TOSHIBA

E6581411 ③

Inverter Maintenance Communication Application

PCM001Z

Instruction Manual

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1. Introduction

“PCM001Z” is a MS-Windows application that has the following functions so that parameter setting and setting data can be simplified and stored by connecting an inverter with a personal computer (PC) by using RS-232C / RS-485. Carefully read this manual together with the Inverter Instruction manual for correct use.

- Parameter off-line setting
- Write the parameters saved in the PC to an inverter
- Read inverter parameters and save them in the PC
- Check changed parameters
- Print the parameter table
- Operation panel
- Display the inverter information
- Graphical display of status monitors

* For the “PCM001Z” support inverter and CPU versions, refer to the *Help* | *About PCM001Z* in the menu of this application.

Performance environment

CPU.....	Intel™ Pentium®-233MHz or more
OS	MS-Windows® Xp / Vista
Memory	32 MB or more
HDD.....	Space area About 10 MB
Display.....	640 x 480 dot / 256 colors or more
Others.....	Equipped with a CD-ROM drive or internet, a serial ports and a mouse

* When a USB-Serial Converter is used, start the PCM001Z while the converter is connected. Please do not pull the converter out, and do not insert it during execution of the PCM001Z.
* Do not change the number of PC's COM port when PCM001Z is actived.
* When a RS232 / 485 converter is used, 2 lines type communication cannot be performed.

* Specifications for this software may change without prior notice.
* We shall not be liable for any direct and indirect damages that are caused by use or disability to use of this software product.
* Pentium is the registered trademark of Intel Corporation in U.S.A
* MS-Windows is the registered trademark of Microsoft Corporation in U.S.A.

Symbols used in this text have the following meaning.

" ": Items and messages of the PCM001Z

[ ]: Buttons on the screen of the PCM001Z

Italic: Menus of the PCM001Z and Windows

[ ]: Keys of the PC

2. Installation procedure

- If other applications are working, end their operation.
- If you update a version of the PCM001Z, uninstall* the older version.
  (The version of PCM001Z can be checked with *Help* | *About PCM001Z* (Section 3.6.2).)

* When uninstalling, use *My Computer* | *Control Panel* | *Add / Remove Programs*. If user data (initial file PCM001Z.ini, skip parameter file, etc.) are remained, delete them using the *Windows Explorer*.

2.1. Installation

When "Setup.exe" is executed, the following window is displayed. Please click [Next] button.

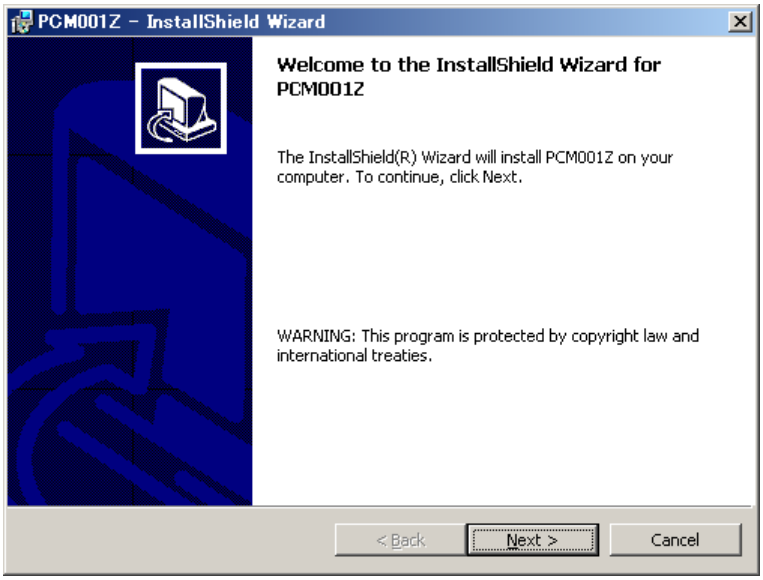


Figure 2-1 Installation Window

Please input the user-name etc. and click [Next] button.

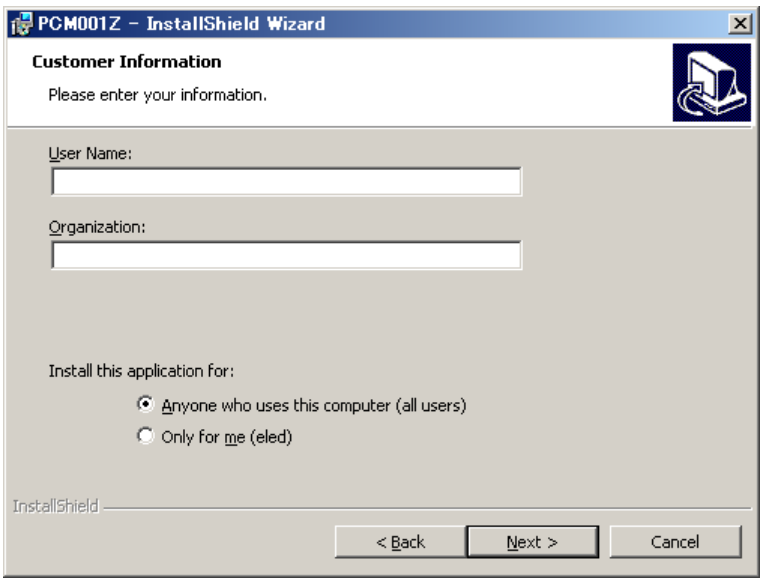


Figure 2-2 Installation Window (Customer Information)

The standard installation destination of PCM001Z is C:¥Program Files¥PCM001Z¥.

Please select [Change] button clicking when you change the installation destination.

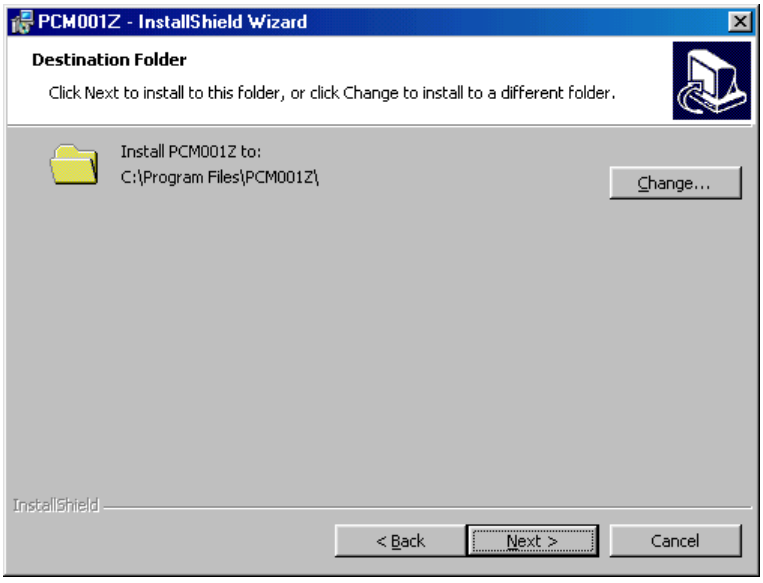


Figure 2-3 Installation Window (Destination Folder)

2.1.1. Drive data installed by "Typical"

VFS7(V121) or later drive data is installed when "Typical" is selected, and it is possible to select on PCM001Z start-up window.

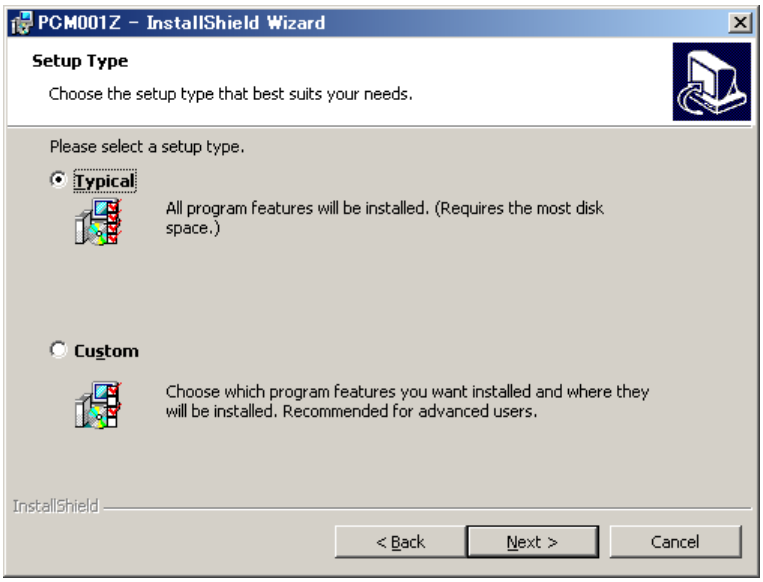


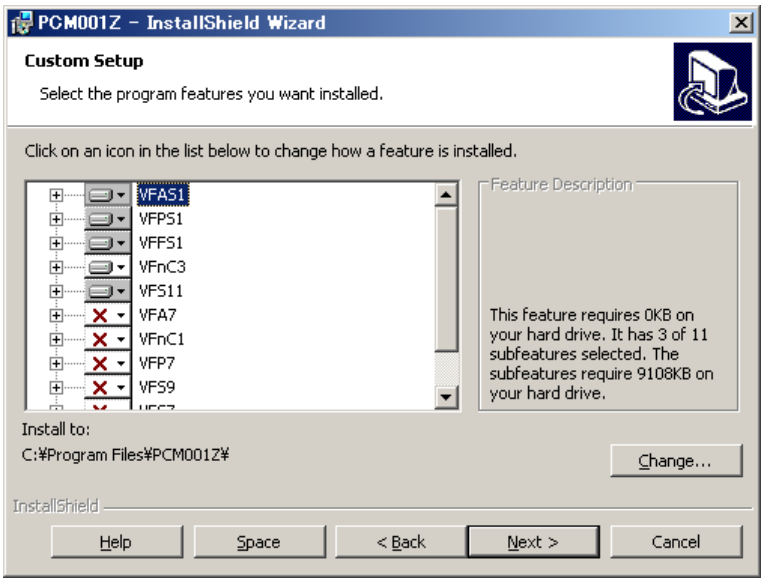
Figure 2-4 Installation Window (Setup Type)

* After installation, the drive data can be added and be deleted. Refer to the section 2.2.

2.1.2. Selection of installed model data

The following window is displayed when "Custom" is selected and the installed drive data can be selected.

* The unselected model data cannot be shown on PCM001Z start-up window.



: All versions have been selected.

: A part of version has been selected.

: All versions have not been selected.

Figure 2-5 Installation Window (Custom Setup)

Selection example 1) using "VFPS1(V614)"

1. Click "VFPS1".

2. Click ▼ on "VFPS1(V614)" button.

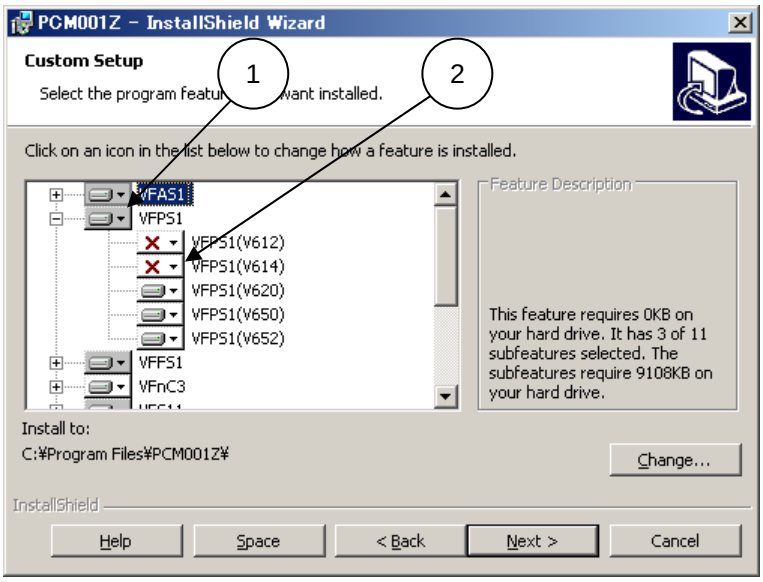


Figure 2-6 Installation Window (Model data selection)

3. The figure below is displayed. Select "This feature will be installed on local hard drive".

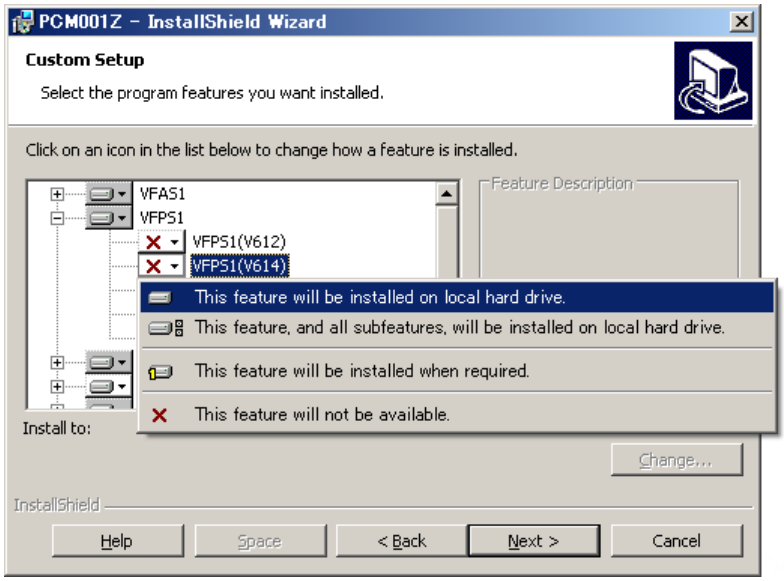


Figure 2-7 Installation Window (Model data selection)

Selection example 2) using all CPU version of "VFS9"

1. Click ▼ on "VFS9" button.
2. The figure below is displayed. Select "This feature, and all subfeatures, will be installed on local hard drive".

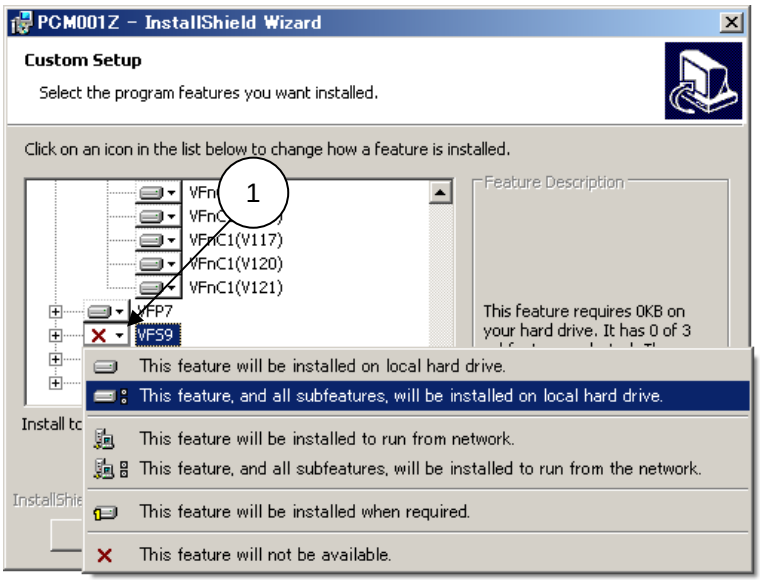


Figure 2-8 Installation Window (Model data selection)

2.2. Add/Delete the model data after Installation

Select *Control panel* | *Add or Remove Programs* (For Windows Xp) from the start menu of Windows.

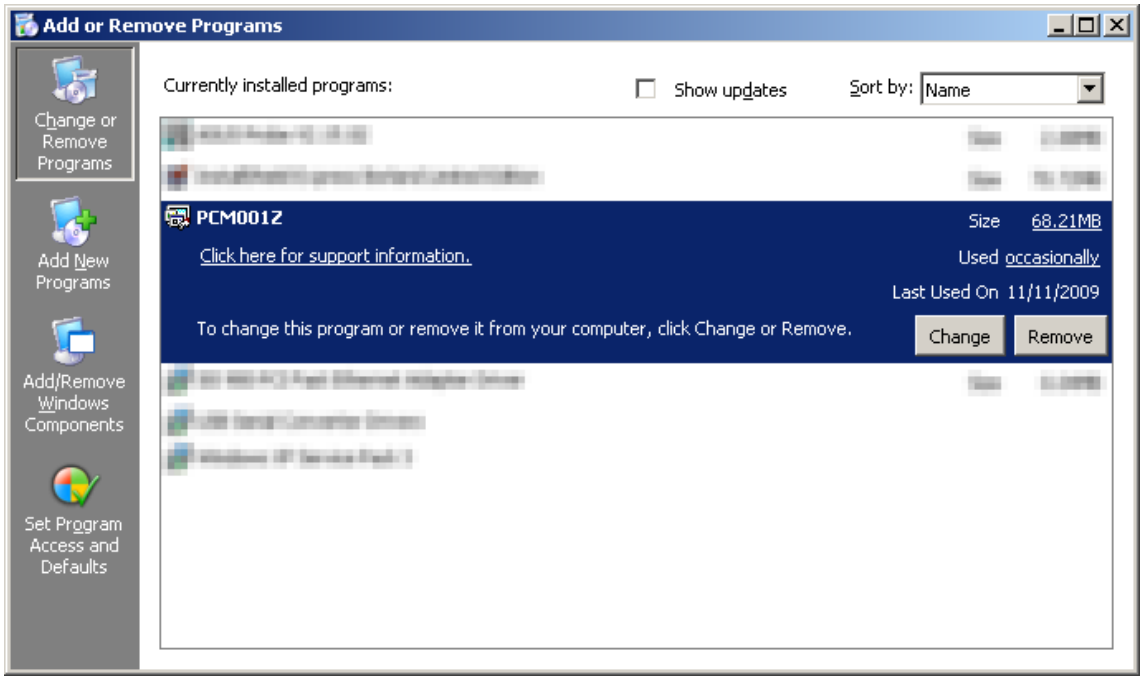


Figure 2-9 *Add or Remove Programs* Window

Select "PCM001Z" and click "Change" button, the following window is displayed.

Check "Modify" and click [Next] button.

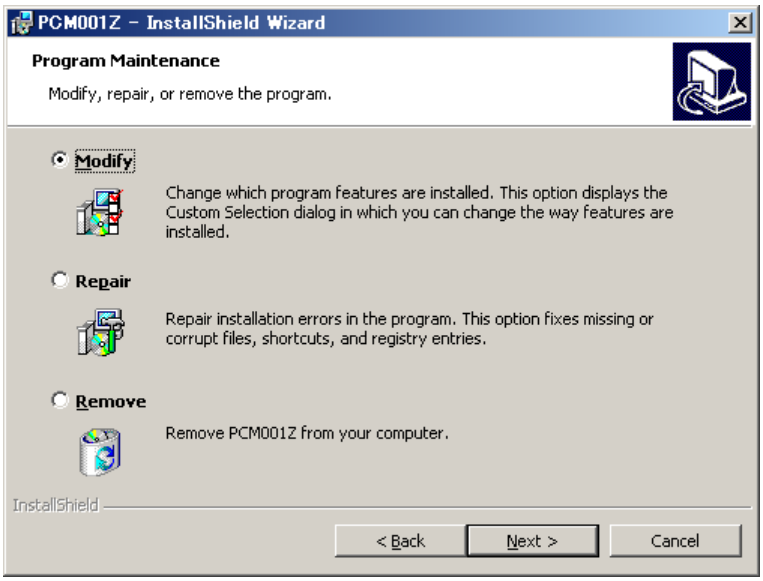


Figure 2-10 Program Maintenance Window

The following window is displayed, and select the model data to add/delete. (Please refer to clause 2.1.2.)

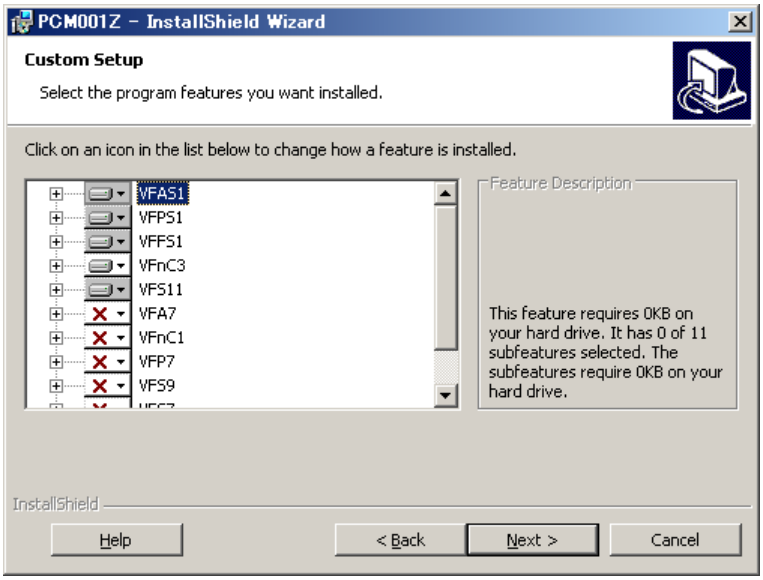


Figure 2-11 Model data selection Window

3. Menu description

Each setting menu is described here.

Starting of PCM001Z displays the selection screen of a language, a inverter type-form, and a CPU version to be used. As for the language, "**Japanese**" is displayed at the first execution after installation, and as for the inverter type-form, "**VFAS1-2004P**" is displayed. Please choose the language, the inverter type-form and the CPU version from a down-list, and push the [**OK**] button.

* The inverter type-form can be made to recognize automatically when it can communicate at the starting. (Related article *Environment Options* (Section 3.5.1.)) However, depending on a communication port of the PC setup and the inverter type-form and the CPU version, even when it can communicate, recognition may be impossible.

Caution

If you select the inverter model different from the connected model, the parameters on the PCM001Z differ from those on the inverter. In this case, the errors will occur at communication.

Figure 3-1 Startup screen

When the language, the model and the 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, some menus and buttons required for communication are displayed inactive (in gray) and cannot be used. When communication becomes possible by pressing *Communication Setup* or *Communication Check* buttons, the menus and buttons become available.

Tool bars

: Check communication each time when this button is pressed (the 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.)

: Start *File* | *Communication 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 3.2.6.)

: Execute *Parameter* | *Find*. (Refer to Section 3.2.14.)

: Execute *Parameter* | *Ampere/Volt*. (Refer to Section 3.2.8.)

: Start *Key Pad*. (Refer to Section 3.3.)

: Execute *Monitoring* | *Inverter Info.*. (Refer to Section 3.4.1.)

: Execute *Monitoring* | *Monitor*. (Refer to Section 3.4.2.)

: Execute *Tools* | *Environment Options*. (Refer to Section 3.5.1.)

: Display *Help*. (Refer to Section 3.6.1.)

* Blank (gray) display means unavailable.

3.1. File

File operations and print are executed.

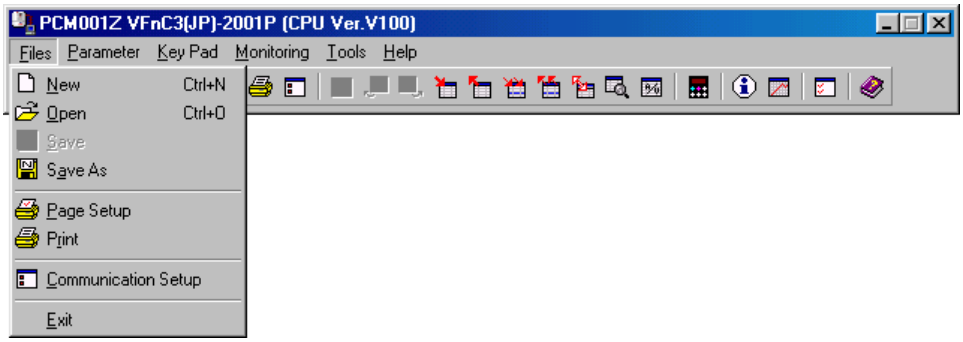


Figure 3-3 *File* menu screen

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 PCM001Z starts. The selected inverter type is displayed on the title bar of the main menu.

3.1.2. Open

Open "***PCM001Z Parameter Data (*.pcm)***" file. A dialog box to select files is displayed. Then specify a file name and press the [**Open**] button. The name of the file is displayed on the title bar of the main menu.

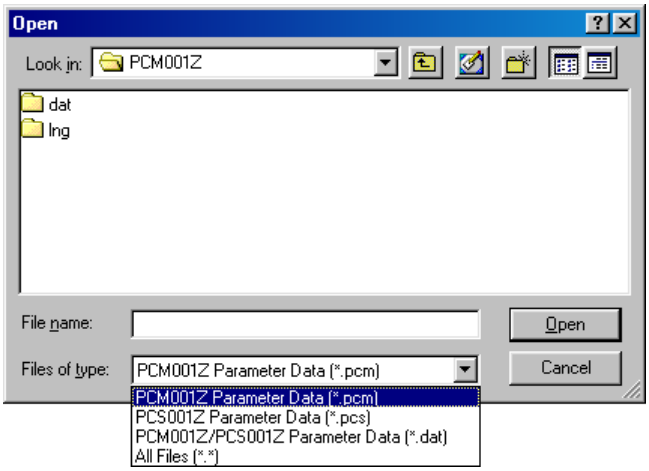


Figure 3-4 *File* | *Open* menu screen

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

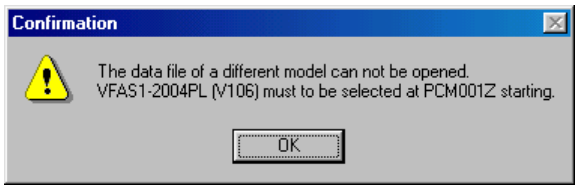


Figure 3-5 *File* | *Open* error message screen

When the file saved for a different inverter 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).

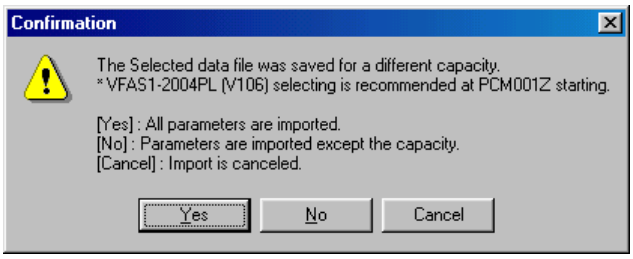


Figure 3-6 *File* | *Open* confirmation message screen

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

When [**Cancel**] button is clicked, stops reading.

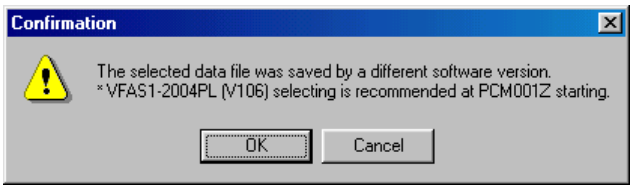


Figure 3-7 *File* | *Open* confirmation message screen

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, the parameter setting will be a blank display and cannot be selected. "***PCM001Z Parameter Data (*.pcm)***" only can be overwritten.

3.1.4. Save As

If you select "***PCM001Z Parameter Data (*.pcm)***", the present parameter setting will be saved. When the file save dialog is displayed, specify a directory, and save as.

* In the status of default, the parameter settings only displayed as "Changed" in the parameter table are saved. (Related article *Environment Options - File/Parameter* (Section 3.5.1.2.))

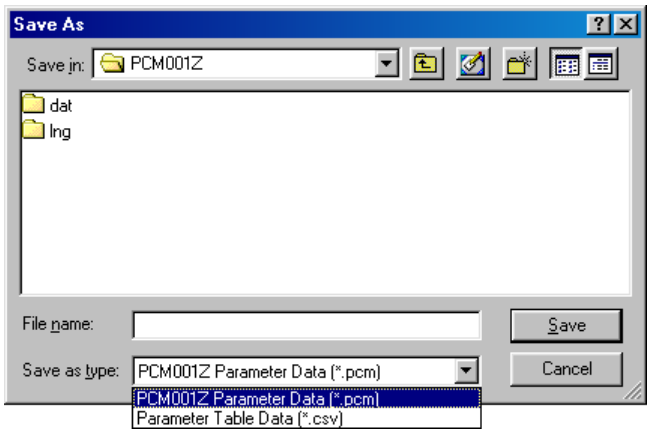


Figure 3-9 *File* | *Save As* screen

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

* If you select the "***Parameter Table Data (*.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 PCM001Z.

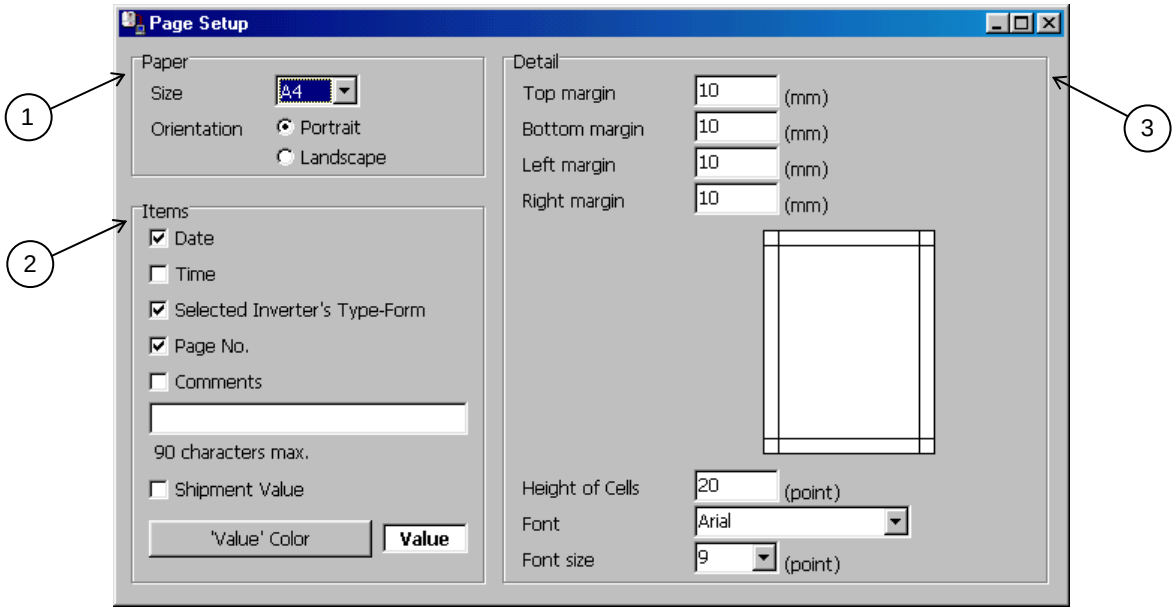


Figure 3-10 *File* | *Page Setup* screen

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. 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.

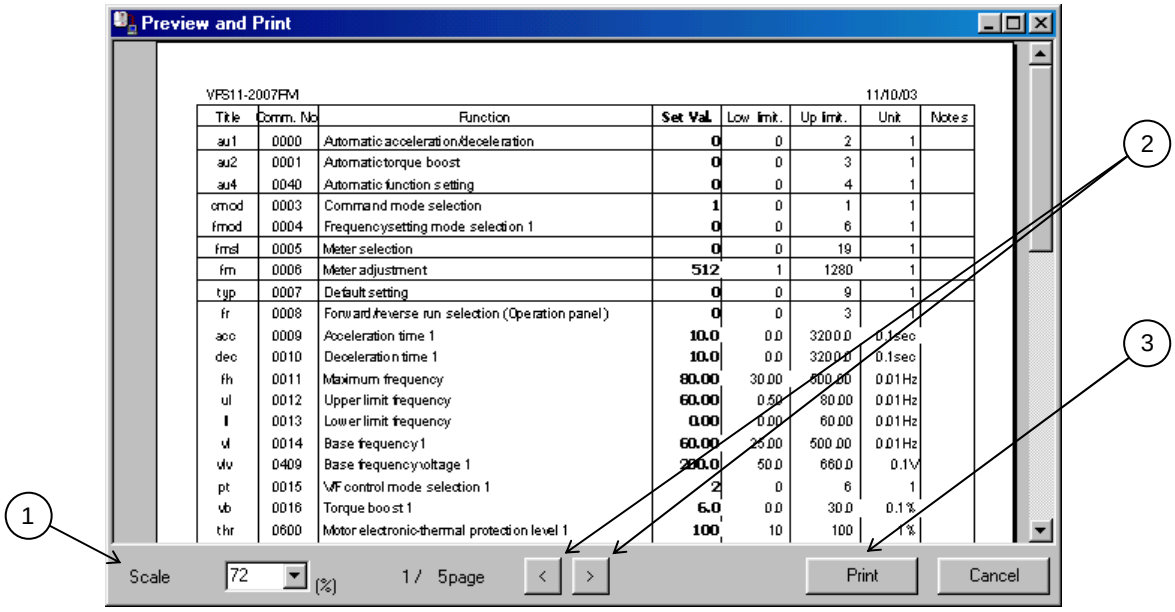
3) **Detail**

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.



Title	Comm. No	Function	Set Val.	Low limit.	Up limit.	Unit	Notes
au1	0000	Automatic acceleration/deceleration	0	0	2	1	
au2	0001	Automatic torque boost	0	0	3	1	
au4	0040	Automatic function setting	0	0	4	1	
cmod	0003	Command mode selection	1	0	1	1	
frmod	0004	Frequency setting mode selection 1	0	0	6	1	
frmsl	0005	Meter selection	0	0	19	1	
frm	0006	Meter adjustment	512	1	1280	1	
typ	0007	Default setting	0	0	9	1	
fr	0008	Forward/reverse run selection (Operation panel)	0	0	3	1	
acc	0009	Acceleration time 1	10.0	0.0	3200.0	0.1sec	
dec	0010	Deceleration time 1	10.0	0.0	3200.0	0.1sec	
fh	0011	Maximum frequency	80.00	30.00	500.00	0.01Hz	
ul	0012	Upper limit frequency	60.00	0.50	80.00	0.01Hz	
l	0013	Lower limit frequency	0.00	0.00	60.00	0.01Hz	
vl	0014	Base frequency 1	60.00	25.00	500.00	0.01Hz	
vlv	0409	Base frequency voltage 1	200.0	50.0	660.0	0.1V	
pt	0015	V/F control mode selection 1	2	0	6	1	
vb	0016	Torque boost 1	6.0	0.0	30.0	0.1%	
thr	0600	Motor electronic-thermal protection level 1	100	10	100	1%	

Figure 3-11 *File* | *Print* screen

1) **Preview Multiplication**

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 click 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. Communication Setup

The setup of the COM 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.

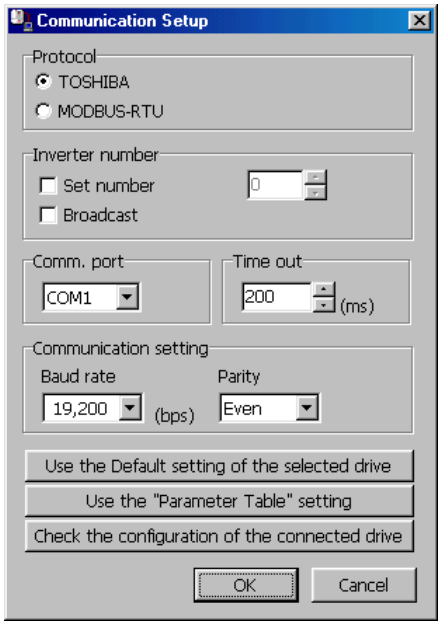


Figure 3-12 *File* | *Communication Setup* screen

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 PCM001Z while the converter is connected.

[Use the Default setting of the selected drive]

The communication setting of the selected drive's shipment is displayed in each item of *Communication Setup*.

[Use the "Parameter Table" setting]

The communication setting of the parameter concerning the communication in *Parameter Table* is displayed in each item of *Communication Setup*.

[Check the configuration of the connected drive]

The communication setting for the connected drive is investigated. When the condition that can be communicated is found, they are displayed in each item of *Communication Setup*.

* The changed item is displayed in blue.

3.1.8. Exit

Close this application.

3.2. Parameter

Parameter setting, Import, and Export are executed.

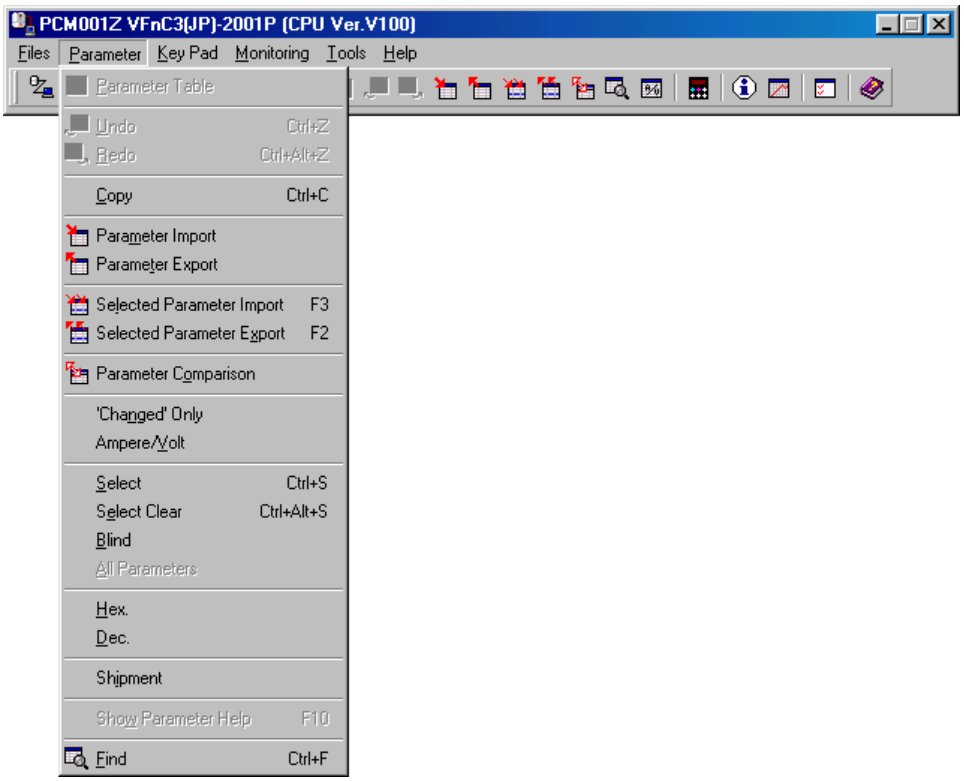


Figure 3-13 *Parameter* menu screen (*Parameter Table* display)

When the *Parameter Table* is not displayed, the menu below is displayed.

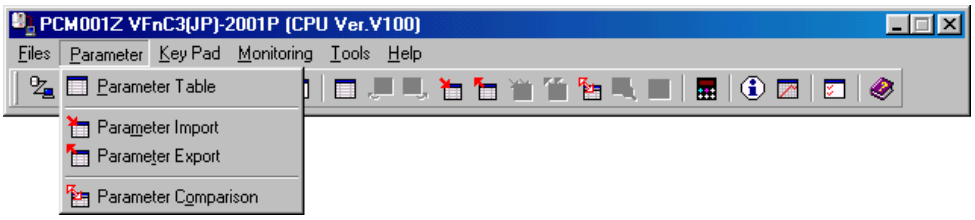


Figure 3-14 *Parameter* menu screen (*Parameter Table* non display)

3.2.1. Parameter Table

Parameters are listed in the table.

Parameter Table VFAS1-2004PL (CPU Ver.V124)

Title	Comm. No.	Function	Set Val.	Low limit.	Up limit.	Unit
AU1	0000	Automatic acceleration/deceleration	0	0	2	1
AU2	0001	Automatic torque boost	0	0	2	1
AU4	0040	Automatic function setting	0	0	5	1
CMOd	0003	Command mode selection	0	0	4	1
FMOd	0004	Frequency setting mode selection 1	2	1	13	1
Pt	0015	V/f control mode selection	0	0	8	1
vb	0016	Manual torque boost 1	8.0	0.0	30.0	0.1%
vL	0014	Base frequency 1	60.00	25.00	500.00	0.01Hz
vLv	0409	Base frequency voltage 1	200.0	50.0	330.0	0.1V
FH	0011	Maximum frequency	80.00	30.00	500.00	0.01Hz
UL	0012	Upper limit frequency	60.00	0.00	80.00	0.01Hz
LL	0013	Lower limit frequency	0.00	0.00	60.00	0.01Hz
ACC	0009	Acceleration time 1	10.0	0.1	6000.0	0.1sec
DEC	0010	Deceleration time 1	10.0	0.1	6000.0	0.1sec
AvF2	0213	RR/S4 input point 2 frequency	60.00	0.00	80.00	0.01Hz
AIF2	0204	VI/II input point 2 frequency	60.00	0.00	80.00	0.01Hz
Sr1	0018	Preset-speed operation frequency 1	0.00	0.00	60.00	0.01Hz
Sr2	0019	Preset-speed operation frequency 2	0.00	0.00	60.00	0.01Hz
Sr3	0020	Preset-speed operation frequency 3	0.00	0.00	60.00	0.01Hz
Sr4	0021	Preset-speed operation frequency 4	0.00	0.00	60.00	0.01Hz
Sr5	0022	Preset-speed operation frequency 5	0.00	0.00	60.00	0.01Hz

Figure 3-15 *Parameter* | *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.

[Esc] key:..... Sets the setting value of selected parameters to the factory default value.

[Del] 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 selected parameters in the inverter.

Numeric value input by hexadecimal code: a numeric value entered with a "**h**" first is regarded as a hexadecimal code.

Display color

Bold in gray:.....Parameters ("**Set Val.**" only) for which writing to the inverter by using the [F2] key failed.

Display in gray:.....Parameters skipped when import from the inverter.

Display in red:.....Parameters unable to set to 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 3.5.1.)

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**" by MS-Excel or other software allows for paste in each cell.

3.2.4. Parameter Import / Parameter Export

Each parameter setting value is imported from the inverter, or the values specified in the *Parameter Table* are exported in the inverter. Note that [**Cancel**] cannot be executed during the operation.

If communications are impossible, communication errors will occur. Please confirm the connection or *Communication Setup*. If the CPU version of the inverter that communicates with the PCM001Z support CPU version is different, communication errors may occur (this is because parameters corresponding to the communication numbers specified on the PCM001Z side for import do not exist on the inverter side). In this case, press the [**OK**] button to skip, and continue parameter import.

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 3.5.1.))

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

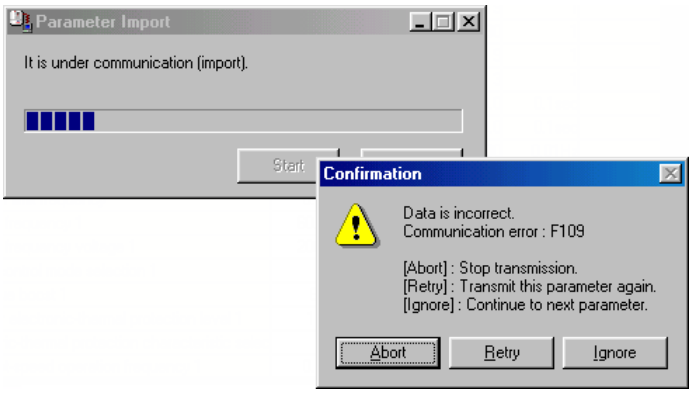


Figure 3-16 Communication Error screen

Caution

If parameters are written in the different model from the model selected at PCM001Z 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* | *Startup/Comm.* tab page (Section 3.5.1.1.))

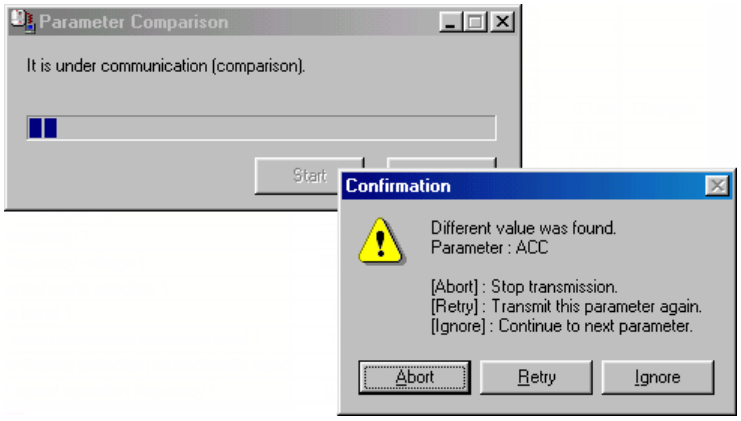


Figure 3-17 *Comparison* message screen

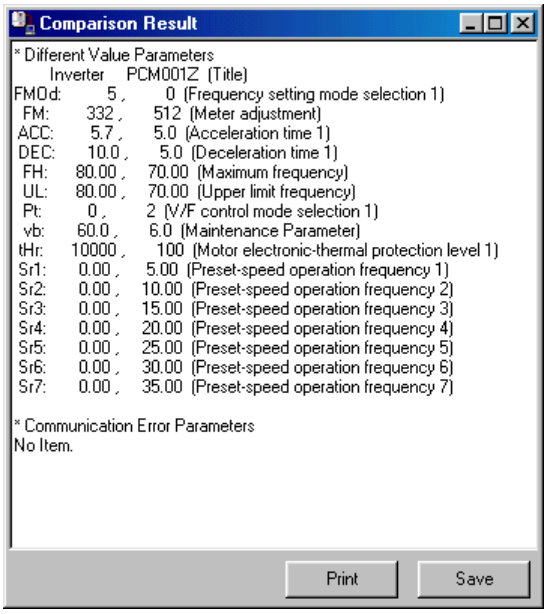


Figure 3-18 *Comparison* result screen

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. Ampere/Volt

The parameter ("Motor electronic-thermal protection level" etc.),"**Set Val.** ", "**Low limit.**", "**Up limit.**" and "**Unit**" for Ampere/Volt function of the drive on *Parameter Table* are displayed in the Ampere or Volt unit. And the setup value can be set by *Ampere/Volt* unit.

3.2.9. Select / Select Clear

Parameters with the cursor presented or parameters in the range selected with the mouse are parameters to be selected. This function can be performed only when cursor is in the "**Set Val.**" column.

The background color 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*

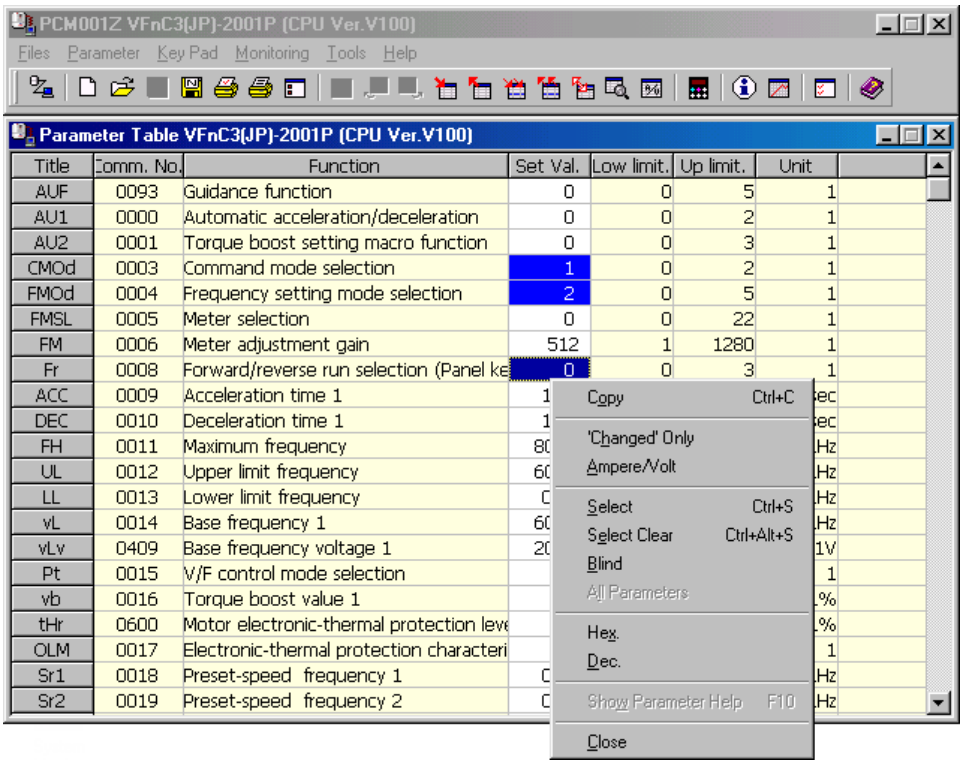


Figure 3-19 *Comparison* result screen

If it is executed again, *Select* is cleared only that parameter.

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

3.2.10. 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 "***PCM001Z Parameter Datas (*.pcm, and *.dat)***" saved in this status is open with *File* | *Open*, the parameters of *Blind* will not be displayed.

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

3.2.11. All Parameters

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

3.2.12. Hex. / Dec.

The selected parameters only are displayed in hexadecimal codes or decimal codes. When entering in hexadecimal codes, enter a "**h**" first, then enter setting values in hexadecimal codes. The value to be entered in hexadecimal codes 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 codes, 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**".

3.2.13. Shipment

Factory default values of the selected parameters are displayed.

3.2.14. 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.

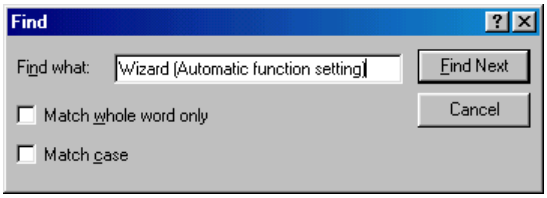


Figure 3-20 *Parameter* | *Find* screen

3.2.15. 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.

3.2.16. Other functions

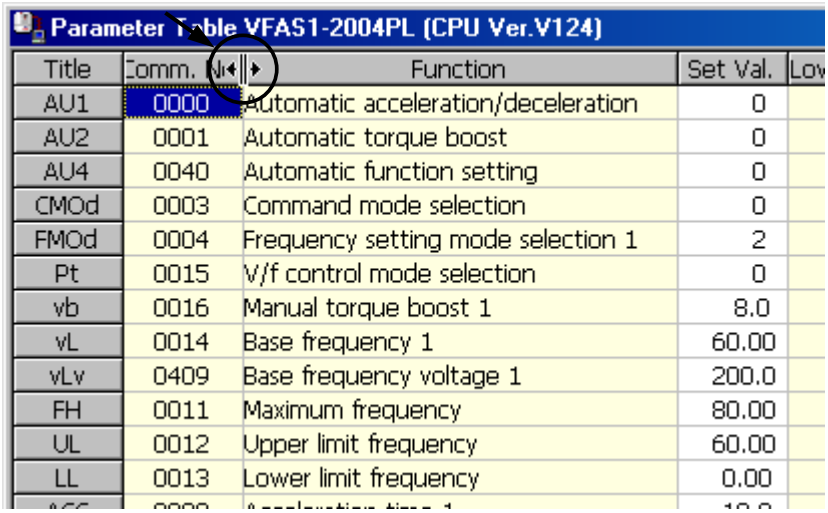
(1) Popup menu

Click on the *Parameter Table* with the mouse right button, a popup menu will be displayed.

Figure 3-21 *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.



Parameter Table VFAS1-2004PL (CPU Ver.V124)

Title	Comm.	Function	Set Val.	Lov
AU1	0000	Automatic acceleration/deceleration	0	
AU2	0001	Automatic torque boost	0	
AU4	0040	Automatic function setting	0	
CMOd	0003	Command mode selection	0	
FMOd	0004	Frequency setting mode selection 1	2	
Pt	0015	V/f control mode selection	0	
vb	0016	Manual torque boost 1	8.0	
vL	0014	Base frequency 1	60.00	
vLv	0409	Base frequency voltage 1	200.0	
FH	0011	Maximum frequency	80.00	
UL	0012	Upper limit frequency	60.00	
LL	0013	Lower limit frequency	0.00	

Figure 3-22 Column width change

3.2.17. Precautions when exporting

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

PCM001Z		Drive	
⋮	Export	⋮	
FMSL = 0	->	FMSL = 0	
FM = 512	->	FM = 512	
tYP = 3	->	tYP = 3	(Parameter initialization start)
Fr = 0	->	Under initialization	(Writing is impossible)
ACC = 10	->	Under initialization	(Writing is impossible)
dEC = 10	->	Under initialization	(Writing is impossible)
⋮		⋮	

In case where all parameters are exported, write "**Changed**" only parameters as for the parameters ("Sr1 - Sr7"of VFS7 and "tHr" of VFS9) regarded as the same value inside the inverter. (Related article *Environment Options- Startup/Comm.* (Section3.5.1.1.))

Example: In the case of VFS7/S7 e/S9

PCM001Z		Drive	
⋮	Export	⋮	
Sr1 = 10	->	Sr1 = 10	
Sr2 = 20	->	Sr2 = 20	
⋮	⋮	⋮	
F280 = 0	->	F280 = 0	(Set to Sr1 = 0)
F281 = 0	->	F281 = 0	(Set to Sr2 = 0)
⋮		⋮	

3.3. Key Pad

Same operations as for the inverter operation panel can be executed on the computer.

To end the operation, click on the “**Close**” right below the operation panel.

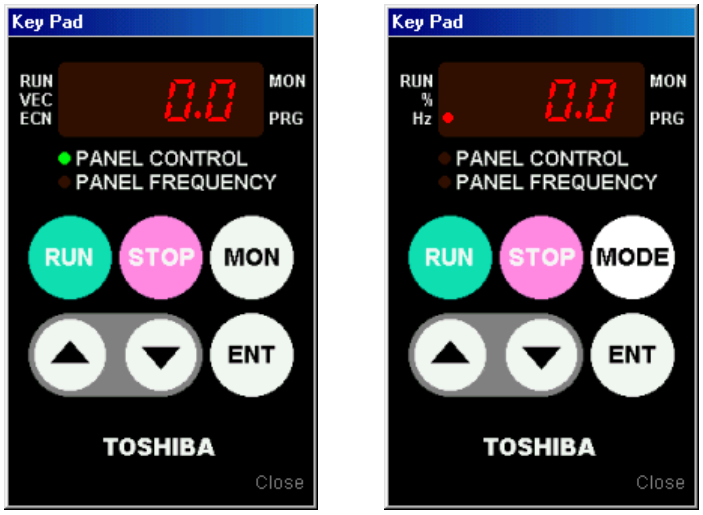


Figure 3-23 *Key Pad* screen (The right figure: in case of the VFAS1.)

Click on the *Key Pad* with the right mouse button, the popup menu will be displayed.

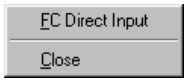


Figure 3-24 *Key Pad* popup menu screen

If you double click (or select *FC Direct input* from the popup menu) on the LED display, you can directly enter the operation frequency command by keys.

After entering any frequency, specify by pressing the Enter key. (In this case, it is necessary that the setting of the “**Frequency setting mode selection (FMOd)**” parameter of the inverter be “**Operation panel**”.)

Press the Enter key, then the Operation Panel display will appear after “FC” is alternatively displayed. If the Esc key is pressed while the operation frequency command value is being entered, the input will be cancelled and the Operation Panel display will appear.

* The setting value written to the inverter by using *Key Pad* is not reflected on the *Parameter Table*. Execute *Parameter Import* at request.

3.4. Monitoring

3.4.1. Inverter Info.

The information of the connecting inverter is displayed.

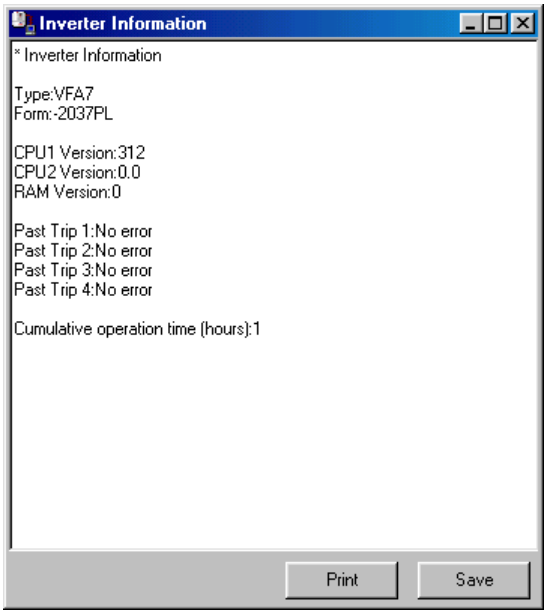


Figure 3-25 *Monitoring* | *Inverter Info.* screen

3.4.2. Monitor

Up to 10 parameters can be displayed in graphs on the inverter status monitor.

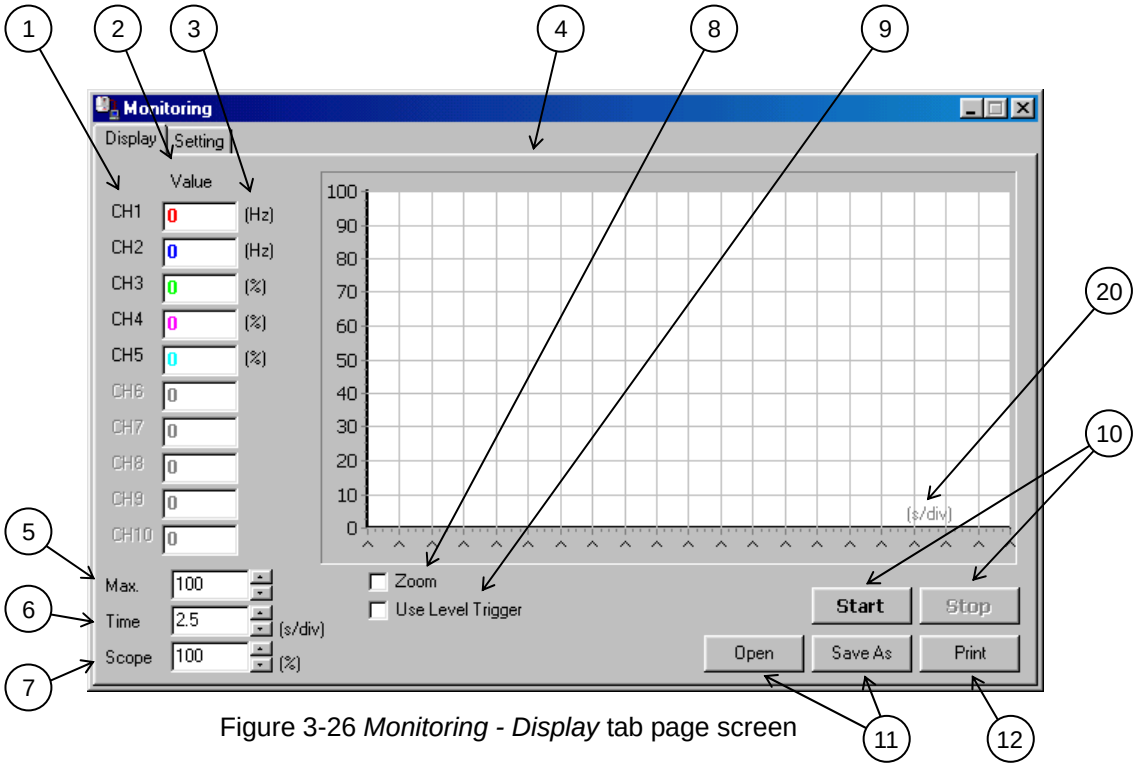


Figure 3-26 *Monitoring - Display* tab page screen

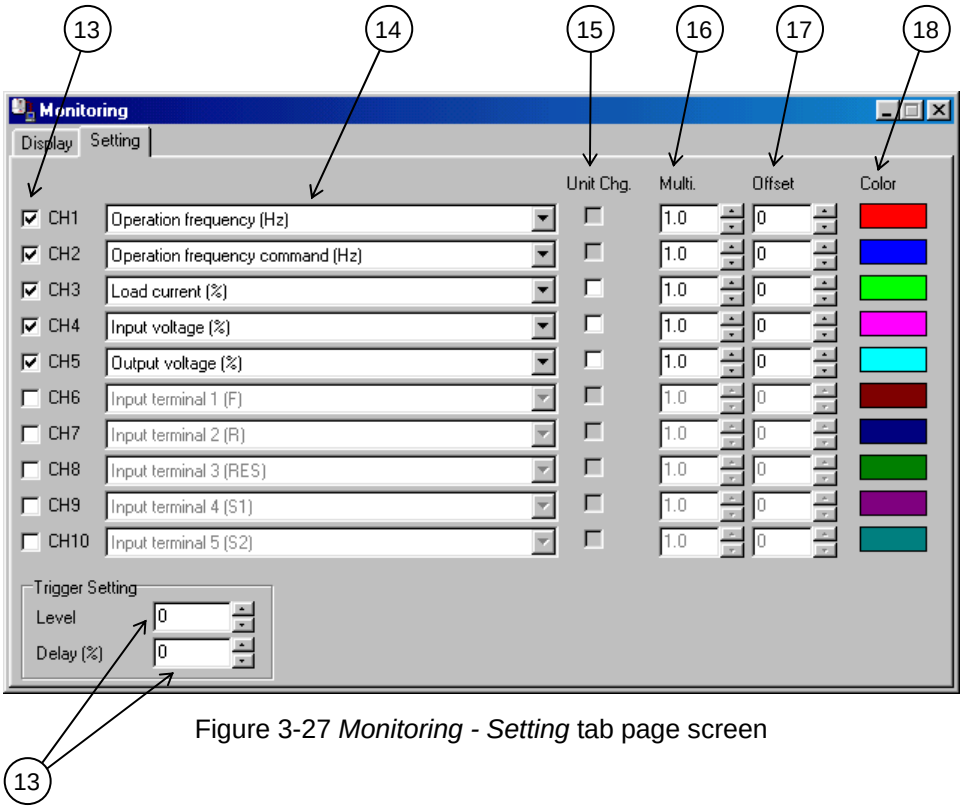


Figure 3-27 *Monitoring - Setting* tab page screen

Screen description

1) **Monitor Channel**

When "Use level trigger (9)" is checked, click to choose the trigger source. Chosen channel (CH) is displayed in a red bold character.

2) **Monitor value**

The monitored value of the inverter is displayed with the selected monitor item (14). The color of characters shows the color of the graph. When "Unit Chg. (15)" in a "Setting" tab page is checked, it changes and displays on the value for which it was suitable.

3) **Unit of the monitor value**

The unit of the monitor value is displayed. When "Unit Chg. (15)" is checked, the unit is changed to "A (ampere)" or "V (volt)."

4) **Monitoring screen**

The value read from the inverter is displayed graphically. Even when " Unit Chg. (15)" is checked, the graph indication of the value before unit conversion is given to a monitoring screen.

Move the mouse while clicking the right button to make it scroll.

If you click on the graph with the left button, details will be displayed.

* As for the displayed data, neither "Multi. (16)" nor "Offset (17)" is added.

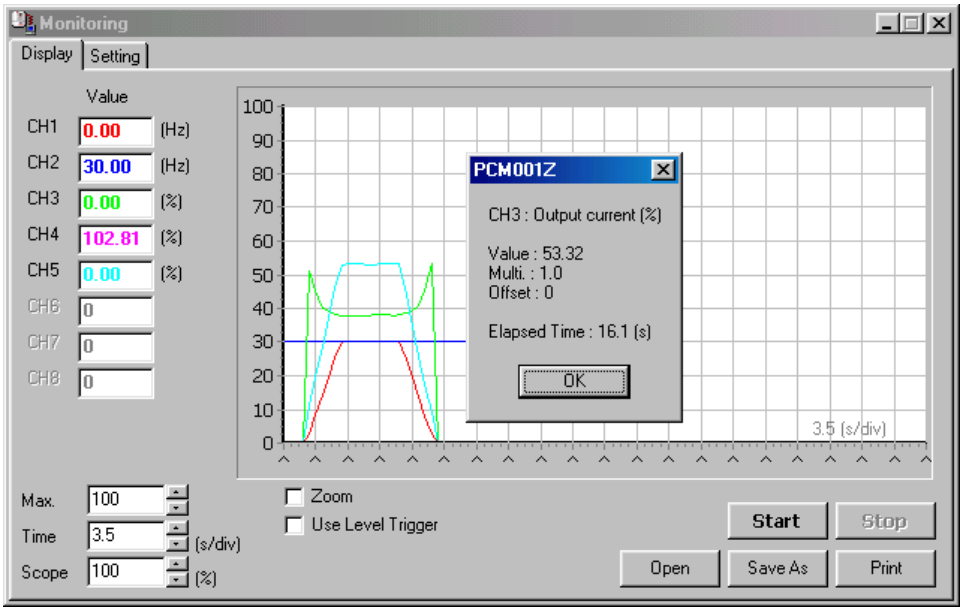


Figure 3-28 *Monitoring - Display* screen

5) **Max.**

The Y-axis maximum of graph is set up. Adjustment range is 100 to 500.

6) **Time axis setting**

The maximum value of the adjustment range is 30s/div. The minimum value changes with communication rate and number of selected CHs (13). The minimum time-axis setting value and the maximum number of samplings when it can communicate become as shown in the following table.

* Depending on the conditions, such as PC processing speed, it may become longer than the following table.

* Max. number of samplings can be changed at *Environment Options* (Section 3.5.1.3.)

Number of CH	Baud rate (bps)						Max. Number of Samplings
	1,200	**2,400**	**4,800**	**9,600**	**19,200**	**38,400**	
1	**1.25**	**0.75**	**0.75**	**0.5**	**0.5**	**0.5**	3000
2	**2.5**	**1.5**	**1.5**	**1**	**1**	**1**	1500
3	**3.75**	**2.25**	**2.25**	**1.5**	**1.5**	**1.5**	1000
4	**5**	**3**	**3**	**2**	**2**	**2**	750
5	**6.25**	**3.75**	**3.75**	**2.5**	**2.5**	**2.5**	600
6	**7.5**	**4.5**	**4.5**	**3**	**3**	**3**	500
7	**8.75**	**5.25**	**5.25**	**3.5**	**3.5**	**3.5**	429
8	**10**	**6**	**6**	**4**	**4**	**4**	375
9	**11.25**	**6.75**	**6.75**	**4.5**	**4.5**	**4.5**	333
10	**12.5**	**7.5**	**7.5**	**5**	**5**	**5**	300

* Gray: Default Value

7) **Scope**

The scale of the monitoring screen (4) is displayed and set up. Changing this, the graph can be stored in one screen or can be expanded.

8) **Zoom**

When this is checked, the graph can expanded by clicking the left button in a monitoring screen (4), and can be reduced by a right button click.

* The data detailed display function and scroll function are unavailable.

9) **Use level trigger**

(Refer to 3.4.2.3.)

10) **Start/Stop**

When [**Start**] button is clicked, starts to read the selected monitor item (14) from the inverter.

When [**Stop**] button is clicked, stops reading.

* The menu items which disturbs the communication are unavailable during monitoring.

11) **Open / Save As**

(Refer to 3.4.2.1.)

12) **Print**

(Refer to 3.4.2.2.)

13) **CH selection**

The checked monitor items (14) are monitored by graph.

* *Environment Options* | "Display Alarm" and "Display Trip" are respectively treated as one of the monitor items. Therefore, when these are checked, selectable CHs become 9 or 8.
  For example, if “Display Alarm” and “Display Trip” on *Environment Options* are checked with 5CHs on Monitoring selected, 7CHs will be monitored.
  (The minimum setting value of a time-axis also becomes the same as the time of 7CH selection).

14) **Monitor item**

Select the monitor items from down list in the inverter status monitors.

15) **Unit selection**

The monitoring value is converted and displayed on voltage (V) and current (A). When the selected item is not convertible or CH selection (13) is not checked, this selection becomes unselectable.

16) **Multiplication**

The monitoring value can be multiplied by the value set up here, and indicated on the graph.

When this value is changed, it is reflected to the graph except during operation.

The adjustment range is 0.1 to 10.

17) **Offset**

The monitoring value can be added to the value set up here, and indicated on the graph.

When this value is changed, it is reflected to the graph except during operation.

The adjustment range is 0 to 500.

18) **Graph color**

The displayed graph color is set up. When color sample is double-clicked, the color dialog will be displayed. Select any color.

19) **Trigger level/Trigger delay**

(Refer to 3.4.2.3.)

20) **Time axis**

When [**Open**] button is clicked and *.mon file is opened, the time-axis at the time of the file last save is displayed. Change of "time axis setting (6)" or CH selection (13) displays the same value as a time axis setting.

3.4.2.1. Open/Save as

The displayed graph and the opened file can be saved/read (only *.mon format) in the following file formats. The opened file name is displayed on the title bar of the *Monitor.*

1) **“PCM001Z Monitor Data (*.mon)”**

This save format is only for PCM001Z, graph can be displayed again to the monitoring screen with the [**Open**] button of a "Display" tab page.

If the file that was saved by the different inverter type is chosen, it can not be opened.

2) **Monitor Data (*.csv)**

The csv format file can be opened with a spreadsheet application.

* As for the saved data, neither "Multi. (16)" nor "Offset (17)" is added.

3) **Monitor Picture (*.bmp)**

The currently displayed graph on the monitoring screen is saved in picture form. The saved picture corresponds to the part currently displayed on the screen. When you need to record a given area, please scroll or zoom so that the required area is displayed on the screen. Moreover, when you need to save the whole graph, please save with “Scope” set to "100 (%)".

Save format can be chosen from the following:

- bmp format: Color information is not lost by compress but the file size is large.
- jpg format: File is made smaller using compression but some color information is lost.
- wmf format: This format is aimed at expansion/reduction.

These files can be read with image-processing application.

3.4.2.2. Print

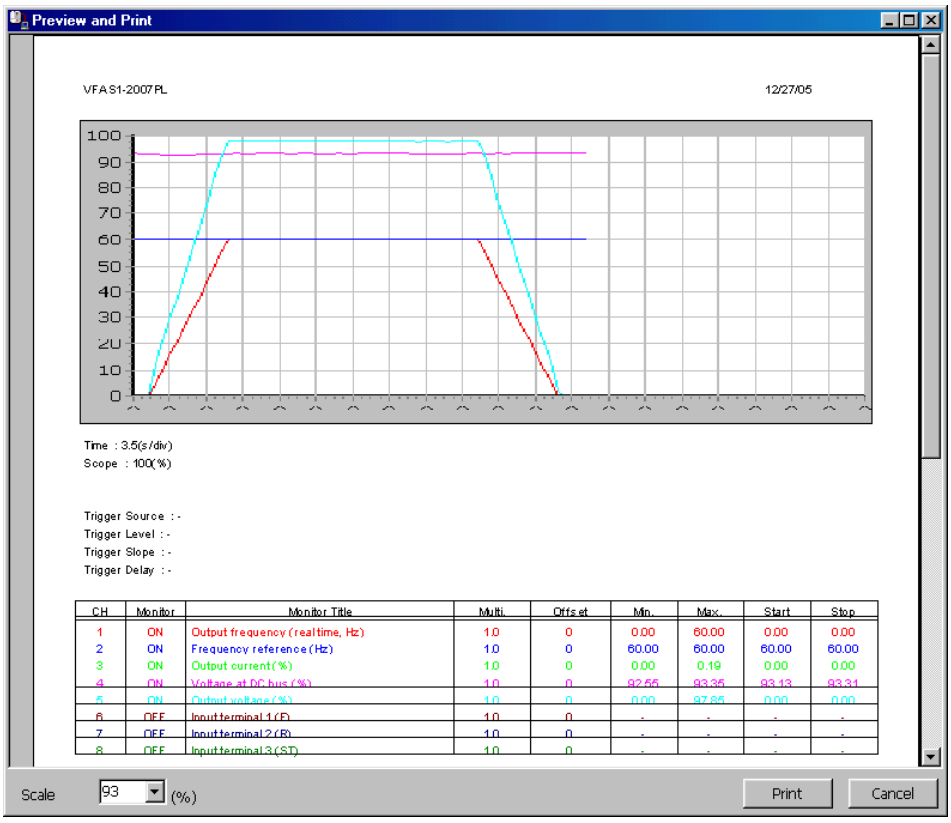
The monitor picture is printed. The image to print can be checked on the preview screen.

Clicking on [**Print**] button starts printing. Paper size is A4 and the orientation is portrait by default.

Those parameters can be set in *File* | *Page Setup* (refer to 3.1.5).

* As for the printed data (minimum value, maximum value, start value, and last value) of each graph, neither "Multi. (16)" nor "Offset (17)" is added.

* When the trigger is not used, “-“ is displayed to “Trigger Source” and soon.



CH	Monitor	Monitor Title	Multi.	Offset	Min.	Max.	Start	Stop
1	ON	Output frequency (realtime, Hz)	1.0	0	0.00	60.00	0.00	0.00
2	ON	Frequency reference (Hz)	1.0	0	60.00	60.00	60.00	60.00
3	ON	Output current (%)	1.0	0	0.00	0.19	0.00	0.00
4	ON	Voltage at DC bus (%)	1.0	0	92.55	93.35	93.13	93.31
5	ON	Output voltage (%)	1.0	0	0.00	97.85	0.00	0.00
6	OFF	Input terminal 1 (F)	1.0	0	-	-	-	-
7	OFF	Input terminal 2 (R)	1.0	0	-	-	-	-
8	OFF	Input terminal 3 (ST)	1.0	0	-	-	-	-

Figure 3-29 *Monitoring* | *Print* screen

3.4.2.3. Use level trigger

If "Use Level Trigger (1)" of the "Display" tab page is checked, a trigger level marker (5), “Source (2)”, and “Slope (3)” will be displayed, and trigger source CH (4) is displayed in red.

Trigger source: This can be chosen by clicking “CH (4)” or double-clicking “Source (2)”.

Trigger level: This can be set dragging the trigger level marker (5) with the mouse, or is set up using "Trigger Setting" - “Level (figure 3-26 (19))”.

Trigger slope: This changes as follows when double-clicking the “Slope (3)”.

Up → Down → Both

If the [**Start**] button is clicked, the graph will be displayed after the monitored value of the trigger source CH exceeds trigger level (when a trigger slope is on "standup").

Trigger delay is the rate to the maximum samplings by the number of selected CH.

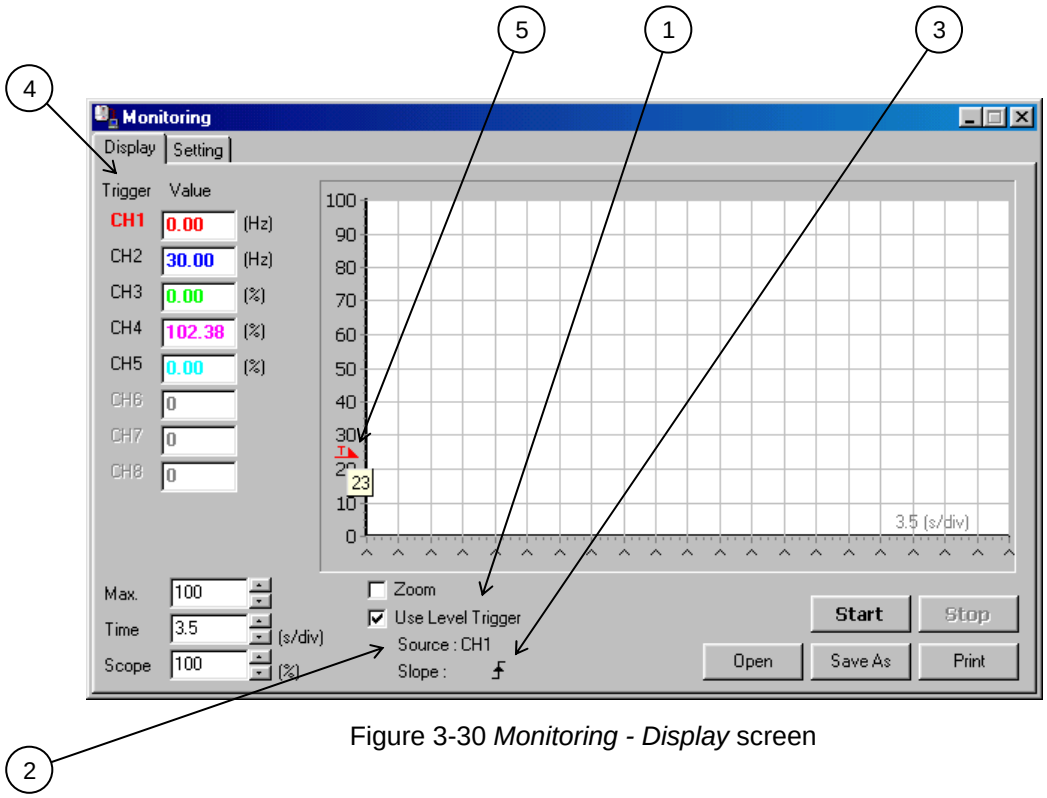


Figure 3-30 *Monitoring - Display* screen

When checking *Environment Options* - “Continuous”, “Continuous Monitoring” is displayed on the position of "Use Level Trigger” (Refer to 3.5.1.3).

3.5. Tools

3.5.1. Environment Options

PCM001Z option setup is executed.

3.5.1.1. Startup/Comm.

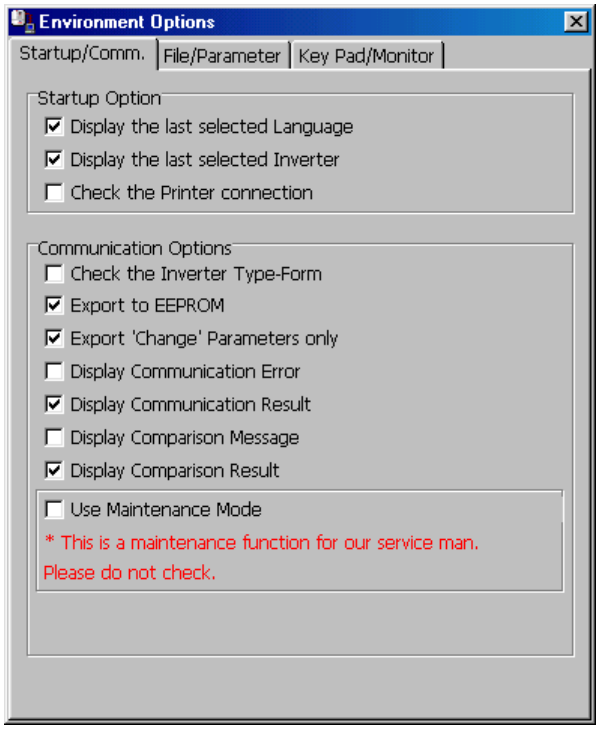


Figure 3-31 *Environment Options - Startup/Comm.* tab page screen

Startup Options

(1) **Display the last selected Language**

When the check box of this item is checked, the lastly selected language automatically appears when PCM001Z 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 PCM001Z is started, the previously selected model is automatically selected regardless of whether communication is enabled or disabled (COM1 - 15). 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 PCM001Z 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 time of *Parameter Import / Export / Comparison* selection. If it differs from the PCM001Z side, a message is displayed.

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

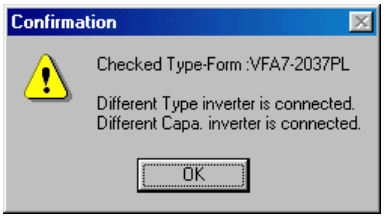


Figure 3-32 *Check Inverter Type-Form* result screen

(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 3.2.17).)

(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.

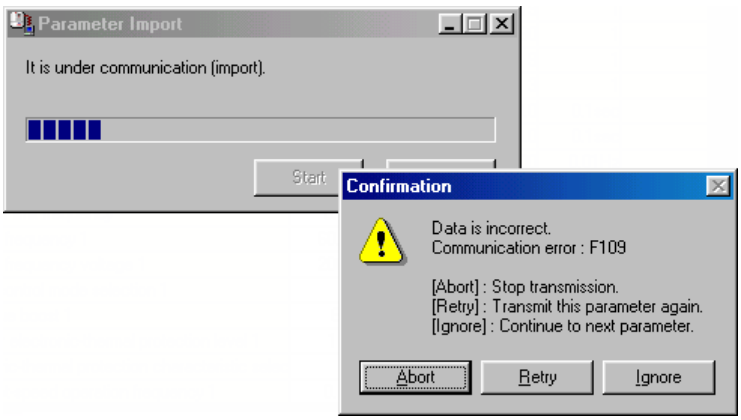


Figure 3-33 Communication error screen

(5) **Display Communication Result**

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

* When the communication error doesn't occur, this window is not displayed.

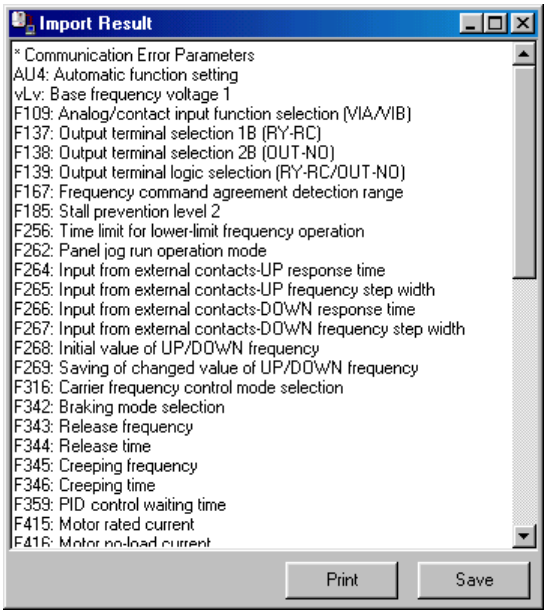


Figure 3-34 *Display Communication Result* screen

(6) **Display Comparison Message**

If this item is checked, when the value on PCM001Z differs from the value on the inverter 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).

* When the communication error doesn't occur, this window is not displayed.

(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.

3.5.1.2. File/Parameter

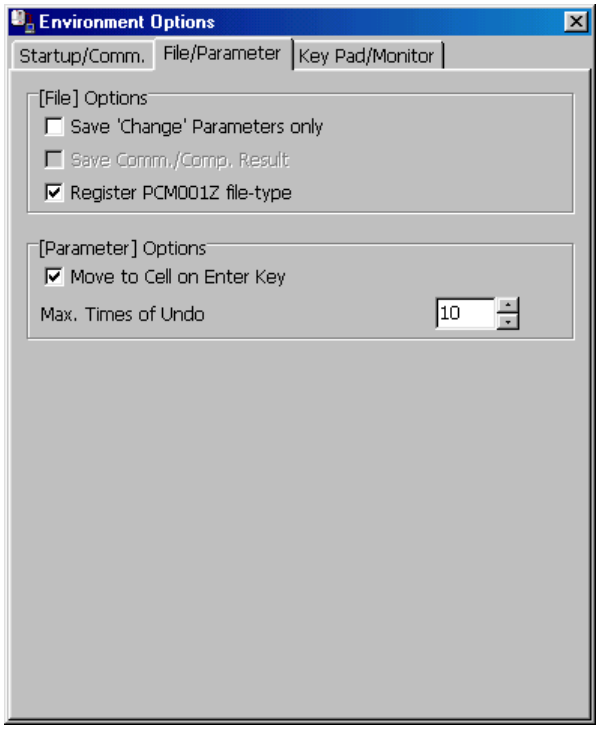


Figure 3-35 *Environment Options - File/Parameter* tab page screen

[File] Options

(1) **Save 'Change' Parameters only**

If this item is checked, only the parameters changed from the factory default value are saved ("***PCM001Z Parameter Data (*.pcm)***"). 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 / Export*, or Result of *Parameter Comparison* will automatically be saved.

(Reference article *Parameter Import / Parameter Export / Parameter Comparison* (Section 3.2.4 / 3.2.6).)

(3) **Register PCM001Z file-type**

If this item is checked, *.pcm format file is related with PCM001Z. Double-clicking on a *.pcm file in the *Windows Explorer*, PCM001Z 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 Enter key in the *Parameter Table*.

(2) **Max. Times of Undo**

Maximum "**Undo**" count specification.

3.5.1.3. Key Pad/Monitor

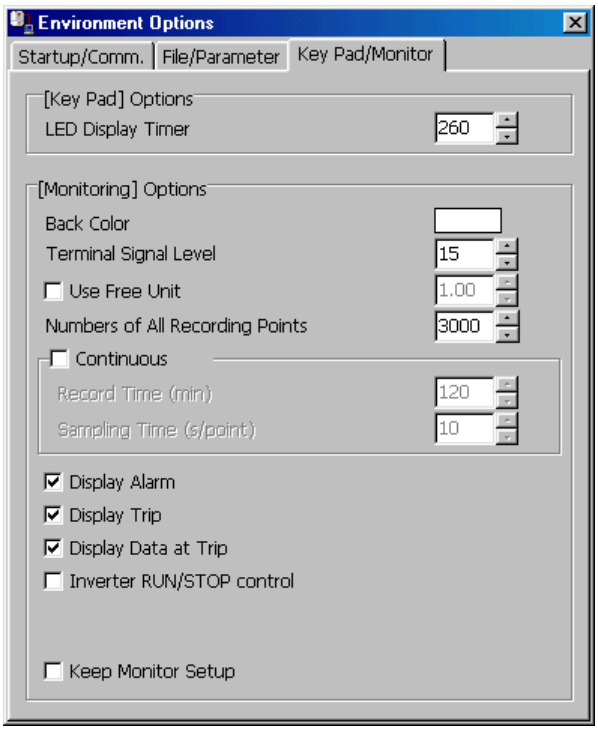


Figure 3-36 *Environment Options - Key Pad/Monitor* tab page screen

[Key Pad] Option

LED Display Timer

If this value is decreased, time interval of the display led blinking will be shortened.

[Monitoring] Options

(1) **Back Color**

Graph background color specification. If you double click on the color sample, the color dialog box will be displayed. Select any color.

(2) **Terminal Signal Level**

Value displayed in the graph as a terminal high level.

(3) **Use Free Unit**

If this item is checked, the value displayed in the *Monitor* is multiplied by the value of this setting.

* Priority is given over "Unit Chg." in "Display" tab page.

(5) **Numbers of All Recording Points**

The number of recording points is set. The recording data is put on the memory of PC during monitoring. So, set this value with enough margins for the memory of PC.

(4) **Continuous**

If this item is checked to execute *Monitor*, monitoring is possible 24 hours max. Specify a recording time and a sampling time. The "**Record Time**" and the "**Sampling Time**" field will become accessible for setting.

If *Monitor* is started with this item checked, the approximate space area required to save the data read from the inverter will be displayed.

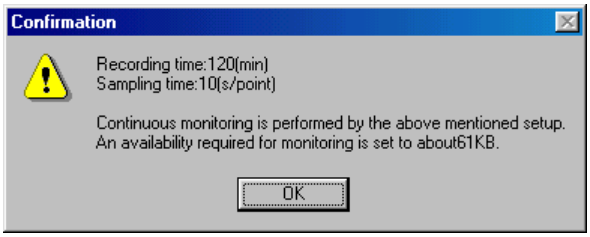


Figure 3-37 *Continuous* monitoring confirmation screen

If the [**OK**] button is clicked, a file selection window will appears. Specify the file where to save data, and close the window. Data are saved in a form of csv when [**Start**] button is pressed.

If the [**Start**] button is pressed after "**Maximum value**" is specified at request, data read will begin. (The value converted to the value for graph display is displayed on "**Time axis**".)

* The data saved in a csv form are the values with "**Display Multiplication**" and "**Offset**" not added.

(5) Display Alarm

If this item is checked, the alarm is displayed on a monitoring screen when alarm is generated at the inverter side.

(6) Display Trip

If this item is checked, the trip is displayed on a monitoring screen when trip is generated at the inverter side.

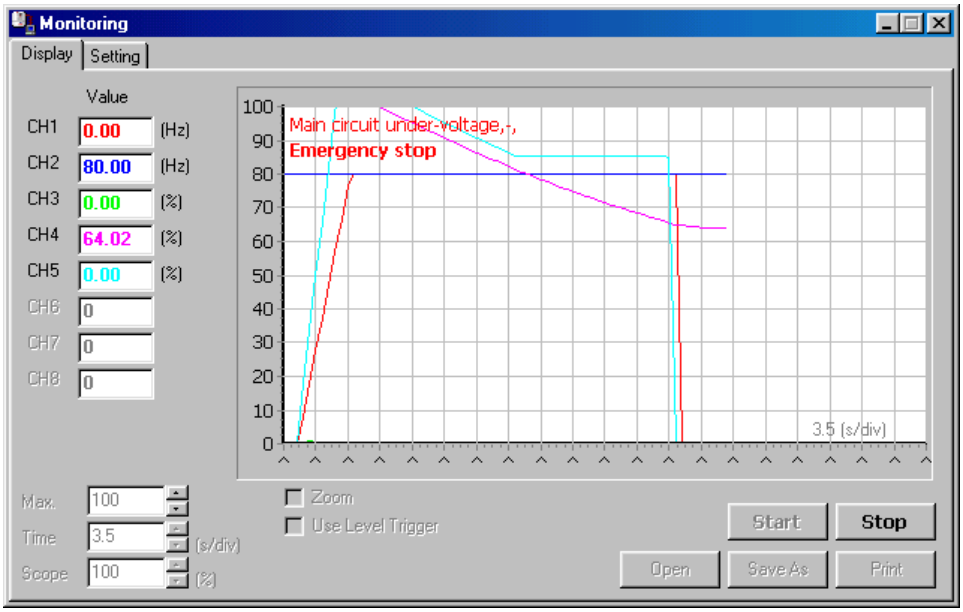


Figure 3-38 *Display Alarm/Trip* screen

(7) Display Data at Trip

If this item is checked, monitoring is stopped when trip is generated at the inverter side, and all monitor item, value, are displayed

When "Display Trip" is not checked, this check box is unselectable.

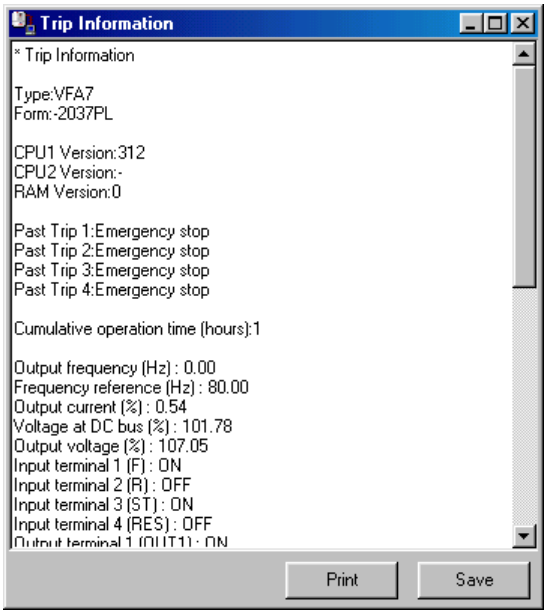


Figure 3-39 Trip information screen

(8) Inverter RUN/STOP control

If this item is checked, run/stop of inverter is possible from PC during *Monitor*.

* “Operation command mode selection" parameter of inverter needs to set "Panel".

RUN..... [Shift] + [F9]

STOP..... [F9]

(9) Keep Monitor Setup

If this item is checked, settings related to *Monitoring* (setting contents of *Environment Options* and *Monitoring*) will be saved, and monitoring can be performed with the same setting at the next setup.

3.5.2. Maintenance mode

The maintenance mode is a service support-specific mode that allows for the display and editing of parameter regions related to inverter control.

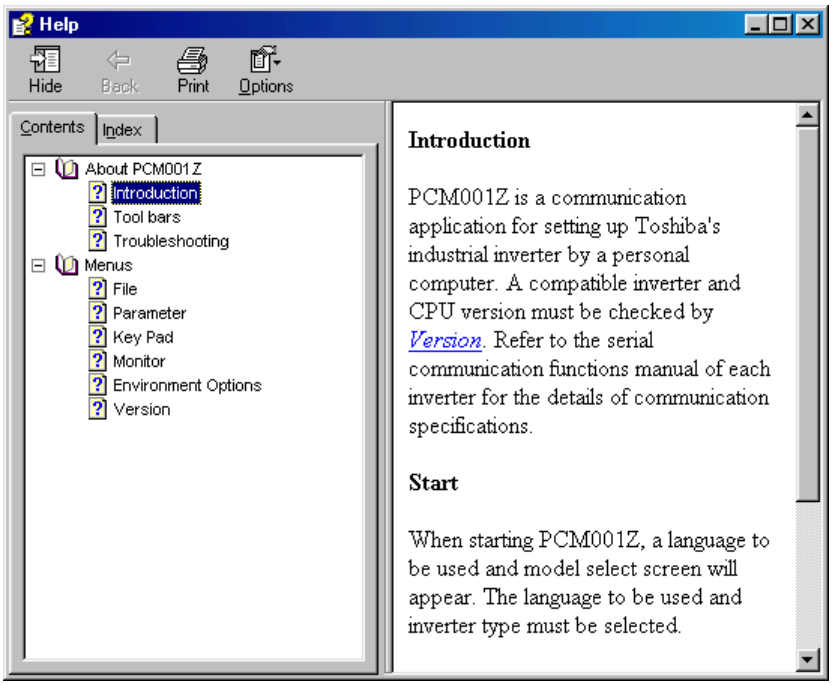
Caution

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.

3.6. Help

3.6.1. Help

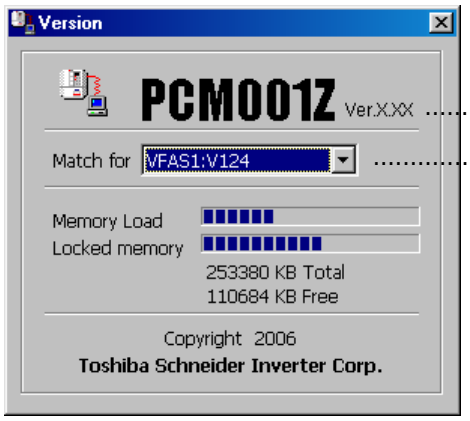
The PCM001Z online help file is not prepared.



3.6.2. About PCM001Z

The PCM001Z version number and corresponding inverters, and CPU versions are displayed.

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



..... Version of PCM001Z.

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

Figure 3-40 *About PCM001Z* screen

4. Standard specification

Items	Contents	Page
Support language*[1]	Japanese English	
Input file	PCM001Z parameter data (*.dat) PCM001Z parameter data (*.pcm) PCS001Z parameter data (*.pcs) PCM001Z monitor data (*.mon)	14
Output file	PCM001Z parameter data (*.pcm) Parameter table data (*.csv) PCM001Z monitor data (*.mon) Monitor data (*.csv) Monitor image (*.bmp, *.jpg, *.wmf)	16 30
Print function	Parameter table output Paper size / orientation, top, bottom, right and left margin setting Print item selection, Comment simultaneous print Preview	18
Communication setting	Protocol: TOSHIBA / MODBUS-RTU Communication port: COM1-15 Baud rate: 1200 / 2400 / 4800 / 9600 / 19200 / 38400bps Parity: None / even number/ odd number Broadcast, Inverter number support	19
Parameter communications	Parameter Import: User and maintenance parameter*[2] Parameter Export: User and maintenance parameter*[2] Parameter Comparison: User and maintenance parameter*[2]	22
Parameter table	User and maintenance parameter display*[3] Undo / Redo Hexadecimal code / Decimal code display Import / Export/Comparison Factory default display Display changed parameters only Display specified parameters only Copy in a clipboard by the MS-Excel form Communication number/function name find	20
Key Pad function	UP / DOWN / MON / ENT / RUN / STOP key support 4-digit 7-segment LED display RUN / MON / PRG / VEC / ECN lamp display, Key lamp display Operation frequency command value input setting function	29

Items	Contents	Page
Monitoring function	The number of monitors: Maximum 10 Time axis adjusting range: 0.5 – 30 s / div*4 Sampling rate: 100 – 5000 ms Number of sampling: 1250 - 10000 Display magnification, Offset adjustment (Real time) Automatic scroll function Automatic roll back at completion function Trigger function, pre-trigger function Long-time recording (24 hours max.) function Monitoring value unit change (A/V) function Zoom function, Data display function Inverter alarm/trip display function All monitor item value display on trip function Print function Graph backcolor, Forecolor setting function Inverter information display function	30
Others	Tool bar, On-line help, Version information, Parameter help*1	

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

*2 Switched by *Environment Options* option.

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

*4 Differs from the number of channels to be read.

5. Using example

A example using PCM001Z is introduced.

5.1. Parameter back-up operation

It is recommendable that the parameter setting of the inverter currently used be saved for regular maintenance and failures.

[Procedure]

(1) Start PCM001Z and select the inverter used.

(2) From *Tools* | *Environment Options*, clear a check from the "**Export 'Change' Parameters only**" and make "**Use Maintenance Mode**" to be checked.

(3) Select *Parameter* | *Parameter Import*, and import the setting value specified in the inverter into the computer. "**Communication error**" may be displayed while reading from the inverter. Press the [OK] button and continue import.

* If errors occur frequently, other causes can be considered. Refer to Troubleshooting of *Help*.

(4) Select *File* | *Save As*, and save the parameters import in the computer.

The parameter setting of the inverter will be saved with the above.

5.2. Inverter / Control board replacement operation

When an inverter or a control board is replaced, follow the procedure below, and write the parameter previously saved to the inverter. It is necessary to initialize a inverter format following the procedure (5) after writing.

[Procedure]

(1) Select the inverter connected.

(2) From *Tools* | *Environment Options*, clear a check from "**Export 'Change' Parameters only**" and make "**Export to EEPROM**" and "**Use Maintenance Mode**" to be checked.

(3) Select *File* | *Open* and specify any file.

* The open file can be checked in the parameter table.

(4) Select *Parameter* | *Parameter Export*, and export setting value from the computer to the inverter. "**Communication error**" may be displayed while writing. Press the [OK] button and continue export.

* If errors occur frequently, other causes can be considered. Refer to Troubleshooting of *Help*.

(5) From the parameter table, enter "**6**" in "**Set Val.**" for the parameter "**Standard setting mode selection (tYP)**", then press the Enter key. Next, press the F2 key, then the inverter is automatically initialized.

* After the initialization, the parameters written are valid. Communications cannot be accepted while the inverter is being initialized.

Parameter setting for the inverter is complete with the above after a inverter unit or a control board has been replaced.