TOSHIBA

E6581478①

TOSVERT VF-AS1/PS1

Trace Tool PCT001Z-E

Instruction Manual

NOTICE

1. Please read this manual before installing or operating. Keep this instruction manual on hand of the end user, and make use of this manual in maintenance and inspection.
2. All information contained in this manual will be changed without notice. Please contact your Toshiba distributor to confirm the latest information.

TOSHIBA

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1.Introduction

This instruction manual is used for PCT001Z-E with version 103 or later.
The version of PCT001Z-E will be frequently upgraded.

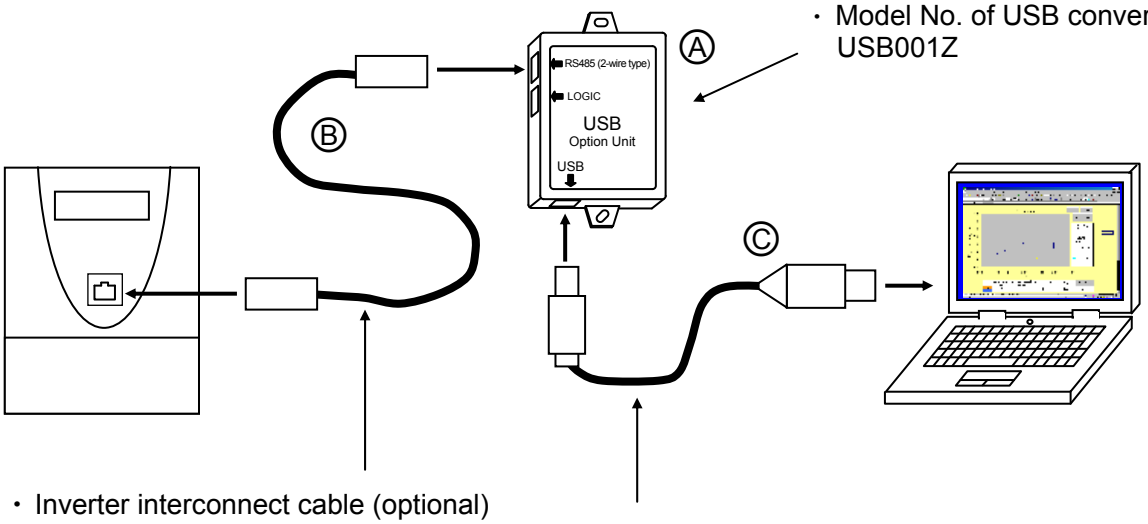
The trace tool “PCT001Z-E” for VF-AS1/PS1 is the software that performs the following functions when used with an inverter connected to a computer via an RS-485 communications device. Please read this manual carefully along with the instruction manual for VF-AS1/PS1 before using PCT001Z-E and use it correctly.

- Exporting and Importing trace function-related parameters
- Reading information on the inverter
- Reading trace data
- Displaying read trace data in graphic form
- Storing trace data

*1 PCT001Z-E does not support any inverters other than VF-AS1/PS1.

*2 To use PCT001Z-E, the USB converter unit shown in Fig. 1 below are required.

- USB converter unit (part Ⓐ in this figure)
- Inverter interconnect cable (part Ⓑ in this figure)
- Computer interconnect cable (part © in this figure)



- Model No. of USB converter unit: USB001Z

- Inverter interconnect cable (optional)

Model number	Cable length
CAB0011	1.2m
CAB0013	3.6m
CAB0015	4.8m

- USB cable (A-B connection type)
  Prepare a commercially available USB cable (USB1.1/2.0-compliant).
  Recommended cable length: 1m

Fig. 1 An example of connection of USB converter unit

*3 PCT001Z-E uses the TOSHIBA inverter protocol. Therefore, please set the TOSHIBA protocol (F807 = 0) to the protocol selection of drive.

*4 System requirements

Personal computer with Microsoft® Excel® installed

Others: A serial port or a USB port is required for the computer to connect to the inverter.

It is recommendable to use a mouse or a similar pointing device for operation.

*5 It has been confirmed that PCT001Z-E runs normally on the software listed in the table below.

Microsoft Excel	MS-Excel 2010
English version	○

*6 When using an optional USB communication converter, connect the converter before starting PCT001Z-E. Do not plug or unplug the connector when PCT001Z-E is running.

*7 How to install PCT001Z-E

To install PCT001Z-E, just extract the zip file and move it into the desired folder.

Take the following precautions when installing PCT001Z-E.

・ Exit running application programs.

・ When updating latest PCT001Z-E, uninstall the old version of PCT001Z-E. (The version of PCT001Z-E is shown in the Opening window (section 2.3).)

*8 How to uninstall PCT001Z-E

To uninstall PCT001Z-E, just remove the folder containing PCT001Z-E from the computer.

☆ The specifications of this software is subject to change without notice.

☆ Toshiba Schneider Inverter assumes no responsibility for damage caused directly or indirectly by the use or a malfunction of this software product.

☆ These system requirements are minimum conditions required for the use of PCT001Z-E. They do not guarantee that all functions of PCT001Z-E are performed normally.

☆ Windows® is listed as the abbreviation for a Microsoft® Windows® operating system. Microsoft® Windows® and Microsoft® Excel® are registered trademarks or trademarks of the US Microsoft Corporation in the USA and other countries.

☆ The symbols used in this manual have the following meanings.

[ ]: Buttons or radio buttons in windows of PCT001Z-E or Microsoft Windows

' ': Menu items of PCT001Z-E

2.How to use PCT001Z-E

2.1.Enabling macros

When PCT001Z-E is started for the first time, the dialog box (shown in Fig. 2 or 3) may appear. If it appears, click the [Enable Macros] or [Enable Content], because PCT001Z-E uses macros.

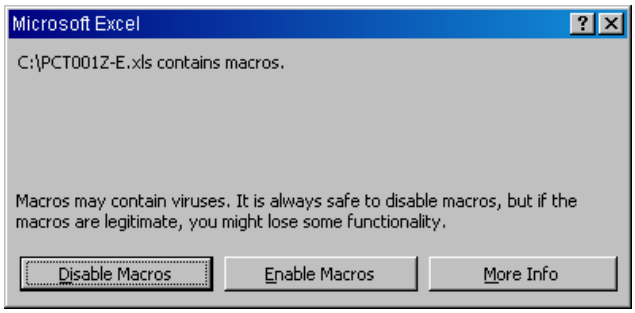


Fig. 2 Security warning 1

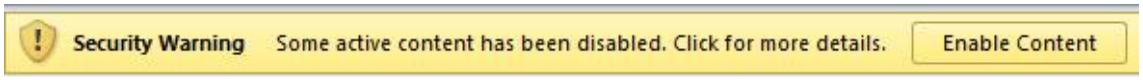


Fig. 3 Security warning 2

2.2.License agreement

When PCT001Z-E is started for the first time or after macros have been enabled, the PCT001Z-E license agreement window (Fig. 4) appears. Read the contents carefully and click [I Agree] if you wish to use PCT001Z-E. Clicking [I Do Not Agree] closes the Excel book.

Fig. 4　License agreement

2.3.Opening window

When macros are executed, the Opening sheet (Fig. 5) appears. After reading the instruction manual (this manual) carefully, click [To setting >] in the top-right of the window and make necessary settings.

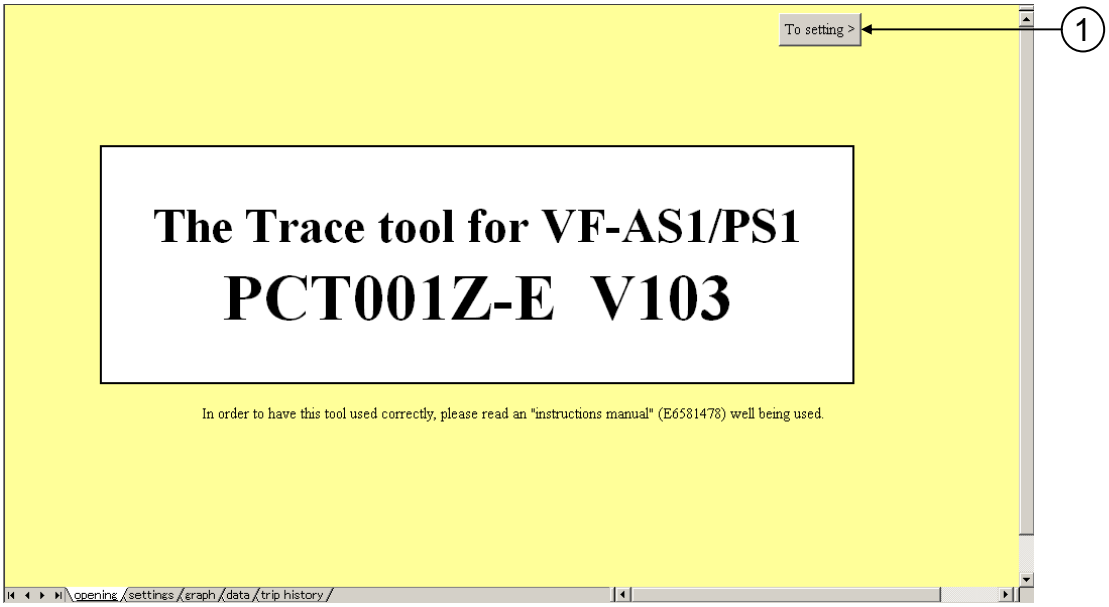


Fig. 5　Opening window

① [To setting >]

Click this button to move from the Opening sheet to the Setting sheet.

2.4.Setting sheet

The Setting sheet (Fig. 6) allows you to make settings necessary for communications between the inverter and the computer and to export and import related parameters.

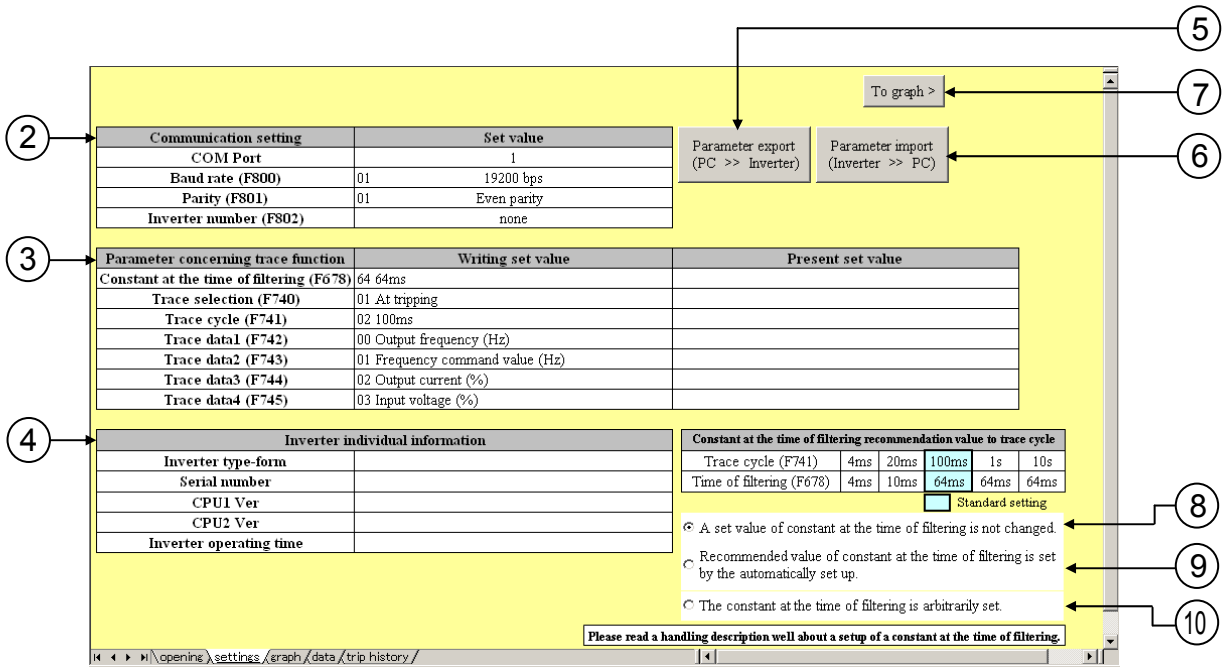


Fig. 6 Setting sheet

② Communication setting[*1]

Communication setting	Set value
COM Port	1
Baud rate (F800)	01 19200 bps
Parity (F801)	00 9600 bps 01 19200 bps 02 38400 bps
Inverter number (F802)	

Fig. 7 Communication setting

'COM Port': Specify the COM port number of the computer.

'Baud rate (F800)': Specify the baud rate of the inverter.

'Parity (F801)': Specify the parity of the inverter.

'Inverter number (F802)': Specify the number assigned to the inverter.

Communicate by disregarding the inverter number when setting the Inverter number of PCT001Z-E to “none”.

*1 If you select a parameter other than parameters set for the inverter or the computer connected to it, an error may occur during communication.

Table 1 Table of settings for communications with inverter[*2]

Title	Content	Adjustment range	Default setting
F800	Baud rate	0:9600bps 1:19200bps 2:38400bps	1
F801	Parity	0:Non parity 1:Even parity 2:Odd parity	1
F802	Inverter number	0~99[*3]	0

*2 The communication error might occur according to the setting of a communication function parameter (F803-F808 and etc.) other than the above.
For details, refer to the instruction manual of VF-AS1/PS1.

*3 Since PCT001Z-E uses the Toshiba inverter protocol ASCII mode, only a number between 0 and 99 can be assigned to an inverter.

③ Parameters concerning trace function[*4]

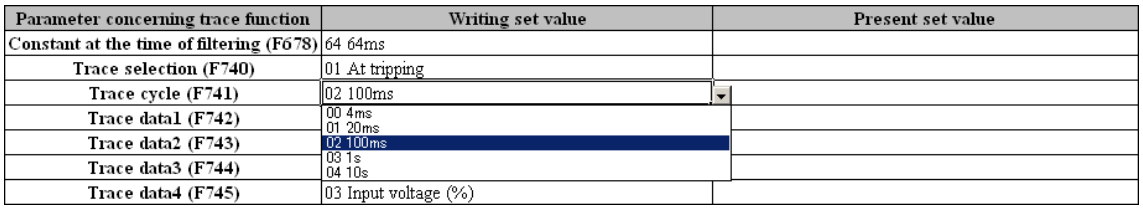


Fig. 8 Parameters concerning trace function

'Constant at the time of filtering (F678)': Select the size of constant at the time of filtering. [*5]
'Trace selection (F740)': Select the trace data acquisition timing.
'Trace cycle (F741)': Select the trace cycle.
'Trace data1 to 4 (F742 to F745)': Select type of data.

*4 Set all trace-related parameters before operating the inverter. If after the inverter did trip or trigger that it is changed, that data cannot be read.

*5 Take special care when using analog output signals (FM and AM terminals) with the inverter.
The constant at the time of filtering (F678) also acts on analog output signals.
Therefore, if there is a probability that these output signals will affect the machine, do not change the value of constant at the time of filtering.
By default, the constant is set at 64ms.

Table2 Parameters concerning trace function

Title	Content	Adjustment range	Default setting
F678	Constant at the time of filtering	4ms, 8ms~100ms	64
F740	Trace selection	0:Deselect 1:At tripping 2:At triggering	1
F741	Trace cycle	0:4ms 1:20ms 2:100ms 3:1s 4:10s	2
F742	Trace data1	00:Output frequency (Hz) 01:Frequency command value (Hz) 02:Output current (%) 03:Input voltage (%) 04:Output voltage (%) 05:Compensated frequency (Hz) 06:Speed feedback (real-time value) (Hz) 07:Speed feedback (1-second filter) (Hz) 08:Torque (%) 09:Torque command (%) 11:Torque current (%) 12:Exciting current (%) 13:PID feedback value (Hz) 14:Motor overload factor (OL2 data) (%) 15:Inverter overload factor (OL1 data) (%) 16:PBR overload factor (OLr data) (%) 17:PBR load factor (%ED) (%) 18:Input power (kW) 19:Output power (kW) 23:Optional AI2 input (%) 24:RR/S4 input (%) 25:VI/II input (%) 26:RX input (%) 27:Optional AI1 input (%) 28:FM output (%) 29:AM output (%) 34:Integral input power (kWhr) 35:Integral output power (kWhr)	0
F743	Trace data2	Same as trace data1*6	1
F744	Trace data3	Same as trace data1*6	2
F745	Trace data4	Same as trace data1*6	3

*6 My Function monitors 1 through 4 at 46 through 49 cannot be specified with any parameter between F742 and F745 (kinds of data to be acquired).

④ Inverter individual information

Inverter individual information	
Inverter type-form	VFAS1-2037PL
Serial number	0000000000000000
CPU1 Ver	160
CPU2 Ver	900
Inverter operating time	10 hours

Fig. 9 Inverter individual information

'Inverter type-form': Displays the type of the inverter.

'Serial number': Displays the serial number of the inverter.

'CPU1 Ver': Displays the version of the inverter's CPU1.

'CPU2 Ver': Displays the version of the inverter's CPU2.

'Inverter operating time': Displays the operating time of the inverter.

⑤ [Parameter export]

The values set for the trace-related parameters (Fig. 8) is exported into the inverter by clicking this button. After that, import the values set for the trace-related parameters (Fig. 8) and information on the inverter (Fig. 9)[*7].

⑥ [Parameter import]

The values set for the trace-related parameters (Fig. 8) and information on the inverter (Fig. 9) are imported by clicking this button.

⑦ [To graph >]

The Graphic sheet is shown by clicking this button.

⑧ [A set value of constant at the time of filtering is not changed.]

If this radio button is checked, clicking [Parameter export] will not change the value of constant at the time of filtering. (Select this option under normal conditions.)

⑨ [Recommended value of constant at the time of filtering is set by the automatic set up.][*8]

If this radio button is checked, clicking [Parameter export] will export the value of constant at the time of filtering recommended for the trace cycle into the inverter. The value set with F678 (constant at the time of filtering), however, does not take effect.

The table below shows correspondences between trace cycle and recommended value of constant at the time of filtering.

Table 3 Correspondence between trace cycle and recommended value of constant at the time of filtering

Trace cycle	4ms	20ms	100ms	1s	10s
Constant at the time of filtering	4ms	10ms	64ms	64ms	64ms

⑩ [The constant at the time of filtering is arbitrarily set.][*8]

If this radio button is checked, clicking [Parameter export] will export the value of constant at the time of filtering you have selected from the drop-down menu into the inverter.

*7 In PCT001Z-E before version 102, a set value is not read after writing.

*8 If you select [Recommended value of constant at the time of filtering is set by the automatic set up.] and [The constant at the time of filtering is arbitrarily set.] to export the set values, the message “Export completion. Please return the vase value of Constant at the time of filtering (F678) after data acquisition ends” (Fig. 10) will soon appear.

Fig. 10 Confirmation of setting

2.5.Graphic sheet

The Graphic sheet (Fig. 11) allows you to read trace data and display it in graphic form.

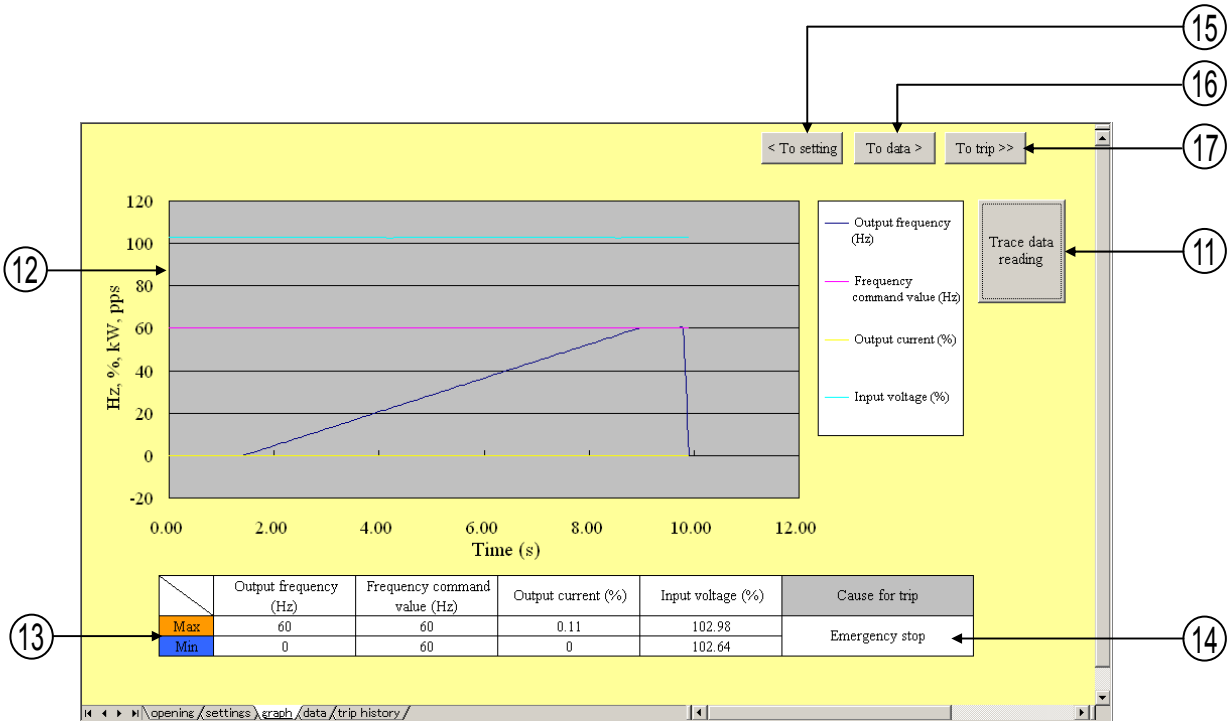


Fig. 11 Graphic sheet

Fig. 12 Reset approval

⑪ [Trace data reading]

The trace data stored in the inverter is read and displayed in graphic form by clicking this button.

If “At triggering” is not selected for the trace selection, the “Reset approval” window (Fig. 12) will appear and data will be read after the approval is given, because the inverter needs to be reset before data is read in such cases.

At that time, the trace selection on the inverter side is disabled temporarily, so if communications are interrupted halfway, the trace selection will remain “disabled.” In that case, please return the value of the trace selection to its original value.

⑫ 'Graph'

Displays acquired data in graphic form.

⑬ 'Max' 'Min'

Displays the maximum and minimum values of 4 kinds of data acquired.

⑭ 'Cause for trip'

Displays the cause of tripping of the inverter.

⑮ [< To setting]

The Setting sheet is shown by clicking this button.

⑯ [To data >]

The Data sheet is shown by clicking this button.

⑰ [To trip >]

The Trip history sheet is shown by clicking this button.

⑱ [I Agree]

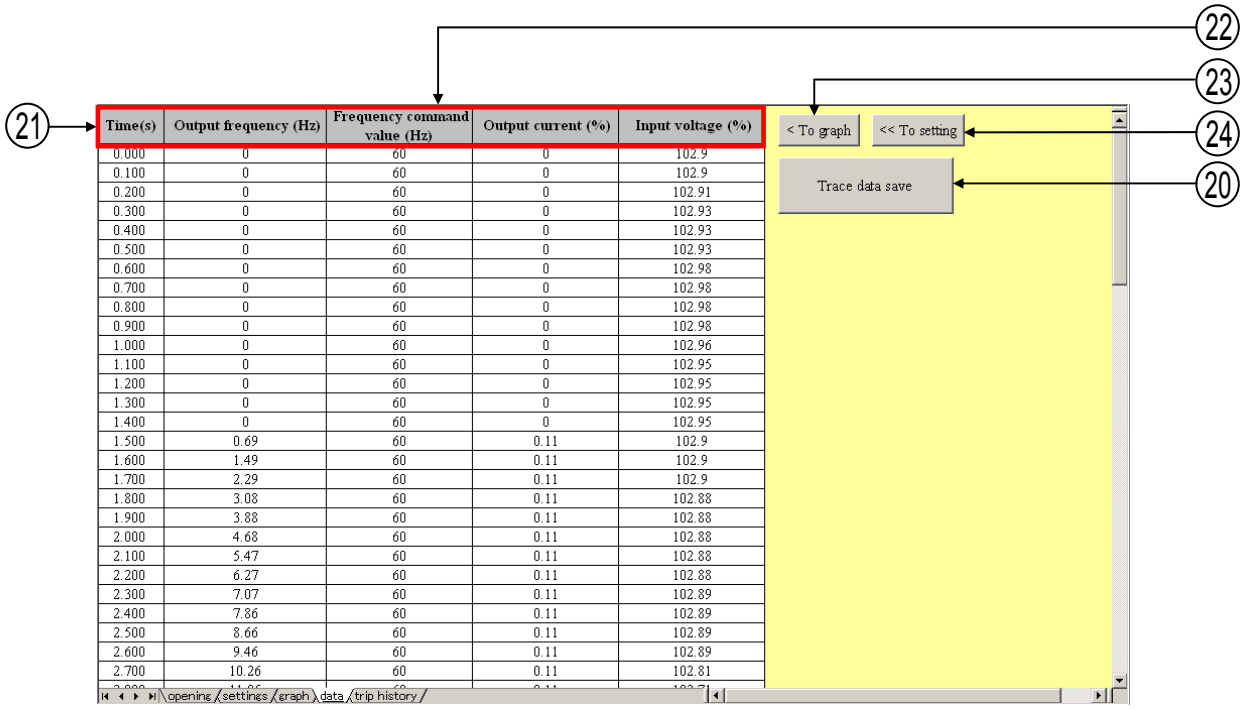
Reset the inverter and read trace data by clicking this button.

⑲ [I Do Not Agree]

Stop operation without resetting the inverter (no trace data is read, but detailed history are read from drive) by clicking this button.

2.6.Data sheet

The data sheet (Fig. 13) lists 4 kinds of acquired numerical data (data 1 through 4) in groups of 100 each.



Time(s)	Output frequency (Hz)	Frequency command value (Hz)	Output current (%)	Input voltage (%)
0.000	0	60	0	102.9
0.100	0	60	0	102.9
0.200	0	60	0	102.91
0.300	0	60	0	102.93
0.400	0	60	0	102.93
0.500	0	60	0	102.93
0.600	0	60	0	102.98
0.700	0	60	0	102.98
0.800	0	60	0	102.98
0.900	0	60	0	102.98
1.000	0	60	0	102.96
1.100	0	60	0	102.95
1.200	0	60	0	102.95
1.300	0	60	0	102.95
1.400	0	60	0	102.95
1.500	0.69	60	0.11	102.9
1.600	1.49	60	0.11	102.9
1.700	2.29	60	0.11	102.9
1.800	3.08	60	0.11	102.88
1.900	3.88	60	0.11	102.88
2.000	4.68	60	0.11	102.88
2.100	5.47	60	0.11	102.88
2.200	6.27	60	0.11	102.88
2.300	7.07	60	0.11	102.89
2.400	7.86	60	0.11	102.89
2.500	8.66	60	0.11	102.89
2.600	9.46	60	0.11	102.89
2.700	10.26	60	0.11	102.81

Fig. 13 Data sheet

⑳ [Trace data save]

Click this button to name and save the file automatically. The file name consists of date and time when data is saved. The file name can be changed when saving the file.

An example of a file name assigned automatically is shown in the table below.

・Example of file name

Current date and time	8:30 A.M. on June 10, 2012
Name assigned to the file	TRACE-061020120830.xls

㉑ 'Time(s)'

Displays the time at the same intervals as the trace cycle.

㉒ “4 kinds of data acquired”

Displays 4 kinds of data acquired in groups of 100 each.

㉓ [< To graph]

The Graphic sheet is shown by clicking this button.

㉔ [<< To setting]

The Setting sheet is shown by clicking this button.

2.7.Trip history sheet

The trip sheet (Fig. 14) lists details history at a past trip of trips 1 to 4.

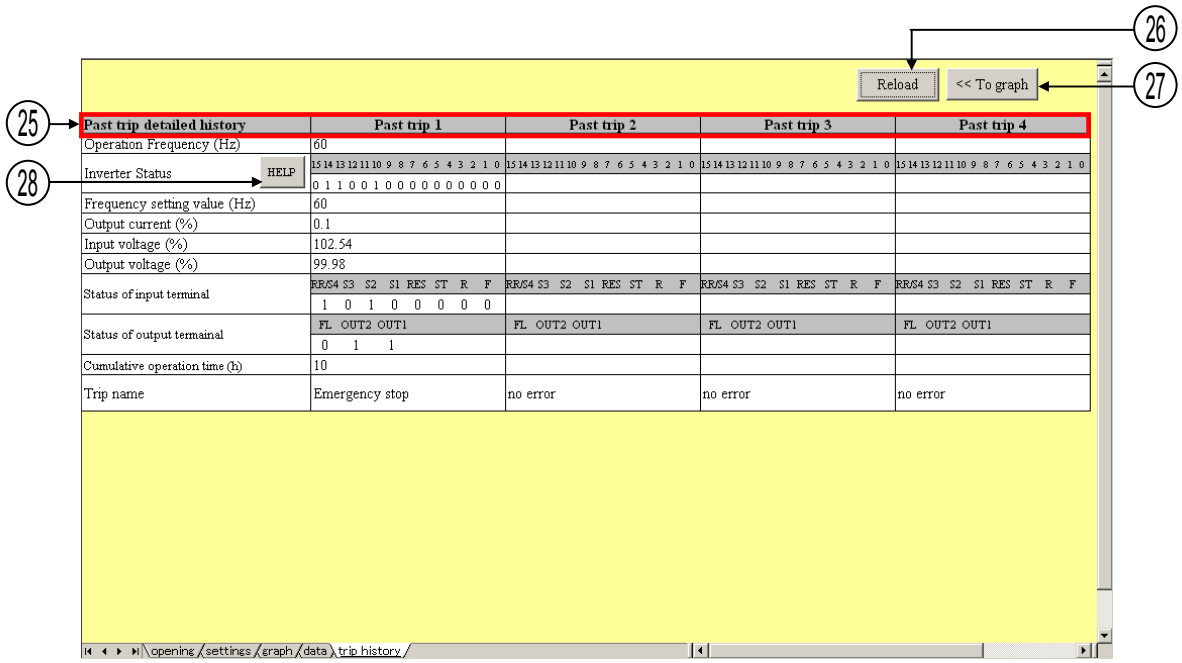


Fig.14 Trip sheet

㉕ “Past trip detailed history”

Displays acquired details on a past trip of trips 1 to 4.

㉖ [Reload]

The detailed history is read from drive by clicking this button. And then, a detailed history will be updated on the sheet.

㉗ [<<To graph]

The Trip sheet is shown to the graph sheet by clicking this button.

㉘ [HELP]

The Inverter Status help is shown by clicking this button.

3.Troubleshooting

This section explains problems that may occur when PCT001Z-E is used.

Q1 : Although the [Trace data reading] button is clicked, time-out occurs.
A1 : Communication between the inverter and the computer is not established. Check whether the cable is connected properly and all settings for communications are made correctly.

Q2 : Although trace data is acquired, no data is displayed or other data is displayed.
A2 : Check whether “Deselect” is selected for 'Trace selection'.

Q3 : Trace data acquired is discontinuous.
A3 : This phenomenon occurs if the inverter is tripped or triggered and the recording of trace data is interrupted before 100 pieces of trace data are collected, and therefore the previous data remains. This phenomenon may occur if the inverter is tripped or triggered immediately after Power supply turning on.

Q4 : The trace tool software has started, but it does not respond to the click of any button.
A4 : This phenomenon occurs if the Excel’s macro security is set at 'High' level. To solve this problem, set the macro security at 'Medium' or lower level.

Q5 : The instruction manuals for VF-AS1 and VF-PS1 states that any number of up to 248 can be assigned to an inverter (F802), but only a number of up to 99 can be assigned with PCT001Z-E.
A5 : Since PCT001Z-E uses the Toshiba inverter protocol ASCII mode, only a number between 0 and 99 can be assigned to an inverter.

Q6 : The communication error is occurred when use PCT001Z-E and PCM001Z.
A6 : Because PCM001Z occupies the communication port, PCM001Z and PCT001Z-E can not be used at the same time. Please use PCT001Z-E after PCM001Z ended. Or please use a different port from PCM001Z.

4.Outline of the trace tool function

Item		Content				
Trace function	Number of sampling	100 points				
	Trace cycle(F741) / Tracing time	4ms / 400ms	20ms / 2s	100ms / 10s	1s / 100s	10s / 1000s
	Number of trace data	4 data. They are set by parameter F742 to F745.				
	Trace object*1 (F742 to F745)	They are selected from following items by parameter settings. Output frequency, Frequency command value, Output current, Input voltage, Output voltage, Compensated frequency, Speed feedback(real-time value), Speed feedback (1-second filter), Torque, Torque command, Torque current, Exciting current, PID feedback value, Motor overload factor (OL2 data), Inverter overload factor (OL1 data), PBR overload factor (OLr data), PBR load factor (% ED), Input power, Output power, Optional AI2 input, RR/S4 input, VI/II input, RX input, Optional AI1 input, FM output, AM output, Integral input power, Integral output power				
Trigger setting	Trip (F740=1)	The update of the trace data is stopped at trip. The trace data is recorded in the nonvolatile storage area in the inverter, and after it resets it, can be read with this tool. When the inverter is doing trip or stopping, the trace data recorded by trip can be read. However, data cannot be read while the inverter is driving.				
	Input terminal (F740=2)	The acquisition of the trace data begins on the terminal input (No.76 or No.77), and after the data of 100 points is acquired, the update of the trace data is stopped. In this case, the trace data is deleted by power supply reset of the inverter.				
Filter setting		The value filtered so that the time constant may reach a set value is preserved as trace data. Setting range of the time constant: 4ms or 8ms to 100ms.				
Saving file format		'.xls' file format				
Com. settings	COM port	1 to 30				
	Baud rate	9600bps, 19200bps, 38400bps (Match it to setting on inverter side. (F800))				
	Parity	No parity, Even parity or Odd parity (Match it to setting on inverter side. (F801))				
	Inverter number	Nothing or 00 to 99 (Match it to setting on inverter side. (F802))				

*1 When the version before V152/V652 of VF-AS1/PS1 is used, a part of data for the trace (PBR overload factor, PB load factor, Input power and Output power) cannot be acquired.