4. Description of the System

4.1 Description of the Program

1) Diagnostic software

This is the main software to support troubleshooting and installation/maintenance services by connecting the ECU and your PC (Figure 4-1). At startup, you can change ECU's ID number and communication speed settings.

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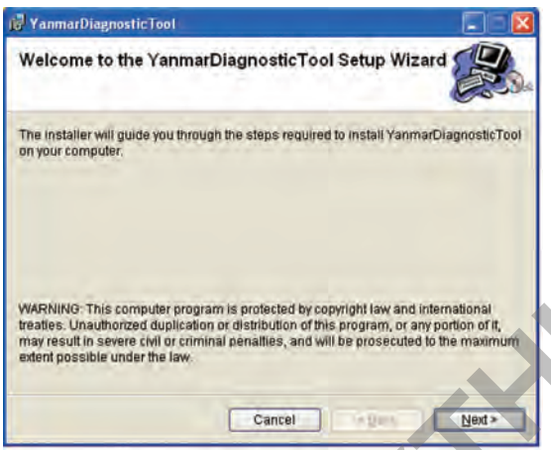
Blurred on purpose. The manual you buy has this page in full quality.



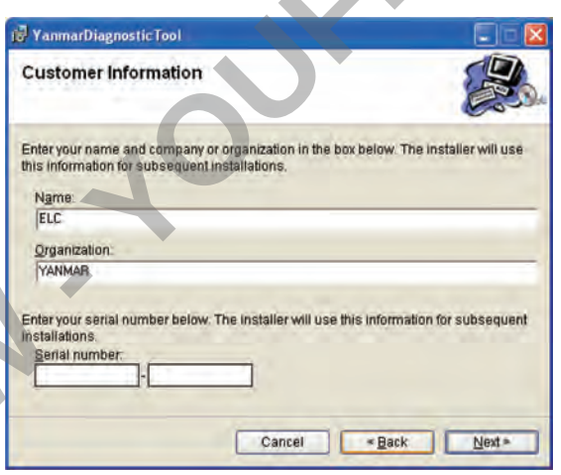
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3. Installing the Software

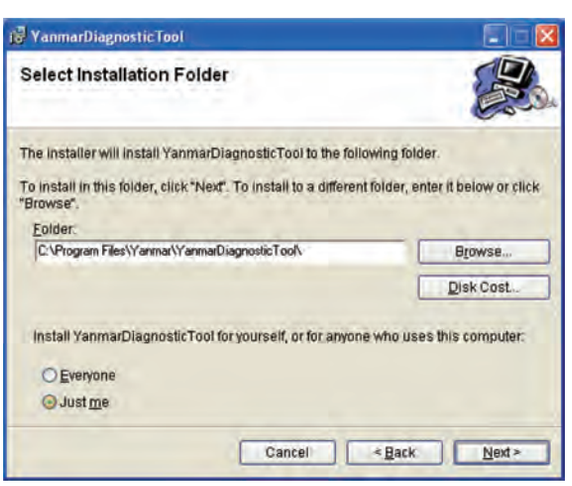
1) Log in as an administrator.
2) Run the Setup. exe file on the CD-ROM.
The following screen will appear.



Click the Next> button.
The following screen will appear.



Enter your name and organization. Enter the serial number of your product, and press the Next> button. If this number is not correct, the program does not operate normally.



Choose a folder to install the program in, and press the Next> button. The confirmation screen appears:

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5.2 Quitting the Software

You can quit the program in the same way as other Windows applications.
Before you turn off the system, you need to quit the program.
① [×] or [File(F)] - [Exit]: The confirmation menu to quit the program appears.
② [Yes] : Click this button to quit the program.
Clicking the [Discon] icon ③ stops communication temporarily without quitting the program. After adjusting the system, click the [Conne] icon again to continue monitoring.



Figure 5-5 Confirmation Screen for Quitting the Program

5.3 Troubleshooting

If a communication error occurs and you cannot perform monitoring normally, check the following points, and restart the program. Note that if a connector is disconnected or the system power is turned off, the system may not recover normally even if you restart the program. In this case, turn off the system once. If you cannot do so, disconnect the diagnostic connector from the service connecter, and then connect them again. This operation initializes the CPU inside the interface box, and restores system operation.

- Is the cable disconnected? Is the cable broken?
- Is the system turned on?
- Is the system in training mode?
- Is the system in disconnect status?
- Is the baud rate correct?

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12. Glossary

Abbreviation	Term	Description
BS	Block Size	Variable related to flow control used in ISO15765.
CAN	Controller Area Network	Communication standard used for in-vehicle LAN.
CSV	Comma Separated Value Format	File format used for PCs.
DA	Destination Address	ID information in CAN communication data.
D-SUB	Connector Standard	—
DTC	Diagnostic Trouble Code	Coded information for troubles.
ECU	Engine (or Electronic) Control Unit	Engine Control Unit is also called ECM.
FFD	Freeze Frame Data	Related data before and after a trouble.
FMI	Failure Mode Identifier	Detailed failure information added to DTC.
LID	Local Identifier	ID information specific to a certain controller.
OC	Occurrence Counter	Number of DTC occurrences.
PC	Personal Computer	—
PF	Protocol Data Unit Format	ID information in CAN communication data.
PDM	Product Data Management	—
SA	Source Address	ID information in CAN communication data.
SAE	Society of Automotive Engineers, Inc.	—
Sno.	Serial Number	Manufacturing serial number of engine, pump, and ECU.
SPN	Suspect Parameter Number	ID commonly used for SAE J1939.
USB	Universal Serial Bus	Serial communication port used for PCs.

13. Appendix

Appendix: FMI (Failure Mode Identifier) List

FMI	Description
0	Data valid but above normal operational range. (Above the upper limit)
1	Data is valid but below normal operational range. (Below the lower limit)
2	Data is erratic, intermittent, or incorrect. (Intermittent failure)
3	Voltage above normal, or shorted to high voltage source. (Signal level above the upper limit)
4	Voltage below the normal, or shorted to low source. (Signal level below the lower limit)
5	Current below normal or open circuit. (Current too low)
6	Current above normal or grounded circuit. (Current too high)
7	Mechanical system not responding or out of adjustment. (Mechanical system fault)
8	Abnormal frequency or pulse width or period. (Frequency / pulse width fault)
9	Abnormal update rate. (Smart sensor / actuator fault)
10	Abnormal rate of change. (Abnormal change rate)
11	Failure code not identifiable. (Wrong subsystem failure code)
12	Bad intelligent device or component. (Intelligent device fault)
13	Out of calibration. (Calibration failure)
14	Special Instructions. (Special instruction)
15	Normal. (Normal)

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7.4 Diagnostic Test

This function lets you check input/output devices individually. To select test item, click one of the tabs for input/output tests and active control on the Screen Select tool bar. Some of the functions requiring output are available only when the clutch is in neutral and the engine is in low idle or stopped. For more information on digital output and active control, see "Appendix A".

7.4.1 Analog/Pulse Input/Output Test【Universal Function】

This function is used to check the operation of input devices after troubleshooting and repair. You can check analog measured values and pulse input values. When the screen is selected, the screen display is automatically refreshed at intervals of 2 seconds by default.

1) Operation tool bar

① : Prints a hardcopy of the screen.
② : Saves the screen in the BMP format.
③ : Saves data on the screen in a CSV file.
④ Refres : Refreshes the current value data.
⑤ Auto Refres : Refreshes the current value data continuously. (At intervals of 2 seconds)
⑥ : Stops continuous refreshing.
⑦ Data Set : After pressing Stop, lets you change the data display order. You can reposition desired items for ease of view. For more information on operations, see "Data Select sub-window" (page 19).

2) Main view

⑧ Description : Displays input device names.
⑨ Value : Displays measured values.
⑩ Unit : Unit.
⑪ Raw Data : Voltage value of analog input (unit: mV).
⑫ Notes : Field for notes.

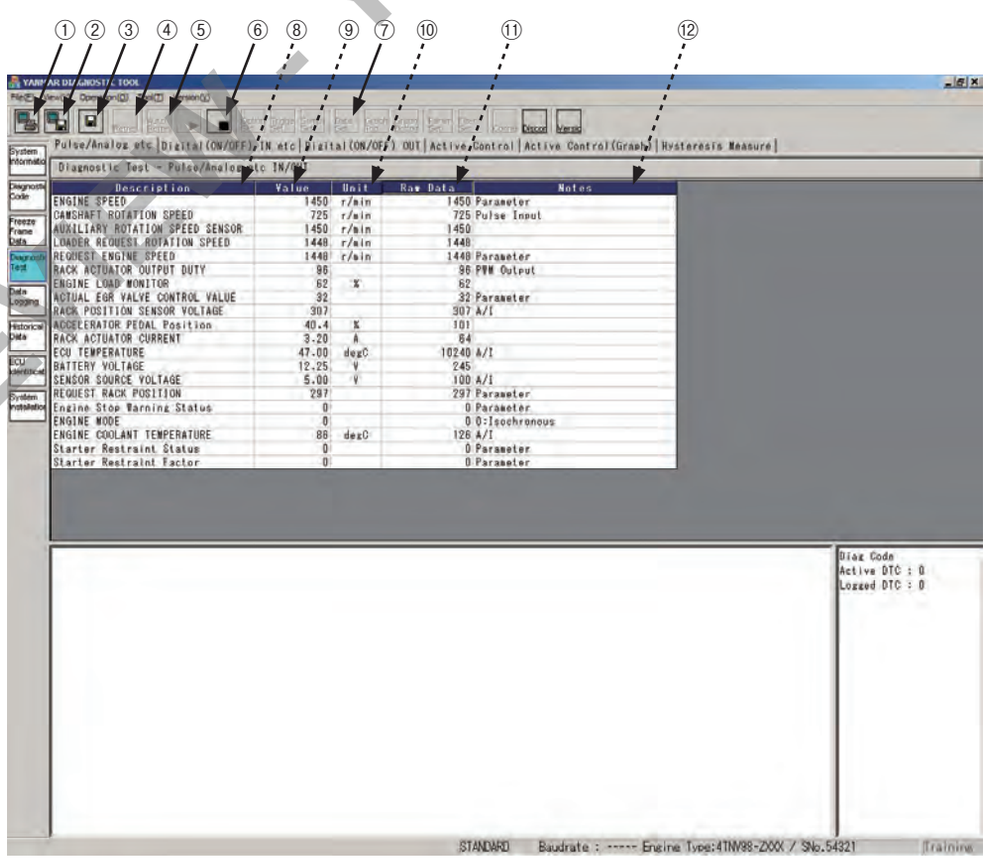


Figure 7-8 [Diagnostic Test] - [Analog/Pulse Input/Output Test] Screen

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3) Data set sub-window

① Data Name : Shows the name of an item for which active control is enabled.
② Measured : Displays the current measured value of the feedback item.
③ Max : Shows the maximum value that can be set for the desired value.
④ Desired : Shows the current setting value (desired value).
⑤ Min : Shows the minimum value that can be set for the desired value.
⑥ Note : Note.
⑦ ▲ / ▼ : Allows you to increment or decrement the value by one of these factors: 1, 10, or 100.
⑧ Measurement Mode : Selects whether to receive feedback data.
⑨ ▲ / ▼ : Increases/decreases Receiving Time.
⑩ Set : Outputs the set data to the ECU.
⑪ Close : Cancels the set data and closes the sub-window.

- To control the selected item manually, increase/decrease the current value with the ▲ / ▼ buttons and press the Set button.
- When graph display mode is selected, you can receive feedback data at the set time and view it on the graph screen. Note that the data is meaningless when the auto tuning function is enabled.

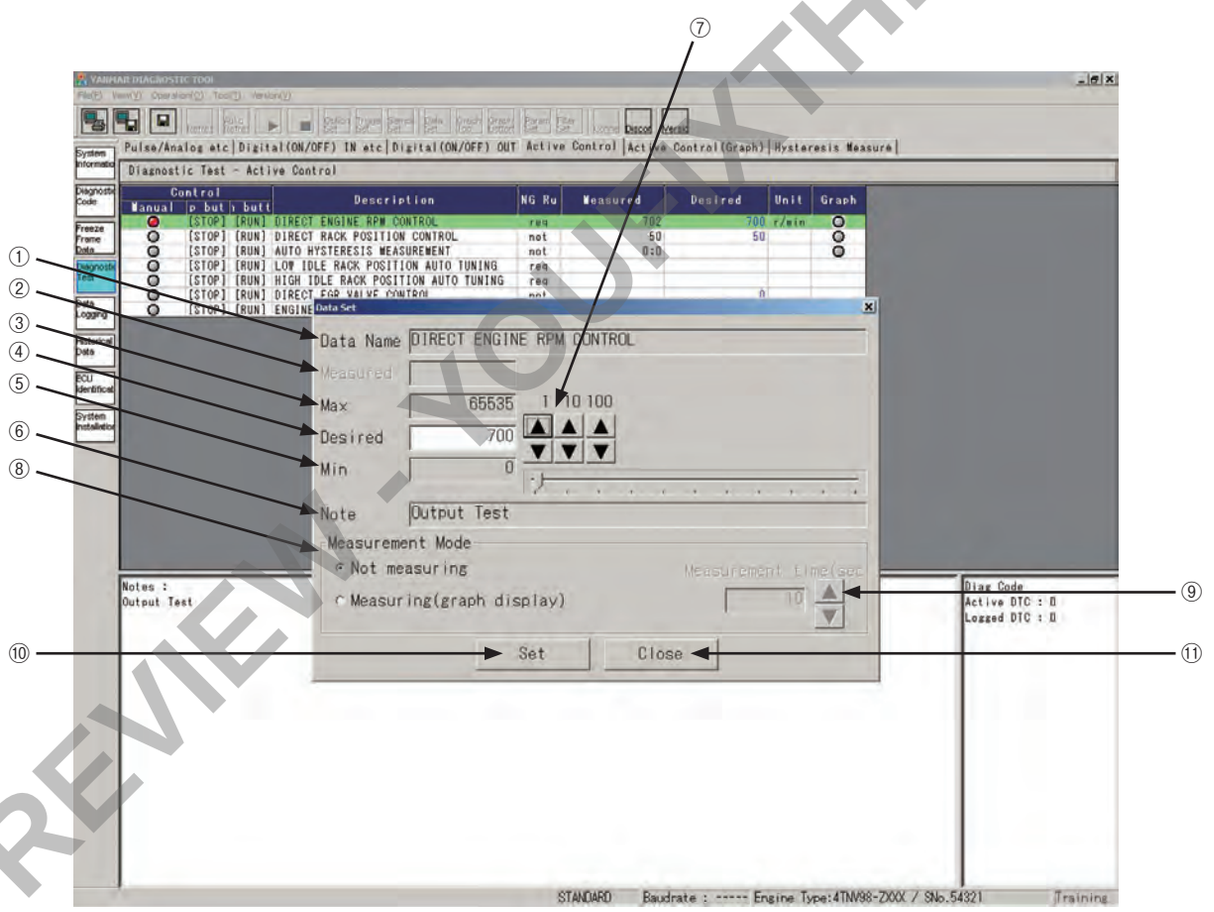


Figure 7-12 [Diagnostic Test] - [Active Control] - [Data Set] Sub-Window Screen

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7.6 History Data

This function is used to display the operation/maintenance information of the engine stored in the ECU. It consists of the Lifetime Data and RPM-Load Profile submenus.

7.6.1 Lifetime Data【Universal Function】

You can check total cumulative operation time and operation time in delayed status, and you can clear trip time data.

1) Operation tool bar

① : Prints a hardcopy of the screen.
② : Saves the screen in BMP format.
③ : Saves all history data as CSV file.
④ Refres : Refreshes all historical data.

2) Function buttons

⑤ Clear Trip Time : Deletes data for which the "Clear" field is checked. When you click the Clear Trip Time button, you will be prompted to enter your password.

3) Main view

⑥ Clear : Field to select an item to be deleted. (Click to checkmark it.)
⑦ Description : Description of stored data.
⑧ Hours : Displays cumulative time.

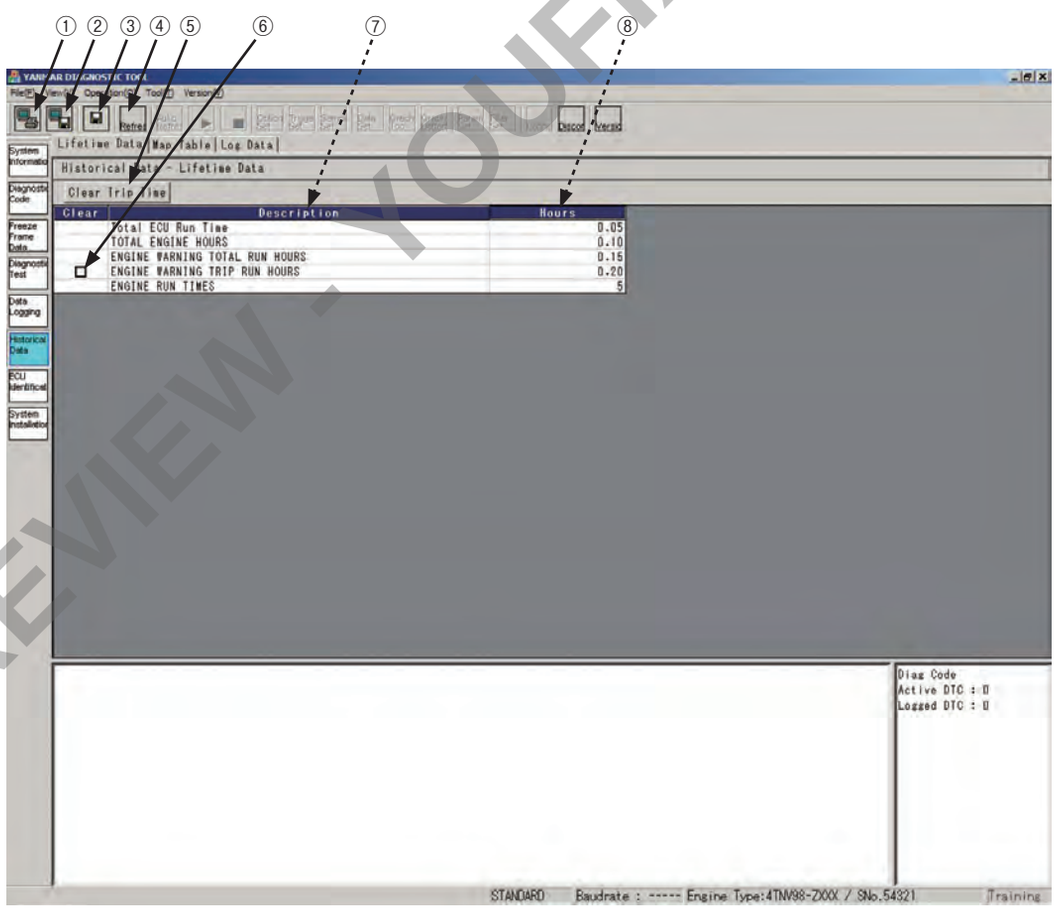


Figure 7-23 [Historical Data] - [Lifetime Data] Screen

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7.4.3 Digital Output Test【Expert Function】

This function is used to check the operation of output devices after troubleshooting and repair. You can turn ON/OFF contacts forcibly only when the engine is stopped. When the screen is selected, the screen display is automatically refreshed at intervals of 2 seconds by default.

1) Operation tool bar

① : Prints a hardcopy of the screen.
② : Saves the screen in BMP format.
③ : Saves data on the screen in a CSV file.
④ Refres : Refreshes the current value data.
⑤ Auto Refres : Refreshes the current value data continuously. (At intervals of 2 seconds)
⑥ : Stops continuous refreshing.

2) Main view

⑦ Active Control Mode : Displays whether manual control mode is enabled. You can change the mode.
- To change the mode, click the checkbox. The checkmark indicates manual mode.
- To return to auto control mode, clear the checkbox.

⑧ Description : Displays output device names.
⑨ On/Off : Displays current values and changed values (painted in light blue).
- Clicking this field reverses the output status.
- If the password (level 2) has not been entered, you need to enter it.
- The password is valid until you exits from this submenu.
- If change is not allowed, the item is painted in red.
- Outputs for which active ON/OFF control are prohibited (main relay, etc) are defined for the system.

⑩ Notes : Field for notes.

3) Screen shift sub-window

This sub-window appears when you make any changes on the screen in manual control mode.

⑪ Yes : Returns to auto control mode.
⑫ No : Keeps values in manual mode.

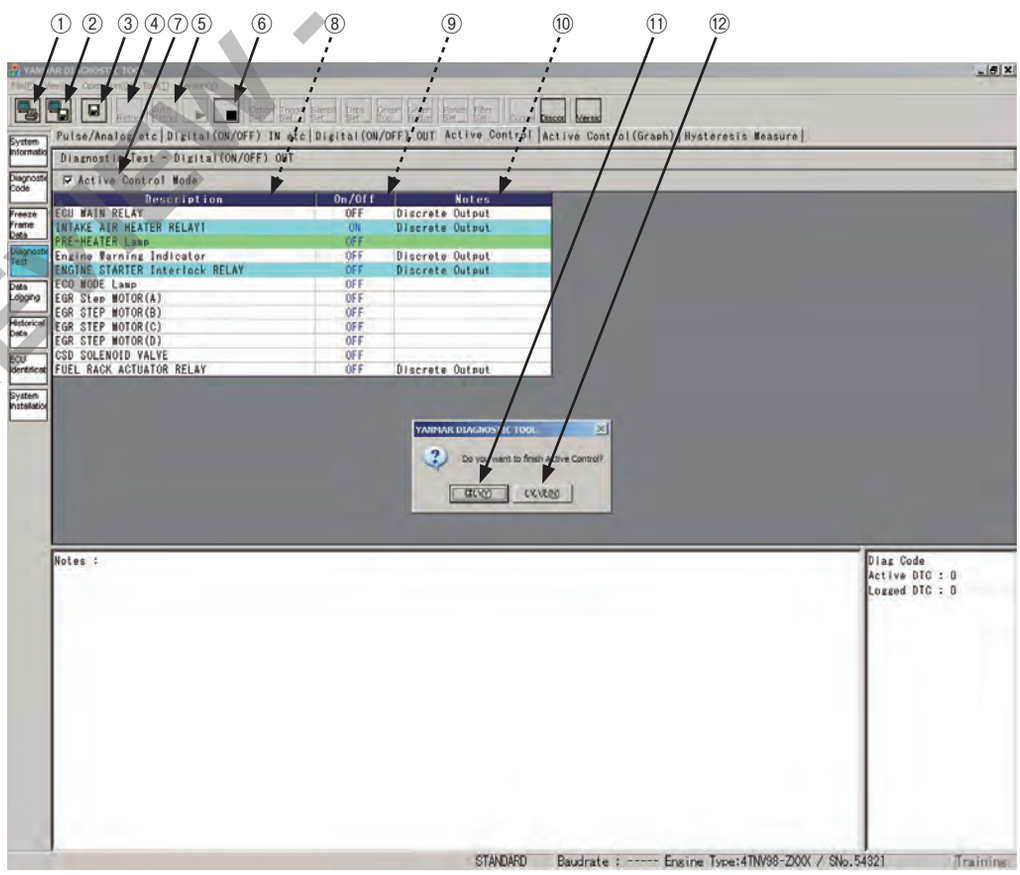


Figure 7-10 [Diagnostic Test] - [Digital Output Test] Screen

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8.1.2 Saving and Loading Setting Values

You can save graph settings, and load and use them later.

■Saving a File

① Opening the Graph Set screen: Click the Graph Top or Graph Bottom button on the Operation tool bar. The sub-window opens.

② Opening the file save screen: Click the File Save button in the upper right of the Graph Set sub-window. The save screen opens.

③ Saving the file: Save a file with a name you can easily search for later. The file extension is gset. The default file folder is "Set".

■Opening a File

④ Open screen: After step of ① , click the Open button in the upper right of the sub-window. The "Open" screen opens.

⑤ Selecting a file: Select a file displayed in the sub-window. Open the file to load and apply the graph setting values that have been saved.

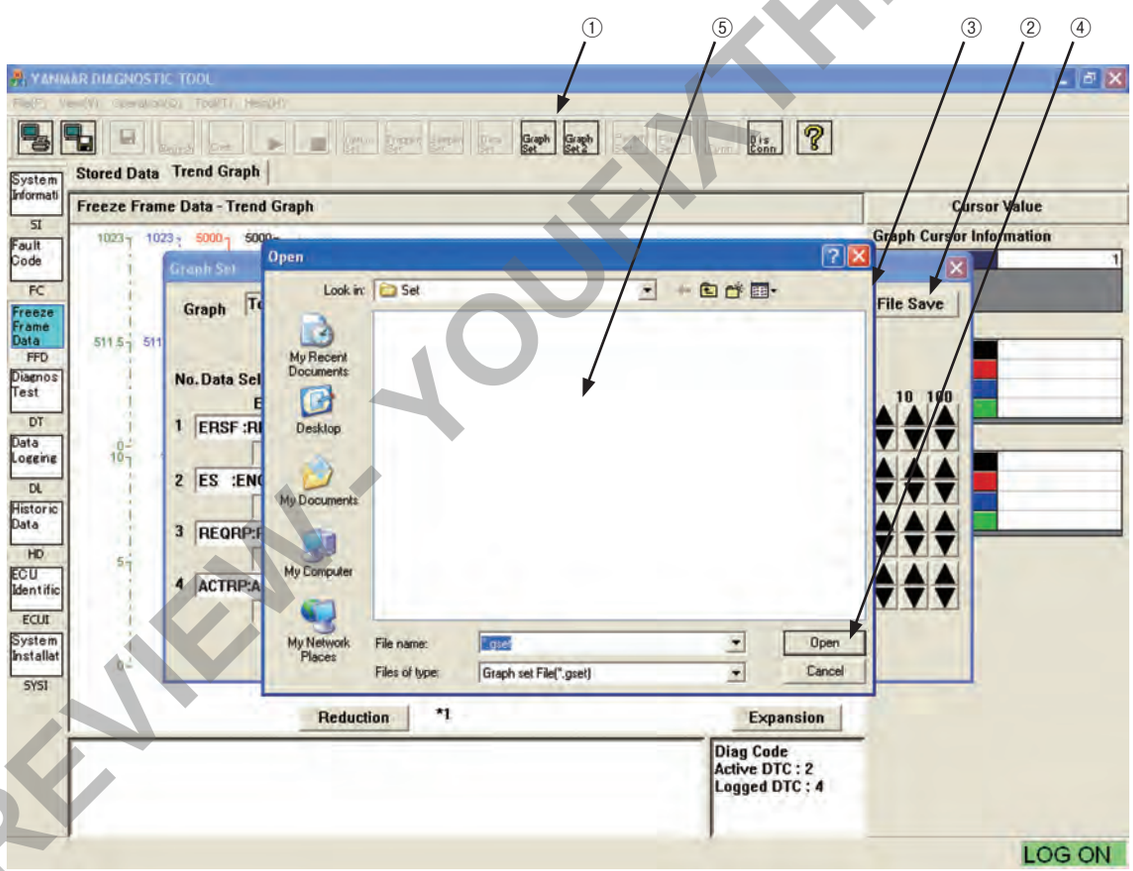


Figure 8-2 [Graph Set] - [Open] Screen

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1.10 EGR Valve Opening Degree Control

1) On the data setting screen, specify the command value:

① Command value : Type in the command value.

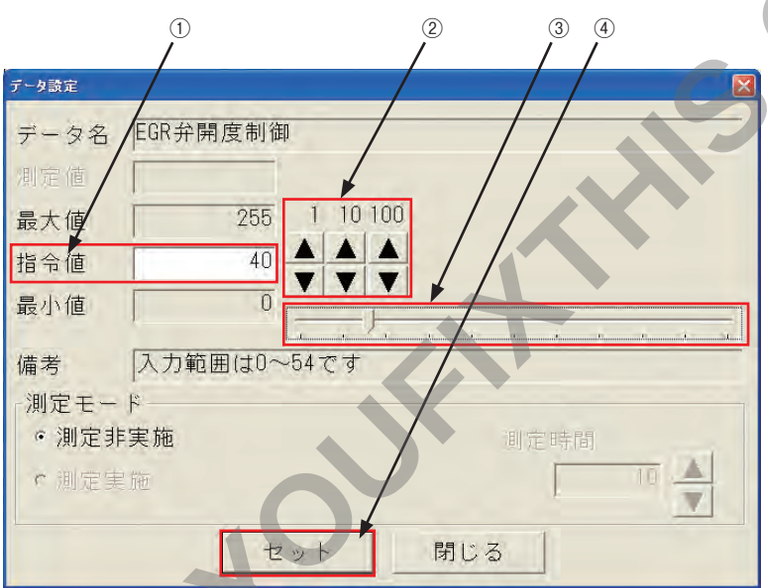
② ▲ / ▼ : Allows you to increment or decrement the value in units of 1, 10, or 100.

③ —|— : You can also use the slider to increment or decrement the value.

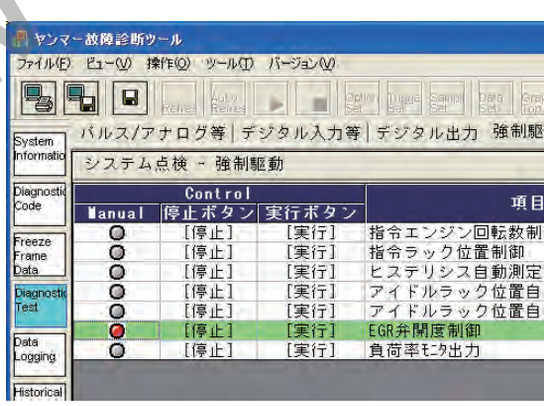
* Carefully note that the command value field accepts any integer between 0 and 255 although the valid range is 0 to 54.

* If your entered value is beyond the upper limit of the valid range, the system assumes that the upper limit value (54) is specified although the desired value displayed on screen may be higher than 54.

④ Set : Sets the entered information.



2) The active control mode takes effect and the Manual lamp icon turns red.



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