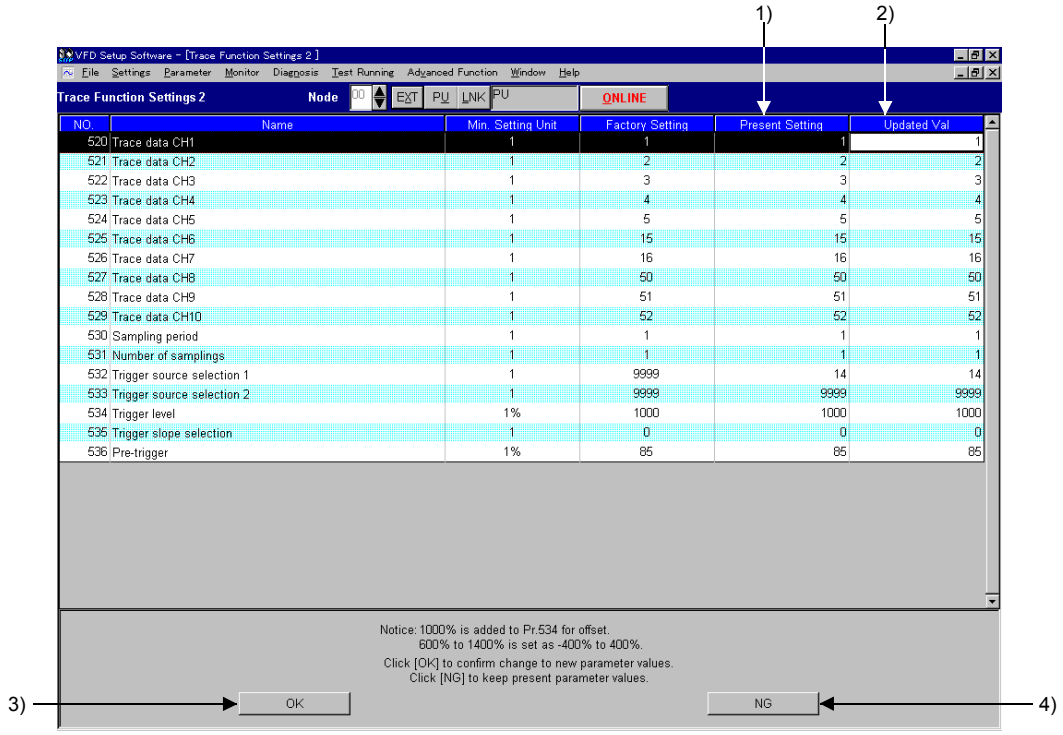
· Pr.538 "Trace start/stop selection"
Select the start or stop of a trace.
On completion of a trace, Pr. 538 is automatically set to "0".

Pr. 538 Setting	Description
0	Trace stop/completion
1	Trace start

CAUTION

When "1" is set in Pr. 538, the previous trace data is deleted.

(5) Parameter check



Parameter check screen

1) Present setting
   Parameter value currently stored in the inverter.
2) Updated value
   New parameter value set using the trace function.
3) OK
   Checking the parameter setting and clicking [OK] writes that value to the parameter.
   Completion of write returns to the trace function oscilloscope screen.
4) NG
   Clicking [NG] returns to the trace function setting screen without write to the parameter being performed.

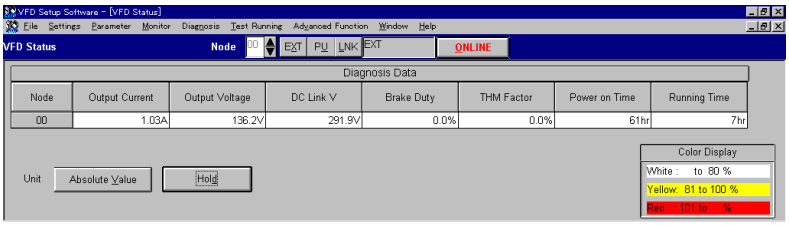
2.5 Diagnosis

2.5.1 VFD Status

Choosing the [Diagnosis] → [VFD Status] command in the menu displays the following screen.

CAUTION

This command can be chosen in the online mode only.



VFD Status: Displays the output current, output voltage, DC link V, Regenerative brake duty, THM factor, Power on Time and Running Time data of all inverter stations specified in the system settings in real time. The data can also be locked by pressing the [Hold] button (Alt+D). The values displayed can be switched between absolute value indication and % indication (Alt+V).

CAUTION

The FR-E500 series or FR-S500 series displays only the output currents/output voltages.

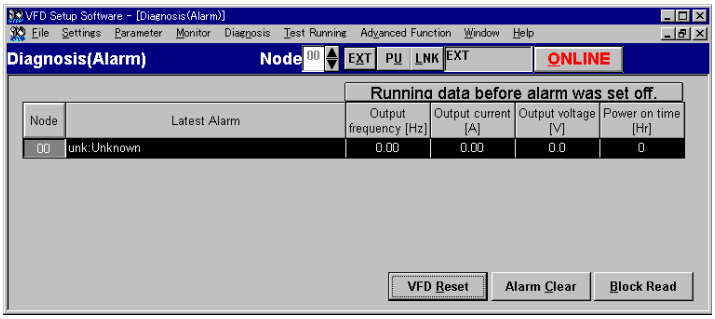
2.5.2 Diagnosis

Choosing the [Diagnosis] → [Diagnosis] command from the menu displays the following screen:

CAUTION

This command can be chosen in the online mode only.

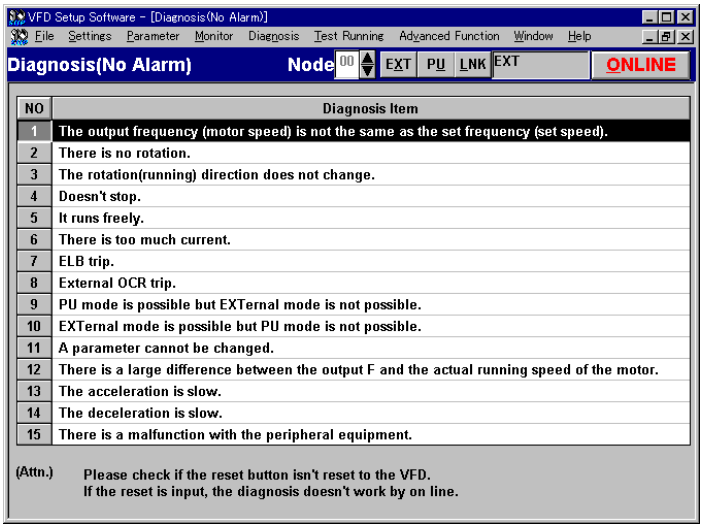
Alarm



Diagnosis (Alarm): Click the [Block Read] button (Alt+B) to batch-read the information of the inverters where alarms have occurred. By clicking the corresponding item, its comment appears.

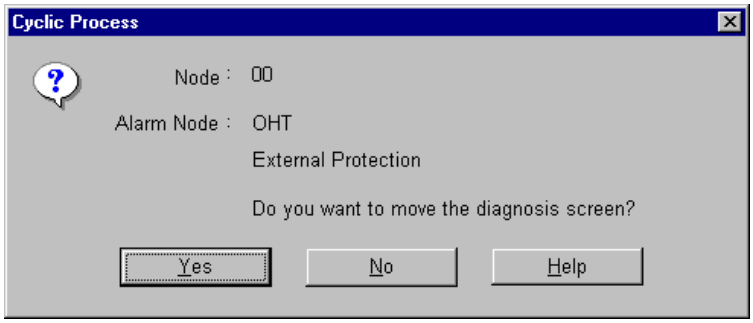
- Alarm Clear (Alt+C)
  Clicking the [Alarm Clear] button clears the alarm history of the chosen station inverter.
- VFD Reset (Alt+R)
  Clicking the [VFD Reset] button resets the chosen station inverter.

No Alarm



Diagnosis (No Alarm): Shows the diagnosis items. When you choose the corresponding item, the panel appears. Enter data in accordance with the display. As a result, the estimated cause, etc. is shown. For diagnosing the running status, the online mode must be selected.

[Alarm occurrence in online mode]
If an inverter alarm has occurred in the online mode, the following panel appears:



Clicking the [Yes] button shows the Diagnosis (Alarm) screen.
Clicking the [Help] button shows the alarm detail help.

CAUTION

The above alarm panel appears only once in the online mode.
Once you have closed the alarm panel, it will not appear even during alarm occurrence. By changing the online mode to the offline, then to the online again, however, the panel will appear again if an alarm has occurred.

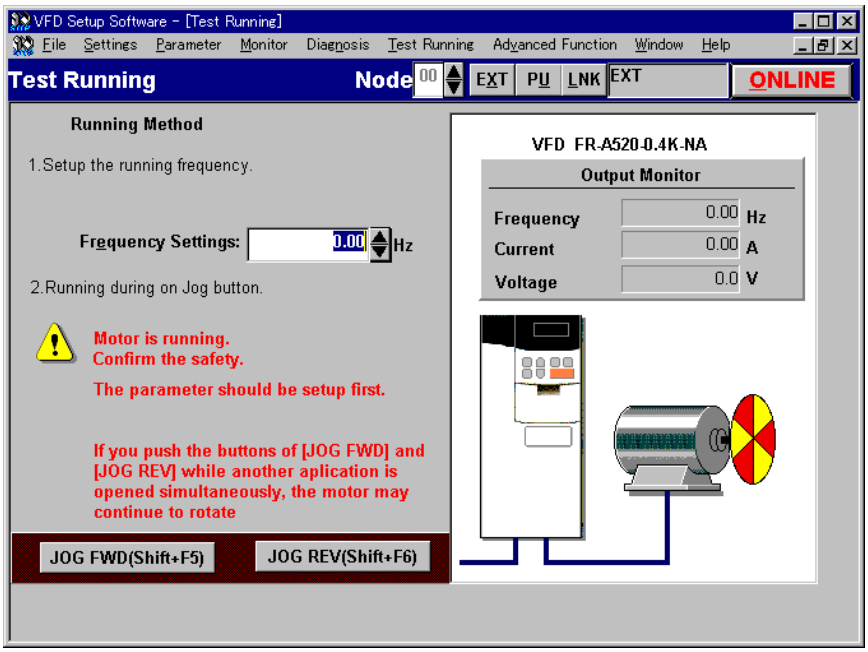
2.6 Test Running

2.6.1 Test Running

Choosing the [Test Running] → [Test Running] command from the menu displays the following screen.

CAUTION

This command can be chosen in the online mode only.



Operation procedure

1) Set the station number of the inverter to be run and the operation mode (PU or LNK (Link) operation).
2) Enter the running frequency (running speed for the FR-V500 (L) series) and press the ↵ key to confirm.
3) Click the [JOG FWD] (Shift+F5) or [JOG REV] (Shift+F6) button. The motor rotates while the button is being pressed. The output frequency (speed for the FR-V500 (L) series), output voltage and output current are monitored on the screen.

CAUTION

1. **If your inverter is the FR-E500 series, set any value other than "0" in Pr. 146 "frequency setting command selection".**
2. **When selecting [JOG REV (Shift+F6)] for the FR-S500 series, set "---" in Pr. 63 "STR terminal function selection". Setting other than "---" does not enable [JOG REV (Shift+F6)].**
3. **The inverter stops if the F6 key is pressed and then released while the inverter is running with [JOG FWD (shift+F5)].**
   Likewise, the inverter also stops if the F5 key is pressed and then released during running with [JOG REV (shift+F6)].

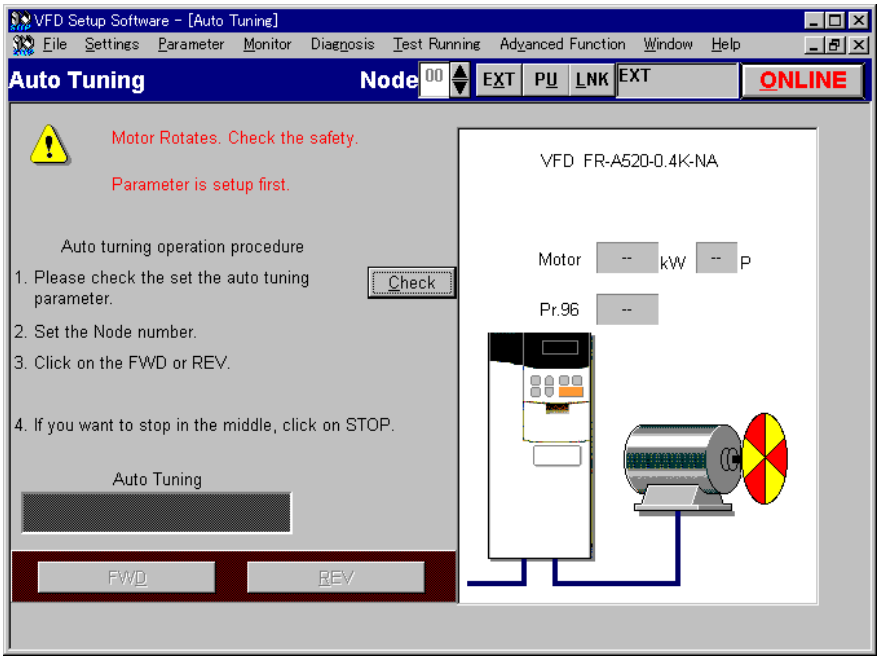
2.6.2 Auto Tuning

Choosing the [Test Running] → [Auto Tuning] command from the menu enables auto tuning. You have to set the auto tuning parameters in advance. If they have not been set, the following screen appears:

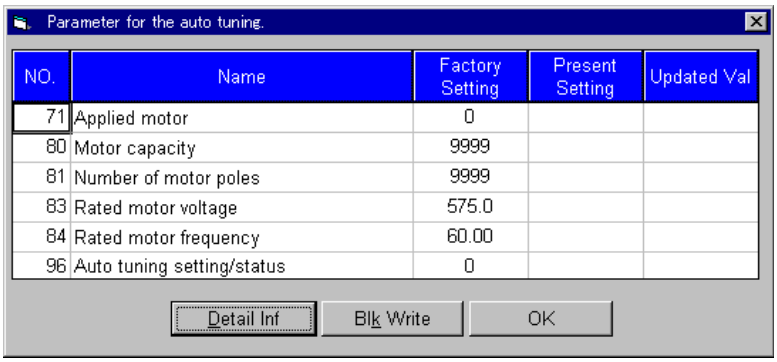


<Operation procedure>

1) Set the station number of the inverter to be run and the operation mode (PU or LNK (Link) operation).



2) Confirmation of the auto tuning parameters
Clicking the [Check] button (Alt+C) shows the parameters on the screen in a dialog box.



After entering all parameter set values, click the [Blk Write] button to write the new parameter values to the inverter.

3) Click the [FWD] (Alt+D) or [REV] (Alt+R) button.
The LED block and monitor screen display the auto tuning status.
When Pr. 96 = "101", the motor is rotated. The motor stops on completion of auto tuning. If the auto tuning has failed, follow the dialog box instructions.

CAUTION

1. **In the offline mode, test running and auto tuning cannot be performed.**
2. **Before starting test running, check and if necessary adjust the parameters. Not doing so may cause some machines to perform unexpected operation.**
3. **Provide safety backup devices such as emergency brakes to ensure that the machinery and equipment are not put in hazardous conditions if the inverters become faulty.**
4. **Auto tuning is not available for the FR-F500 (L) series and FR-S500 series. (Can be displayed on the screen.)**

2.7 Advanced Function

2.7.1 Machine analyzer (for FR-V500 (L) series only)

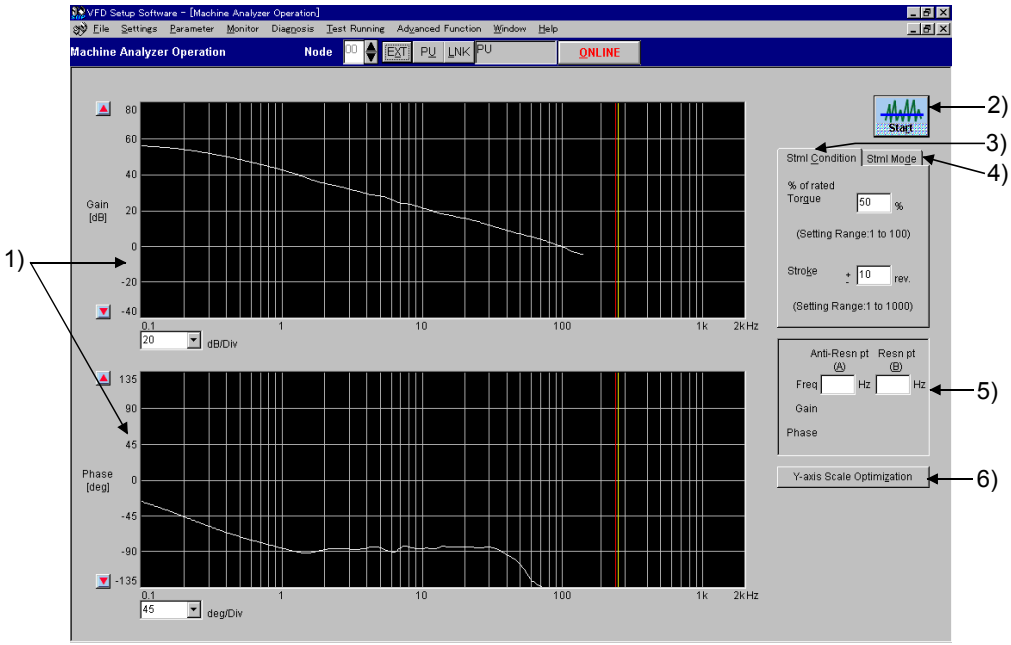
Machine analyzer reads and analyzes the torque and speed data available when the inverter oscillates the motor at random torque for about 0.5 to 4 seconds.
This allows measurement of the response frequency characteristic of speed relative to the motor torque of the machine so that you can grasp the frequency at which the mechanical system has the resonance point.

CAUTION

1. **The machine analyzer function is available for only the system that can perform PLG vector control with the FR-V500 (L) series.**
2. **The machine analyzer function is not performed in any of the following cases.**
   - **During inverter operation**
   - **When the second motor is selected (Pr. 450 ≠ "9999")**
   - **When the control mode is other than the PLG vector control mode (Pr. 800 ≠ "0 to 5")**

(1) Machine analyzer screen

Choosing the [Advanced function] → [Machine analyzer] command in the menu displays the following screen. Before starting machine analyzer operation, set the oscillation conditions and oscillation mode.



Machine analyzer screen

•Various buttons, status indications

1) Waveform data
   Frequency characteristic measurement results are displayed in the board chart (gain, phase).
2) Start
   Used to start Machine analyzer.
3) Stml Condition
   Set the oscillation conditions for Machine analyzer.
4) Stml Mode
   Set the oscillation mode for Machine analyzer.
5) Resonance point, opposite resonance point cursors
   Used to directly enter and specify the resonance point and opposite resonance point when they cannot be detected automatically.
6) Y-axis Scale Optimization
   Used to change the scale automatically so that the waveform is contained within the screen.

(2) Machine analyzer setting

Make the following settings when using Machine analyzer.

1) Stml condition

· "% of rated Torque"..... Set the maximum oscillation torque for oscillating the motor under a random torque command. (Setting range: 1 to 100%)

· "Stroke"..... Set the rotation range permitted for oscillation, beginning at the motor position when Machine analyzer is started. If this range is exceeded, Machine analyzer is stopped immediately, and the motor is coasted in the vertical shaft mode or is coasted after deceleration in the normal mode. (Setting range: ±1 to ±1000 revolutions)

REMARKS

- If a measurement result varies, accurate measurement may not have been made.
- Accurate measurement may not be made in a mechanical system whose oscillation torque is too small or whose friction is large. In such a case, increase the oscillation torque and restart Machine analyzer.
- If the oscillation torque is too large relative to the load inertia moment, an overcurrent or similar alarm may occur. At that time, reduce the oscillation torque and restart Machine analyzer.
- Starting oscillation switches to the torque control mode automatically, shifting a position. Before starting operation after oscillation, therefore, always make a home position return.

2) Stml mode

· "Normally Mode"..... The inverter operates in the torque control mode, oscillating the motor randomly.

· "Vertical Axis Mode"..... A servo lock is placed in the speed control mode, preventing a drop. Gain setting must have been made to ensure that stable servo lock operation will be performed at that time.

REMARKS

In "vertical shaft mode"

· The accuracy of 100Hz or less on the low frequency side may become low.

· Too high setting of the position loop gain (Pr. 422) may lower the measurement accuracy.

CAUTION

When the machine is a vertical shaft, always perform this function in the "vertical shaft mode" since a drop may occur.

(3) Starting Machine analyzer operation

1) Checking the settings

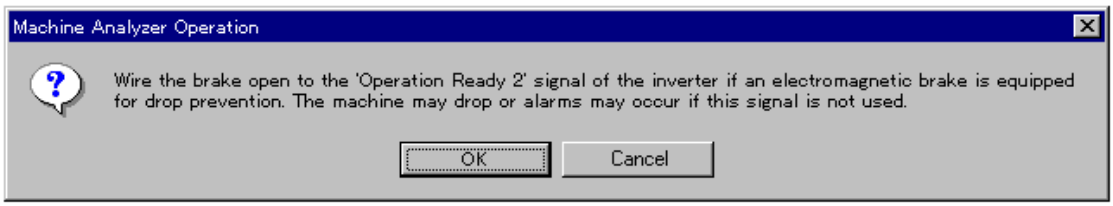
Click the [Start] button to check the settings of "Stml condition" and "Stml mode".

· "Stml condition".....The following screen appears if either or both "% of rated Torque" and "Stroke" are set outside the setting ranges.



Clicking the [OK] button returns to the Machine analyzer setting screen.

· "Stml mode".....In the "normally mode", the Machine analyzer operation start screen appears. The following screen appears when the "vertical axis mode" is selected.



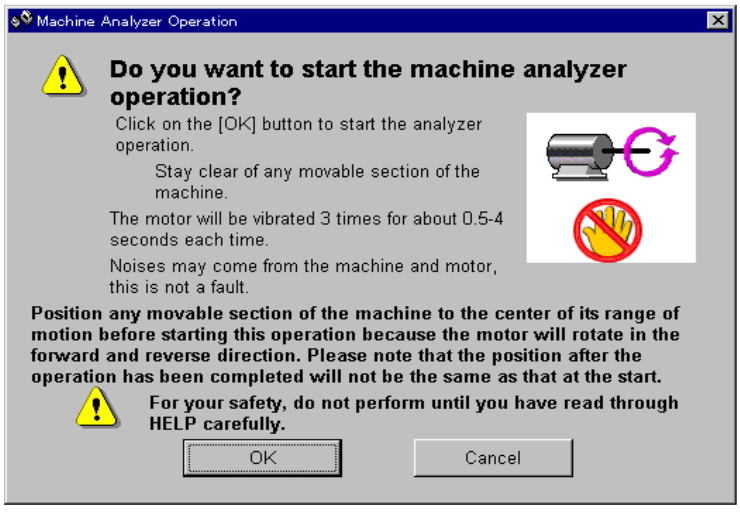
Clicking the [Cancel] button returns to the Machine analyzer setting screen.

Clicking the [OK] button displays the Machine analyzer operation start screen.

CAUTION

1. **When Machine analyzer is executed in the vertical shaft mode, a servo lock is first placed, the "Operation ready 2" signal is then output, and in 0.5 seconds, the motor is started.**
2. **When an electromagnetic brake is used, assign the "Operation ready 2" signal to any of the output terminals (DO1 to DO3, ABC) and modify the circuit to open the electromagnetic brake using this signal. If this is not done, a machine drop or an overcurrent or similar alarm may occur. (For details of Pr. 190 to Pr. 192 and Pr. 195 "output terminal function selection", refer to the instruction manual (basics) of the inverter.)**

2) Operation start



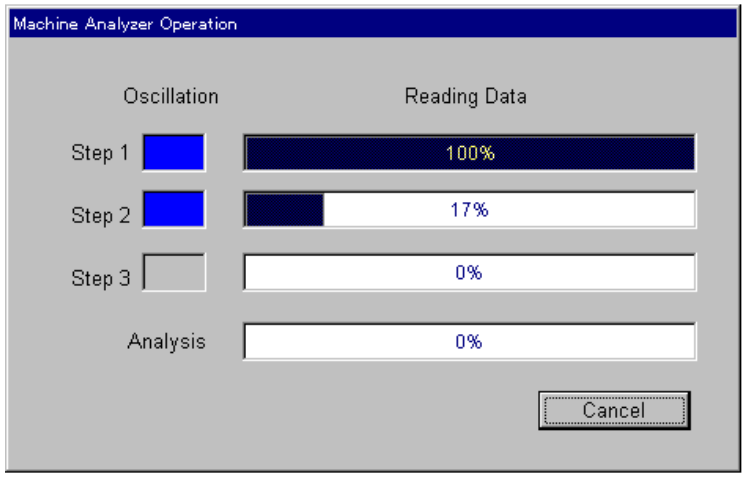
Machine analyzer operation start screen

Clicking the [Cancel] button returns to the Machine analyzer screen.

Clicking the [OK] button starts Machine analyzer and displays the Machine analyzer operation data read status screen.

(4) Reading the Machine analyzer operation data

When Machine analyzer is started, the following screen appears so that you can check the Machine analyzer progress conditions.



Machine analyzer operation data read status screen

Oscillation time varies with the step.

Step	Oscillation Time
Step 1	About 0.5s
Step 2	About 1s
Step 3	About 5s
Analysis	About 15s

Clicking the [Cancel] button returns to the Machine analyzer screen.

REMARKS

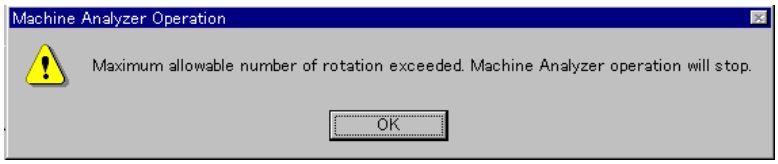
- During oscillation, oscillation can be stopped with the [Cancel] button, MRS signal (output stop signal) or the parameter unit [STOP] key.

The following screen appears if the motor rotation stroke exceeds the permissible range or the motor speed exceeds 3000r/min during oscillation.
Clicking the [OK] button returns to the Machine analyzer setting screen.

· If the motor rotation stroke exceeds the permissible range



· If the motor speed exceeds 3000r/min

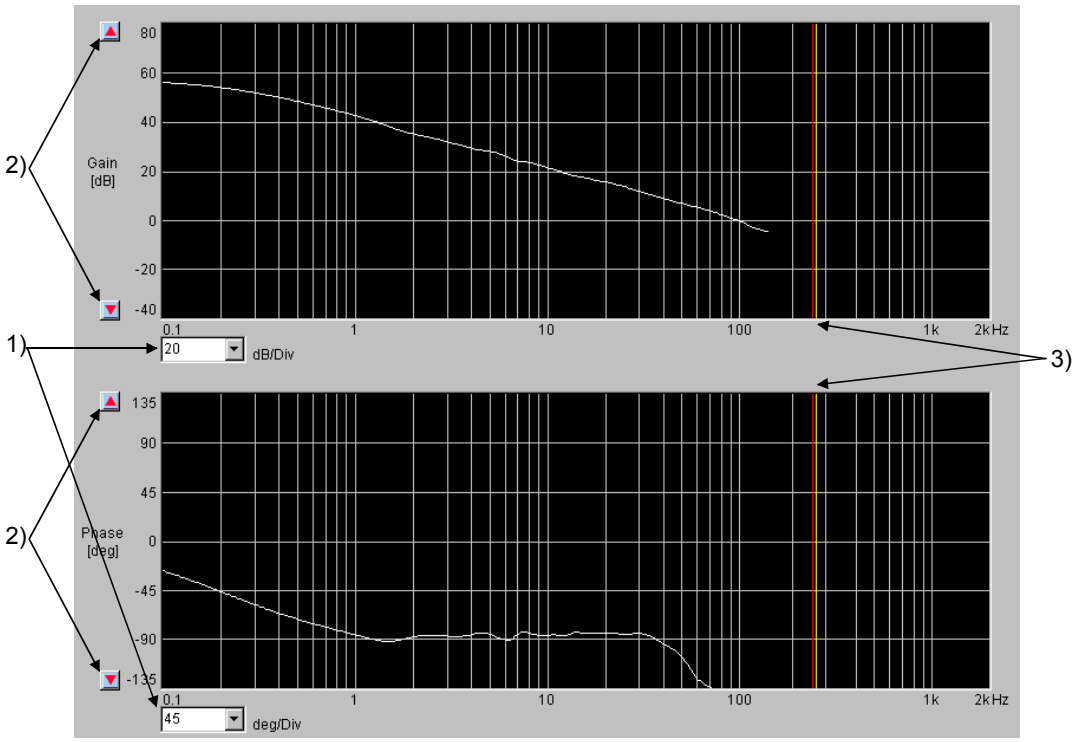


On normal completion of Machine analyzer, the frequency characteristics are displayed on the Machine analyzer screen.

(1) Observation of waveforms

The frequency characteristics measured by Machine analyzer are displayed in board charts.

For the waveform data, you can change the vertical axis scale and/or move the resonance point and opposite resonance point cursors.



1) Changing the scale
   - Vertical axis ..... Clicking [▼] displays the drop-down list, from which you can choose the unit of the vertical axis scale.
     By clicking the " Y-axis scale optimization" button, you can change the scale value to the one that will put the waveform within the screen automatically.
   - Horizontal axis..... The horizontal axis is fixed.

2) Moving the zero point position in the waveform
   - Vertical axis ..... Click the [▲]/[▼] button to move the position of the zero point.
   - Horizontal axi..... The horizontal axis is fixed.

3) Resonance point, opposite resonance point cursors
   The resonance point (red cursor) and opposite resonance point (yellow cursor) are automatically detected, but they may not be detected automatically depending on the characteristic. In such a case, move the cursors to the normal positions by directly rewriting the resonance point and opposite resonance point frequencies.

REMARKS

Inverters (FR-V500 series) manufactured in and before February 2002 need the trace option unit T-TRC50 to be fitted. Any of the models may be used with the trace option unit if its SERIAL number indicated on the rating plate and package has the following numbers or earlier.
(Only the first three digits of the control number are printed on the package.)

Type	SERIAL
FR-V520-1.5K to 7.5K	F 2 2 ○○○○○○
FR-V520-37K	C 2 2 ○○○○○○

F 2 2 ○○○○○○
Symbol Year Month Control number
SERIAL number

Refer to page 25 for installation of the trace option unit T-TRC50.

2.8 Saving, Reading and Printing the Files

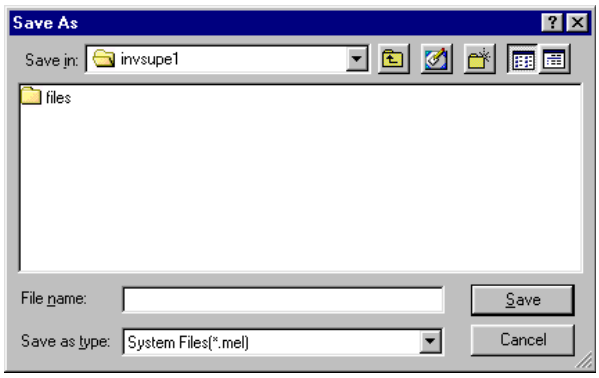
2.8.1 File types

File Name	Description
*.MEL	Manages the system settings and parameter lists (all stations) as a single file.
*.ADT	Manages the alarm history data. (All stations)
*.MDT	Manages the data indication data in monitoring. (Data on one screen)
*.MMT	Manages the meter indication data in monitoring. (Data on one screen)
*.ODT	Manages the oscilloscope data in monitoring. (Data on one screen)
*.TDT	Controls the trace data of the monitor.
*.TXT, *.CSV	Saves the parameter list in a text file format.
*.PRM	Saves the parameter setting information.
*.HDT	Controls the frequency characteristic measurement data of Machine analyzer.
*.XLS	Saves the parameter list in a Microsoft® Excel file format. (edditable with Microsoft® Excel 97 or later)

2.8.2 Saving method

1) *.MEL file

When the system settings and parameter lists to be saved are open, choose the [File] → [Save] command from the menu. The "Save As" panel appears. Choose "Save file as type" to save the file with the "File name".
Choose the [File] → [Save] command in the menu to overwrite the currently open file. If no file is open, the "Save As" panel appears.
The file is saved in the "invsupe1" folder in the hard-disk where the Setup S/W is installed.



CAUTION

When saving the file, the stations whose data are not opened are judged as "data absence". Therefore, if the file is saved as it is, the previous data will be erased. Always save the file with the data open.

2) *.ADT, *.MDT, *.MMT, *.ODT, *.HDT, *.TXT, *.CSV and *.XLS files

Choose the [File] → [Save] command from the menu on the corresponding display screen. The "Save As" panel appears. Choose "Save as type" to save the file with the "File name".
The file is saved in the "invsupe1" folder in the hard-disk where the Setup S/W is installed.

3) *.TDT file

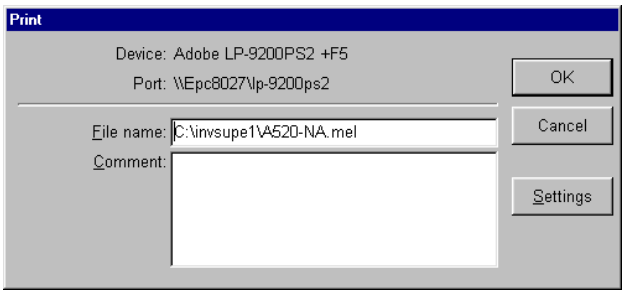
Choose the [File] → [Save] command on the trace screen.
Choose a location for the file to be saved and save it with a file name. The file is saved in a TDT file format. You can edit TDT files using various application software, e.g., spreadsheet software, and graph out their traced data, etc.

2.8.3 Reading the file

To read the saved file, choose the [File] → [Open] command from the menu. The "Open" panel appears. Choose the file to be read and click the [OK] button to read the saved data.

2.8.4 Printing

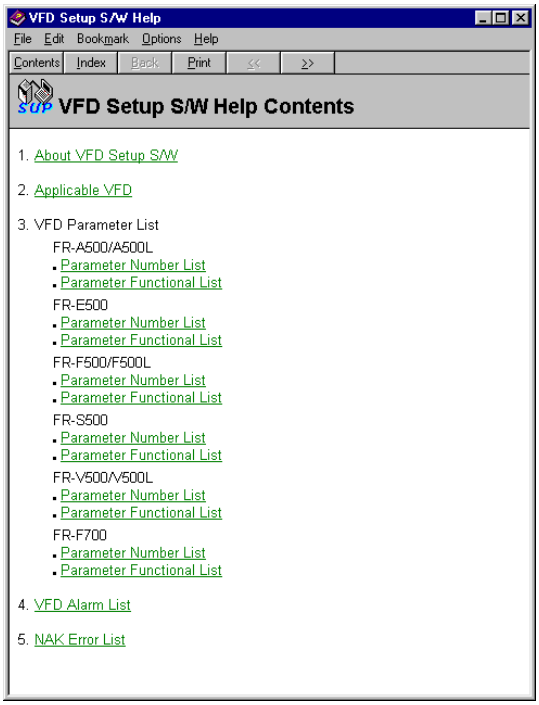
Calling the screen to be printed and choosing the [File] → [Print] command in the menu displays the "Print" panel. Make printer and other settings and click the [OK] button to start printing.



2.9 Help

2.9.1 Help contents

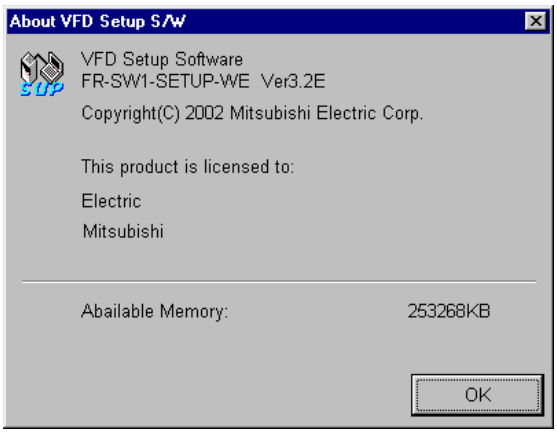
Choosing the [Help] → [Contents] command from the menu displays the following screen:



1) About VFD Setup S/W
   Explains how to use the VFD Setup Software.
2) Applicable VFD
   Displays a list of inverters with which the VFD Setup Software is compatible.
3) VFD Parameter List
   Explains each parameter.
4) VFD Alarm List
   Explains inverter alarms.
5) NAK Error List
   Explains the errors displayed in the setup software, e.g. NAK error.

2.9.2 Version information

Choosing the [Help] → [About VFD Setup S/W] command in the menu displays the copyright, the version information, the user and company names set for installation and other data on the following screen:



MEMO

3 ERROR INDICATIONS

This chapter explains the "error indications" which may be given during use of this product.
Always read the instructions before using this software.

3.1 Error codes 47

3.1 Error codes

3.1.1 Error code lists

When any error occurs, the corresponding error code is output to the error code display column (indicated by 3) on the screen on page 6).

(1) Error codes related to a communication error (inverter side)

Error Code (HEX)	Error Name	Definition
0(00H)	Computer NAK error	The number of errors consecutively detected in communication data from the computer is greater than the permissible number of retries.
1(01H)	Parity error	The parity check result does not match the specified parity.
2(02H)	Sumcheck error	The sum check code in the computer does not match that of the data received by the inverter.
3(03H)	Protocol error	Data received by the inverter is in wrong protocol or data receiving is not completed within the predetermined time.
4(04H)	Framing error	The stop bit length is different from the setting.
5(05H)	Overrun error	New data has been sent by the computer before the inverter completes receiving the present data.
7(07H)	Character error	The character received is invalid (other than 0 to 9, A to F, control code).

(2) Error codes related to an inverter error

Error Code (HEX)	Error Name	Definition
17(11H)	Outside parameter range	Data outside the setting range was specified for the running frequency (running speed), parameter write or like.
18(12H)	Operation mode error	The present operation mode is not allowed to perform. Change the operation modes.
19(13H)	Running	The inverter is running.
20(14H)	Parameter write inhibit	Parameter write is inhibited.
22(16H)	No parameters	There are no parameters or related parameters have not been set.
23(17H)	No options	The preset option is not connected to the inverter.
24(18H)	Narrow error	There is no difference between analog value settings of Pr. 902 (Pr. 904) and Pr. 903 (Pr. 905).
26(1AH)	Instruction code error	A non-existing instruction code was sent to the inverter.
33(21H)	Running in present mode	Mode change etc. cannot be made since the inverter is running in the present operation mode.
34(22H)	With STF	Mode change etc. cannot be made since the forward rotation command is entered.
35(23H)	With STR	Mode change etc. cannot be made since the reverse rotation command is entered.
36(24H)	Operation mode specified	Cannot be executed in the present operation mode.
37(25H)	Pr. 75 specified	Since Pr. 75 is specified, inverter reset cannot be executed.

(3) Error codes related to a communication error (personal computer side)

Error Code	Error Name	Definition
2000	Normal termination	Communication terminated without fault.
2001	Time-out occurrence	Communication with the inverter cannot be made.
2002	Send data error occurrence	Send data error
2003	Checksum error	The sum check code value of the data received by the computer is invalid.
2004	Receive data error	Data from the inverter is invalid.
2005	NAK receive	Data from the inverter is invalid.
2006	Line offline	The present line is offline.
2007	Unconnected	This station number is not yet connected.

3.1.2 Panel-displayed errors

Display	Definition
Program setting environment is invalid. Redo setup again.	There is no program file read from the EXE file. The program directory is different.
Data directory is invalid. After starting, make environmental setting.	Data directory setting is invalid.
The following file is not found. The program is terminated.	The user file is not in the specified directory.
Time-out occurred. Check the wiring and communication settings.	Communication stopped for some reason in the online mode.

REMARKS

When making communication with the inverters, set a value other than 0 in Pr. 122 "communication check time interval" on the inverter's operation panel. For the FR-S500 series, set a value other than 0 in the communication parameter n6 (336) "communication check time interval". (Refer to the inverter instruction manual for the setting method.)

4 APPENDICES

This chapter provides the "appendices" for use of this product. Always read the instructions before using this equipment.

4.1 Supplementary Software 49

4.1 Supplementary Software

4.1.1 Introduction

The parameter file edit software (hereafter "PREDIT") is specifically designed to make changes/additions to the models supported by the VFD setup software (hereafter "setup software") and additions/deletions/changes to the display parameters. Please acknowledge that the PREDIT is not supported.

4.1.2 Parameter files

(1) What are parameter files?
Parameter files are text files which consist of information on the models compatible with the setup software and the parameter information of those models. Installing the setup software into the personal computer also installs the following files into the directory where the setup software is installed.

Applicable Model	Parameter File Name	Description
FR-A500	fra520. ine	FR-A520-0.4K to 55K
	fra540. ine	FR-A540-0.4K to 55K
	fra520na. ine	FR-A520-0.4K to 55K-NA
	fra540na. ine fra540ec. ine fra540ch. ine	FR-A540-0.4K to 55K-NA FR-A540-0.4K to 55K-EC FR-A540-0.4K to 55K-CH
	fra560na. ine	FR-A560-0.75K to 55K-NA
FR-A500L	fra52l. ine	FR-A520L-75K, 90K
	fra54l. ine fra54lna. ine fra54lec. ine fra54lgna. ine fra54lgec. ine fra54lsec. ine fra54lsch. ine	FR-A540L-65K to 450K FR-A540L-65K to 450K-NA FR-A540L-65K to 450K-EC FR-A540L-65K to 450K-G-NA FR-A540L-65K to 450K-G-EC FR-A540L-60K to 375K-S-EC FR-A540L-60K to 375K-S-CH
	fra56lna. ine	FR-A560L-75K to 450K-NA
FR-E500	fre520. ine fre520na. ine	FR-E520-0.1K to 7.5K FR-E520-0.1K to 7.5K-NA
	fre520w. ine fre52wna. ine	FR-E510W-0.1K to 0.75K FR-E510W-0.1K to 0.75K-NA
	fre520s. ine fre52sec. ine fre52sch. ine	FR-E520S-0.1K to 0.75K FR-E520S-0.4K to 2.2K-EC FR-E520S-0.4K to 2.2K-CH
	fre540. ine fre540na. ine fre540ec. ine fre540ch. ine	FR-E540-0.4K to 7.5K FR-E540-0.4K to 7.5K-NA FR-E540-0.4K to 7.5K-EC FR-E540-0.4K to 7.5K-CH
FR-F500	frf520. ine frf520na.ine	FR-F520-0.75K to 55K FR-F520-0.75K to 55K-NA
	frf540. ine frf540na. ine frf540ec. ine frf540ch. ine	FR-F540-0.75K to 55K FR-F540-0.75K to 55K-NA FR-F540-0.75K to 55K-EC FR-F540-0.75K to 55K-CH
FR-F500L	frf52l. ine	FR-F520L-75K to 110K
	frf54l. ine frf54lna. ine frf54lec. ine frf54lch. ine frf54lgch. ine frf54lsch. ine	FR-F540L-75K to 530K FR-F540L-75K to 530K-NA FR-F540L-75K to 530K-EC FR-F540L-75K to 530K-CH FR-F540L-75K to 530K-G-CH FR-F540L-75K to 400K-S-CH

Applicable Model	Parameter File Name	Description
FR-F700	frf720. ine frf720na. ine	FR-F720-0.75K to 55K FR-F720-00046 to 02330-NA
	frf740. ine frf740na. ine frf740ec. ine frf740ch. ine	FR-F740-0.75K to 160K FR-F740-00023 to 03610-NA FR-F740-00023 to 03610-EC FR-F740-0.75K to 55K-CH FR-F740-S75K to S185K-CH
FR-S500	frs520. ine frs520na. ine frs520e.ine frs52ena.ine	FR-S520-0.1K to 3.7K-R FR-S520-0.1K to 3.7K-NAR FR-S520E-0.1K to 3.7K FR-S520E-0.1K to 3.7K-NA
	frs520w. ine frs52wna. ine frs520we.ine frs52wen.ine	FR-S510W-0.1K to 0.75K-R FR-S510W-0.1K to 0.75K-NAR FR-S510WE-0.1K to 0.75K FR-S510WE-0.1K to 0.75K-NA
	frs520s. ine frs52sec. ine frs52sch. ine frs520se.ine frs52see.ine frs52seh.ine	FR-S520S-0.1K to 1.5K-R FR-S520S-0.2K to 1.5K-ECR FR-S520S-0.2K to 1.5K-CHR FR-S520SE-0.1K to 1.5K FR-S520SE-0.2K to 1.5K-EC FR-S520SE-0.2K to 1.5K-CHT
	frs540. ine frs540na. ine frs540ec. ine frs540ch. ine frs54e.ine frs54ena.ine frs54eec.ine frs54ech.ine	FR-S540-0.4K to 3.7K-R FR-S540-0.4K to 3.7K-NAR FR-S540-0.4K to 3.7K-ECR FR-S540-0.4K to 3.7K-CHR FR-S540E-0.4K to 3.7K FR-S540E-0.4K to 3.7K-NA FR-S540E-0.4K to 3.7K-EC FR-S540E-0.4K to 3.7K-CHT
FR-V500	frv520. ine	FR-V520-1.5K to 55K
	frv540. ine	FR-V540-1.5K to 55K
FR-V500L	frv52l. ine	FR-V520L-75K
	frv54l. ine frv54lna. ine	FR-V540L-75K to 250K FR-V540L-75K to 250K-NA

(2) Parameter file structure

The parameter file consists of a machine information part and a parameter information part. The machine information part is used to choose a model on the system setting screen and the parameter information part is used to chiefly display the parameter screen.

[Machine information part]

- Model name (such as FR-A520)
- Model type code (NA, EC, CH...)
- Power supply capacity (100V class: 1, 200V class: 2, 400V class: 4)
- Model code

Model	Model code
FR-A500 series	&HA5
FR-A500L series	&H05
FR-E500 series	&HBF
FR-F500 series	&HF5
FR-F500L series	&HF51

Model	Model code
FR-F700 series	&HF7
FR-S500 series	&H55
FR-V500 series	&25H
FR-V500L series	&HB5

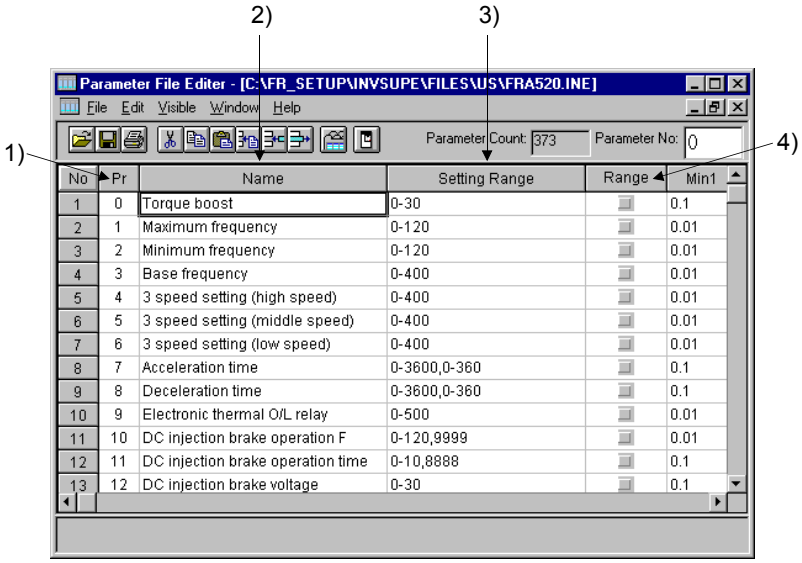
- Allowable capacity (0.1K, 0.2K, 0.4K...)
- Rated current value (0.8A, 1.5A, 3A...)
- Connectable option (A5AX, A5AY...)
- Number of parameters

[Parameter information part]

- Help context ID (number for help display)
- Parameter number
- Name
- Unit (Hz, r/min, V, A...)
- Step (1, 0.1, 0.01, 0.001)
- Factory setting
- Function-based list code (parameter displayed on the functional list screen)
- Setting range check flag (0: checked, 1: not checked)
- Setting range

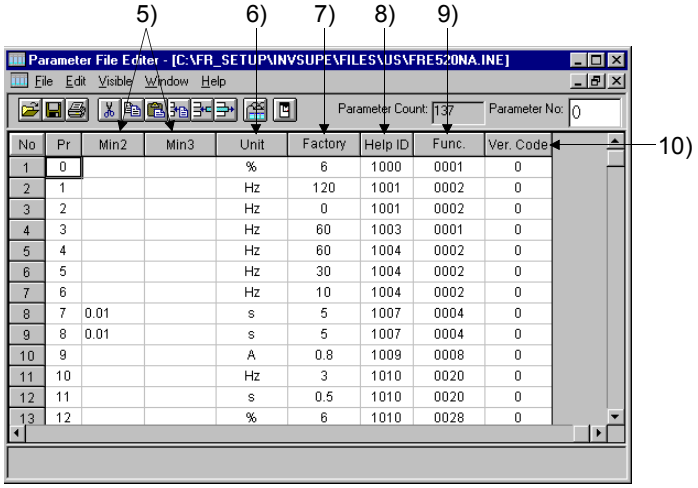
4.1.3 Parameter file edit software (PREDITE)

This software is specifically designed to edit the parameter file for the setup software, and cannot be used for other applications. By editing and saving the file, it can be displayed on the parameter screen (all list, functional list, etc.) as a setup software parameter file. You can make an updated inverter version or a special or another inverter compatible with the setup software.



(1) Input items

1) Pr ..... Write the parameter number. Set the parameter numbers in the ascending order and do not write the same parameter number.
2) Name ..... Write the parameter name.
3) Setting Range ..... Enter the parameter setting range and use "," and "-" for separation.
Example: 0 to 6, 9999 → 0-6, 9999
4) Range ..... Choose whether the setup software range is checked or not. By checking this column, a range check is not made in the setup software.



No	Pr	Min2	Min3	Unit	Factory	Help ID	Func.	Ver. Code
1	0			%	6	1000	0001	0
2	1			Hz	120	1001	0002	0
3	2			Hz	0	1001	0002	0
4	3			Hz	60	1003	0001	0
5	4			Hz	60	1004	0002	0
6	5			Hz	30	1004	0002	0
7	6			Hz	10	1004	0002	0
8	7	0.01		s	5	1007	0004	0
9	8	0.01		s	5	1007	0004	0
10	9			A	0.8	1009	0008	0
11	10			Hz	3	1010	0020	0
12	11			s	0.5	1010	0020	0
13	12			%	6	1010	0028	0

5) Minimum ..... Choose the minimum setting increment from among "1", "0.1", "0.01" and "0.001" in the combo box.
6) Unit ..... Write the parameter unit. This column may be left blank for parameters which do not have units.
7) Factory setting ..... Write the value set at the factory.
8) Help ID ..... Write the help ID. Used to display help relating to the chosen parameter. When adding a parameter, you cannot add its help and therefore set "0".
9) Function list ..... Enter the hexadecimal code as the function class for display on the functional list format screen. Choosing "Edit" → "Functional List Code" shows the functional list code edit panel.
10) Condition count ..... Shows the number of conditions set in parameter read condition editing.

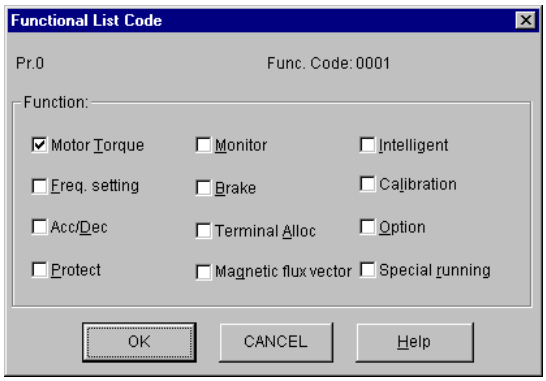
REMARKS

The number of parameters and the number of setting ranges need not be entered as they are set automatically.

(2) Functions

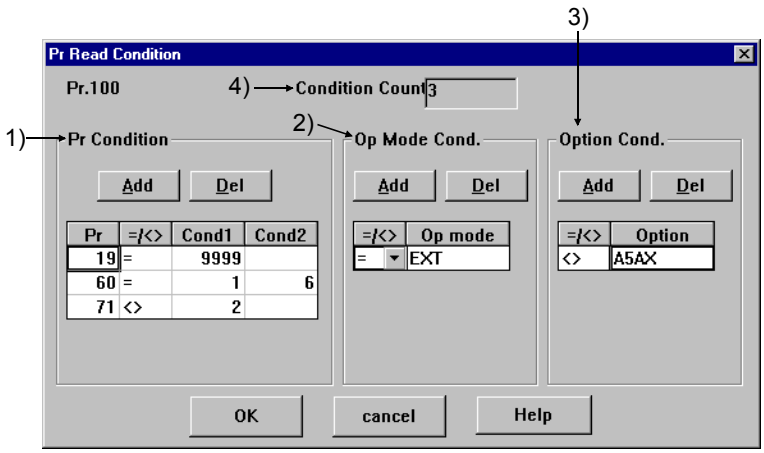
1) File
- Open
  Opens the parameter file (Tool button available)
- Close
  Closes the currently open file.
- Save
  Overwrites the currently open file. (Tool button available)
- Save As
  Shows the file saving combo box and saves the file with a new name.
- Print
  Prints the open file. (Tool button available)
- Exit
  Exits from the software.

2) Edit (may also be displayed with the right button of the mouse)
   - Cut
     Cuts the currently chosen range and pastes it to the clipboard. (Tool button available)
   - Copy
     Copies the currently chosen range and pastes it to the clipboard. (Tool button available)
   - Paste
     Pastes the data of the clipboard. (The clipboard data from another application may not be pasted correctly.) (Tool button available)
   - Insert & Paste
     Inserts the data cut or copied on a line basis. (Tool button available)
   - Insert
     Inserts a blank line to above the currently chosen line. (Tool button available)
   - Delete
     Deletes the currently chosen line. (Tool button available)
   - Functional list code edit
     Shows the functional code list of the currently chosen parameter.
     Clicking the item to be displayed in the functional list and pressing the [OK] button automatically shows the functional list code.



Functional List Code Edit Panel

   - Pr read condition edit
     When performing Block Read or Block Check by the VFD setup software, no error indication will be displayed by setting the parameter reading conditions, even if the parameters of inverter's parameter setting and setup software do not match. (Refer to page 14 for Block Read and Block Check of the parameters.)



REMARKS

Refer to the inverter instruction manual for the parameter reading conditions of the inverter.

1) Parameter condition
Set the read disable conditions for other parameters.
When adding a condition, press the [Add] button and add one row. Enter the parameter number that will be the read disable condition into the Pr. item, = (equal) or <> (not equal) as the condition, and the parameter setting into the Cond1 item. When the setting has a range, enter the range into Cond1 and Cond2. To delete the condition, choose the item to be deleted and press the [Delete] button.
ex) When Pr. 19=9999, Pr. 60=1 to 6, Pr. 71<>2

Pr	=/<>	Cond1	Cond2
19	=	9999	
60	=	1	6
71	<>	2	

2) Operation mode condition
Set the read disable conditions for the operation mode.
When adding a condition, press the [Add] button and add one row. Choose = (equal) or <> (not equal) as the condition, and select the mode disabled for read from Op mode.
To delete the condition, choose the item to be deleted and press the [Delete] button.
ex) In the external mode the reading is not correct

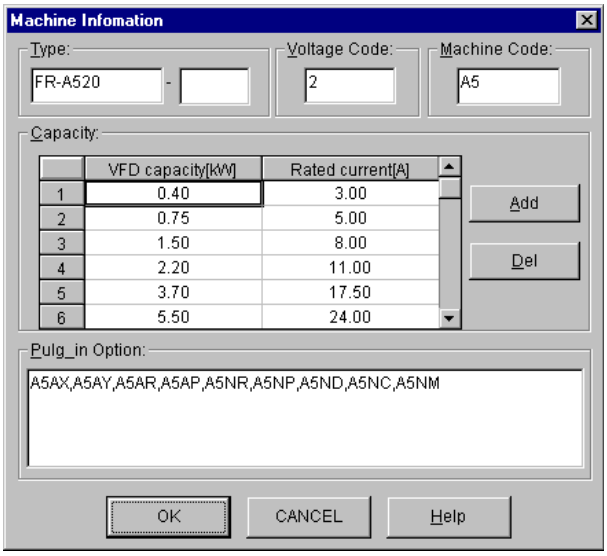
=/<>	Op mode
=	EXT

3) Inboard option condition
Set the read disable conditions for option fitting.
When adding a condition, press the [Add] button and add one row. Choose = (equal) or <> (not equal) as the condition, and enter the option name into the Option item. The option name to be entered is the one set in the model information panel of the setup software.
To delete the condition, choose the item to be deleted and press the [Delete] button.
ex) The parameter can only be read with FR-A5AX fitted

=/<>	Option
<>	A5AX

4) Number of Condition
Display setting condition. Automatic setting "OK" button.

- Machine information edit
  Shows the machine information part edit panel of the parameter file. (Tool button available)
  You can edit the inverter type, voltage code, model code, inverter rating, rated current and compatible options.



Machine Information Edit Panel

3) Display
   - Display column
     Choose whether the display column (refer to the input items) is to be displayed or not.
   - Toolbar
     Choose whether the toolbar is to be displayed or not.
   - Status bar
     Choose whether the status bar is to be displayed or not.
   - Font
     Choose the font of the display list. The set font is also displayed after the next startup.
4) Window
   - Cascade display
     Shows the displayed windows side by side.
   - Tile display
     Shows the displayed windows one over another.
5) Help
   - Contents
     Shows the contents of help.
   - Version information
     Shows the version information panel.
6) Parameter count
   Shows the number of parameters currently being displayed. Line insertion or deletion automatically changes the number of parameters.
7) Parameter No.
   Shows the parameter number currently being chosen. After entering the parameter number, pressing the return key displays the entered parameter number at the front of the list.
8) Automatic cell width adjustment
   Double-click the item name (Pr., name, range check ...) in the list to adjust the cell width to the maximum width of the column.
9) Mouse right-click
   Press the right button of the mouse to show the edit menu.
10) Tool button function display
    Placing the mouse on the tool button shows the button function details on the status bar.
11) By relating this software with the parameter file, you can open this software from the parameter file.

CAUTION

Before editing the parameter file, always make a backup copy of the file.

REVISIONS

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

Print Date	*Manual Number	Revision
Nov., 2002	IB(NA)-0600081-A	First edition
Feb., 2003	IB(NA)-0600081-B	Additions Supported models: FR-A540L-65K to 450K (-NA) (-G-NA) (-EC) (-G-EC), FR-A540L-S-60K to 375K (-EC) (-CH), FR-A560L-75K to 450K (-NA), FR-F520-NA, FR-F540-NA, FR-F520L-75K to 110K, FR-F540L-75K to 530K (-NA) (-EC) (-CH) (-G-CH), FR-F540L-S-75K to 400K (-CH), FR-V520L-75K, FR-V540L-75K to 250K (-NA)
Nov., 2004	IB(NA)-0600081-C	Additions Supported models: FR-F720-0.75K to 55K, FR-F720-00046 to 02330 (-NA) FR-F740-0.75K to 160K, FR-F740-00023 to 03610 (-NA) (-EC) FR-F740-0.75K to 55K, S75K to S185K (-CH)
May, 2006	IB(NA)-0600081-D	Additions Supported models: FR-S520E-0.1K to 3.7K (-NA), FR-S540E-0.4K to 3.7K (-NA) (-EC) (-CHT) FR-S520SE-0.1K to 1.5K, (FR-S520SE-0.2K to 1.5K (-EC) (-CHT)) FR-S510WE-0.1K to 0.75K (-NA)