TOSHIBA

TOSVERT VF-AS3

Trace Tool PCT003Z-E

Instruction Manual

TOSHIBA INDUSTRIAL PRODUCTS AND SYSTEMS CORPORATION

NOTICE

1. 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.

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1.Introduction

The trace tool "PCT003Z-E" for VF-AS3 is software that performs the following functions when used with an inverter connected to a computer via an RS-485 communications device. Read this manual carefully along with the instruction manual for VF-AS3 before using PCT003Z-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 PCT003Z-E does not support any inverters other than VF-AS3.

*2 To use PCT003Z-E, the USB converters unit shown in Fig. 1 below are required.

*3 PCT003Z-E use the TOSHIBA inverter protocol. Therefore, please set the TOSHIBA protocol (F807 = 0) or (F827=0) to the protocol selection of inverter.
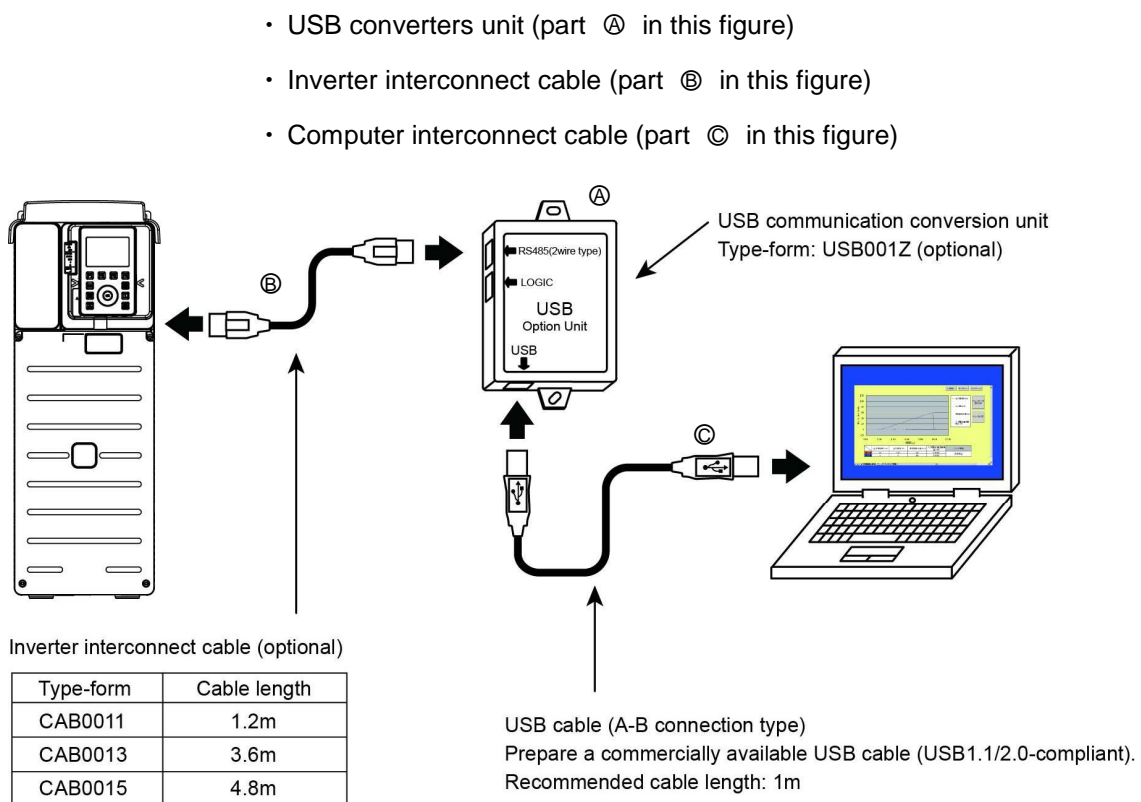
・ USB converters unit (part Ⓐ in this figure)

・ Inverter interconnect cable (part Ⓑ in this figure)

・ Computer interconnect cable (part Ⓒ in this figure)

Inverter interconnect cable (optional)

Type-form	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 converters unit

*4 System requirements

Personal computer with Microsoft® Excel® installed

Others: 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 PCT003Z-E may not run normally on some types of PC-98 series computers.

*6 It has been confirmed that PCT003Z-E runs normally on the software listed in the table below.

Microsoft Excel	MS-Excel 2007 32bit
English version	○

*7 Connect the optional USB communication converter before starting PCT003Z-E. Do not plug or unplug the connector when PCT003Z-E is running.

*8 How to install PCT003Z-E

To install PCT003Z-E, just extract the zip file and move it into the desired folder.

Take the following precautions when installing PCT003Z-E.

・ Exit running application programs.

・ When updating latest PCT003Z-E, uninstall the old version of PCT003Z-E. (The version of PCT003Z-E is shown in the Opening window (section 2.3).)

*9 How to uninstall PCT003Z-E

To uninstall PCT003Z-E, just remove the folder containing PCT003Z-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 PCT003Z-E. They do not guarantee that all functions of PCT003Z-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.

☆ PC-98 series is a trademark or registered trademark of NEC Corporation.

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

[ ]: Buttons or radio buttons in windows of PCT003Z-E or Microsoft Windows

' ': Menus items of PCT003Z-E

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2.How to use PCT003Z-E

2.1.Enabling macros

When PCT003Z-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 PCT003Z-E uses macros.
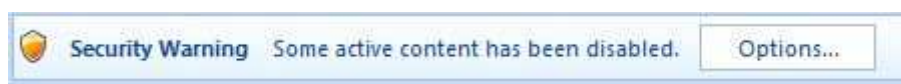

Fig. 2   Security warning 1

Fig. 3   Security warning 2

2.2.License agreement

When PCT003Z-E is started for the first time or after macros have been enabled, the PCT003Z-E license agreement window (Fig. 4) appears. Read the contents carefully and click [I Agree] if you wish to use PCT003Z-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.
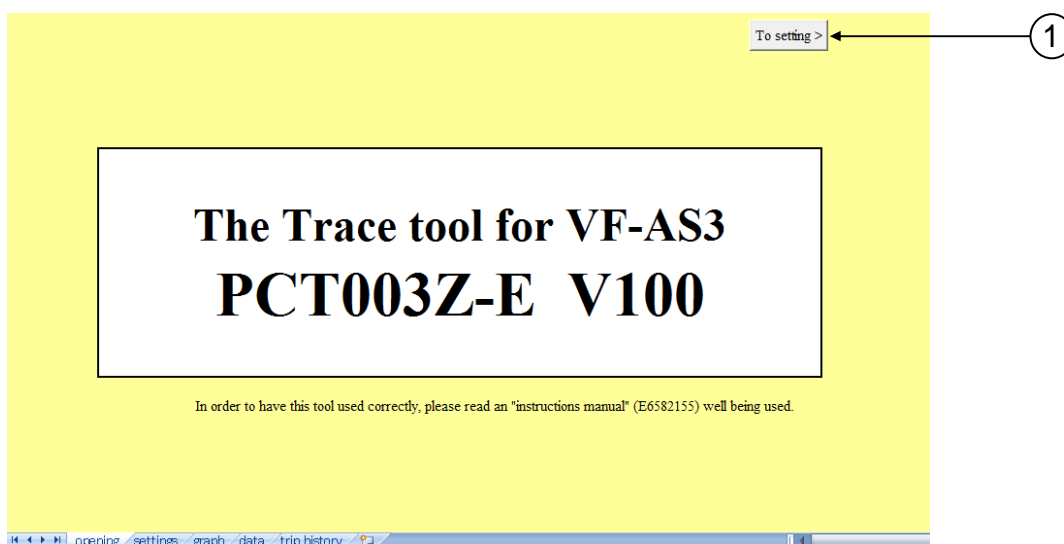

Fig. 5   Opening window

① [To setting >]

The Setting sheet is shown by clicking this button.

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.
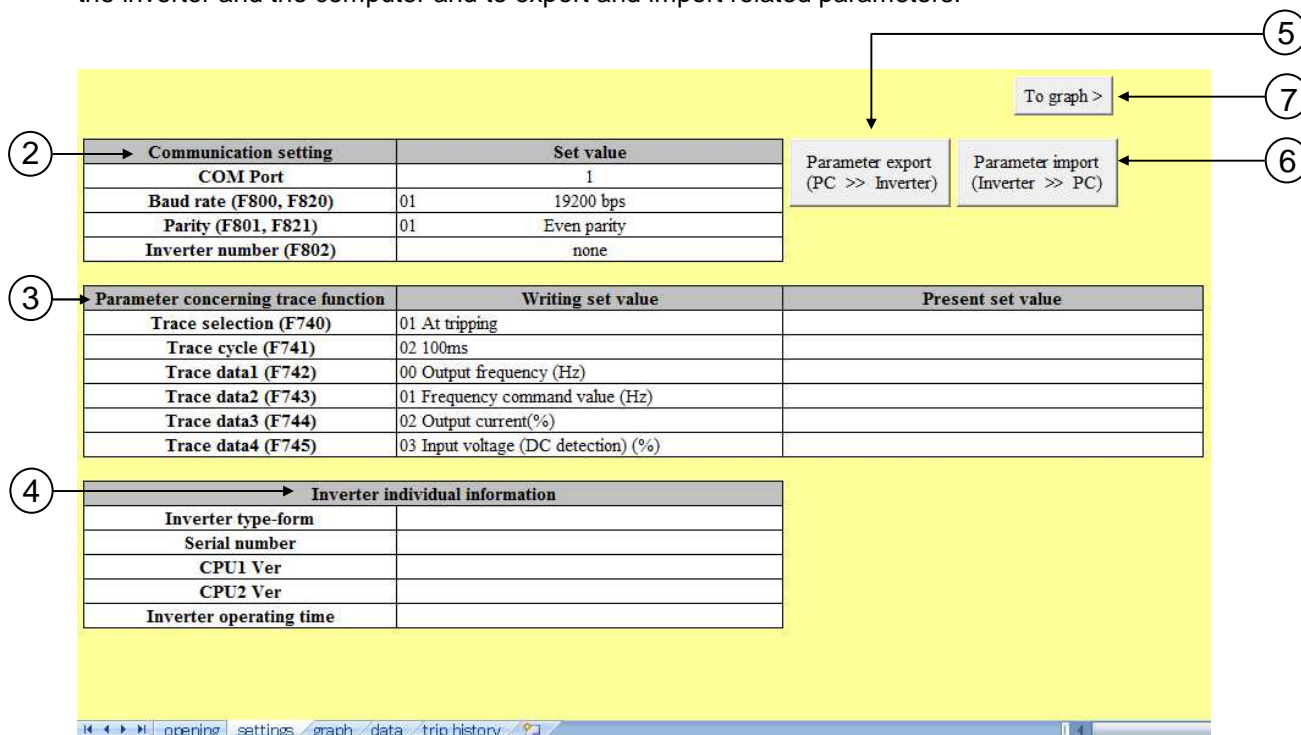

Fig. 6   Setting sheet

② Communication setting[*1]

Fig. 7   Communication setting

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

'Baud rate': Specify the baud rate (F800, F820[*2]) of the inverter.

'Parity': Specify the parity (F801, F821[*2]) of the inverter.

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

Communicate by disregarding the inverter number when setting the Inverter number of PCT003Z-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.

*2 Please set the parameters of the RS485 port (1 or 2) to be used.

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

Title	Content	Adjustment range	Default setting
F800, F820	Baud rate	0:9600bps　1:19200bps　2:38400bps	1
F801, F821	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) other than the above.

For details, refer to "TOSVERT VF-AS3 Detailed manual : E6582062".

*3 Since PCT003Z-E uses the Toshiba inverter protocol ASCII mode, only a number

between 0 and 99 can be assigned to an inverter.

③ Parameter concerning trace function[4]

Parameter concerning trace function	Writing set value	Present set value
Trace selection (F740)	01 At tripping	
Trace cycle (F741)	02 100ms	
Trace data1 (F742)	00 4ms / 01 20ms / 02 100ms / 03 1s / 04 10s	
Trace data2 (F743)		
Trace data3 (F744)		
Trace data4 (F745)	03 Input voltage(DC detection) (%)	

Fig. 8　Parameter concerning trace function

'Trace selection(F740)': Select the trace data acquisition timin.

'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.

Table2　Parameter concerning trace functions

Title	Content	Adjustment range	Default setting
F740	Trace selection	0:Deselect　1:At tripping　2:At triggering　3:1+2	1
F741	Trace cycle	0:4ms　1:20ms　2:100ms　3:1s　4:10s	2
F742	Trace data1	0-162	0
F743	Trace data2	0-162	1
F744	Trace data3	0-162	2
F745	Trace data4	0-162	3

[F742] to [F745] setting

Set value	Communication number	Trace data (Monitor data)	Communication unit at trace
0	FD00	Output frequency	0.01Hz
1	FD02	Frequency command value	0.01Hz
2	FD03	Output current	0.01%
3	FD04	Input voltage (DC detection)	0.01%
4	FD05	Output voltage	0.01%
5	FD15	Stator frequency	0.01Hz
6	FD16	Speed feedback frequency (real time)	0.01Hz
7	FD17	Speed feedback frequency (1-second filter)	0.01Hz
8	FD18	Torque	0.01%
9	FD19	Torque command	0.01%
10	FD99	Output frequency during run. Frequency command value during stop.	0.01Hz
11	FD20	Torque current	0.01%
12	FD21	Exciting current	0.01%
13	FD22	PID feedback value	0.01Hz
14	FD23	Motor overload factor (OL2 data)	0.01%
15	FD24	Inverter overload factor (OL1 data)	0.01%
16	FD25	Braking resistor overload factor (OLr data)	1%
17	FD28	Braking resistor load factor (%ED)	1%
18	FD29	Input power	0.01kW
19	FD30	Output power	0.01kW
20	FE76	Input cumulative power	[F749] setting
21	FE77	Output cumulative power	[F749] setting
24	FE35	Terminal RR input value	0.01%
25	FE36	Terminal RX input value	0.01%
26	FE37	Terminal II input value	0.01%
27	FD94	Motor speed command	$1min^{-1}$
34	FD26	Motor load factor	1%
35	FD27	Inverter load factor	1%
62	FD48	PID result frequency	0.01Hz
63	FD58	PID set value	0.01Hz
64	FD50	Light-load high-speed switching load torque	0.01%
65	FD51	Light-load high-speed torque during constant speed run	0.01%
71	FD90	Motor speed (estimated value)	$1min^{-1}$
76	FE56	Terminal S4/S5 pulse train input value	1pps
79	FD87	Dancer control PID result frequency	0.01Hz

[F742] to [F745] setting

Set value	Communication number	Trace data (Monitor data)	Communication unit at trace
120	FD83	Internal temperature 1	-
124	FE78	Power circuit board temperature	-
130	FD96	External PID3 set value	-
131	FD97	External PID3 feedback value	-
132	FD98	External PID3 result value	-
133	FE96	External PID4 set value	-
134	FE97	External PID4 feedback value	-
135	FE98	External PID4 result value	-
155	FD18	Signed torque	0.01%
156	FD19	Signed torque command	0.01%
158	FD20	Signed torque current	0.01%
160	FE37	Signed terminal RX input value	0.01%
161	FE38	Signed terminal AI4 input value	0.01%
162	FE39	Signed terminal AI5 input value	0.01%

④   Inverter individual information

Inverter individual information	
Inverter type-form	VFAS3-2022P
Serial number	0001000200030004
CPU1 Ver	102
CPU2 Ver	1101
Inverter operating time	0 hour

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, the values set for the trace-related parameters (Fig. 8) and information on the inverter (Fig. 9) are imported.

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.

2.5.Graphic sheet

The Graphic sheet (Fig. 10) allows you to read trace data and display it in graphic form.
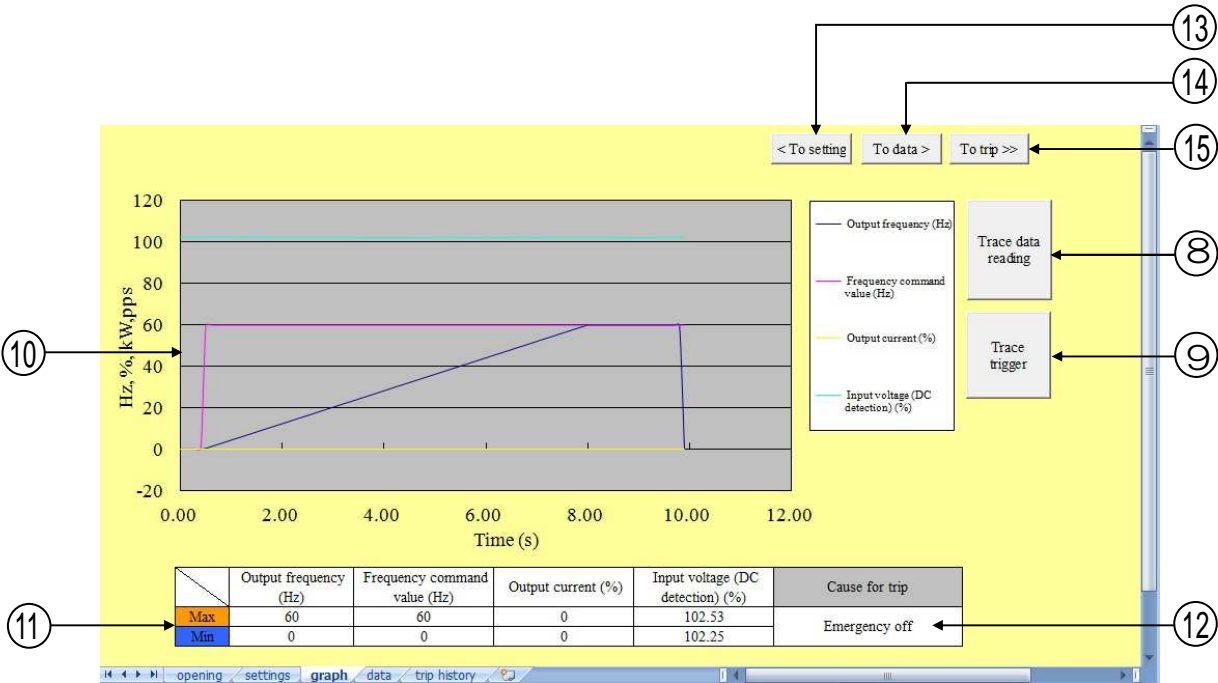

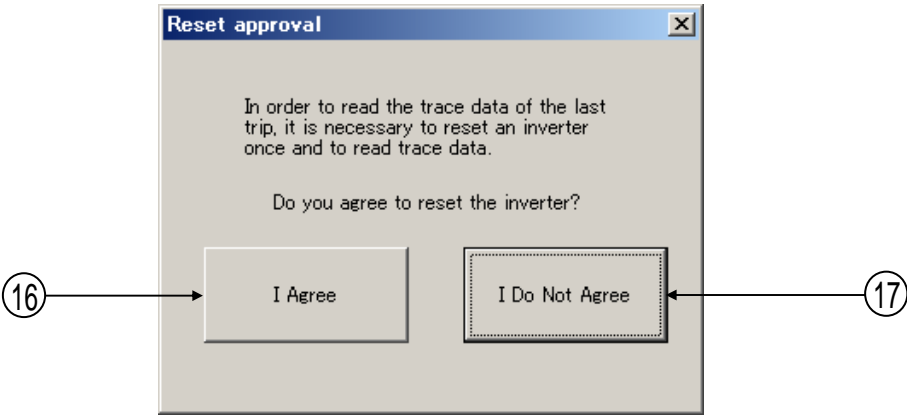Fig. 10   Graphic sheet

Fig. 12   Reset approval

⑧ [Trace data reading]

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

When 1 or 3 is set to F740 and read the data until occur the trip, please execute reading in the state of the trip to read data correctly. Alternatively, if you record the trace data with the trigger, please read the trace data before resetting the power supply.

⑨ [Trace trigger]

When setting value of F740 is 1 or 3, The trace data until that time stored in the inverter is read and displayed in graphic form by clicking this button. At that time, the trace selection on the inverter side is disabled temporarily, so if communications are interrupted halfway, the trace selection will be set to "disabled". In that case, please set the former value once again.

⑩ 'Graph'

Displays acquired data in graphic form.

⑪ 'Max' 'Min'

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

⑫ 'Cause for trip'

Display the cause of tripping of the inverter.

⑬ [< To setting]

The Setting sheet is shown by clicking this button.

⑭ [To data >]

The Data sheet is shown by clicking this button.

⑮ [To trip >>]

The Trip history sheet is shown by clicking this button.

⑯ [I Agree]

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

⑰ [I Do Not Agree]

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

2.6.Data sheet

The data sheet (Fig. 12) lists 4 kinds of acquired numerical data (data 1 through 4) in groups of 100 each.
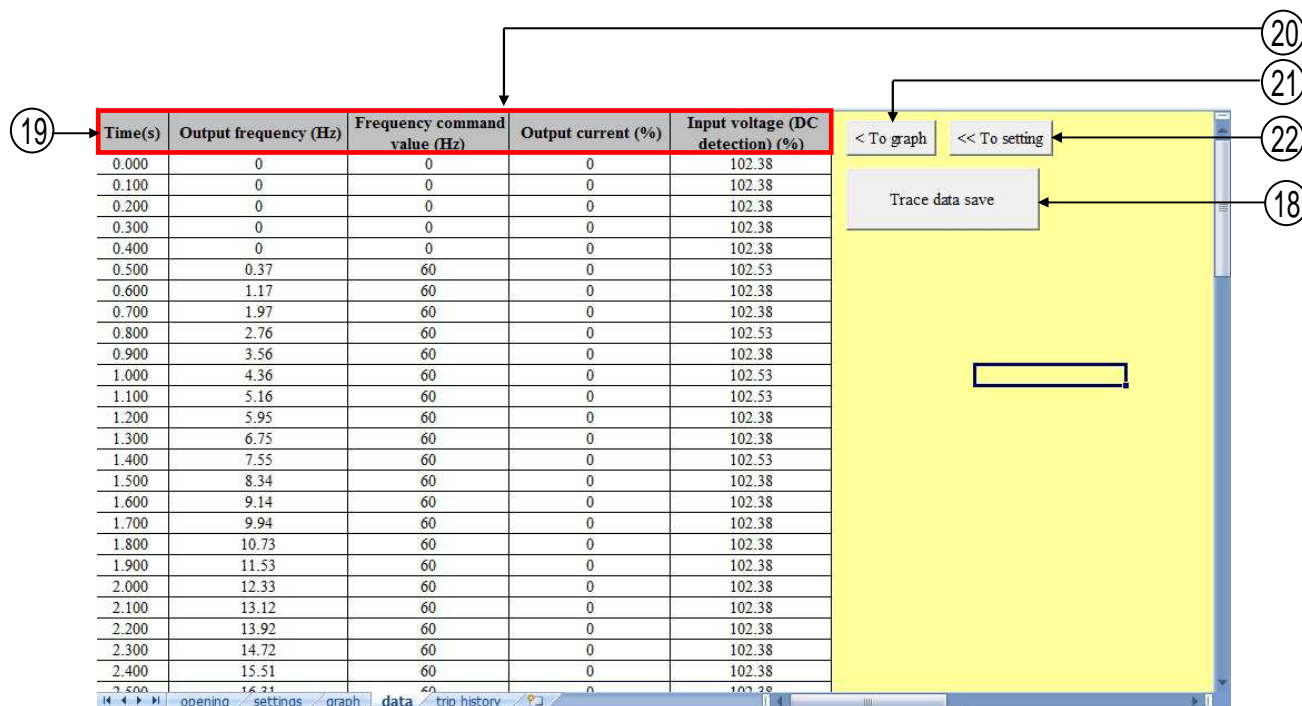

Time(s)	Output frequency (Hz)	Frequency command value (Hz)	Output current (%)	Input voltage (DC detection) (%)
0.000	0	0	0	102.38
0.100	0	0	0	102.38
0.200	0	0	0	102.38
0.300	0	0	0	102.38
0.400	0	0	0	102.38
0.500	0.37	60	0	102.53
0.600	1.17	60	0	102.38
0.700	1.97	60	0	102.38
0.800	2.76	60	0	102.53
0.900	3.56	60	0	102.38
1.000	4.36	60	0	102.53
1.100	5.16	60	0	102.53
1.200	5.95	60	0	102.38
1.300	6.75	60	0	102.38
1.400	7.55	60	0	102.53
1.500	8.34	60	0	102.38
1.600	9.14	60	0	102.38
1.700	9.94	60	0	102.38
1.800	10.73	60	0	102.38
1.900	11.53	60	0	102.38
2.000	12.33	60	0	102.38
2.100	13.12	60	0	102.38
2.200	13.92	60	0	102.38
2.300	14.72	60	0	102.38
2.400	15.51	60	0	102.38
2.500	16.31	60	0	102.38

Fig. 12   Data sheet

⑱ [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	9:30 A.M. on Apr. 5, 2012
Name assigned to the file	TRACE-040520120930.xls

⑲ 'Time(s)'

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

⑳ "4 kinds of data acquired"

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

㉑ [< To graph]

The Graphic sheet is shown by clicking this button.

㉒[<< To setting]

The Setting sheet is shown by clicking this button.

2.7.Trip history sheet

The trip sheet (Fig. 13) lists acquired details on a past trip of trips 1 to 8.

Fig.13   Trip sheet

㉓"Past trip detailed history"

Displays acquired details on a past trip of trips 1 to 8.

㉔ [Reload]

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

㉕ [<<To graph]

The Graph sheet is shown by clicking this button.

㉖ [HELP]

The Inverter Status help is shown by clicking this button.

3.Troubleshooting

This section explains problems that may occur when PCT003Z-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 : The trace tool software has started, but it does not respond to the click of any button.
A3 : This phenomenon occurs if the Excel's macro setting is set at "Disable all macros without notification". To solve this problem, set the macro setting at "Disable all macros with notification".

Q4 : The instruction manual for VF-AS3 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 PCT003Z-E.
A4 : Since PCT003Z uses the Toshiba inverter protocol ASCII mode, only a number between 0 and 99 can be assigned to an inverter.

Q5 : The communication error is occurred when PCT003Z and PCM001Z are used together.
A5 : Because PCM001Z occupies the communication port, PCM001Z and PCT003Z cannot be used at the same time. Please use PCT003Z after PCM001Z ended. Or please use a different port for PCM001Z.
When you set parameters with PCM tool for VFAS3, please use PCM002Z.
PCM001Z is not compatible with VFAS3.

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 （*F742* to *F745*）	Refer to Table2 Parameter concerning trace functions				
Trigger setting	Trip (*F740*=1)	The trace data is constantly updated, and update is stopped at trip. 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.				
	1+2 (*F740*=3)	The trace data is constantly updated, and update is stopped at trip or when the input terminal function (No.76 or No.77(negative logic)) is enabled.				
Conservation form		'.xls' file format				
Com. settings	COM port	1 to 30				
	Baud rate	9600bps, 19200bps, 38400bps (Match it to setting on inverter side. (*F800*, *F820*))				
	Parity	Non parity, Even parity or Odd parity (Match it to setting on inverter side. (*F801*, *F821*))				
	Inverter number	none or 00 to 99 (Match it to setting on inverter side. (*F802*))				