

**VEHICLE ELECTRONICS PROGRAMMING
STATION**

VCP User's Guide

VEPS 7.52

Additions and Changes in the VCP

- ***Cummins VCP Addition (7.5.x)***
Added remaining support for the Heavy Duty (ISM/ISX) 2007 platform and Mid Range (ISB and ISC/ISL) 2007 platform. PAR files will use S,MODULE,EAGLE or S,MODULE,ISB07 or S,MODULE,ISC07 for these ECMs. All three of these options can be used for ANY of the 2007 platforms.
- ***Cummins VCP Addition (7.4)***
Added remaining support for the Heavy Duty (ISM/ISX) 2007 platform. PAR files will use S,MODULE,EAGLE for these ECMs.
- ***Cummins VCP Addition (7.3.3)***
If a Write Verification Error occurs, attempt to write the parameter again before reporting the error.
- ***Cummins VCP Addition (7.3)***
Added support for the Heavy Duty (ISM/ISX) 2007 platform. PAR files will use S,MODULE,EAGLE for these ECMs. This release contains a subset of all 2007 parameters. The rest of the parameters will be supported in the next release.
- ***Cummins VCP Addition (7.2)***
Added support for the European Level 4 Emissions application.
- ***Cummins VCP configuration (7.1)***
A problem with the Cummins VCP control panel applet has been fixed. PCs that had more the five drivers listed in their RP121032.INI file could not run the Cummins VCP control panel applet.
- ***Base Communications Addition (7.0)***
A new ECM to tool interface has been implemented (GTIS 4.5). Additional features of the common components library (MDAS CC) are used to communicate with GTIS 4.5 compliant ECMs. All remaining references to the DCL have been removed.
- ***VCP Configuration and Administration Rights (7.0)***
Previously, if a user without administration rights used VEPS, the default settings for VCP configuration were always used, instead of the VCP Configuration settings programmed by the administrator. Now, if the administrator changes the VCP Configuration from the default settings, users without administration rights will see these changes.
- ***Trace / Debug (6.61)***
The MDAS CC now supports the use of Trace / Debug to aid in debugging should a problem arise.

- ***Base Communications Change (6.60)***
The existing low level communications component (DCL) was replaced by an updated communications library (MDAS CC). This change was implemented to allow support for future engine programs.

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1 Overview

The Cummins VCP is an Engine programming tool designed to help OEM's program engine on the assembly line. It is designed in accordance with standards for Vehicle Electronics Programming Stations (VEPS) outlined in SAE J2461 and supports the associated J2286 compliant parameter and verification files.

The basic operation of any VEPS VCP is to program an ECM according a parameter file, and pass status information back to the calling program in a verification file. The names of the parameter and verification files are passed via the command line. This is shown in Figure 1.

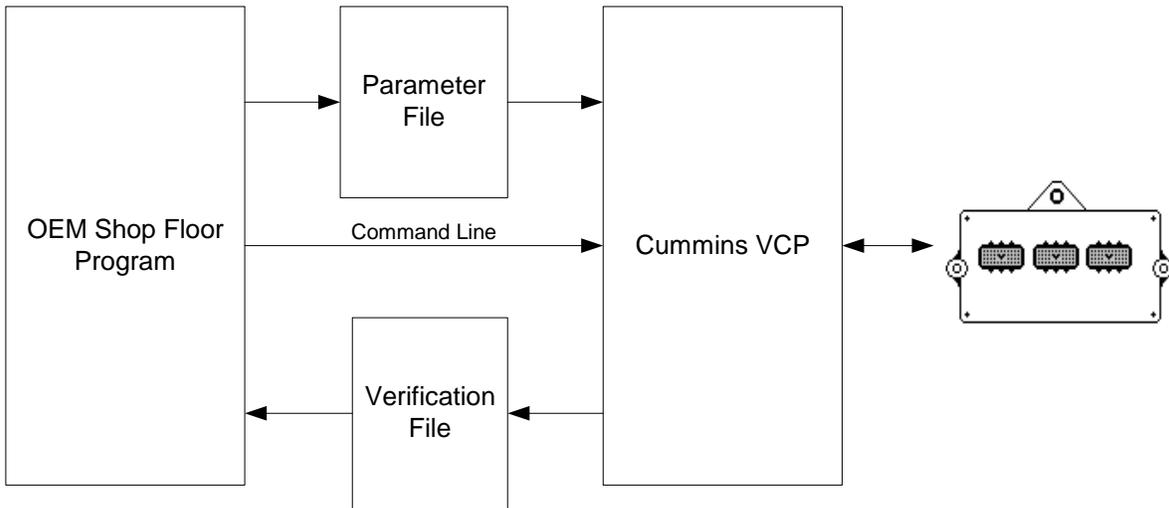


Figure 1 - VEPS Operation

2 VEPS Wiring Connections

OEM programming of a Cummins engine over J1587 or J1939 datalinks can be accomplished either prior to or after the engine is installed the vehicle chassis. Programming the engine after it is installed in the chassis is recommended; however, if this is not possible and the engine must be programmed prior to installation in the chassis, additional precautions need to be taken to limit the potential damage to the Engine Control Module (ECM).

- When connecting VEPS to the vehicle or ECM datalink, the datalink adaptor power supply must have a common ground connection with the Battery (-) connection of the ECM. The datalink adaptor should be powered from the same power supply as the ECM. If this is not possible and the datalink adaptor has a separate power supply, the supply must have a common ground connection with the Battery (-) connection of the ECM.
- The ECM power connection must be made prior to energizing the ECM (Do not "Hot Plug" the ECM).
- The ECM Battery (-) must be connected to the engine block prior to energizing the key switch line.
- The key switch line must be de-energized prior to de-energizing the ECM.
- ECM must be de-energized prior to disconnecting the power and ground connections.

3 Parameter File

The parameter file is the primary interface to the Cummins VCP. It is a text file containing a list of parameters and values to be programmed in the ECM. The Cummins VCP supports three SAEJ2286 record formats.

- Setup Records
- Parameter Records, and
- Remarks Records

Setup Records

Two setup records are required for VEPS to program an engine ECM.

- Communications Port, and
- Engine Module Type

The communications port setup record is used to identify the port to which the datalink adapter is connected. Here is an example that specifies COMM 1 as the port:

```
S,COMX,1
```

The engine module type setup record is used to specify the target ECM family for a given parameter file. That is, this record limits the type of ECMs VEPS will program with a given parameter file. This is to prevent a parameter file intended for say an ISB to be loaded into an N14. Here is the format of the module type setup record:

S, MODULE, <Module Name>

Module Names are as follows:

HDD or 98HDD for ISM, ISX, & Signature 600,
NCORE for ISB, ISC, & ISL,
Celect+ for N14 & M11,
ECHO for ISBe,
CGAS for C8.3G Plus, L10 Plus & B5.9G Plus,
DE for ISX 02, ISM 02, & ISM 04,
ECHO2 for ISB 02, ISC 03 & ISL 03,
TIER3C2 for QSB 07, QSC 04 and QSL 04
EAGLE for ISM 07 and ISX 07
ISB07 (or EAGLE) for ISB 07
ISC07 (or EAGLE) for ISC 07 or ISL 07

Parameter Records

Parameter Records indicated which parameters and values to program in the ECM. The parameter file may contain any number of parameter records, in any order. The format for parameter records must be as follows:

P,<VEPS name>,<command>,<value>,<comment>

The VEPS names for each parameter are defined in the OEM reference manuals for each engine. The command field may take on the value of R (read), W (write), or B (both) although specifying B has the same effect as specifying W. Values must be numeric for trims, Y or N for features, and ASCII for Dataplate.

Remark Records

Remark records are used to place comments in the parameter file, and are ignored by the application. The format of a remark record is shown below:

REM <remark>

An example of a parameter file for a HDD module is shown below.

S , COMX , 1
S , MODULE , HDD

P,10000,W,100
P,20011,W,Y
P,21781,W,Y
P,12280,W,4599
P,12310,W,4000
P,12860,W,3000
P,12870,W,2000
P,12479,W,Y
REM P,10300,W,2
REM P,11340,W,5

4 Command Line

VEPS parameter and verification files must be passed as command line arguments to the VCP. The VCP will also generate a report file and documentation file if specified on the command line

Parameter File

-p <Path and File name for the parameter file>

Use this command line option to specify the name of the parameter file to be loaded into the Engine ECM. If the -p option is omitted, the VCP will look for a file named ceco600.par in the install directory to load into the ECM.

Verification File

-v <Path and File name for the parameter file>

Use this command line option to specify the name of the verification file to receive the results of the programming session. If the -v option is omitted, the VCP will create a file named ceco600.ver in the install directory.

Report File

-r <Path and File name for the parameter file>

Use this option to save a comma delimited version of the VEPS Session report in the specified file. This option is provided as a means to save session reports since the VCP will not save or redisplay previously generated session reports. Report files can be viewed later by importing them into most spreadsheets.

OEM Key

-i <Report Identifier>

Use this option to place a unique identifier in the header of the session report. This option is provided as a means to associate a report with a specific vehicle. Typically the report identifier is a VIN or customer order number, but it may also be a model number, or other identifying string..

Documentation File

-d

Use this option by itself to generate a comma delimited version of OEM documentation. This option places a file called OEMDoc.csv in the Documents subdirectory of the install directory. Once this file is created, the user may open the OEM Documentation.doc file and run a macro that will build a complete set of parameter documentation for that specific ECM.

The following example illustrates the use of the command line parameters:

```
ceco600.exe -p c:\VCP\Cummins\abc.par -v c:\VCP\Cummins\abc.ver -r c:\VCP\Cummins\abc.vrp -i 123456
```

In the previous example, the VCP (ceco600.exe) will look for the parameter file (abc.par) in the directory c:\VCP\Cummins. The VCP will write the verification file (abc.ver) in the directory c:\VCP\Cummins. The VCP will write the report file (abc.vrp) in the directory c:\VCP\Cummins. The OEM key “123456” will be printed in header of the VEPS session report.

5 User Interface

LED's

LED's are used to give a visual status of the programming session. There are 5 ways in which the LED's provide status information.

Blinking Yellow

The VCP is attempting to initialize communication with the Engine.

Blinking Green

The VCP has established communication with the ECM and is programming the specified parameters.

Solid Green

Successful VEPS session. There are no parameter errors.

Solid Yellow

A parameter error has occurred. The VEPS session was successful, but at least one parameter has an error. If the user clicks on the parameter error icon, then a message box will appear with a detailed description of the error, as shown in Figure 5

Solid Red

A fatal error has occurred. The VCP has terminated communications with the ECM. The cause of the error is displayed in the list box.

List Box

During the VCP session, runtime status messages are displayed in the list box on the main window. These status messages are used primarily inform the user of status and for trouble shooting.

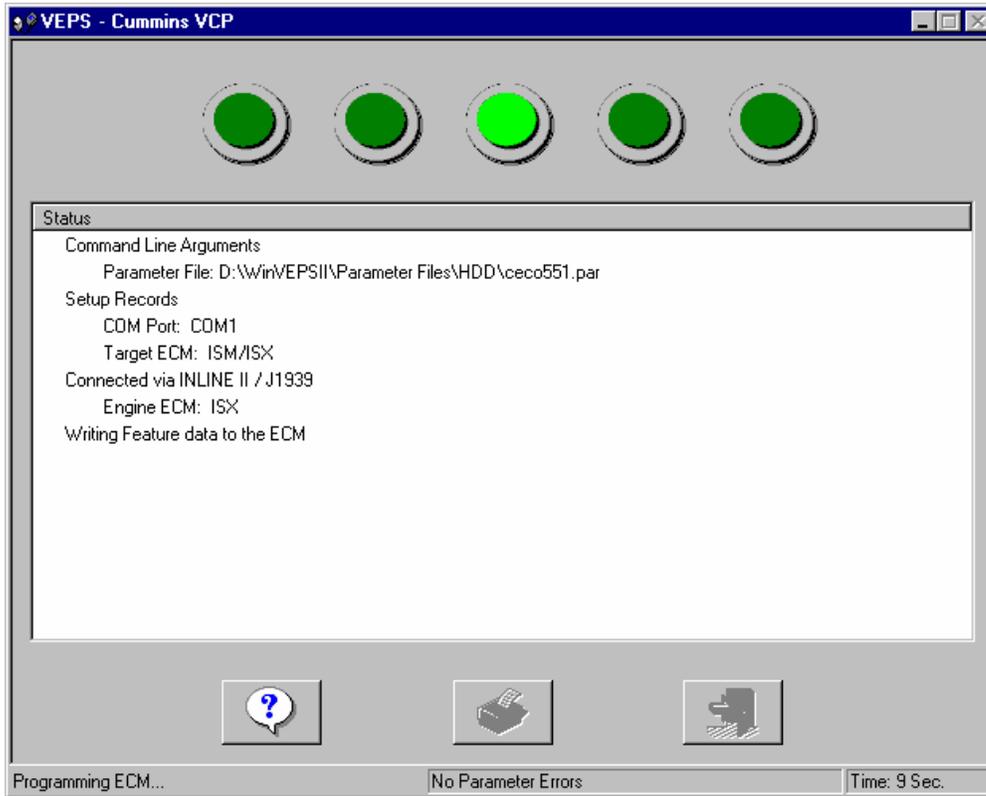


Figure 2 – VCP Status

Once the VCP has finished programming the ECM, the List Box displays the programmed parameters as shown in Figure 3.

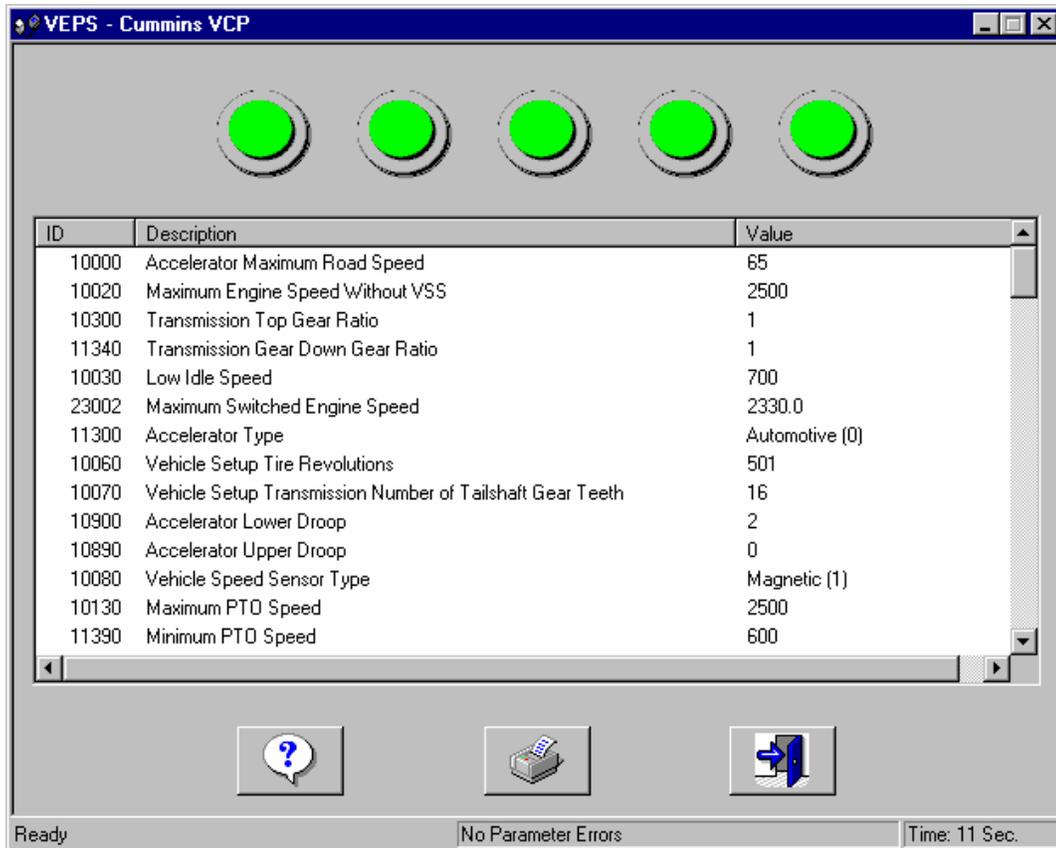


Figure 3 – End of Session

If an error occurred on one of the programmed parameters, the list box displays a yellow exclamation icon next to the parameter(s) which encountered the error (See Figure 4). All parameter errors will be shown in the list box first.

If the parameter had an error, the user may double click on the icon or VEPS Name of the parameter to display a detail error message. This is shown in Figure 5

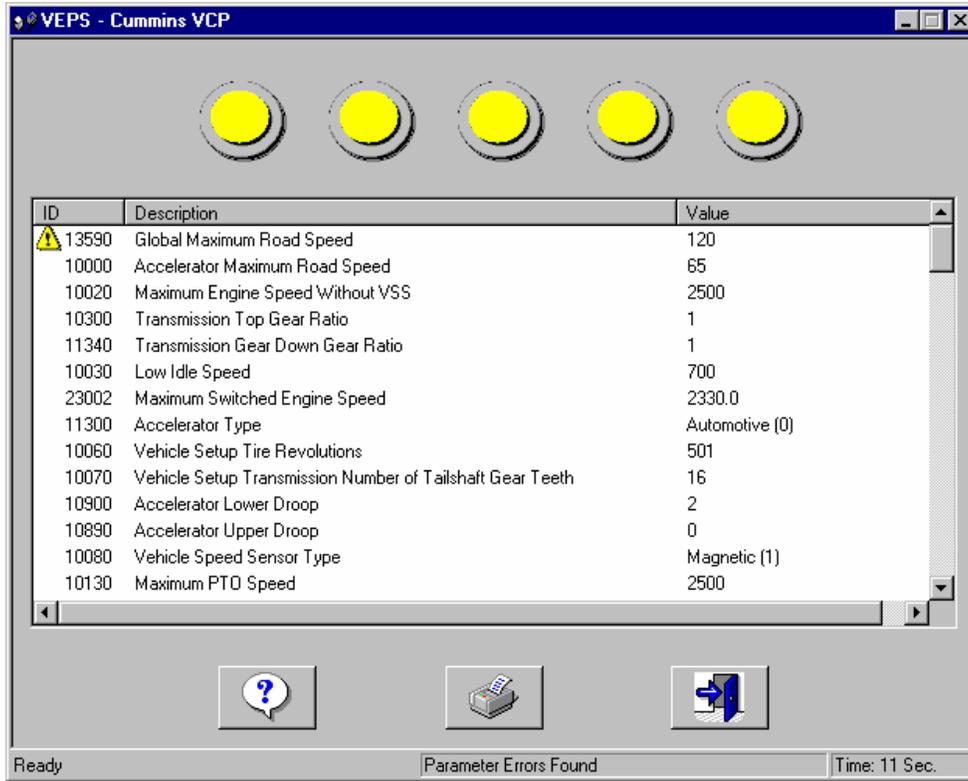


Figure 4 – Parameter Error

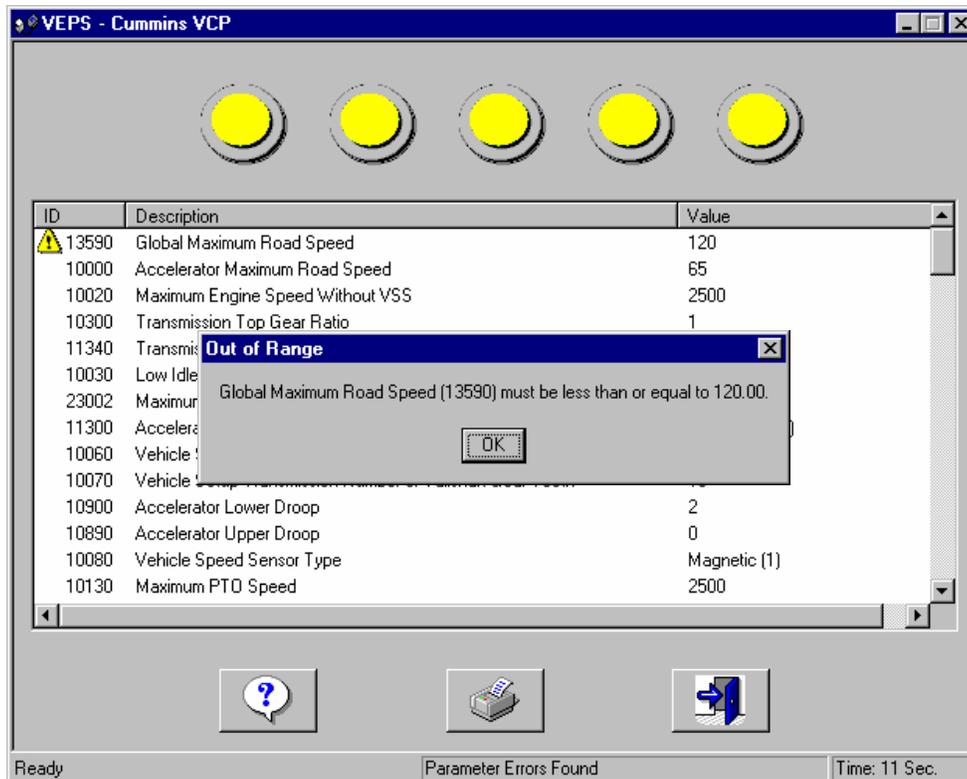


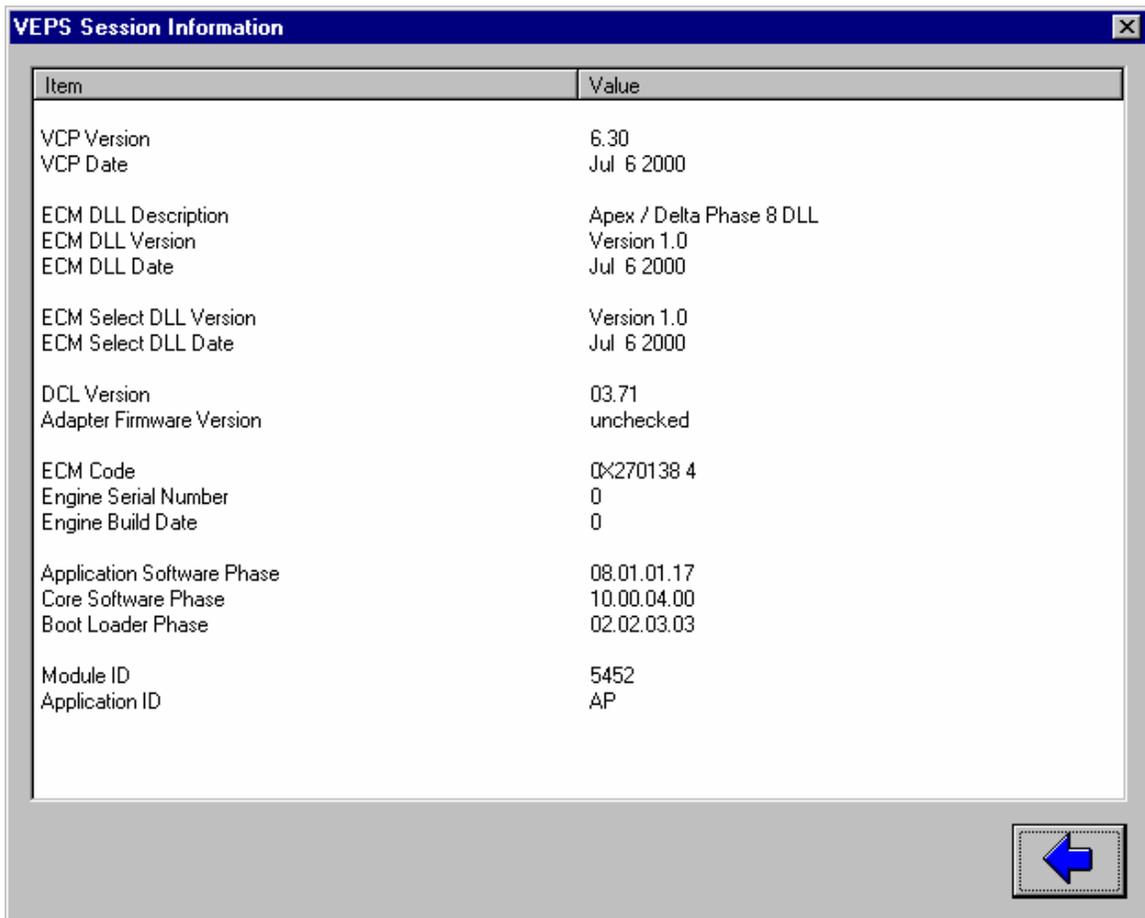
Figure 5 - Error Message Displayed

Buttons

There are three Buttons on the main window; Information Button, Report Button, and Exit Button. These buttons are disabled until the VEPS session is completed.

Information Button

Pressing the Information Button will display advanced information about the ECM, ECM Calibration, and VCP Software. This information is often valuable when trouble shooting the application.



Item	Value
VCP Version	6.30
VCP Date	Jul 6 2000
ECM DLL Description	Apex / Delta Phase 8 DLL
ECM DLL Version	Version 1.0
ECM DLL Date	Jul 6 2000
ECM Select DLL Version	Version 1.0
ECM Select DLL Date	Jul 6 2000
DCL Version	03.71
Adapter Firmware Version	unchecked
ECM Code	0x270138 4
Engine Serial Number	0
Engine Build Date	0
Application Software Phase	08.01.01.17
Core Software Phase	10.00.04.00
Boot Loader Phase	02.02.03.03
Module ID	5452
Application ID	AP

Figure 6 - Information Dialog

Report Button

Pressing the report button will display the VEPS session report in a “print preview “style window. The report may be printed from this screen, or the user may simply exit to the main window.

CUMMINS ENGINE COMPANY **PASS**
VEPS Session Report

Config ID:
VIN: 1234567890
Engine Model: 0 HP ISX
Engine S/N: 0

VEPS Name	Parameter	OEM Value	Old Value	New Value	Status
VEHICLE SETUP					
10050	Rear Axle Ratio - Low/Single	3.73	3.73	3.73	
10070	Vehicle Setup Transmission Number of Tailshaft Gear Teeth	16	16	16	
10060	Vehicle Setup Tire Revolutions	501	501	501	Rev.Mile
10300	Transmission Top Gear Ratio	1	1	1	
11340	Transmission Gear Down Gear Ratio	1	1	1	
10080	Vehicle Speed Sensor Type	Magnetic	Magnetic	Magnetic	
11410	Vehicle Setup Transmission Type	Manual	Manual	Manual	
10100	Vehicle Setup Switch Usage	Set/coast and resume/acce	Set/coast and resume/acce	Set/coast and resume/acce	
12479	Top2 Enable	Disabled	Disabled	Disabled	
21561	Water In Fuel Sensor	Disabled	Disabled	Disabled	
21641	Smart RSG	Disabled	Disabled	Disabled	
21741	Electronic Air Compressor Governor	Disabled	Disabled	Disabled	
24000	Smart Lockout	Enabled	Enabled	Enabled	
Multiplexing					
30000	J1939 Multiplexing Enable	Disabled	Disabled	Disabled	

Ready No Parameter Errors Time: 14 Sec.

Figure 7 – VEPS Session Report

Exit Button

This button exits the VCP.

6 Configuration Utility

A configuration utility program is included with the Cummins VCP distribution. This utility allows the user to modify some aspects of VCP operation. The configuration utility may be accessed via the control panel.

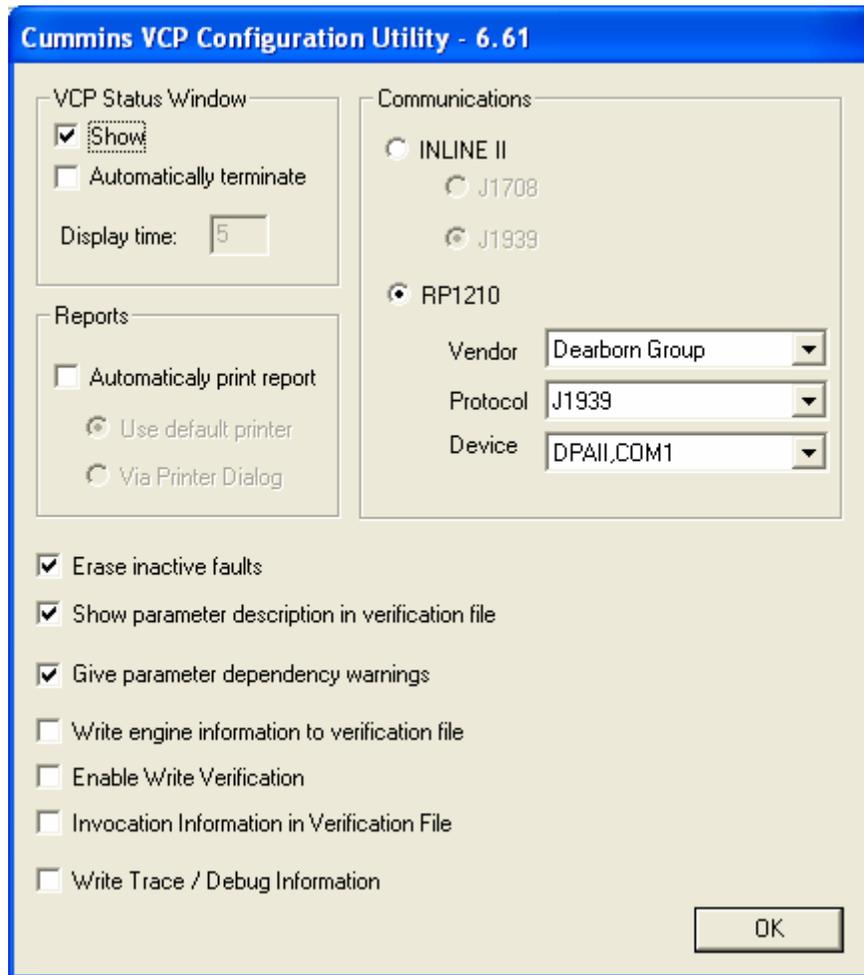


Figure 8 - VCP Configuration Utility

VCP Status Window

The User Interface can be given various behaviors based on the calling environment, and how the VCP is integrated in with the OEM's VEPS system.

VCP Status Window - Show

This check box determines if the VCP user interface is to be displayed. If the user does not want the user interface to be displayed during programming, then this box should be unchecked.

VCP Status Window- Automatically Terminate

This checkbox should be checked if the user desires that the user interface automatically terminate at the end of the VEPS session, instead of waiting for the user to press the Exit button. This option may be used to return control to the calling program without any additional user interaction

VCP Status Window - Display time

This value is only valid when the user has configured the VCP to automatically terminate. This value is the amount of time, in seconds, that the user interface will stay active *after* the VCP session has ended.

Communications

Inline II – J1939

When specifying the Inline II, the VCP will try to communicate with the engine using the protocol that has been selected by the J1708 / J1939 radio buttons. If communications cannot be established with the chosen protocol, the VCP will attempt the alternate protocol before failing. Choosing the protocol that is currently in use will decrease the time needed for the VCP to establish communication with the Engine. The COMM port is selected in the VEPS parameter file. See Section 3.

RP1210

If one or more RP1210 drivers have been installed on the system, the VCP will detect it and enable the RP1210 radio button. If RP1210 is selected, the user must specify which Vendors RP1210 driver to use (if there is more than one), and the protocol and device which is being used. When using RP120, the COMM port specified in the parameter file is ignored, the correct comport must be selected in the Device combo box.

Reports

VEPS session reports can be setup to be printed automatically after the VCP completes programming. If this option is selected, the user can chose to print to the default printer, or print via the print dialog. The advantage to choosing the default printer is to automatically print reports without any additional user interaction. Choosing to print via the print dialog will allow the user to specify the printer, and will also give them a chance to cancel the print job.

Miscellaneous settings

Erase inactive faults

This checkbox should be checked if the user desires that the VCP automatically erase all inactive faults in the ECM after the parameters are programmed.

Show parameter description in verification file

If this checkbox is checked, then all parameters listed in the verification file will have their corresponding parameter description listed. The parameter description will be the last value in the parameter record, and it will be delimited by a comma.

Example 1. Parameter feature is enabled. Parameter description is written in verification file.

```
...
P,0000,0000,5.73,    Rear Axle Ratio
P,0007,0000,520.00, Tire Revolutions per Mile
P,0005,0002,0.74,   Transmission Top Gear Ratio
...
```

Example 2. Parameter feature is disabled. Parameter description is NOT written in verification file.

```
...
P,0000,0000,5.73
P,0007,0000,520.00
P,0005,0002,0.74
...
```

Give warnings for parameter dependencies

Many of the dependencies that are enforced by the VCP can be disabled. These warnings are intended to inform the user that a parameter will have no effect due to the state of a related parameter. Cummins recommends that these dependency warnings be left on to give feed back on potential problems with the parameter set which is being programmed into the ECM. If this check box is unchecked, the VCP will still enforce dependencies which must be enforced to maintain the integrity of the ECM's data.

Example 1. Feature enabled. Feature-parameter errors are recorded in the verification file.

```
...
S,PERROR,T,
P,0013,0000,N,    Cruise Control Enable
P,0060,0959,1.00, Cruise Control Lower Droop
P,0061,0959,0.00, Cruise Control Upper Droop
...
```

Example 2. Feature disabled. Feature-parameter errors are NOT recorded in the verification file.

```
...
S,PERROR,F,
P,0013,0000,N,    Cruise Control Enable
P,0060,0000,1.00, Cruise Control Lower Droop
```

```
P,0061,0000,0.00,    Cruise Control Upper Droop
...
```

Write engine information to verification file

The VCP will always read the Engine Serial Number from the engine. This information is displayed on the user interface. If the user wishes to have this information written to the verification file, then this item should be enabled.

Example. Feature enabled. Engine information is written to the verification file.

```
...
P,5001,0000,ISB,          Engine Type
P,5003,0000, J90669.25,   ECM Code
P,5005,0000,185.00,      Horsepower
P,5007,0000,6069.00,     SC Option
P,5009,0000,9189.00,     DO Option
...
```

Enable Write Verification

To verify that parameters were correctly written to the ECM, at the end of the VCP session, the program will complete a second read of all parameters from the ECM. The VCP program will then compare these values with the values in the parameter file to verify that the values are correct. The process of reading the ECM values the second time adds time to the VCP session.

Invocation Information in Verification File

This setting adds the program invocation information to the third line of the verification file. If this is disabled, the third line of the verification file will be a blank line.

Writer Trace / Debug Information

This setting allows the communications common components to log information to a file which can later be used for debugging. This setting should only be set if directed by your VEPS representative.