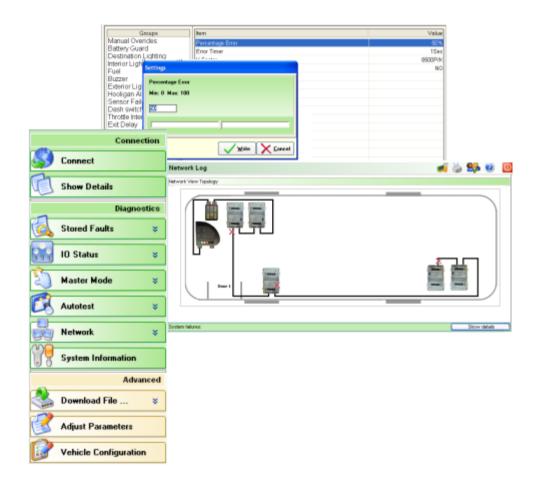


# Multi-AID Multi-Bus Application **User Guide**





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#### 1. Introduction

Welcome to the Actia Multi-Bus diagnostic software for maintaining and updating the Actia Multi-Bus multiplexed system. This document gives instructions of how to set-up, use and maintain the PC based diagnostic application.

#### 1.1. System Requirements

In order to successfully run the Multi-Bus diagnostic software you will need the following computer hardware, diagnostic interface and cables.

#### 1.1.1. PC Requirements

Actia recommend the following PC requirements,

- PC or laptop with 1 GHz processor or greater
- 256 Mb Ram
- 2 Gb of available hard disk space
- CD or DVD drive
- SVGA monitor
- USB port for VCI BasicXS connection OR RS232 9-pin COM Port for UDI
- Windows XP (Vista compatible version to be released in 2007)

#### 1.1.2. Additional Hardware

To communicate with the Multi-Bus system on the vehicle you will also need the following equipment:

For a BasicXS Vehicle Communication Interface system:

Description	Part Number
Vehicle Communication Interface	IME3901409/B
Diagnostic Extension Cable	505-01-2900
Multi-Bus Diagnostic Adapter Cable	505-01-0062
Multi-Bus Forced Download Adapter Cable	505-01-0061
SCU Download Adapter Cable	505-01-2020

#### For a Universal Diagnostic Interface system:

Description	Part Number
Universal Diagnostic Interface	505-01-0010
UDI – PC Cable	505-01-0031
Diagnostic Extension Cable	505-01-0020
Multi-Bus Diagnostic Adapter Cable	505-01-0062
Multi-Bus Forced Download Adapter Cable	505-01-0061
SCU Download Adapter Cable	505-01-2020

#### 2. Connection Hardware

#### 2.1. The BasicXS Vehicle Communication Interface (VCI)

A PC interface adapter is required to enable the PC to communicate with the vehicle electronic systems. The BasicXS has been designed to replace a number of dedicated interface adapters that are normally supplied with each individual diagnostic application.

The Interface features:

- USB Connectivity
- CAN 2.0B ISO 11898
- High Speed CAN up to 1 MBit/s
- Low Speed CAN fault tolerant
- K-Line ISO 9141 (100 mA)
- K-Line ISO 14230 (KWP2000)
- J1708 Interface



Please note that only the diagnostic interface is powered by the vehicles supply.

#### 2.2. The Universal Diagnostic Interface (UDI)

The UDI is the predecessor to the VCI but can still be used with the latest Multi-Bus diagnostic software.

The UDI is manually configured for the correct system by selecting the relevant channel. The channel is specified when the user selects the diagnostic application.

For Multi-AID system please ensure that Channel 1 is selected.



## 3. Setting Up Connection Hardware

#### 3.1. The BasicXS VCI

The following gives step-by-step instructions for the assembly and interconnection of the BasicXS system.

1. Connect the BasicXS USB connection to your PC USB port.



2. Connect the main diagnostic extension cable (505-01-2900) to the Vehicle Communication interface (VCI) located in the rubber enclosure at the rear of the tablet.



3. Connect the Multi-Bus Diagnostic Adapter cable (505-01-0062), the Multi-Bus Forced Download cable (505-01-0061) or the SCU Adapter Cable (555-01-2020) to the main diagnostic extension cable.



4. Connect the adapter cable to the vehicle diagnostic connector.



5. Power up the Laptop PC.



#### 3.2. The UDI

The following gives step-by-step instructions for the assembly and connection of the UDI system.

1. Using the PC to UDI connecter (505-01-0031), connect the red 9-pin d-type connector to COM1.



2. Connect the red 15-way connector of the PC to UDI cable (505-01-0031) to the UDI.



3. Connect the Main Diagnostic extension cable (505-01-0020) to the UDI



4. Connect the Multi-Bus Diagnostic Adapter cable (505-01-0062), the Multi-Bus Forced Download cable (505-01-0061)) or the SCU Adapter Cable (555-01-2020) to the main diagnostic extension cable.



5. Connect the adapter cable to the vehicles diagnostic connector.

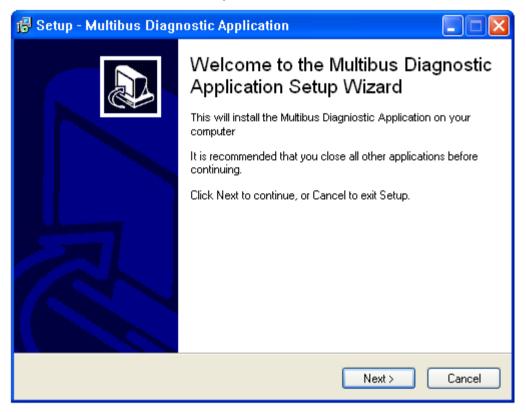


6. Turn on the Laptop PC.



## 4. Installing the Software

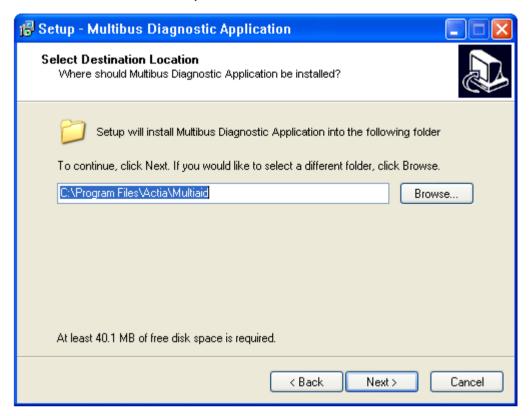
**1.** Insert the software update into the DVD drive. The following installation screen should automatically load.



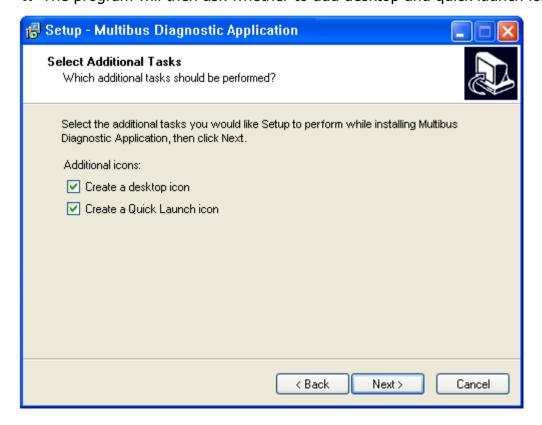
**2.** If setup does not start automatically, locate the setup.exe file within the install CD and double click.



**3.** Choose install directory.

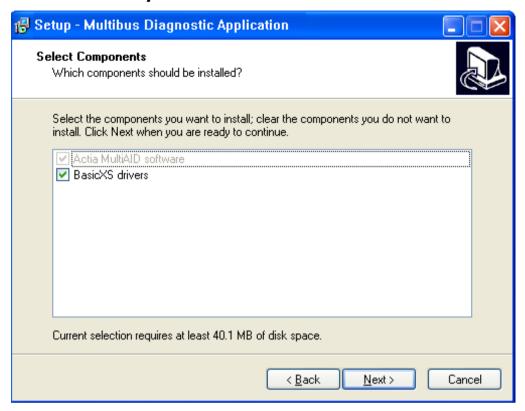


**4.** The program will then ask whether to add desktop and quick launch icons.



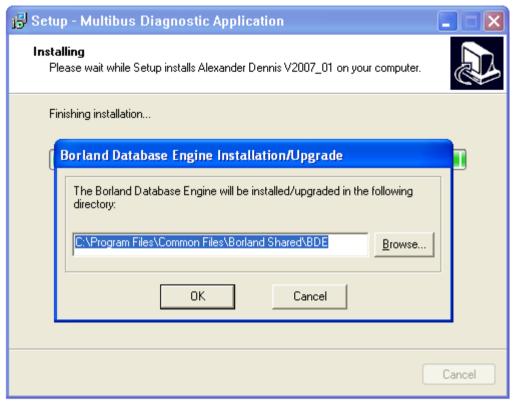


**5.** After an install directory has been chosen, the installer will ask whether to install BasicXS drivers. **Make sure this option is selected if using the BasicXS VCI system**.

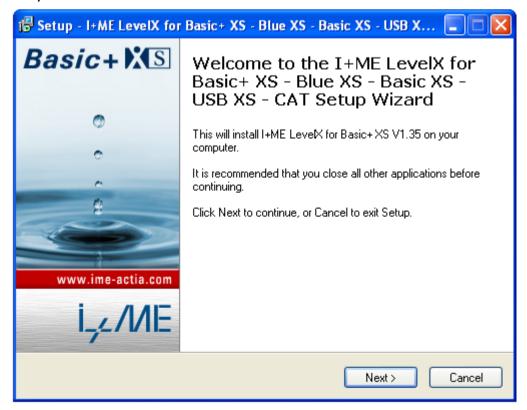


**6.** Once Multi-AID has been installed you will be asked to provide a location to install the Borland Database Editor. **Ensure the default directory is used.** 

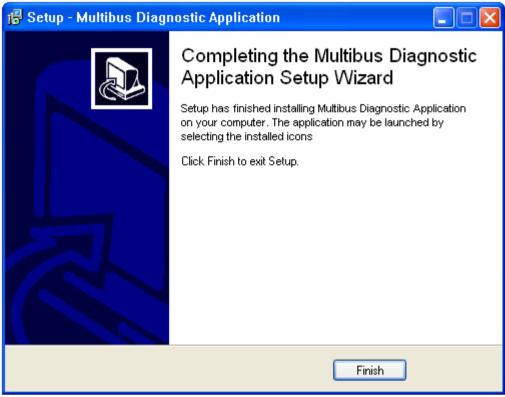




**7.** If the BasicXS driver install was selected at the beginning of the install process, the program will then automatically install the BasicXS drivers on you PC.



**8.** Once the program has finished installing, the final screen below will appear.

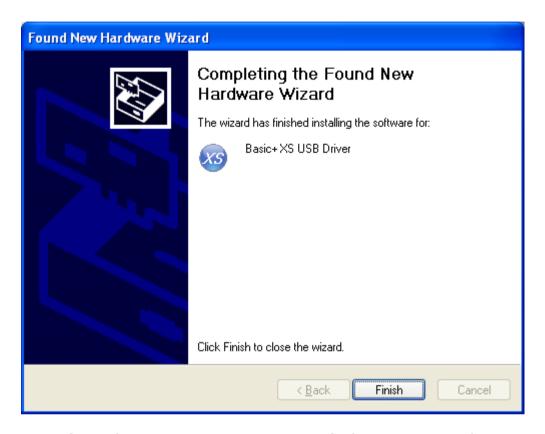


**9.** Once the install program has finished, plug the diagnostic device into the laptop. Windows XP should detect the device and try to install the correct drivers for it by bringing up the following screen. Select *Install the software automatically (Recommended)* and click *Next*.





**10.** Once the drivers have been successfully installed, the Multi-Bus Diagnostic software is ready to run.



**11.** Refer to the *Section 6 – Testing*, to verify the system is working correctly.

If the drivers do not install, the diagnostic application will not work correctly. If this happens call the helpline with the relevant information, as explained in *Section 18*.



## **5. Registering the Product**

If this product has not been registered before, you will need to do so in order to gain full use of the application. If the product is not registered, a Register button will appear in the menu bar. Simply click this and follow the instructions given to get your Unlock Code.





When you have your Unlock Code, enter it in the box at the bottom of the dialog and click on OK to unlock the application.

## 6. Testing the Software

This section describes how to test the Multi-AID system following installation and connection.

- 1. Connect the case power cable and switch on the Laptop.
- 2. Once the Laptop powers up run through the Multi-AID software according to the instructions given in *Section 4*.
- 3. To fully test the Multi-AID system it is necessary to connect to a vehicle and perform a diagnostic operation.
- 4. Connect to a Multi-Bus system using the main diagnostic cable and the Multi-Bus adapter cable.
- 5. Switch the vehicle contact on.
- 6. Run the Multi-AID diagnostic application.
- 7. Perform a diagnostic operation, for example reading faults. If this operation is successful then the system is functioning correctly.
- 8. If the diagnostic operation is unsuccessful check the following and repeat:
  - ✓ Vehicle contact is on.
  - ✓ Connections to the vehicle diagnostic connector.
  - ✓ The BasicXS / UDI connections to the Laptop.

## 7. Using the Software

#### 7.1. Starting the Application

Before starting the software, ensure that the diagnostic cable is connected to the vehicle and the software has been correctly installed.

Once the install is completed, double click on the AID.

If the software is being run for the first time you will be asked to select the type of PC Platform that you are using, once selected the screen layout is optimised to suit screen size of the PC which you are using.

The Platform type can also be changed at any time by clicking on the setting button, this will be explained in a later section.



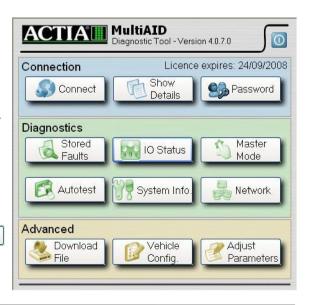
#### 7.2. Desktop PC or Laptop Screen Layout

If a Desktop or Laptop platform is selected then the main menu is permanently visible on the left hand side of the screen as shown throughout this document.

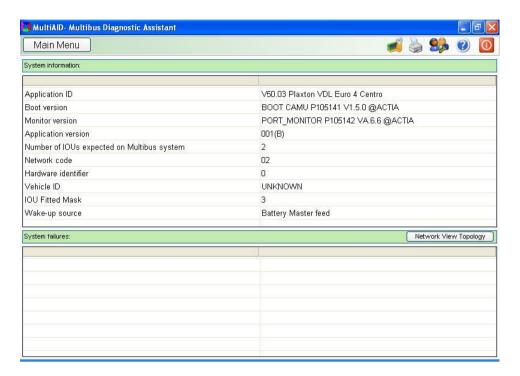
#### 7.3. Tablet PC Screen Layout

When a Tablet PC platform is selected a Main Menu is presented which features large buttons to enable easy access to the functions available using only the touch sensitive screen.

You can then return to this main menu from any of the <u>function</u> screens by clicking the .. <u>Main Menu</u> button on the top left of any screen.



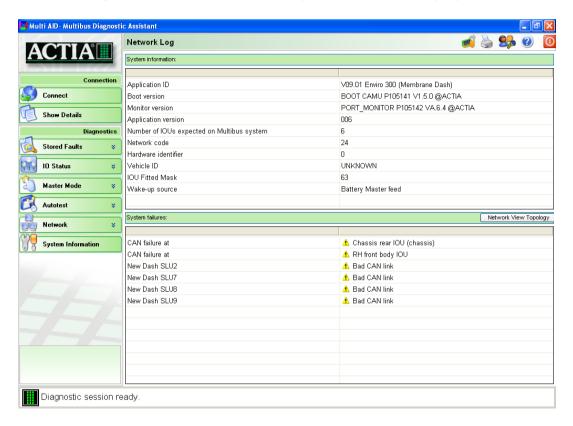




Once the platform type has been successfully chosen and the Multi-AID frontend has been displayed you can attempt to connect to a Multi-Bus system (after setting up the connection hardware) by clicking on the Connect button.

#### 7.4. Using the Application

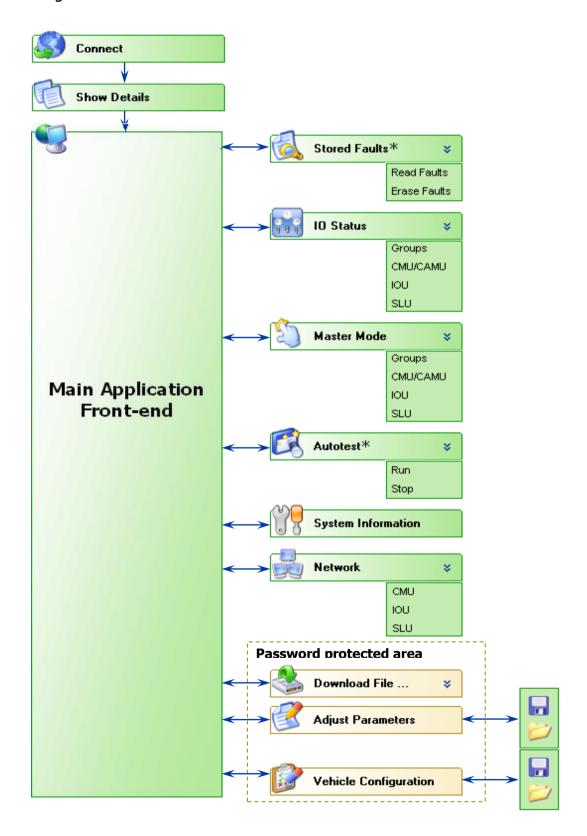
After starting Multi-AID, the Network Log screen will be displayed:



This shows a status summary of the Multi-Bus network, as well as several tabs on the left side of the window allowing more advanced features to be used. These are explained in later sections.

## 7.5. Program Structure

The diagnostic sections of the Multi-Bus software are:

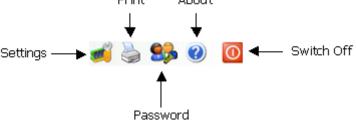


<sup>\*</sup>These features are not available for all systems

#### 7.6. Main Menu

The main menu is located on the top right of all screens, and gives access to the items.

Print About



#### **7.6.1. Settings**

Allows the adjustment of font sizes and enables the PC platform to be changed.

#### 7.6.2. Print

Allows the printing of currently viewed diagnostic information, unless indicated by a red cross:

#### 7.6.3. Password

To gain access to the password protected pages click onto the Password tab at the top of the screen.

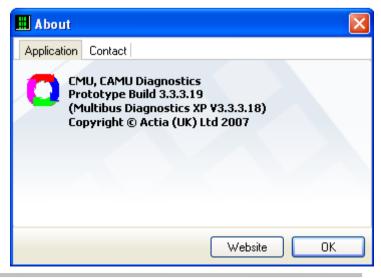
Enter in the password and press the OK button. The extra tabs on the side of the screen will appear allowing the user to select additional functions such as uploading new programs to the Multi-Bus system.



#### 7.6.4. About

Clicking the help icon will bring up the application information, this displays any information concerning the diagnostic tool software version.

The contact tab displays contact information for Actia (UK) Ltd.

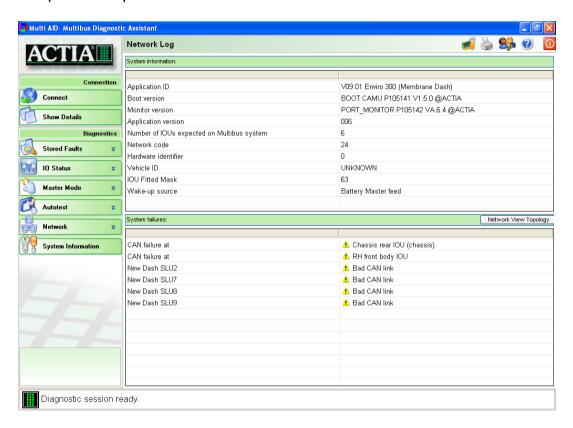


#### 8. Connect

This page appears when the application starts up.

Click the *Connect* button to begin communications with the Multi-Bus system.

Once communications are established, the diagnostic tool reports the results of the system integrity check, which is executed by the Multi-Bus system each time it is powered up.



The main points to observe are;

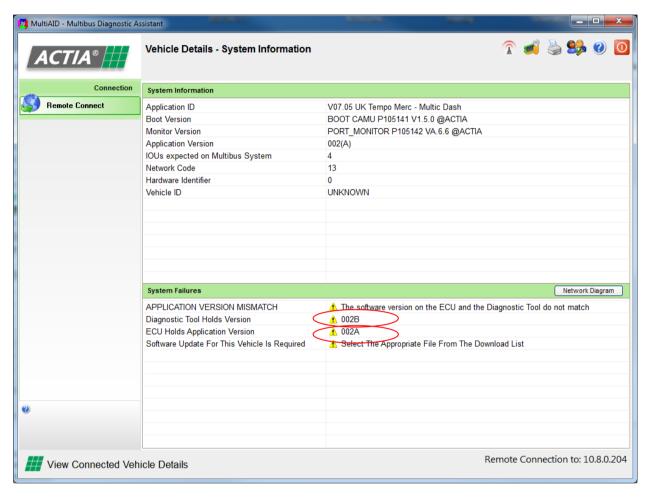
- Application ID this is the software name
- Number of IOU's expected on the system
- Network code this tells how many IOU's are on each Can bus branch of the CAMU

```
1^{st} number = number of IOU's on RH Branch (CN3)
2^{nd} number = number of IOU's on LH Branch (CN2)
```

I.e. network code 24 means 2 IOUs on RH Can bus & 4 on LH Can bus.

#### 9. Connection Failure

Should the following screen appear, then this identifies that the software in the vehicle is older than what is in the diagnostic tool. In this situation, the engineer should download into the CAMU the latest version held in the diagnostic tool.



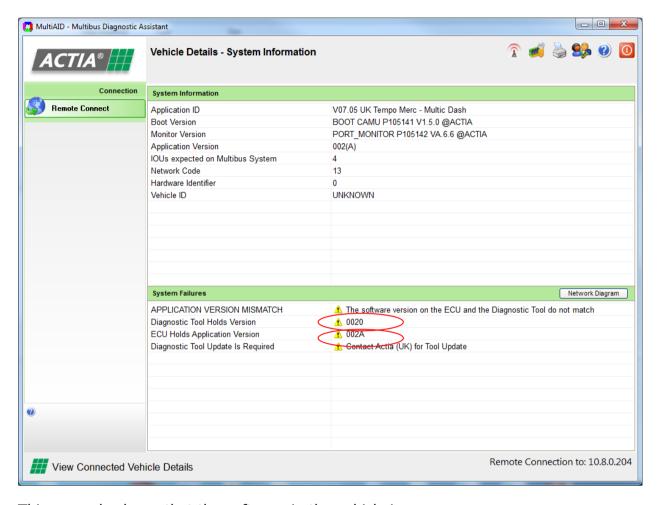
This example shows that the software in the vehicle is: V07.05.002B UK Tempo Merc

The software in the diagnostic tool is: V07.05.002A UK Tempo Merc

The engineer should proceed to the download tab and select V07.05.002A UK Tempo Merc from the download list.



Should the following screen appear, then this identifies that the software in the diagnostic tool is newer than what is in the vehicle. In this situation, the engineer should contact the vehicle manufacturer to obtain the latest diagnostic tool update.



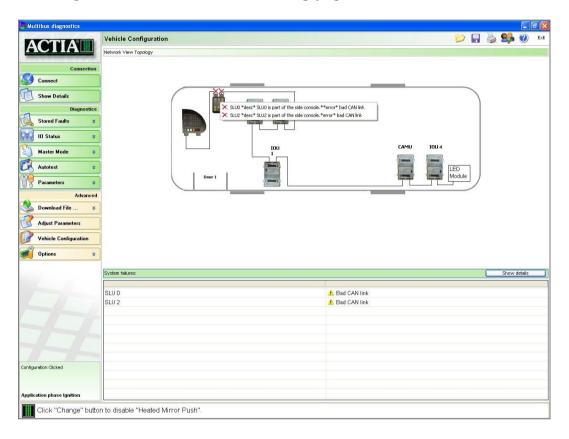
This example shows that the software in the vehicle is: V07.05.002A UK Tempo Merc

The software in the diagnostic tool is: V07.05.002 UK Tempo Merc

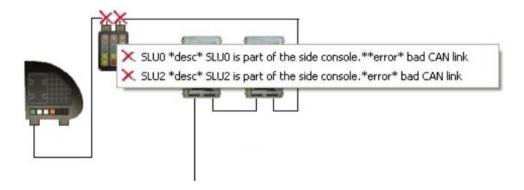
The engineer should contact the vehicle manufacturer for the latest diagnostic tool update.

## 10. Network View Topology

The status of all units on the system is represented graphically on the vehicle configuration page. This can be found by clicking the Network View Topology button on the right-hand side of the Network Log page.



If any unit has a fault, the icon of that unit will indicate the problem area on that unit by a *Red Cross:* 



Click on the icon with the left mouse button to obtain the report status of the unit and all its pins. The information will be displayed in the *Status Window*.

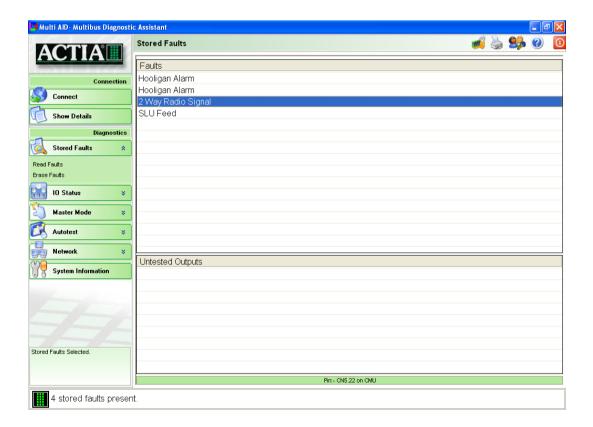
#### 11. Stored Faults

The Multi-Bus system stores a record of faults that are present each time the battery master is turned off. These faults may or may not be present on the vehicle at the time they are read.

Click the *Read Faults* button to view the faults currently stored by the Multi-Bus system.



Click the *Erase Faults* button to remove all stored fault information.



Value

ON OFF

OFF

ON

OFF OFF

Fault

ON

OFF

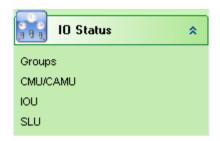
PV/M 90%

## 12. Input / Output Status

A live view of each input and output of the Multi-Bus system is presented on this page.

Choose the information to be displayed by selecting either the *Groups* List or the Specific Multi-Bus Unit *(CAMU, IOU, SLU)*.

Information about individual pins is displayed in the *Input* and *Output* windows.



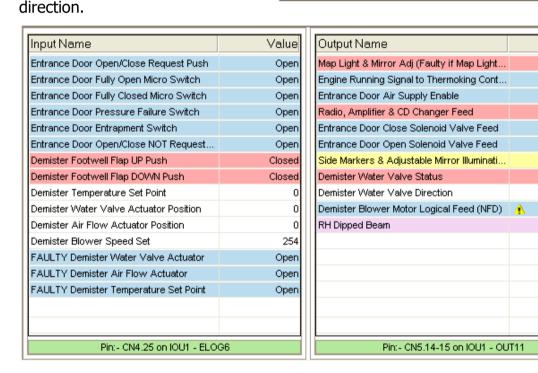
The inputs can be logical or an analogue representation. The outputs can be logical, PWM or bi-directional bridge outputs.

Note: the bridge output is made up of two lines – the on/off status above and the direction below, with a right facing arrow indicating a forward

Demister Water Valve Direction

Demister Water Valve Direction

Power of two lines – the on/off status above and the direction on the on/off status above and the direction below, with a right facing arrow indicating a forward on the on/off status above and the direction below, with a right facing arrow indicating a forward on the on/off status above and the direction below, with a right facing arrow indicating a forward on the on/off status above and the direction below, with a right facing arrow indicating a forward on the only of the on/off status above and the only of the only o

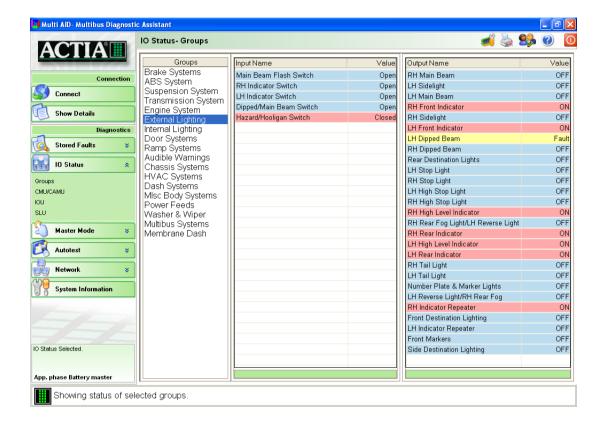


A left mouse click on an item will show the pin number at the bottom of the display list.



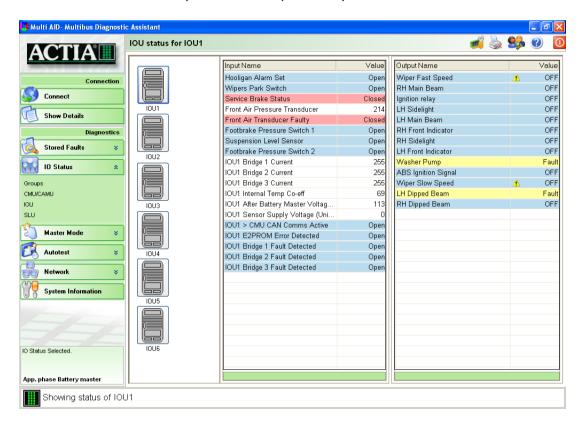
#### 12.1. Group listings

Click on the *Groups* box to display the *IO Status - Groups* window. Click on the groups you would like to view, individual input and outputs are displayed in the relevant windows.



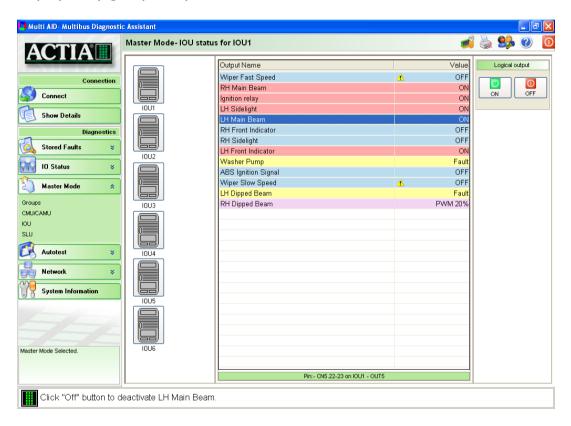
#### 12.2. Specific Multi-Bus unit

Click on the type of unit you wish to view (*CAMU, IOU or SLU*), and then select the number of the unit you want to specifically look at.



#### 13. Master Mode

To drive individual outputs independently of the controlling software on the Multi-Bus system, select the *Master Mode* page. The outputs can either be displayed by group or by unit.



#### 13.1. Logical Outputs

To activate an output select from the group list or specific unit the output you wish to activate, then click the *ON* button. To switch off the output click the *OFF* button.

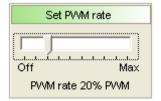
The output selected will display its status. This will be one of the following:

- ON
- OFF
- Fault

#### 13.2. PWM ouputs

To drive PWM outputs, use the slider to set the speed of the PWM signal. This can be varied from 0 to 100%







#### 13.3. Bridge Outputs

Bridge outputs can be set using the directional output control. They can be driven forward or backward with the right and left arrows respectively, or turned off with the OFF button.

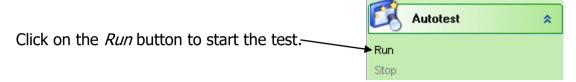


The output display works in a similar way to the IO status window, with the status displayed on two lines, the top for ON/ OFF, the bottom for directionality, with a right facing arrow indicating the motor is being driven forward.



#### 14. Autotest

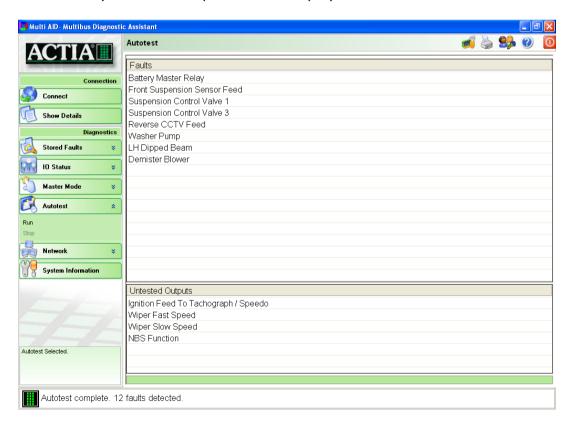
All the outputs on the Multi-Bus system can be tested for circuit faults in one operation through the Autotest function.



A warning window will be displayed asking the operator to confirm that all personnel are away from the vehicle. An indicator bar will then be displayed showing the progress of the test.

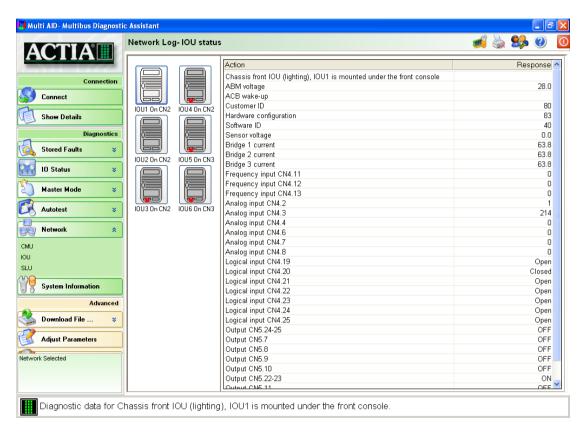
Click on the *Stop* button to cancel the test at any time.

Once the test is completed, the results are displayed in the disclosed faults window. Any untested outputs will be displayed at the bottom of the screen.



#### 15. Network

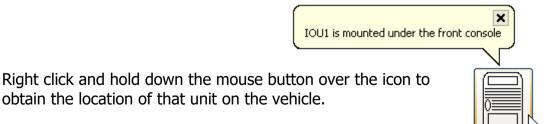
The status of all units on the system is represented graphically on the network page.



If any IOU has a fault, the icon of that unit will indicate the problem area on that unit by a *Red Cross* 



Click on the IOU icon with the left mouse button to obtain the report status of the IOU and all its pins. The information will be displayed in the *IOU Status Window.* 

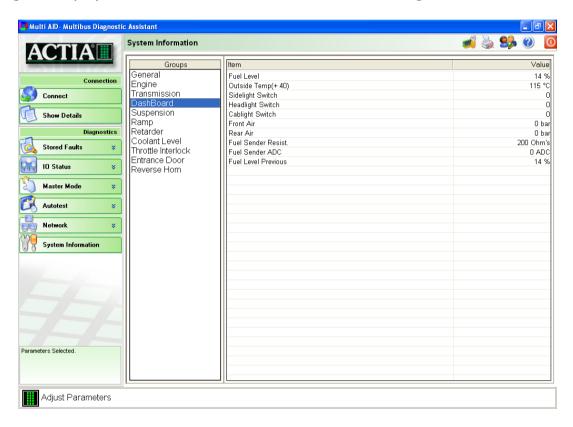


IOU1 On CN2

## 16. System Information

The current status of all the conditions monitored or controlled by the Multi-Bus system can be viewed through the System Information page.

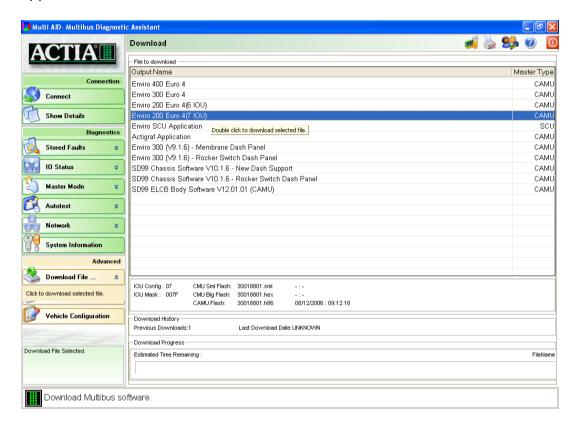
The variables are broken down by location or function in the *Groups* window, and left clicking will display the status of all variables under that heading.



#### 17. Download File

#### 17.1. Download procedure for a programmed CAMU

To update the CAMU application software, click on the *Application* in the list. The name, date and time of the hex file are displayed at the bottom of the application list.



To begin a download, simply double-click the desired program. The CAMU will shut down and the download will commence.

An indicator bar will show the progress of the download and the time remaining before completion. Do not interrupt the download until complete.

This download procedure applies to any vehicle with software already loaded onto the CAMU.

Note: The files to download will only be available if you have entered the correct password.

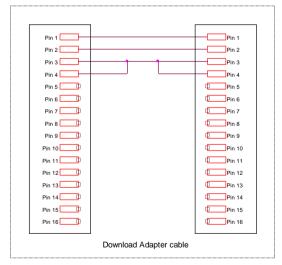
#### 17.2. Download procedure for a new blank CAMU.

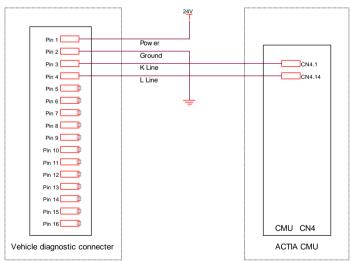
The download for a new blank CAMU is as follows:

- 1. Ensure the vehicle Multi-Bus system is shut down before attempting a download.
- 2. Connect laptop to vehicle via the diagnostic cable and download adapter.
- **3.** Run the Diagnostic software by clicking on the Icon on the desktop
- **4.** Select the Password tab
- **5.** Enter in the appropriate password
- **6.** Select the desired file to Download from the view window
- 7. Select the download button.
- 8. Confirm that you have chosen the correct file
- **9.** At this point the download will commence. After a short period of time, the diagnostic tool will inform you of how long the download will take.
- **10.** Once completed, remove the download adapter, power the system up & reinitialise the diagnostics. This will verify that the correct software has been installed.

If this procedure is followed, download will always be successful.

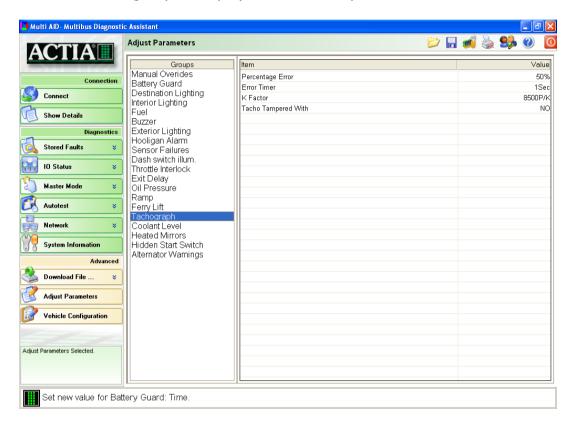
The pin-out of the diagnostic cable is shown below:





#### **18. Adjust Parameters**

The *Adjust Parameters* page provides access to set parameters on the CAMU. Parameters are divided up into groups for convenience shown in the *Groups* list box. Click on a group to display the individual parameter item.



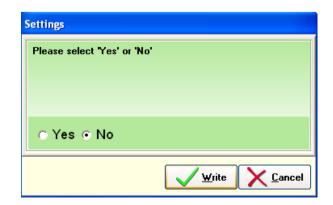
Some parameters have values associated with them others are logical.

#### 18.1. Logical Parameter

To change a logical parameter, click on the item in the current settings list and the settings dialog will be displayed.

Select either *Yes* or *No*, then hit *Write* to close the Settings window and modify that parameter.

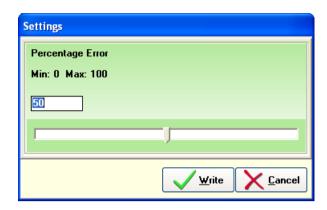
The *Cancel* button will close the dialog but have no effect on the selected parameter.



#### 18.2. Value Parameter

To change a parameter with a value parameter, click on the item in the current settings list and the settings dialog will be displayed.

Enter the value for the new setting, ensuring that the new value is within the maximum – minimum values shown. Click the *Write* button and the settings dialog will close and the new value will appear in the current settings list.



The cancel button will close the dialog but will have no effect on the selected parameter. The stored values for the current settings list are read when diagnostic communications are initialised. Certain values may not be exactly as they have been set because of a rounding during conversion.

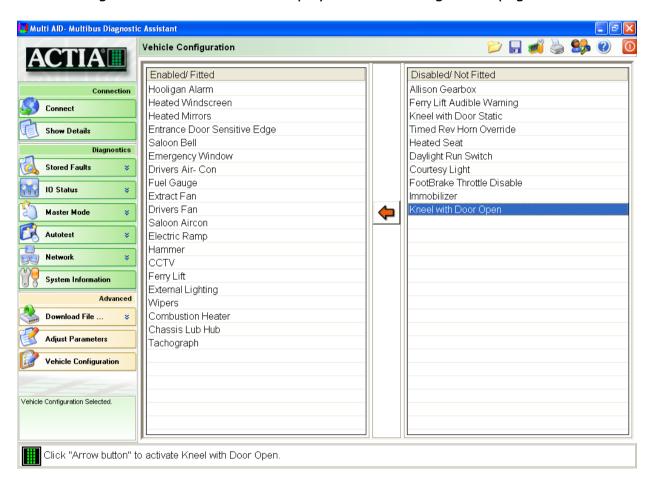
#### 18.3. Load / Save

These icons will appear in the menu bar when the Adjust Parameter tab is clicked and can be used to save a new parameter configuration or load an old one.



## 19. Vehicle Configuration

When the diagnostic communications are initialised the diagnostic tool reads back from the CAMU the configuration of the optional vehicle functions. The configuration of the vehicle is displayed on the Configuration page.



To change the configuration, click on the option in either the *Active* options or *Disabled* options list and click the *Arrow* button.

To print a listing of the current configuration, click the *Print* button on the options bar.

#### 19.1. Load / Save

Vehicle configurations can be saved and loaded with the icons on the menu bar.



## 20. Helpline Support

ACTIA (UK) is the central point of contact for all problems relating to the use of the Multi-AID system. This includes:

- ACTIA front end software
- Vehicle problems
- 'Finger trouble'

The number to call is:

#### +44 (0) 1686 611150

Alternatively, additional contact information can be found in the *contact* section of the *about* dialog box.

The Helpline is manned throughout normal working hours:

Mon - Thurs: 8.00am to 5.00pmFri: 8.00am to 1.00pm

Before contacting Actia be prepared to;

- Give a brief description of the problem you are having.
- Name the software or update version being used.
- Include the exact wording or description of any error message you have received.
- Describe any changes or steps taken before the problem occurred.