

Inverter Setup Communication Application

PCS001Z

Instruction Manual

Toshiba Schneider Inverter Corporation

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1. Introduction

"PCS001Z" is a MS-Windows application program connecting a PC and the inverter using RS-232C for the purpose of simplifying the inverter parameter settings and saving the setting data and so on, "PCS001Z" has the following functions. Read this manual carefully together with the instruction manual of the inverter and then use the product correctly.

- Parameter offline settings
- Writing parameters saved on the PC to the inverter
- Reading parameters and saving them to the PC
- Checking the changed parameters
- Printing the parameter table
- Parameter settings for each purpose

* For the inverters and CPU versions which "PCS001Z" conforms, to see the application menu *Help* | *About*.

Operating environment

- CPU..... Intel™ Pentium®-233MHz or more
- OS MS-Windows® 95 / 98 / 2000 / Xp
- Memory 64MB or more (128MB minimum recommended)
- HDD..... Required free space is approx. 10MB.
- Display 640 × 480 dots / 256 colors or more
- Others: Either a CD-ROM drive or Internet connection environment is required for installation of this program.
Serial port^{*3} is required to connect with the inverter.
To operate this program, a pointing device such as a mouse is recommended.

- * This software may not work in some models of the PC-98 Series.
- * When the USB-Serial Converter is used, start the PCS001Z while the converter is connected.
Please do not pull the converter out, and do not insert it during execution of PCS001Z.
- * When a RS232 / 485 converter is used, 2 line type communication cannot be performed.

- * The specification of this software may be changed without prior notice.
- * Toshiba assumes no responsibility for direct or indirect damage caused from use or inability to use this software product.
- * Pentium is a registered trademark of Intel Corporation in U.S.A.
- * MS-Windows is a registered trademark of Microsoft Corporation in U.S.A.
- * PC-98 Series is a registered trademark of NEC Corporation.

Symbols used in this instruction manual have the following meaning.

- " "..... Items and messages of PCS001Z
- [] Buttons on the screen of PCS001Z
- Italic*..... Menu of PCS001Z and Windows
- Keys of personal computer (hereinafter PC)

2. About Installation

Precautions required when installing this software are as follows.

- When other applications are operating, terminate those applications.
- To upgrade PCS001Z, uninstall the old version (You can check the version of PCS001Z with *Help* | *About* (Section 3.7.2).)

- * To uninstall the program, use menu such as *My Computer* | *Control Panel* and then proceed with *Add / Remove Programs*. In some cases, user data (such as initial file PCS001Z.ini, skip parameter file) may remain on the PC. Delete these files using an application such as *Windows Explorer*.

- * PCS001Z is a multi-language application and the installer is made in English version. For this reason, some of the areas (folder etc.) may not be displayed correctly when installed.

3. Menu Description

Each setting menu is described here.

When PCS001Z is executed, the selection screen for the language to use and the inverter type is displayed. The language and the inverter type that appear after the installation when started for the first time are “Japanese” and “VFA7-2004PL” respectively.

Select the desired language, inverter type, and CPU version from the pull-down menu and press the [OK] button.

* If communication is enabled when started, the inverter type can be automatically recognized (Reference article *Environment Options* (Section 3.6.1)). However, it may not be possible to recognize the inverter type depending on the communication port setting of the PC, inverter type or CPU version.



CAUTION

If you select a model different from the model connected to, the parameters on the PCS001Z side differ from those on the inverter side, and errors will occur at communication.



Figure 3-1 Startup Screen

When the language, type, and inverter CPU version are selected and the [OK] button is pressed, the main menu and *Parameter Table* are displayed.

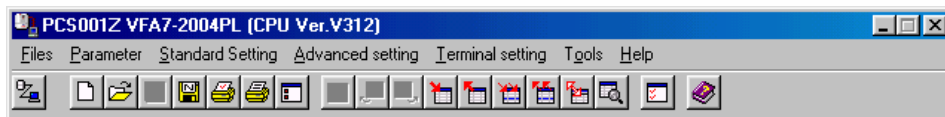


Figure 3-2 Main Menu Screen

* When communication is impossible, menus and buttons required for communication are displayed inactive (in gray) and cannot be used. When communication becomes possible by pressing *RS-232C Setup* or *Communication Check* buttons, the menus and buttons become available. If *Normal Use Printer* is not installed on your computer, print-related menus cannot be used.

Tool bars



: Check communication each time when this button is pressed.

(Left is a status where communication is possible.)



* : when communication is impossible



: Communicating...



: Execute *File* | **New** (Refer to Section 3.1.1)



: Execute *File* | **Open** (Refer to Section 3.1.2)



: Execute *File* | **Save** (Refer to Section 3.1.3)



: Execute *File* | **Save As** (Refer to Section 3.1.4)



: Execute *File* | **Page Setup** (Refer to Section 3.1.5)



: Execute *File* | **Print** (Refer to Section 3.1.6)



: Execute *File* | **RS-232C Setup** (Refer to Section 3.1.7)



: Execute *Parameter* | **Parameter Table** (Refer to Section 3.2.1)



: Execute *Parameter* | **Undo** (Refer to Section 3.2.2)



: Execute *Parameter* | **Redo** (Refer to Section 3.2.2)



: Execute *Parameter* | **Parameter Import** (Refer to Section 3.2.4)



: Execute *Parameter* | **Parameter Export** (Refer to Section 3.2.4)



: Execute *Parameter* | **Selected Parameter Import** (Refer to Section 3.2.5)



: Execute *Parameter* | **Selected Parameter Export** (Refer to Section 3.2.5)



: Execute *Parameter* | **Parameter Comparison.** (Refer to Section .)



: Execute *Parameter* | **Find** (Refer to Section 3.2.13)



: Start *Tools* | **Environment Options** (Refer to Section 3.6.1)



: Display *Help* | **Contents** (Refer to Section 3.7.1)

* Blank (grayed out) shows unselectable.

3.1. File

File operations and print are executed.

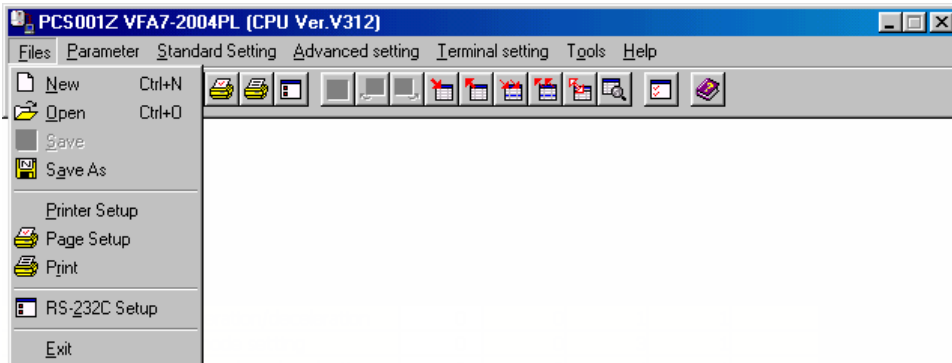


Figure 3-3 File Menu Screen

3.1.1. New

The present parameter setting is discarded, and parameter setting files are newly created. The selection of the inverter type starts again. Language change is possible only when PCS001Z starts. The selected inverter type is displayed on the title bar of the main menu.

3.1.2. Open

Read "**PCS001Z parameter data (*.pcs)**" file. A dialog box to select files is displayed, then specify a file name and press the **[Open]** button. The open file name is displayed on the title bar of the main menu.

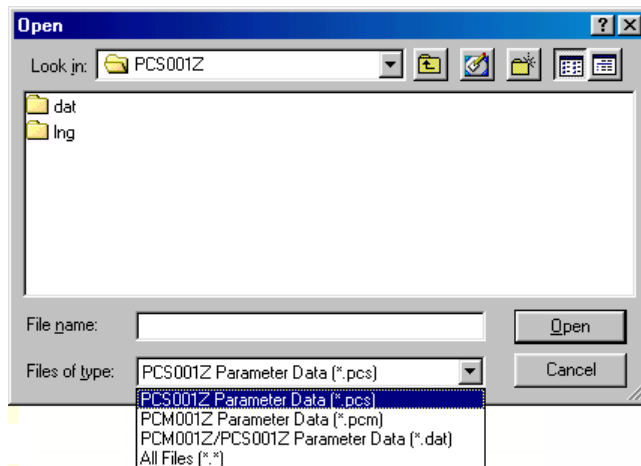


Figure 3-4 Open Screen

If a file related to another inverter type is chosen, the following message is displayed.



Figure 3-5 *File | Open* error message screen

When the file saved for a different inverter type (capacity) is chosen, the following message is displayed.

When button [No] is clicked, the file is read except the data specific to the inverter type (As for the inverter form parameter data, default data is read).

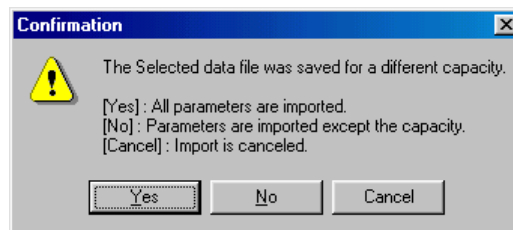


Figure 3-6 *File | Open* confirmation message screen

When the file saved by a different inverter software version is chosen, the following message is displayed (Only *.pcs format file).

When [Cancel] button is clicked, stops reading.

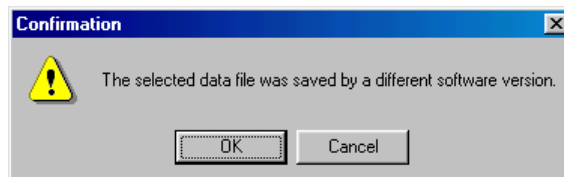


Figure 3-7 *File | Open* confirmation message screen

When a parameter is missing during opening, the message below is displayed.

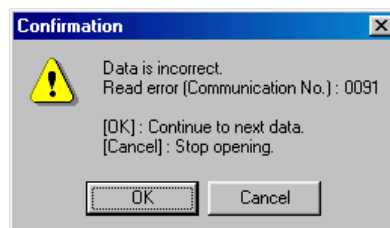


Figure 3-8 *File | Open* confirmation message screen

3.1.3. Save

The present parameter setting is overwritten in the existing files. If there is no file to be overwritten, this command is grayed-out and cannot be selected. Only "**PCS001Z parameter data (*.pcs)**" files can be overwritten.

3.1.4. Save As

If you select "**PCS001Z parameter data (*.pcs)**", the present parameter setting will be saved. When the file save dialog is displayed, specify a directory, and save as.

The saved file name is displayed on the title bar of the main menu.

* In the status of default, the parameter settings only displayed as "Changed" in the parameter table are saved. (Related article *Environment Options* (Section 3.6.1.2).)

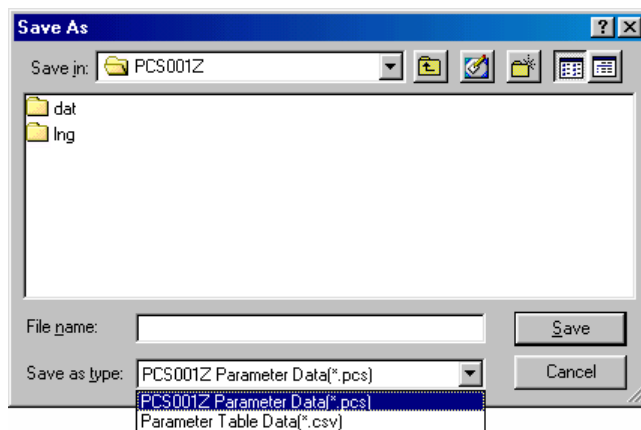


Figure 3-9 File Menu Screen

If you select "**Parameter table data (*.csv)**" as the file type, "Parameter Table" will be saved in csv form.

* If you select the "**Parameter Table Datas (*.csv)**" on the 'Changed' Only or Blind, the parameters only being displayed are output.

* The saved file name is displayed on the title bar of the main menu.

3.1.5. Page Setup

When printing the parameter table, specify the paper size and other items for PCS001Z.

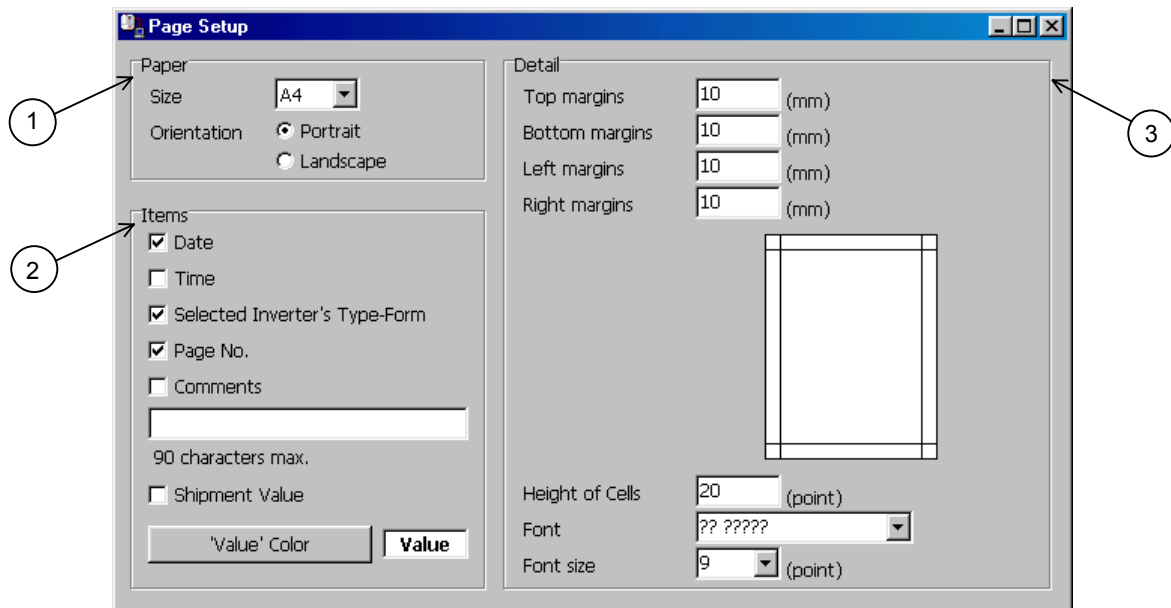


Figure 3-10 Page Setup Screen

1. Paper

Specify the size of paper to use and orientation. You can select the size from A3, A4, A5, B4 and B5.

2. Items

Select the items to be printed together with the parameter table. If you check "**Comments**", the characters entered in the writing space below will be printed. Comments are 90 character strings in double bytes. If "**Comments**" is not checked, the comments will be displayed in gray.

If you check "**Shipment value**", the factory default value will be added and printed as the "Default" item on the left side of the "Set Val." column in the parameter table.

The color of characters of "Set Val." can be specified by "**Value' color**" at printing.

3. Detail

Spaces other than spaces in the parameter table, with respect to the paper, are specified by "**Margin**". For example, if you open punch holes in the printed paper, set the left margin to about 20 mm. The height of cells of the parameter table is specified by "**Height of Cells**". When printing in a sheet of large paper, you can adjust "**Height of Cells**" and "**Font size**" so that print becomes natural.

The style and font size to use for print can be specified by "**Font**" and "**Font size**" (cannot be applied to "Title").

3.1.6. Print

Print the parameter table. A print image can be checked on the preview screen.

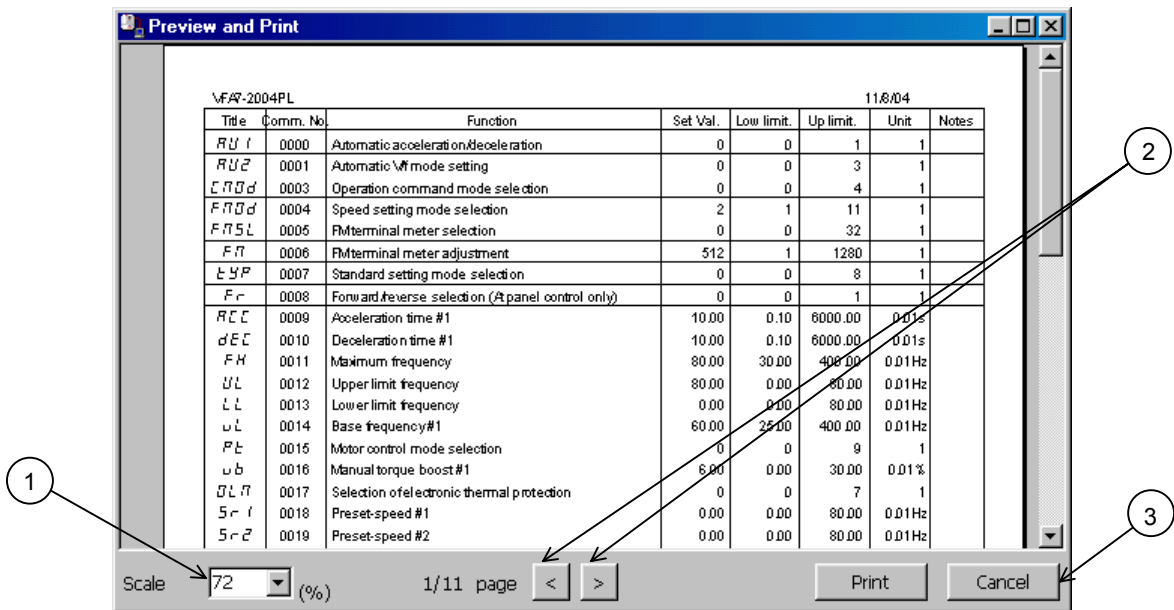


Figure 3-11 Preview and Print Screen

1. Preview magnification

The scale factor of the displayed preview is changed.

2. Page selection

The previous page and the next page can be previewed with the [<] and [>] buttons, respectively.

3. Print execution

If you press the [Print] button, the preview contents will be sent to a printer for print.

* [Print] can be selected after preview process is complete.

3.1.7. RS-232C Setup

The setup of the RS-232C (serial port) on the computer side is executed. Set to the communication setting of the inverter you use. Improper setting does not allow the correct data communications.

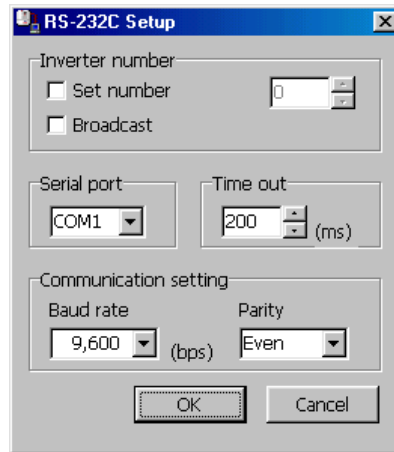


Figure 3-12 RS-232C Setup Screen

If the baud rate is low, such as 1,200 bps or 2,400 bps, it is necessary to specify “**Time out**” to be longer.

- *1 The “**Broadcast**” function does not support communications by group units that use the wild card (*) described in “VFA7 Serial Communications Function Manual”.
- *2 When a USB-Serial Converter is used, start the PCS001Z while the converter is connected.

3.1.8. Exit

End this application.

3.2. Parameter

Parameter setting, Import, and Export are executed.

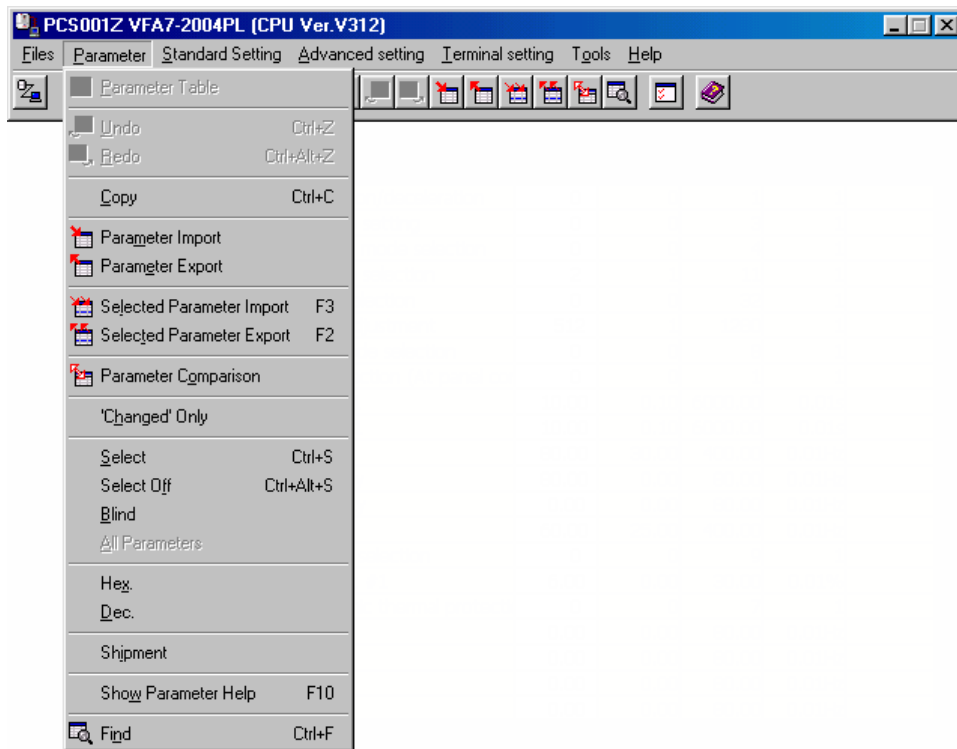


Figure 3-13 Parameter Menu Screen (Parameter table display)

When the parameter table is not displayed, menu below is displayed.

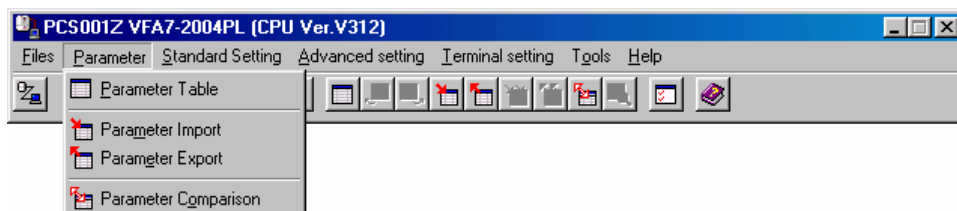


Figure 3-14 Parameter Menu Screen (Parameter table non display)

3.2.1. Parameter Table

Parameters are listed in the table.

Title	Comm. No.	Function	Set Val.	Low limit	Up limit	Unit
AU1	0000	Automatic acceleration/deceleration	0	0	1	1
AU2	0001	Automatic V/f mode setting	0	0	3	1
CMoD	0003	Operation command mode selection	0	0	4	1
FMOd	0004	Speed setting mode selection	2	1	11	1
FMSL	0005	FM terminal meter selection	0	0	32	1
FM	0006	FM terminal meter adjustment	512	1	1280	1
tyP	0007	Standard setting mode selection	0	0	8	1
Fr	0008	Forward/reverse selection (At panel cor	0	0	1	1
ACC	0009	Acceleration time #1	10.00	0.10	6000.00	0.01s
dEC	0010	Deceleration time #1	10.00	0.10	6000.00	0.01s
FH	0011	Maximum frequency	80.00	30.00	400.00	0.01Hz
UL	0012	Upper limit frequency	80.00	0.00	80.00	0.01Hz
LL	0013	Lower limit frequency	0.00	0.00	80.00	0.01Hz
vL	0014	Base frequency #1	60.00	25.00	400.00	0.01Hz
Pt	0015	Motor control mode selection	0	0	9	1
vb	0016	Manual torque boost #1	6.00	0.00	30.00	0.01%
OLM	0017	Selection of electronic thermal protecti	0	0	7	1
Sr1	0018	Preset-speed #1	0.00	0.00	80.00	0.01Hz
Sr2	0019	Preset-speed #2	0.00	0.00	80.00	0.01Hz
Sr3	0020	Preset-speed #3	0.00	0.00	80.00	0.01Hz
Sr4	0021	Preset-speed #4	0.00	0.00	80.00	0.01Hz

Figure 3-15 Parameter Table Screen

If a parameter column is clicked, parameters can be entered in "Set Val." cells (white). The contents of other cells (yellow) cannot be changed.

The setting values that are different from the factory defaults are displayed as "Changed" on the right side of columns. Setting values of the parameters not written in the inverter after the change are displayed in bold.

Key enter

- Enter** key Determines the value entered as a setting value.
- Del** key Sets the setting value of selected parameters to the factory default value.
- Esc** key Returns to the setting value that was not changed when pressed during changing.
- F3** key Imports the setting value of selected parameters from the inverter.
- F2** key Exports the setting value of the selected parameters to the inverter.

Hexadecimal value input: a numeric value entered with a "h" first is regarded as a hexadecimal value.

Display color

- Bold in grayParameters ("Set Val." only) for which writing to the inverter by using the **F2** key failed.
- Display in grayParameters skipped when read from the inverter.
- Display in redParameters unable to write in the inverter..

3.2.2. Undo / Redo

The operation executed by the **[Enter]** key is undone. The undo count can be specified with *Tools | Environment Options* (Section 3.6.1.2).

When you redo the operation undone, execute *Redo*.

3.2.3. Copy

Fix cells (cells in gray) corresponding to the range selected with the mouse are transferred to a clipboard. *Paste* to MS-Excel or other software allows for paste in each cell.

3.2.4. Parameter Import / Export

Each parameter setting value is read from the inverter, or the values specified in the parameter table are written in the inverter. Note that **[Cancel]** cannot be executed during the operation.

If communications are impossible, communication errors will occur. Please confirm the access or *RS-232C Setup*. If the CPU version of the inverter that communicates with the PCS001Z support CPU version is different, communication errors may occur (This is because parameters corresponding to the communication numbers sent from the PCS001Z side do not exist on the inverter side.) In this case, press the **[OK]** button to skip, and continue parameter read. (It is recommendable that the *Export 'Change' Parameters only of Environment Options* (Section 3.6.1.1) be checked for batch write.)

The parameter communication number and function name skipped at *Parameter Import* is named as a file name showing "DD/HH/MM/SS", and can automatically be saved in a folder where this application was installed. (Related article *Environment Options* (Section 3.6.1.2).)

(Example: When read is complete at 2:21:43 p.m. on 25th, it shows 25d14h21m43s.txt.)

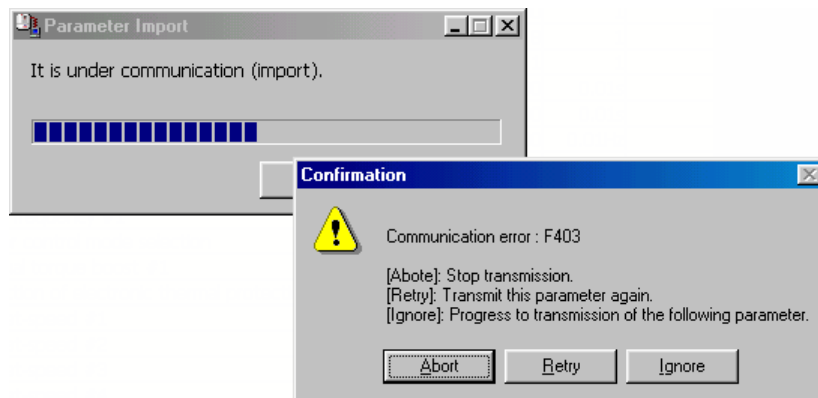


Figure 3-16 Skip Screen



CAUTION

If parameters are written in the different model from the model selected at PCS001Z startup, there is possibility of incidents which may cause damage to inverters or motors.

3.2.5. Selected Parameter Import / Export

The only parameters selected in *Select* are import or export from / in the inverter.

3.2.6. Parameter Comparison

PCM001Z side parameter setting value is compared with the inverter side parameter setting value.

When a different setting value is found, the following message is displayed.

(Related article *Environment Options* (Section 3.6.1.1.))

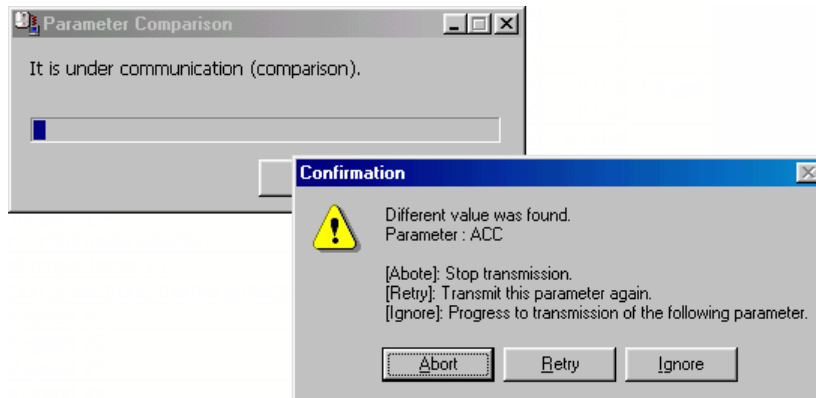


Figure 3-17 Comparison message screen

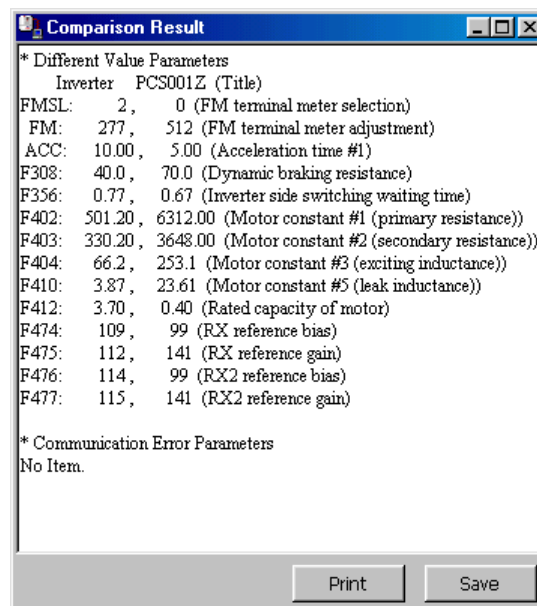


Figure 3-18 Comparison result screen

3.2.7. 'Changed' Only

Only the parameters different from the factory default are displayed in the table. All parameters will be displayed by executing either *'Changed' Only* again or *All Parameters*.

3.2.8. Select / Select Off

Parameters with the cursor presented or parameters in the range selected with the mouse are parameters to be selected. The backcolor of cells for the parameter setting values selected are displayed in blue. Following functions are target-selected parameters.

- *Selected Parameter Import*
- *Selected Parameter Export*
- *Blind*
- *Hex.*
- *Dec.*
- *Shipment*

To clear, execute *Select Off*. The *Select Off* is executed for all selected parameters.

3.2.9. Blind

The selected parameters are not displayed. (It is necessary that parameters of *Blind* be executed with *Select* in advance before the execution of *Blind*.) If "**PCS001Z Parameter Datas (*.pcs, and *.dat)**" saved in this status is read with *File | Open*, the parameters of *Blind* will not be displayed.

* If *Parameter Import / Export* is executed, parameters of *Blind* will also be executed.

3.2.10. All Parameters

The parameters being performed with *'Changed' Only* or *Blind* are all displayed.

3.2.11. Hex. / Dec.

The selected parameters only are displayed in hexadecimal numbers or decimal numbers. When entering in hexadecimal numbers, enter a “h” first, then enter setting values in hexadecimal numbers. The value to be entered in hexadecimal numbers is a value divided by the minimum setting unit.

Example: When setting the acceleration time to 10.2 seconds by VFS9

Since the minimum setting unit is 0.1, an expression is $10.2 / 0.1 = 102$

When this is converted into hexadecimal numbers, the product becomes 66, so the value to be entered is “h66”.

* For VFA7, the minimum setting unit of the acceleration time is 0.01, so, the product becomes “h3FC”.

3.2.12. Shipment

Factory default values of the selected parameters are displayed.

3.2.13. Find

When the [Find] button is clicked, the find window below is opened. So, enter character strings to be found, and click on the [Find Next] button. If a parameter matching the character string is found, the cursor will move to the applicable parameter. Items to be found are either a function name or a communication number.

If the cursor is on a cell in the parameter table, the content of that cell will be automatically displayed in “Find what” when the find window is opened.

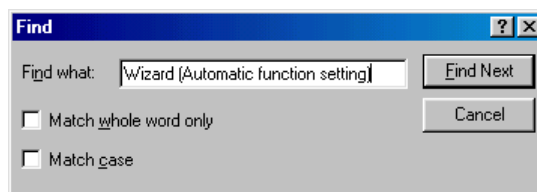


Figure 3-19 Find Screen

3.2.14. Parameter Information

If a parameter information file is prepared, individual parameter information can be displayed. Double-click on the parameter table can also implements the same function.

3.2.15. Other Functions

(1) Popup menu

Click on the parameter table with the mouse right button, a popup menu will be displayed.

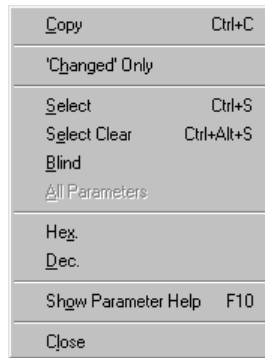


Figure 3-20 Parameter Popup Menu Screen

(2) Column width change

Drag the right-side border line of fix cells (the cells in gray on the top of the column) until you get the desired width.

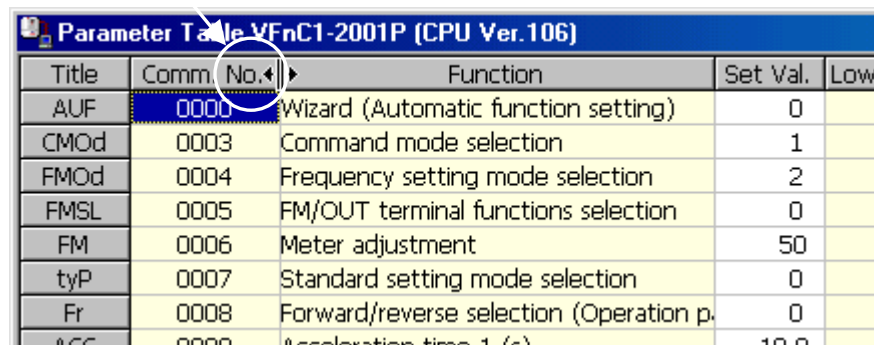


Figure 3-21 Column Width Change

3.2.16. Precautions when Exporting data

Writing process with the batch parameter or two or more parameters selected is executed in the order of communication numbers. Therefore, individually write the parameter setting value ("**ℓYP = 3**") by which the inverter communication process becomes temporary impossible at the time of exporting process.

The following shows the batch exporting when "**ℓYP = 3**" setting is included.

PCS001Z		INV
⋮	Writing	⋮
<i>F_{NSL}</i> = 0	->	<i>F_{NSL}</i> = 0
<i>F_N</i> = 512	->	<i>F_N</i> = 512
ℓYP = 3	->	ℓYP = 3 (Start parameter initialization)
<i>F_r</i> = 0	->	Initializing... (Writing disabled)
<i>ACC</i> = 10	->	Initializing... (Writing disabled)
<i>dEC</i> = 10	->	Initializing... (Writing disabled)
⋮		⋮

In addition, in the case of the settings where all parameters are written, only "Changed" parameters must be written for parameters that are handled as the same values inside the inverter (such as "**5_{r1} ~ 5_{r7}**" of VFS7/S7e and "**ℓH_r**" of VFS9).

(Reference article *Environment Options* (Section 3.6.1.1))

Example: In the case of VFS7/S7e/S9,

PCS001Z		INV
⋮	Writing	⋮
<i>5_{r1}</i> = 10	->	<i>5_{r1}</i> = 10
<i>5_{r2}</i> = 20	->	<i>5_{r2}</i> = 20
⋮	⋮	⋮
<i>F₂₈₀</i> = 0	->	<i>F₂₈₀</i> = 0 (Set to <i>5_{r1}</i> = 0)
<i>F₂₈₁</i> = 0	->	<i>F₂₈₁</i> = 0 (Set to <i>5_{r2}</i> = 0)
⋮		⋮

3.3. Standard Setting

The menu to set the basic operations of the inverter is provided.

For the setting values displayed when each menu is started, the values read from the inverter are used if communication with the inverter is enabled and the values in the *Parameter Table* are used if communication is disabled.

The menu section corresponding to the parameters that does not exist in the model selected when PCS001Z is started, becomes **blank (grayed out)**, and it cannot be changed.

3.3.1. Easy Setting

When *Easy setting* is selected, the following menus appear and when these are set sequentially, you can set a series of basic parameters.

- *Motor information setting*
- *Operation and frequency command mode setting*
- *Acc. / dec. time and run frequency setting*
- *Preset-speed setting*
- *Status monitor setting (panel display setting)*
- *Meter setting*

Check and enter the necessary values on each screen and press the **[Next]** button (press the **[Finish]** button in the last menu) and if communication is enabled, the setting values will be changed in the *Parameter Table* and they will be written to the inverter. If communication is disabled, the setting values will be changed in the "Parameter Table" and the system goes to the next menu.

Pressing the **[Back]** button returns you to the previous menu.

Pressing the **[Cancel]** button ends the *Easy Setting* operation.

3.3.2. Individual Setting

The basic parameter settings can be arbitrary selected from the menu.

When the **[Set]** button of each menu is pressed, if communication with the inverter is enabled, the setting values in that menu will be written to the inverter and the setting values will be changed in the *Parameter Table*. If communication is disabled, the setting values will be changed only in the *Parameter Table*.

When the **[Set]** button is pressed, the target parameters to write to the inverter or the parameters to change in the *Parameter Table* are the parameters not grayed out in the menu. Even if settings are changed in each menu, the parameters grayed out when the **[Set]** button is pressed will not be written to the inverter or changed in the *Parameter Table*. (This excludes some of the parameters. For details, see each menu.)

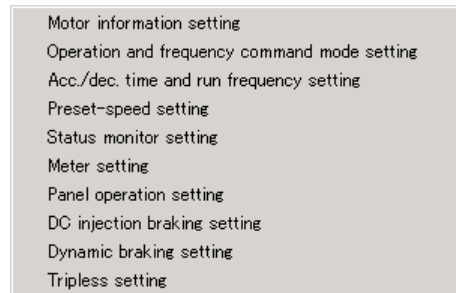


Figure 3-22 *Standard setting Menu Screen*

3.3.3. Motor Information Setting

Information of the motor connected to the inverter can be checked and entered.

When the "Change "Motor info. and basic parameters setting"" check box is checked, the grayed-out "Motor info. and basic parameter setting" items return to normal and the settings can be made.

The motor capacity corresponding to the model type-form selected when PCS001Z is started appears as default. Select the capacity of the motor you use.

Clicking this icon shows precautions required when using a special motor.

If a corresponding motor exists in the database from "Motor capacity", "Type" and "Constant voltage" the motor's rated current appears. If not found in the database, "Err." appears. Then enter the value directly.

Select the type of the motor you use.

If the "Rated current" is changed, this value changes accordingly.

The same value as the "Rated frequency" appears.

The rated current of the model type-form selected when PCS001Z is started appears.

This value changes automatically in accordance with the "Overload protection level"

When Individual setting is selected, [Set] instead of [Next] appears.

Figure 3-23 Motor information setting Screen

If the "Overload protection level (%)" indication is "Err." when [Set] is clicked, the following message appears. If [No] is selected, nothing will be written. If [Cancel] is selected, the screen returns to the *Motor information setting* Screen.

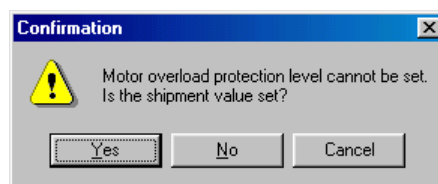


Figure 3-24 Message Screen

[Setting parameter]

`uL, OLN, F411, F412, F600`

(* These parameters become target parameters to write when [Set] is performed even if they are grayed out.)

3.3.4. Operation and Frequency Command Mode Setting

The inverter operation method is set here.

3.3.4.1. Operation

How to start and stop the inverter is set here.

Whether to start and stop the inverter from the inverter panel (RUN/STOP key) or by using an external contact signal (connected to the inverter terminal block) is selected here.

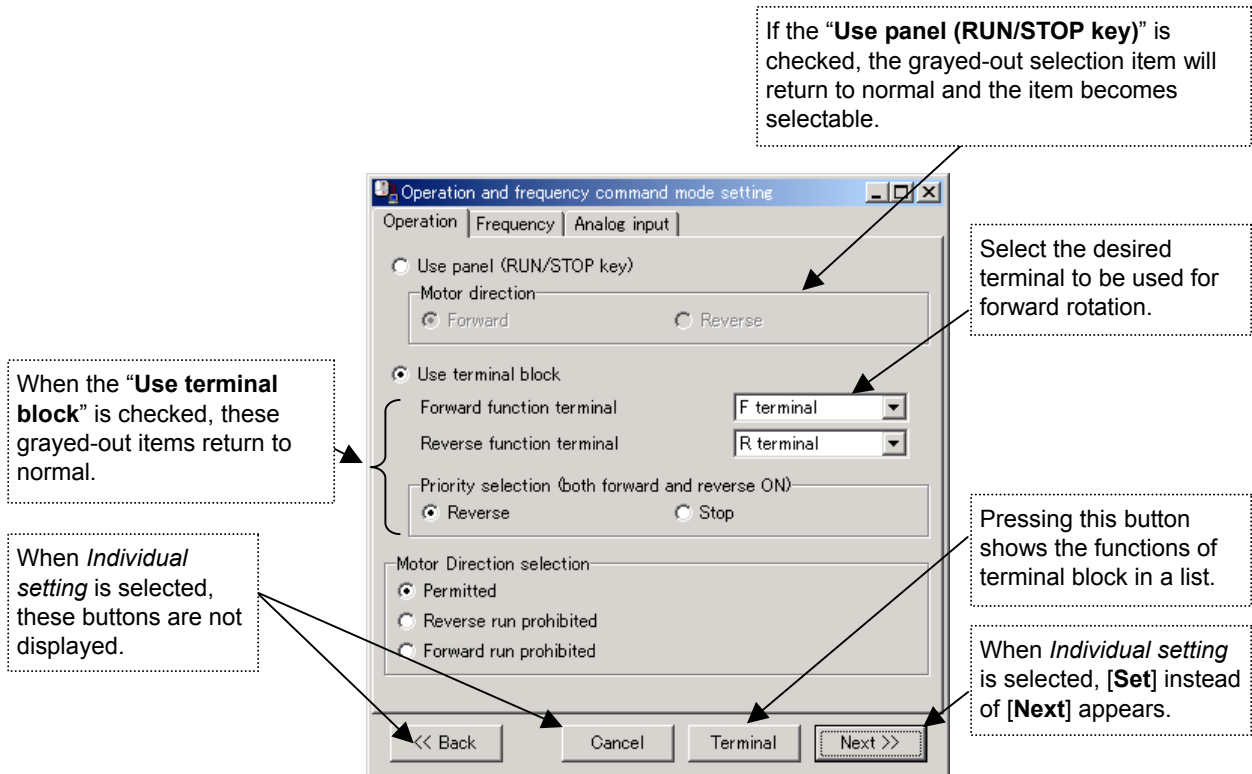


Figure 3-25 Operation and frequency command setting (Operation) Screen

If you change the terminal block function, the following message appears.

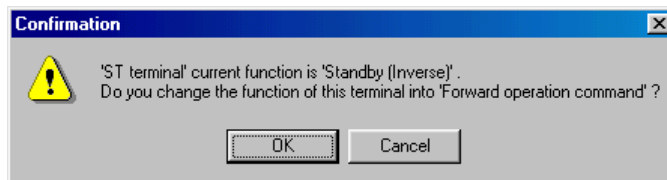


Figure 3-26 Terminal Block Function Changing Message

3.3.4.2. Frequency

Specification of the inverter operation frequency (motor speed) is set here.

For example, if no internal potentiometer is provided for the model selected when PCS001Z is started, this item grays out.

When the “Use terminal for 2 frequency commands” is checked, the following grayed-out items return to normal. Select and set the desired switching method.

Only when “Use contact input of terminal” is selected, these grayed-out items return to normal.

Only when “Set switching frequency” is selected, these grayed-out items return to normal.

When *Individual setting* is selected, these buttons are not displayed.

When *Individual setting* is selected, [Set] instead of [Next] appears.

Figure 3-27 Operation and frequency command setting (Frequency) Screen

3.3.4.3. Analog input

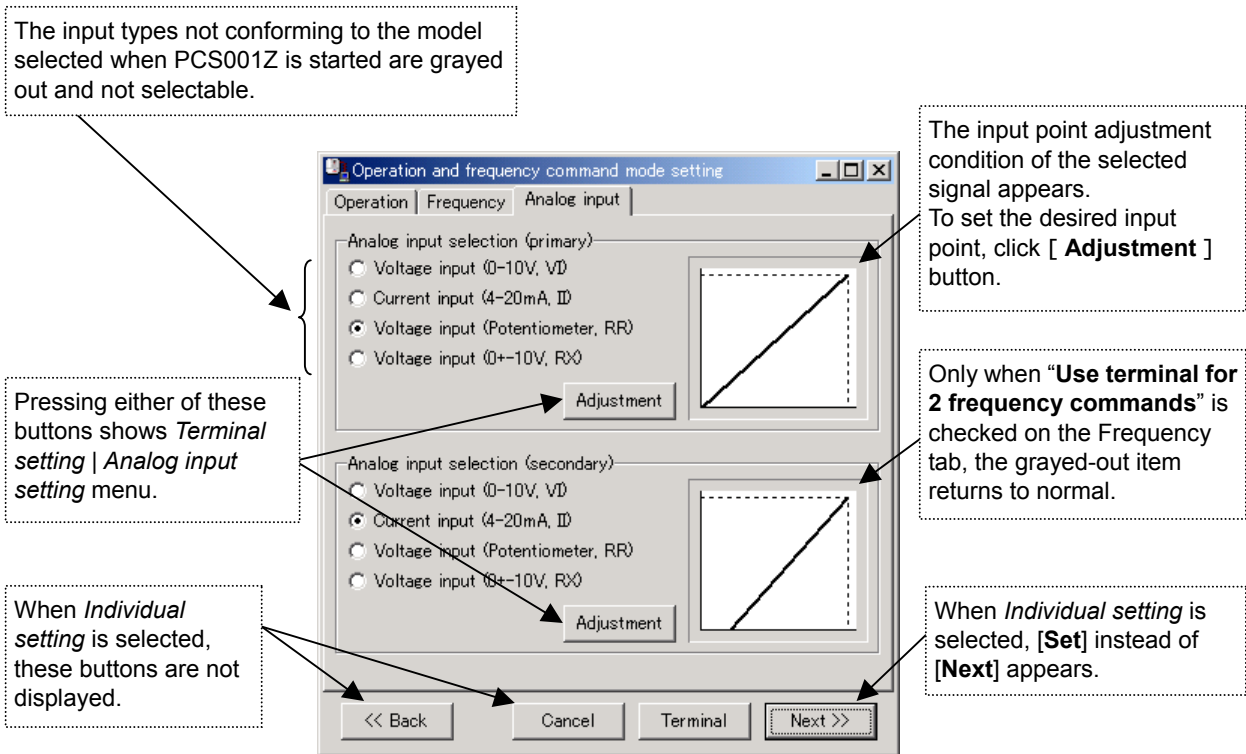


Figure 3-28 Operation and frequency command setting (Analog input) Screen

3.3.4.4. Setting parameter

CNOd, FNOd, Fr, F 105, F200, F207, F208, F311

3.3.5. Acc. / Dec. Time and Run Frequency Setting

The inverter output frequency and acceleration/deceleration time are set here.

When "Frequency command" value is entered, the approximate time for acceleration to complete appears. This value will not be set to the inverter and *Parameter Table*.

When the input field is focused, the corresponding area on the graph is displayed in red and the graph changes in accordance with the input value.

Pressing this button shows *S-pattern setting* (Figure 3-24) screen.

Pressing this button shows *DC breaking setting* screen.

This value will not be set to the inverter and *Parameter Table*.

When *Individual setting* is selected, this button is not displayed.

When *Individual setting* is selected, this button are not displayed.

When *Individual setting* is selected, [Set] instead of [Next] appears.

Figure 3-29 Acc./dec. time and run frequency setting Screen

When the "Set S-pattern adjustment amount" radial button is checked, these grayed-out items return to normal.

Figure 3-30 Acc. / dec. time and run frequency setting (S-pattern setting) Screen

[Setting parameter]

ACC, DEC, FH, UL, LL, F502, F506, F507

For *DC breaking setting*, see Section 3.3.10.

3.3.6. Preset-speed Setting

The preset-speed operation frequency is set here.

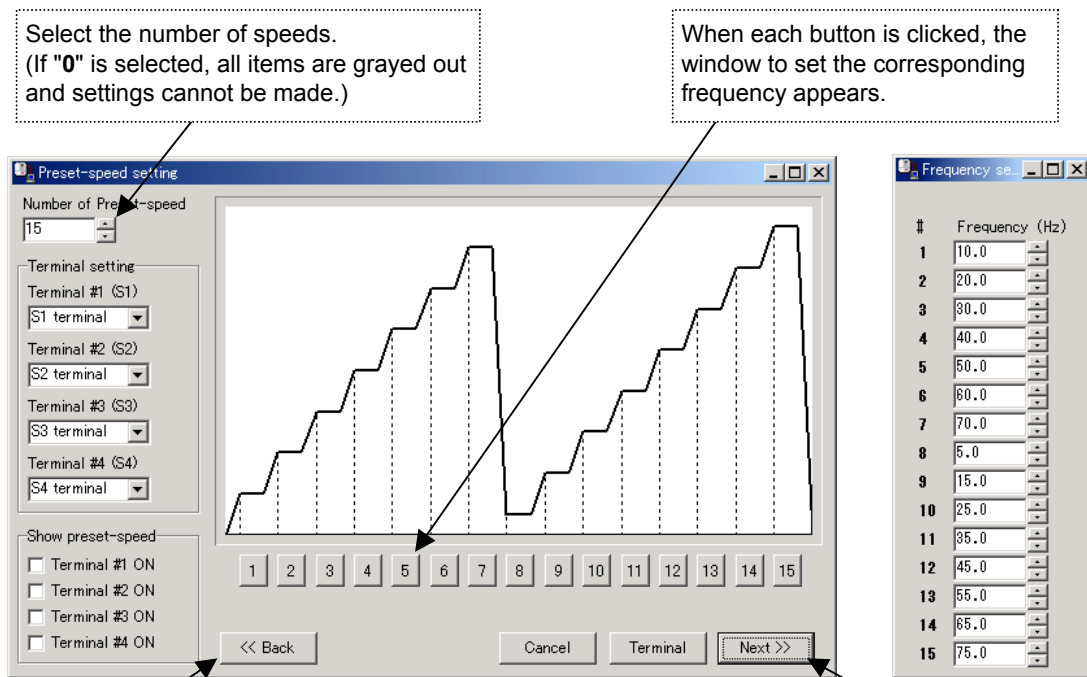


Figure 3-31 Preset-speed setting Screen



Depending on the "Number of Preset-speed," the areas other than the required ones will be grayed out.

If "Show preset-speed" is selected, the frequency to be output on the graph screen when its terminal is turned on and the corresponding button below the graph is displayed in red.

If the operation command selection (CNOd) is not set to "Terminal block" when the [Set] button is clicked, the following message appears.

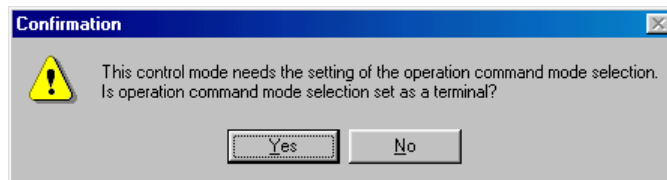


Figure 3-32 Run operation selection function change message Screen

[Setting parameter]

Sr 1~5r 7, F287~F294, CNOd

3.3.7. Status Monitor Setting

Data display of the inverter status monitor is set here.

3.3.7.1. Panel Display Setting

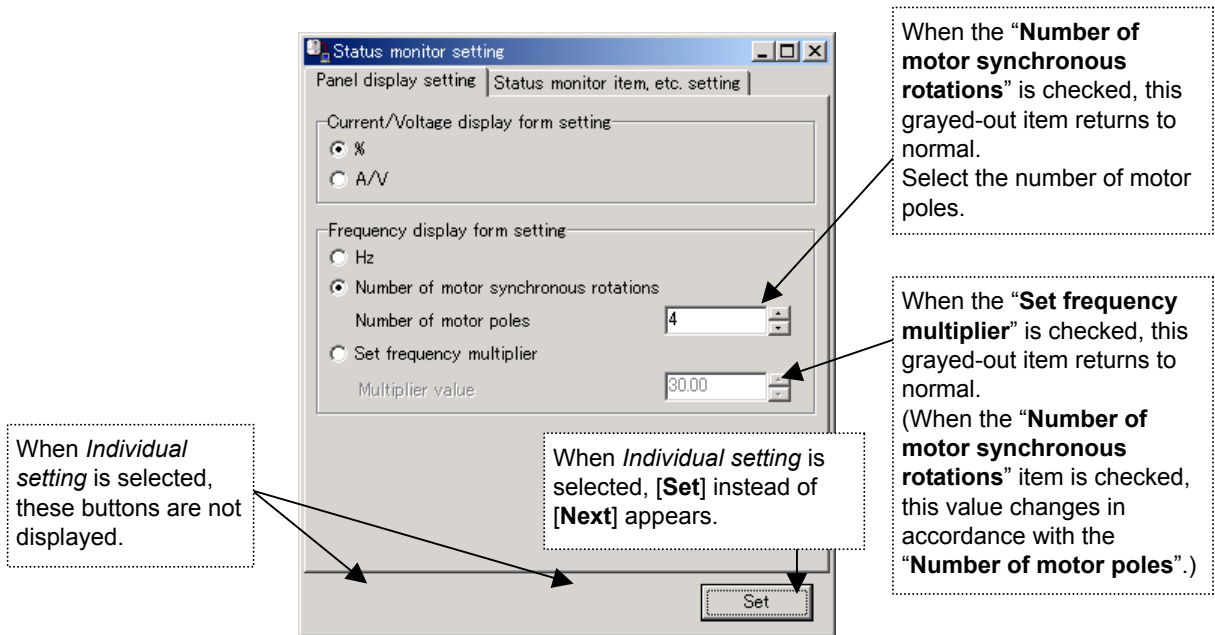


Figure 3-33 Status monitor setting (Panel display setting) Screen

For “**Current / voltage display form setting**”, either % value with the inverter rated value set as 100, or actual **A** (ampere) or **V** (volt) value can be selected.

3.3.7.2. Status Monitor Item, etc. Setting

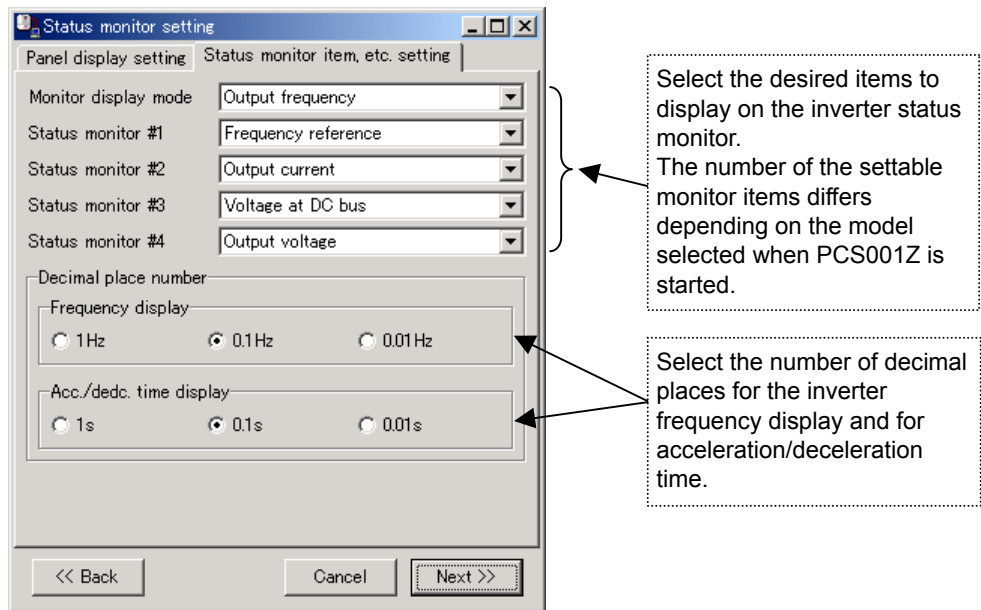


Figure 3-34 Status monitor setting (Status monitor item, etc. setting) Screen

3.3.7.3. Setting Parameter

F 4 1 1, F 7 0 1~F 7 0 4, F 7 1 0~F 7 1 4

3.3.8. Meter Setting

The inverter FM/AM terminal output is adjusted here.

The currently selected signal is read from the inverter for each second (blanked out when communication is disabled).

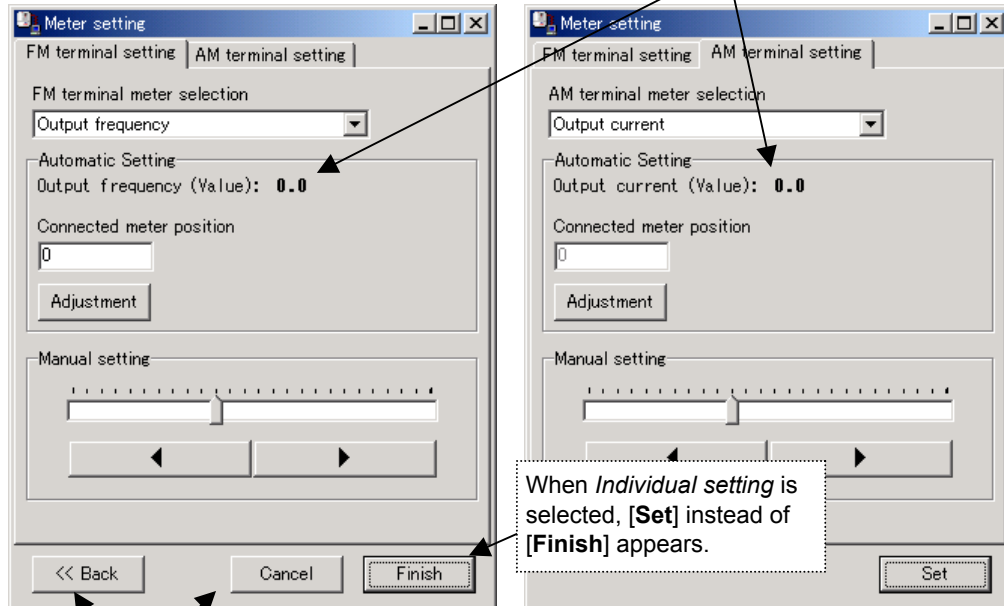


Figure 3-35 Meter setting Screen

When Individual setting is selected, these buttons are not displayed.

About meter adjustment (in the case of FM terminal)

1. Select “**FM terminal meter selection**” from the pull-down list. When communication with PCS001Z is enabled, the current output value at FM terminal appears instead of “**Automatic Setting**” output being blanked out.
2. Enter the value indicated by the meter connected to the FM terminal into the “**Connected meter position**” box and press the [**Adjustment**] button, then the FM terminal output can be roughly adjusted.
3. Fine adjustment can be made using the “**Manual setting**”. When the “**Manual setting**” track bar is dragged, the FM terminal output changes accordingly. Thus adjust the bar while observing the meter.
[◀] and [▶] buttons are used to finely adjust the value.

3.3.8.1. Setting Parameter

F65L, F67, F670, F671

3.3.9. Panel Operation Setting

The panel key operation of the inverter main unit is set here.

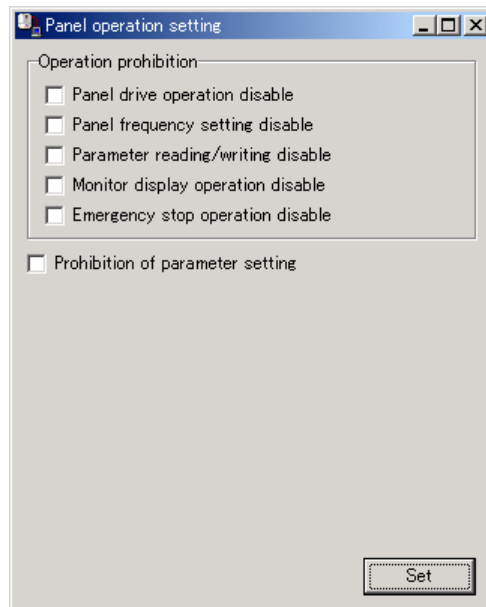


Figure 3-36 Panel Operation Setting Screen

Select the restricted items of the inverter key operation. Check the check boxes of the required items.

[Setting parameter]

F 700, F 730

3.3.10. DC Injection Braking Setting

When this item is checked, the following grayed-out items return to normal and the settings regarding the DC injection braking are enabled.

When the input field is focused, the corresponding area on the graph is displayed in red and the graph changes in accordance with the input value.

DC injection braking setting

Use DC injection braking

DC injection braking start frequency (Hz)

DC injection braking current (%)

DC injection braking time (s)

Operation command during DC braking

DC braking is discontinued to restart the operation

Priority is given to DC braking

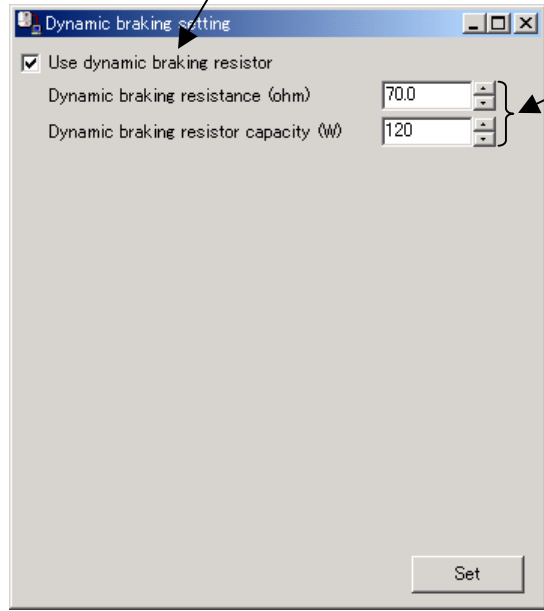
Figure 3-37 DC injection braking setting Screen

[Setting parameter]

F250~F253

3.3.11. Dynamic Braking Setting

When this item is checked, the following grayed-out items return to normal. Set the desired values in accordance with the braking resistor you use.



In the case of VFS7/S9, "Unselected" appears when this menu is started.
* Even in this case, you can set this item by entering the desired resistance value and the resistor capacitor.

Figure 3-38 Dynamic braking setting Screen

[Setting parameter]

F 304, F 308, F 309

3.3.12. Tripless Setting (Avoiding Trip)

The effective settings are set here against general trips (protection) that occur while the inverter is used.

3.3.12.1. Voltage

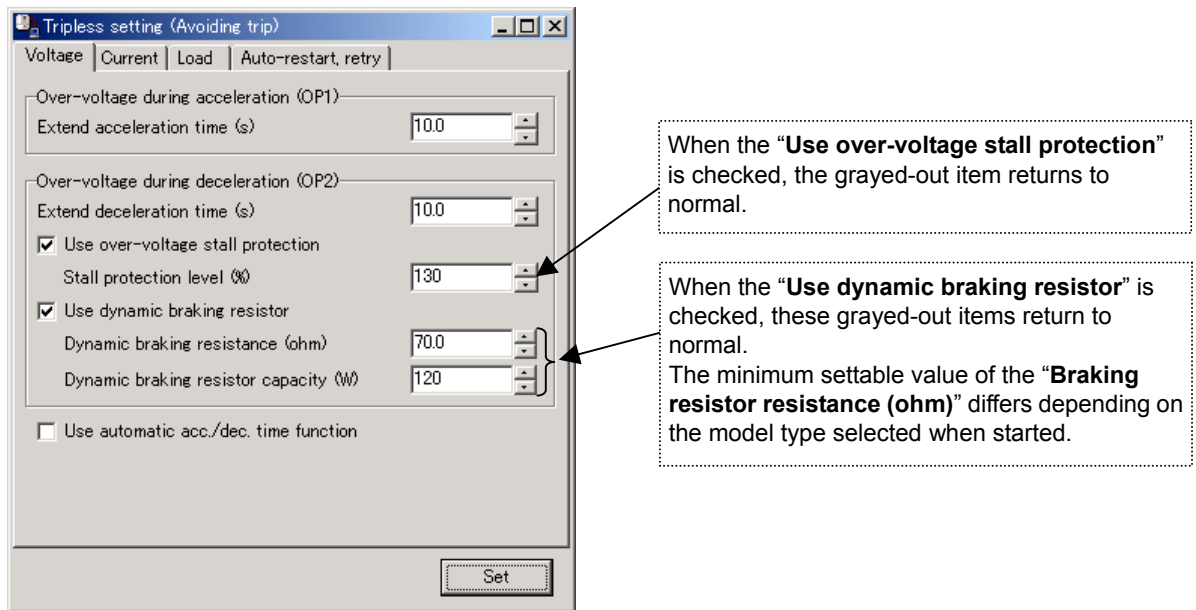


Figure 3-39 Tripless Setting (Voltage) Screen

3.3.12.2. Current

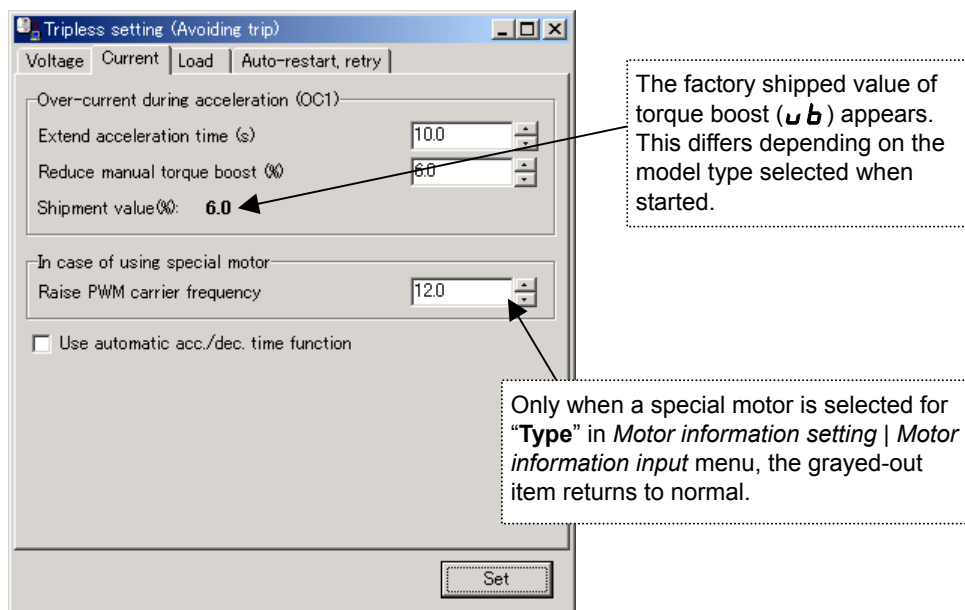


Figure 3-40 Tripless Setting (Current) Screen

3.3.12.3. Load

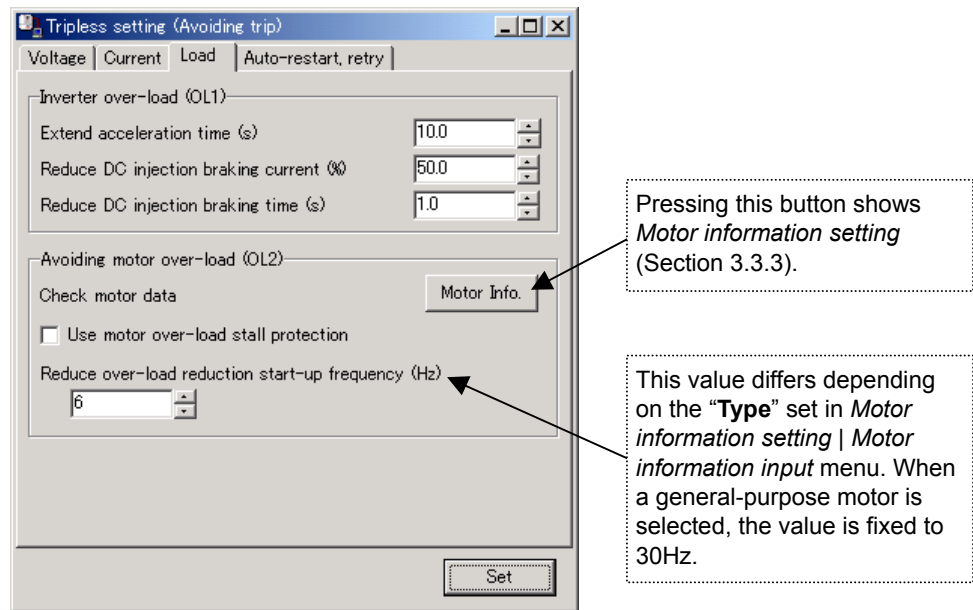


Figure 3-41 Tripless Setting (Load) Screen

To detect the motor over-load, it is necessary to enter the capacity and the type of the motor to the inverter. Press the [Motor Info.] button to check the motor information and set the motor rating and other items.

3.3.12.4. Auto-restart, Retry

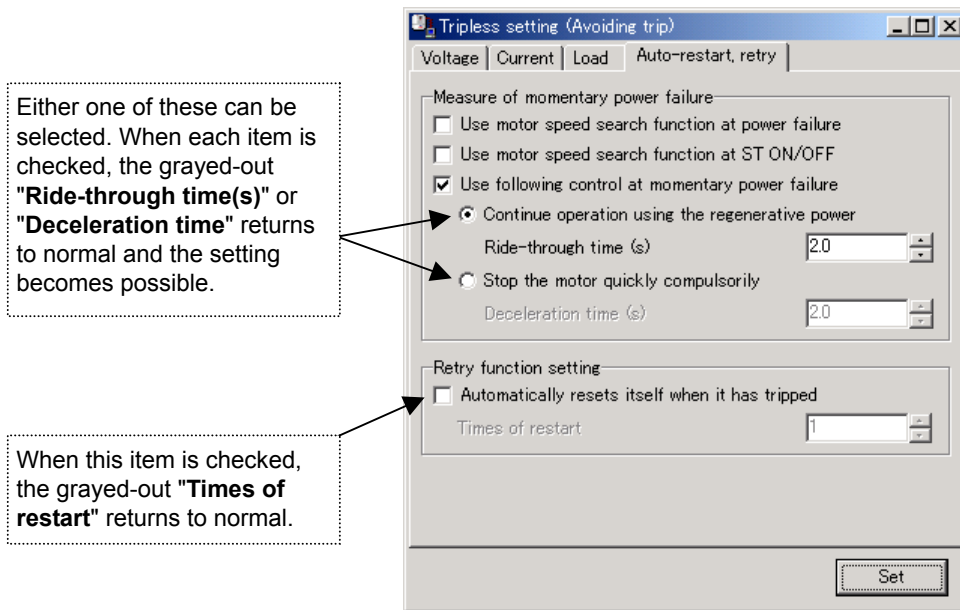


Figure 3-42 Tripless Setting (Auto-restart, retry) Screen

3.3.12.5. Setting Parameter

AU 1, ACC, DEC, wb, OLN, F251, F252, F300~F305, F308~F310, F606, F626

3.4. Advanced Setting

More detailed parameter settings can be made.

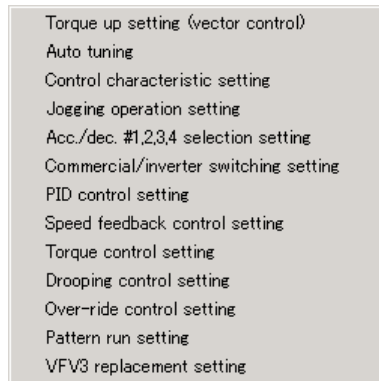


Figure 3-43 *Advanced Setting Menu Screen*

3.4.1. Torque up Setting (vector control)

When the "Use vector control" is checked, the following grayed-out items return to normal.

When the "Change "Motor constant setting"" is checked, these grayed-out "Motor constant parameter setting" items return to normal and the settings can be made.

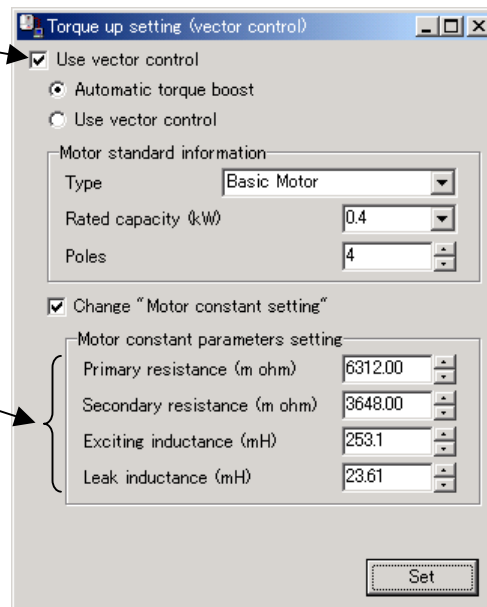


Figure 3-44 Torque-up setting (vector control) Screen

[Setting parameter]

Pt, F402~F404, F410~F413

3.4.2. Auto Tuning

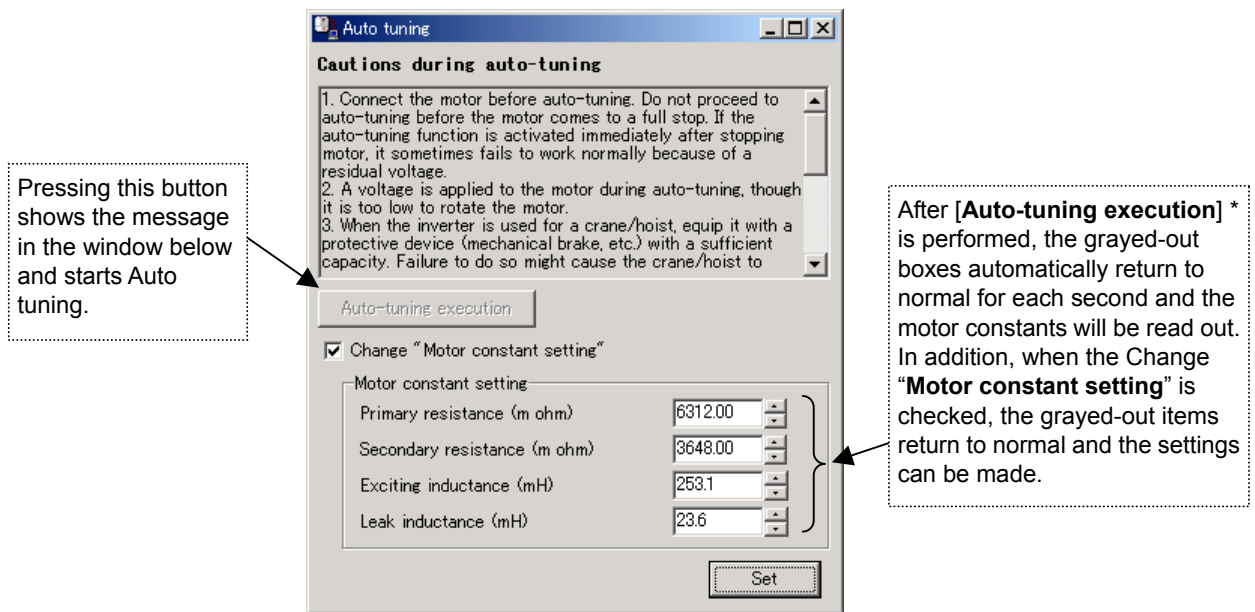


Figure 3-45 Auto tuning Screen

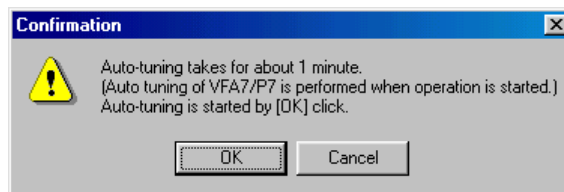


Figure 3-46 [Auto-tuning execution] Message

* Even if an auto tuning error occurs, no special indication is provided. In case each value of "Motor constant setting" items is not changed after [Auto tuning execution] is performed, check whether an auto tuning error (E t n) is generated or not on the inverter side.

[Setting parameter]

F 4 0 2 ~ F 4 0 4 , F 4 1 0

3.4.3. Control Characteristic Setting

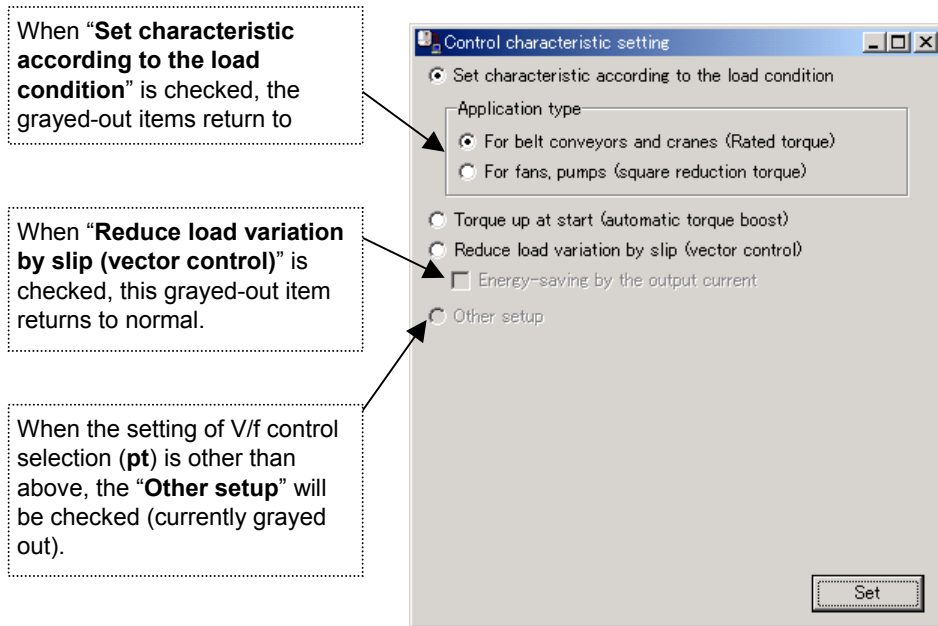


Figure 3-47 Control characteristic setting Screen

[Setting parameter]

Pt

3.4.4. Jogging Operation Setting

If this item is not checked, the following items are grayed out and the setting cannot be made.

The terminal name set with "Jogging function terminal" appears.

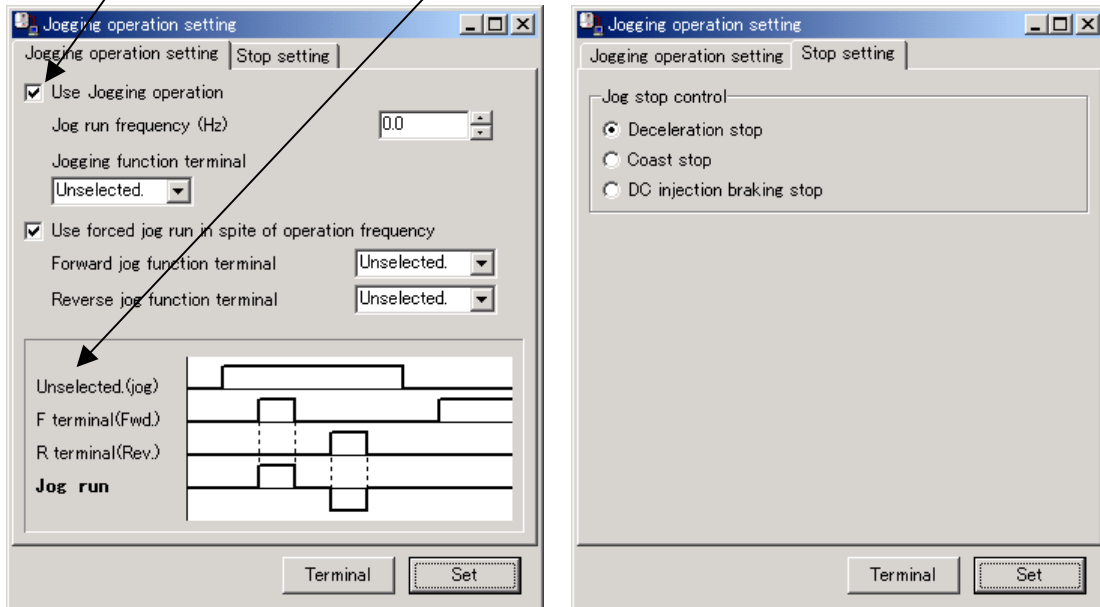


Figure 3-48 Jogging operation setting, Stop setting Screen

3.4.4.1. Setting Parameter

F260, F261

3.4.5. Acc. / Dec. # 1 to 4 Selection Setting

When the "Acc. / dec. time selection" is checked, this item becomes selectable.

When the "Set switching frequency" is checked, these items become selectable.

When the "Use contact input of terminal" is checked, these items become selectable.

When the input field is focused, the corresponding area on the graph is displayed in red and the graph changes in accordance with the input value.

Pressing this button shows the *Terminal setting* (Setting 3.5).

When the check box of each item is checked, the corresponding area on the graph is displayed in red.

The screenshot shows a window titled "Acc./dec. #1,2,3,4 selection setting" with a graph and several control panels. The graph displays a trapezoidal acceleration/deceleration profile. The control panels include:

- Acc./dec. time selection:** Radio button selected, dropdown menu set to "Acc./dec. #1".
- Set switching frequency:** Radio button selected, three frequency input fields (20.0, 40.0, 60.0).
- Use contact input:** Radio button unselected, two terminal dropdown menus (Terminal #1, Terminal #2) both set to "Unselected".
- Show Acc./dec. time:** Two checkboxes for "Terminal #1 ON" and "Terminal #2 ON", both unchecked.
- Terminal:** A button at the bottom left.
- Time and Pattern settings:** A grid of input fields for Acc. time #1-4 (5.0, 10.0, 15.0, 20.0), Dec. time #1-4 (10.0, 10.0, 10.0, 10.0), and Pattern #1-4 (all set to "Linear").
- Set:** A button at the bottom right.

Figure 3-49 Acc. / dec. #1 to 4 selection setting Screen

[Setting parameter]

ACC, DEC, F500~F505, F5 10~F5 13, F5 14~F5 17

3.4.6. Commercial / Inverter Switching Setting

3.4.6.1. Switching setting

When the "Use contact input of terminal" is checked, the grayed-out item returns to normal.

When the "Set switching frequency" is checked, the grayed-out item returns to normal.

If the check box of this item is not checked, the following items are grayed out and the settings cannot be made.

When the input field is focused, the corresponding area on the graph is displayed in red.

Pressing this button shows the Terminal setting (Section 3.5).

Figure 3-50 Commercial / inverter (switching setting) Screen

3.4.6.2. Commercial /Inverter Switching Timing Setting

If the check box of this item is not checked, the following items is grayed out and the settings cannot be made.

The terminal names selected in “Output terminal setting for switching” on the previous page appears.

When the input field is focused, the corresponding area on the graph is displayed in red.

Figure 3-51 Commercial / inverter (switching timing setting) Screen

3.4.6.3. Setting Parameter

F354~F357

3.4.7. PID Control Setting

3.4.7.1. System Setting

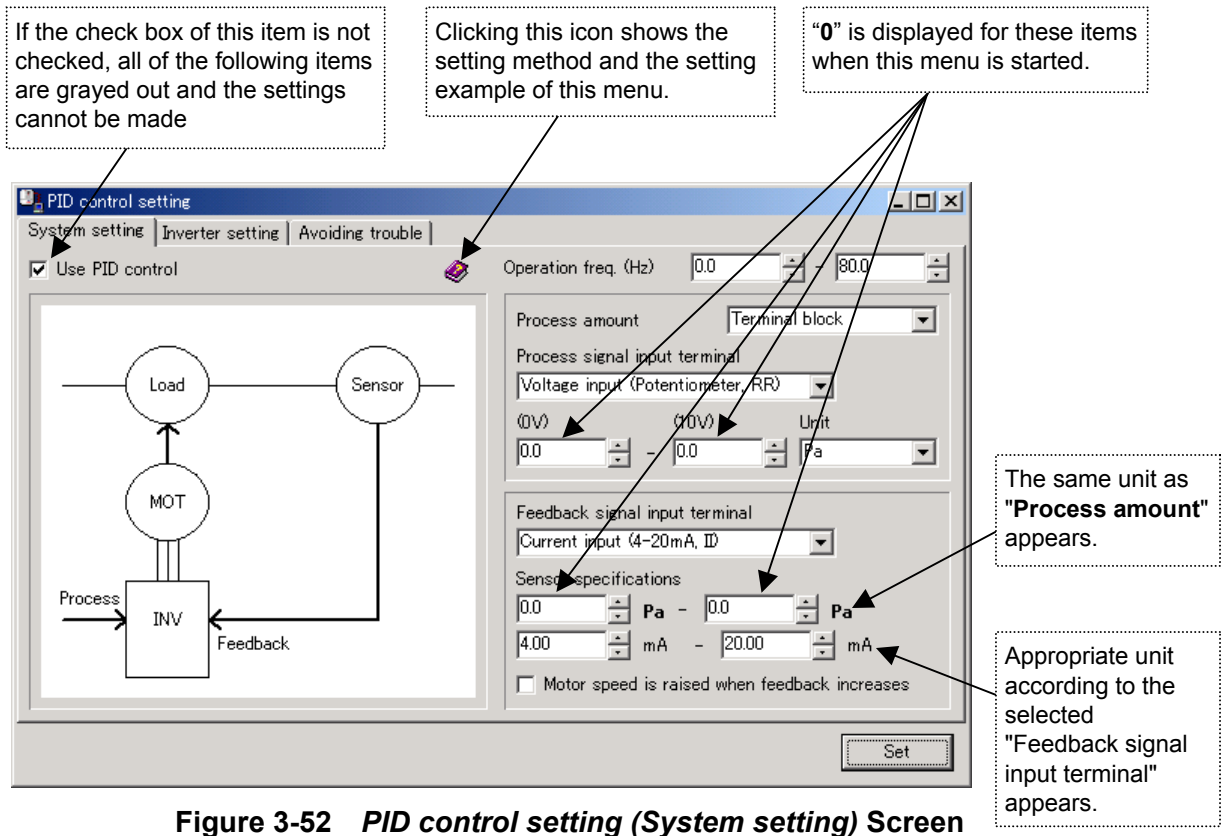


Figure 3-52 PID control setting (System setting) Screen

Enter the system equipment information here.

For example,

- **Pressure setting:** The pressure is set within the range of 1 to 5 atmospheres (signal is 0 – 10V).
- **Mechanical specification:** The equipment operates in 30 to 70Hz.
- **Sensor:** 4 - 20mA corresponds to 1 to 6 atmospheres.

In the case of the above compressor,

1. Set the "Operation freq." to **30-70**Hz.
2. Select "**Terminal block**" for "Process amount" and "**Voltage input**" for "Process signal input terminal".
3. Select "**1**" for (0V), "**5**" for (10V) as "Process amount" and "**Pa (Atmosphere)**" for unit.
4. Select "**Current input**" for "Feedback signal input terminal".
5. Set **4 - 20 (mA)** for **1-6 (Pa)** as "Sensor specifications."

3.4.7.2. Inverter Setting

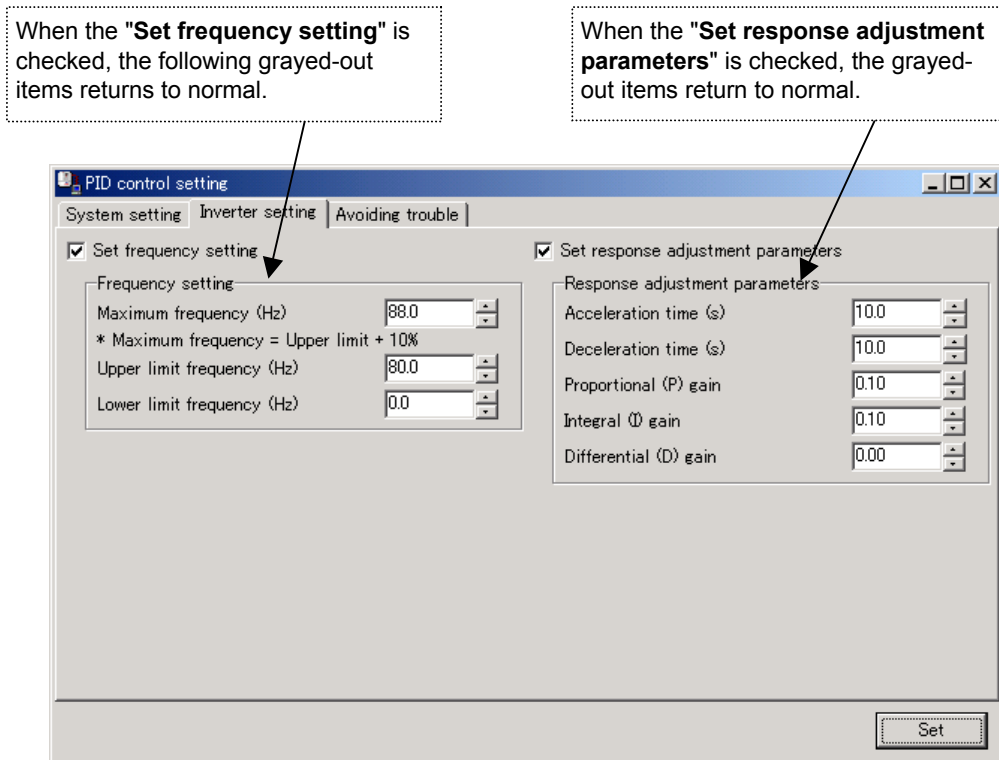


Figure 3-53 PID control setting (Inverter setting) Screen

In the "Frequency setting" area, the settings made on the inverter side by "System setting" – "Operation freq." appears. Change the settings if necessary.

3.4.7.3. Avoiding Trouble

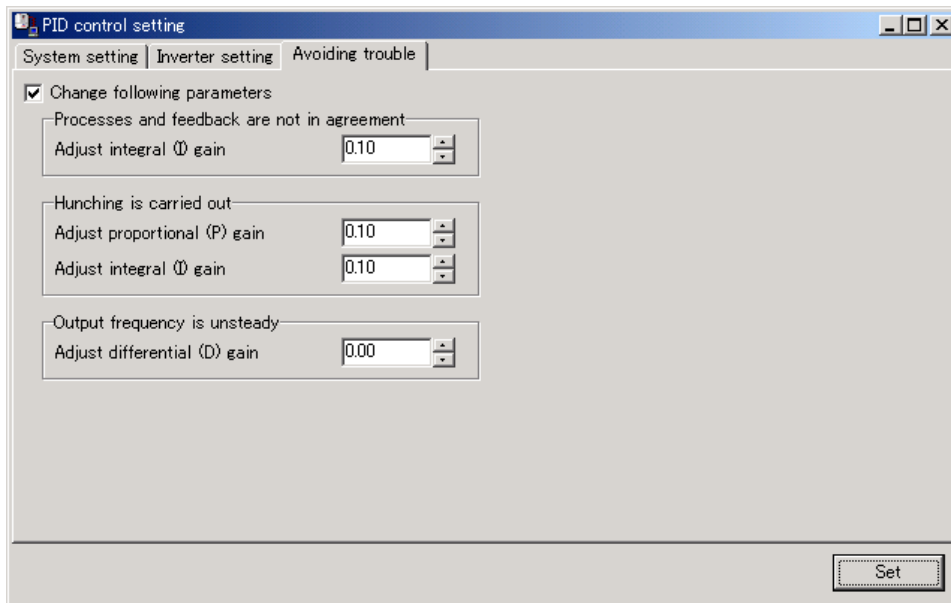


Figure 3-54 PID control setting (Avoiding trouble) Screen

3.4.7.4. Setting Parameter

*F00d, ACC, dEC, FH, UL, LL, F 109, F 360, F 362, F 363, F 366,
F 20 1~F 204, F 2 10~F 2 13, F 2 16~F 2 19*

3.4.8. Speed Feedback Control Setting

3.4.8.1. Speed Feedback Control Setting

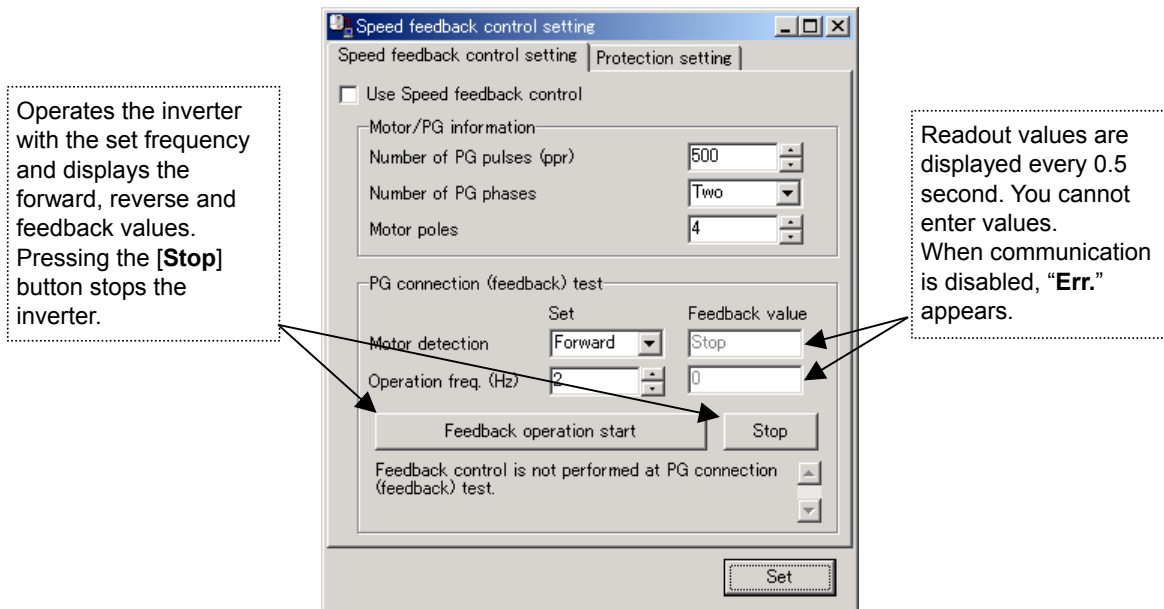


Figure 3-55 Speed feedback control setting Screen

Set the values appropriate for the motor and PG used into the “**Motor / PG information**” boxes.

To check whether the PG feedback can be performed correctly with these settings, “**PG connection (feedback) test**” should be performed. The procedure is as follows:

1. Set the “**Motor direction**” and the “**Operation freq.**”.
2. Press the [**Feedback operation start**] button to send an operation command to the inverter and to read and display the feedback signal from the PG.

If the “**Motor direction**” and “**Operation freq.**” match the ones set in 1., connection and setting have been made correctly.

3.4.8.2. Protection Setting

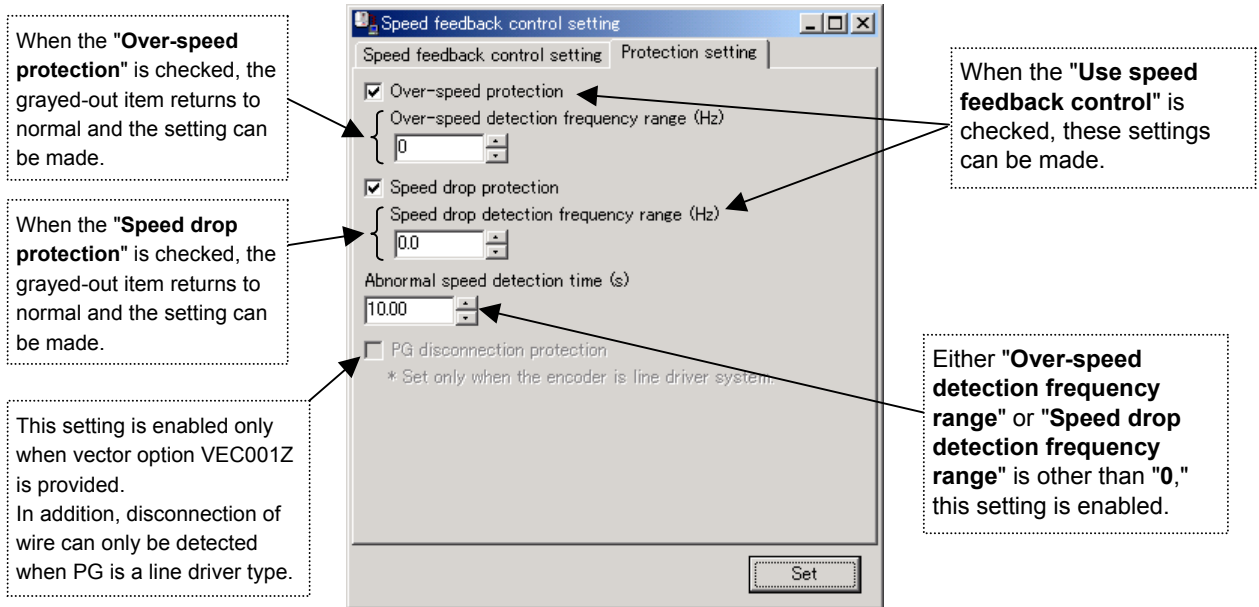


Figure 3-56 Speed feedback control setting (Protection setting) Screen

3.4.8.3. Setting parameter

Pt, F367~F369, F411, F622~F624

3.4.9. Torque Control Setting

3.4.9.1. Control Mode

If the "Use torque control" is not checked, this menu grays out and the settings cannot be made.

If the "Panel reference" is not checked, this box grays out and the setting cannot be made.

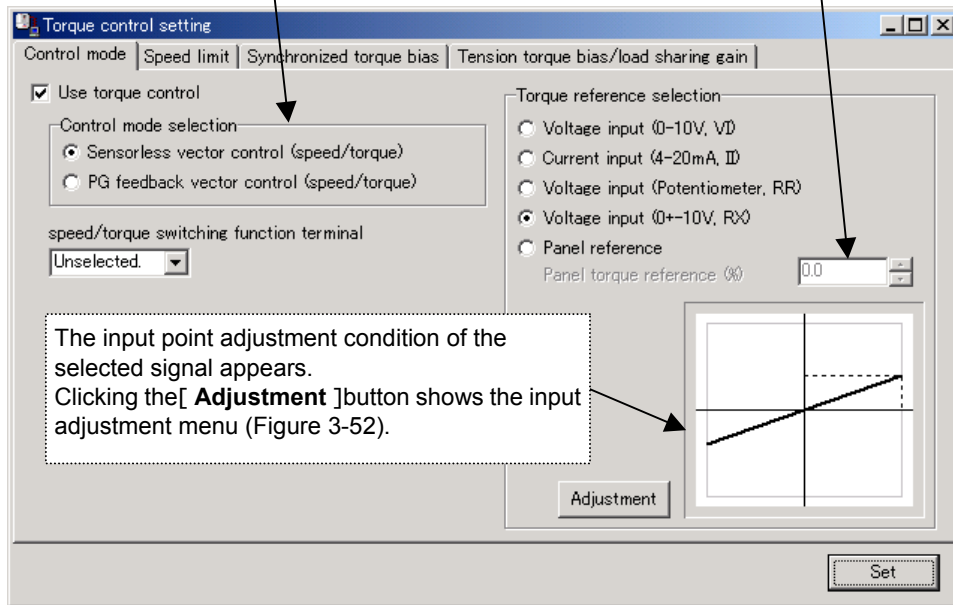


Figure 3-57 Torque control setting (Control mode) Screen

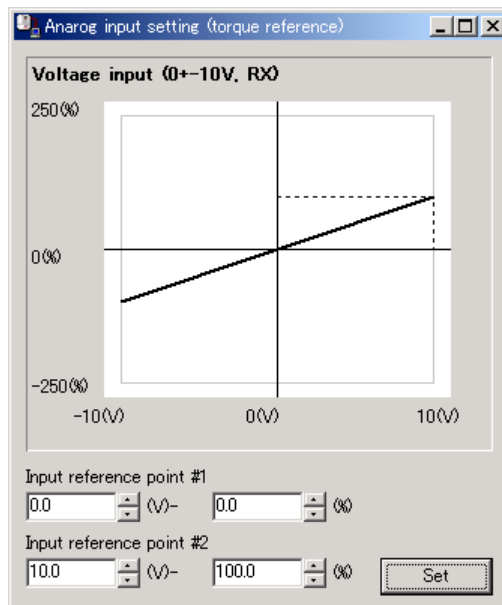


Figure 3-58 Analog input setting (torque reference) Screen

3.4.9.2. Speed Limit when Torque is Controlled

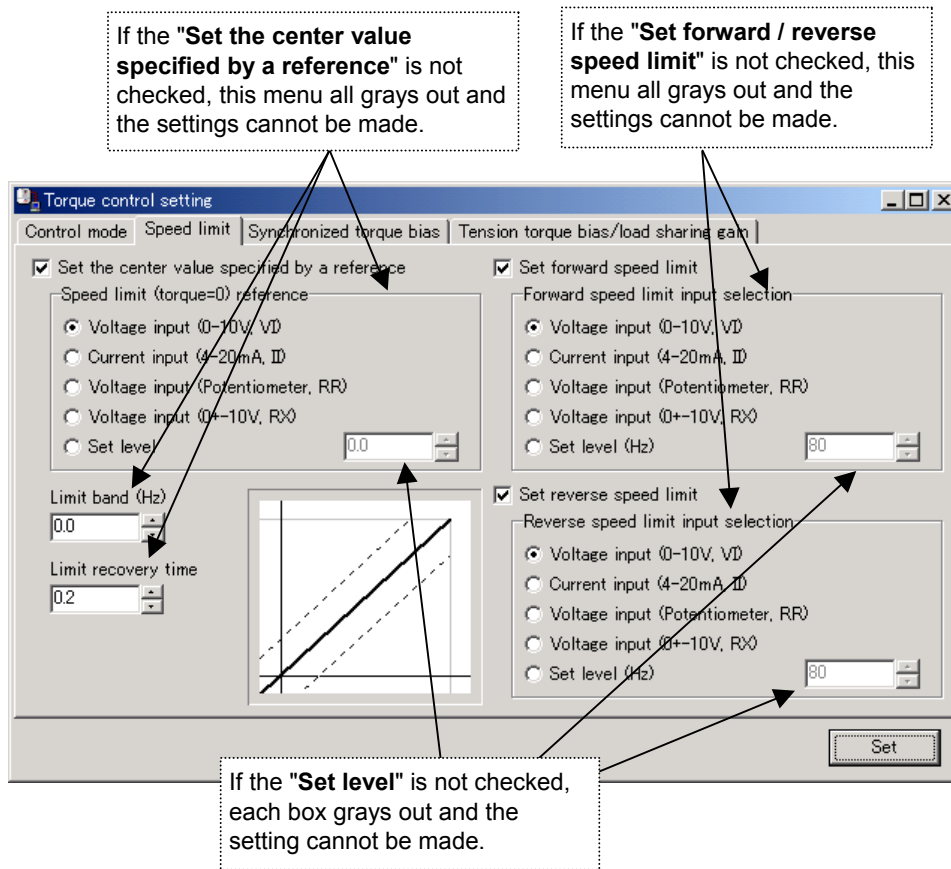


Figure 3-59 Torque control setting (Speed limit) Screen

3.4.9.3. Synchronized Torque Bias

If the "Set synchronized torque parameters" is not checked, this menu all grays out and the settings cannot be made.

If the "Panel reference (%)" is not checked, this box grays out and the setting cannot be made.

Figure 3-60 Torque control setting (Synchronized torque bias) Screen

3.4.9.4. Tension torque Bias /Load Sharing Gain

If the "Set tension torque bias parameters" is not checked, this menu all grays out and the settings cannot be made.

If the "Panel reference (%)" is not checked, the corresponding box grays out and the setting cannot be made.

If the "Set load sharing gain parameters" is not checked, this menu all grays out and the settings cannot be made.

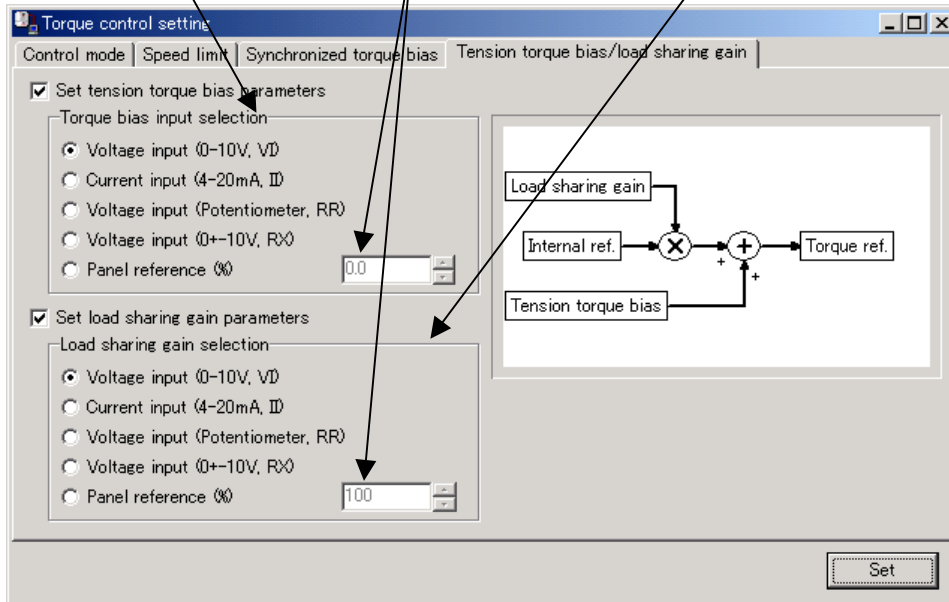


Figure 3-61 Torque control setting (Tension torque bias / load sharing gain) Screen

3.4.9.5. Setting Parameter

Pt, F420, F422~F428, F430~F433, F725~F728

3.4.10. Drooping Control Setting

When the check box of this item is checked, the following grayed-out items return to normal and the drooping control setting can be made.

When the input field is focused, the corresponding area on the graph are displayed in red and the graph changes in accordance with the input value.

The value set to the "Max. drooping gain to internal torque reference" appears.

Drooping control setting

Use Drooping control

Max. drooping gain to internal torque reference (%)
60.0

Drooping insensitive torque band
10.0 (% to reted torque)

Drooping amount adjustment

0	N·m -	60.00	Hz
0.21	N·m -	120.00	Hz

Set

Figure 3-62 Drooping control setting Screen

[Setting parameter]

Pt, F320~F323

3.4.11. Over-ride Control Setting

The screenshot shows a dialog box titled "Over-ride control setting" with the following elements:

- Over-ride frequency is added to reference frequency
- Dropdown menu: Addition input selection (Panel (Up/Down key))
- Dropdown menu: Addition signal input terminal (Unselected) with an "Adjustment" button.
- Output frequency is multiplied by over-ride frequency
- Radio button selection:
 - Multiplication signal is input from terminal
 - Dropdown menu: Multiplication signal input terminal (Unselected) with an "Adjustment" button.
 - Multiplication signal is fixed value
 - Input field: Multiplication value (%) (0)
- Graph: A graph showing a solid line above a dashed line, with a red-shaded area under the solid line.
- Button: Set

Callout boxes provide additional context:

- When the "Over-ride frequency is added to reference frequency" is checked, the grayed-out items return to normal and the settings can be made.
- When the "Output frequency is multiplied by over-ride frequency" is checked, the grayed-out items return to normal and the settings can be made.
- When the input field is focused, the corresponding area on the graph is displayed in red and the graph changes in accordance with the input value.
- To check and set the input point, press each of these buttons to show the Terminal setting (Section 3.5.4).
- When the radial button "Multiplication signal is fixed value" is checked, this item can be set.

Figure 3-63 Over-ride setting Screen

[Setting parameter]

F660, F661, F729

3.4.12. Pattern Run Setting

3.4.12.1. Comprehensive Setting

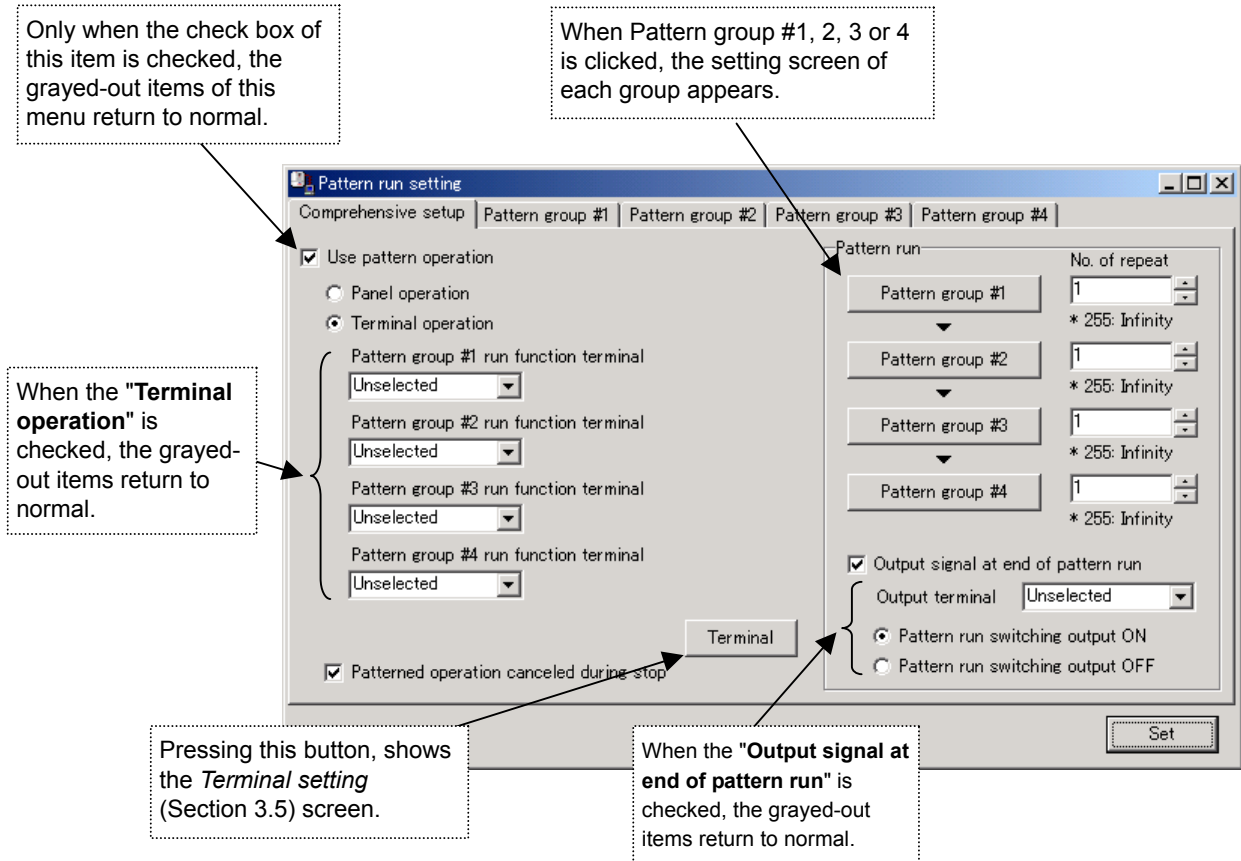


Figure 3-64 Pattern run setting (Comprehensive setup) Screen

3.4.12.2. Pattern Group #1 to 4

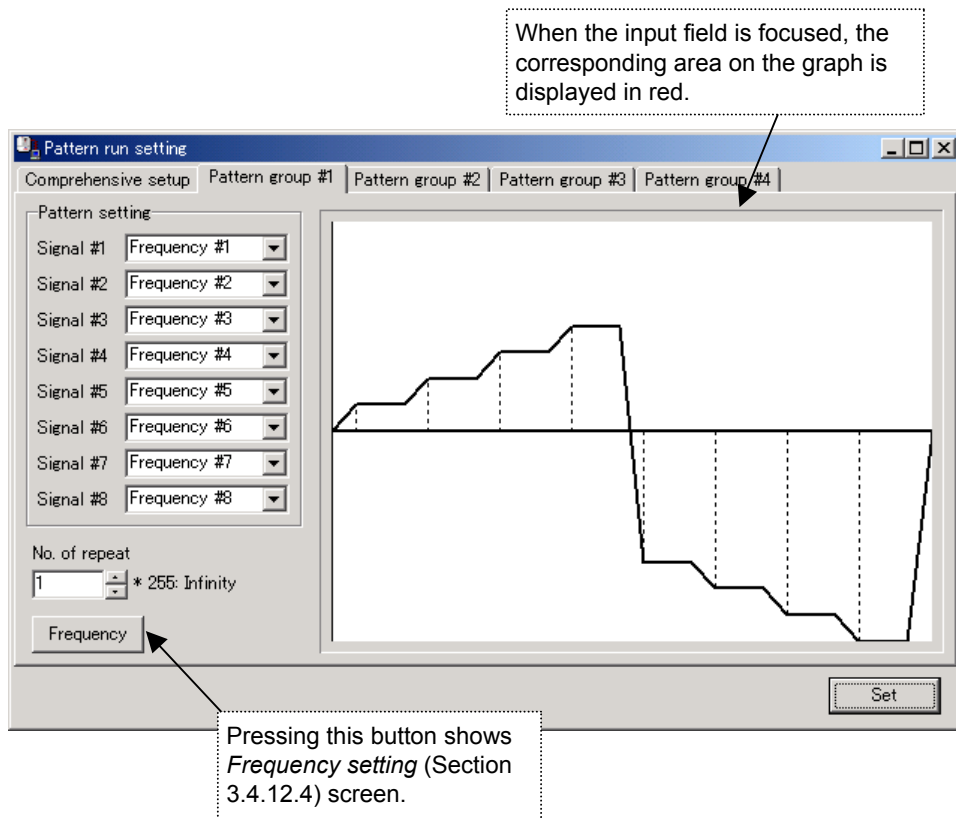
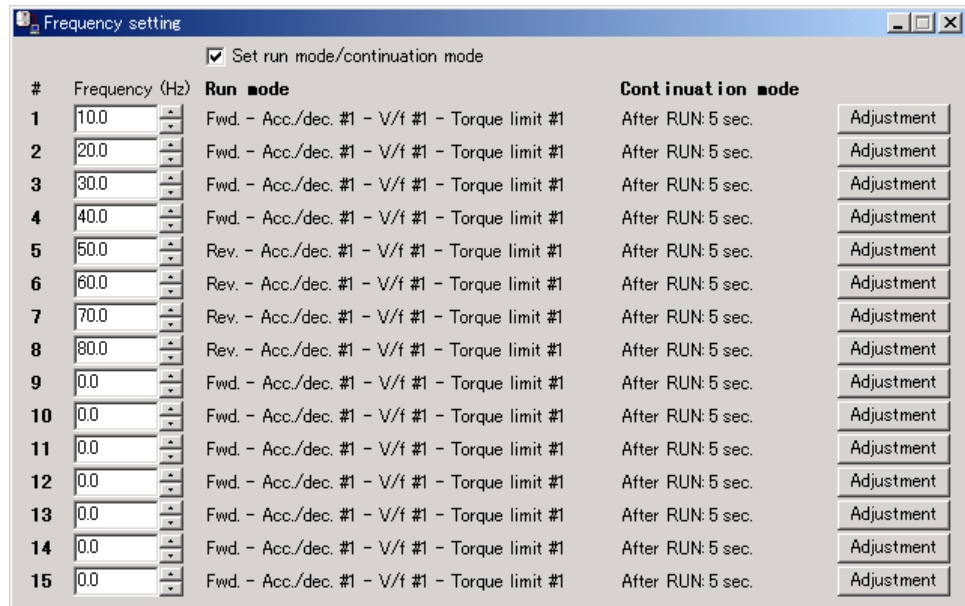


Figure 3-65 Pattern run setting (Pattern group #1 to 4) Screen

3.4.12.3. Setting Parameter

- C00d, F520, F521*
- F530~F538* (Pattern group 1)
- F540~F548* (Pattern group 2)
- F550~F558* (Pattern group 3)
- F560~F568* (Pattern group 4)

3.4.12.4. Frequency Setting



These items can be set when the "Set run mode / continuation mode" is checked. If the [Adjustment] button is pressed, the menu to change the "Run mode" and "Continuation mode" settings appears (Figure 3-61).

Figure 3-66 Frequency setting Screen

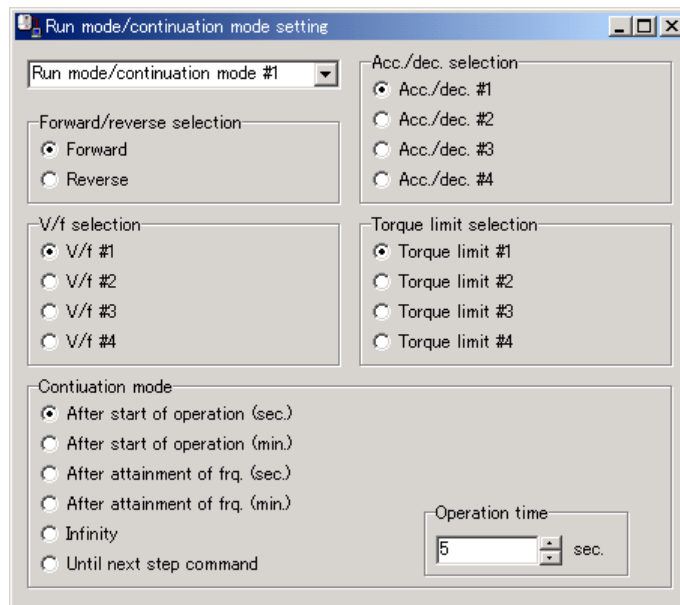


Figure 3-67 Run mode / continuation mode setting Screen

[Setting parameter]

F_r 1~5 r 7, F287~F294

F38 1~F395, F540~F584, F585~F599

3.4.13. VFV3 Replacement Setting

3.4.13.1. Motor Info./Speed Feedback Setting

When the "Change "Motor information"" is checked, the grayed-out "Motor information" items return to normal and the settings can be made.
* "Type" is fixed to V3 Motor.

The motor capacity of the 2-frame smaller than the model type set when PCS001Z is displayed as default. Select the capacity of the motor you use.

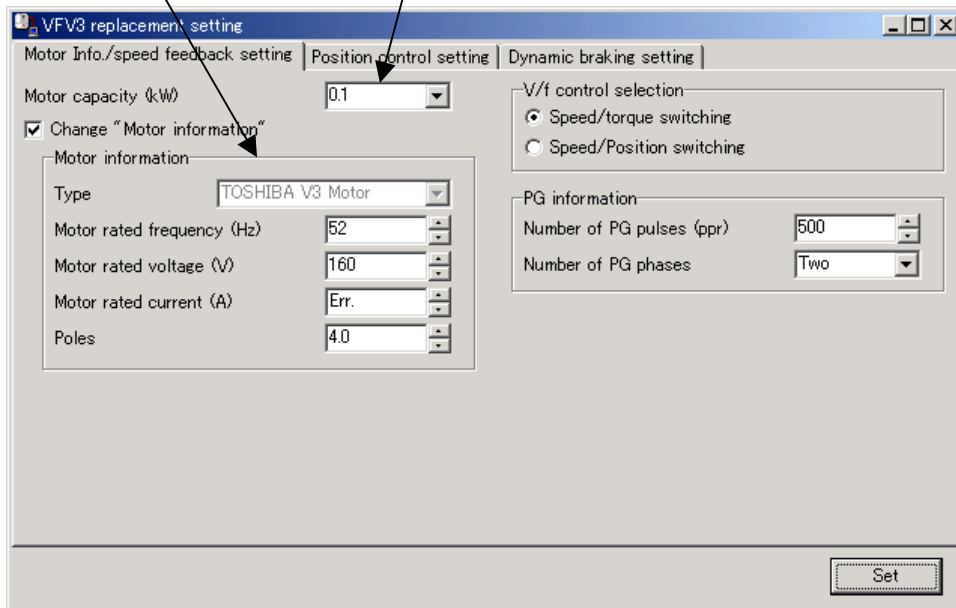


Figure 3-68 VFV3 replacement setting (Motor info. / speed feedback setting) Screen

3.4.13.2. Position Control Setting

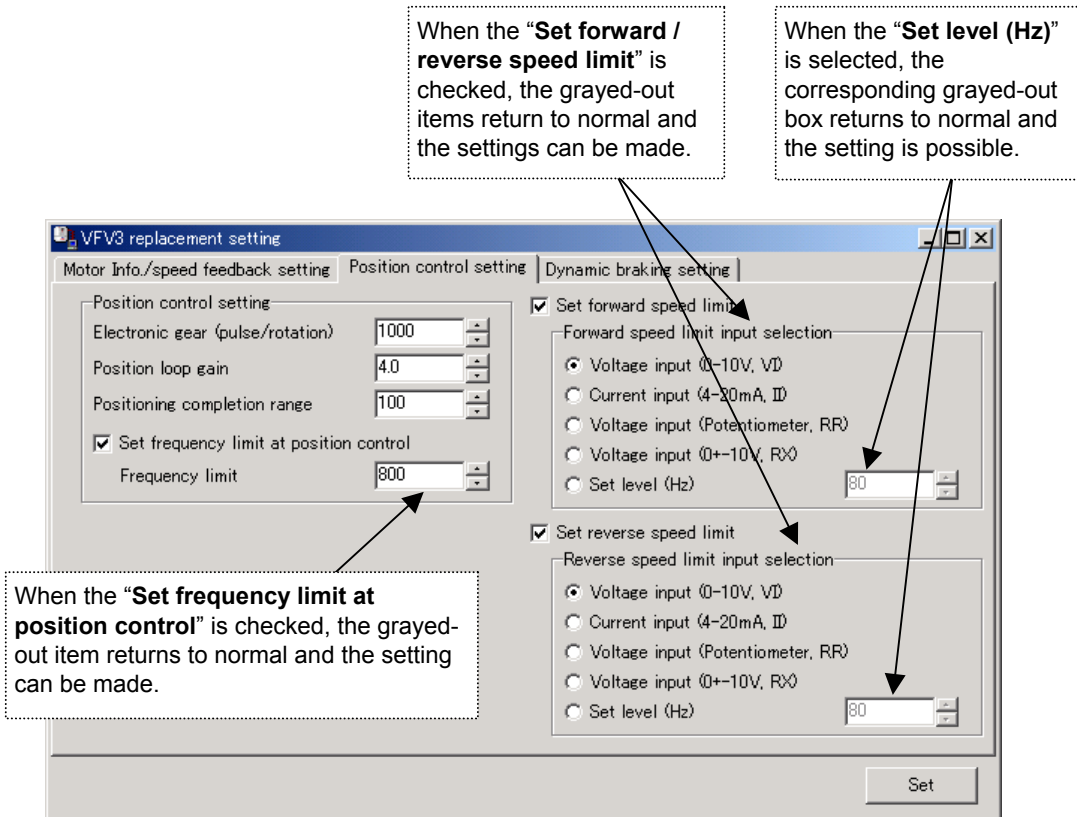


Figure 3-69 VFV3 replacement setting (Position control setting) Screen

3.4.13.3. Dynamic Braking Setting

When the “**Use dynamic braking resistor**” is checked, the grayed-out items return to normal and the settings can be made.

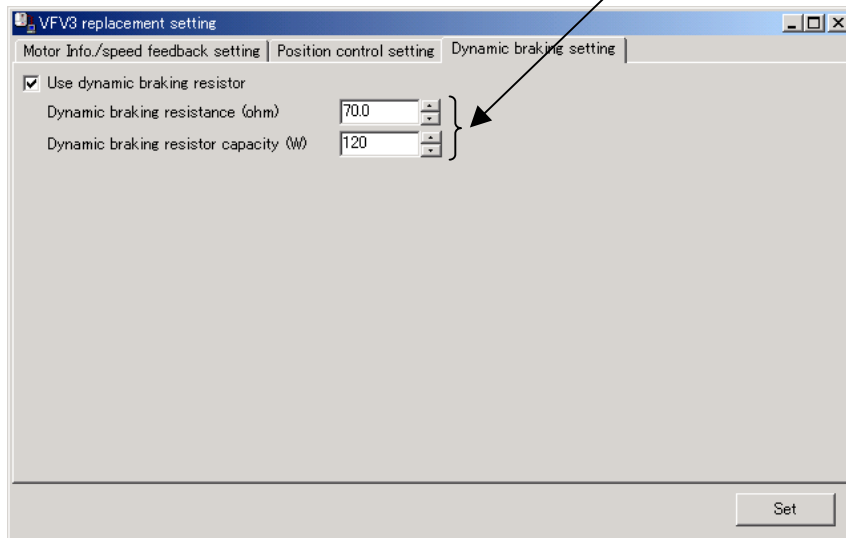


Figure 3-70 VFV3 replacement setting (Dynamic braking setting) Screen

3.4.13.4. Setting Parameter

uL, OLN, F306, F411~F413, F600

(* The above parameters are written when [Set] is made even if they are displayed grayed out.)

Pt, F304, F308, F309, F367, F368, F370~F373, F400, F425~F428

3.5. Terminal Setting

The functions made using the terminal block can be set.

3.5.1. Input Terminal Function Setting

The number of input terminals, output terminals and terminal names differ depending on the selected model.

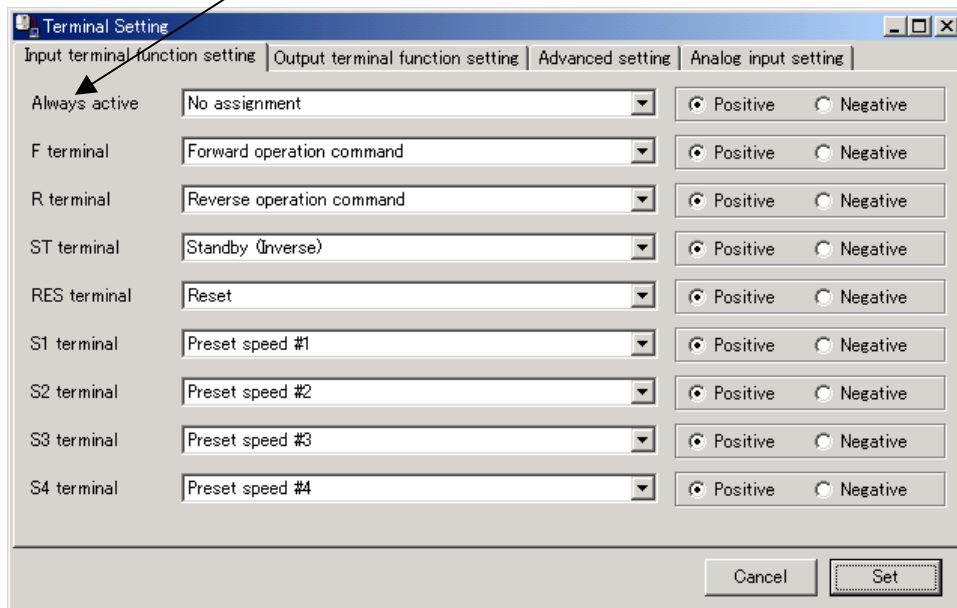


Figure 3-71 Terminal Setting (Input terminal function setting) Screen

* When “VFS11” is chosen, “Sink/ Source” are displayed on the portion of the logic instead of “Positive/Negative”.

3.5.2. Output Terminal Function Setting

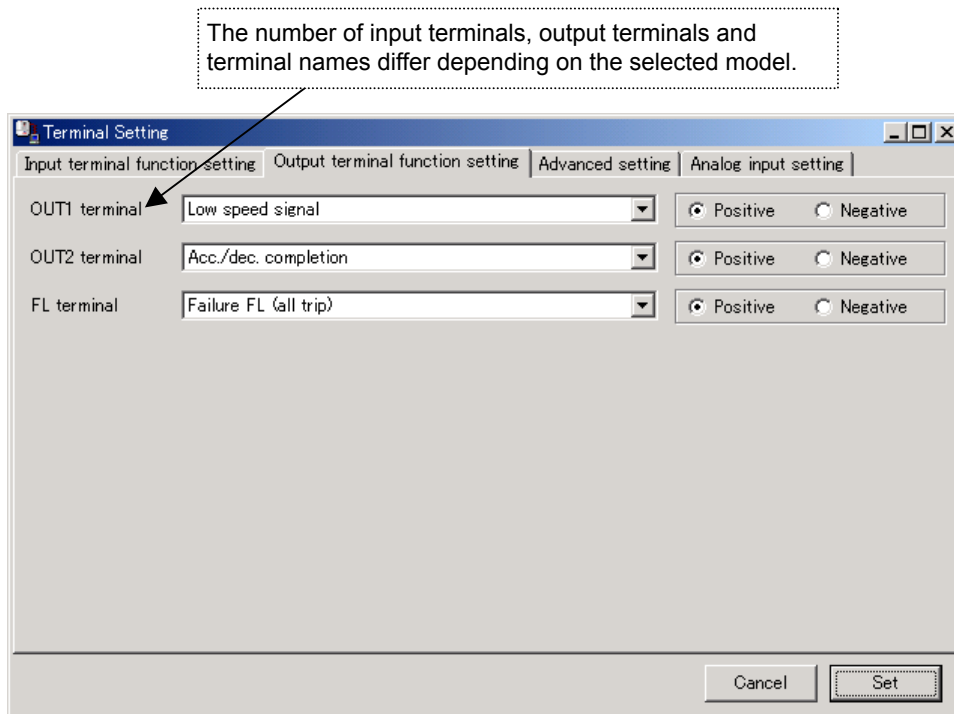


Figure 3-72 Terminal Setting (Output terminal function setting) Screen

* When "VFS11" is chosen, "Sink/ Source" are displayed on the portion of the logic instead of "Positive/Negative".

3.5.3. Advanced Setting

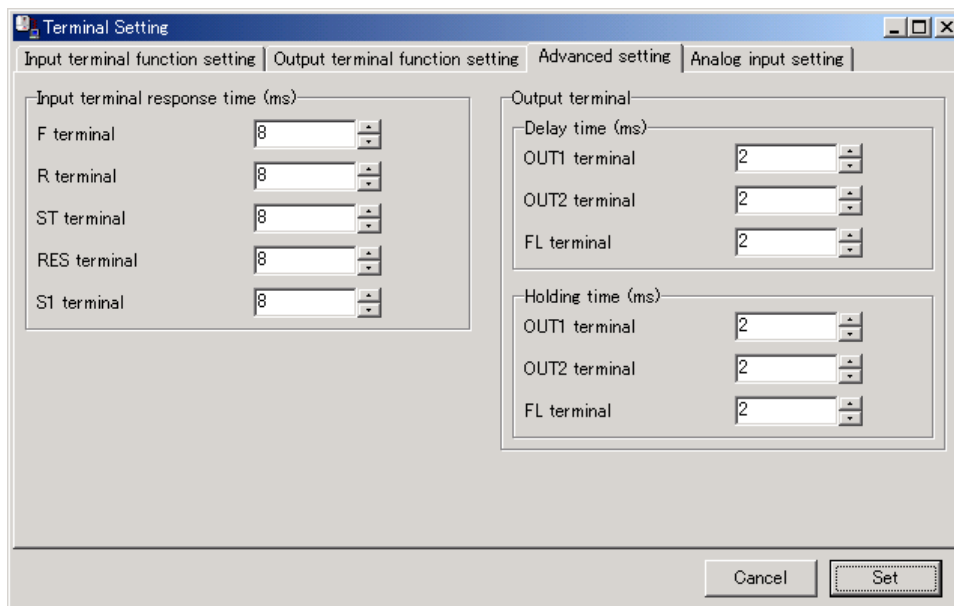


Figure 3-73 Terminal Setting (Advanced setting) Screen

3.5.4. Analog Input Setting

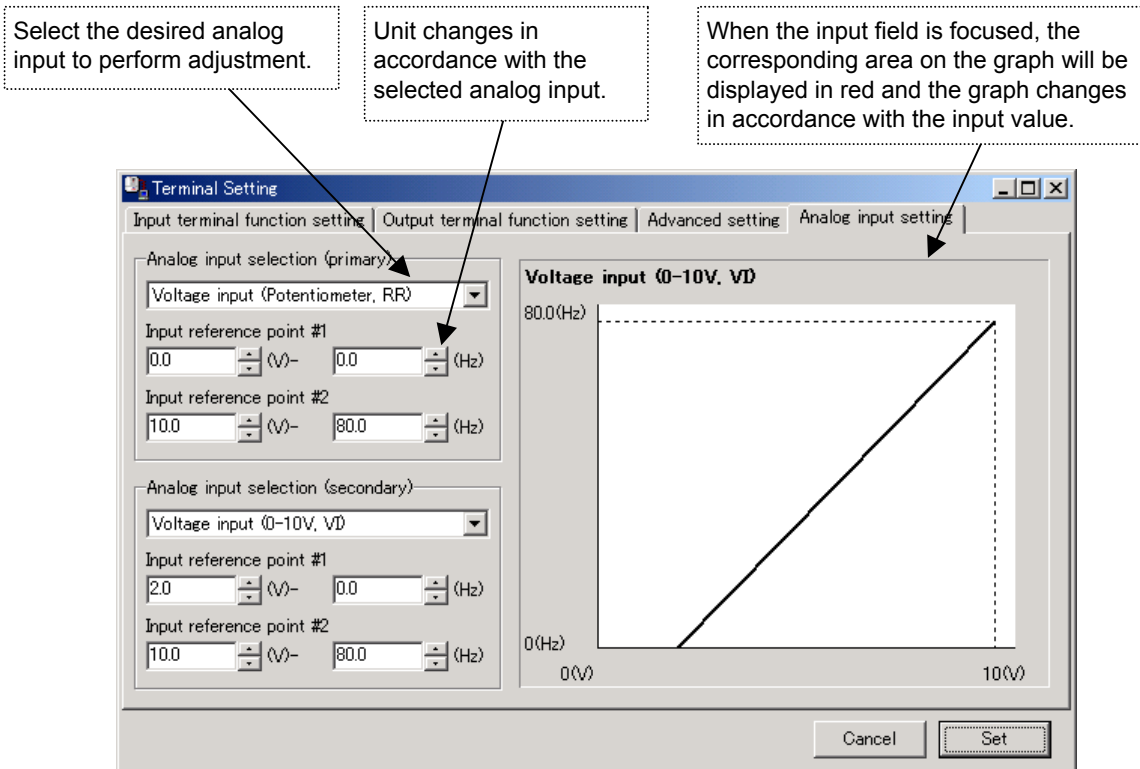


Figure 3-74 Terminal Setting (Analog input setting) Screen

3.5.4.1. Setting Parameter

*F 110~F 118, F 130~F 132
 F 140~F 144, F 150~F 152, F 160~F 162
 F 201~F 204, F 210~F 213, F 216~F 219*

3.6. Tools

3.6.1. Environment Options

PCS001Z option settings are performed here.

3.6.1.1. Startup/Com.

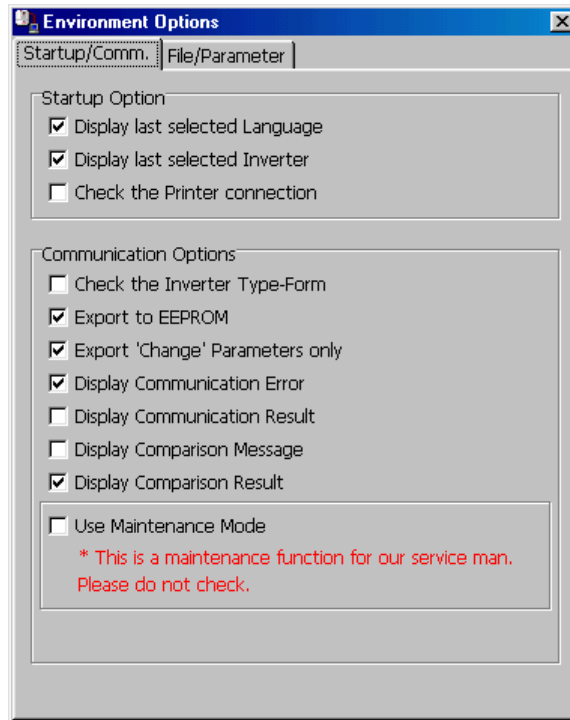


Figure 3-75 Environment options Screen

Startup Options

(1) Display the last selected Language

When the check box of this item is checked, the lastly selected language automatically appears when PCS001Z is started. If not checked, Japanese language is selected.

(2) Display the last selected Inverter

If the check box of this item is checked when PCS001Z is started, the previously selected model is automatically selected regardless of whether communication is enabled or disabled. If this check box is not checked, the system examines ports on the PC when started and if a port is available, the system checks the communication settings on the inverter and displays the corresponding model type. (It may take about 1 minute.)

(3) Check the Printer connection

If the check box of this item is checked when PCS001Z is started, if no printer is available, the menu about printing becomes unselectable.

If this check box is not checked, the printing menus are enabled regardless of whether a printer is available.

Communication Options

(1) Check the Inverter Type-Form

When the check box of this item is checked, connected inverter type-form is checked at the following timing. If it differs from the PCS001Z side, a message is displayed.

- The time of "Communication Check" speed button click
- The time of *RS-232C Setup* setup
- The time of *Parameter Import / Export / Comparison* selection
- The time of *Parameter Table* active
- The time of *Selected Parameter Import / Export* active
- The time of *Key Pad* selection
- The time of *Monitor* active and time of **[Start]** button click.
- The time of *Environment Option | Use Maintenance Mode Check*

* Type and Form are separately checked, and a message is displayed even when only Forms differ.

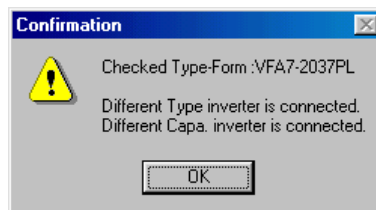


Figure 3-76 Check Inverter Type-Form result screen

(2) Export to EEPROM

If *Parameter Export* and *Selected Parameter Export* are executed with this item checked, the setting value will also be exported to EEPROM. (The setting value written will be retained even if the inverter power supply is turned off.)

If a check is cleared from this item, the setting value will be exported only to the RAM of the inverter, consequently, the setting value exported will be lost when the inverter power supply is turned off.

(3) Export 'Change' Parameters only

If *Parameter Export* is executed with this item checked, the parameters only changed from the factory default values will be exported to the inverter. If this item is not checked, all parameters will be exported to the inverter.

(Reference article *Precautions when exporting* (Section 3.2.16).)

(4) Display Communication Error

If this item is checked, the message will be displayed if a communication error occurs at the time of *Parameter Import / Export / Comparison*. If this check box is not checked, even if the communication error occurs, the message is not displayed.

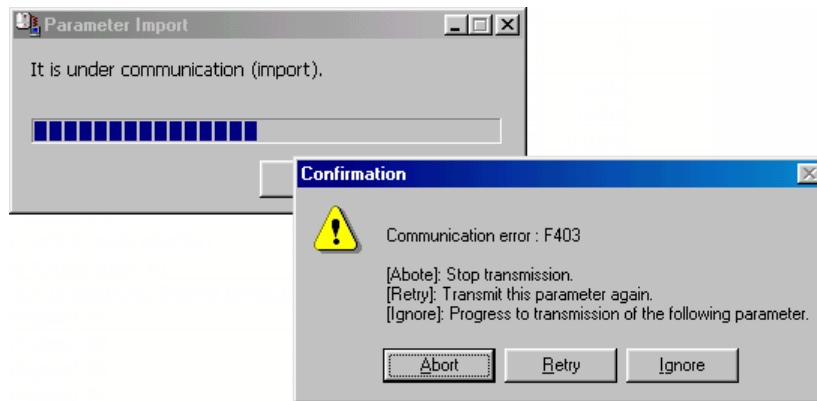


Figure 3-77 Communication error screen

(5) Display Communication Result

If this item is checked, the communication result is displayed *Parameter Import / Export / Comparison* finished.

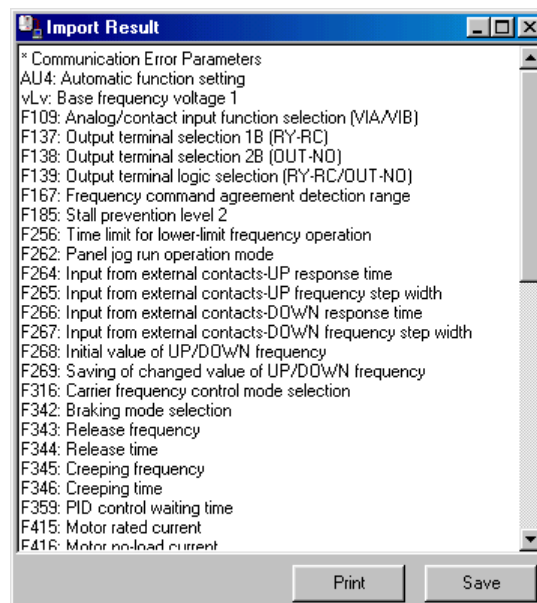


Figure 3-78 Display Communication Result screen

(6) Display Comparison Message

If this item is checked, if PCS001Z side value differs from inverter side value at the time of *Parameter Comparison*, the message will be shown.

(7) Display Comparison Result

If this item is checked, the communication result is shown by list at the time that *Parameter Comparison* finishes (refer to 3.2.6).

(8) Use Maintenance Mode

When this box is checked, *Parameter Import / Export / Comparison* will be done for the inverter control parameter area as well as for the user parameter area. When the check box of this item is not checked, *Parameter Import / Export / Comparison* will be done for the user parameter area (parameters described in the Inverter instruction manual).

* This is a maintenance function for our service man. Please do not check.

However, only the user parameter area (described in the inverter instruction manual) will be displayed on the Parameter Table display.

3.6.1.2. File/Parameter

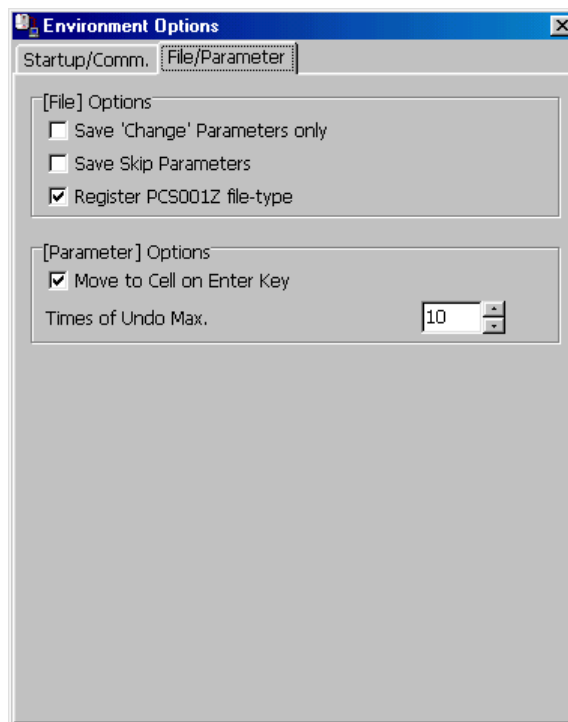


Figure 3-79 Environment Options - File/Parameter tab page screen

File Options

(1) Save 'Change' Parameters only

If this item is checked, only the parameters changed from the factory default value are saved ("PCS001Z Parameter Data (*.pcs)"). If this item is not checked, all parameters will be saved in files.

(2) Save Comm./Comp. Result

If this item is checked, the parameters skipped by *Parameter Import / Comparison* will automatically be saved.

(Reference article *Parameter Import / Parameter Export* (Section 3.2.4).)

(3) Register PCS001Z file-type

If this item is checked, *.pcs format file is related with PCS001Z. Double-clicking on a *.pcs file in the *Windows Explorer*, PCS001Z will start and open the saved inverter type-form and CPU version. If this check is unchecked, correlation will be canceled.

Parameter Options

(1) Move to Cell on Enter key

If this check is cleared, the cursor will not move to the cell below when pressing the key in the Parameter table.

(2) Max. Times of Undo

Maximum "Undo" count specification.

3.6.2. Maintenance Mode



This mode is used only for the purpose of service only. Users are not allowed to change setting values other than user parameter regions. This may cause accidents or damages to the inverter or the motor.

3.7. Help

3.7.1. Contents

This is the online help of PCS001Z.

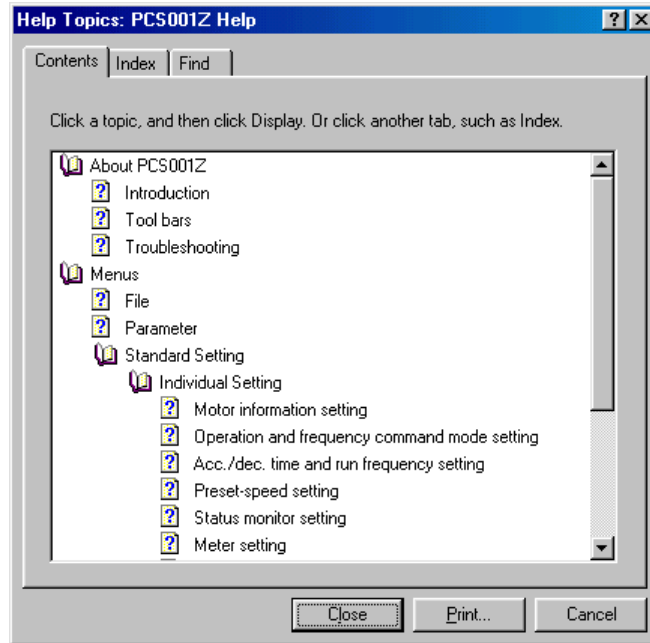


Figure 3-80 Help Screen

3.7.2. About

The PCS001Z version number and corresponding inverters, and CPU versions are displayed. The model currently selected is displayed at *Version* startup. Other models are described in the down-list .

* If the CPU version of the inverter currently used is newer than the version displayed in *Version*, obtain the latest parameter data.



.....Version of PCS001Z.

..... The newest CPU version of corresponding inverters.

Figure 3-81 About (Version) Screen

4. Standard Specification

Item	Contents	Page
Support language*1	Japanese English	-
Applicable inverter*1	VFA7/P7 series (V311, V312) VFS11 series (V102, V104, V108, V109) VFnc1 series (V106, V111, V116) VFS9 series (V101, V110) VFS7 series (V121) VFS7e series (V121)	-
Input file	PCS001Z parameter data (*.dat) PCS001Z parameter data (*.pcs) PCM001Z parameter data (*.pcm)	8
Output file	PCS001Z parameter data (*.pcs) Parameter table data (*.csv)	10
Print function	Parameter table output Paper size/orientation, top / bottom / left / right margin setting Print item selection, comment simultaneous print Preview	12
Communication setting	Communication port: COM1-7 Baud rate: 1200 / 2400 / 4800 / 9600 / 19200bps Parity: none / even number / odd number Broadcast, inverter number support	13
Parameter communication	Parameter Import: user and maintenance parameter*2 Parameter Export: user and maintenance parameter*2 Parameter Comparison: User and maintenance parameter*2	16
Parameter table	User and maintenance parameter*3 Undo/redo Hexadecimal code / decimal display Import / export / comparison Shipment Display changed parameter only Display specified parameter only Copy in clipboard by the MS-Excel form communication number/function name find	14
Parameter setting function	Easy setting: 6 items from Standard settings Standard setting: 10 items Advanced setting: 13 items	22 39
Others	Automatic inverter identification at startup Toolbar, On-line help, Version information, Parameter help*1	-

*1 Can be added by external data creation and change.

*2 Switched by *Environment options*.

*3 Maintenance parameter display is executed only in the maintenance mode.