SMARTASSIST-Direct

YANMAR

YANMAR CO., LTD.

http://www.yanmar.co.jp

0AYSA-G00100

OPERATION MANUAL

SMARTASSIST-Direct

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YANMAR CO., LTD.

Head office
Umeda Gate Tower 1-9 Tsurunocho, kita-ku, Osaka, Japan
Phone: 81-6-6376-6237

Agricultural Machinery & Equipment Division
Quality Assurance Dept.
Umeda Gate Tower 1-9 Tsurunocho, kita-ku, Osaka, Japan
Phone: 81-6-6376-6347

Power System Operations Division
Quality Assurance Dept.
1009-2, Kawamichi-cho, Nagahama-city, Shiga, 526-0111, Japan
Phone: 81-749-72-5195

Marine Operations Division
Quality Assurance Dept.
3-1, 5-Chome, Tsukaguchi-honmachi, Amagasaki, Hyogo, 661-0001, Japan
Phone: 81-6-6428-3137

Yanmar Construction Equipment Co., Ltd.
Service Information Section
1717-1, Kumano, Chikugo-shi, Fukuoka, 833-0055, Japan
Phone: 81-942-53-8427

- The pictures in this manual refer to Windows 7 (some to Windows XP).
- The contents of this manual may change without prior notice.

OPERATION MANUAL	Model	SMARTASSIST-Direct
	Code No.	0AYSA-G00100

OPERATION MANUAL

SMARTASSIST-Direct

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1. Overview

The SMARTASSIST-Direct software supports the error diagnosis, and mounting and maintenance services of electrical control devices. It runs on Windows personal computers.

2. Operation Environment of SMARTASSIST-Direct

The service tool operates in the below environment.

● PC

• CPU:	Intel Pentium 4	2 GHz or more recommended
• HDD:	200 MB or more recommended [*1]	
• OS/Memory:	Windows XP SP3	1 GB recommended
	Windows Vista SP2	2 GB recommended
	Windows 7 SP1	2 GB recommended
• Display resolution:	1024 x 768 or higher	
• USB 1.1:	1 port	

- Microsoft Excel 2000 or higher (for the display of operation data)
- Internet Explorer 6.0 or higher, or Mozilla Firefox 5.0 or higher (for the manual link)

[*1] Does not included memory for data storage.

● Interface Box (YANMAR Diagnosis Interface Box)

1R1999-25000

● Display Language of SMARTASSIST-Direct

- Japanese
- English

3. Contents of SMARTASSIST-Direct

3.1 Contents of the Program

● Software

The engine ECU (hereafter ECU), the 3G controller (hereafter ECU) and the drivers connect to the PC via the interface box (a signal converter) ([Figure 3-1 Connection to the product]). The software performs error diagnosis, writing of software, and initial settings.

● Training Mode

In this mode, you can practice how to use SMARTASSIST-Direct on your PC without connecting to the ECU. The operation of the software and the ECU are simulated using data that is stored on the PC in advance.

● Displaying measurement data and operation data

- All data collected during maintenance can be displayed with the provided software.
- The data can be compared to other data of the same kind.
- All collected data can be displayed on other SMARTASSIST-Direct workstations.

● Communication with the Center

The software uses the Internet to download required data and updates, and to upload collected data.

● Detail Settings

The settings allow to change the communication speed to the ECU and other conditions. It is also possible to select the training mode and confirm software updates.

As a basic rule, do not change the communication settings unless instructed to do so by YANMAR.

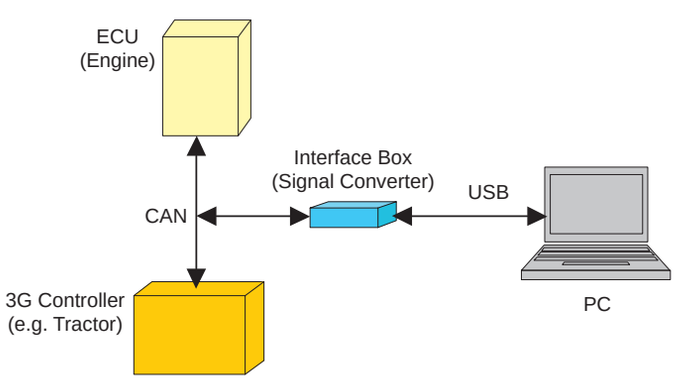


Figure 3-1 Connection to the product

3.2 Function Mode

Two settings for the usable functions are available, depending on the service level.

● **Standard Mode**

Just as on the display panel, a basic error diagnosis function is available.

● **Expert Mode (Expert Function)**

In addition to the functions in standard mode, the expert mode allows to write data to the ECU and driver as well as to change settings. To use it, users with an expert mode license must log in with their user ID and password. When clearing data or changing settings, the password must be entered again at the time of data writing. It is not necessary to enter the password again if working with an active connection and the password was entered less than 10 minutes ago.

Separate licenses issued for different product categories and the limited YDT expert mode may further limit the machine models for which maintenance is possible.

○: Usable ×: Not usable △: Option

Type		Standard	Expert	YDT Equivalent to Expert
Utilization limitation	Per product category All models available	○	○	Limited models
License Management	License Update	○	○	○
Error Diagnosis	Basic Error Diagnosis	○	○	○
	Rewrite Setting Values	×	○	○
	ECU Writing	×	○	○
ECU Maintenance Data Upload		○	○	○
Operation data	Operation data	○	○	○
Service data	Manual link	×	○	×
	Service bulletin link	△	△	×
Software update		○	○	×

3.3 Updating SMARTASSIST-Direct

The SMARTASSIST-Direct service tool updates automatically.

Connect the PC to the Internet, launch the service tool and log in. It communicates automatically with the center, receives the setup files, and performs the update.

Note If you activate the Internet connection AFTER starting the service tool, it will not update.

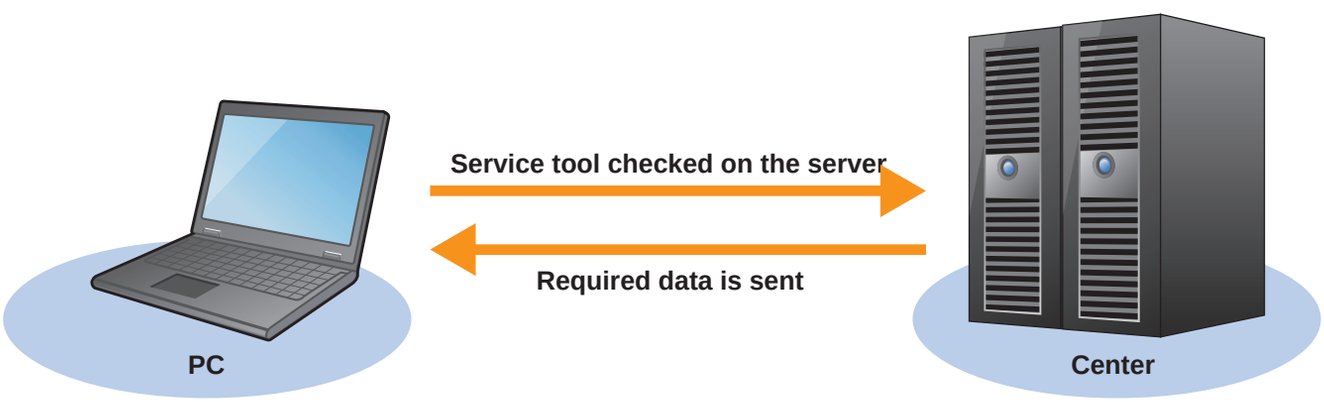
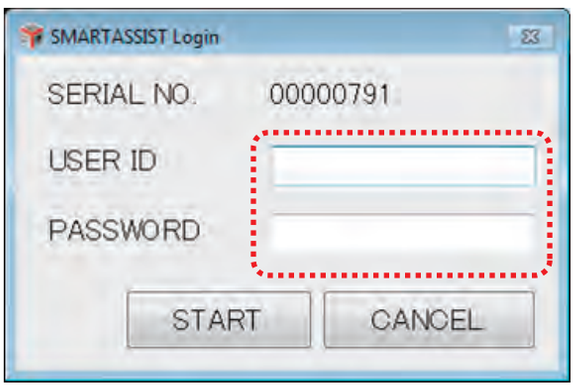


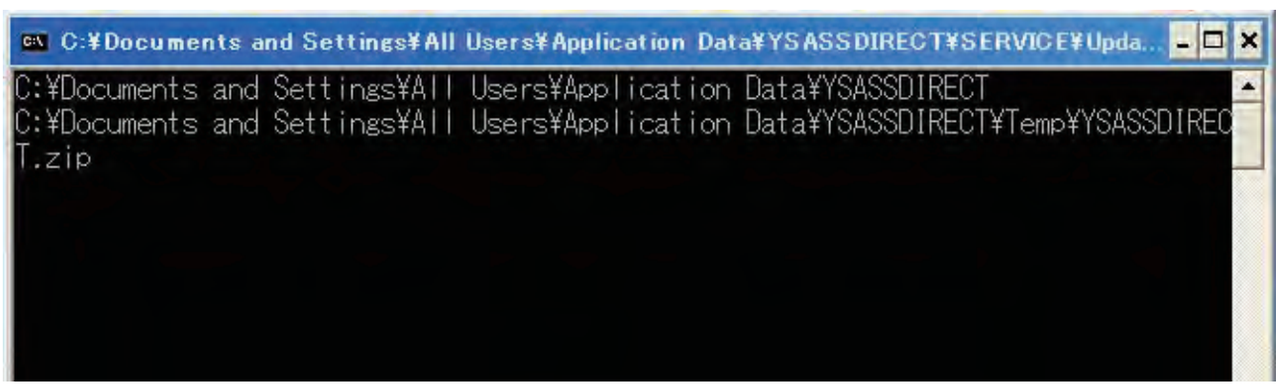
Figure 3-2 Update schema

After an automatic update, the login screen is displayed again after the process screen is shown. This is not a malfunction. Simply enter your user ID and password again to log in.

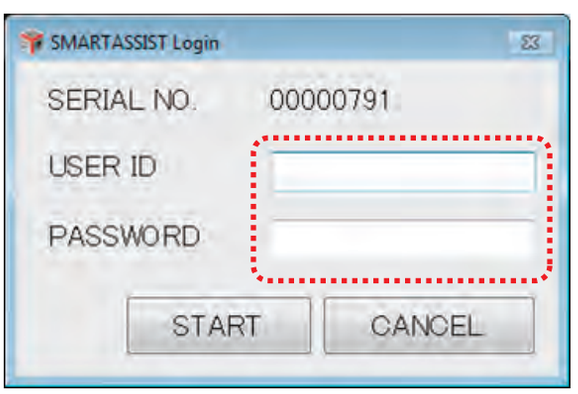
1 Enter your user ID and password to log in.



2 After an automatic update, the below screen is displayed for a couple of seconds.



3 After the update is completed, the login screen is displayed and it is necessary to log in again.



3.4 License Security Check

To ensure that you always use the latest version of the software, a security check of the license is conducted at the center. Software management is necessary because some functions may influence engine performance.

● **Security Check Period**

The security check period is three months after the last communication with the center.

● **Security Check Period Warning**

One month before the security check period expires, a warning is displayed each time the service tool is started to remind of the end of the security check period.

● **Exceeding the Security Check Period**

If the security check period has exceeded and the service tool has not been used for an extended period of time, the usage period is extended for a grace period of 7 days.

After the grace period, the system switches to default mode and its functions become unavailable. Connecting to the center will make it serviceable again. (The security check period is extended by 3 months when connecting to the center.)

X: Remaining warning days until the security check effective period (30 days)

Y: Usage permitted days after the security check expiration detection (7 days)

Z: Security check effective period interval (90 days)

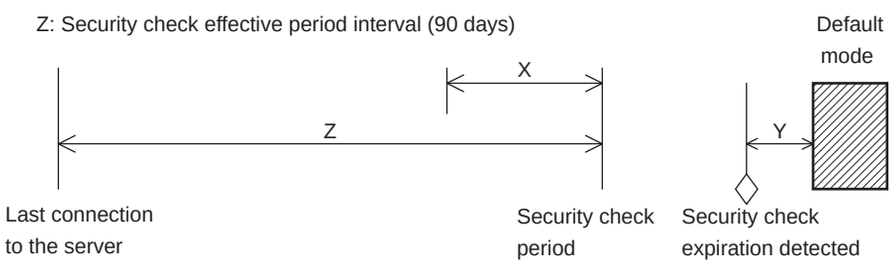


Figure 3-3 Security check period schema

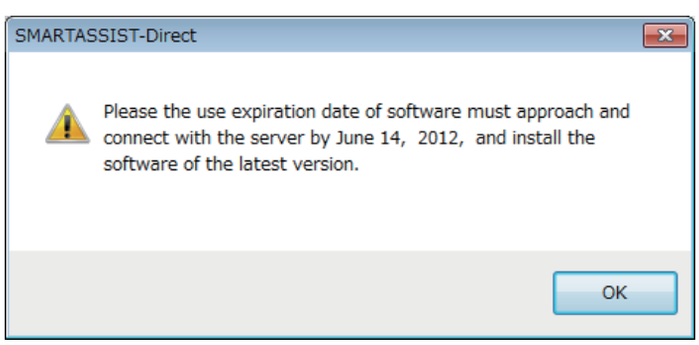


Figure 3-4 Before Incident Warning Screen

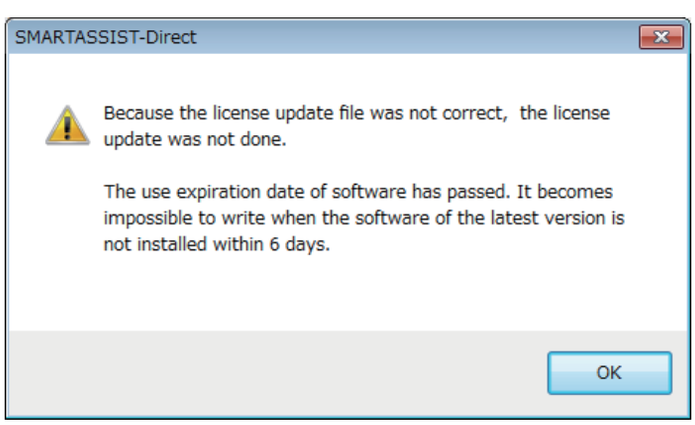


Figure 3-5 Screen After Exceeding Limit

Remark
- The security check is performed for each PC.
- If one PC is used by multiple users and one user connects the PC to the center, the last connection date is updated.

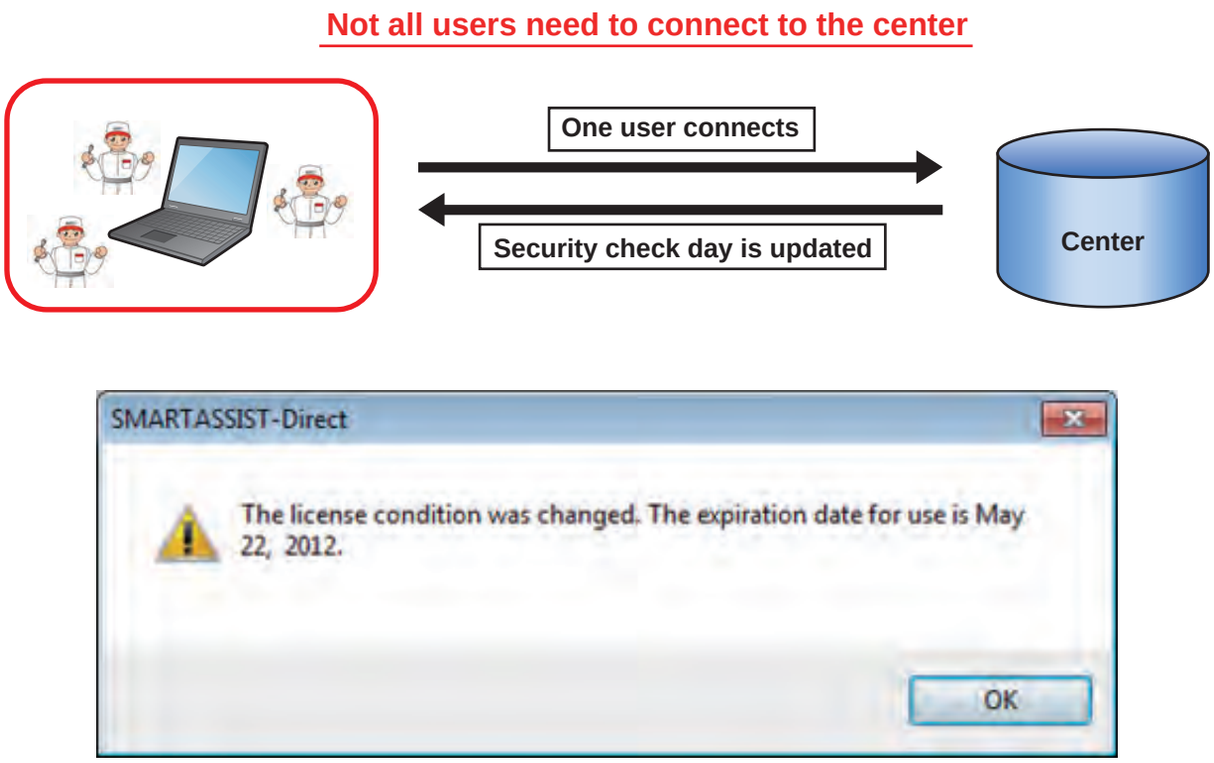


Figure 3-6 Example screen for security check update

3.5 License Expiration Date

The license is generally valid for one year, from January 1 to December 31.

If a security check was conducted, but the license period is exceeded, it is not possible to connect to the center. Please confirm with YANMAR whether to extend the license period before it expires.

X: Security Check Period (90 days)

Y: License Extension Confirmation Period (60 days)

Z: License Period (1 year)

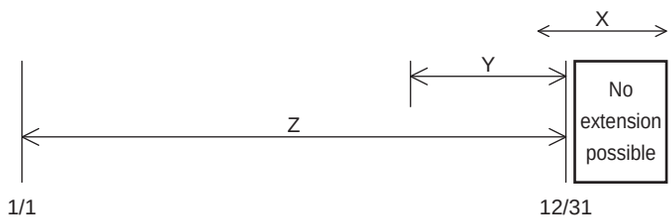


Figure 3-7 License expiration date schema

3.6 Maintenance Information for the ECU, Driver, Pump and Other Parts

In the earlier YDT system, it was necessary to formally register information that was written to the ECU or similar parts to YGSM.

SMARTASSIST-Direct automatically uploads to the center all data that was written or deleted, making it unnecessary to register the data separately.

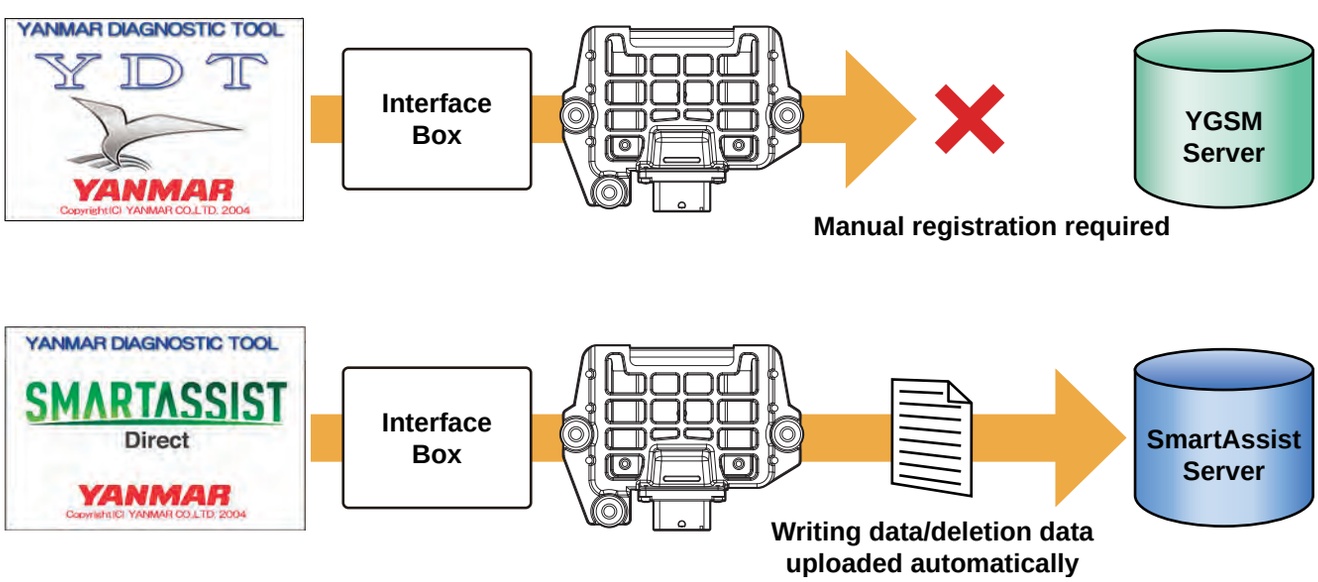


Figure 3-8 Upload of write data

Important

- To make sure that the data is sent and registered, start SMARTASSIST-Direct **with an active Internet connection soon after maintenance is finished.**
- The writing process can be canceled from the software's menu. (It is necessary to send cancellation/deletion data to the center.)

3.7 Software Serial Number and the License

YANMAR produces a wide range of products. To be able to conduct proper maintenance after appropriate training for the product, licenses are issued separately for each product category. (Same as YDT)

The product category-specific license information is affiliated with the software serial number. (License serial number)

Multiple product category-specific licenses can be affiliated to the same serial number

The standard mode license (with basic error diagnosis functions) and the expert mode license (with rewrite functions of the ECU and similar parts) are operated by separate software serial numbers.

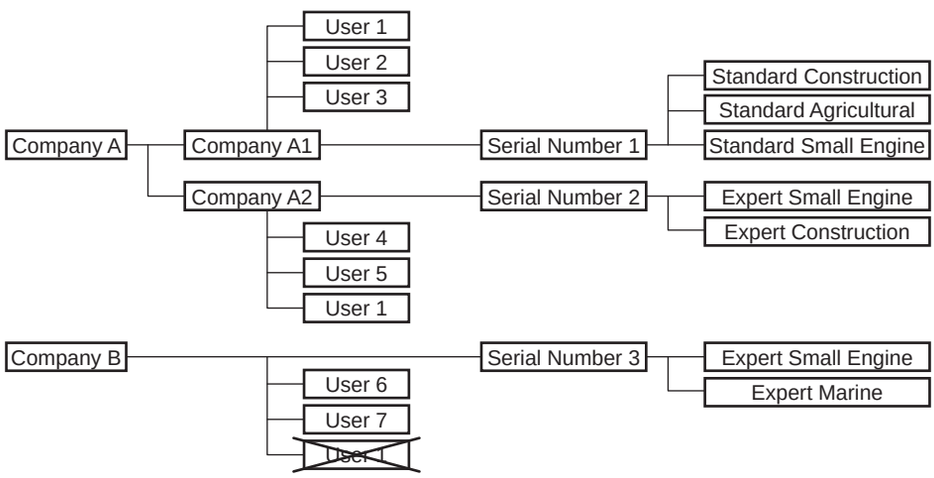


Figure 3-9 Serial number and user schema

The SMARTASSIST-Direct installed on the PC has an individual software serial number and can only be used by users registered for that serial number.

Example 1: User #4 cannot log into the PC with serial number 3 using his ID and password.

Example 2: User #1 is registered as user for the PCs with serial number 1 and 2 that have the same company code, and can log into both PCs with his ID and password.

Example 3: User #1 cannot be registered for the PC with serial number 3 that has a different company code.

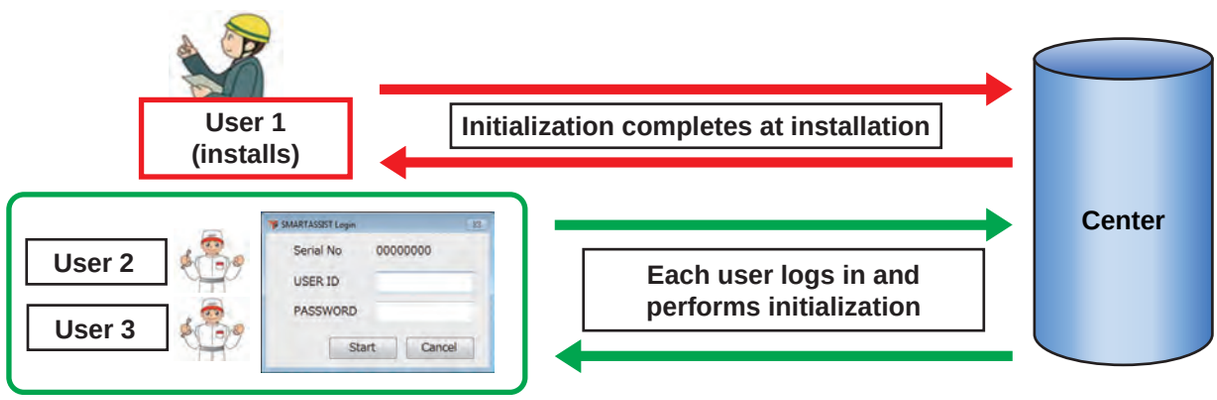
3.8 Software Serial Number and the User ID

Under SMARTASSIST-Direct, the users per PC are limited for reasons of safety and security.

- After the software installation is complete, the software connects to the center and activates. SMARTASSIST-Direct then confirms the serial number based on the information registered at the center in advance during the application.
- This serial number and user ID is affiliated with the registration information. Other SMARTASSIST-Direct users who are not affiliated cannot use the system.

Point **The initialization (user verification) is performed for each user ID.**

After the installation is completed, each user should log into SMARTASSIST-Direct with an active Internet connection. (The initialization is performed automatically.)



3.9 User ID and Password

The SMARTASSIST-Direct user ID and password are the same as for YANMAR D SITE (YDS).

● **If You Forget Your User ID or Password**

It is necessary to reassign a user ID and password within the YDS system through the YDS operation tool.

For details, consult with a representative of the business unit or your sales agent.

Important It is a rule within YDS to change the password on a regular basis.

Depending on the usage condition, it is possible that the SMARTASSIST-Direct password and the YDS password are different the first time that you use SMARTASSIST-Direct after a password change.

● When using the system with an active Internet connection

Enter the new password

● When using the system without an active Internet connection

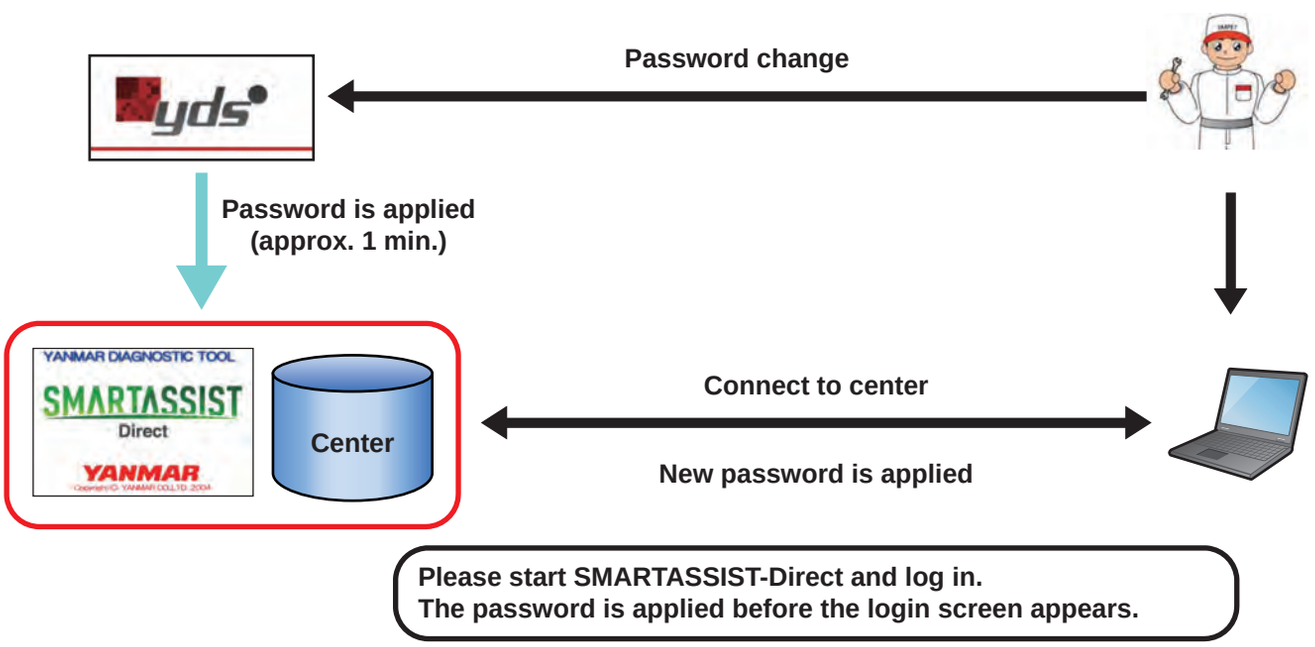
Enter the old password

(This is because the new password has not yet been sent to the PC from the center.)

Point **The YDS password change is reflected on the SMARTASSIST-Direct server in approx.** 1 minute.

Start SMARTASSIST-Direct right after the change and login to the system and the PC password is also changed.

(This method requires some extra effort, but it is the most reliable method.)



Note Because YANMAR employees use the same ID and password as for the "My Portal" **system, they need to exercise the same care after a password change as when us**ing YDS.

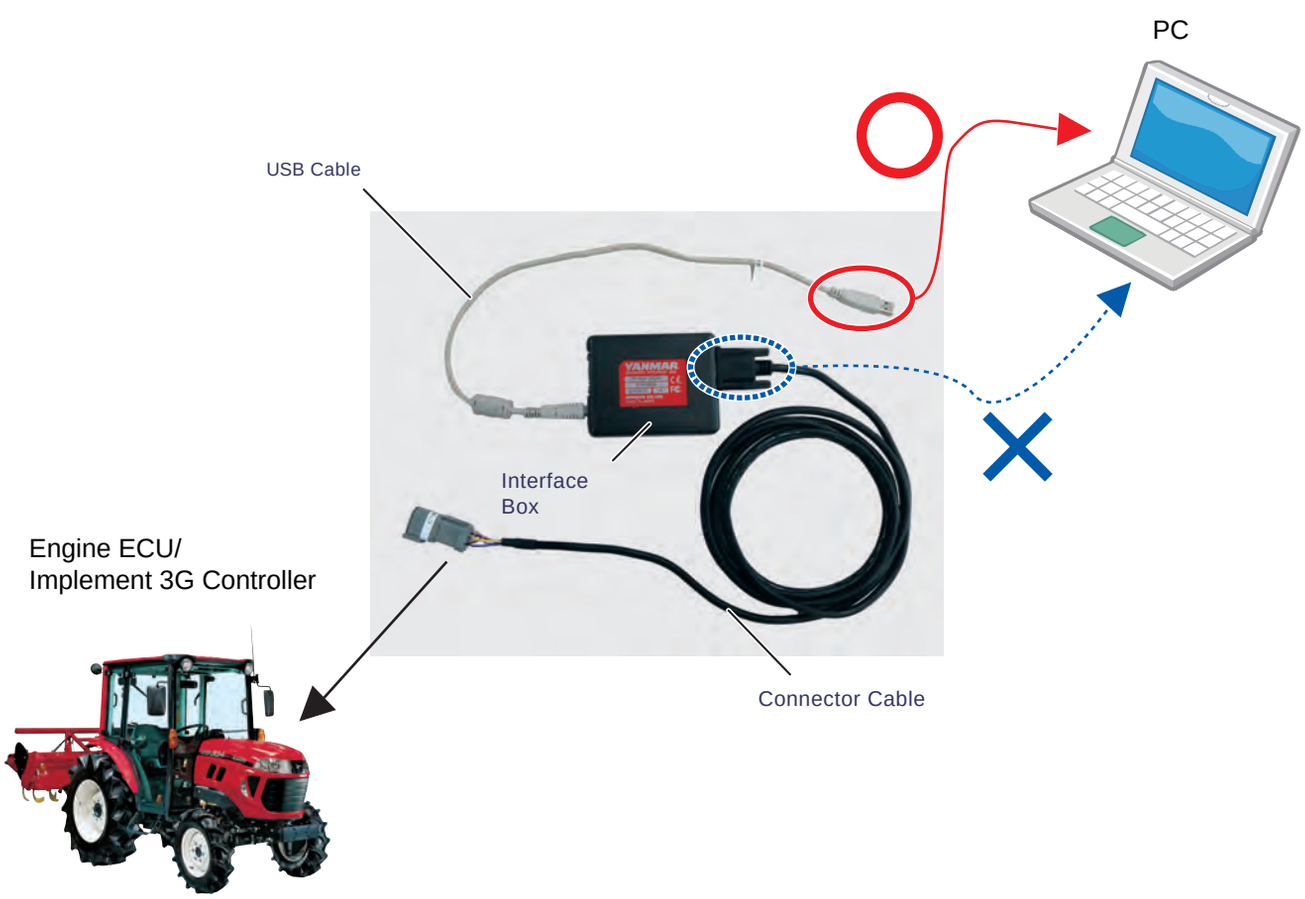
4. Start, Stop and Finish Procedures

4.1 Operation Procedures

4.1.1 SMARTASSIST-Direct Connection

1. Plug the USB cable into the USB port of the PC and the USB port of the interface box.
2. Plug the diagnostic cable into CN1 (D-SUB 9P male end) of the interface box.
3. Plug the diagnostic cable into the service connector.
   The interface box is powered by the device. Be careful: using a defective cable or short-circuiting the cable connector terminal is very dangerous.

The correct way to connect the cables is: Plug the connector cable into the interface box. Connect the interface box with the USB cable to the PC.
It is not possible to do the connection without the interface box (e.g. by plugging the connector cable directly into the PC or using a serial USB conversion cable). Always use the supplied interface box when using SMARTASSIST-Direct.



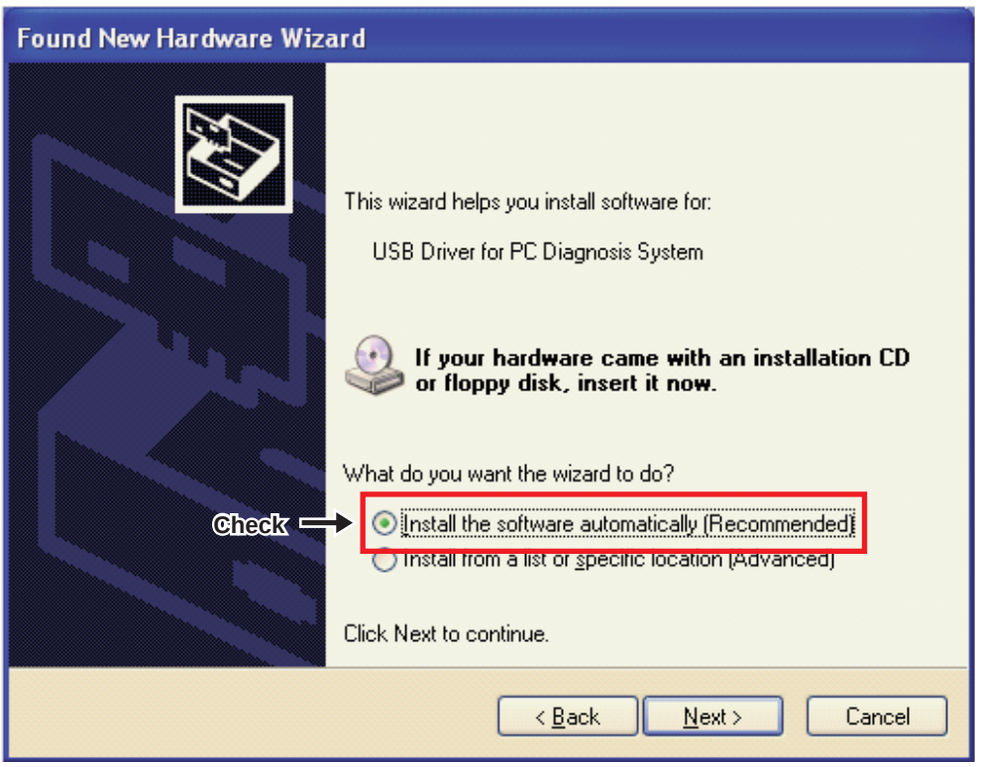
4.1.2 Power Supply

Except when using in training mode, it is necessary to turn on the power of the connection destination or the ECU (ignition key or power switch) before starting SMARTASSIST-Direct.

4.1.3 USB-Driver Installation

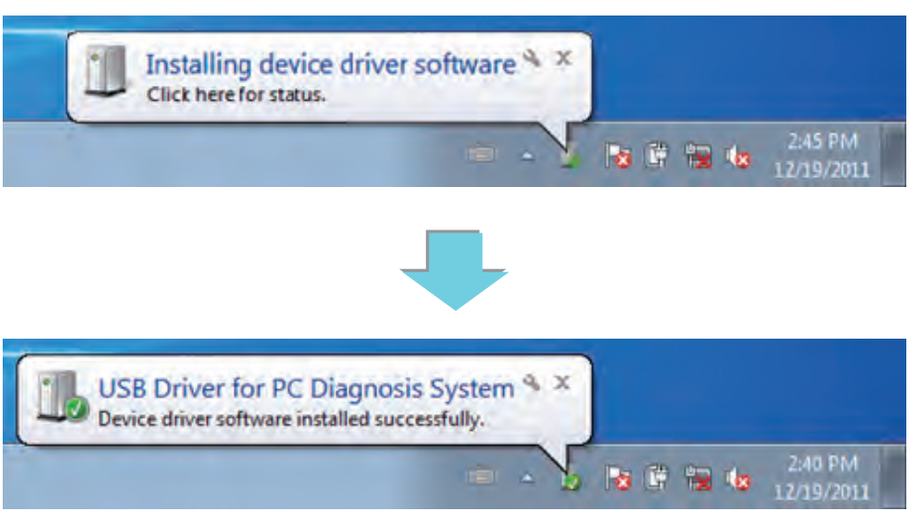
When you plug the powered interface box[Note)] into the USB port of your PC, the driver set-up wizard starts automatically.

Follow the instructions on the screen to install the driver. (The example screen is for Windows XP.)

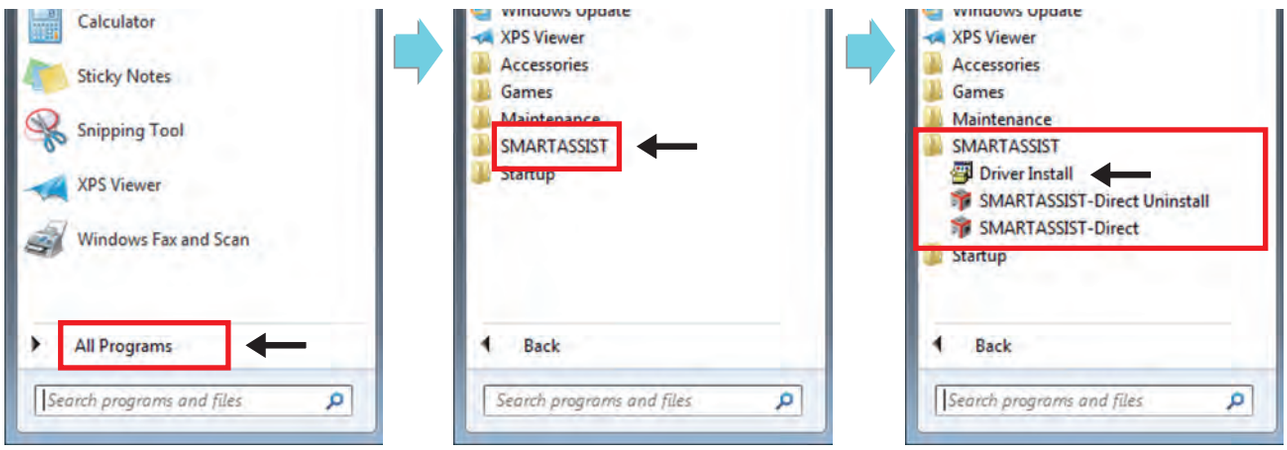


Note **The interface box is supplied with power (for example, connected to the product** with the key switch turned on).

Depending on the version of Windows, the setup wizard may not start and the driver may be installed automatically. (The example screen is for Windows 7.)



Depending on the specification and setting of your PC, the USB driver may not be installed automatically.
In such a case, manually install the driver from the PC start menu.

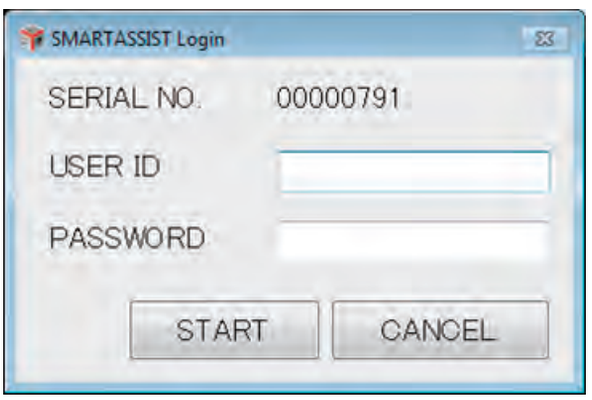


4.1.4 Login Screen

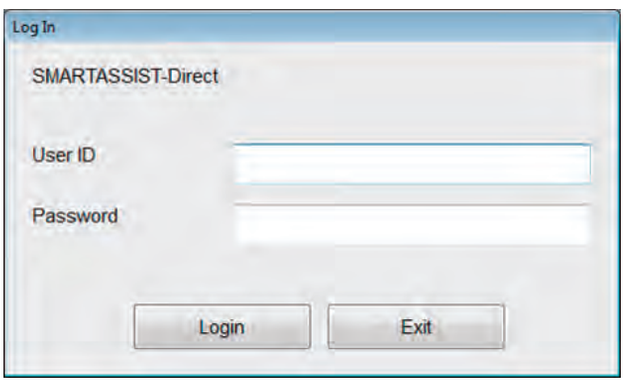
■How to Log In

Double-click the icon () that was created during installation.

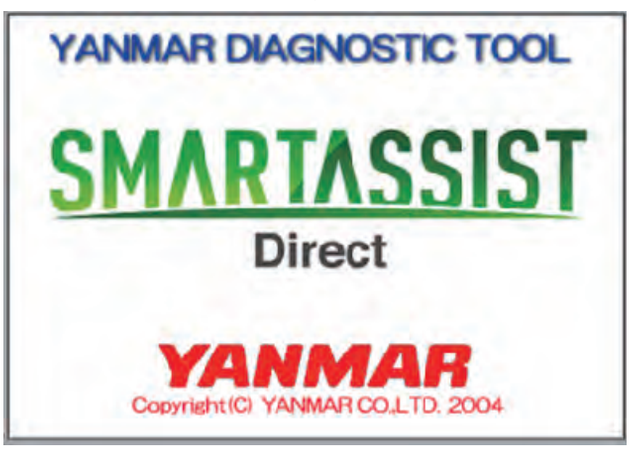
The SMARTASSIST-Direct logo appears, then the login screen is displayed.



Internet connection active

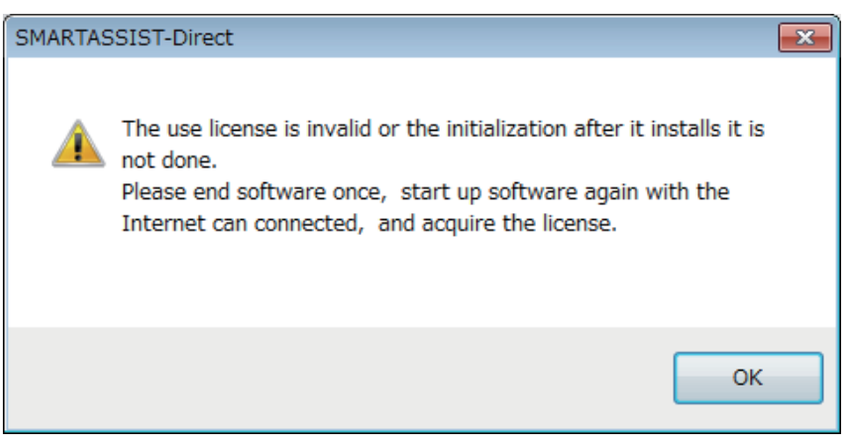


Internet connection inactive



Note

- If the usage license is invalid or the initialization is not complete (because the software could not connect to the center directly after installation), the below warning is displayed.



- The user ID and password are the same as those for the YANMAR D SITE (YDS). If the YDS password has changed, refer to [3.9 User ID and Password] on page 10 for details.

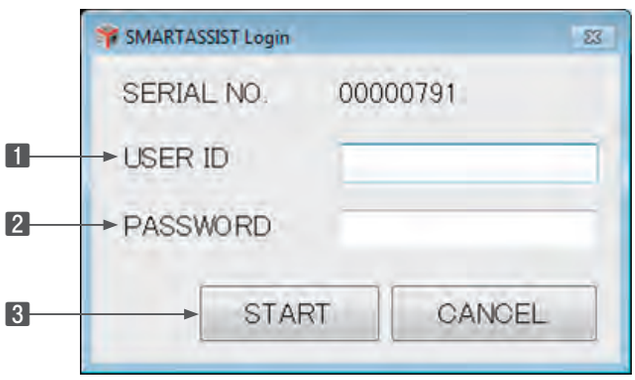
■Entering the User ID and Password

The Login Screen is displayed.

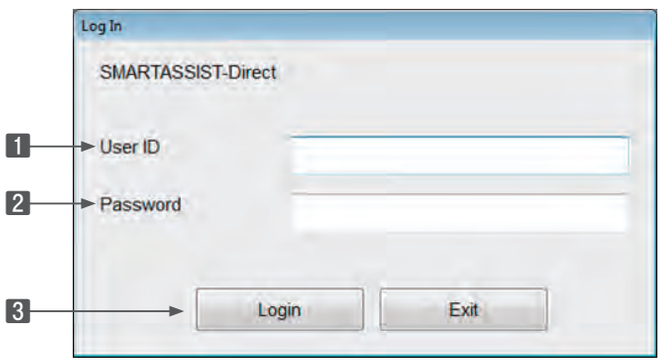
1 **User ID** : Enter the user ID.

2 **Password** : Enter the password for this user ID.

3 Check the above, and click the **Start** or **Login** button.



Internet connection active



Internet connection inactive

Note If you enter your user ID or password incorrectly, the following warning appears.

4.1.5 Start Menu

After login, the Start Menu is displayed.

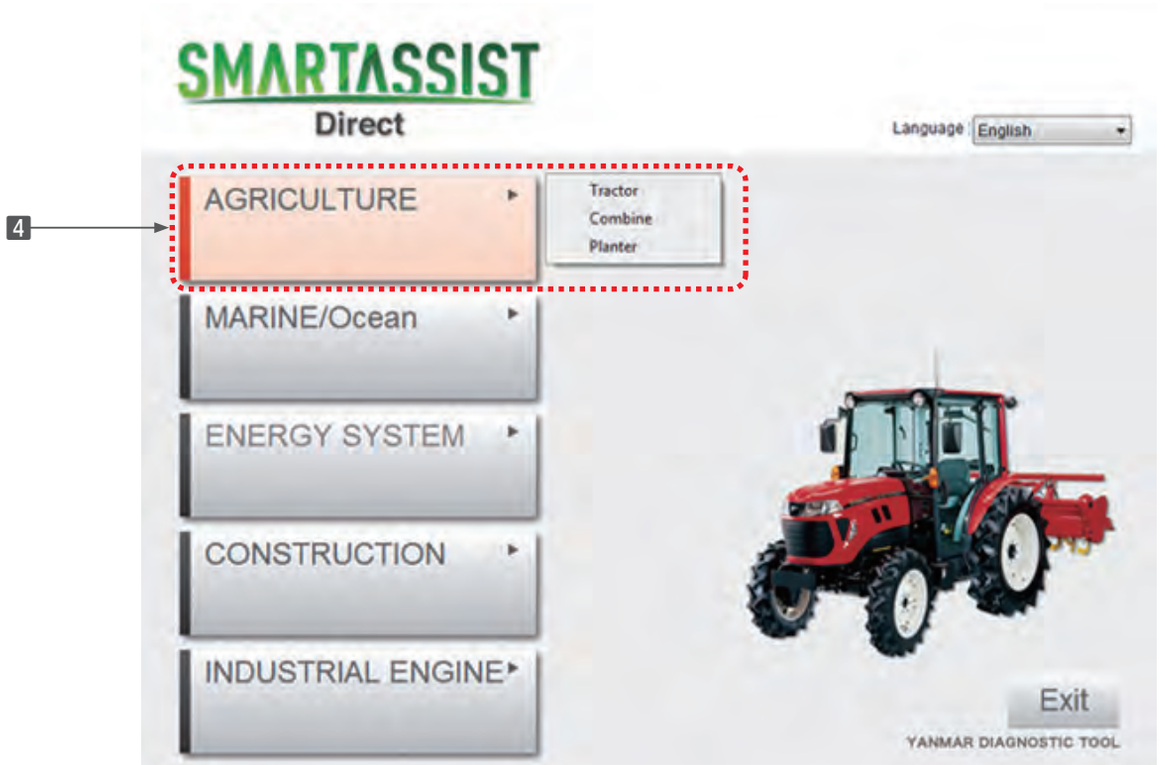
1 : It is possible to change the display language. (Japanese/English as of January 2012)

2 : Select the product category that you wish to use.

3 : Exit the software.

Note You can only select the category for which the license is registered.

4 : The selected category turns red. Select the model.

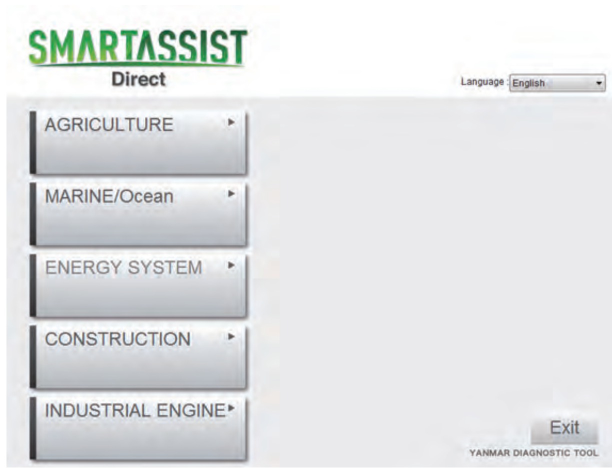


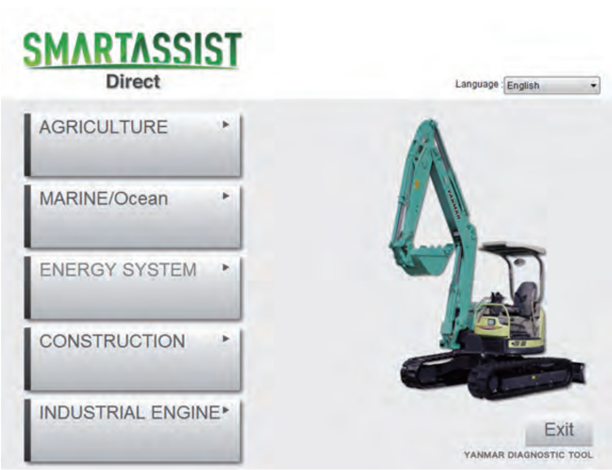
The available models are listed below. (January 2012)

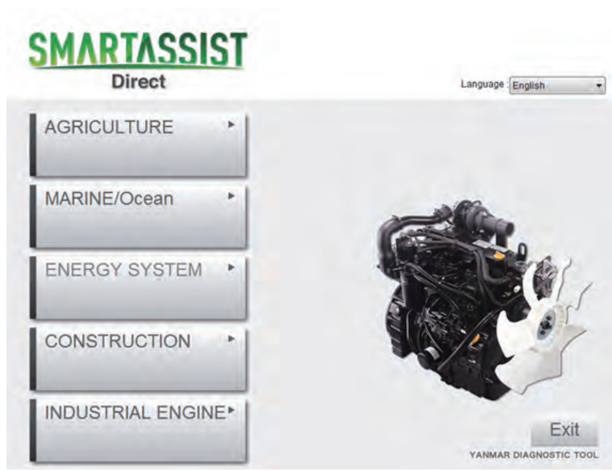
Agriculture	Tractor
	Combine
	Rice-Transplanter
Marine/Ocean	Marine Gear
	Marine Engine
	Large Engine
Energy System	Generator
Construction	Construction
Industrial Engine	Small Land Engine

Note The categories and models increase with time.

After selecting the category, the picture of a representative model is displayed.







4.1.6 Main Menu

All functions of SMARTASSIST-Direct are displayed sorted in categories depending on the work situation.

1 Operations with ECU Connected

Operations that are performed with the ECU (controller) connected

2 Operations with ECU Disconnected

Operations that can be performed without the ECU (controller) connected

3 Collecting Related Data

Related data is collected voluntarily (via a connection to the center)

4 Detail Settings/Additional Functions

Settings and additional functions related to system operations (including training mode)

5 Job Assistant

Guide function to perform a series of operations

6 Selection button for all functions. Functions that are not shown in red are unavailable.

7 An explanation for all functions is displayed.

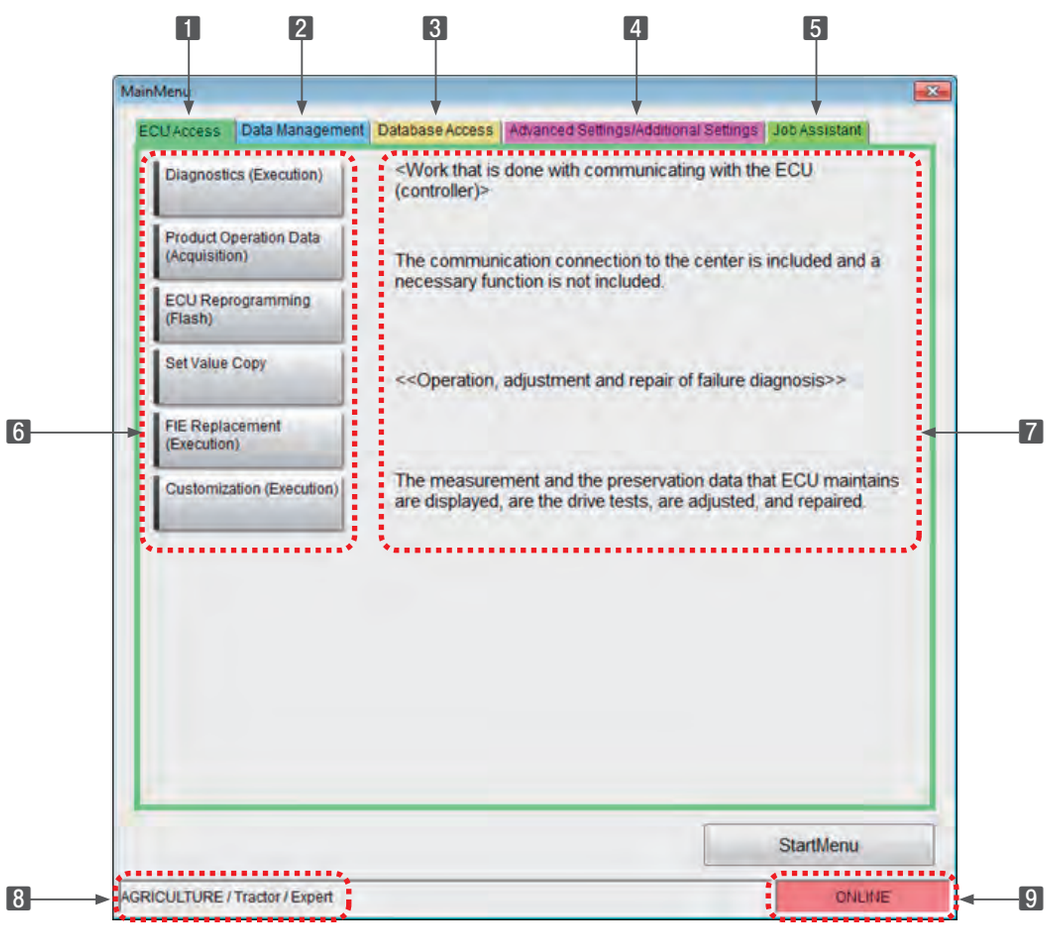
8 The product category or model selected in the start menu and the available function mode is displayed.

9 It is displayed whether a connection to the center or Internet is active.

Online: Connected

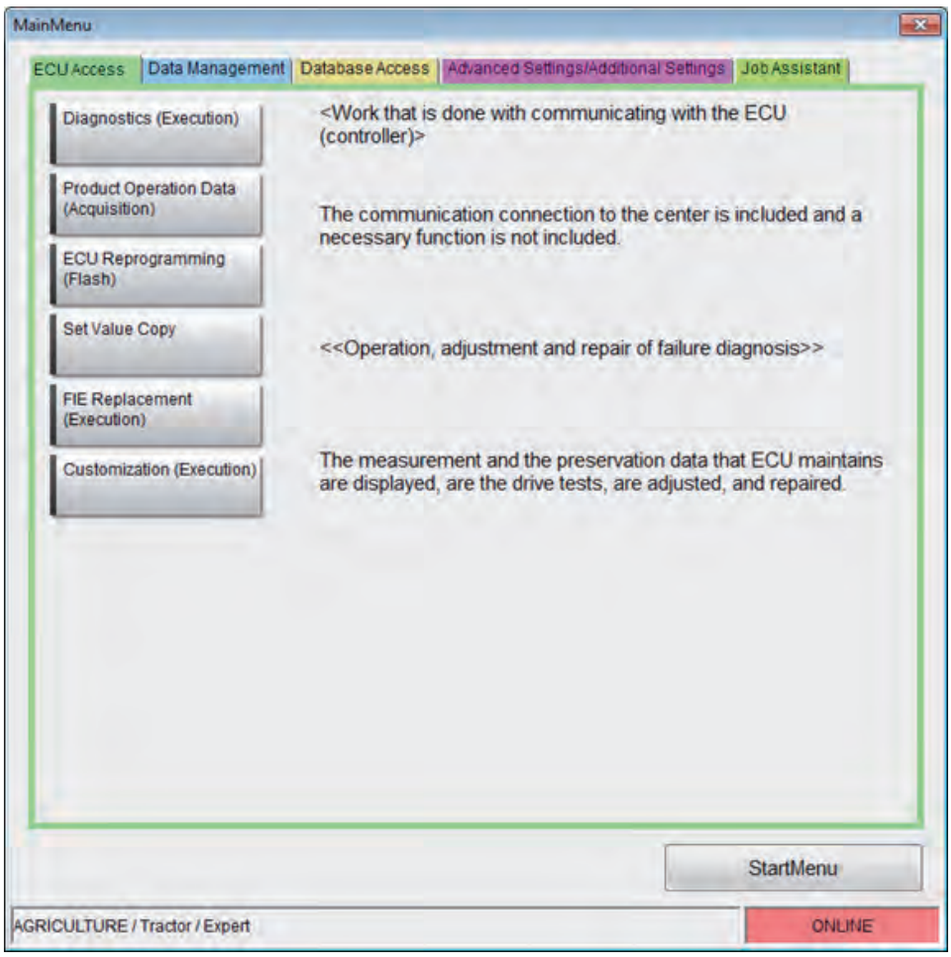
Offline: Not connected

Note **To change from offline to online status, it is necessary to exit the software, restart it, and log in. Being connected with a LAN cable alone is not sufficient to** change to the online status.



1 Operations with ECU Connected

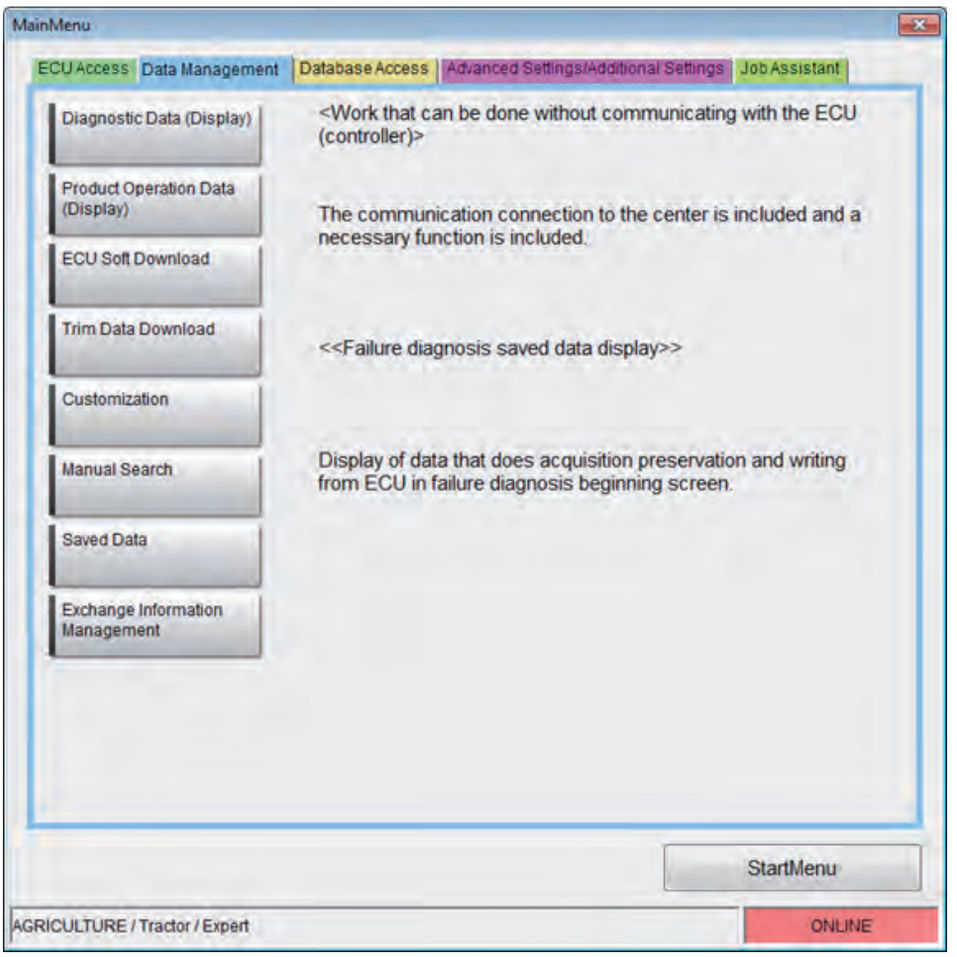
Operations that are performed with the ECU (controller) connected



Diagnostics (Execution)	Operations, adjustments and repairs during error diagnosis	View the measurement data and save data of the ECU, and perform an operational test, adjustments and repairs.	Refer to page 38.
Product Operation Data (Acquisition)	Collecting and saving operation data	View all saved operation data of the ECU, and do a comparative analysis with past data.	Refer to page 187.
ECU Reprogramming (Flash)	ECU software writing	Performed in case of ECU replacement or software updates. First, it is necessary to download the software with the ECU disconnected.	
Set Value Copy	Copying the settings during ECU replacement	Reading and writing setting values and correction values for ECU replacement. It is necessary to write the software to the new ECU in advance.	
FIE Replacement (Execution)	Rewriting correction values	Rewrite correction values for the pump, injector and other parts.	
Customization (Execution)	Customizing and deleting the settings	Change the settings according to your needs. First, it may be necessary to download the custom data with the ECU disconnected.	

2 Operations with ECU Disconnected

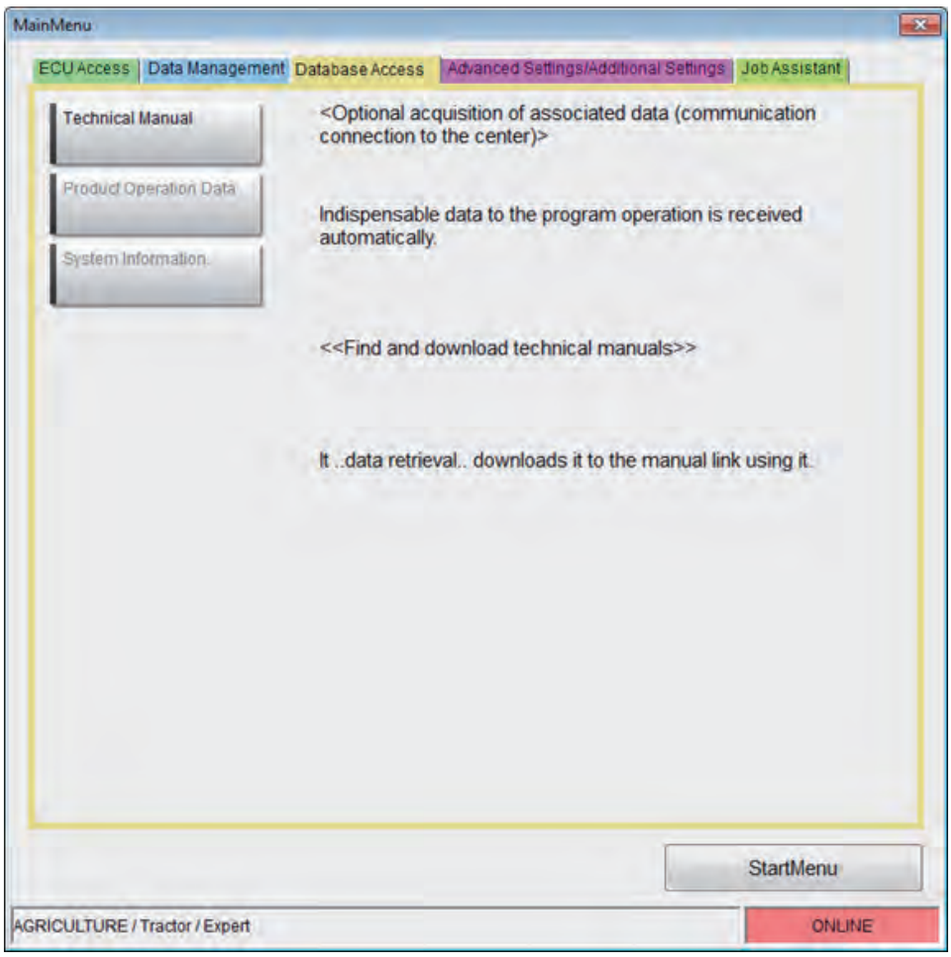
Operations that can be performed without the ECU (controller) connected



Diagnostic Data (Display)	Viewing the saved error diagnosis data	View and compare the saved data of the ECU in the error diagnosis start screen. Data that has been collected at other workstations must be imported from the Data Management menu.	Refer to page 139.
Product Operation Data (Display)	View saved operation data	View and compare the saved data of the ECU in the operation data screen.	Refer to page 193.
ECU Soft Download	ECU Software Download	Performed in case of ECU replacement or software updates. When writing to the ECU, it is necessary to do so with the ECU connected.	
Trim Data Download	Downloading the correction values for electrical parts	Download the pump correction values. The correction value of the injector for repair is not available for download.	
Customization	Customizing and deleting the settings	Download the maps and parameters for customization or cancellation.	
Manual Search	Searching and Viewing Technical Manuals	Search for downloaded manuals or manuals on external media.	Refer to page 170.
Saved Data	Managing data on the workstation	Import, export and delete data, and edit memos about data saved on the workstation (e.g. ECU write data, error diagnosis data, and operation data)	
Exchange Information Management	Manually upload data on replaced electrical parts	Manually upload to the management server data regarding completion and cancellation of electrical parts replacement and software updates	

3 Collecting Related Data

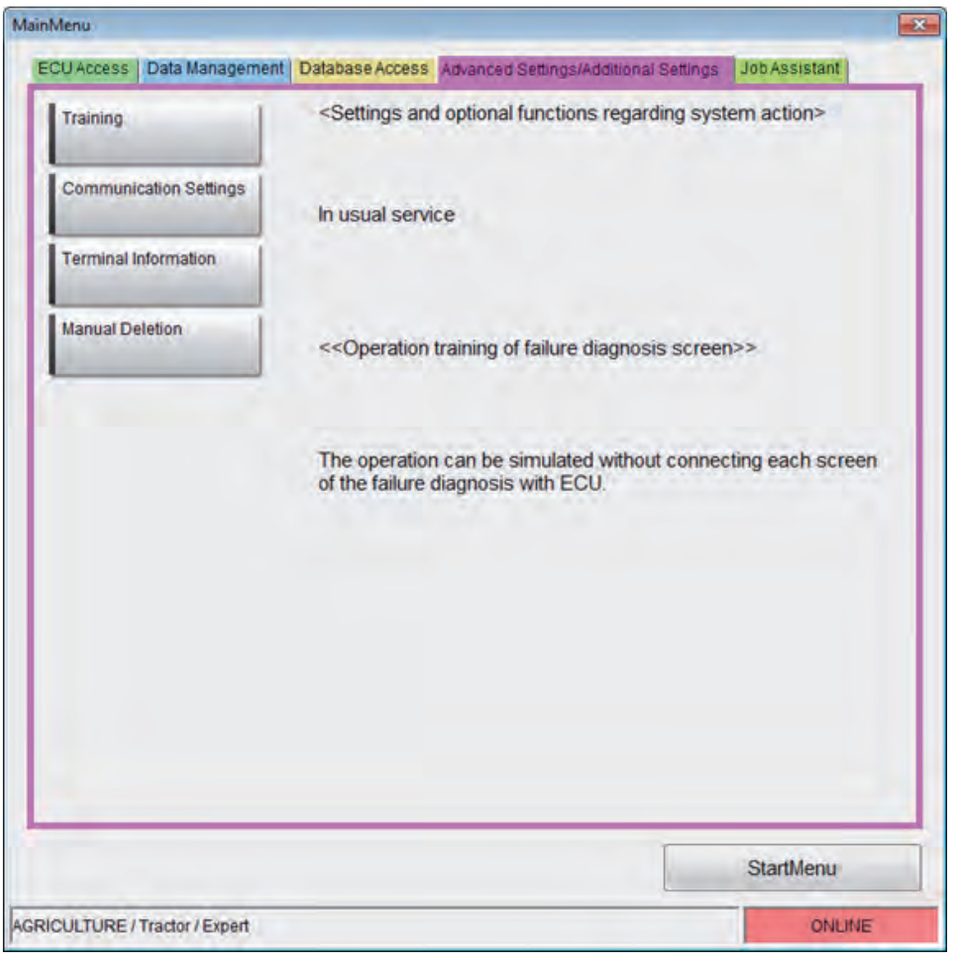
Related data is collected voluntarily (via a connection to the center)



Technical Manual	Search and download technical information	Search and download data used in the manual link.	Refer to page 176.
Product Operation data	Search and download operation data by model and machine number	Search and download operation data saved in the database.	
System Information		This is a menu for special operations. It is not normally available.	

4 Detail Settings/Additional Functions

Settings and additional functions related to system operations (including training mode)

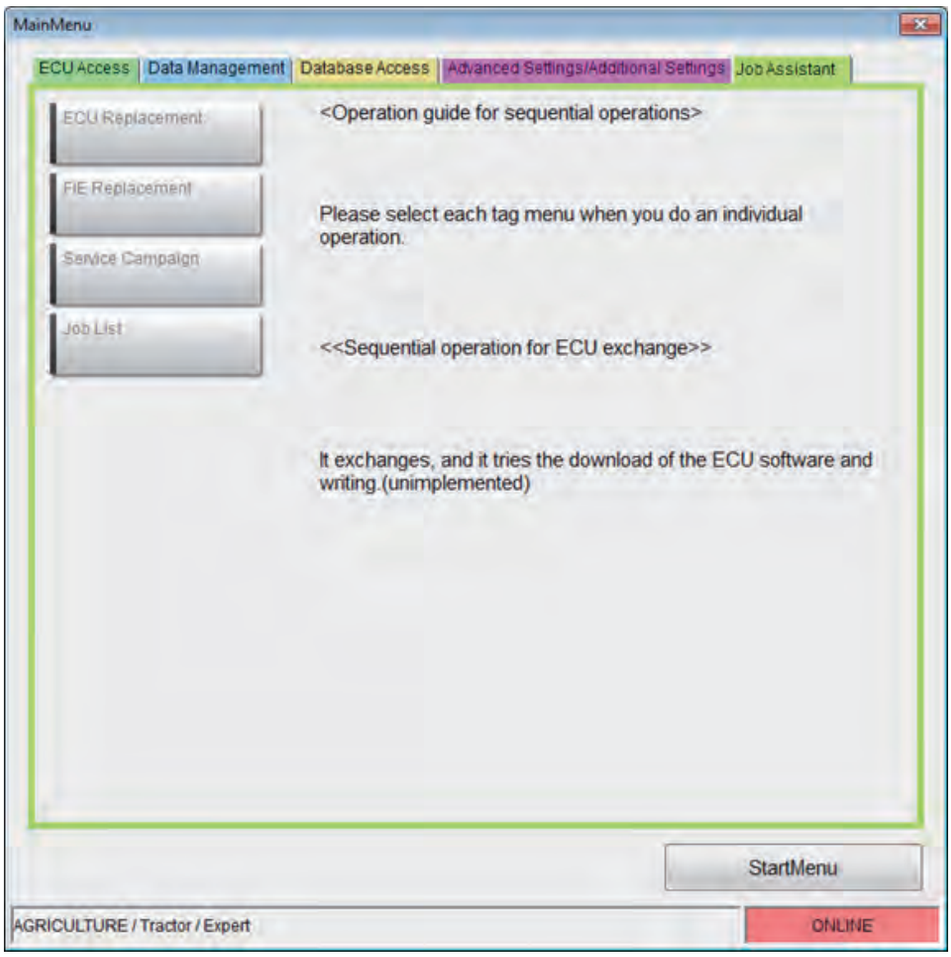


Training	Operation training for the error diagnosis screen	It is possible to simulate operating the error diagnosis screen of a representative model without connecting to the ECU.	
Communication settings	Edit the settings for communicating with the ECU	Normally, it is not necessary to change the settings.	Refer to page 203.
Terminal information	View all settings of the workstation	It is possible to confirm the usage license, software version, and updated information on supported models.	Refer to page 208.
Manual Deletion	Deleting data for the manual link	Delete obsolete data for the manual link.	Refer to page 183.

5 Job Assistant

Guide function to perform a series of operations

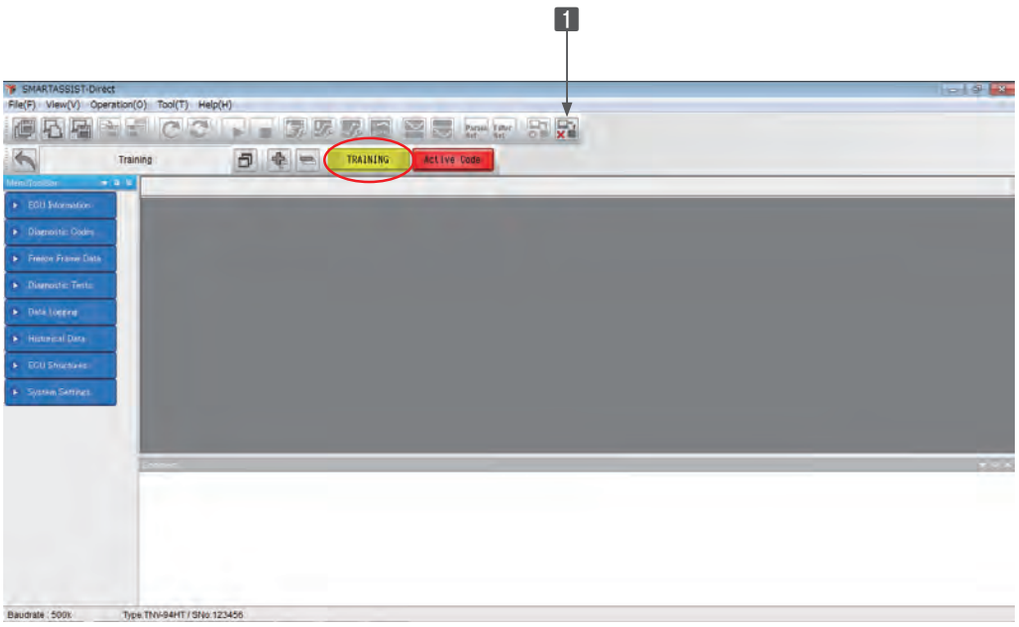
Note This function is unavailable as it is still under development. (January 2012)

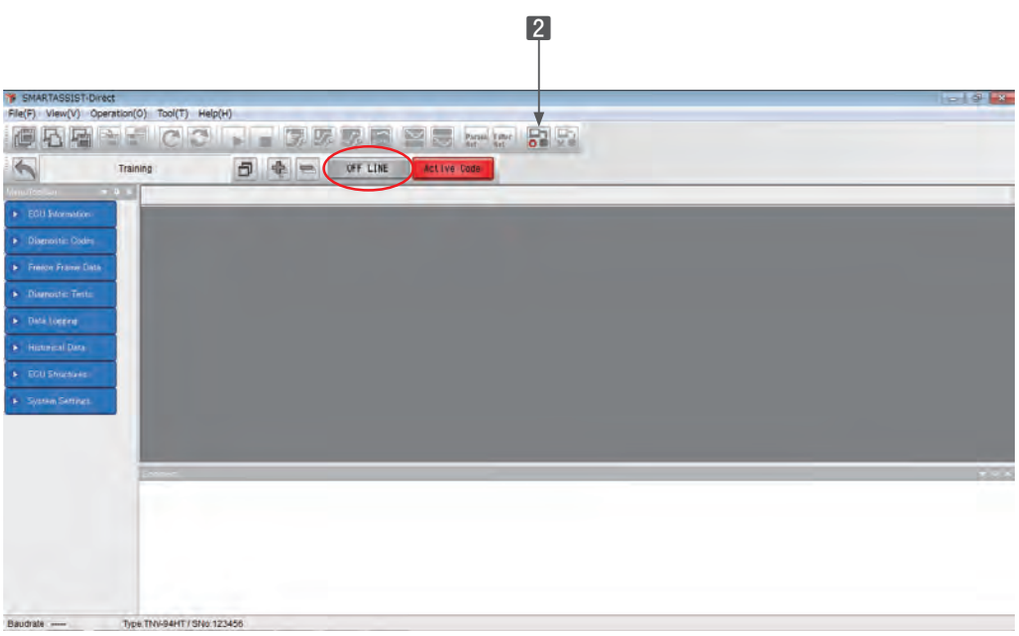


ECU Replacement			
FIE Replacement			
Service Campaign			
Job List			

4.2 Stop Procedure

Click icon 1 to disconnect from the ECU without exiting the program. After the adjustments of the product are complete, click icon 2 to continue monitoring.



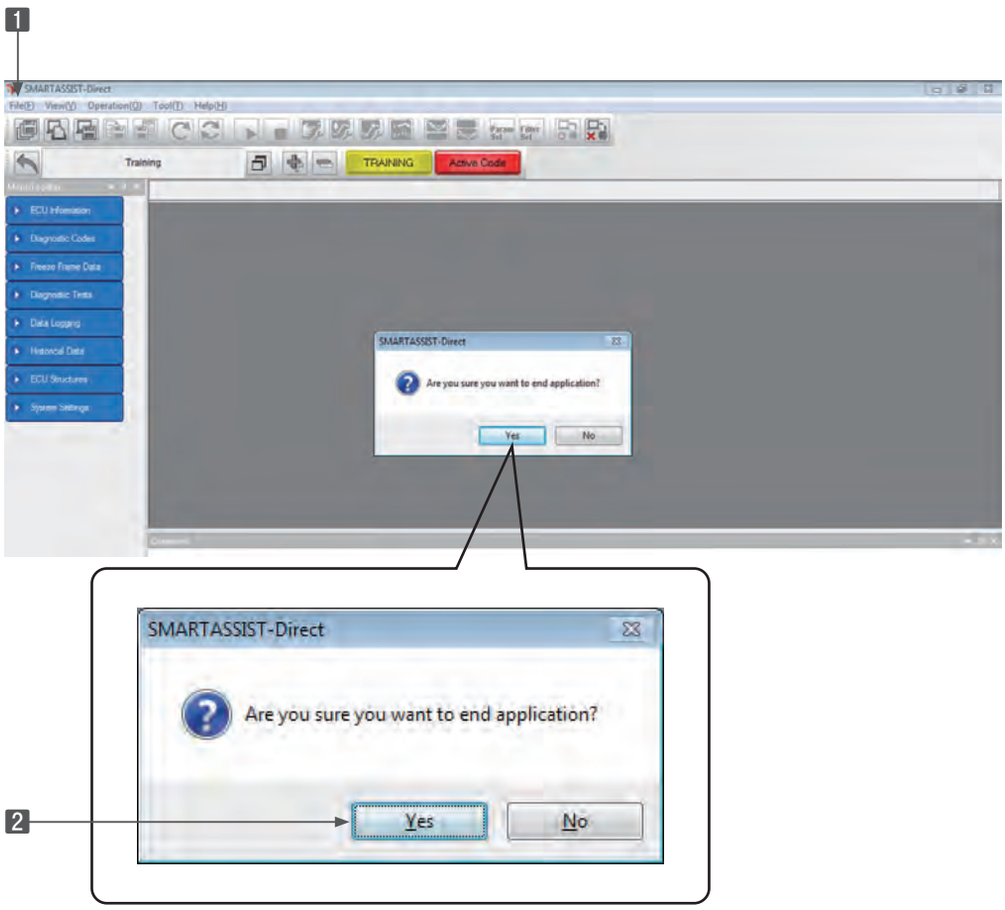


4.3 Finish Procedure

SMARTASSIST-Direct can be exited in the same way as other Windows applications. When disconnecting the interface box, do so after exiting the SMARTASSIST-Direct software.

1 [×] or "File (F)" - "Exit (X)": A confirmation message is displayed to exit the program.

2 [Yes] : Click to exit the program.



3 [Exit] : Click this to exit from the Start Menu.

4.4 Troubleshooting

If communication with the ECU is faulty and normal monitoring is not possible, check the below points and restart SMARTASSIST-Direct.

If the communication cable disconnects or the power supply to the ECU/product is interrupted during data transmission, the system may not operate normally even after a restart. In that case, turn off the power (with the key switch) or, if that is not possible, disconnect the interface box from the product's service connector and reconnect it. The interface box will reset and operations will return to normal.

- Are all cables connected? Are all cables in good condition?
- Does the product have power?
- Is the system not in training mode?
- Is the system connected?

For details on the warning messages, refer to [14. Error Screen and Warning Screen] on page 211.

5. Screen Functions

5.1 Basic Screen

● Toolbar

1 Standard Toolbar : On the standard toolbars that allow basic operations 2 to 4, you can press ALT and the bracketed letter as a shortcut.

2 Operation Toolbar : On all screens, the available operations are shown on a toolbar, and only the necessary function icons are displayed.

3 Function Selection Toolbar : The view is equivalent to the standard toolbar where standard functions are selected.

4 Screen Display Toolbar : Expand and minimize the function selection toolbar and display messages and warnings.

5 Subfunction Selection Toolbar : A subfunction button is displayed within each function. Also, if the product has a multi-ECU, the communication destination controller can be switched.

● Display Box

6 Main Box : Displayed depending on the selected function.

7 Additional Information Box : Used as a special display on graph screens and time series data screens.

8 Comment Box : Usually, the current error status is displayed. The error criteria and error diagnosis results are displayed in the screen that shows the error code.

9 Status Box : Displays the current communication status.

● Function Buttons

10 The function buttons that are not on the standard toolbar (e.g. the clear button) are in the main box or the additional information box.

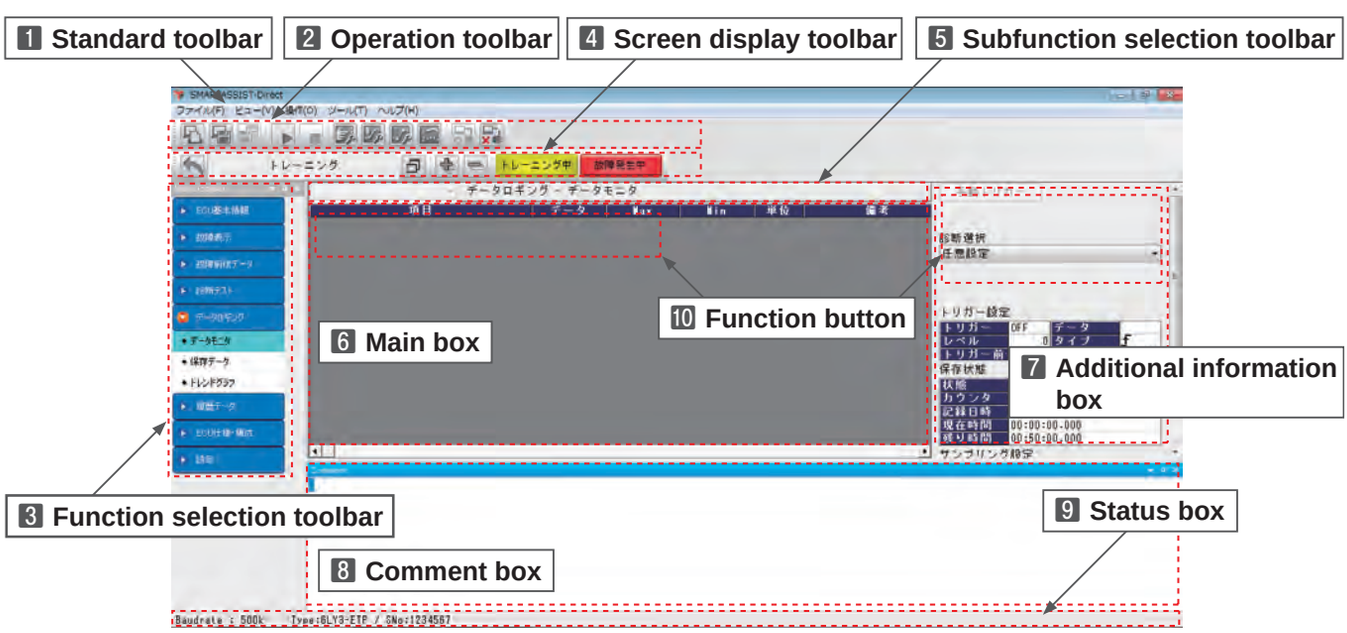


Figure 5-1 Basic Screen

5.1.1 Standard Toolbar

Toolbar to select the functions, screens, operations and tools. Select by clicking. When a menu is displayed, you can press ALT and the bracketed letter behind a menu entry as a shortcut.

File (F)
Saving Files (S)
Screen Print (P
Saving Screen Bitmap (B)
Main Menu (M)
Exit (X)

View (V)
ECU Basic Information (I)
Main Data (I)
Defect Display (F)
Current Defect (A)
Defect History (L)
List of Error Codes (I)
Display Data Before/After Error (R)
Save Data (S)
Trend Graph (T)
Diagnosis Test (D)
Pulse/Analog Input/Output (A)
Digital Entry/Bit Status (I)
Digital Output (O)
Forced Operation (D)
Forced Operation Graph (G)
Forced Operation Hysteresis Graph (H)
Data Logging (L)
Data Monitor (M)
Save Data (S)
Trend Graph (T)
History Data (H)
Integrated Value (L)
Distribution Chart (M)
Incident Record (G)
ECU Specification/Structure (E)
Analog Signal (A)
Digital Dignal (D)
ECU ID Data (E)
ECU Data Saving (S)
Settings (S)
Configuration (C)
Sensor Correction (A)
Parameter Adjustment (T)
Initial Settings (I)
Manual Search (M)

Operation (O)
Update (R)
Automatic Update (C)
Start (S)
Stop (P)
Option Settings (O)
Trigger Settings (T)
Sampling Settings (L)
Data Settings (D)
Top Graph Settings (G)
Bottom Graph Settings (H)
Parameter Settings (E)
Filter Settings (F)
Clear (A)
Manual Trigger (M)
Connect (Z)
Disconnect (X)

Tool (T)
Toolbar (T)
Menu Toolbar
Comment
Status Bar (F)
Communication Settings (C)
Option (O)

Help (H)
Version Information (V)

5.1.2 Operation Toolbar

On all screens, the available operations are shown on a toolbar, and you can operate them by clicking them. Unavailable operations are displayed in a darker color.

	Saving/Reading ECU Storage Data		Screen Print		Saving Screen Bitmap
	Saving Files		Saving Measuring Data		Update
	Continued Update		Start		Stop
	Option Settings		Trigger Settings		Sampling Settings
	Data Settings		Top Graph Settings		Bottom Graph Settings
	Parameter Settings		Filter Settings		Connecting
	Disconnecting		Return to Menu		

5.1.3 Function Selection Toolbar

● Toolbar to select the functions of the service tool. Select a menu by clicking it. The view is equivalent to the standard toolbar.

Name		Description
News	News	Displayed when relevant news data for the connected product is available.
ECU Information	ECU Basic Information	Displays main system information of the ECU or controller.
Diagnostic Codes	Defect Display	Displays current or past defects detected by the ECU or controller.
Freeze Frame Data	Data Before/After Error	Displays relevant data before/after a recent error was detected (expert function).
Diagnostic Tests	Diagnosis Test	Separately checks the input/output tools. The input/output test has a forced operation function.
Data Logging	Data Logging	Diagnoses faults and analyses the operating conditions while the engine operates.
Historical Data	History Data	Displays the operating condition stored in the ECU.
ECU Structures	ECU Specification/Structure	Displays ECU and controller data and input/output layout information (expert function).
System Settings	Settings	Necessary when performing initial settings and repair, and adjustments such as ECU or controller replacement.

● Operation tool available in all menus

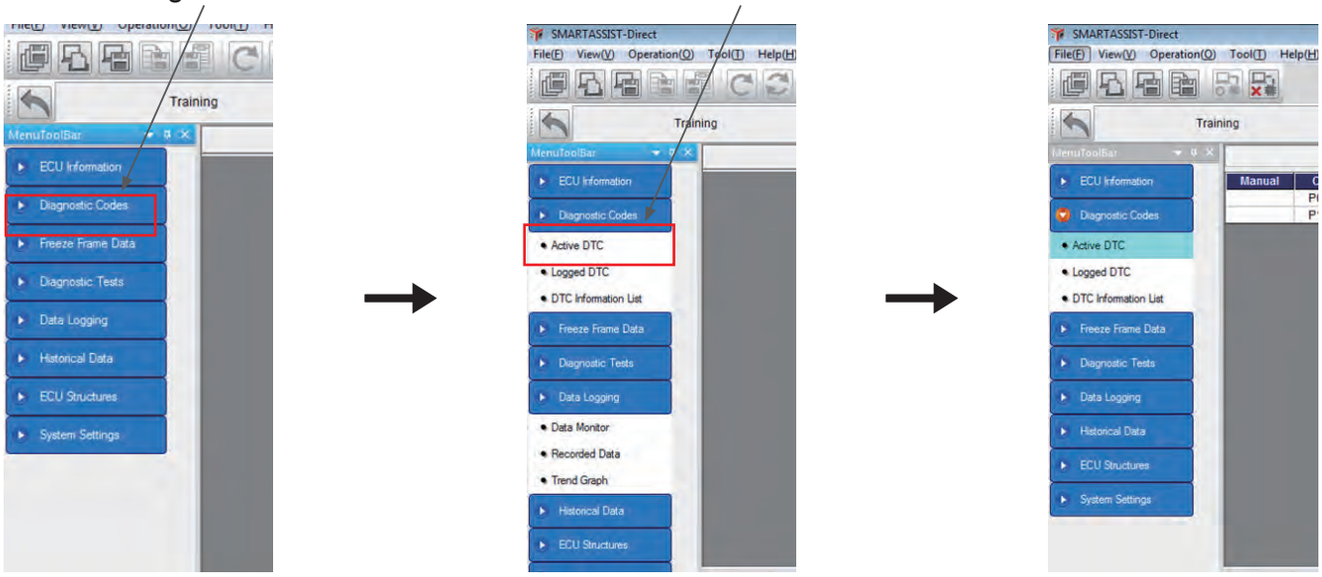
Menu	Submenu	Saving and reading the ECU storage data *1	Screen Print	Saving Screen Bitmap	Saving Files	Update	Continued Update	Start	Stop	Option Settings	Trigger Settings	Sampling Settings	Data Settings	Top Graph Settings	Bottom Graph Settings	Connecting	Disconnecting
News	News Display																
ECU Basic Information	Main Data		○	○	○	○	–	–	–	–	–	–	–	–	–	○	○
Defect Display	Current Defect		○	○	○	–	–	–	–	–	–	–	–	–	–	○	○
	Defect History		○	○	○	○	–	–	–	–	–	–	–	–	–	○	○
	List of Error Codes		○	○	○	–	–	–	–	–	–	–	–	–	–	○	○
Display Data Before/ After Error	Save Data		○	○	○	○	–	–	–	–	–	–	○	–	–	○	○
	Trend Graph		○	○	–	–	–	–	–	–	–	–	–	○	○	○	○
Diagnosis Test	Pulse/Analog Input/Output		○	○	○	○	○	–	○	–	–	–	○	–	–	○	○
	Digital Entry/Bit Status		○	○	○	○	○	–	○	–	–	–	–	–	–	○	○
	Digital Output		○	○	○	○	○	–	○	–	–	–	–	–	–	○	○
	Forced Operation		○	○	○	–	–	–	–	–	–	–	–	–	–	○	* 2
	Forced Operation Graph		○	○	○	–	–	–	–	–	–	–	–	○	–	○	○
	Forced Operation Hysteresis Graph		○	○	○	–	–	–	–	–	–	–	–	○	–	○	○
Data Logging	Data Monitor		○	○	–	–	–	○	○	○	○	○	○	–	–	○	○
	Save Data		○	○	○	–	–	–	–	–	–	–	○	–	–	○	○
	Trend Graph		○	○	–	–	–	○	○	–	–	–	–	○	○	○	* 2
History Data	Integrated Value		○	○	○	○	–	–	–	–	–	–	–	–	–	○	○
	Distribution Chart		○	○	○	○	–	–	–	–	–	–	–	○	–	○	○
	Incident Record		○	○	○	○	–	–	–	–	–	–	–	–	–	○	○
ECU Specification/ Structure	Analog Signal		○	○	○	–	–	–	–	–	–	–	–	–	–	○	○
	Digital Signal		○	○	○	–	–	–	–	–	–	–	–	–	–	○	○
	ECU ID Data		○	○	○	○	–	–	–	–	–	–	–	–	–	○	○
	ECU Data Saving		○	○	○	○	–	–	–	–	–	–	–	–	–	○	○
Settings	Configuration		○	○	○	–	–	–	–	–	–	–	–	–	–	○	○
	Sensor Correction		○	○	○	–	–	–	–	–	–	–	–	–	–	○	○
	Parameter Adjustment		○	○	○	–	–	–	–	–	–	–	–	–	–	○	○
	Initial Settings		○	○	○	–	–	–	–	–	–	–	–	–	–	○	○
Manual Search	-		○	○	–	–	–	–	–	–	–	–	–	–	–	–	–

*1: Operation with ECU connected: saving ECU storage data
Operation with ECU disconnected: reading ECU storage data
*2: Cannot disconnect during forced operation and when receiving logged data

● Display of the Function Selection Toolbar

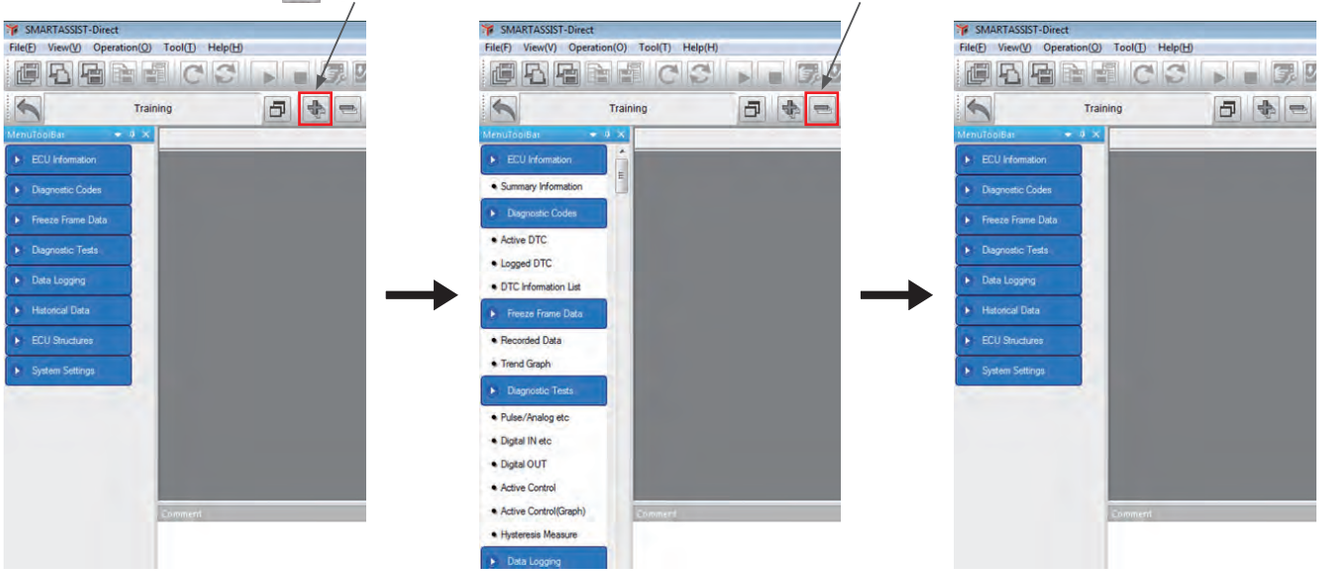
Click the button on the menu to open the submenu. Click it again to close the submenu.

The selected submenu is displayed in blue. You cannot close the selected submenu.



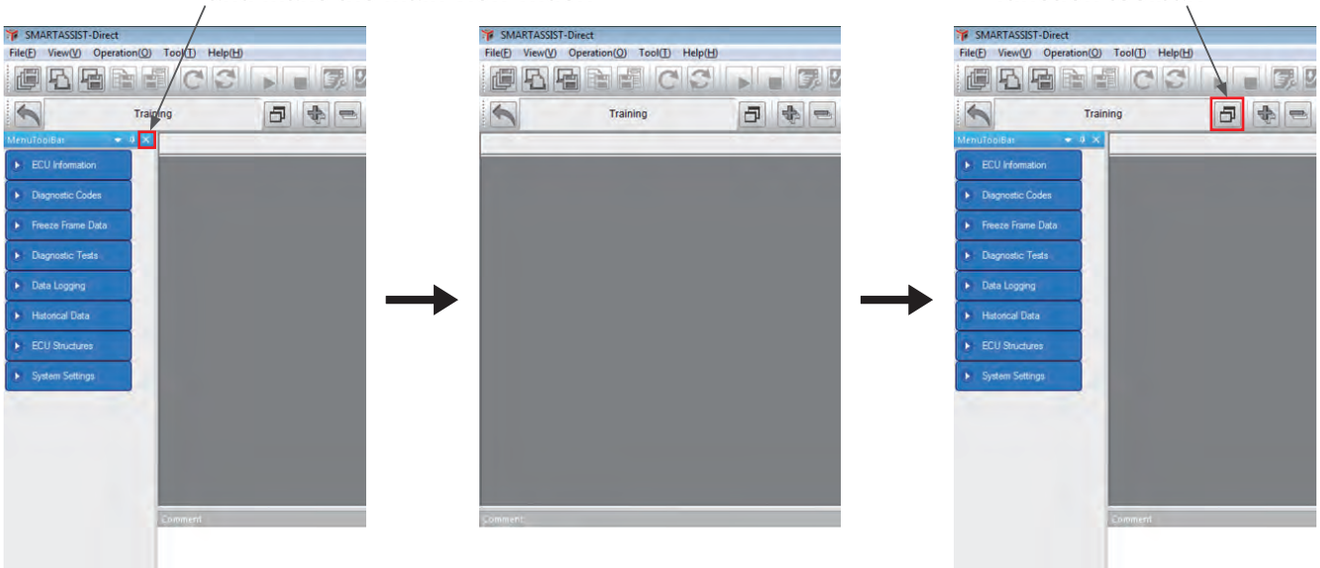
Click to open all submenus.

Click to close all submenus.
You cannot close selected submenus.



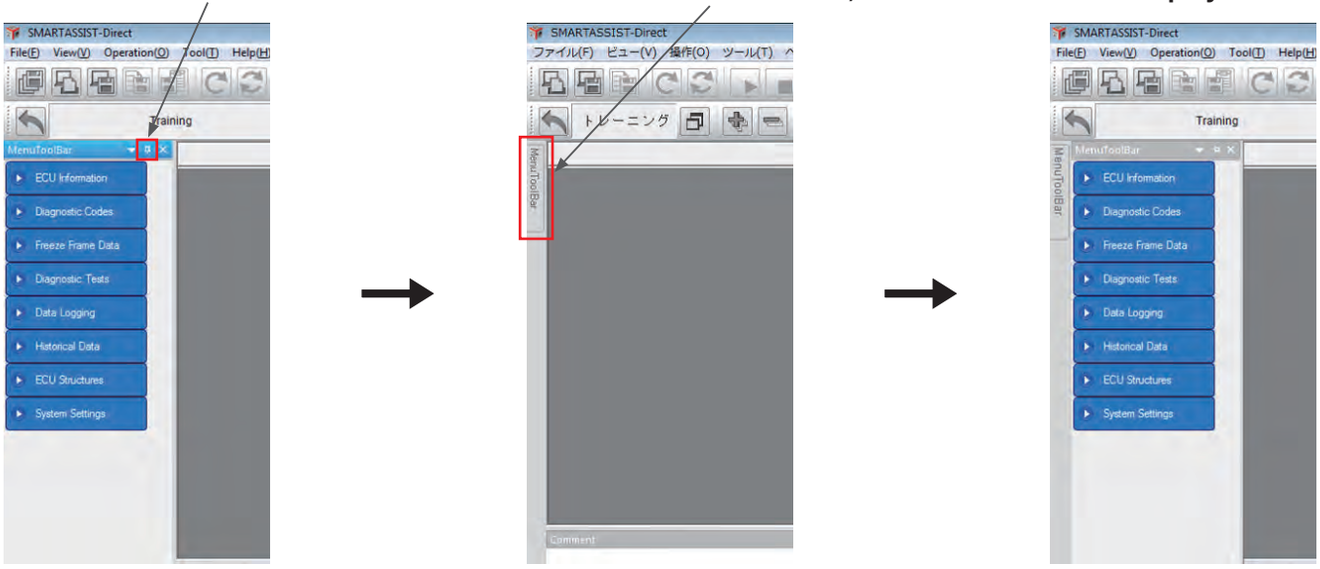
Click ✕ to close the function toolbar and make the main view wider.

Click to show the function toolbar.

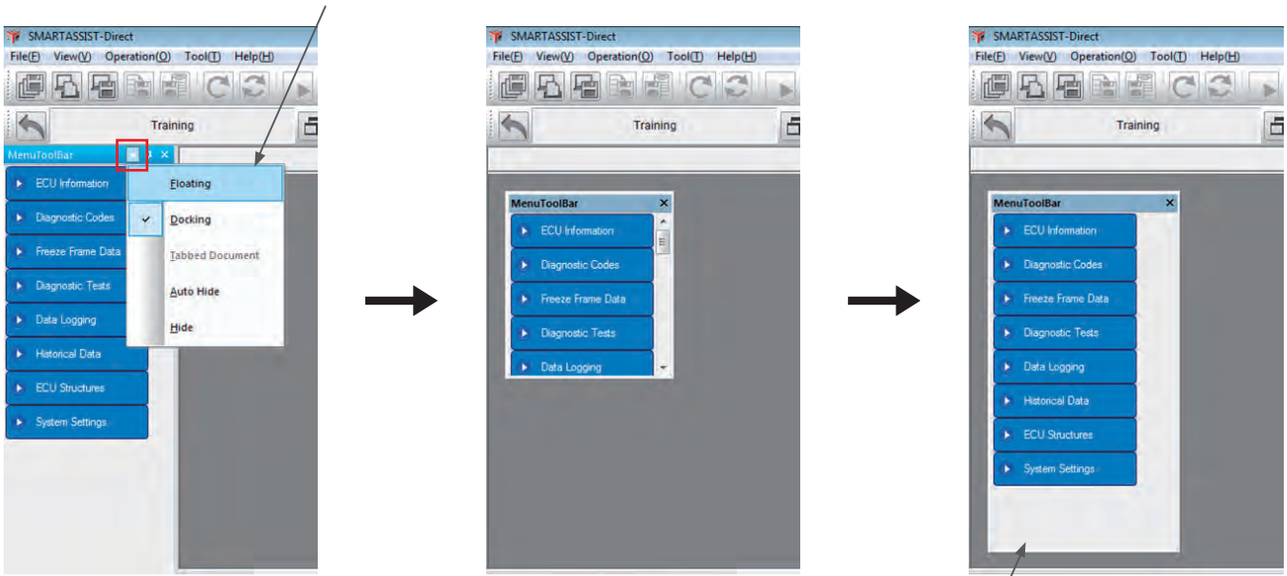


Click to hide the function toolbar and make the main view wider.

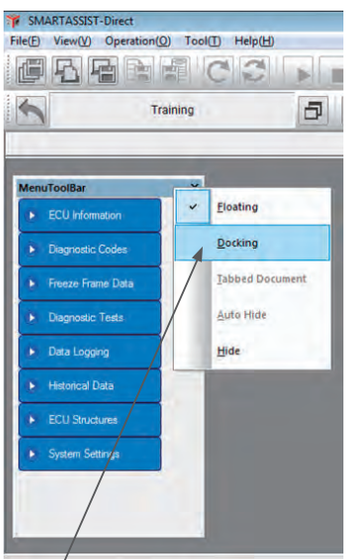
If you move the cursor close to the function toolbar tab, the hidden toolbar is displayed.



Click ▼ and select Floating to detach the function toolbar and move it to the desired location.



You can adjust the size.



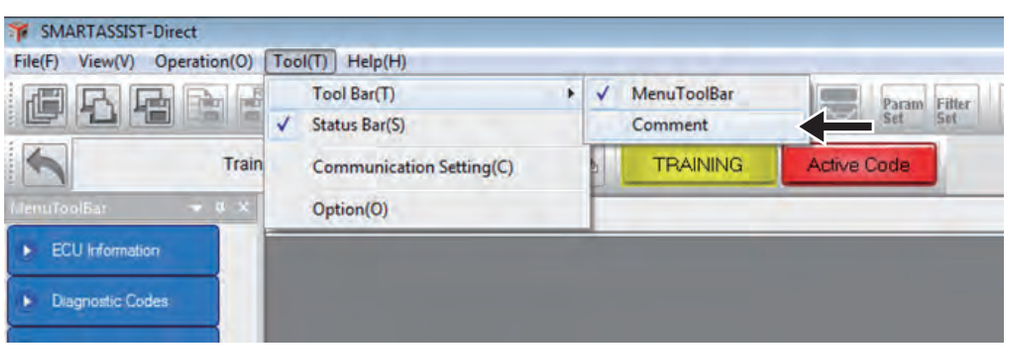
Right-click the function toolbar and select Docking to return it to its original position.

5.1.4 Comment Box

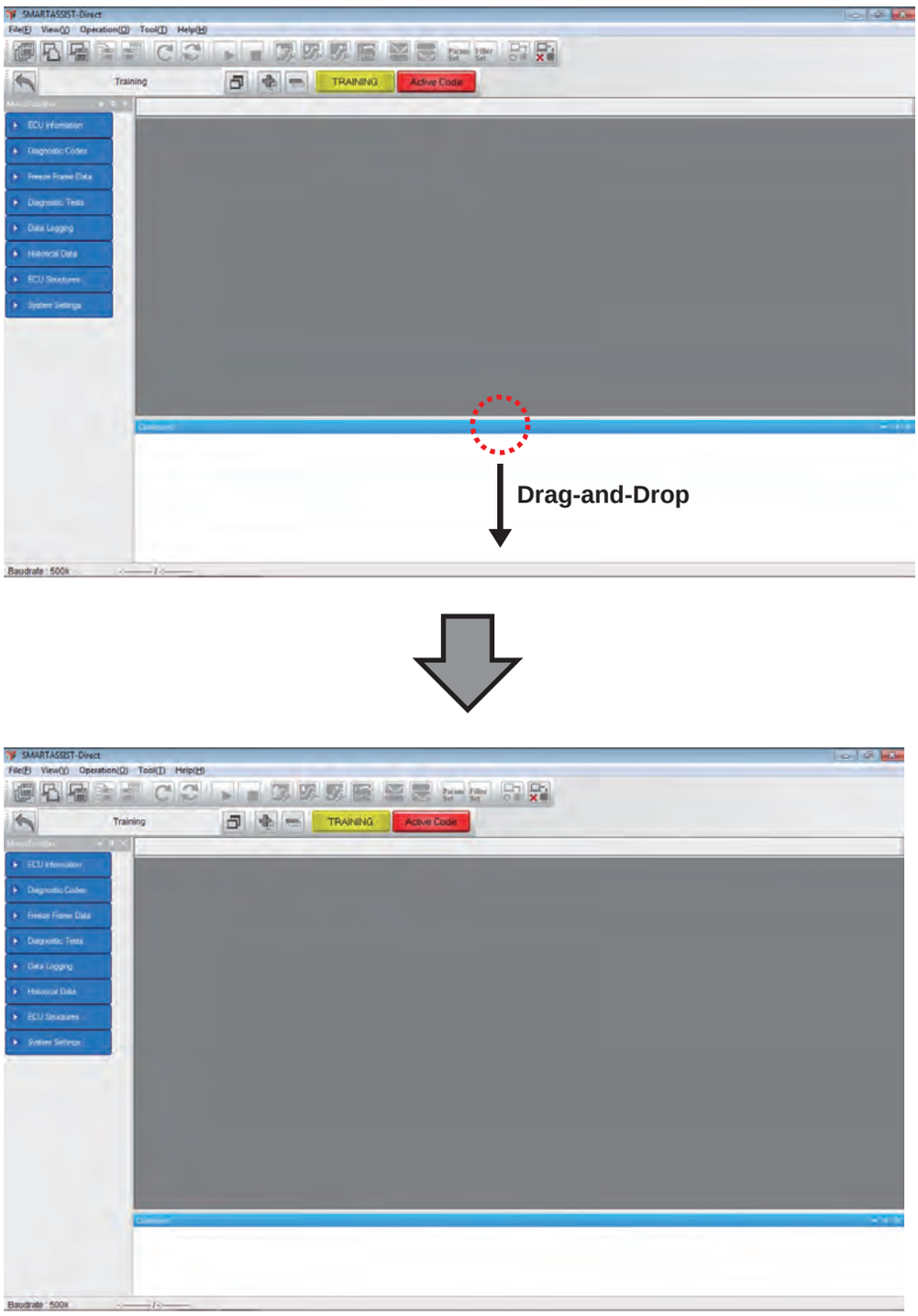
The display of the comment box can be changed in the same way as the function selection toolbar.

1 : Push to Hide button to hide the comment box.

To display the comment box again, go to the standard toolbar and click Tool (T), Toolbar (T), and Comment.

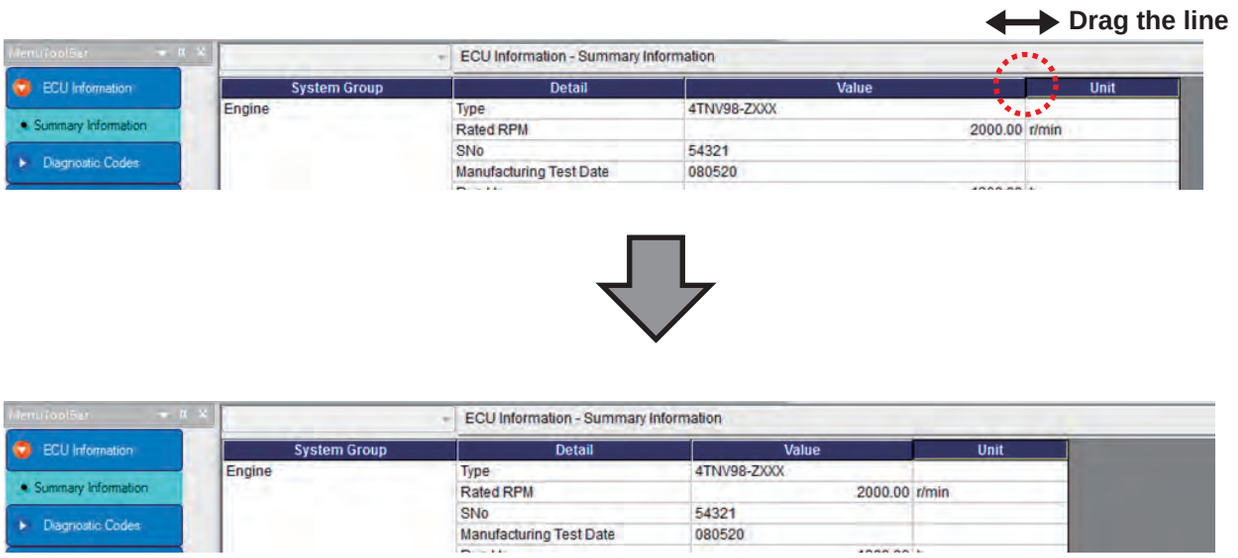


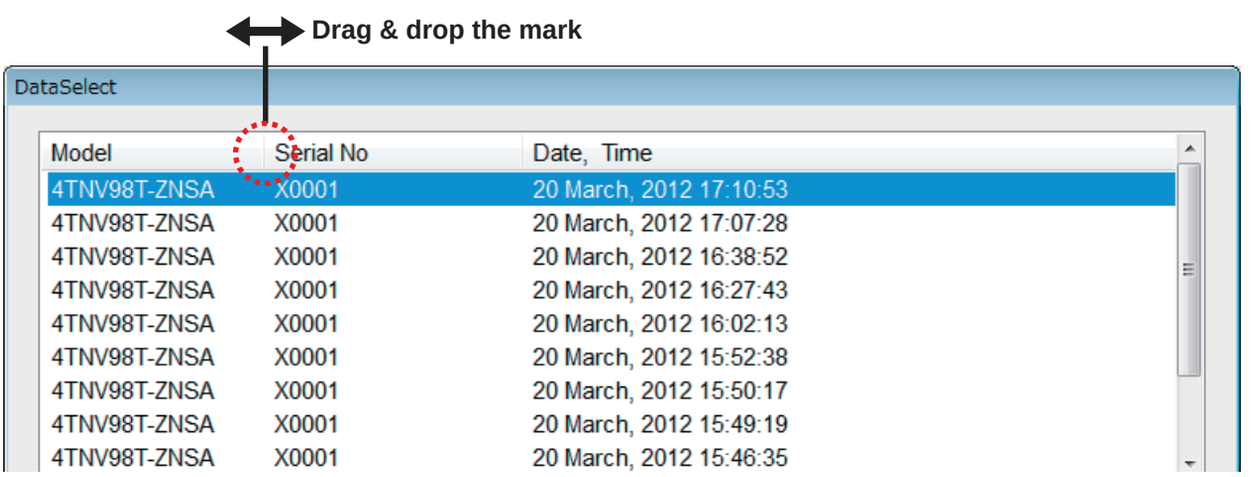
The size of the comment box is adjustable. (Operate by drag-and-drop.)

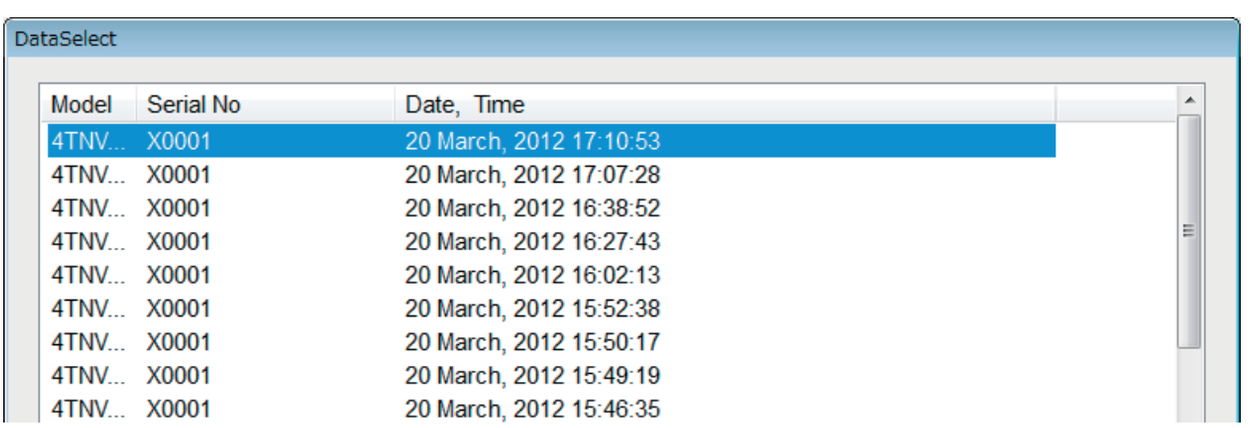


5.1.5 Changing the Display Border Width

The display border width of the display box and all selection screens is adjustable.







5.1.6 Screen Display Toolbar

1 : Return to the Main Menu

2 : Display box for the selected function

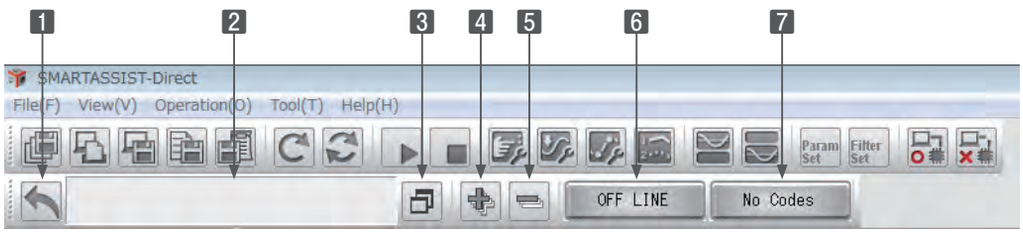
3 : Show the Function Selection Toolbar again

4 : Expand submenus of the Function Selection Toolbar

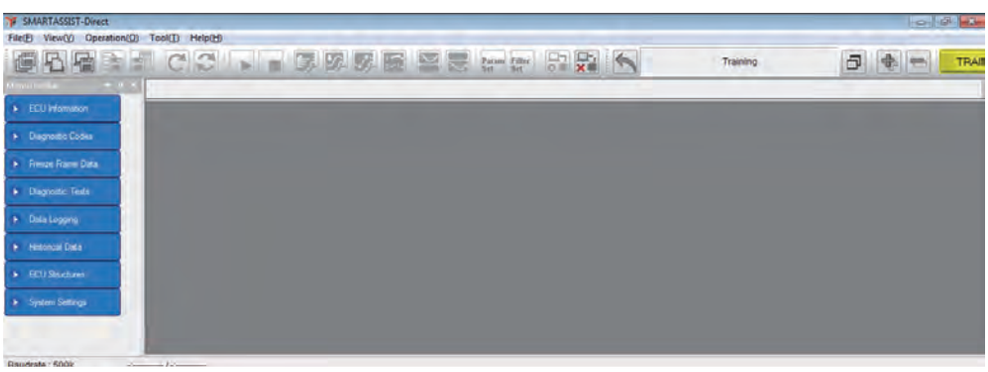
5 : Minimize submenus of the Function Selection Toolbar

6 Display of ECU/controller communication status: 通信接続中 トレーニング中 etc.

7 Display of current errors: 故障発生中



You can change the position of the Screen Display Toolbar. (Operate by drag-and-drop.)

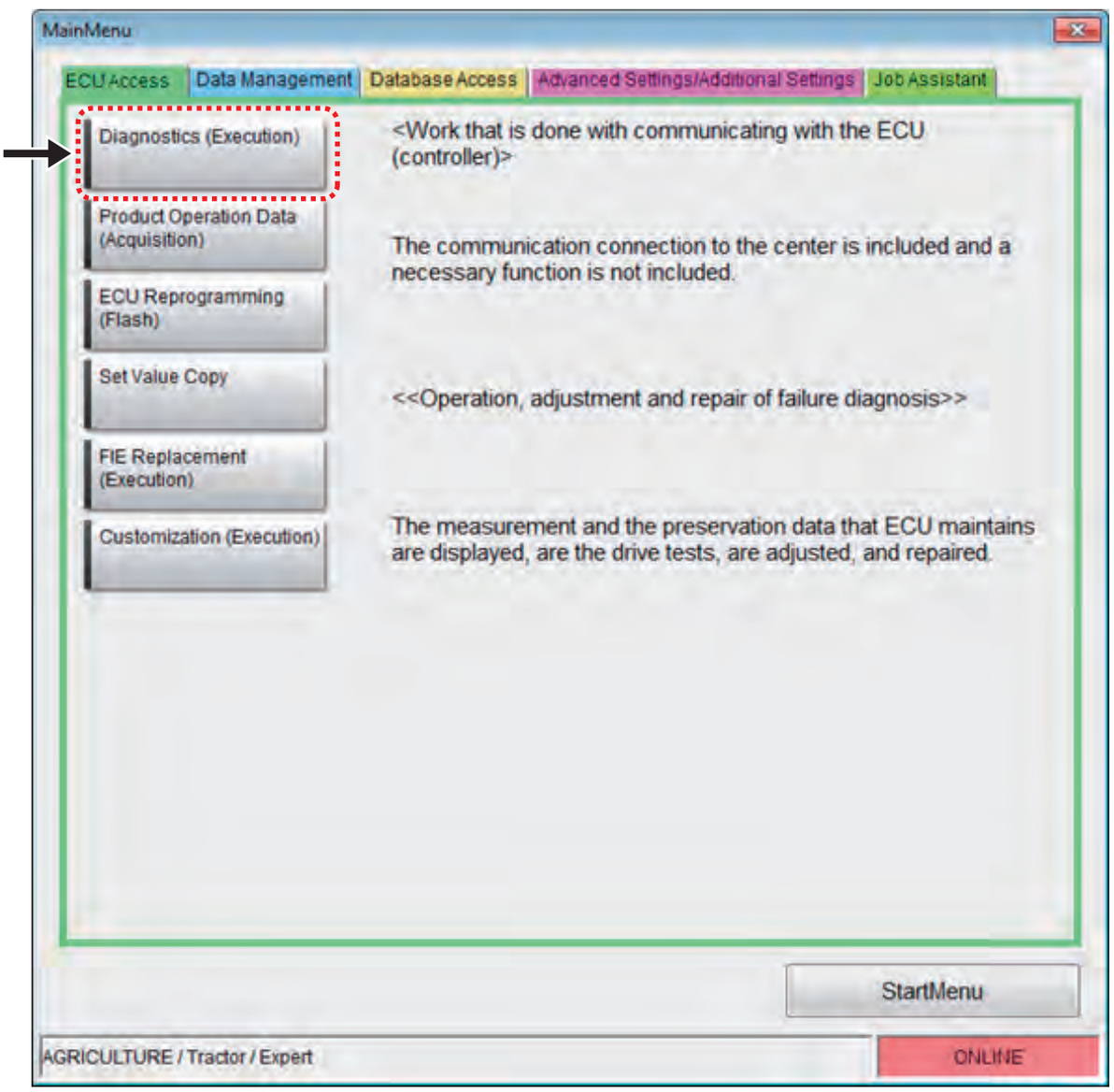


Example of a change

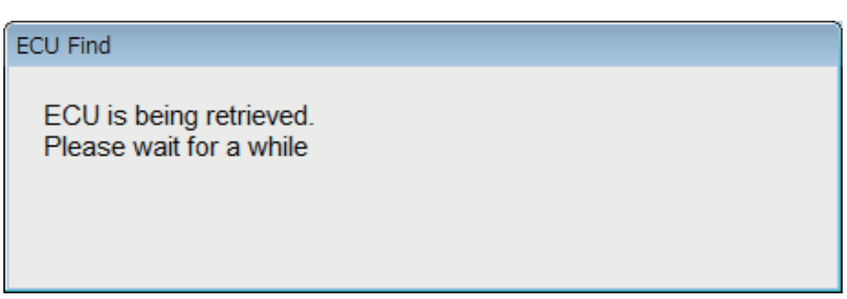
6. Error Diagnosis Function (ECU Connection)

6.1 Starting the Error Diagnosis

1. Connect the product and the PC with the interface box.
2. Turn on the product. (Turn the key switch to "On".)
3. Select the tab "ECU Connection".
4. Select the button "Diagnostics (Execution)".



5. Search the ECU/controller.



6 When the search of the product's internal ECU is finished, the selection screen for the connection destination is displayed. Select connection destination 2, and click "Start".

1 Normally this is automatically set by a part that adjusts the communication speed and cannot be changed.

2 Select the connection destination. Normally, the parts in the product's internal ECU that can be connected to are displayed.

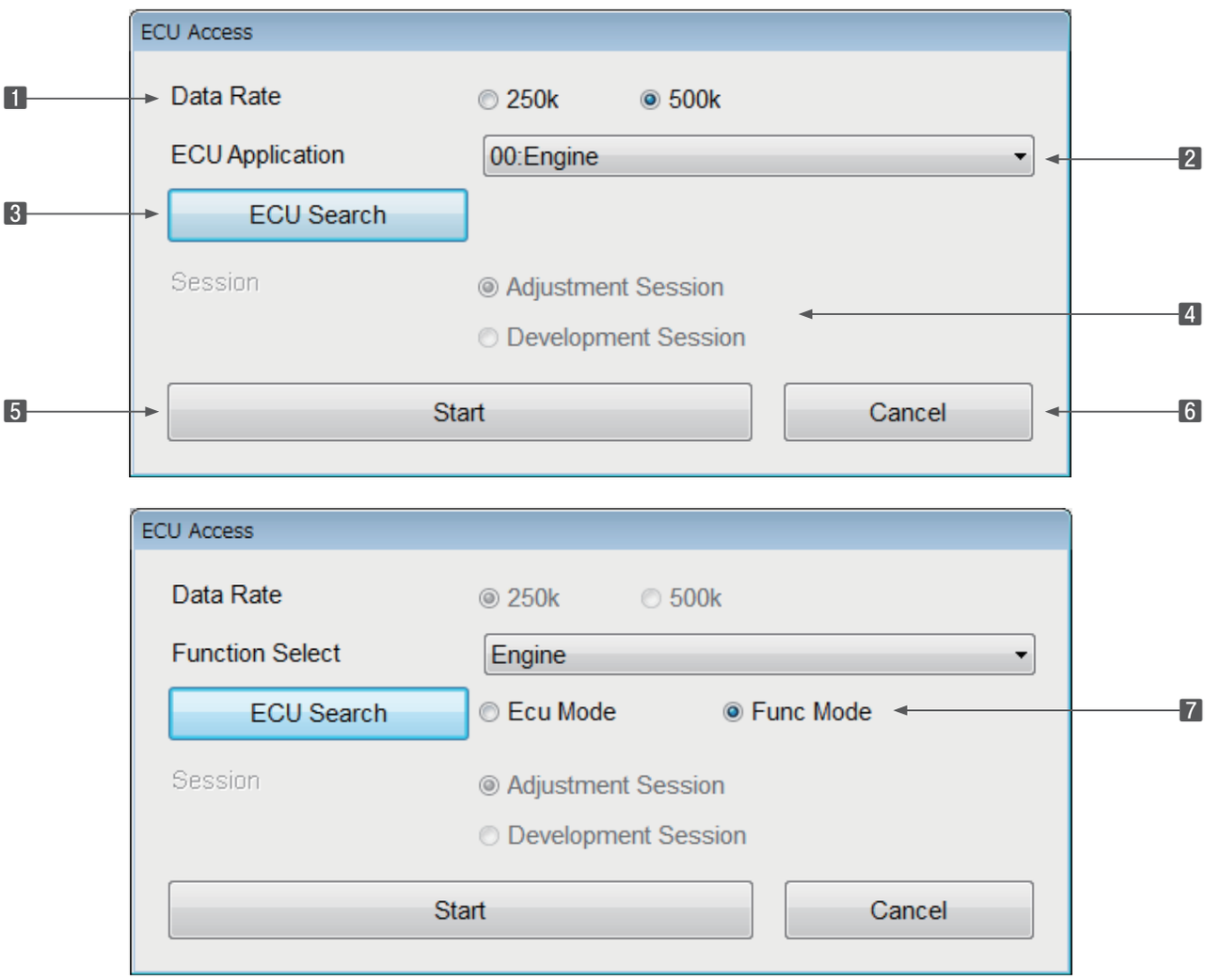
3 Search the ECU again.

4 Used by the development and production departments. Not used for servicing.

5 Activate the connection.

6 Cancel the connection.

7 The display method can be changed to "Sort By ECU" and "Sort By Function". (Refer to [7 Display Sorted by Function] on page 39.)



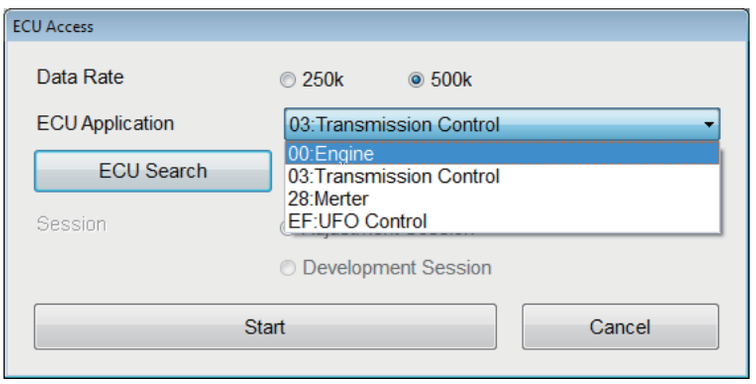
7 Display Sorted by Function

To improve the product's functionality, a multi-ECU type has been developed that allows the control of one function on multiple ECU. In that case, select the display method "Sorted by Function" to view the necessary data filtered from multiple ECU.

Example: Running control, horizontal control

Note

- If the search cannot be conducted because the power is turned off, the power supply is unstable, a cable is not connected or other reasons, an ECU list is displayed on the selection screen of 2 that suggests connection destinations from the product category selected on the start menu. If the search is not successful, changing the communication speed becomes available. For marine use, the standard is 250 kB; for land use, agricultural and construction equipment, the standard is 500 kB. The Baud rate can vary depending on the machine model. Select the communication speed and the ECU address, and click "Start".
- The ECU address of the model selected at the Start Menu is displayed as selection destination.



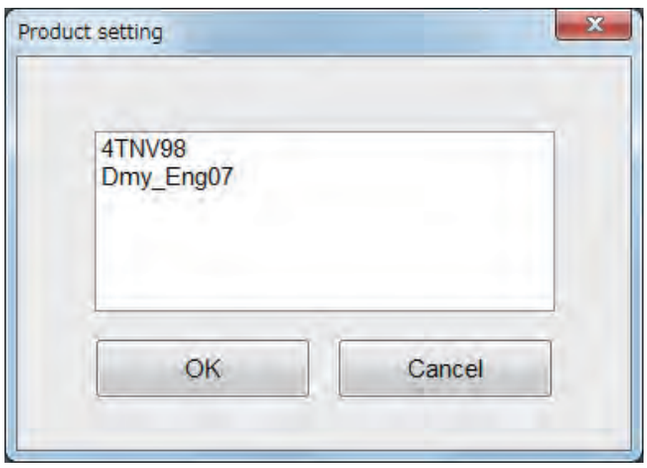
- If connected to a service ECU (new ECU), refer to [10 Connecting to the service ECU] on page 43.

8 The communication with the ECU or controller starts.

Note **If communication fails and an error screen is displayed, refer to ○○○○.**

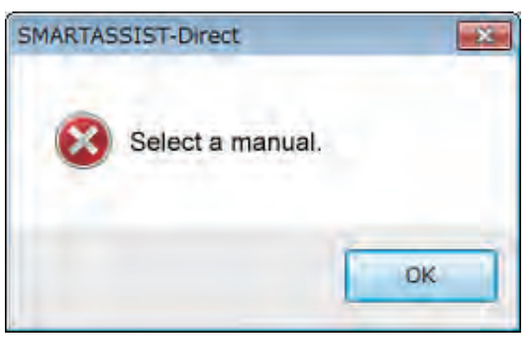
9 Data Selection Screen for the Manual Link Function

① When the connection to the product is established, the product model is confirmed and the manual link data for error diagnosis is automatically set. If multiple data sets are available, the data selection screen is displayed. Select the desired data, and click "OK".

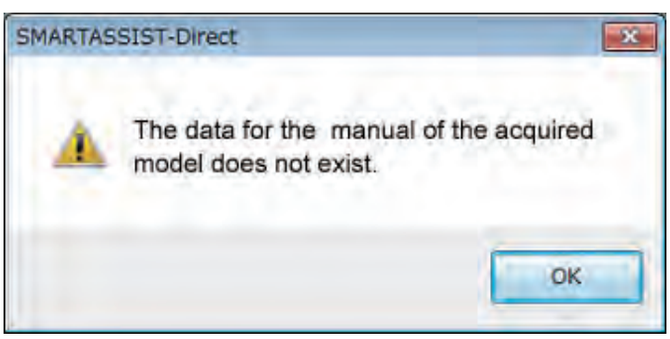


Example screen

If you click "OK" without selecting the data, the below warning screen is displayed.



② If no applicable technical manual is available, the below screen is displayed.



Note If only one manual link data set is available, the screens described in ① and ② are not displayed and the data is set automatically.

③ If the manual link data is of a different language than the language set for the operating system, the below notice screen is displayed, asking for confirmation.

1 Selection window for different languages

2 If confirmed

3 If not confirmed

Note When the manual display language setting and the language set for the PC's operating system are different, the manual display language setting is prioritized.

10 Connecting to the service ECU

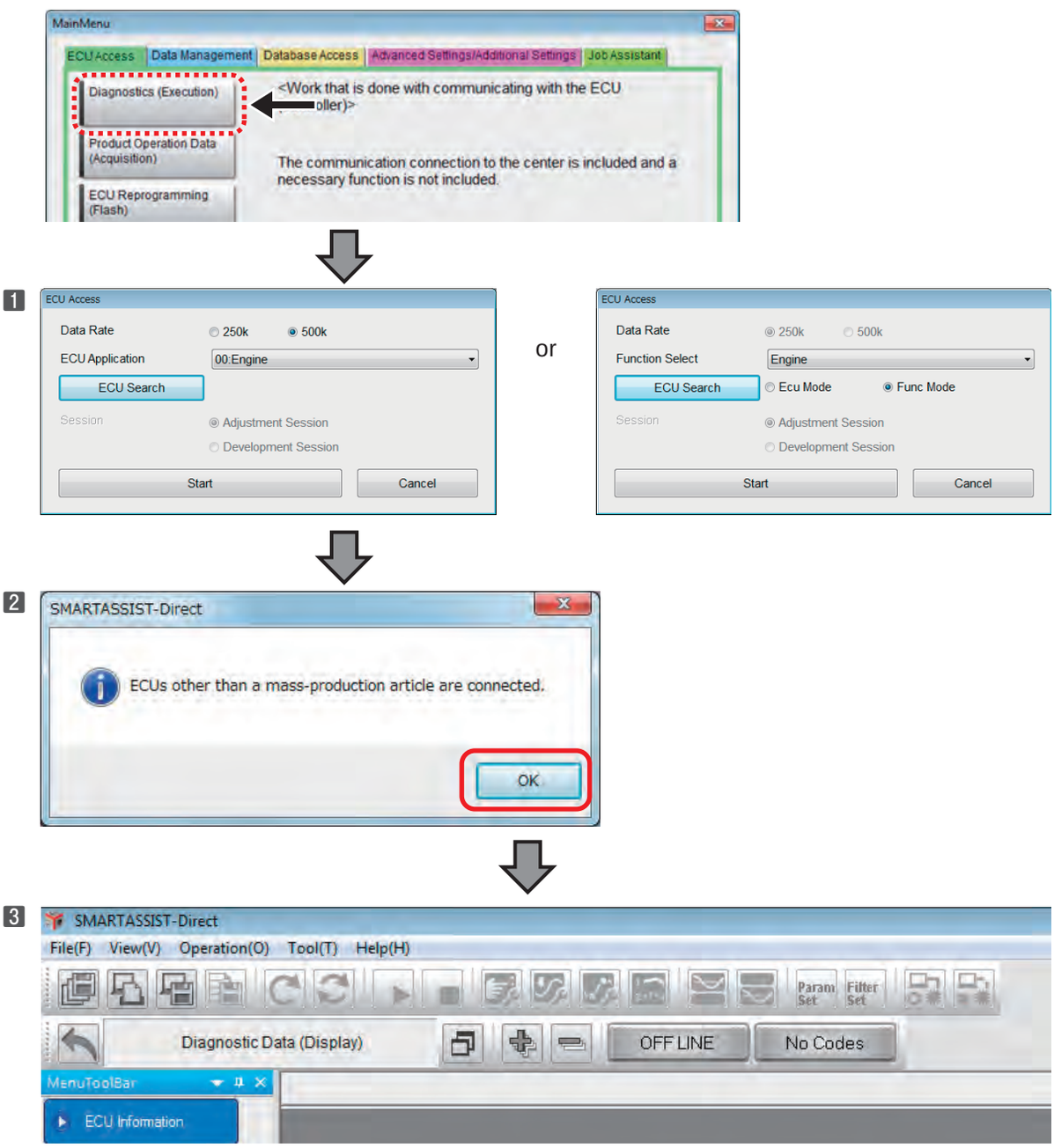
When an error diagnosis (execution) is performed at the service ECU (new ECU), displays and functions are different between the engine ECU and the implement 3G controller.

● Engine ECU

1 The search results for "Communication Speed" and "ECU Address" of the connected service ECU are displayed.

2 When starting the connection, a warning is displayed stating that the connected ECU is not a marketed product.

3 The error diagnosis screen for the service ECU is displayed.



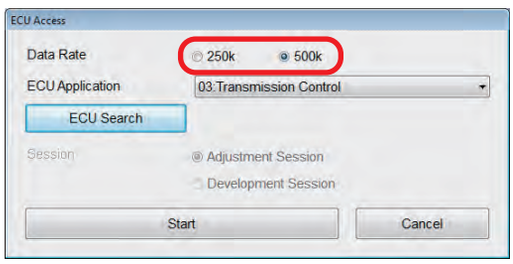
● Implement 3G Controller (ECU)

1 The implement 3G controller (ECU) cannot be connected with the error diagnosis (execution) function.

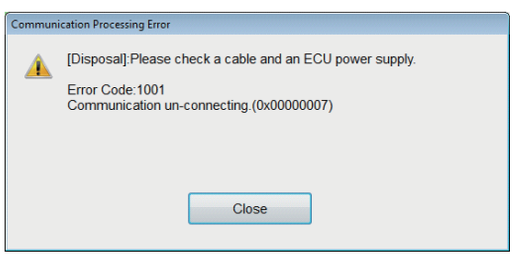
2 If you click "Error Diagnosis (Execution)", the communication speed will not automatically be set. (selectable)

3 If you set the communication speed or the ECU address manually, a warning screen is displayed, and the error diagnosis (execution) function ends automatically.

2



3



6.2 ECU Basic Information

6.2.1 Display

Displays main data of the ECU.

● Operation Toolbar

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2 : Print the screen.

3 : Save a screenshot in BMP format.

4 : Save the screen data in CSV format.

5 : Update data.

● Main Box

6 : If multiple ECU are installed, you can switch between screens.

7 **System Group** : Show the display categories.

8 **Item** : Show the names of the categories.

9 **Data** : Show data.

10 **Unit** : Display the unit.

11 **ECU** : Show the name of the ECU or controller whose data is saved.

● Comment Box

12 Comment box: Show annotations.

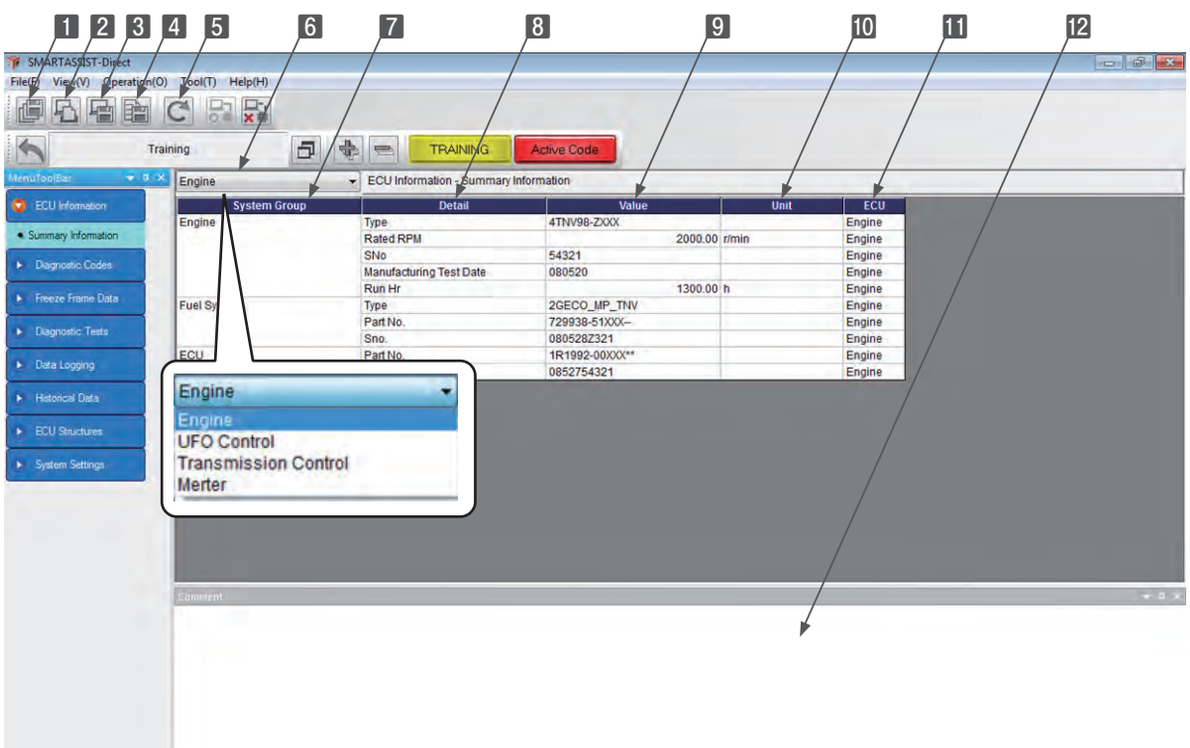


Figure 6-1 ECU Basic Data Display Screen

6.2.2 Screen Print

Click the button of 2 to open the printer settings screen.

Select an available printer and print.

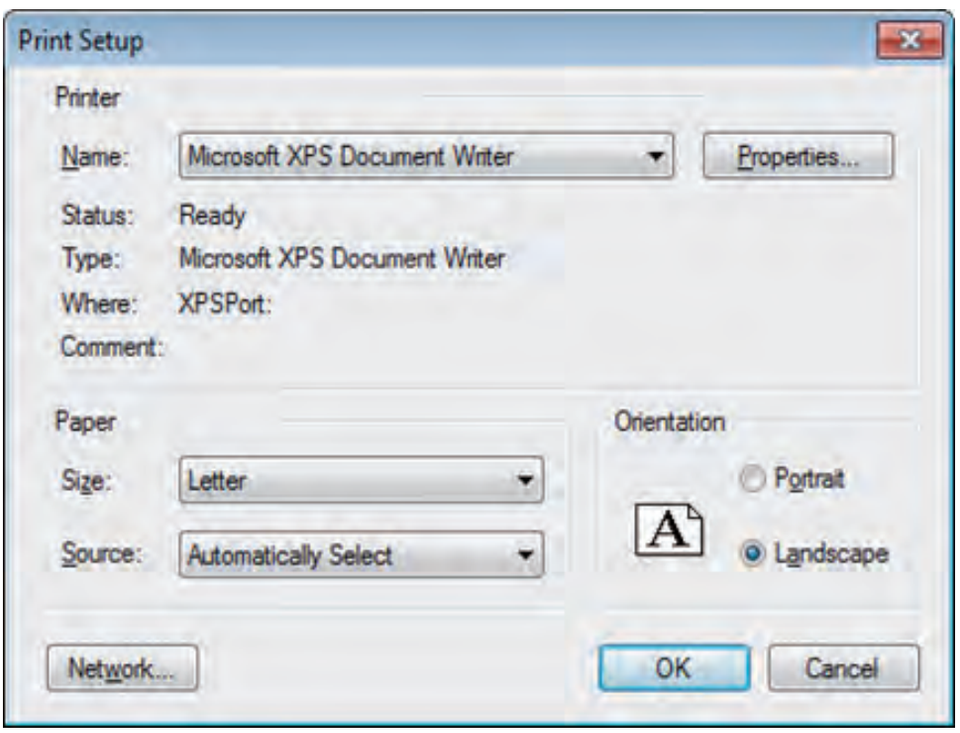


Figure 6-2 Example screen for Windows 7

6.2.3 Saving Image Bitmap

Click the button of 3 to open the selection screen for the save location of the bitmap data.

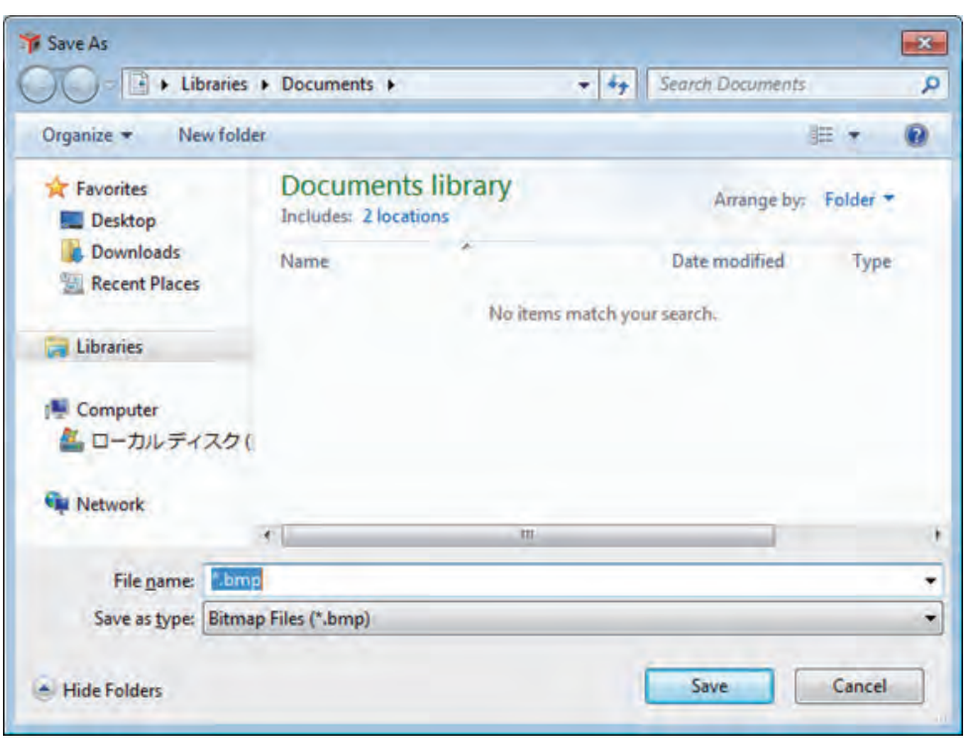
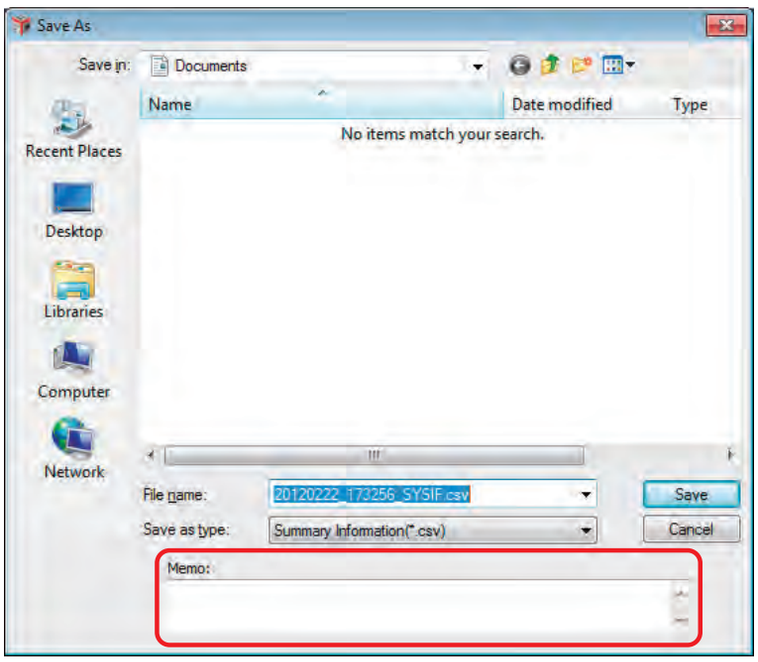


Figure 6-3 Example screen for Windows 7

6.2.4 Saving Files

Click the button of 4 to open the selection screen for the save location.

You can write a memo and attach it to the save data.



Remark The data is saved as Comma Separated Values (CSV).

When saving data such as the data below with button of 4,

Engine — ECU Information - Summary Information

System Group	Detail	Value	Unit	ECU
Engine	Type	4TNV98-ZXXX		Engine
	Rated RPM	2000.00	r/min	Engine
	SNo	54321		Engine
	Manufacturing Test Date	080520		Engine
	Run Hr	1300.00	h	Engine
Fuel System	Type	2GECO_MP_TNV		Engine
	Part No.	729938-51XXX--		Engine
	Sno.	080528Z321		Engine
ECU	Part No.	1R1992-00XXX**		Engine
	SNo.	0852754321		Engine

it is saved in the below format.

4TNV98-ZXXX	54321	Data 1	
Information Type	Item	Data	Unit
Engine data	Type	4TNV98-ZXXX	
Engine data	Rated Speed	2000	r/min
Engine data	SNo.	54321	
Engine data	Shipment Adjustment Day	80520	
Engine data	Operating Hours	1300	h
Pump Data	Type	2GECO_MP_TNV	
Pump Data	Part No.	729938-51XXX--	
Pump Data	SNo.	080528Z321	
ECU Data	Part No.	1R1992-00XXX* *	
ECU Data	SNo.	852754321	

Memo displayed here.

6.3 Defect Display

Displays current or past defects detected by the ECU. Click the Screen Selection toolbar to display current defects or the defect history. Has a manual link function that links to more detailed technical information.

6.3.1 Current Defect

This function lists the current or past defects detected by the ECU in real-time (automatic update every 2 seconds). It displays the error code and its contents, and provides a simple explanation and solution in the box on the bottom. If the cause of the defect is removed and the machine works normally again, the defect display on the top disappears.

● **Operation Toolbar**

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2 : Print the screen. (Refer to [6.2.2])

3 : Save a screenshot in BMP format. (Refer to [6.2.3])

4 : Save the screen data in CSV format. (Refer to [6.2.4])

● **Main Box**

5 **Manual** : In entries that have this button **Display**, pressing it displays more detailed technical information.

6 **Code** : Display error codes (DTC) that conform to SAE J2012 or that have been specified for the product.

7 **FMI** : Display the error code. (Refer to [15. Attached Documents] on page 244.)

8 **Description** : Display the contents of the error code.

9 **Probable Cause** : Display the reason for the error determination.

10 **ECU** : Display the ECU of the faulty device. (Only if multiple ECU are connected.)

● **Comment Box**

11 Comment box: Display the contents of the error diagnosis for the selected error (line colored in green).

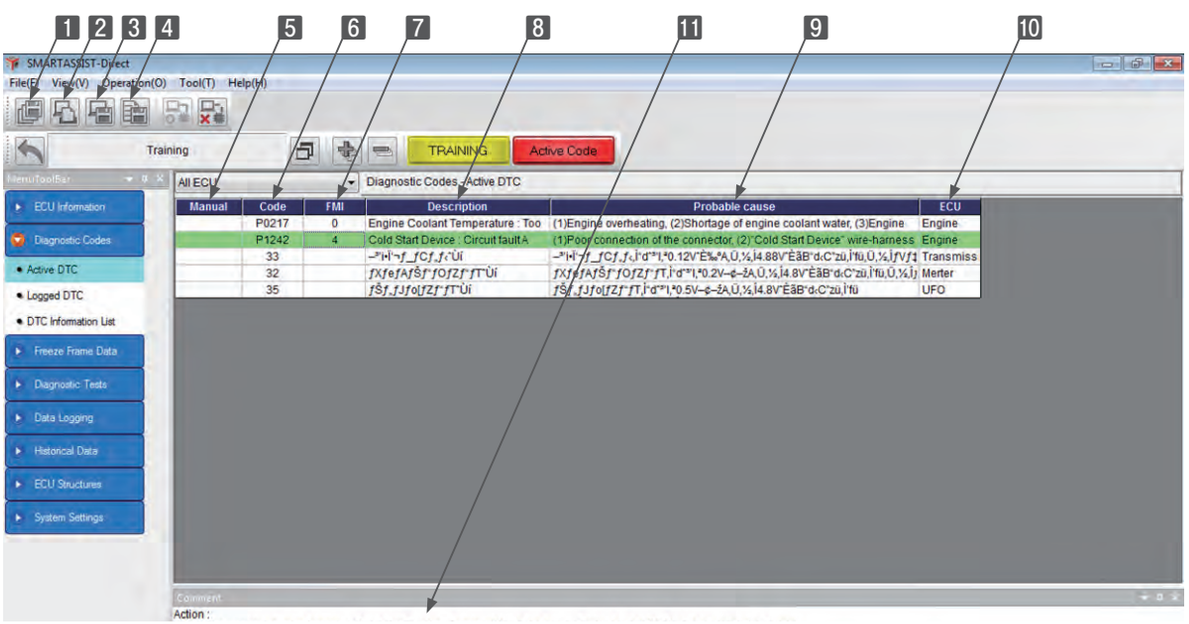


Figure 6-4 Current Defect Screen

6.3.2 Defect History (Expert Function)

Displays the stored past defect history, error code, error content, number of occurrences, and time of first and latest occurrence. Also, delete the complete defect history or single entries.

● **Operation Toolbar**

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2 : Print the screen. (Refer to [6.2.2])

3 : Save a screenshot in BMP format. (Refer to [6.2.3])

4 : Save the complete history data in CSV format. (Refer to [6.2.4])

5 : Update the complete history data.

● **Function Buttons**

6 **Clear Selected DTC** : Select data in the **Clear** box and delete it.

7 **Clear All** : Delete the complete defect history. Past data are deleted, but current defects will still be displayed.

● **Main Box**

8 **Clear** : Display the data selected for deletion. (Click to tick the checkbox.)

9 **Active** : Current defects are marked with a lamp symbol.

10 **Code** : Display error codes (DTC) that conform to SAE J2012 or that have been specified for the product.

11 **FMI** : Display the error mode. (Refer to [15. Attached Documents] on page 244.)

12 **Description** : Display the contents of the error code.

13 **OC** : Display the total number of occurrences for the same defect.

14 **First** : Display the time (machine operation) of the first occurrence.

15 **Latest** : Display the time (machine operation) of the last occurrence.

16 **ECU** : Display the ECU of the faulty device. (Only if multiple ECU are connected.)

● **Comment Box**

17 Comment box: Display the reason for the error determination for the selected error (line colored in green).

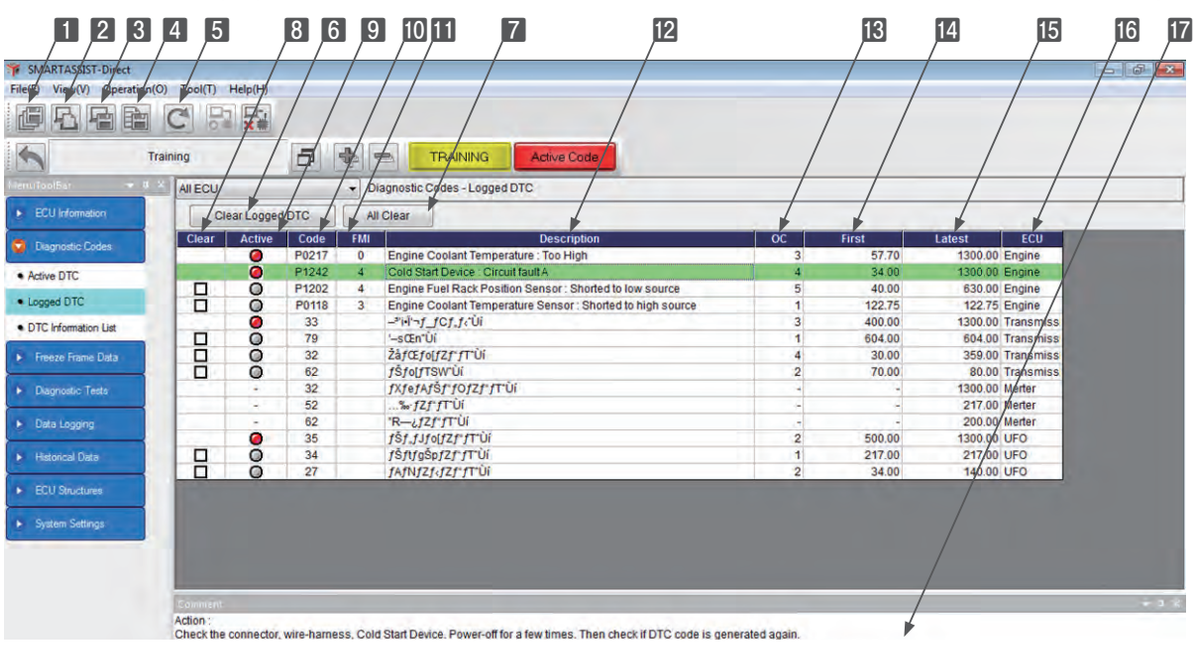


Figure 6-5 Defect History Screen

6.3.3 List of Error Codes

Displays the list of error codes that can be detected by the ECU.

Also, do a keyword search.

● **Operation Toolbar**

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2 : Print the screen. (Refer to [6.2.2])

3 : Save a screenshot in BMP format. (Refer to [6.2.3])

4 : Save the complete history data in CSV format. (Refer to [6.2.4])

● **Function Buttons**

5 **Detail Search** : Enter the keyword for the search.

6 **Search** : Perform the search.

● **Main Box**

7 **Code** : Display error codes (DTC) that conform to SAE J2012 or that have been specified for the product.

8 **FMI** : Display the error mode.

9 **Description** : Display the contents of the error code.

10 **SPN** : Display parameter ID numbers that comply to SAE J1939, and numbers for the sensors and actuators

11 **ECU** : Display the ECU that controls the devices. (Only if multiple ECU are connected.)

Note The displayed contents can vary by product.

● **Comment Box**

12 Comment box: Display details of the error code for the selected line (colored in green).

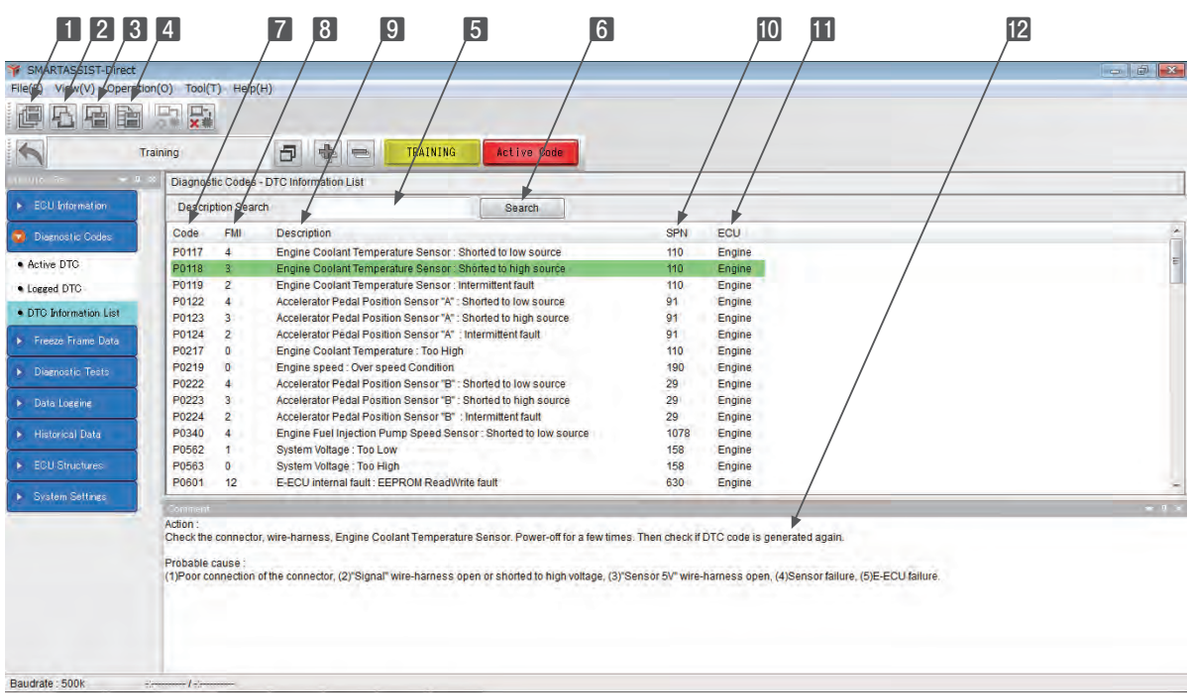


Figure 6-6 List of Error Codes Screen

6.4 Data Before/After Error (Expert Function)

Displays relevant data before/after a recent error was detected, and click the screen selection toolbar to view a list of the data and a transition graph.

Note
- The kind of data that is stored during an error is set in the factory. It cannot be set later.
- **Depending on the product specification, data before/after error or only before error is saved.**

6.4.1 Save Data

● Additional Information Box

The saved data is displayed in a list. Click a box to display the data in the main box.

1 **No.** : Display the line number of the data.

2 **DTC** : Error code (The content can be confirmed at "Defect Display" - "Defect History".)

3 **Time** : Display the time of error occurrence (total operating time).

● Operation Toolbar

4 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

5 : Print the screen. (Refer to [6.2.2])

6 : Save a screenshot in BMP format. (Refer to [6.2.3])

7 : Save the data displayed in the main box in CSV format. (Refer to [6.2.4])

8 : Update the data.

9 : Display the data selection subwindow to add, delete and sort the displayed data.

● Function Buttons

10 **Clear FFD** : Delete the selected data. (The Password Entry Screen is displayed.)

* FFD: Freeze Frame Data

● Main Box

11 : If multiple ECU are installed, you can switch between screens.

12 **No.** : Display the time line number of the data.

13 **Item Box** : The first letter of the selected data name is displayed, and the name is displayed at 12 . (Content such as the unit can be confirmed on the ECU Specification/Structure [Analog Signal] Menu screen.) Right-click the item box to switch the data format from binary to decimal to hexadecimal.

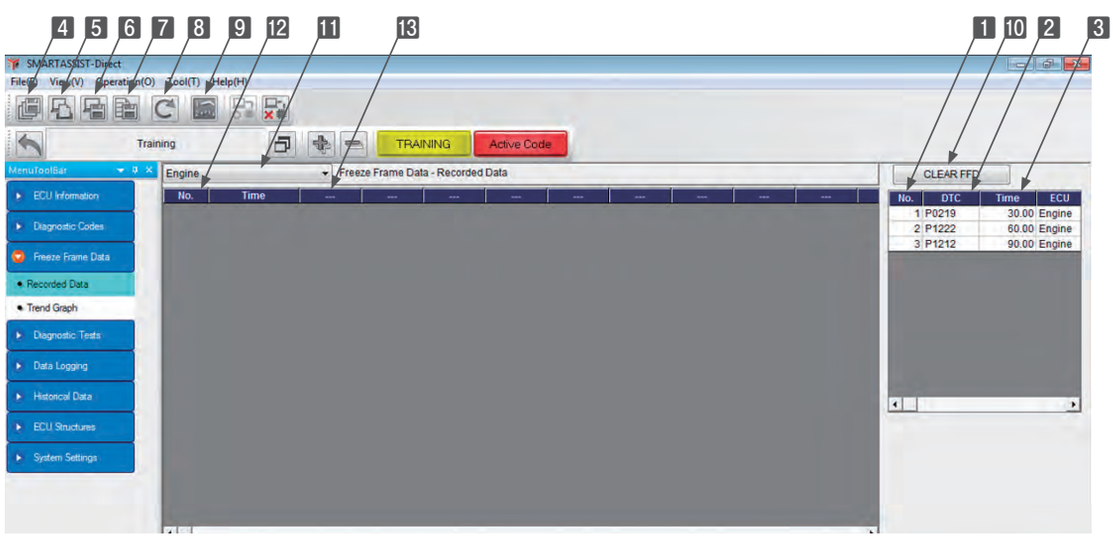


Figure 6-7 Display Data Before/After Error Screen

● **Data Selection Window**

Select the data displayed in the main box.

1 Data : List all available data.

2 ◀ / ▶ : Select/deselect data for display.

3 Set data : The data displayed in the main box.

4 ▲ / ▼ : Change the order in which the selected data is displayed.

5 **Default** : Previously selected main items are set automatically.

6 **Set** : Confirm an entry.

7 **Cancel** : Discard an entry.

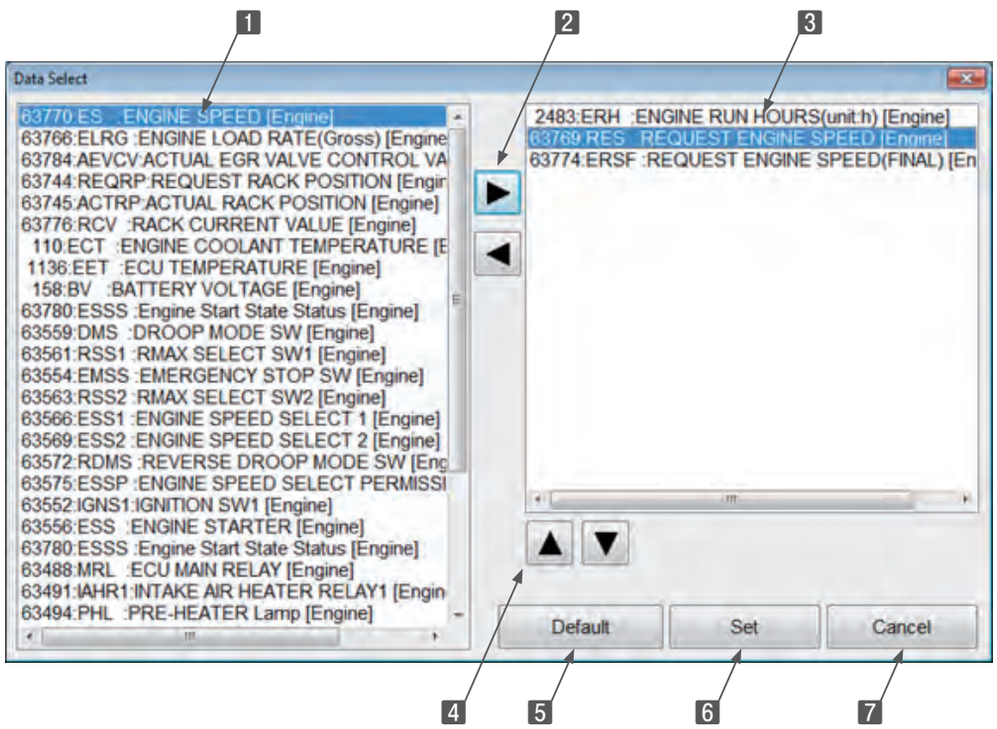


Figure 6-8 Data Selection Window Screen

6.4.2 Trend Graph

● **Additional Information Box**

With the graph setting operation, display the name of the selected data item and the position of the cursor.

Graph 1 shows top values, graph 2 shows bottom values.

1 Position : Numeric value for the cursor position

2 Display item and data : Display the item name and data. The background color and the line color are of the same color.

● **Operation Toolbar**

3 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

4 : Print the screen. (Refer to [6.2.2])

5 : Save a screenshot in BMP format. (Refer to [6.2.3])

6 : Do the settings for the display item and the scaling of the top graph.

7 : Do the settings for the display item and the scaling of the bottom graph.

● **Main Box**

8 Cursor position : Click the screen to change the position.

9 Minimize : Contract the graph.

10 *1 : Set the expansion value.

11 Expand : Expand the graph.

12 Counter value : Display the counter value of the y-axis.

Graph 1 and graph 2 are displayed. For details regarding operation of the graph, refer to [7.1 Error Diagnosis Data Save and Display Functions] on page 139.

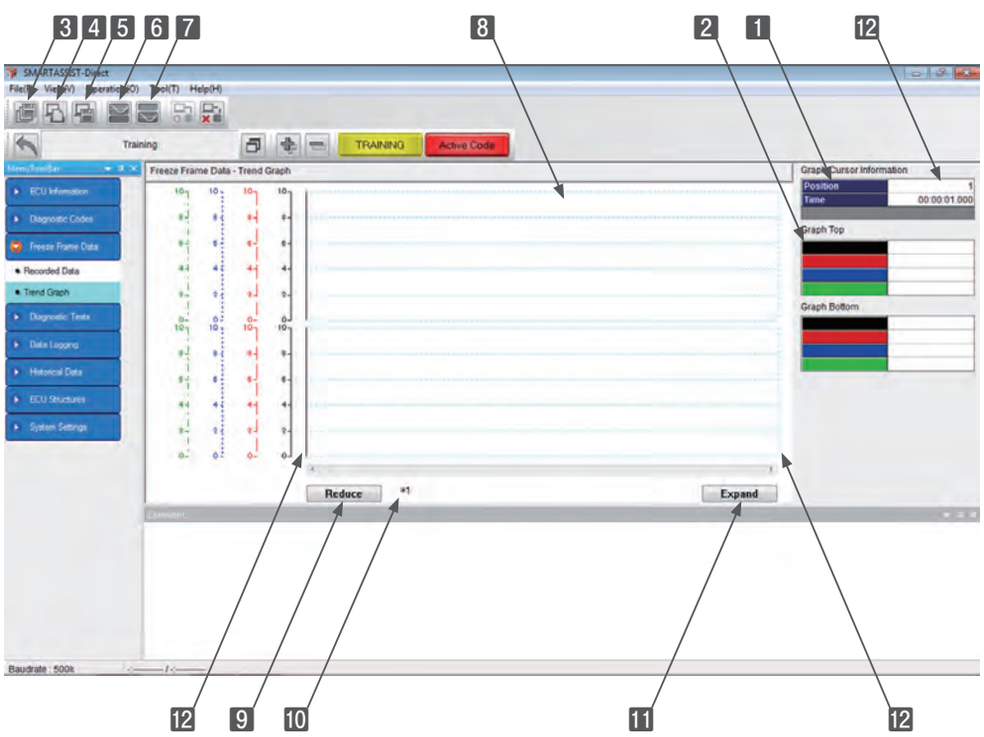


Figure 6-9 Transition Graph Screen

6.5 Diagnosis Test

Allows to separately test the input/output device. Select the input/output test and the forced operation function by clicking them on the screen selection toolbar. Operation within this function that involve output may be usable only with the clutch in neutral and the engine in low idle or stopped.

Important

- The test involves many operations where the product actually operates. Only personnel who have taken the SMARTASSIST-Direct training may perform the test, and must pay due attention to their surroundings.
  If not, the product may move unexpectedly and cause serious accidents.

Important

- In an emergency, turn off the power of the ECU/controller (turn the key switch to "Off") to stop the product.
- "Maintain the previous status" or "Automatically controlled test - Return to previous status" are operations in case that the diagnosis test is canceled under the below conditions, but which one is set varies by product.
  - **The buttons "Abort, "Stop" or "Cancel" were clicked.**
  - **The connection harness between the product and the PC is disconnected.**
  - **The SMARTASSIST-Direct software was exited.**

Important Reset

- Turn off the power of the ECU/controller after the diagnosis test is finished. (Turn the key switch to "Off".)
  Put the product in forced operation with the SMARTASSIST-Direct, and the ECU/controller will change to force operation mode. If you continue using the device in this state, the automatic control will become unoperational.

6.5.1 Analog/Pulse Input/Output

The analog measuring values and pulse input values can be confirmed with this function when checking operations of the input device after error diagnosis or repair. When switching screens, the screen display automatically updates every 2 seconds.

● **Operation Toolbar**

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2 : Print the screen. (Refer to [6.2.2])

3 : Save a screenshot in BMP format. (Refer to [6.2.3])

4 : Save the complete history data in CSV format.

5 : Update the current data.

6 : Continuously update the current data. (2 second interval)

7 : Stop continuous update.

8 : After stopping, change the order of the data. With this operation, important data can be sorted in way that is easier to see. For operation details, refer to [Data Selection Window] on page 52.

● **Main Box**

9 : If multiple ECU are installed, you can switch between screens.

10 **Description** : Display the input device name.

11 **Value** : Display the measurement values.

12 **Unit** : Unit

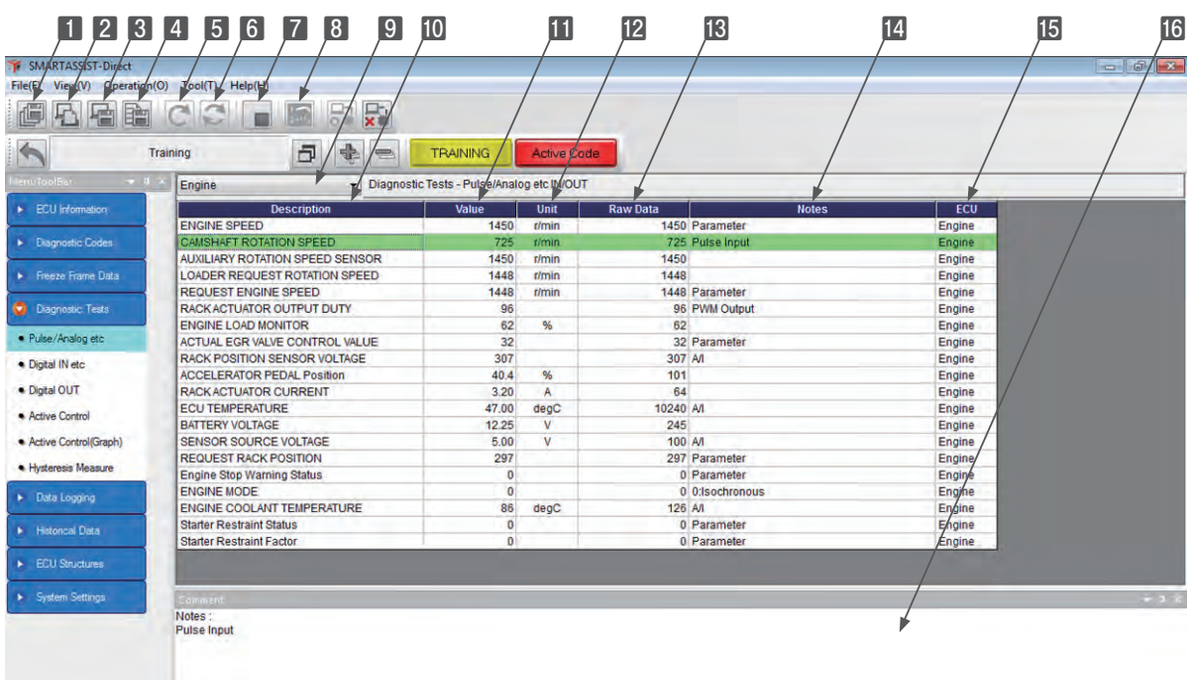
13 **Raw Data** : Voltage of analog input (mV)

14 **Notes** : Annotation box

15 **ECU** : Display the ECU/controller that controls the devices. (Only if multiple ECU are connected.)

● **Comment Box**

16 Comment box: Display information for the selected line (colored in green).



Description	Value	Unit	Raw Data	Notes	ECU
ENGINE SPEED	1450	r/min	1450	Parameter	Engine
CAMSHAFT ROTATION SPEED	725	r/min	725	Pulse Input	Engine
AUXILIARY ROTATION SPEED SENSOR	1450	r/min	1450		Engine
LOADER REQUEST ROTATION SPEED	1448	r/min	1448		Engine
REQUEST ENGINE SPEED	1448	r/min	1448	Parameter	Engine
RACK ACTUATOR OUTPUT DUTY	96		96	PWM Output	Engine
ENGINE LOAD MONITOR	62	%	62		Engine
ACTUAL EGR VALVE CONTROL VALUE	32		32	Parameter	Engine
RACK POSITION SENSOR VOLTAGE	307		307	A/I	Engine
ACCELERATOR PEDAL Position	40.4	%	101		Engine
RACK ACTUATOR CURRENT	3.20	A	64		Engine
ECU TEMPERATURE	47.00	degC	10240	A/I	Engine
BATTERY VOLTAGE	12.25	V	245		Engine
SENSOR SOURCE VOLTAGE	5.00	V	100	A/I	Engine
REQUEST RACK POSITION	297		297	Parameter	Engine
Engine Stop Warning Status	0		0	Parameter	Engine
ENGINE MODE	0		0	0:Isochronous	Engine
ENGINE COOLANT TEMPERATURE	86	degC	126	A/I	Engine
Starter Restraint Status	0		0	Parameter	Engine
Starter Restraint Factor	0		0	Parameter	Engine

Figure 6-10 Input/Output Screen (e.g. Analog/Pulse)

6.5.2 Digital Input

The On/Off status can be confirmed with this function when checking operations of the input device after error diagnosis or repair. When switching screens, the screen display automatically updates every 2 seconds.

● **Operation Toolbar**

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2 : Print the screen. (Refer to [6.2.2])

3 : Save a screenshot in BMP format. (Refer to [6.2.3])

4 : Save the complete history data in CSV format.

5 : Update the current data.

6 : Continuously update the current data. (2 second interval)

7 : Stop continuous update.

● **Main Box**

8 : If multiple ECU are installed, you can switch between screens.

9 **Description** : Display the input device name.

10 **On/Off** : Display the on/off status.

11 **Notes** : Annotation box

12 **ECU** : Display the ECU/controller that controls the devices. (Only if multiple ECU are connected.)

● **Comment Box**

13 Comment box: Display information for the selected line (colored in green).

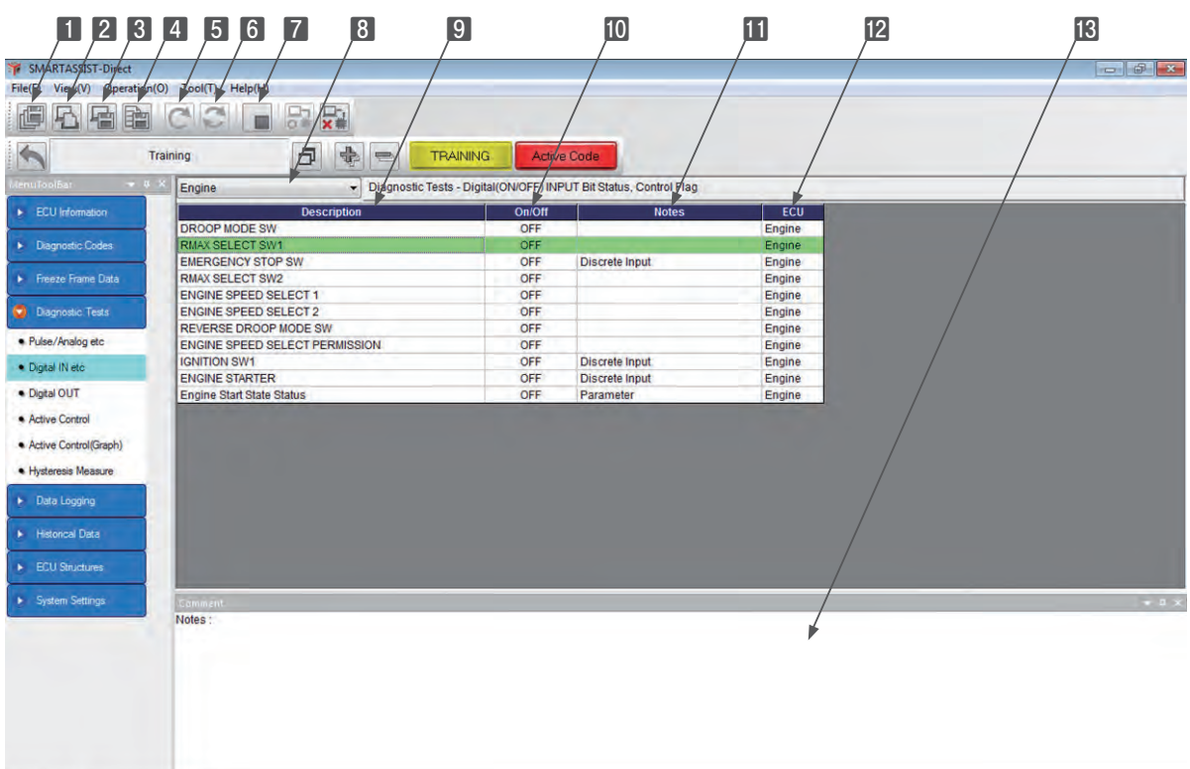


Figure 6-11 Digital Input Screen

6.5.3 Digital Output (Expert Function)

This function checks operations of the output device after error diagnosis or repair. The forced On/Off status of the contact cannot be executed if the engine is not stopped. When switching screens, the screen display automatically updates every 2 seconds.

● **Operation Toolbar**

1  : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2  : Print the screen. (Refer to [6.2.2])

3  : Save a screenshot in BMP format. (Refer to [6.2.3])

4  : Save the complete history data in CSV format.

5  : Update the current data.

6  : Continuously update the current data. (2 second interval)

7  : Stop continuous update.

● **Main Box**

8 [ ] : If multiple ECU are installed, you can switch between screens.

9 Forced Operation Mode : Display manual operations and update operations.

- When an update operation is performed, manual control is indicated by a check mark.
- Remove the check mark by clicking it and return to automatic control.

> **Important** **When returning to automatic control, whether the status "Maintain the previous status" or "Automatically controlled test - Return to previous status" is set in the ECU/ controller varies by product. Use it with due care.**

10 **Description** : Displays the output device name.

11 **On/Off** : Displays the status of the current value.

- For changeable items, "On/Off" is displayed in blue.
- Toggle between On and Off by double-clicking.
- When changing the status, it is necessary to enter the password.
- The password confirmation will be valid as long as you use this screen.
- If toggling between On and Off is not permitted by other devices, the words are displayed in red.
- Output that cannot be turned on and off (e.g. the main relay) is set by the ECU/controller.

12 **Notes** : Annotation box

13 **ECU** : Display the ECU/controller that controls the devices. (Only if multiple ECU are connected.)

● **Comment Box**

14 Comment box: Display information for the selected line (colored in green).

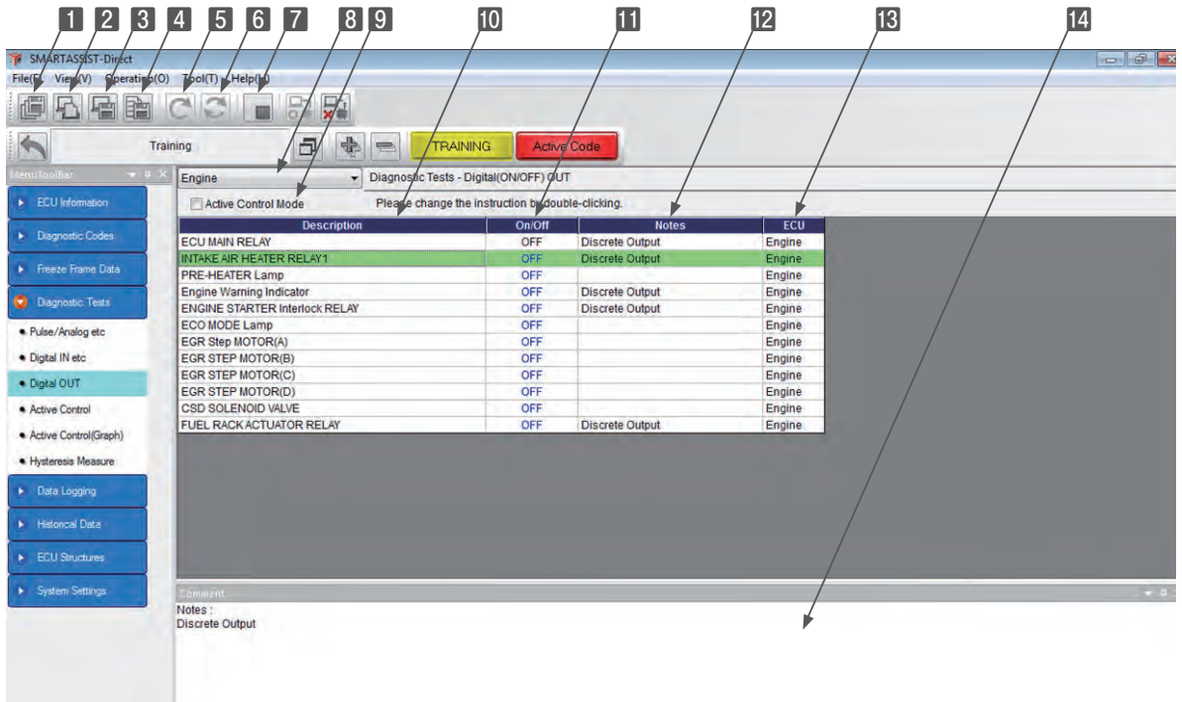


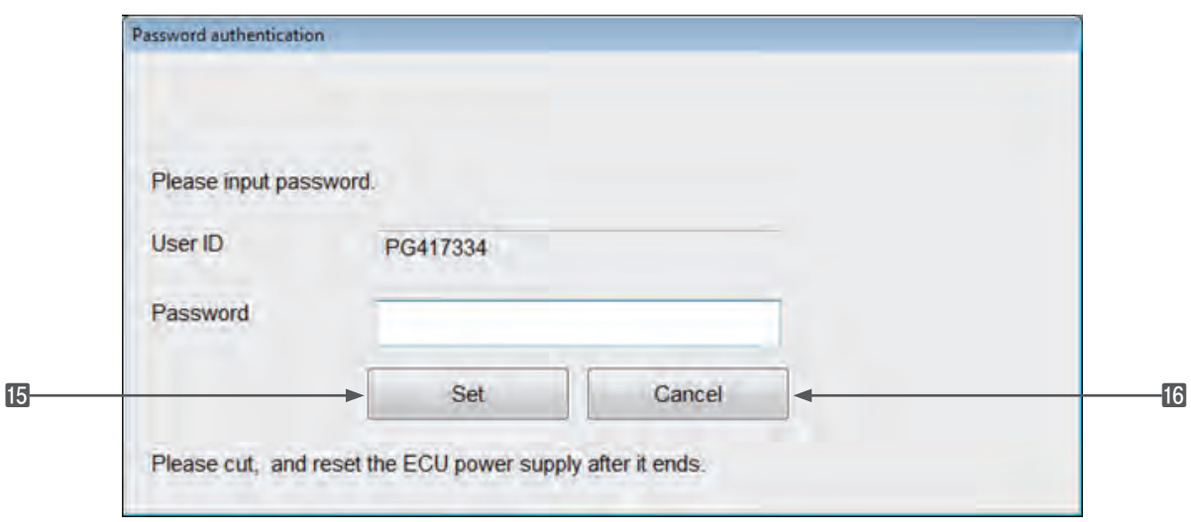
Figure 6-12 Digital Input Screen

● Subwindow (Screen Shift)

11 If you click "On/Off", the password entry screen is displayed.

15 **Set** : Toggle (On/Off).

16 **Cancel** : Cancel the toggling and return to the previous screen.



6.5.4 Forced Operation (Expert Function)

Sets the status for all devices (e.g. engine, clutch, switch, sensor) when operating each product separately by confirming the feedback control (e.g. control the rack position or speed governing of the engine) and product operation.

Important When you start it, the product may start as well.

- Be careful when you work with other personnel.
- Operate with due care to the surroundings.

● Operation Toolbar

1  : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2  : Print the screen. (Refer to [6.2.2])

3  : Save a screenshot in BMP format. (Refer to [6.2.3])

4  : Save the complete history data in CSV format. (Refer to [6.2.4])

● Main Box

5 [ ] : If multiple ECU are installed, you can switch between screens.

6 **Manual** : Display the status of the forced operation; a red circle indicates that the forced operation is in progress, a gray circle indicates that it is stopped.

7 **Stop Button** : Click to stop the forced operation.

8 **Run Button** : Click to start the forced operation.

9 **Description** : Control item names

10 **ENG Run** : Indicates that the forced operation is available.

Req: Forced operation only during engine operation.

Not: Forced operation only during engine stop.

11 **Measured** : Display the measurement value (feedback value).

12 **Desired** : Display the target value (current set value). Click the target value to open the subwindow and change the value.

13 **Unit** : Display the unit.

14 **Graph** : A red circle indicates that the graph can be displayed; a gray circle indicates that a measurement is necessary to display the graph. Clicking the red circle after forced operation switches to the graph display screen.

15 **ECU** : Display the ECU/controller that controls the devices. (Only if multiple ECU are connected.)

● Comment Box

16 Comment box: Display information for the selected line (colored in green).

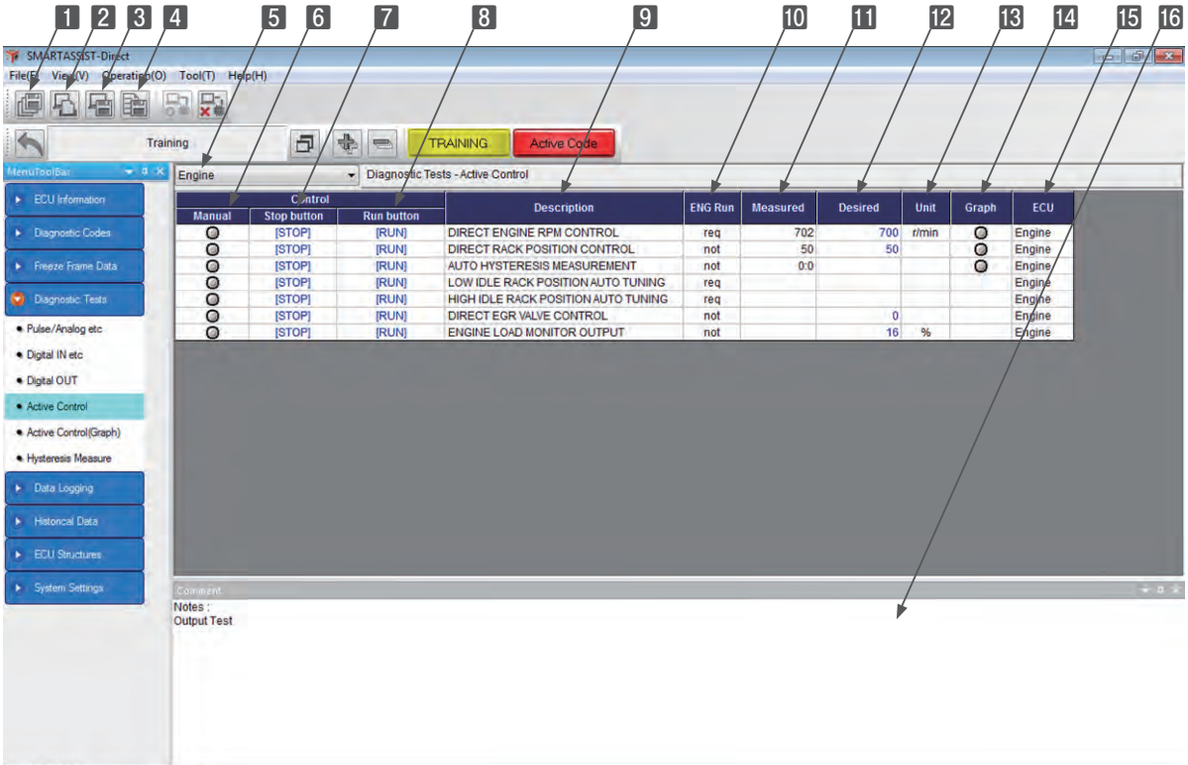


Figure 6-13 Forced Operation Screen

● Change Subwindow 1

1 **Item Name** : Display the name of the forced operation items.

2 **Operation Button** : Display operation buttons such as Up (▲) and Down (▼).

3 **Operation Message** : Display conditions set before forced operation.

4 **Precaution Message** : Display precautions regarding forced operation.

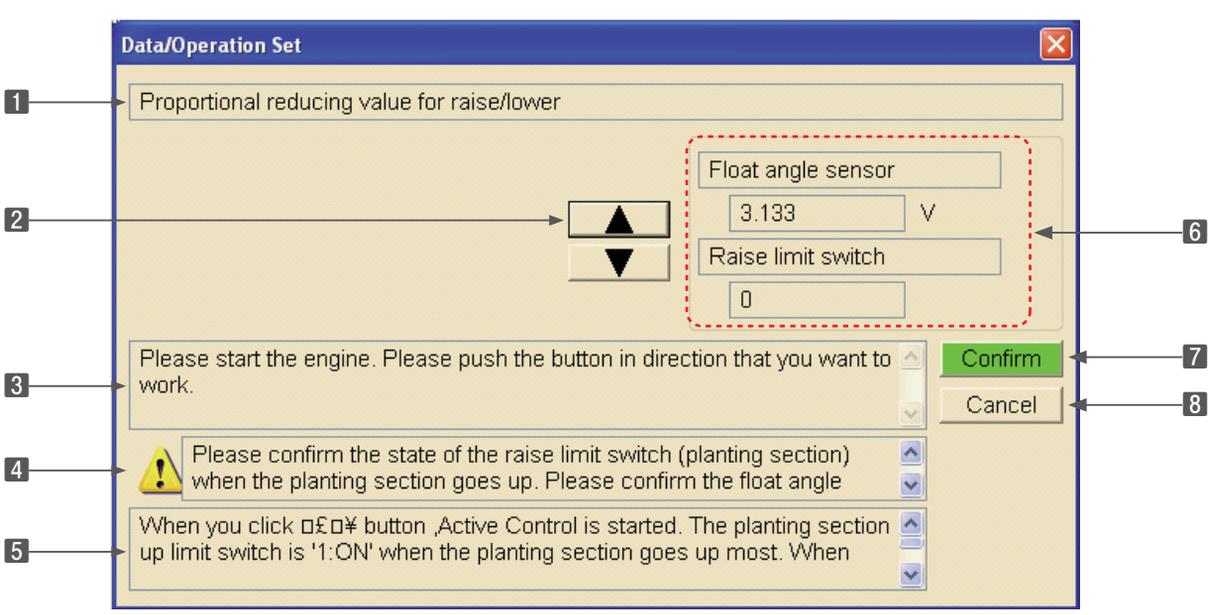
5 **Assistance Message** : Display additional information for forced operation.

6 **Assistance Message** : Display target values/measurement values.

7 **Confirm** : The confirmation button has two functions.

- A green light indicates that the product can be operated in forced operation.
- The light goes out if the upper limit or lower limit is exceeded during forced operation.

8 **Cancel** : Close the subwindow.

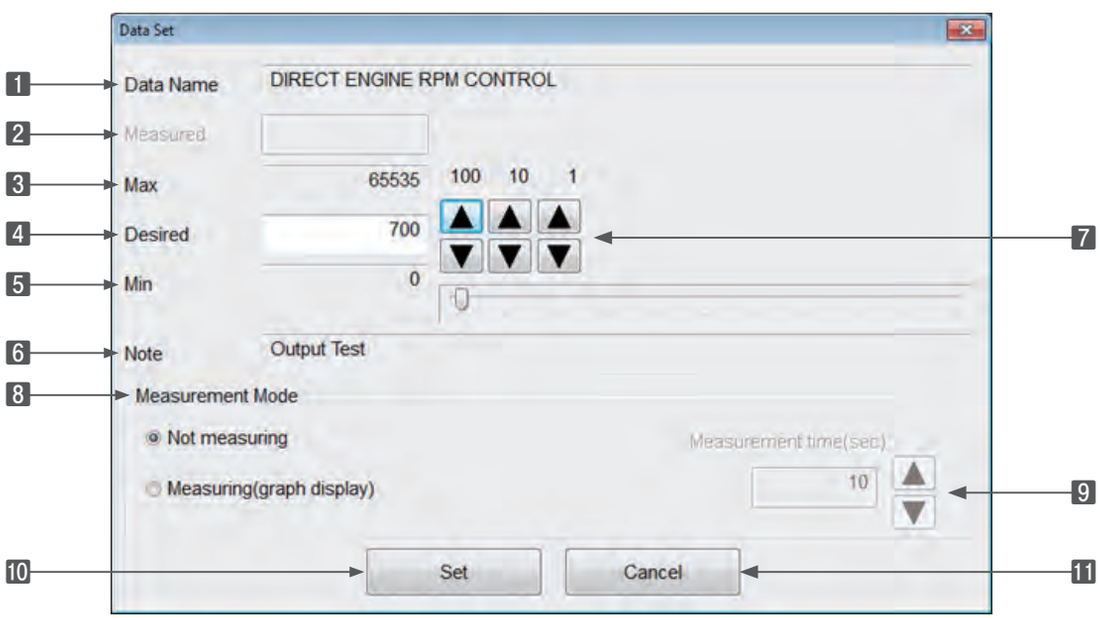


● **Change Subwindow 2**

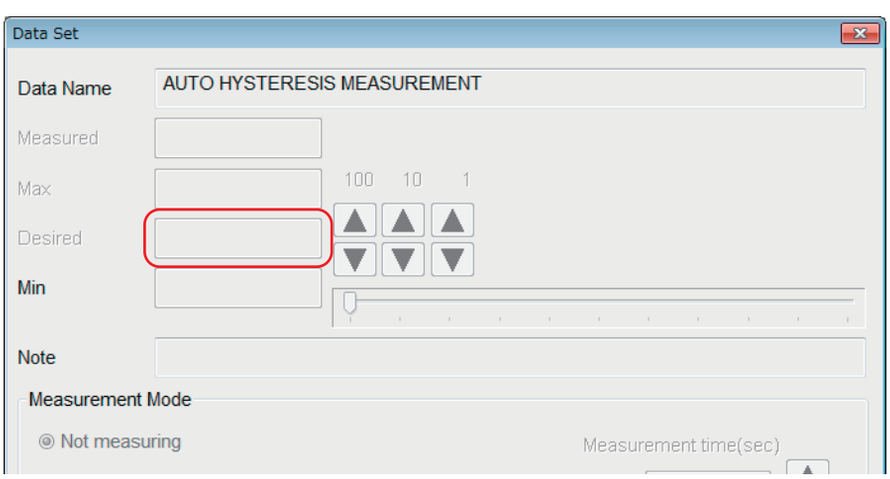
1	**Data Name**	: Display the name of the forced operation items.
2	**Measured**	: Display the current measurement value of the feedback item.
3	**Max**	: Display the maximum setting for the target value.
4	**Desired**	: Display the current setting (target value).
5	**Min**	: Display the minimum setting for the target value.
6	**Note**	: Annotation
7	▲/▼	: Change the setting in increments of 1, 10, and 100.
8	**Measurement Mode**	: Select to measure the feedback data.
9	▲/▼	: Adjust the measurement time.
10	**Set**	: Send the set directive value to the ECU and perform forced operation.
11	**Cancel**	: Cancel the forced operation and close the sub-window.

● Adjust the direct value with the ▲ / ▼ buttons. Set the direct value of the selected item with the **Set** button.

● Select 8 "Execute Measurement" with **Measurement Mode**, save the feedback data of the set time, and view the data on the graph screen.



A part of the forced operation items are tested according to the previously set program for forced operations.
In that case, the directive value cannot be entered.



6.5.5 Forced Operation Graph

The graph is only displayed if Execute Measurement is selected for forced operation.

● **Additional Information Box (Cursor Value)**

Displays the name and value for the data selected by the graph setting operation.

Graph 1: Top, data value

1 Position: Displays the data number for the cursor position.

2 Display item data: Displays the item name and data. The background color and the color of the graph are the same.

● **Operation Toolbar**

3 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

4 : Print the screen. (Refer to [6.2.2])

5 : Save a screenshot in BMP format. (Refer to [6.2.3])

6 : Save the complete history data in CSV format. (Refer to [6.2.4])

7 : Save the measured data. Save the data of the forced operation after measurement. For the display of the saved data, refer to [7. Error Diagnosis Data Save and Display Functions].

8 : Do the settings for the display item and the scaling of the top graph.

● **Main Box**

Graph 1 is displayed. For details regarding operation of the graph, refer to [7.1 Error Diagnosis Data Save and Display Functions] on page 139.

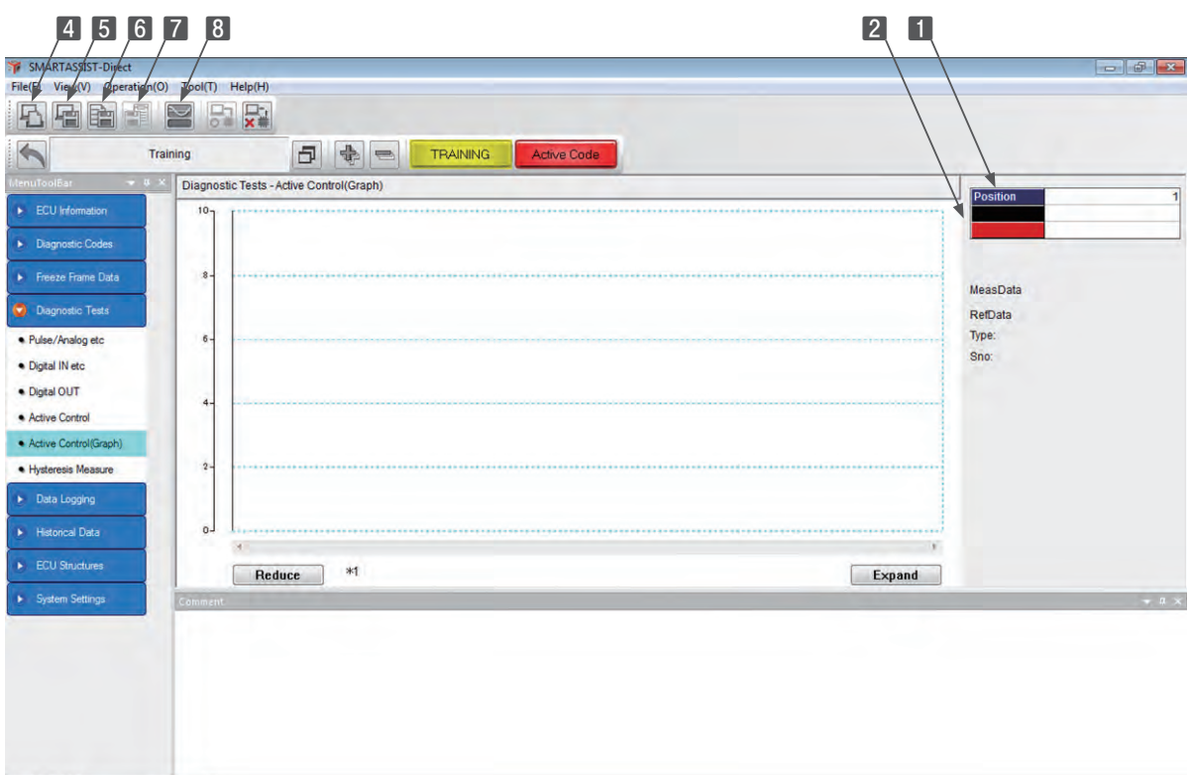
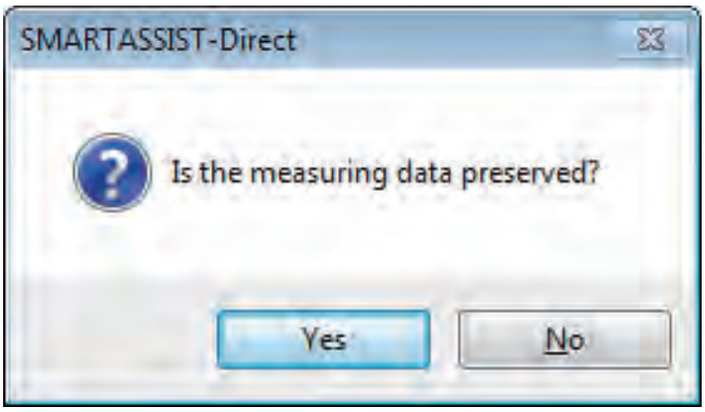


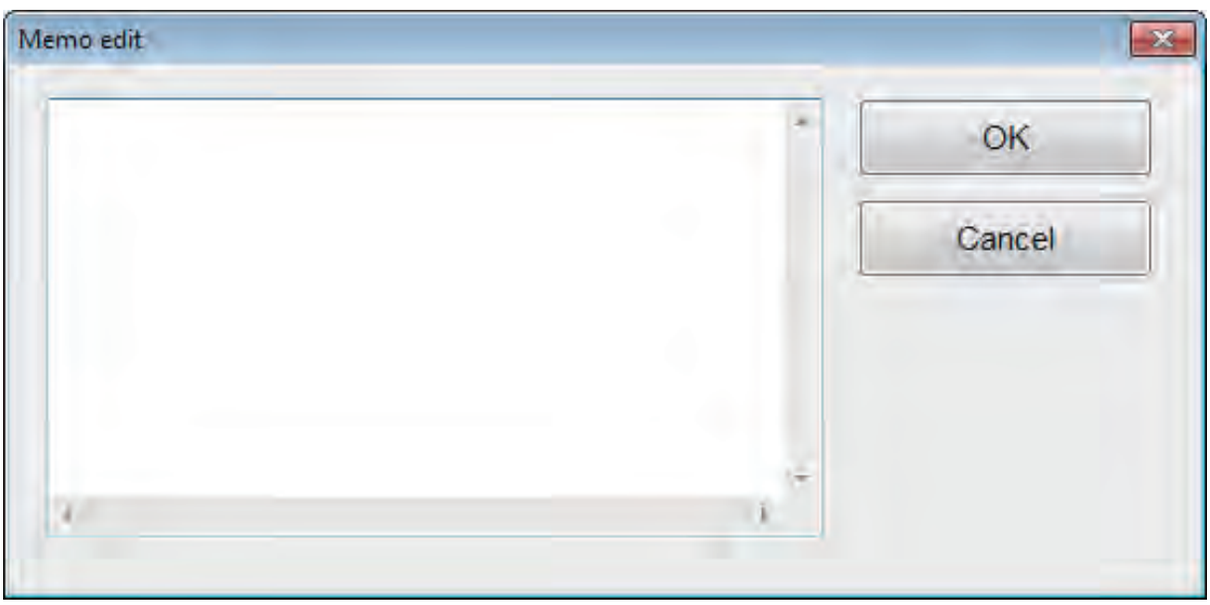
Figure 6-14 Forced Operation Graph Screen

6.5.6 Saving the Measured Data

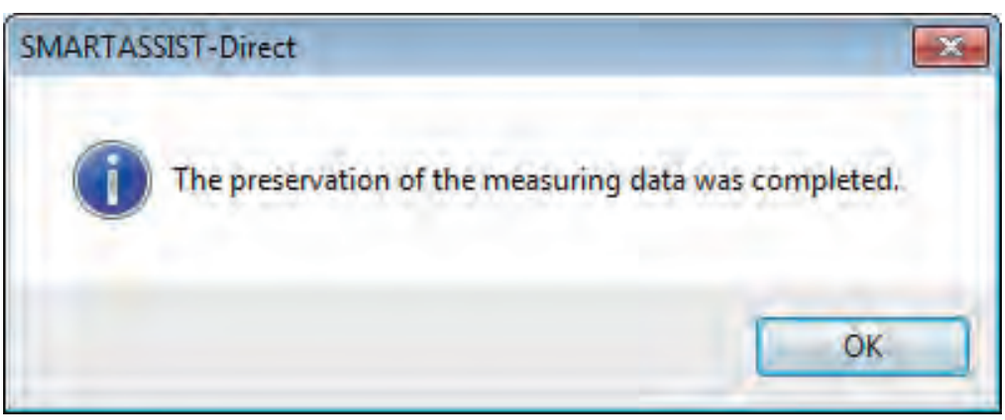
● Click the button of 7 to open the confirmation screen.



● Click "Yes" to enter a memo regarding the measured data.



● After entering the memo, saving is complete.



Note ● You cannot select the save location.

● **You can change the contents of the memo. For details, refer to ○○○.**

6.5.7 Forced Operation Hysteresis Graph

Execute the forced operation (active control) of all automatic hysteresis measurements to start the set program, collect data from the ECU, active the below functions and display the graph in this screen.

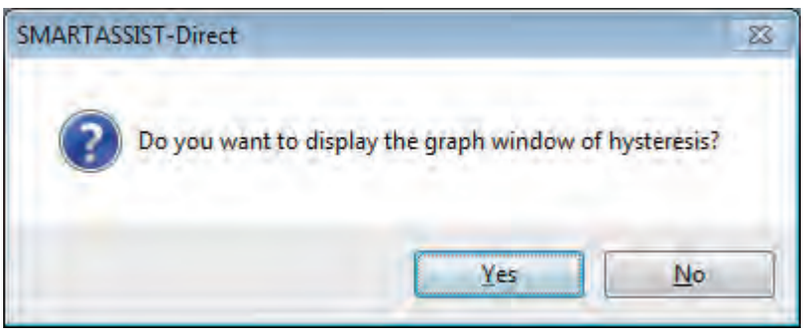


Figure 6-15 Selection Screen for Graph Display

Note

- The response to the results gathered by the automatic hysteresis measurement differs depending on the product.
- For details, refer to the product's technical manual or consult with the YANMAR Service Department.

● Additional Information Box (Data Display)

1 **Cursor Data** : Display data for the cursor position. (Only on the trend graph screen)

2 **X-Y**, **Trend** : Click the corresponding button to switch to an X-Y graph (x-axis: current) and trend graph (x-axis: time) .

● Operation Toolbar

3 : Print the screen.

4 : Save a screenshot in BMP format.

5 : Save the measurement results in CSV format.

- date_time_DTHY.CSV: raw data of X-Y graph only
- date_time_DTHYC.CSV: point data and calculated results

6 : Save the measured data. Save the data of the forced operation after measurement. For the display of the saved data, refer to [7. Error Diagnosis Data Save and Display Functions].

7 : Do the scaling settings for the X-Y plot graph.

● **Main Box**

Displays a graph of the raw data on the top.

For details regarding operation of the graph, refer to [7.1 Error Diagnosis Data Save and Display Functions] on page 139.

X-Y graph

Figure 6-16 Forced Operation Hysteresis Graph Screen

Trend graph

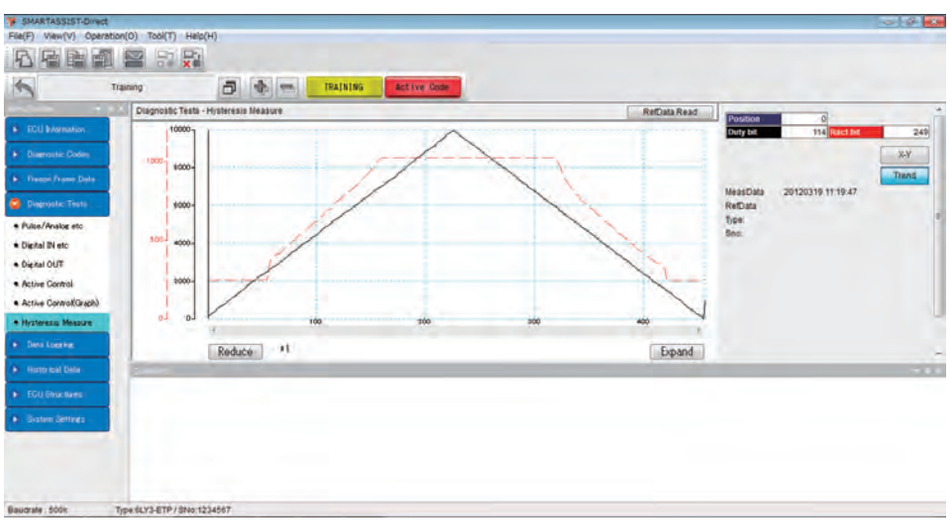


Figure 6-17 Trend Graph Screen

Remark In case of rack hysteresis

- **The substitute value (pulse duty value) of the rack actuator current is on the x-axis.** The substitute value (digital encode value of the voltage) of the rack position is on the **y-axis. Because the rack position value is displayed together with the increased or decreased x-axis value, the hysteresis is easily identified. Generally, if the x-axis value is increased, the y-axis value changes along the bottom line; if the x-axis value is decreased, the y-axis value changes along the top line.**
- **The x-axis shows time (0.1 sec/point), the y-axis shows the substitute value for rack** position (digital encode value of voltage) and the substitute value for the rack actuator current (pulse duty value). Any divergence between the rack position (rack) and the **electric current value (duty) is easily identified.**

6.5.8 Reference material: Digital output/forced operation (Engine/2G Eco TNV series)

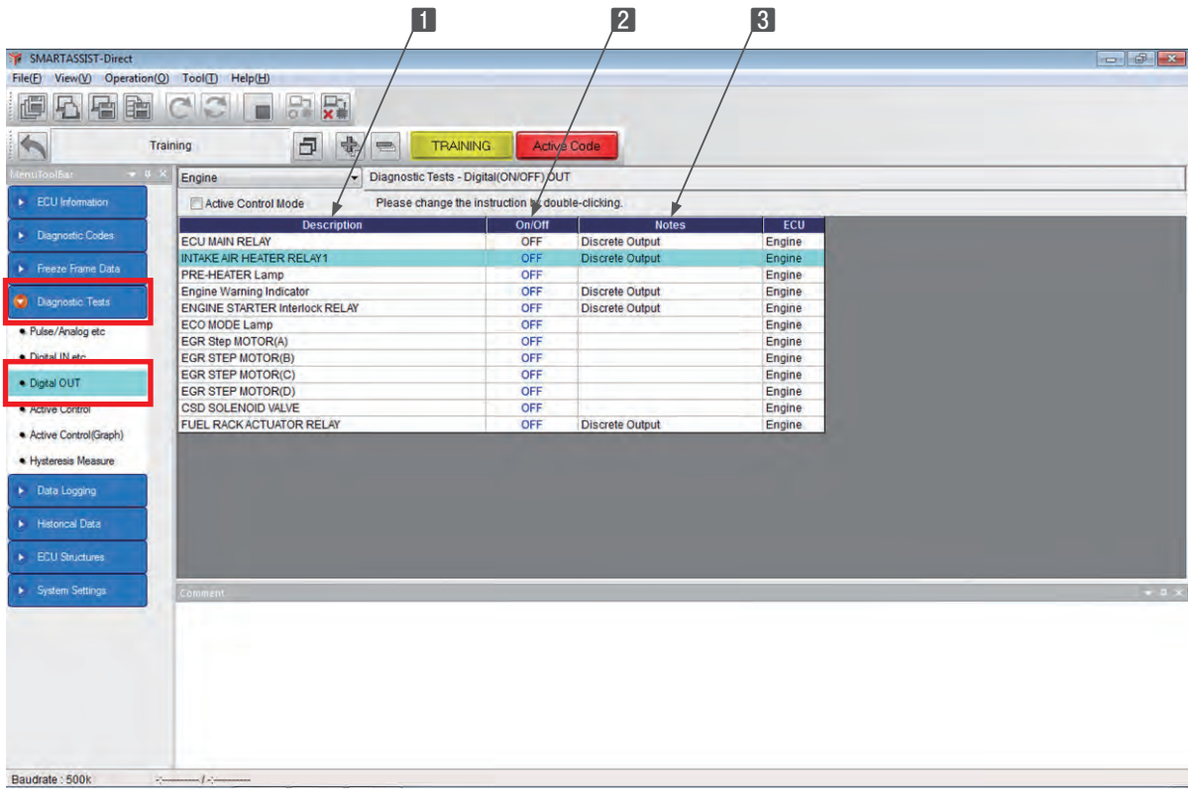
■Digital Output Screen

In the red box in the below menu **Diagnosis Test**, select **Digital Output** to switch to the digital output screen.

1 **Description** : Display the setting items.

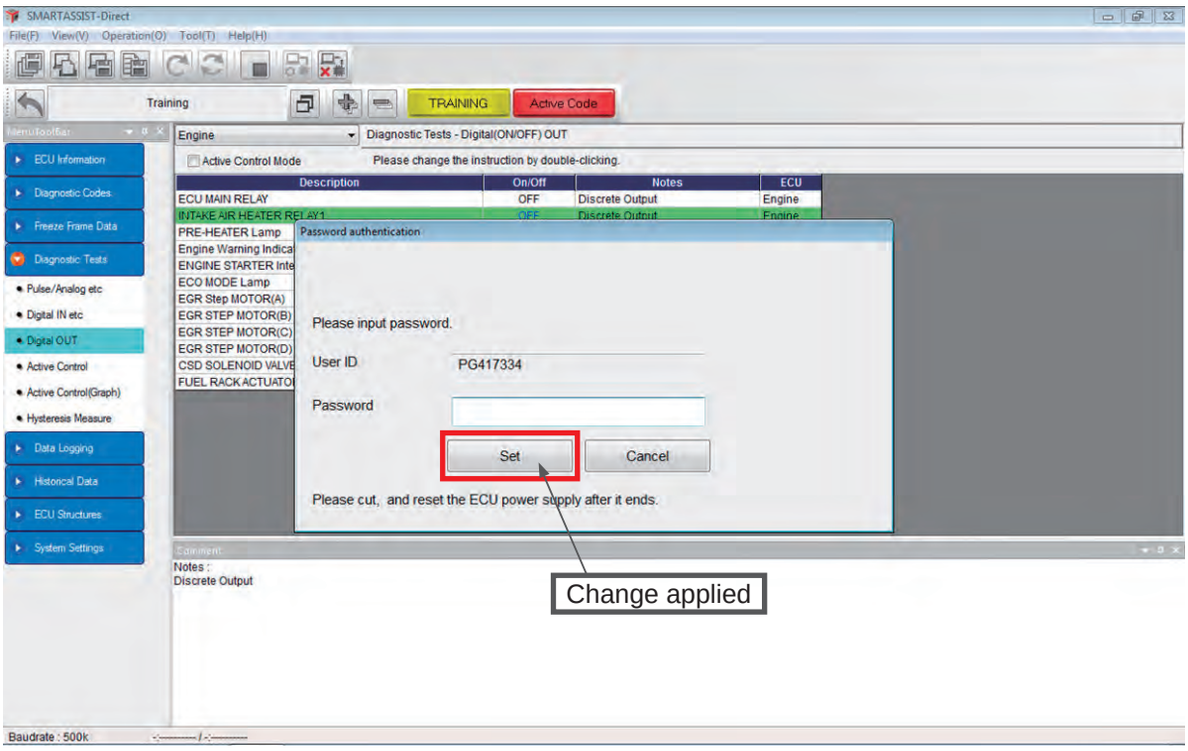
2 **On/Off** : Display the current settings.

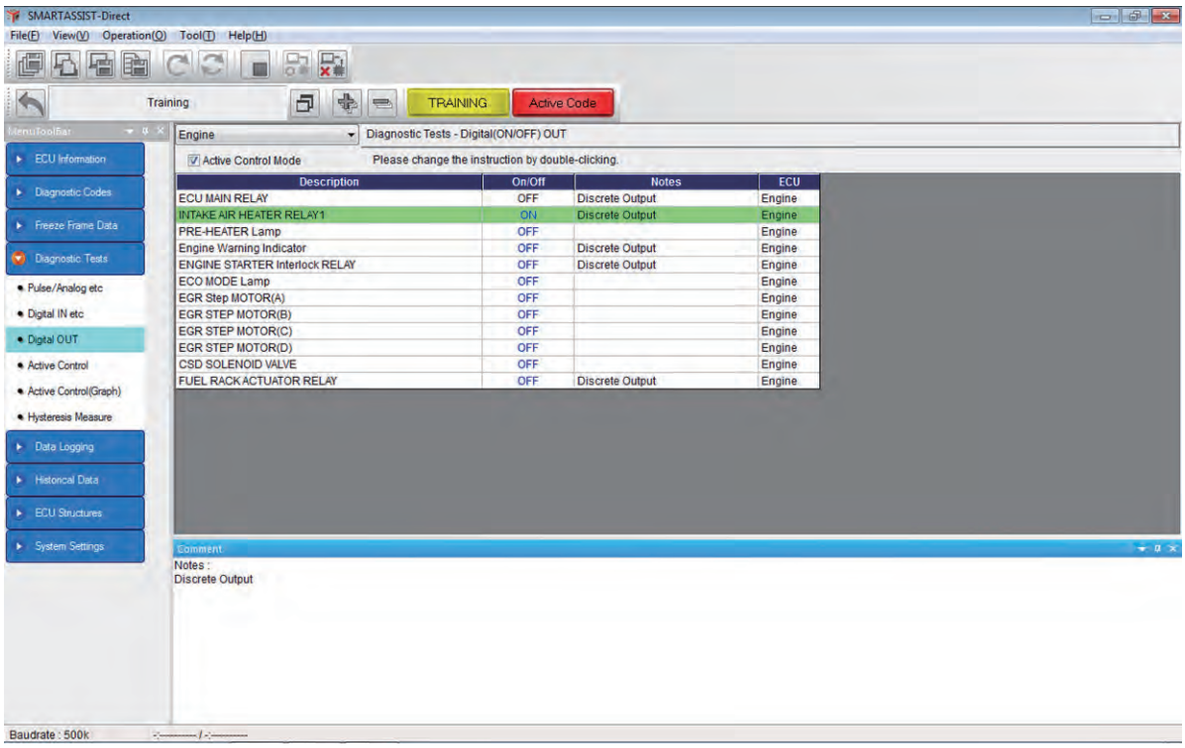
3 **Notes** : Display reference information.



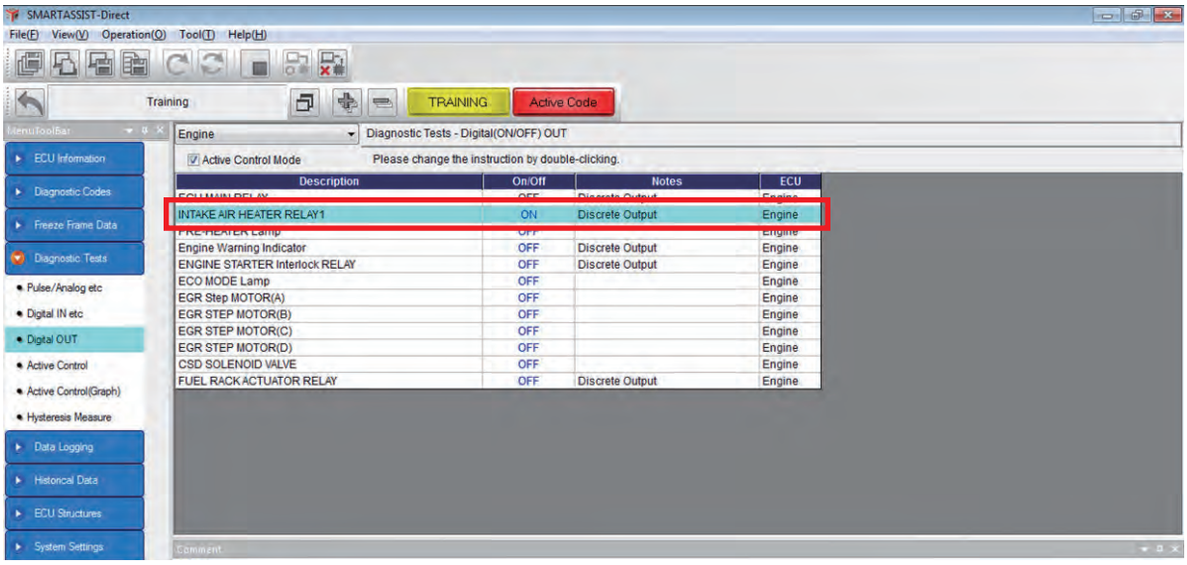
■How to Perform Digital Output

Click the On/Off box to the right of the desired item. The password confirmation screen is displayed. First time only: Enter the login password and double-click the set button to toggle the output on/off.

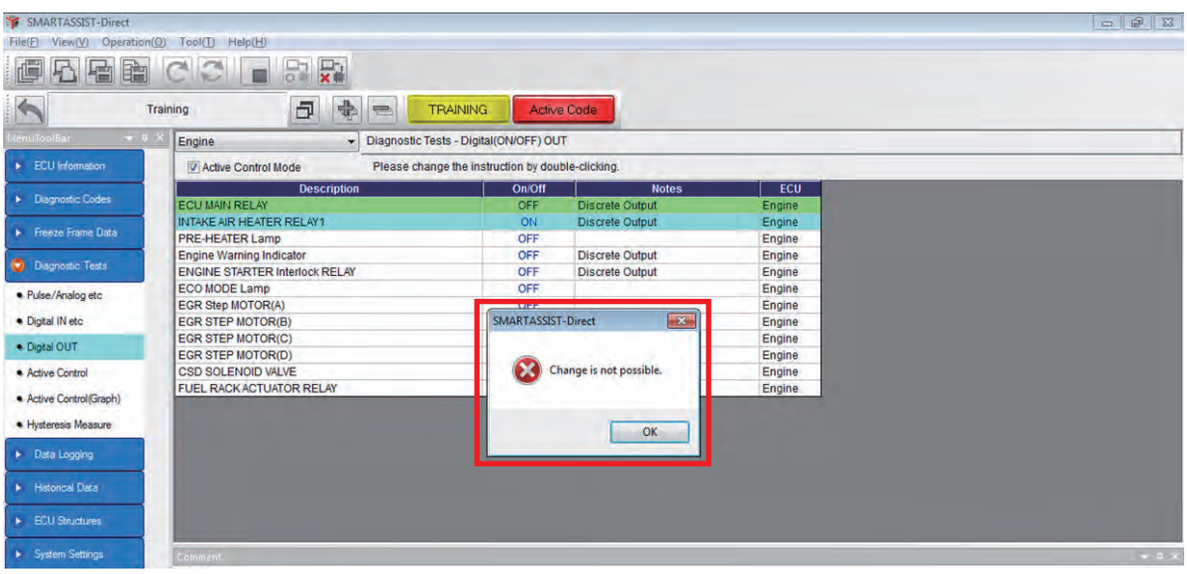




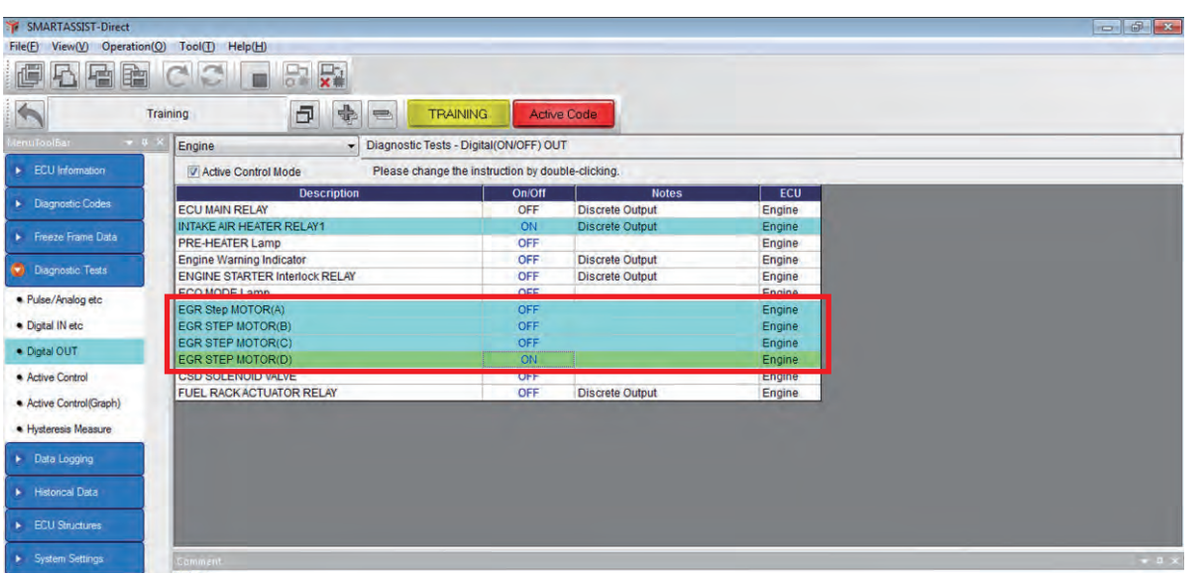
If an item is light blue, digital output has been performed before.



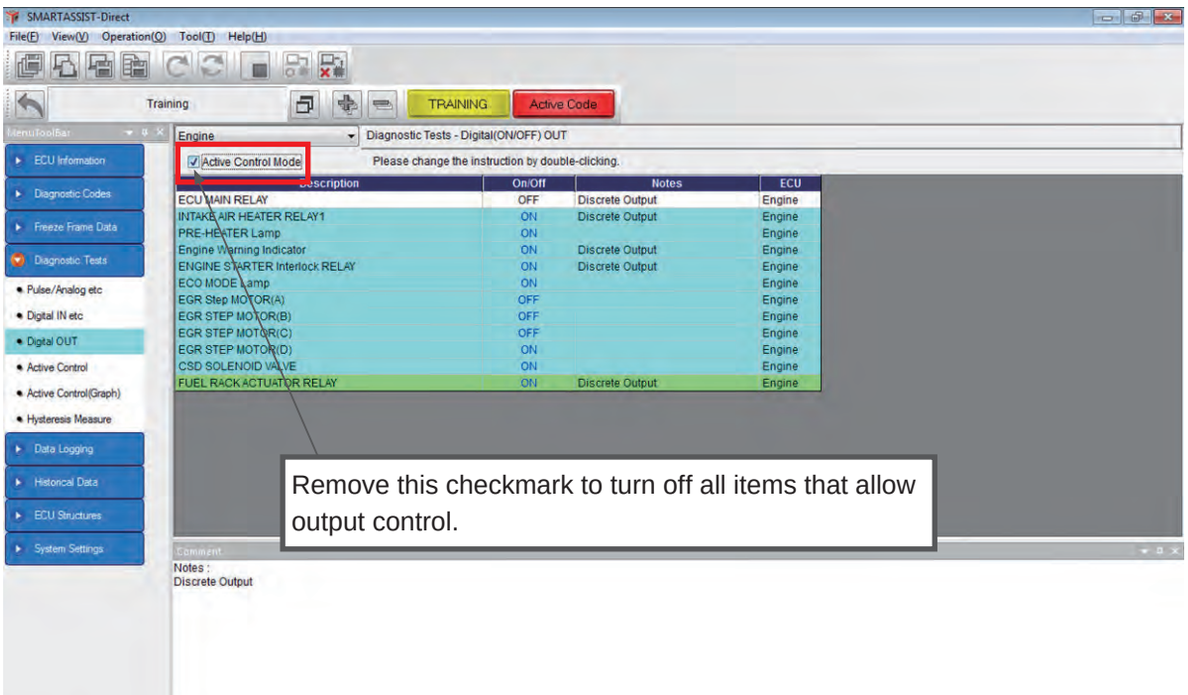
If an On/Off box is black, digital output cannot be performed on that item.

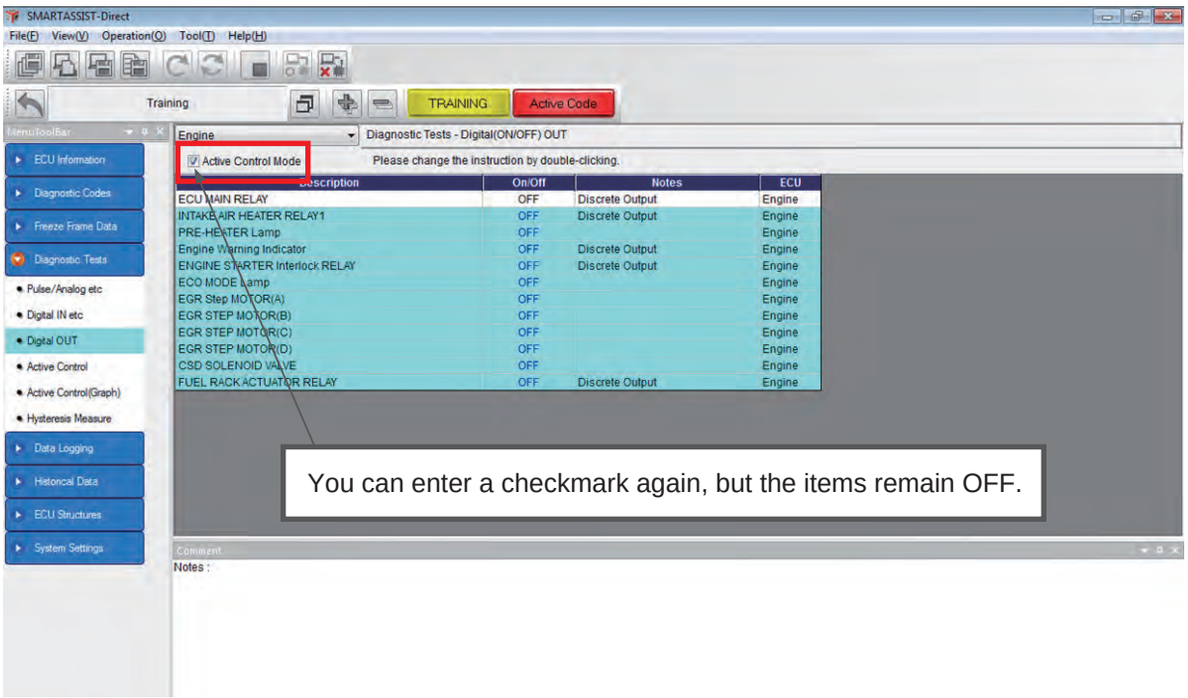


Step motors (phase A to D) can only have one item turned on.



Performing digital output automatically puts a check mark into the checkbox.

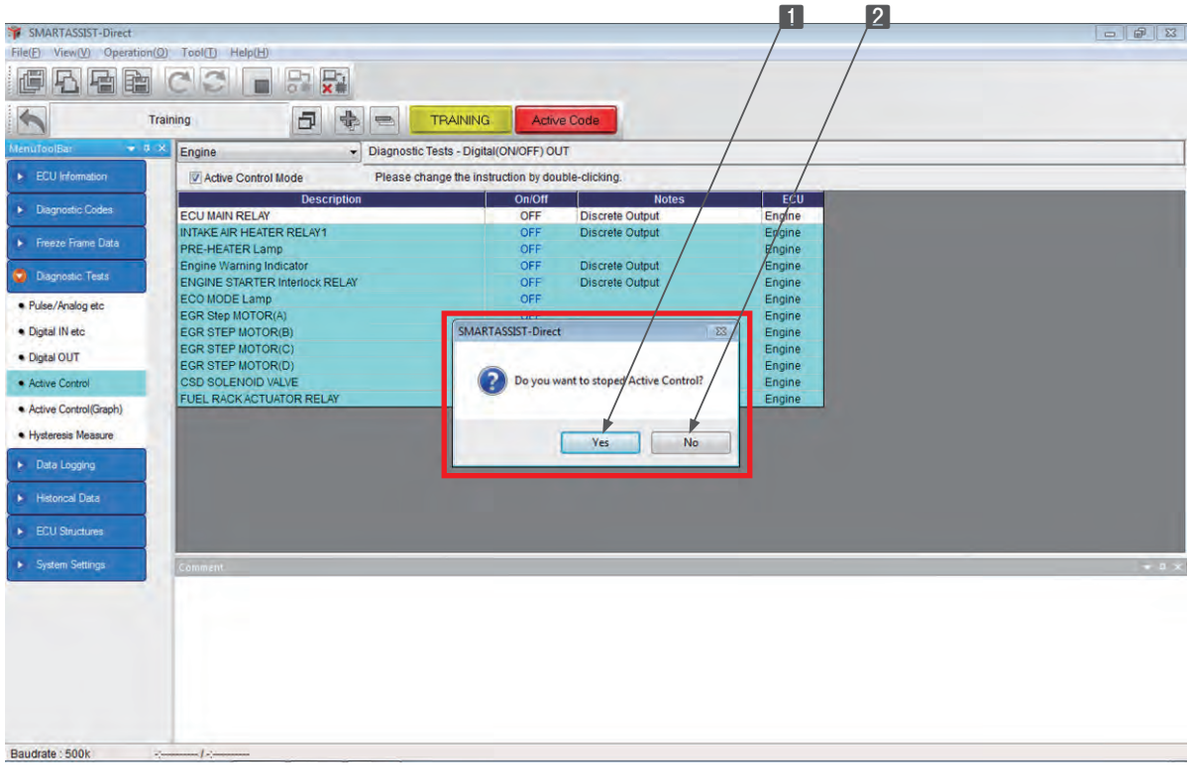




When moving to another tab, a confirmation dialog for the end of the forced operation is displayed.

1 **Yes** : Turn all applicable output statuses to off and move to another tab.

2 **No** : Keep all current output statuses and move to another tab.



■Forced Operation Initial Screen

1 **Manual** : Marked with a red light during forced operation.

2 **Stop Button/Run Button** : Select Stop/Run.

3 **ENG Run** : Indicates that the forced operation is available.

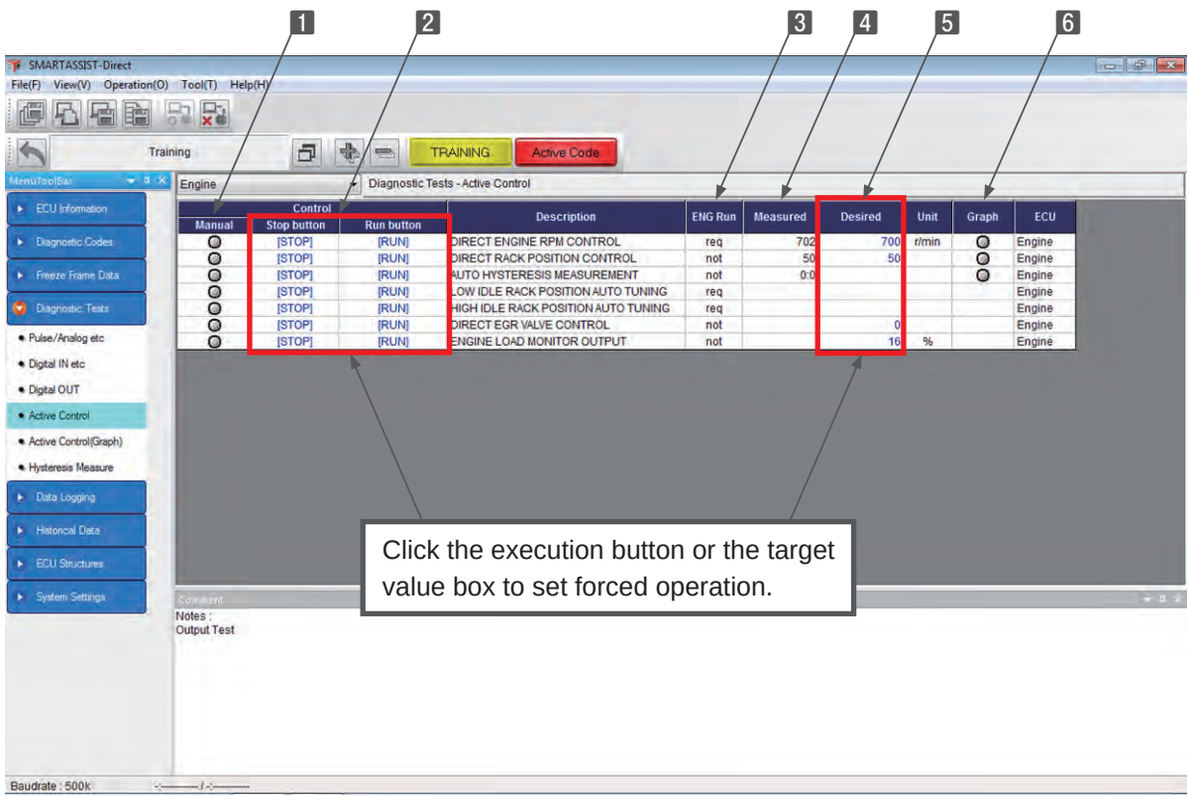
Req: Only active during engine operation

Not: Only active during engine stop

4 **Measured** : Display the current measurement values.

5 **Desired** : Display the control target values.

6 **Graph** : Graph display button

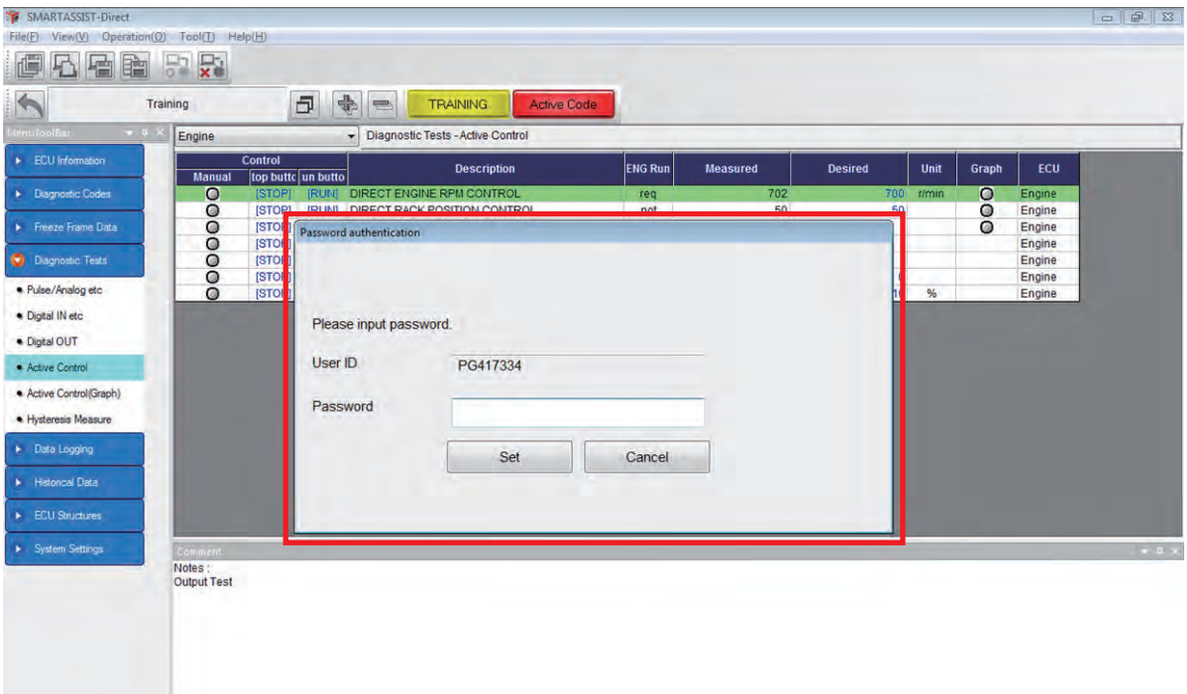


* A safety is locked on the ECU side.

If the forced operation cannot be performed, the in-progress lamp does not turn on.

■Directive Engine Speed Control

1 Clicking the execution button or the target value box displays the password confirmation screen. Enter the password. (First time only):



2 Select the directive value on the data setting screen.

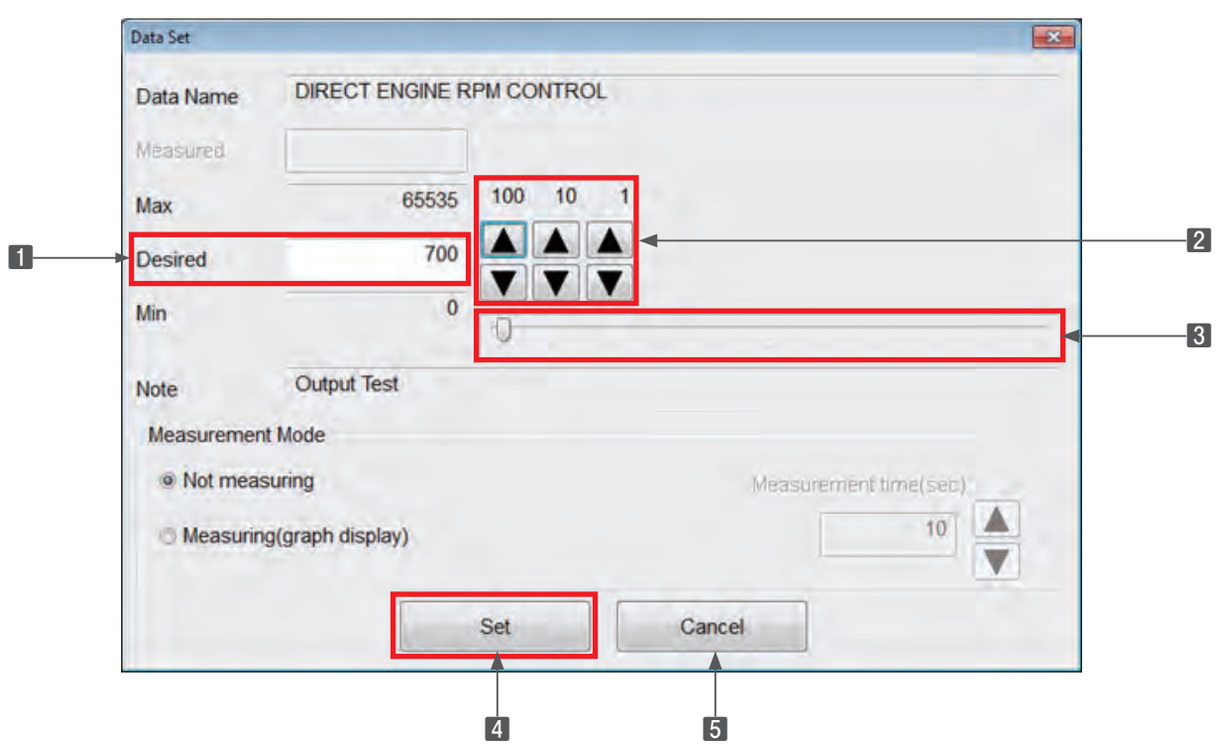
1 **Desired** : Enter the desired value.

2 ▲ / ▼ : Adjustable in increments of 1, 10, and 100.

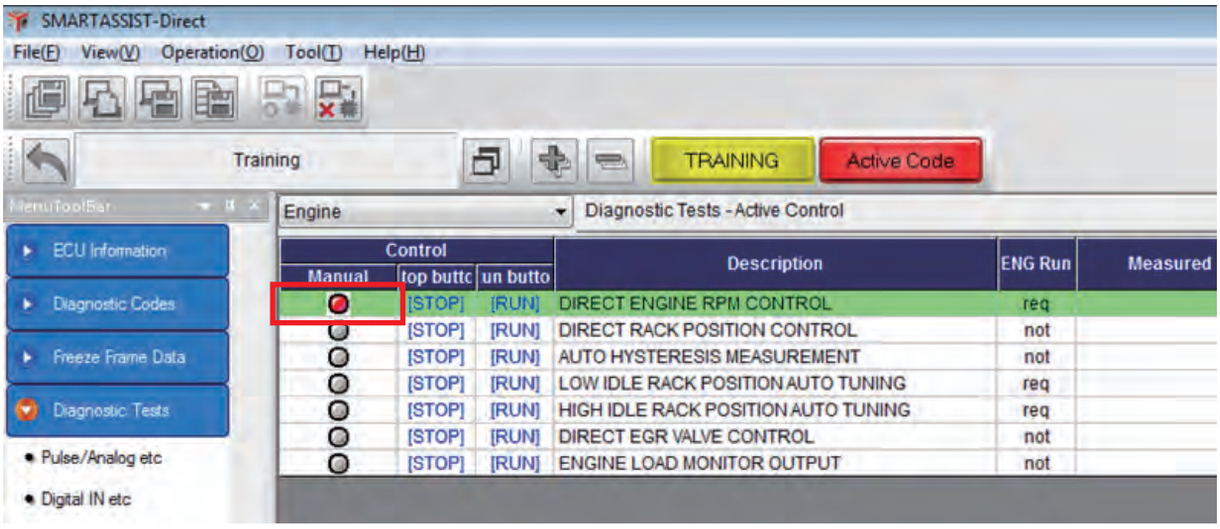
3 : Adjustable by a slider.

4 **Set** : Confirm an entry.

5 **Cancel** : The manual lamp is lit, but it indicates the forced operation mode.



3 During forced operation, the manual lamp is red.



■Directive Engine Speed Control (Measurement)

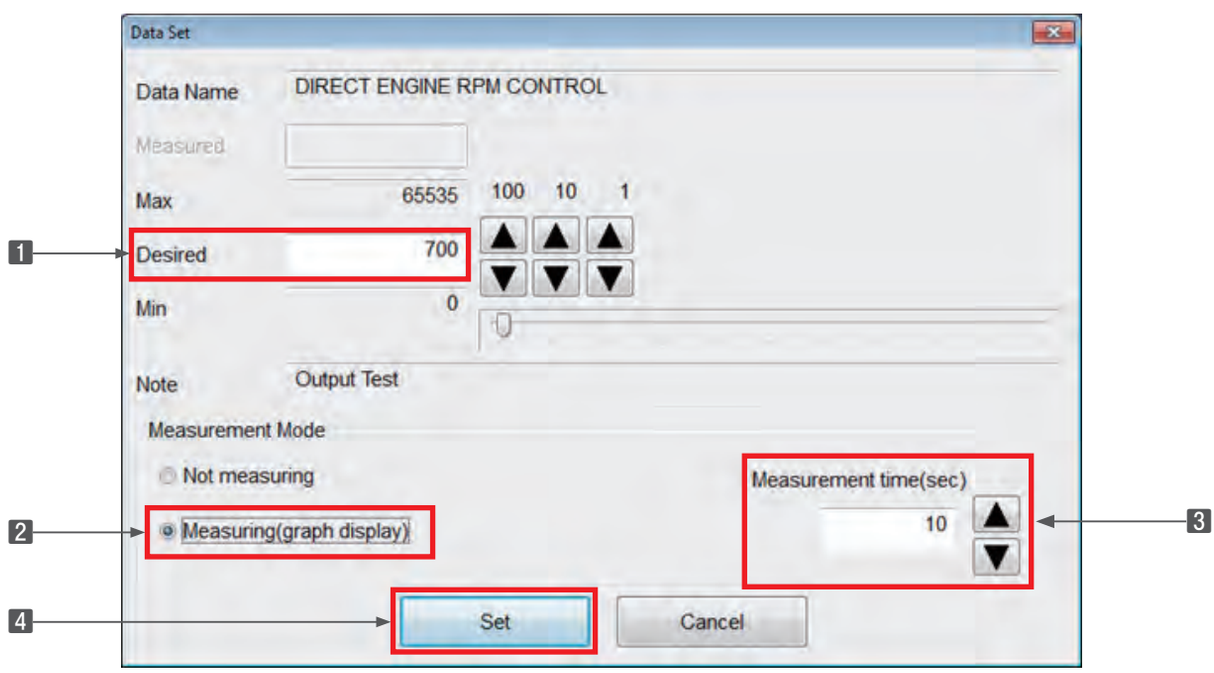
1 Select the directive value at the data selection screen. Change the measurement mode to "Change to execute measurement".

1 **Desired Value** : Enter the desired value.

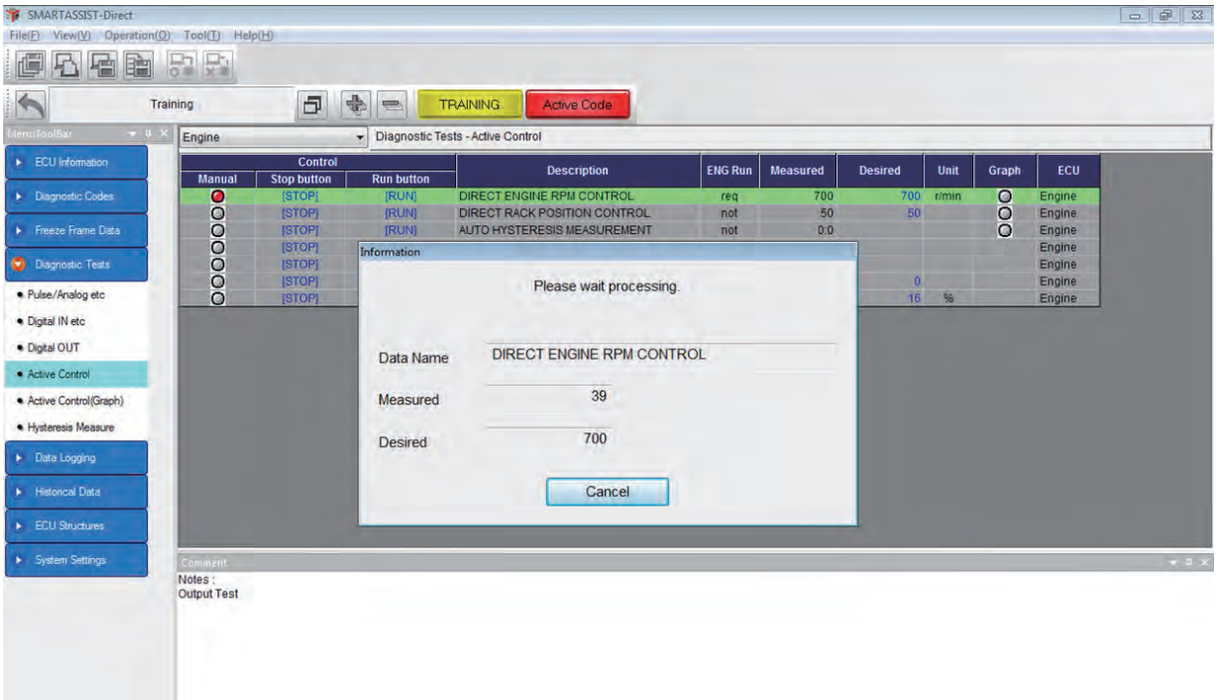
2 **Measuring** : Insert a checkmark.

3 **Measurement Time** : Enter the measurement time. (seconds)

4 **Set** : Start the measurement.

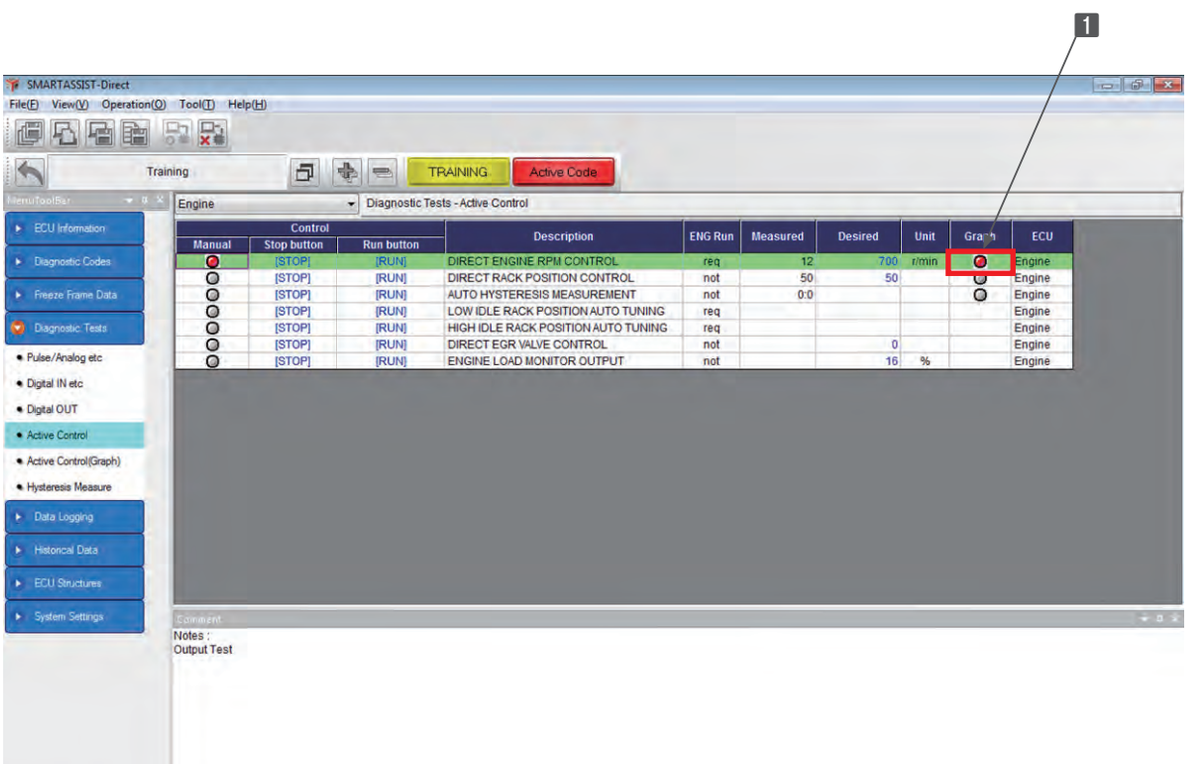


2 Wait until the measurement is finished.



3 When the measurement is finished, a graph is displayed. (The forced operation continues.)

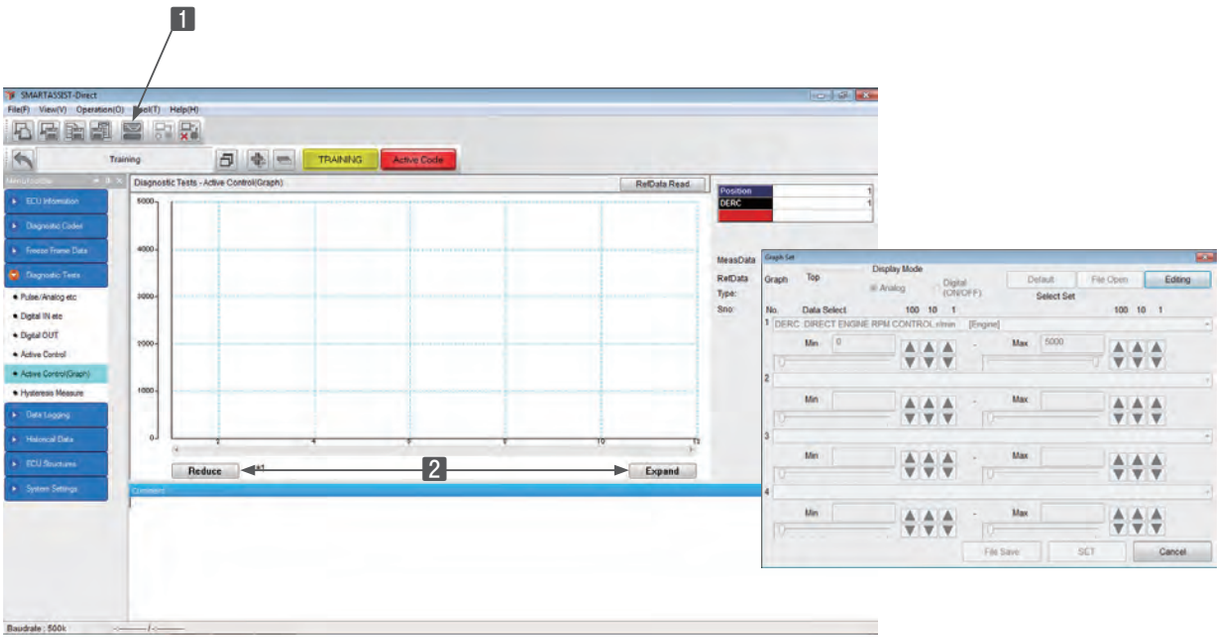
1 **Graph** : Display the graph.



4 The measurement results are displayed in a graph.

1 : The y-axis scale is adjustable.

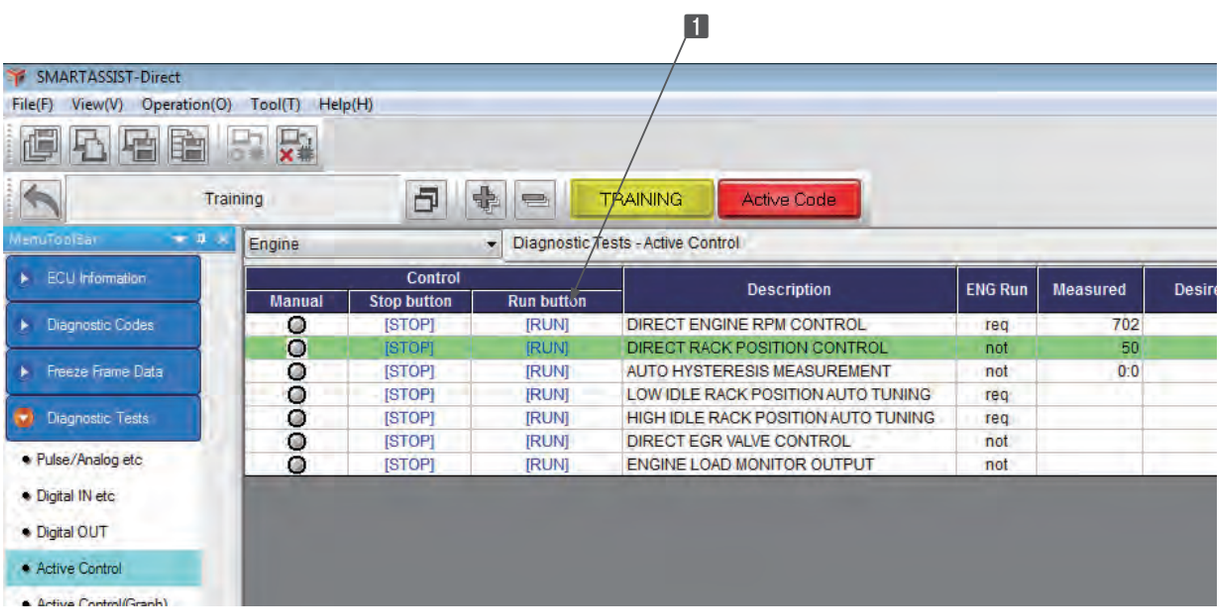
2 **Minimize** / **Expand** : The x-axis scale is adjustable in 6 steps.



■Specified Rack Position Control

1 Clicking the execution button or the target value box opens the data setting screen.

1 **Run Button** : Display the setting screen.



2 Select the directive value on the data setting screen.

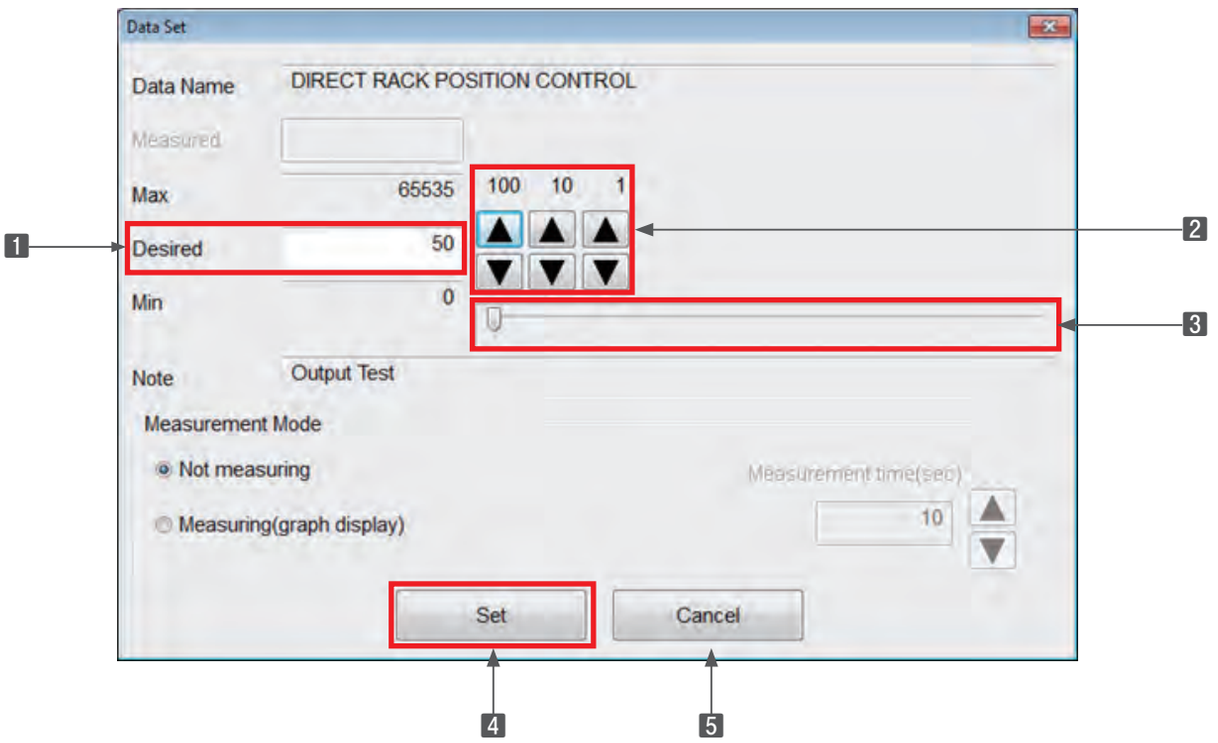
1 **Desired** : Enter the desired value.

2 ▲ / ▼ : Adjustable in increments of 1, 10, and 100.

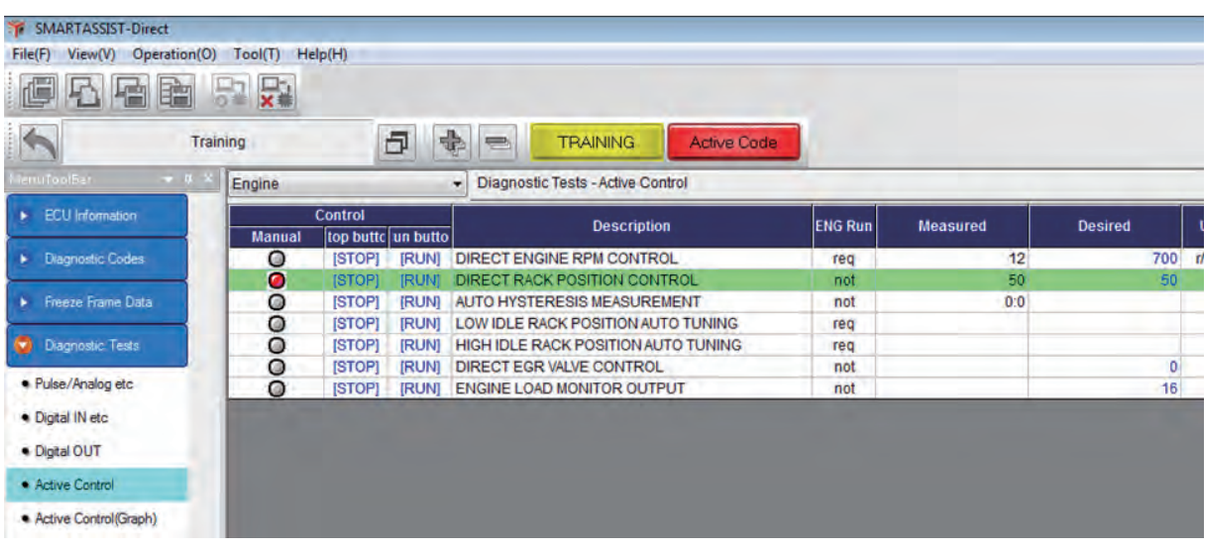
3 : Adjustable by a slider.

4 **Set** : Confirm an entry.

5 **Cancel** : The manual lamp is lit, but it indicates the forced operation mode.



3 During forced operation, the manual lamp is red.



■Specified Rack Position Control (Measurement)

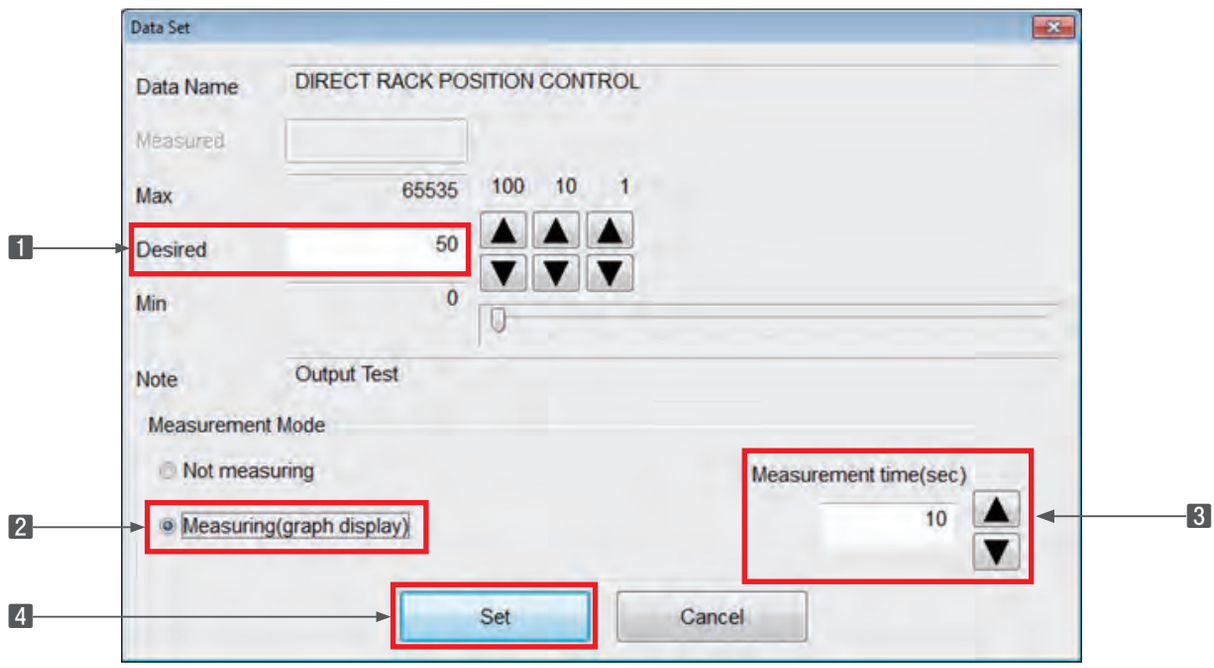
1 Select the directive value on the data setting screen. Change the measurement mode to "Change to execute measurement".

1 **Desired** : Enter the desired value.

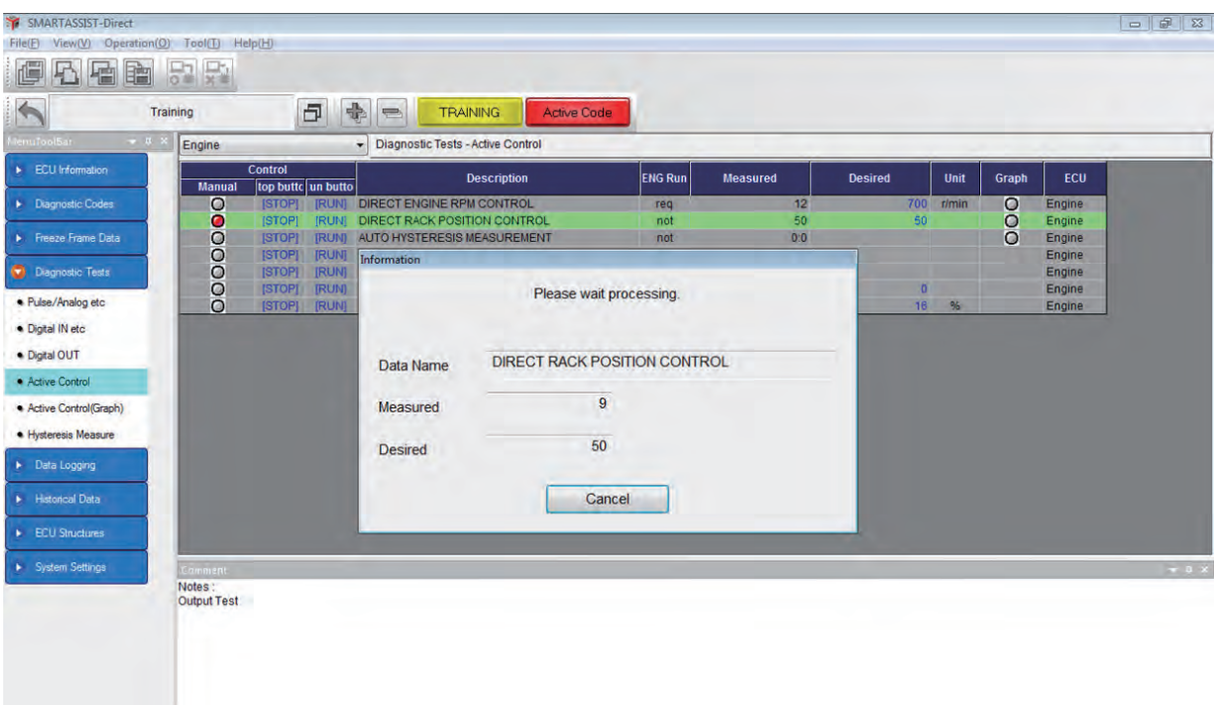
2 ⊙ **Measuring** : Insert a checkmark.

3 **Measurement Time** : Enter the measurement time. (seconds)

4 **Set** : Start the measurement.

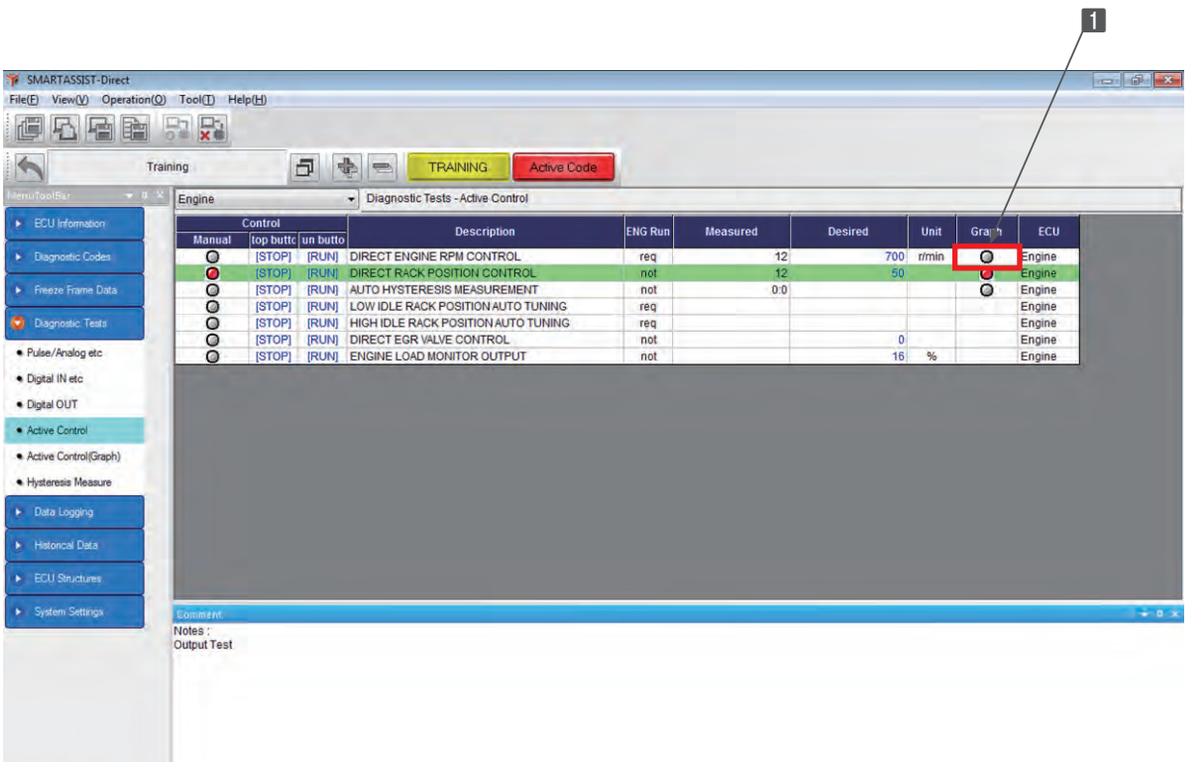


2 Wait until the measurement is finished.



3 When the measurement is finished, a graph is displayed. (The forced operation continues.)

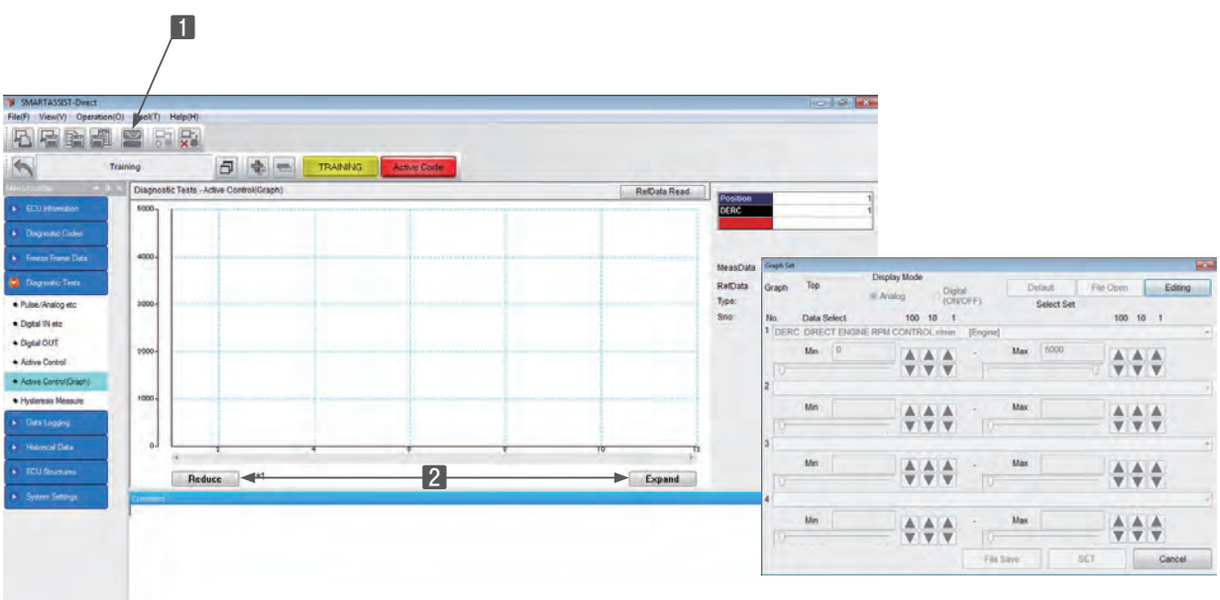
1 **Graph** : Display the graph.



4 The measurement results are displayed in a graph.

1 : The y-axis scale is adjustable.

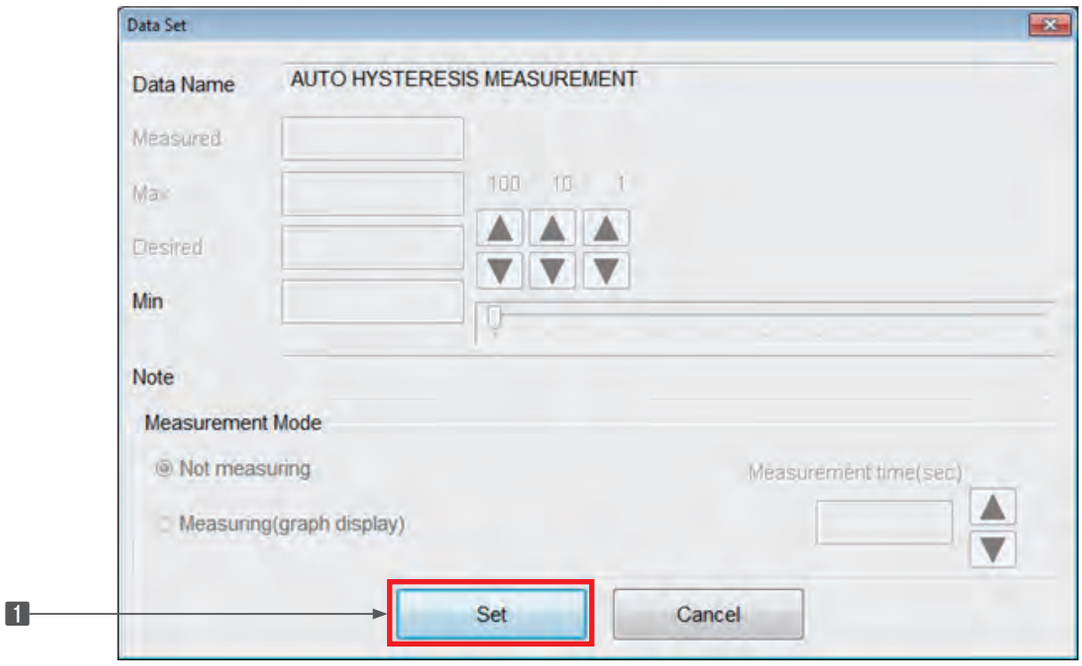
2 **Minimize** / **Expand** : The x-axis scale is adjustable in 6 steps.



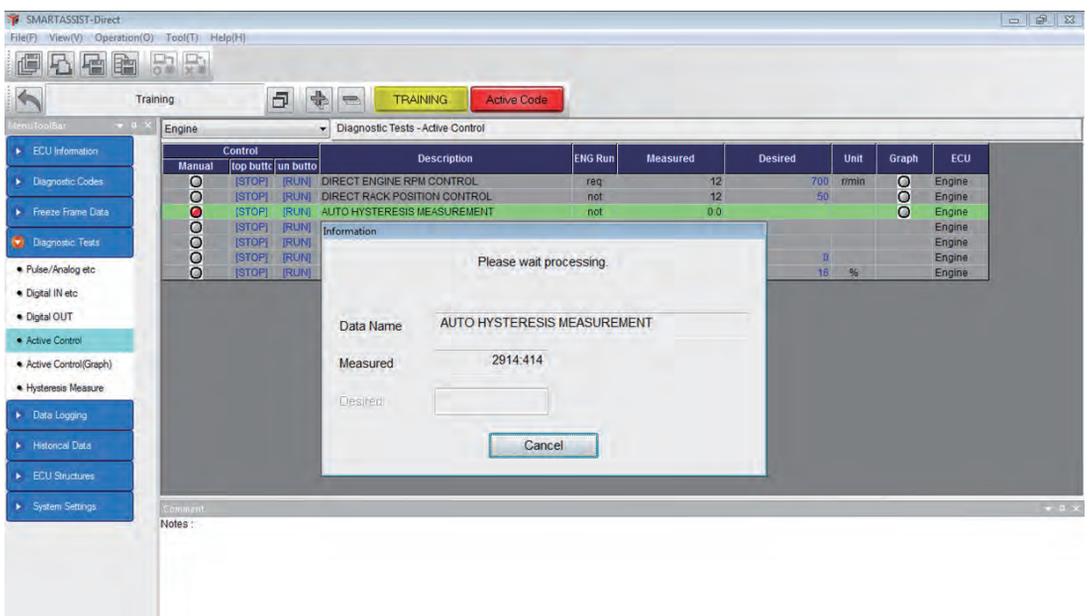
■Automatic Hysteresis Measurement

1 Measure the hysteresis of the rack actuator.

1 **Set** : Start the measurement.

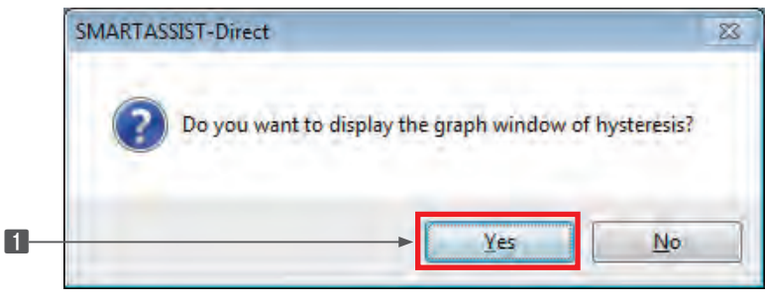


2 Wait until the measurement is finished.



3 Switch to the hysteresis graph.

1 **Yes** : Display the measurement graph.



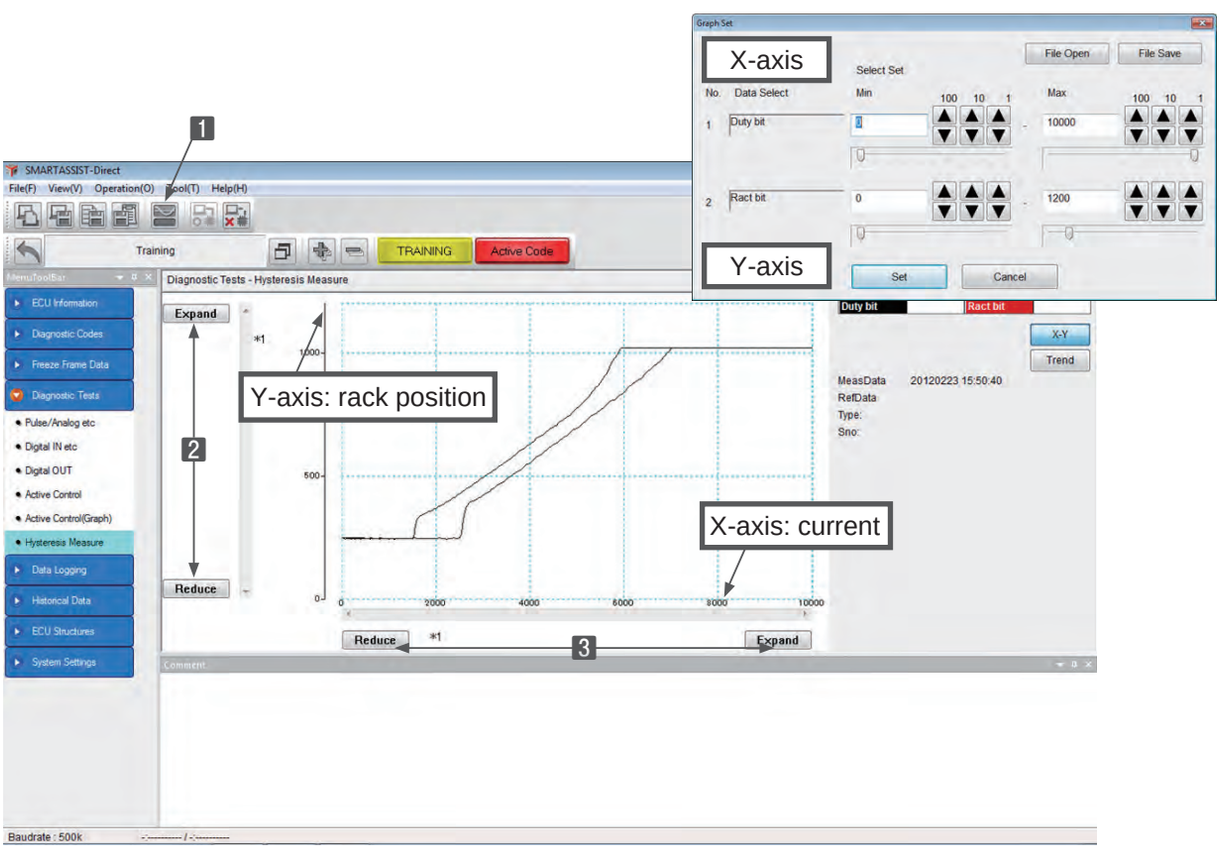
4 The X-Y display mode compares measurement discrepancies between the forward and reverse measurement, and its wrap-around is at the right end of the graph.

1 : The x- and y-axis scale are adjustable.

2 **Minimize** / **Expand** : The y-axis scale is adjustable in 6 steps.

3 **Minimize** / **Expand** : The x-axis scale is adjustable in 6 steps.

4 **X-Y** : Display the X-Y display mode.

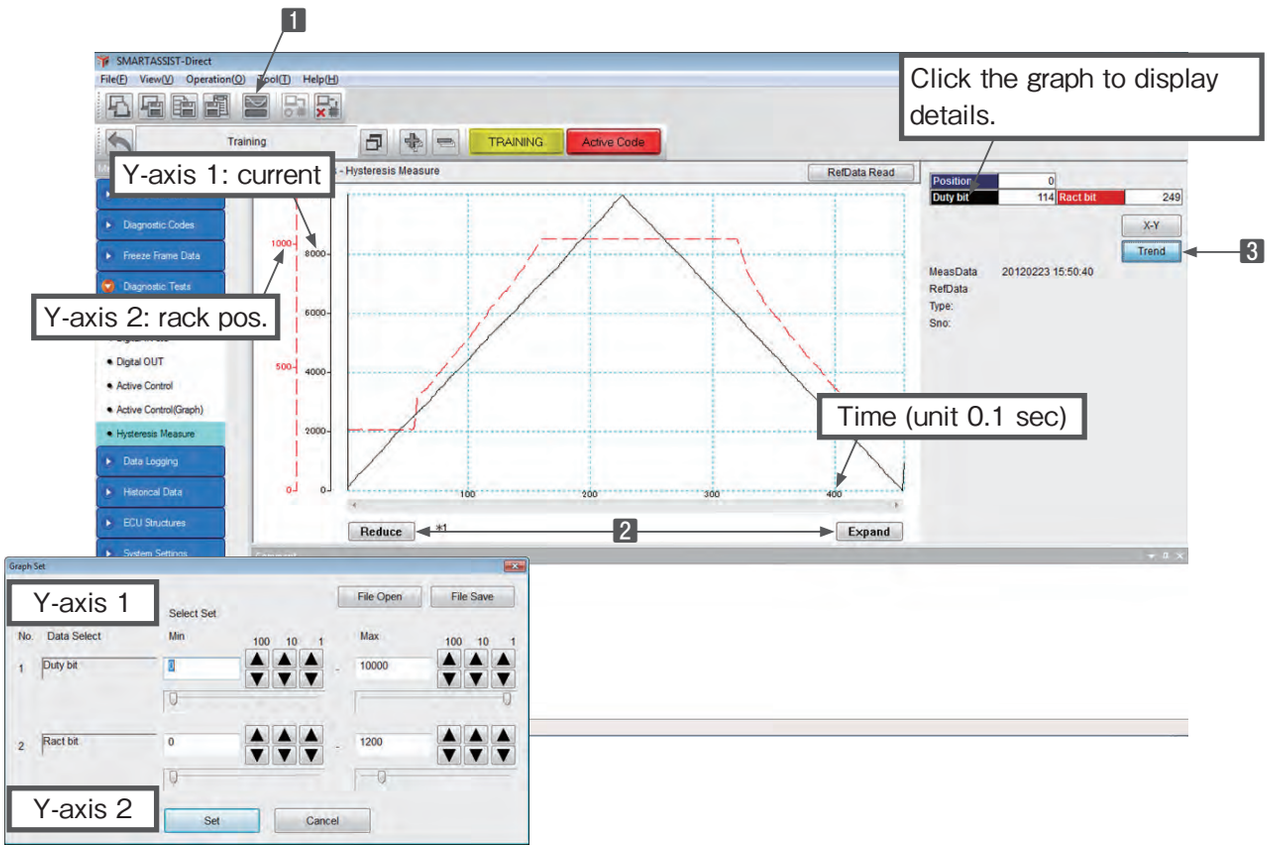


5 The trend display mode compares the directive value (black) and the measurement value (red), and displays a time line.

1  : The y-axis scale is adjustable.

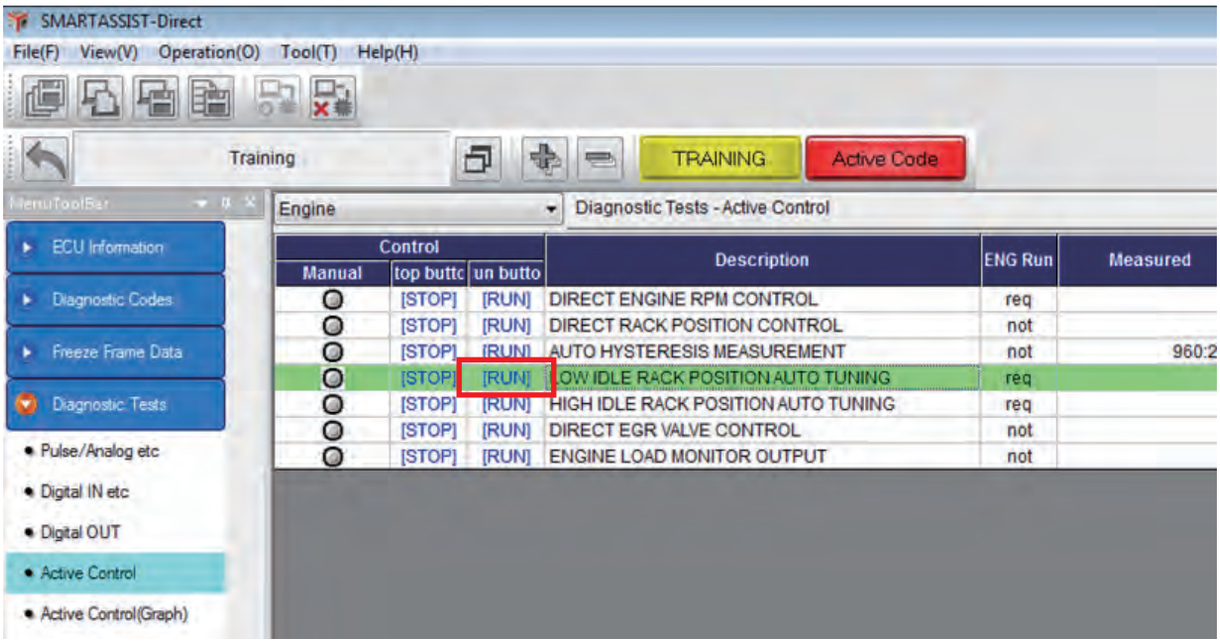
2 **Minimize** / **Expand** : The x-axis scale is adjustable in 6 steps.

3 **Trend** : Display the trend display mode.

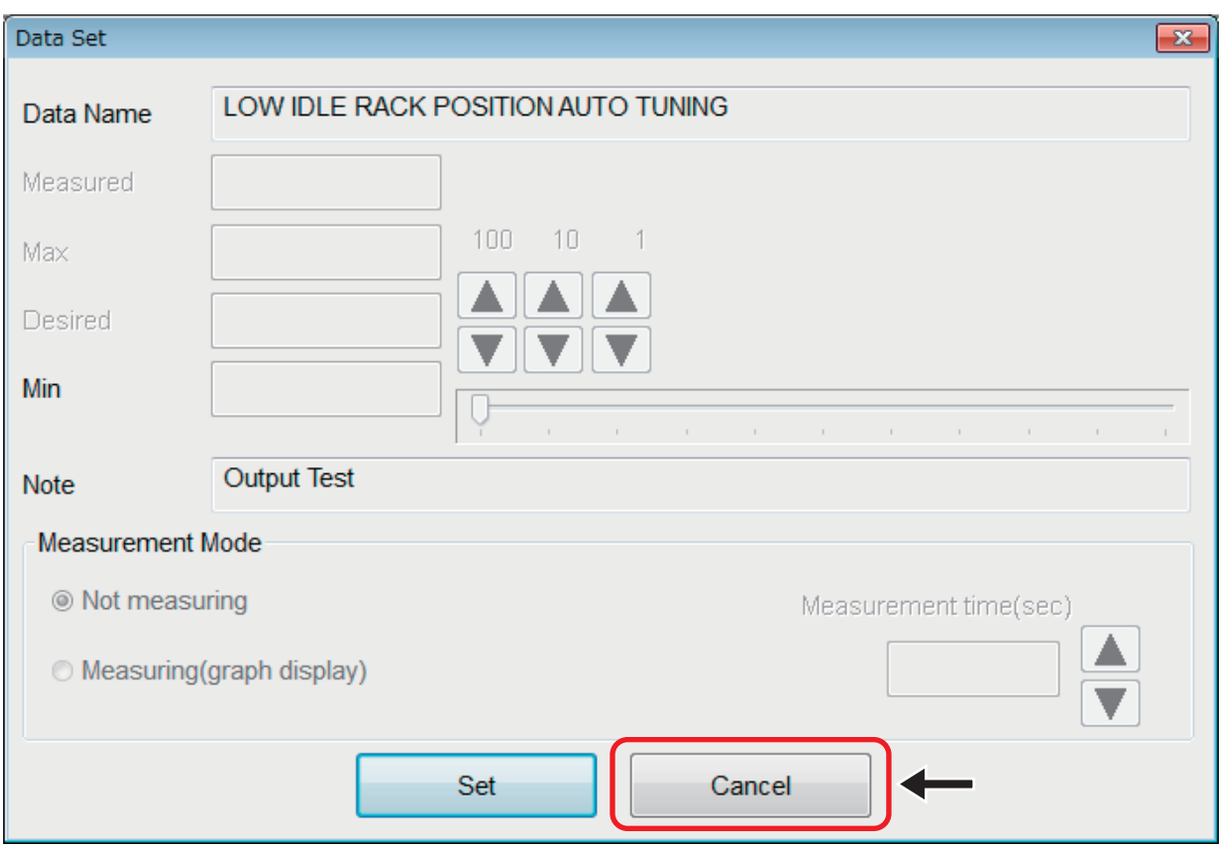


■Automatic Correction of the Idle Rack Position (L-idle, H-idle)

This function is limited to developers.



When trying to execute it, the below error message is displayed.



■EGR Valve Opening Control

1 Select the directive value on the data setting screen.

1 **Desired** : Enter the desired value.

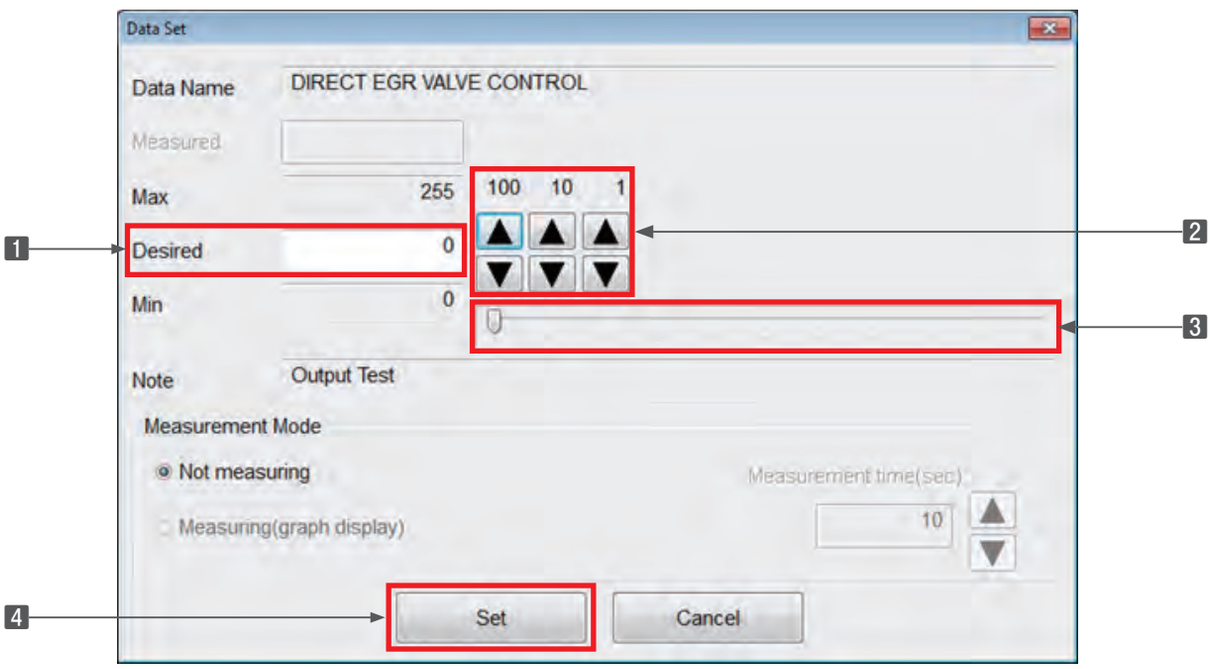
2 ▲/▼ : Adjustable in increments of 1, 10, and 100.

3 : Adjustable by a slider.

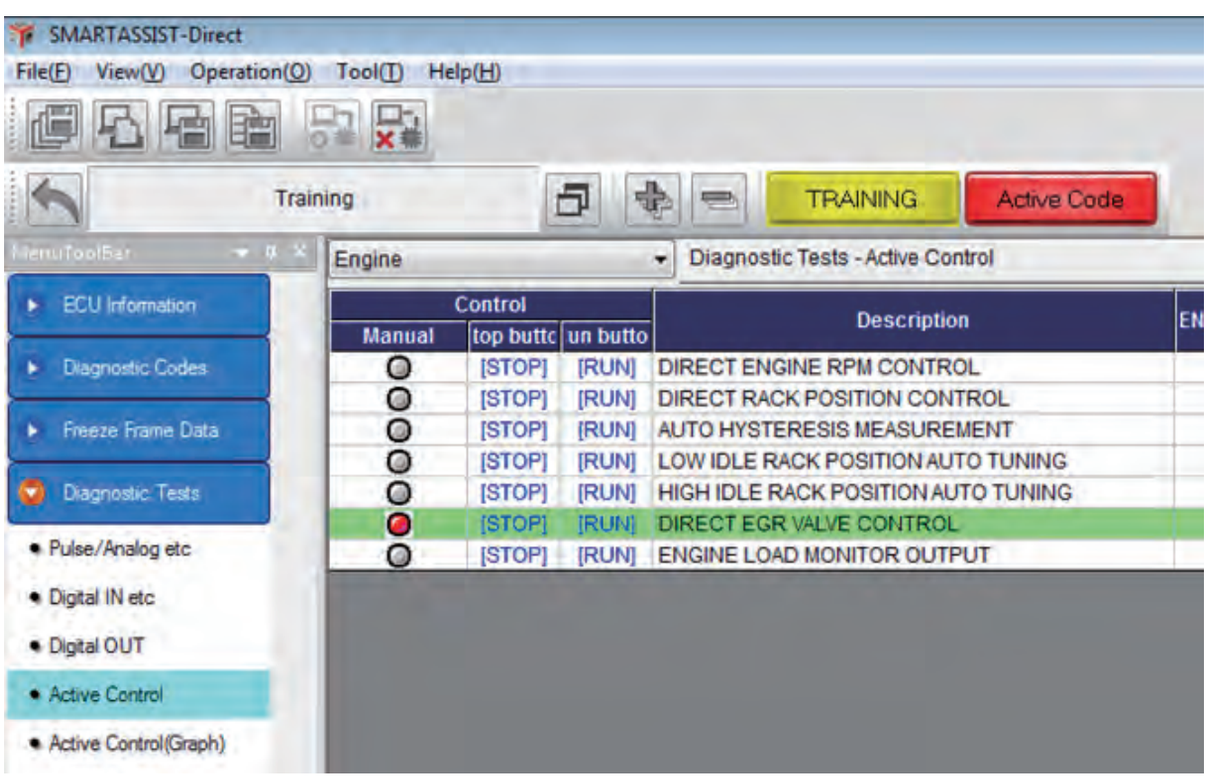
* The directive value must be between 0 and 255. (Entry range is 0 - 54)

* If a value higher than the specified entry value (max. 54) is set, the value on the screen may be greater than 54, but the actual effective value is limited to 54.

4 **Set** : Confirm the entry.



2 The forced operation starts, and the manual lamp lights in red.



■Load Ratio Monitor Output

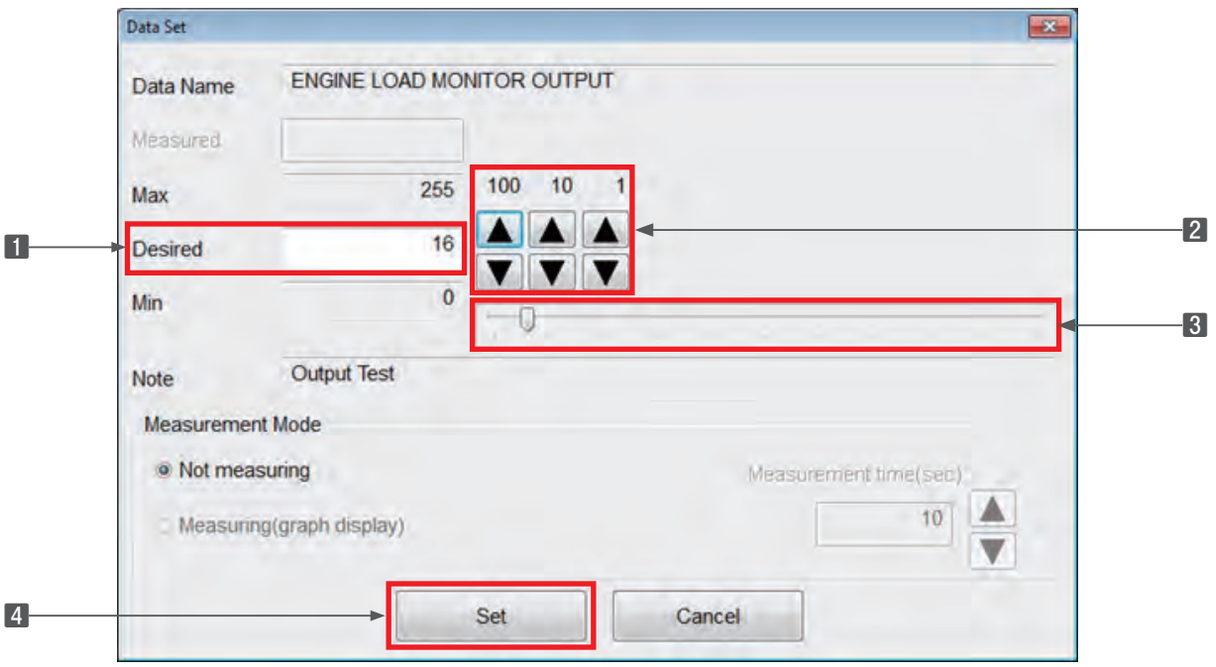
1 Select the directive value on the data setting screen.

1 **Desired** : Enter the desired value.

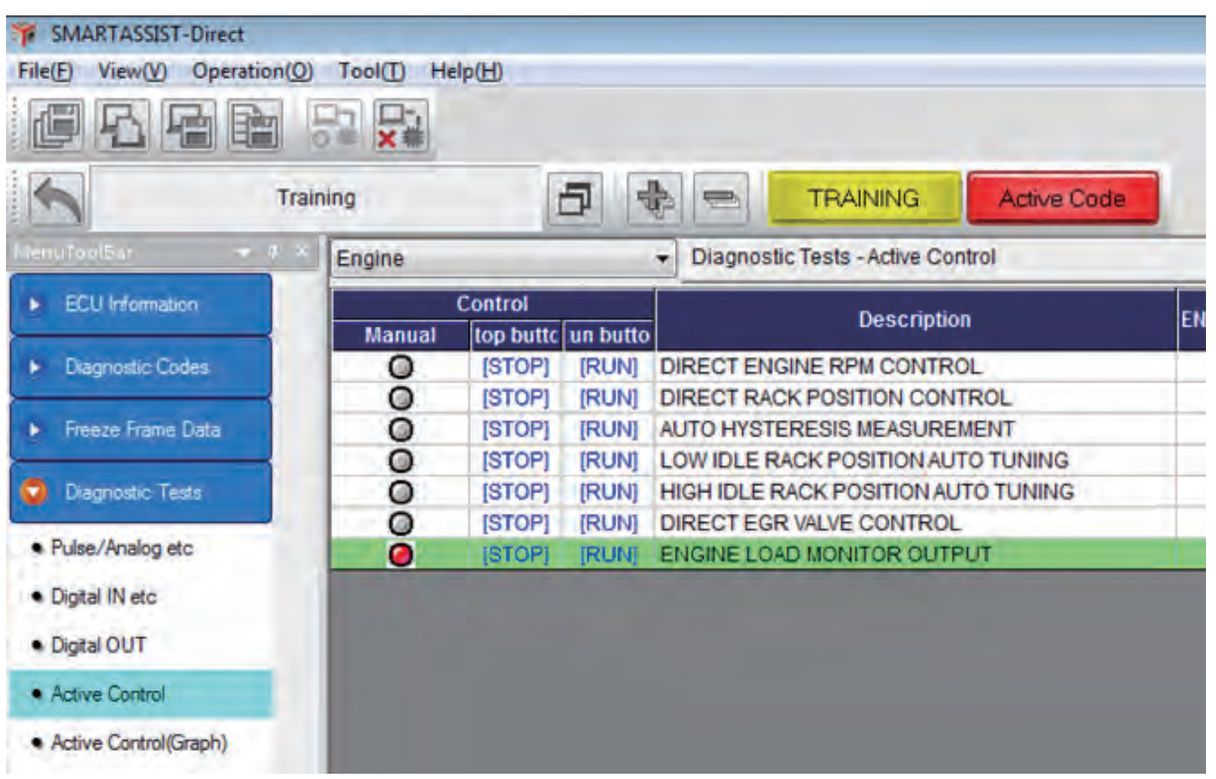
2 ▲/▼ : Adjustable in increments of 1, 10, and 100.

3 : Adjustable by a slider.

4 **Set** : Confirm the entry.



2 The forced operation starts, and the manual lamp lights in red.



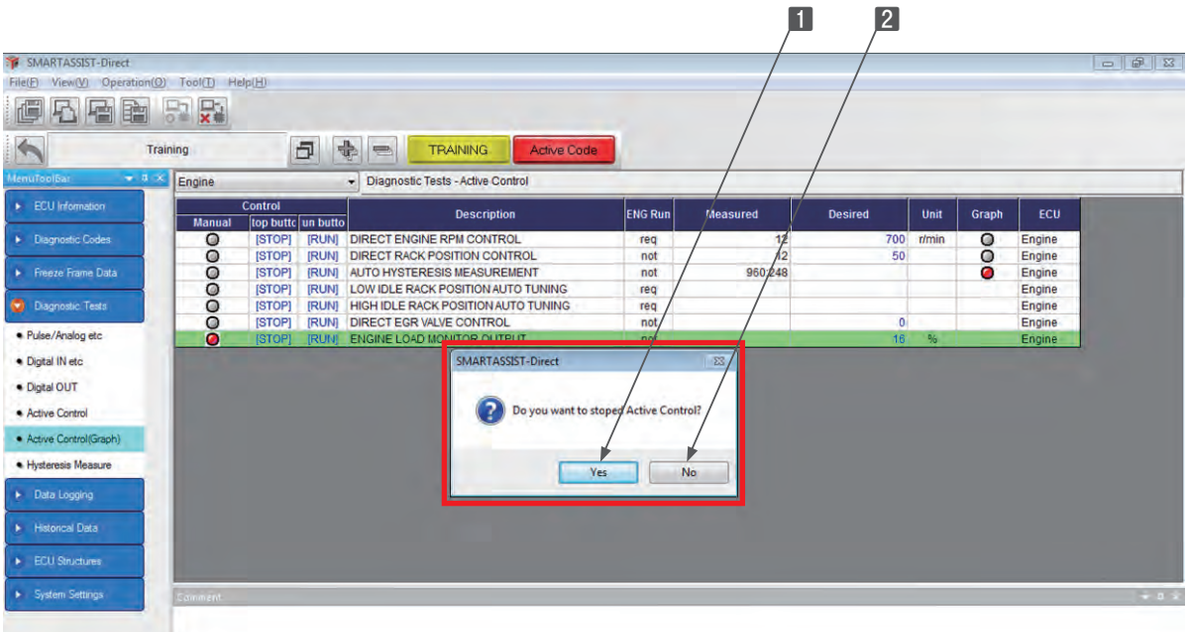
■Additional Descriptions

When clicking another tab, a confirmation dialog for the end of the forced operation is displayed.

1 **Yes** : Stop all items and move to another tab.

2 **No** : Keep all current executed statuses and move to another tab.

* After switching the tab, the digital output will remain displayed in light blue.



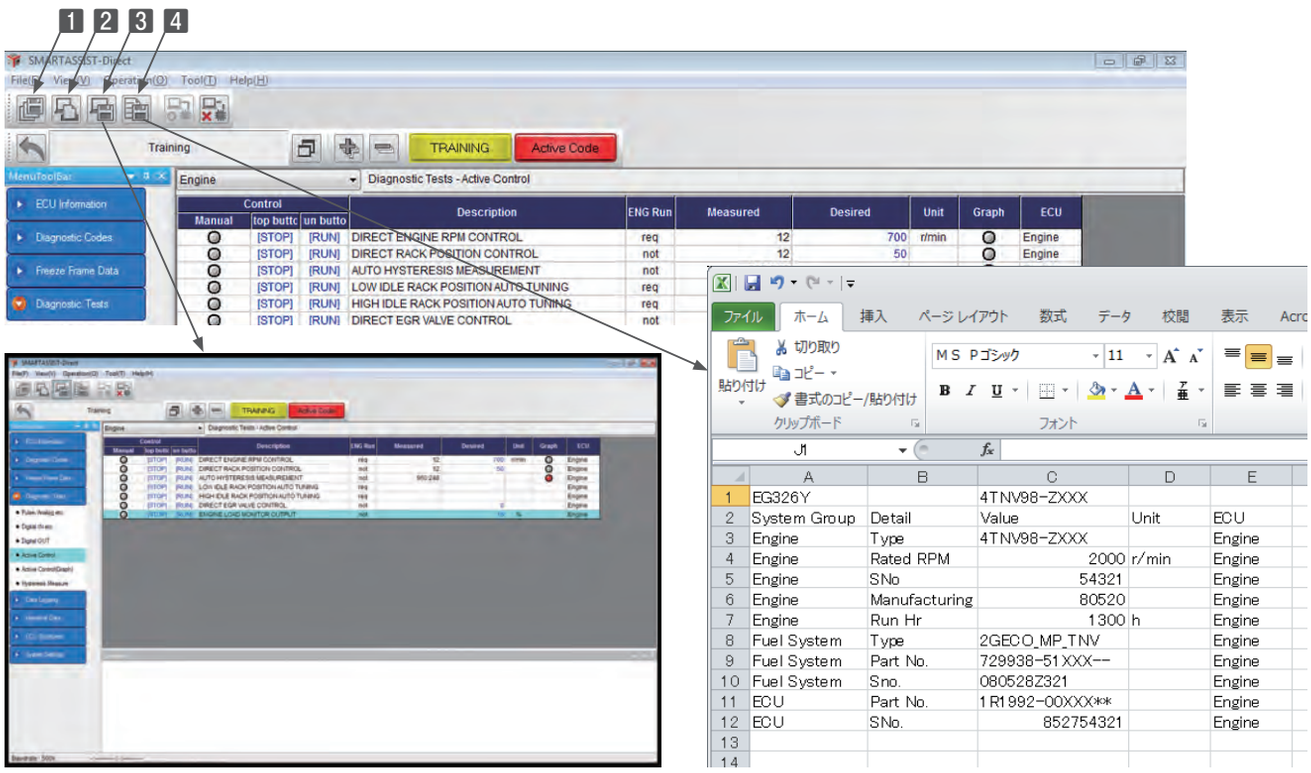
When necessary, save as CSV, save a screenshot or make a printout of the screen.

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions])

2 : Print the screen. (Refer to [6.2.2])

3 : Save a screenshot in BMP format. (Refer to [6.2.3])

4 : Save the screen data in CSV format. (Refer to [6.2.4])

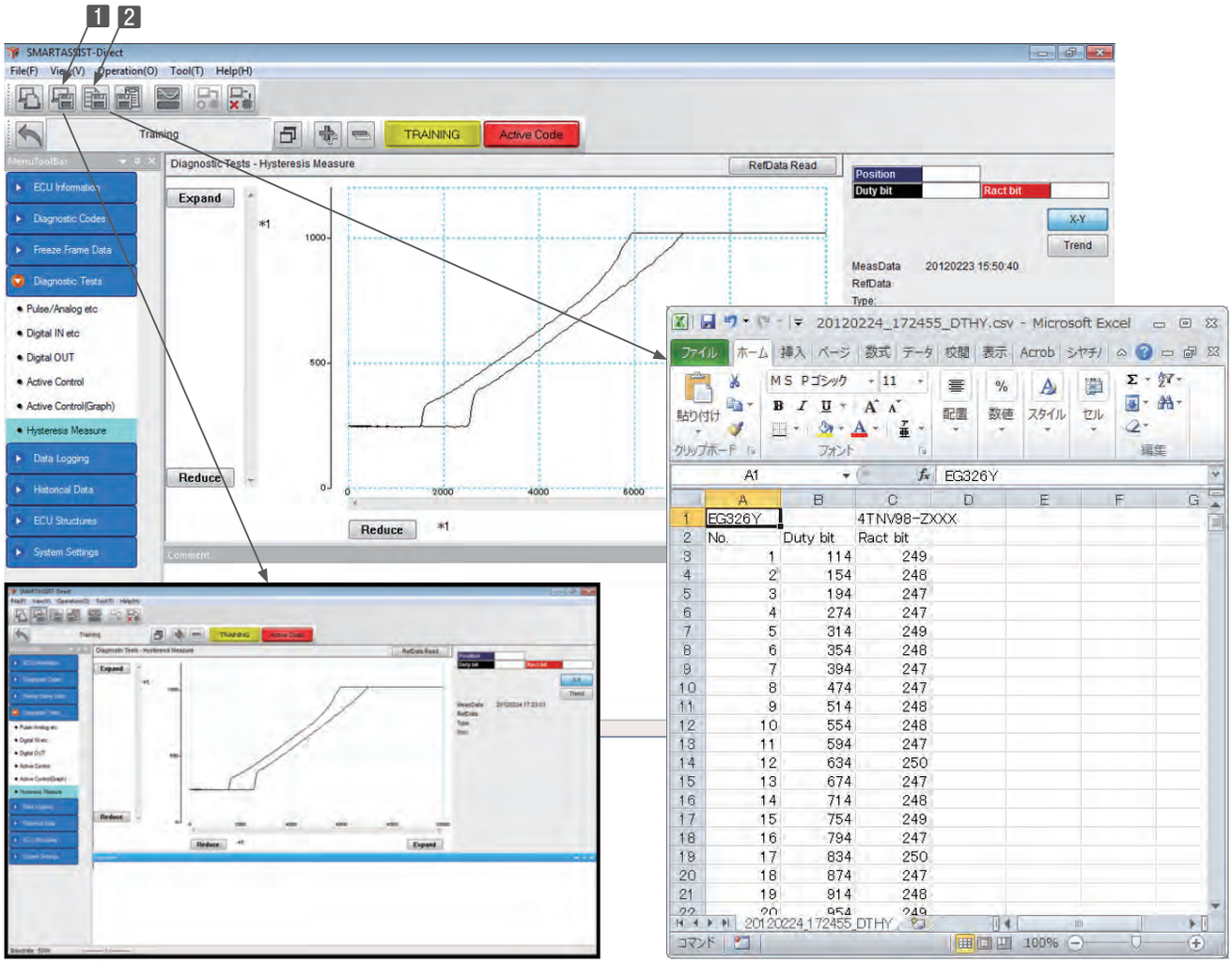


The graph measured during forced operation is overwritten when other items are measured, so save the graph screen as bitmap or save the data in CSV format.

Be careful: The graph is deleted when other items are executed in forced operation.

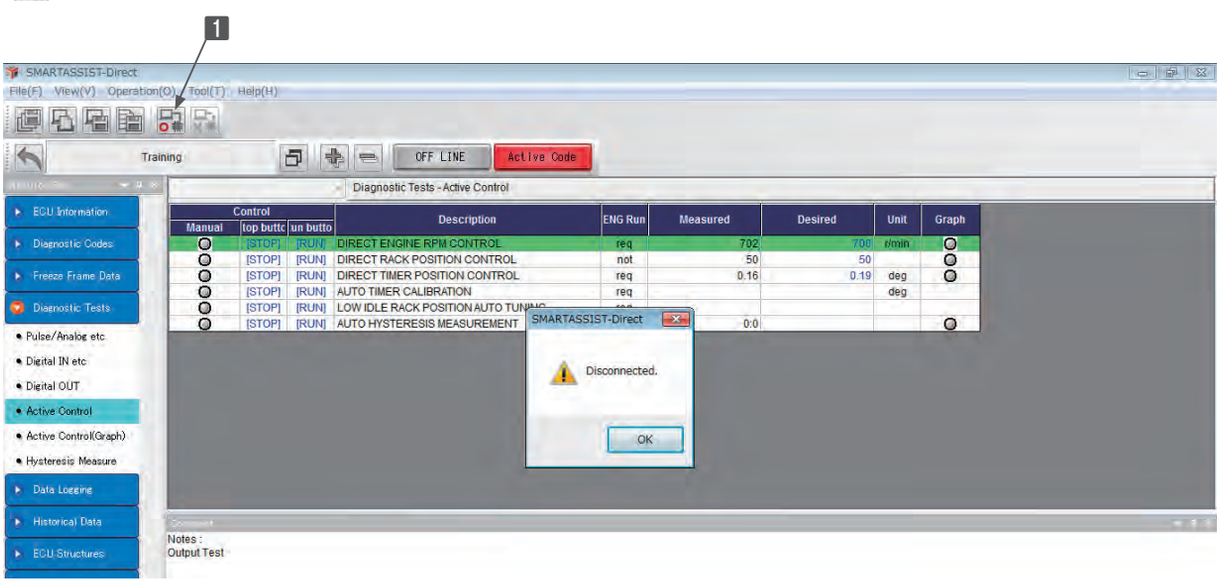
1 : Save a screenshot in BMP format. (Refer to [6.2.3])

2 : Save the screen data in CSV format. (Refer to [6.2.4])



If the communication with the ECU is interrupted and forced operation is performed, the below dialog box is displayed.

1 : The communication with the ECU starts.



6.6 Data Logging (Expert Function)

From the submenu of the graph display, you can select the data monitor that displays logged data in real-time or save data. The logged data is gathered by a tool that can determine defects and analyze the operating status during operation of the product. The logged data contains data before/after error (Refer to [6.4]) and arbitrarily set optional data. There is also a trigger setting that makes saving data easier.

6.6.1 Data Monitor

The measurement data of the ECU sensor and the control data are received at a sample interval set in advance (minimum 0.1 sec). A trigger that starts the recording of the data can be set.

● **Operation Toolbar**

1 : Print the screen. (Refer to [6.2.2])

2 : Save a screenshot in BMP format. (Refer to [6.2.3])

3 : Save the measured data. For the display of the saved data, refer to [7. Error Diagnosis Data Save and Display Functions].

4 : The receiving of data starts. (Data that has not been saved according to [6.5.6 Saving the Measured Data] is overwritten and lost.)

5 : Manually stop the receiving of data.

6 : Settings of the option data that run the data monitor. When clicking, the option data settings subwindow is displayed and the settings can be changed.

7 : Set the trigger conditions (trigger on/off, data selection, level (trigger value) selection, trigger type), number of delays and number of saved data sets. When clicking, a trigger settings subwindow is displayed and the settings can be changed.

8 : Set the sampling rate. When clicking, a sampling settings subwindow is displayed and the settings can be changed.

9 : Set the data that is displayed in the main box. When clicking, a data settings sub-window is displayed and the settings can be changed.

● **Main Box**

10 **Description** : Display the name of the logged data.

11 **Data** : Display the measurement values.

12 **Max** : Maximum value

13 **Min** : Minimum value

14 **Unit** : Unit

15 **Notes** : Annotation box

16 **ECU** : Display the ECU/controller that controls the devices. (Only if multiple ECU are connected.)

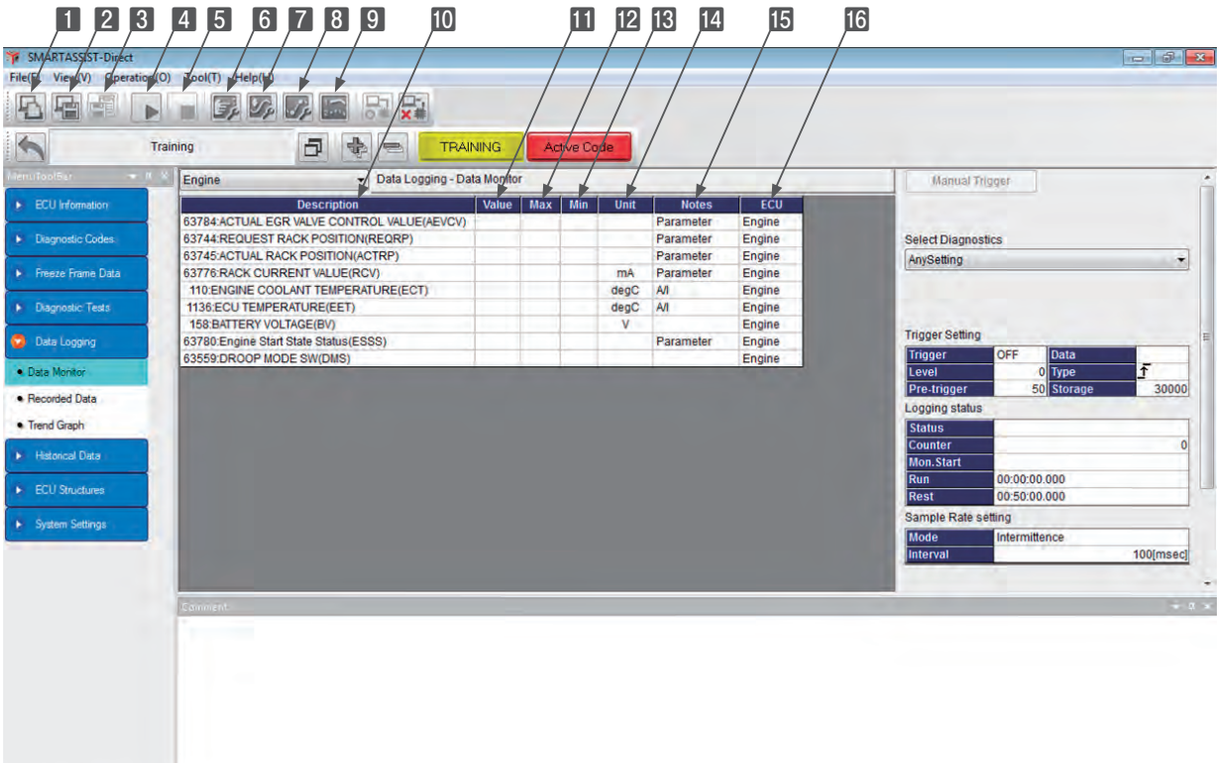


Figure 6-18 Data Monitor Screen

● Additional Information Box

• Trigger Settings

Displays the trigger setting information.

1 **Manual Trigger** : Click to manually apply the trigger.

2 **Select Diagnosis** : Package data sets with the most appropriate settings sorted per event

3 **Trigger** : Display the status of the trigger settings.

4 **Level** : Display the values of the trigger settings.

5 **Pre-trigger** : Display the number of data sets from start of memorization to the trigger event.

6 **Data** : Display the data abbreviations of the trigger settings.

7 **Type** : Display the set trigger type (leading/trailing).

8 **Storage** : Display the number of data sets memorized. (Counting as one set the data collected at a given time.)

• Saving status

Displays the data logging status.

9 **Status** : Display the measurement status. "Data saving (awaiting trigger)", "Data saving in progress", "Data saving complete"

10 **Counter** : Display the number of collected data sets.

11 **Mon. Start** : Display the time when the monitor was started.

12 **Run** : Display the time passed since start of measurement.

13 **Rest** : Display the time left until end of measurement.

• Sampling Settings

Displays the current settings.

14 **Mode** : Displays "discharge" if the sampling rate is set to 100 msec; displays "polling" for all other sampling rates.

15 **Interval** : Displays the sampling interval.

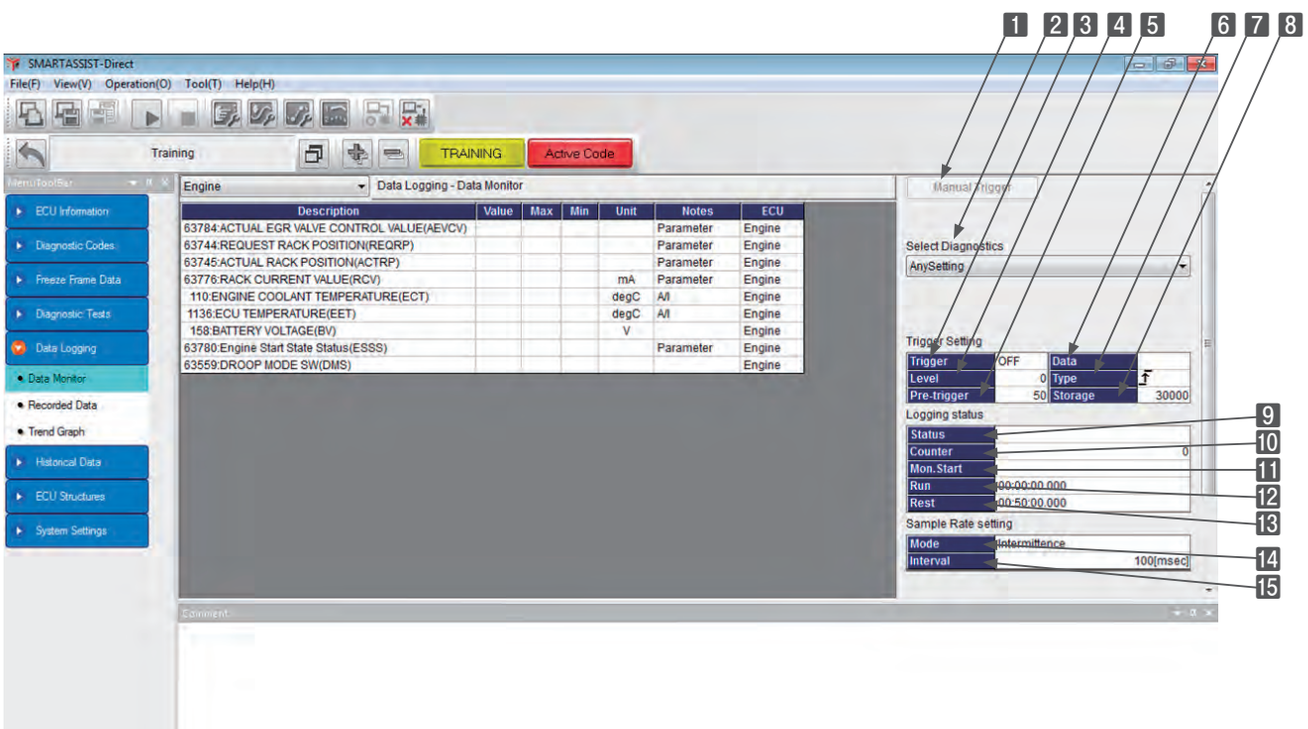


Figure 6-19 Data Monitor Screen

● Data Settings Subwindow

The items that display data and the display order can be set arbitrarily. Click the button on the operation toolbar to make the settings. You can select and register data from the arbitrarily displayed data that was registered before the event and is separated by category except data before/after error (Refer to [6.4]). For details, refer to [Data Selection Window].

● Option Data Settings Subwindow

You can select and register data from the arbitrarily displayed data that was registered before the event and is separated by category except freeze frame data.

Click the button of the operation toolbar to open the selection screen.

1 Data: List all available data.

2 ◀ / ▶ : Select/deselect data for display.

3 Set data: The data displayed in the main box.

4 **Set** : Confirm the entry.

5 **Cancel** : Close the entry screen.

Point

Data monitor items	Screen display
• Data Before/After Error • Optional data	Data items selected in the Data Settings window on the left.

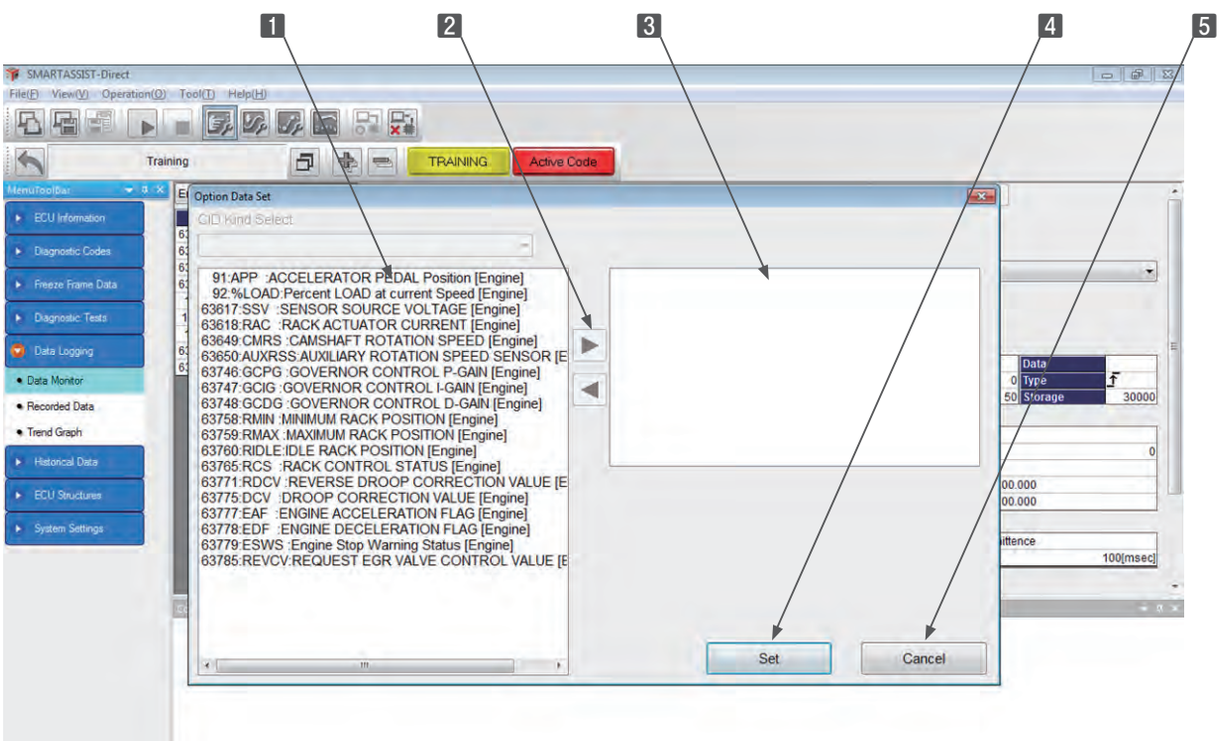


Figure 6-20 Option Data Settings Subwindow

● Trigger Settings Subwindow

Click the button on the operation toolbar to change the trigger settings.

1 **Trigger (On)** : Activate the trigger.

2 **Data Select** : Select the trigger data.

3 **Level** : Set the trigger value.

4 **Type** : Set the set trigger type (leading/trailing).

Leading : Start saving if the value of the selected data exceeds the trigger value.

Trailing : Start saving if the value of the selected data falls under the trigger value.

5 **Delay** : Display the number of data sets from start of memorization to the trigger event.

6 **Storage** : Set the number of data sets memorized. (Counting as one set the complete data monitor items at a given time.)

7 **Set** : Confirm the entry.

8 **Cancel** : Close the entry screen.

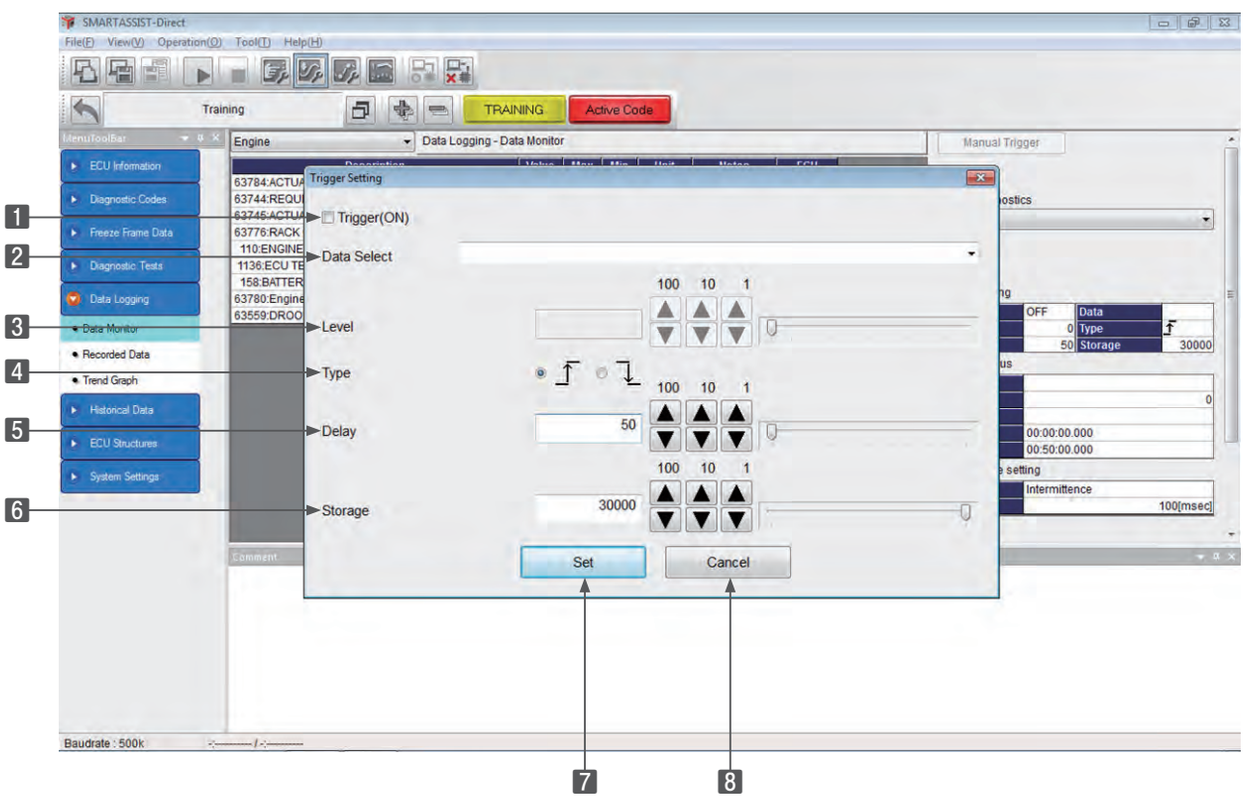


Figure 6-21 Trigger Settings Subwindow

● Sampling Settings Subwindow

Click the button on the operation toolbar to change the sampling rate settings.

1 **Select** : Add a checkmark to the button to select the sampling rate.

2 ▲ / ▼ : When inserting a checkmark to the desired setting, the sampling rate is adjustable in increments of 1, 10, and 100.

3 **Unit** : Select the unit.

4 **Set** : Confirm the entry.

5 **Cancel** : Close the entry screen.

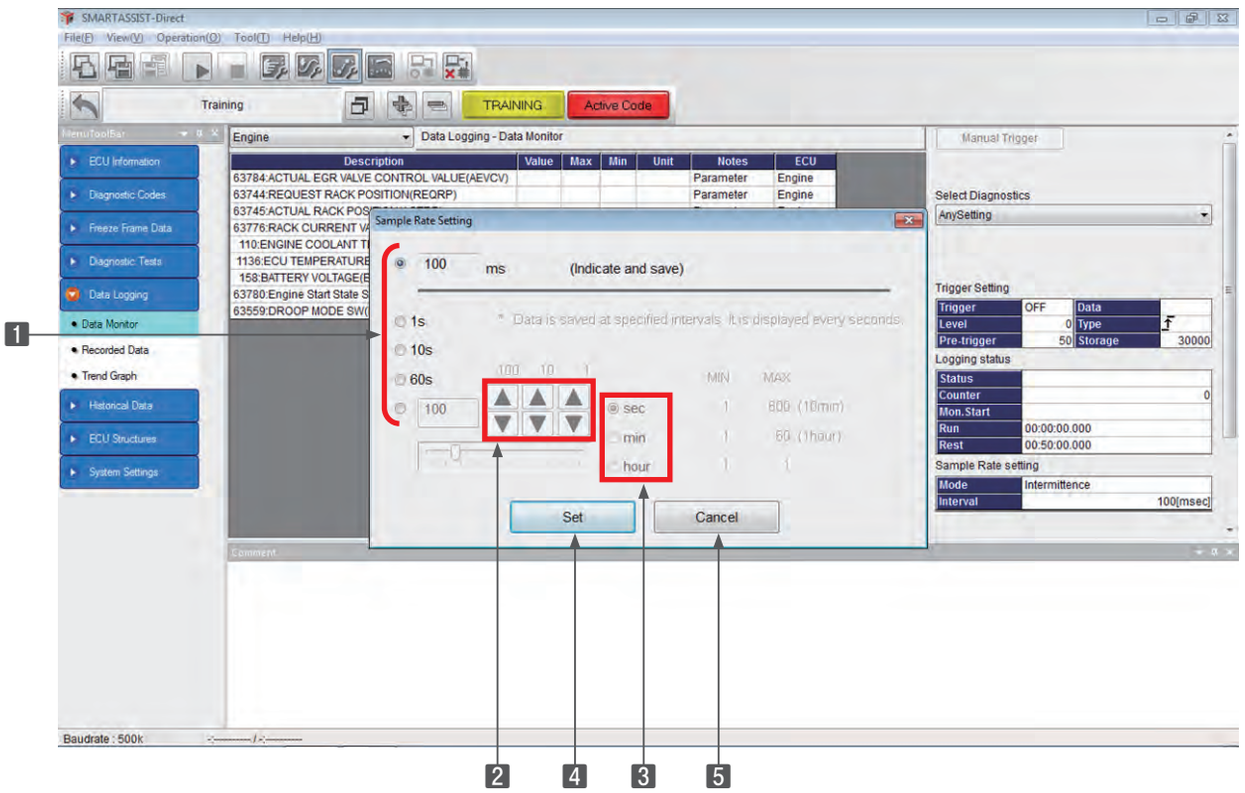
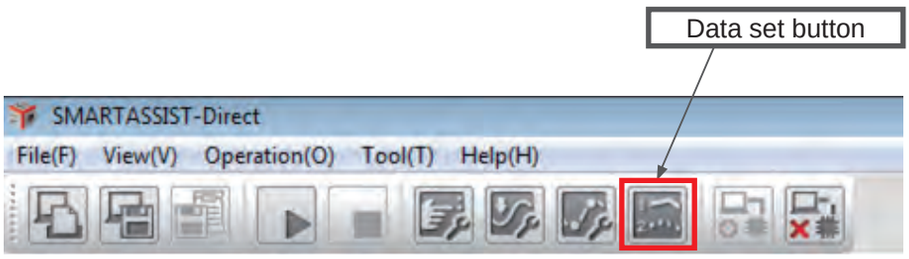


Figure 6-22 Sampling Settings Subwindow

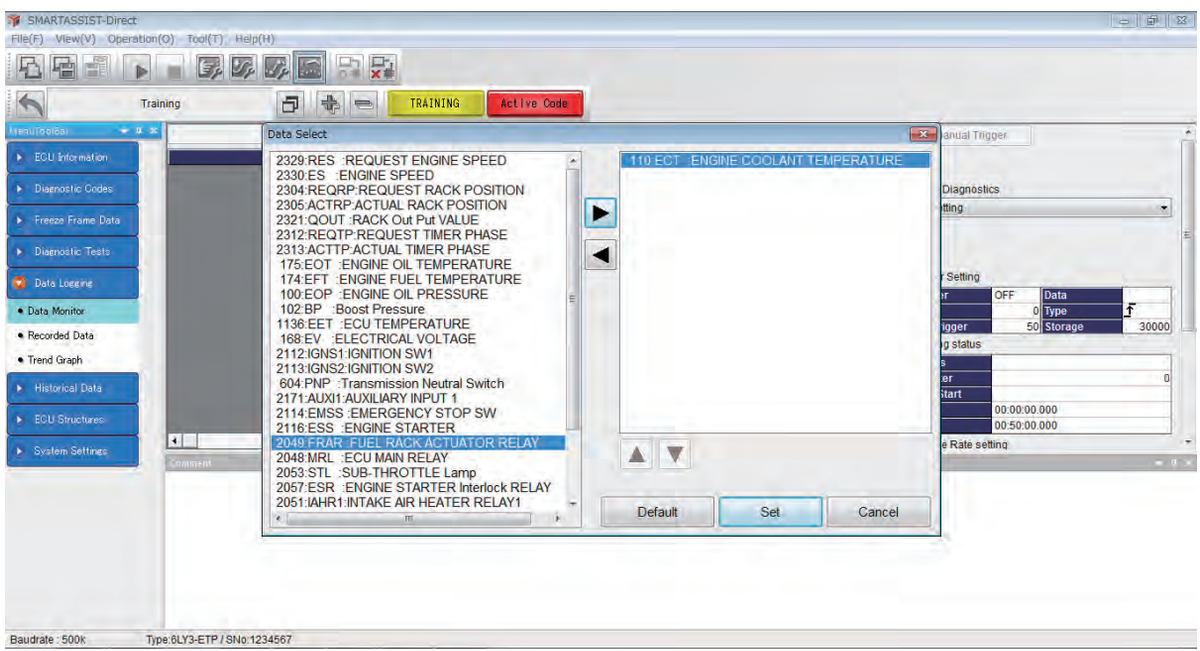
6.6.2 Overview of the Data Sampling Operation

* This description applies to the TNV series engine.

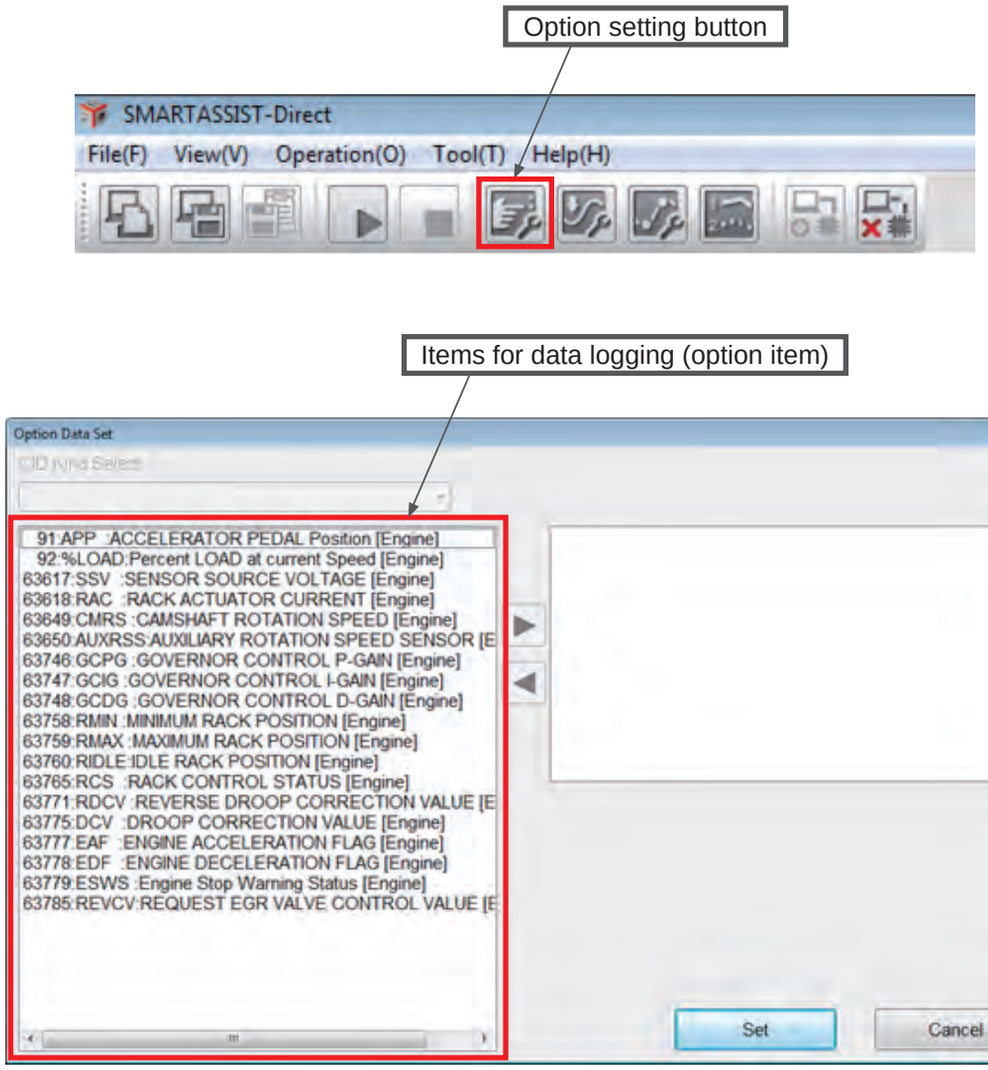
1 Select the data you want to display.



* If you wish to monitor items that are not displayed on this list, go to 2. Option Settings.

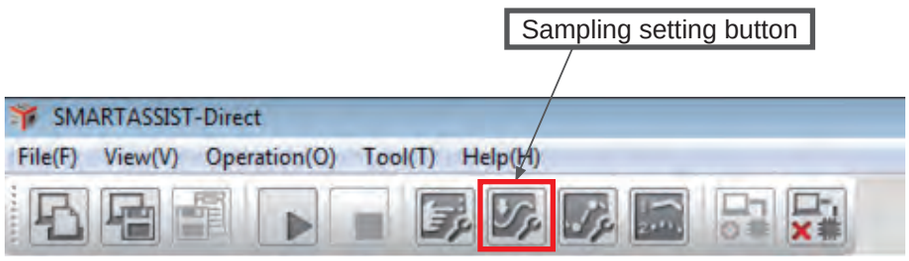


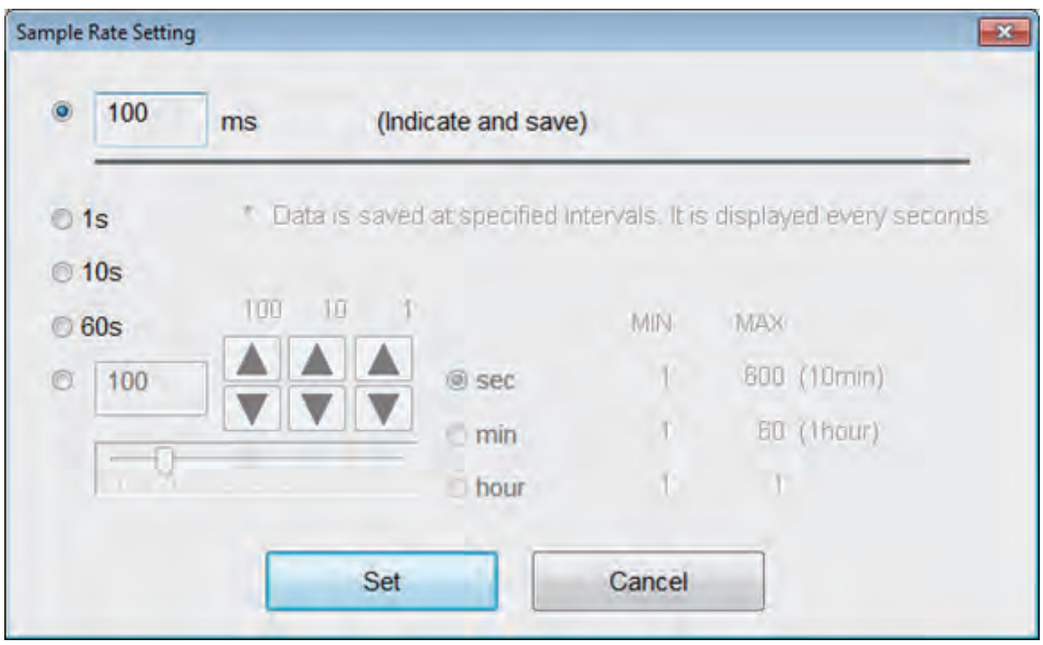
2 Option Settings



3 Set the sampling rate as necessary.

* Normally, a change is not necessary.



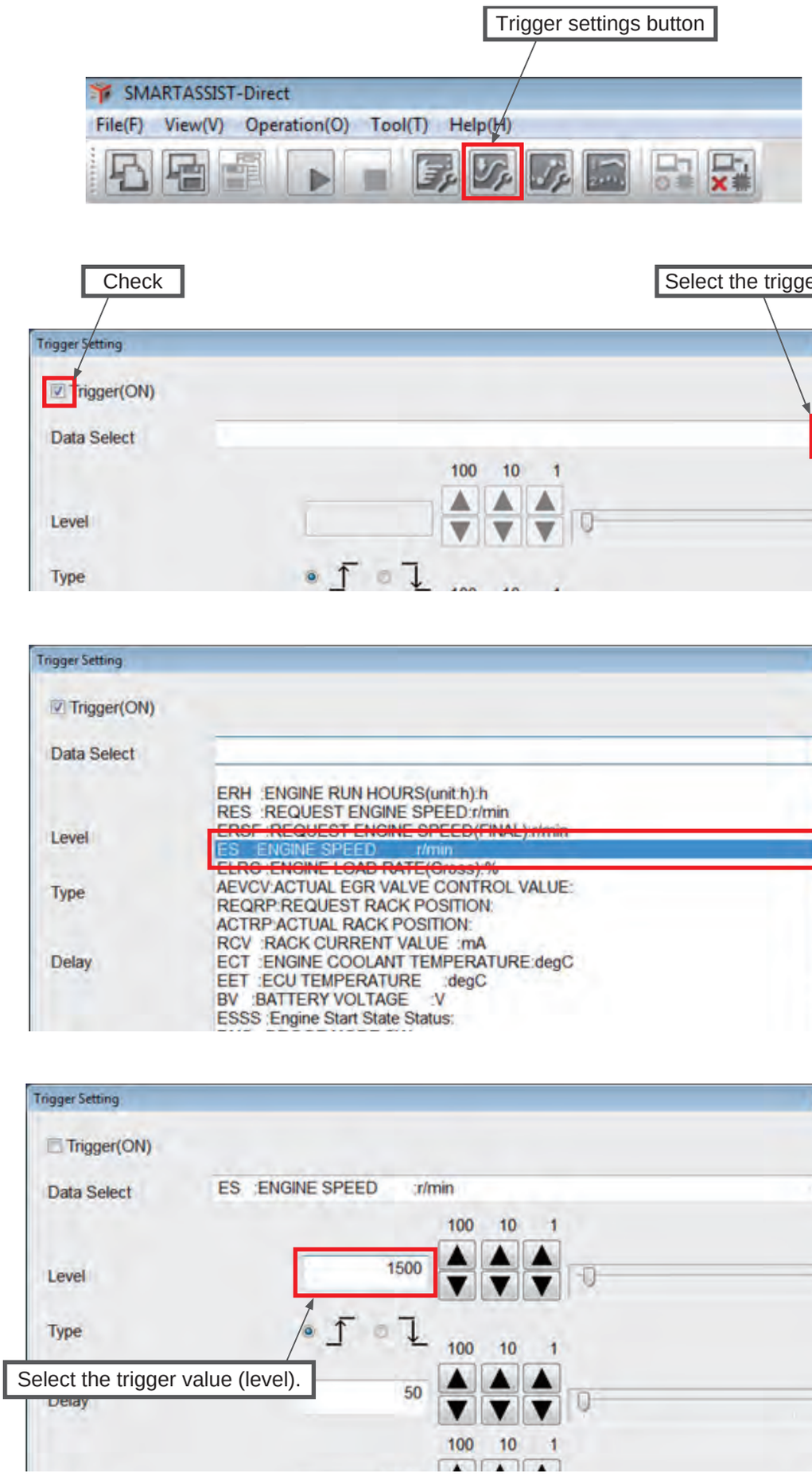


Note

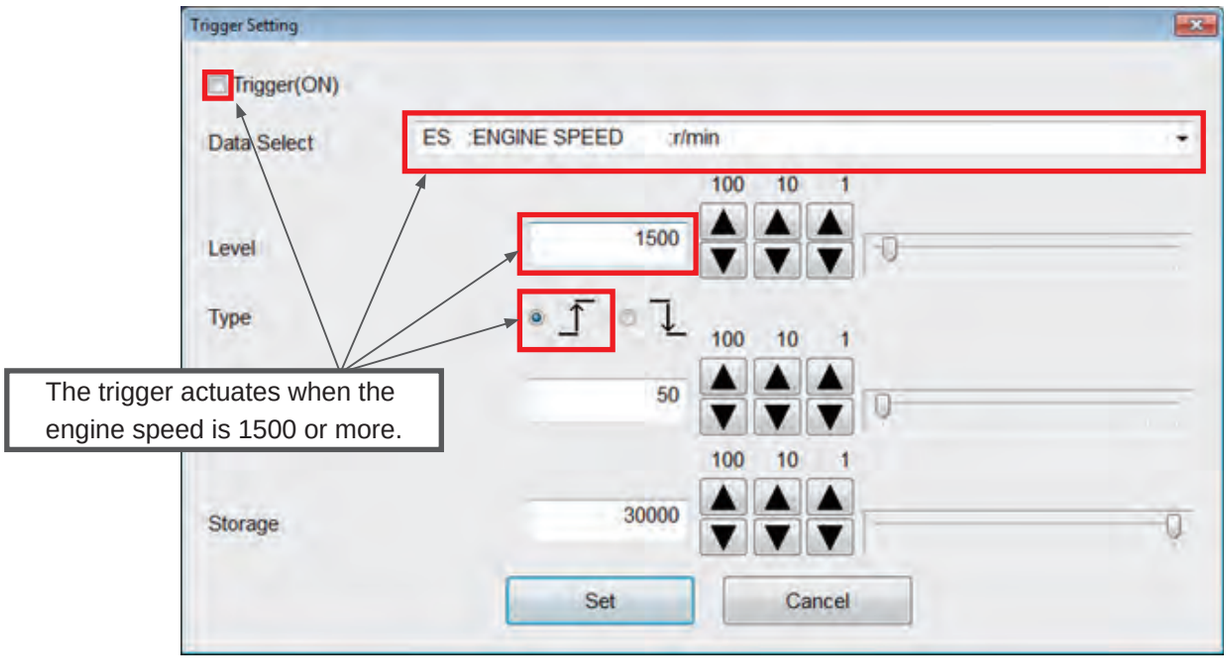
- The standard is 100 msec.
- On ECU that do not support a change, the other values are grayed-out.

4 Set the trigger.

A change is not necessary if the monitor was started by manual trigger.



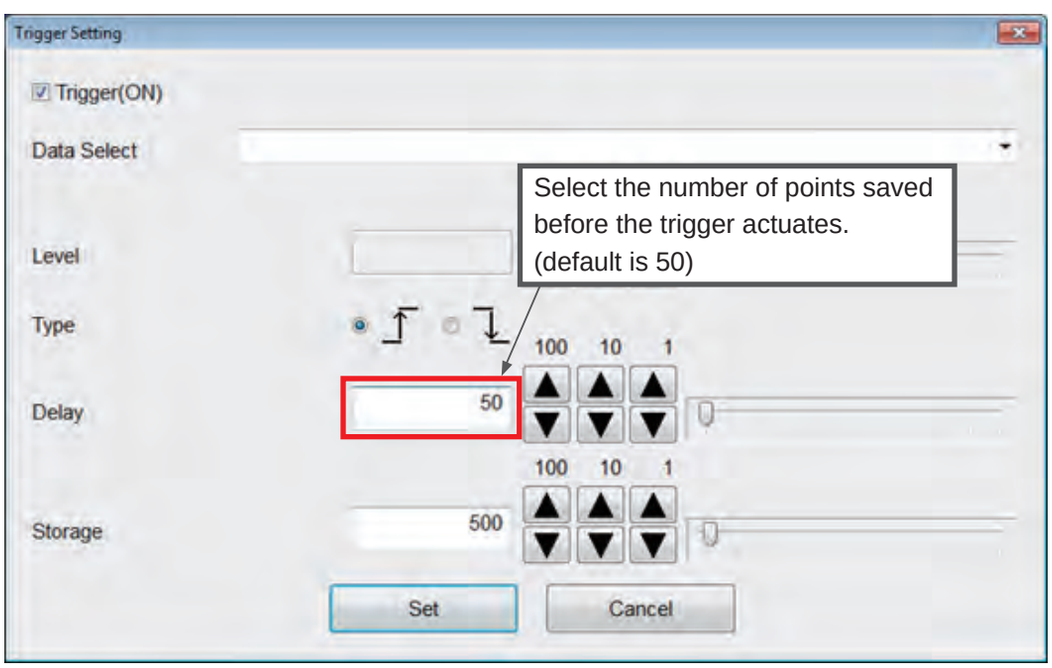
5 Description of the trigger settings



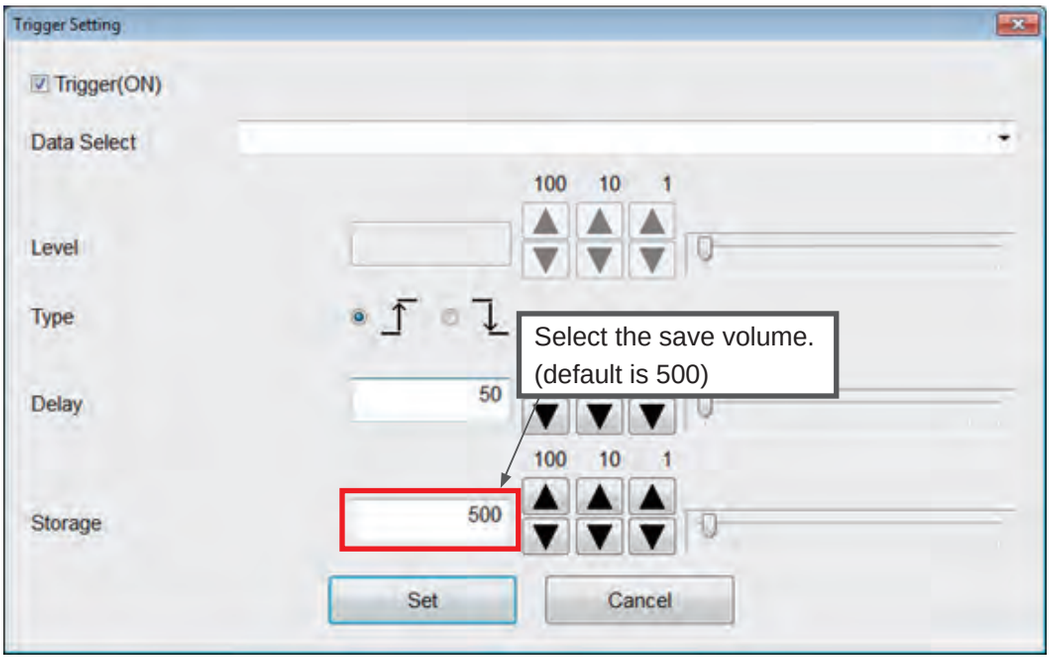
In trigger mode, the values before the trigger is applied can be saved.

* Normally, a change is not necessary.

  Change if necessary.

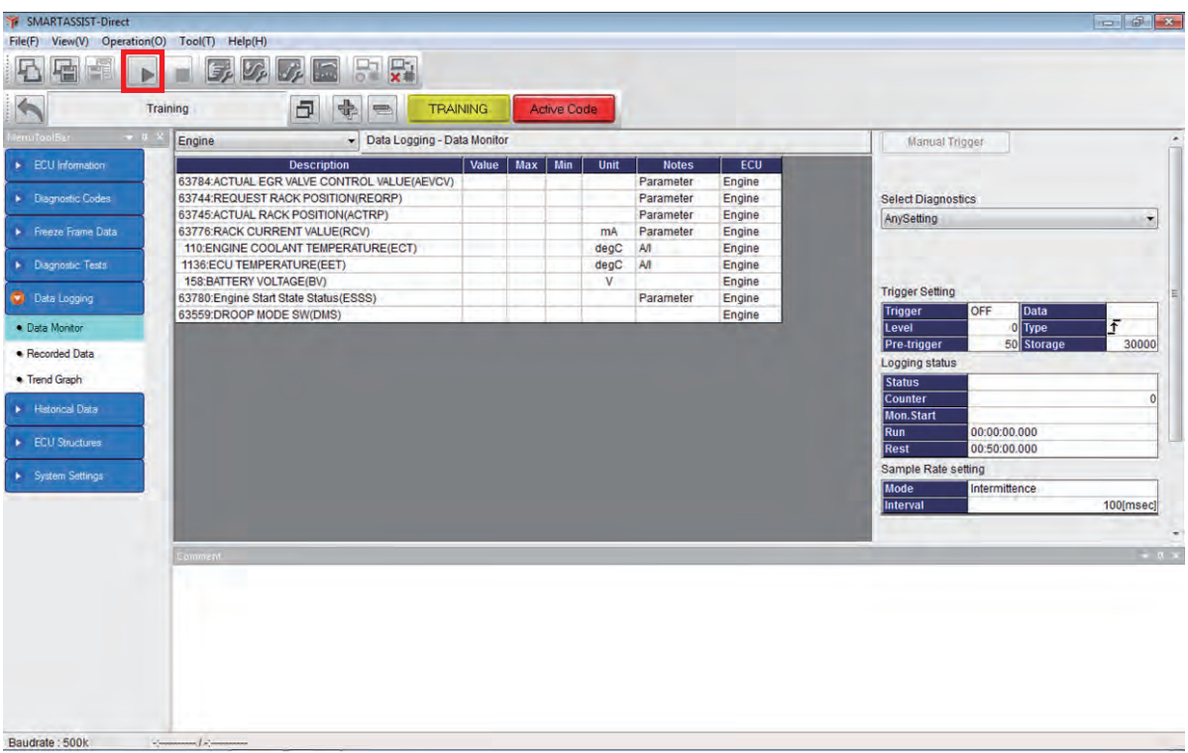


Example: If the sampling time is 100 msec, 50 x 100 = 5000 msec (5 sec), thus the values are saved from 5 seconds before the trigger is applied.

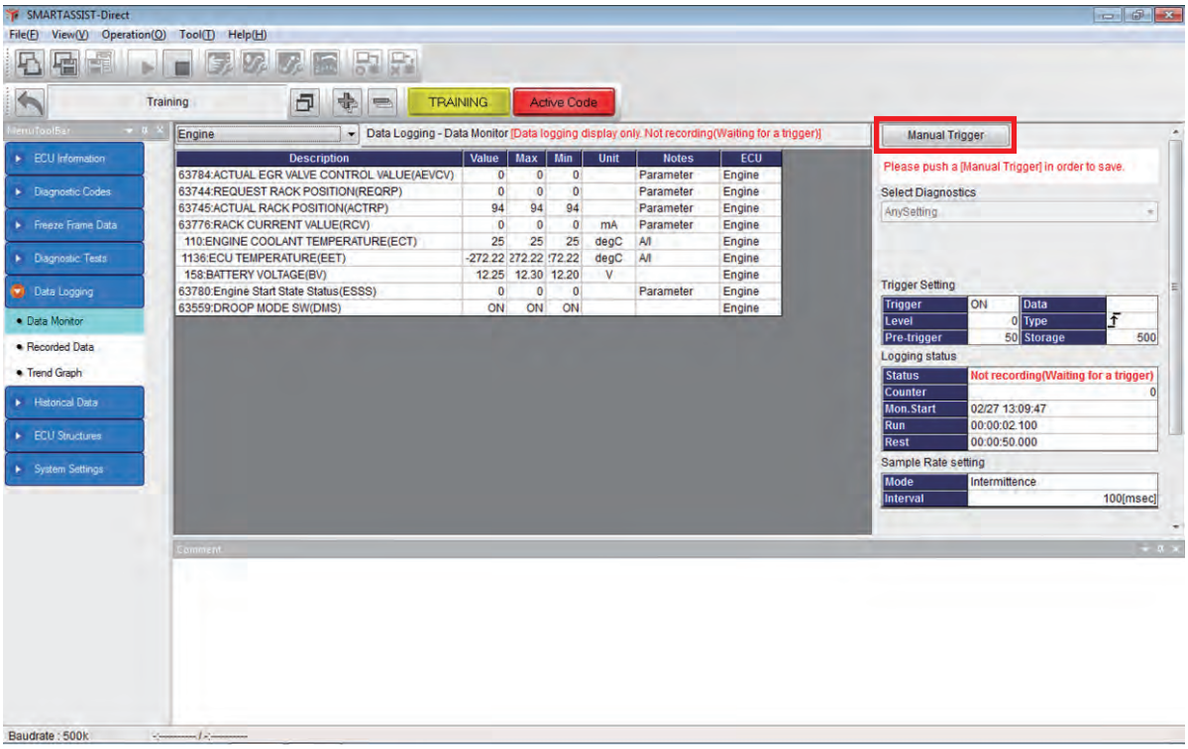


Example: If the sampling time is 100 msec, 500 x 100 = 50000 msec (50 sec), thus the values are saved from 50 seconds before the trigger is applied.

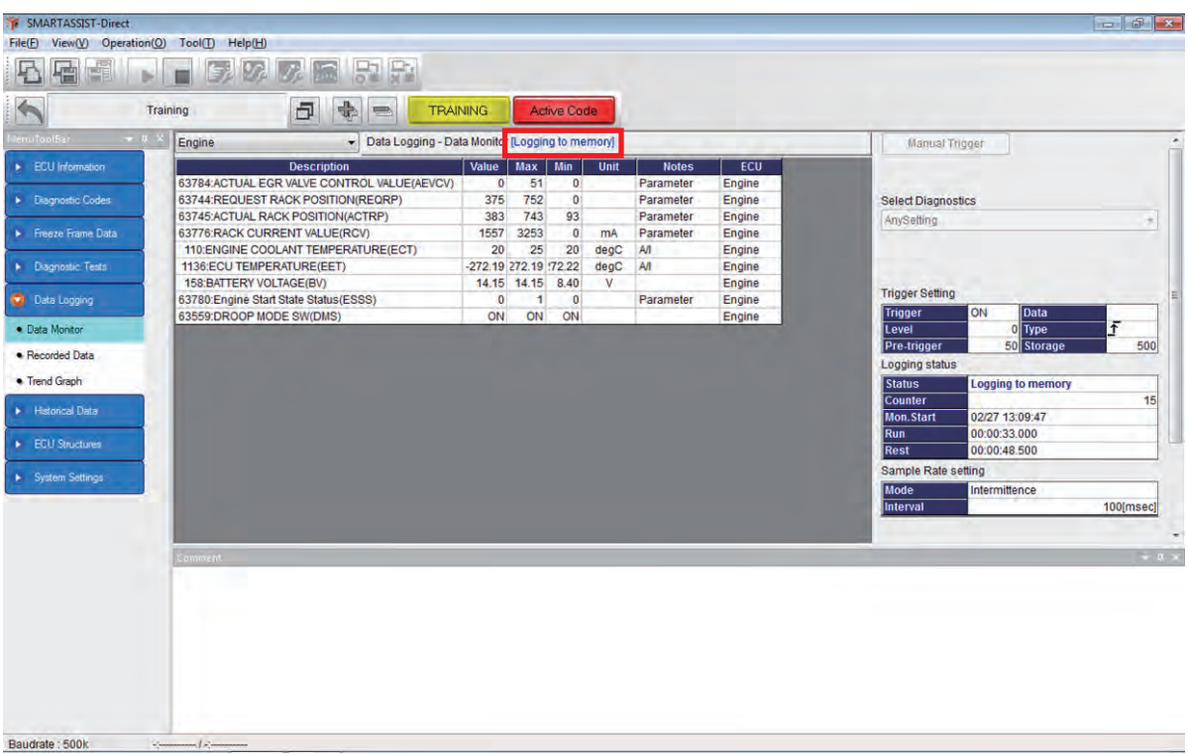
6 Click the ▶ button to start the monitor.



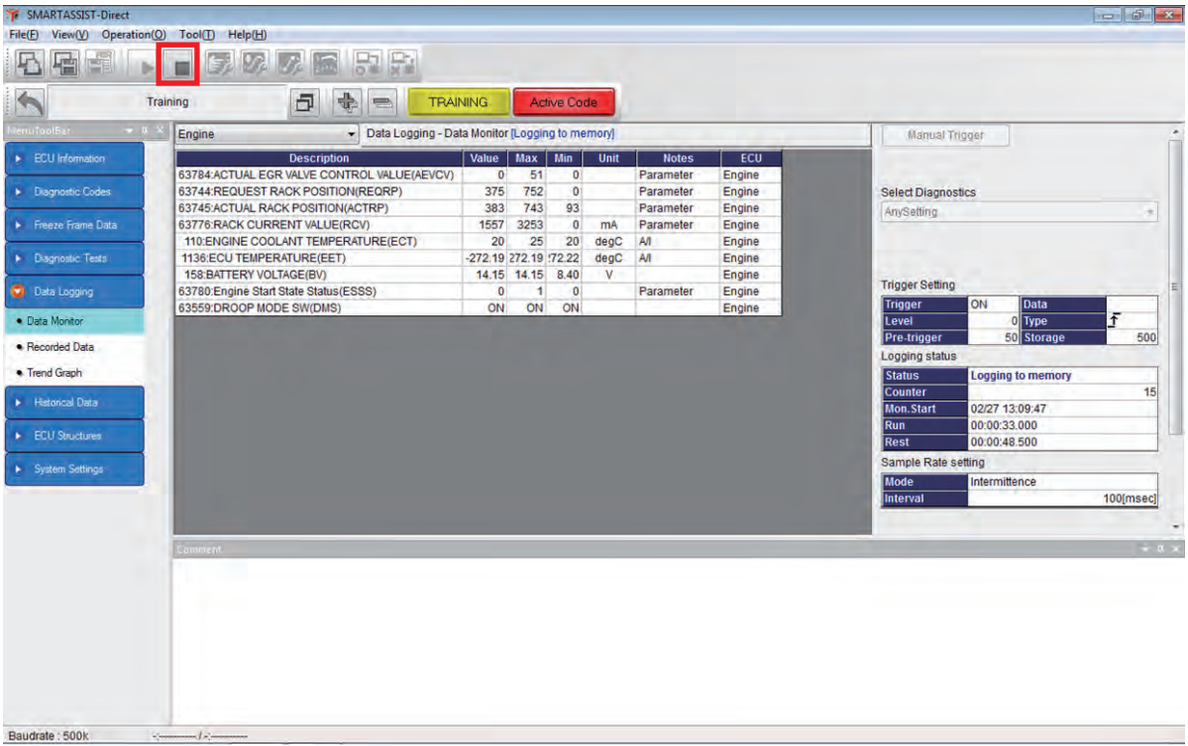
* Click the **Manual Trigger** button if necessary.

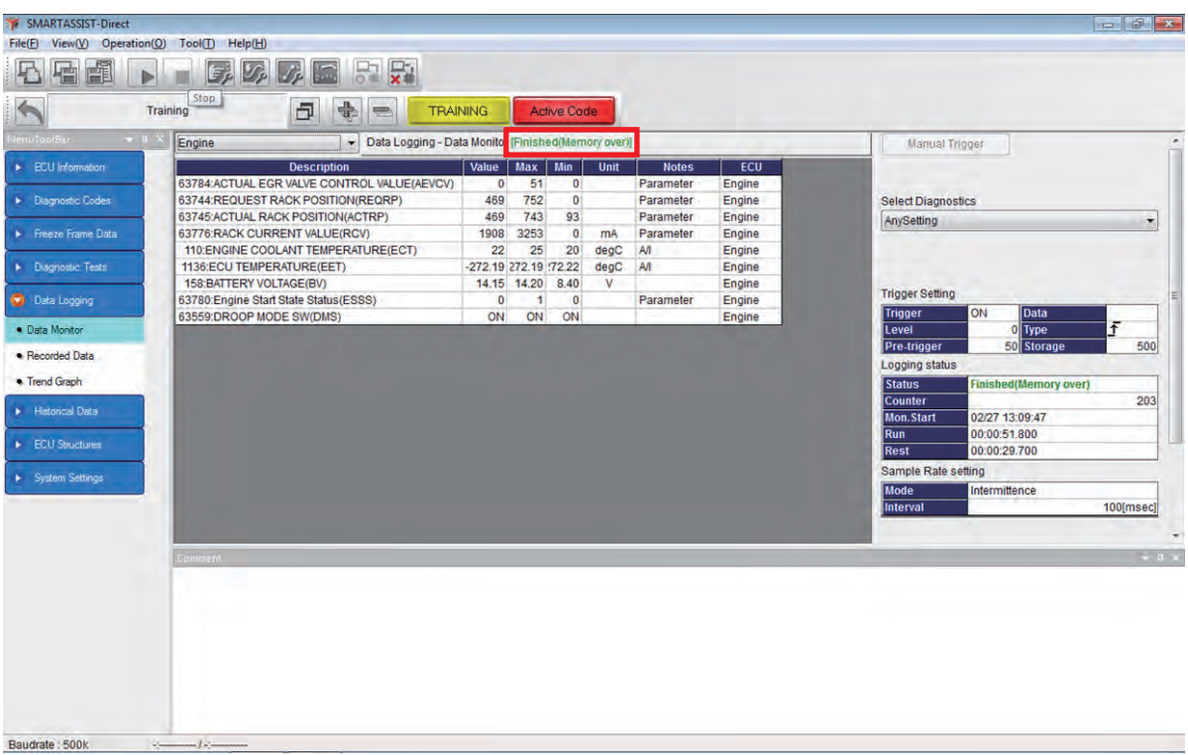


7 If the trigger is applied, "Logging to memory" is displayed.



8 Click the button ■ to end the monitor.

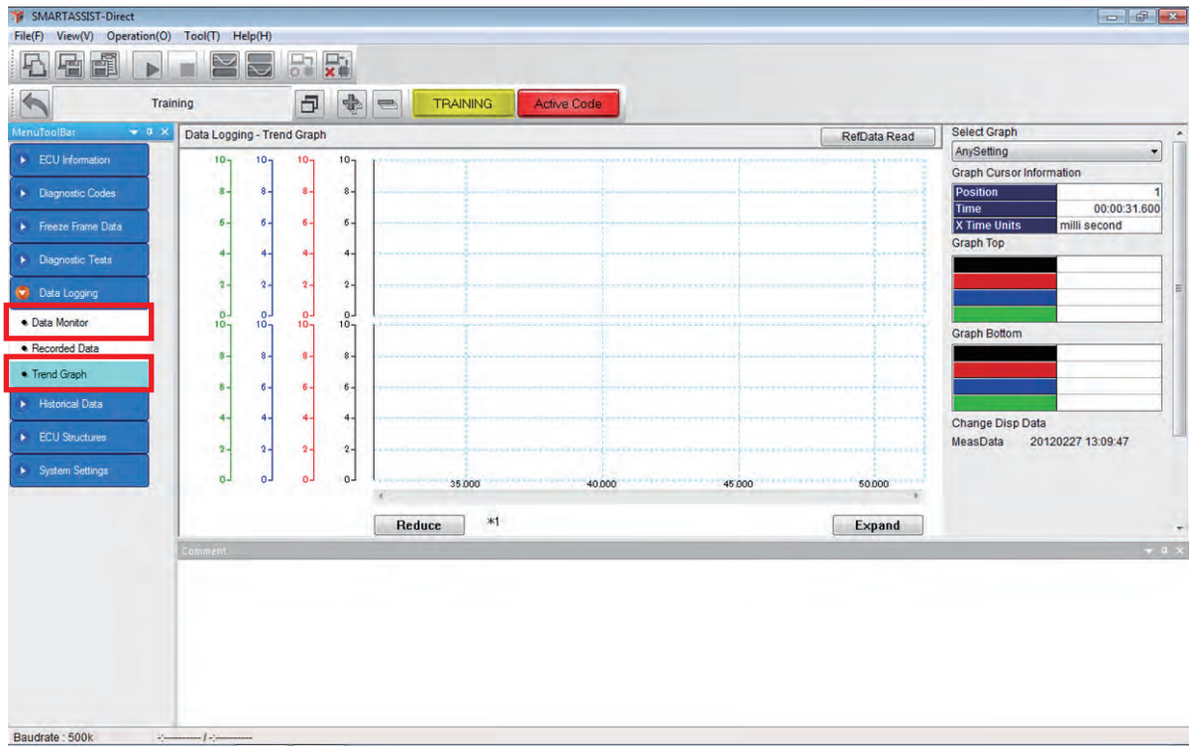




* If the memory is full, the data saving ends automatically.

6.6.3 Switching Screens

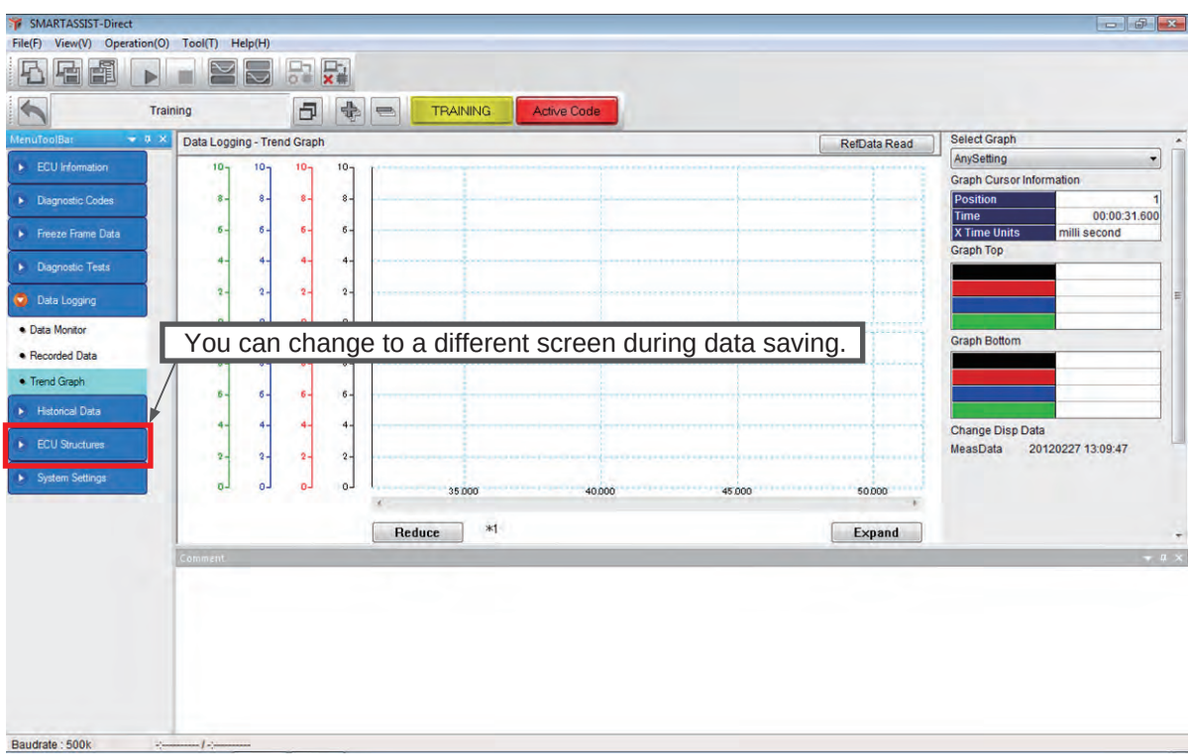
You can select Data Display and Graph Display during data monitoring and data saving



6.6.4 Continued Data Saving

If you switch to a different screen during data saving, the process stops temporarily.

But when returning to the Data Logging screen, the save process resumes automatically.



6.6.5 Monitor Data Confirmation

The monitor results are saved primarily on the PC, and all data values can be confirmed. This submenu is not available during receiving of data. If stopped without the trigger applied, no data has been memorized, thus the item display is not available.

● **Operation Toolbar**

1  : Print the screen. (Refer to [6.2.2])

2  : Save a screenshot in BMP format. (Refer to [6.2.3])

3  : Save the complete history data in CSV format. (Refer to [6.2.4])

4  : Save the measured data. Save the data of the forced operation after measurement. For the display of the saved data, refer to [7. Error Diagnosis Data Save and Display Functions].

5  : Open the subwindow, and set the display items and the order of the received data. For details, refer to [Data Selection Window].

● **Main Box**

6 **No.** : Display the time line number of the data.

7 **Time** : Display the time axis data. Also, the maximum and minimum values are displayed at the bottom of the list.

8 **Item Box** : The first letter of the selected data name is displayed. (Contents, such as the name and unit, can be confirmed on the ECU Specification/Structure screen.) Right-click the item box to switch the display format from binary to decimal to hexadecimal.

6.6.6 Trend Graph (Expert Function)

Displays the currently received data or saved data in a graph. Select related items for and display them together in a graph. Digital data can be displayed as 1/0 by changing the display mode. The data-receiving graph is automatically shown as additional plot display.

● **Additional Information Box**

1 Graph display item selection: Package data sets with the most appropriate settings sorted per event
The data item names set for graph display and the cursor position where the graph is clicked are displayed. Graph 1 shows top cursor values, graph 2 shows bottom cursor values.

2 **Position** : Display data number for the cursor position.

3 **Time** : Display time passed for the cursor position.

4 **Unit** : Display the time unit.

5 Display item and data: Display the item name and data; The item color corresponds to the graph line color.

● **Operation Toolbar**

6 : Print the screen. (Refer to [6.2.2])

7 : Save a screenshot in BMP format. (Refer to [6.2.3])

8 : The receiving of data starts. (Data that has not been saved according to "7.5.2 Save Data" is overwritten and lost.)

9 : Save the measured data. Save the data of the forced operation after measurement. For the display of the saved data, refer to [7. Error Diagnosis Data Save and Display Functions].

10 : Do the settings for the display item and the scaling of the top graph.

11 : Do the settings for the display item and the scaling of the bottom graph.

● **Main Box**

Graph 1 and graph 2 are displayed. For details regarding operation of the graph, refer to [7.1 Error Diagnosis Data Save and Display Functions].

● **Comment Box**

12 Comment Box: The full name of the displayed data is displayed.

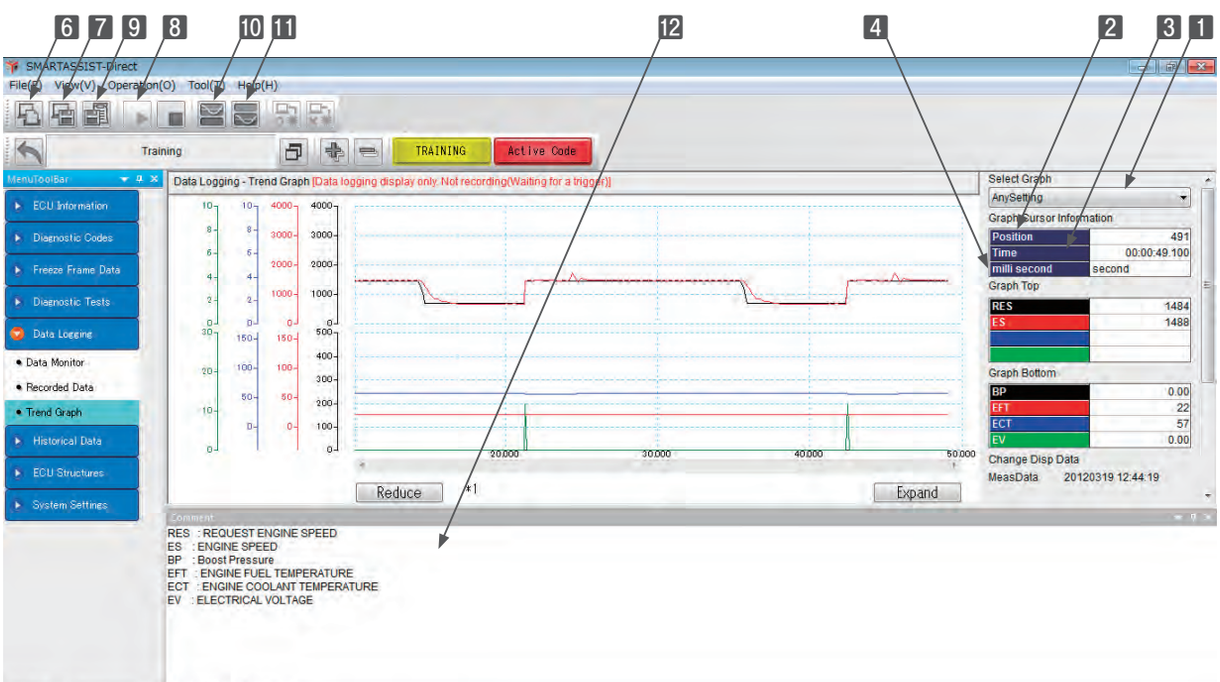


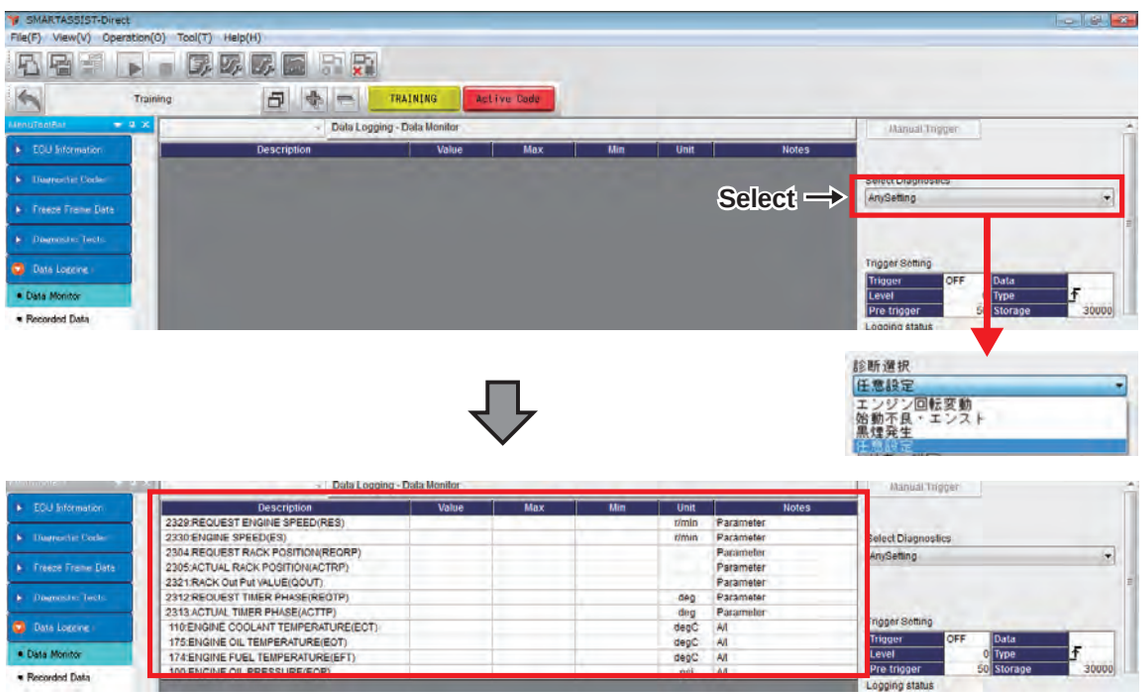
Figure 6-23 Trend Graph Screen

6.6.7 Package Data Set

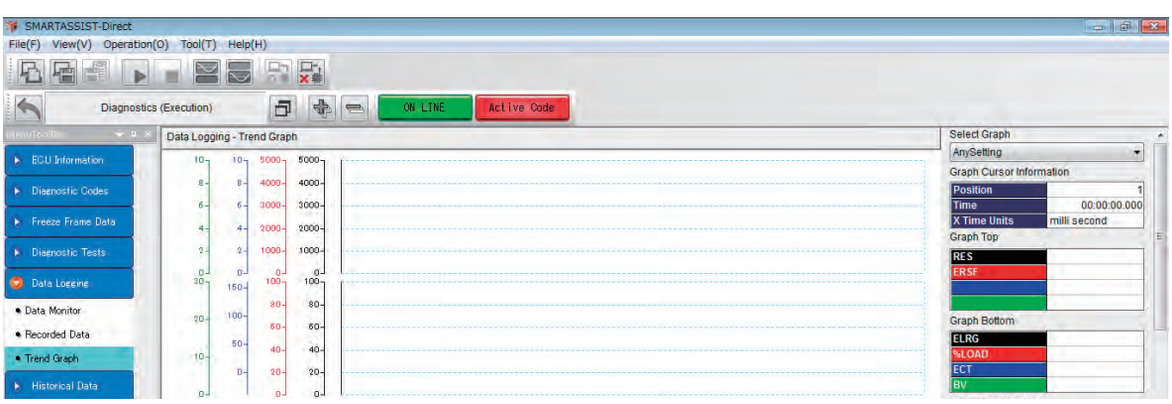
It is difficult to determine without experience from the multiple data sets which item is active when monitored (data setting/option setting) or displayed as a graph. SMARTASSIST-Direct offers package data sets that allow you to set in advance the most appropriate item for each incident.

■Package Data Set Selection

The item is set from the selected analysis selection content.



The trend graph display selection is also set to the content set before the event by the package data.

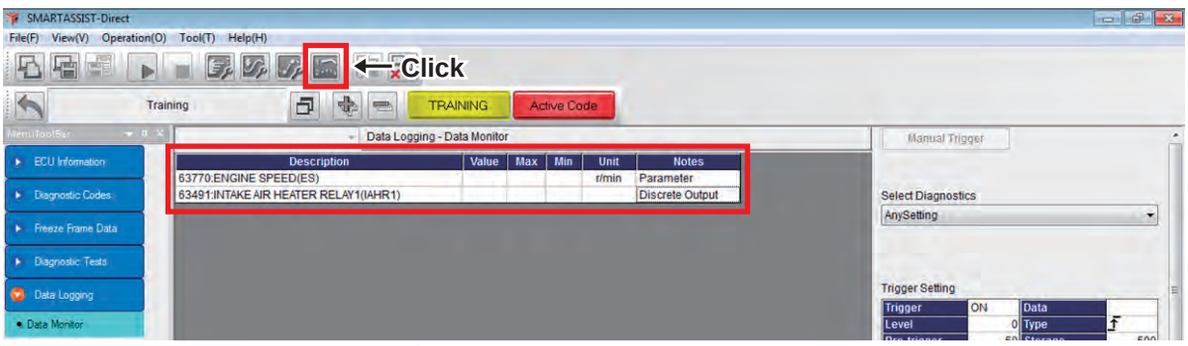


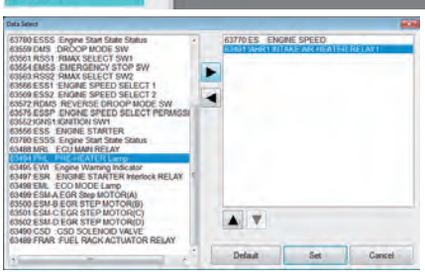
■Setting User for Package Data Sets

Package data can be created for each user.

(The user can be set at the time when data logging is executed as the data setting saving function.)

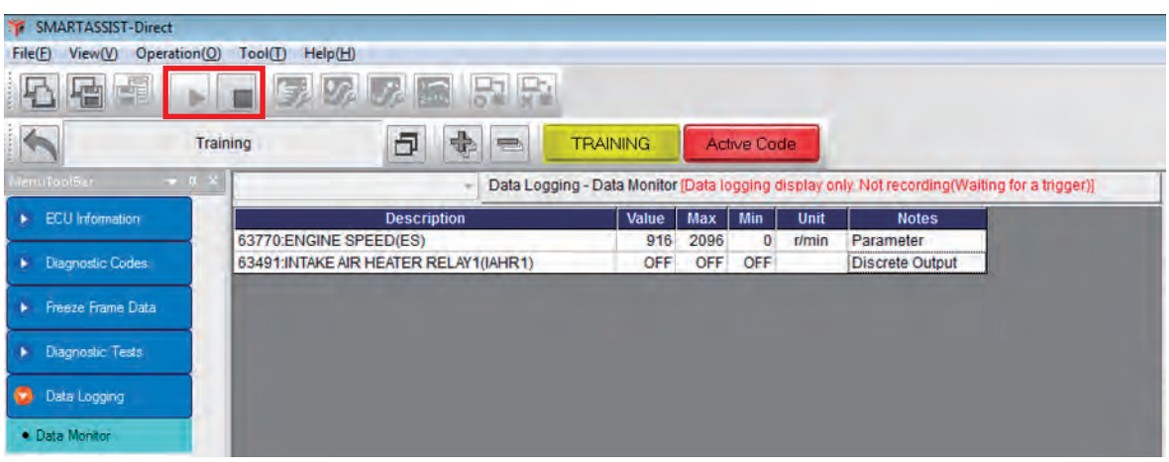
1 It is set arbitrarily with the Data Setting button.





← **Select the data and click “Set”.**

2 To check whether the setting is valid, conduct the measurement once under the usual conditions.

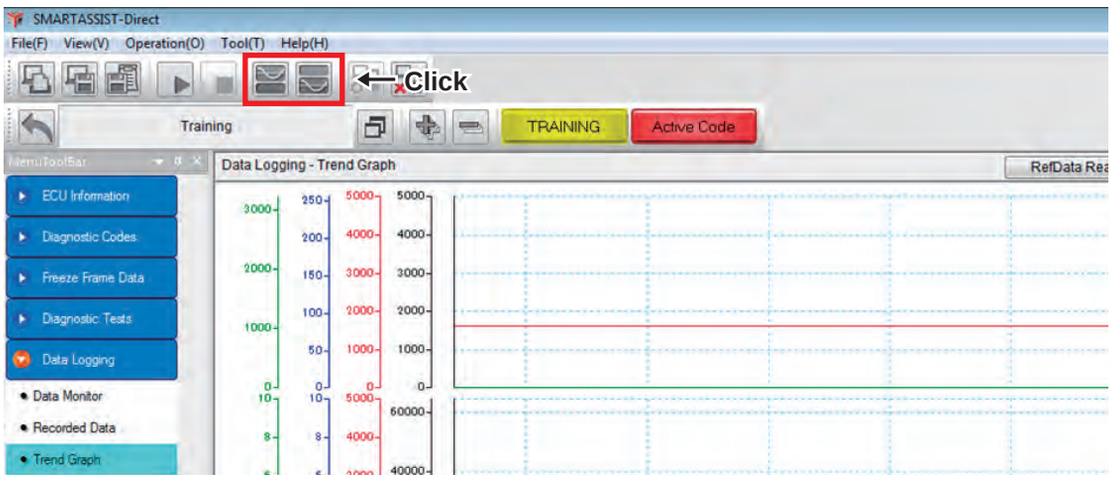


① Click the Start button.

② Use the manual or automatic trigger and do a measurement.

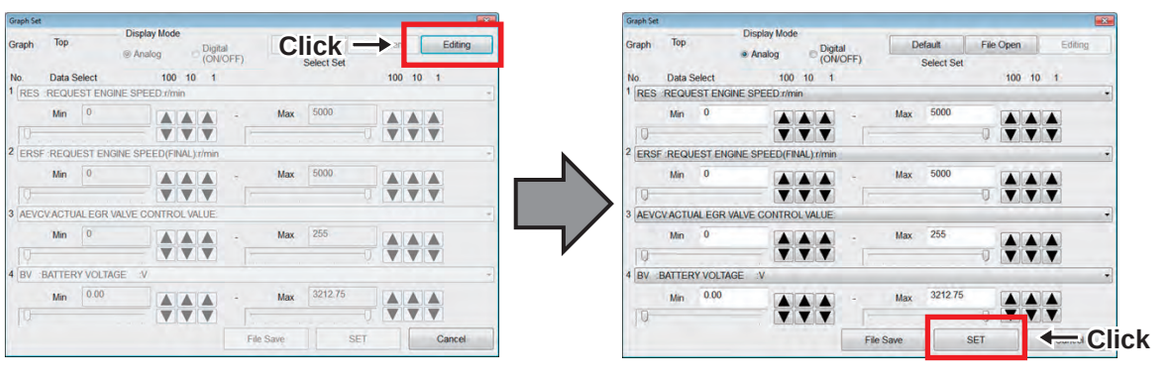
③ When necessary, press the Stop button to end the measurement.

3 After the measurement, arbitrarily set the graph settings.



Note For package data sets created by the user, the graph can only be set to one kind.

4 Click the Edit button, arbitrarily set the graph settings, and click the Set button.

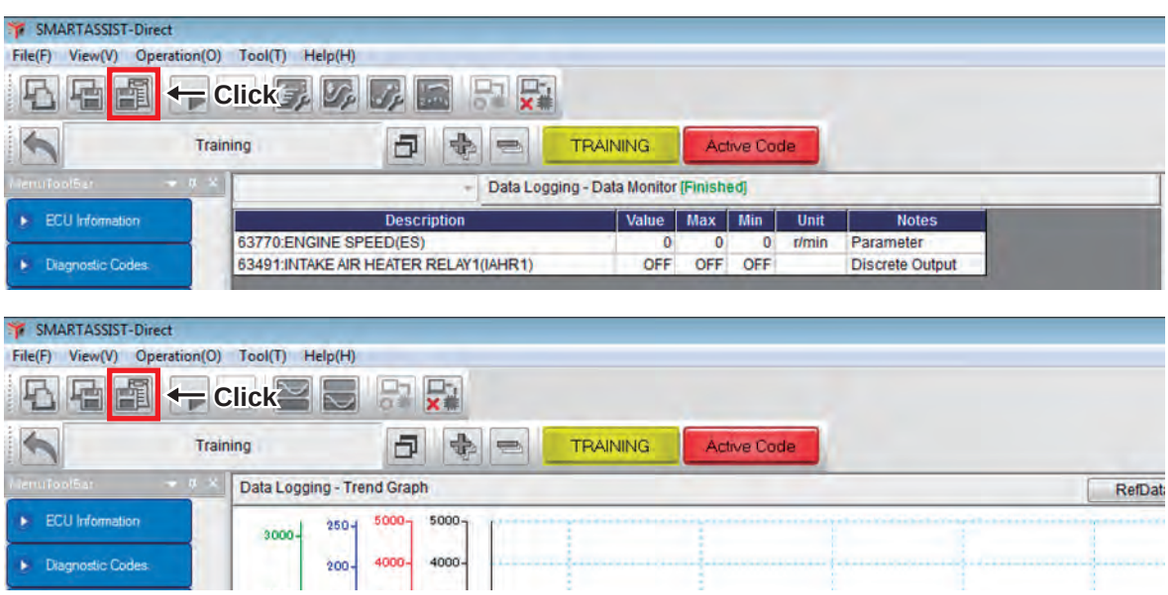


Point Click Save File to separately save only the graph settings. (This will not save the settings for the package data set.)

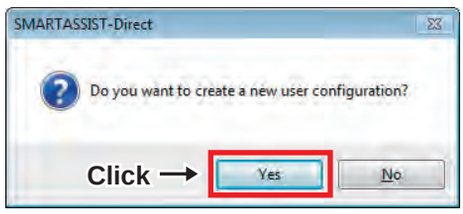
This is useful when saving multiple graph settings for the data settings of one set.

For details, refer to [7.1 Error Diagnosis Data Save and Display Functions].

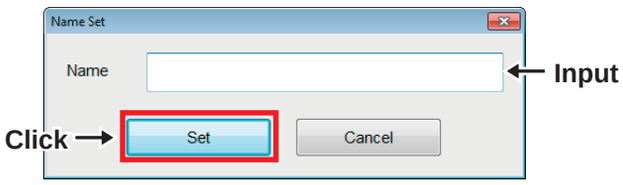
5 Click the "Measurement data saving" button that is activated on the data monitor screen and trend graph screen. (You may use either of the screens.)



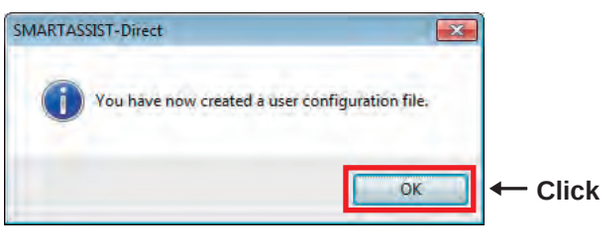
6 The confirmation screen for the user setting file creation is displayed. Click **Yes**



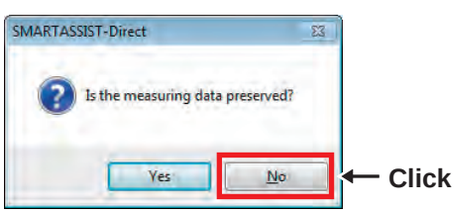
7 Enter the desired name for the setting file and click the **Set** button.



8 The end display is shown. Click **OK**



9 Then, the confirmation screen for saving the measurement data is displayed. If you wish to save only the settings, click **No**.

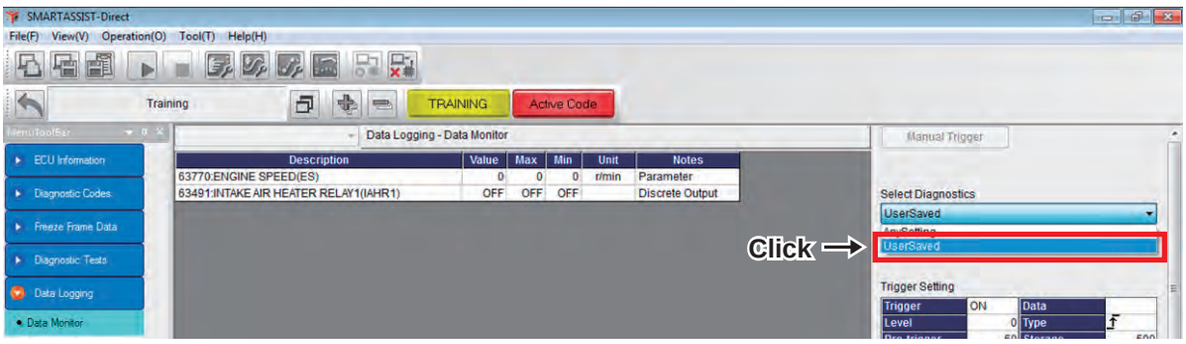


Note For details on how to save the measured data, refer to [7. Error Diagnosis Data Save and Display Functions].

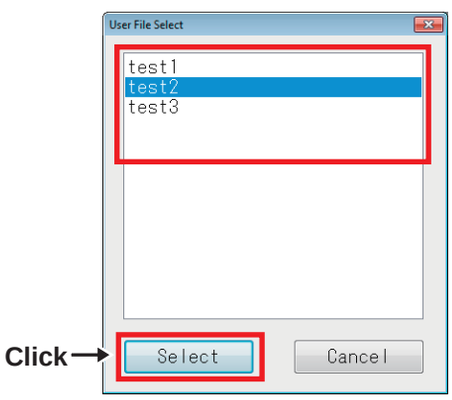
■Package Data Set with User Settings Selection

Select the saved package data in the following manner.

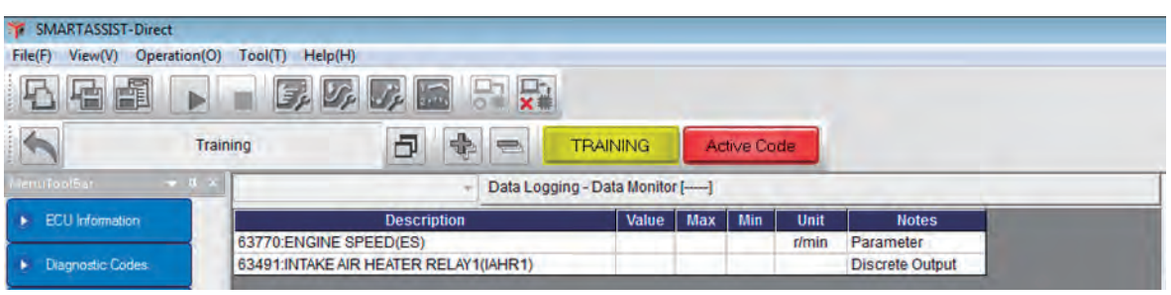
1 Click "Save User" in the Analysis Selection window.



2 Refer to its name and select the settings file for the package data set, and click the **Select** button.



3 The data will be set according to the user settings.



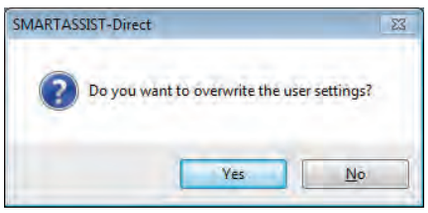
■Package Data Set Editing

Edit the package data settings in the following manner.

● Package Data Set in Advance within SMARTASSIST-Direct.

Cannot be edited (overwritten)

After selecting the package data and changing the data item/graph display settings, create a new user setting to save the changes.



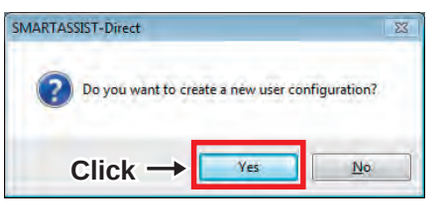
● Package Data Set with User Settings

Overwrite Saving

Can be edited (overwritten).

After selecting the package data and changing the data item/graph display settings, press the "Save Measurement Data" button to overwrite and a confirmation screen is displayed.

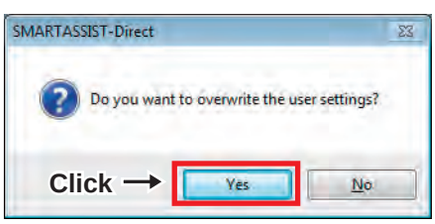
Click **Yes**.



Save as New File

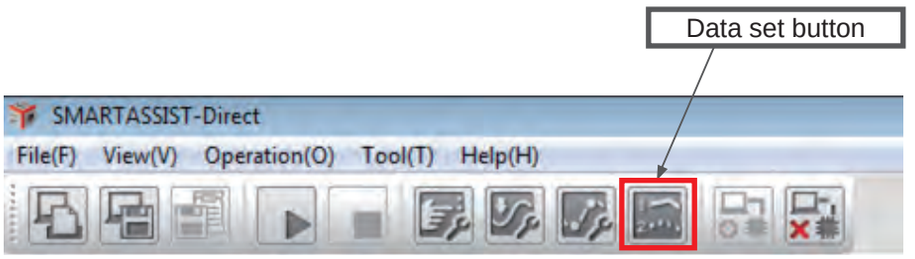
If you want to save the changed content separately, click "No" on the confirmation screen when asked to overwrite.

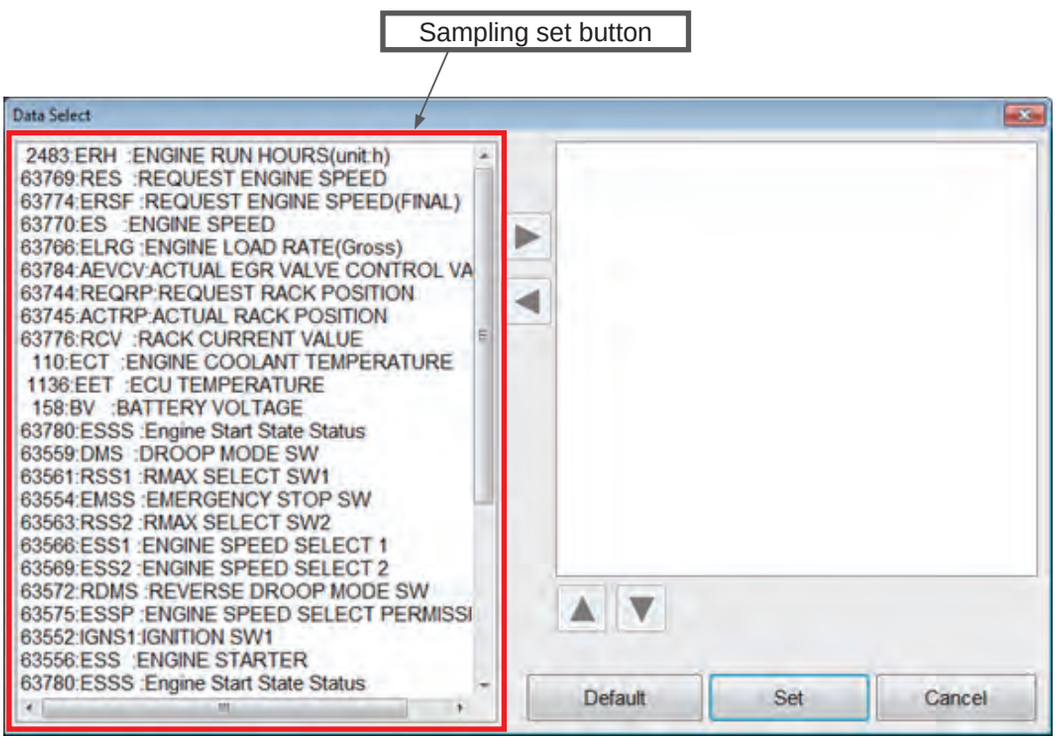
A confirmation to create a new file is displayed, so click **Yes**.



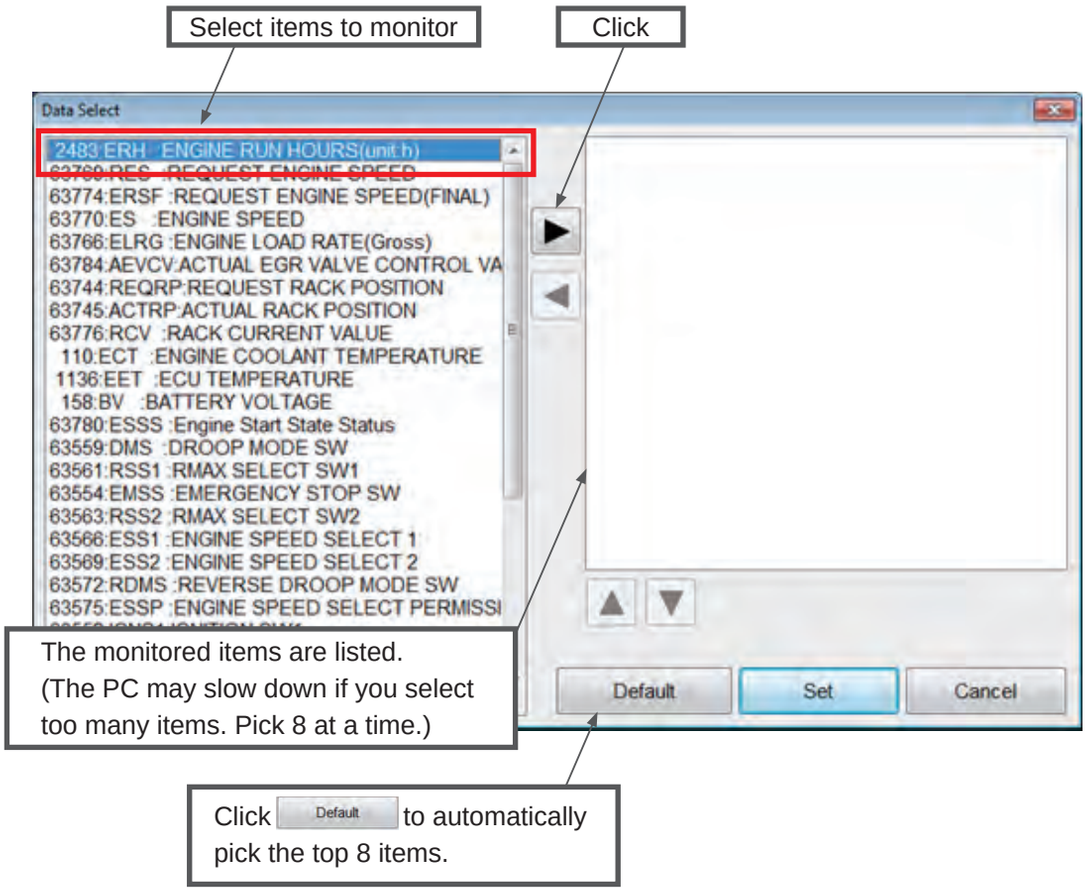
6.6.8 Reference material: Data logging (Engine/2G Eco TNV series)

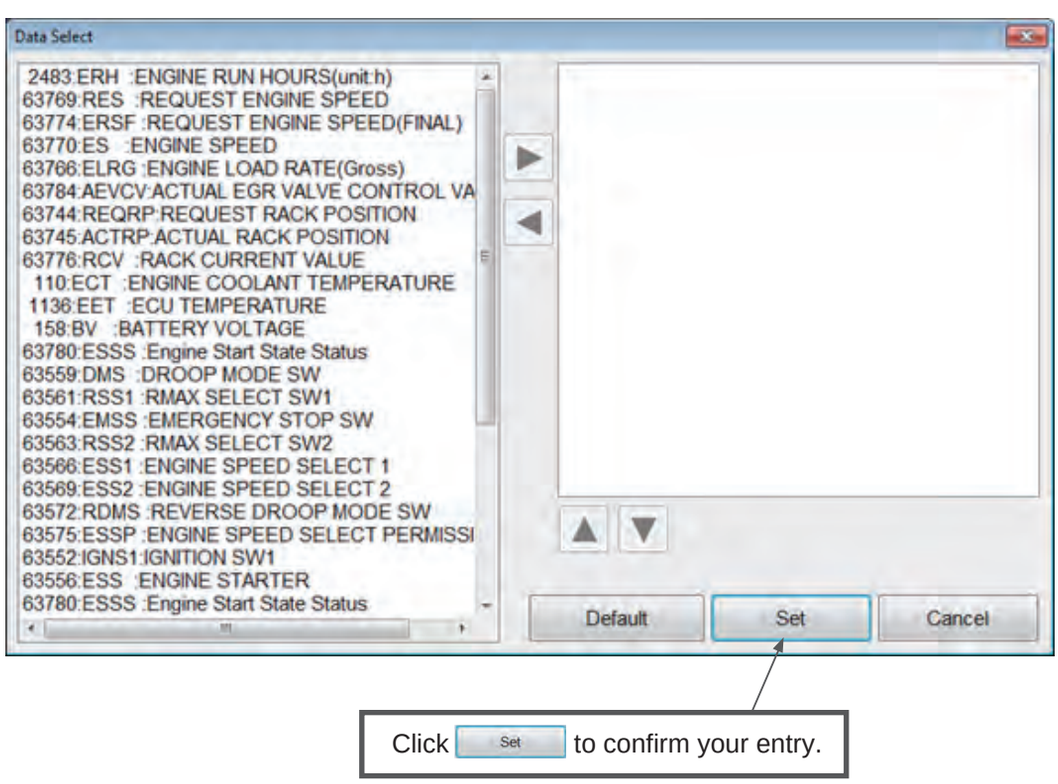
■Data Set



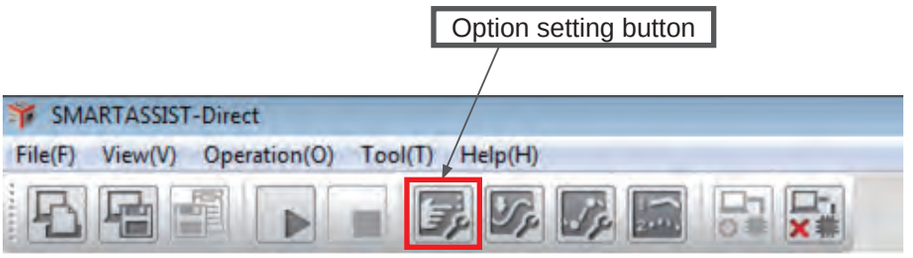


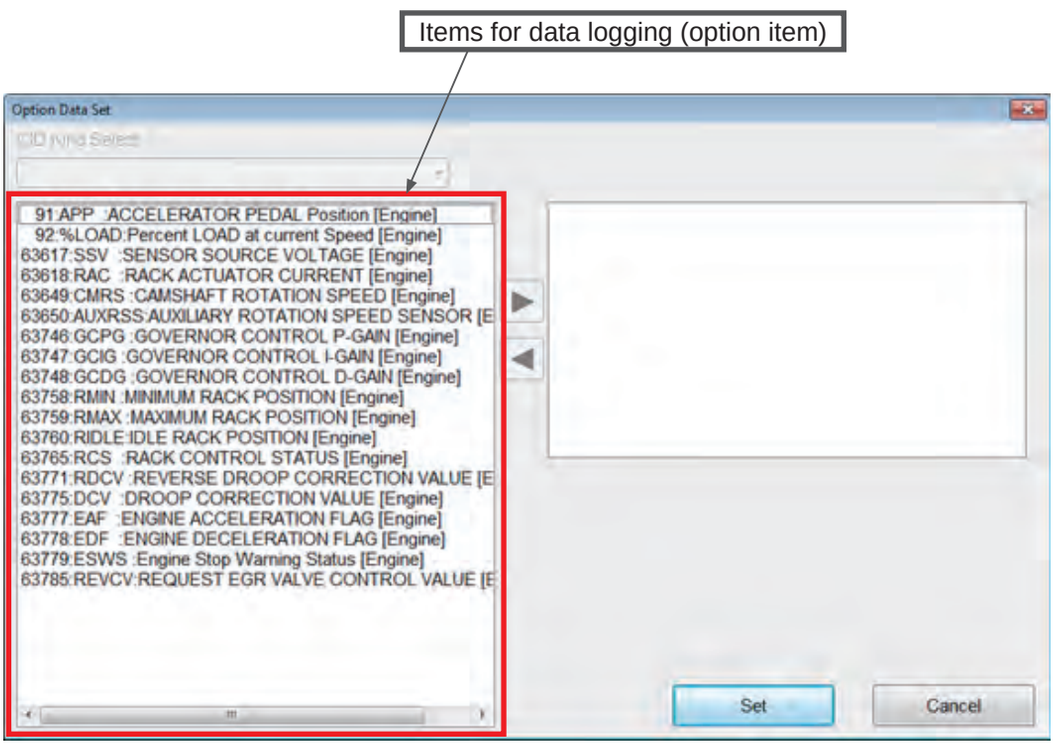
* Item that are not displayed on this list can be set in the Data Logging Options (see below).


Select items to monitor
Click
Data Select
2483:ERH :ENGINE RUN HOURS(unit:h)
63774:ERSF :REQUEST ENGINE SPEED(FINAL)
63770:ES :ENGINE SPEED
63766:ELRG :ENGINE LOAD RATE(Gross)
63784:AEVCV:ACTUAL EGR VALVE CONTROL VA
63744:REQRP:REQUEST RACK POSITION
63745:ACTRP:ACTUAL RACK POSITION
63776:RCV :RACK CURRENT VALUE
110:ECT :ENGINE COOLANT TEMPERATURE
1136:EET :ECU TEMPERATURE
158:BV :BATTERY VOLTAGE
63780:ESSS :Engine Start State Status
63559:DMS :DROOP MODE SW
63561:RSS1 :RMAX SELECT SW1
63554:EMSS :EMERGENCY STOP SW
63563:RSS2 :RMAX SELECT SW2
63566:ESS1 :ENGINE SPEED SELECT 1
63569:ESS2 :ENGINE SPEED SELECT 2
63572:RDMS :REVERSE DROOP MODE SW
63575:ESSP :ENGINE SPEED SELECT PERMISSI
Default
Set
Cancel
The monitored items are listed.
(The PC may slow down if you select too many items. Pick 8 at a time.)
Click Default to automatically pick the top 8 items.


Data Select
2483:ERH :ENGINE RUN HOURS(unit:h)
63769:RES :REQUEST ENGINE SPEED
63774:ERSF :REQUEST ENGINE SPEED(FINAL)
63770:ES :ENGINE SPEED
63766:ELRG :ENGINE LOAD RATE(Gross)
63784:AEVCV:ACTUAL EGR VALVE CONTROL VA
63744:REQRP:REQUEST RACK POSITION
63745:ACTRP:ACTUAL RACK POSITION
63776:RCV :RACK CURRENT VALUE
110:ECT :ENGINE COOLANT TEMPERATURE
1136:EET :ECU TEMPERATURE
158:BV :BATTERY VOLTAGE
63780:ESSS :Engine Start State Status
63559:DMS :DROOP MODE SW
63561:RSS1 :RMAX SELECT SW1
63554:EMSS :EMERGENCY STOP SW
63563:RSS2 :RMAX SELECT SW2
63566:ESS1 :ENGINE SPEED SELECT 1
63569:ESS2 :ENGINE SPEED SELECT 2
63572:RDMS :REVERSE DROOP MODE SW
63575:ESSP :ENGINE SPEED SELECT PERMISSI
63552:IGNS1:IGNITION SW1
63556:ESS :ENGINE STARTER
63780:ESSS :Engine Start State Status
Default
Set
Cancel
Click Set to confirm your entry.

■Option Settings

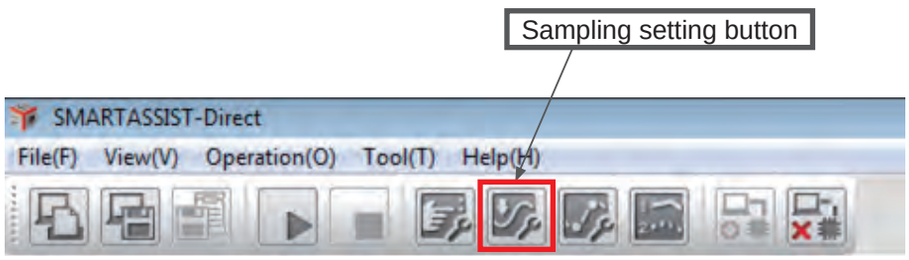


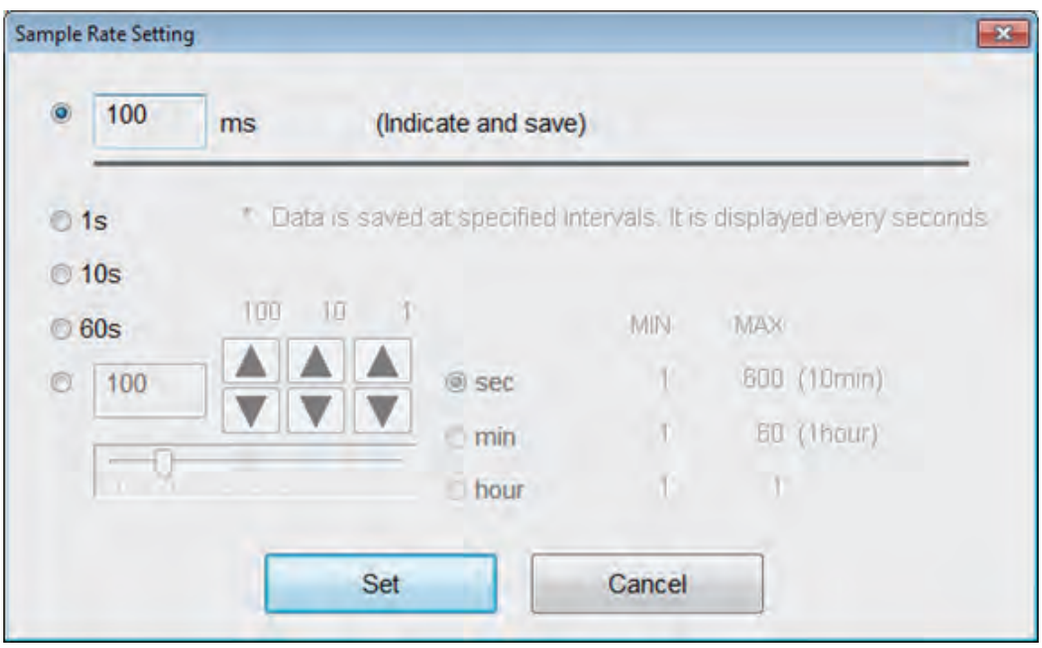


■Sampling Time Settings

* Normally, a change is not necessary.

  Change if necessary.





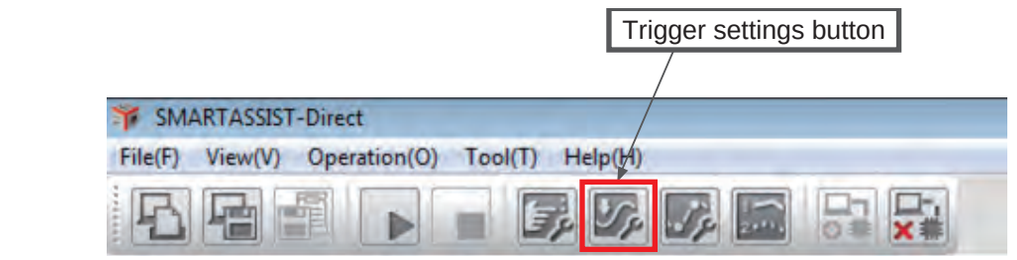
* The standard is 100 msec.

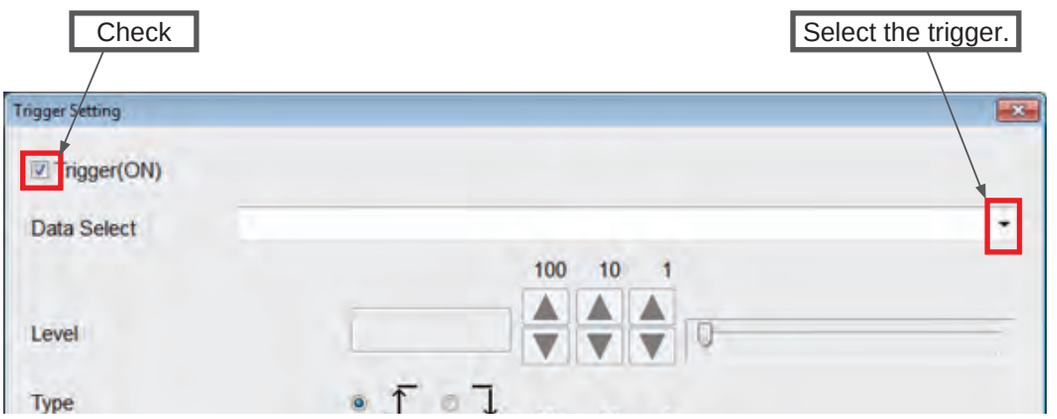
* On ECU that do not support a change, the other values are grayed-out.

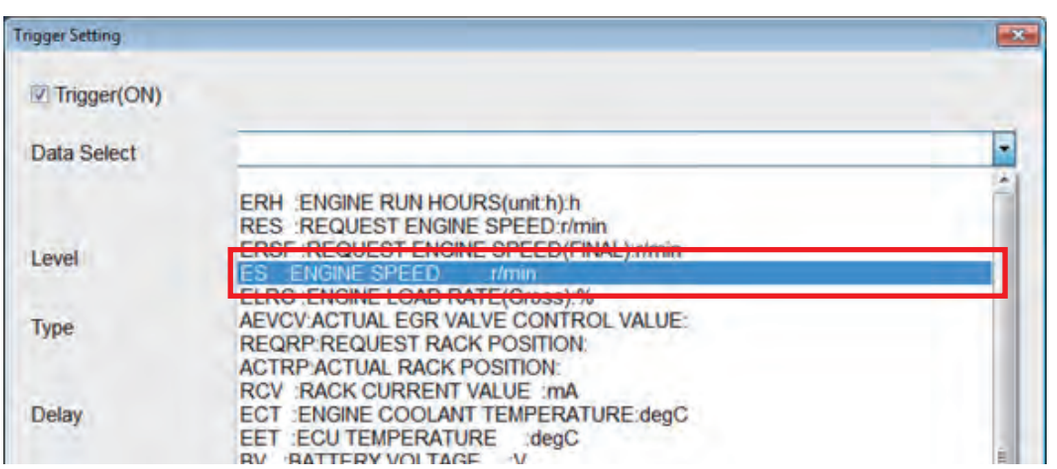
■Trigger Settings

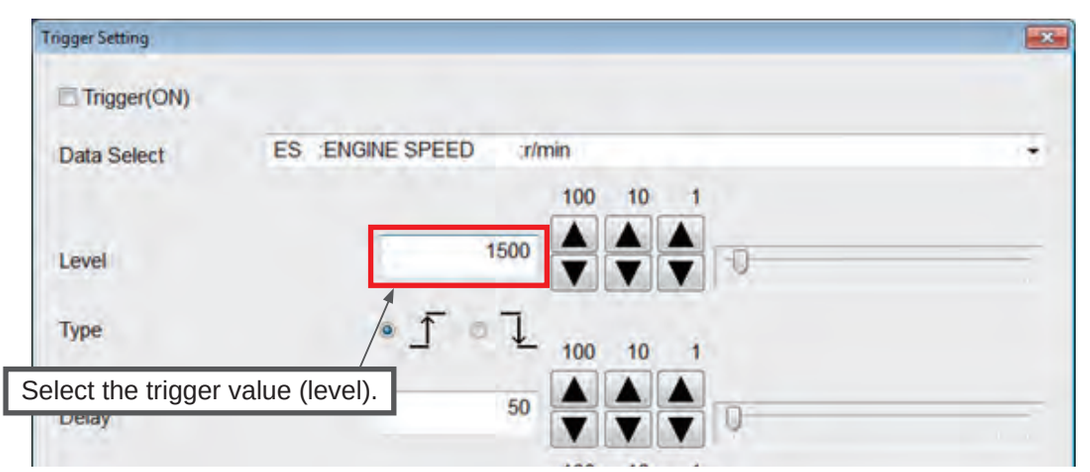
* Normally, a change is not necessary.

  Change if necessary.

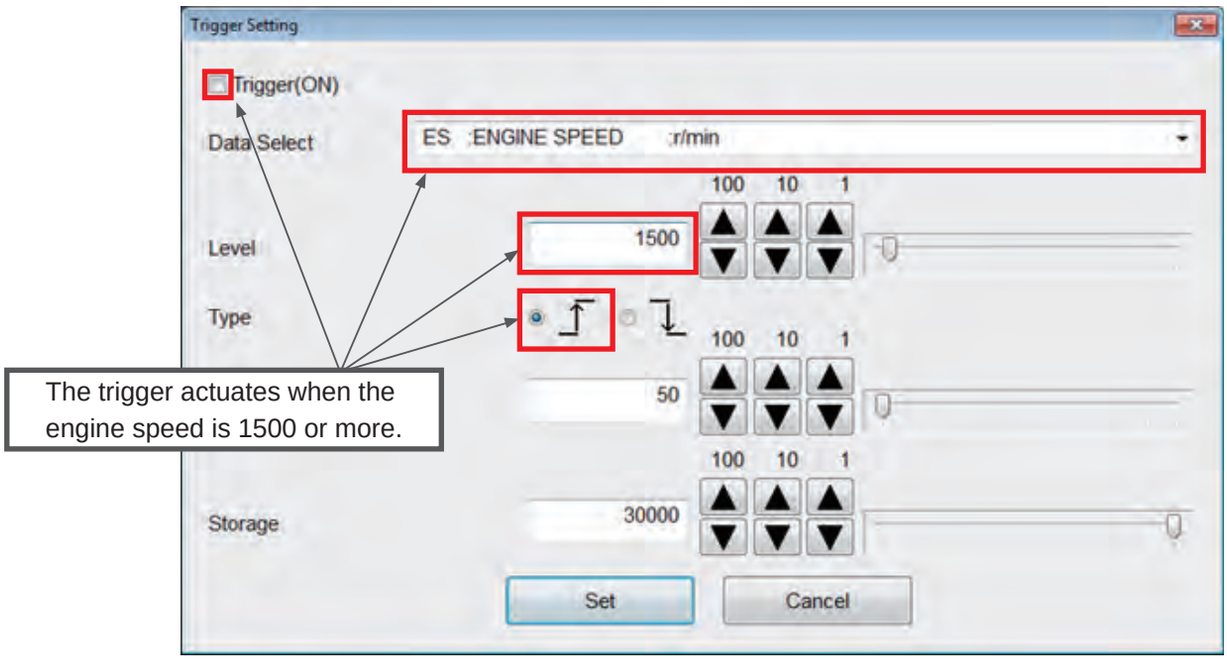








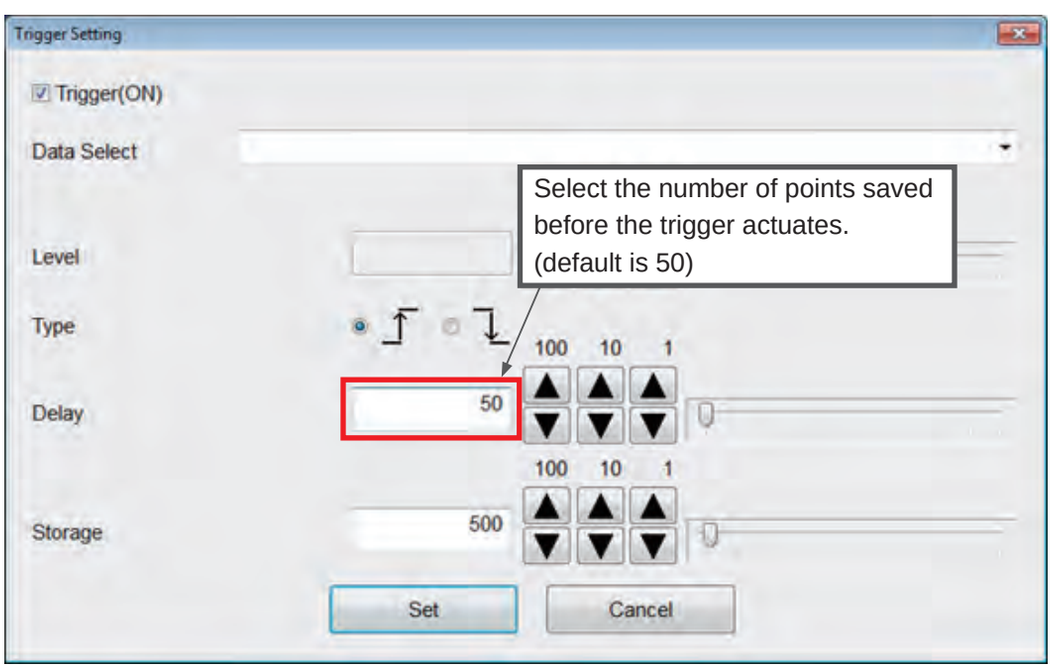
■Description of the Trigger Settings



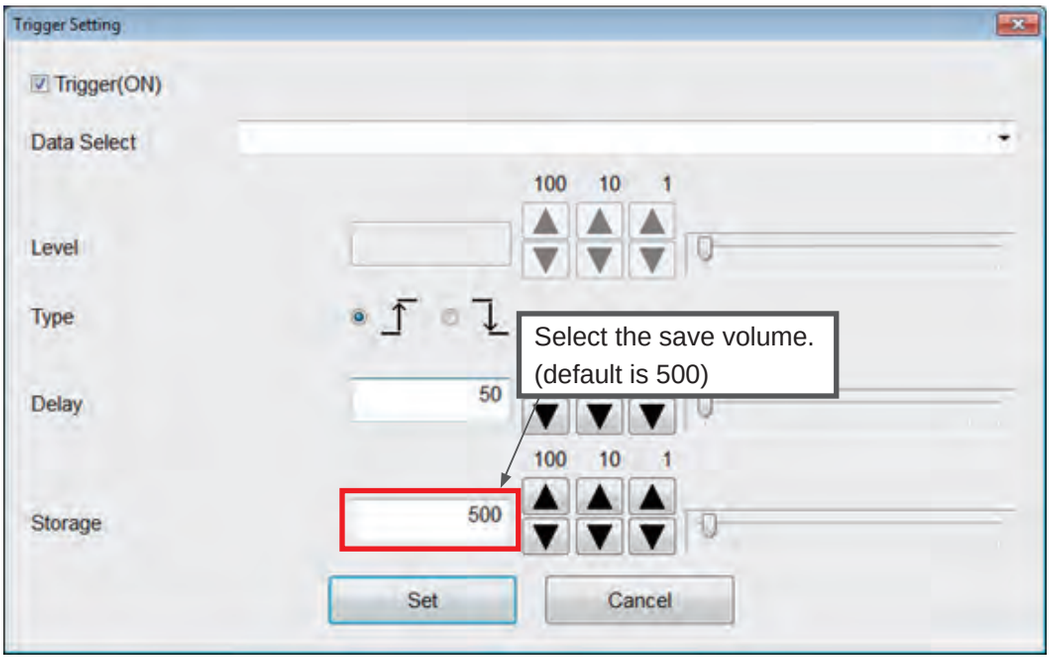
In trigger mode, the values before the trigger is applied can be saved.

* Normally, a change is not necessary.

  Change if necessary.

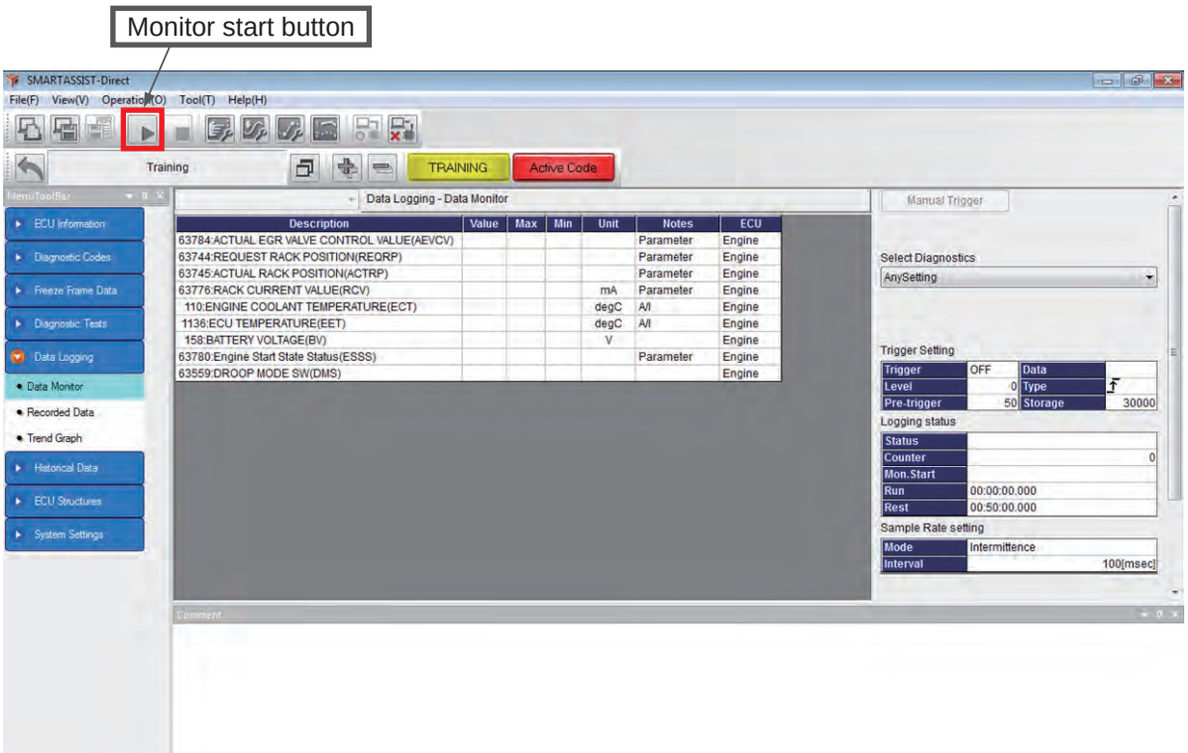


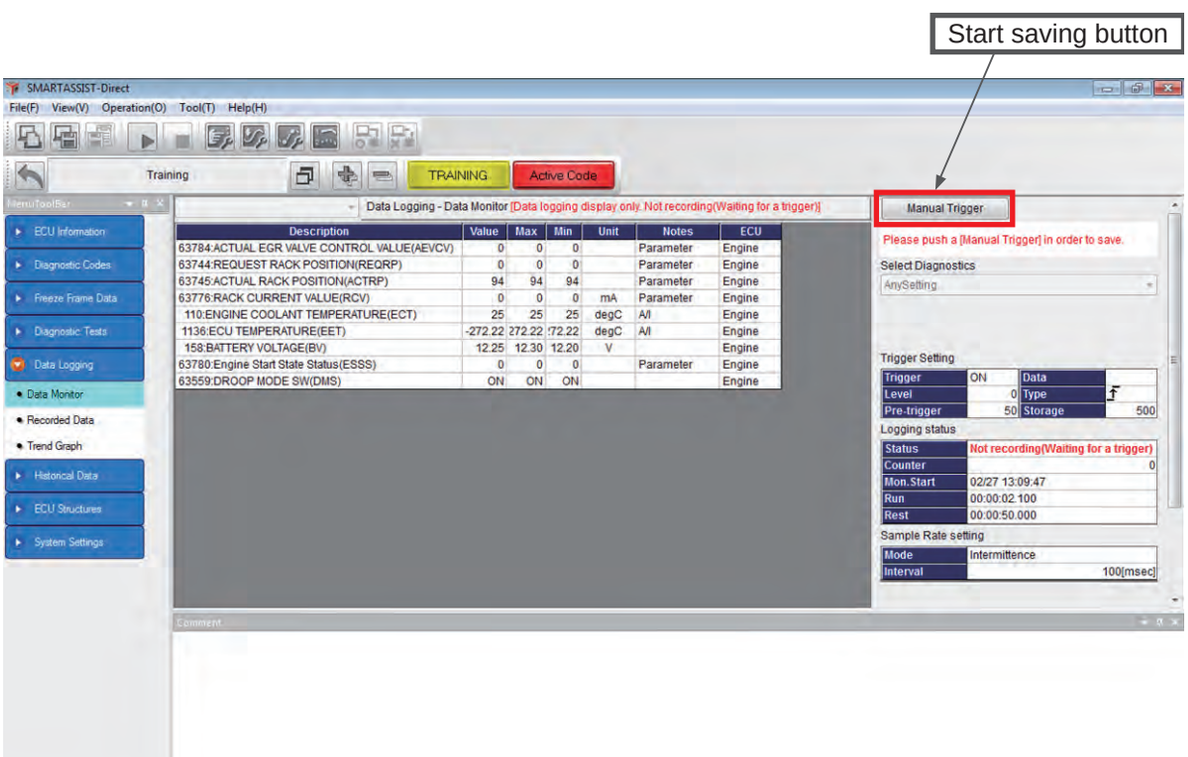
Example: If the sampling time is 100 msec, 50 x 100 = 5000 msec (5 sec), thus the values are saved from 5 seconds before the trigger is applied.

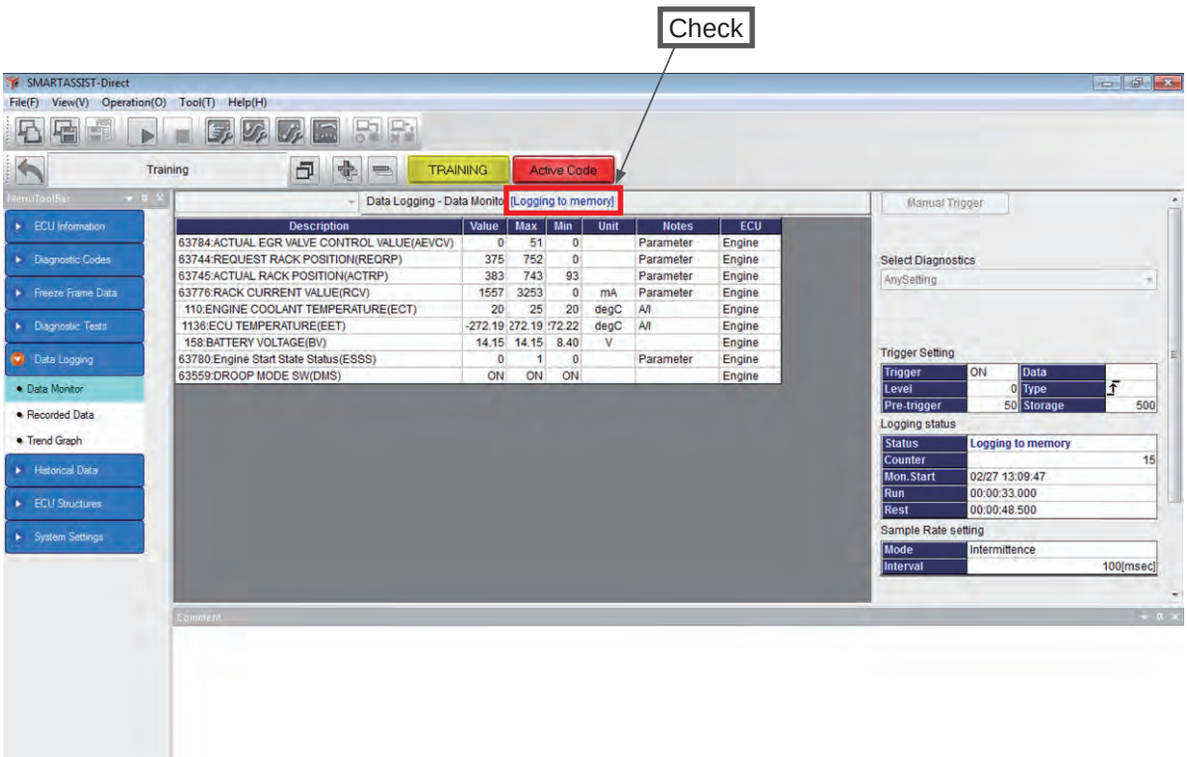


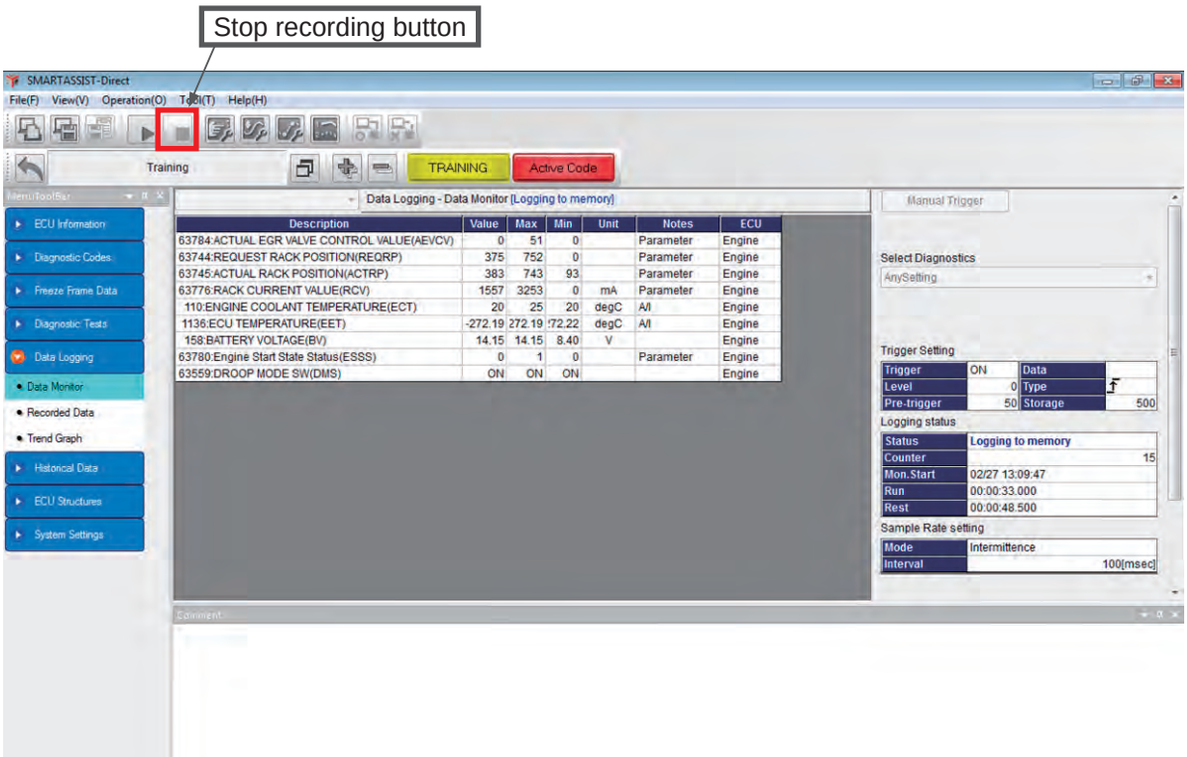
Example: If the sampling time is 100 msec, 500 x 100 = 50000 msec (50 sec), thus the values are saved from 50 seconds before the trigger is applied.

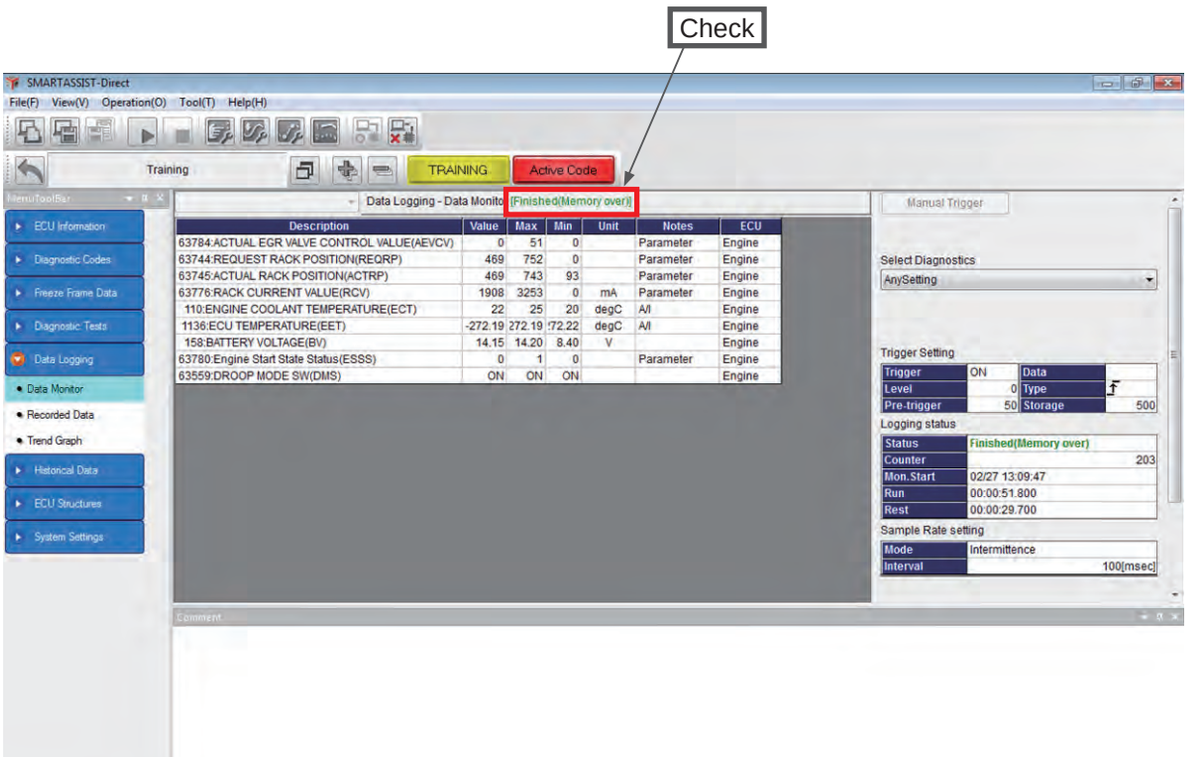
■Data Monitor Save Function



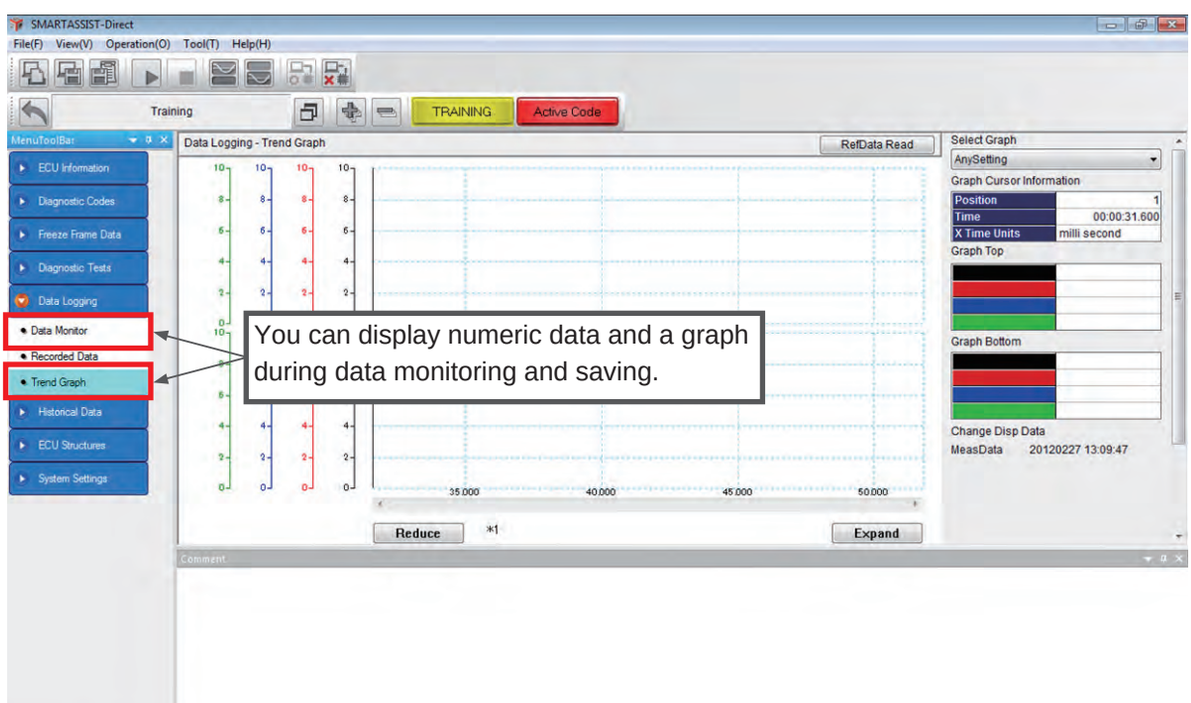



Check
SMARTASSIST-Direct
File(F) View(V) Operation(O) Tool(T) Help(H)
Training
TRAINING
Active Code
Data Logging - Data Monitor [Logging to memory]
Manual Trigger
ECU Information
Diagnostic Codes
Freeze Frame Data
Diagnostic Tests
Data Logging
Data Monitor
Recorded Data
Trend Graph
Historical Data
ECU Structures
System Settings
Description Value Max Min Unit Notes ECU
63784:ACTUAL EGR VALVE CONTROL VALUE(AEVCV) 0 51 0 Parameter Engine
63744:REQUEST RACK POSITION(REQRP) 375 752 0 Parameter Engine
63745:ACTUAL RACK POSITION(ACTRP) 383 743 93 Parameter Engine
63776:RACK CURRENT VALUE(RCV) 1557 3253 0 mA Parameter Engine
110:ENGINE COOLANT TEMPERATURE(ECT) 20 25 20 degC A/I Engine
1136:ECU TEMPERATURE(EET) -272.19 272.19 -272.22 degC A/I Engine
158:BATTERY VOLTAGE(BV) 14.15 14.15 8.40 V Engine
63780:Engine Start State Status(ESSS) 0 1 0 Parameter Engine
63559:DROOP MODE SW(DMS) ON ON ON Engine
Select Diagnostics
AnySetting
Trigger Setting
Trigger ON Data
Level 0 Type
Pre-trigger 50 Storage 500
Logging status
Status Logging to memory
Counter 15
Mon.Start 02/27 13:09:47
Run 00:00:33.000
Rest 00:00:48.500
Sample Rate setting
Mode Intermittence
Interval 100[msec]
Comment


Stop recording button
SMARTASSIST-Direct
File(F) View(V) Operation(O) Tool(T) Help(H)
Training
TRAINING
Active Code
Data Logging - Data Monitor [Logging to memory]
Manual Trigger
ECU Information
Diagnostic Codes
Freeze Frame Data
Diagnostic Tests
Data Logging
Data Monitor
Recorded Data
Trend Graph
Historical Data
ECU Structures
System Settings
Description Value Max Min Unit Notes ECU
63784:ACTUAL EGR VALVE CONTROL VALUE(AEVCV) 0 51 0 Parameter Engine
63744:REQUEST RACK POSITION(REQRP) 375 752 0 Parameter Engine
63745:ACTUAL RACK POSITION(ACTRP) 383 743 93 Parameter Engine
63776:RACK CURRENT VALUE(RCV) 1557 3253 0 mA Parameter Engine
110:ENGINE COOLANT TEMPERATURE(ECT) 20 25 20 degC A/I Engine
1136:ECU TEMPERATURE(EET) -272.19 272.19 -272.22 degC A/I Engine
158:BATTERY VOLTAGE(BV) 14.15 14.15 8.40 V Engine
63780:Engine Start State Status(ESSS) 0 1 0 Parameter Engine
63559:DROOP MODE SW(DMS) ON ON ON Engine
Select Diagnostics
AnySetting
Trigger Setting
Trigger ON Data
Level 0 Type
Pre-trigger 50 Storage 500
Logging status
Status Logging to memory
Counter 15
Mon.Start 02/27 13:09:47
Run 00:00:33.000
Rest 00:00:48.500
Sample Rate setting
Mode Intermittence
Interval 100[msec]
Comment



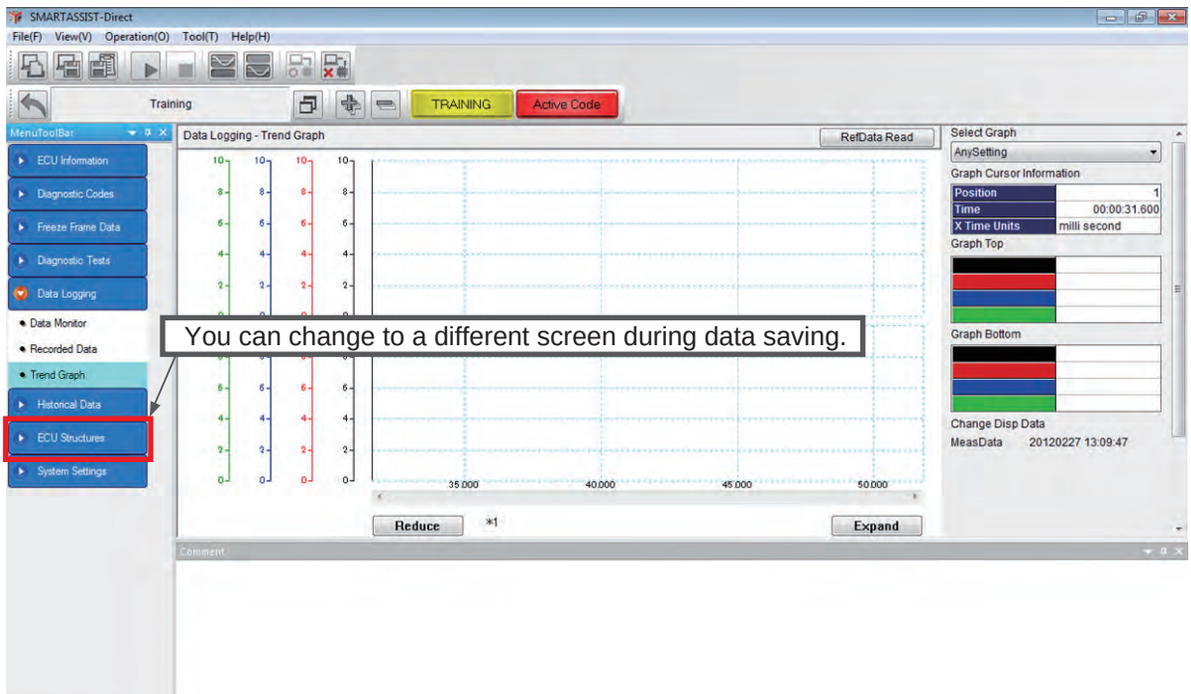
■Switching Screens



■Additional Function (Continued Data Saving)

If you switch to a different screen during data saving, the process stops temporarily.

But when returning to the Data Logging screen, the save process resumes automatically.



6.7 History Data

Display the product's operating data saved to the ECU/controller. There are submenus for the integrated value, distribution chart, and incident record.

Note
- The saved content is different for each product.
- The history data is saved in a precision range that does not affect the control of the product. Thus, use the history data as a guideline.

6.7.1 Integrated Value Display

Displays these values: total operating hours, total time and speed etc. during alarms (status when operation is limited due to fault detection), total values and total mean values such as distance.

● Operation Toolbar

1  : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2  : Print the screen. (Refer to [6.2.2])

3  : Save a screenshot in BMP format. (Refer to [6.2.3])

4  : Save the complete history data in CSV format. (Refer to [6.2.4])

5  : Update the current data.

● Function Buttons

6 [ ] : Select the ECU/controller that is displayed.

7 [Clear Trip Time] : Delete the data of the selected (checkmark) item. After pushing the button [Selection Item Clear], the password is confirmed.

Note **If the clear box does not have a checkbox, the data cannot be deleted.**

● Main Box

8 [Clear] : Box selected for deletion (click to insert checkmark)

9 [Description] : Save data

10 [Value] : Display total time

11 [ECU] : ECU/controller where data is saved

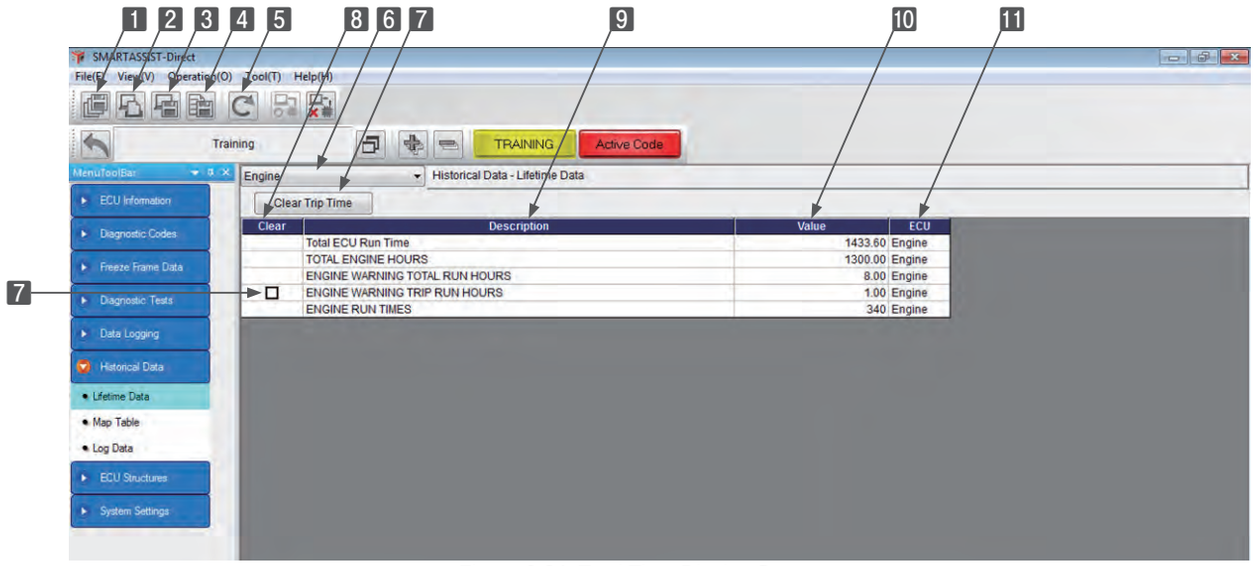


Figure 6-24 Total Time Display Screen

6.7.2 Distribution Chart (Expert Function)

Visualizes the operation status and displays a distribution chart of the frequency information saved in the ECU/controller. The integrated data cannot be deleted. (E.g. the engine load pattern)

● **Operation Toolbar**

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2 : Print the screen. (Refer to [6.2.2])

3 : Save a screenshot in BMP format. (Refer to [6.2.3])

4 : Save the complete history data in CSV format. (Refer to [6.2.4])

5 : Update the current data.

6 : Open the adjustment subwindow; full scale of all axes is adjustable in 3 steps (25%, 50%, 100%).

● **Function Buttons**

7 [ ] : Select the displayed ECU/controller.

8 [ ] : Select the data that is displayed.

● **Main Box**

9 [**Data**] : Total operating hours under all loads and speeds

10 [**Total**] : Total operating hours for all lines (rows)

11 [**(%)**] : Ratio for total operating hours for all lines (rows)

12 [**Bar Graph**] : Bar graph for all axes full scale

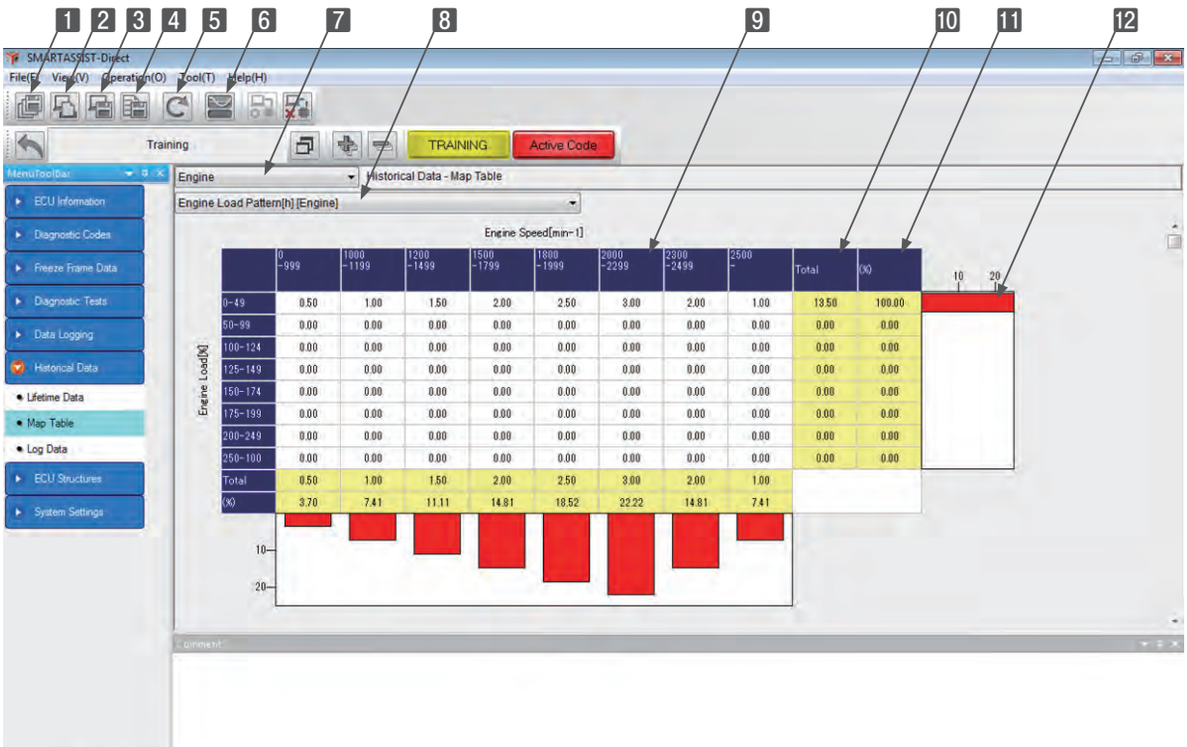
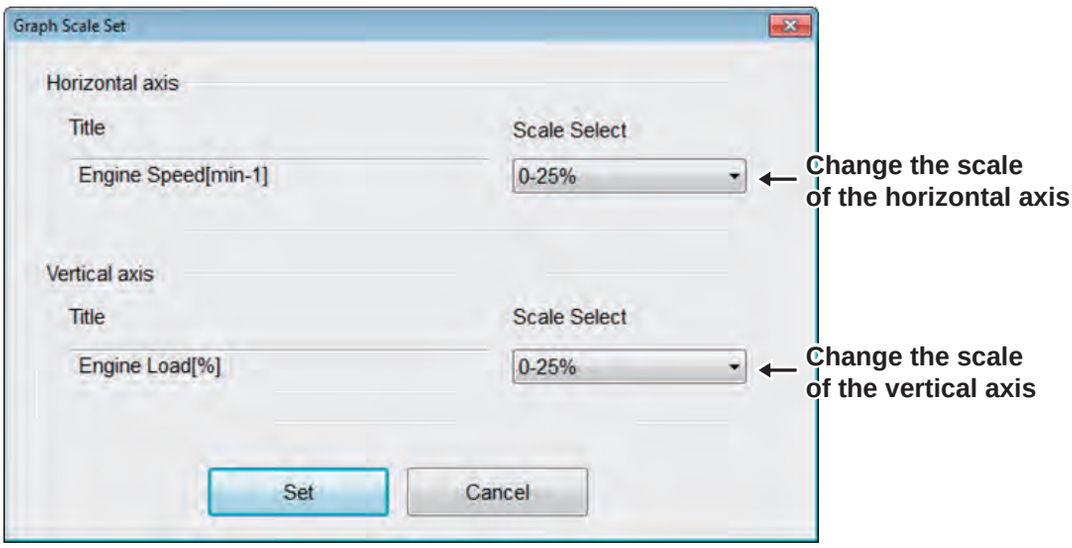
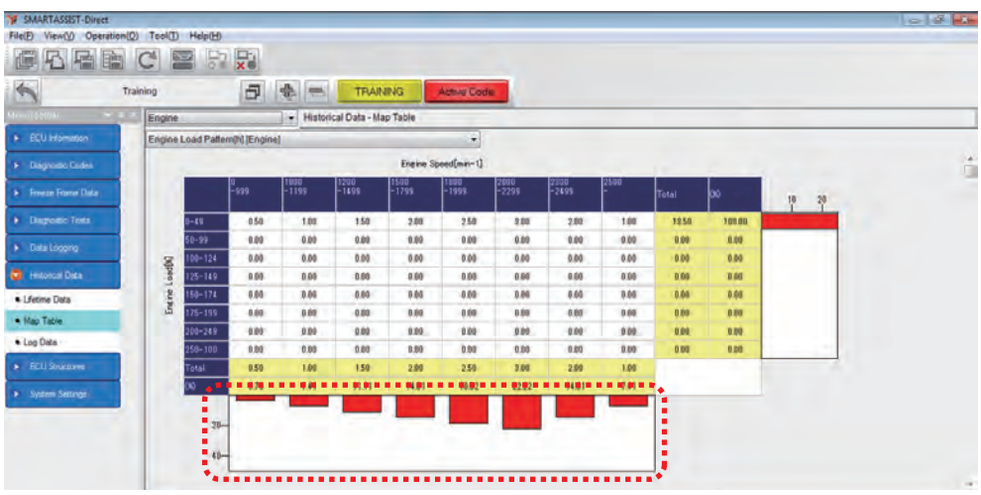


Figure 6-25 Distribution Chart Screen

● **Scale Change**

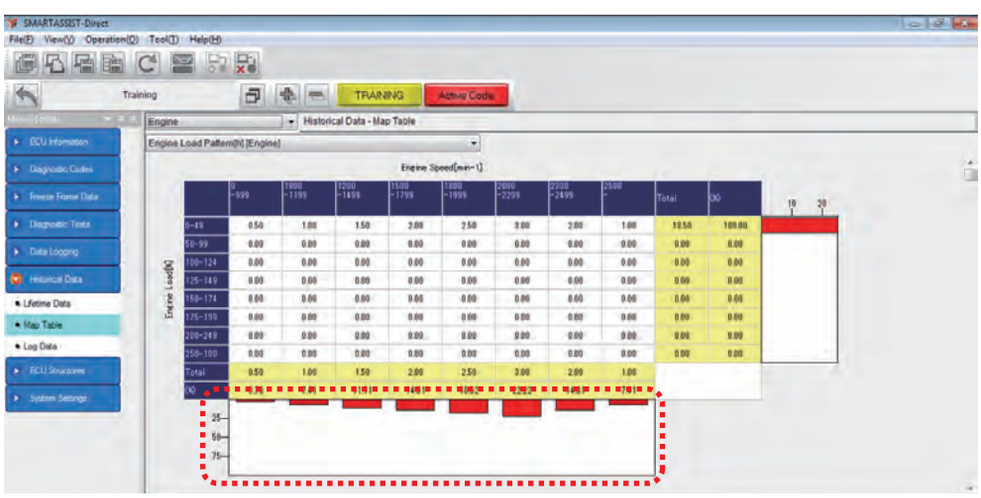
Click 5 to open the below screen.





50%

Figure 6-26 50% Example Display Screen



100%

Figure 6-27 100% Example Display Screen

6.7.3 Incident Record

The incident record is displayed in two formats of save data.

- Total operating hours when the specified incident occurred
- Number of times and average value that the specified incident occurred during a certain range of operating hours

● Operation Toolbar

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2 : Print the screen. (Refer to [6.2.2])

3 : Save a screenshot in BMP format. (Refer to [6.2.3])

4 : Save the complete history data in CSV format. (Refer to [6.2.4])

5 : Update the current data.

● Main Box

6 **No.** : Display the number of the data.

7 **Factor (B)** : Display the factor of the specified item separated in bits.
(By right-clicking, the data can be changed to "binary number", "decimal number" and "hexadecimal number".)

8 Time of Occurrence (h) : Display the operating hours at the time of the incident

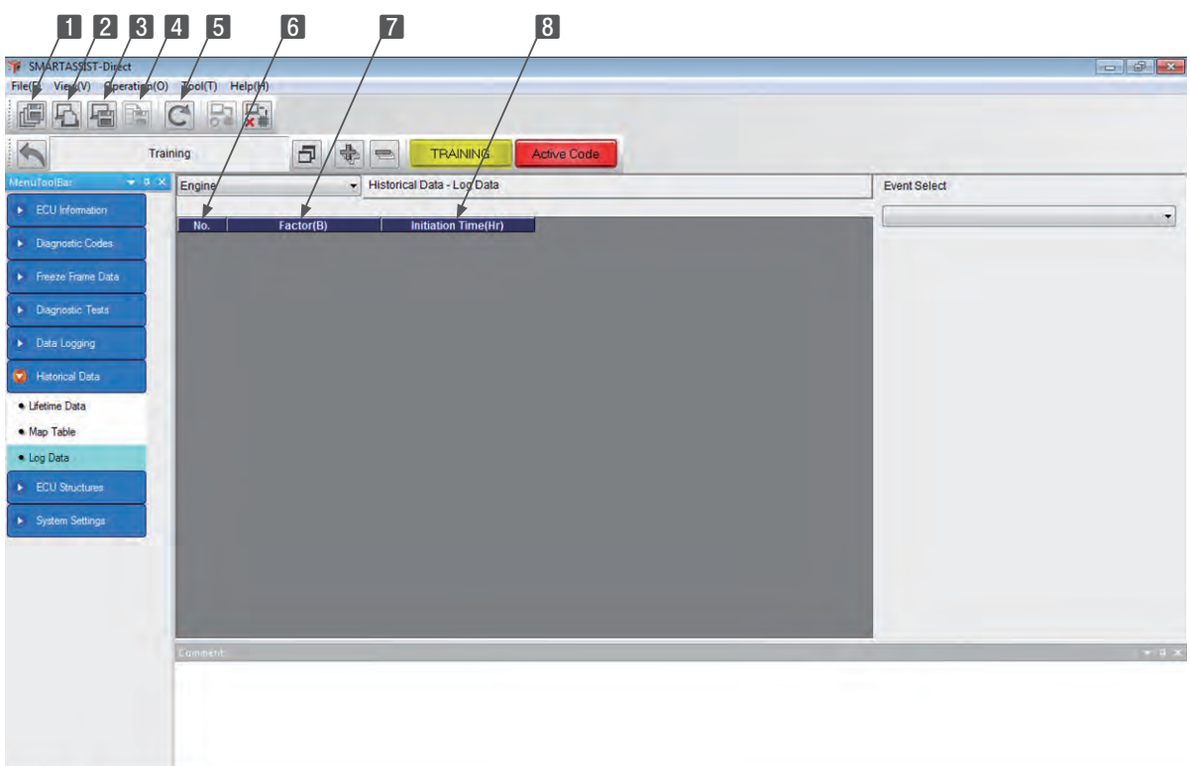


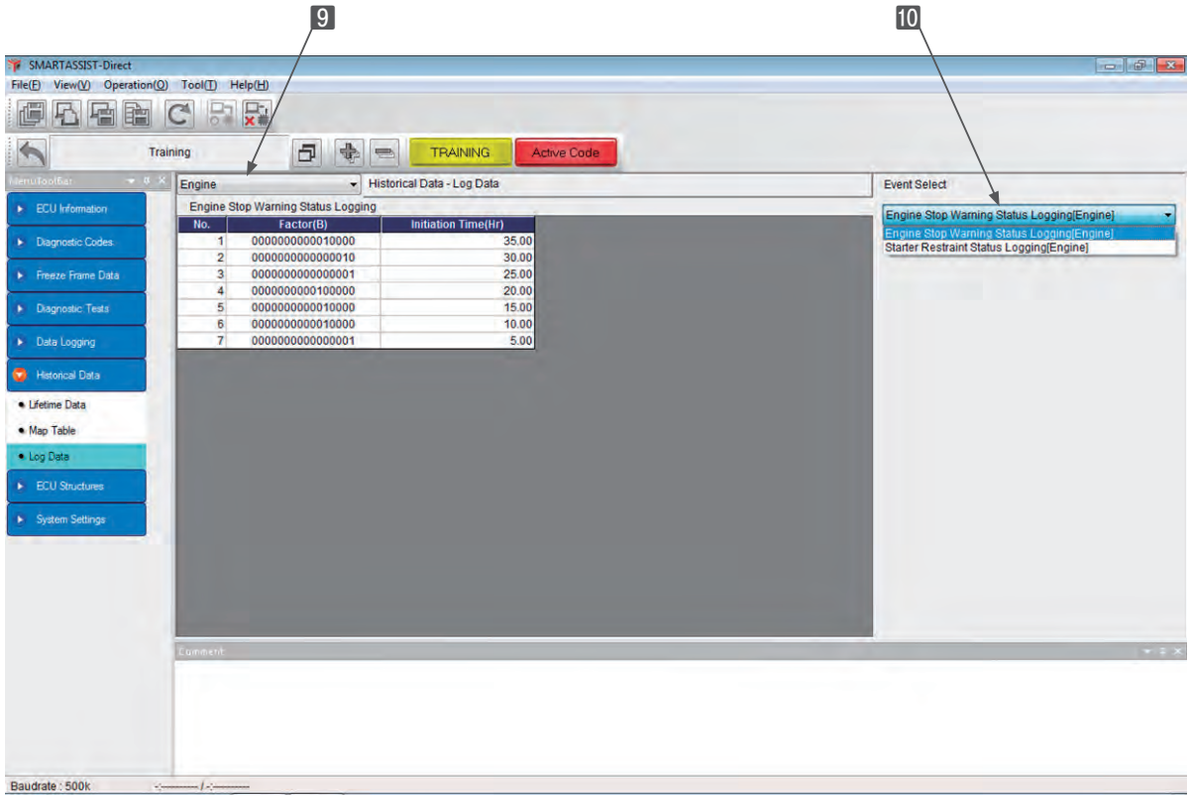
Figure 6-28 Log Data Screen

● Incident Selection

9 [ ] : Select the displayed ECU/controller.

10 [ ] : Select the data saved to the ECU/controller selected at 9.

If no data has been saved, an empty box is displayed.



Example for binary display

No.	Factor(B)	Initiation Time(Hr)
1	0000000000010000	35.00
2	0000000000000010	30.00
3	0000000000000001	25.00
4	0000000000100000	20.00
5	0000000000010000	15.00
6	0000000000010000	10.00
7	0000000000000001	5.00

Example for decimal display

No.	Factor(D)	Initiation Time(Hr)
1	16	35.00
2	2	30.00
3	1	25.00
4	32	20.00
5	16	15.00
6	16	10.00
7	1	5.00

Example for hexadecimal display

No.	Factor(H)	Initiation Time(Hr)
1	0010	35.00
2	0002	30.00
3	0001	25.00
4	0020	20.00
5	0010	15.00
6	0010	10.00
7	0001	5.00

● **Example incident data for TNV series engine**

Engine Stop Cause Log (Engine) : Click to display in the main box a recording of the incident cause that occurred when the engine stopped.

Start Restraint Cause Log (Engine) : Click to display in the main box a recording of the incident cause that occurred when the starter restraint actuated.

6.8 ECU Specification/Structure (Expert Function)

This function displays the ID information of the product's electronic control system/ECU/controller and the distribution of the ECU input/output channel.

6.8.1 Analog Signal

This screen is mainly used for communication between developers and the development department.

Information such as units, scaling, and channel information of the analog signal is displayed.

● **Operation Toolbar**

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2 : Print the screen. (Refer to [6.2.2])

3 : Save a screenshot in BMP format. (Refer to [6.2.3])

4 : Save the complete history data in CSV format. (Refer to [6.2.4])

● **Function Buttons**

5 : Select the displayed ECU/controller.

● **Main Box**

6 **CID** : Used as common ID number for SAE J1939 compliant parameters

7 **Description** : Contents of sensors, signals etc.

8 **Acronym** : Abbreviation number (SAE compliant)

9 **Size** : Data Length

10 **Resolution** : Resolution

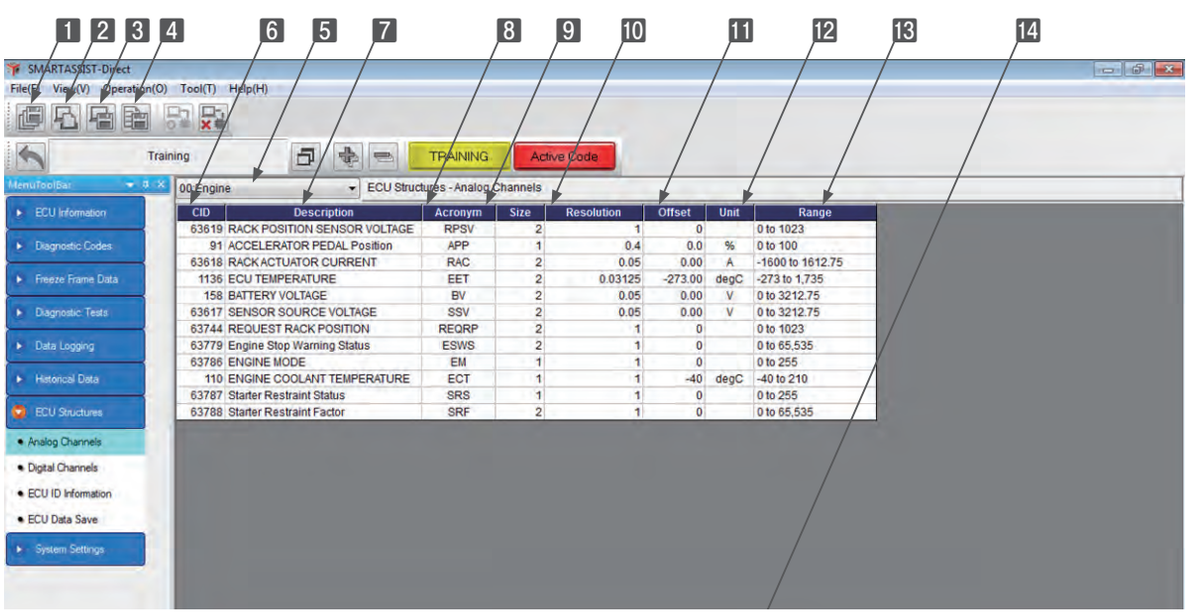
11 **Offset** : Offset

12 **Unit** : Unit

13 **Range** : Range

● **Comment Box**

14 Comment box: Display information for the selected line (colored in green).



CID	Description	Acronym	Size	Resolution	Offset	Unit	Range
63619	RACK POSITION SENSOR VOLTAGE	RPSV	2	1	0		0 to 1023
91	ACCELERATOR PEDAL Position	APP	1	0.4	0.0	%	0 to 100
63618	RACK ACTUATOR CURRENT	RAC	2	0.05	0.00	A	-1600 to 1612.75
1136	ECU TEMPERATURE	EET	2	0.03125	-273.00	degC	-273 to 1,735
158	BATTERY VOLTAGE	BV	2	0.05	0.00	V	0 to 3212.75
63617	SENSOR SOURCE VOLTAGE	SSV	2	0.05	0.00	V	0 to 3212.75
63744	REQUEST RACK POSITION	REQRP	2	1	0		0 to 1023
63779	Engine Stop Warning Status	ESWS	2	1	0		0 to 65,535
63786	ENGINE MODE	EM	1	1	0		0 to 255
110	ENGINE COOLANT TEMPERATURE	ECT	1	1	-40	degC	-40 to 210
63787	Starter Restraint Status	SRS	1	1	0		0 to 255
63788	Starter Restraint Factor	SRF	2	1	0		0 to 65,535

Figure 6-29 Analog Signal Screen

6.8.2 Digital Signal (Expert Function)

This screen is mainly used for communication between developers and the development department.

It displays information such as acceptance or rejection of the forced output for output, logic, and channel information of the contact input/output signal.

● **Operation Toolbar**

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2 : Print the screen. (Refer to [6.2.2])

3 : Save a screenshot in BMP format. (Refer to [6.2.3])

4 : Save the complete history data in CSV format. (Refer to [6.2.4])

5 : Update the current data.

● **Function Buttons**

6 [ ] : Select the displayed ECU/controller.

● **Main Box**

7 **IN/OUT** : Input/output division

8 **CID** : ID numbers for SAE J1939 compliant parameters

9 **Description** : Contents of sensors, signals etc.

10 **Acronym** : Abbreviation number (SAE compliant)

11 **Byte** : Byte position of data

12 **Bit** : Bit position of data

13 **Logic** : Logic reversal

14 **Mask** : Authorization mask for forced operation (0 means no change possible)

● **Comment Box**

15 Comment box: Display information for the selected line (colored in green).

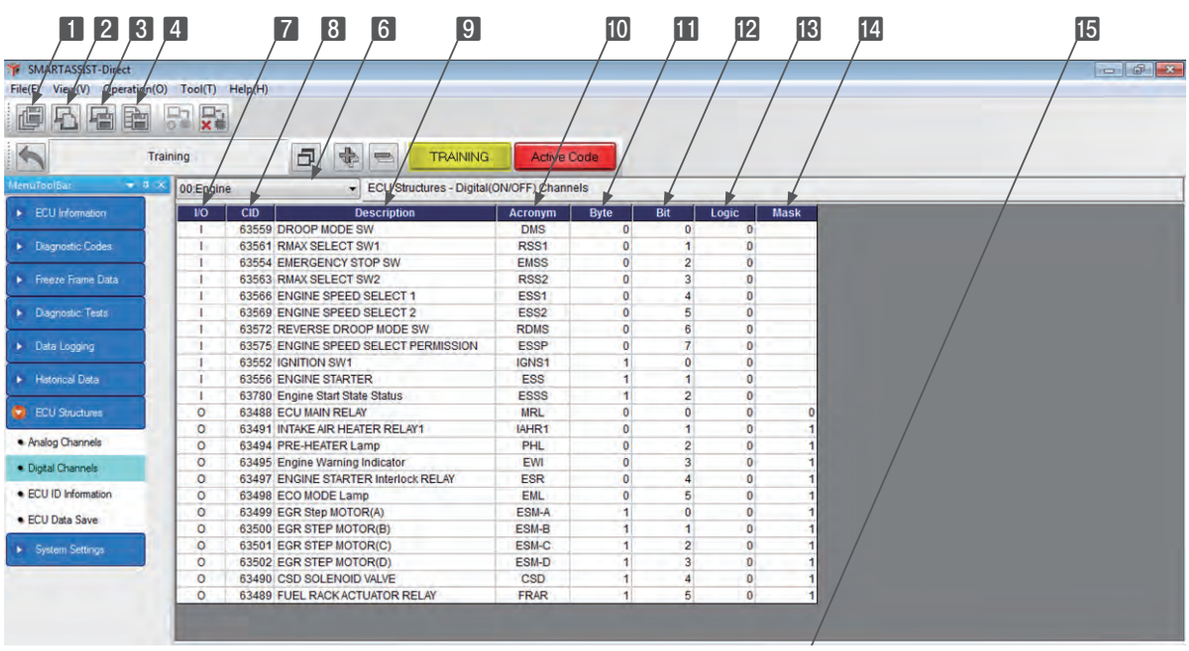


Figure 6-30 Digital Signal Screen

6.8.3 ECU ID Data

Displays detailed ID information for each ECU/controller. (Related to "ECU Basic Information" and "Main Data")

● **Operation Toolbar**

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2 : Print the screen. (Refer to [6.2.2])

3 : Save a screenshot in BMP format. (Refer to [6.2.3])

4 : Save the complete history data in CSV format. (Refer to [6.2.4])

5 : Update the current data.

● **Function Buttons**

6 : Select the displayed ECU/controller.

● **Main Box**

7 **ECUID** : Management number for the data saved in the ECU

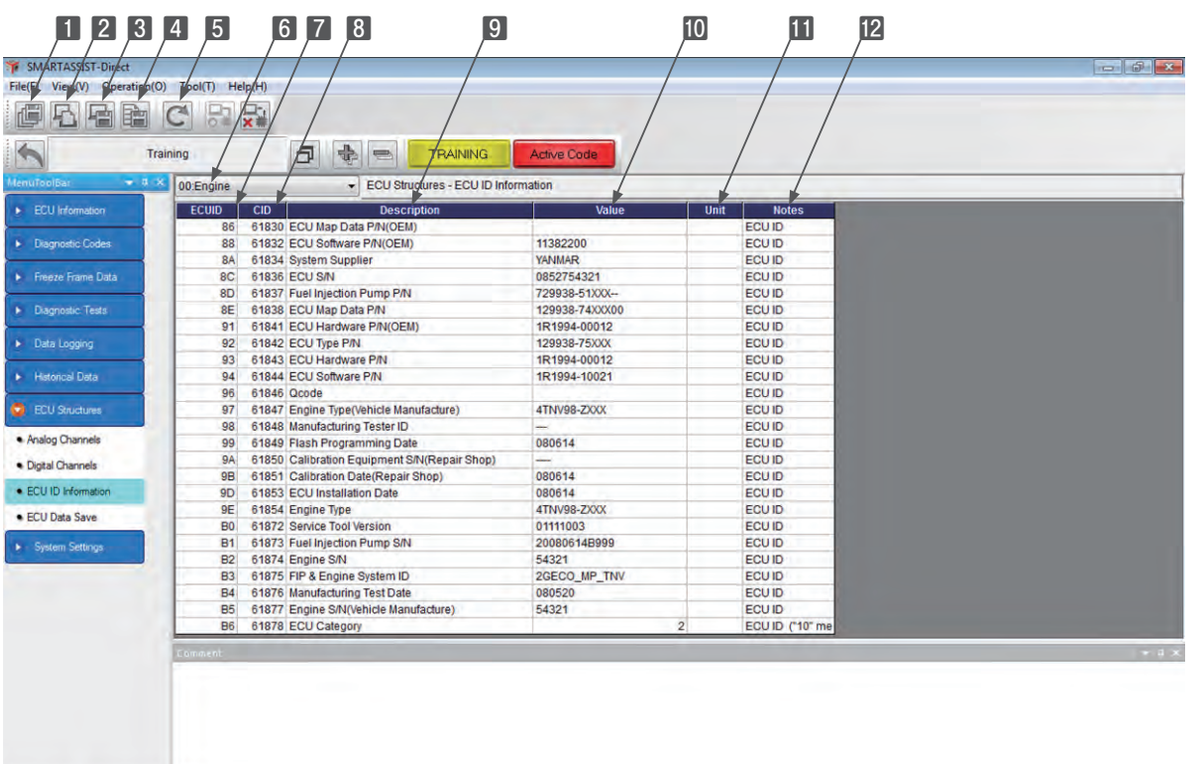
8 **CID** : Management number for the data called common ID

9 **Description** : Item name that is displayed

10 **Data** : Item content

11 **Unit** : Unit

12 **Notes** : Annotation box



ECUID	CID	Description	Value	Unit	Notes
86	61830	ECU Map Data P/N(OEM)			ECU ID
88	61832	ECU Software P/N(OEM)	11382200		ECU ID
8A	61834	System Supplier	YANMAR		ECU ID
8C	61836	ECU S/N	0852754321		ECU ID
8D	61837	Fuel Injection Pump P/N	729938-51XXX--		ECU ID
8E	61838	ECU Map Data P/N	129938-74XXX00		ECU ID
91	61841	ECU Hardware P/N(OEM)	1R1994-00012		ECU ID
92	61842	ECU Type P/N	129938-75XXX		ECU ID
93	61843	ECU Hardware P/N	1R1994-00012		ECU ID
94	61844	ECU Software P/N	1R1994-10021		ECU ID
96	61846	Qcode			ECU ID
97	61847	Engine Type(Vehicle Manufacture)	4TNV98-ZXXX		ECU ID
98	61848	Manufacturing Tester ID	—		ECU ID
99	61849	Flash Programming Date	080614		ECU ID
9A	61850	Calibration Equipment S/N(Repair Shop)	—		ECU ID
9B	61851	Calibration Date(Repair Shop)	080614		ECU ID
9D	61853	ECU Installation Date	080614		ECU ID
9E	61854	Engine Type	4TNV98-ZXXX		ECU ID
B0	61872	Service Tool Version	01111003		ECU ID
B1	61873	Fuel Injection Pump S/N	20080614B999		ECU ID
B2	61874	Engine S/N	54321		ECU ID
B3	61875	FIP & Engine System ID	2GECO_MP_TNV		ECU ID
B4	61876	Manufacturing Test Date	080520		ECU ID
B5	61877	Engine S/N(Vehicle Manufacture)	54321		ECU ID
B6	61878	ECU Category	2		ECU ID ("10" me

Figure 6-31 ECU ID Information Screen

6.8.4 ECU Data Saving

Saves the previously made settings in CSV format. The settings include correction values, adjustment values, initialization values and ECU ID information that are saved in the ECU.

Note This function is different from 1 Saving the ECU's screen display data.

● Operation Toolbar

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2 : Print the screen. (Refer to [6.2.2])

3 : Save a screenshot in BMP format. (Refer to [6.2.3])

4 : Save the complete history data in CSV format. (Refer to [6.2.4])

5 : Update the current data.

● Function Buttons

6 [ ] : Select the displayed ECU/controller.

● Main Box

7 **Browse** : Calls up a report format that contains the settings which data items are saved. This function is mainly used by developers. It is not necessary to change it during service work. You can select whether to save the data only or save the data and the title.

	A
1	4TNV98-ZNSA
2	729939-51390--
3	129988-75000
4	54686
5	20070914B080
6	680000065
7	1
8	2
9	3
10	4

「データのみ」の例

	A	B	C
1	エンジン型式(銘板名称)		4TNV98-ZNSA
2	ポンプ部品コード		729939-51390--
3	ECU仕組部品コード		129988-75000
4	エンジンシリアルNo(機番)		54686
5	ポンプシリアルNo		20070914B080
6	ECUシリアルNo		680000065
7	Pump	ポンプ最大ラック位置補正(回転軸1) 管理Trq1	1
8		ポンプ最大ラック位置補正(回転軸2) 管理Trq2	2
9		ポンプ最大ラック位置補正(回転軸3) 管理Trq3	3
10		ポンプ最大ラック位置補正(回転軸4) 定格出力	4

「データとタイトル」の例

8 **Title** : Display the title.

9 **Subtitle** : Display the sub-title.

10 **Data** : Display the data values.

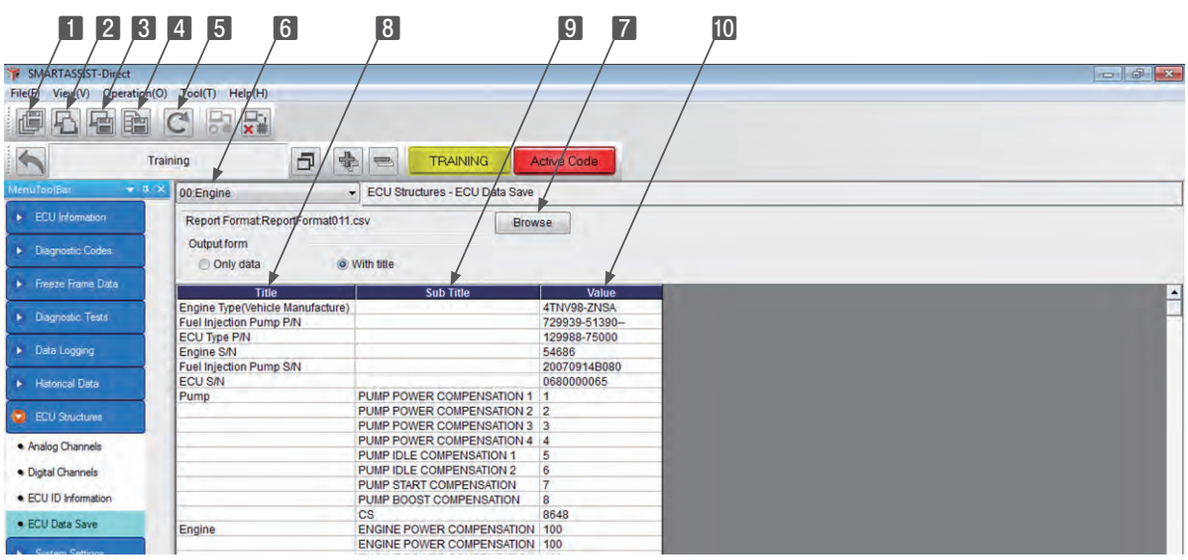


Figure 6-32 ECU Data Saving Screen

6.9 Settings (Expert Function)

This function allows you to change the settings necessary for replacing, repairing and adjusting the ECU/controller, fuel injection pump, fuel injection valve (injector), and all sensors and switches after mounting and installation of the product. It has the submenus "Structure Settings", "Sensor Correction", "Parameter Adjustment", and "Initial Settings". You can create a report file after finishing the settings.

Important Follow the instructions in the technical manuals of the relevant product when changing values with any functions within the settings.
If you change settings without due care, the product might stop working or the performance may decrease.

6.9.1 Configuration

You can backup and write the settings and setting values of the product's basic functions.

● **Operation Toolbar**

1  : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2 : Print the screen. (Refer to [6.2.2])

3  : Save a screenshot in BMP format. (Refer to [6.2.3])

4  : Save the screen data in CSV format. (Refer to [6.2.4])

● **Function Buttons**

5 [ ] : Select the displayed ECU/controller.

6 [Exchanges] : • This function saves the initial settings saved in the ECU and the correction values (ECU Data Backup (ECU to PC)) and writes these settings and values to the PC.
• This function writes the correction values of the fuel injection pump to the ECU after it was replaced.

The function by this button is the same as for the ECU Replacement (Execution), part replacement and adjustment, and it is in the location as in YDT, the predecessor to SMART-ASSIST-Direct.

Refer to the relevant page for instructions.

● **Main Box**

The adjustable items are listed.

7 [Description] : Display the setting items.

8 [Value] : Clicking the blue digits of the current setting value opens a window to change the setting value. To make the change, it is necessary to enter the password.

9 [Notes] : Reference information for the setting entry is displayed.

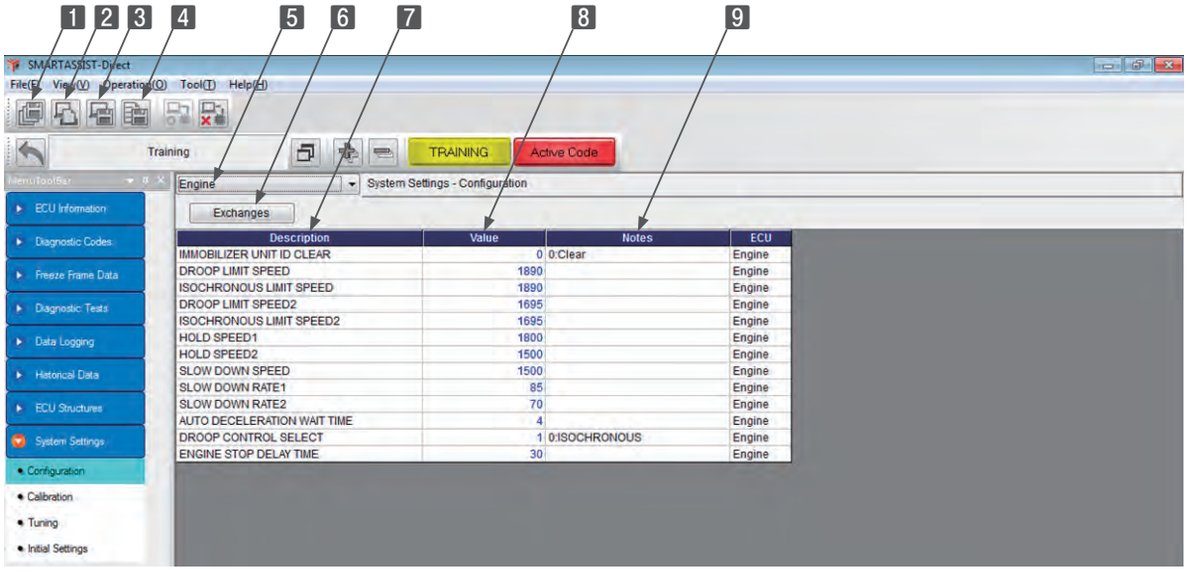


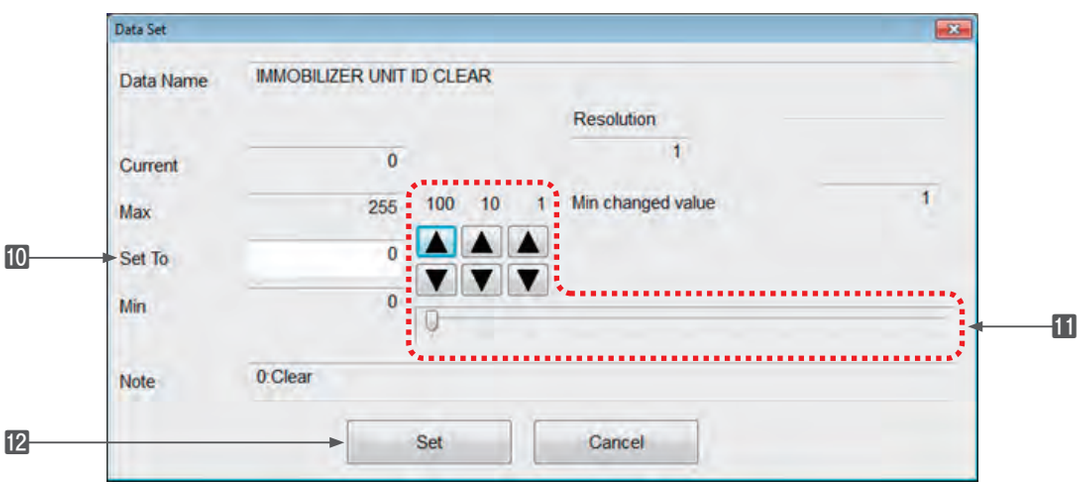
Figure 6-33 ECU Data Saving Screen

● Subwindow

10 **Set To** : Display the setting values.

11 ▲ / ▼ : Adjust the settings.

12 **Set** : Confirm the settings value.



6.9.2 Sensor Correction (Calibration)

This function allows adjusting the standard position for sensors such as the accelerator position sensor.

Note When using this function, refer to the service manual and technical information of the relevant product.

● **Operation Toolbar**

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions].)

2 : Print the screen. (Refer to [6.2.2])

3 : Save a screenshot in BMP format. (Refer to [6.2.3])

4 : Save the screen data in CSV format. (Refer to [6.2.4])

● **Function Buttons**

5 : Select the displayed ECU/controller.

● **Main Box**

The adjustable items are listed.

6 **Description** : Display the correction category.

7 **Data** : Display the current offset quantity. Clicking opens a window to change the quantity. To apply the change, click "Set".

8 **Notes** : Display the relevant comment.

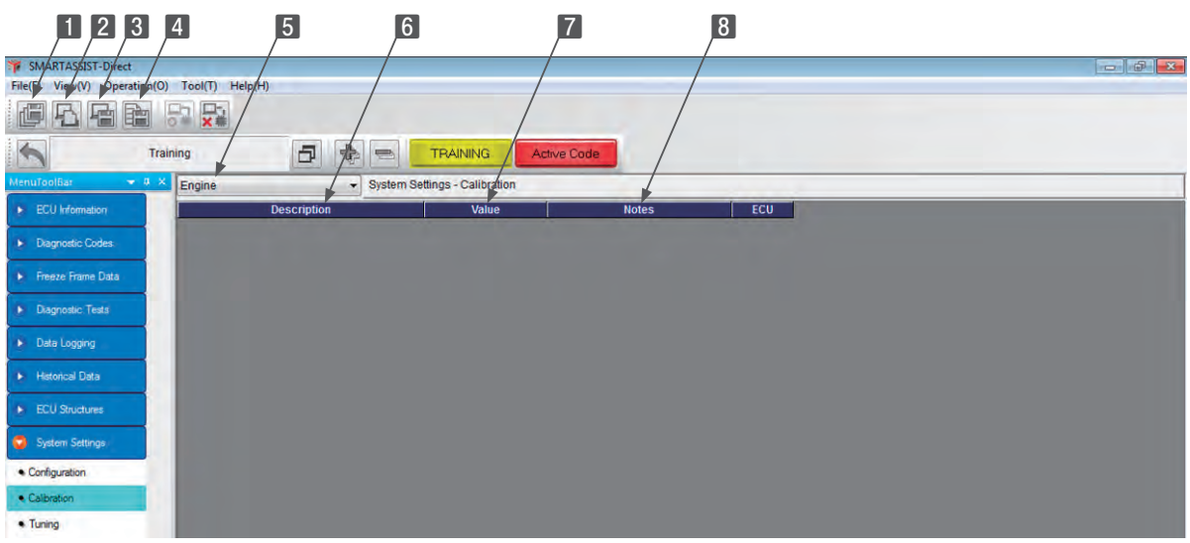


Figure 6-34 Sensor Correction Screen

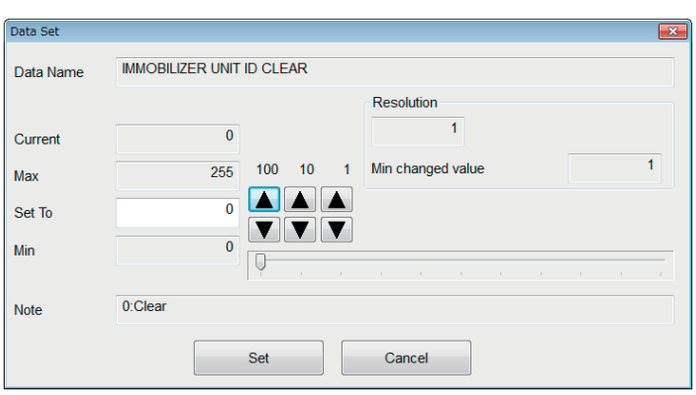


Figure 6-35 Example Change Screen

6.9.3 Parameter Adjustment (Tuning)

You can adjust and set all performance parameters in accordance with industry standards and Yanmar Industrial Standards.

Example: Adjusting the engine low idle speed, torque patterns, and speed performance within exhaust gas standards

Note When using this function, refer to the service manual and technical information of the relevant product.

● **Operation Toolbar**

1 : Save the ECU's screen display data. (Refer to [7. Error Diagnosis Data Save and Display Functions])

2 : Print the screen. (Refer to [6.2.2])

3 : Save a screenshot in BMP format. (Refer to [6.2.3])

4 : Save the screen data in CSV format. (Refer to [6.2.4])

● **Function Buttons**

5 : Select the displayed ECU/controller.

● **Main Box**

6 **Description** : Display the setting category.

7 **Data** : Display the current parameter quantity. Clicking opens a window to change the parameters.

8 **Unit** : Display the unit.

9 **Notes** : Display the relevant comment.

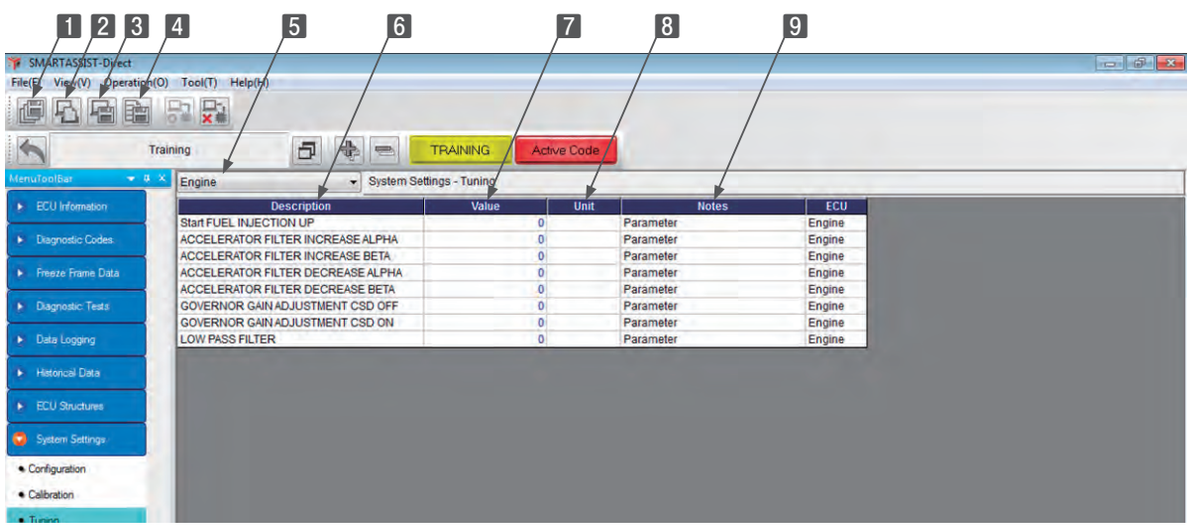


Figure 6-36 Parameter Adjustment Screen

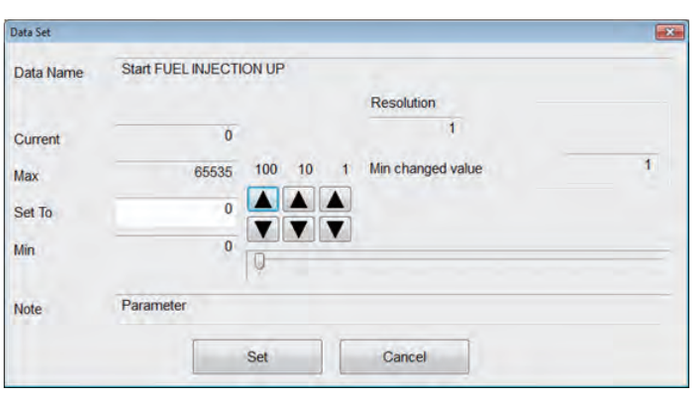


Figure 6-37 Example Change Screen

6.9.4 Initial Settings

This function allows to combine all feedback values of the sensor and set the ECU/controller accordingly when replacing or adjusting the ECU/controller or sensors. There are a number of types and subwindows with concrete instructions.

Important

- Initial settings involve many items that actually operate the product. Only personnel who have taken the SMARTASSIST-Direct training may perform the test, and must pay due attention to their surroundings.
  If not, the product may move unexpectedly and cause serious accidents.

Important

- In an emergency, turn off the power of the ECU/controller (turn the key switch to "Off") to stop the product.
- "Maintain the previous status" or "Return to the automatically controlled status" are operations in case that the initial setting is canceled under the below conditions, but which one is set varies by product.
  - **The buttons "Abort, "Stop" or "Cancel" were clicked.**
  - **The connection harness between the product and the PC is disconnected.**
  - **The SMARTASSIST-Direct software was exited.**

Important Reset

- Turn off the power of the ECU/controller after the initial settings are completed. (Turn the key switch to "Off".)
  Put the product to the initial settings with the SMARTASSIST-Direct, and the ECU/controller will change to initial settings mode. If you continue using the device in this state, the automatic control will become unoperational.

● Operation Toolbar

1  : Print the screen. (Refer to [6.2.2])

2  : Save a screenshot in BMP format. (Refer to [6.2.3])

● Function Buttons

3 [ ] : Select the displayed ECU/controller.

● Main Box

4 **Description** : Display the setting items.

5 **Control** : Clicking the Execute button opens a window to change the parameters.

6 **Notes** : Annotation box

7 **ECU** : Display the ECU.

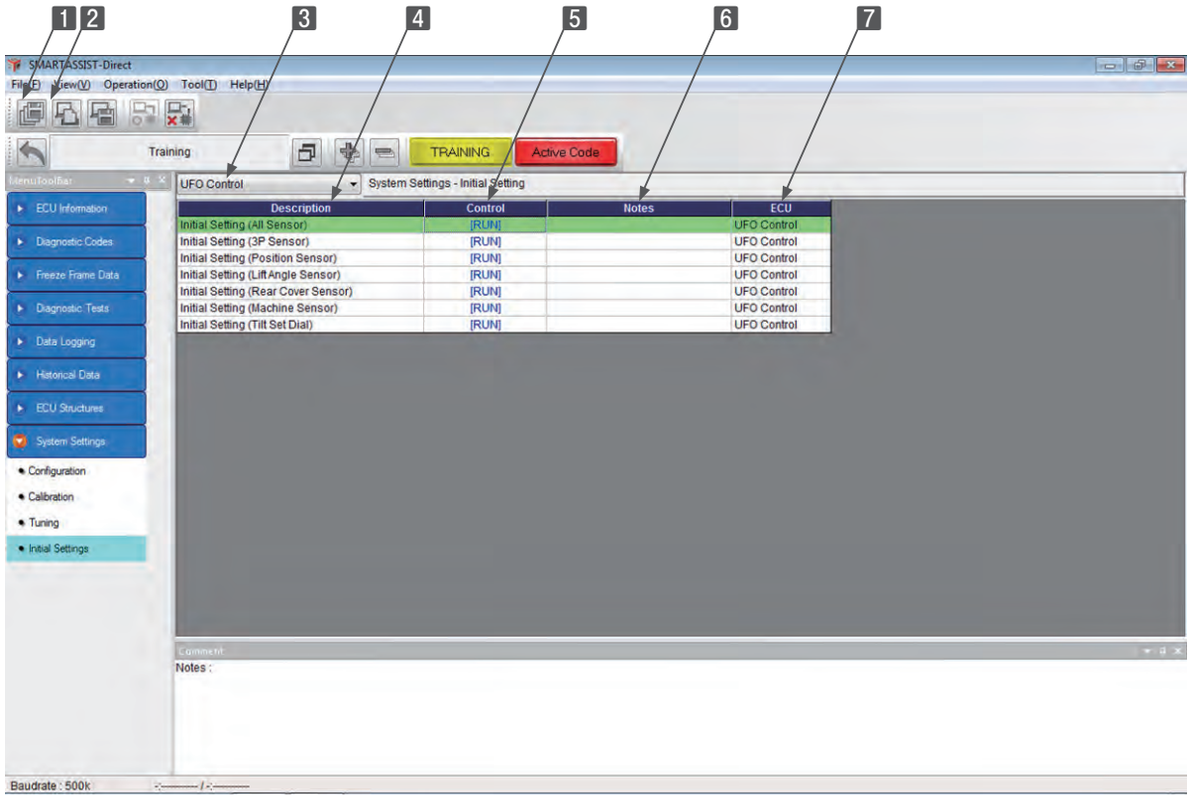


Figure 6-38 ECU Data Saving Screen

● Data Set Subwindow

7 **Data Name** : Display the name of the selected items.

8 **▲/▼** : Display operation buttons such as Up (▲) and Down (▼).

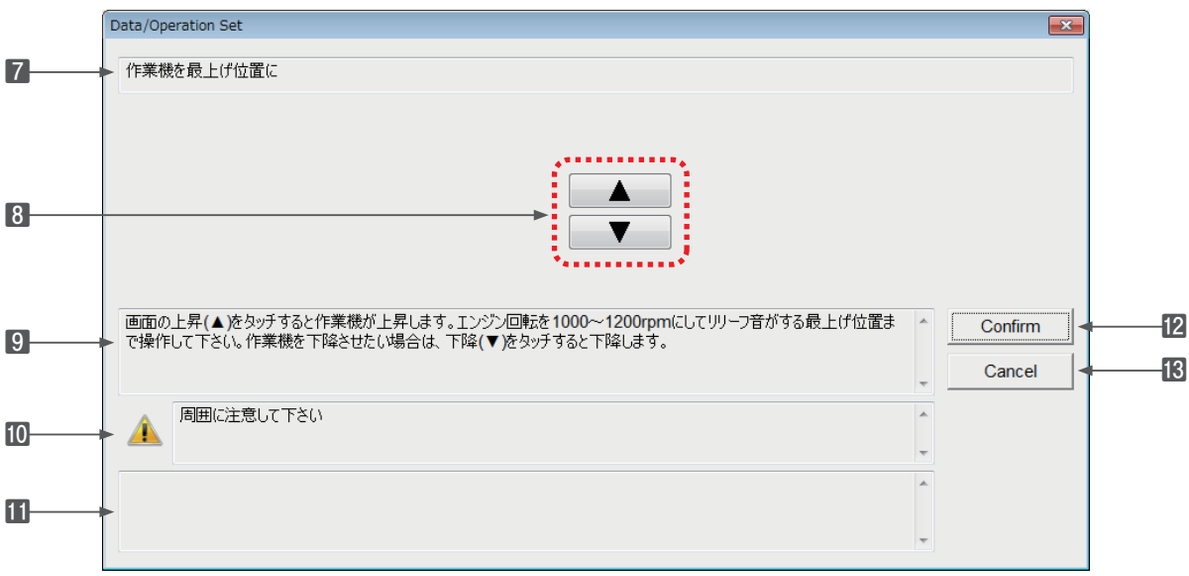
9 **Operation Message** : Display conditions set before operation.

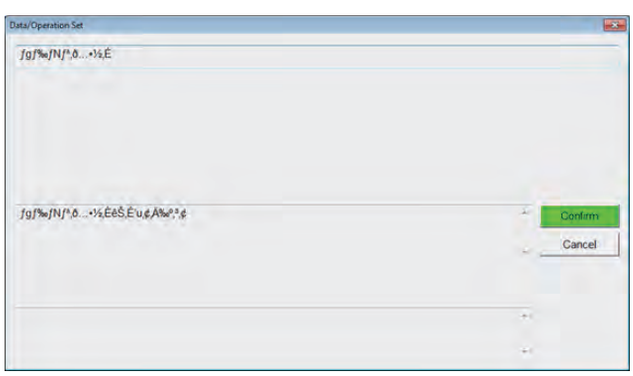
10 **Precaution Message** : If the operation is dangerous, a precaution reminder is displayed.

11 **Assistance Message** : If the forced operation is unavailable, a notice is displayed.

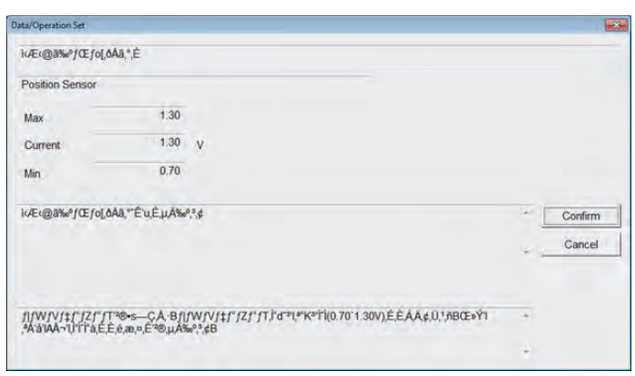
12 **Confirm** : This button is green when the operation conditions are met. Click to switch to the next screen.

13 **Cancel** : When aborting the initialization, the sub-window closes.





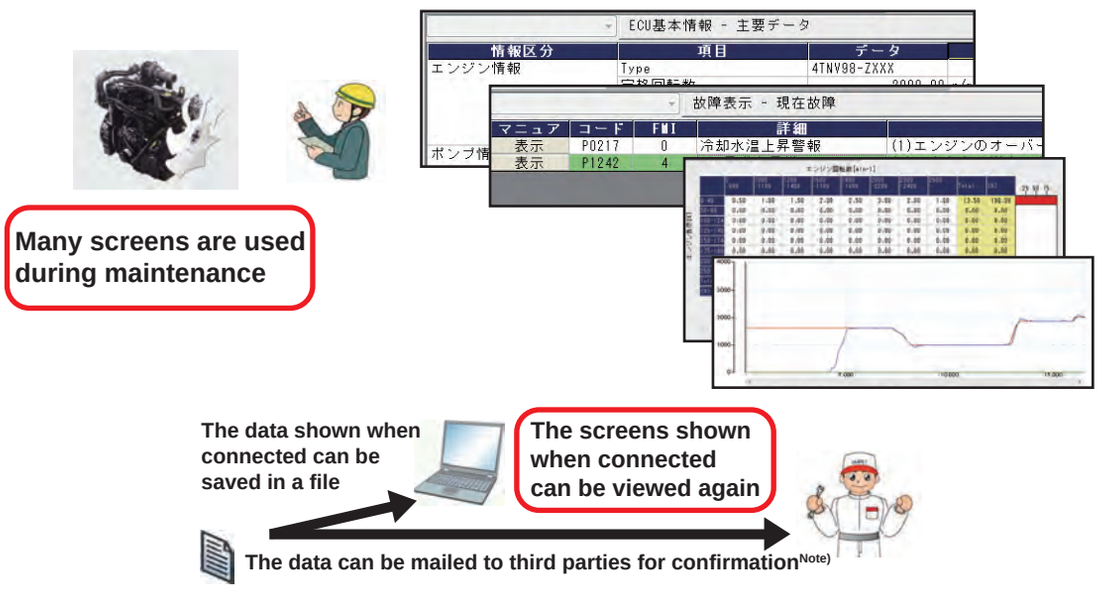
Example Screen 1



Example Screen 2

7. Error Diagnosis Data Save and Display Functions

7.1 Error Diagnosis Data Save and Display Functions



Note **It is necessary to import/export the data management function.**

The ECU storage data for error diagnosis screen display and the three types of measurement execution data can be saved.

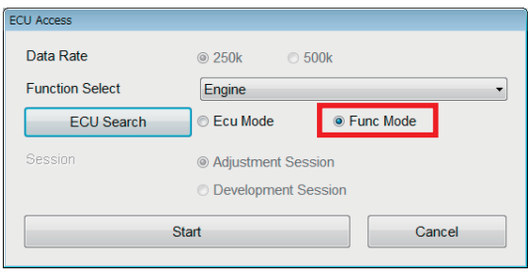
- **Displaying the Error Diagnosis Screen**
  - ECU Storage Data
- **Measurement Execution Data**
  - Forced Operation (Graph)
  - Forced Operation Hysteresis (Graph)
  - Data Logging

Note For display, only the save data in the product category selected in the start menu can be selected.

Example: Even a user with a license for both agricultural machinery and construction machinery cannot display the save data for "Construction Machinery" when "Agricultural Machinery" is selected in the start menu.

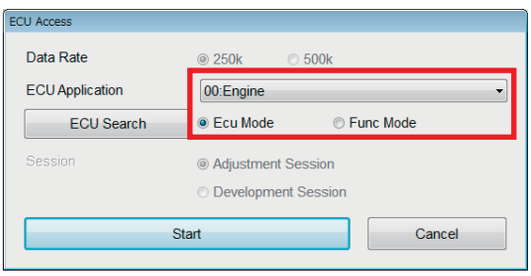
7.2 Saving the ECU Data for Screen Display

1 If the product allows selecting the screen display method of the error diagnosis, the content of the data to be saved is different depending on the selected screen display method.



Sort By Function

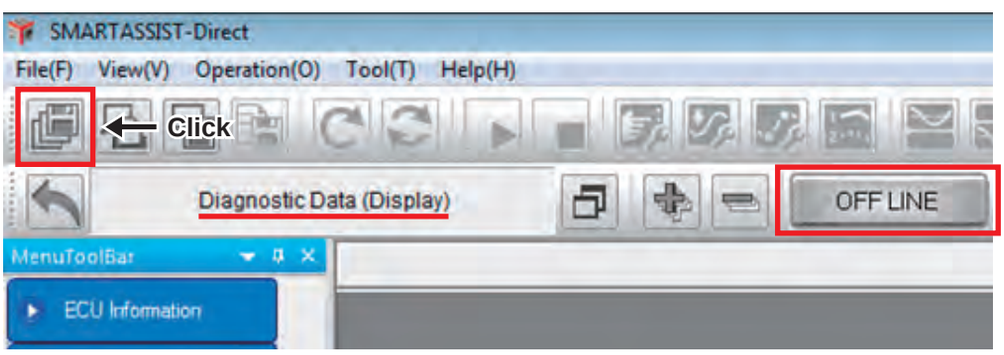
Save the connected ECU's screen display data.



Sort By ECU

Save the selected ECU's screen display data only.

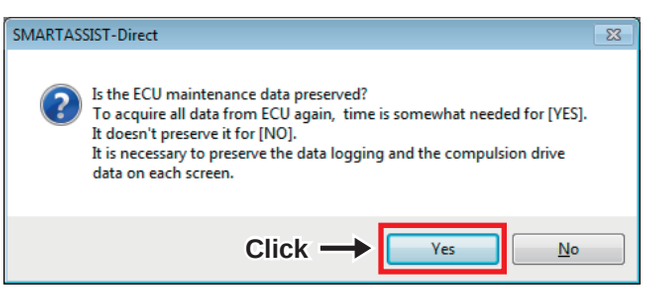
2 Click the "Save ECU Storage Data" button after executing the error diagnosis.



Note The data cannot be saved when the product is not connected.

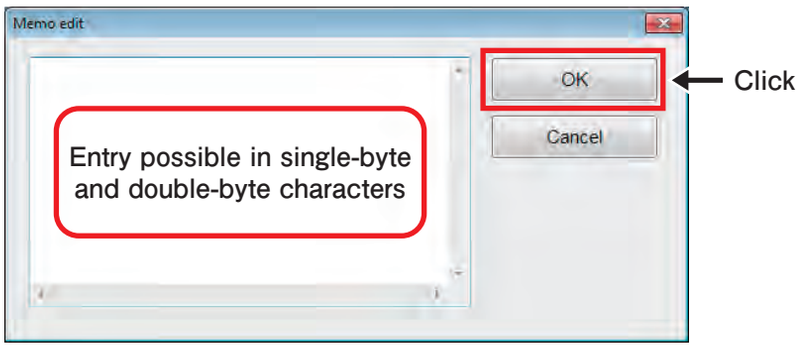
The save confirmation screen is displayed.

Click "Yes" to save the data.



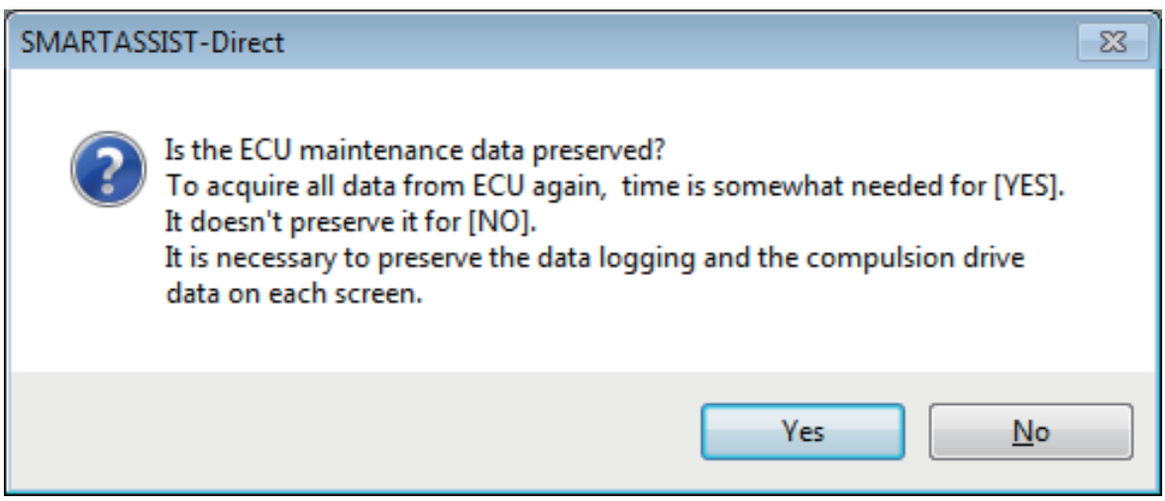
The memo entry screen is displayed.

Enter a memo and click "OK".

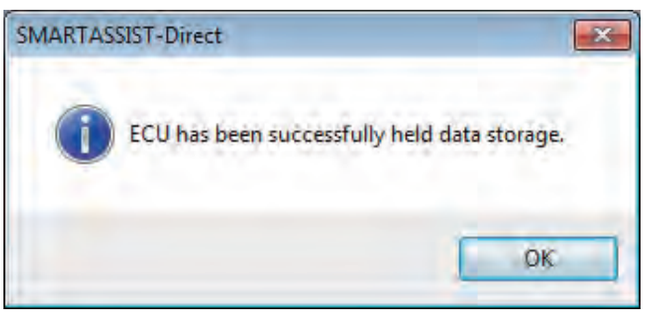


Point Even if you select "Cancel" in the memo screen, the error diagnosis data is saved. You can edit the memo with the data management function after saving the data.

The communication with the product starts and the data is collected and saved.

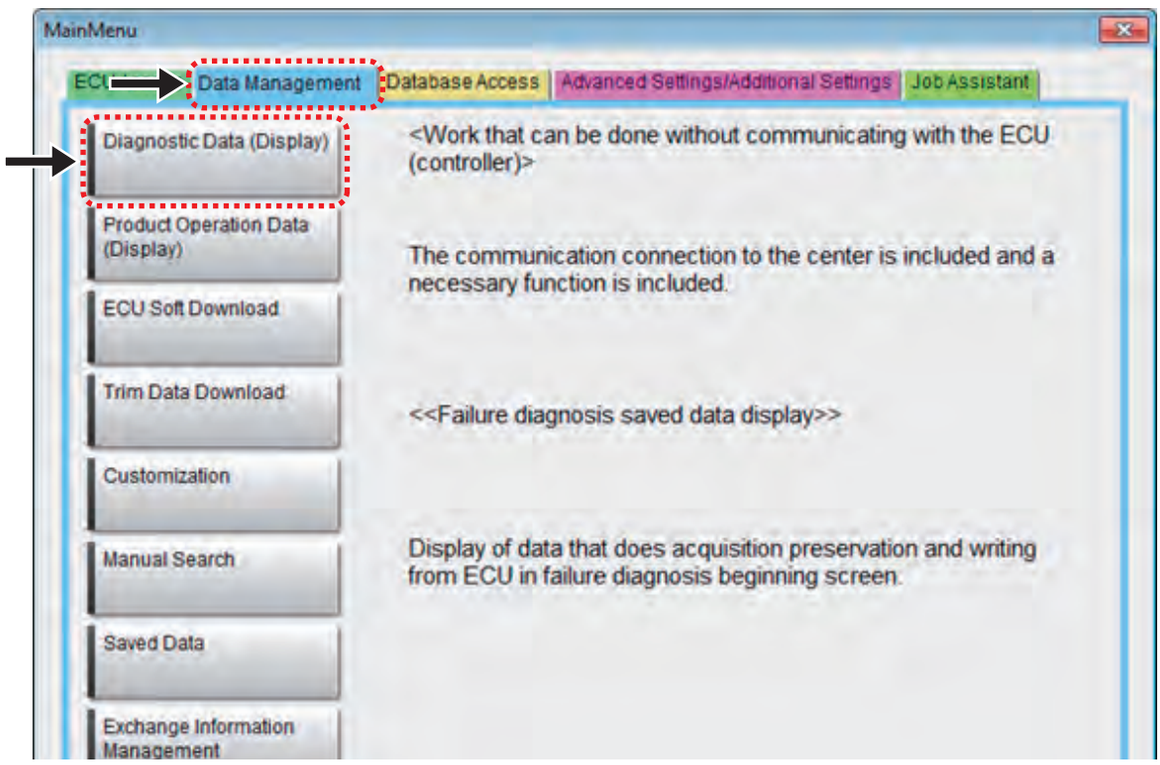



Wait Information
YANMAR DIAGNOSTIC TOOL
SMARTASSIST
Direct
YANMAR
Copyright(C) YANMAR CO.,LTD. 2011
Getting information so please be patient.
Communicating UFO Control ECU 1/1
The version of the service tool is acquired.
Cancel


SMARTASSIST-Direct
ECU has been successfully held data storage.
OK

7.3 Displaying the Saved ECU Display Data

Select "Diagnostic Data (Display)" of the tab "Operations with ECU Disconnected".



The ECU storage data for screen display and the three types of the diagnosis execution result selection screen are displayed.

1 Select the data type "ECU Storage Data".

2 Machine model selected in the main menu at the time of saving

3 Model

4 Machine number

5 Date when data was saved

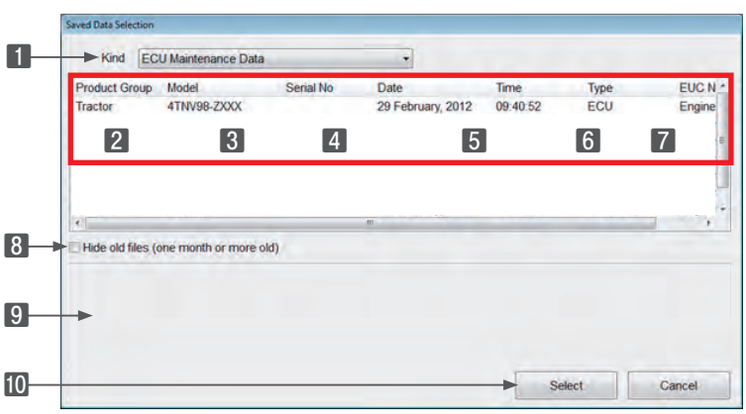
6 Display class ("By Function" or "By ECU") selected at the time of saving

7 ECU name of the original data

8 Display selection for the data saved more than 1 month ago

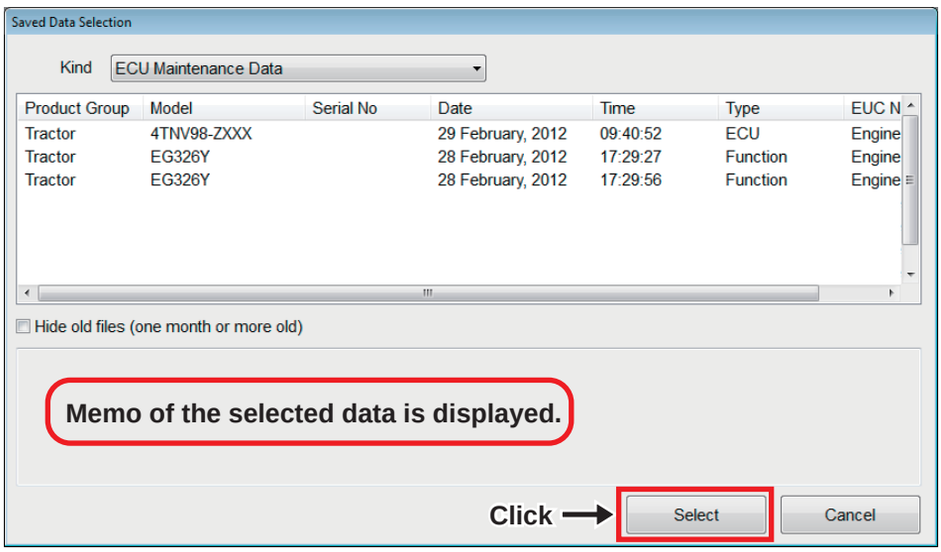
9 Memo display box at the time of saving

10 Selection button



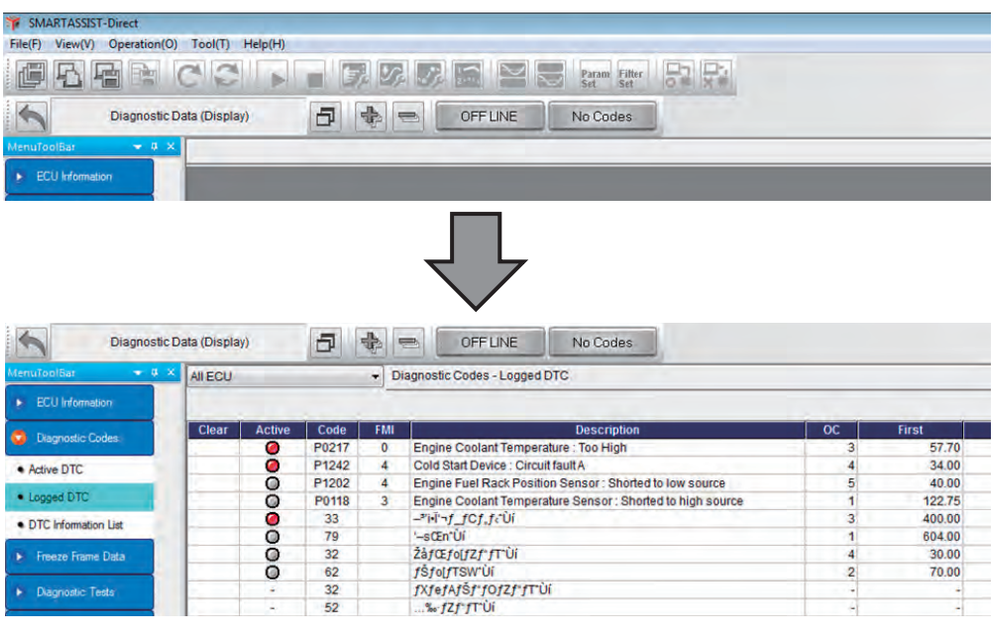
Remark Click 2 - 7 within the red frame and change the sorting order (ascending/descending) of the display.

Select the data you want to display and click the "Select" button.



The error diagnosis data screen appears.

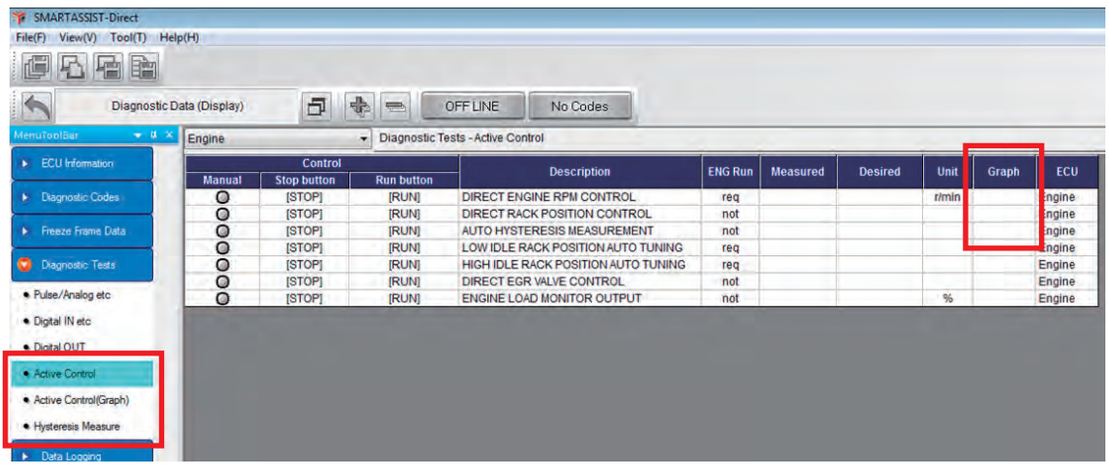
Open the item that you want to confirm. The saved information is displayed.



To change the save data that you want to display, click the "Read ECU Save Data" button. The data selection screen is displayed.

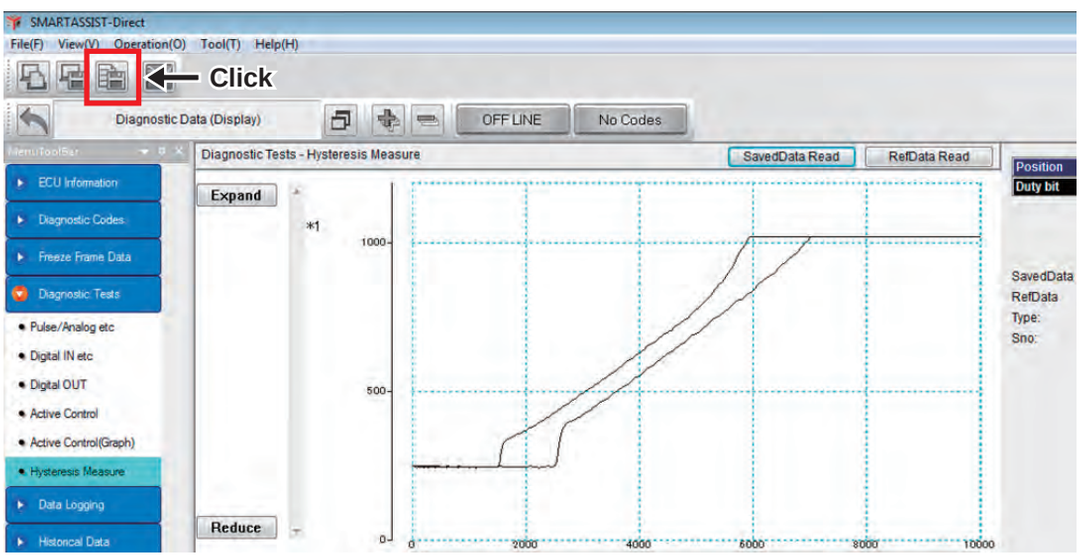
7.4 Saving the Forced Operation and Forced Operation Hysteresis Measurement Execution Data

The "Forced Operation" function allows to save the measurement data for items with "Graph" output.



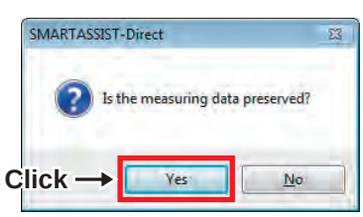
Click the "Save Measurement Data" button on the "Forced Operation Graph" or "Forced Operation Hysteresis Graph" screen after executing the forced operation.

When the graph is not displayed, you cannot click the button.



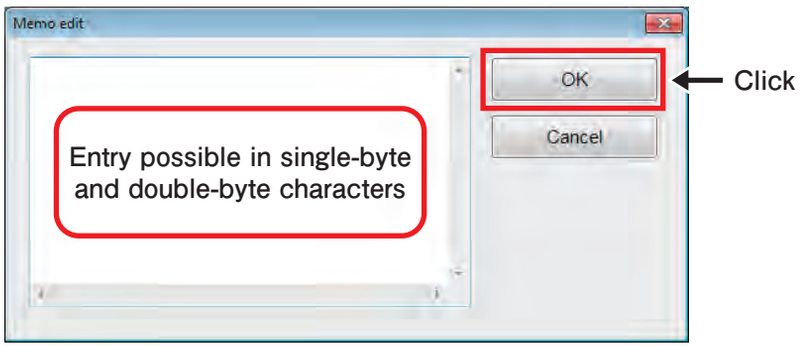
The save confirmation screen is displayed.

Click "Yes" to save the data.



The memo entry screen is displayed.

Enter a memo and click "OK".

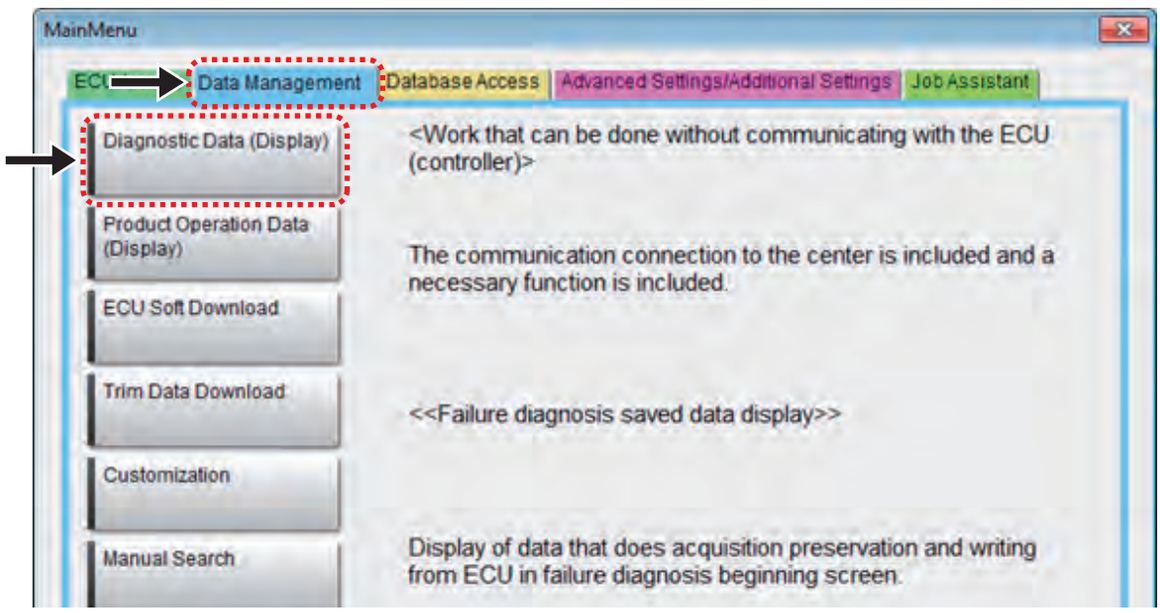


Point Even if you select "Cancel" in the memo screen, the measurement data is saved. You can edit the memo with the data management function after saving the data.

7.5 Displaying the Saved Forced Operation and Forced Operation Hysteresis Measurement Execution Data

7.5.1 Displaying the Data

Select "Diagnostic Data (Display)" of the tab "Operations with ECU Disconnected".



The ECU storage data for screen display and the three types of the diagnosis execution result selection screen are displayed.

1 Select the data types "Forced Operation Data" and "Forced Operation Hysteresis Data".

2 Machine model selected in the main menu at the time of saving

3 Model

4 Machine number

5 Date when data was saved

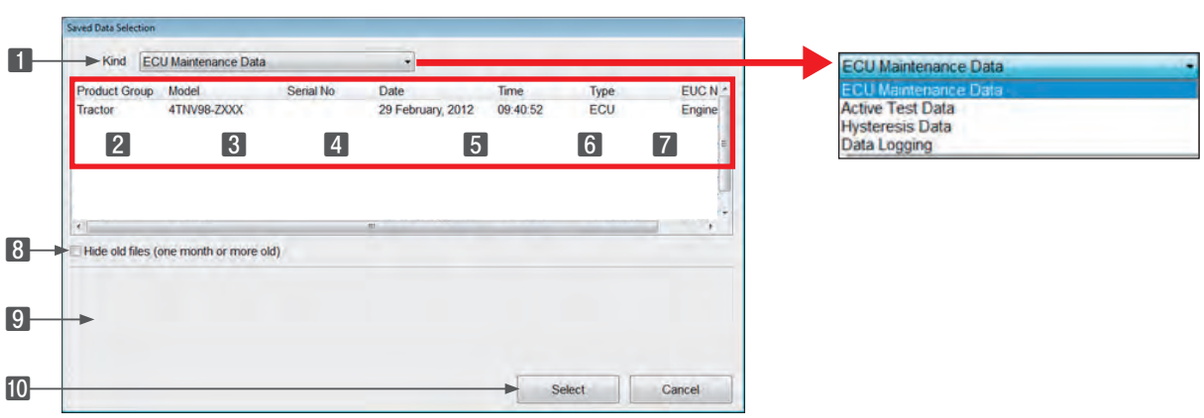
6 Display class ("By Function" or "By ECU") selected at the time of saving

7 ECU name of the original data

8 Display selection for the data saved more than 1 month ago

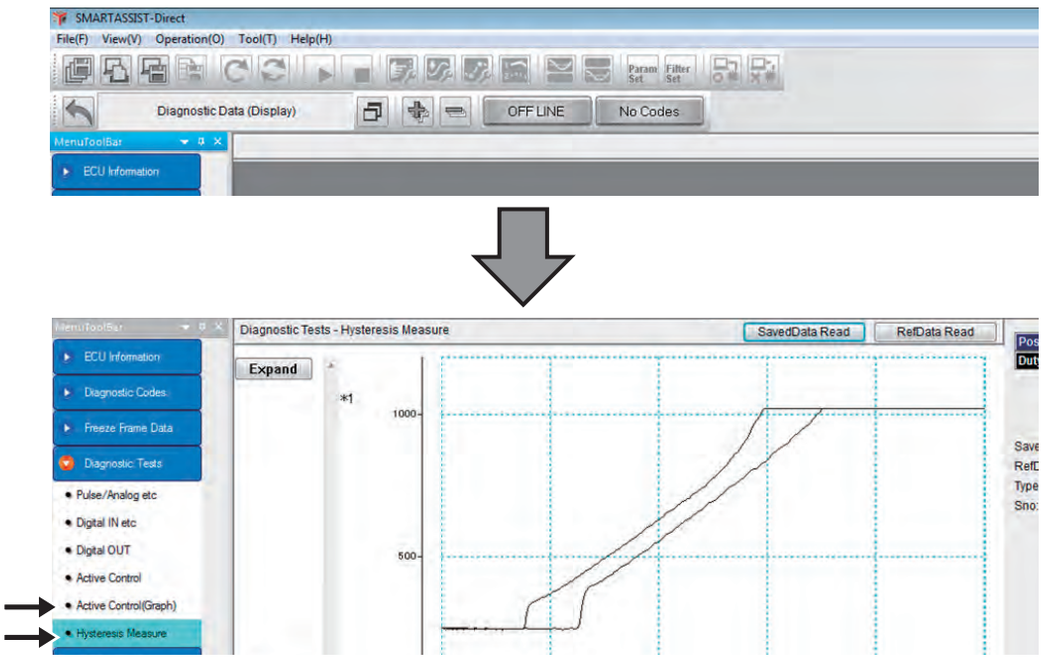
9 Memo display box at the time of saving

10 Selection button



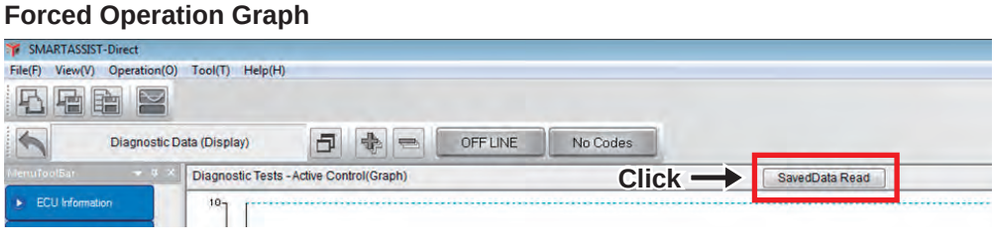
Point Click 2 - 7 within the red frame and change the sorting order (ascending/descending) of the display.

The error diagnosis data (view) screen appears after selecting the data. Open "Forced Operation Graph" and "Forced Operation Hysteresis Graph" of "Diagnosis Test" and check the content.

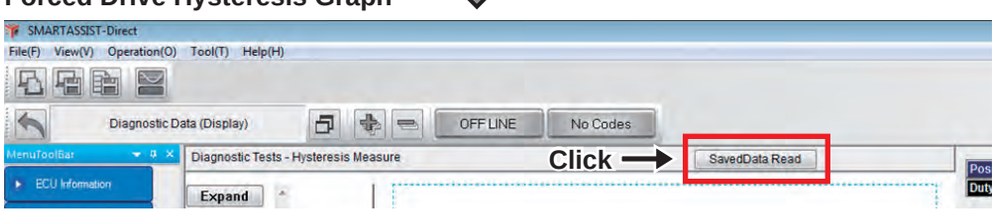


To change the save data that you want to display, click the "SavedData Read" button. The data selection screen is displayed.

Forced Operation Graph



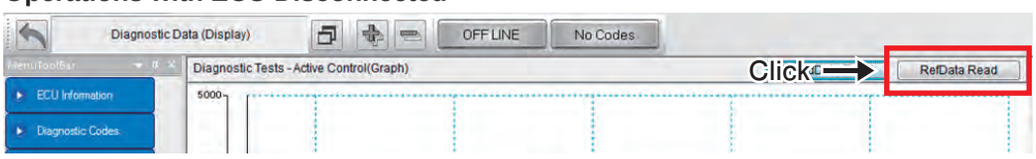
Forced Drive Hysteresis Graph



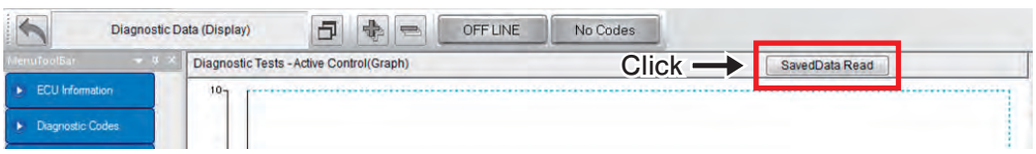
7.5.2 Calling Up the Reference Data

If the save data is on your PC, call up the "RefData" after "Execute Measurement" or "SavedData Read" to match the data.

Operations with ECU Disconnected



Operations with ECU Connected



Point

- The reference data is displayed in a different line color.
- "RefData Read" can be selected in the tab screen "ECU Connection" in the main menu.

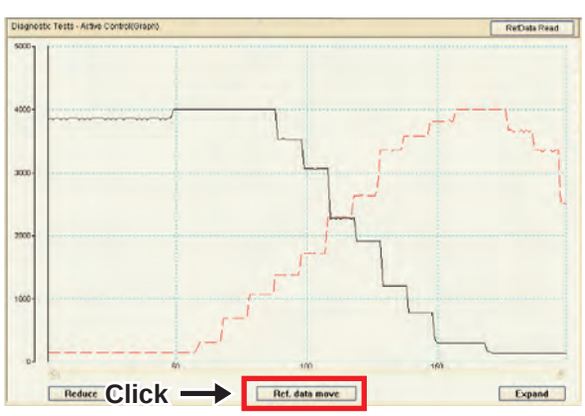
7.5.3 Moving the Display Location of the Reference Data

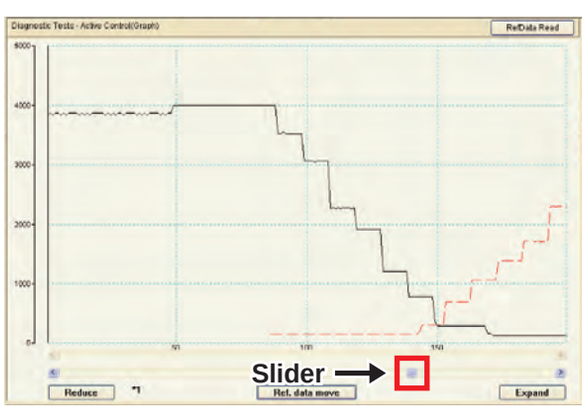
The "Reference Data" in the overlap display can be moved horizontally.

Use this to compare characteristic parts of the data.

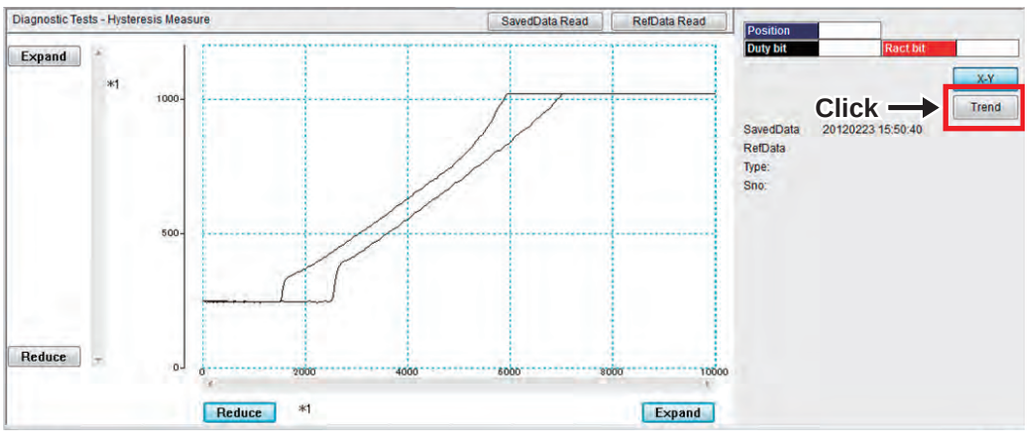
Remark In the "Forced Operation Hysteresis Graph", the "Reference Data" can be moved with the "Trend Graph" display.

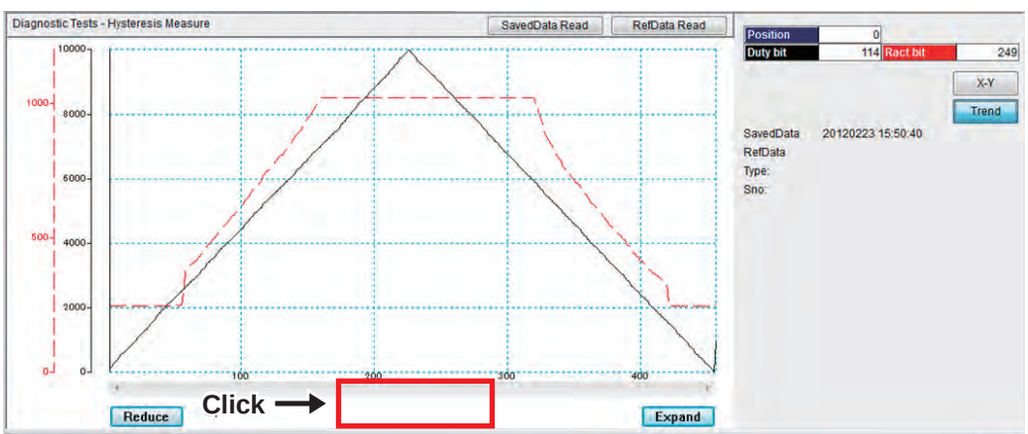
Forced operation graph: example of moving the reference data horizontally

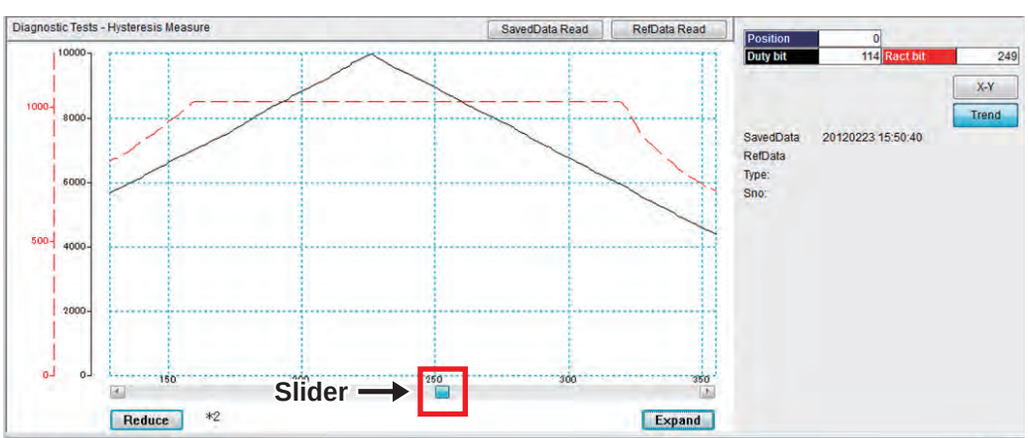




Forced operation hysteresis graph: example of moving the reference data horizontally



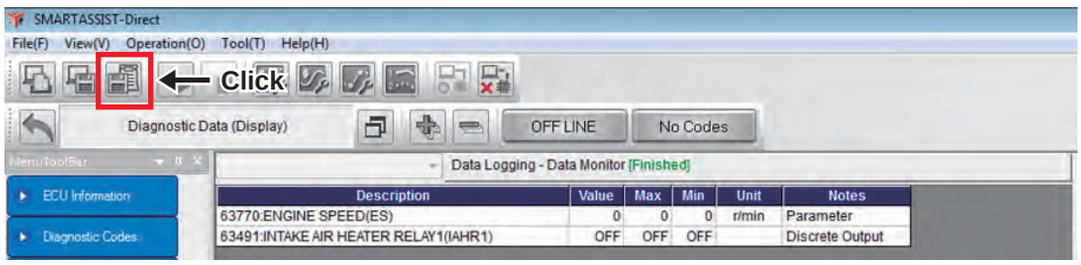




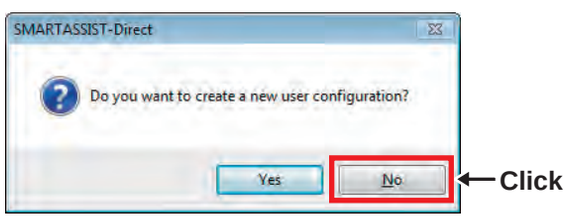
7.6 Saving the Data Logging Measurement Data

The data logging function allows to save the measurement data in the "Data Monitor" or "Trend Graph" screen.

1 Click the "Save Measurement Data" button.



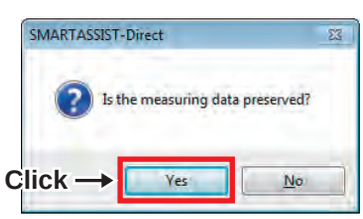
2 A screen is displayed to confirm that you want to create a user settings file for the measurement data. Note)
Click "No" to only save the measurement data.



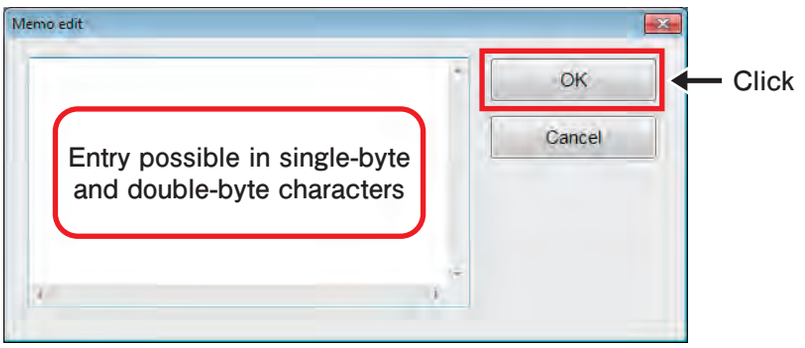
Note

- When the package data set is performed on the "Diagnosis Selection Window", this screen is not displayed.
- **For details on creating the user settings file, refer to "User Settings for Package Data".**

3 The confirmation screen for saving the measurement data is displayed. Click "Yes".

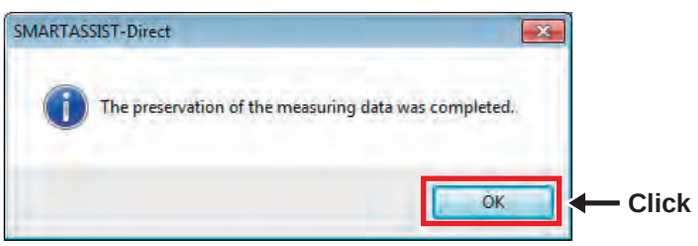


4 The memo entry screen is displayed. Enter a memo and click "OK".



Point Even if you select "Cancel" in the memo screen, the measurement data is saved. You can edit the memo with the data management function after saving the data.

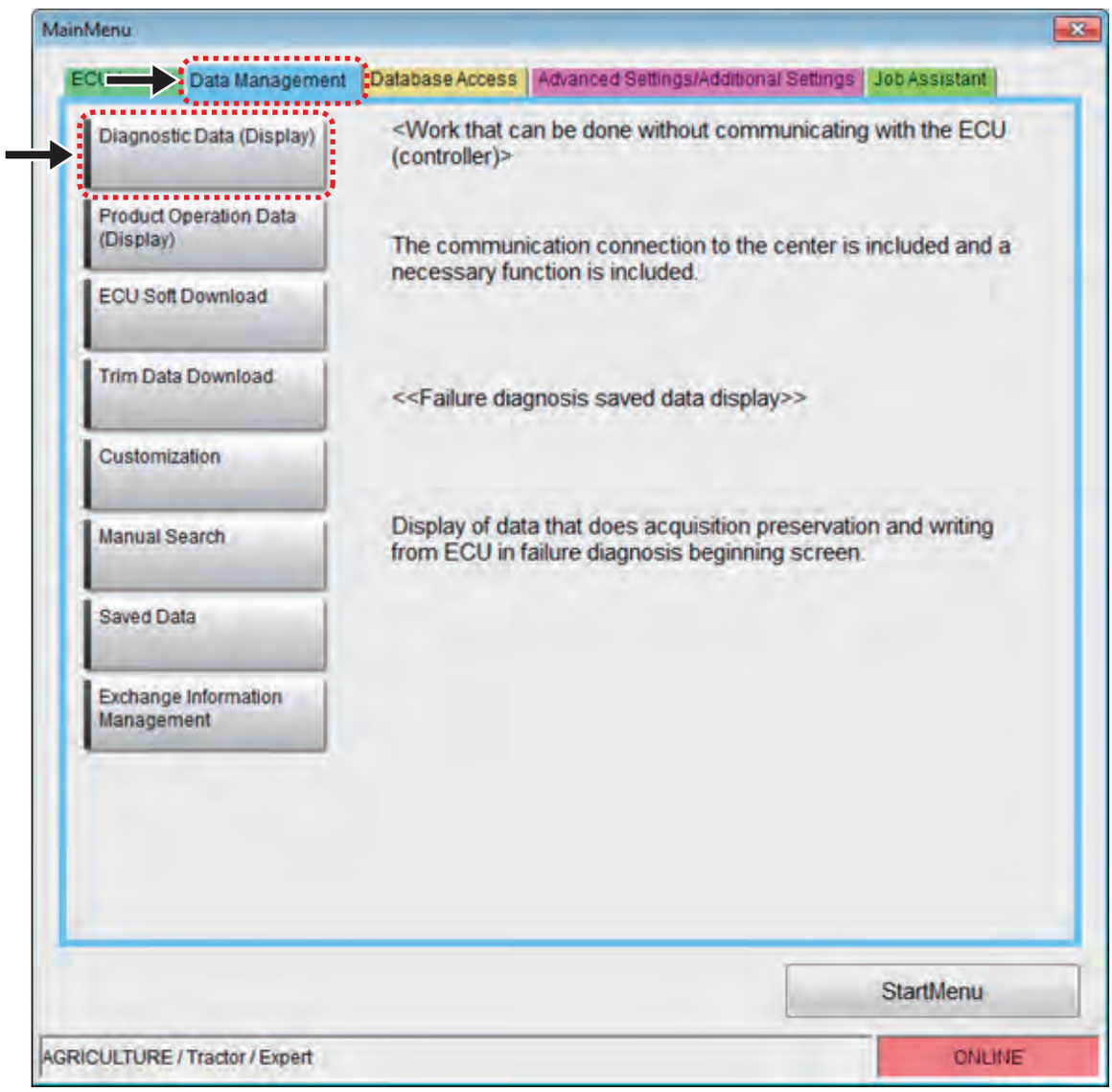
5 The Save Complete screen is displayed. Click "OK".



7.7 Displaying the Saved Data Logging Measurement Data

7.7.1 Displaying the Save Data

Select "Error Diagnosis Data (View)" of the tab "Operations with ECU Disconnected".



Click the "Display Reference Data" button. The selection screen appears. Select the save data that you want to display.

1 Select the "Data Logging" data type.

2 Product category selected in the main menu at the time of saving.

3 Model

4 Machine number

5 Date when data was saved

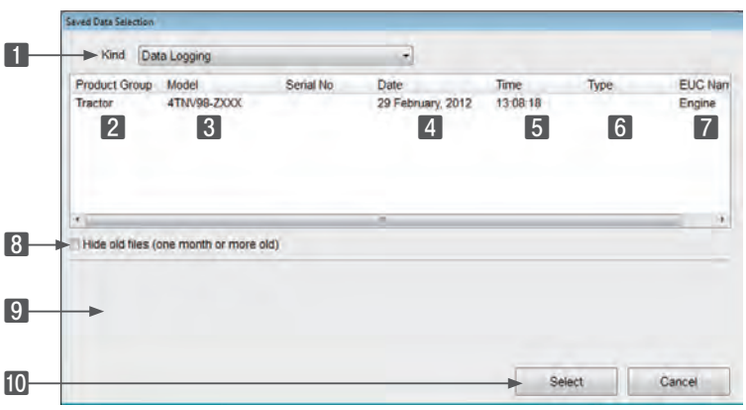
6 Not displayed

7 ECU name of the original data

8 Display selection for the data saved more than 1 month ago

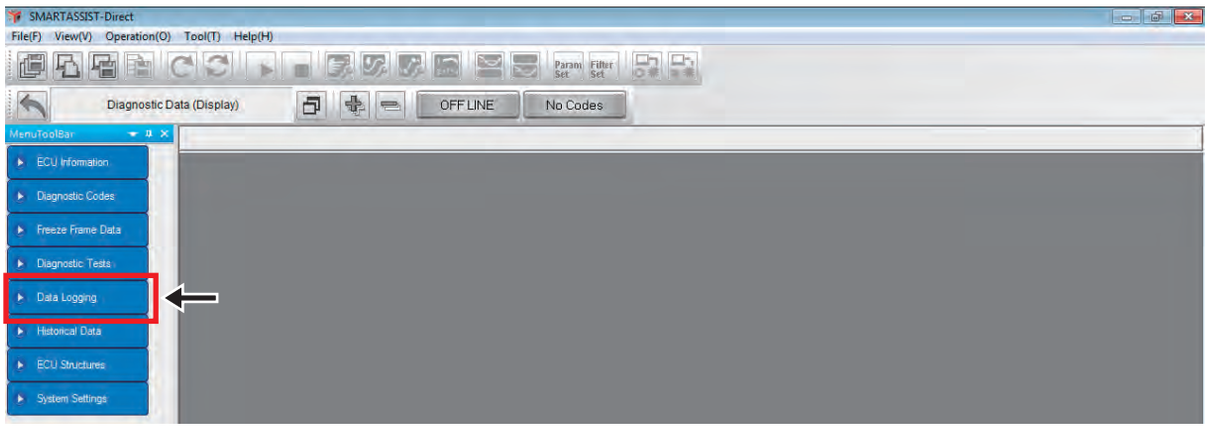
9 Memo display box at the time of saving

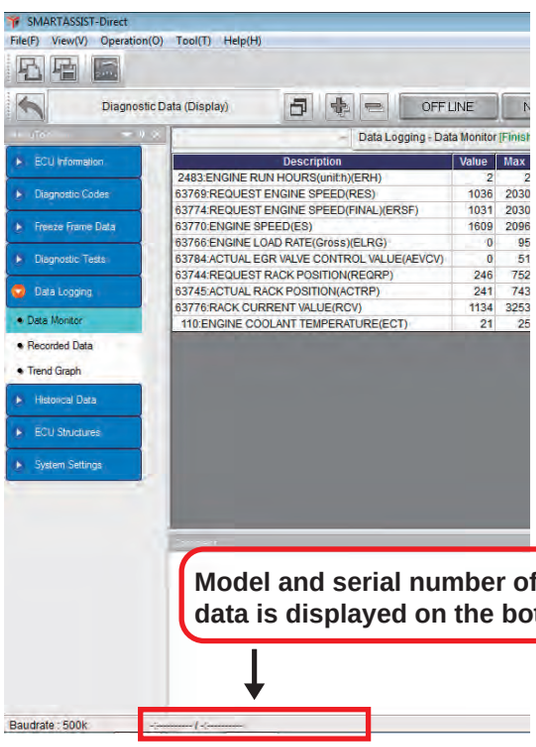
10 Selection button



The error diagnosis data (view) screen appears after selecting the data.

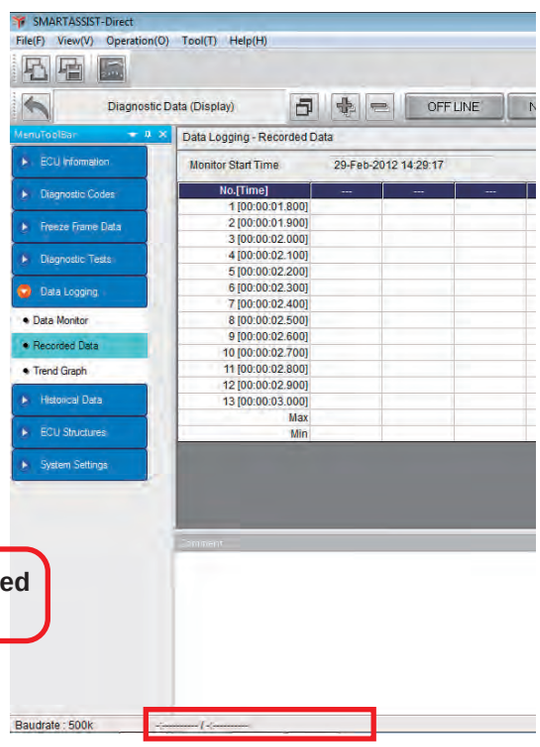
Open the data logging menu and confirm the content.





Data monitor screen

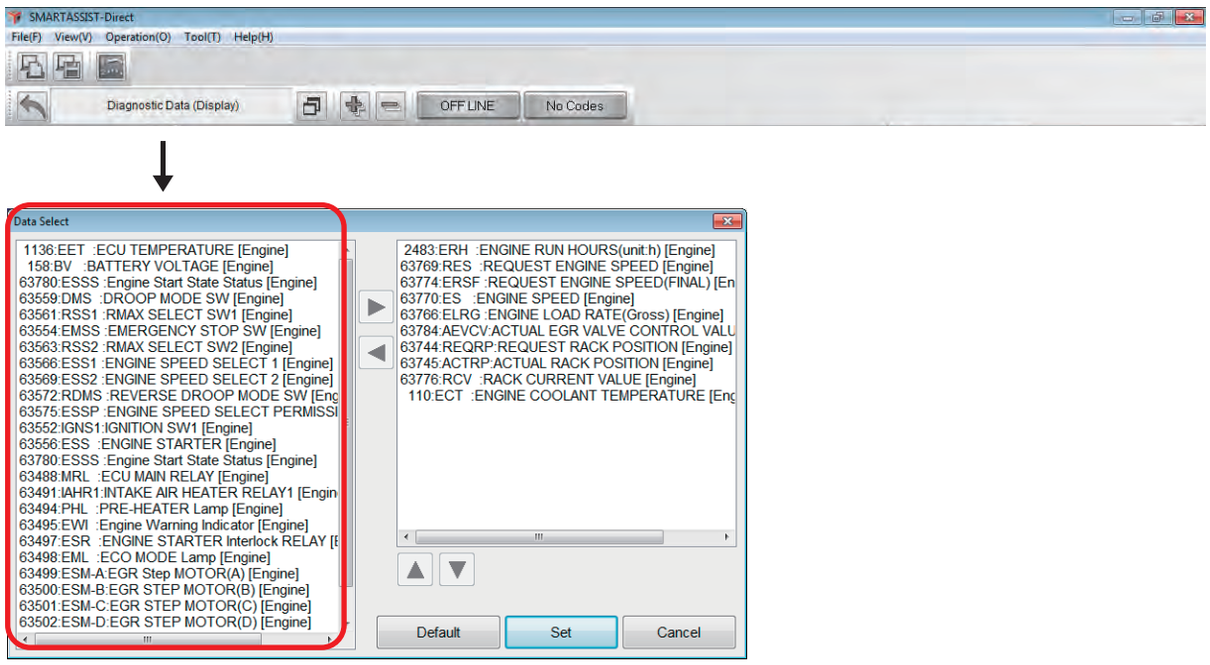
Model and serial number of the selected data is displayed on the bottom



Save data screen

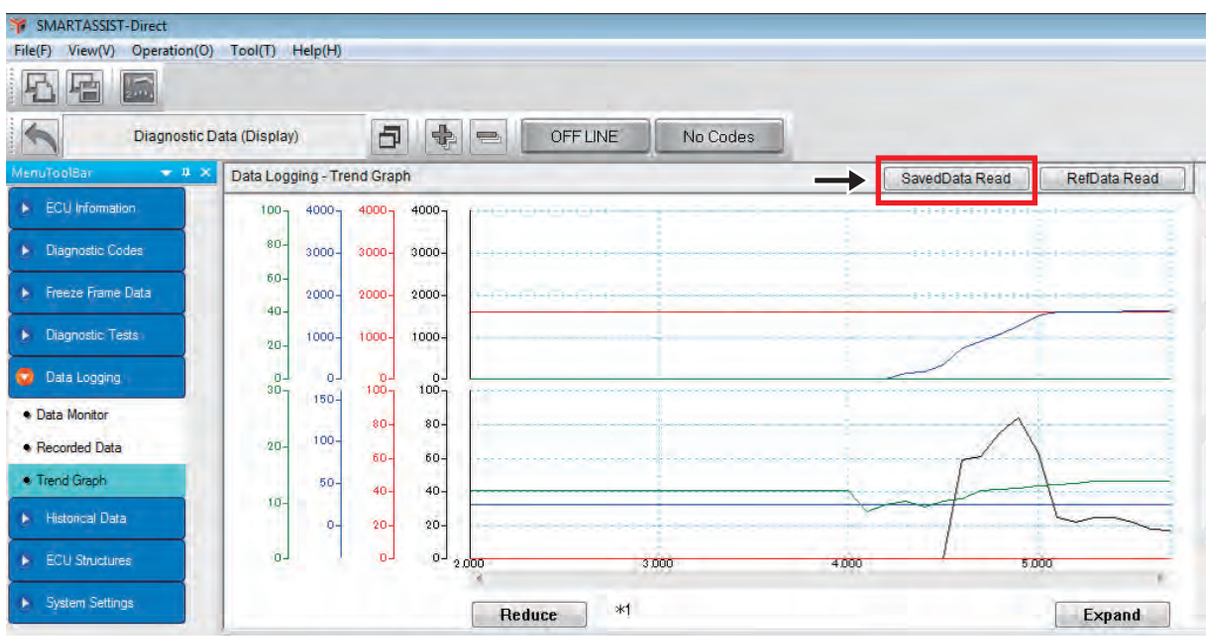
In the saved measurement data, not only the display items at the time of storing but all logging data is included. The displayed data can be changed by clicking the "Data Settings" button.

For details on the selection screen, refer to [6.6.2 Overview of the Data Sampling Operation].



Point **Items that are not displayed in the data selection box cannot be saved.**

To change the save data that you want to display, click the "SavedData Read" button on the trend graph screen. The data selection screen is displayed.



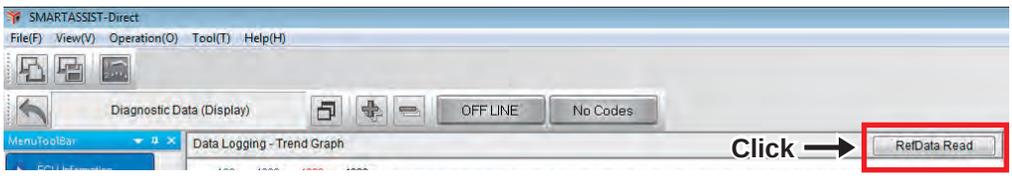
Trend graph screen

7.7.2 Calling Up the Reference Data

If the save data is on your PC, read the "Reference Data" after "Execute Measurement" or "SavedData Read" to sort the data vertically.

Operations with ECU Disconnected

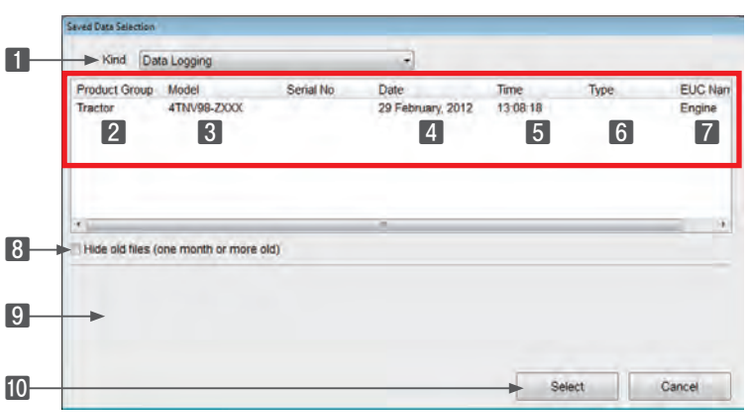
Operations with ECU Connected



Point **"RefData Read" can be operated on the "Error Diagnosis (Execution)" screen in the** tab "ECU Connection" in the main menu.

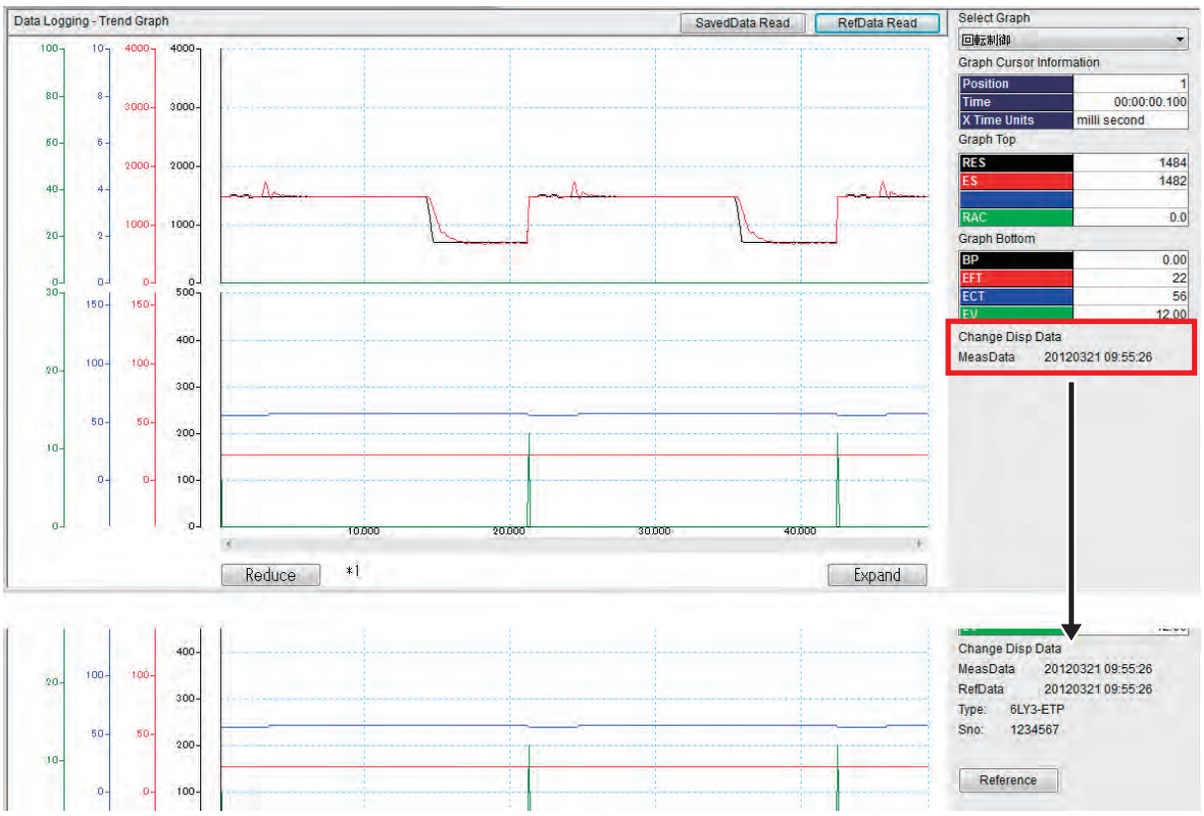
Click the "Display Reference Data" button. The selection screen appears. Select the save data that you want to display.

1 Select the "Data Logging" data type.
2 Machine model selected in the main menu at the time of saving
3 Model
4 Machine number
5 Date when data was saved
6 Not displayed
7 ECU name of the original data
8 Display selection for the data saved more than 1 month ago
9 Memo display box at the time of saving
10 Selection button



Point Click 2 - 7 within the red frame and change the sorting order (ascending/descending) of the display.

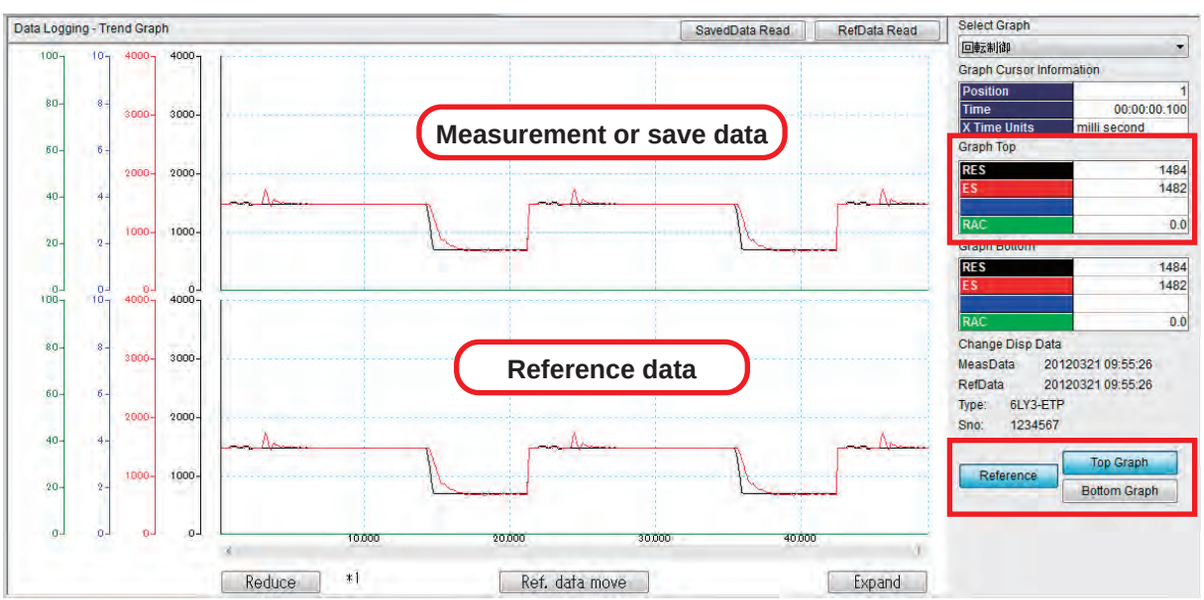
The reference data and the "Comparison Display" button appear.



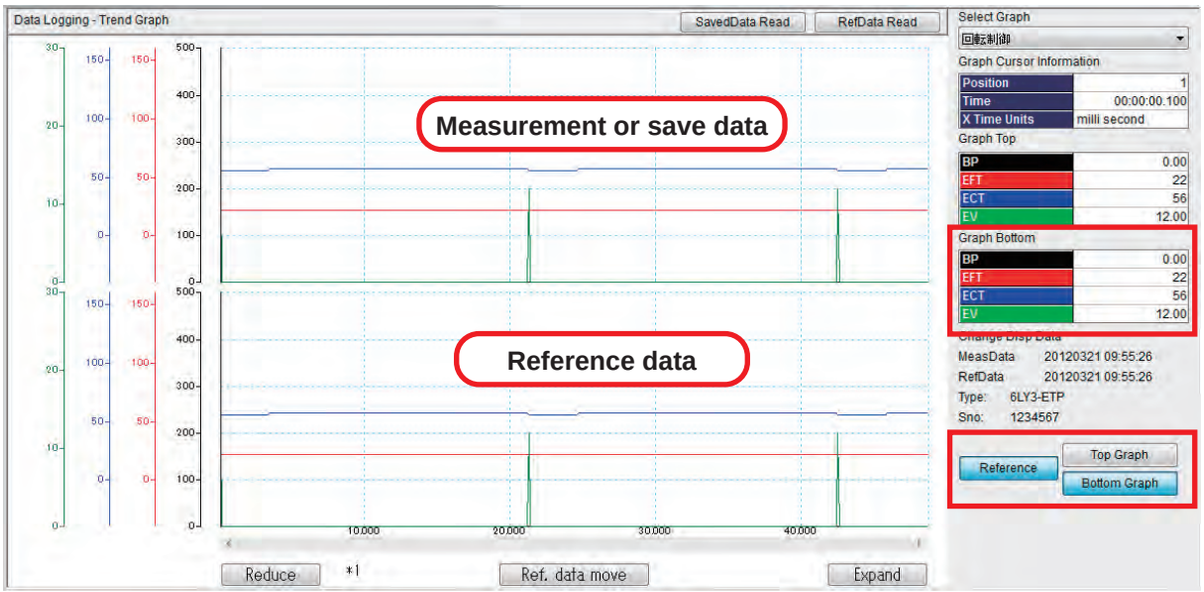
Click the "Comparison Display" button. The "Top Graph" and "Bottom Graph" buttons appear.

Select the graph (top or bottom) for the comparison display.

Display example when "Top Graph" is clicked



Display example when "Bottom Graph" is clicked



7.7.3 Moving the Display Location of the Reference Data

The display location of the graph for the "Reference Data" (bottom graph) can be moved horizontally.

Use this to compare characteristic parts of the graph.

Example of horizontal movement for the bottom graph

To change the data that is displayed in a graph, refer to "[8. SCIB Graph Function]".

8. SCIB Graph Function

The graph display and basic operation function have the common specification on the screen as shown below.

- "Data Before/After Error" - "Trend Graph"
- "Diagnosis Test" - "Forced Operation Graph" "Forced Operation Hysteresis Graph"
- "Data Logging" - "Trend Graph"

8.1 Graph Settings

The graph settings have the following characteristics:

- With the and buttons on the control tool bar, the two graph screens on the top and the bottom can be set, respectively.

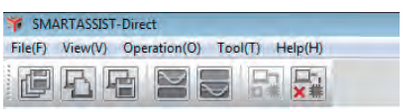


Figure 8-1 Data Before/After Error

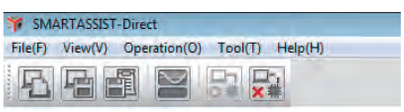


Figure 8-2 Diagnosis Test

Figure 8-3 Data Logging

Note In "Diagnosis Test" of "Forced Operation Graph" "Forced Operation Hysteresis Graph", the graph is displayed on one screen.

- Four line graphs can be displayed in one graph.
- "Analog mode" or "Digital mode" can be selected in the graph display.

Point The separate mode can be set for the top and the bottom screens.

Figure 8-4 Graph display example (top: digital, bottom: analog)

- You cannot display the combination of analog/digital data within the same graph screen.

- The minimum and maximum graph values can be set in the analog mode.
- The content of the graph settings can be saved as the user settings file. The graph settings can be called up for problem analysis.
- Click the "Editing" button to perform the graph settings.

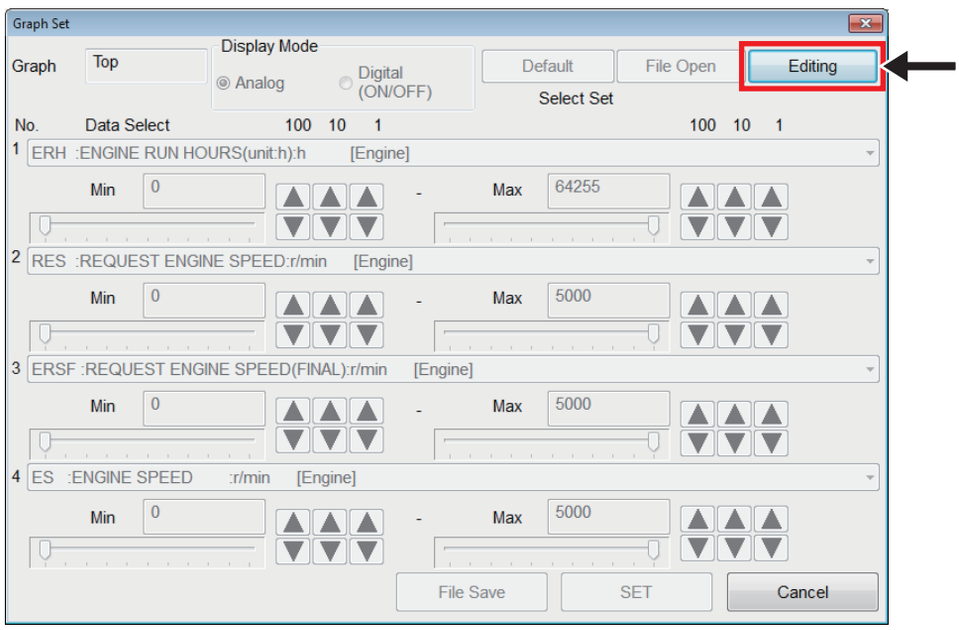


Figure 8-5 Graph settings screen

8.1.1 Analog Mode Basic Operation

The basic operation in the analog mode is as follows:

1 Graph to be set : "Top" and "Bottom" are displayed.
In case of the screen with only one graph, the "Top" is displayed.

2 Analog mode selection : Click **Analog** of the display mode to insert a checkmark.

3 Default : All items are automatically set to the default SMARTASSIST-Direct settings.

4 Read file : The saved settings are read.
(Refer to [8.1.3 Saving and Calling Up the Settings Value] on page 165.)

5 Data selection : Select the data that you want to display. Set up to 4 data sets.

6 Minimum value : Set the minimum graph value with the lever button and ▲ / ▼ buttons.

7 Maximum value : Set the maximum graph value with the lever button and ▲ / ▼ buttons.

8 Saving files : Save the entered values to the settings file.
(Refer to [8.1.3 Saving and Calling Up the Settings Value] on page 165.)

9 Set : Set the entered values and display the graph.

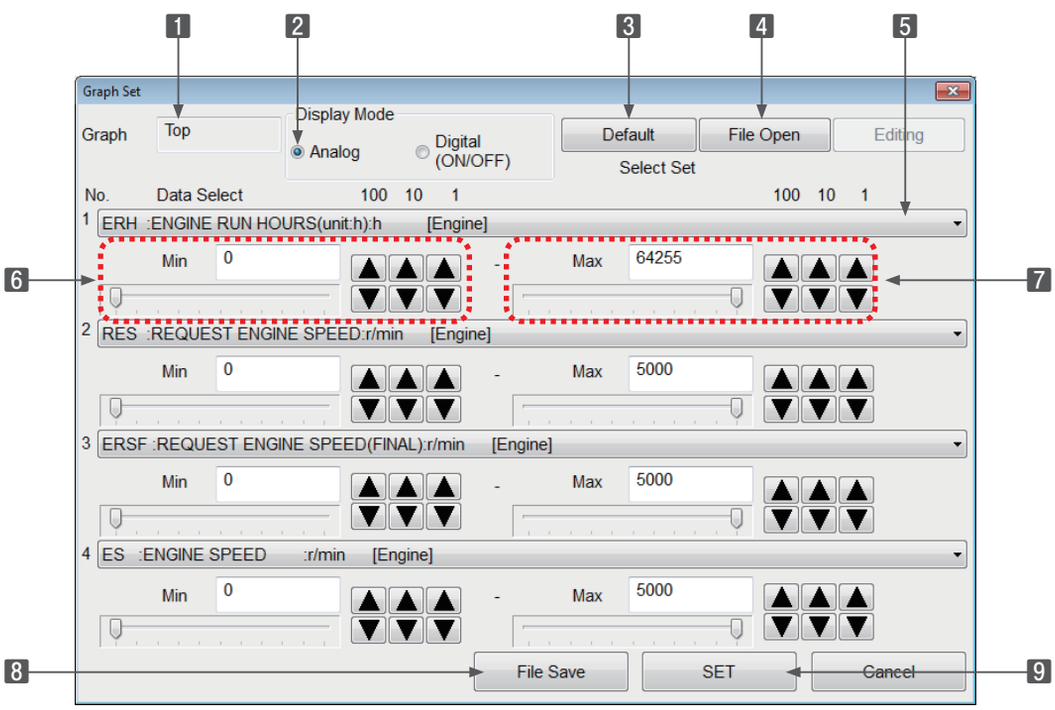
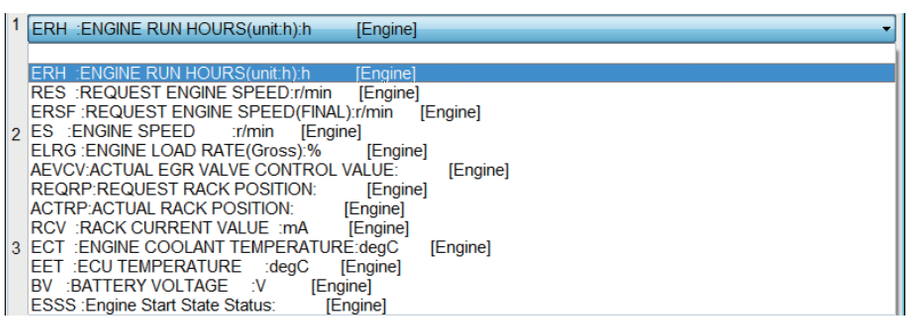


Figure 8-6 Analog mode basic operation screen

Click 5 to display the selectable data items.



8.1.2 Digital mode

Use this mode to display the ON/OFF information of digital input/output and control flag. The available data can be confirmed at the ECU ID ([6.8.2 Digital Signal (Expert Function)] on page 129).

Point As the graph is displayed in "0" or "1" in the digital mode, it is not required to set the **minimum/maximum values. (Unable to enter.)**

1 Digital mode : Click **Digital** of the display mode to insert a checkmark.

2 Data selection : Select the data that you want to display. Set up to 4 data sets.

3 Settings confirmation : **Set** Click the button to confirm the settings and display the graph.

Saving the file and opening operation can be performed in the same procedures as the analog mode.
(Refer to [8.1.3 Saving and Calling Up the Settings Value] on page 165.)

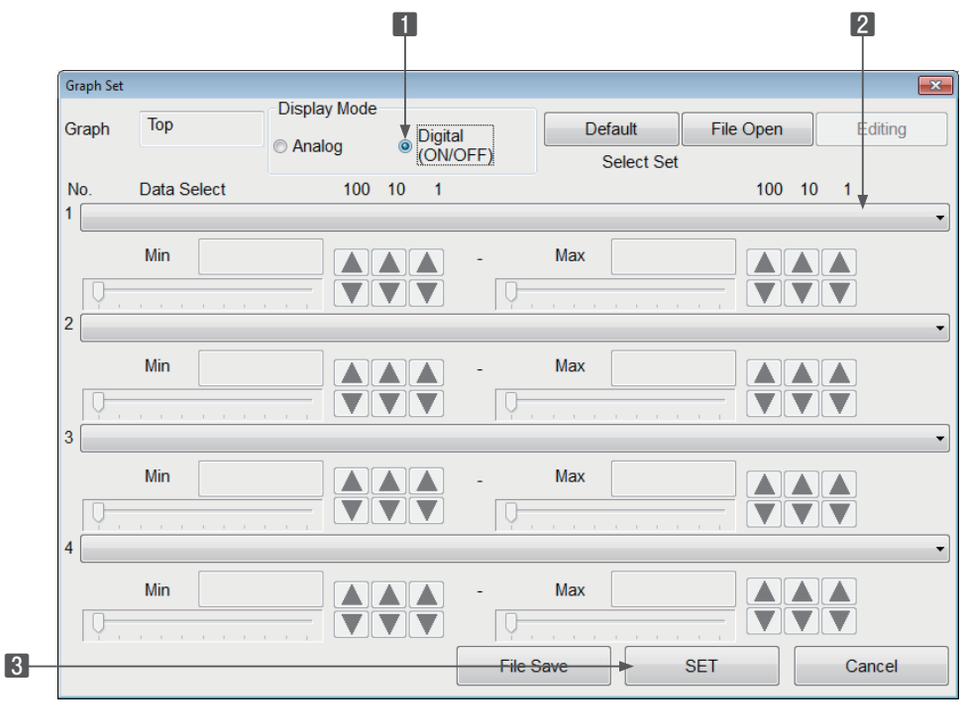


Figure 8-7 Digital mode screen

8.1.3 Saving and Calling Up the Settings Value

The content of the graph settings can be saved and called up later.

Note This function is different from the user settings of [6.6.7 Package Data Set].

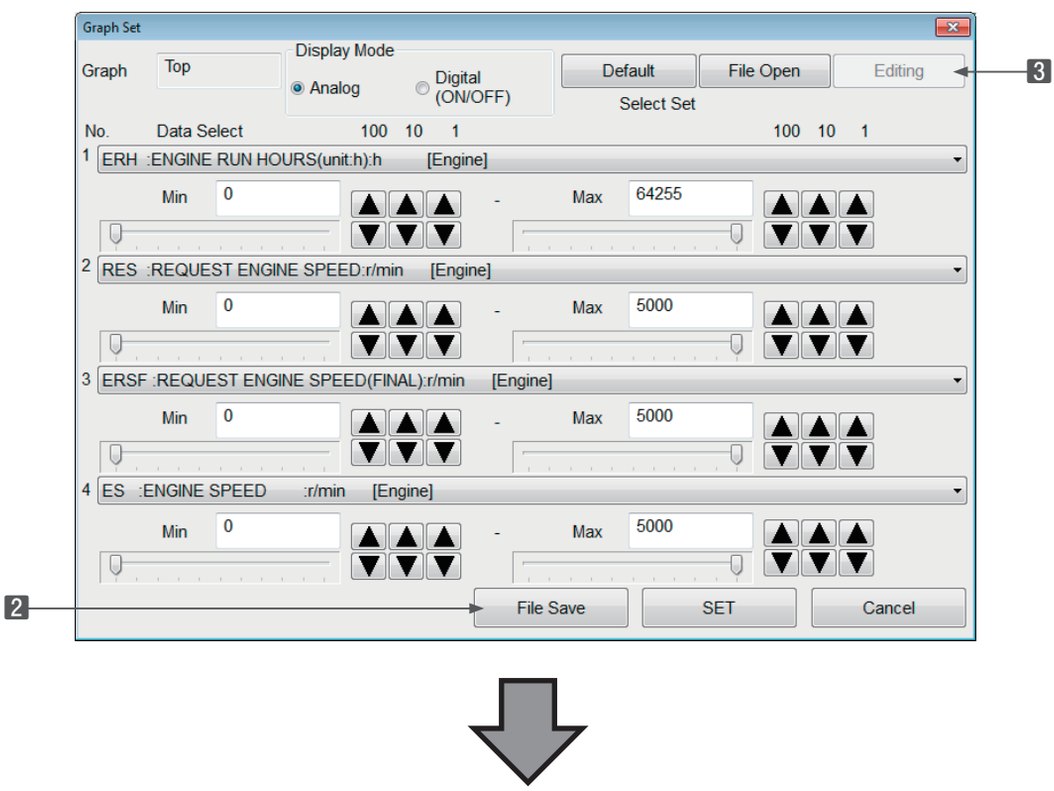
■Saving the Settings Vvalue

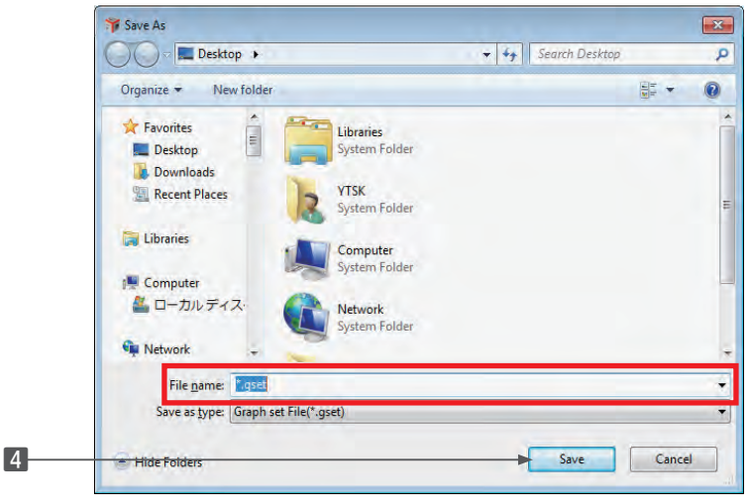
1 Opening the graph settings screen : Click the or button of the operation toolbar to open the subwindow.

2 Open the Save File screen : Click the "Save File " button in the bottom of the graph settings subwindow to open the save screen.

Point To save the graph settings after the error diagnosis, click the 3 "Edit" button on the top right, and then click the "Save File" button.

4 Saving files : Save the file with a name that you can easily remember or search for. You can save the data to any location, but do not change the ".gset" file extension.





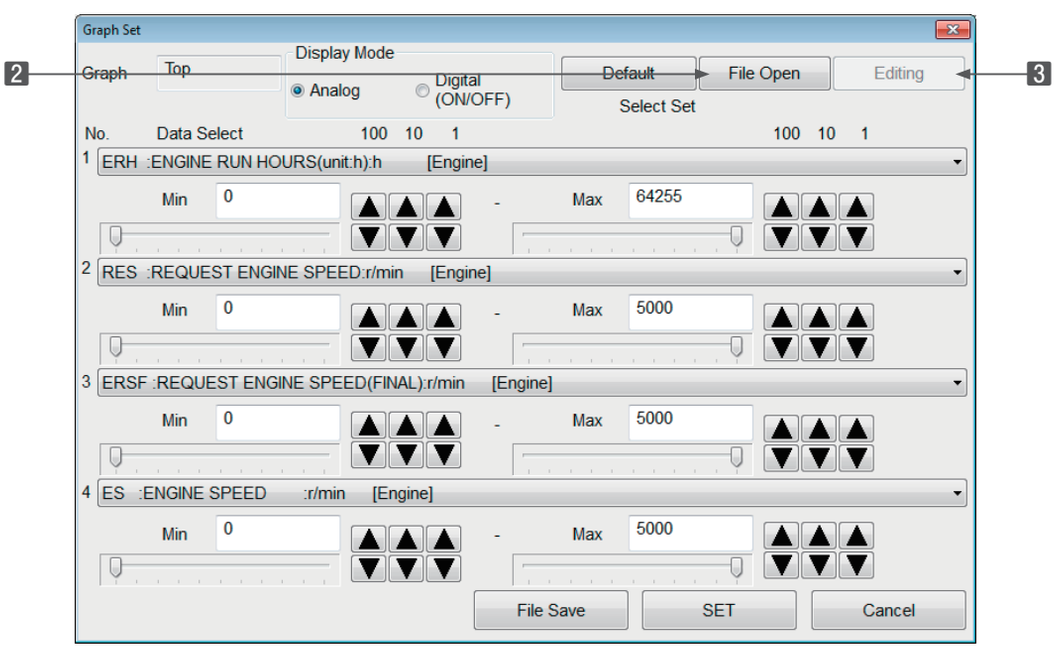
■Calling Up the Settings Value

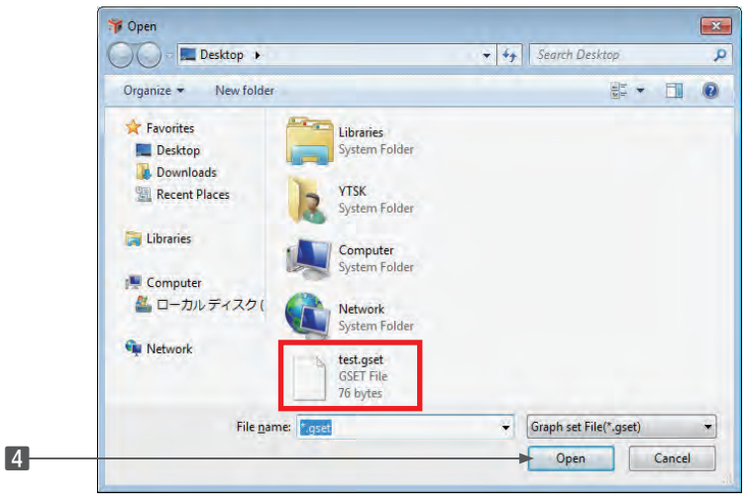
1 Opening the graph settings screen : Click the or button of the operation toolbar to open the subwindow.

2 Open File screen : After the operation of 1, click the **File Open** button in the upper right of the subwindow to open the file open screen.

Point To save the graph settings after the error diagnosis, click the 3 "Editing" button on the top right, and then click the "Save File" button.

4 File Selection : Select the file name displayed in the subwindow and click the Open button to automatically insert the saved graph setting value.




Open
Desktop
Search Desktop
Organize
New folder
Favorites
Desktop
Downloads
Recent Places
Libraries
Computer
ローカルディスク(
Network
Libraries
System Folder
YTSK
System Folder
Computer
System Folder
Network
System Folder
test.gset
GSET File
76 bytes
File name: *.gset
Graph set File(*.gset)
Open
Cancel
4

8.2 Graph Control

1 Minimize the time axis : Click the **Minimize** button to minimize the time axis and see the approximate tendency of the data transition. The display scale factor is shown in the right side of the button. "*1" is the smallest minimize value.

2 Expand the time axis : To look at a part of the graph in detail, click the **Expand** button to expand. The maximum scale factor is 10.

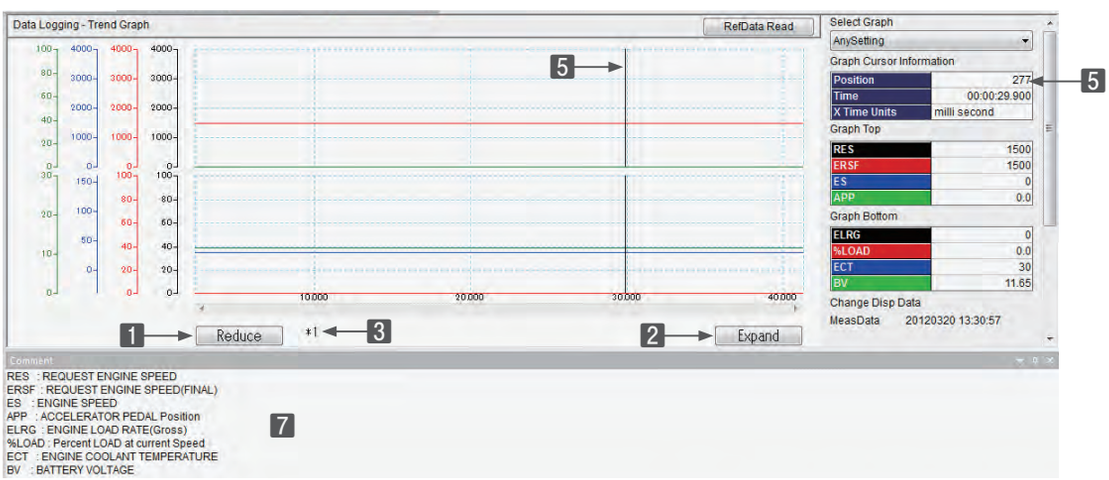
3 Scale factor of the time axis : It is possible to change the scale factor to 1, 2, 4, 6, 8, and 10.

4 Moving the window : The display range of the enlarged graph can be moved with the scroll bar.

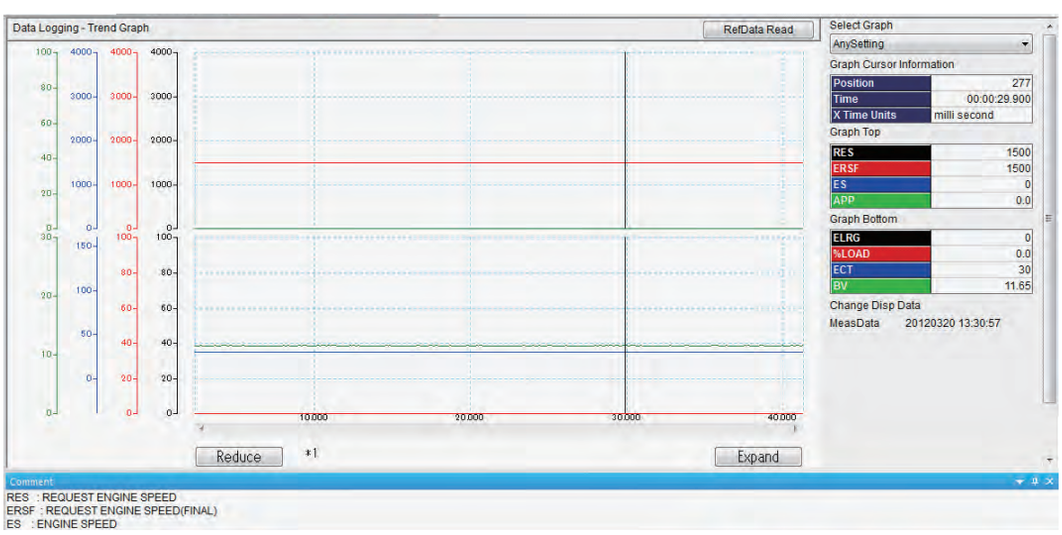
5 Moving the cursor and checking the values : Click on the graph to move the cursor and the cursor value box is displayed for the data value of that point.

6 Expand/minimize the y-axis : Drag the comment box to the top to widen it, and expand/minimize the y-axis.

7 Comment box : The full name of the data displayed in the graph is displayed.



6



● **Display color of the graph**

The background color 1 for each cursor value box is displayed in the common color as the display color of the data value scale and the line color 2 of the line graph.

Data selection No.	Cursor value box	Line graph	Scale of data value
	Background color	Line color	Display color
1	Black	Black	Black
2	Red	Red	Red
3	Blue	Blue	Blue
4	Green	Green	Green

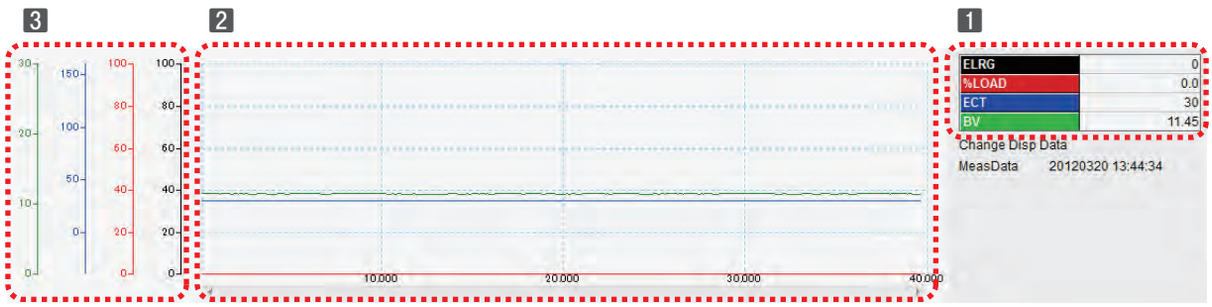
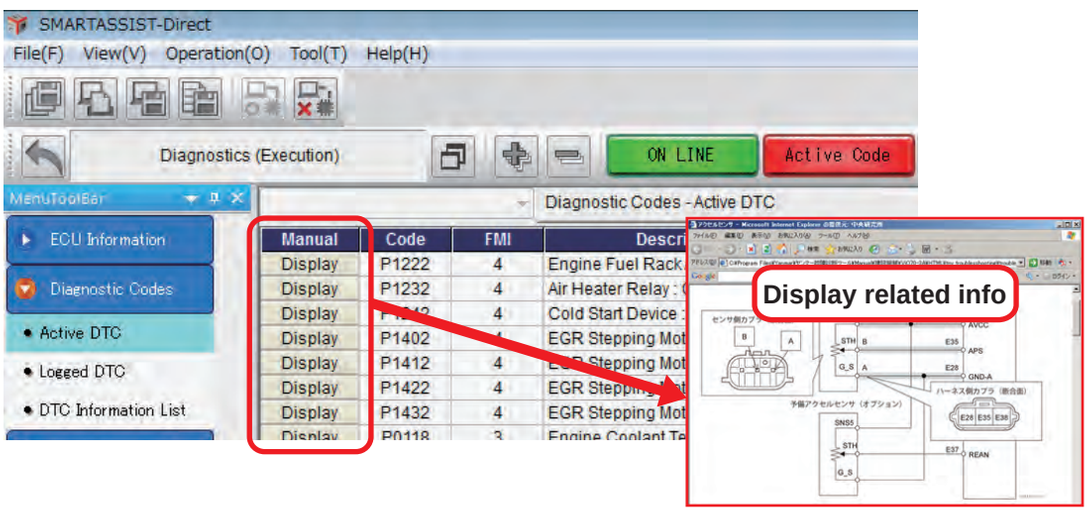


Figure 8-8 Graph Control Screen

9. Manual Link Function

Manual link is the current error screen for the error diagnosis (execution) function. By clicking the defect display item, this function allows you to link to the data related to maintenance and service.

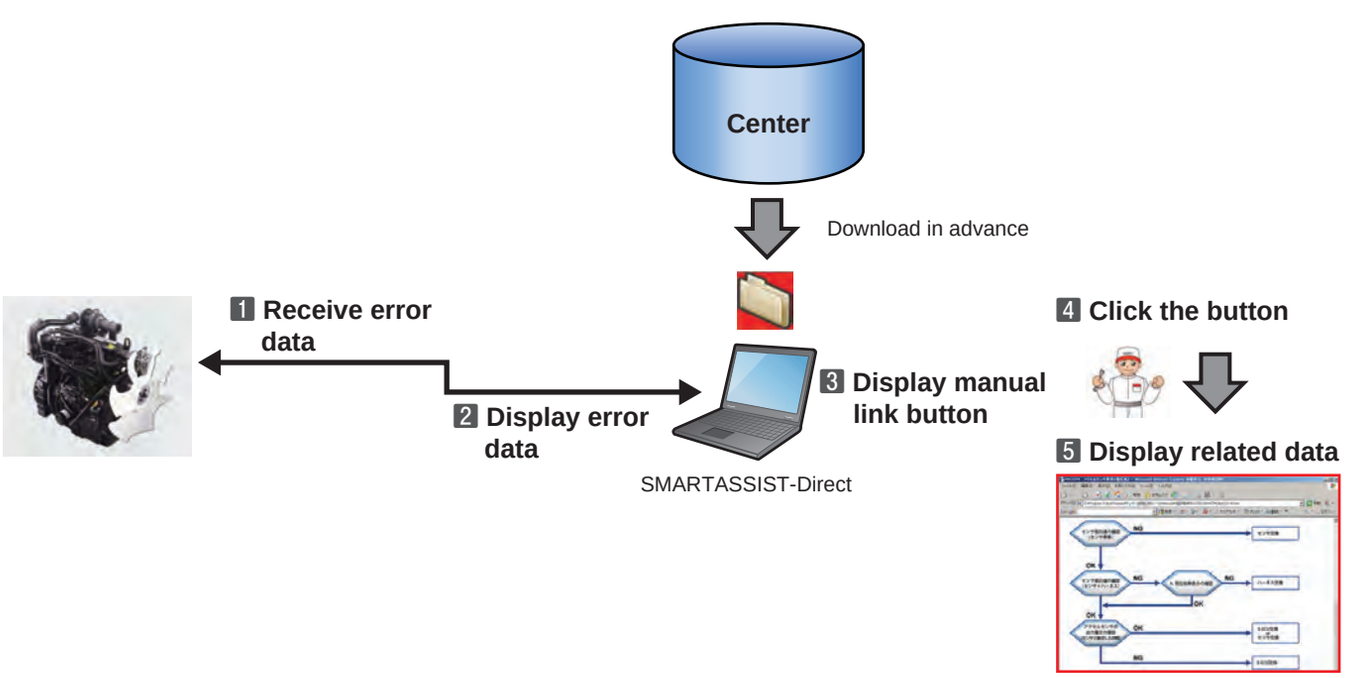
With this function, service personnel can promptly obtain the corresponding data for the defect (failure).



Note

- Yanmar provides the data displayed with manual link function separately from the normal technical and service manuals.
- **The images used in this chapter are all example screens.**
- Depending on the product, the data may not be available.

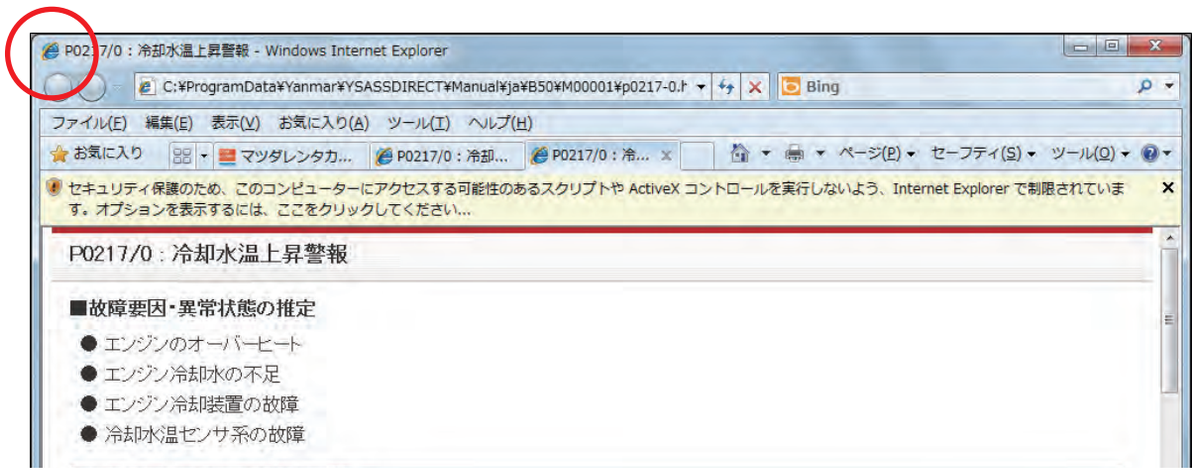
9.1 Structure of the manual link function



Note The manual link button is only displayed if the manual link data that was from the center by model is the same as the model of the connected product and information relevant to the error signal is included.

9.2 PC functions required for display

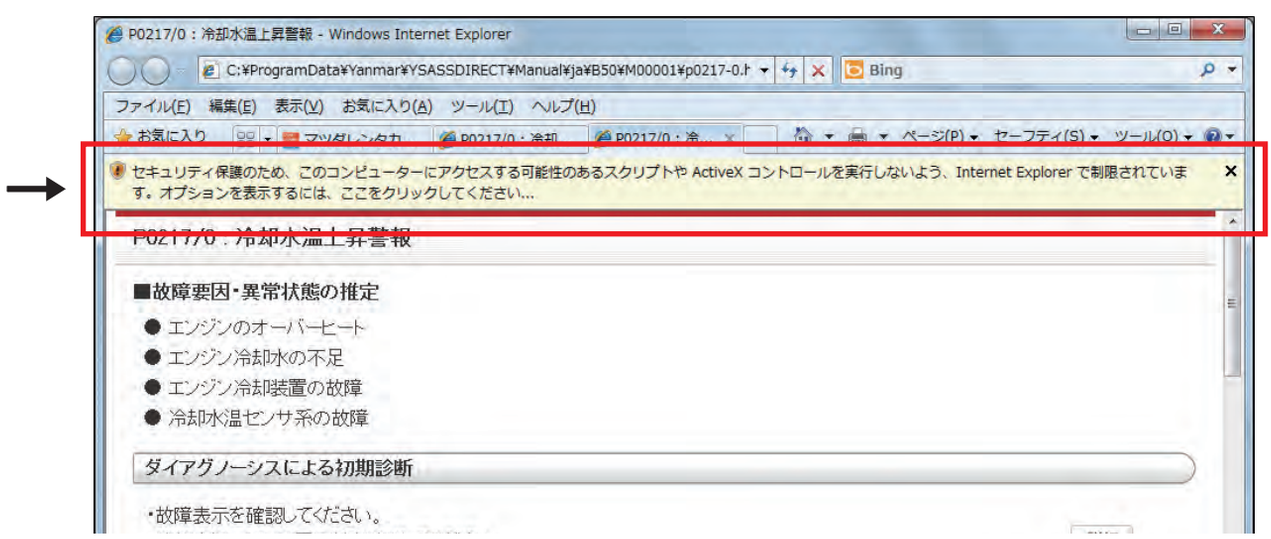
The related information data is displayed in the browser, e.g. Internet Explorer (IE).



Note

- **The following browsers are supported:**
  Internet Explorer 6.0 or higher
  Mozilla Firefox 5.0 or higher
- The displayed (called up) data is an independent, stand-alone HTML document. After display, the functions are not related to the SMARTASSIST-Direct functions.

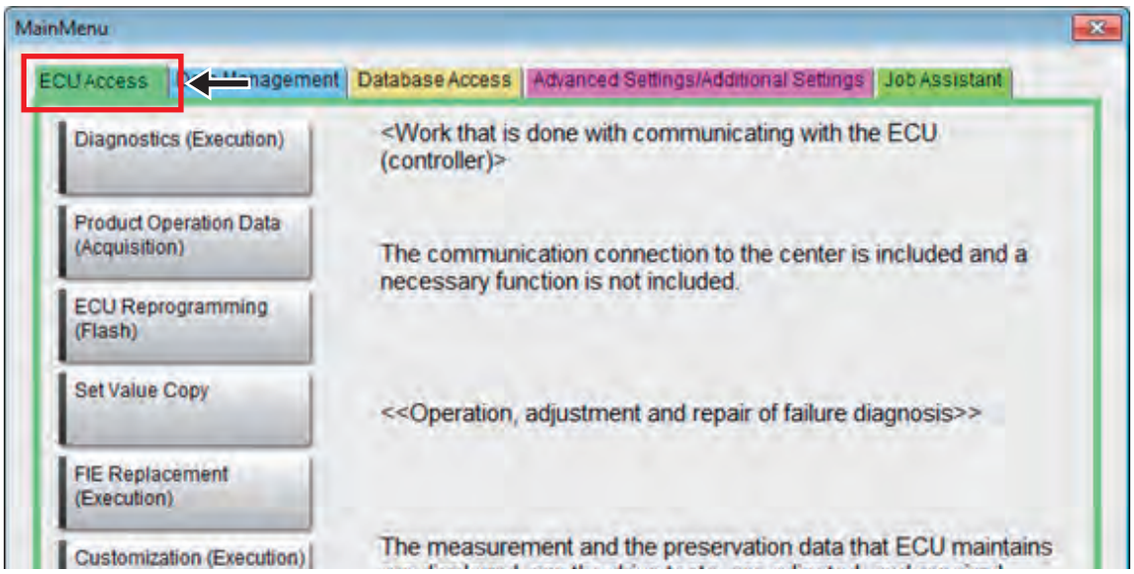
Browser warnings



Note Depending on the security settings on your PC, the above message may be displayed. This is not a problem.

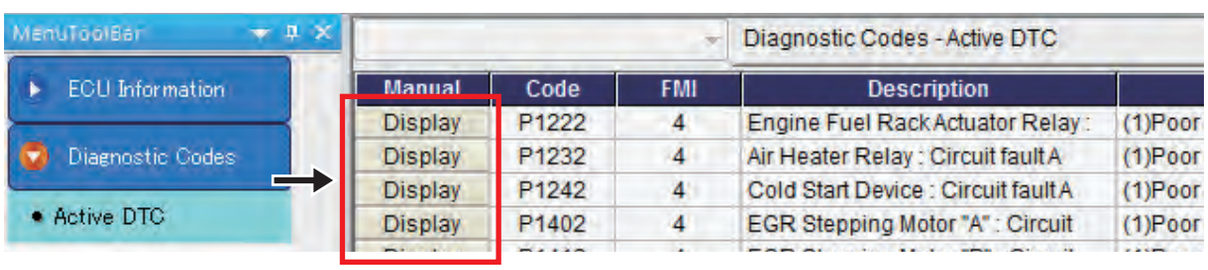
9.3 Displaying Manual Link Data

Manual link function operates on the "Error Diagnosis (Execution)" menu of "ECU Connection".

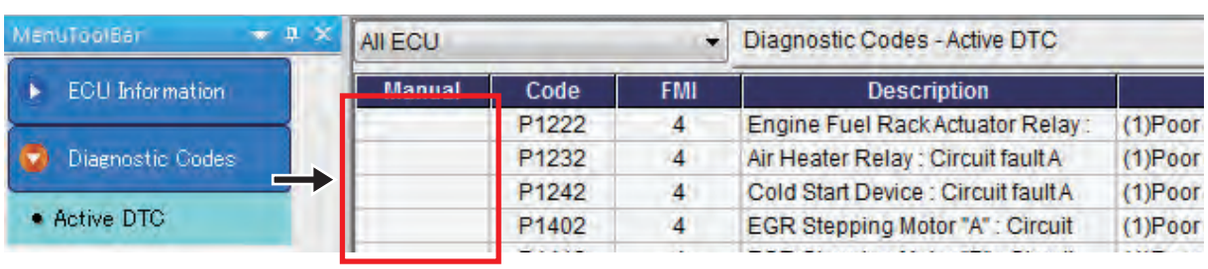


Note The function is not operable in "Error Diagnosis (View)" of Operations with ECU Disconnected.

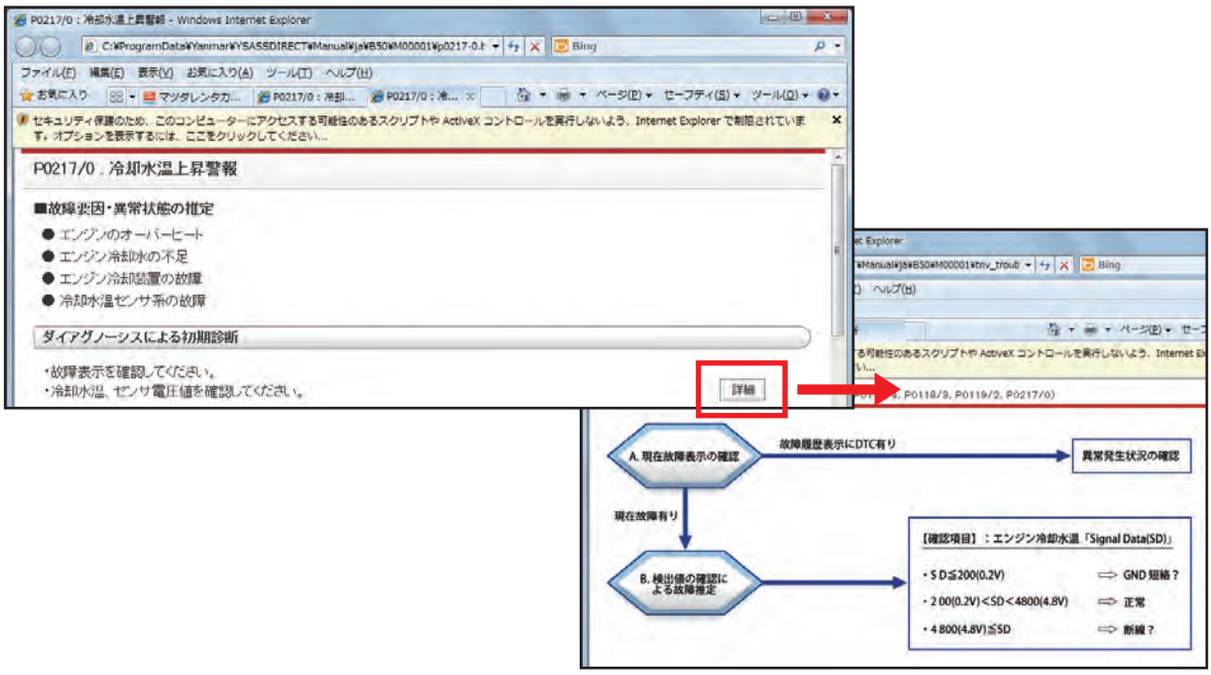
When there is an item for manual link data related to the current error item, the "Display" button is displayed.



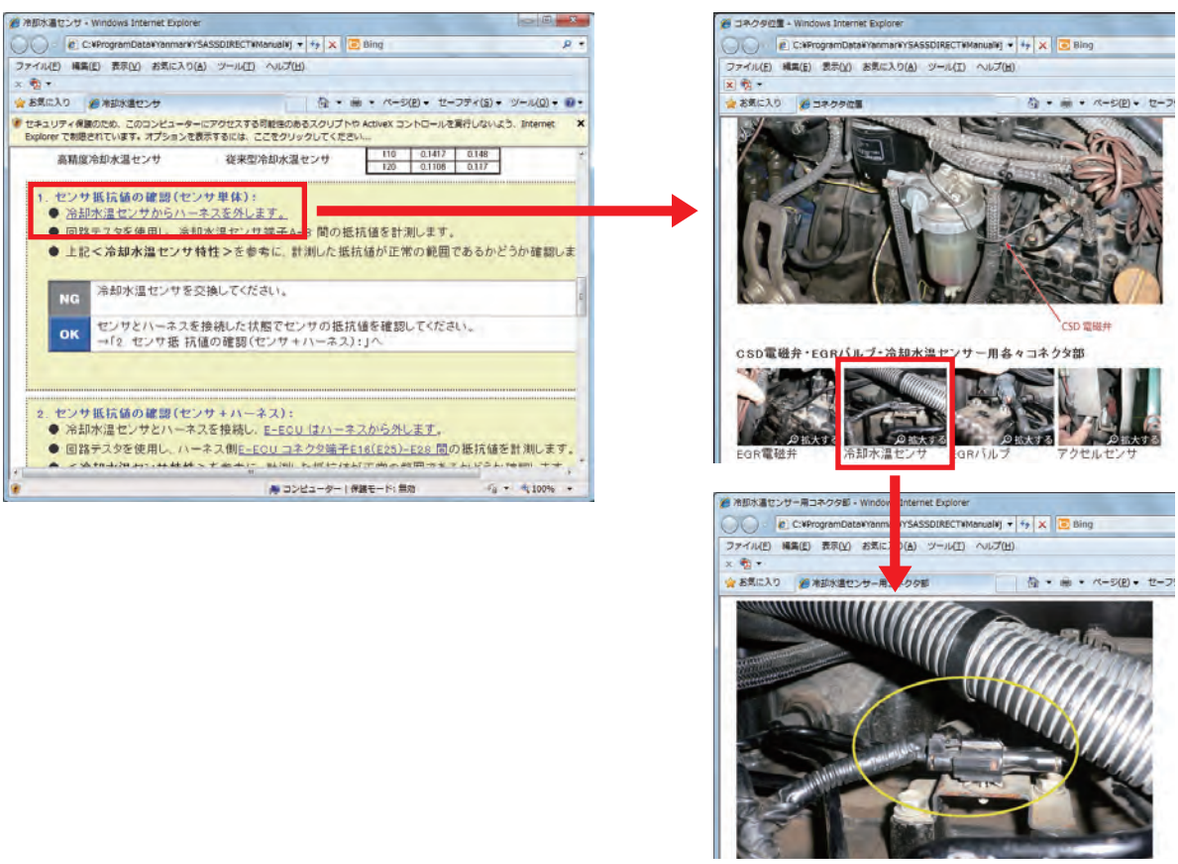
Items without display data are blank.



Click the "Display" button to display related information. The displayed page may have a further link to other related information.



Not only buttons but also images and characters displayed in another color have links to other information.



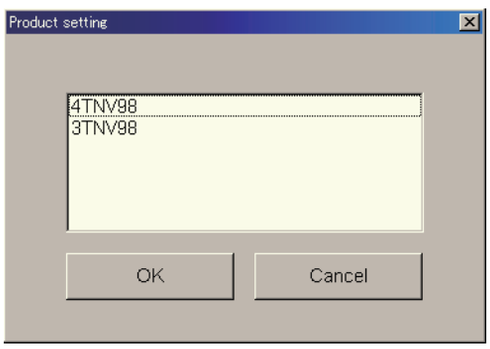
9.4 Notice Screen When Starting the Error Diagnosis (Execution) Screen

The notice screen about available manual link data on your PC from the ECU data of the connected product is displayed.

Display when there is multiple data

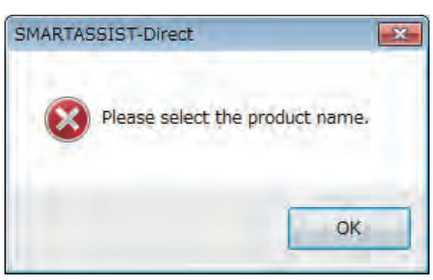
The selection screen for available data is displayed.

Select the data and click "OK". Then, the main screen is displayed.



Example screen

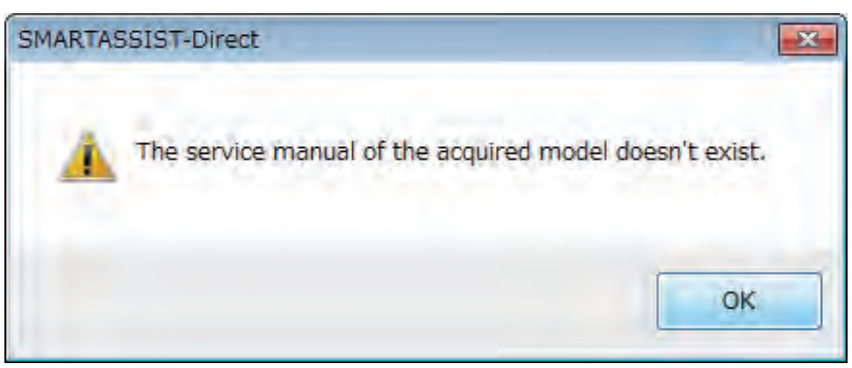
When clicking "OK" without selecting any data, a warning screen is displayed and you return to the selection screen.



Note If there is only one available data set, it is set automatically. No notice is displayed.

Display When No Data Is Available

The warning screen is displayed. Click "OK" to go to the main screen.



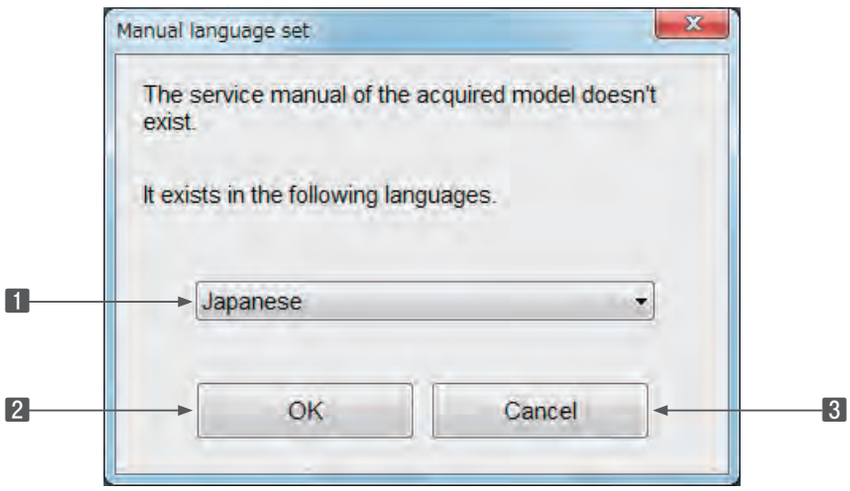
Note In this case, the manual link function does not operate.

If manual link data in a language different from your OS is saved on your PC, the following notice screen is displayed. You can select the data in a different language.

1 Selection window for different languages

2 If used.

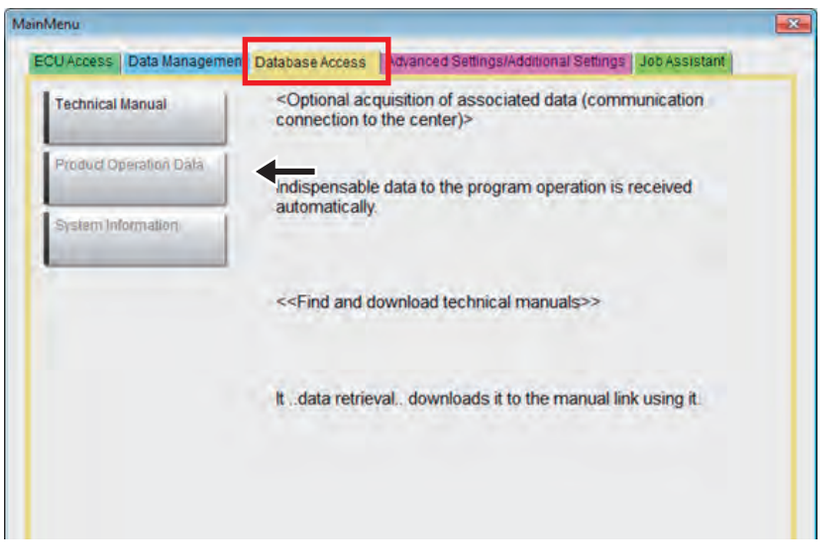
3 If not used.

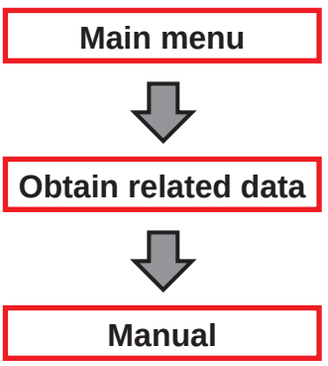


Note When the manual display language setting and the OS language are different, the manual display language setting is prioritized.

9.5 Downloading Manual Link Data

You can download manual link data by manual selection from the center.





Note **Note: You can only download manual link data from the available product category.**

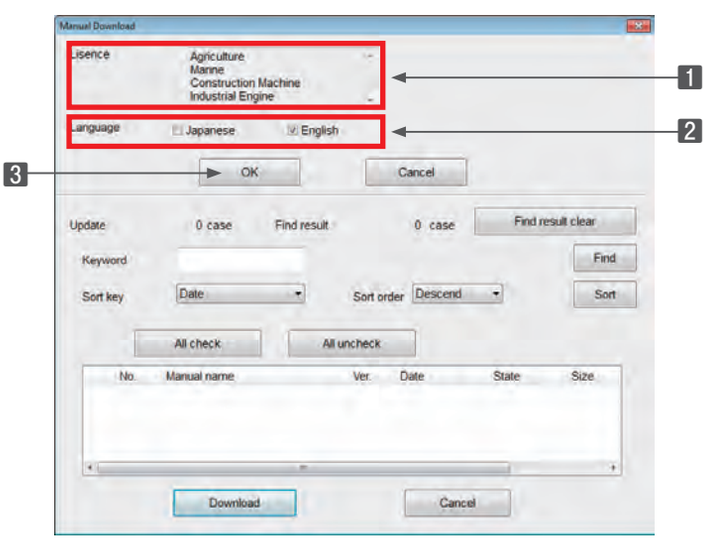
The selection screen for manual link data is displayed.

Firstly, connect to the center and obtain the download candidate list.

1 The product category license for the login user appears. (Unable to apply the change)

2 Select the language for data for the manual. You can select both "Japanese" and "English".

3 Click "OK" and request a list of available downloads from the center.



After communicating to the center, the available data list appears.

(The already downloaded data is not displayed)

1 Number of available downloads

2 Manual name (applicable model name)

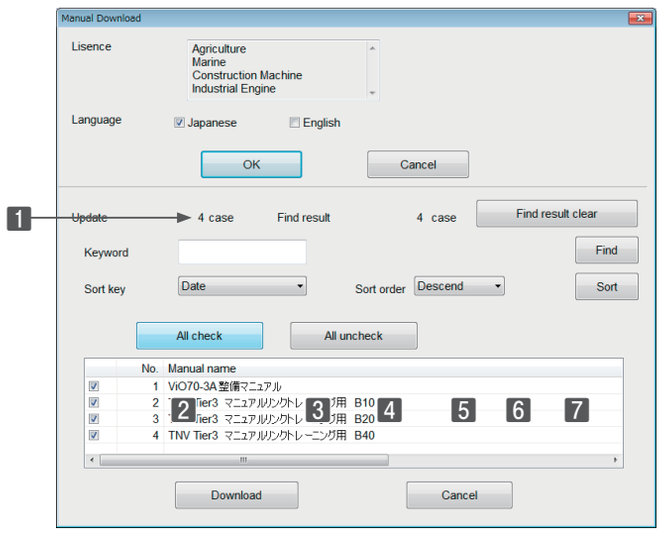
3 Data version

4 Date of data release (correction)

5 "N (New)" or "C (Correction)"

6 Data volume

7 Display language



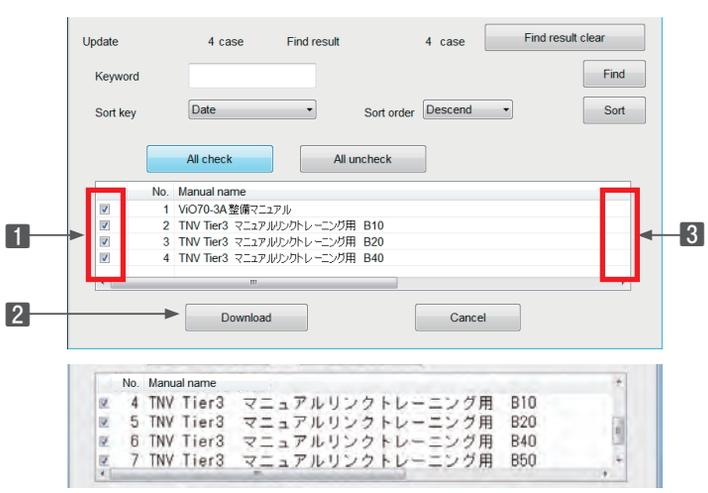
Note The list is not displayed for models without the issued manual link data.

Select the item you want to download and click the "Download" button. Download begins.

1 Tick the checkbox. You can download multiple items at the same time.

2 Download Execution button

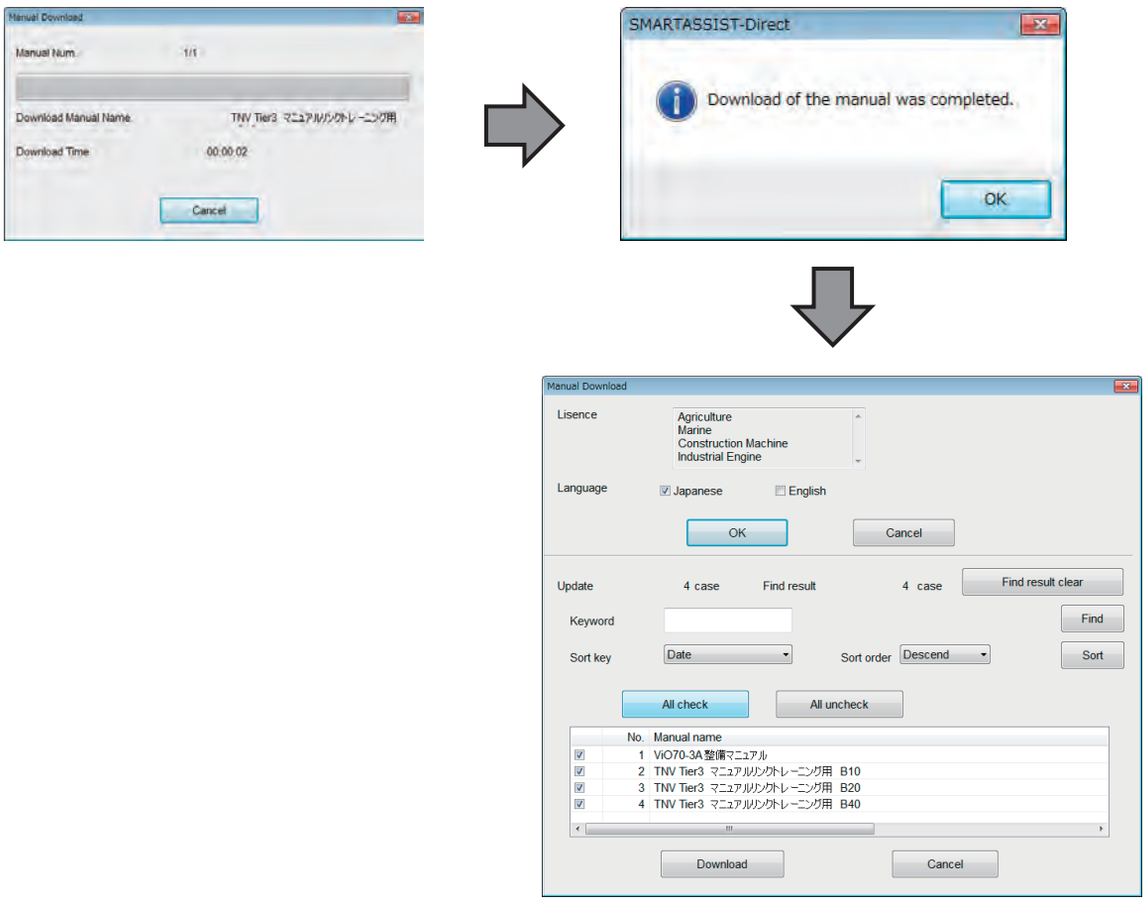
3 Scroll Bar



Point

- It takes time to download multiple items at the same time. Control the scroll bar 3 **and check all checkbox.**
- **All checkboxes are selected when displayed.**

The download condition is displayed. After the download is complete, you are back to the selection screen.



Remark **The downloaded data is automatically stored at a specified folder in your PC.**

Search refinement is possible for the download data. Select the item you want to download and click the "Download" button 1 to start downloading.

1 Download Execution button

2 Number of search results

3 Clear the search results and display all results.

4 Keyword input field

5 Start Keyword Search button

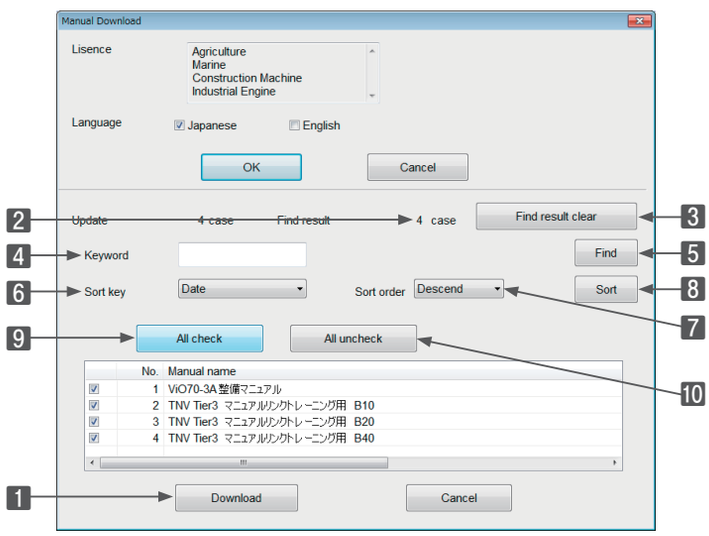
6 Selection of sorting key

7 Select the sort order (ascending / descending).

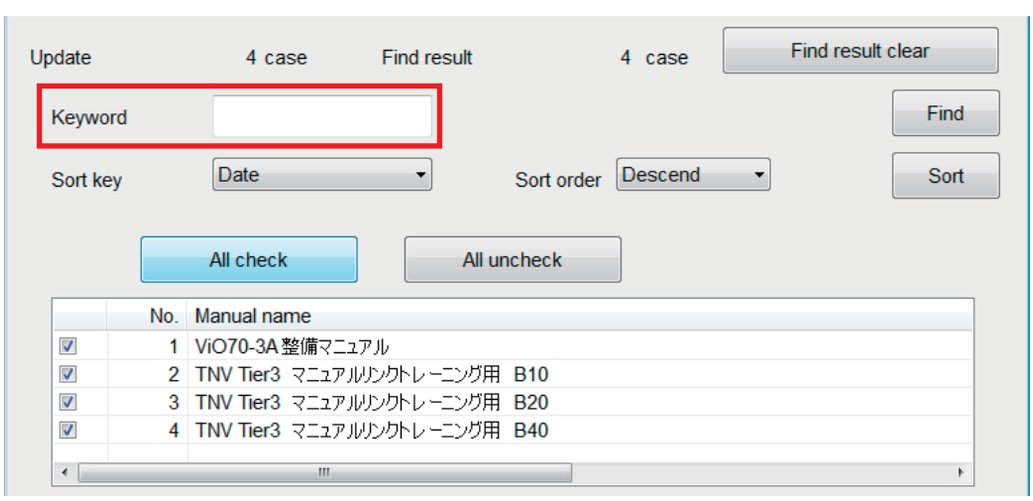
8 Start Sorting button

9 Select all checkboxes for the data that you want to download.

10 Clear all ticked checkbox for the data you want to download.



The keyword search is performed in "perfect match" and "prefix match". If you want to search in backward match, enter "*xxxx".



Point **If you want to search in middle match, enter "*xxxx*".**

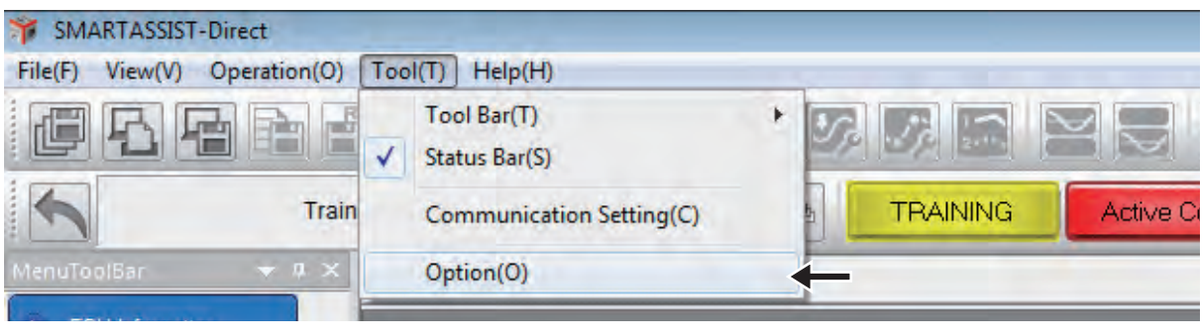
9.6 Language Change Setting of Manual Link Data

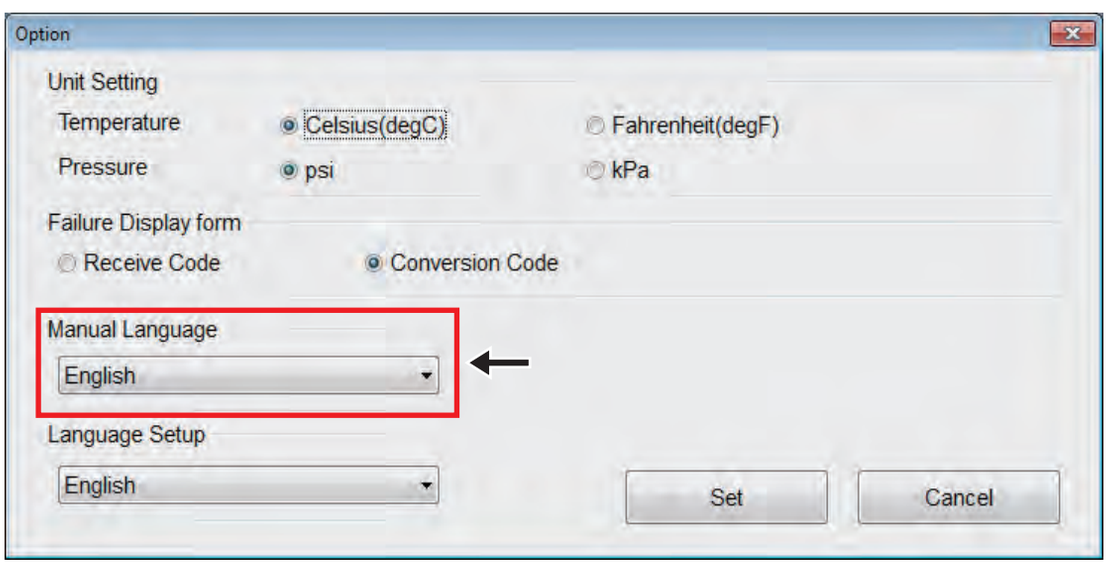
Language settings are available for the manual link data. (As of 2012, Japanese and English are available)

Regardless of the OS language setting on your PC, you can change the language of the manual link data.

- When you want to confirm English (correspondence for inquiries, etc.)
- When you want to confirm Japanese

Click "Option" in "Tool" on the main screen for setting method.



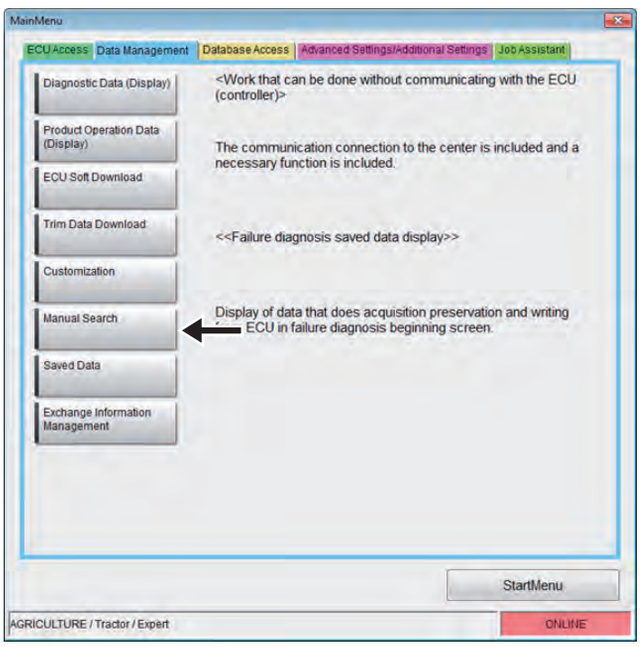


Note In the manual link function, the manual display language setting has priority over the OS language on your PC.

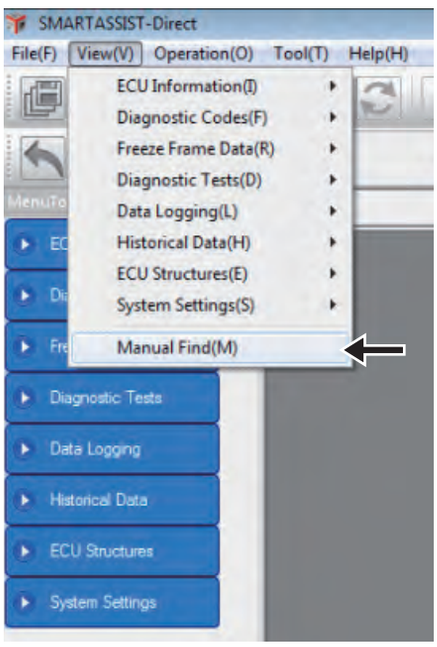
9.7 Searching and Displaying Manual Link Data

If necessary, the downloaded manual link data can be displayed from other locations than the Defect Display screen. It can be used like a normal technical manual.

Main menu: Operations with ECU Disconnected→Manual Search

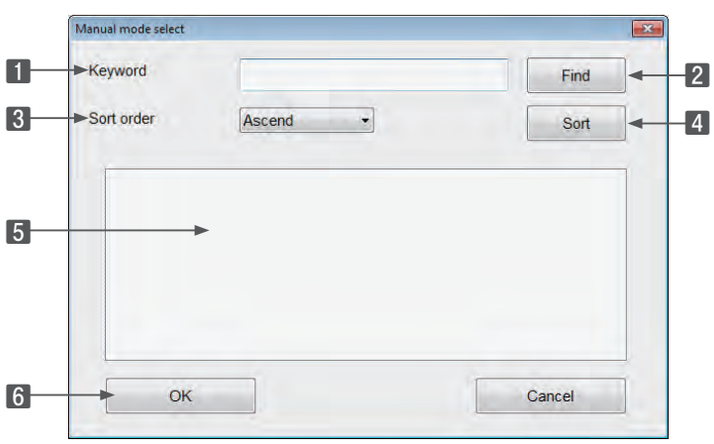


Main Screen: View→Manual Find

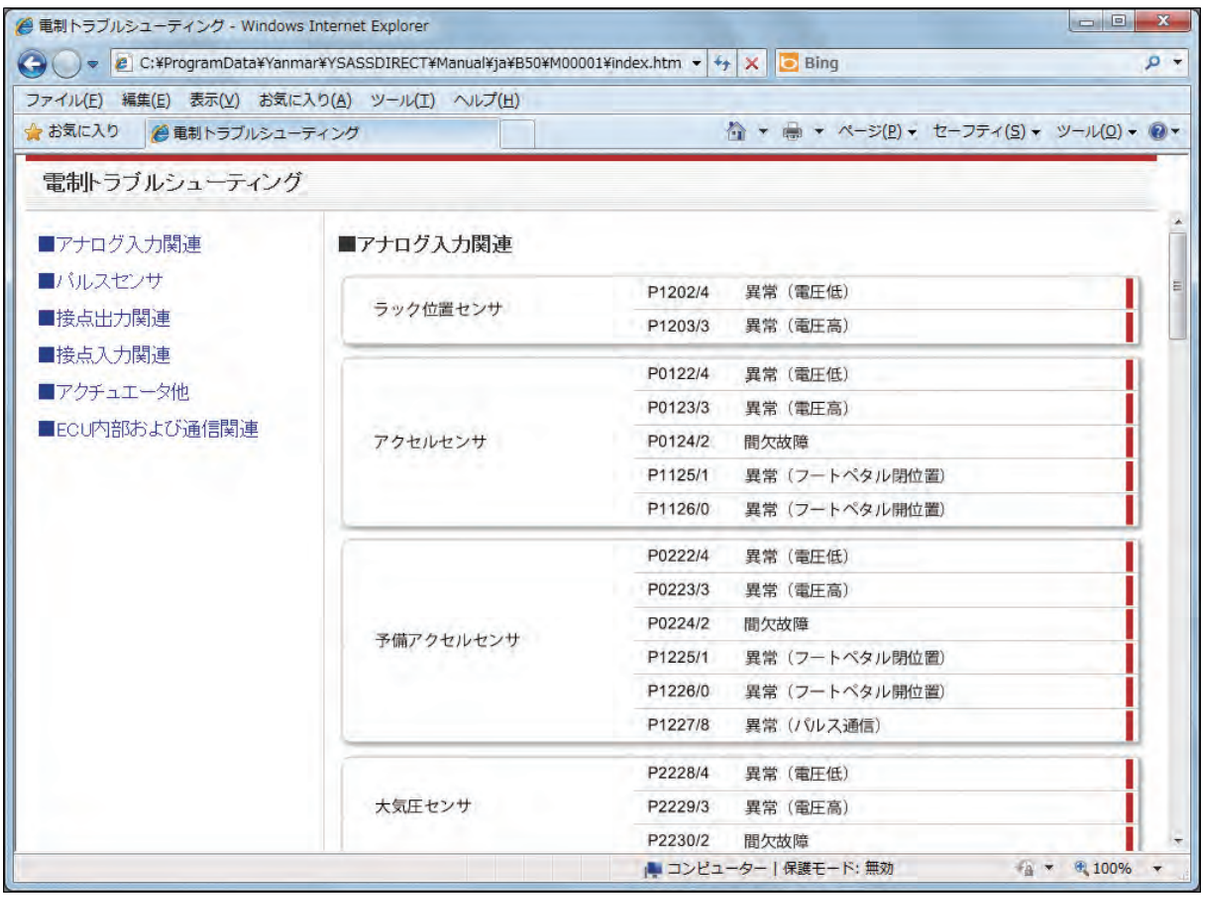


Display selection screen of manual link data

1. Keyword search character input field (enter either "Representative Model Name" or "Series Name")
2. Search Execution button
3. Change Sorting "Ascending/Descending"
4. Start Sorting button
5. Display/selection field of manual link data
6. Display button

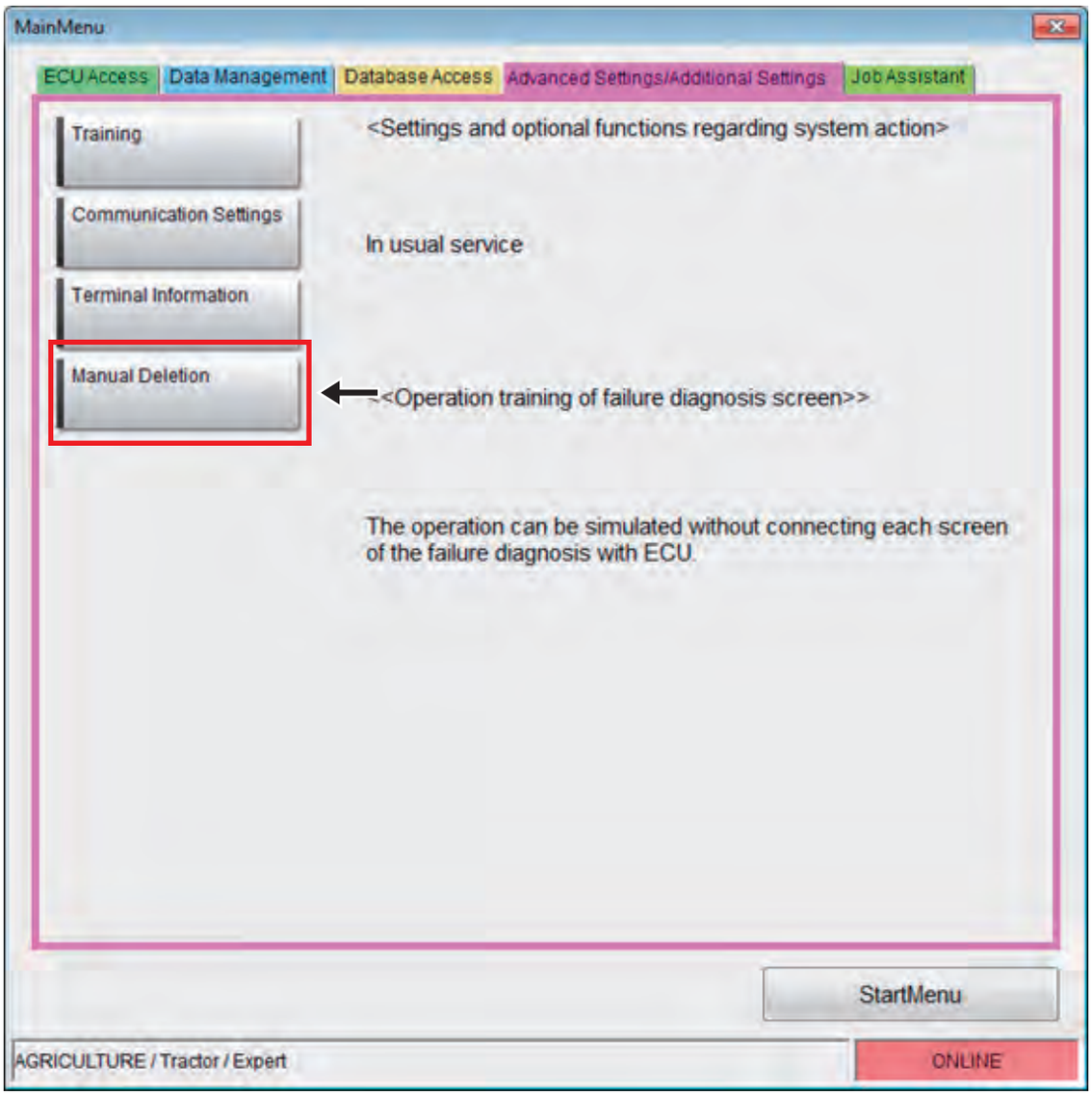


When the manual link data is displayed from the "Manual Search/Review" menu, the "Content Page" opens. This "Content Page" has links to each related page within the data.



9.8 Deleting Manual Link Data

Deletion of the manual link data can be performed from the main menu.



Delete selection screen of manual link data

1 Keyword search character input field

2 Search Execution button

3 Toggle sorting from "Ascending" to "Descending"

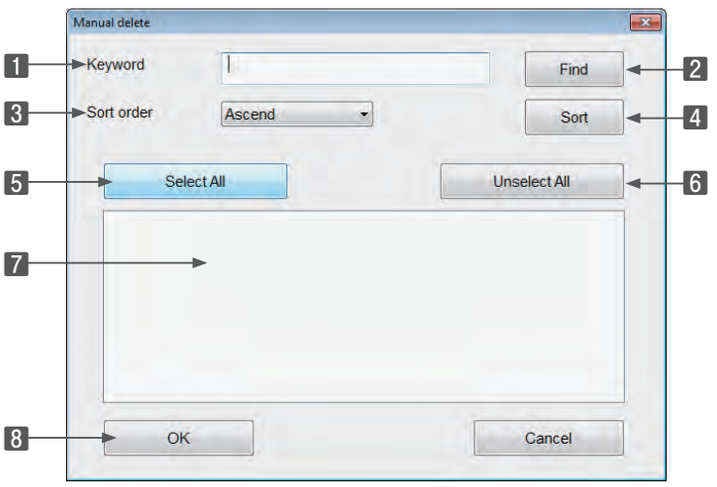
4 Start Sorting button

5 Select All button

6 Deselect All button

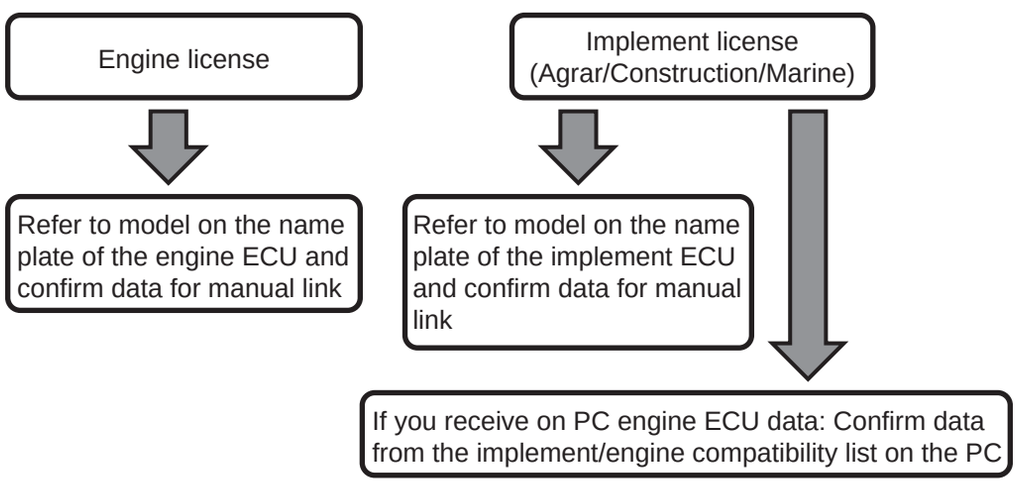
7 Display/selection field of manual link data

8 Start Deletion button



Remark

Depending on the user's license, the confirmation method of manual link data for reference is different.



Based on the nameplate model information stored in the ECU, confirm the reference data.

10. Functions Related to the Operation Data

■About Functions Related to the Operation Data

● These are functions to call up, display and save information about the operation status of the machine (i.e. operation data) stored in each ECU/controller equipped in the product.

Also, it is possible to display the comparison of the past save data for the same product and the save data of the other product.

Understand and use the operation data for maintenance and usage guidance for the users.

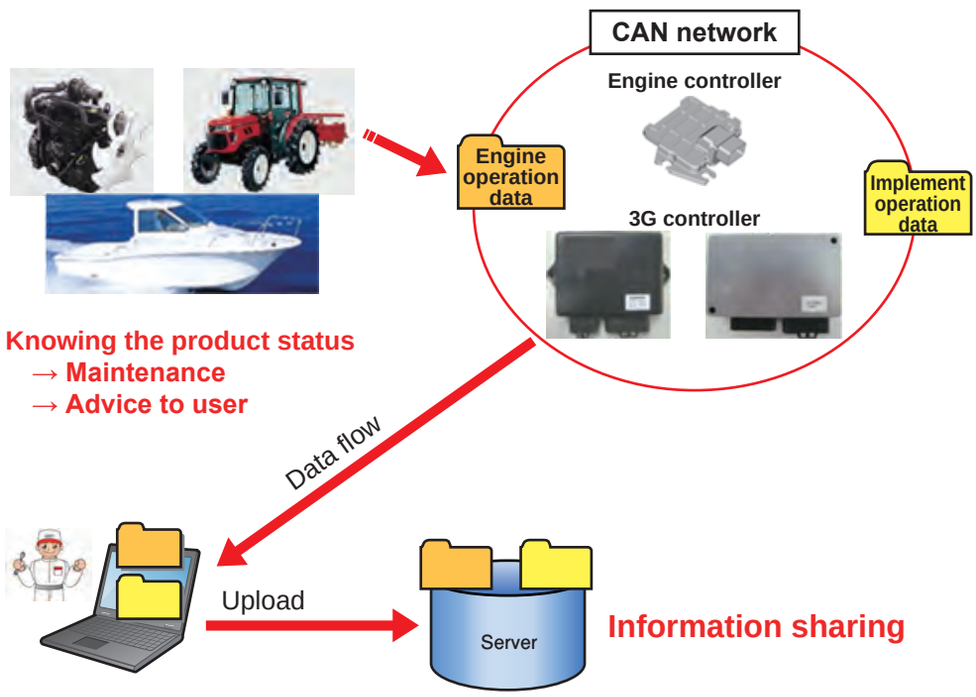


Figure 10-1 Outline of operation data

● The operation data is categorized into 3 types of information.

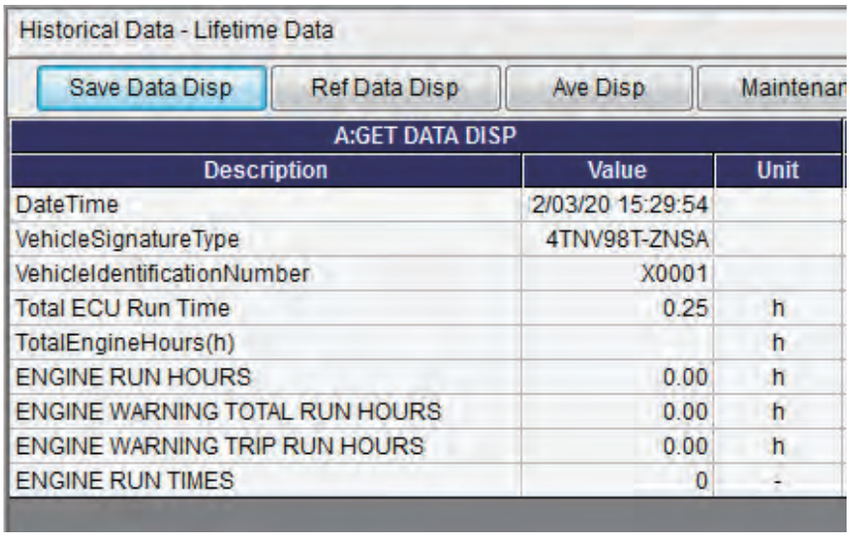


Figure 10-2 Example screen of the integrated value data (integrated data for whole period)

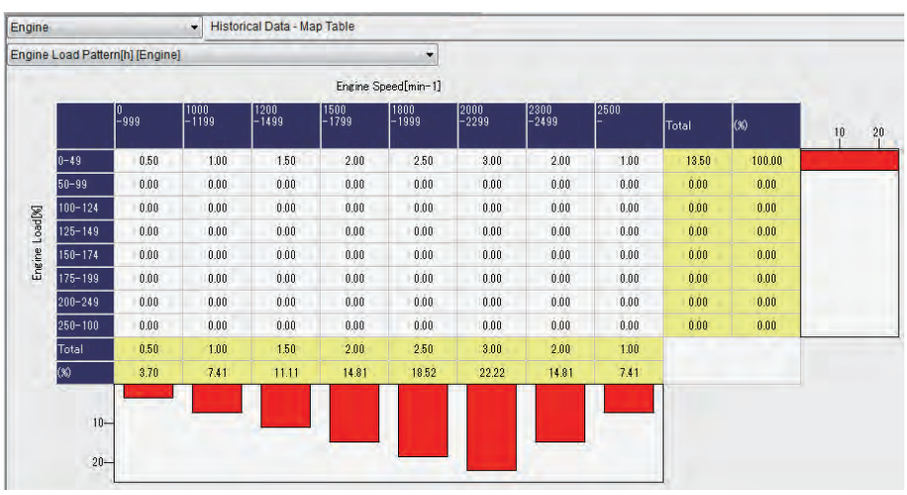


Figure 10-3 Example screen of the distribution diagram data (integrated data for whole period)

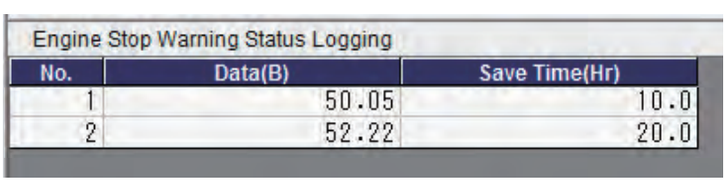


Figure 10-4 Example screen of the log data (integrated data for a given period)

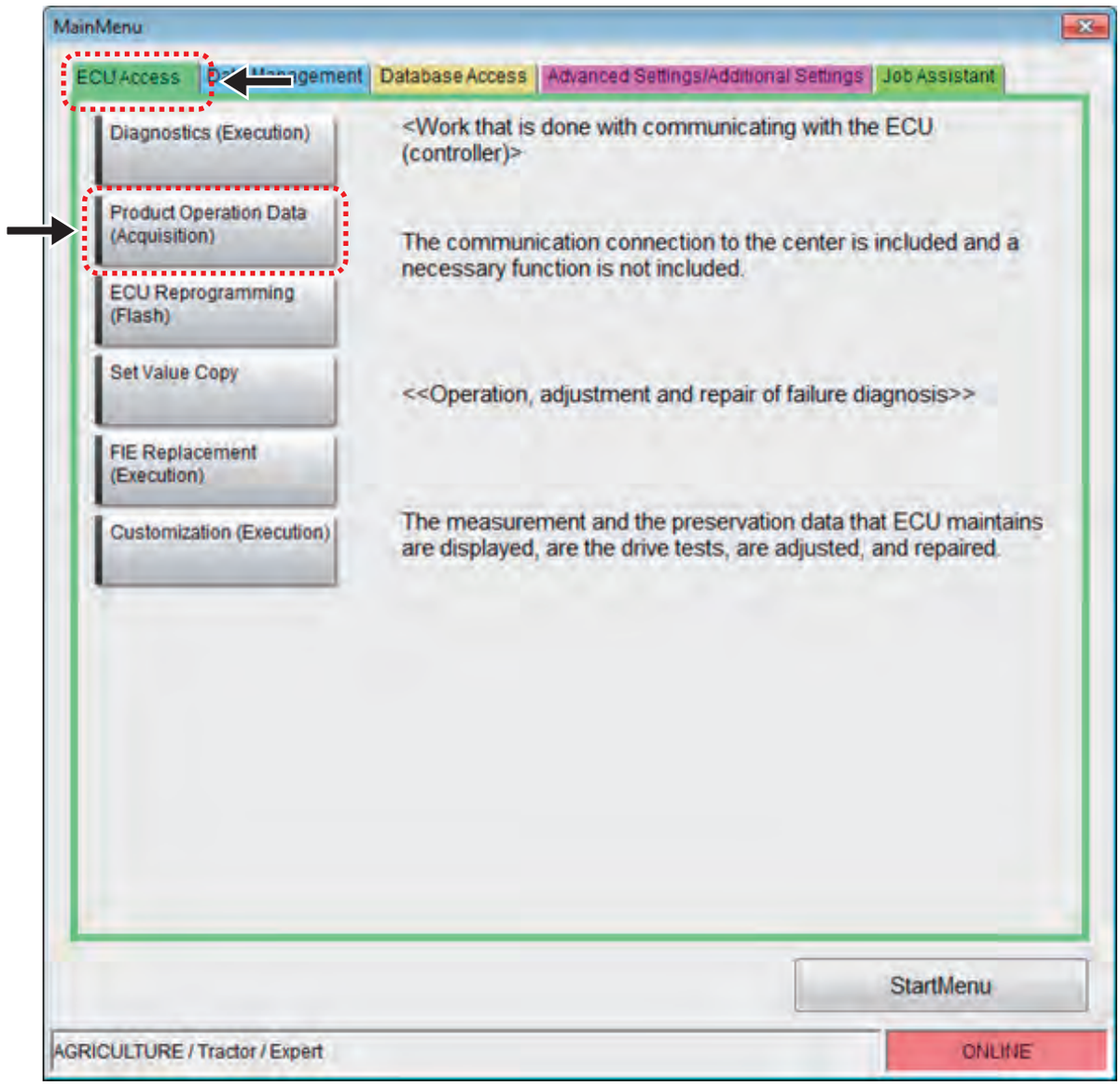
Note

- Each value of the obtained operation data is not a strictly measured data. Use the values as a guideline.
- The operation data stored in your PC is automatically uploaded when connected to the center, and accumulated as the operation data database.
- **When there is no stored information in the ECU, an empty box is displayed. Depending on** the product, the content of the operation data is different.
- **As no information related to location, specific information on individuals, voice, or image** is included in the operation data, operation data is not considered personal information. *

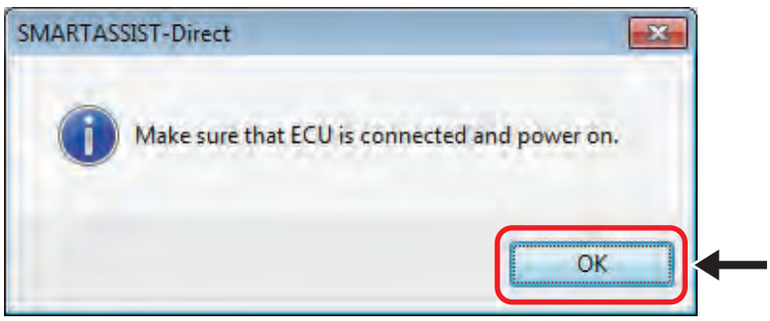
* In Japan

10.1 Collection of Operation Data

1 Select "Operation Data" (Collection) of the tab "ECU Connection" in the main menu.

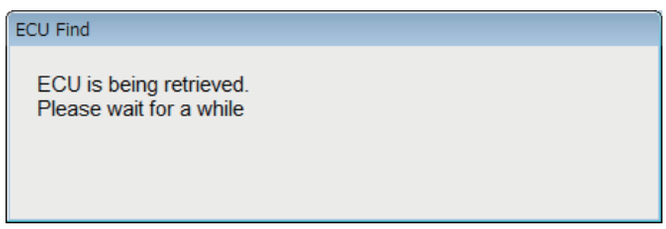


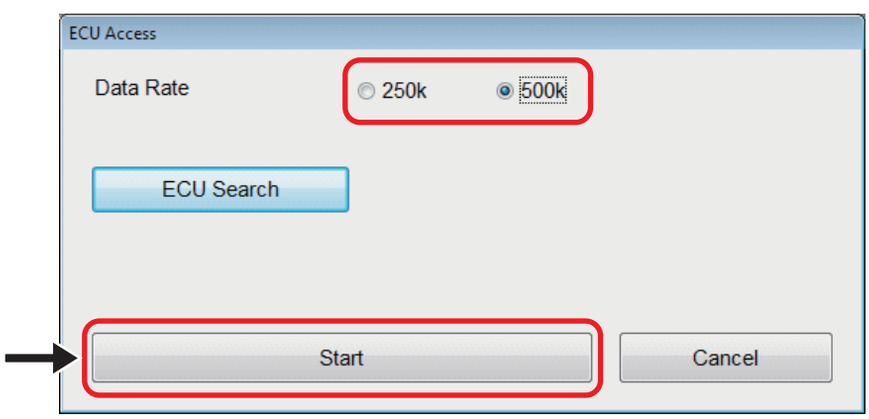
2 The display that urges to connect your PC with the ECU (product) and the power supply appears.



After connecting your PC and the check coupler of the product with an interface box and turning ON the power (key switch), click the "OK" button. The communication with the ECU starts.

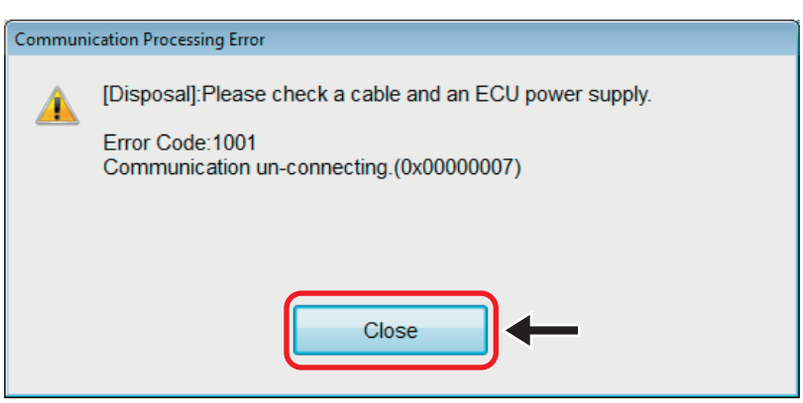
3 A connectable ECU is searched for and the connection execution screen is displayed. Click "Start".



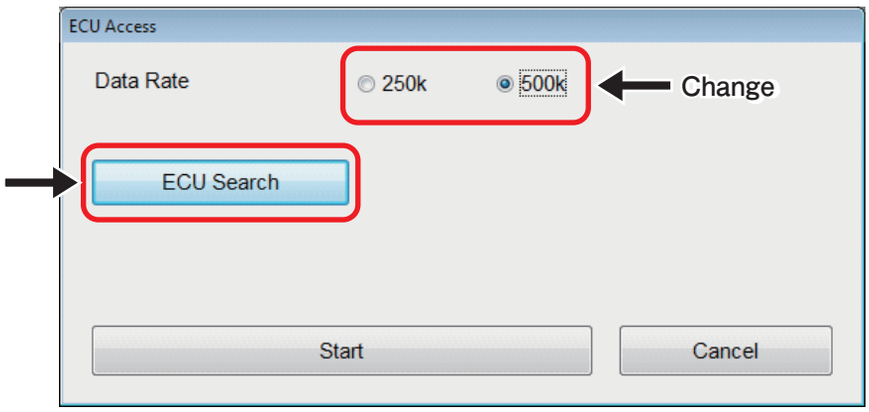


If there are problems such as the power is not turned on, the power is unstable, or the communication cable is disconnected, an error is displayed.

Click "Close" and determine the cause of problem.



4 If there is no connectable ECU in the preset communication speed, the communication speed change screen is displayed. Change the speed and click the "ECU Search" button.



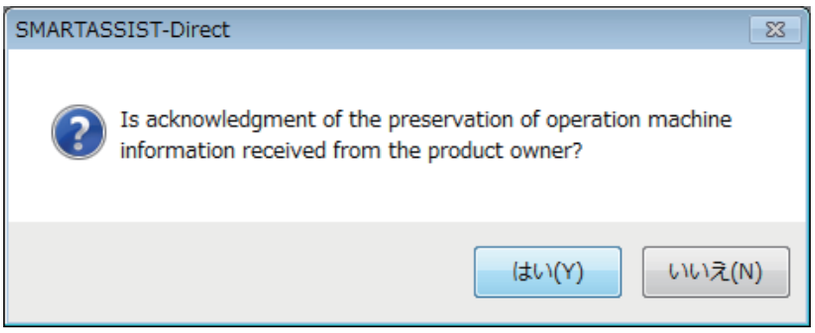
Remark Right after turning on the power of the product (with the key switch), ECU **searches from external devices may be disabled. This is for internal processes** such as system checks. In such a case, click "Cancel" once and restart the procedures from 1. later.

5 The communication with the ECU starts and the collection of operation data starts.

Example screen

6 When the communication with the ECU is complete, the below message appears.

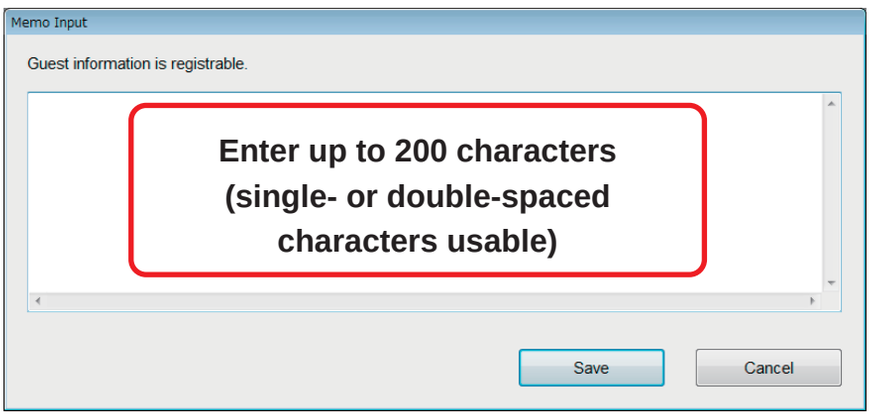
- Click "Yes (Y)" to display the operation data after saving it on your PC.
- Click "No (N)" to display the operation data without saving it.



Point As no information related to location, specific information on individuals, voice, or image is included in the operation data, operation data is not considered personal information. *

* In Japan

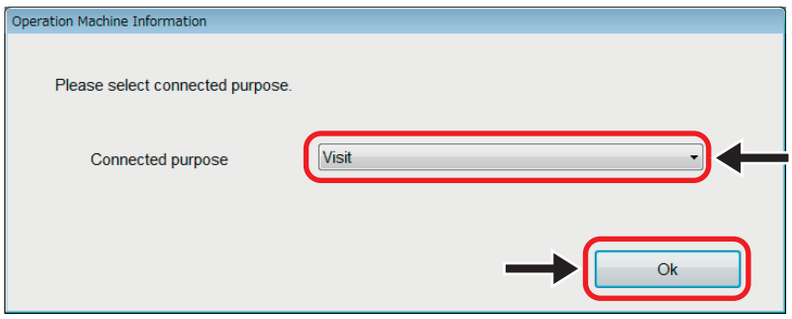
7 Click "OK". The memo entry screen is displayed.



Point Even you select "Cancel" in the memo screen, the operation data is saved.
You can edit the memo with the data management function after saving the data.

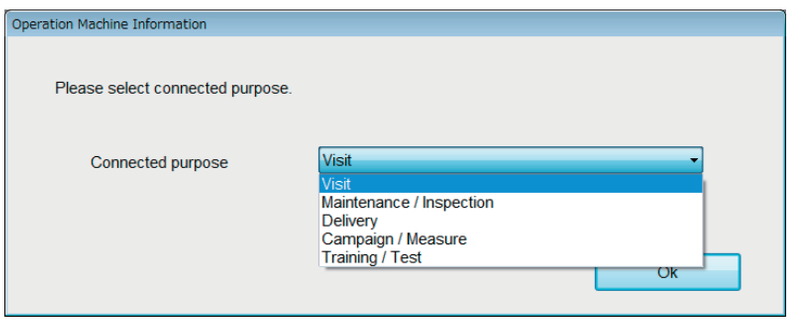
8 Then, enter the connection purpose.

Select the most suitable item from the choices.



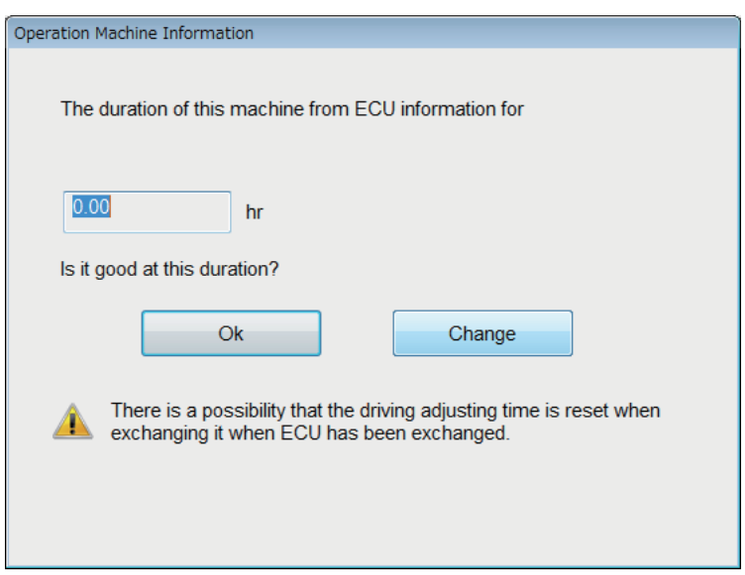
Select

- Use this as a filter when you use or search the obtained operation data.
- To obtain data for training and practise, select “Training/test” to keep it separate from the actual data.



9 Then, the usage time check screen is displayed.

Click "OK". The collection information is displayed. Click "Change". The usage time entry screen is displayed.



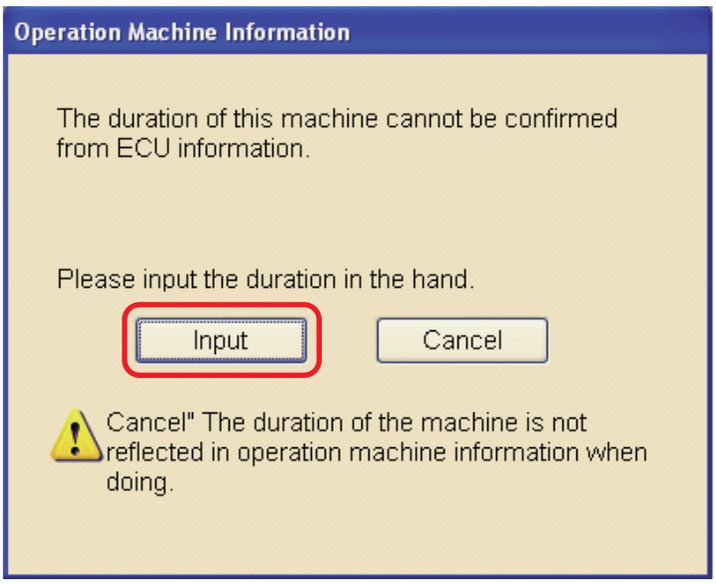
Usage time check screen

Reason for Confirmation

- The usage time of the machine is the most important item of the operation data.
- When maintenance using the service ECU is performed, the information in the ECU is reset.

10 When there is no usage time information in the ECU information, the warning screen is displayed.

Click "Input". The usage time entry screen is displayed. Click "Cancel" to display the operation data without saving it.

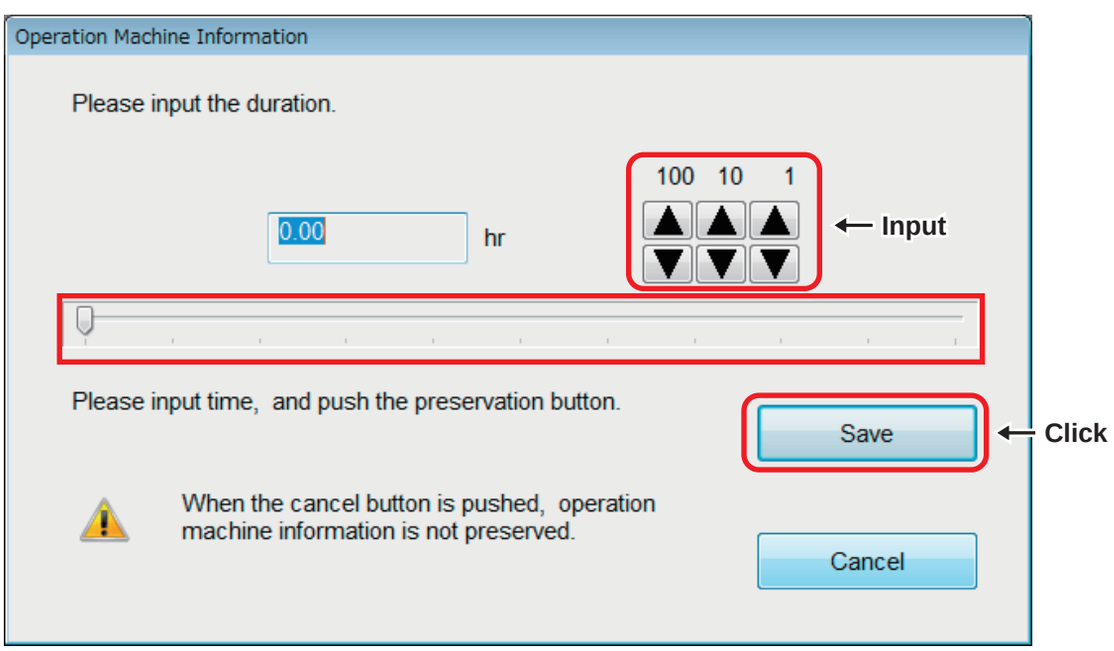


Screen when the usage time cannot be confirmed

Reason for Entry

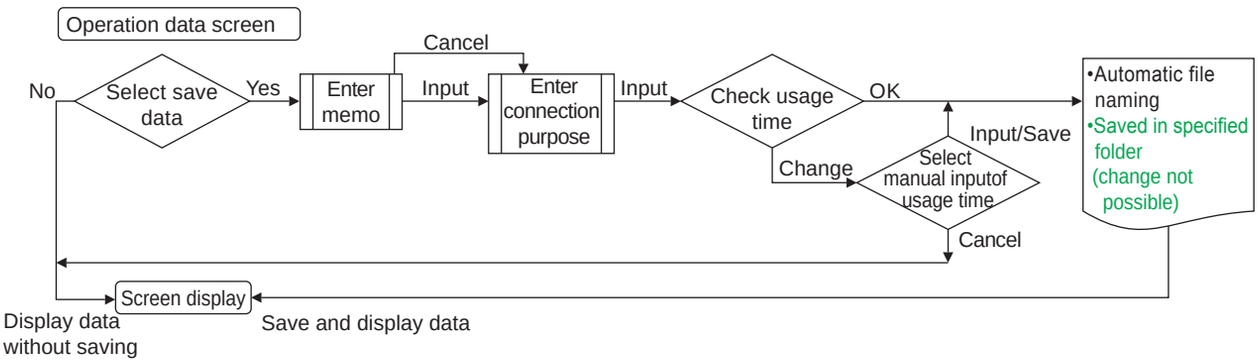
- The usage time of machine is the most important item of the operation data.
- There are many cases in which the usage time of the 3G controller is not recorded.

11 After manually entering the usage time by controlling the button, click the "Save" button. The collection information display screen is displayed.



Important **If you select "Cancel" in the usage time manual entry screen, the operation data is not saved.**

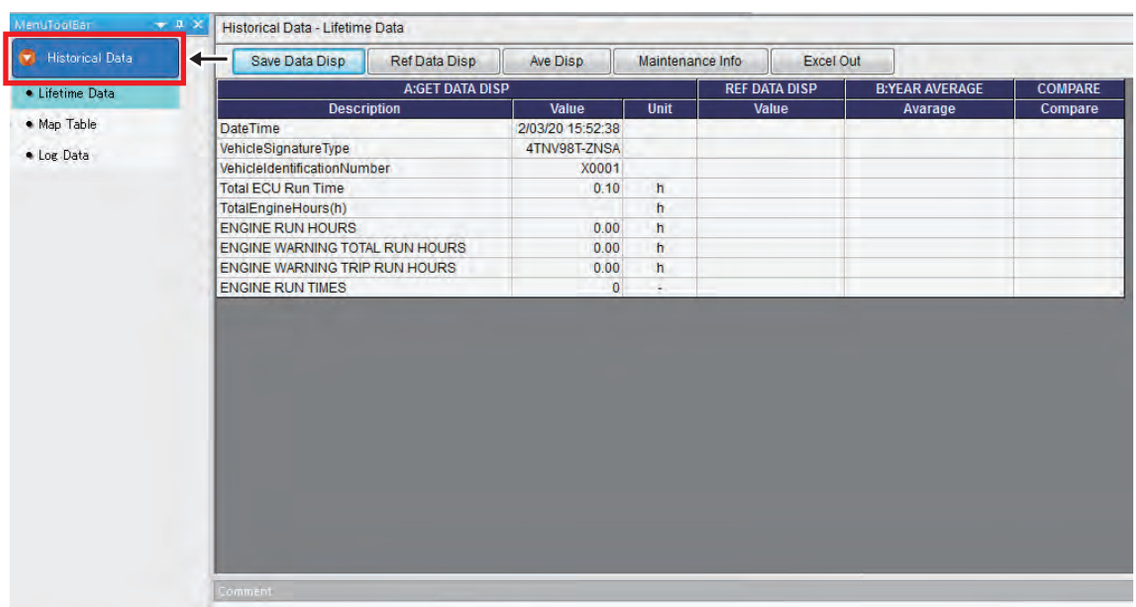
■Summary of flow up to saving the operation data



10.2 Display Screen of Operation Data

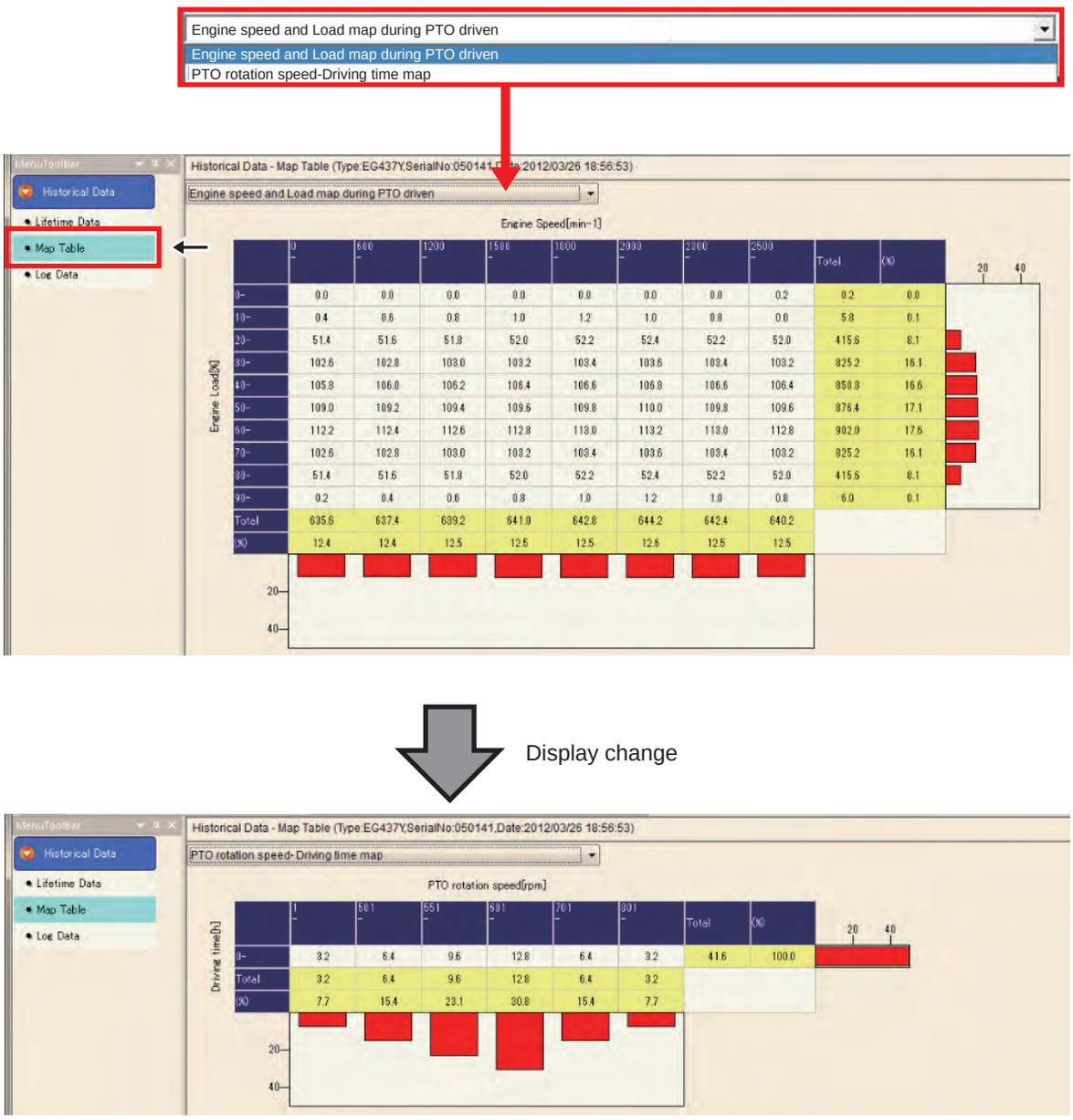
- Access to all ECU on the same CAN network, and display the saved operation data. (Even if the saved operation data is in multiple ECU, it is displayed in one screen.)
- The model is displayed in the stored information in the ECU.
- The model of the machine equipped with multiple ECU is displayed under the model of the "Implement ECU".
- The history data saved in the engine ECU is also collected and displayed as operation data.

- **"Integrated Value" Display Screen of Operation Data**

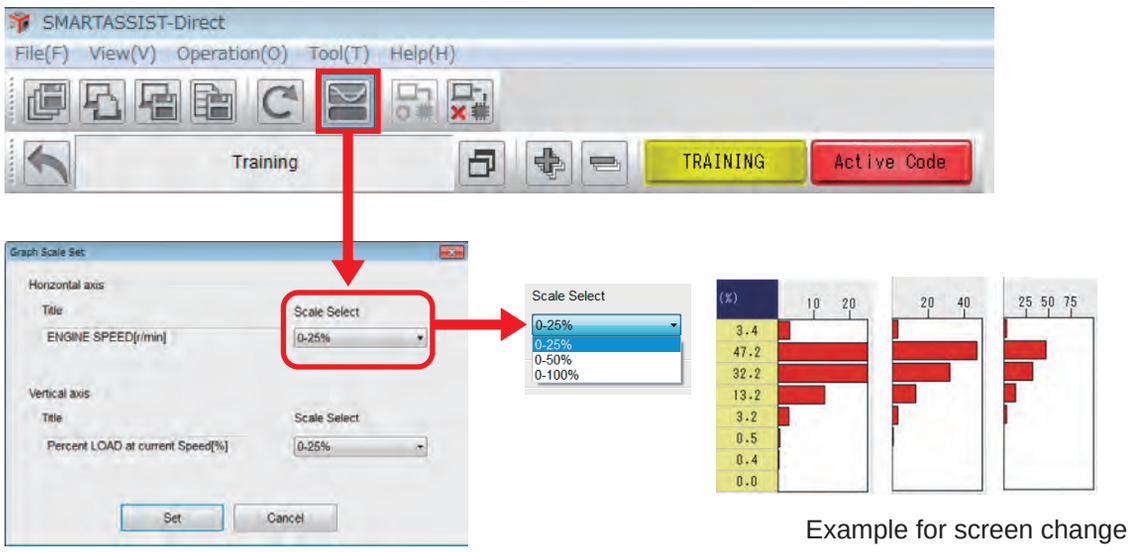


● "Distribution Chart" Display Screen of Operation Data

- This is the display screen for the operation data stored as the distribution chart. (The maximum display for maps is 16 rows x 16 columns.)
- The history data for the existing engine is also collected and displayed as the operation data.
- The display can be selected and changed when the multiple distribution chart information is saved.



The scale value of the bar graph can be changed to 25%, 50% and 100%.



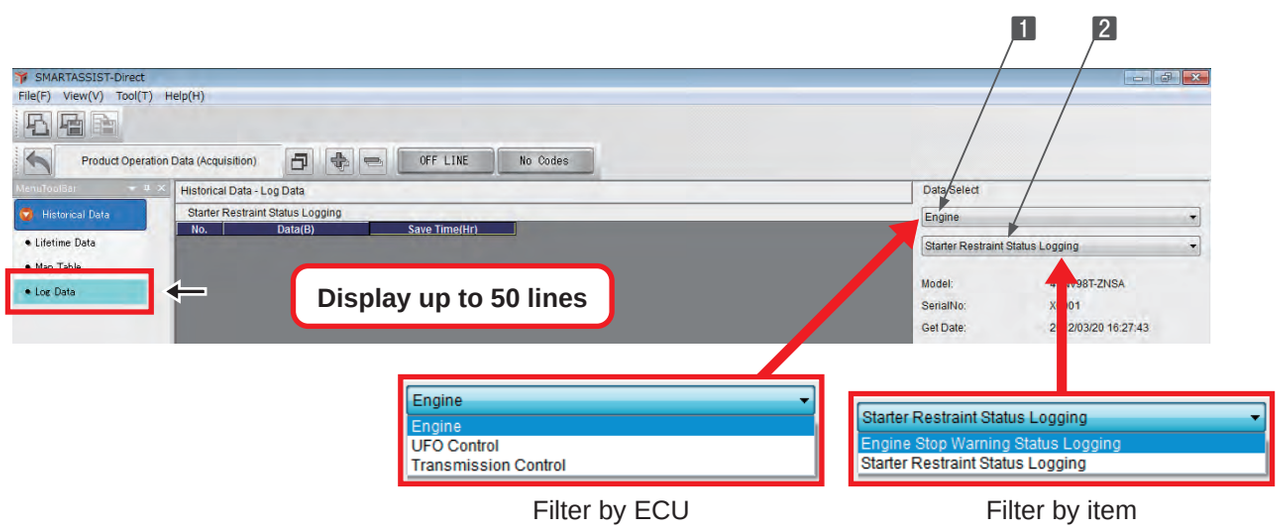
Example for screen change

● "Log Data" Display Screen of Operation Data

- Two display systems are supported: save the time of the event occurrence and save the values per unit time.
- The displayed data can be divided by ECU and type of data.
- The history data saved in the engine ECU is also collected and displayed as operation data.

1 Example for ECU Selection Display

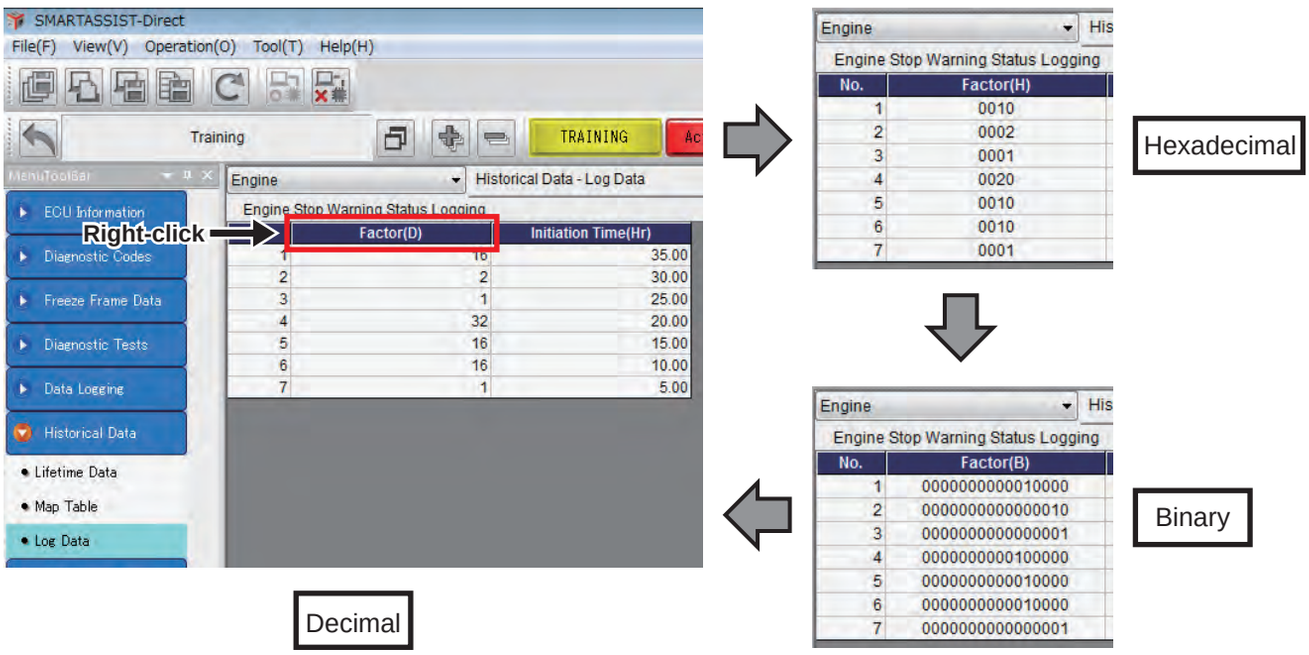
2 Operation Data Selection Display



Filter by ECU

Filter by item

By right-clicking the "Factor (D)" box, the data display can be changed to binary, decimal and hexadecimal numbers.



● **Function buttons on the accumulated information screen**

1 : Print the screen. (Refer to [6.2.2])

2 : Save a screenshot in BMP format. (Refer to [6.2.3])

3 : Save the complete history data in CSV format. (Refer to [6.2.4])

4 **Save Data Disp** : Select and display the save data.

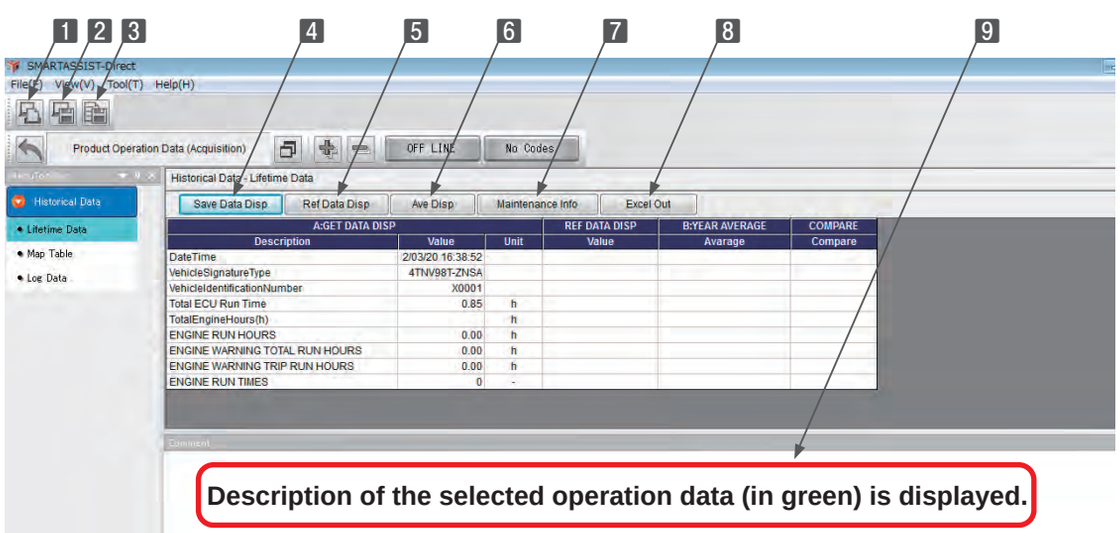
5 **Ref Data Disp** : Select and display the reference data.

6 **Ave Disp** : Comparison with the average values per model and year of shipment.

7 **Maintenance Info** : Maintenance information display

8 **Excel Out** : Output in Excel-format.

9 Explanation display for individual operation data item



10.3 Operation for the operation data (integrated value)

■Function buttons and display screen

● Operation Toolbar

1 : Print the screen. (Refer to [6.2.2])

2 : Save a screenshot in BMP format. (Refer to [6.2.3])

3 : Save the complete history data in CSV format. (Refer to [6.2.4])

● Function Buttons

4 **Save Data Disp** : A: Call up and display the saved data in the collected (saved) data display box.

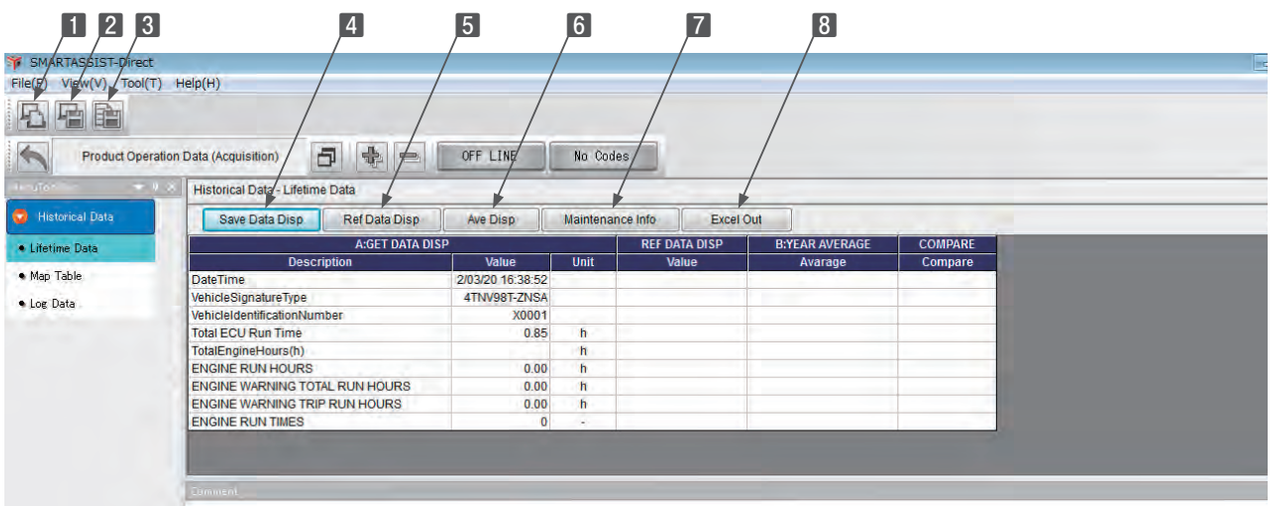
5 **RefData Disp** : Display the saved data as reference.

6 **Ave Disp** : Display and compare the "Average values per model and year of shipment".

7 **Maintenance Info** : Display the maintenance information.

8 **Excel Out** : Export the screen information in the specified EXCEL format.

9 **Selection Item Clear** : Clear the maintenance information.



● Main Box

10 **A:GET DATA DISP** : Display the collected or saved data.

11 **Description** : Display the operation data name.

12 **Value** : Display the saved value.

13 **Unit** : Display the unit.

14 **REF DATA DISP** : Display the reference data.

15 **B:YEAR AVERAGE** : Display the "average values per model and year of shipment".

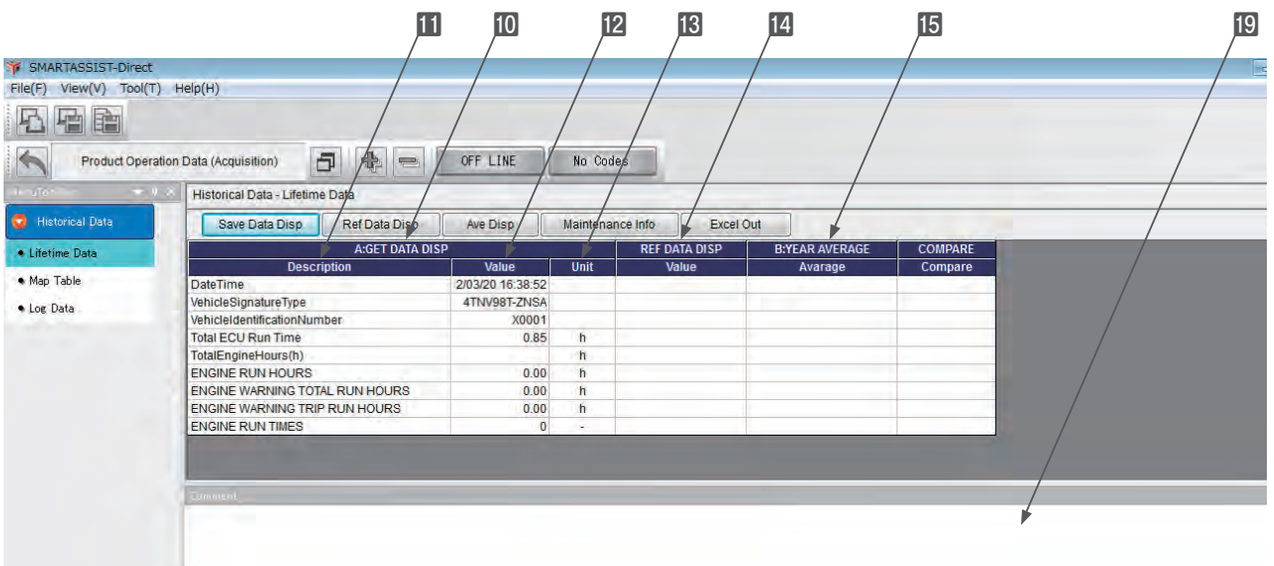
16 **Average Value Comparison** : Display the comparison of the values 10 and 15 .

17 **Clear** : Display the maintenance information clear box.

18 **Maintenance Information** : Display the maintenance information "Details" button.

● Comment Box

19 "Comment" box: Display the comment for the clicked operation data.

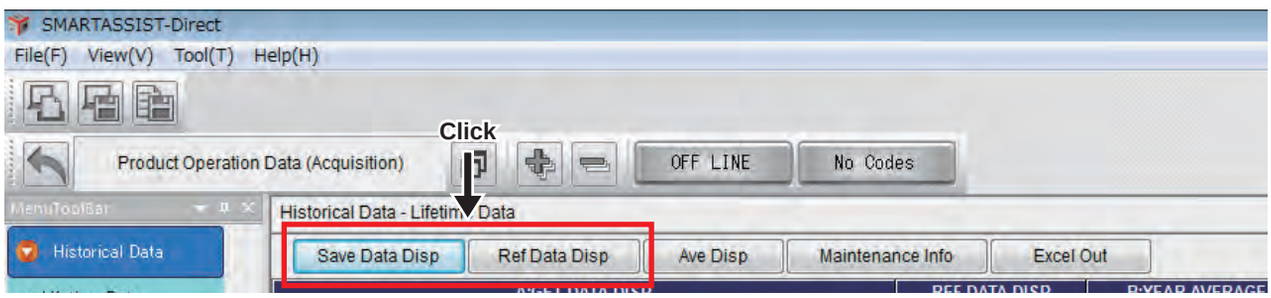


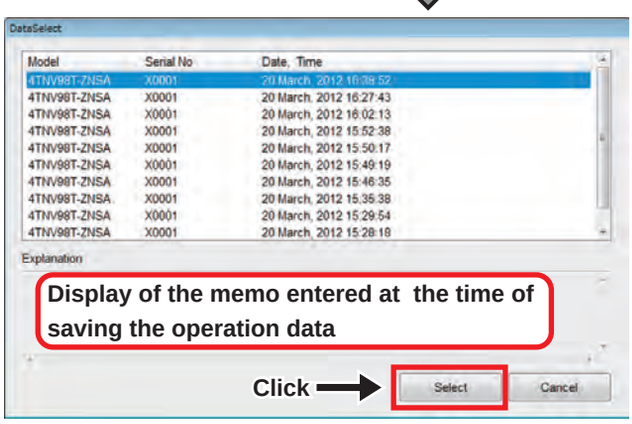
■Display the Save Data and Reference Data

The operation data stored in your PC can be displayed in comparison.

Utilization example

- Check the temporal change for the same machine.
- Check the difference in the usage condition with the other machine.





From the saved operation data, select the data that refers to the below information and click “Select” .

- Model
- Machine number
- Date when data was saved
- Description (memo)

The collected (called up) data is displayed in the left row, the reference data is displayed in the right row.

A:GET DATA DISP			REF DATA DISP
Description	Value	Unit	Value
DateTime	2/03/20 16:38:52		2012/03/20 16:38:52
VehicleSignatureType	4TNV98T-ZNSA		4TNV98T-ZNSA
VehicleIdentificationNumber	X0001		X0001
Total ECU Run Time	0.85	h	0.85
TotalEngineHours(h)		h	
ENGINE RUN HOURS	0.00	h	0.00
ENGINE WARNING TOTAL RUN HOURS	0.00	h	0.00
ENGINE WARNING TRIP RUN HOURS	0.00	h	0.00
ENGINE RUN TIMES	0	-	0

Unlike serial numbers, the operation data for different models can be displayed as the reference data.

A:GET DATA DISP			REF DATA DISP	B:YEAR AVERAGE
Description	Value	Unit	Value	Avarage
DateTime	2/03/20 17:10:53		2012/03/20 15:28:18	
VehicleSignatureType	4TNV98T-ZNSA		4TNV98T-ZNSA	
VehicleIdentificationNumber	X0001		X0001	

A:GET DATA DISP			REF DATA DISP	B:YEAR AVERAGE
Description	Value	Unit	Value	Avarage
DateTime	2/03/20 17:10:53		2012/03/20 15:28:18	
VehicleSignatureType	4TNV98T-ZNSA		4TNV98T-ZNSA	
VehicleIdentificationNumber	X0001		X0001	

Remark Only the matched operation data items with the collected (called) data are displayed for the reference data.

Example: If the construction machinery and the agricultural machinery data are displayed, the common engine-related operation data is displayed. (In case of having the engine-related operation data in both data.)

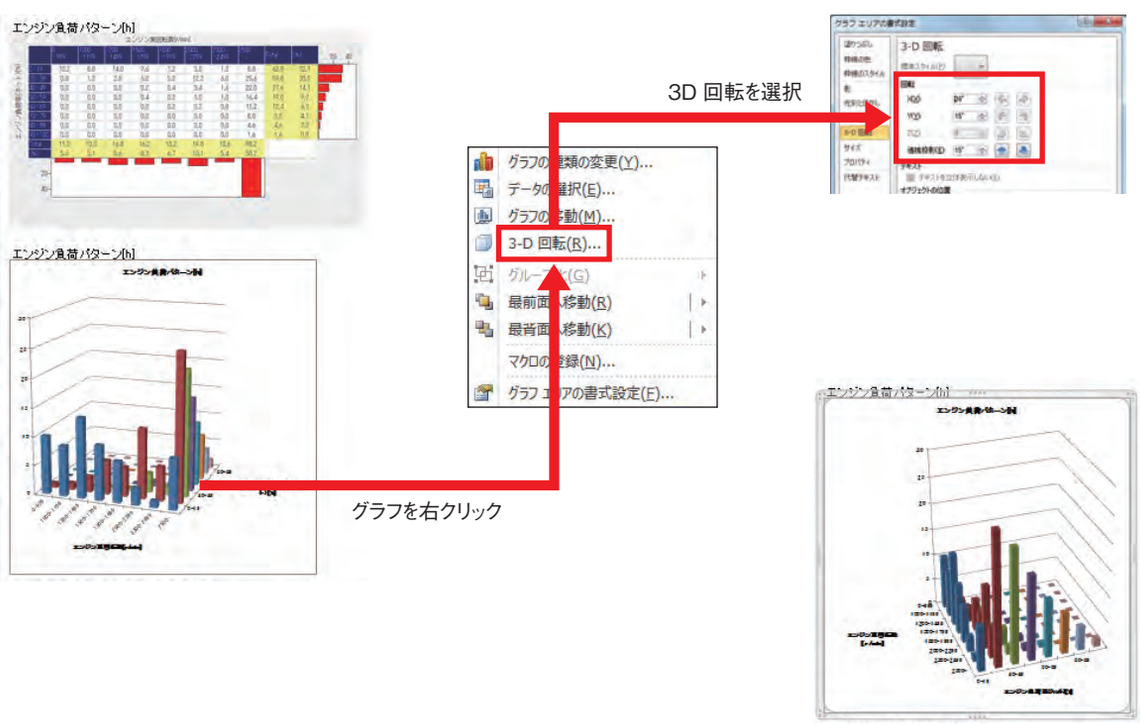
This is a function to export the operation data in the specified EXCEL format.

Assuming that the data is submitted to the end user and attached to the work report, it has the below characteristics.

- Output the required information in easy-to-see format.
- Unlike the output in CSV file format, reprocessing is not necessary.

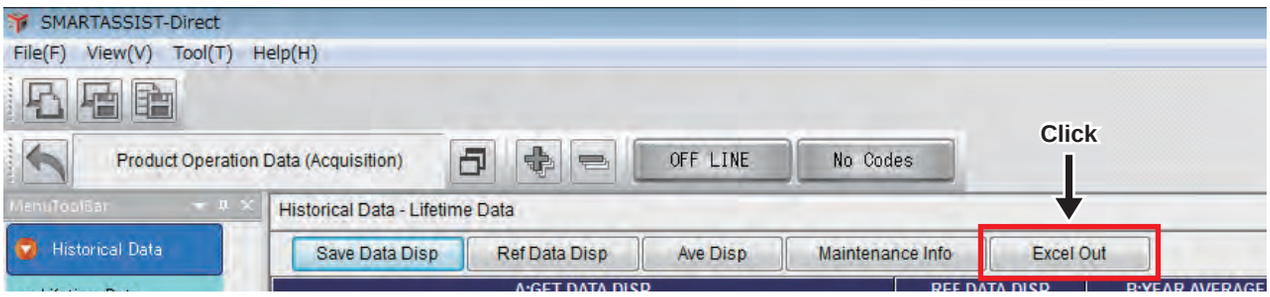
Get Date						
User ID						
Engine			Vehicle			
Engine Signature Type			Vehicle Signature Type			
Engine Identification Number			Vehicle Identification Number			
Operating time			Operating time (Manual input)			

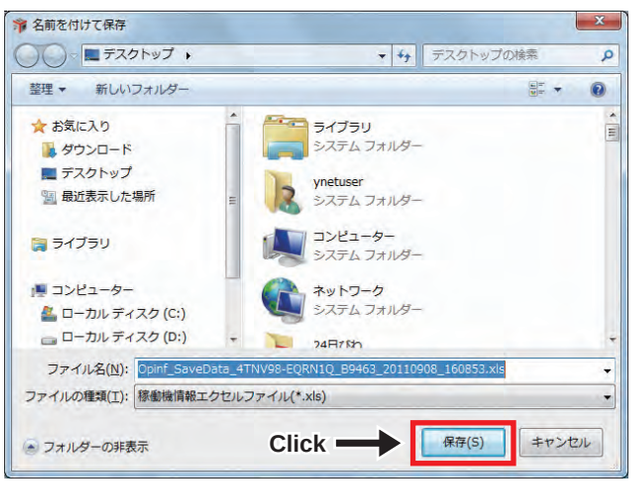
	Date time A:Description	Value	Unit	REF Data	(Reference) B: Average	Compare A/B (%)
1	Total ECU Run Time					
2	ENGINE RUN HOURS					
3	ENGINE WARNING TOTAL RUN HOURS					



Note Output the integrated value information and the distribution chart information (2D **and 3D) in EXCEL. (You cannot export the log data.)**

Click the "EXCEL Write" button, select the save location, and then click the "Save" button.





The default file name contains information of the obtained (saved) data in the below order.

- Model
- Serial number
- Date obtained

The file name can be changed.

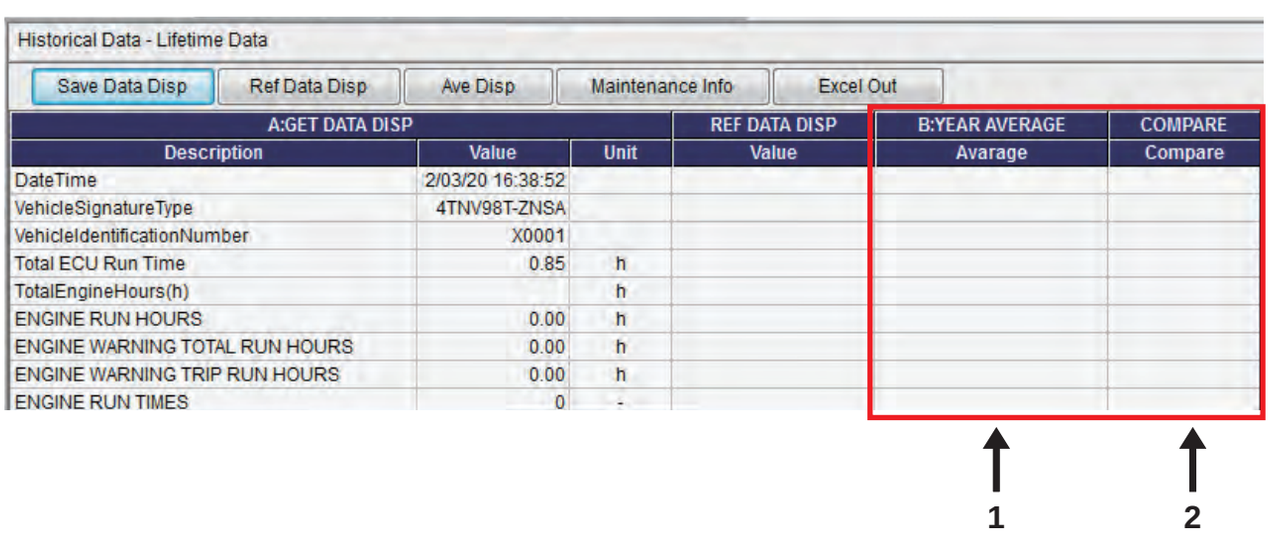
Point The file created by "EXCEL Write" can be handled between PCs without processing "Export" and "Import" in the "Data Management Function".

● Display the Average Values

1 The average values calculated from the operation data uploaded to the center are displayed.

2 The ratio of the collected data (right) for the average values is calculated.

3 The average values are calculated per model and year of shipment in the beginning of every month and automatically downloaded when logging in to the SMARTASSIST-Direct with an active Internet connection.



11. Tool Function

11.1 Communication Settings

This is the screen to perform the communication settings between the SMARTASSIST-Direct and the product. When connected to the product, it is automatically set, so there is no need to operate during normal service. Change the settings only when instructed to do so by YANMAR.

Important **The parameters for CAN communication can be changed. To change the parameters, you need to have sufficient knowledge of CAN. As the communication can be cut off, change only when instructed to do so by YANMAR.**

● **Settings Screen**

You can open the communication settings screen by clicking the "Communication Settings" button in the tab "Detail Settings/Additional Functions" in the main menu. (You can also open the screen from the control screen.)

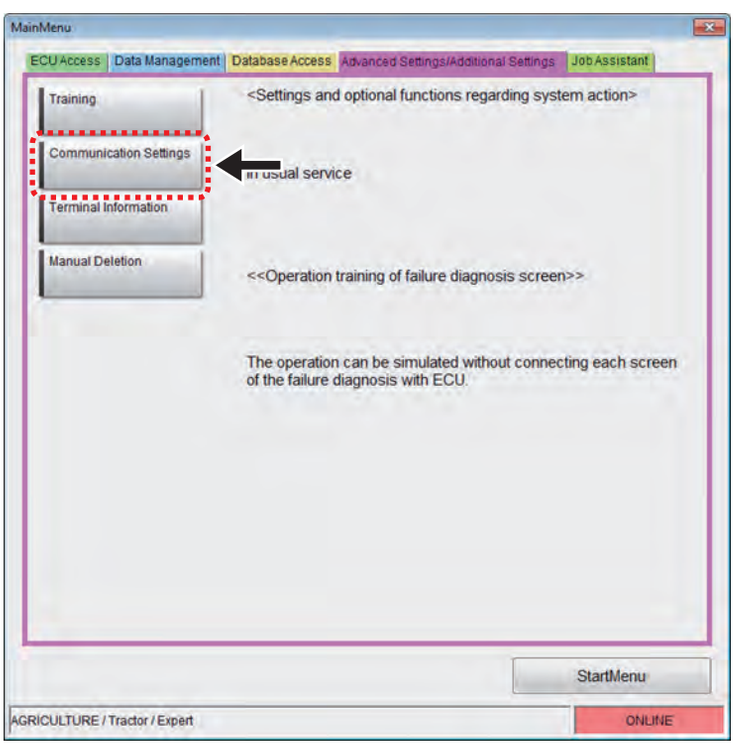


Figure 11-1 Main Menu

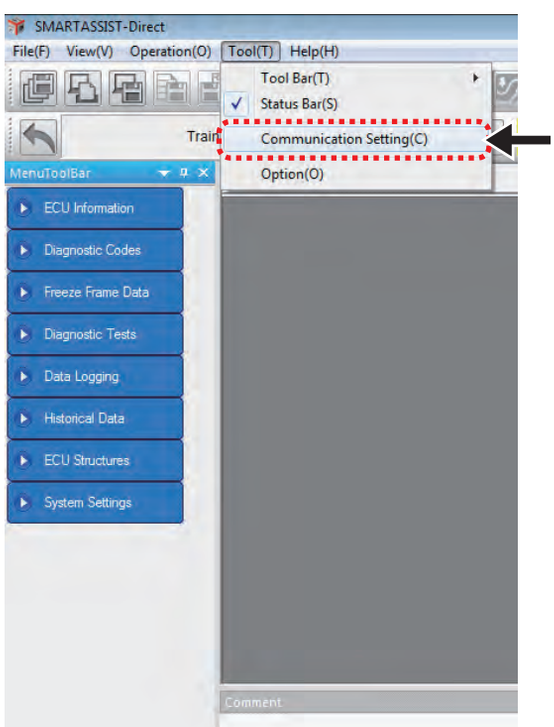


Figure 11-2 Control Screen

● Control Method

1 **Set Select** : Four types of names can be registered and read.

2 **Port** : Fixed at USB.

3 **Version Select** : As some initial ECU for small-sized engine have a different communication specification, the version can be selected.

4 **Baud Rate Check CAN-ID** : Prepared for adding new specification in the future specification change.

5 **CAN ID** : There is no need to change the parameters for the CAN signal.

6 **Priority** : The standard value is 6.

7 **Physical Address** : The standard value is DA00h. In systems with multiple ECU, it is required to change it to 00h.

8 **Function Address** : Fixed at DB33h.

9 **SA** : Address for the service tool, fixed at F0h.

10 **Data Rate** : Communication baud rate. For marine use, 250 kbps is standard. For land use, 500 kbps is standard.

11 **ISO 15765** : The parameters for flow control. There is no need to change.

12 **Message Timing** : The timing parameters for CAN message. There is no need to change.

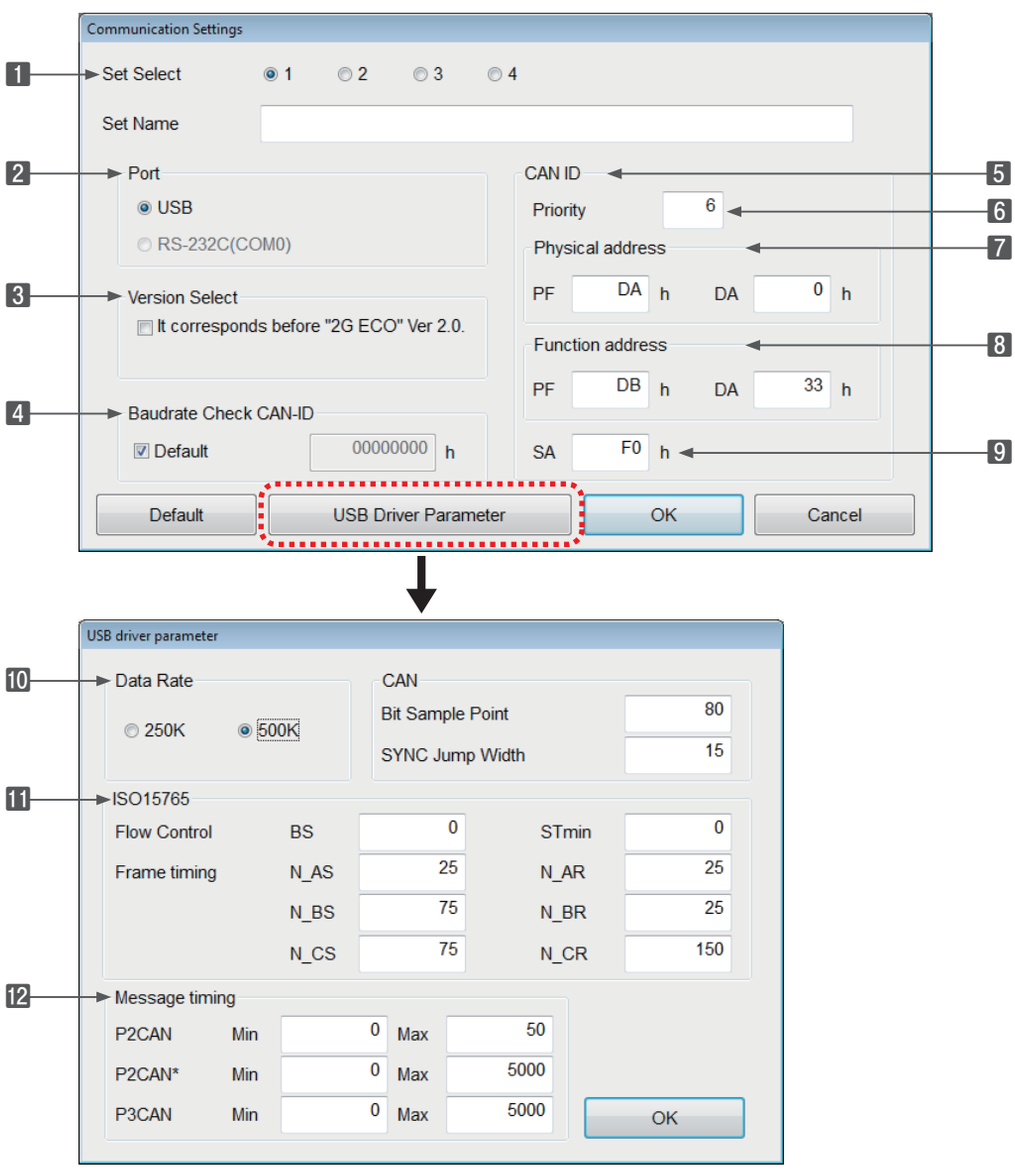


Figure 11-3 Graph Control Screen

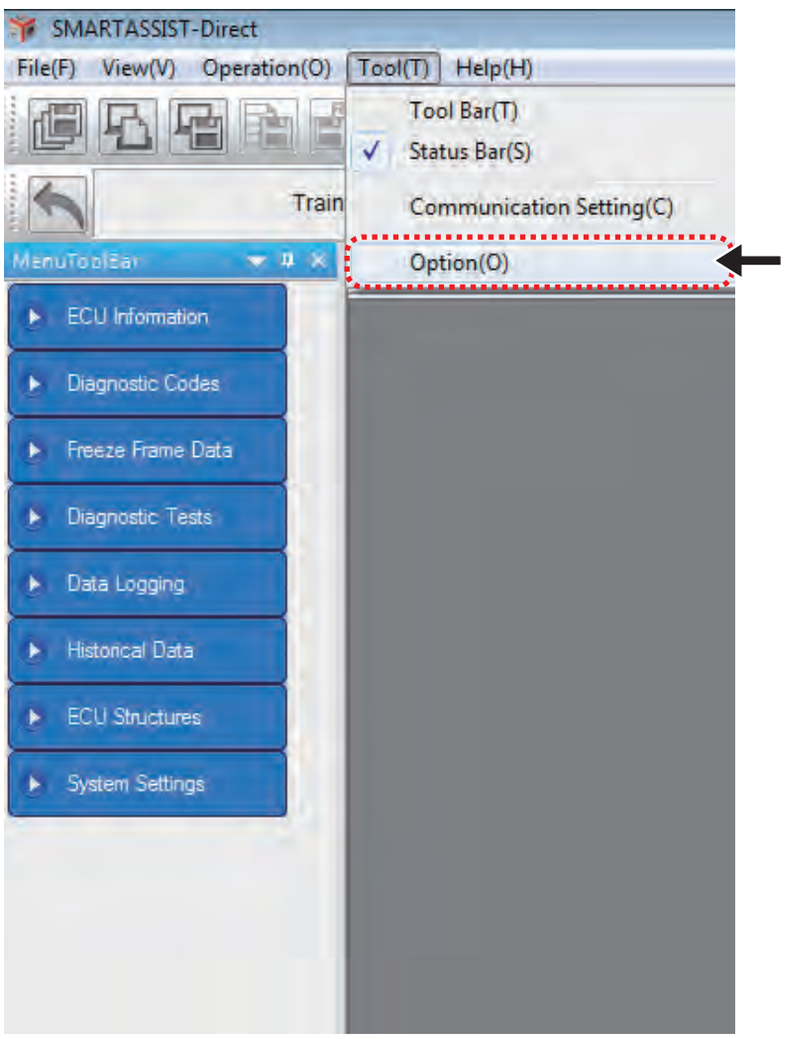
11.2 Option Settings

This is a screen to perform the screen settings. Mainly, the following settings can be performed.

- Change the display unit.
- Change the language.

● Settings Screen

You can open the settings screen by clicking "Option" in "Tool" in the control screen.



● **Control Method**

1 Set the units for temperature and pressure.

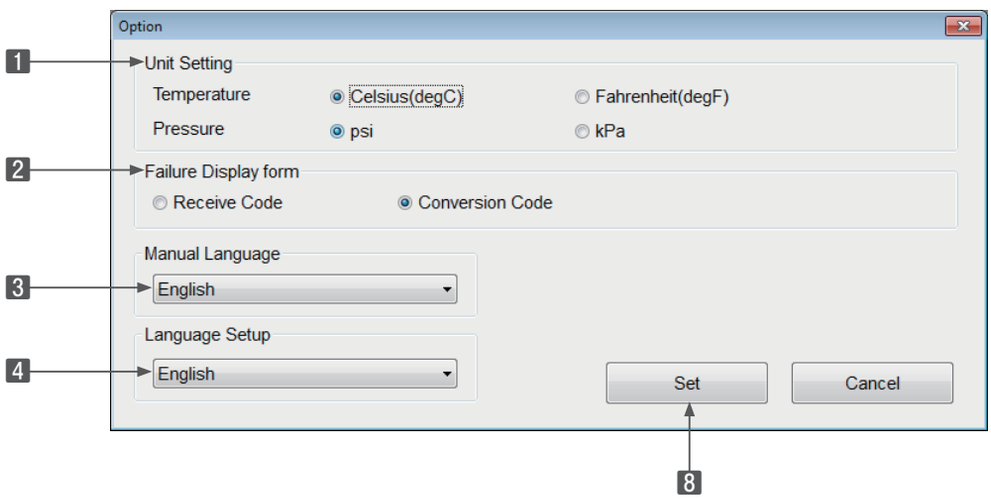
2 Change the display format of the error codes.

Point Normally set in the determined display format for the product, but if you want to see it in another error code format, you can change it.

3 Set the language for the manual link data of the error diagnosis function.

4 Change the display language of SMARTASSIST-Direct.

5 Confirm the changed content.



12. Glossary

Abbreviation	Name	Content
BS	Block Size	Flow control related parameters used in ISO 15765
CAN	Controller Area Network	Communication standard used in the in-vehicle LAN
CSV	Comma Separated Values	File format used in PC
DA	Destination Address	ID information for the CAN communication data
D-SUB	Connector Standard	-
DTC	Error Diagnosis Code	Coded information according to the failure content
ECU	Engine (or Electronic) Control Unit	Also called ECM.
FFD	Freeze Frame Data	Data related to before and after the failure
FMI	Failure Mode Identifier	Detailed failure information added to the DTC
LID	Local Identifier	ID information specific to the controller
OC	Occurrence Counter	Number of DTC occurrences
PC	Personal Computer	-
PF	Protocol Data Unit Format	ID information for the CAN communication data
PDM	Product Data Management	-
SA	Source Address	ID information for the CAN communication data
SAE	Society of Automotive Engineers	-
Sno.	Serial Number	Manufacturing serial number for engine, pump and ECU
SPN	Source Parameters Number	Common ID used in SAE J1939
USB	Universal Serial Bus	Serial communication port used in PC

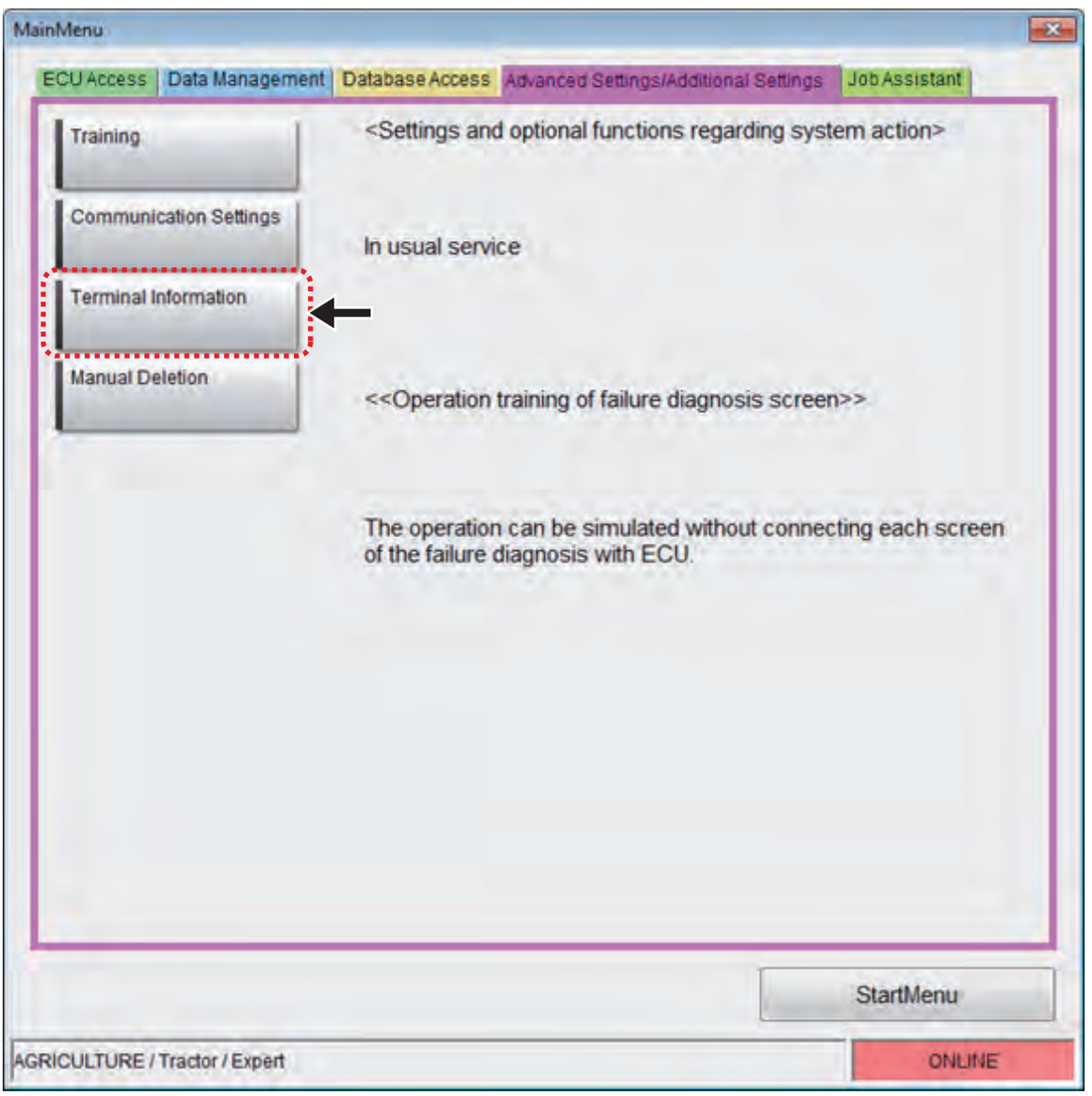
13. Workstation Information (Version Information)

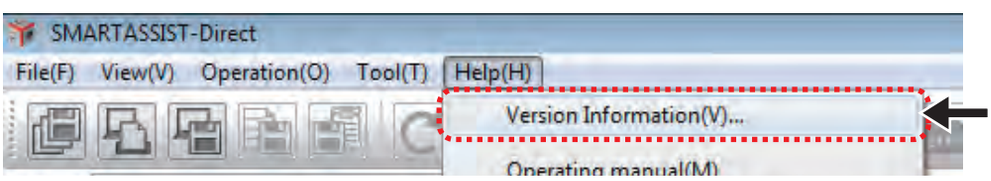
You can check the SMARTASSIST-Direct software information.

- Software version information.
- Updated information of the corresponding models.
- License expiration date and authority information.

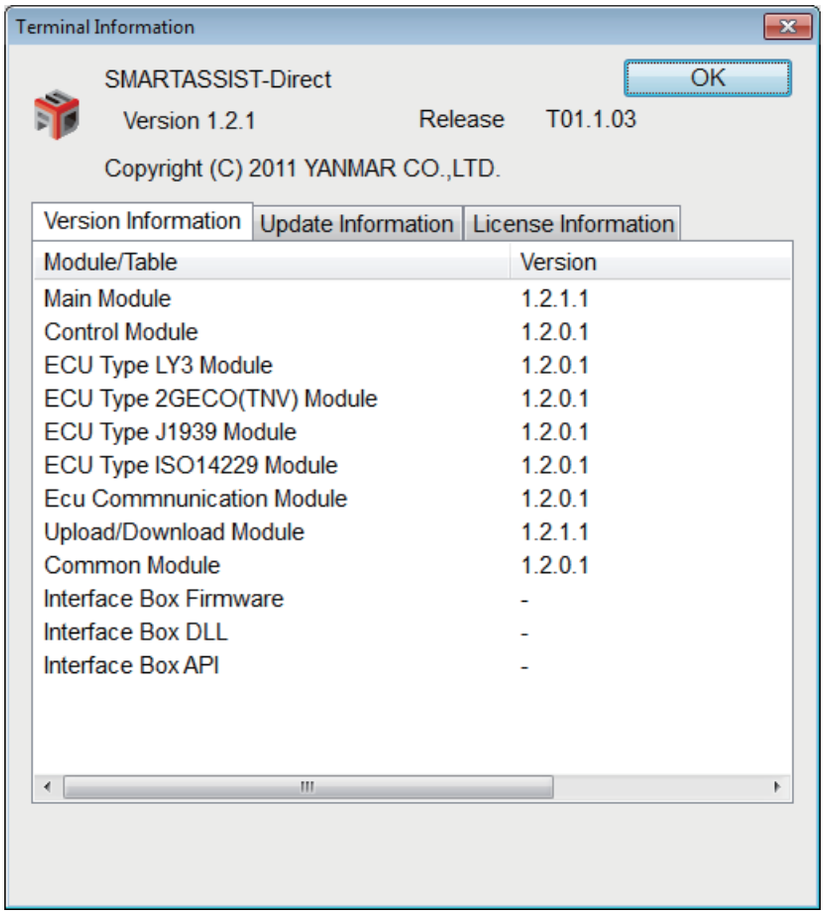
● Check screen

You can open the check screen by clicking "Terminal Information" in the tab "Detail Settings/Additional Functions" in the main menu. (You can also open the screen from the control screen.)

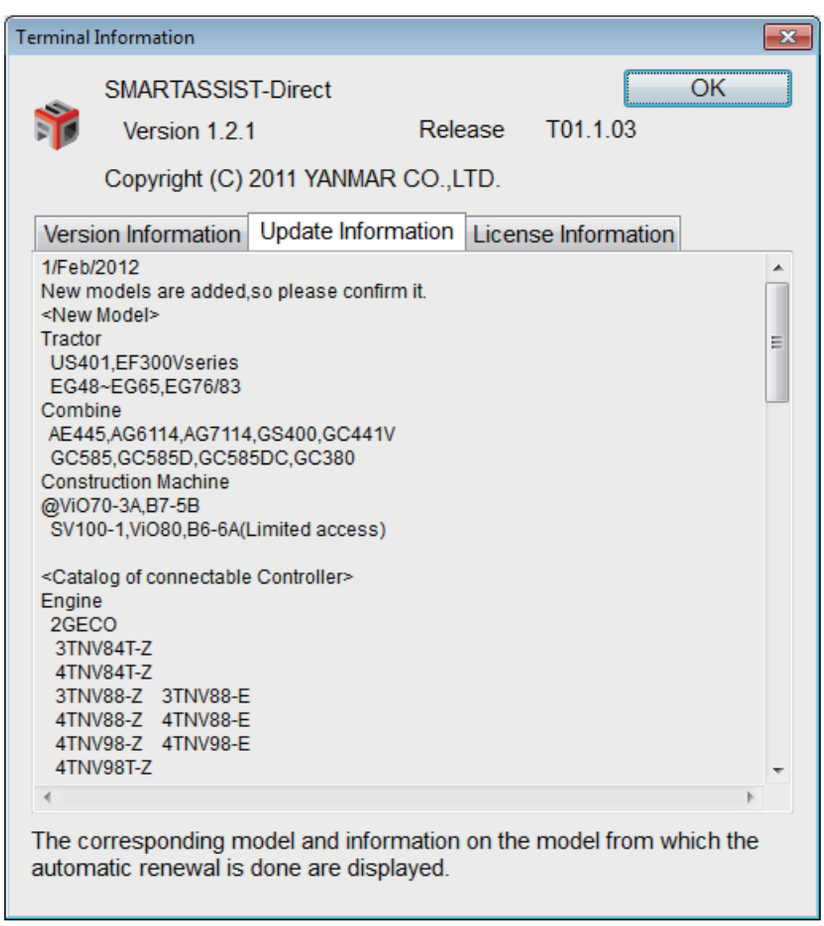




● **Version Information Screen**



● **Updated Information Screen of the Supported Models**



● **License Information Screen**

1 Display the security check period.

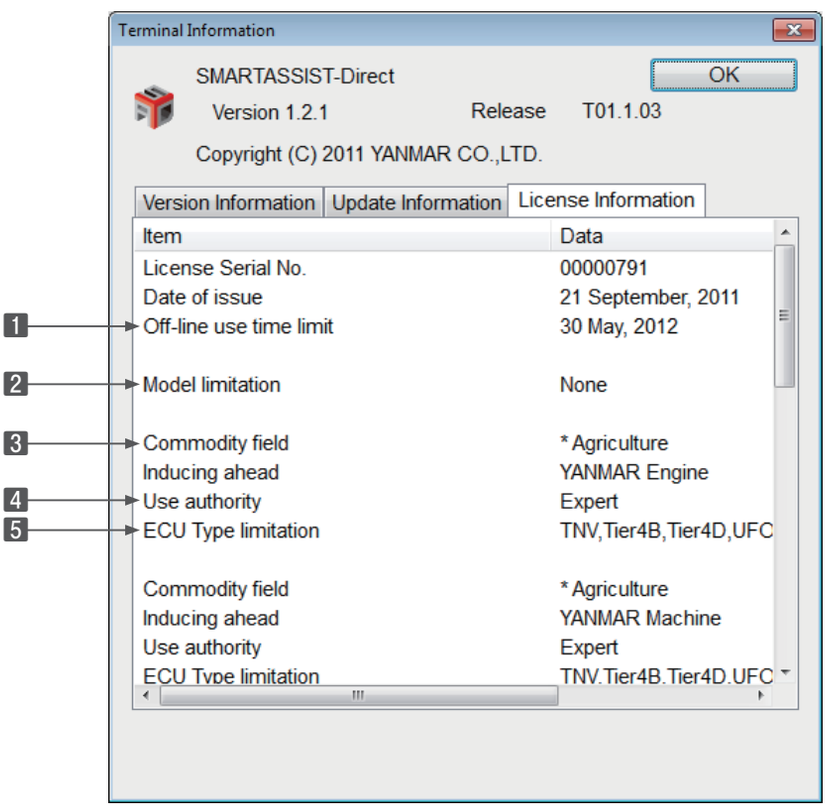
2 Presence and absence of the utilization limitation by model

3 Available product category

4 License mode

5 Presence and absence of the utilization limitation by ECU/controller

Note To use the SMARTASSIST-Direct, a security check is required every 3 months.
Check this screen periodically and make sure that your license does not become invalid. Start the SMARTASSIST-Direct with your PC connected to the Internet. The software automatically communicates with the center and the security check is performed.



14. Error Screen and Warning Screen

Various "Error Screen" and "Warning Screen" appear while you are using the SMARTASSIST-Direct.

14.1 Error Screen

Screen when a failure occurred mainly in the stage of communication processing between the SMARTASSIST-Direct and the product.

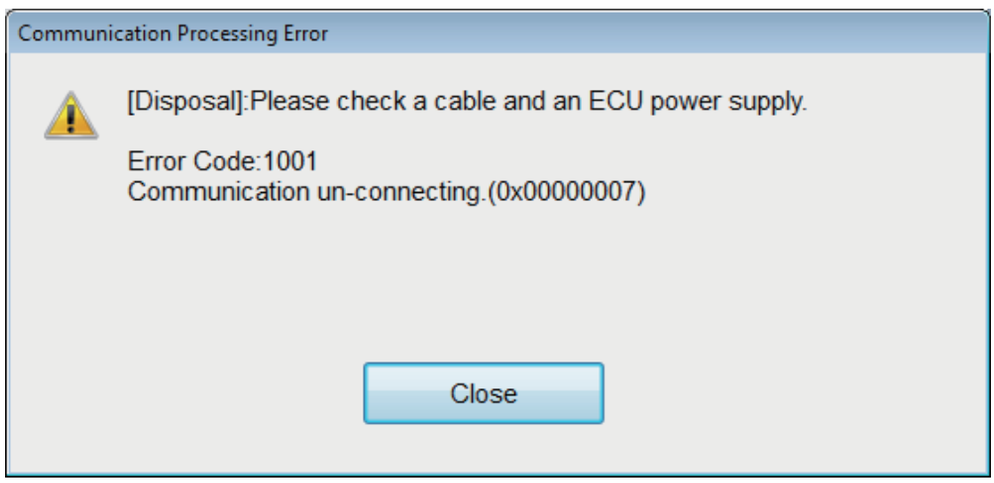


Figure 14-1 Error screen example

Error Message List

No.	Error message	Cause
1	**Error code: 1001** **Error content: Not connected (code)** **Process message: "Check the communication cable and the ECU power supply".** ***The code is displayed in the return value from the I/F Box in hexadecimal.**	● **Undefined error occurred (0x00000007) (0x00000008) (0xFFFFFFFD)** **• When the I/F Box is not connected** **• When the ECU power is not turned on** **• The USB driver is not correctly installed** • Incomplete setting of PDIB32.dll (production bench only) ● Time-out occurred (0x00000009) ● Message buffer is empty (0x00000010) • This error occurs when the source address is different.

2	**Error code: 1002** **Error content: Abnormal communication (code)** **Process message: "Upgrade the version of the ECU, IF/Box, and service tool."** ***The code is displayed in the return value from the I/F Box in hexadecimal.**	Error from the I/F box determined. **(0xFFFFFFFE): When there is a problem in the ECU side setting (EEPROM fault, etc.): 1002** ● Unsupported function is requested (0x00000001). ● Invalid channel ID is specified (0x00000002) ● Invalid protocol ID is specified (0x00000003) ● Null pointer is specified (0x00000004) ● Invalid message buffer size is specified (0x00000005) ● Invalid flags are specified (0x00000006) ● Invalid message is specified (0x0000000A) ● Invalid time interval is specified (0x0000000B) ● Periodic Msg Filter setting that exceeds the limit is requested (0x0000000C) ● Invalid Msg ID is specified (0x0000000D) ● Invalid Error ID is specified (0x0000000E) ● Invalid Ioctl ID is specified (0x0000000F) ● Message buffer is full (0x00000011) ● Message buffer is overflown (0x00000012) ● Invalid pin number is specified (0x00000013) ● Specified Channel ID is in use (0x00000014) ● Protocol ID in the message is invalid (0x00000015) ● Tester message transmission failed (0x800D0001) ● ECU reception error occurred (0x800E0001) ● ECU message checksum error (0x800F0001) ● ECU message structure error (0x80100001) ● ECU message byte time error (0x80110001) ● ECU message time error (0x80120001) Other errors (0xFFFFFFFF): Incorrect argument error: 1002 (0xFFFFFFFC): Incorrect response data error: 1002 (0xFFFFFFFB): Security access denial error: 1002 (0xFFFFFFFA): Different protocol error: 1002 (0xFFFFFFF9): Abnormal memory error: 1002

3	**Error code: 1003** **Error content: Abnormal service response (code)** ***The code is displayed from the ECU in hexadecimal. When there is no response, the display is blank.** **Process message: "Check the version of the ECU, IF/Box, and service tool."**	When the following negative response is received from the ECU ● General refusal (0x10) ● Service not provided (0x11) ● Subfunction not provided (0x12) ● When the conditions of the ECU are not met (forced operation, etc.) ● Out of request range (0x31) ● Security access refused (0x33) ● Invalid security key (0x35) ● Download not permitted (0x40) ● Incompatible download format (0x41) ● Specified download address disapproved (0x42) ● Number of download request bytes disapproved (0x43) ● Service not provided in the current diagnostic mode (0x78) No response from the ECU

Note When an error other than the underlined error code occurred, it is possibly related to development of the product. Contact YANMAR.

14.2 Error (Warning) Message

■At Application Start-up

Function	Process	Message (example)	Cause	Operation after display	Remark
Direct start-up	License	There is a problem with the license. Please repeat the set-up.	Installation failure. There is a problem with the license file. (YSASS_License.lic)	Application closed.	
		Unable to start because the version is incorrect. Please repeat the set-up.	Installation failure. Updating the module failed. The module structure of the version is incorrect (not matched).	Application closed.	
		The usage license is invalid or the initialization after installation has not been performed. To obtain the license, exit the software, confirm that the computer is connected to the Internet, and start the software again.	The license file and the user information are not collected.	Start with the default mode.	
			The license key of the license file does not match the install key.	Start with the default mode.	
			License is expired.	Start with the default mode.	
			When the license is inconsistent	Start with the default mode.	
		The license was not updated because the license update file is incorrect. The software utilization term has expired. If the latest software is not installed within 7 days, writing is disabled.	License has expired.	Normal operation (Only for the displayed valid term)	
		License conditions were changed. The utilization term is until 2011/12/31.	License was updated.	Normal operation	
Login		Enter the user ID.	Your user ID is not entered at login.	Re-enter login	
		Enter your password.	Your password is not entered at login.	Re-enter login	
		The user ID or your password is different. Note: Using a common password with YDS might have changed the password. To update the settings file: Exit the software, confirm that the computer is connected to the Internet, start the software again, and log in.	Wrong user ID or password is entered.	Re-enter login	
		Click OK to exit.	When you exit the program	When "Yes", Direct closes. When "No", Exit is canceled.	

Function	Process	Message (example)	Cause	Operation after display	Remark
Operation maintenance information	Extract the compressed file	Extracting the maintenance data failed.	Processing the file reply for the operation data and maintenance information failed.	Continue the process (Cancel the extraction of the maintenance information)	
Start Menu	Exit operation	Click OK to exit.	When you exit the program	When "Yes", Direct closes. When "No", Exit is canceled.	
Main Menu		Change data not found.	When there is no parts replacement information in the parts replacement screen.	Process is canceled	
		Reading the save data failed.	For some reason (internal cause or breakage of a file), reading the operation data failed.	Process is canceled	
		Operation is not possible because the server is offline.	The menu is selected when the server is offline.	Not operable	Currently not supported
Common for each view	Function change	Switch to XXXX function?	The function selection combo box for each function screen is changed.	When "Yes", execute change. When "No", do not change.	
	ECU change	Switch to XXXX?	The ECU selection combo box for each function screen is changed.	When "Yes", execute change. When "No", do not change.	

■Defect Display

Function	Process	Message (example)	Cause	Operation after display	Remark
Current Defect	Manual display	The manual does not exist.	The selected manual file does not exist.	The manual is not displayed.	

■Data Before/After Error

Function	Process	Message (example)	Cause	Operation after display	Remark
Trend Graph	Graph Settings	Check the conditions of the range setting. (Select the settings so that the lower limit is smaller than the upper limit.)	In the minimum and maximum settings for graph, a minimum value that is greater or equal to the maximum was set.	Re-enter in the graph settings screen.	

■Diagnosis Test

Function	Process	Message (image)	Cause	Operation after display	Remark
Digital Output	Data Settings	Unable to apply the change.	When the selected data cannot be changed	No action.	
	Screen change	Stop the forced driving?	When the screen change is executed while executing the force operation (fixed control)	When "Yes", recover control. When "No", control remains fixed. Change the screen, respectively.	
Forced Operation	Data Settings	Unable to apply the change.	When the selected data cannot be changed	No action.	
		Stop the forced driving?	When the screen change is executed while executing the force operation (fixed control)	When "Yes", recover control. When "No", control remains fixed. Change the screen, respectively.	
		Switch to the hysteresis graph?	When the hysteresis measurement is performed and exited	When "Yes", change to the graph screen. When "No", no action.	
Forced Operation Graph		Check the conditions of the range setting. (Select the settings so that the lower limit is smaller than the upper limit.)	In the minimum and maximum settings for graph, a minimum value that is greater or equal to the maximum was set.	No action. Re-enter in the graph settings screen.	
		Save the measured data?	When saving the measured data.	When "Yes", save. When "No", do not save.	
		Measure data saved.	The measured data is complete.		
		Saving the measured data failed.	For some reason, saving the measured data failed.	Saving is interrupted.	
Forced Operation Hysteresis Graph		Same as the forced operation graph			

■Data Logging

Function	Process	Message (image)	Cause	Operation after display	Remark
Data Monitor		Creating the user settings file failed.	For some reason (internal cause), saving the user settings information file failed.	The process is canceled.	
		Saving the measured data failed.	For some reason (internal cause), saving the measured data failed.	The process is canceled.	
		The optional settings of the ECU and this software do not match. Set the option data again.	When you need to reset the option information in the beginning of logging, check before displaying the option settings screen.	The process is canceled after setting the option settings.	
		Polling mode is not supported.	When the polling mode is set for the sampling settings in the beginning of logging and the ECU does not support the polling mode.	The process is canceled.	
		Acquiring saved user settings data failed.	For some reason (internal cause), reading the user settings information file failed.	The process is canceled.	
		Settings are not saved.	When trying to read the user settings information file, but nothing was saved	The process is canceled.	
Save Data		Creating the user settings file failed.	For some reason (internal cause), saving the user settings information file failed.	The process is canceled.	
		Saving the measured data failed.	For some reason (internal cause), saving the measured data failed.	The process is canceled.	
Trend Graph		Check the conditions of the range setting. (Select the settings so that the lower limit is smaller than the upper limit.)	In the minimum and maximum settings for graph, a minimum value that is greater or equal to the maximum was set.	No action. Re-enter in the graph settings screen.	

■History Data

Function	Process	Message (example)	Cause	Operation after display	Remark
Integrated Value	Clear	Make a selection.	The "Clear Selection Items" button is pressed without the ticking the clear box.	No action.	

■Settings

Function	Process	Message (image)	Cause	Operation after display	Remark
Configuration (Configuration)	Data Settings	Unable to apply the change.	The selected data cannot be changed.	No action.	
Sensor Correction (Calibration)		Same as the configuration			
Parameter Adjustment (Tuning)		Same as the configuration			
Initial Settings	Data Settings	Unable to apply the change.	The selected data cannot be changed.	No action.	
	Data Settings	Sequence data not found.	Not processed, due to inconsistency in the sequence settings.	The process is canceled.	
	Data Settings	Unable to extract local ID from the process ID.	Not processed, due to inconsistency in the sequence settings.	The process is canceled.	

■Development mode

Function	Process	Message (image)	Cause	Operation after display	Remark
Common ID access		This summary CID cannot be added because it is set as a string. Check the settings file.	The specified CID is set as a string.	The process is canceled.	
		The CID is not registered in the LID/CID response list.	SPN is not set in the settings file. (In case of TNV-CR)	The process is canceled.	
		The CID is not registered in the LID/CID response list.	SPN is not set in the settings file. (In case of ISO 14229)	The process is canceled.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Common ID access	Processing file	File is defective. (verification error)	The file model did not match while reading the settings file.	The process is canceled.	
		File not found.	Settings file not found.	The process is canceled.	
		Writing the file failed.	For some reason (internal cause), saving the settings file failed.	The process is canceled.	
		Unable to apply the change.	The selected data cannot be changed.	The process is canceled.	
Common ID access (text)		This summary CID cannot be added because it is set as 2D or 3D map. Check the settings file.	2D, 3D maps are set in the common ID access (text) function.	The process is canceled.	
		The CID is not registered in the LID/CID response list.	SPN is not set in the settings file. (In case of TNV-CR)	The process is canceled.	
		The CID is not registered in the LID/CID response list.	SPN is not set in the settings file. (In case of ISO 14229)	The process is canceled.	
		File is defective. (verification error)	The file model did not match while reading the settings file.	The process is canceled.	
		File not found.	Settings file not found.	The process is canceled.	
		Writing the file failed.	For some reason (internal cause), saving the settings file failed.	The process is canceled.	
	Data Settings	Unable to apply the change.	When the selected data cannot be changed	No action.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Address specified access		Unable to apply the change.	Out of the address range	No action.	
			The "+F" row is pressed by WORD specification.	No action.	
Data ID specified access					

■ECU Software Writing

Function	Process	Message (image)	Cause	Operation after display	Remark
Preparation for writing		Copying the file to the write process sheet failed.	For some reason (internal cause), copying the downloader file and the writing settings file failed.	The process is canceled.	
		Reading the engine production history data failed.	For some reason (internal cause), reading the engine production history data failed.	The process is canceled.	
		Reading the individual data definition file failed.	For some reason (internal cause), reading the individual data definition file failed.	The process is canceled.	
		Reading the initial individual data file failed.	For some reason (internal cause), reading the initial individual file failed.	The process is canceled.	
		Reading the implement production history data failed.	For some reason (internal cause), reading the implement production history data failed.	The process is canceled.	
		Reading the specified pump correction data file failed.	For some reason (internal cause), reading the pump correction data file failed.	The process is canceled.	
		Reading the specified ROM writer data file (ZIP) failed.	For some reason (internal cause), reading the ROM writer data file (ZIP) failed.	The process is canceled.	
		Reading the specified initial individual data file (LZH) failed.	For some reason (internal cause), reading the initial individual file (LZH) failed.	The process is canceled.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Prepara-tion for writing		Reading the specified ROM writer data file (LZH) failed. Copy UNLHA32.DLL to the SYSTEM32 folder.	Because the compres-sion/decompression DLL is not set, reading the ROM writer data file (LZH) failed.	The process is canceled.	
		Reading the specified initial individual data file (LZH) failed. Copy UNLHA32.DLL to the SYSTEM32 folder.	Because the compression/ decompression DLL is not set, reading the initial individual file (LZH) failed.	The process is canceled.	
		Mask processing of the map file failed.	For some reason (internal cause), reading or writing the map file failed.	The process is canceled.	
		Writing the individual data file failed.	For some reason (inter-nal cause), reading the individual file failed.	The process is canceled.	
		Reading the specified ROM writer data file (ZIP) failed.	For some reason (internal cause), extracting the ROM writer data file (ZIP) failed.	The process is canceled.	
		Reading the specified initial individual data file (ZIP) failed.	For some reason (internal cause), extracting the initial individual file (ZIP) failed.	The process is canceled.	
		Creating the write process sheet failed.	For some reason (inter-nal cause), writing the process sheet failed.	The process is canceled.	
		Custom map file not found.	For some reason (ROM writer data, internal cause), the custom map file could not be found.	The process is canceled.	
		Individual data definition file not found.	For some reason (ROM writer data, internal cause), the individual data definition file could not be found.	The process is canceled.	
		Initial individual data file not found.	For some reason (ROM writer data, internal cause), the initial indi-vidual success definition file could not be found.	The process is canceled.	
		Initial individual data file (INDEX) not found.	For some reason (ROM writer data, internal cause), the initial individ-ual data (Index) file could not be found.	The process is canceled.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Prepara-tion for writing		Control map file not found.	For some reason (ROM writer data, internal cause), the control map file could not be found.	The process is canceled.	
		Mask map file not found.	For some reason (ROM writer data, internal cause), the mask map file could not be found.	The process is canceled.	
		Control program file not found.	For some reason (ROM writer data, internal cause), the control program file could not be found.	The process is canceled.	
		Several custom map files found.	For some reason (ROM writer data, internal cause), multiple custom map files are found after extracting the ROM writer data.		
		Several engine production history files found.	For some reason (ROM writer data, internal cause), multiple engine production history files are found after extracting the ROM writer data.		
		Several pump production history files found.	For some reason (ROM writer data, internal cause), multiple pump production history files are found after extracting the ROM writer data.		
		Several individual data definition files found.	For some reason (ROM writer data, internal cause), multiple individual data definition files are found after extracting the ROM writer data.		

Function	Process	Message (image)	Cause	Operation after display	Remark
Prepara-tion for writing		Several initial individual data files found.	For some reason (ROM writer data, internal cause), multiple initial individual files are found after extracting the ROM writer data.		
		Several initial individual data files (INDEX) found.	For some reason (ROM writer data, internal cause), multiple initial individual files (INDEX) are found after extracting the ROM writer data.		
		Several control map files found.	For some reason (ROM writer data, internal cause), multiple control map files are found after extracting the ROM writer data.		
		Several mask map files found.	For some reason (ROM writer data, internal cause), multiple mask map files are found after extracting the ROM writer data.		
		Several implement production history files found.	For some reason (ROM writer data, internal cause), multiple implement production history files are found after extracting the ROM writer data.		
		Several control map files found.	Multiple files are found while reading the control map file.		

Function	Process	Message (image)	Cause	Operation after display	Remark
Preparation for writing		Folder "Diag_Tool" not found in the extracted ROM writer data.	Folder "Diag_Tool" not found in the extracted ROM writer data.	The process is canceled.	
		Folder "Table" not found in the extracted ROM writer data.	Folder "Table" not found in the extracted ROM writer data.	The process is canceled.	
Flash writing		There is no manufacturer code that matches the license.	The manufacturer code collected from the writing process sheet could not match the manufacturer code of the license.	The process is canceled.	
		The checksum of the manufacturer code does not match.	Checksum for the manufacturer code of the writing process sheet did not match.	The process is canceled.	
		The checksum does not match.	Checksum of the writing process sheet did not match.	The process is canceled.	
		Delete the current control program and rewrite?	Check when the ECU, H/W, and serial No. collected from the writing process sheet did not match.	When "Yes", continue processing. When "No", interrupt processing.	
		ECU 3N does not match.	The ECU 3N code collected from the writing process sheet did not match.	The process is canceled.	
		ECU H/W part number does not match.	The ECU part No. collected from the writing process sheet did not match.	The process is canceled.	
		ECU H/W serial number does not match.	The ECU, H/W, and serial No. collected from the map file did not match.	The process is canceled.	
		Unable to count RMNC.	The RMNC count did not match when processing the service ECU.	The process is canceled.	
		CB reset failed.	For some reason (ECU and internal cause), resetting in the CB area failed.	The process is canceled.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Flash writing		Engine serial number does not match.	The engine serial No. collected from the map file did not match.	The process is canceled.	
		Engine type does not match.	The engine model collected from the writing process sheet did not match.	The process is canceled.	
		Unable to change this ECU to a service ECU (RMNC error).	The RMNC count did not match when processing the service ECU.	The process is canceled.	
		Unable to change this ECU to a service ECU (TRUN error).	The TRUN count did not match when processing the service ECU.	The process is canceled.	
		Model name does not match.	The model name did not match when processing the model check.	The process is canceled.	
		Deleting Flash failed.	For some reason (ECU and internal cause), deleting Flash failed.	The process is canceled.	
		Communication with ECU failed.	Communication with ECU failed while writing ECU.	The process is canceled.	
		Clearing DTC failed.	Deletion failed in the deletion process of the DTC area.	The process is canceled.	
		ECU reset failed.	For some reason (ECU and internal cause), resetting ECU failed.	The process is canceled.	
		Writing for EEPROM initialization failed.	For some reason (ECU and internal cause), writing for the EEPROM initialization failed.	The process is canceled.	
		Writing initial setting data failed.	For some reason (ECU and internal cause), writing the initial data failed.	The process is canceled.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Flash writing		Verifying the key file failed.	Verifying the key collected from the writing process sheet failed.	The process is canceled.	
		Hard check of LY3 failed.	Hard check collection of LY3 (ECU S/N) failed.	The process is canceled.	
		Writing the manufacturer code failed.	For some reason (ECU and internal cause), writing the manufacturer code failed.	The process is canceled.	
		The checksum of the object does not match.	For some reason (internal cause), checksum of the object writing (APL software, map file, individual data) did not match.	The process is canceled.	
		Download of object failed.	For some reason (ECU and internal cause), downloading the object (APL software, map file, individual data) failed.	The process is canceled.	
		Reading of common data failed.	For some reason (ECU and internal cause), reading the common data failed.	The process is canceled.	
		Reading of data ID failed.	For some reason (ECU and internal cause), reading the data ID failed.	The process is canceled.	
		Reading of map category failed.	For some reason (ECU and internal cause), reading the map category failed.	The process is canceled.	
		Reading of EEPROM failed.	For some reason (ECU and internal cause), reading the EEPROM data failed.	The process is canceled.	
		SBL download failed.	For some reason (ECU and internal cause), downloading SBL failed.	The process is canceled.	
		Security access failed.	For some reason (ECU and internal cause), the security access (programming mode, adjustment mode) failed.	The process is canceled.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Flash writing		Writing of common data failed.	For some reason (ECU and internal cause), writing the common data failed.	The process is canceled.	
		Writing of data ID failed.	For some reason (ECU and internal cause), writing the data ID failed.	The process is canceled.	
		Writing of EEPROM failed.	For some reason (ECU and internal cause), writing the EEPROM data failed.	The process is canceled.	
		Rewriting the fingerprint of data rewrite failed.	For some reason (ECU and internal cause), rewriting the data, rewriting the fingerprint failed.	The process is canceled.	
		Rewriting the fingerprint of software rewrite failed.	For some reason (ECU and internal cause), rewriting fingerprint of the software failed.	The process is canceled.	
		Unable to connect to the ECU because the license type is limited.	Because the limited models of the license function is set, the limited models do not match.	The process is canceled.	
		License key does not match.	The license key collected from the writing process sheet did not match.	The process is canceled.	
		Report format file not found.	Format file corresponding to the ECU not found.	The process is canceled.	
		Unable to perform the abnormal writing process.	Displayed when connected in the programming session before executing the abnormal writing.	The process is canceled.	
		Process aborted.	The "Cancel" button was pressed while writing the ECU.	The process is canceled.	
		Reading the write settings file failed.	Reading the write settings file collected from the writing process sheet failed.	The process is canceled.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Flash writing		Reading the write process sheet file failed.	For some reason (internal cause), reading the writing process sheet failed.	The process is canceled.	
		Saving the report failed.	For some reason (ECU and internal cause), storing the report failed.	The process is canceled.	
		This service is currently unavailable. Please restart the ECU.	For some reason (ECU and internal cause), collecting the parameters failed.		
		The system is currently in forced driving mode. To release the forced driving mode, it is necessary to restart the ECU.	The report parameters collection are performed while in the forced operation mode.		
Flash ROM writing tool menu		Reading the download file (ZIP) failed.	For some reason (internal cause, corrupted file), reading the downloaded file failed.	The process is canceled.	
		The operation is currently not supported.	The download file type specified the files of 213, 2C3, and xx6.	The process is canceled.	
		Reading the key file failed.	For some reason (internal cause, corrupted file), reading the downloaded file failed.	The process is canceled.	
		The checksum does not match.	Checksum of the process sheet file collected from the extracted download file did not match.	The process is canceled.	
		Reading the write process sheet file failed.	Reading the process sheet file collected from the extracted download file failed.	The process is canceled.	

■ECU Software Writing

Function	Process	Message (image)	Cause	Operation after display	Remark
ECU Replacement		Copy-protection: unable to write.	Writing failed due to the ECU copy limit.	The process is canceled.	
		Unable to apply the change.	Writing to the ECU was not allowed.	The process is canceled.	
		Verification of data failed.	The check data did not match when manually entering the ECU data.	The process is canceled.	
		The BBC of XXXXXXXXXX does not match.	BCC did not match when reading the PDM file.	The process is canceled.	
		File not found.	For some reason (internal cause), the PDM file could not be found.	The process is canceled.	
		File is defective.	For some reason (internal cause), reading the PDM file failed.	The process is canceled.	
		Unable to write because the model or machine number is different.	Model or machine number of the ECU data is different.	The process is canceled.	
		Writing data to the ECU failed.	For some reason (ECU and internal cause), writing the ECU failed.	The process is canceled.	
		Reading the pump interchangeability file failed.	For some reason (internal cause), reading the pump compatibility file failed. (If pump data is available.)	The process is canceled.	
		The replacement pump is not interchangeable. Unable to write.	The replacement pump is not interchangeable. (If pump data is available.)	The process is canceled.	
		The pump part code is different. Write the correct value?	A confirmation message is displayed to check whether or not to write the data when the mode is not the developer mode, the ECU is LY3, and the pump part code is different. (If pump data is available.)	When "Yes", execute writing. When "No", interrupt processing.	

Function	Process	Message (image)	Cause	Operation after display	Remark
ECU Replacement		The pump part code is different. Unable to write.	Do not perform writing except for the developer mode or the ECU is LY3. (If pump data is available.)	The process is canceled.	
		The number is different. Write the correct value? (ECU: XXXXXXXXXX / Input: XXXXXXXXXX)	A confirmation message is displayed to check whether or not to write data when the name of the pump model matches up to the 11th character. (If pump data is available.)	When "Yes", execute writing. When "No", interrupt processing.	
		The engine model or engine serial number is different. Unable to write.	The engine model or engine serial number of the ECU data is different. (LY3 only)	The process is canceled.	
		Enter the parameter.	There is an omission in the input parameters of the ECU data. (Manual entry)	The process is canceled.	
Saving the report		Report format file not found.	For some reason (internal cause, file not installed), the format file could not be found.	The process is canceled.	
		Saving the report failed.	For some reason (ECU and internal cause), saving the report failed.	The process is canceled.	

■Part Replacement

Function	Process	Message (image)	Cause	Operation after display	Remark
Pump replacement		File not found.	The file could not be found in reading the EXCDPF file, the EXCSF file, and the EXCDOC file.	The process is canceled.	
		The BBC of XXXXXXXXXX does not match.	BCC did not match when reading the EXCEL file.	The process is canceled.	
		Unable to apply the change.	Writing to the ECU was not allowed in writing the part replacement.	The process is canceled.	
		Unable to write because the model or machine number is different.	Model or machine number of the ECU data is different.	The process is canceled.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Pump replacement		Writing data to the ECU failed.	For some reason (ECU and internal cause), writing the ECU failed.	The process is canceled.	
		Reading the pump interchangeability file failed.	For some reason (internal cause), reading the pump compatibility file failed.	The process is canceled.	
		The replacement pump is not interchangeable. Unable to write.	When the replacement pump is not compatible.	The process is canceled.	
		The pump part code is different. Write the correct value?	A confirmation message is displayed to check whether or not to write the data when the mode is not the developer mode, the ECU is LY3, and the pump part code is different.	When "Yes", execute writing. When "No", interrupt processing.	
		The pump part code is different. Unable to write.	Do not perform writing except for the developer mode or the ECU is LY3.	The process is canceled.	
		The number is different. Write the correct value? (ECU: XXXXXXXXXX / Input: XXXXXXXXXX)	A confirmation message is displayed to check whether or not to write data when the name of the pump model matches up to the 11th character.	When "Yes", execute writing. When "No", interrupt processing.	
		The engine model or engine serial number is different. Unable to write.	The engine model or engine serial number of the ECU data is different. (LY3 only)	The process is canceled.	
		Enter the parameter.	There is an omission in the input parameters of the ECU data.	The process is canceled.	
		Verification of data failed.	The check data did not match when reading the EXCDPF file, the EXCSF file, the EXCDOC file and the old ECU data.	The process is canceled.	
			The check data did not match when manually entering the ECU data.	The process is canceled.	
Injector replacement		File is defective.	For some reason (internal cause), reading the PDM file failed.	The process is canceled.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Injector replacement		File not found.	For some reason (internal cause), the PDM file could not be found.	The process is canceled.	
		The BBC of XXXXXXXXXX does not match.	BCC did not match when reading the PDM file.	The process is canceled.	
		Unable to apply the change.	Writing to the ECU was not allowed.	The process is canceled.	
		The data is defective. Enter it again.	The data is defective in the injector data entry.	The process is canceled.	
		Writing data to the ECU failed.	For some reason (ECU and internal cause), writing the ECU failed.	The process is canceled.	
Common	Saving the report	Report format file not found.	For some reason (internal cause, file not installed), the format file could not be found.	The process is canceled.	
		Saving the report failed.	For some reason (ECU and internal cause), saving the report failed.	The process is canceled.	

■Part Replacement

Function	Process	Message (image)	Cause	Operation after display	Remark
Operation data collection		Reading the unique ID table failed.	Occurs when the unique ID table file does not exist and the reading failed. (Opinf_UniqueID (K).tbl)	The process is canceled. Interrupt the operation data collection and return to the main menu.	
		Reading the working machine initial setting table failed.	Occurs when the initial setting table file does not exist and the reading failed. (Opinf_InitSet (K).tbl)	The process is canceled. Interrupt the operation data collection and return to the main menu.	
		Reading the data table for initial setting acquisition failed.	Occurs when the initial setting collection table file does not exist and the reading failed. (Opinf_InitItemInfo.tbl)	The process is canceled. Interrupt the operation data collection and return to the main menu.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Operation data collection		Reading the operation data auxiliary setting table failed.	Occurs when the operation data auxiliary setting table file does not exist and the reading failed. (Opinf_Setting_Sub.tbl)	The process is canceled. Interrupt the operation data collection and return to the main menu.	
		Reading the display format file failed.	Occurs when the display format file does not exist and the reading failed. "xxxxx" of the file name is the support information number received from the ECU. (Opinf_Setting_XXXXX.tbl)	Although the screen (integrated value, map, log) is not displayed, the data can be saved. Processing continues.	
		Saving failed.	Occurs when saving the data failed, such as the specified folder does not exist at the time of storing the operation data file (for storing SA-D and uploading to the server), and the file with the same file name exists.	Processing continues, because the screen can be displayed.	
Refer to the save data.		Select a file.	Occurs when the section button is clicked without selecting the save data on the list on the screen.	Display the warning only.	
		Save data not found.	Occurs when there are no SA-D save data files in the specified folder. (MngData\OperationData)	Transfer to the file selection screen.	
Operation time manual entry screen		No			
Connection purpose entry screen		The connection purpose is not selected.	Occurs when the OK button is clicked without selecting the connection purpose.	It does not occur except for incorrect setting or damage data of the settings file. If this occurs, a forced exit is required.	
Integrated value information screen		Mean value data not found.	Occurs when the relevant average values for the displayed data could not be found at the time of clicking the average value display button.		
		Reading the mean value file (by model and year) failed.	Occurs when the relevant average values for the displayed data is found but the mean value file (by model and year) could not be found at the time of clicking the average value display button and the reading failed.		
		Reading the unique ID table failed.	Occurs when the unique ID table file does not exist and the reading failed. (Opinf_UniqueID (K).tbl)		
		Reading the save data failed.	Occurs when the reading failed including the incorrect data file format selected on the data selection screen at the time of clicking the save data display or reference data display button.	Return to the integrated value screen display without reading the relevant data.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Integrated value information screen		Reading the display format file failed.	Occurs when the display format file does not exist and the reading failed. "xxxxx" of the file name is the support information number received from the ECU. (Opinf_Setting_XXXXX.tbl)		
		Maintenance data not found.	Occurs when the relevant maintenance information for the displayed data could not be found at the time of clicking the maintenance information button.		
		Reading the maintenance data failed.	Occurs when the relevant maintenance information for the displayed data is found but the maintenance information file does not exist and the reading failed.		
		Excel write settings file (XXXXXXXXXX) not found.	Occurs when the display format file does not exist and the reading failed. "xxxxx" of the file name is the support information number received from the ECU. (Opinf_Setting_XXXXX.tbl)		
		Excel template file (XXXXXXXXXX) not found.	Occurs when the template file for EXCEL output does not exist. "xxx" of the file name is described in the display format file. (Opinf_E_Template_XXX(K).xls)		
		The operation failed because writing to the save file failed. Check that the writing file is not open and perform the operation again.	Occurs when copying to the specified location of the template file for EXCEL output failed or the file with the same file name exists.		
		Unable to open Excel write settings file (XXXXXXXXXX).	Occurs when opening the file failed including the display format file exists but the other program is opened for exclusive operation. (Opinf_Setting_XXXXX.tbl)		
		Unable to open Excel file (XXXXXXXXXX).	Occurs when the EXCEL file could not be created.		
		Writing to Excel failed.	Occurs when a program error occurred during the EXCEL output.		
		Make a selection.	Occurs when the clear button is clicked without selecting the clear item.		

Function	Process	Message (image)	Cause	Operation after display	Remark
Integrated value information screen		Saving the maintenance data clear table failed.	Occurs when the file could not be created or the specified folder for the maintenance clear table file could not be found at the time of clicking the clear button.		
Map screen		Reading the unique ID table failed.	Occurs when the unique ID table file does not exist and the reading failed. (Opinf_UniqueID (K).tbl)		
Log screen		Reading the unique ID table failed.	Occurs when the unique ID table file does not exist and the reading failed. (Opinf_UniqueID (K).tbl)		
Operation data download		Operation is not possible because the server is offline.	Occurs when tried to display the operation data download screen in the offline condition (not connected to the server).	Without displaying the operation data download screen, return to the main menu.	
		Enter the nameplate model with 2 letters or more.	Occurs when the entry is not made in "nameplate model", or less than 2 characters are entered and the search button is clicked.	Search is not conducted.	
		Enter the user ID.	Occurs when the search button is clicked without entering "User ID" while the "Specified User ID No." is selected for the "Data Search Object".	Search is not conducted.	
		Enter the month with a number from 1 to 12.	Occurs when the numeric value except for 1 to 12 for "Month" of "Upload Date" or "Collection Date" is entered and the search button is clicked.	Search is not conducted.	
		Enter the year.	Occurs when only the "Month" is entered and not the "Year" in "Upload Date" or "Collection Date" and the search button is clicked.	Search is not conducted.	
		Creating the operation data list request file failed.	Occurs when the XML file for server request could not be created, such as the specified folder does not exist or could not be written.	Search is not conducted.	
		Process aborted.	Displayed when searching or downloading is interrupted.		
		Download of operation data list request response failed.	Occurs when there is no response for the search result from the server.		

Function	Process	Message (image)	Cause	Operation after display	Remark
Operation data download		Communication during download of operation data list request response failed. Error code: XXXXXXXXXX Message: XXXXXXXXXX	Occurs when an error occurred on the server side.		
		Response error Error code: XXXXX	Occurs when the search result response from the server is an error.		
		More than 300 search results. Narrow down the search parameters.	Occurs when the search result exceeds the specified number (300 items).	Search is not conducted.	
		Select the operation data that you want to download.	Occurs when the download button is clicked without selecting the operation data for download.		
		Download of operation data failed.	Occurs when the specified operation data could not be downloaded.		
		Incorrect file.	Occurs when the downloaded operation data is structurally incorrect.		
		Moving the operation data download file failed.	Occurs when the downloaded operation data could not be moved to the specified folder, such as the folder does not exist.		

■Data Management

Function	Process	Message (image)	Cause	Operation after display	Remark
Import	Select	Select a category.	"Import" is executed without selecting the section.	No action. Return to the data management screen.	
		Select a type.	"Export" is executed without selecting the type.	No action. Return to the data management screen.	
	Execute	Unable to import XXXXXXXXXX because the file format is wrong.	Importing a file with the file format that does not belong to the selected section or type was attempted.	No action. Return to the data management screen.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Import	Execute	Registration of XXXXXXXXXX failed. Retry?	When saving the file failed for some reason.	Press "Yes" to retry on the same file. Press "No" to not register and process the next file. Press "Cancel" to abort the process.	
		XXXXXXXXXX is already registered. Overwrite?	Overwriting check when the file is already registered.	Press "Yes" to overwrite. Press "No" to not overwrite and process the next file. Press "Cancel" to abort the process.	
		Model XXXXXXXXXX or machine number XXXXX is already registered. Overwrite?	Confirming to overwriting when the file with the same format and machine number is registered for the ECU software and pump correction values.	Press "Yes" to overwrite. Press "No" to not overwrite and process the next file. Press "Cancel" to abort the process.	
Export	Select	Select a category.	"Export" is executed without selecting the section.	No action. Return to the data management screen.	
		Select the data that you want to export.	"Export" is executed without selecting the export data.	No action. Return to the data management screen.	
	Execute	XXXXXXXXXX is already registered. Overwrite?	The file for export already exists in the output destination (same file name).	Press "Yes" to export by overwriting the file. Press "No" to cancel the operation.	
		Unable to export the specified data.	When trying to export a file that cannot be exported.	No action. Return to the data management screen.	
		Unable to export the specified data because the data was imported.	The file that was attempted to export cannot be exported because it is an imported file.	No action. Return to the data management screen.	
		Data export failed.	For some reason (internal cause), the export failed.	The process is canceled. Return to the data management screen.	
Delete	Select	Select a category.	"Delete" is executed without selecting the section.	Press "OK" to return to the data management screen.	
		Select the data that you want to delete.	"Delete" is executed without selecting the data to be deleted.	No action. Return to the data management screen.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Delete	Select	Deleting XXXXXXXXXX failed.	For some reason (internal problem), it cannot be deleted.	The process is canceled. Return to the data management screen.	
Memo Edit	Select	Select a category.	"Memo Edit" is executed without selecting the section.	No action. Return to the data management screen.	
		Select the data (memo) that you want to edit.	"Memo Edit" is executed without selecting the data.	No action. Return to the data management screen.	
		Unable to edit because the memo was not found.	When there is no memo area in the data.	The process is canceled. Return to the data management screen.	
	Save	Saving the memo failed.	For some reason (internal cause), the memo registration failed.	The process is canceled. Return to the data management screen.	

■Manual

Function	Process	Message (image)	Cause	Operation after display	Remark
Download		Operation is not possible because the server is offline.	The "Manual" menu of the main menu is selected when the server is offline.	The process is canceled.	
		No manual selected for download.	The "Download" button is clicked without selecting the manual.	The process is canceled.	
		Download failed. Cancel process?	For some reason (internal cause or communication cause, etc.), downloading failed.	Press "Yes" to continue downloading the next manual. Press "No" to interrupt downloading.	
		ZIP file not found.	The manual file (ZIP file) could not be downloaded.		
		Acquiring the manual list failed.	There was a problem while downloading the manual list.	The process is canceled.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Initialization and folder check		The data for the service manual of the acquired model does not exist.	Manual not found.		
Initialization and folder check	Execute	Select the product name.	The "OK" button was clicked without selecting the product in the product selection screen.	The process is canceled.	
Search and review	Execute	Select the product name.	The "OK" button was clicked without selecting the product in the manual product selection screen.	The process is canceled.	
		The manual does not exist.	There is no manual for the selected product in the manual product selection screen.		
Delete	Execute	Select a manual.	The "OK" button was clicked without selecting the manual to be deleted in the manual deletion screen.	The process is canceled.	
		Unable to delete XXXXXXXXXX.	There is no selected manual in the manual deletion screen.	The process is canceled.	

■Service bulletin link

Function	Process	Message (image)	Cause	Operation after display	Remark
Download	Main Menu	Update of error diagnosis data in progress. The selected function can affect operation. Abort data update and execute the selected function?	Check when the ECU connection operation is selected while downloading.	Press "Yes" to interrupt downloading and execute the selected process. Press "No" to continue downloading and do not execute the selected process.	
News Display	Detail display	Select the attachment file.	The "Selection" button was clicked on the news detail screen without selecting the attached file.	No action. Return to the bulletin detail screen.	
		File not found.	Although the attached file was selected on the news detail screen, the specified file could not be found.	No action. (The attached file is not opened.) Return to the bulletin detail screen.	

■J1939 line monitor

Function	Process	Message (image)	Cause	Operation after display	Remark
Line monitor	Save	J1939 log was not saved.	For some reason (real-time log is lost or could not be read), the log file could not be stored.	The process is canceled.	
		File already exists. Overwrite?	Check when the log file already existed in the specified folder.	"Yes" to save and overwrite. "No" to cancel saving.	
	Start	J1939 log was not saved.	Monitoring is started without selecting the filter (CAN-ID).	The process is canceled.	
Save Data	Reading	Reading the file failed.	For some reason, the log file is broken or the log file in different format is read.	The process is canceled.	

■Saving the ECU Storage Data

Function	Process	Message (image)	Cause	Operation after display	Remark
ECU Storage Data	Reading	File not found.	The selected data file does not exist.	The process is canceled.	Does not happen under normal circumstances.
	Save	Saving the ECU data failed.	For some reason, saving failed.	The process is canceled. (Not stored)	Does not happen under normal circumstances.
Measurement data	Reading	Same as the ECU storage data			

■Download/Upload (ECU software related)

Function	Process	Message (image)	Cause	Operation after display	Remark
Common server communication		Process aborted.	When processing is aborted by the cancel button while communicating to the server	The process is canceled.	
		Communication failed. Error code: % Message: %	This occurs when the content of the "Status" tag is "False". (* This is improbable in the current specification according to YISS.)	The process is canceled.	Display the content of the server response tags "errorcode" and "message".
		Response error Error code: %	This occurs when an undefined response code is received from the server.	The process is canceled.	Display the content of the "resp-code" tag.
Common server communication		Specified model not found.	This occurs when the response code 10 is received from the server.	The process is canceled.	If the "resp-code" tag has the value "10".
		Specified machine number not found.	This occurs when the response code 20 is received from the server.	The process is canceled.	If the "resp-code" tag has the value "20".
		The number of digits for the serial number is incorrect.	This occurs when the response code 30 is received from the server.	The process is canceled.	If the "resp-code" tag has the value "30".
		License not found.	This occurs when the response code 40 is received from the server.	The process is canceled.	If the "resp-code" tag has the value "40".
		No applicable object found.	This occurs when the response code 50 is received from the server.	The process is canceled.	If the "resp-code" tag has the value "50".
		Exchange in progress.	This occurs when the response code 60 is received from the server.	The process is canceled.	If the "resp-code" tag has the value "60".
		ECU is use.	This occurs when the response code 70 is received from the server.	The process is canceled.	If the "resp-code" tag has the value "70".
		Parts exchange data is corrupt.	This occurs when the response code 80 is received from the server.	The process is canceled.	If the "resp-code" tag has the value "80".

Function	Process	Message (image)	Cause	Operation after display	Remark
Common server communi-cation		Data server process faulty. Please contact the administrator.	This occurs when the response code 99 is received from the server.	The process is canceled.	If the "resp-code" tag has the value "99".
ECU list download		Enter the model and machine number.	This occurs when the clear transmission button was pressed without entering the model or machine number.	The process is canceled.	
		Specified model is not an engine model. Enter the model again.	This occurs when the machine model was entered despite the engine being selected on the machine selection screen.	The process is canceled.	
		Specified model is not the model of this machine. Enter the model again.	This occurs when the engine model was entered despite the engine being selected on the engine and machine selection screen.	The process is canceled.	
ECU write download		Select an item for download.	This occurs when the transmission button was clicked without selecting (ticking) the download item.	The process is canceled.	
		Enter the serial number.	This occurs when the transmission button is pressed without entering the serial number for ECU replacement (actual machine/desktop) only.	The process is canceled.	
		Reading the download file (ZIP) failed.	This occurs when the ECU software ZIP file does not exist and could not be stored in the specified file.	The process is canceled.	
Part Replacement	Pump replacement	Enter the model and machine number.	This occurs when the clear transmission button was pressed without entering the model or machine number.	The process is canceled.	
		Select an item for download.	This occurs when the transmission button was clicked without selecting (ticking) the download item.	The process is canceled.	
Custom map		Enter the model and machine number.	This occurs when the clear transmission button was pressed without entering the model or machine number.	The process is canceled.	
		Select an item for download.	This occurs when the transmission button was clicked without selecting (ticking) the download item.	The process is canceled.	

Function	Process	Message (image)	Cause	Operation after display	Remark
Replace-ment Data Upload (Replace-ment complete)	Replacement complete	Select an item for upload.	This occurs when the transmission button was pressed without selecting (ticking) the upload item.	The process is canceled.	
	Replacement canceled	Select an item for upload.	This occurs when the transmission button was pressed without selecting (ticking) the upload item.	The process is canceled.	

15. Attached Documents

Attached document: FMI (Failure Mode Identified) list

FMI	Content
0	The data is valid, but exceeds the normal operation range. (Upper limit exceeded)
1	The data is valid, but does not reach the normal operation range. (Lower limit exceeded)
2	The data is unstable, intermittent, and inappropriate. (Intermittent fault)
3	The voltage exceeds the normal operation range or short-circuited on the high-voltage side. (Signal fault upper limit)
4	The voltage does not reach the normal operation range or short-circuited on the low-voltage side. (Signal fault lower limit)
5	The current does not reach the normal operation or the circuit is open. (Electric current fault low)
6	The current does exceeds the normal operation or the circuit is grounded. (Electric current fault high)
7	The machine system is not reacting or misaligned. (Machine system fault)
8	The rotational speed or pulse width/cycle is faulty. (Rotational speed, pulse width fault)
9	The update ratio is faulty. (Smart sensor and actuator fault)
10	The rate of change is faulty. (Rate of change fault)
11	The error code is unknown. (Incorrect sub-system error code)
12	There is a problem in the intelligent device/component. (Intelligent device problem)
13	Unable to calibrate. (Calibration disabled)
14	This is a special command. (Special command)
15	Normal. (Normal)