

# ***THE DIAGNOZER***

## ***Operation Manual***

Version 3.00

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**Mitsubishi Heavy Industries, Ltd.**

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## 1. Outline of Functions

### 1.1 Outline of Functions

This application is a service tool for each type of controllers installed in forklifts. It monitors I/O values and failures, and sets various parameters.

Table 1.1 lists the controllers supported by this application.

Major functions

- (1) Protection function
- (2) Multilanguage support function
- (3) Model selection function
- (4) I/O value monitoring function
- (5) Failure monitoring function
- (6) Failure history monitoring function
- (7) Setup value monitoring and change function
- (8) I/O value graph display function
- (9) Active test function
- (10) Firmware update function
- (11) Screen print function

Table 1.1 Support controllers (1/2)

| Model name  | Controller part No.  | Cable part No.             |
|---|--|----------------------------|
| EP16KT-20KT, EP16K-20KC   | 16A50-XXXXX  | 16A68-00800                |
| EP16KT-20KT, EP16K-20KC   | 16A33-X002X  | 16A68-00200                |
| GP/DP40K-50K  | 16A33-X003X  | 16A68-00800                |
| GP/DP10K-35K  | 91206-7150X  | 16A68-00200                |
| EP20K-35K   | 16A60-X10XX (Traction)<br>16A60-X303X (Hydraulic)  | 16A68-00500                |
| EP20K-35K PAC   | 16A62-X001X  | 16A68-00500                |
| P3000-7000, C3000-6500,<br>DP/GP15N-35N, GC15-33N,<br>GP/DP15ND-35NFT | 16A36-X001X (VCM-1)<br>16A33-X004X (VCM-2)<br>16A35-X001X (DCM)  | 16A68-01320<br>16A68-01420 |
| ET3000-4000,<br>EP16NT-20NT,<br>EP16N-20CN                            | 16A70-X205X (Logics)<br>16A78-X001X (OUT-UNIT)<br>16A78-X002X (IN-UNIT)<br>16A70-X201X(Traction inverter)<br>16A70-X202X(Hydraulic inverter) | 16A68-01320<br>16A68-01420 |
| E3000-6500,<br>EC15N-30N  | 16A70-X308X (Logics)<br>16A70-X301X(Traction inverter)<br>16A70-X302X(Hydraulic inverter)  | 16A68-01320<br>16A68-01420 |
| ES3000-5000   | 16A70-X108X (Logics)<br>16A78-X001X (OUT-UNIT)<br>16A70-X101X(Traction inverter)<br>16A70-X102X(Hydraulic inverter)                          | 16A68-01320<br>16A68-01420 |

Table 1.1 Support controllers (2/2)

| Model name   | Controller part No.   | Cable part No.             |
|--|---|----------------------------|
| EP10-25(H)   | 16A30-0001X ~ 0008X<br>16A30-1001X ~ 1008X<br>16A30-0203X ~ 0204X<br>16A30-1201X ~ 1204X<br>16A30-2006X ~ 2008X<br>16A30-2201X ~ 2204X<br>16A30-3006X ~ 3008X | 16A68-00800                |
| P17500-36000,<br>P13500LPG-P11500LPG,<br>DP80N-160N, GP60N-70N | 16A36-X004X (VCM-3)<br>16A36-X005X (VCM-3 OP)<br>16A78-X001X (OUT-UNIT)<br>16A78-X002X (IN-UNIT)  | 16A68-01320<br>16A68-01420 |
| EP10KRT-15KRT PAC  | 16A70-X508X (Logics)<br>16A70-X501X(Traction inverter)<br>16A70-X502X(Hydraulic inverter)   | 16A68-01320<br>16A68-01420 |
| NR14N-25NH   | 16A70-X403X(Logics)<br>16A78-X101X(OUT-UNIT)<br>16A78-X102X(IN-UNIT)<br>16A70-X401X (Traction inverter)<br>16A70-X402X(Hydraulic inverter)                    | 16A68-01320<br>16A68-01420 |
|  |   |                            |

## 1.2 Required System

|                    |  |
|--------------------|--|
| OS                 | Windows 2000 or Windows XP   |
| CPU                | Intel Pentium class 800 MHz or higher (1GHz or higher recommended)                 |
| Memory             | 256 MB or more (512 MB or more recommended)  |
| Hard disk          | 300 MB or more free space  |
| Display            | Resolution: 1024 × 768 dots or more  |
| Communication port | Serial port (RS-232C D-sub 9 pin)<br>(Or USB port and USB-Serial conversion cable) |

**Microsoft .NET Framework Version 1.1 (provided free) or later must be installed. \*<sup>1</sup> Incompatible to .NET Framework Version 2.0.\*<sup>2</sup>**

\*<sup>1</sup> Select "Add or Remove Programs" from the Control Panel and make sure that Microsoft .NET Framework 1.1 or later is installed as shown in Figure 1.2-1. If Microsoft .NET Framework 1.1 or later is not installed, execute Windows Update to install it.

\*<sup>2</sup> Where only Microsoft .NET Framework Version 2.0 or later has been installed, please additionally install Version 1.1 as well.

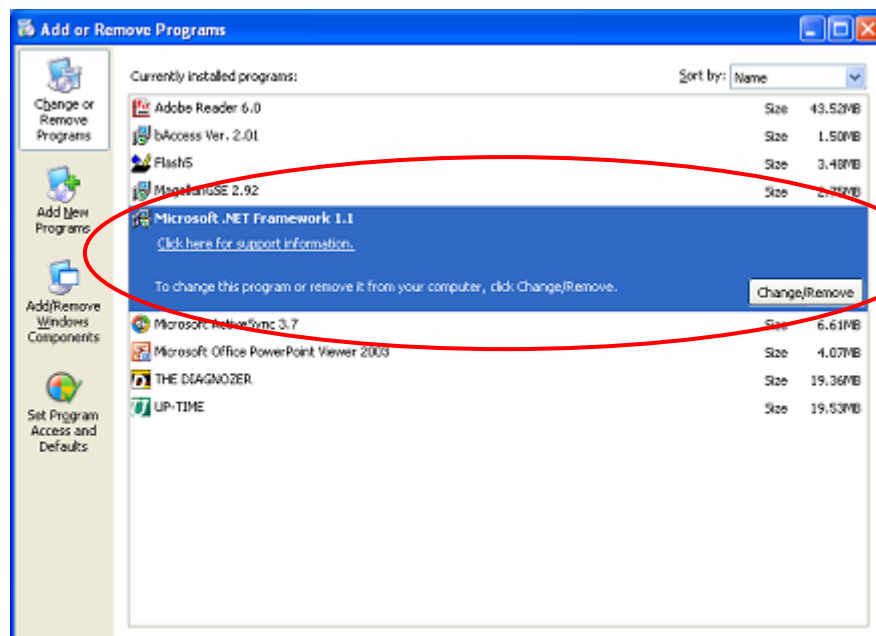


Figure 1.2-1 Add or Remove Programs window

## 2. Installation

### 2.1 Installation Procedure

If this application has been downloaded from the Web, decompress the downloaded file at an arbitrary location. Open the folder thus generated, and you can find "Setup.Exe" (Figure 2.1-1). When installing the application from the CD-ROM, insert the CD-ROM into the CD-ROM drive and open the folder with the name of the version to be installed. You can find "Setup.Exe" (Figure 2.1-1) there. Double-click "Setup.Exe". The installer starts running and begins installation (Figure 2.1-2). If the screen shown in Figure 2.1-2 does not appear but the screen shown in Figure 2.1-3 appears, probably Microsoft .NET Framework Version 1.1 is not installed. Install it while referring to Section 1.2. Click the **Next** button. The screen shown in Figure 2.1-4 appears.

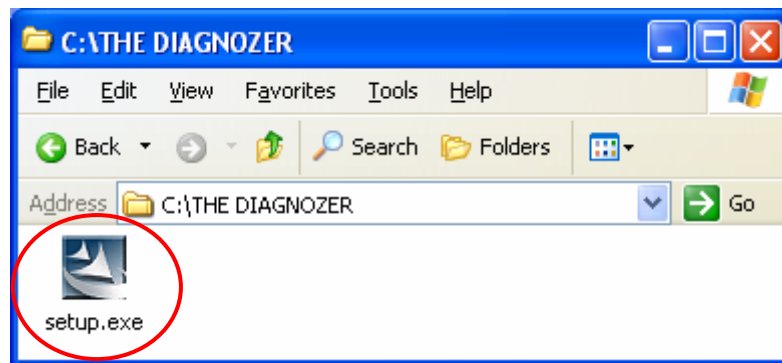


Figure 2.1-1 Setup file

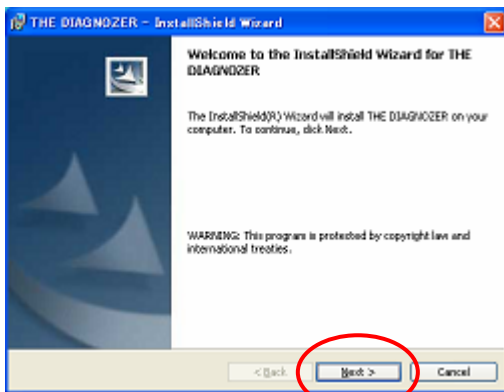


Figure 2.1-2 Setup wizard

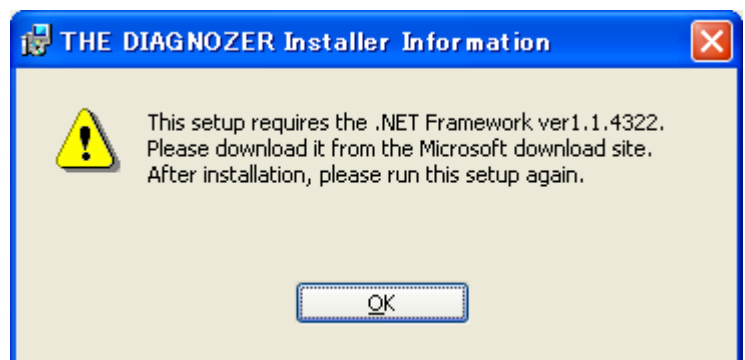


Figure 2.1-3 Error message box

If you agree the software license agreement, select "I accept the terms in the license agreement" and click the **Next** button. If you do not agree it, click **Cancel** button to stop installation.

Then, the window shown in Figure 2.1-5 appears. Select the folder in which you want to install the application. If do not want to specify any folder, specify nothing and simply click the **Next** button. The window shown in Figure 2.1-6 appears.

At the window shown in Figure 2.1-6, click the **Install** button if you want to continue installation. The window shown in Figure 2.1-7 appears and software installation begins.

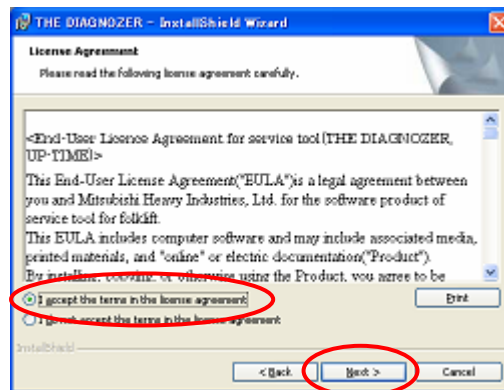


Figure 2.1-4 License agreement

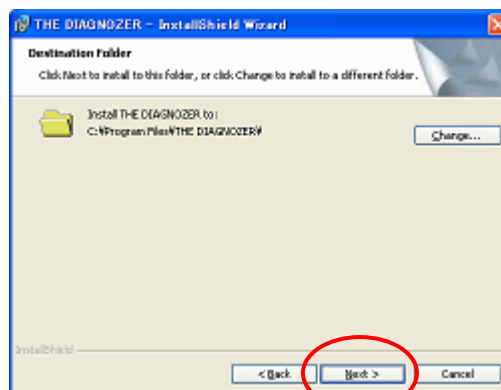


Figure 2.1-5 Selection of installation folder

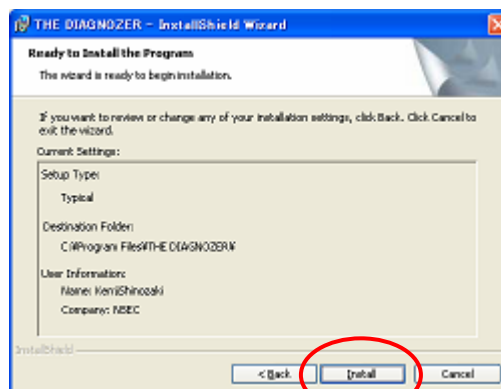


Figure 2.1-6 Confirmation of installation

The window in Figure 2.1-8 appears. Click the **Finish** button to complete installation.

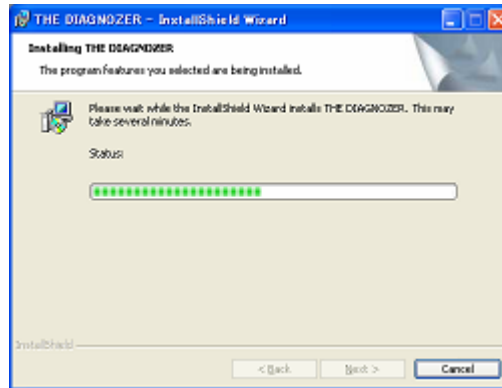


Figure 2.1-7 Progress of installation

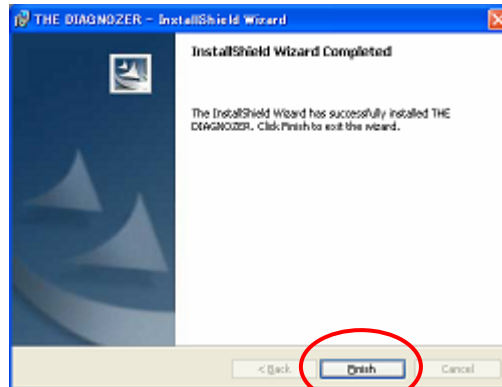


Figure 2.1-8 Completion of installation

## 2.2 Uninstallation Procedure

Select [Start] - [Control Panel] and then double-click [Add or Remove Programs]. The programs currently installed are listed (Figure 2.2-1). Click "THE DIAGNOZER" and click **Remove**. The confirmation dialog box shown in Figure 2.2-2 appears. Click **Yes**. Program uninstallation begins to delete the program with the uninstallation in the progress window shown in Figure 2.2-3 displayed.

The uninstallation procedure may differ depending on the version. Execute uninstallation in accordance with the instructions given on the screen.

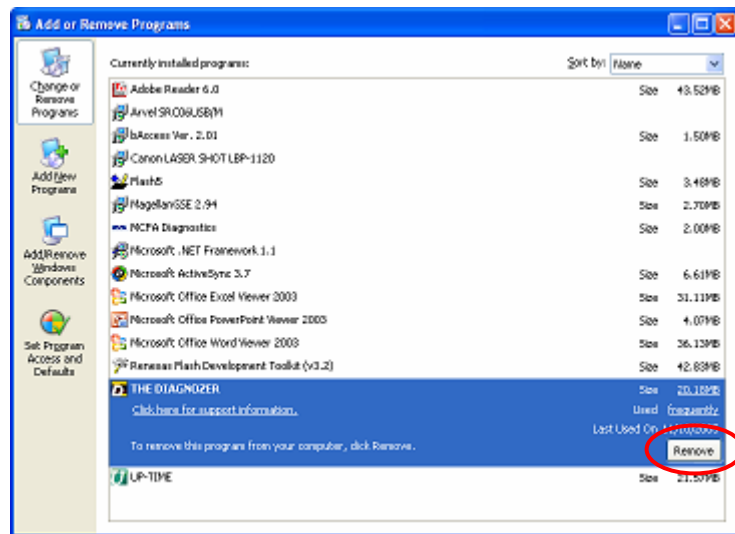


Figure 2.2-1 Add or Remove Programs

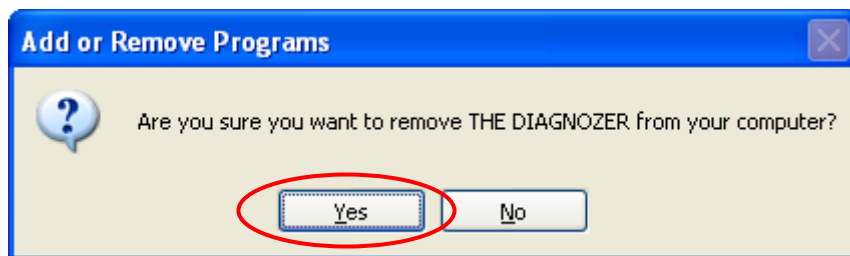


Figure 2.2-2 Confirmation dialog box

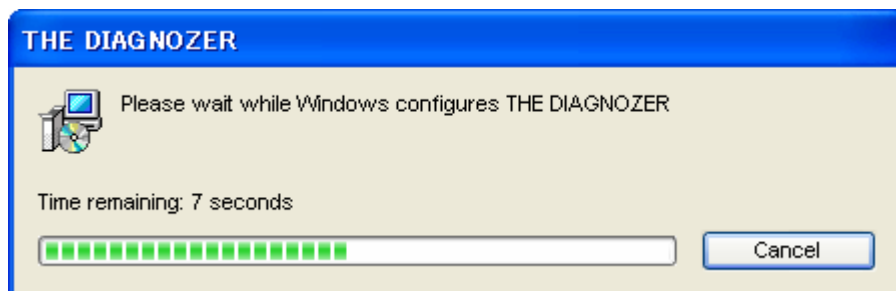


Figure 2.2-3 Deletion-in-progress dialog box

## 2.3 Version Upgrading Procedure

- **Upgrading the version to Version 3.00**

- (1) Install Version 3.00 in accordance with Section 2.1. Installing Version 3.00 automatically uninstalls the old version.

### 3. User Registration Procedure

#### 3.1 User Registration Method

##### 3.1.1 Selecting a user registration method

You must undergo user registration when you start the application for the first time. Once you finish user registration, the user registration window will not appear any more. When you start the software for the first time, the registration method selection window shown in Figure 3.1.1 appears. Select the registration method by clicking the corresponding button.

**Direct registration:** Select this method when the PC on which the application was installed is connected to the Internet. → Go to Section 3.2.

**External registration:** Select this method when the PC on which the application was installed is not connected to the Internet. → Go to Section 3.3.

\* The window in Figure 3.1.1 may appear after version upgrading even though user registration has already been finished. If so, select External registration. In the window appearing next, enter the Activation Code that was issued during user registration previously performed in STEP3 in the window shown in Figure 3.3.1.

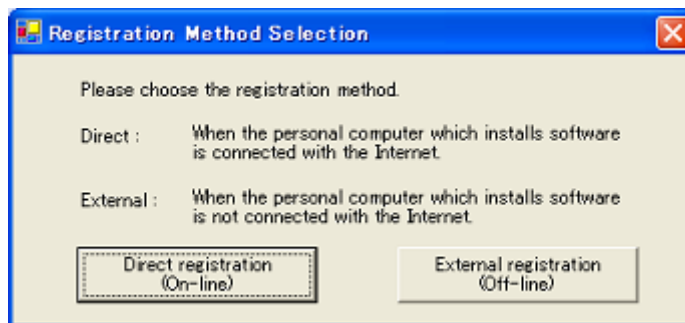


Figure 3.1.1 Registration method selection window

## 3.2 Direct registration

### 3.2.1 Input of a Serial Number and User Information

A window for entering the Serial Number and User Information (Figure 3.2.1) appears for user registration. Enter data in all items and click the **Register** button. If data is missing in any item or a connection to the Internet is not set up, a warning dialog box appears. Check the entry items and the connection to the Internet, and click the **Register** button again.

| Serial Number   |                               |
|-----------------|-------------------------------|
| Serial Number : | XXXXX - XXXXX - XXXXX - XXXXX |

| User Information  |                 |
|-------------------|-----------------|
| First Name        | Mistubishi      |
| Last Name         | Taro            |
| E-mail            | XXX@XXX.com     |
| Company           | MHI             |
| Address           | Tana3000        |
| City              | Sagamihara-shi  |
| State / Province  | Kanagawa-ken    |
| Country           | Japan           |
| ZIP / Postal Code | 229             |
| Phone             | +81-42-XXX-XXXX |
| Fax               | +81-42-XXX-XXXX |

Register

Figure 3.2.1 Input of a Serial Number and User Information window

### 3.2.2 Display of registration results

After user registration is complete, the user registration complete window (Figure 3.2.2) appears.

If registration is successful, the application starts normally.

If registration is unsuccessful, the application ends.

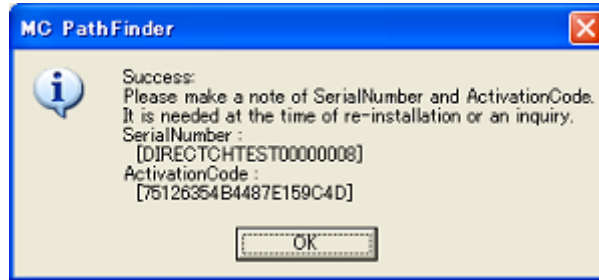


Figure 3.2.2 User registration complete dialog box

### 3.3 External registration

#### 3.3.1 Input of a Serial Number

The Generate Activation Code window (Figure 3.3.1) appears. Enter the serial number in STEP1. Next, select the Activation Code generation method in STEP2 by clicking the corresponding button.

**Web:** Select this method when generating the Activation Code by connecting the PC on which the application is installed or another PC to the Internet.

→ Go to Section 3.3.2.

**Fax:** Select this method when obtaining the Activation Code through a Fax.

→ Go to Section 3.3.3.

**Phone:** Select this method when obtaining the Activation Code through the phone.

→ Go to Section 3.3.4.

The image shows a dialog box titled "Generate Activation Code". It is divided into three sections: STEP 1, STEP 2, and STEP 3. STEP 1 asks for the product's Serial Number, with four input fields separated by hyphens, each containing "XXXXX". STEP 2 asks for the method to generate the Activation Code, with three buttons: "Web", "Fax", and "Phone". The "Web" button is highlighted with a dashed border. STEP 3 asks for the Activation Code, with an "Enter Activation Code" button. At the bottom right is a "Cancel" button.

Figure 3.3.1 Activation Code generation window

### 3.3.2 Web registration

#### Selecting the Web connection method

The Generate Activation Code - Web window (Figure 3.3.2-1) appears. Select the Web connection method by clicking the proper button.

- a) If the PC on which the application is installed is connected to the Internet, click the **Generate** button. → Go to "Connecting to the Internet through the installation PC."
- b) If the PC on which the application is installed is not connected to the Internet and another PC is used to connect to the Internet, click the **Print URL** button. → Go to "Connecting to the Internet through a non-installation PC."



Figure 3.3.2-1 Generate Activation Code - Web window

#### Connecting to the Internet through the installation PC

##### **Entering registration information**

The Web browser starts and displays the Web registration window (Figure 3.3.2-2). Enter contact information and click **Submit** button.

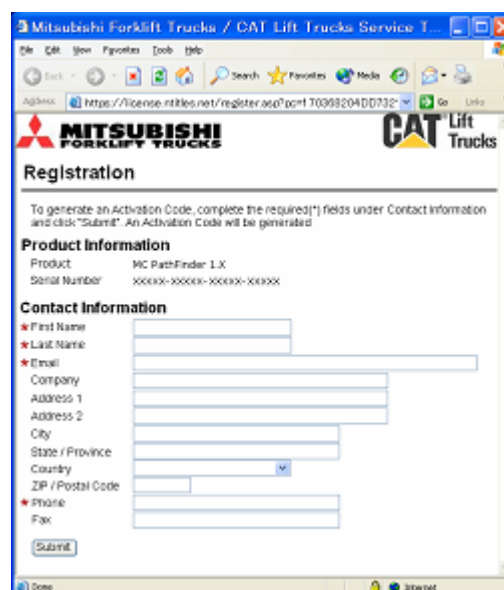


Figure 3.3.2-2 Web registration window

## Issuance of Activation Code

After registration ends successfully, the Activation Code issue window (Figure 3.3.2-3) appears. Put down the activation code displayed. → Go to Section 3.3.5.

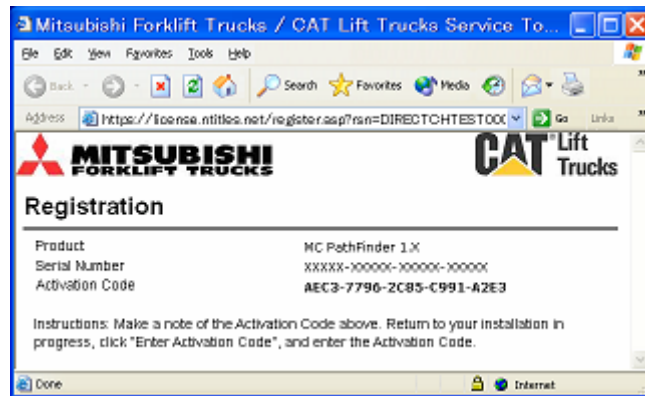


Figure 3.3.2-3 Activation Code issue window

## Connecting to the Internet through a non-installation PC

### Displaying URL

The Print Activation URL window (Figure 3.3.2-4) displays the URL where an Activation Code can be generated. Click the **Print** button to print the URL. The document thus printed is shown in Figure 3.3.2-5.

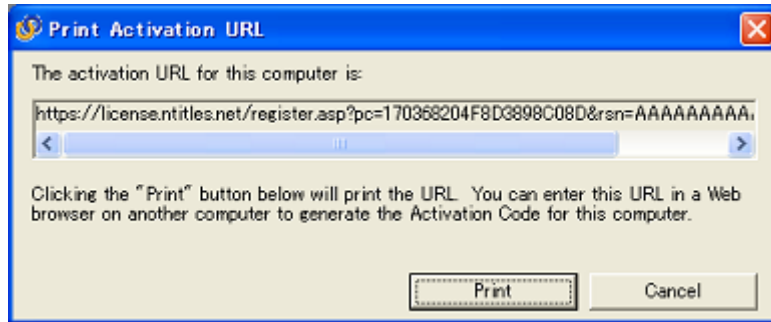


Figure 3.3.2-4 Print Activation URL window

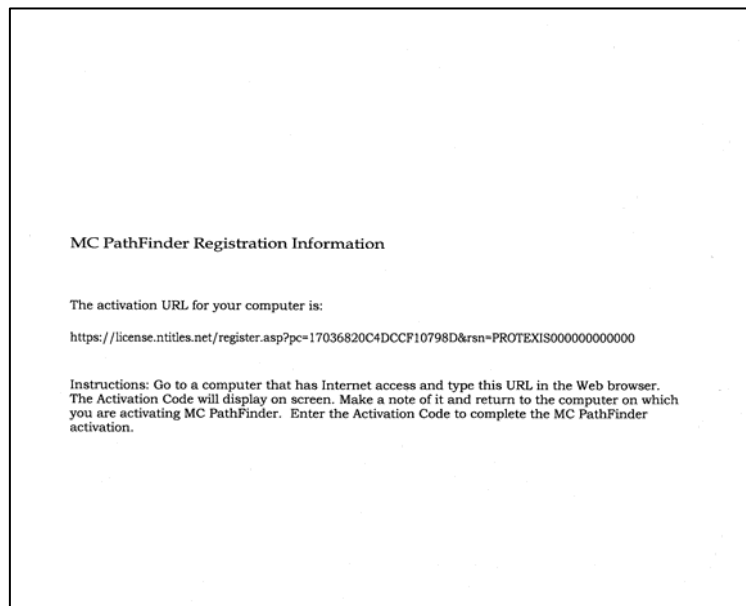
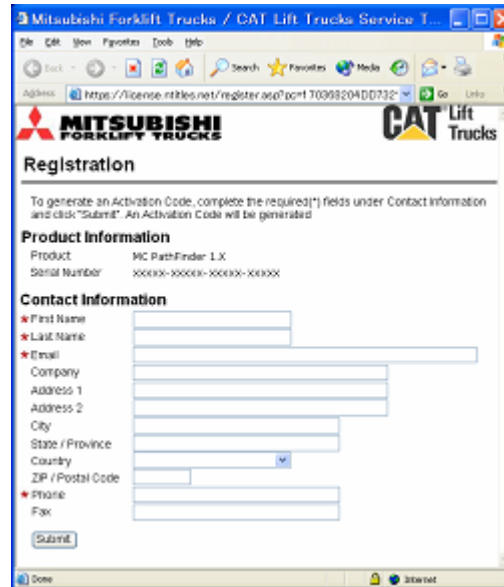


Figure 3.3.2-5 URL print document

## Entering registration information

Access the URL printed on the previous page using the Web browser on another PC connected to the Internet. The Web registration window (Figure 3.3.2-6) appears. Enter contact information and click the **Submit** button.



The screenshot shows a web browser window titled "Mitsubishi Forklift Trucks / CAT Lift Trucks Service Tool". The address bar shows the URL "https://license.ntiles.net/register.asp?pc=170398204DD732". The page content includes the Mitsubishi and CAT logos, a "Registration" heading, and instructions: "To generate an Activation Code, complete the required[\*] fields under Contact Information and click 'Submit'. An Activation Code will be generated".

**Product Information**

|               |                         |
|---------------|-------------------------|
| Product       | MC PathFinder 1.X       |
| Serial Number | XXXXX-XXXXX-XXXXX-XXXXX |

**Contact Information**

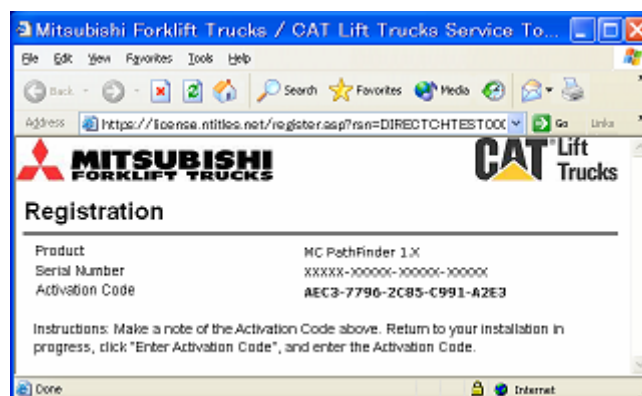
- \* First Name
- \* Last Name
- \* Email
- Company
- Address 1
- Address 2
- City
- State / Province
- Country
- ZIP / Postal Code
- \* Phone
- Fax

A "Submit" button is located at the bottom of the form.

Figure 3.3.2-6 Web registration window

## Issuance of Activation Code

After registration ends successfully, the Activation Code issue window (Figure 3.3.2-7) appears. Put down the activation code displayed. → Go to Section 3.3.5.



The screenshot shows the same web browser window, but the registration form is now filled with the following information:

|                 |                          |
|-----------------|--------------------------|
| Product         | MC PathFinder 1.X        |
| Serial Number   | XXXXX-XXXXX-XXXXX-XXXXX  |
| Activation Code | AEC3-7796-2C85-C991-A2E3 |

Below the table, the instructions read: "Instructions: Make a note of the Activation Code above. Return to your installation in progress, click 'Enter Activation Code', and enter the Activation Code."

Figure 3.3.2-7 Activation Code issue window

### 3.3.3 Fax registration

#### Entering user Information

The Generate Activation Code - Fax window (Figure 3.3.3-1) appears. Enter user information and click the **Print** button to print a Fax transmission document (Figure 3.3.3-2). Fax it to the Support Center to obtain an Activation Code. → Go to Section 3.3.5.

The list of support centers is shown in Table 3.3.4-1.

| Company | City   | Country         |
|---------|--------|-----------------|
| MCF A   | XXXXXX | America         |
| MCF E   | XXXXXX | the Netherlands |

\* Name: Mitsubishi Taro  
Company: MH  
\* Address: Tana3000  
\* City: sagamihara-shi  
\* Province/State: kanagawa-ken  
\* Country: Japan  
Zip/Postal code: 229  
\* Phone number: +81-42-752-XXXX  
\* Fax number: +81-42-752-XXXX  
E-mail address: XXX@mh.co.jp

Figure 3.3.3-1 Generate Activation Code - Fax window

Instructions: Fax this page to the fax number listed. When you receive the license key, re-start MC PathFinder installation.

ATTN: XXX  
MCFE  
FAX: +31-36-5494695  
FROM: Mitsubishi Taro  
DATE: 04/06/10  
RE: MC PathFinder Registration Information  
PAGES: 1

Dear Sir/Madam:

Please register this product and return the Activation Code to me. The information required for the registration is listed below.

Best Regards,

REGISTRATION INFORMATION

URL: <https://license.ntiles.net/admin.asp>

Product Information  
Serial Number: PROTE-XIS00-00000-00000  
Installation Code: 1703-6820-C4DC-CF10-798D

Contact Information  
Name: Mitsubishi Taro  
E-Mail: XXX@mh.co.jp  
Company: MH  
Address: Tana3000  
sagamihara-shi  
kanagawa-ken  
Japan  
229  
Phone: +81-42-752-XXXX  
Fax: +81-42-752-XXXX

Figure 3.3.3-2 Fax transmission document

### 3.3.4 Phone registration

#### Calling the Support Center

The Generate Activation Code - Phone window (Figure 3.3.4-1) appears. Call the Support Center to obtain an Activation Code.

The list of support centers is shown in Table 3.3.4-1.

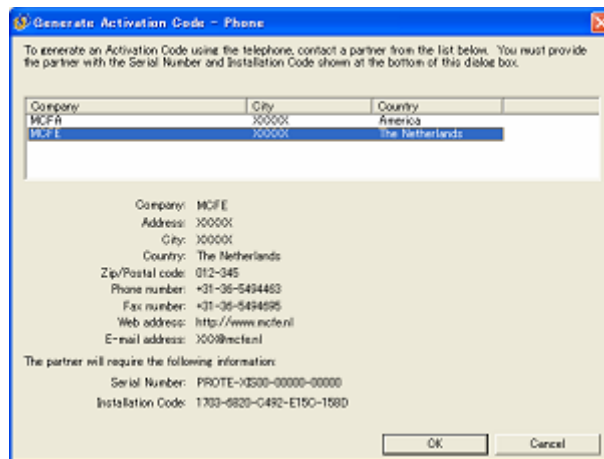


Figure 3.3.4-1 Generate Activation Code - Phone window

Table 3.3.4-1 Support Center

|                        | MCFE                      | MCFE                        |
|------------------------|---------------------------|-----------------------------|
| Company                | Cat Lift Trucks           | CAT Lift Trucks             |
| Name                   | Technical Contact Center  | Service Engineering         |
| Address                | 2121 W Sam Houston Pkwy N | Hefbrugweg 77               |
| City                   | Houston TX                | Almere                      |
| Country                | USA                       | The Netherlands             |
| Zip Code / Postal Code | 77043                     | 1332AM                      |
| Phone Number           | 713-935-2521              | Contact Service Engineering |
| Fax Number             | 713-365-1655              | +31 (0)365494695            |
| Web Address            | www.cat-lift.com          | www.cat-lift.com            |
| E-mail Address         | cat.support@mcf.com       | gse@mcf.nl                  |

|                        | MCFS  | MHI                                  |
|------------------------|---|--------------------------------------|
| Company                | Mitsubishi Caterpillar Forklift<br>Asia PTE LTD | Mitsubishi Heavy Industries,<br>LTD. |
| Name                   | Product support                                 | Product support                      |
| Address                | 2 Tuas Avenue 20                                | 3000 Tana                            |
| City                   | Singapore                                       | Sagamihara-shi Kanagawa-ken          |
| Country                | Singapore                                       | Japan                                |
| Zip Code / Postal Code | 638818  | 229-1193                             |
| Phone Number           | +65-6862-5290                                   | 042-761-1440                         |
| Fax Number             | +65-6861-9277                                   | 042-762-9258                         |
| Web Address            | www.catforklift.com.sg                          | Now preparing                        |
| E-mail Address         | No general e-mail address                       | Now preparing                        |

### 3.3.5 Entering the Activation Code

Click the **Enter Activation Code** button in STEP3 in the window shown in Figure 3.3.1. The Enter Activation Code window (Figure 3.3.5) appears. Enter the Activation Code obtained previously, and click the **Continue Setup** button. If the Activation Code is valid, user registration will be complete and the application will start normally.

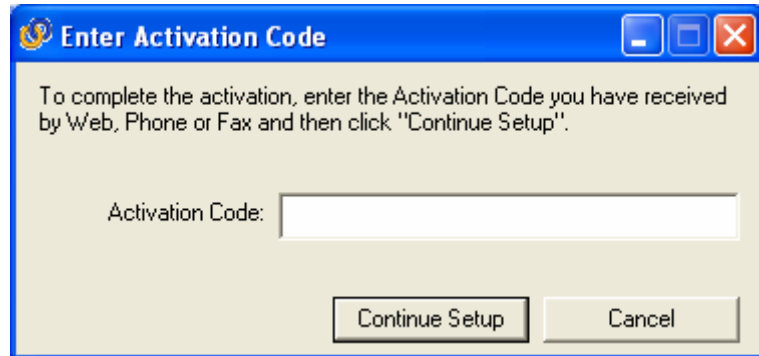


Figure 3.3.5 Enter Activation Code window

## 4. Operation Procedures

### 4.1 Connecting

Connect dedicated cable (or dedicated cable and commercially available USB serial conversion cable) between the serial port on the PC on which this service tool is installed and the service tool connector on the forklift controller.

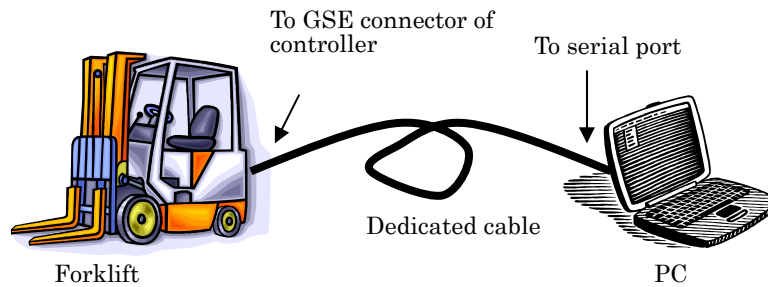


Figure 4.1 Connection status

### 4.2 Starting

Turn on the power to the PC and controller.

From the lower left on the PC monitor screen, select [Start] - [Program] - [THE DIAGNOZER] to start the application. You can also start the application by clicking THE DIAGNOZER shortcut icon on the desktop.

You have to undergo user registration when you start the application for the first time. Undergo user registration in accordance with the procedure provide in Section 3. You cannot use the application without user registration.

After you pass user registration or when you start the application after you once underwent user registration, the model selection window appears. Select the model in accordance with Section 4.3.

### 4.3 Selecting Model

In the model selection window (Figures 4.3.1, 4.3.2 and 4.3.3), select the model of the connected controller. When the window shown in Figure 4.3.7 is displayed, read a model selection file as explained later in this section.

You can use the tabs provided on the upper left of the window to change screens for the engine vehicle, the battery vehicle, and the FC controller. Figure 4.3.1 shows the window for selecting an engine vehicle model, Figure 4.3.2 shows the window for selecting a battery vehicle model, and Figure 4.3.3 shows the windows for selecting FC controller types.

Move the mouse pointer to the image or name of the connected model and click to select the model. Depending on the selected model, the controller type selection window shown in Figure 4.3.4 appears. Select the connected controller. After model selection, the system automatically checks the version and other information of the software running on the connected controller.

If automatic checking is disabled such as when the controller power is off or for a communication error, the communication setting window shown in Figure 4.3.5 appears. Check the communication settings and the controller power. If automatic checking is disabled such as when it is canceled in the communication setting window, the manual selection window shown in Figure 4.3.6 appears. Select applicable elements according to the controller specifications.

After automatic checking of the controller specifications, the main window appears.

### Reading a model selection file

When the model selection window shown in Figure 4.3.7 is displayed, a model selection file needs to be read. Obtain the model selection file from the distribution source of this application.

Click the **Register** button to display a file selection dialog box, and select a model selection file. After completion of registration of the selected file, the dialog box shown in Figure 4.3.8 appears. Quit the application and restart it again. After the application restarts, confirm that the model icon has been added to the model selection window.

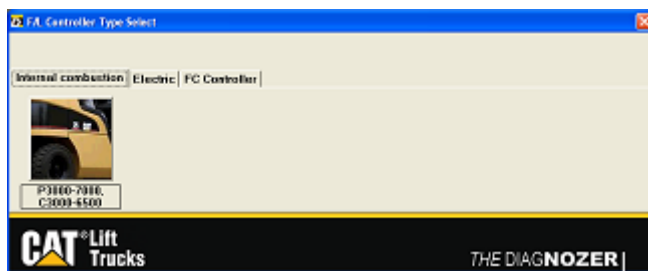


Figure 4.3.1 Selection of engine vehicle models

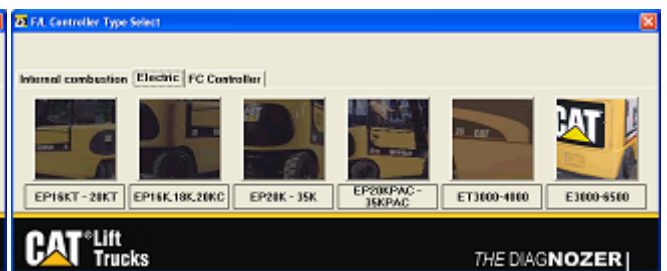


Figure 4.3.2 Selection of battery vehicle models

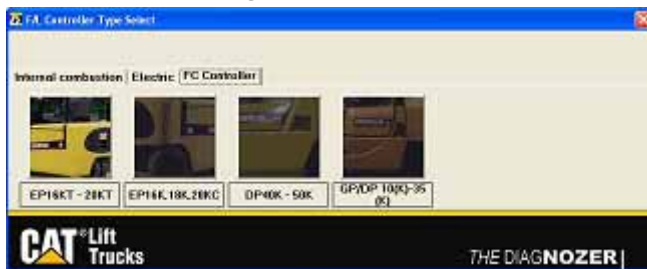


Figure 4.3.3 Selection of FC controller types

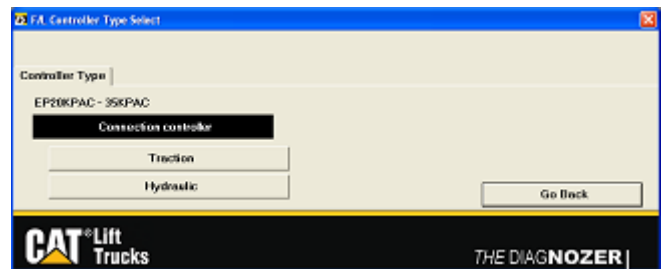


Figure 4.3.4 Controller type

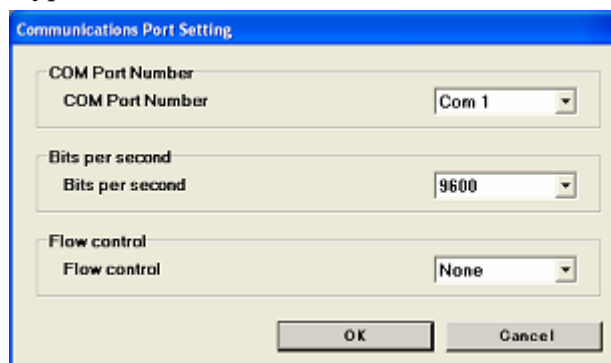
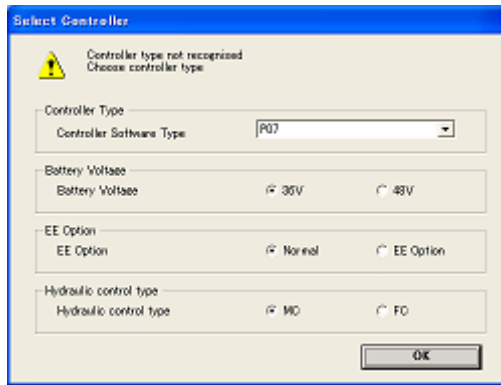
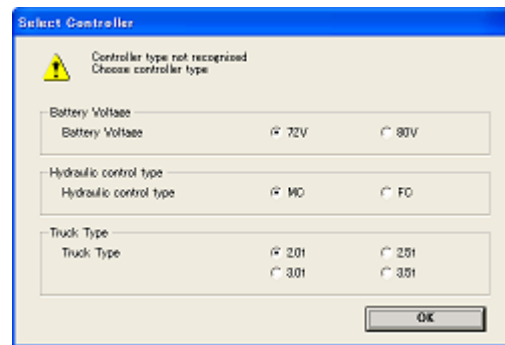


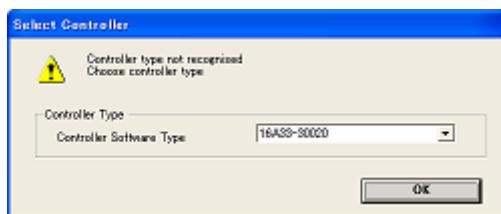
Figure 4.3.5 Communication setting window



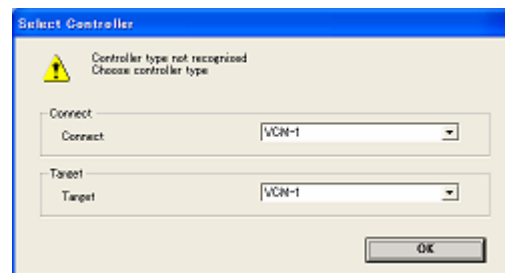
EP16KT - 20KT, EP16K, 18K, 20KC  
traction controller



EP20K - 35K, EP20KPAC - 35KPAC



EP16KT - 20KT, EP16K, 18K, 20KC  
FC controller



P3000 - 7000, C3000 - 6500  
GP15N - DP35N, GP15ND - DP35ANFT  
EP16 - 20N, NT, NC, etc.

Figure 4.3.6 Manual selection window

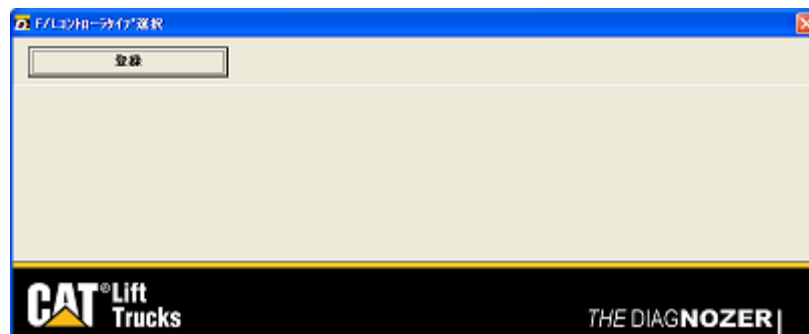


Figure 4.3.7 Model selection window

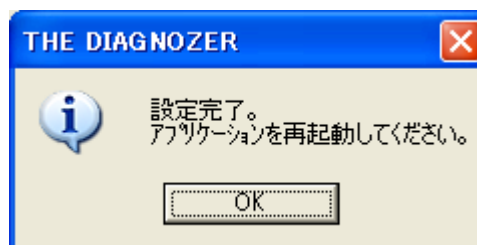


Figure 4.3.8 Completion of setting window

## 4.4 Outline of Menu

The main window shown in Figure 4.4 allows the user to select various functions. The functions that can be used vary depending on the connected controller.

### 4.4.1 File menu

a) Print

Prints the window being displayed.

b) Exit

Exits this application.

### 4.4.2 View menu

a) Input monitor

Monitors input values.

b) Output monitor

Monitors output values.

c) Custom monitor

Monitors specific I/O values.

d) Fault status

Monitors the current fault status.

e) Fault history

Monitors the fault history.

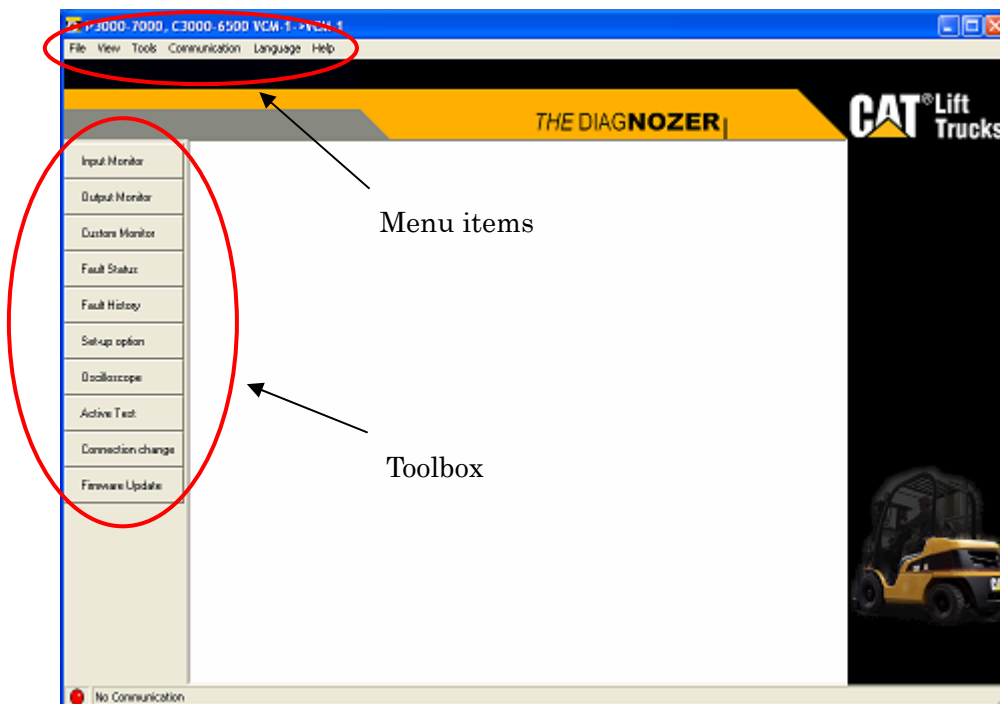


Figure 4.4 Main window

### **4.4.3 Tool menu**

a) Setup option

Monitors or changes setup values.

b) Oscilloscope

Graphs I/O values. The graph being displayed can be saved as data. Also, the graph can be redisplayed by reading the data.

c) Active test

Forcibly outputs signals to test operation.

d) Change connected controller

Allows the user to change the connected controller or the controller to be operated.

e) Firmware update

Update the firmware of the connected controller.

f) Adjustment of auto-light sensitivity

Adjusts the sensitivity of the auto-light.

g) Password resetting

Initializes the password for the display.

### **4.4.4 Communication menu**

a) Set

Changes the communication port and communication speed.

### **4.4.5 Language menu**

a) Languages

Displays using the selected language.

### **4.4.6 Help menu**

a) Contents

Displays help contents.

b) Topic search

Searches for Help topics.

c) Popup display

Specifies whether to pop up an item name and button name.

d) Version information

Displays version information on this software.

## 4.5 Menu Detail

### 4.5.1 File menu

Figure 4.5.1 shows the window that displays the file menu.

#### 4.5.1.1 Print

Clicking [File] - [Print] on the menu bar prints the monitor window being displayed.

#### 4.5.1.2 Exit

Clicking [File] - [Exit] on the menu bar exits this application.

You can also click the  button on the upper right corner of the main window to exit the application.

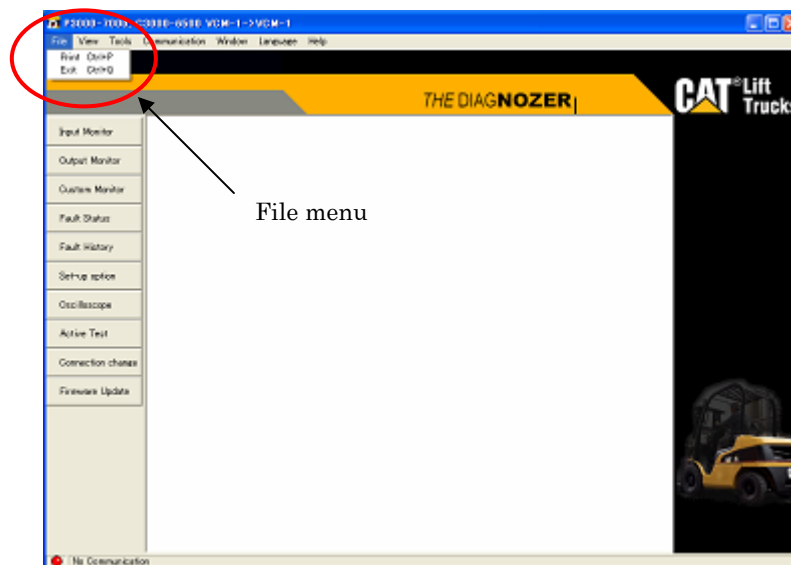


Figure 4.5.1 File menu

## 4.5.2 View menu

Figure 4.5.2 shows the window that displays the Monitor menu.

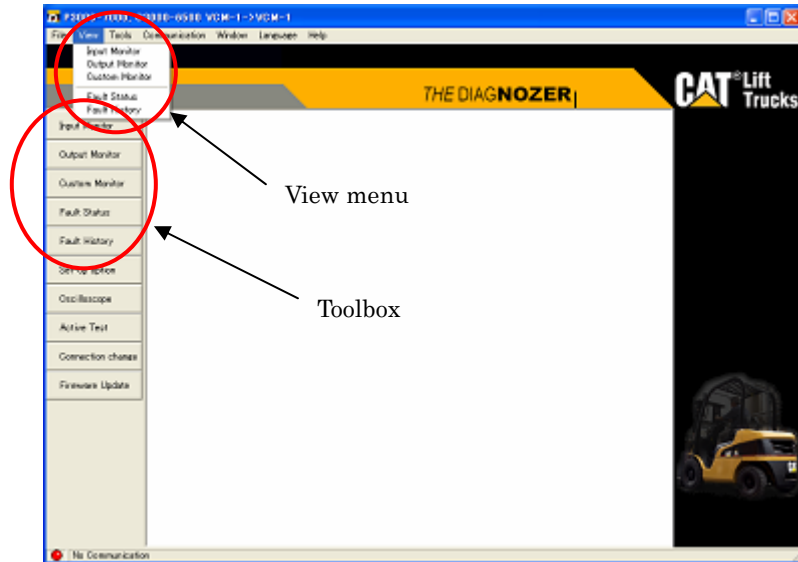


Figure 4.5.2 View menu

#### 4.5.2.1 Input monitor

Clicking [View] - [Input Monitor] on the menu bar or clicking the  button in the toolbox displays the input monitor window (Figure 4.5.2.1) in the main window.

You can use the input monitor window to read input values from the controller and display them.

Display information

- a) Item: Display signal name
- b) Normal range: Normal range of values  
The display color changes to red when the normal range is exceeded. "\*" indicates that the normal range is not applicable.
- c) Value: Current value
- d) Min value: Minimum value after start of monitoring
- e) Max value: Maximum value after start of monitoring

When you click the  button, the system starts reading the current values. The system thus saves the values of the displayed items to a file at given intervals.

Click the  button to stop reading the current values. Since a file save dialog box appears, enter the save file name and click the  button. The file is saved in the tab-delimited format, and item names with the current values are saved at regular intervals. You can click the button only while values are being read.

When you click the  button, the maximum and minimum values are reset and the current values are set.

Display explanation: Select the check box to display the monitor item explanation window or clear it to not display the window.

Click the  button to close the input monitor window.



### 4.5.2.2 Output monitor

Clicking [View] - [Output Monitor] on the menu bar or clicking the **Output Monitor** button in the toolbox displays the output monitor window (Figure 4.5.2.2) in the main window.

You can use the output monitor window to read output values from the controller and display them.

Display information

- a) Item: Display signal name
- b) Normal range: Normal range of values  
The display color changes to red when the normal range is exceeded. "\*" indicates that the normal range is not applicable.
- c) Value: Current value
- d) Min value: Minimum value after start of monitoring
- e) Max value: Maximum value after start of monitoring

When you click the **Start Recording** button, the system starts reading the current values. The system thus saves the values of the displayed items to a file at given intervals.

Click the **Stop Recording** button to stop reading the current values. Since a file save dialog box appears, enter the save file name and click the **Save** button. The file is saved in the tab-delimited format, and item names with the current values are saved at regular intervals. You can click the button only while values are being read.

When you click the **Reset Values** button, the maximum and minimum values are reset and the current values are set.

Display explanation: Select the check box to display the monitor item explanation window or clear it to not display the window.

Click the **Close** button to close the output monitor window.



### 4.5.2.3 Custom monitor

Clicking [View] - [Custom Monitor] on the menu bar or clicking the **Custom Monitor** button in the toolbox displays the custom monitor window (Figure 4.5.2.3-1) in the main window.

From the custom monitor window, you can select arbitrary monitor items related to I/O and the system reads the values of the selected items and displays them.

Display information

- a) Item: Display signal name
- b) Normal range: Normal range of values  
The display color changes to red when the normal range is exceeded. "\*" indicates that the normal range is not applicable.
- c) Value: Current value
- d) Min value: Minimum value after start of monitoring
- e) Max value: Maximum value after start of monitoring

When you click the **Start Recording** button, the system starts reading the current values. The system thus saves the values of the displayed items to a file at given intervals.

Click the **Stop Recording** button to stop reading the current values. Since a file save dialog box appears, enter the save file name and click the **Save** button. The file is saved in the tab-delimited format, and item names with the current values are saved at regular intervals. You can click the button only while values are being read.

When you click the **Reset Values** button, the maximum and minimum values are reset and the current values are set for the maximum and minimum values.

Display explanation: Select the check box to display the monitor item explanation window or clear it to not display the window.

Zoom: Select the check box to switch to the zoom monitor window. Figure 4.5.2.3.2 shows the zoom monitor window. The zoom monitor window displays up to six of the selected monitor items from the top.

Click the **Close** button to close the custom monitor window.

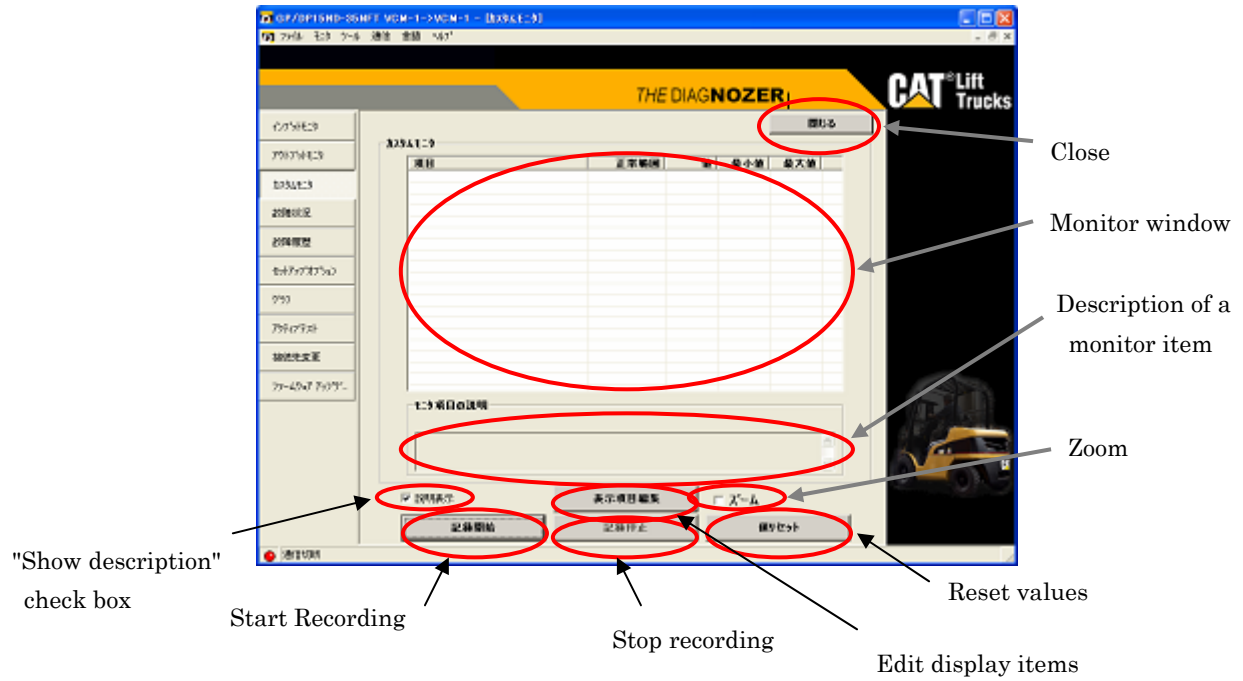


Figure 4.5.2.3-1 Custom monitor

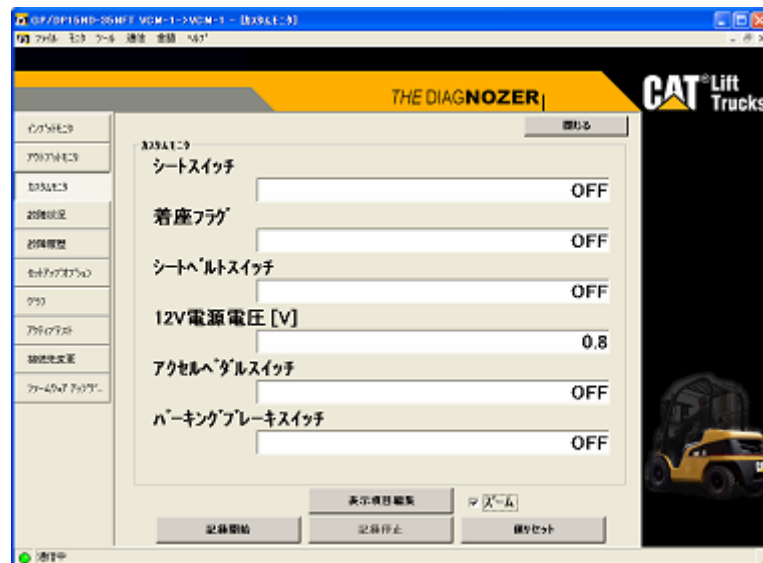


Figure 4.5.2.3.2 Zoom monitor



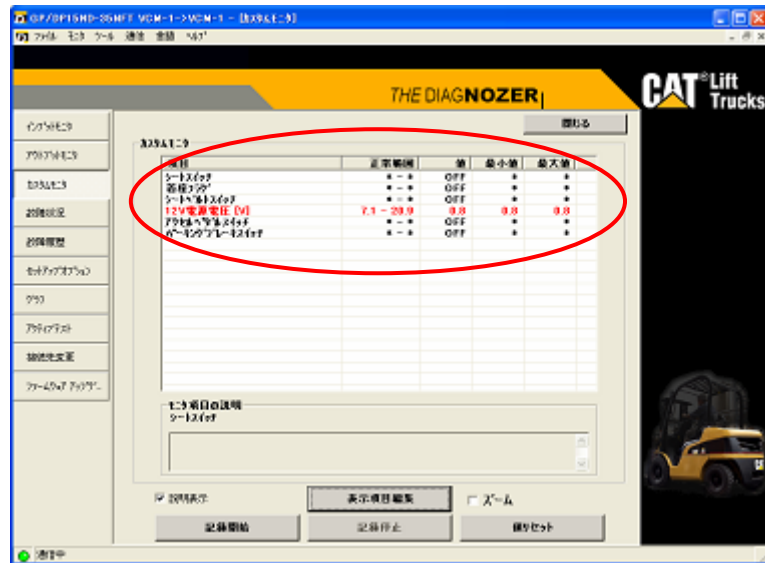


Figure 4.5.2.3-5 Window after addition of custom monitor items

### Saving and reading custom monitor items

The data after editing of display items can be saved in up to five patterns for each controller.

To save a custom monitor item, select the custom pattern name to be saved from the custom pattern name box (initial names are undefined 1 to 5) shown in the window in Figure 4.5.2.3-6. After you add/delete monitor items, enter the pattern name with which you want to save the edit results in the custom pattern name box, and click the **Save** button. The monitor items listed in the display item box are saved with the specified pattern name.

To read the contents of a display item that was saved previously, select the relevant custom pattern name you want read from the custom pattern name box and click the **Read** button. The monitor item that has been read is displayed in the display item box.

When you want to reedit a display item that was saved previously, select the custom pattern name you want to reedit from the custom pattern name box and click the **Read** button. Add or remove monitor items and click the **Save** button to save the edited monitor items in overwrite mode.

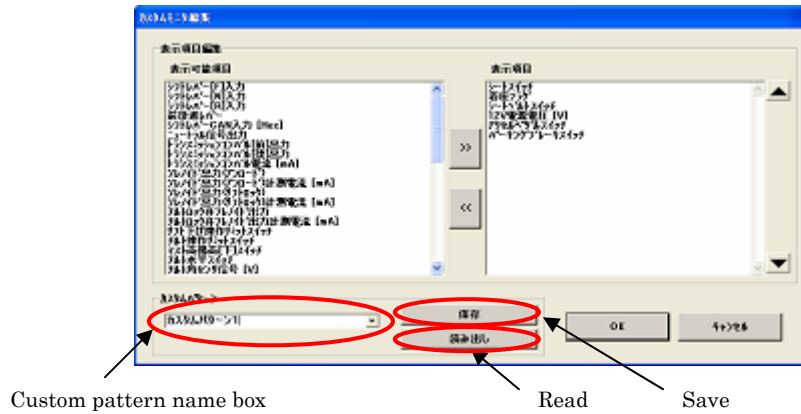


Figure 4.5.2.3-6 Custom monitor edit window

### Default custom pattern

Default custom patterns are stored in advance in some models.

When you select a default custom pattern, the default monitoring items are fetched and displayed in the display item box.

You cannot edit the file name and monitoring items of the default custom pattern.

#### 4.5.2.4 Fault status

Clicking [View] - [Fault status] on the menu bar or clicking the **Fault status** button in the toolbox displays the fault status monitor window (Figure 4.5.2.4-1) in the main window.

You can use the fault status monitor window to monitor the status of failure currently caused.

Display information

- a) Error Code: Error code
- b) Description: Error information

#### Saving fault status information

Click the **Record** button to display a file save dialog box. Enter the name of the save file and click the **Save** button. The file is saved in the tab-delimited format. The file contains Error Code and Description.

#### Displaying the troubleshooting manual

Double-click an error item in the monitor window. The Web browser then starts and displays the troubleshooting manual as shown in Figure 4.5.2.4-2.

Note that a troubleshooting manual may not be displayed for some controllers.

Clicking the **Troubleshooting Manual** button displays a troubleshoot manual. Note that some type of controller does not display the **Troubleshooting Manual** button.

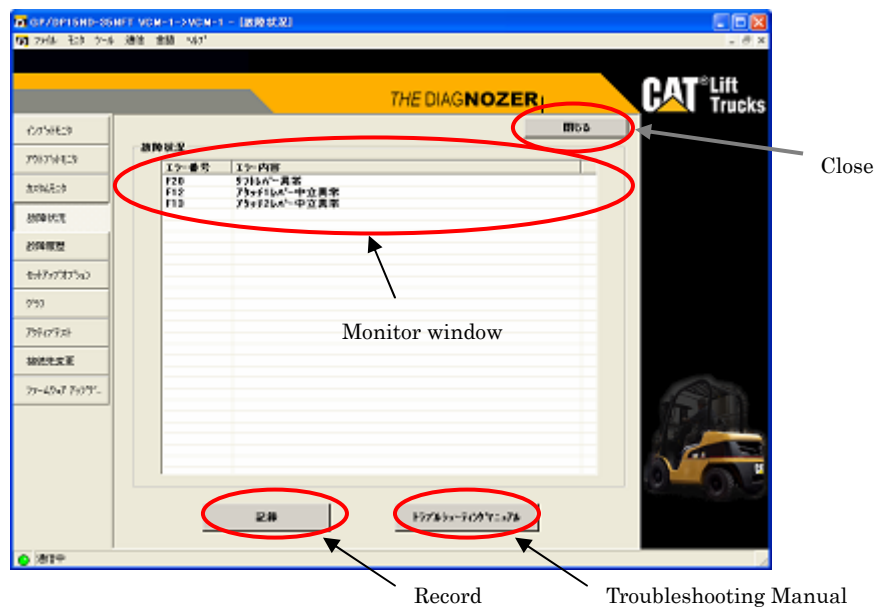


Figure 4.5.2.4-1 Fault status monitor

Subject: Appendix of Error code 60 trouble shooting - Microsoft Internet Explorer

Address: E:\Program Files\MyCarFinder\Out\handk15.html

|                |   |            |                                      |
|----------------|---|------------|--------------------------------------|
| Error code     | F-34  | Error name | Vehicle Speed Sensor Abnormal Signal |
| Error criteria | The vehicle speed sensor is open-circuited or short-circuited<br>Threshold Check: 1.3 V or less, or 4.9 V or more<br>Duration: 400 ms or more |            |                                      |
| Error cause    | 1. Abnormal installation of vehicle speed sensor<br>2. Abnormal vehicle speed sensor<br>3. Abnormal harness<br>4. Abnormal controller         |            |                                      |

Processing flow

```

graph TD
    Start([F-34]) --> Step1[Check the installation state of the vehicle speed sensor (push to sensor end)]
    Step1 --> Decision1{Is installation normal?}
    Decision1 -- N --> Step2[Install the vehicle speed sensor normally]
    Decision1 -- Y --> Step3[Replace the vehicle speed sensor]
    Step3 --> Decision2{Does replacement of vehicle speed sensor solve the problem?}
    Decision2 -- Y --> Step4[Abnormal vehicle speed sensor]
    Decision2 -- N --> Step5[Replace the VCM controller]
  
```

Figure 4.5.2.4-2 Troubleshooting manual

### 4.5.2.5 Fault history

Clicking [View] - [Fault history] on the menu bar or clicking the **Fault history** button in the toolbox starts reading information on the fault that have been caused and recorded in the controller. If reading is successful, the dialog box shown in Figure 4.5.2.5-1 appears. If reading is unsuccessful, the dialog box shown in Figure 4.5.2.5-2 appears. After a while, the fault history monitor window (Figure 4.5.2.5-3) appears in the main window.

Display information

- a) No.: Error occurrence order (the latest error is 1)
- b) Error Code: Error code
- c) Description: Error information
- d) Hour: Hour meter
- e) BDI: BDI value

The types of recorded information vary depending on the controller, and some items may not have display data, in which case "----" is displayed.

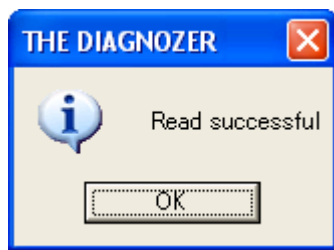


Figure 4.5.2.5-1 Successful reading



Figure 4.5.2.5-2 Unsuccessful reading

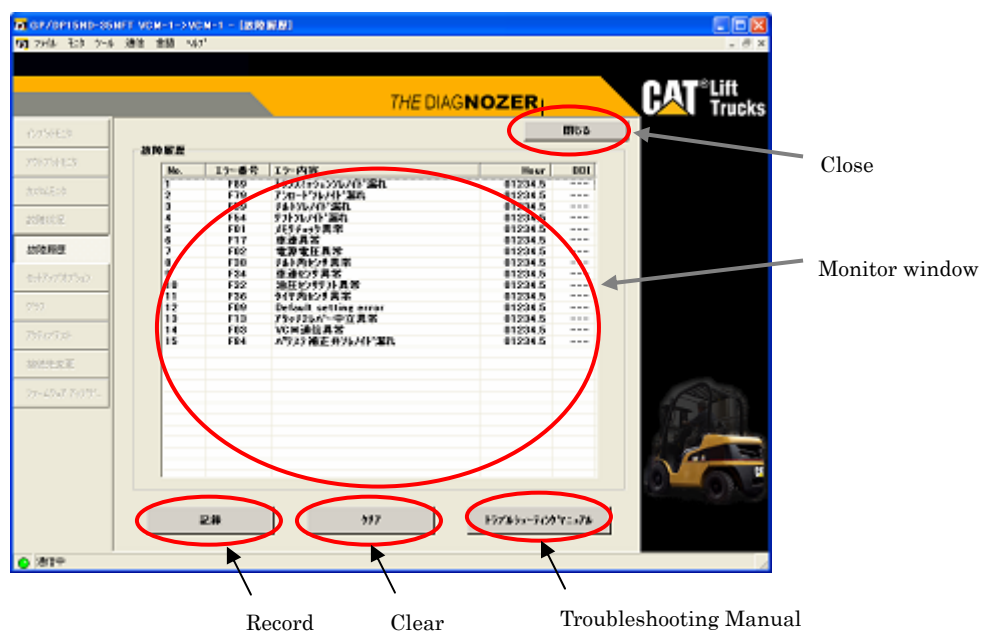


Figure 4.5.2.5-3 Fault history monitor

### Saving fault history

Click the **Record** button to display a file save dialog box. Enter the name of the save file and click the **Save** button. The file is saved in the tab-delimited format. The file contains No., Error Code., Description, Hour, and BDI.

Double-click an error item in the monitor window. The Web browser then starts and displays the troubleshooting manual as shown in Figure 4.5.2.4-2.

### Clearing fault history

Clicking the **Clear** button displays a confirmation dialog box for deleting the fault history as shown in Figure 4.5.2.5-4. Click the **Yes** button to delete the fault history, or click the **No** button to not delete the fault history. If deletion turns out successful, the dialog box shown in Figure 4.5.2.5-5 appears. If deletion turns out unsuccessful, the dialog box in Figure 4.5.2.5-6 appears. The fault history can be deleted only in the diagnosis mode.

### Displaying the troubleshooting manual

Click the displayed error item to highlight it and then double-click it. The Web browser starts and displays the troubleshooting manual as in the window shown in Figure 4.5.2.4-2. Note that some type of control does not display the troubleshooting manual.

Clicking the **Troubleshooting Manual** button also displays the troubleshooting manual. Note that some type of control does not display the troubleshooting manual.

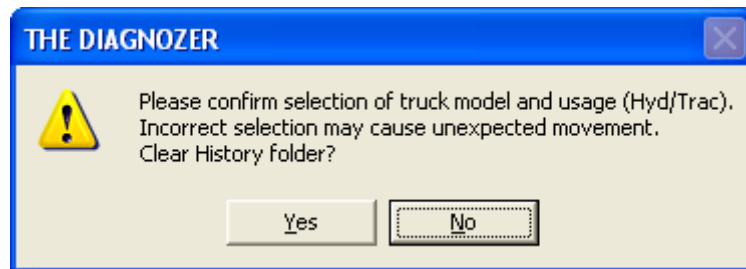


Figure 4.5.2.5-4 Fault history clear confirmation window

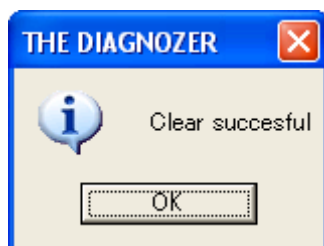


Figure 4.5.2.5-5 Fault history cleared successfully

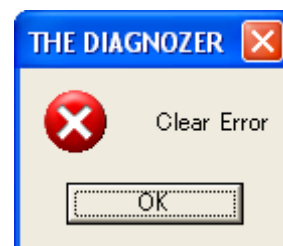


Figure 4.5.2.5-6 Fault history not cleared

### 4.5.3 Tool menu

Figure 4.5.3 shows the window that displays the tool menu.

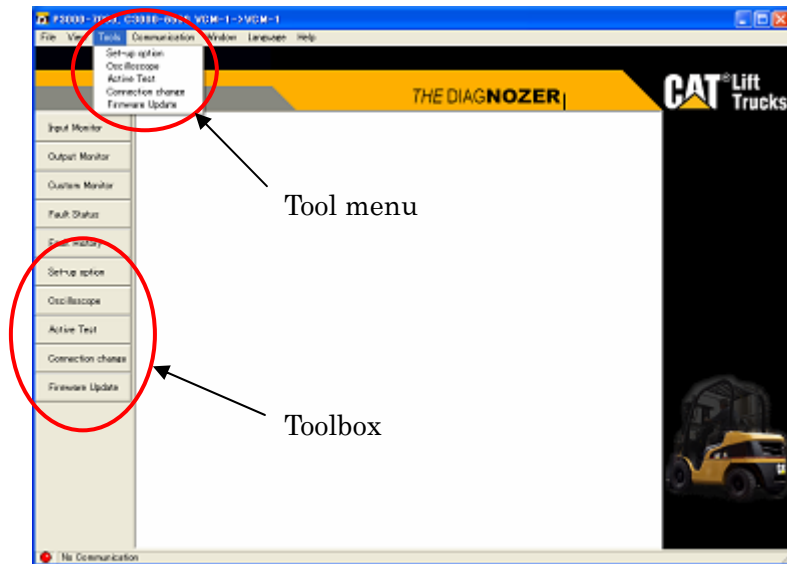


Figure 4.5.3 Tool menu

### 4.5.3.1 Set-up option

Clicking [Tool] - [Set-up option] on the menu bar or clicking the Set-up option button in the toolbox displays the setup option window (Figure 4.5.3.1-1) in the main window.

With the setup option window, you can monitor the setup values that are currently set, or change setup values. You may not change setup values for some controllers.

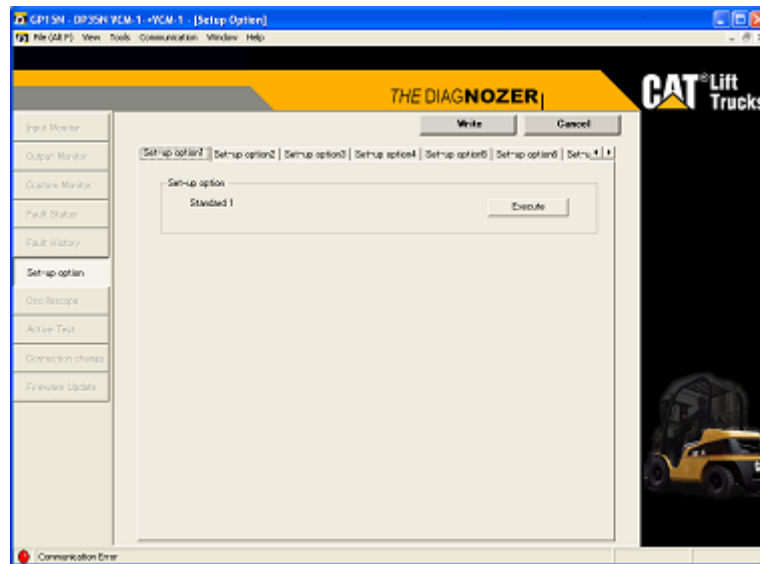


Figure 4.5.3.1-1 Set-up option

### Note

When change setup values using the setup option function, never fail to ensure in advance that model selection has been performed normally. If model selection has been performed incorrectly, setup values may not be changed normally and moreover the controller may malfunction.

After changing setup values, be sure to check that the values have been changed normally.

The operation of the set-up option function varies depending on the controller. Operate the function using the patterns classified for individual types of controllers as in Table 4.5.3.1-1.

Table 4.5.3.1-1 Operating patterns for individual types of controller

| Model name  | Operation                 |
|---|---------------------------|
| Vehicle controller<br>EP16KT-20KT, EP16K-20KC<br>EP20K-35K<br>EP20K-35K PAC<br>EP10-25(H)   | <a href="#">Pattern A</a> |
| FC controller<br>EP16KT-20KT, EP16K-20KC<br>GP/DP40K-50K<br>GP/DP10K-35K  | <a href="#">Pattern B</a> |
| P3000-7000, C3000-6500<br>DP/GP15N-35N, GC15-33N<br>GP/DP15ND-35NFT<br>P17500-36000, P13500LPG-P11500LPG<br>DP80N-160N, GP60N-70N | <a href="#">Pattern C</a> |
| ET3000-4000, EP16NT-20NT, EP16N-20CN<br>E3000-6500, EC15N-30N<br>ES3000-5000<br>EP10KRT-15KRT PAC<br>NR14N-25NH                   | <a href="#">Pattern D</a> |

## Pattern A operation

Figure 4.5.3.1.1-1 shows the setup option window.

When the window appears, the current setup values are read from the controller and displayed.

To change a setup value, click the  or  button displayed on the right side of the setup item until the target value is reached. The changed value is marked blue. The setup value can be changed only in the set mode.

Next, click the  button to display the rewrite confirmation dialog box shown in Figure 4.5.3.1.1-2. Click the  button.

If rewrite turns out successful, the dialog box in Figure 4.5.3.1.1-3 appears. If rewrite turns out unsuccessful, the dialog box shown in Figure 4.5.3.1.1-4 appears.

The operation procedure after rewrite is displayed in the dialog box (Figure 4.5.3.1.1-5 for EP20K-35K or Figure 4.5.3.1.1-6 for others). Perform operation in accordance with the instructions displayed.

#1 Application Pre-Sets cannot be rewritten simultaneously with another setup item. When you rewrite #1 with another setup item, first rewrite #1 setup item and then rewrite another setup item.

Figure 4.5.3.1.1-7 shows a setup option group2 window.

### Notes on rewriting EP20K-35K

If the group selected and displayed on the screen when the  button is pressed matches the group displayed on the forklift display, EP20K-35K rewrites only the setup option items with the displayed group number to the controller.

#### Example:

While the forklift display displays the setup option number of group 2, this application changes the values of #2 and #3 of group 1, #20 and #24 of group 2, and #44 and #45 of group 3. When the  button is pressed while the group 2 tab is selected and displayed, only #20 and #24 of group 2 are rewritten to the controller. #2 and #3 of group 1, and #44 and #45 of group 3 are not rewritten to the controller. To change the values of other groups, select the tab of the target group and press the  button while ensuring that the setup number of the target group is also displayed on the forklift display.

With other models, pressing the  button rewrites all setup option items that have been updated previously.

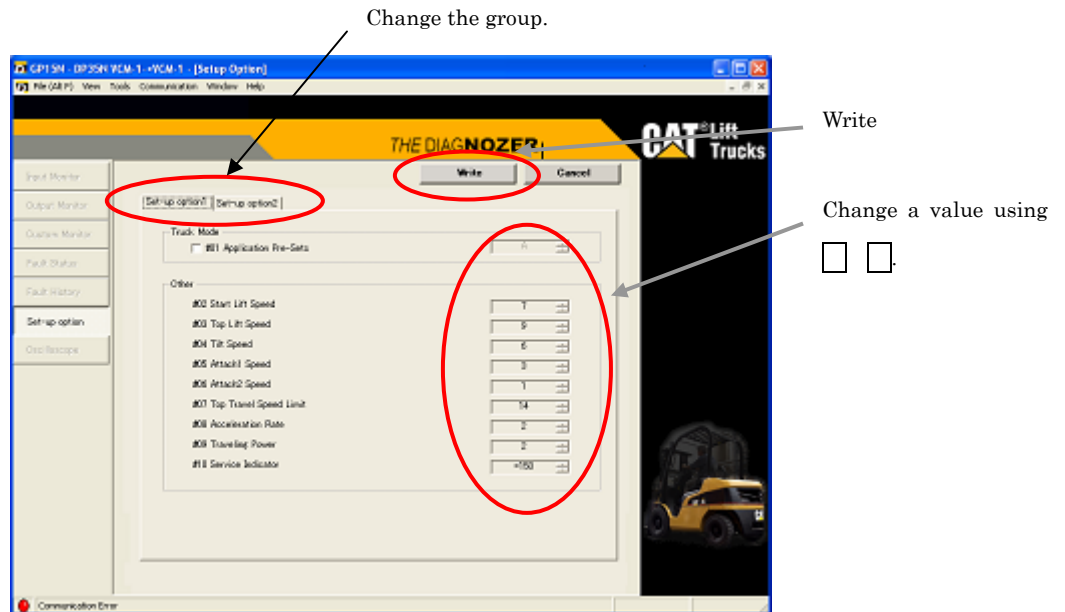


Figure 4.5.3.1.1-1 Setup option (EP16KT-20KT, EP16K-20KC)

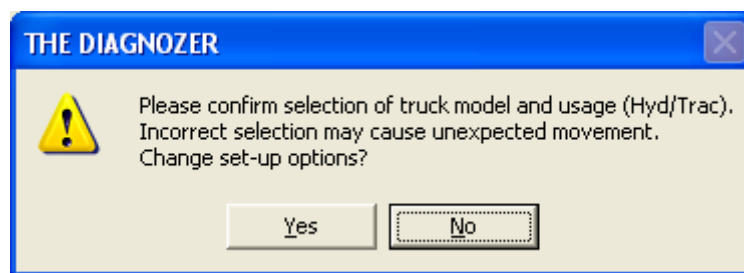


Figure 4.5.3.1.1-2 Rewrite confirmation

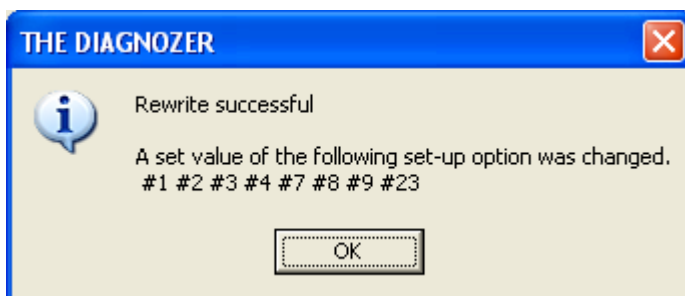


Figure 4.5.3.1.1-3 Rewrite successful



Figure 4.5.3.1.1-4 Rewrite unsuccessful



Figure 4.5.3.1.1-5 Operation after rewrite (EP20K-35K)

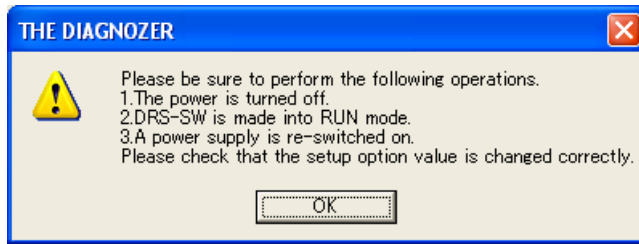


Figure 4.5.3.1.1-6 Operation after rewrite  
(Except EP20K-35K)

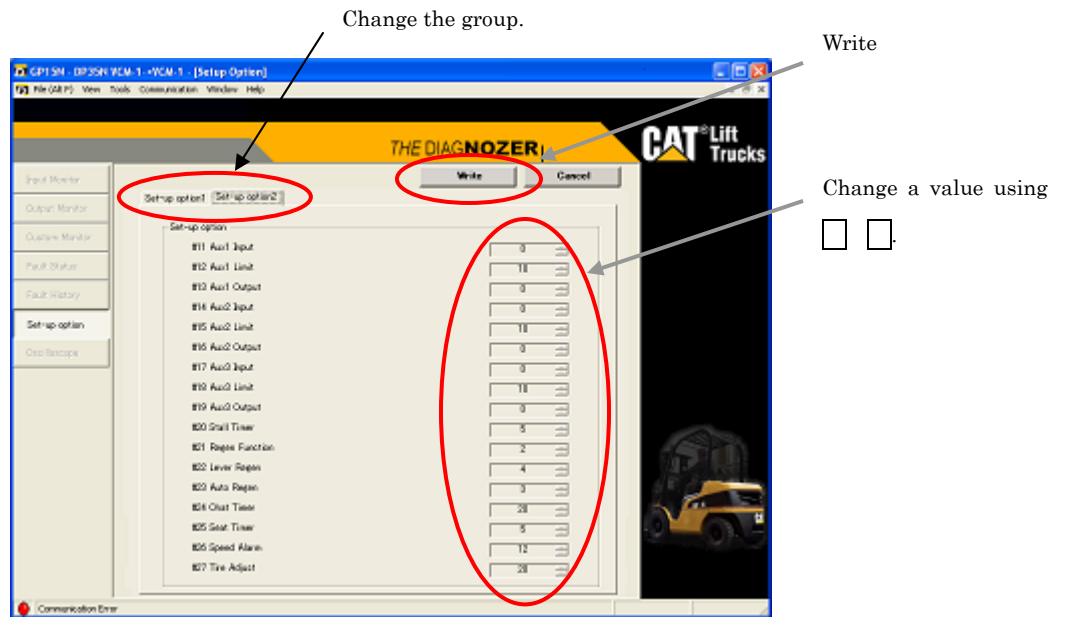


Figure 4.5.3.1.1-7 Setup option group 2  
(EP16KT-20KT, EP16K-20KC)

## Pattern B operation

Figure 4.5.3.1.2-1 shows the setup option window.

While the window is displayed, the current setup values are constantly read from the controller and displayed. In this window, you can only monitor values and cannot rewrite the setup values.

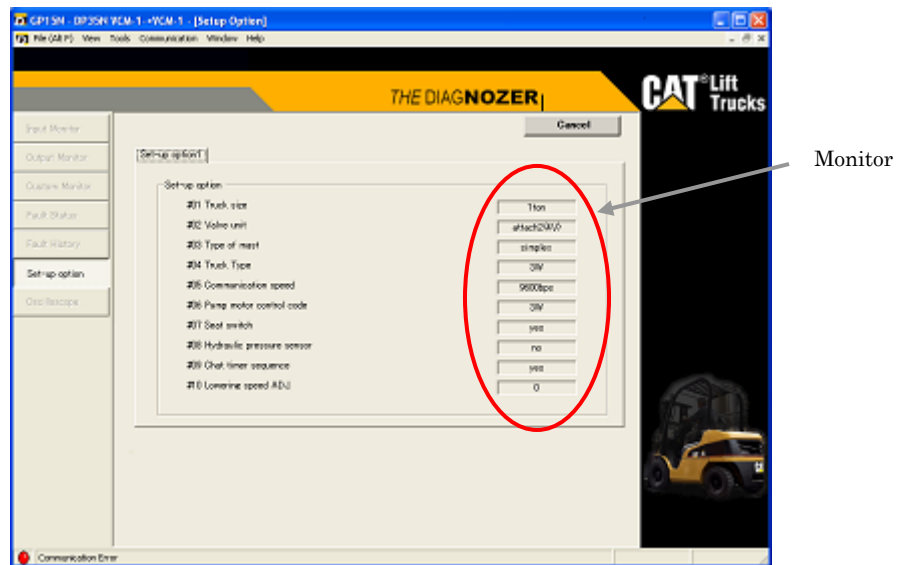


Figure 4.5.3.1.2-1 Setup option  
(EP16KT-20KT, EP16K-20KC)

## Pattern C operation

Figure 4.5.3.1.3-1 shows the setup option window.

When the window appears, the current setup values are read from the controller and displayed.

For a "Standard 1" setup option item as shown in Figure 4.5.3.1.3-1, click the **Execute** button on the right side. The rewrite confirmation dialog box shown in Figure 4.5.3.1.3-2 appears. Click the **Yes** button. If rewrite turns out successful, the dialog box in Figure 4.5.3.1.3-3 appears. If rewrite turns out unsuccessful, the dialog box shown in Figure 4.5.3.1.3-4 appears.

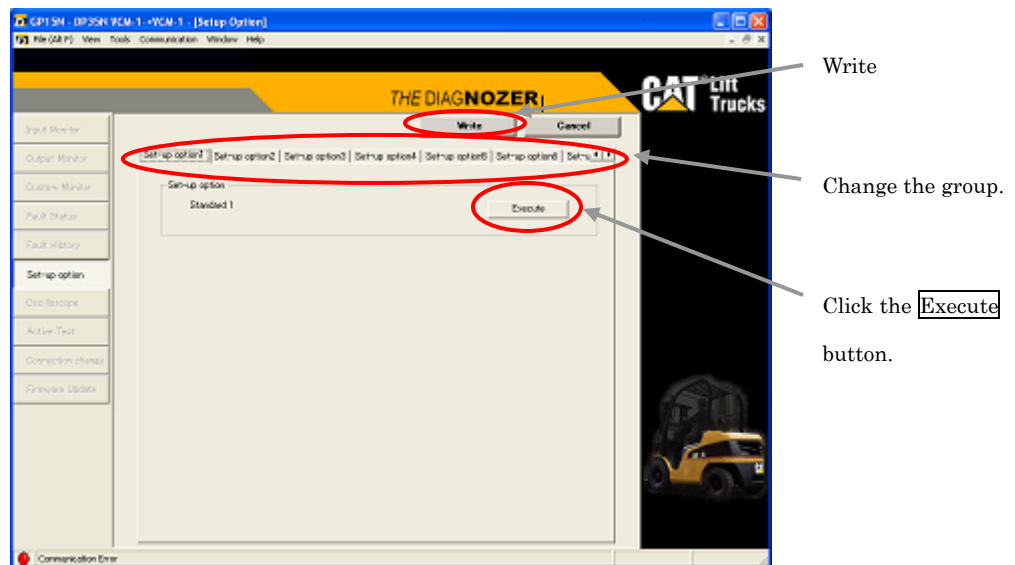


Figure 4.5.3.1.3-1 Setup option (VCM1)

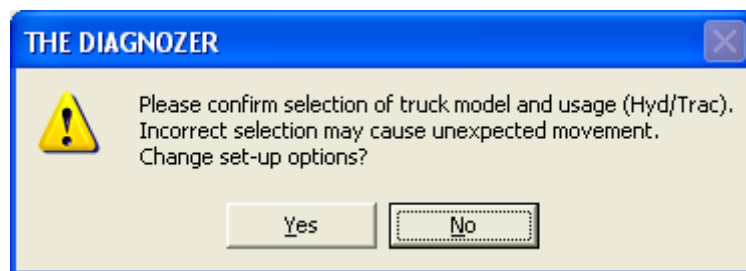


Figure 4.5.3.1.3-2 Rewrite confirmation

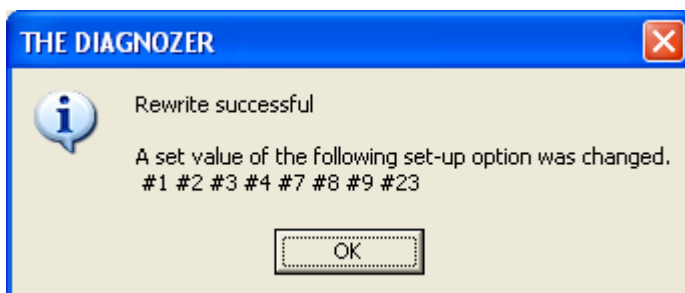


Figure 4.5.3.1.3-3 Rewrite successful

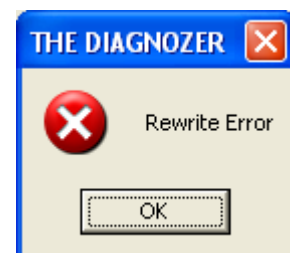


Figure 4.5.3.1.3-4 Rewrite unsuccessful

For a setup option item for which a text box is displayed as shown in Figure 4.5.3.1.3-5, you can write a value to the text box directly from the keyboard. For a text box with the  and  buttons, click the buttons to show the value to be set. The locations thus changed are marked blue. After you change the values of all necessary items, click the **Write** button. The rewrite confirmation dialog box shown in Figure 4.5.3.1.3-2 appears. Click the **Yes** button.

If rewrite turns out successful, the dialog box in Figure 4.5.3.1.3-3 appears. If rewrite turns out unsuccessful, the dialog box shown in Figure 4.5.3.1.3-4 appears.

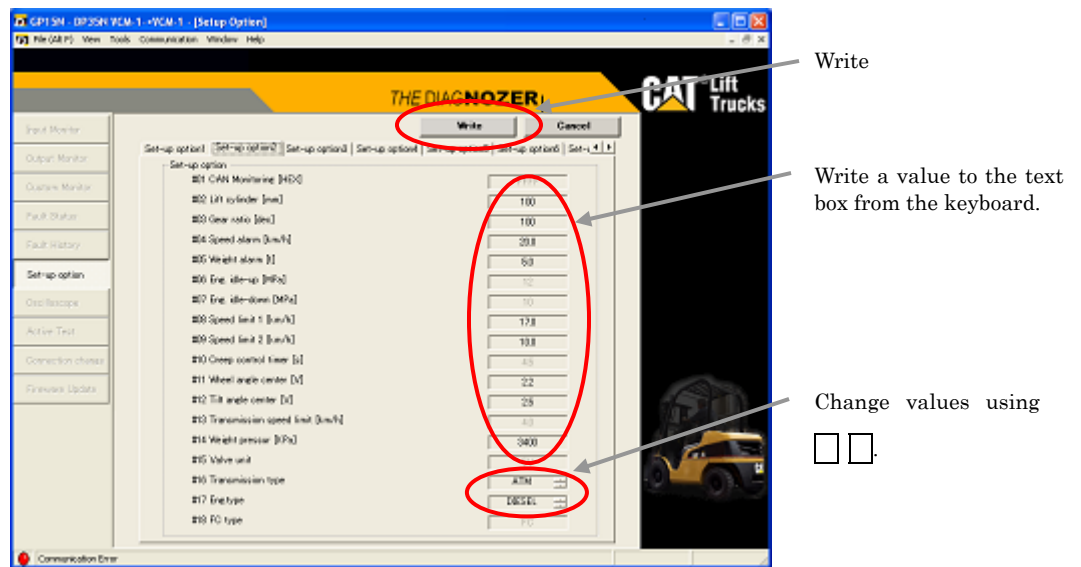


Figure 4.5.3.1.3-5 Setup option (VCM1)

For "Load default data" or "Load shipment default data" as shown in Figure 4.5.3.1.3-6, click the **Run** button on the right side. The rewrite confirmation dialog box shown in Figure 4.5.3.1.3-2 appears. Click the **Yes** button. If initialization turns out successful, the dialog box in Figure 4.5.3.1.3-3 appears. If initialization turns out unsuccessful, the dialog box shown in Figure 4.5.3.1.3-4 appears.

"File save" saves the current setup option values to a file. Click the **Run** button on the right side. A file save dialog box appears. Enter the name of the save file and click the **Save** button. The current setup option values are written to the saved file.

"File load" can load the file that was saved with "File save." Thereafter, writing them to the controller can set the controller setup values to the same setup option values as the saved file. Click the **Run** button on the right side to display a file open dialog box. Select the file to be read and click the **Open** button. The setup option values are read from the file, and the values of individual items are changed accordingly. The locations thus changed are marked blue. To write the setup option values to the controller, click the **Write** button. The rewrite confirmation dialog box shown in Figure 4.5.3.1.3-2 appears. Click the **Yes** button. If rewrite turns out successful, the dialog box in Figure 4.5.3.1.3-3 appears. If rewrite turns out unsuccessful, the dialog box shown in Figure 4.5.3.1.3-4 appears.

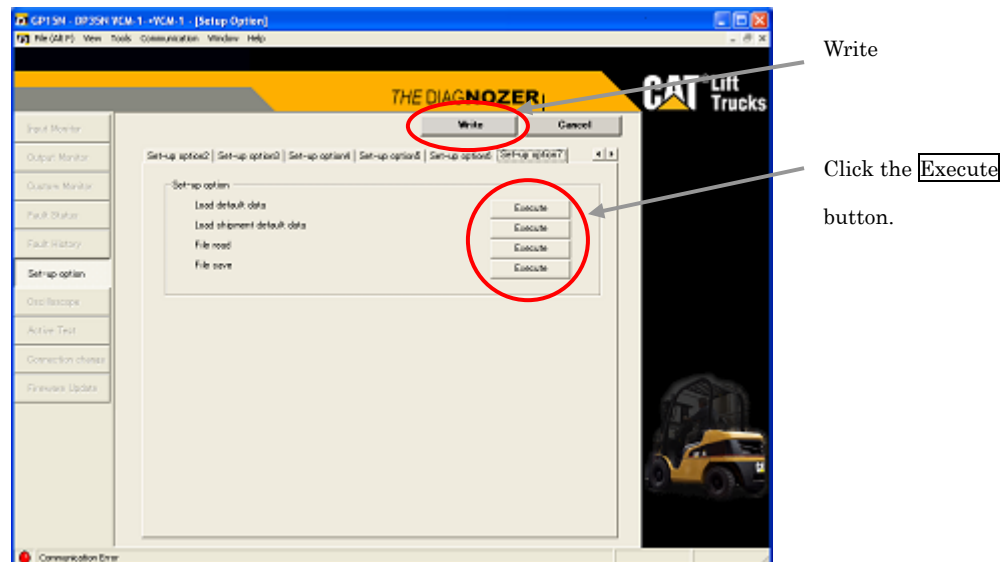


Figure 4.5.3.1.3-6 Setup option (VCM1)

## Pattern D operation

Figure 4.5.3.1.4-1 shows the setup option window.

When the window appears, the current setup values are read from the controller and displayed.

To change a setup value, click the  and  buttons, which are displayed on the right side of the setup item you want to change, to show the value to be set. The value thus change turns blue. If the value is outside the setting range, it turns red. You can change setup values only in setup mode.

Next, click the  button. The rewrite confirmation dialog box shown in Figure 4.5.3.1.4-2 appears. Click the  button.

If rewrite turns out successful, the dialog box shown in Figure 4.5.3.1.4-3 appears. If rewrite turns out unsuccessful, the dialog box shown in Figure 4.5.3.1.4-4 appears. The procedure to be followed next or caution messages may also be displayed. If so, follow them.

The operation procedure to be followed after rewrite is displayed in the dialog box shown in Figure 4.5.3.1.4-5. Follow the instructions given in the dialog box.

For "Load default data," click the  button on the right side. The rewrite confirmation dialog box shown in Figure 4.5.3.1.4-2 appears. Click the  button. If initialization turns out successful, the dialog box in Figure 4.5.3.1.4-3 appears. If initialization turns out unsuccessful, the dialog box shown in Figure 4.5.3.1.4-4 appears.

"File save" saves the current setup option values to a file. Click the  button on the right side. A file save dialog box appears. Enter the name of the save file and click the  button. The current setup option values are written to the saved file.

"File read" can read the file that was saved with "File save." Thereafter, writing them to the controller can set the controller setup values to the same setup option values as the saved file. Click the  button on the right side to display a file open dialog box. Select the file to be read and click the  button. The setup option values are read from the file, and the values of individual items are changed accordingly. The locations thus changed are marked blue. To write the setup option values to the controller, click the  button. The rewrite confirmation dialog box shown in Figure 4.5.3.1.4-2 appears. Click the  button.

If rewrite turns out successful, the dialog box in Figure 4.5.3.1.4-3 appears. If rewrite turns out unsuccessful, the dialog box shown in Figure 4.5.3.1.4-4 appears.

**Notes on rewrite**

If #1 Application Pre-Sets is changed with other setup option items changed, the rewriting will take place in such a way that the values set on this Setup window have a higher priority than those which are set in #01.

The setup values of the groups 1 and 2 can be changed only after the setup values of option 3 have been correctly set and the default setting is complete. They cannot be changed if a value outside the setting range is displayed. Therefore, make sure in advance that all setup values are within each setting range.

Default setting can be performed after the setup values of the group 3 have been set correctly. The default values to be set vary depending on a combination of #40, #41, and #43. When all the Set-Up options of the group 3 have been set for the first time, the fault history will then be cleared properly. The value set with #1 Application Pre-Sets vary with a combination of #40, #41, and #43.

When any of the setup values of the group 3 is modified to within the normal range of setting values, the fault history will be properly cleared.

Table 4.5.3.1.4-1 Setup Option Nos. vs. Group Nos.

| Product model                        | Group 1 | Group 2         | Group 3     |
|--------------------------------------|---------|-----------------|-------------|
| ET3000-4000, EP16NT-20NT, EP16N-20CN | 1 ~ 10  | 11 ~ 35         | 40 ~ 47     |
| E3000-6500, EC15N-30N                | 1 ~ 10  | 11 ~ 32         | 40 ~ 47, 51 |
| ES3000-5000                          | 1 ~ 12  | 14 ~ 38, 76, 77 | 40 ~ 48     |
| EP10KRT-15KRT PAC                    | 1 ~ 10  | 11 ~ 32         | 40 ~ 47     |

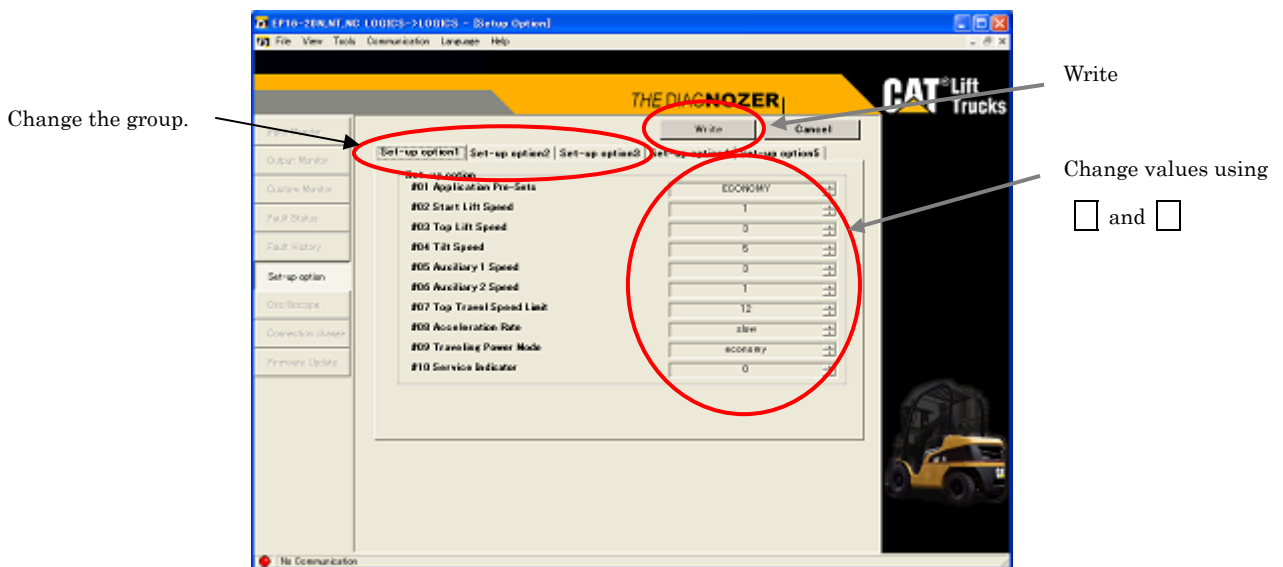


Figure 4.5.3.1.4-1 Setup option (ET3000-4000, EP16NT-20NT, EP16N-20CN)

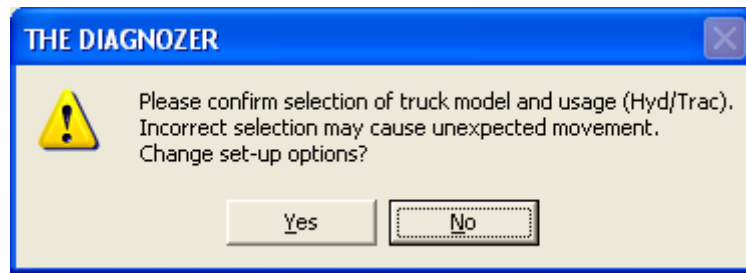


Figure 4.5.3.1.4-2 Rewrite confirmation

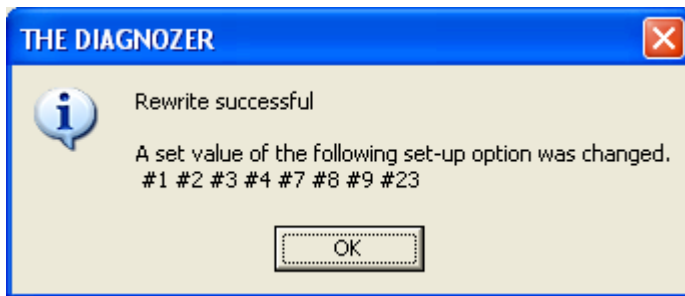


Figure 4.5.3.1.4-3 Rewrite successful



Figure 4.5.3.1.4-4 Rewrite unsuccessful

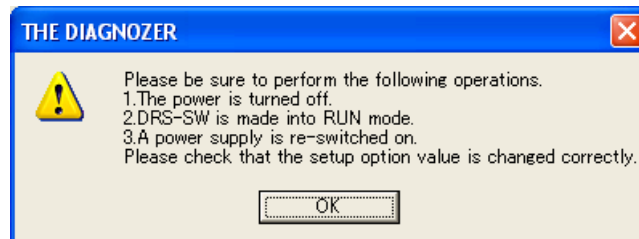


Figure 4.5.3.1.4-5 Operation procedure after rewrite

### 4.5.3.2 Oscilloscope

Clicking [Tool] - [Oscilloscope ] on the menu bar or clicking the **Oscilloscope** button in the toolbox displays the Oscilloscope window shown in Figure 4.5.3.2-1 in the main window.

In the Oscilloscope window, the specified I/O values are read and plotted into graphs. The graph data displayed in the window can be saved to a file, so reading the file can redisplay the graph.

The oscilloscope window can be printed through a printer by clicking the **Print Screen** button.

This oscilloscope function is a simple type which includes some delays and errors in the waveforms. To measure waveforms accurately, use a dedicated measuring instrument.

#### Graph display procedure

- (1) Click the **CH1** or **CH2** button. The dialog box shown in Figure 4.5.3.2-2 appears. Select the I/O item to be graphed and Unit Division, then click the **OK** button. If you select the Unit Division auto adjust check box, graph display is performed while automatically switching to the optimum Unit Division for which the maximum value is displayed.
- (2) Click the **Setting** button. The dialog box shown in Figure 4.5.3.2-3 appears. Select the time axis and click the **OK** button.
- (3) Click the **Start** button. The system starts reading values from the controller and displays a graph as shown in Figure 4.5.3.2-4. To stop graph display, click the **Stop** button.

1 The graph display item, Unit Division, line color and time axis cannot be set while graph display is in progress. Stop graph display before setting.

2 If the Unit Division or time axis is changed while the graph is stopped during displaying, the graph is redisplayed with the selected Unit Division. If an item is changed at this time, the graph is cleared.

3 When a horizontal scrollbar is displayed under the graph display area while the graph display is stopped, you can move the bar to display past graphs. When a vertical scrollbar appears on the right side of the graph display area, you can move the bar to move the graph vertically.

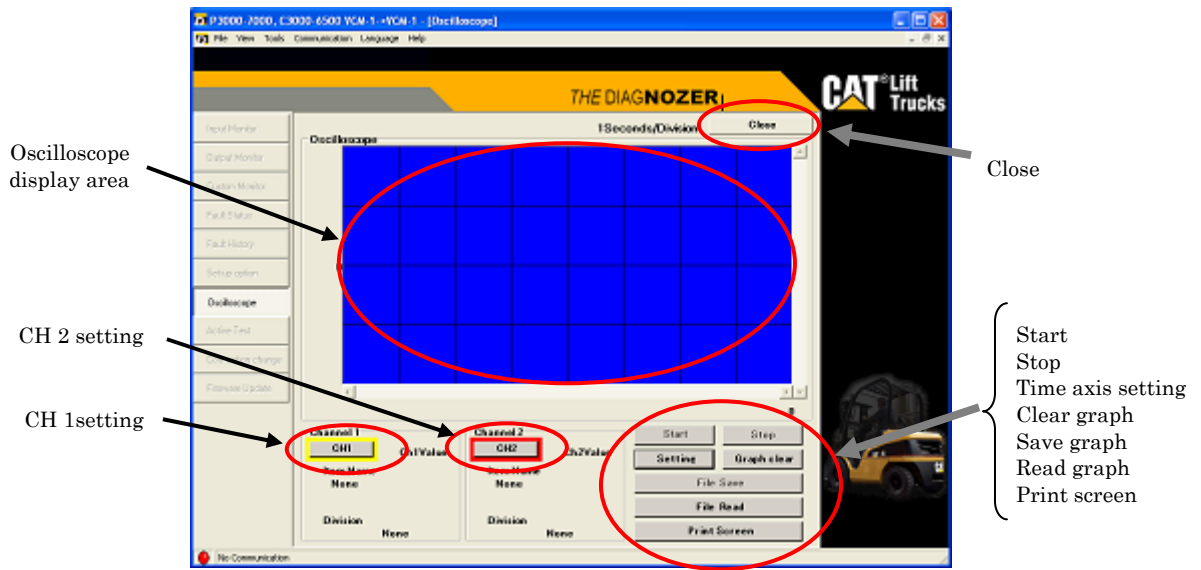


Figure 4.5.3.2-1 Graph

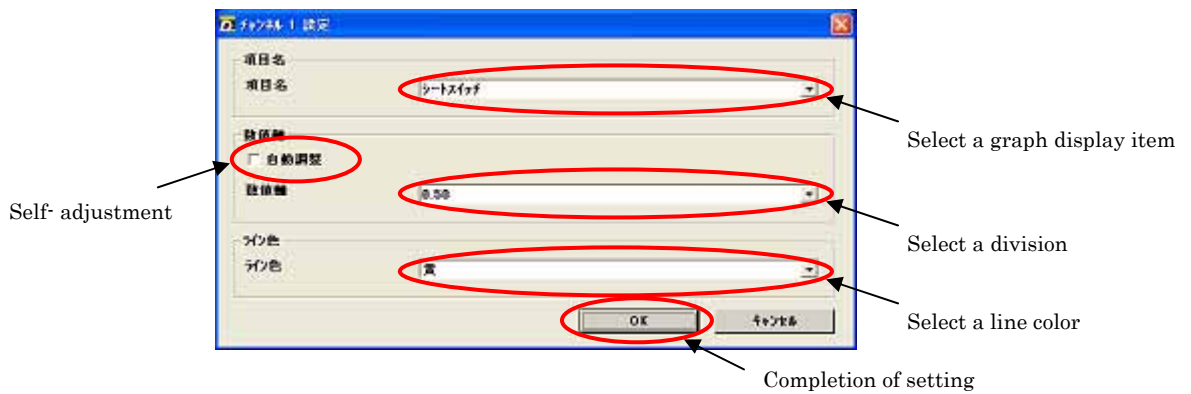


Figure 4.5.3.2-2 Channel setting

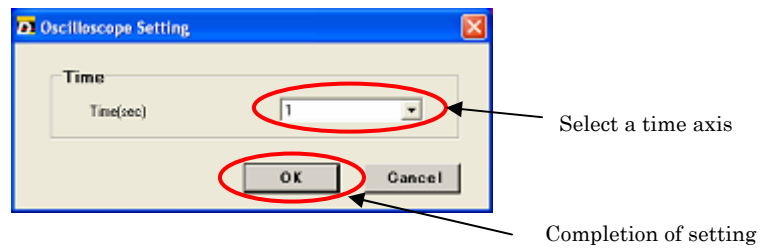


Figure 4.5.3.2-3 Time axis setting

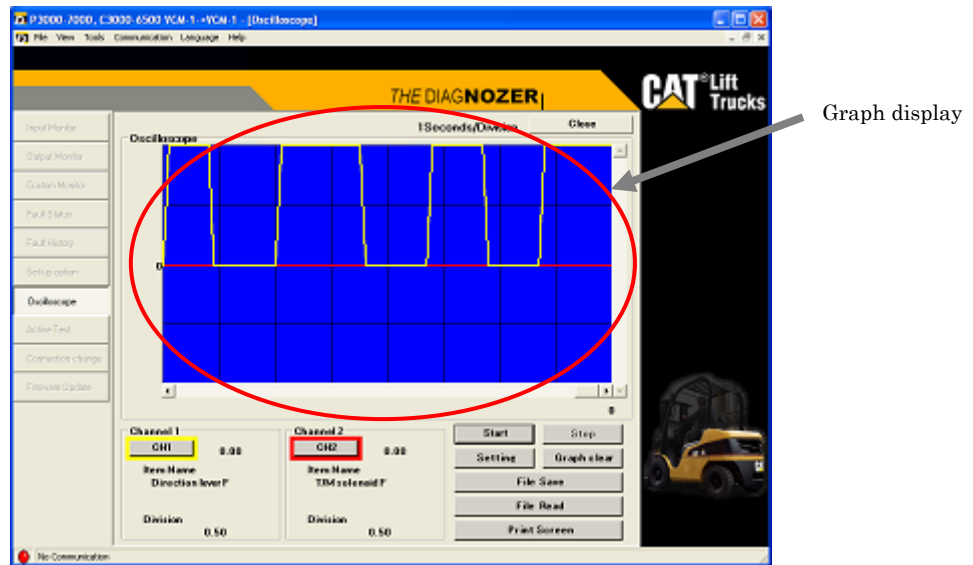


Figure 4.5.3.2-4 Graph display

### Scaling the graph display

- (1) While the graph display is stopped as shown in Figure 4.5.3.2-4, change the Unit Division or time axis setting to enable enlarged or reduced display.
- (2) A scrollbar appears on the right side and the underside of the graph display area. You can move the bar to move the graph display position.

### Saving graph data

- (1) While a graph is displayed in the oscilloscope graph window as shown in Figure 4.5.3.2-4, click the **File Save** button. The file save dialog box shown in Figure 4.5.3.2-5 appears. Enter the file name and click the **Save** button.

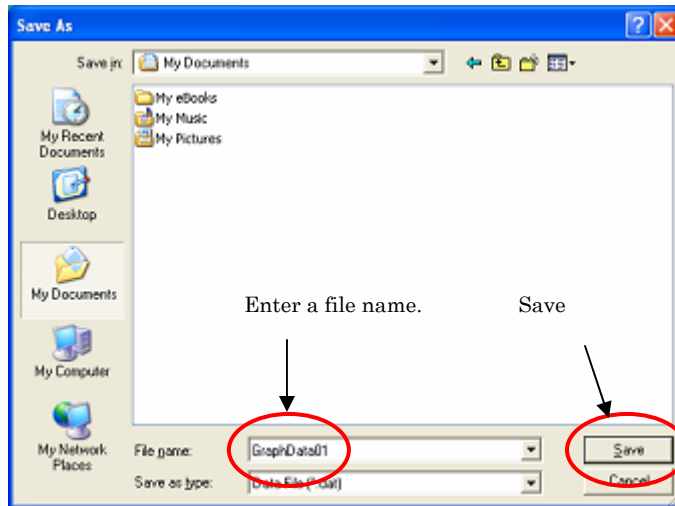


Figure 4.5.3.2-5 File save dialog box

### Reading graph data

- (1) While the oscilloscope window is displayed, click the **File Read** button. The file open dialog box shown in Figure 4.5.3.2-6 appears. Select the graph data file to be displayed and click the **Open** button.
  - (2) Graph data is read from the file and a graph is displayed in the graph window.
- \* If the controller selected by this application does not match the one from which the graph data file was read, an error message is displayed and no graph is displayed. Quit the application, and rerun it on the same controller model as that from which the graph data was read.

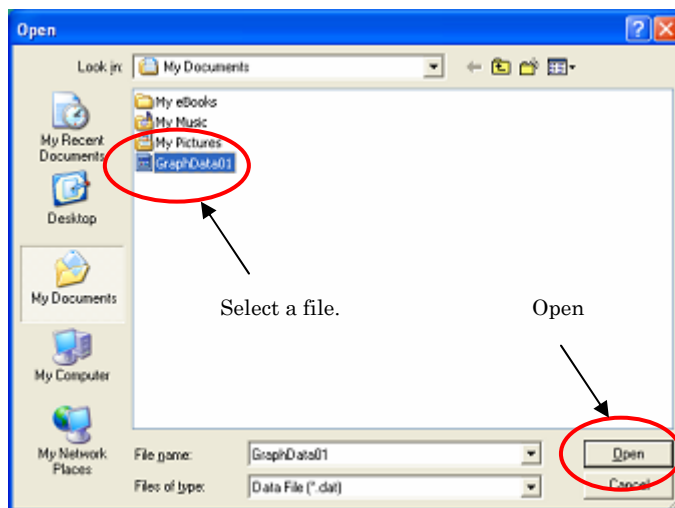


Figure 4.5.3.2-6 File open dialog box

### 4.5.3.3 Active test

Clicking [Tool] - [Active Test] on the menu bar or clicking the **Active Test** button in the toolbox displays the active test window shown in Figure 4.5.3.3-1 in the main window.

You can use the active test window to forcibly output a specified signal to check operation.

As the basic window configuration, output signal items are displayed on the left side and the monitor items for the output signals are displayed on the right side.

## Caution

**The active test forcibly outputs a specified signal to check operation. Therefore, the machine may suddenly begin to operate during the active test. Secure the safety of works and conduct a test carefully.**

**In addition, make sure in advance that the connected controller and the controller to be operated are the right ones. Selecting wrong controllers may cause unexpected behaviors.**

The operation of the active test function varies depending on the controller. Operate the function according to the operation method of the controller defined as the target controller.

Operation of the VCM1, VCM2, VCM3 or VCM3OP controllers → [To VCM1, VCM2, VCM3 or VCM3OP](#)

Operation of the DCM controller → [To DCM](#)

Operation of the ECM controller → [To ECM](#)

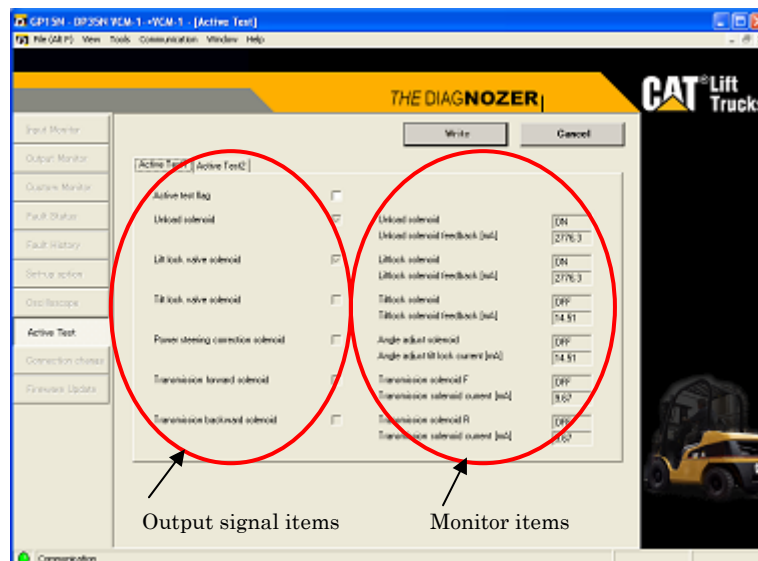


Figure 4.5.3.3-1 Active Test Window

## For VCM1, VCM2, VCM3 or VCM3OP

Figure 4.5.3.3.1-1 shows an active test window (VCM1).

When the window is displayed, the current values of the output signal items and monitor items are read from the controller and displayed. The values of the monitor items are constantly updated.

### Active test procedure

- (1) Click "Active test flag" to select the check box. An active test cannot be conducted with the "Active test flag" check box cleared.
- (2) Click the output signal item for which an active test is to be conducted. Make sure that the check box is selected.
- (3) Click the **Write** button. The dialog box shown in Figure 4.5.3.3.1-2 appears. Because the vehicle may run suddenly, secure safety and then click the **Yes** button.
- (4) If writing ends normally, the dialog box shown in Figure 4.5.3.3.1-3 appears, the signal selected in (3) is output and monitor item values change.

Depending on the vehicle status, the relevant signal may not be output and monitor item values may not change. If writing is unsuccessful, the dialog box shown in Figure 4.5.3.3.1-4 appears.

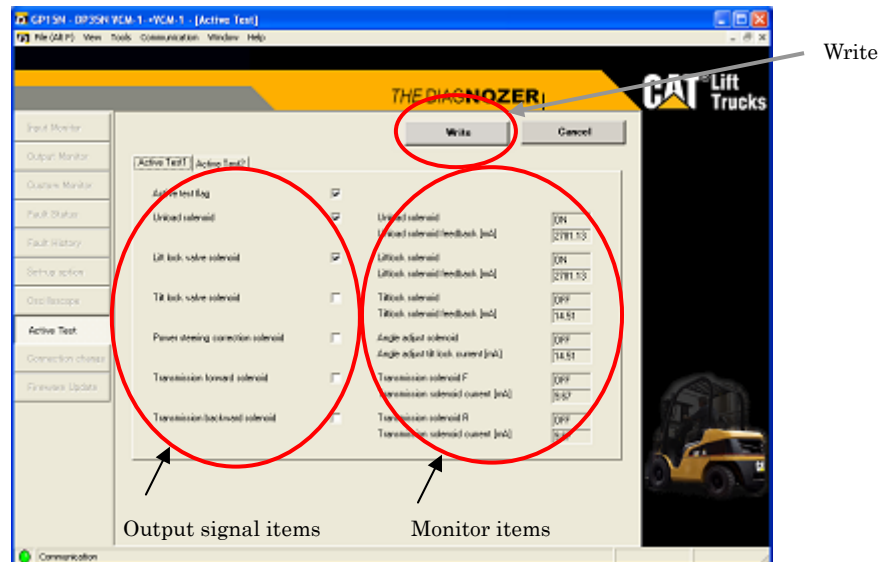


Figure 4.5.3.3.1-1 Active test (VCM1)

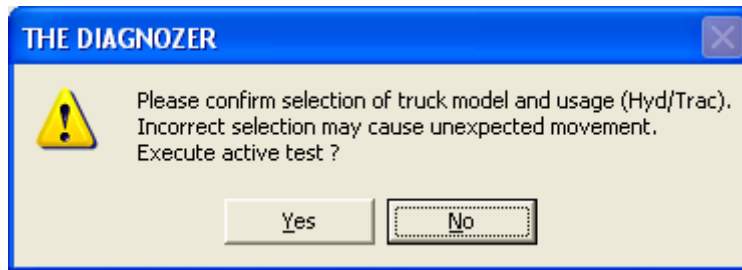


Figure 4.5.3.3.1-2 Confirmation dialog box



Figure 4.5.3.3.1-3 Rewrite successful



Figure 4.5.3.3.1-4 Rewrite unsuccessful

## For DCM

Figure 4.5.3.3.2-1 shows the active test 1 window (DCM).

When the window is displayed, the current values of output signal items are read from the controller and displayed.

### Active test procedure 1

- (1) Click "Active test flag" to select the check box. An active test cannot be conducted with the "Active test flag" check box cleared.
- (2) Click the output signal item for which an active test is to be conducted. Make sure that the check box is selected.
- (3) Click the **Write** button. The dialog box shown in Figure 4.5.3.3.1-2 appears.  
Because the vehicle may run suddenly, secure safety and then click the **Yes** button.
- (4) If writing ends normally, the dialog box shown in Figure 4.5.3.3.1-3 appears, the signal selected in (3) is output and monitor item values change.

Depending on the vehicle status, the relevant signal may not be output and monitor item values may not change. If writing is unsuccessful, the dialog box shown in Figure 4.5.3.3.1-4 appears.

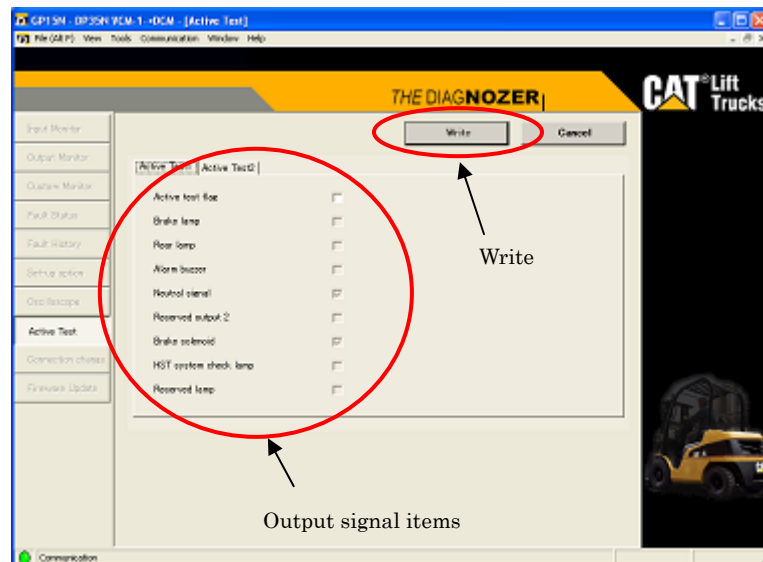


Figure 4.5.3.3.2-1 Active test (DCM)

Figure 4.5.3.3.2-2 shows the active test 2 window (DCM).

### Active test procedure 2

- (1) Click the **Execute** button. The dialog box shown in Figure 4.5.3.3.1-2 appears.  
Because the vehicle may run suddenly, secure safety and then click the **Yes** button.
- (2) If the active test ends normally, the dialog box shown in Figure 4.5.3.3.2-3 appears. If it ends abnormally, a dialog box shown in Figure 4.5.3.3.2-4 or 4.5.3.3.2-5 appears.

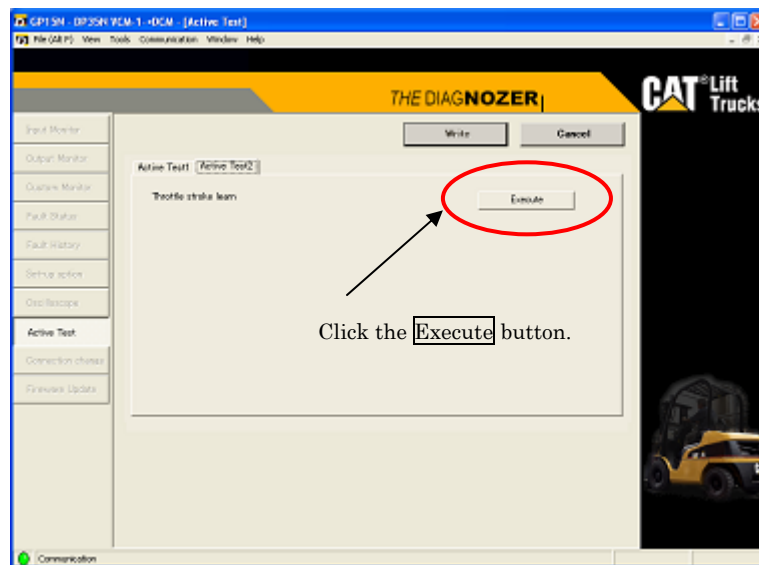


Figure 4.5.3.3.2-2 Active test (DCM)

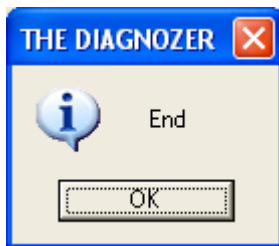


Figure 4.5.3.3.2-3 Normal end

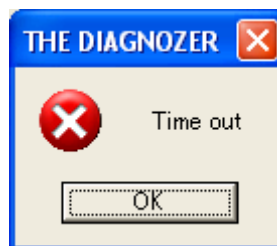


Figure 4.5.3.3.2-4 Timeout

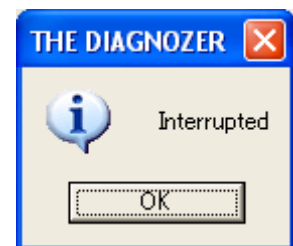


Figure 4.5.3.3.2-5 Interrupted

## For ECM

Figure 4.5.3.3.3-1 shows an active test window (ECM).

### Active test procedure

- (1) Click the **Execute** button. The dialog box shown in Figure 4.5.3.3.1-2 appears. Because the vehicle may run suddenly, secure safety and then click the **Yes** button. Depending on the active test, change the value in the test box or select or clear the check box, and then click the **Execute** button.
- (2) If the active test ends normally, the dialog box shown in Figure 4.5.3.3.2-3 appears. If it ends abnormally, a dialog box shown in Figure 4.5.3.3.2-4 or 4.5.3.3.2-5 appears.

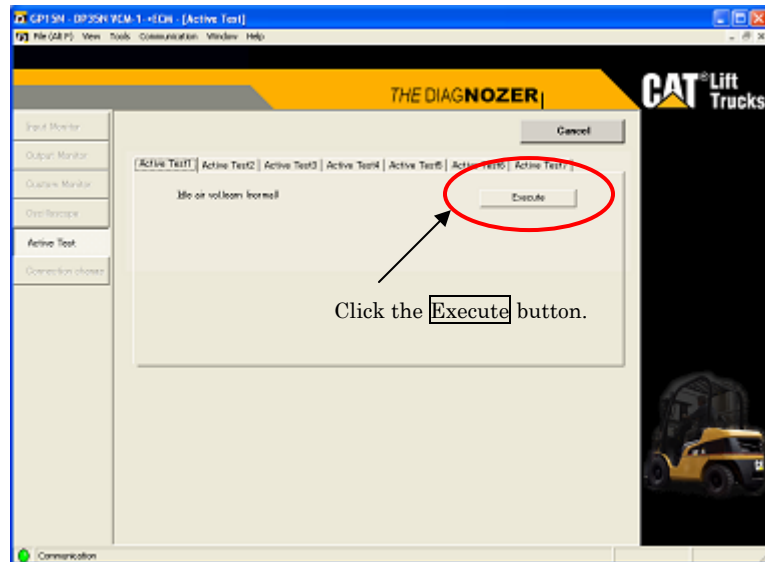


Figure 4.5.3.3.3-1 Active test (ECM)

#### 4.5.3.4 Changing the connection destination

Clicking [Tool] - [Connection Change] on the menu bar or clicking the **Connection Change** button in the toolbox displays the Connection/Target change dialog box shown in Figure 4.5.3.4-1.

With the Connection/Target change dialog box, you can change the cable connection destination controller and operation target controller.

To change the connection destination, select a controller connected to the cable from the selection box on the right side of the connection destination field.

To change the operation controller, select an operation target controller from the selection box on the right side of the target field.

After selecting the connection destination and operation target controllers, click the **OK** button. The connection destination and operation target controllers are changed as specified. If you want to refrain from changing the controllers, click the **Cancel** button.

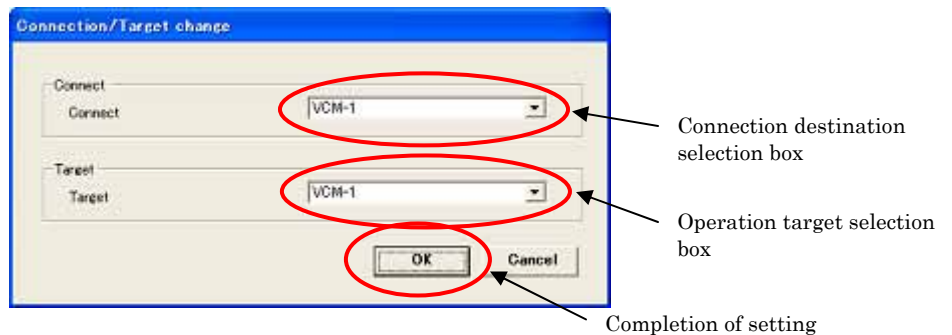


Figure 4.5.3.4-1 Changing the connection destination and operation target

#### 4.5.3.5 Firmware Update

Select [Tool] - [Firmware Update] from the menu or click the **Firmware Update** button in the toolbox to display the firmware update window shown in Figure 4.5.3.5-1. The display content varies depending on the connected controller.

In the firmware update window, you can select or update the software version of the connected controller and write software.

In the firmware update window, you can display the software version of the connected controller, select write software, and update it.

You can update firmware only in setup mode. However, you can update any time the firmware of a controller that does not support the setup mode.

### Caution

Do not turn off the key switch or disconnect any cable during execution of firmware update. The controller does not function normally unless firmware update processing ends normally. The controller that has failed in firmware update cannot be updated again.

Before starting update, be sure to turn off the PC screen saver function and sleep mode. If this application is put in the halt state while it is updating firmware, it may fail in update.

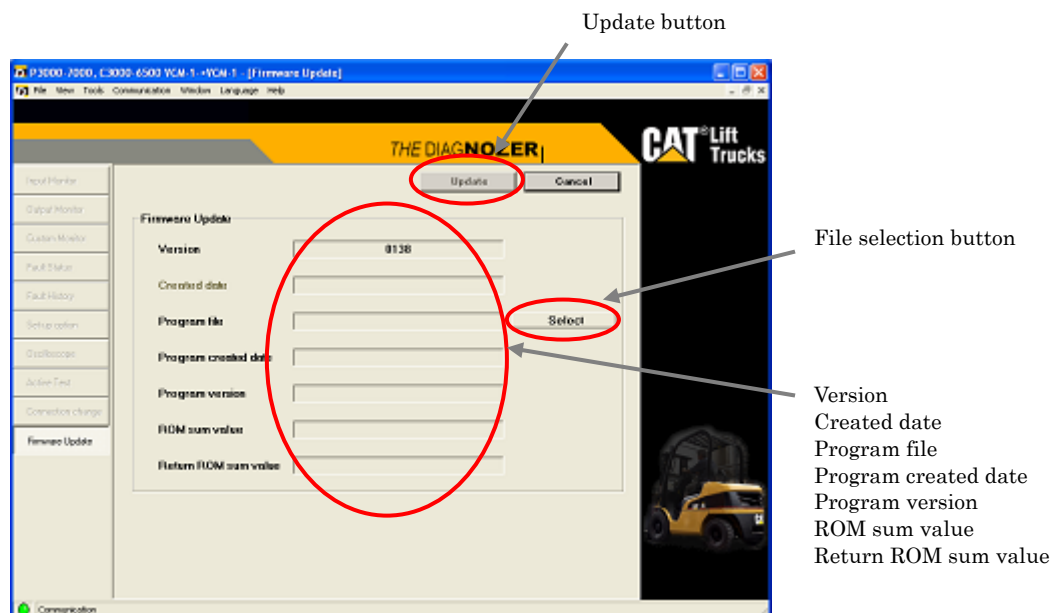


Figure 4.5.3.5-1 Firmware updating

## Firmware update procedure

- (1) Check the version and date/time of creation.

Version: Software version of the connected controller  
Created date: Date/time of creation of the software of the connected controller (may not be displayed depending on the connected controller)

- (2) Click the **Select** button to display the file selection dialog box. Select the program file to be written to the controller. When the selected program file is valid, the following types of information are displayed.

Program file: Path of the selected program file  
Program created date: Date/time of creation of the selected program file  
Program version: Software version of the selected program file  
ROM sum value: Sum value of the selected program

- (3) Click the **Update** button. The update confirmation dialog box shown in Figure 4.5.3.5-2 appears. Click **Yes** to execute.

- (4) Program writing begins and the progress is displayed. Do nothing during rewrite; otherwise, rewrite may fail. If rewrite turns out successful, the dialog box shown in Figure 4.5.3.5-3 appears. If rewrite turns out unsuccessful, the dialog box shown in Figure 4.5.3.5-4 appears.

- (5) When update ends normally, the following content is displayed. Check whether the ROM sum value matches the return ROM sum value. If they do not match, update may have failed. Turn off power and turn it on again, then reexecute update.

Return ROM sum value: Sum value of the written program received from the controller at the end of rewrite

\* This data may not be displayed depending on the type of the connected controller.

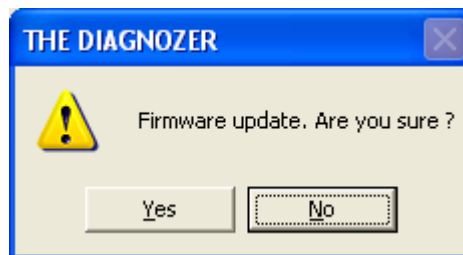


Figure 4.5.3.5-2 Confirmation dialog box

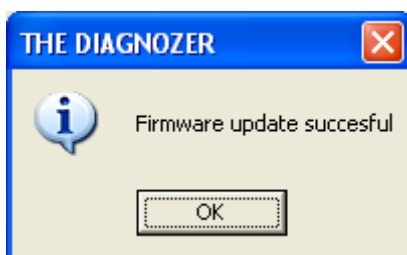


Figure 4.5.3.5-3 Rewrite successful

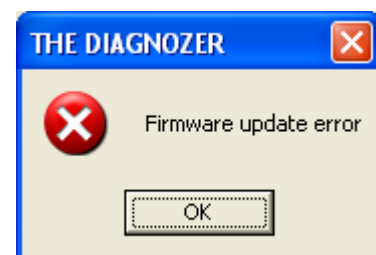


Figure 4.5.3.5-4 Rewrite unsuccessful

### 4.5.3.6 Adjustment of Auto-light Sensitivity

For EP20K-35K, EP20K-35K PAC hydraulic controllers only.

Clicking [Tool] - [Auto-light Sensitivity Adjustment] on the menu bar displays the Auto-light Sensitivity Adjustment window (See Figure 4.5.3.6-1).

In order to raise the threshold of illumination intensity (sensitivity) at which the light will automatically turn on, click the **Increase sensitivity** button. For lowering the threshold, click on the **Decrease sensitivity** button instead. When the modification of sensitivity is successful, the dialog as shown in Figure 4.5.3.6-2 will appear, and, if it is unsuccessful, the dialog as shown in Figure 4.5.3.6-3 or Figure 4.5.3.6-4 will appear.

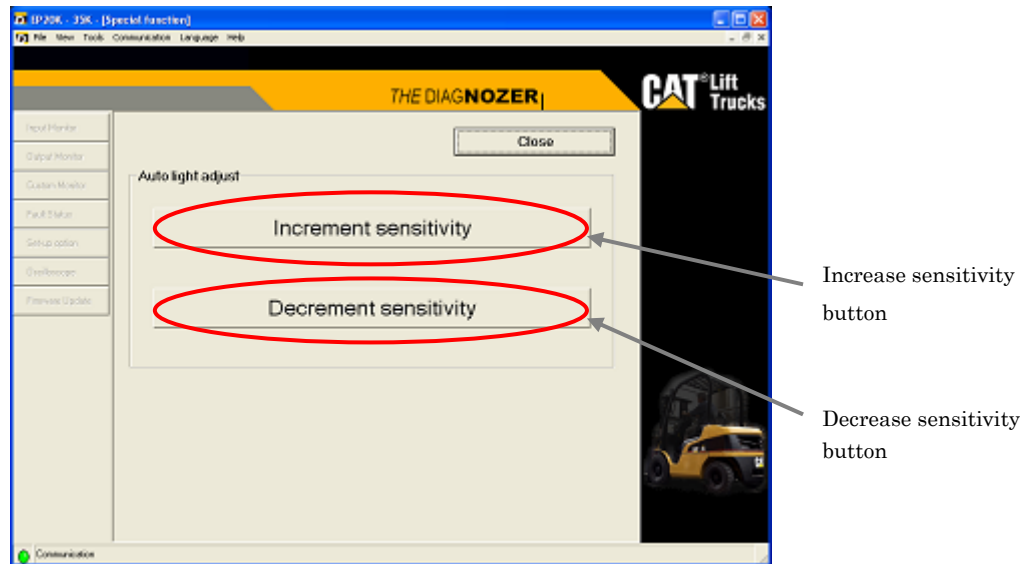


Figure 4.5.3.6-1 Auto-light Sensitivity Adjustment

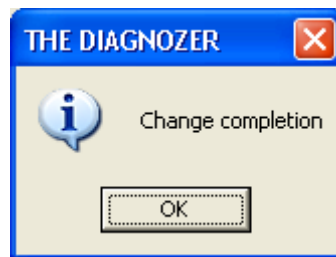


Figure 4.5.3.6-2 Modification successful



Figure 4.5.3.6-3 Modification unsuccessful



Figure 4.5.3.6-4 Timeout

### 4.5.3.7 Resetting password

For ES3000-5000 only.

Clicking [Tool] - [Reset password] on the menu bar displays the Confirmation dialog for password resetting (Figure 4.5.3.7-1). In order to reset the password set for the display to its default, select **Yes**. Otherwise select **No**.

When the resetting is successful after pressing **Yes**, the dialog as shown in Figure 4.5.3.7-2 will appear. If it is unsuccessful, the dialog as shown in Figure 4.5.3.7-3 will appear instead.

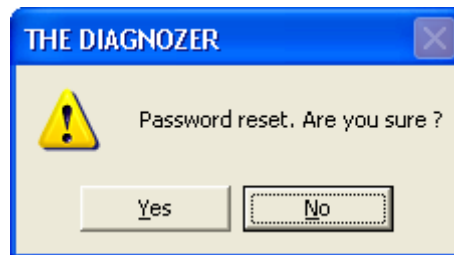


Figure 4.5.3.7-1 Confirmation dialog



Figure 4.5.3.7-2 Resetting successful



Figure 4.5.3.7-3 Resetting unsuccessful

#### 4.5.4 Communication menu

Figure 4.5.4 shows the window that displays the communication menu.

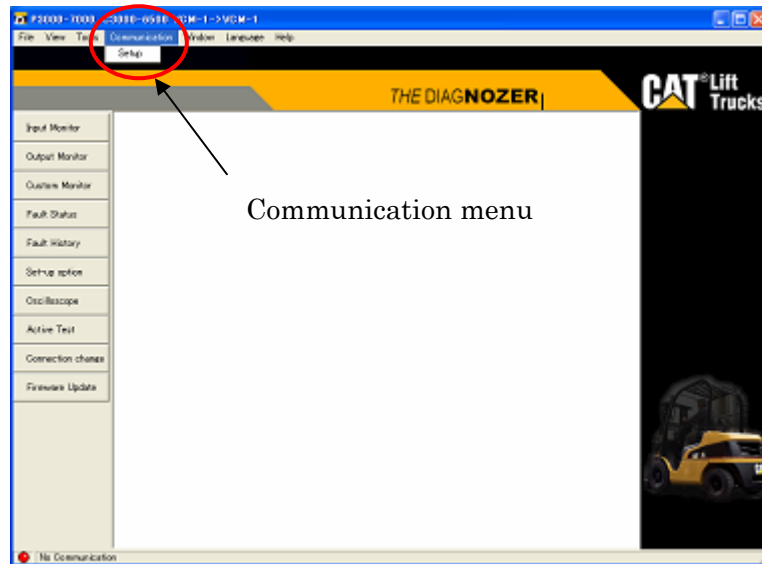


Figure 4.5.4 Communication menu

#### 4.5.4.1 Setup

Clicking [Communication] - [Setup] on the menu bar displays the communication port setting change dialog box as shown in Figure 4.5.4.1-1.

When the monitor screen displays as much as one, the dialog box in Figure 4.5.4.1-2 appears. Please select it again after close all the open monitor screens.

With the communication port setting change dialog box, you can change the communication port, communication speed and flow control.

To change the communication port, select the number of the serial port of the PC from the selection box on the right side of the COM port number field. The default is Com1.

To change the communication speed, select the same communication speed as the connected controller from the selection box on the right side of the bps field.

Normally, the same communication speed as the controller is selected by default.

To change flow control, select the new flow control from the selection box on the right side of the flow control marking.

After selecting the communication port, communication speed and flow control, click the **OK** button to change the settings. If you do not want to change them, click the **Cancel** button.

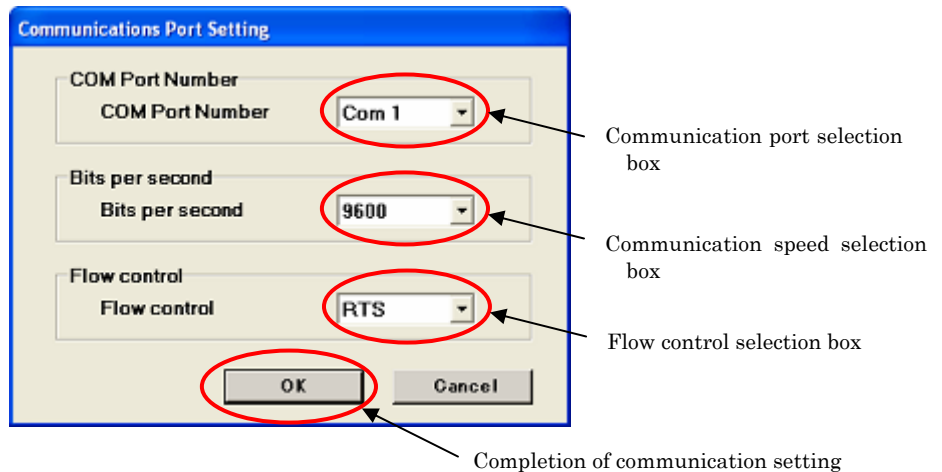


Figure 4.5.4.1-1 Communication port setting

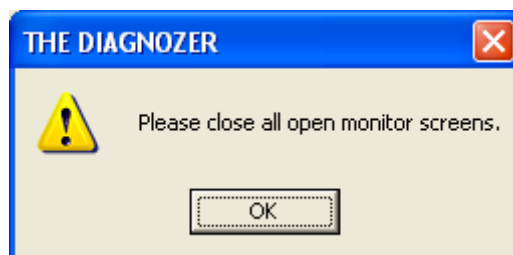


Figure 4.5.4.1-2 Warning dialog

### Checking the port number

- (1) Select [Start] - [Control panel] to open Control Panel. Open [System] on the Control Panel and click the hardware tab. Figure 4.5.4.1-3 shows the system property dialog box.
- (2) Next, click Device Manager to display the Device Manager dialog box shown in figure 4.5.4.1-4. Expand the subitems of Port in the Device Manager dialog box. Check "Communication port (COM\*)" in the expanded list and set the same port as COM\* as in Section 4.5.4.1.

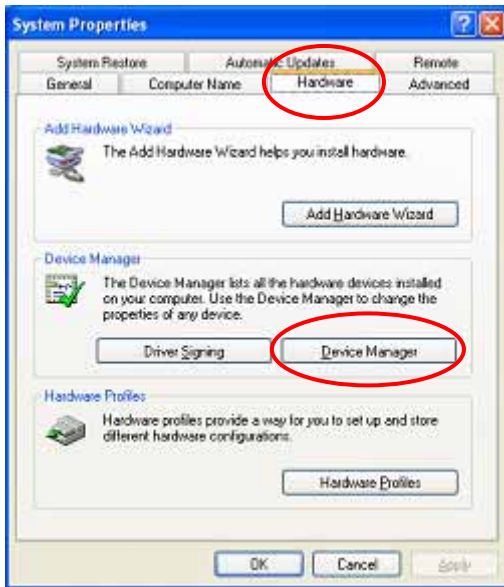


Figure 4.5.4.1-3 System property

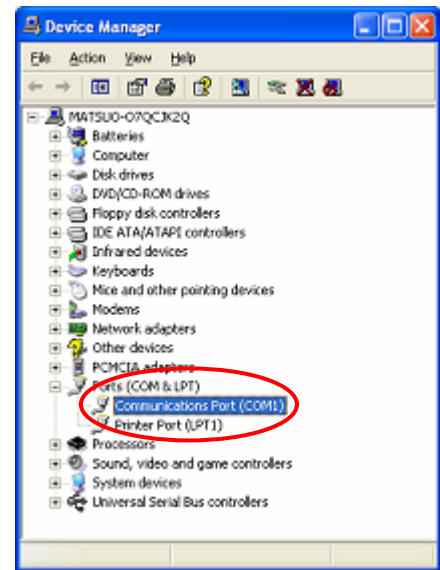


Figure 4.5.4.1-4 Device manager

## 4.5.5 Language menu

Figure 4.5.5 shows the window that displays the language menu.

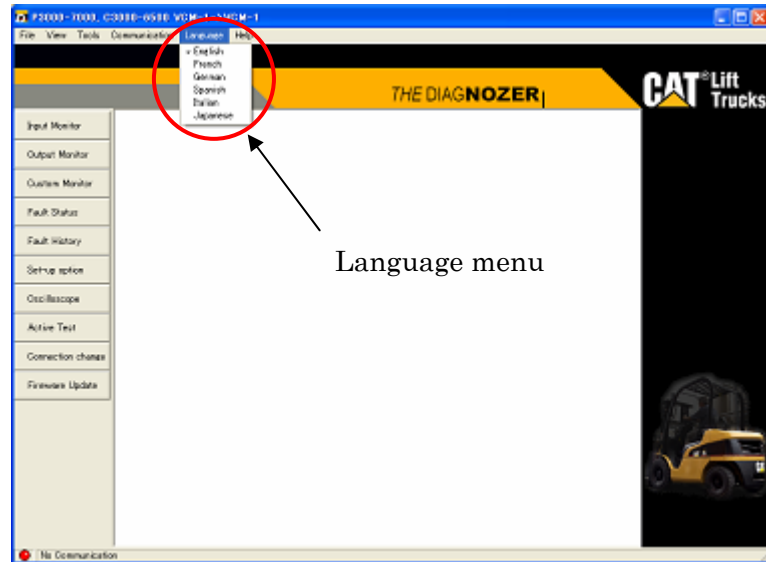


Figure 4.5.5 Language menu

### 4.5.5.1 Changing the language

Click [Language] - [National language] from the menu to change the language used for display.

A warning dialog box appears if you attempt to change the language while even one monitor window is open. Close all windows before changing the language.

Some part may be displayed using the language of the OS running on the PC.

An example is a dialog box displayed with the PC OS language.

## 4.5.6 Help menu

Figure 4.5.6 shows the window that displays the Help menu.

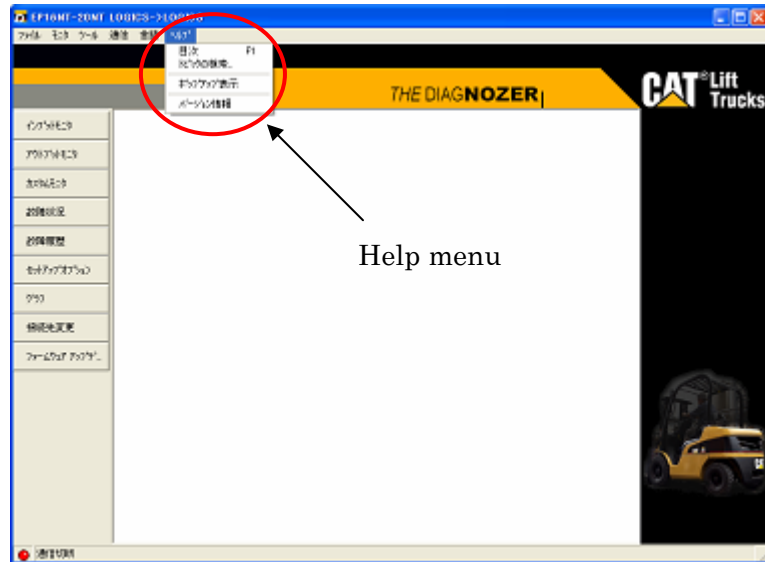


Figure 4.5.6 Help menu

#### 4.5.6.1 Contents

Clicking [Help] - [Contents] on the menu bar displays the Help file.

#### 4.5.6.2 Topic search

Clicking [Help] - [Topics] on the menu bar displays topics of the Help file.

#### 4.5.6.3 Popup display

Clicking [Help] - [Popup Display] on the menu bar to check the item causes the item name or button name to be popped up when you place the cursor on a item or button. Clicking [Popup Display] again to uncheck it disables popup display.

Item names to be popped up:

- (a) Setup option
- (b) Graph
- (c) Active test
- (d) Firmware update

#### 4.5.6.4 Version information

Clicking [Help] - [Version] on the menu displays the version information dialog box.



Figure 4.5.6.3-1 Version information